B&B ELECTRONICS

Make The Right Connections

TECHNICAL REFERENCE GUIDE

+ PRODUCT FEATURES
+ TECHNICAL SPECIFICATIONS

From the Edge of Nowhere to the Middle of Anywhere

Where does *your* network need to go?

B&B Electronics is a company of engineers, technicians and precision manufacturers. We are committed to bringing to market a full spectrum of best-in-class data communications equipment and networking solutions that are easy to buy, easy to install and, more importantly, easy to use.

For more than three decades, B&B Electronics has engineered and manufactured rugged, reliable networking communications products for industrial, hazardous and demanding environments.

The network edge is continuing to expand, including new applications and new industries in increasingly harsh environments. M2M devices can now be monitored and controlled in locations that were previously unreachable or even unimaginable.

B&B ELECTRONICS

We manufacture the devices and provide the solutions that let you take your network just about anywhere it needs to go.

Find *your* M2M Solution with B&B Electronics...

CELLULAR

FOR REMOTE ACCESS SOLUTIONS:

Running copper cable or fiber optics to remote locations can be quite expensive. And sometimes it cannot be done at all, due to inconvenient geography or a lack of cooperation from property owners along the intended route. But cellular modems and routers will let you monitor and control your equipment anywhere there is cellular cell phone service. They can also provide redundant backhaul for wired systems. So if a backhoe takes your cable connectivity out, your data will still get through.

WIRELESS

FOR M2M CONNECTIVITY:

Wireless data communications open the door to networking opportunities that cable cannot match, but office grade wireless equipment will not stand up to real world environments. We provide the rugged, reliable wireless devices that can actually do the job. We will help you select the most appropriate solution for your application, whether it operates via Wi-Fi, 2.4 GHz, 900 MHz, cellular or another wireless protocol.

FIBER OPTICS

FOR LONG DISTANCE MANAGEMENT:

With long range, high bandwidth and immunity to electromagnetic interference, surges and spikes, fiber optics have become one of the basic building blocks of industrial networks. We provide a broad selection of Managed and Unmanaged Fiber Media Converters, Optical Access/FTTx, SFPs, Fiber-to-Fiber Mode Converters and Chassis options, and support 10, 100, 10/100, 10/100/1000, Gigabit, VDSL, T1/E1 and DS3/E3 technologies.

USB

FOR INSTRUMENTATION & FIELD SERVICE:

USB's convenience, flexibility, and interoperability have simplified everything from cabling to device installation. But its five-meter range limitation and its vulnerability to noise, surges, spikes and ground loops can make it the weakest link in your industrial network. Our USB Hubs, Extenders, Isolators and Converters address those problems and make USB rugged and reliable in industrial environments. For high vibration locations, choose one of our models with high retention ports. They grip standard USB cables firmly and will resist up to 1.54 kg (3.4 lbs.) of force.

SERIAL

FOR LEGACY CONNECTIVITY:

New data communications technologies continue to appear, but too many people have too much invested in legacy serial equipment to let those protocols fall by the wayside. We will help you turn your legacy serial devices into nodes on modern networks, preserving all of their functionality while adding new capabilities, like Ethernet media conversion and Wi-Fi. With the industry's broadest selection of RS-232, RS-422, and RS-485 serial connectivity devices, we will help you get the most out of your equipment investments, both new and old.

ETHERNET

FOR INDUSTRIAL NETWORKING:

Our Ethernet managed and unmanaged switches, extenders and serial device servers are engineered and manufactured for performance in harsh and hazardous environments. We make it easy to link industrial equipment to your Ethernet backbone, and we give you the peace of mind that comes with knowing that your network will give you many years of trouble-free service.

Extending the Network Edge for Specialized Industries

WE OFFER A COMPLETE LINE OF PRODUCTS DESIGNED TO EXPAND NETWORKING CAPABILITIES INTO INDUSTRIAL, HAZARDOUS AND DEMANDING ENVIRONMENTS WHERE MONITOR AND CONTROL WERE PREVIOUSLY UNREACHABLE. LEARN MORE ABOUT THESE SOLUTIONS...

INDUSTRIAL AUTOMATION

New data communication technologies and protocols continue to appear. At the same time, the world's installed base of existing M2M equipment and infrastructure is far too valuable - and far too useful - to discard. So modern industrial networks must be able to network-enable many different kinds of equipment and ensure that each piece is used to its full potential - even when many of the pieces are several technological generations apart.

Whether you're designing an entirely new production system, retrofitting an existing installation or looking for ways to extend the edge of your network, B&B Electronics can provide the right wired or wireless data communications solution. From legacy serial equipment to cellular M2M, we'll help you network-enable just about anything, just anywhere, and we'll see to it that the end result is seamless.

ENERGY UTILITIES

From energy production to wastewater treatment, utilities are expected to deliver uninterrupted, trouble-free service. B&B Electronics provides the connectivity solutions and the rugged, reliable networking devices that will keep your network up and running, even in adverse circumstances and harsh environmental conditions. Wired or wireless, from Modbus to TCP/IP, we'll help you create and maintain network connections that let you monitor and control your equipment wherever you may need it to be.

PETROLEUM/ OIL/GAS

Fossil fuel exploration and production take data networking into some of the harshest environments on the planet. Farther downstream, in the pipelines, the refineries and even the local gas station, conditions are still far from ideal. Whether your application involves monitoring, control or security, and whether your connections need to be wired or wireless, B&B Electronics designs and builds rugged, reliable M2M products and solutions that ensure that your data - as well as the fuel - will get where they need to go.

TRAFFIC AND TRANSPORTATION

To keep modern transportation systems moving, networks must provide connections for signaling systems, digital signage, toll management systems, smart parking, trackside management, telematics, remote mobile asset management and more.

Whether your connections need to be wired or wireless, B&B Electronics provides the tough, reliable M2M networking solutions and connectivity devices that will help you keep your data - and the traffic - flowing smoothly.

SECURITY

In the old days a security system consisted of a watchman with a flashlight and handful of keys. Modern security systems are a bit more complex. They may incorporate any mix of RFID tags and readers, IP/digital cameras, access control systems, video analytics, facial recognition systems, card scanners and biometrics. And every piece has its own communications requirements.

Security cameras need good bandwidth. A parking gate has to function reliably in any weather. A card scanner is useless if its network connection fails. Devices may be located indoors or out, in both public and private spaces. And they'll all need reliable connections.

B&B Electronics has decades of experience in providing data communications solutions. We'll help you extend your network to include any location that needs protection.

TRANSACTION MANAGEMENT

ATMs, ticketing and lottery machines, POS devices and kiosks are normally placed in locations that are convenient for their human users. But they may not look convenient to the network designers who need to connect them to central control.

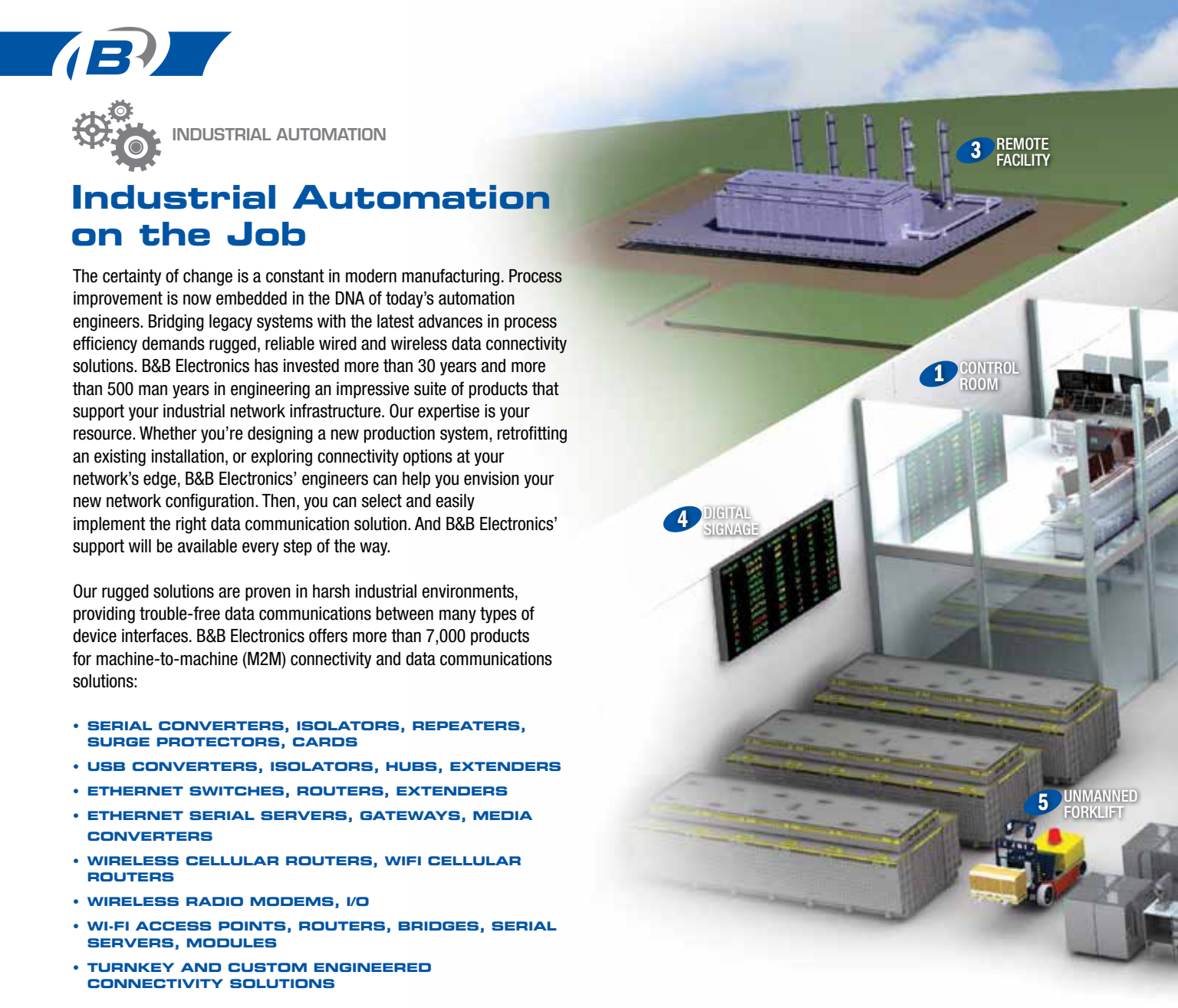
B&B Electronics can eliminate the inconvenience. There's no reason you can't establish rugged, reliable, all weather network connections, wired or wireless, just about anywhere. All you need is the right solution.

Industrial Automation on the Job

The certainty of change is a constant in modern manufacturing. Process improvement is now embedded in the DNA of today's automation engineers. Bridging legacy systems with the latest advances in process efficiency demands rugged, reliable wired and wireless data connectivity solutions. B&B Electronics has invested more than 30 years and more than 500 man years in engineering an impressive suite of products that support your industrial network infrastructure. Our expertise is your resource. Whether you're designing a new production system, retrofitting an existing installation, or exploring connectivity options at your network's edge, B&B Electronics' engineers can help you envision your new network configuration. Then, you can select and easily implement the right data communication solution. And B&B Electronics' support will be available every step of the way.

Our rugged solutions are proven in harsh industrial environments, providing trouble-free data communications between many types of device interfaces. B&B Electronics offers more than 7,000 products for machine-to-machine (M2M) connectivity and data communications solutions:

- SERIAL CONVERTERS, ISOLATORS, REPEATERS, SURGE PROTECTORS, CARDS
- USB CONVERTERS, ISOLATORS, HUBS, EXTENDERS
- ETHERNET SWITCHES, ROUTERS, EXTENDERS
- ETHERNET SERIAL SERVERS, GATEWAYS, MEDIA CONVERTERS
- WIRELESS CELLULAR ROUTERS, WIFI CELLULAR ROUTERS
- WIRELESS RADIO MODEMS, I/O
- WI-FI ACCESS POINTS, ROUTERS, BRIDGES, SERIAL SERVERS, MODULES
- TURNKEY AND CUSTOM ENGINEERED CONNECTIVITY SOLUTIONS



DEEP EXPERTISE IN INDUSTRIAL AUTOMATION AND CONTROL

B&B Electronics supplies a complete line of connectivity solutions, interface products, and other essential elements for industrial automation to control, monitor, and protect your production systems. B&B Electronics' technology is found throughout the plant, connecting critical automation environments.

Process Control

Robotics

Machining Centers

Dispensing

Packaging/Labeling

Warehousing/ Distribution

1 Industrial Serial Converter
485LDRC9
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2 3 Wireless Ethernet Bridge
GhostBridge5
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EIR-M-SC
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5 Wireless Access Point
APXN-Q5428
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6 Modbus Ethernet to Serial Gateway
MESR901
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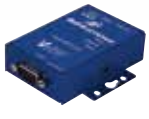

7 Ethernet Mini Serial Server
VESP211
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ENERGY UTILITIES

Energy Production and Distribution and Natural Resource Management

Energy producers and facilities that safeguard natural resources, such as water and wastewater treatment plants, demand an efficient and reliable data communications infrastructure. B&B Electronics can help you integrate the latest data connectivity solutions with your legacy systems to ensure your systems continue to provide dependable performance. For more than 30 years, B&B Electronics has been developing an impressive suite of products to support your energy generation and distribution network infrastructures. Today, you can put that expertise to work for you. Whether you're designing a new system, retrofitting an existing one, or exploring connectivity options at your network's edge, B&B Electronics engineers can help you re-image your network configuration, then help you select and implement the data communication solutions necessary to make it a reality. Technical support will be by your side every step of the way.

Our rugged solutions are proven in harsh environments from mountaintops to deserts, providing trouble-free data communications between many types of device interfaces. B&B Electronics offers more than 7,000 products for machine-to-machine (M2M) connectivity and data communications solutions:

- CLASS 1/DIVISION 2 RATED PRODUCTS
- WIRELESS CELLULAR ROUTERS, WIFI CELLULAR ROUTERS
- WIRELESS RADIO MODEMS, I/O
- WI-FI ACCESS POINTS, ROUTERS, BRIDGES, SERIAL SERVERS, MODULES
- SERIAL CONVERTERS, ISOLATORS, REPEATERS, SURGE PROTECTORS, CARDS
- ETHERNET SWITCHES, ROUTERS, EXTENDERS
- ETHERNET SERIAL SERVERS, GATEWAYS, MEDIA CONVERTERS
- CUSTOM AND OEM ENGINEERED CONNECTIVITY SOLUTIONS

DEEP EXPERTISE IN THE FULL SPECTRUM OF ENERGY AND RESOURCE MANAGEMENT INDUSTRIES

B&B Electronics supplies a complete line of connectivity solutions, interface products, and other essential elements for controlling, monitoring and protecting your systems. B&B Electronics' technology is found throughout modern energy generation and distribution systems and resource management facilities:

Coal & Fossil Fuel Plants

Solar Power Generation

Hydro-Electric Power Systems

Wind Power Generation

Nuclear Power Generation

Public Water Systems

Wastewater Treatment and Monitoring

Well Level Monitoring

1 Modbus Ethernet to Serial Gateway
MESR901

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2 Wireless Ethernet Bridge
GhostBridge5

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3 Radio Modem
ZP24D-250RM-SR

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4 Industrial Ethernet Switch
ESW208-T

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5 Wireless Modem
Conel ER75i v2

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6 Industrial Isolated Serial Repeater
4850PDRi-PH

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PETROLEUM/OIL/GAS

Intelligently Controlling Oil and Gas Generation, Production and Distribution Starts with Smarter Data Communications

Throughout the traditional energy production and distribution infrastructure, B&B Electronics is there. We have experience in serving the full spectrum of energy industry applications, whether in upstream exploration and production or downstream in refineries, pipelines and local gas stations. We bring thirty years of wired and wireless network expertise in all types of harsh and hazardous environments. Whether you're building a new system or expanding or reorganizing an existing one, B&B Electronics' engineers can help you envision your new network configuration, then select and install the right data communication bridges, routers, and gateways.

B&B Electronics brings focused solutions to oil and gas industry applications. Our rugged solutions provide trouble-free data communications. B&B Electronics offers more than 7,000 products for machine-to-machine (M2M) connectivity and data communications solutions:

- WIRELESS CELLULAR ROUTERS, WIFI CELLULAR ROUTERS
- WIRELESS RADIO MODEMS, I/O
- WI-FI ACCESS POINTS, ROUTERS, BRIDGES, SERIAL SERVERS, MODULES
- CLASS 1/DIVISION 2 RATED PRODUCTS
- TELEMATICS
- SERIAL CONVERTERS, ISOLATORS, REPEATERS, SURGE PROTECTORS, CARDS
- ETHERNET SWITCHES, ROUTERS, EXTENDERS
- ETHERNET SERIAL SERVERS, GATEWAYS, MEDIA CONVERTERS
- TURNKEY AND CUSTOM ENGINEERED CONNECTIVITY SOLUTIONS

DEEP EXPERTISE IN THE DATA COMMUNICATIONS NEEDS OF THE OIL AND GAS INDUSTRIES

B&B Electronics supplies a complete line of highly secure connectivity solutions designed for controlling, monitoring and protecting your system in hazardous environments, B&B Electronics' technology is found throughout modern energy generation and distribution systems facilities.

Oil and Natural Gas Exploration and Production

Petroleum Products Storage

Hydraulic Fracturing

Refineries and Pipelines

1 PIPELINES

2 TANK FARM

3 OIL REFINERY

6 TRANSPORT VEHICLES

1

Modbus Ethernet to Serial Gateway

MESR901

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Radio Modem

ZP24D-250RM-SR

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Industrial Ethernet Switch

ESW205-T

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Industrial Wireless I/O

ZXT24-IO-222R

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5

Industrial Isolated Serial Repeater

4850PDRi-PH

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6

Telematics OBDII Streamer

HDV100A3

www.bb-elec.com

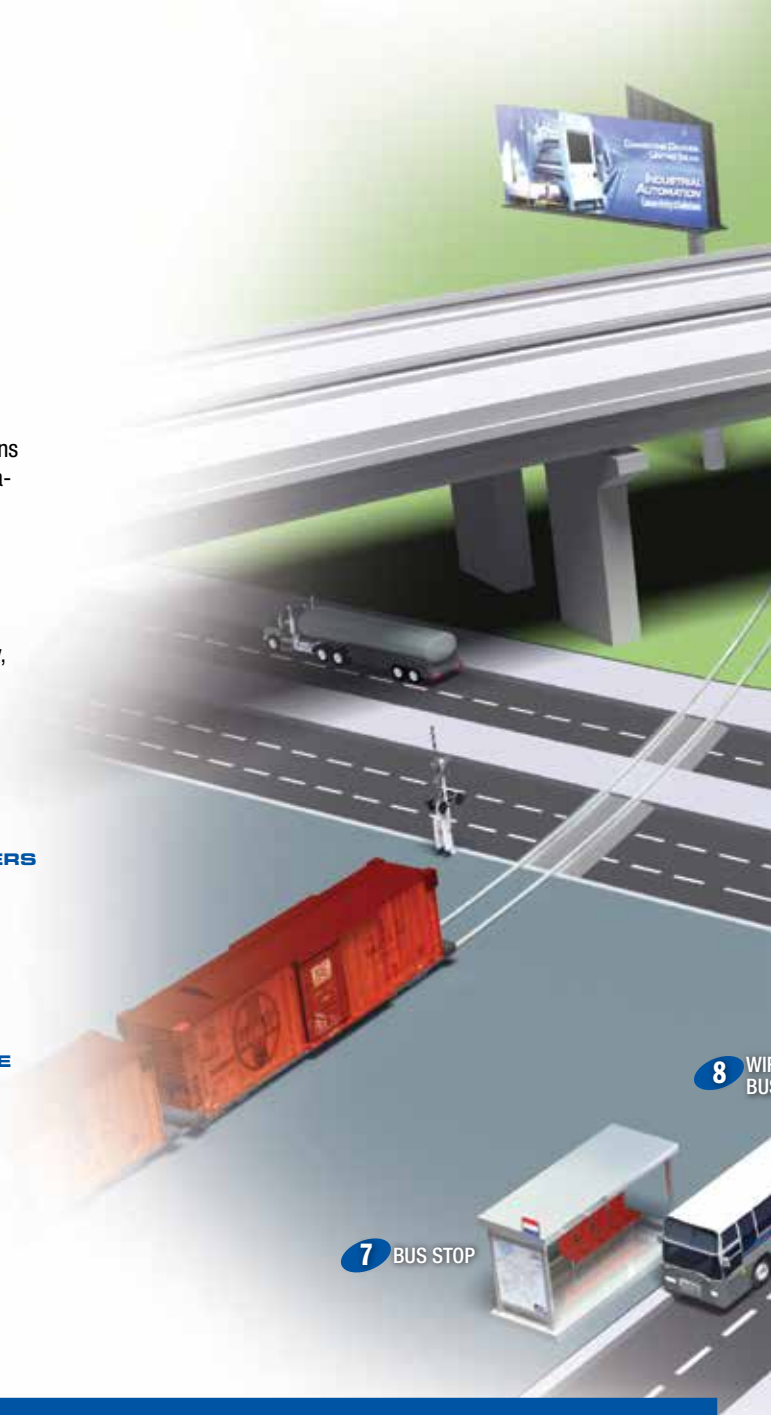
TRAFFIC & TRANSPORTATION

Transportation System Efficiency Starts with Data Communication

Transportation is still the lifeblood of modern commerce – nobody gets paid until the goods are delivered or people make it to work. Data communications solutions from B&B Electronics are at the heart of a growing number of data-driven transportation-related applications. From signaling systems, digital signage, toll management and smart parking to trackside management, telematics and remote mobile asset management, B&B Electronics brings focused solutions to intelligent transportation.

With more than 7,000 products for machine-to-machine (M2M) connectivity, we'll have your transportation solution:

- ETHERNET MEDIA CONVERTERS
- WIRELESS RADIO MODEMS, I/O
- WI-FI ACCESS POINTS, ROUTERS, BRIDGES, SERIAL SERVERS, MODULES
- WIRELESS CELLULAR ROUTERS, WIFI CELLULAR ROUTERS
- TELEMATICS
- ETHERNET SWITCHES, ROUTERS, EXTENDERS
- ETHERNET SERIAL SERVERS, GATEWAYS, MEDIA CONVERTERS
- TURNKEY AND CUSTOM ENGINEERED CONNECTIVITY SOLUTIONS
- SERIAL CONVERTERS, ISOLATORS, REPEATERS, SURGE PROTECTORS, CARDS
- USB CONVERTERS, ISOLATORS, HUBS, EXTENDERS



DEEP EXPERTISE IN DATA COMMUNICATIONS FOR THE TRANSPORTATION INDUSTRY

B&B Electronics supplies a complete line of connectivity solutions, interface products, and essential components to monitor, control and protect your transportation communication systems. B&B Electronics' technology is found throughout modern transportation systems.

Traffic Control, Lights and Cameras

Tollbooths

Parking Control

Fleet Management

Weigh Stations

Subway Systems

Railways

Air Traffic Control

1 Industrial Wireless Ethernet Bridge
ABDN-ER-IN5018

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2 Industrial Wireless I/O
ZXT24-IO-222R

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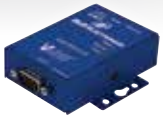

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VESP211

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5 Ethernet to Serial Server
VESR901

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6 Telematics OBDII Streamer
LDVDSB2-SV

www.bb-elec.com

7 8 Wireless Access Point
APXN-Q5428

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SECURITY

The Intelligent Approach to Physical Security Starts with Intelligent Networked Devices

Once, physical security meant armed guards on foot patrol, deadbolt locks and many, many keys. Today, it involves networking systems of RFID tags and readers, IP/digital cameras located inside in both public and private spaces and outside in parking facilities, and access control systems integrating servers, cameras, video analytics, facial recognition systems, card scanners or biometrics. Some systems even incorporate video feeds to monitoring centers and/or to roaming security personnel or their vehicles.

Communications solutions from B&B Electronics are at the heart of a growing number of security-related applications. By combining ruggedness, reliability and extended reach, our technology connects the remote devices you need to protect both people and property around the clock. We offer a broad portfolio of wired and wireless Ethernet solutions for both copper and fiber media, as well as the industry's broadest line of Power over Ethernet (PoE) products to address IP devices anyplace, even if local power is not available.

With more than 7,000 products for machine-to-machine (M2M) connectivity, B&B is your one-stop source when building physical security systems:

- ETHERNET MEDIA CONVERTERS
- ETHERNET SERIAL SERVERS, GATEWAYS, MEDIA CONVERTERS
- ETHERNET SWITCHES, ROUTERS, EXTENDERS
- WIRELESS RADIO MODEMS, I/O
- WI-FI ACCESS POINTS, ROUTERS, BRIDGES, SERIAL SERVERS, MODULES
- WIRELESS CELLULAR ROUTERS, WIFI CELLULAR ROUTERS
- SERIAL CONVERTERS, ISOLATORS, REPEATERS, SURGE PROTECTORS, CARDS
- USB CONVERTERS, ISOLATORS, HUBS, EXTENDERS

2 CONSTRUCTION SITE SECURITY CAMERA

DEEP EXPERTISE IN DATA COMMUNICATIONS FOR THE PHYSICAL SECURITY INDUSTRY

B&B Electronics supplies a complete line of highly secure connectivity solutions designed for controlling, monitoring and protecting your assets, visitors and personnel. B&B Electronics' technology is integral to networking new facilities and modernizing legacy assets in existing ones.

Corrections

Education

Finance

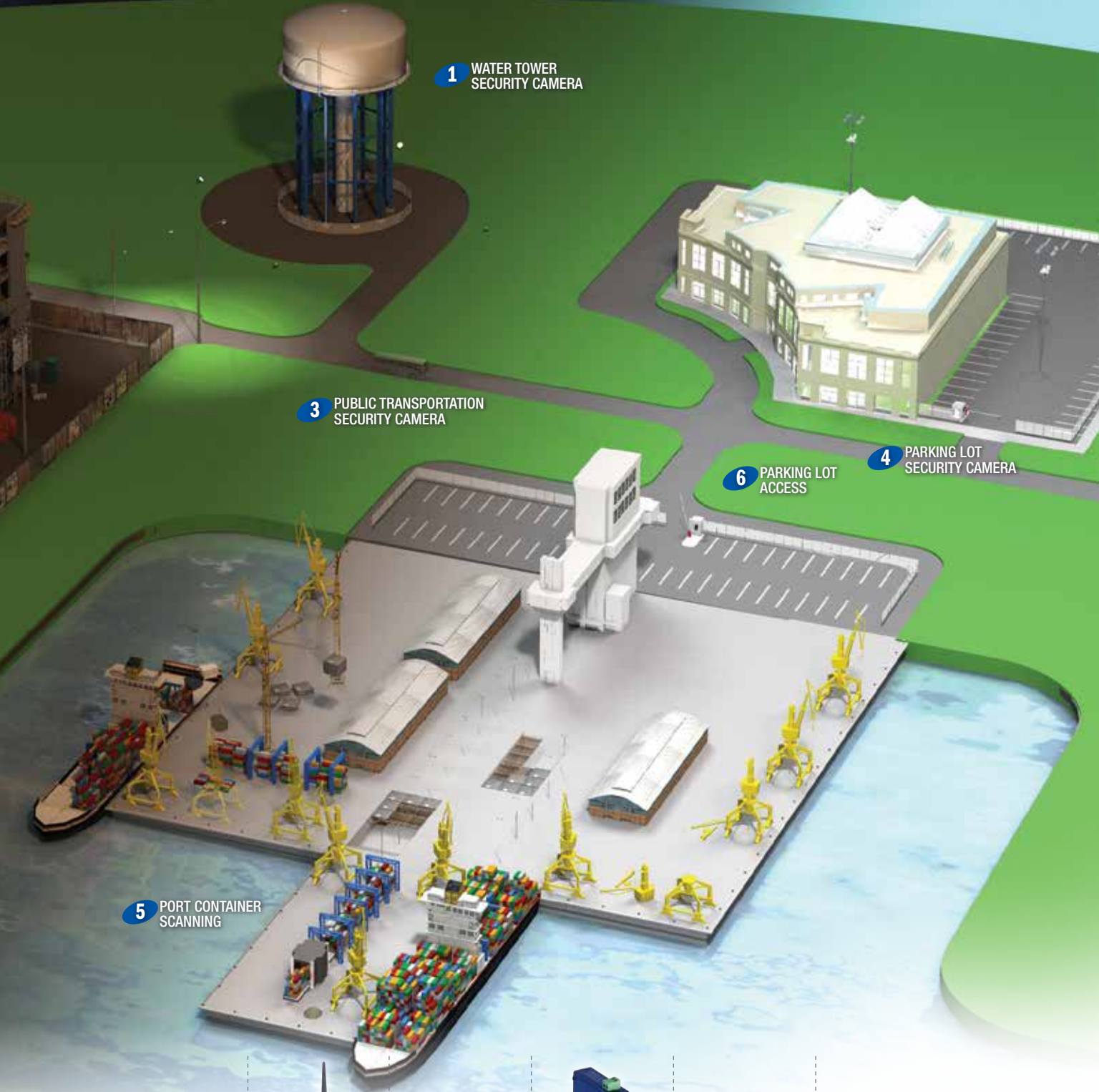
Gaming

Government/ Municipalities

Healthcare

Infrastructure Protection

Retail



1 Industrial Wireless Ethernet Bridge *ABDN-ER-IN5018*

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2 Industrial Wireless I/O *ZXT24-IO-222R*

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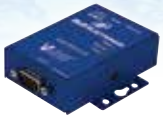

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www.bb-elec.com

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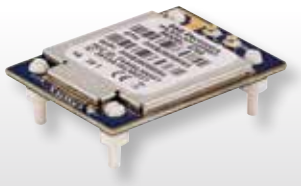

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ZLINX
2.4 GHz, IP67, Outdoor
Model: ZXT2440-
Mode
Modbus
P2P Master
P2P Slave
I/O Status
DI
DO
Wireless
Power
ELECTRONICS
SPECTRE 3G
USR
SIM2
SIM1
WAN
DAT
PWR
ANT
DIV
RST
I/O
USB
PORT2
PORT1
ETH
PWR

WIRELESS CONNECTIVITY

THAT EXTENDS YOUR INDUSTRIAL NETWORK TO THE EDGE

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EXTEND YOUR INDUSTRIAL NETWORK TO THE EDGE

B&B Electronics has been expanding and reinforcing its reputation as a global source for best-in-class rugged, reliable network and data communications products for more than three decades. And today, increasingly, wireless is the solution of choice for M2M device connectivity.

- *Vehicle Telematics & Diagnostics*
- *Security & Access Control*
- *Industrial Automation Test & Measurement*
- *Water and Waste-water treatment*
- *Monitoring and Instrumentation*
- *Medical Equipment*
- *Energy Management*
- *Retail / Point of Sale Products*
- *Metrology, Alarm and Warning Systems*

WIRELESS SOLUTIONS

CELLULAR ROUTERS

- GPRS / EDGE / UMTS / HSDPA / HSUPA / HSPA+ routers
- 3G routers are equipped with 10/100 Ethernet port and optional interfaces (RS-232, RS-422, RS-485, Modbus or I/O)
- Wi-Fi 802.11a/b/g/n access point

WIRELESS I/O AND RADIO MODEMS

- 2.4 GHz short range, 900 MHz long range (Class 1/Division 2)
- IP30 ingress protection rated
- Top of the line AES security
- Wide temperature range (-40 to +80˚C)
- Low latency response rates
- Modbus compatible
- Dual power, 10-40VDC or 24VAC
- Outdoor IP67 rated models

WI-FI ETHERNET BRIDGES, ROUTERS, SERIAL DEVICE SERVERS, AND ACCESS POINTS

- Wide temperature (-40 to +85°C), environmental specifications
- Plug-n-play serial and Ethernet to 802.11a/b/g/n connectivity
- Enterprise Class wireless security (WPA2/WPA-Enterprise, WPA2/WPAPreShared Key, WEP, Open, EAP, 802.11i)
- AirborneM2M Management Center™ - device discovery, control and management
- Variable 5-36 VDC power supply
- AirborneM2M SpeedLink roaming for enhanced connection reliability
- Supports Airborne Portflex technology for advanced port configuration and routing
- Compact form factor in a rugged metal box
- Access point & wireless router with serial device server support

WI-FI EMBEDDED MODULES

- Wide operating temperature (-40 to +85°C)
- Enterprise Class wireless security (WPA2/WPA-Enterprise, WPA2/WPAPreShared Key, WEP, Open, EAP, 802.11i)
- 32-bit ARM9 processor with 802.11a/b/g/n radio for increased range and throughput
- Airborne Management Center – discover, control, manage devices
- Advanced low power modes for power save applications
- Access point & wireless router with serial device server support

HIGH-SPEED WIRELESS ETHERNET BRIDGE

- Secure, long-range Ethernet
- Fast, easy and secure high-speed wireless Ethernet right out of the box. Zero set-up — just aim it, mount it and plug it in.
- 80° 15 dBi sector antenna integrated into the housing
  5 GHz radio built from 802.11n 2X2 MIMO technology for long range connectivity (15 km/9 mi)
- Temperature range of -30 to +80°C
- UV stable plastic case rated for outdoor use
- Maximum data rate of 150 Mbps

Class 1/Division 2 Certified For Hazardous Locations

Zlinx® Xtreme Radio Modems & I/O
Zlinx® Standard Long-range Radio Modem
Zlinx® Standard Wireless I/O

For applications that require C1/D2 certification, B&B Electronics has a range of connectivity and communication solutions designed to operate in hazardous environments.

- see page 470 for a complete listing of C1D2 products.

c UL us LISTED

WIRELESS CONNECTIVITY

WHICH IS RIGHT FOR YOU?

CELLULAR - NORTH AMERICA

PRODUCT FAMILY	Cellular Router	Cellular Router
PRODUCT SERIES	**Spectre 3G**	**Spectre 3G WiFi**
MOBILE WIRELESS NETWORK TECHNOLOGY		
GPRS	✔	✔
UMTS/HSPDA	✔	✔
UMTS/HSPA+	✔	✔
CDMA 2000 1X, EV-DO REV A,B	✔	✔
Wi-Fi Ethernet		✔
COMMUNICATION INTERFACES AND EXPANSIONS		
Ethernet 10/100	✔	✔
Ethernet 10/100 3-port switch	✔	
Wi-Fi (IEEE 802.11 b,g,n)		✔
USB Host	✔	✔
RS232/RS422/RS485	✔	✔
MBUS, Wireless MBUS	✔	✔
I/O CNT	✔	✔
I/O CNT (1xIN/1xOUT)	✔	✔
DESIGN, DIMENSIONS, SIM, ENVIRONMENTAL		
Metal Casing (42x80x113 mm/1.7x3.1x4.5 in))	✔	✔
2xSIM Card	✔	✔
Antenna Rx Diversity	✔	✔
Power Supply 10V - 30V DC	✔	✔
Operating Temperature -30° to +60° C	✔	✔
DIN holder TS35/TS32	✔	✔

continued...

PRODUCT FAMILY	Cellular Router	Cellular Router
PRODUCT SERIES	**Spectre 3G**	**Spectre 3G WiFi**
FUNCTIONS		
Linux	✔	✔
IPSec (DES, 3DES, AES, MD5, SHA-1, DH2, DH5)	✔	✔
OpenVPN, PPTP, L2TP, GRE	✔	✔
Authentication (X509 certification, Pre-shared Key, PW)	✔	✔
EasyVPN	✔	✔
Firewall	✔	✔
DHCP	✔	✔
NAT/PAT	✔	✔
HTTP/HTTPS Server	✔	✔
Telnet/SSH	✔	✔
DynDNS	✔	✔
FTP Server	✔	✔
NTP Server, NTP Client	✔	✔
SNMP	✔	✔
VRRP	✔	✔
SMTP, E-mail	✔	✔
SMS Functions	✔	✔
VLAN 802.1Q	✔	✔
QoS, IGMP, BGP, OSPF, RIP	✔	✔
PPPoE Bridge	✔	✔
COM Port TCP/UDP server/client	✔	✔
Modbus RTU/TCP Gateway	✔	✔
4 Configuration Profiles	✔	✔
Automatic Configuration and FW Upgrade	✔	✔
Page	**34**	**36**

WIRELESS CONNECTIVITY

WHICH IS RIGHT FOR YOU?

CELLULAR

PRODUCT FAMILY	Cellular Router	Cellular Router	Cellular Router	Cellular Router	Cellular Router	Cellular Router	Cellular Router
PRODUCT SERIES	**ER75i v2**	**UR5i v2 Libratum**	**UR5i v2**	**LR77 v2**	**CR10 v2**	**UCR11 v2**	**XR5i v2**
MOBILE WIRELESS NETWORK TECHNOLOGY							
GPRS	✔	✔	✔	✔		✔	
UMTS/HSPDA		✔	✔	✔		✔	
UMTS/HSPA+		✔	✔	✔		✔	
LTE				✔			
CDMA 2000 1X, EV-DO Rev A,B					✔	✔	
WAN Ethernet	optional	optional	optional	optional	optional	optional	✔
COMMUNICATION INTERFACES AND EXPANSIONS							
Ethernet 10/100	✔	2x	✔	✔	✔	✔	✔
Ethernet 10/100 3-port switch	optional		optional	optional	optional	optional	
Wi-Fi (IEEE 802.11 b,g,n)	optional	optional	optional	optional	optional	optional	optional
USB Host	✔		✔	✔	✔	✔	✔
RS232/RS422/RS485	optional		optional	optional	optional	optional	optional
MBUS, Wireless MBUS	optional		optional	optional	optional	optional	optional
I/O CNT	optional		optional	optional	optional	optional	optional
I/O CNT (1xIN/1xOUT)	✔		✔	✔	✔	✔	✔
GPRS Receiver			optional	optional			
DESIGN, DIMENSIONS, SIM, ENVIRONMENTAL							
Plastic Casing (50x83x116 mm/2.0x3.3x4.6 in)	optional	optional	optional	optional	optional	optional	optional
Metal Casing (42x80x113 mm/1.7x3.1x4.5 in)	optional	optional	optional	optional	optional	optional	optional
2xSIM Card	optional	✔	optional	optional		optional	optional
Antenna Rx Diverity		✔	✔	✔	optional		
Power Supply 10V - 30V DC	✔	✔	✔	✔	✔	✔	✔
Operating Temp. -30° to +60° C	✔	+70°C	✔	✔	✔	✔	✔
DIN holder TS35/TS32	✔	✔	✔	✔	✔	✔	✔

continued...

PRODUCT FAMILY	Cellular Router	Cellular Router	Cellular Router	Cellular Router	Cellular Router	Cellular Router	Cellular Router
PRODUCT SERIES	**ER75i v2**	**UR5i v2 Libratum**	**UR5i v2**	**LR77 v2**	**CR10 v2**	**UCR11 v2**	**XR5i v2**
FUNCTIONS							
Linux	✔	✔	✔	✔	✔	✔	✔
IPSec (DES, 3DES, AES, MD5, SHA-1, DH2, DH5)	✔	✔	✔	✔	✔	✔	✔
OpenVPN, PPTP, L2TP, GRE	✔	✔	✔	✔	✔	✔	✔
Authentication (X509 certification, Pre-shared Key, PW)	✔	✔	✔	✔	✔	✔	✔
EasyVPN	optional	optional	optional	optional	optional	optional	optional
Firewall	✔	✔	✔	✔	✔	✔	✔
DHCP	✔	✔	✔	✔	✔	✔	✔
NAT/PAT	✔	✔	✔	✔	✔	✔	✔
HTTP/HTTPS Server	✔	✔	✔	✔	✔	✔	✔
Telnet/SSH	✔	✔	✔	✔	✔	✔	✔
DynDNS	✔	✔	✔	✔	✔	✔	✔
FTP Server	✔	✔	✔	✔	✔	✔	✔
NTP Server, NTP Client	✔	✔	✔	✔	✔	✔	✔
SNMP	✔	✔	✔	✔	✔	✔	✔
VRRP	✔	✔	✔	✔	✔	✔	✔
SMTP, E-mail	✔	✔	✔	✔	✔	✔	✔
SMS Functions	✔	✔	✔	✔	✔	✔	✔
VLAN 802.1Q	✔	✔	✔	✔	✔	✔	✔
QoS, IGMP, BGP, OSPF, RIP	optional	optional	optional	optional	optional	optional	optional
PPPoE Bridge	✔	✔	✔	✔	✔	✔	✔
COM Port TCP/UDP server/client	✔		✔	✔	✔	✔	✔
Modbus RTU/TCP Gateway	optional		optional	optional	optional	optional	optional
4 Configuration Profiles	✔	✔	✔	✔	✔	✔	✔
Automatic Configuration and FW Update	✔	✔	✔	✔	✔	✔	✔
ADDITIONAL SOFTWARE SUPPORT							
SW Plug-in Modules	✔	✔	✔	✔	✔	✔	✔
Page	**38**	**40**	**42**	**44**	**46**	**48**	**50**

WIRELESS CONNECTIVITY

WHICH IS RIGHT FOR YOU?

WIRELESS BASE I/O

PRODUCT FAMILY	Wireless I/O	Wireless I/O	Wireless I/O	Wireless I/O	Wireless I/O
PRODUCT SERIES	**Zlinx Xtreme**	**Zlinx Xtreme**	**Zlinx Standard**	**Zlinx Standard**	**Zlinx Standard**
Frequency	900 MHz	2.4 GHz	900 MHz	2.4 GHz	868 MHz
Max TX Power	1 W	63mW	1 W	63mW	316 mW
Over-the-air Data Rate	115 Kbps or 9600 bps	250 Kbps	115 Kbps or 9600 bps	250 Kbps	24 Kbps
AES Encryption	256 Bit	128 Bit	256 Bit	128 Bit	128 Bit
Range (outdoor) w/Supplied Antenna (line of sight)	14 mi/22.5 km	1 mi/1.6 km	14 mi/22.5 km	1 mi/1.6 km	25 mi/40 km
Range (indoor) w/Supplied Antenna (line of sight)	3000 ft/ .91 km	300 ft/ 91 m	3000 ft/ 91 km	300 ft/ 91 m	1800 ft/549 m
Enclosure IP67	✔	✔			
Serial 232/422/485					
Max Digital Inputs/Outputs (base)	2	2	4	4	4
Max Analog Inputs/Outputs (base)	2	2	2	2	2
Accepts IO Expansion Modules			✔	✔	✔
Repeater Mode	✔		✔		
DC Input 10 - 40 VDC			✔	✔	✔
DC Input 10 - 30 VDC	✔	✔			
AC Input 24 VAC			✔	✔	✔
Modbus RTU/ASCII	✔	✔	✔	✔	✔
Operating Temp (-40 to 74°C)	✔	✔			
Operating Temp (-40 to 80°C)			✔	✔	✔
Class 1/Division 2			✔	✔	
NEMA TS2					
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WIRELESS RADIO MODEMS

Radio Modem	Radio Modem	Radio Modem	Radio Modem	Radio Modem
Zlinx Xtreme	**Zlinx Xtreme**	**Zlinx Standard**	**Zlinx Standard**	**Zlinx Standard**
900 MHz	2.4 GHz	900 MHz	2.4 GHz	868 MHz
1 W	63 mW	1 W	63 mW	316 mW
115 Kbps or 9600 bps	250 Kbps	115 Kbps or 9600 bps	250 Kbps	24 Kbps
256 Bit	128 Bit	256 Bit	128 Bit	128 Bit
14 mi/22.5 km	1 mi/1.6 km	14 mi/22.5 km	1 mi/1.6 km	25 mi/40 km
3000 ft/ 91 km	300 ft/ 91 m	3000 ft/ 91 km	300 ft/ 91 m	1800 ft/549 m
✔	✔			
✔	✔	✔	✔	✔
✔		✔		
		✔	✔	✔
✔	✔			
		✔	✔	✔
✔	✔	✔	✔	✔
✔	✔			
		✔	✔	✔
		✔	✔	
✔	✔			
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WIRELESS CONNECTIVITY

WHICH IS RIGHT FOR YOU?

WIRELESS BASE I/O

PRODUCT FAMILY	Ethernet Bridge/Routers	Ethernet Bridge/Routers, Serial Servers	Access Point	Enterprise & Access Point	Ethernet Bridge
PRODUCT SERIES	**AirborneM2M Enterprise**	**AirborneM2M Industrial**	**AirborneM2M**	**Embedded Modules**	**GhostBridge**
802.11a/b/g/n	✔	✔	✔	✔	✔ (n)
RS232/422/485		✔	✔	2 UARTS	
10/100 Ethernet	✔	✔	✔	✔	
Access Point Mode			✔	✔	✔
WPA/WPA2 Enterprise	✔	✔	✔	✔	✔
Encrypted Config	✔	✔	✔	✔	
SSH/SSL Tunnel	✔	✔	✔	✔	
Username/Password	✔	✔	✔	✔	✔
HTTP (Web Server)	✔	✔	✔	✔	
DHCP Server	✔	✔	✔	✔	
NAT3 Router	✔	✔	✔	✔	
Bridge	✔	✔	✔	✔	✔
Command Line Interface	✔	✔	✔	✔	
-40°C to +85°C	✔	✔	✔	✔	✔
Barrel Jack (5VDC)	✔	✔	✔	✔	✔
Terminal Block (5-36VDC)		✔	✔		
PoE (802.3af PD)		✔	✔		✔
SAE-J1455 Environmental	✔	✔	✔	✔	
FCC (US)	✔	✔	✔	✔	✔
IC (Canada)	✔	✔	✔	✔	✔
CE (Europe)	✔	✔	✔	✔	✔
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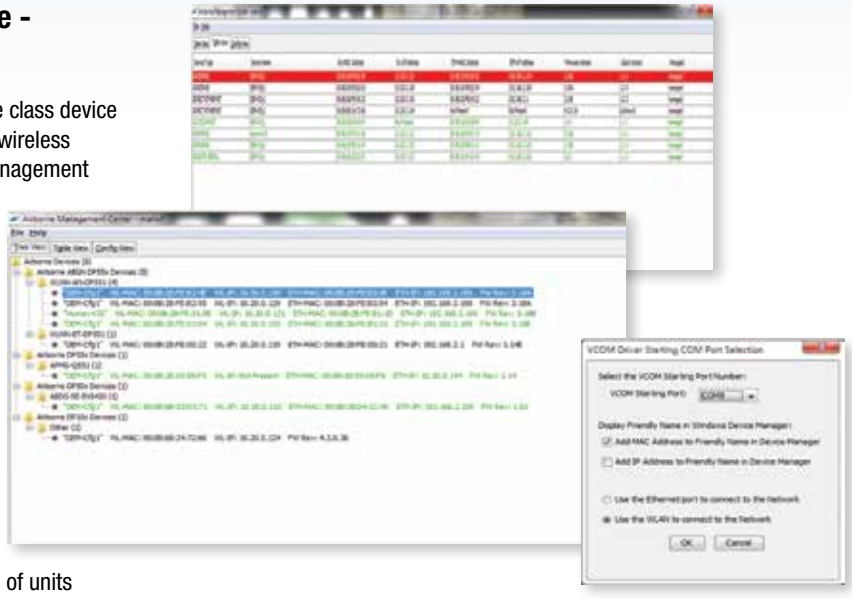
THE AIRBORNEM2M™ MANAGEMENT CENTER (AMC)

Managing AirborneM2M devices is simple - whether you have one or one thousand

AirborneM2M Management Center (AMC) brings enterprise class device discovery, control, and management to the world of M2M wireless devices. The application supports individual and group management of all device details:



- Configuration and firmware management
- Deliver certificates and private keys
- Access and monitor groups of devices
- Access management (passwords)
- Virtual COM port installation
- Devices update their firmware in the background
- Directly launch web browser for devices from AMC
- Supports cloning device configurations across groups of units
- Records configuration changes for automatic update logging
- Remembers discovered devices, maintains configuration databases
- Allows unauthorized devices to be marked as rogue
- Automatically informs user of new and unmanaged devices
- Predefined device configuration templates available
- Included JAVA application runs on Windows, Linux, Mac platforms

SpeedLink The AirborneM2M SpeedLink roaming feature provides high level connection reliability, enabling mobile and OEM devices to roam quickly and freely on a wireless network without losing important data or connection. Airborne PowerSave firmware enables OEMs to maximize efficiency and reduce power consumption by up to 70% - critical for battery powered mobile devices. Whether you're walking around a hospital or driving through a warehouse, SpeedLink ensures you stay connected.

FULLY MODULAR CONCEPT – BUY EXACTLY WHAT YOU NEED

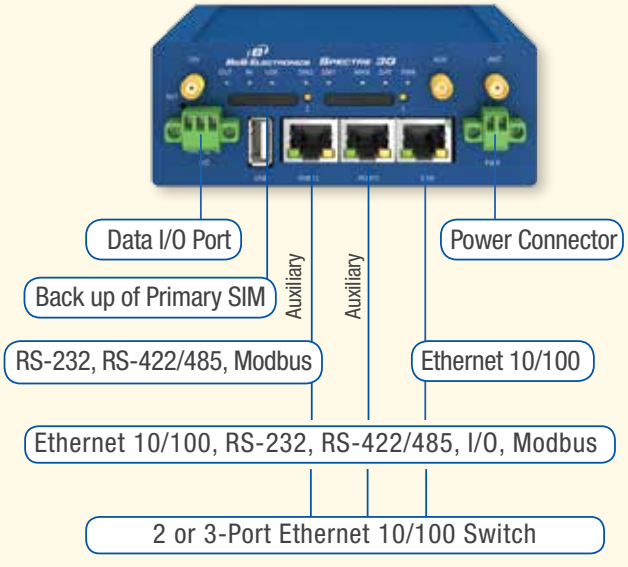
FIXED COMMUNICATION INTERFACES:

- Ethernet 10/100
- USB Host
- I/O port with 1x input and 1x output
- 2 SIM card holders

Optional interfaces to optimize according to your application, with the ability to add additional interfaces in the future:

- 1-2x Ethernet 10/100 with possible modes:
  - 2-port Ethernet switch
  - 3-port Ethernet switch
  - 2x independent LAN
  - 1x independent LAN and 2-port Ethernet switch
- RS-232 serial port
- RS-422/485 galvanic separation possible
- Modbus master for up to 30 slave meters
- I/O CNT interface including 4x binary inputs:
  2 inputs may be configured as counter,
  2x analogue inputs and 1x binary output
- Wi-Fi 802.11a/b/g/n

SPECTRE 3G FEATURES:



Certified for use with these networks:

AT&T, Verizon, Sprint, T-Mobile, and Rogers

Contact B&B Electronics for the latest approvals.

HSPA+/UMTS/CDMA/EDGE/GPRS ROUTER

ROUTER	CELLULAR WIRELESS NETWORK TECHNOLOGY	MAX DOWNLOAD	MAX UPLOAD
Spectre 3G CDMA/ GSM router	UMTS/HSPA+ & GPRS/EDGE & CDMA	14.4 Mbps	5.7 Mbps

USA, Canada.
Check with your local distributor for availability and options.

FUNCTIONS & SOFTWARE FEATURES

B&B Electronics routers offer enhanced functionality, incorporating self-diagnostics and a hardware watchdog, ensuring secure and consistent operability and ultra-reliable wireless connections. For critical applications, these routers offer SMS and email messaging and control capability for remote alerts and resets. They support the most commonly used LAN/ WAN network protocols and B&B Electronics's custom software allows for easy, flexible and effective networking and management.

NETWORKING

- DHCP: automatic IP addressing in LAN network
- NAT/PAT: IP address and port translation
- Firewall: filtering of addresses, ports, protocols
- VRRP: virtual backup router function
- DynDNS client: access to the dynamic IP address
- VLAN 802.1Q: virtual LAN
- QoS: quality of service
- PPPoE Bridge: PPP over Ethernet Bridge mode
- Dial-in: communicate over dial CSD call
- NTP client, NTP server: time synchronization

VPN TUNNELING

- IPSec, OpenVPN, PPTP, L2TP, EasyVPN, GRE
- Authentication by certificates, shared keys, name/password

REMOTE ROUTER SUPERVISION & MASS NETWORK MANAGEMENT

- HTTP/HTTPS, Telnet/SSH for local and remote configuration and firmware updates
- Automatic configuration and firmware updates from FTP/HTTP server by schedule
- Up to 4 independent configuration profiles can be stored and remotely switched using scripts, SMS messages, I/O, etc.
- Additional software for easy networking and monitoring SmartCLUSTER and R-SeeNet

DIAGNOSTICS

- Detailed logs of operational information, including signal status and data traffic
- Signal level data, cell identifiers and data traffic are saved in router's memory for up to 2 months
- SNMP: router diagnostics, communication with I/O and M-Bus
- LED indication: signal strength, connection status, ports

SMS & EMAIL INFO

- Information about status, connection or disconnection and many others
- SMS control: on/off connection, switching SIM, router profile, I/O, etc.
- SMS communication: AT commands (RS232 and TCP/IP), I/O or HTTP

MODULAR LINUX SOFTWARE ENVIRONMENT

Open LINUX based system allows use of common LINUX commands, scripts and other features. B&B Electronics routers offer an extension of standard firmware with optional software plug-ins. You can create your own plug-in and simply apply it to the router. The router has 128kb non-volatile RAM memory, ready for data collection and processing applications that can be expanded with USB port if desired.

SOFTWARE PLUG-INS

- Easy VPN client: secure, encrypted VPN
- Dynamic routing protocols: BGP, OSPF, RIP
- QoS: quality of service
- IGMP: multicast protocols
- Modbus RTU/TCP gateway and mapping: convert data from RTU to TCP/IP format

Spectre 3G Specifications at a Glance

Sometimes the answer is isn't just great products – it is a great solution that is more than the sum of the products. Our engineering support teams can handle special network challenges and provide unique solutions for specific applications. Whether it's combining cellular routers with wireless radios to support dual cellular networks, or producing a custom product design, B&B Electronics is your best connection for innovative cellular solutions.

DATA TRANSFER TECHNOLOGY	
UMTS/HSPA+	✔
UMTS/HSUPA	✔
UMTS/HSDPA	✔
GPRS/EDGE	✔
CDMA	✔
PORTS & INTERFACES - SEE PRODUCT DETAILS FOR MORE INFORMATION	
Ethernet 10/100	✔
USB Host	✔
RS-232	optional
RS-485	optional
Modbus	optional
I/O	optional
3-Port 10/100 Ethernet Switch	optional
Ethernet 10/100 WAN Port	optional
Wi-Fi 802.11b/g/n	optional
OPERATING TEMPERATURE	
-30°C to +60°C	✔
POWER SUPPLY	
10-30 VDC	✔
SIMS	
SIM card slots (2)	✔

OPTION ALLOWING ATTACHMENT TO DIN RAIL	
OPERATING SYSTEM	
Linux	✔
BASIC FUNCTIONS - SEE PRODUCT DETAILS FOR MORE INFORMATION	
VPN-Ipsec	✔
VPN-OpenVPN	✔
VPN-L2TP	✔
VPN-GRE	✔
DHCP	✔
HTTP server	✔
FTP	✔
NAT/PAT	✔
SNMP	✔
VRRP	✔
DynDNS	✔
NTP	✔
Telnet	✔
SSH	✔
PPoE bridge	✔
SMS + e-mail functions	✔
Auto config/FW update	✔
SmartCLUSTER	✔

SELECT YOUR SPECTRE 3G SOLUTION

MODEL NO.	PORT 1	PORT 2	WI-FI
RT3G-300	–	–	
RT3G-302	–	RS-232	
RT3G-304	–	RS-422/485	
RT3G-322	RS-232	RS-232	
RT3G-324	RS-232	RS-422/485	
RT3G-330	12-bit I/O (AI, DI, DO)	–	
RT3G-311	Ethernet	Ethernet	
RT3G-310	Ethernet	–	
RT3G-300-W	–	–	✔
RT3G-310-W	Ethernet	–	✔
RT3G-320-W	RS-232	–	✔
RT3G-330-W	12-bit I/O (AI, DI, DO)	–	✔
RT3G-340-W	RS-422/485	–	✔

USA, Canada.
Check with your local distributor for availability and options.

Smart Decisions Begin with Intelligent Management Software

R-SEENET

R-SEENET - MONITORING & MANAGEMENT SOFTWARE

R-SeeNet is the software system used for monitoring B&B Electronics routers. It continuously collects information from individual routers in the network and records the data into a SQL database. This data is then presented in a clear and concise dashboard for the Network Administrator to effectively manage their devices.

R-SeeNet consists of two parts:

R-SeeNet Server

A server application that can be programmed to automatically send SNMP queries (Simple Network Management Protocol) to each router defined in the network. The application retrieves status information from the routers and records it in the SQL database.

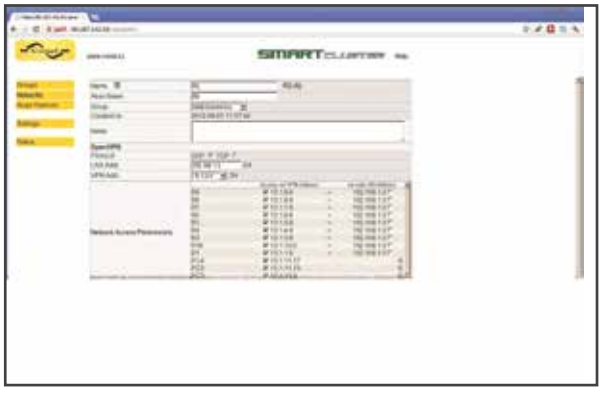
R-SeeNet PHP

A web-based application that accesses the SQL database and provides the Network Administrator detailed information on the individual routers and health of the network.

AVAILABLE DATA

Everything you need to know about your network's current status as well as a historical view of the information transferred today, yesterday, this week, this month and last month.

- Signal strength
- Data traffic
- Response time
- Router availability
- Number of PPP connections
- Number of various channels connected
- Visual reports, tables and graphs
- Up to 2 months of past data for each router



SMARTCLUSTER

SMARTCLUSTER - INTERNET VPN PORTAL

SmartCLUSTER is software designed to create safe communications systems while using a public network - the Internet. SmartCLUSTER is an OpenVPN server that offers three functions for the creation of safe private networks in a public environment.

1. As an OpenVPN server it connects clients (B&B Electronics routers and end-user computers) via an OpenVPN tunnel. It creates communication links between individual tunnels and thereby enables individual devices to communicate with each other.

2. Based on the user-defined network configuration and connection parameters of VPN tunnels, SmartCLUSTER creates a configuration file for B&B Electronics routers and also creates secure certificates for both sides of the secured OpenVPN tunnel. This allows the user to install individual B&B Electronics routers easily into a virtual private network, confident the system is secure against attacks or unauthorized access.

3. SmartCLUSTER can be used as an instrument for basic network management through information on the connection status of individual routers.

THE SMARTCLUSTER SOLUTION

- SmartCLUSTER provides solutions for applications where you need to connect devices on local area networks (LANs), and a router. The router provides the communication with the LAN and does not have a public internet IP address. SmartCLUSTER solves problems relevant to network security and the secure connection of individual local networks.

- SmartCLUSTER solves the problem of how to connect devices which are behind routers with cellular service sourced from various network operators.

Cellular Router - CDMA/HSPA

Spectre 3G Series

PRODUCT FEATURES

- Designed for M2M applications
- Modbus TCP to Modbus RTU
- Modular design to fit application requirements
- Dual SIM Cards for redundant backhaul
- Up to 5.7 Mbps upload/14.4 Mbps download
- LINUX Platform & Advanced Networking Functions
- 'C' based dev environment to build user applications

The Spectre 3G cellular router connects Ethernet equipment and remote LANs via the cellular telephone network. It creates secure Ethernet connections in locations where cable connections are impractical, as is so often the case with devices like ATM machines and remote video cameras. The Spectre 3G also creates reliable mobile Ethernet connections.

With upload speeds of up to 5.7 Mbps and download speeds of up to 14.4 Mbps, the Spectre 3G provides ample bandwidth, even for applications that require video. The standard configuration includes multiple 10/100 Ethernet ports, one USB host port, one binary input/output (I/O) port and dual SIM card holders. The second SIM card holder provides network redundancy, as the router can automatically switch between cellular service providers if one connection fails.

The router supports the creation of VPN tunnels using IPsec, OpenVPN and L2TP. It supports DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS, and numerous other functions, as well as additional software like SmartCluster, VPN Server and R-SeeNet. A password-protected Web interface allows users to configure and manage the Spectre 3G from remote locations. The router can automatically upgrade its configuration and firmware from the operator's central server, allowing for simultaneous mass reconfiguration of every router on the network.

Users may insert Linux scripts and they can create up to four different configurations for the same router. Examples would include the SMS and binary input configurations. Users may switch from one configuration to another at any time.

ORDERING INFORMATION

MODEL NUMBER	ETHERNET 10/100	USB	I/O	RS232	RS422/485	I/O INPUT/ OUTPUT
RT3G-300	1	1	1			
RT3G-302	1	1	1	1		
RT3G-304	1	1	1		1	
RT3G-310	2	1	1			
RT3G-311	3	1	1			
RT3G-322	1	1	1	2		
RT3G-324	1	1	1	1	1	
RT3G-330	1	1	1			1

USA, Canada.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-20-24	24VDC, 20W, 1 A power supply
C5UMB3FBG	Category 5E UTP 3 ft/1 m - Beige cable
C5UMB10FBL	Category 5E 10 ft/3 m - Blue cable
	Antenna options available

Certified for use with these networks:

AT&T, T-Mobile, Rogers, Sprint, Verizon

Contact B&B Electronics for the latest approvals.

Cellular Router - CDMA/HSPA

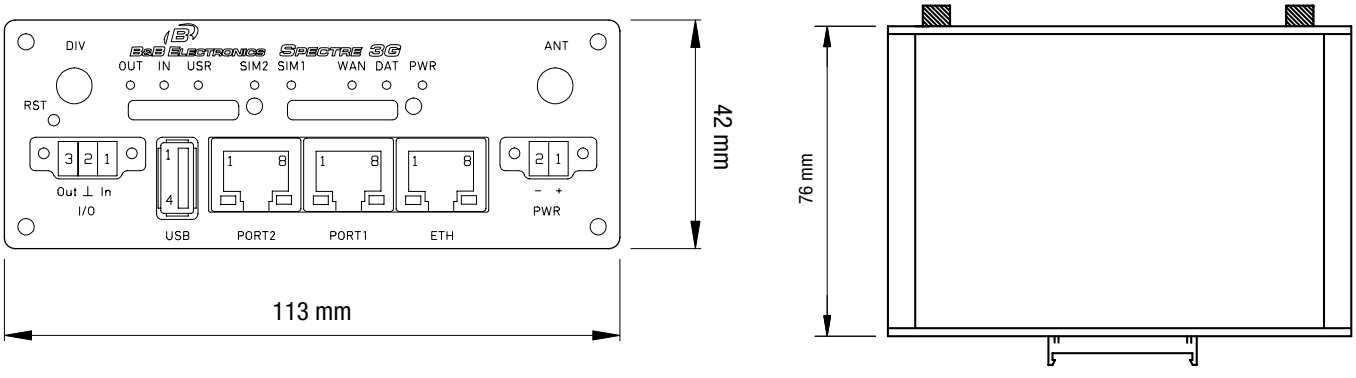
Spectre 3G Series

SPECIFICATIONS

INTERFACES	
Standard	
Ethernet	10/100 Mbits
USB	USB Type A Host
Binary I/O	1 input / 1 output
SIM 1	SIM Card
SIM 2	SIM Card
EXPANSION PORT OPTIONS	
Port 1	Ethernet 10/100 RS-232/422/485 Modbus, CNT (I/O)
Port 2	RS-232/422/485 Modbus CNT (I/O)
I/O CNT	4 Binary inputs, 1 Binary output (2 inputs maybe configured as counters) 2 analog inputs, I Binary output
ANTENNA	
SMA – 50 Ohm	
3G: 2 dBi, penta band, right angle dipole	
FREQUENCY BANDS	
Quad Band UMTS (WCDMA): 850, 900,1900 and 2100 MHz	
Quad-Band GSM/GPRS/EDGE: 850, 900, 1800,1900 MHz	
POWER	
Source	10 – 30 VDC
Consumption	300 mW receive mode Up to 3.5 W (GPRS transmission) Up to 5.5 W (UMTS/HSDPA transmission)
MECHANICAL	
Dimensions	42x76x113 mm/1.7x3.0x4.5 in (DIN 35 mm)
Enclosure	Metal
Weight	150 g
ENVIRONMENTAL	
Operating Temperature	-30 to 60°C
Storage Temperature	-40 to 85°C
VPN TUNNELING	
IPsec, OpenVPN, L2TP – secure encrypted tunnels	
GRE tunnel – simple tunnel without security measures	

NETWORKING	
DHCP – automatic IP addressing in LAN network	
NAT – IP address and ports translation between inside/outside network	
Firewall: filtering of addresses, ports, protocols	
VRRP – virtual backup router function	
DynDNS client – access to the router with a dynamic IP address	
VLAN 802.11Q: virtual LAN	
QoS: quality of service	
Dial-in – Communicate via CSD call	
NTP client, NTP Server: time synchronization	
PPPoE Bridge – PPP frames encapsulation inside ETH frames	
CONFIGURATION AND DIAGNOSTICS	
HTTP server – configuration via web server	
Telnet – configuration and access to the file system	
SNMP – router diagnostics, communication with I/O and M-BUS	
Cellular state signalization LED	
On-line info on cellular signal status (level, cell, neighbors)	
SMS info – power on, cellular connection or disconnection	
SMS control – on/off cellular connection, switch SIM, I/O, etc.	
Transferred data counting, one more APN as backup	
Remote router group configuration change, switching among configuration profiles	
SSH – encrypted configuration and access to the file system	
ADDITIONAL FUNCTIONS	
Linux based: program your own applications	
NTP client, NTP Server – time synchronization	
SMS communication – AT commands on RS232, Ethernet and I/O	
M-RAM memory inside – router statistic saved into memory	
APPROVALS / CERTIFICATIONS	
	FCC Part 15, CE
	EN 550 221B
	ETS 300 342 immunity
	EN60747 isolation
	EN60950 safety; EN 60950-1:06 ed.2 + A11:09 + A1:10
	EN 301 511, v9.0.2; EN 301 908-1&2, v3.2.1
	ETSI EN 301 489-1 V1.8.1
Service Providers	GSM: AT&T, Rogers, T-Mobile. CDMA: Sprint, Verizon

MECHANICAL DIAGRAM



Cellular Router - Wi-Fi

Spectre 3G-W Series

PRODUCT FEATURES

- Creates a Wi-Fi hotspot for M2M applications
- Modbus compatible
- Modular design to fit application requirements
- Dual SIM Cards for redundant backhaul
- Up to 5.7 Mbps upload/14.4 Mbps download
- LINUX platform & advanced networking functions

The Spectre 3G-W cellular router is a single box solution that provides local M2M network connectivity via its built-in Wi-Fi hotspot, Ethernet 10/100 and I/O ports and connects to the Internet via CDMA and HSPA+ cellular telephone networks. The Spectre 3G-W also creates reliable mobile Ethernet connections.

With upload speeds of up to 5.7 Mbps and download speeds of up to 14.4 Mbps, the Spectre 3G-W provides ample bandwidth, even for applications that require video. The standard configuration includes multiple 10/100 Ethernet ports, one USB host port, one binary input/output (I/O) port and dual SIM card holders. The second SIM card holder provides network redundancy, as the router can automatically switch between cellular service providers if one connection fails.

The router supports the creation of VPN tunnels using IPsec, OpenVPN and L2TP. It supports DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS, and numerous other functions, as well as additional software like SmartCluster VPN Server and R-SeeNet. A password-protected Web interface allows users to configure and manage the SPECTRE 3G from remote locations. The router can automatically upgrade its configuration and firmware from the operator's central server, allowing for simultaneous mass reconfiguration of every router on the network.

Users may insert Linux scripts and they can create up to four different configurations for the same router. Examples would include the SMS and binary input configurations. Users may switch from one configuration to another at any time.

ORDERING INFORMATION

MODEL NUMBER	ETHERNET 10/100	USB	I/O	RS232	RS422/485	I/O INPUT/ OUTPUT
RT3G-300-W	1	1	1			
RT3G-310-W	2	1	1			
RT3G-320-W	1	1	1	1		
RT3G-330-W	1	1	1			1
RT3G-340-W	1	1	1		1	

USA, Canada.
Check with your local distributor for availability and options.

ACCESSORIES

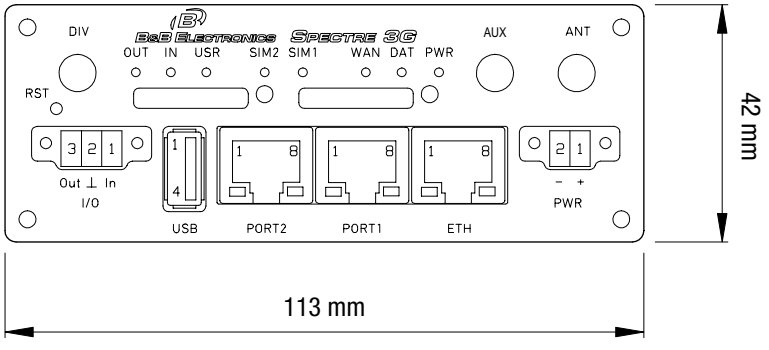
MDR-20-24	24VDC, 20W, 1 A power supply
C5UMB3FBG	Category 5E UTP 3 ft/1 m - Beige
C5UMB10FBL	Category 5E 10 ft/3 m - Blue
	Antenna options available

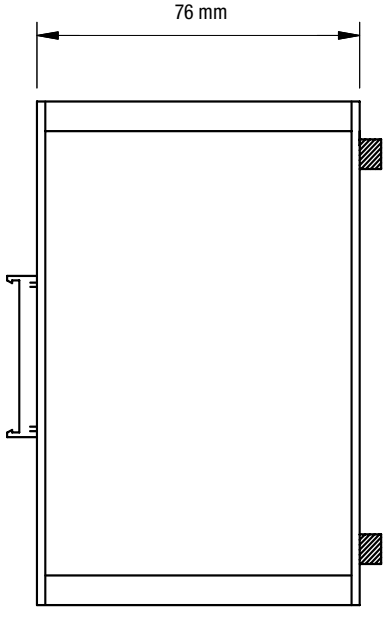
Certified for use with these networks:

AT&T, T-Mobile, Rogers, Sprint, Verizon

Contact B&B Electronics for the latest approvals.

MECHANICAL DIAGRAM





SPECIFICATIONS

INTERFACES	
Standard	
Ethernet	10/100 Mbits
USB	USB Type A Host
Binary I/O	1 input / 1 output
SIM 1	SIM Card
SIM 2	SIM Card
Expansion Port Options	
Port 1	Ethernet 10/100 RS-232/422/485 Modbus CNT (I/O)
Port 2	RS-232/422/485 Modbus CNT (I/O)
I/O CNT	4 Binary inputs, 1 Binary output (2 inputs maybe configured as counters) 2 Analog inputs, I Binary output

ANTENNA:	CELLULAR & WI-FI
SMA – 50 Ohm	
3G: 2 dBi, penta band, right angle dipole (2). WiFi: 1.8 dBi right angle dipole (1)	

FREQUENCY BANDS
Quad Band UMTS (WCDMA): 850, 900,1900 and 2100 MHz+
Quad-Band GSM/GPRS/EDGE: 850, 900, 1800 and 1900 MHz

POWER	
Source	10 – 30 VDC
Consumption	300 mW receive mode Up to 3.5 W (GPRS transmission) Up to 5.5 W (UMTS/HSDPA transmission)

MECHANICAL	
Dimensions	42x76x113 mm/1.7x3.0x4.5 in (DIN 35 mm)
Enclosure	Metal
Weight	150 g

ENVIRONMENTAL	
Operating Temperature	-30 to 60°C
Storage Temperature	-40 to 85°C

FEATURES			
WIFI Specifications	(802.11 b/g/n)		
RX Sensitivity	11b 11g (HT20) 11n (HT20) 11n	11Mbps 54Mbps MSC7 MSC7	-85 dBm -70 dBm -66 dBm -62 dBm
TX Output power	11b, 11g, 802.11n 802.11n	11Mbps 54Mbps (HT20) (HT20)	19 dBm 16 dBm 15 dBm 15 dBm
Frequency band	2.4 GHz		

NETWORKING
DHCP – automatic IP addressing in LAN network
NAT – IP address and ports translation between inside/outside network
Firewall: filtering of addresses, ports, protocols
VRRP – virtual backup router function
DynDNS client – access to the router with a dynamic IP address
VLAN 802.11Q: virtual LAN
QoS: quality of service
Dial-in – Communicate via CSD call
NTP client, NTP Server: time synchronization
PPPoE Bridge – PPP frames encapsulation inside ETH frames

VPN TUNNELING
IPsec, OpenVPN, L2TP – secure encrypted tunnels
GRE tunnel – simple tunnel without security measures

CONFIGURATION AND DIAGNOSTICS
HTTP server – configuration via web server
Telnet – configuration and access to the file system
SNMP – router diagnostics, communication with I/O and M-Bus
Cellular state signalization by LED
On-line info on cellular signal status (level, cell, neighbors)
SMS info – power on, cellular connection or disconnection
SMS control – on/off cellular connection, switch SIM, I/O, etc.
Transferred data counting, one more APN as backup
Remote router group configuration change, switching among configuration profiles
SSH – encrypted configuration and access to the file system

ADDITIONAL FUNCTIONS
Linux based: program your own applications
NTP client, NTP Server – time synchronization
SMS communication – AT commands on RS232, Ethernet and I/O
M-RAM memory inside – router statistic saved into memory

APPROVALS / CERTIFICATIONS	
	FCC Part 15
Certifications	GGSM: AT&T, Rogers, T-Mobile CDMA: Sprint, Verizon
CE	EN 301 511, v9.0.2 EN 301 908-1&2, v3.2.1 ETSI EN 301 489-1 V1.8.1 EN 60950-1:06 ed.2 + A11:09 + A1:10
Emission	EN 55022/B
Immunity	ETS 300 342
Safety	EN 60950
Isolation	EN 60747

Cellular Router - GPRS/EDGE

ER75i v2 Series

PRODUCT FEATURES

- Designed for M2M applications
- WiFi, M-BUS and Modbus TCP / Modbus RTU
- Modular design to fit application requirements
- Single or Dual SIM Cards for redundant backhaul
- Up to 85.6 KBps upload/236.8 KBps download
- LINUX Platform & Advanced Networking Functions
- 'C' based dev environment to build user applications

GPRS/EDGE ER75i v2 router is used to wirelessly connect various equipment and devices via Ethernet interface 10/100 to the Internet or intranet. With a high security level and wide coverage of GPRS/EDGE technology provided by mobile phone operators, it is mostly used in industrial applications, for remote maintenance and service of machines, or for data transfer from solar or wind power plants. Other benefits and advantages includes high modularity and option to connect various devices via Ethernet 10/100, RS232, RS485, RS422, M-Bus or I/O.

Key features

As a standard, this industrial ER75i v2 wireless router is equipped with one Ethernet 10/100, one USB Host port, one binary input/output (I/O) port and one SIM card. To save and backup communication data, a version with 2 SIM cards is available. The wide range of interface options of this wireless router further expands an optional Port1 and Port2 - selected by the customer. For example, Ethernet port 10/100, serial interface ports RS232/RS485/RS422/M-Bus or (I/O - CNT). Port2 may be equipped with serial interfaces RS232/RS485/RS422/M-Bus or (I/O - CNT). The wireless router is supplied either in a plastic or metal casing, based on the requirements of the customer.

Configuration is done via web interface protected by password. The GPRS/EDGE router supports creation of VPN tunnels using technologies IPsec, OpenVPN and L2TP to ensure safe communication. Web interface provides detail statistics about the wireless router activities, signal strength, detailed log, etc. Router supports functions: DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS and many other functions.

Other diagnostic functions to ensure continuous communication include automatic inspection of PPP connection offering an automatic restart feature - in case of connection losses, or hardware watchdog which monitors the status of the router. With the help of a special start up script window, you may insert Linux scripts for various actions. For some applications the option to create several different configurations for one wireless GPRS/EDGE router, the profiles (maximum of 4), and the option to switch between them (for example via SMS, binary input status, etc.) is essential. Cellular wireless routers may automatically upgrade configuration and firmware from server. This allows mass reconfiguration of many routers in one time.

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	USB	SIM	RS232	RS485/ RS422	M-BUS	I/O	I/O (CNT)	WIFI
ER75i v2B Set	1	1	1				1		
ER75i v2B ETH Set	2	1	1				1		
ER75i v2B RS232 Set	1	1	1	1			1		
ER75i v2B RS485/422 Set	1	1	1		1		1		
ER75i v2B M-Bus Set	1	1	1			1	1		
ER75i v2B CNT Set	1	1	1				1	1	
ER75i v2F Set	1	1	2				1		
ER75i v2F ETH Set	2	1	2				1		
ER75i v2F RS232 Set	1	1	2	1			1		
ER75i v2F RS485/422 Set	1	1	2		1		1		
ER75i v2F M-Bus Set	1	1	2			1	1		
ER75i v2F CNT Set	1	1	2				1	1	
ER75i v2F WIFI Set	1	1	2				1		1
ER75i v2F SWITCH Set	3	1	2				1		
SL	Router metal casing (sample ER75i v2B SL)								

If the optional second port is installed in the Full (F) version, the order code generator will use: the name of the router interface + F + interface of the optional Port 1 + interface of the second optional (Port 2).
Example: ER75i v2F ETH RS232 set (supplied UR75i v2 router + 2 x ETH 10/100 + 1 x RS232 + 1 x USB HOST + 2 x SIM, 1 x I/O, accessories)

Europe, Middle East, Africa, Asia, South America, Latin America.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-40-24	24VDC, 20W, 1 A power supply
C5UMB3FBG	Category 5E UTP 3 ft/1 m - Beige
C5UMB10FBL	Category 5E 10 ft/3 m - Blue

APPLICATIONS

Self-service terminals
IT and communication
Metrology, alarm and warning systems
Energy and power industry
Transportation and security

SPECIFICATIONS

INTERFACES	
Standard	
Ethernet Independent or Bridged	10/100 Mbits
USB	USB 2.0 Host, Type A
SIM	SIM Card
I/O	Binary input/output
2 Optional Ports	
Port 1	Ethernet (10/100Mbps) RS232 RS422/485 M-Bus I/O Input/Output
Port 2	RS232 RS422/485 M-Bus
Optional	2nd SIM Card holder
ANTENNA	
	SMA – 50 Ohm
FREQUENCY BANDS	
Quad Band	GSM 900, 1800 MHz GSM 850, 1900 MHz
GPRS/EDGE	
	Maximum download 236,8 kb/s
	Maximum upload 85,6 kb/s
POWER	
Source	10 – 30 VDC
MECHANICAL	
Dimensions	42×76×113 mm (DIN rail 35 mm) Metallic (SL) version - 42x80x113mm
ENVIRONMENTAL	
Temperature Range	-30° to +60°C
Storage Temperature	-40° to +85°C

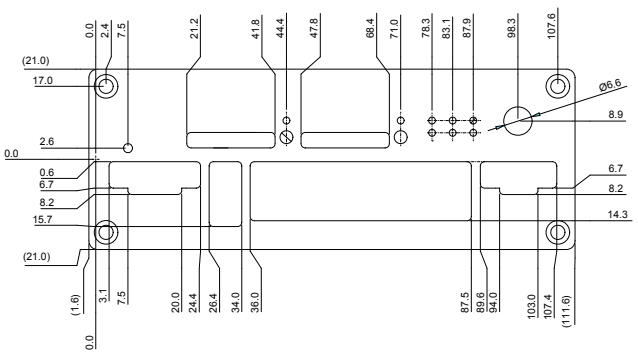
FEATURES
Linux based, possibility to program your own application
NTP client, NTP Server – time synchronization
SMS communication – AT commands on RS232, Ethernet and I/O
M-RAM memory inside – router statistic´s saving into memory
NETWORKING
DHCP – automatic IP addressing in LAN network
NAT/PAT – IP address and ports translation between inside/outside network
VRRP – virtual backup router function
DynDNS client – access to the router with a dynamic IP address
Dial-in – the ability to communicate over dial CSD call
PPPoE Bridge – PPP frames encapsulation inside ETH frames
VPN TUNNELING
IPsec, OpenVPN, L2TP secure encrypted tunnels
GRE tunnel simple tunnel without security measures
CONFIGURATION AND DIAGNOSTIC
HTTP server – configuration via web server
Telnet configuration and access to the file system
SNMP router diagnostics, communication with I/O and M-Bus
GPRS/EDGE state signalization by LED
On-line info on GSM signal status (level, cell, neighbors)
SMS info power on, GPRS connection or disconnection
SMS control on/off GPRS connection, switch SIM, I/O etc.
Transferred data counting, one more APN as backup
Remote router group configuration change, switching among configuration profiles
SSH encrypted configuration and access to the “le system

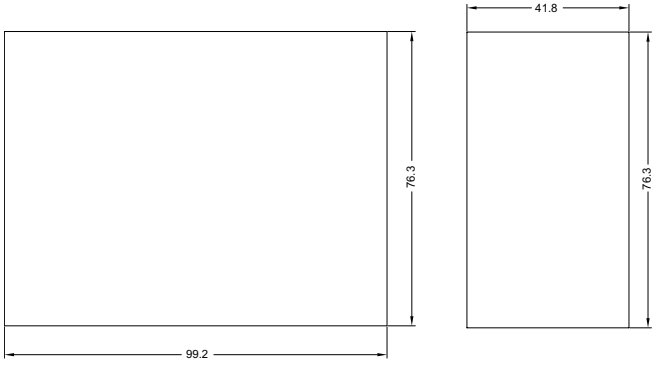
APPROVALS/CERTIFICATIONS	
CE	EN 301 511, v9.0.2 EN 301 908–1&2, v3.2.1 ETSI EN 301 489–1 V1.8.1 EN 60950–1:06 ed. 2 + A11:09

R-SEENET SMART CLUSTER

MECHANICAL DIAGRAM

Dimensions are in mm





Cellular Router - UMTS/HSPA+ & GPRS/EDGE

UR5i V2 Libratum Balanced Routers

PRODUCT FEATURES

- 2-port Ethernet switch
- 2 independent LAN
- Models with Wi-Fi: AP or client mode
- Dual-SIM fail over
- Antenna Rx Diversity
- Temperature up to +85°C

Balanced router UR5iv2 Libratum a UMTS/HSPA+, non-modular wireless router features high speed data rates 14.4 Mbps, two Ethernet 10/100 ports and dual-SIM failover capability for mission critical applications. This router is particularly suited to the demands of the "Transaction Management" industry such as point-of-sale terminals, remote ATMs and vending terminals as well as a huge variety of intelligent remote monitoring and control applications in the Transport, Energy and Security sectors.

Key features

This exceptionally fast UMTS/HSPA+ UR5i v2 Libratum wireless router is equipped with two Ethernet 10/100 ports and two SIM cards. Two SIM cards backup communication in mobile operator network or networks and provide failover to each other. WiFi extension available on demand. Configuration is done via a web interface protected by password. The 3G UMTS/HSPA+ router supports creation of VPN tunnels using IPsec, OpenVPN and L2TP to assure safe communication. Web interface provides detail statistics about the 3G router activities, signal strength, detailed log, etc. Cellular router supports functions: DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS and many other functions.

Other diagnostic functions for continuous communication include automatic inspection of PPP connection offering an automatic restart feature - in case of connection losses, or hardware watchdog which monitors the status of the router. With the help of a start up script window you may insert Linux scripts for various actions.

For some applications the key option is to create several different configurations for one UMTS/HSPA+ wireless router, the so-called profiles (maximum of 4), and the option to switch among them (for example via SMS, binary input status, etc.) is essential. Cellular wireless routers may automatically upgrade configuration and firmware from server. This allows mass reconfiguration of many routers in one time.

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	SIM	I/O	WIFI	PLASTIC CASE	METAL CASE	ACCESSORIES
UR5i v2 Libratum set	2	2	1		3		3
UR5i v2 Libratum SL set	2	1	1			3	3
UR5i v2 Libratum WiFi set	2	2	1	1	3		3
UR5i v2 Libratum WiFi SL set	2	2	1	1		3	3

Europe, Middle East, Africa, Asia, South America, Latin America.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-40-24	24VDC, 20W, 1 A power supply
C5UMB3FBG	Category 5E UTP 3 ft/1 m - Beige
C5UMB10FBL	Category 5E 10 ft/ 3m - Blue

SELECTED APPLICATIONS

Transportation and security
IT and communication
Self-service terminals
Energy and power industry
Meteorology, alarm and warning systems

Cellular Router - UMTS/HSPA+ & GPRS/EDGE

UR5i V2 Libratum Balanced Routers

SPECIFICATIONS

INTERFACES	
Standard	
Ethernet 2x independent or bridged	10/100 Mbits
SIM 1	SIM Card
SIM 2	SIM Card
ANTENNA CONNECTORS	
SMA – 50 Ohm	
FREQUENCY BANDS	
Quad Band HSPA+ 850/900/1900/2100 MHz	
Quad Band GSM 850/900/1800/1900 MHz	
HSPA+ PARAMETERS	
Bit rate 14.4 Mbps / 5,76 Mbps 3GPP rel. 6/7 standard Data compress 3GPP	
UMTS PARAMETERS	
Download – 384 kbps Upload – 384 kbps 3GPP rel. 6/7 standard	
EDGE/GPRS PARAMETERS	
Bit rate EDGE 237 kbps / 237 kbps Bit rate GPRS 85,6 kbps / 85,6 kbps Multislot class 12, CS 1 to 4, 3GPP rel. 99/4 standard	
WIFI	
802.11b, 802.11g, 802.11n Security - 64/128 WEP, TKIP, AES Authentication - Shared, WPA-PSK, WPA2-PSK	
POWER	
Source	10 – 30 VDC
MECHANICAL	
Dimension	Plastic version - 50x83x116mm Metallic (SL) version - 42x80x113mm
ENVIRONMENTAL	
Temperature range	-30° to +85°C
Storage Temperature	-40° to +85°C

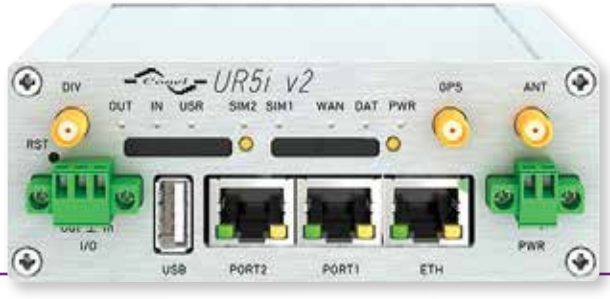
FEATURES
DHCP – automatic IP addressing in LAN network
NAT – IP address and ports translation between inside/outside network
Firewall: filtering of addresses, ports, protocols
VRRP – virtual backup router function
DynDNS client – access to the router with a dynamic
NETWORKING
IP address
VLAN 802.11Q: virtual LAN
QoS: quality of service
Dial-in – Communicate via CSD call
NTP client, NTP Server: time synchronization
PPPoE Bridge – PPP frames encapsulation inside ETH frames
VPN TUNNELING
IPSec, Pre-Shared key, Username/Password, X.509, Initiator - Responder (DES, 3DES, AES, MD5, SHA-1, DH-2,5,14-18)
OpenVPN, Pre-Shared key, Username/Password, X.509, Server/Client/Multiclient (BF-CBC, AES128, DES3DES)
L2TP, PPTP, simple tunnel with Username/Password auth.
EasyVPN, simple tunnel with Username/Password auth.
GRE, simple tunnel without security measures
DIAGNOSTIC
Status Network all information about active interface
Status DHCP status of DHCP server
Status UMTS/GPRS mobile network information, statistic
Status IPSec status of IPSec
System Log list of system messages
SNMP traps with R-SeeNET

APPROVALS/CERTIFICATIONS	
CE	EN 301 511, v9.0.2 EN 301 908-1&2, v3.2.1 ETSI EN 301 489-1 V1.8.1 EN 60950-1:06 ed.2 + A11:09 + A1:10

R-SEENET SMART CLUSTER

Cellular Router - 3G UMTS/HSPA+

UR5i v2 Series



PRODUCT FEATURES

- Designed for M2M applications
- WiFi, M-BUS and Modbus TCP / Modbus RTU
- Modular design to fit application requirements
- Single or dual SIM cards for redundant backhaul
- Up to 5.7 Mbps upload to 21.1 Mbps download
- LINUX platform & advanced networking functions
- 'C' based dev environment to build user applications

3G UMTS/HSPA routers, UR5i v2 series, are used to wirelessly connect various equipment and devices via Ethernet 10/100 to the Internet or intranet. High data transfer speed of up to 21.1 Mbit/s (download) and upload speed up to 5.7 Mbit/s, make it an ideal wireless solution for traffic and security camera systems, individual computers, LAN networks, automatic teller machines (ATM) and other self-service terminals, etc.

Key features

This exceptionally fast 3G UR5i v2 wireless router is equipped with one Ethernet 10/100, one USB Host port, one binary Input/Output (I/O) port and one SIM card. To save and backup communication data, a version with 2 x SIM cards is available. A wide range of user-defined interface options further expands optional Port1 and Port2. (EX: Ethernet port 10/100, serial interface ports RS232/RS485/RS422/M-Bus or (I/O - CNT). Port2 may be equipped with serial interfaces RS232/RS485/RS422/M-Bus or (I/O - CNT). This 3G wireless router is available in a plastic or metal casing.

Configuration is done via web interface protected by password. The 3G UMTS/HSPA+ router supports creation of VPN tunnels using IPsec, OpenVPN and L2TP to ensure safe communication. Web interface provides detail statistics about router activities, signal strength, detailed log, etc. Cellular router supports functions: DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS and many other functions.

Other diagnostic functions ensuring continuous communication include automatic inspection of PPP connection offering an automatic restart feature in case of connection losses, and hardware watchdog which monitors the status of the router. With the help of a start up script window you may insert Linux scripts for various actions and, for some applications the option to create several different configurations for one 3G wireless router, profiles (maximum of 4), and the option to switch between them (for example via SMS, binary input status, etc.). Cellular wireless routers can automatically upgrade configuration and firmware from server. This allows mass reconfiguration of multiple routers at one time.

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	USB	SIM	RS232	RS485/ RS422	M-BUS	I/O	I/O (CNT)	WIFI
UR5i v2B Set	1	1	1				1		
UR5i v2B ETH Set	2	1	1				1		
UR5i v2B RS232 Set	1	1	1	1			1		
UR5i v2B RS485/422 Set	1	1	1		1		1		
UR5i v2B M-Bus Set	1	1	1			1	1		
UR5i v2B CNT Set	1	1	1				1	1	
UR5i v2F Set	1	1	2				1		
UR5i v2F ETH Set	2	1	2				1		
UR5i v2F RS232 Set	1	1	2	1			1		
UR5i v2F RS485/422 Set	1	1	2		1		1		
UR5i v2F M-Bus Set	1	1	2			1	1		
UR5i v2F CNT Set	1	1	2				1	1	
UR5i v2F WIFI Set	1	1	2				1		1
UR5i v2F SWITCH Set	3	1	2				1		
SL	Router metal casing (sample ER75i v2B SL)								

Europe, Middle East, Africa, Asia, South America, Latin America.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-40-24	24VDC, 20W, 1 A power supply
C5UMB3FBG	Category 5E UTP 3 f/1 m - Beige
C5UMB10FBL	Category 5E 10 ft/ 3 m - Blue

SELECTED APPLICATIONS

Transportation and security
IT and communication
Self-service terminals
Energy and power industry
Metrology, alarm and warning systems

SPECIFICATIONS

INTERFACES	
Standard	
Ethernet Independent or Bridged	10/100 Mbits
SIM	SIM Card
I/O	Binary input/output
USB	USB 2.0 Host, Type A
2 Optional Ports	
Port 1	Ethernet (10/100Mbps) RS232 RS422/485 M-Bus I/O Input/Output
Port 2	RS232 RS422/485 M-Bus
Optional	2nd SIM Card holder

ANTENNA CONNECTORS
SMA – 50 Ohm

FREQUENCY BANDS
Quad Band UMTS (WCDMA): 850, 900, 1900 and 2100 MHz
Quad-Band GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz

HSPA+ PARAMETERS
Bit rate 14.4 Mbps / 5,76 Mbps 3GPP rel. 6/7 standard Data compress 3GPP

UMTS PARAMETERS
Download – 384 kbps Upload – 384 kbps 3GPP rel. 6/7 standard

EDGE/GPRS PARAMETERS
Bit rate EDGE 237 kbps / 237 kbps Bit rate GPRS 85,6 kbps / 85,6 kbps Multislot class 12, CS 1 to 4, 3GPP rel. 99/4 standard

POWER	
Source	10 – 30 VDC

ENVIRONMENTAL	
Temperature range	-30° to +60°C
Storage Temperature	-40° to +85°C

DIMENSION
42×76×113 mm (DIN rail 35 mm)
Metallic (SL) version - 42x80x113mm

FEATURES
Linux based, possibility to program your own application
NTP client, NTP Server – time synchronization
SMS communication – AT commands on RS232, Ethernet and I/O
M-RAM memory inside – router statistic´s saving into memory

NETWORKING
DHCP – automatic IP addressing in LAN network
NAT/PAT – IP address and ports translation between inside/outside network
VRRP – virtual backup router function
DynDNS client – access to the router with a dynamic IP address
Dial-in – the ability to communicate over dial CSD call
PPPoE Bridge – PPP frames encapsulation inside ETH frames

VPN TUNNELING
IPsec, OpenVPN, L2TP – secure encrypted tunnels
GRE tunnel – simple tunnel without security measures

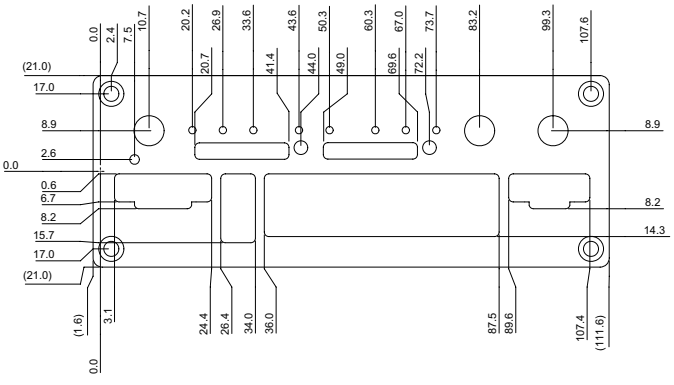
CONFIGURATION AND DIAGNOSTIC
HTTP server – configuration via web server
Telnet – configuration and access to the file system
SNMP – router diagnostics, communication with I/O and M-BUS
GPRS state signalization by LED
On-line info on GSM signal status (level, cell, neighbors)
SMS info – power on, GPRS connection or disconnection
SMS control – on/off GPRS connection, switch SIM, I/O etc.
Transferred data counting, one more APN as backup
Remote router group configuration change, switching among configuration profiles
SSH – encrypted configuration and access to the #le system

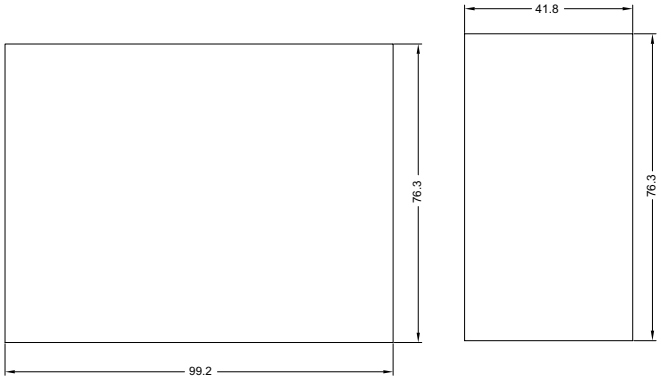
APPROVALS/CERTIFICATIONS	
CE	EN 301 511, v9.0.2 EN 301 908–1&2, v3.2.1 ETSI EN 301 489–1 V1.8.1 EN 60950–1:06 ed. 2 + A11:09

R-SEENET SMART CLUSTER

MECHANICAL DIAGRAM

Dimensions are in mm





Cellular Router - 4G LTE

LR77 v2 Series

PRODUCT FEATURES

- Designed for M2M applications
- WiFi, M-BUS and Modbus TCP / Modbus RTU
- Modular design to fit application requirements
- Single or dual SIM cards for redundant backhaul
- LTE Up to 50 Mbps upload to 100 Mbps download
- LINUX platform & advanced networking functions
- 'C' based dev environment to build user applications

4G LTE router LR77 v2 provides wireless connection of equipment and devices via Ethernet 10/100 or serial interfaces to the Internet or intranet. 4G router LR77 v2 is ideal for transferring large data loads. With LTE its ultra fast data transfer speed reaches up to 100 Mbit/s download and up to 50 Mbit/s upload. The LR77 v2 series is an ideal wireless solution for traffic and security camera systems, individual computers, LAN networks, automatic teller machines (ATM) and other self-service terminals, etc.

This extra fast 4G LR77 v2 wireless router is equipped with one Ethernet 10/100, one USB Host port, one binary Input/output (I/O) port and one SIM card. To save and backup communication data, a version with 2 x SIM cards is available. A wide range of user-defined interface options further expands optional Port1 and Port2. Port1 is available as an Ethernet port 10/100, serial interface ports RS232/RS485/RS422/M-Bus or (I/O - CNT). Port2 may be equipped with serial interfaces RS232/RS485/RS422/M-Bus or (I/O - CNT). Another option is inserting a XC-SW board to provide 3 x switched Ethernet 10/100 ports. This router is available either in a plastic or metal casing.

Configuration is done via web interface protected by password. The 4G LTE router supports creation of VPN tunnels using IPsec, OpenVPN and L2TP to ensure safe communications. Web interface provides detailed statistics about router activities, signal strength, detailed log, etc. Supports functions: DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, HTTPS, SSH, OSPF, RIP, BGP control by SMS and many other functions.

Other diagnostic functions to ensure continuous communication include automatic inspection of PPP connection with an automatic restart feature in case of connection losses and a hardware watchdog which monitors the status of the router. With the help of a start up script window you may insert Linux scripts for various actions. For some applications it is possible to create several different configurations or profiles for router (maximum of 4), and the option to switch between them (for example via SMS, binary input status, etc.). Cellular LTE wireless router LR77 v2 supports automatic upgrade of configuration and firmware from the server. This allows mass reconfiguration of multiple routers in one time. It is also possible to develop user defined modules that modify LTE router behavior.

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	USB	SIM	RS232	RS485/ RS422	M-BUS	I/O	I/O (CNT)	WIFI
LR77 v2B Set	1	1	1				1		
LR77 v2B ETH Set	2	1	1				1		
LR77 v2B RS232 Set	1	1	1	1			1		
LR77 v2B RS485/422 Set	1	1	1		1		1		
LR77 v2B M-Bus Set	1	1	1			1	1		
LR77 v2B CNT Set	1	1	1				1	1	
LR77 v2F Set	2	1	2				1		
LR77 v2F RS232 Set	1	1	2	1			1		
LR77 v2F RS485/422 Set	1	1	2		1		1		
LR77 v2F M-Bus Set	1	1	2			1	1		
LR77 v2F CNT Set	1	1	2				1	1	
LR77 v2F SWITCH Set	3	1	2				1		
LR77 v2F WIFI Set	1	1	2				1		1
LR77 v2F SWITCH Set	3	1	2				1		
SL	Router metal enclosure (sample LR77 v2B SL)								

Europe, Middle East, Africa, Asia, South America, Latin America.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-40-24	24VDC, 20W, 1 A power supply
C5UMB3FBG	Category 5E UTP 3 ft/ 1m - Beige
C5UMB10FBL	Category 5E 10 ft/3 m - Blue

APPLICATIONS

Transportation and security
IT and communication
Self-service terminals
Energy and power industry
Metrology, alarm and warning systems

R-SEENET SMARTCLUSTER

SPECIFICATIONS

INTERFACES	
Standard	
Ethernet Independent or Bridged	10/100 Mbits
SIM	SIM Card
I/O	Binary input/output
USB	USB 2.0 Host, Type A
2 Optional Ports	
Port 1	Ethernet (10/100Mbps) RS232 RS422/485 M-Bus I/O Input/Output Ethernet Switch (with port 2)
Port 2	RS232 RS422/485 M-Bus WM-Bus SDH WiFi Ethernet Switch (with port 1)
Optional	2nd SIM Card holder
ANTENNA CONNECTORS	
SMA – 50 Ohm	
FREQUENCY BANDS	
	GSM/GPRS/EDGE: 900/1800/1900 MHz
	UMTS/HSDPA/HSUPA/HSPA+: 900/2100 MHz
	LTE: 800/900/1800/2100/2600 MHz
LTE	
	Maximum download 100 Mbps
	Maximum upload 50 Mbps
POWER	
Source	10 – 30 VDC
CONSUMPTION	
Reception	2.3 W
GPRS	to 3.5 W (GPRS transmission)
LTE	to 5.5 W (LTE transmission)
ENVIRONMENTAL	
Temperature Range	-30° to +60°C
Storage Temperature	-40° to +85°C
DIMENSION	
	42×76×113 mm (DIN rail 35 mm)
	Metallic (SL) version - 42x80x113 mm
WEIGHT	
	LR77 v2 – 150 g
	LR77 v2 SL – 280 g

LTE PARAMETERS
Bit rate 100 Mbps (DL) / 50 Mbps (UL)
3GPP rel. 8 standard
Supported bandwidth: 5 Mhz, 10 Mhz, 20 Mhz
HSPA+ PARAMETERS
Bit rate 21,1 Mbps (DL) / 5,76 Mbps (UL)
3GPP rel. 7 standard
UE CAT. 1 to 6, 8, 10, 12, 14
3GPP data compress
UMTS PARAMETERS
PS bit rate 384 kbps (DL) / 384 kbps (UL)
CS bit rate 64 kbps (DL) / 64 kbps (UL)
W-CDMA FDD standard
GPRS/EDGE PARAMETERS
Bit rate 237 kbps (DL) / 59,2 kbps (UL)
GPRS multislot class 10, CS 1 to 4
EDGE multislot class 12, CS 1 to 4
MCS 1 to 9
SUPPORTED GPRS/EDGE POWER CLASSES
EGSM 900: Class 4 (33 dBm)
GSM 1800/1900: Class 1 (30 dBm)
EDGE 900: Class E2 (27 dBm)
EDGE 1800/1900: Class E2 (26 dBm)
FEATURES
Linux based, possibility to program your own application
NTP client, NTP Server – time synchronization
SMS communication – AT commands on RS232, Ethernet and I/O
M-RAM memory inside – router statistic´s saving into memory
NETWORKING
DHCP – automatic IP addressing in LAN network
NAT/PAT – IP address and ports translation between inside/outside network
VRRP – virtual backup router function
DynDNS client – access to the router with a dynamic IP address
Dial-in – the ability to communicate over dial CSD call
PPPoE Bridge – PPP frames encapsulation inside ETH frames
VPN TUNNELING
IPsec, OpenVPN, L2TP – secure encrypted tunnels
CONFIGURATION AND DIAGNOSTIC
HTTP server – configuration via web server
Telnet – configuration and access to the file system
SNMP – router diagnostics, communication with I/O and M-Bus
GPRS state signalization by LED
On-line info on GSM signal status (level, cell, neighbors)
SMS info – power on, GPRS connection or disconnection
SMS control – on/off GPRS connection, switch SIM, I/O etc.
Transferred data counting, one more APN as backup
Remote router group configuration change, switching among configuration profiles
SSH – encrypted configuration and access to the file system
APPROVALS/CERTIFICATIONS
CE	EN 301 511, v9.0.2, EN 301 908-1 & -2: v3.2.1, ETSI EN 301 489-1 V1.8.1, EN 60950-1:06 ed.2 + A11:09 + A1:10

Cellular Router - CDMA

CR10 v2 Series

PRODUCT FEATURES

- SMS and E-mail functions
- Up to 3.1 Mbps download and 1.8 Mbps upload
- WiFi, M-BUS and Modbus TCP / Modbus RTU
- Modular design to fit application requirements
- Single or dual SIM cards for redundant backhaul
- LINUX platform & advanced networking functions

CDMA router CR10 v2 provides wireless connection of equipment and devices via Ethernet 10/100 or serial interfaces to the Internet or intranet. CDMA router CR10 v2 is perfect for transferring large data loads. Its fast data transfer speed reaches up to 3.1 Mbit/s download and up to 1.8 Mbit/s upload. CDMA technology makes it an ideal wireless solution for data transfer from traffic and security camera systems, individual computers, LAN networks, automatic teller machines (ATM) and other self-service terminals, etc.

CDMA router CR10 v2 is equipped with one Ethernet 10/100, one USB Host port, one binary Input/output (I/O) port and one SIM card. A wide range of user-defined interface options can expand optional Port1 and Port2. Port1 is available as Ethernet port 10/100, serial interface ports RS232/RS485/RS422/M-Bus or (I/O - CNT). Port2 may be equipped with serial interfaces RS232/RS485/RS422/M-Bus or (I/O - CNT). Another option is inserting an XC-SW board to provide 3 x switched Ethernet 10/100 ports. CDMA wireless routers are available in either in a plastic or metal casing.

Configuration is done via password protected web interface. It supports creation of VPN tunnels with IPsec, OpenVPN and L2TP to ensure safe communications. Web interface provides detailed statistics of router activities, signal strength, detailed log, etc. Supports functions: DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, HTTPS, SSH, OSPF, RIP, BGP and many more.

Other diagnostic functions to ensure continuous communications include automatic inspection of PPP connection with an automatic restart feature in case of connection losses, hardware watchdog that monitors router status. With the help of a start-up script window, you can insert Linux scripts for various actions. It is also possible to create different configurations or profiles for one CDMA wireless router (maximum of 4), and the option to switch between them (for example via binary input status, etc.). Or, develop user-defined modules to modify CDMA router behavior. The router supports automatic upgrade of configuration and firmware from server allowing mass reconfiguration of multiple routers at one time.

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	USB	SIM	RS232	RS485/ RS422	M-BUS	I/O	I/O (CNT)	WIFI
CR10 v2B Set	1	1	1				1		
CR10 v2B ETH Set	2	1	1				1		
CR10 v2B RS232 Set	1	1	1	1			1		
CR10 v2B RS485/422 Set	1	1	1		1		1		
CR10 v2B M-Bus Set	1	1	1			1	1		
CR10 v2B CNT Set	1	1	1				1	1	
CR10 v2F Set	1	1	2				1		
CR10 v2F ETH Set	2	1	2				1		
CR10 v2F RS232 Set	1	1	2	1			1		
CR10 v2F RS485/422 Set	1	1	2		1		1		
CR10 v2F M-Bus Set	1	1	2			1	1		
CR10 v2F CNT Set	1	1	2				1	1	
CR10 v2F WIFI Set	1	1	2				1		1
CR10 v2F SWITCH Set	3	1	2				1		
SL	Router metal enclosure (Example: CR10 v2B SL)								

Europe, Middle East, Africa, Asia, South America, Latin America.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-40-24	24VDC, 20W, 1 A power supply
C5UMB3FBG	Category 5E UTP 3 ft/1 m - Beige
C5UMB10FBL	Category 5E 10 ft/3 m - Blue

APPLICATIONS

Energy and power industry
Self-service terminals
Transportation and security
IT and communication
Metrology, alarm and warning systems

R-SEENET SMARTCLUSTER

SPECIFICATIONS

INTERFACES	
Standard	
Ethernet Independent or Bridged	10/100 Mbits
SIM	SIM Card
I/O	Binary input/output
USB	USB 2.0 Host, Type A
2 Optional Ports	
Port 1	Ethernet (10/100Mbps) RS232 RS422/485 M-Bus I/O Input/Output Ethernet Switch (with port 2)
Port 2	RS232 RS422/485 M-Bus WM-BUS SDH WiFi Ethernet Switch (with port 1)
Optional	2nd SIM Card holder

ANTENNA CONNECTORS
SMA – 50 Ohm

CDMA PARAMETERS
Rev. A: Bit rate 3.1 Mbps (DL) / 1.8 Mbps (UL)
Rev. B: Bit rate 14.7 Mbps (DL) / 5.4 Mbps (UL)
Backward compatible with Rev.0

TRANSMIT POWER
+23.0 dBm 47 to 30.0 dBm

SUPPORTED BANDS
450 MHz (Sub band A,B,L)

POWER	
Source	10 – 30 VDC

CONSUMPTION	
Reception	2.6 W
CDMA	to 4 W

ENVIRONMENTAL	
Temperature Range	-30° to +60°C
Storage Temperature	-40° to 85°C

DIMENSIONS
42×76×113 mm (DIN rail 35 mm)
Metallic (SL) version - 42x80x113mm

WEIGHT
280 g

FEATURES
Linux based, possibility to program your own application
NTP client, NTP Server – time synchronization
SMS communication – AT commands on RS232, Ethernet and I/O
M-RAM memory inside – router statistic´s saving into memory

NETWORKING
DHCP – automatic IP addressing in LAN network
NAT/PAT – IP address and ports translation between inside/outside network
VRRP – virtual backup router function
DynDNS client – access to the router with a dynamic IP address
Dial-in – the ability to communicate over dial CSD call
PPPoE Bridge – PPP frames encapsulation inside ETH frames

VPN TUNNELING
IPsec, OpenVPN, L2TP – secure encrypted tunnels

CONFIGURATION AND DIAGNOSTIC
HTTP server – configuration via web server
Telnet – configuration and access to the file system
SNMP – router diagnostics, communication with I/O and M-Bus
GPRS state signalization by LED
On-line info on GSM signal status (level, cell, neighbors)
SMS info – power on, GPRS connection or disconnection
SMS control – on/off GPRS connection, switch SIM, I/O, etc.
Transferred data counting, one more APN as backup
Remote router group configuration change, switching among configuration profiles
SSH – encrypted configuration and access to the file system

APPROVALS/CERTIFICATIONS	
CE	EN 301 511, v9.0.2, EN 301 908-1 & -2: v3.2.1, ETSI EN 301 489-1 V1.8.1, EN 60950-1:06 ed.2 + A11:09 + A1:10

UMTS/CDMA Router

UCR11 v2 Series

PRODUCT FEATURES

- UMTS and CDMA in one router
- Up to 21.1 Mbps download and 5.76 Mbps upload
- Single or dual SIM cards for redundant backhaul
- Modular design to fit application requirements
- LINUX platform & advanced networking functions
- WiFi, M-BUS and WM-BUS
- SMS and Email

The UCR11 v2 is wireless UMTS/CDMA router provides the exceptional modularity in mobile wireless network environments. The router may be equipped with 2 independent RF modules (UMTS, CDMA). You can select between CDMA 450 MHz and 3G UMTS) technology. CDMA 400 MHz is backed up by UMTS and vice versa to eliminate downtime. The redundancy of the UMTS/CDMA Router UCR11 v2 is particularly suited to industrial applications.

The router features high speed data rates 21.1 Mbps, one Ethernet 10/100 port and dual-SIM failover capability for mission critical applications. it is particularly suited to the demands “Transaction Management” applications such as point-of-sale terminals, remote ATMs and vending terminals as well as a variety of intelligent remote monitoring and control applications in the Transport, Energy and Security sectors.

Other benefits and advantages includes high modularity - the router connection of various user devices via Ethernet 10/100, RS-232, RS-485, RS-422, MBUS, WiFi or I/O.

This exceptionally fast UMTS/CDMA wireless router is equipped with one Ethernet 10/100, one USB host port, one binary Input/ output (I/O) port and two SIM card slots to save and backup communication data.

A wide range of interface options further expands optional Port1 and Port2 - selected by the customer. Optional Port 1 can be defined as Ethernet port 10/100 or serial interface ports RS-232 or RS-485/RS-422 or MBUS or I/O - CNT.

Port2 may be equipped with serial interfaces RS-232 or RS-485/ RS-422 or MBUS or I/O – CNT or WiFi. Another option is inserting an XC-SW board to provide 3 x switched Ethernet 10/100 ports.

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	USB	SIM	PORT	I/O	UMTS SIGNAL
UMTS Router						
UCR11 v2F-01 SL set Poland-Orange	2	1	2	2	1	✔
UCR11 v2F-02 SL set Poland-Plus	2	1	2	2	1	✔
UCR11 v2F-03 SL set Czech Republic - Telefónica	2	1	2	2	1	✔
UCR11 v2F-04 SL set Germany - INET	2	1	2	2	1	✔
UCR11 v2F-05 SL set Sweden - NET1	2	1	2	2	1	✔
UCR11 v2F-06 SL set Norway - NET1	2	1	2	2	1	✔
UCR11 v2F-07 SL set Russia - SkyLink	2	1	2	2	1	✔

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	USB	SIM	PORT	I/O	CDMA SIGNAL
CDMA Router						
UCR11 v2F-01D SL set Poland-Orange	2	1	2	2	1	✔
UCR11 v2F-02D SL set Poland-Plus	2	1	2	2	1	✔
UCR11 v2F-03D SL set Czech Republic - Telefónica	2	1	2	2	1	✔
UCR11 v2F-04D SL set Germany - INET	2	1	2	2	1	✔
UCR11 v2F-05D SL set Sweden - NET1	2	1	2	2	1	✔
UCR11 v2F-06D SL set Norway - NET1	2	1	2	2	1	✔
UCR11 v2F-07D SL set Russia - SkyLink	2	1	2	2	1	✔

Europe, Middle East, Africa, Asia, South America, Latin America.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-40-24 - 24VDC, 20W, 1 A power supply

C5UMB3FBG - Category 5E UTP 3 ft/1 m - Beige

C5UMB10FBL - Category 5E 10 ft/3 m - Blue

APPLICATIONS

Transportation and security
IT and communication
Self-service ATM, Gaming terminals
Industry -SCADA and Remote Management
Energy and power industry
Meteorology, alarm and warning systems

R-SEENET SMARTCLUSTER

SPECIFICATIONS

USER INTERFACE	
Standard	
Ethernet Independent or Bridged	10/100 Mbits
SIM	2 SIM slots
I/O	Binary input/output
USB	USB 2.0 Host, Type A
2 OPTIONAL PORTS	
Port 1	Ethernet (10/100Mbps) RS232 RS422/485 M-Bus I/O Input/Output
Port 2	RS232 RS422/485 M-Bus I/O Input/Output
ANTENNA CONNECTORS	
	SMA – 50 Ohm
UMTS MODULE	
UMTS/HSPA+	Maximum download 14.4 Mbps Maximum upload 5.7 Mbps
HSPA+ parameters	Bit rate 21.1 Mbps (DL) / 5.76 Mbps (UL) 3GPP rel. 7 standard UE CAT. 1 to 6, 8, 10, 12, 14 3GPP data compress
UMTS parameters	PS bit rate 384 kbps (DL) / 384 kbps (UL) CS bit rate 64 kbps (DL) / 64 kbps (UL) W-CDMA FDD standard
GPRS/EDGE parameters	Bit rate 237 kbps (DL) / 59.2 kbps (UL) GPRS multislot class 10, CS 1 to 4 EDGE multislot class 12, CS 1 to 4 MCS 1 to 9
Supported channels	GSM/GPRS/EDGE: 850/900/1800/1900 MHz UMTS/HSDPA/HSUPA/HSPA+: 850/900/1900/2100 MHz
CDMA MODULE	
CDMA parameters	Rev. A: Bit rate 3.1 Mbps (DL) / 1.8 Mbps (UL) Rev. B: Bit rate 14.7 Mbps (DL) / 5.4 Mbps (UL) Backward compatible with Rev.0
Transmit power	+23.0 dBm to 30.0 dBm
Supported bands	450 MHz (Sub band A,B,L)
POWER	
Source	10 – 30 VDC
Consumption	Reception 2.6W CDMA to 4.0W UMTS 5.5W

ENVIRONMENTAL	
Temperature range	-30°C to +60°C
Storage temperature	-40°C to +85°C
MECHANICAL	
Dimension	Metallic - 42x80x113mm (DIN rail 35 mm)
Linux based, possibility to program your own application	
NTP client, NTP Server – time synchronization	
SMS communication – AT commands on RS232, Ethernet and I/O	
M-RAM memory inside – router statistic´s saving into memory	
Email warnings or critical information	
NETWORKING	
DHCP – automatic IP addressing in LAN network	
NAT/PAT – IP address and ports translation between inside/outside network	
VRRP – virtual backup router function	
DynDNS client – access to the router with a dynamic IP address	
PPPoE Bridge – PPP frames encapsulation inside ETH frames	
VPN TUNNELING	
IPsec, OpenVPN, L2TP – secure encrypted tunnels	
GRE tunnel – simple tunnel without security measures	
CONFIGURATION AND DIAGNOSTIC	
HTTP server – configuration via web server	
Telnet – configuration and access to the file system	
SNMP – router diagnostics, communication with I/O and M-BUS	
GPRS state signalization by LED	
On-line info on GSM signal status (level, cell, neighbors)	
SMS info – power on, GPRS connection or disconnection	
SMS control – on/o! GPRS connection, switch SIM, I/O etc.	
Transferred data counting, one more APN as backup	
Remote router group configuration change, switching among configuration profiles	
SSH – encrypted configuration and access to the file system	
STANDARDS	
CE	
EN 301 511, v9.0.2	
EN 301 908-1 & -2: v3.2.1	
ETSI EN 301 489-1 V1.8.1	
EN 60950-1:06 ed.2 + A11:09 + A1:10	

Industrial Router

XR5i v2 Series

PRODUCT FEATURES

- Modular design to fit application requirements
- Provided secure connection between two networks
- Provides USB, Serial and I/O connectivity
- Configuration with password protected web interface
- SNMP protocol for remote management

The XR5i v2 industrial router secures connections between two local networks (LAN) via two Ethernet interfaces 10/100. The XR5i v2 can also convert serial RS232, RS485, M-BUS, I/O to IP local area network (LAN Ethernet 10/100).

The XR5i v2 Industrial router will also connect two devices with different serial interfaces (RS232, RS485, M-Bus, I/O, etc.) to the local network. In this configuration, the communication device has an Ethernet 10/100 port and two serial interfaces which user definable. A third option uses combination of two previous versions, when the industrial XR5i v2 router equipped with two Ethernet interfaces 10/100 and one optional serial interface.

Standard on the XR5i v2 Industrial Router is one Ethernet 10/100 port, one USB A (host) port, I/O port and two optional interfaces. Users can select a second Ethernet port, 10/100, serial interface RS232/RS485/RS422/MBUS or other Inputs/Outputs (I/O). Industrial XR5i v2 router can be ordered with either a plastic or metal housing.

Configuration is password protected, via web interface. The router supports creation of VPN tunnels using IPsec, OpenVPN and L2TP to ensure safe communication. Web interface provides detail statistics about router activities.

ORDERING INFORMATION

MODEL NUMBER	ETH 10/100	USB	RS232	RS485	MBUS	I/O	CNT	WIFI
XR5i v2F ETH	2	1				1		
XR5i v2F RS232	1	1	1			1		
XR5i v2F RS485	1	1		1		1		
XR5i v2F MBUS	1	1			1	1		
XR5i v2F CNT	1	1				1	1	
XR5i v2F ETH RS232	2	1	1			1		
XR5i v2F RS232 RS485	1	1	1	1		1		
XR5i v2F ETH MBUS	2	1			1	1		
XR5i v2F ETH CNT	2	1				1	1	
XR5i v2F RS232 MBUS	1	1	1		1	1		
XR5i v2F WiFi SET	1	1				1		1
SL	Metal casing (Example: XR5i v2F ETH SL)							

Europe, Middle East, Africa, Asia, South America, Latin America.
Check with your local distributor for availability and options.

ACCESSORIES

MDR-40-24 - 24VDC, 20W, 1 A power supply

C5UMB3FBG - Category 5E UTP 3 ft/1 m - Beige

C5UMB10FBL - Category 5E 10 ft/3 m - Blue

APPLICATIONS

Industry
Self-service terminals
IT and communication
Energy and power industry
Communication

R-SEENET SMARTCLUSTER

SPECIFICATIONS

USER INTERFACE	
Standard	
Ethernet	10/100 Mbits
Serial	RS232
USB	USB 2.0 Host, Type A I/O Input/Output
I/O	Binary Input/Output
2 OPTIONAL PORTS	
Port 1	Ethernet (10/100Mbps) RS232 RS422/485 M-Bus I/O Input/Output (CNT)
Port 2	RS232 RS422/485 M-Bus SHD WI FI WM-BUS
POWER	
Source	10 – 30 VDC
Consumption	Without Communications 1.6W With Communications 5.5W
ENVIRONMENTAL	
Temperature range	-30 to +60°C
Storage Temperature	-40 to +85°C
MECHANICAL	
Dimension	42 x 76 x 113 mm (DIN rail 35 mm)

FEATURES
Linux based, possibility to program your own application
NTP client, NTP Server – time synchronization
SMS communication – AT commands on RS232, Ethernet and I/O
M-RAM memory inside – router statistic´s saving into memory
Email warnings or critical information
NETWORKING
DHCP – automatic IP addressing in LAN network
NAT/PAT – IP address and ports translation between inside/outside network
VRRP – virtual backup router function
DynDNS client – access to the router with a dynamic IP address
PPPoE Bridge – PPP frames encapsulation inside ETH frames
VPN TUNNELING
IPsec, OpenVPN, L2TP – secure encrypted tunnels
GRE tunnel – simple tunnel without security measures
CONFIGURATION AND DIAGNOSTIC
HTTP server – configuration via web server
Telnet – configuration and access to the file system
SNMP – router diagnostics, communication with I/O and M-BUS
GPRS state signalization by LED
On-line info on GSM signal status (level, cell, neighbors)
SMS info – power on, GPRS connection or disconnection
SMS control – on/off GPRS connection, switch SIM, I/O etc.
Transferred data counting, one more APN as backup
Remote router group configuration change, switching among configuration profiles
SSH – encrypted configuration and access to the file system
STANDARDS
CE
ETSI EN 301 489-1 V1.8.1,
EN 60950-1:06 ed.2 + A11:09 + A1:10

IP67 Outdoor Rated Industrial Wireless I/O

Zlinx Xtreme Wireless I/O

PRODUCT FEATURES

- IP67 rated for outdoor applications
- Flexible configuration for multiple types of analog/digital I/Os
- Modbus compatible
- Range to 40 miles (64 km) Line of Sight & External Antenna
- Heavy-duty machine mount industrial grade case and components
- Signal strength indicator aids trouble shooting
- 900 MHz and 2.4 GHz versions
- Wide operating temperature range -40° to 74°C
- Versatile power 10- 30 VDC
- AES Encryption
- UL, Class1/Division2

Do you need to monitor remote assets via discrete analog and digital sensors? Or do you need to control remote control equipment from a central SCADA/PLC? Is the remote equipment outdoor? Zlinx Xtreme I/Os can do the job faster, easier and less expensively than stringing cable.

These compact and rugged IP67 units are ideal for outdoor applications in extreme weather conditions for connecting remote I/Os to local I/Os wirelessly (via Peer-to-Peer Mode) or to connect remote I/Os in multiple locations to a central PLC or SCADA or HMI system via a Serial Radio Modem (Via Modbus mode).

Zlinx® Industrial Wireless products operate in license-free, Proprietary RF 900 MHz and 2.4 GHz ISM bands. Select the 900 MHz version for longer distances. For further flexibility, the output power is software selectable. The 900 MHz units offer 256 bit AES Encryption. The 2.4 GHz have 128 bit AES Encryption.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION	ANALOG INPUTS	ANALOG OUTPUTS	DIGITAL INPUTS	DIGITAL RELAY OUTPUTS
Zlinx Xtreme Wireless I/O					
ZXT24-IO-222R2	2.4 GHz *	2	2	2	2
ZXT9-IO-222R2	900 MHz *	2	2	2	2

World-wide.
Check with your local distributor for availability and options.
* Check wireless regulations/standards in your geographic area.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
Zlinx Xtreme Wirless I/O Kit	
ZXT9-IOA-KIT	**Zlinx Xtreme IP67 Peer-to-Peer I/O Kit:** 2 - ZXT9-IO-222R2 (I/O Modules), 2 - CLG-60-24 (Power Supply). 1 - USBAMBM-6F (Program Cable)
ZXT9-MB1A-KIT	**Zlinx Xtreme IP67 Modbus I/O Kit:** 1 - ZXT9-RM (Radio Modem), 1 - ZXT9-IO-222R2 (I/O Module), 2 - CLG-60-24 (Power Supply), 1 - USBAMBM-6F (Program Cable)
ZXT9-MB2A-KIT	**Zlinx Xtreme IP67 Modbus I/O Kit:** 1 - ZXT9-RM (Radio Modem), 2 - ZXT9-IO-222R2 (I/O Module), 3 - CLG-60-24 (Power Supply), 1 - USBAMBM-6F (Program Cable)

ACCESSORIES

CLG-60-24	P67 Power Supply, Panel Mount, 24VDC, 60 W
ZXT9-ANT	900 MHz Spare Antenna
ZZ24D-ANT1	2.4 GHz Spare Antenna
ZXTMT	Conduit Mounting Kit

IP67 Outdoor Rated Industrial Wireless I/O

Zlinx Xtreme Wireless I/O

SPECIFICATIONS

RF PROPERTIES	
Physical Standard	802.15.4
FREQUENCY	
ZXT9-IO-xxxx	900 MHz ISM (902-928 MHz)
ZXT24-IO-xxxx	2.4 GHz ISM (2.4 to 2.5 GHz)
TRANSMIT POWER	
ZXT9-IO-xxxx	1 mW, 10 mW, 100 mW, 500 mW 1 W – Software Selectable
ZXT24-IO-xxxx	10 mW, 16 mW, 25 mW, 30 mW 63 mW – Software Selectable
RECEIVER SENSITIVITY	
ZXT9-IO-xxxx	-100 dBm
ZXT24-IO-xxxx	-105 dBm
OVER THE AIR DATA RATE	
ZXT9-IO-xxxx	9.6 or 115.2 kbps Software Selectable
ZXT24-IO-xxxx	250 kbps
OUTDOOR RANGE	
ZXT9-IO-xxxx	Supplied Antenna 14 mi (23 km) High Gain Antenna 40 mi (64 km)
ZXT24-IO-xxxx	Supplied Antenna 1.5 mi (2.4 km) High Gain Antenna 10 mi (16 km)
Range estimates based on optimal RF conditions and an unobstructed line of sight.	
TRANSMISSION METHOD	
ZXT9-IO-xxxx	FHSS
ZXT24-IO-xxxx	DSSS
Modulation	FSK
CHANNEL CAPACITY	
ZXT9-IO-xxxx	10 hop sequences share 50 frequencies
ZXT24-IO-xxxx	12 direct sequence channels
Network Topologies	I/O to I/O: One-to-one (Peer-to-Peer mode) Radio Modem to I/O: One-to-many (Modbus I/O mode)
ENCRYPTION	
ZXT9-IO-xxxx	256 bit AES
ZXT24-IO-xxxx	128 bit AES
SUPPLIED ANTENNA	
ZXT9-IO-xxxx	Impedance – 50 Ω Connector – RPSMA Female VSWR – 2.0 Max (in-band) Gain – 3 dBi Polarization – Vertical Length – 7.8 in (198 mm)
ZXT24-IO-xxxx	Impedance - 50Ω Connector – RPSMA Female VSWR – 2.0 Max (in-band) Gain – 2.1 dBi Polarization – Vertical Length – 4.38 in (113 mm)
Antenna Connection	RPSMA Male

DIGITAL INPUTS	
Voltage Range Configuration	0 to 48 VDC PNP (default) / NPN (selectable)
Low Voltage (0)	1 VDC Maximum
High Voltage (1)	Greater than 1 VDC
Pull Up/Down Current	38 µA
Frequency Input	2 DIs per module software selectable as counters with 0 to 20 KHz range
DIGITAL OUTPUTS (RELAY)	
Number of Relays	2
Type	C (Normally Open and Normally Closed)
Output Connection	3 Terminals Per Relay (Common, NO, NC)
Comm. Connection	3.5 mm Terminal Block
Ratings	250 VAC @ 4 A, 30 VDC @ 4 A
ANALOG INPUTS / OUTPUTS	
Ranges	0 to 5 VDC, 0 to 10 VDC, 0 to 20 mA 4 to 20 mA
Resolution	16 bit (Inputs), 12 Bit (Outputs)
AI Load Resistance	100 MΩ - configured for Voltage 250 Ω - configured for Current
AO Output Current	1 mA maximum configured for Voltage
AO Source Load	450 Ω maximum configured for current
Input Protection	Over voltage to 2x max input voltage
POWER	
Power Connector	Terminal Block
Input Voltage	10 to 30 VDC
Power Use	
ZXT9-IO-xxxx	6.8 W (maximum)
ZXT24-IO-xxxx	4.5 W (maximum)
TERMINAL BLOCKS	
Wire Size	26 to 14 AWG
Torque	0.5 Nm (min) 0.6 Nm (max)
ENVIRONMENT	
Dimensions	5.12x5.12x2.37 in /130.1x130.1x60.2 mm
Operating Temp	-40 to 74°C (-40 to 165°F)
Storage Temp	-40 to 85°C (-40 to 185°F)
Op Humidity	0 to 95% (Non-Condensing)
Enclosure Rating	IP67
Use	Indoor and Outdoor
CERTIFICATIONS	
CE	EN55022: 2006 – Class A EN61000-6-1: 2006 – Heavy Industrial EN61000-4-2:2008 – ESD EN61000-4-3:2006 – EFT EN61000-4-6:2005 – Cond. Immunity
FCC	Class A FCC ID – ZXT9-RM – OUR-9XTEND FCC ID – ZXT24-RM – OUR-XBEEPRO
UL	C1D2, File – E245458
CONTROLS AND INDICATORS	
Signal Strength	8 Green RSSI LED's indicate signal strength
Power	Green LED
Receive Data	Green LED
Transmit Data	Green LED
Programming Port	USB
Reset	Push Button

Peer-to-Peer and Modbus I/O

Zlinx Standard Wireless I/O

PRODUCT FEATURES

- Modular, Customizable Wire Replacement
- Flexible configuration for multiple types of analog/digital I/Os
- Software Selectable RF Transmit Power
- Software Selectable Over-the-air Data Rate
- Modbus ASCII /RTU Compatible
- 900 MHz and 2.4 GHz Versions
- Wide Operating Temperature
- Active Repeater Functionality
- 10 to 40 VDC & 24 VAC Input Power
- AES Encryption

Zlinx™ Wireless Modbus I/O - flexible enough to fit your applications. These plug-n-play units combine traditional Modbus RTU remote analog and discrete I/O with built-in wireless connectivity. Wireless RTU serves as Modbus slave RTU in radio-based SCADA systems, or as a peer-to-peer communication platform.

Two Ranges Available - Short, Long range.

Active Repeaters - With built-in repeater functionality on 900 MHz -LR models, you can ensure vital signals get through.

Modular - Just snap on your I/O and you are ready to communicate.

Wide Temperature - Meets most indoor or outdoor applications.

Rugged circuitry - prevents signal degradation.

128 / 256 Bit AES Encryption - Secures data.

Selectable RF Transmit Power - Allows you to optimize the transmitter power for your application.

Selectable Over-the-air Data Rate - Allows you to decrease the OTA Data Rate (on -LR and -LR-AU versions), effectively increasing the radio transmitter's range.

Exception Reporting - In Modbus mode, allows the reporting of possible problems with connected devices.

Fail Safe - Allows you to set I/O to a safe state in the event of a communications failure.

Calibration - Calculates correction factors to make I/O values better match your sensor.

Communications Failure Alarm - Allows the first DO to be configured as a COM failure alarm indicator.

Invert Output - You can invert the logic of all DO's in peer-to-peer mode.

Monitor - Use the Zlinx™ Manager Software to monitor your I/O.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
ZZ8D-XX-LR Base Modules *	
ZZ8D-NA-LR	868MHz, 2 AI, 2 AO, 2 DI, 2 DO Sourcing, Long Range
ZZ8D-NB-LR	868MHz, 4 DI, 4 DO Sourcing, Long Range
ZZ8D-NC-LR	868MHz, 2 AI, 2 AO, 2 DI, 2 DO Sinking, Long Range
ZZ8D-ND-LR	868MHz, 4 DI, 4 DO Sinking, Long Range
ZZ9D-XX-LR Base Modules *	
ZZ9D-NA-LR	900MHz, 2 AI, 2 AO, 2 DI, 2 DO Sourcing, Long Range
ZZ9D-NA-LR-AU	900MHz, 2 AI, 2 AO, 2 DI, 2 DO Sourcing, Long Range
ZZ9D-NB-LR	900MHz, 4 DI, 4 DO Sourcing, Long Range
ZZ9D-NB-LR-AU	900MHz, 4 DI, 4 DO Sourcing, Long Range
ZZ9D-NC-LR	900MHz, 2 AI, 2 AO, 2 DI, 2 DO Sinking, Long Range
ZZ9D-NC-LR-AU	900MHz, 2 AI, 2 AO, 2 DI, 2 DO Sinking, Long Range
ZZ9D-ND-LR	900MHz, 4 DI, 4 DO Sinking, Long Range
ZZ9D-ND-LR-AU	900MHz, 4 DI, 4 DO Sinking, Long Range
ZZ24D-XX-SR Base Modules*	
ZZ24D-NA-SR	2.4GHz, 2 AI, 2 AO, 2 DI, 2 DO Sourcing, Short Range
ZZ24D-NB-SR	2.4GHz, 4 DI, 4 DO Sourcing, Short Range
ZZ24D-NC-SR	2.4GHz, 2 AI, 2 AO, 2 DI, 2 DO Sinking, Short Range
ZZ24D-ND-SR	2.4GHz, 4 DI, 4 DO Sinking, Short Range

World-wide.
Check with your local distributor for availability and options.
* Check wireless regulations/standards in your geographic area.

MODEL NUMBER	DESCRIPTION
Expansion Modules	
ZZ-8DI-DC	8 Digital Inputs, 10-48VDC
ZZ-8DO-T	8 Digital Outputs Sourcing
ZZ-8DO-T1	8 Digital Outputs Sinking
ZZ-8DO-R	8 Relay Outputs
ZZ-4AI	4 Analog Inputs
ZZ-4AO	4 Passive Source Analog Inputs, Requires Isolated External Power Supply
ZZ-4AO-2	4 Analog Output Sourcing
ZZ-4RTD1	4 RTD Input
ZZ-4DI4DO-DCT	4 Digital Inputs, 10-48VDC, 4 Digital Outputs Sourcing
ZZ-4DI4DO-DCT1	4 Digital Inputs, 10-48VDC, 4 Digital Outputs Sinking
ZZ-2AI2AO	2 Analog Inputs, 2 Analog Outputs

ACCESSORIES

ZZ-PROG1-USB	Zlinx USB Programming Module, Cable, Software CD
ZZ24D-ANT1	2.4 GHz Spare Antenna
ZZ9D-ANT1	900 MHz Spare Antenna
ZZ-DIN 1	Replacement DIN Clip and Spring
ZZ-TB1	Replacement Terminal Block Kit

SPECIFICATIONS

BASE MODULE RADIO PROPERTIES

Model No.	Frequency	Software Selectable RF Power Options	Factory RF Power Setting	AES Encryption	Over-the-air Data Rate
ZZ24D-Nx-SR	2.4 GHz	10mW, 16mW, 25mW, 40mW, 63mW	63mW	128 Bit	250 Kbps
ZZ9D-Nx-LR	900 MHz *	1mW,10mW, 100mW, 500mW, 1000mW	1000mW	256 Bit	9.6 or 115.2 Kbps
ZZ9D-Nx-LR-AU	900 MHz *	1mW, 10mW, 100mW, 500mW, 1000mW	1000mW	128 Bit	9.6 or 115.2 Kbps
ZZ8D-Nx-LR	868 MHz **	1mW, 23mW, 100mW, 159mW, 316mW	316mW	128 Bit	24 Kbps

Note: ZZ9D-Nx-LR and ZZ9D-Nx-LR-AU have software selectable OTA data rates.

	Range w/Supplied Antenna (indoor / outdoor) maximum	Range w/High Gain Antenna (Outdoor) maximum
ZZ24D-Nx-SR	300 Feet (91 Meters) / 1 Mile (1.6 Kilometers)	N/A
ZZ9D-Nx-LR	3000 Feet (914 Meters) / 14 Miles (23 Kilometers)	40 Miles (64 Kilometers)
ZZ9D-Nx-LR-AU	3000 Feet (914 Meters) / 14 Miles (23 Kilometers)	40 Miles (64 Kilometers)
ZZ8D-Nx-LR	1800 Feet (549 Meters) / 25 Miles (40 Kilometers)	25 Miles (40 Kilometers)

*Note: 900 MHz units are not sold in Europe

** Note: 868 MHz units are not sold in North America

LATENCY

Base Module	Modbus		Peer-to-Peer	
	Digital	*Analog*	*Digital*	*Analog*
ZZ24D-xx-SR	8mS	15mS	20mS	25mS
ZZ9D-xx-LR	9mS	104mS	55mS	52mS

Latency times were measured in a clean RF environment with devices less than 3 feet (1m) apart.

Add 45mS per analog expansion module and 25mS per digital expansion module.

ZZ8D-Nx-LR radios have a 10% maximum duty cycle.

I/O POINTS

Model No.	Digital Inputs	Digital Outputs	Analog Inputs	Analog Outputs
ZZxD-NA-xx (Base)	2 (Pull-up Resistors)	2 (Sourcing)	2 (mA, V)	2 (V, mA, Sinking)
ZZxD-NB-xx (Base)	4 (Pull-up Resistors)	4 (Sourcing)	---	---
ZZxD-NC-xx (Base)	2 (Pull-up Resistors)	2(Sinking)	2 (mA, V)	2 (V, mA, Sinking)
ZZxD-ND-xx (Base)	4 (Pull-up Resistors)	4 (Sinking)	---	---
ZZ-8DI-DC	8 (Pull-up Resistors)	---	---	---
ZZ-8DO-T	---	8 (Sourcing)	---	---
ZZ-8DO-T1	---	8 (Sinking)	---	---
ZZ-4DI4DO-DCT	4 (Pull-up Resistors)	4 (Sourcing)	---	---
ZZ-4DI4DO-DCT1	4 (Pull-up Resistors)	4 (Sinking)	---	---
ZZ-4AI	---	---	4 (mA, V)	---
ZZ-4AO	---	---	---	4 (V, mA, Sinking)
ZZ-4AO-2	---	---	---	4 (V, mA, Sourcing)
ZZ-2AI2AO	---	---	2 (mA, V)	2 (V, mA, Sinking)
ZZ-8DO-R	---	8 (Relay)	---	---
ZZ-4RTD1	---	---	4 (RTD)	---

SOFTWARE PROGRAMMING KITS – REQUIRED TO PROGRAM YOUR SYSTEM

Model Number	Description
ZZ-PROG1-USB	Programming Module (USB Interface), USB cable and Software CD

Note: The Software CD is only available with the programming kit. Software and Firmware can also be downloaded at www.bb-elec.com

continued...

Peer-to-Peer and Modbus I/O

Zlinx Stamdard Wireless I/O

SPECIFICATIONS

DIGITAL INPUTS	
Voltage Range:	0 to 48 VDC
Low Voltage (0):	0.8 V maximum
High Voltage (1):	4.0 V minimum
Pull Up Current:	38 micro-amps
Frequency Input:	2 DI inputs per module Software selectable as frequency counters, 0 to 5 KHz range.
DIGITAL OUTPUTS	
Voltage Range:	10 to 40 VDC (Sourcing) 0 to 48 VDC (Sinking) 40 mA per output
RELAY OUTPUTS	
Number of Relays:	8
Type:	C -normally open & normally closed
Output Connection:	3.5mm removable terminal block (2 per output)
Common Connection:	3.5mm removable terminal block
Ratings:	250VAC @ 8A, 30VDC @5A (maximum per bank of 4 as grouped on the label)
RADIO PROPERTIES (2.4 GHZ - SR MODELS)	
Frequency:	2.4 GHz
Output Power:	100 mW
Receiver Sensitivity:	-102 dbm
Antenna:	The included antenna is a 4.25 inch omni-directional with RPSMA connector. (p/n ZZ24D-ANT1)
RADIO PROPERTIES (900 MHX - LR MODELS)	
Frequency:	900 MHz
Output Power:	1W
Receiver Sensitivity:	100 dbm @ 115.2 K, 110 dbm @ 9.6K
Antenna:	The included antenna is a 6.5 inch omni-directional with RPSMA connector. (p/n ZZ9D-ANT1)
RADIO PROPERTIES (868 MHZ LR MODELS)	
Frequency:	868 MHz
Output Power:	315 mW
Receiver Sensitivity:	-112 dbm
Antenna:	The included antenna is a 6.5 inch omni-directional with RPSMA connector. (p/n ZZ9D-ANT1)
LED INDICATORS	
Receive Signal Strength:	Tri-color – Off = No Signal Red = Weak Signal Yellow = Medium Signal Green = Strong Signal
RF Data:	Green – Blinks with TD or RD Off = No Data
Local Bus Data:	Green – Blinks with TD or RD Off = No Data
Power:	Red – On = Power applied Off = No Power

ANALOG INPUTS AND OUTPUTS	
Ranges:	0 to 10 VDC or 0 to 20 mA ZZ-4AO-2 is an active current source. All others are passive
Resolution:	12 Bit
Input Accuracy:	0.2% full scale reading typical
Output Accuracy:	0.27% full scale reading typical
AI Load Resistance:	100 Mega Ohms when configured for voltage input 250 Ohms when configured for current input
AO Max Output Current:	1 mA when configured for voltage output.
AO Max Load	450 Ohms when configured for current output @ 12V
RTD INPUTS	
Number of RTD:	4
Wire Configuration:	2, 3, and 4 wire
Type:	PT100, PT1000 (Optimized for temperature coefficient of 385 C), Cu10 (Optimized for temperature coefficient of 427 C)
Input Connection:	3.5mm removable terminal block (4 per output)
Temperature Range:	PT100 = (-) 200 to (+) 650 C PT1000 = (-) 200 to (+) 100 C Cu10 = (-) 100 to (+) 260 C
Resolution:	0.1C cross at (-) 40 to (+) 80 C
Accuracy @ 25 C:	(+/-) 0.5 C typical
Accuracy (-)40 to (+) 80C	(+/-) 2.0 C maximum
ENVIRONMENTAL	
Operating Temperature	
ZZ-8DO-R	-40 to 55°C (-40 to 131°F)
All Others	-40 to 80°C (-40 to 176°F)
MAXIMUM AMBIENT AIR TEMPERATURE	
ZZ-8DO-R	55°C (131°F)
All Others	80°C (176°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95% Non-condensing
Enclosure	Plastic IP30
Mounting	35mm DIN Rail
Expansion	1 Base Module supports up to 6 Expansion Modules
Dimensions	1.2 x 3.7 x 5.0 in (2.9 x 9.3 x 12.7 cm)

SPECIFICATIONS

SOFTWARE	
Supported OS	A software CD is provided with programming kits and contains Zlinx Manager software, Users Manual and Quick Start Guide.

AGENCY APPROVALS	
FCC Part 15 Class A	Download DoC at www.bb-elec.com
CE	Download DoC at www.bb-elec.com
UL/cUL	File Numbers E245458 (Class 1, Div 2) & E222870 (UL508) **Models that are Class 1/Division 2 listed:** ZZ24D-Nx-SR (2.4GHz, Short range) ZZ9D-Nx-LR (900 MHz, Long range) ZZ-2AI2AO ZZ-4AI ZZ-4AO ZZ-4AO-2 ZZ-4DI4DO-DCT ZZ-4DI4DO-DCT1 ZZ-4RTD1 ZZ-8DI-DC ZZ-8DO-R ZZ-8DO-T ZZ-8DO-T1 ZZ-PROG1-USB **Class 1, Division 2 exceptions:** ZZ-8DO-R is not UL508 listed. ZZxxD-Nx-MR, ZZxxD-Nx-xR-AU and ZZ8D-Nx-xR models are not Class 1, Division 2 Listed but are UL508 listed.

MTBF (HOURS)			
ZZ24D-NA-SR	85547	ZZ24D-NB-SR	137106
ZZ24D-NC-SR	86247	ZZ24D-ND-SR	138362
ZZ24D-NA-MR	88006	ZZ24D-NB-MR	142946
ZZ24D-NC-MR	88746	ZZ24D-ND-MR	144909
ZZ9D-NA-MR	88006	ZZ9D-NB-MR	144746
ZZ9D-NC-MR	88746	ZZ9D-ND-MR	144909
ZZ9D-NA-LR	88195	ZZ9D-NB-LR	143446
ZZ9D-NC-LR	88938	ZZ9D-ND-LR	145422
ZZ8D-NA-LR	88195	ZZ8D-NB-LR	143446
ZZ8D-NC-LR	88938	ZZ8D-ND-LR	145422
ZZ-4AI	136050	ZZ-4AO	113996
ZZ-2AI2AO	119183	ZZ-8DI-T	317530
ZZ-8DO-T	313100	ZZ-8DO-T1	317530
ZZ-4DI4DO-DCT	197045	ZZ-4DI4DO-DCT1	200795
ZZ-8DO-R	40670	ZZ-4RTD1	243007
ZZ-4AO-2	113996		

ZLINX RADIO MODEM & I/O COMPATIBILITY	
Radio Modem	**Zlinx Base I/O Module**
ZP24D-250RM-SR	ZZ24D-Nx-SR
ZP9D-115RM-LR	ZZ9D-Nx-LR / ZZ9D-Nx-LR-AU
ZP8D-24RM-LR	ZZ8D-Nx-LR

POWER (BASE MODULES)	
Source	An external power supply is required (not included)
Voltage	10-40 VDC, 24 VAC Class 2, (2.7A Maximum)
Power Connection	Removable Terminal Block, 3.81 mm spacing

WIRING TERMINALS	
Wire Type	Copper Wire Only
Conductors	One Conductor Per Terminal
Wire Range	28 to 16 AWG
Tightening Torque	1.7 lb – in
Field Wiring Temp Rating	105°C Minimum (Sized for 60°C ampacity).
Power Consumption	10.0 W
SR Models	9.5 W
900 MHz LR Models	12.0 W
868 MHz LR Models	

POWER (EXPANSION MODULES)	
Source	Class 2 Power Derived from base modules Voltage and current listed on product label.
Power Consumption	
ZZ-4AI	1.0 W
ZZ-4AO	1.1 W
ZZ-2AI2AO	1.2 W
ZZ-8DI-DC	0.4 W
ZZ-8DO-T	15.8 W
ZZ-8DO-T1	1.1 W
ZZ-4DI4DO-DCT	8.1 W
ZZ-4DI4DO-DCT1	1.0 W
ZZ-8DO-R	3.2 W
ZZ-4RTD1	0.4 W
ZZ-4AO-2	6.0 W

OUTPUTS	
ZZ-8DO-R	Relay Output, 250VAC 2 A General Purpose/Point 8 A General Purpose Total
All Others	Low Voltage, Limited Energy Communications Protocol
Wire Type	
Conductors	Copper Wire Only
Wire Size	One Conductor Per Terminal 28 to 16 AWG
Tightening Torque	0.2 Nm (Newton-Meters)

REPLACEMENT PARTS	
ZZ-DIN1	Replacement DIN clip and spring for all ZZ products, also comes with spare screws for enclosure
ZZ-TB1	Replacement terminal block kit for ZZ products. Kit includes (1) Two position TB (3.81mm) (1) Four position TB (3.5mm) (1) Eight position TB (3.5mm) (1) Cover for local Bus
ZZ24D-ANT1	2.4 GHZ band antenna
ZZ9D-ANT1	900 MHz Spare Antenna

IP67 Outdoor Rated Industrial Radio Modem

Zlinx Xtreme Wireless Radio Modems

PRODUCT FEATURES

- IP67 rated for outdoor applications
- RS-232/422/485, serial communications
- Modbus Compatible
- Ranges to 40 miles (64 km) Line of Sight & Antenna Dependent
- Heavy duty machine mount industrial grade case and components
- Signal strength indicator aids trouble shooting
- 900 MHz and 2.4 GHz versions
- Wide temperature range -40 to 74°C
- Wide range power input: 10VDC to 30VDC
- AES Encryption
- UL Class1/Division2
- NEMA TS2

Do you need to get a digital signal across a highway or river? Zlinx® Xtreme Radio Modems can do it faster, easier, and less expensively than stringing cable. Easy plug-and-play set-up saves installation and maintenance time. These compact and rugged IP67 units are ideal for outdoor applications requiring Serial-to-Serial (RS-232/422/485) connectivity or to connect Zlinx® Xtreme Wireless I/O's to a Modbus RTU Master over a wireless network. Point-to-Multi Point connections are also possible.

Zlinx® Industrial Wireless products operate in license-free, Proprietary RF 900 MHz and 2.4 GHz ISM bands. Select the 900 MHz version for longer distances. For further flexibility, the output power is software selectable.

The 900 MHz units offer 256 bit AES Encryption. The 2.4 GHz units have 128 bit AES Encryption.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
ZXT9-RM	Zlinx Xtreme IP67 900MHz Radio Modem, Long Range, RS- 232/422/485
ZXT24-RM	Zlinx Xtreme IP67 2.4GHz Radio Modem, Short Range, RS-232/422/485
ZXT9-RM-KIT	Zlinx Xtreme IP67 900MHz Radio Modem Kit, (2) Radio Modems, (2) 24VDC IP67 Power Supplies, (1) USB Programming Cable

World-wide.
Check with your local distributor for availability and options.
* Check wireless regulations/standards in your geographic area.

ACCESSORIES

CLG-60-24	IP67 Power Supply, Panel Mount, 24V DC, 60W
ZXT9-ANT	900 MHz Spare Antenna
ZZ24D-ANT1	2.4 GHz Spare Antenna
ZXTMT	Zlinx Xtreme Conduit Kit

IP67 Outdoor Rated Industrial Radio Modem

Zlinx Xtreme Wireless Radio Modems

SPECIFICATIONS

RF PROPERTIES	
Physical Standard	802.15.4
FREQUENCY	
ZXT9-RM	900 MHz ISM (902-928 MHz)
ZXT24-RM	2.4 GHz ISM (2.4 to 2.5 GHz)
TRANSMIT POWER	
ZXT9-RM	1 mW, 10 mW, 100 mW, 500 mW 1 W – Software Selectable
ZXT24-RM	10 mW, 16 mW, 25 mW, 30 mW 63 mW – Software Selectable
Receiver Sensitivity	-100 dBm
OVER THE AIR DATA RATE	
ZXT9-RM	9.6 or 115.2 kbps
ZXT24-RM	Software Selectable 250 kbps
OUTDOOR RANGE	
ZXT9-RM	Supplied Antenna 14 mi (23 km) High Gain Antenna 40 mi (64 km)
ZXT24-RM	Supplied Antenna 1.5 mi (2.4 km) High Gain Antenna 10 mi (16 km)
Range estimates based on optimal RF conditions and an unobstructed line of sight.	
TRANSMISSION METHOD	
ZXT9-RM	FHSS
ZXT24-RM	DSSS
Modulation	FSK
CHANNEL CAPACITY	
ZXT9-RM	10 hop sequences share 50 Frequencies
ZXT24-RM	12 Direct Sequence Channels
Network Topologies	Peer-to-Peer, Point-to-Point, Point-to-Multi Point
ENCRYPTION	
ZXT9-RM	256 bit AES
ZXT24-RM	128 bit AES
SUPPLIED ANTENNA	
ZXT9-RM	Impedance – 50 Ω Connector – RPSMA Female VSWR – 2.0 Max (in-band) Gain – 3 dBi Polarization – Vertical Length – 7.8 in (198 mm)
ZXT24-RM	Impedance - 50Ω Connector – RPSMA Female VSWR – 2.0 Max (in-band) Gain – 2.1 dBi Polarization – Vertical Length – 4.38 in (113 mm)
Modem Antenna Con.	RPSMA Male
SOFTWARE	
Support	Win XP, 7
Features	RSSI signal range test

SERIAL PROPERTIES	
Data Rates	
ZXT9-RM	1.2 to 230.4 kbps
ZXT24-RM	1.2 to 115.2 kbps
Data Bits	8
Parity	None, Even, Odd, Mark, Space
Stop Bits	1 or 2
Flow Control	None or Software
RS-232	Connector: Terminal Block Signals: TD, RD, RTS, CTS, GND
RS-422	Connector: Terminal Block Signals: TDA(-) TDB(+) RDA(-) RDB(+) GND
RS-485 (2/4 Wire)	Connector: Terminal Block Signals (4-Wire): TDA(-), TDB(+), RDA(-), RDB(+), GND Signals (2-Wire): Data A(-), Data B(+), GND
SD Control	Automatic Bit Wise
Termination	120Ω Ohm DIP Switch Selectable
Industrial Bus	MODBUS RTU
POWER	
Power Connector	Terminal Block
Input Voltage	10 to 30 VDC
Power Use	ZXT9-RM: 1.7 W (typical), 5.8 W (maximum) ZXT24-RM: 1.2 W (typical), 3.5 W (maximum)
ENVIRONMENT	
Dimensions	5.12x5.12x2.37 in /130.1x130.1x60.2 mm
Operating Temp	-40° to 74°C (-40 to 165°F)
Storage Temp	-40° to 85°C (-40 to 185°F)
Op Humidity	0 to 95% (Non-Condensing)
Enclosure Rating	IP67
Use	Indoor and Outdoor
CERTIFICATIONS	
UL	UL, cUL, Class 1 Div 2 Groups A, B, C, D File E245458
CE	EN55022: 2006 – Class A EN61000-6-1: 2006 – Heavy Industrial EN61000-4-2:2008 – ESD EN61000-4-3:2006 – EFT EN61000-4-6:2005 – Cond. Immunity
FCC	Class A FCC ID – ZXT9-RM – OUR-9XTEND FCC ID – ZXT24-RM – OUR-XBEEPRO
NEMA TS2	
CONTROLS AND INDICATORS	
Signal Strength	8 Green RSSI LED's indicate signal strength
Power	Green LED
Receive Data	Green LED
Transmit Data	Green LED
Programming Port	USB
Reset	Push Button

REMOTE MONITORING WITH WIRELESS SENSORS... IN

by **Bill Conley** Product Manager - Cellular & Proprietary Devices

USING SOLAR POWER AND RADIO TO ESTABLISH ETHERNET CONNECTIVITY

...where there's no access to a power grid or internet infrastructure.

If remote sensors are to be autonomous, and if they are to report their data in real time, they must have a reliable power source and a stable Ethernet connection.

The United States Geological Survey (USGS), for example, monitors water conditions with a nationwide array of automated sensors, and uses their data to update the USGS web site with the latest information. Many of these sensors must function in locations where there is no access to the power grid and no Internet infrastructure, and where regular human interaction with the sensor installation would be impractical. B&B Electronics, specialists in M2M connectivity solutions for harsh and remote environments, worked with the USGS to overcome those issues. The team integrated a sensor with a solar panel and a NEMA 3R weatherproof enclosure that contained B&B Electronics' Zlinx Xtreme IP67-rated outdoor radio transmitter with a high-gain antenna, maintenance-free battery and lifetime warranty. The goal was to create a water-monitoring station that could reliably transmit its data up to 64 km, 24/7.

Nothing can be accomplished without power, so the first step was to determine the daily power requirements for each sensor and its attached radio transmitter. A typical sensor using an analog output might use 0.60 Amp hours per day (0.4 W x 24 hours at 12 V.). A digital sensor might use 0.72 Amp hours per day. If connected to a an IP67-rated outdoor radio transmitter like the B&B Electronics Zlinx Extreme, which requires around 2.4 Amp hours per day, the total power requirement would be 3.12 Amp hours per day.

There is no need for an onsite generator when the power requirements are that low. A solar panel and attached battery will do the job. The size and cost of the required solar panel will be a function of the location and its solar insolation, the measure of solar energy received on a given surface area over a specified period of time. In a location like Chicago, IL, for example, with an average yearly solar insolation level of 3.72, a 50 W solar panel would provide enough power to operate a transmitter and its associated sensor while simultaneously charging the attached 12 V battery so that transmission can continue during the hours of darkness. After calculating the power requirements for each USGS installation, an appropriate solar panel was selected.

After that it was a matter of radio physics. Currently, the most commonly used unlicensed frequencies are 2.4 GHz and 900 MHz, although the move to digital television has freed up new bandwidth at lower frequencies.

At 2.4 GHz radio has greater bandwidth, but less range – and for now – more interference from other transmitters. Additionally, the higher the radio frequency, the more it will be affected by multipath propagation, a phenomenon that occurs when broadcast radio signals bounce off intervening objects and arrive at the receiver at different times, and out of sequence.

At 900 MHz radio has greater range, less competition from other devices and is less susceptible to multipath propagation. But it provides less bandwidth. A transmitter like the Zlinx Extreme can broadcast in either frequency. So the successful remote installation involved experimenting with both options to see which one provided the best signal strength in the local environment.

REAL-TIME

EXTREME SOLUTION FOR REMOTE MONITORING APPLICATIONS

... monitoring volcano activity wirelessly.

What do icelandic volcanoes do? The answer to this question is extremely important for many people and companies – not only on Iceland. In 2010 air traffic was shut down due to volcano ash in the atmosphere. Thousands of people waited in vain for scheduled flights and numerous cargo shipments were delayed across Europe. For these reasons and more, remote monitoring of volcanoes is important to all of us.

Wireless routers help transfer data from seismological stations via cellular mobile operator network technology to a central location where it is processed and analyzed.

"Wireless data transfer from geo-measuring devices is one of the large varieties of applications where cellular mobile operator network communication is really efficient. Reliability and security of such a solution is vital. Also important are entry-level and operating costs compared to other technologies available on market," says Otakar Müller, B&B Electronics Sales and Marketing Director for Cellular, EMEA.

His opinion is proven by the operation of hundreds of other, similar applications. Wireless routers are also suitable for industrial uses, data transfer from ATMs, ticketing terminals and kiosks, and more.

Industrial Grade Radio Modems – Up to 40mi/64km Range

Zlinx Wireless Radio Modems

PRODUCT FEATURES

- RS-232/422/485, Serial communications
- Modbus compatible – no additional converters needed
- Ranges up to 40 miles (64 km)
- Heavy duty DIN mount industrial grade case and components
- Signal strength indicator aids trouble shooting
- 900 MHz, 868 MHz, 2.4 GHz Versions
- Wide temperature range -40º to 85º C
- Wide Range Power Input: 10 to 48 VDC or 18 to 30 VAC
- AES Encryption
- UL Class1/Division2 (Long Range Only)

Do you need to get a digital signal across a highway or river or to the other end of your big warehouse? Zlinx radio modems can do the job faster, easier, and less expensively than stringing cable. Easy plug-and-play set-up saves installation and maintenance time. These compact and rugged units are compatible with Modbus and Profibus so no additional converters are required.

Despite their low prices, these are not wimpy consumer or office grade products. Select the power level you need to punch through whatever distance and interference situations you encounter. Zlinx radio modems are built to handle the heat, cold, and environments of industrial operations.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
ZP24D-250RM-SR	Zlinx Radio Modem 2.4 GHz Short Range, RS 232/422/485
ZP9D-115RM-LR	Zlinx Radio Modem 900 MHz Long Range, RS-232/422/485
ZP9D-115RM-LR-AU	Zlinx Radio Modem 900 MHz Australian Version
ZP8D-24RM-LR*	Zlinx Radio Modem, 868 MHz, Long Range
RM-LR-KIT	900 MHz Radio Modem, Long Range Starter Kit
RM-SR-KIT	2.4 GHz Radio Modem Short Range Starter Kit
RM-LR824-KIT	868 MHz Radio Modem Kit

Kits contain: (2) radio modems, (2) power supplies, 24VDC 30W, and (2) 6ft/1.8m serial cables

World-wide.
Check with your local distributor for availability and options.
* European - Check wireless regulations/standards in your geographic area.

ACCESSORIES

DR-75-24	75W Power Supply
ZP9D-ANT1	900 MHz Spare Antenna
ZP24D-ANT1	2.4 GHz Spare Antenna
ZP9D-DIN1	Replacement DIN clip kit for ZP9D radio modems
ZP24D-DIN1	Replacement DIN clip kit for ZP24D radio modems
ZP9D-TB1	Replacement terminal block kit for radio modems. Contains complete set of terminal blocks and dip switch cover
DRPM25	Panel Mount Adapter

Industrial Grade Radio Modems – Up to 40mi/64km Range

Zlinx Wireless Radio Modems

MODEL NUMBER:	ZP24D-250RM-SR	ZP8D-24RM-LR	ZP9D-115RM-LR
RF PROPERTIES			
Standard	IEEE 802.15.4	Proprietary Radio	Proprietary Radio
Range(with included antenna)	up to 300ft/91m indoor or 1mi/1.6km outdoor	Up to 24.9mi/40km outdoor	up to 3000ft/.91km indoor or 14mi/22.5km outdoor
Frequency	2.4 GHz	868 MHz	900 MHz
Transmit Power	100mW	316mW	1W
SOFTWARE			
Support	Win XP, Win 7		
Features	RSSI signal range test Modem emulation		
INCLUDED OMNI ANTENNA			
	2.1 dBi	3 dBi	3 dBi
ANTENNA CONNECTOR			
	External Reverse Polarity SMA male jack connector, omni directional (included with product)		
SERIAL PROPERTIES			
Baud	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400
Data Bit; Parity; Stop Bit	8 only; none only; 1 only	7, 8; None, even, odd, mark, space; 1, 2	7, 8; None, even, odd, mark, space; 1, 2
RS-232	DB9F DCE or Terminal Block (TX, RX, GND available on Terminal Block		
RS-422	Removeable terminal block, 2 or 4 wire - TX+, TX-, RX+, RX-, GND, 120 Ohm Dipswitch selectable		
RS-485	Removeable terminal block, 2 or 4 wire - TX+, TX-, RX+, RX-, GND, Bit wise, 120 Ohm Dipswitch selectable		
WIRELESS LINK FAILURE			
	Removeable terminal block, Open collector, dry contact, 40mA		
POWER			
Power Supply	10-48 VDC, 18-30 VAC, Removeable terminal block		
Power Consumption	2.0W max	6W max	5.0W max
DIMENSIONS			
	1.2W x 3.3D x 4.7H		
ENVIRONMENTAL			
Operating Temperature	-40° to 85ºC		
Storage Temperature	-40° to 85ºC		
Operating Humidity	10 to 90% non-condensing		
ENCLOSURE RATING			
Rating	IP30		
Mounting	DIN rail mount, 35mm		
LED Status	Power, Signal Strength, Wireless Data		
CERTIFICATIONS			
FCC	FCC Part 15 Class B		
CE	CISPR (EN55022) Class B EN61000-6-1 Generic Standards for Residential, Commercial, & Light Industrial EN61000-4-2-ESD, EN61000-4-3 RFI, EN61000-4-4 EFT, EN61000-4-5 Surge, EN61000-4-6 CI, EN61000-4-8 Power Frequency Magnetic, EN61000-4-11 Voltage Dips & Interruptions		
UL	UL, cUL	UL, cUL	UL, cUL, Class 1 Div 2 Groups A, B, C, D File E245458
RoHS directive (lead free)	Yes		

Dual Band (2.4 GHz, 5 GHz) Ethernet Bridge/Router

AirborneM2M™ Enterprise Series

PRODUCT FEATURES

- 10/100 Mbps to 802.11a/b/g/n (2.4 GHz, 5 GHz)
- Wide operating temperature Range (-20°C to +85°C)
- Compact form factor
- AirborneM2M™ SpeedLink roaming provides enhanced connection reliability
- Advanced Enterprise Class wireless security (WPA2-Enterprise, WPA, WEP, EAP)
- Available in OEM version (without enclosure)
- Supported by Airborne Management Center (AMC) device discovery, management and control application software

AIRBORNEM2M™ DUAL BAND WIRELESS

The AirborneM2M™ line of enterprise wireless Ethernet Routers and Bridges are built for networking equipment in an array of machine to machine (M2M) applications. The small compact form factor, integrated options and ease of use make it ideal for commercial enterprise environments.

Dual-Band Wi-fi

The AirborneM2M™ products establish wireless connections over both 2.4 GHz and 5 GHz bands. Whenever the 2.4 GHz airspace is overcrowded with competing wireless transmission, AirborneM2M™ products can be switched over to 5 GHz band to keep data flowing.

Enterprise Class Security

Security protocols are important to mission-critical wireless M2M applications. AirborneM2M™ multi-layered security approach addresses the requirements of Enterprise-class networks and corporate IT departments. These advanced security features include wireless security (801.11i/WPA2 Enterprise); network security (EAP authentication and certificate support); communication security (SSH functionality and fully encrypted data tunnels); and device security (multi-level encryption capability to protect configuration data).

SpeedLink™ Roaming

The latest AirborneM2M™ SpeedLink™ roaming feature further enhances the high level of connection reliability. SpeedLink™ enables AirborneM2M™ devices to roam quickly and freely throughout a wireless network without loosing important data. If you're walking around a hospital or driving through a warehouse, SpeedLink™ ensures you stay connected.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
AirborneM2M™ Enterprise Series	
ABDN-ER-DP551	Dual Band 802.11a/b/g/n (2.4 GHz, 5 GHz) Ethernet bridge and router with WPA2-Enterprise, WPA, WEP, EAP Security Support Advanced Enterprise Security
ABDN-ER-DP553	Dual Band 802.11a/b/g/n (2.4 GHz, 5 GHz) Ethernet bridge and router OEM Version

World-wide.
Check with your local distributor for availability and options.

AIRBORNEM2M™ ENTERPRISE MODELS OPERATE IN A WIDE-RANGE OF COMMERCIAL APPLICATIONS:

Medical devices
Retail / Point of sale products
Material handling & Logistics
Test & Measurement
Security & Access control

Dual Band (2.4 GHz, 5 GHz) Ethernet Bridge/Router

AirborneM2M™ Enterprise Series

SPECIFICATIONS

TECHNOLOGY	
Technology	IEEE 802.11a/b/g/n, Wi-Fi compliant
Wired Interface	10/100 Ethernet port (Bridge, Router (NAT3) Modes)
Frequency	2.4 ~ 2.4835 GHz (US/Canada/Europe) 5.150 ~ 5.350 GHz 5.725 ~ 5.825 GHz
Modulation Technology	DSSS, CCK, OFDM
Modulation Type	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
Network Access Modes	Infrastructure (Client), Ad Hoc
Channels	US/Canada: 11 Channels 802.11b/g 13 Channels 802.11a Europe: 13 Channels 802.11b/g 19 Channels 802.11a France: 4 Channels 802.11b/g
Wireless Data Rate	802.11b = 11, 5.5, 2, 1 Mbps 802.11a/g = 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n = 65, 58.5, 42, 39, 26, 19.5, 13, 6.5 Mbps
MAC	CSMA/CA with ACK, RTS, CTS
Network Protocols	TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING
Receive Sensitivity **802.11 b/g**	54Mb/s = -72 dBm 36Mb/s = -78 dBm 18Mb/s = -84 dBm 6Mb/s = -89 dBm 11Mb/s = -86 dBm 1Mb/s = -92 dBm
Receive Sensitivity **802.11 a**	54Mb/s = -74 dBm 36Mb/s = -80 dBm 18Mb/s = -86 dBm 6Mb/s = -90 dBm
Dimensions	63.4x99.0x46.7 mm (2.6x4.0x1.9 in)

FEATURES	
Transmit Power	802.11b 15 dBm (31.6mW) 802.11g 12.6dBm (18.12mW) 802.11a 17 dBm (50.1mW)
Security Protocols	Disabled, WEP 64 & 128bit, WPA (TKIP), WPA (AES), WPA2 (AES), 802.1x (EAP) Supplicant 802.11I, WPA & WPA2 Enterprise supplicants (EAP-TLS, EAP-TTLS(MSCHAPv2), EAPTTLS (MDS5), EAP-PEAPv0 (MSCHAPv2, LEAP), EAP-FAST, LEAP) Supports Certificates and Private Key Upload and Storage (Multiple)
Antenna	Integrated RP-SMA Omni-directional 2dBi 2.4/5 GHz Antenna
Power Supply	5.0VDC+/-5%
Supply In-rush Current	3000mA (MAX) for 20ms
DC Characteristics	Operating Current (Tx, 802.11g) = 370mA Typ. Operating Current (Rx, 802.11g) = 200mA Typ.
Environmental	Operating Temperature: -20° to +85°C Storage Temperature: -20° to +85°C Relative humidity: 5% - 95% (non-condensing) Vibration: 20G peak-to-peak, 20Hz-2KHz swept Shock: 1500G peak-to-peak, 0.5mS duration
Interfaces	10/100 Ethernet
Enclosure	Nylon (Gray)
LED Indicators	3 indicator LEDs (Power, LINK, COMM)
Agency Approvals	North America: FCC Title 47 Part 15 Class B Sub C Intentional Radiator, IOC RSS210 Europe: CE ETSI EN300 328 RoHS & WEEE compliant

M2M Dual Band (2.4GHz, 5GHz) Ethernet Bridge/Router; Serial Server

AirborneM2M™ Industrial Series

PRODUCT FEATURES

- RS-232/422/485 or 10/100 Mbps Ethernet to 802.11a/b/g/n (2.4 GHz, 5 GHz)
- One or two serial ports, one Ethernet port
- Advanced Enterprise class wireless security
- 2 kV serial ESD surge suppression
- Variable DC power supply (5-36 VDC), PoE 802.3af Power over Ethernet
- Extended operating temperature range (-40°C to +85°C)
- AirborneM2M™ SpeedLink roaming - enhanced connection reliability
- Supported by Airborne Management Center (AMC) device discovery, management and control application software

The AirborneM2M™ line of industrial wireless device serial servers and Ethernet Bridge/Routers are built for networking equipment in an array of machine-to-machine (M2M) applications. AirborneM2M™ Industrial Series feature industrial strength packaging and support a wide temperature rating (-40° to 85°C) to withstand challenging M2M environments. Available in both single and dual serial port models or a single Ethernet port model. Power options include 5-36VDC input or PoE 802.3af (Power over Ethernet) on select models.

Dual-Band Wi-Fi

The AirborneM2M™ products establish wireless connections over both 2.4 GHz and 5 GHz bands. Whenever the 2.4 GHz airspace is overcrowded with competing wireless transmission, AirborneM2M™ products can be switched over to 5 GHz band to keep data flowing.

Enterprise Class Security

Security protocols are important to mission-critical wireless M2M applications. AirborneM2M™ multi-layered security approach addresses the requirements of Enterprise-class networks and corporate IT departments. These advanced security features include wireless security (801.11i/WPA2 Enterprise); network security (EAP authentication and certificate support); communication security (SSH functionality and fully encrypted data tunnels); and device security (multi-level encryption capability to protect configuration data.

SpeedLink™ Roaming

The latest AirborneM2M™ SpeedLink™ roaming feature further enhances the high level of connection reliability. SpeedLink™ enables AirborneM2M™ devices to roam quickly and freely throughout a wireless network without loosing important data. If you're walking around a hospital or driving through a warehouse, SpeedLink™ ensures you stay connected.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
ADDN-ER-IN5010	Dual Band AirborneM2M™ Industrial Wireless Ethernet Bridge/ Router with 802.11i/WPA2 Enterprise Security Support
ABDN-ER-IN5018	Dual Band AirborneM2M™ Industrial Wireless Ethernet Bridge/ Router with 802.11i/WPA2 Enterprise Security Support; PoE
ABDN-SE-IN5410	Dual Band Industrial wireless serial server with one RS-232/422/485 to 802.11a/b/g/n
ABDN-SE-IN5420	Dual Band Industrial wireless serial server with two RS-232/422/485 to 802.11a/b/g/n

World-wide.
Check with your local distributor for availability and options.

ACCESSORIES

PS-WDS: 120-240VAC 50/60Hz; 5VDC, 2 A barrel connector power supply

MDR-20-24: 120-240VAC 50/60 Hz to 24VDC 1.0 A DIN rail

ACH2-DBAT-DP002: 2 dBi portable (Rubber duck) 2.4/5 GHz antenna

ACH2-DBAT-DP003: 3.8/5.5 dBi portable (Rubber duck) 2.4/5 GHz antenna

AIRBORNEM2M™ INDUSTRIAL PRODUCTS CAN BE DEPLOYED INTO A WIDE RANGE OF APPLICATIONS ACROSS VARIOUS INDUSTRIES INCLUDING:

Vehicle Telematics & Diagnostics
Material Handling & Logistics
Industrial Automation Test & Measurement
Security & Access Control
Military communications

M2M Dual Band (2.4GHz, 5GHz) Ethernet Bridge/Router; Serial Server

AirborneM2M™ Industrial Series

SPECIFICATIONS

TECHNOLOGY	
Wireless Technology	IEEE 802.11 a/b/g/n, Wi-Fi Compliant
Wired Interface	2 ports, RS-232/422/485, (RS-232/422 4 wire or RS-485 2 wire) 10/100 Ethernet port (Bridge, Router (NAT3) Modes) Software selectable
Frequency	2.4~2.4835 GHz (US/Canada/Europe) 2.4~2.497 GHz (Japan) 5.150 ~ 5.350 GHz 5.725 ~ 5.825 GHz
Modulation Technology	DSSS, CCK, OFDM
Modulation Type	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
Network Access Modes	Infrastructure (Client), Ad Hoc
Channels	US/Canada: 11 Channels 802.11b/g 13 Channels 802.11a Europe: 13 Channels 802.11b/g 19 Channels 802.11a France: 4 Channels 802.11b/g Japan: 14 Channels 802.11b 13 Channels 802.11g 23 Channels 802.11a
Wireless Data Rates	802.11a/g 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11b = 11, 5.5, 2, 1 Mbps 802.11n 65, 58.5, 42, 39, 26, 19.5, 13, 6.5 Mbps
Network Protocols	TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING, HTTP, FTP
Receive Sensitivity 802.11 b/g	54Mb/s = -72 dBm 36Mb/s = -78 dBm 18Mb/s = -84 dBm 6Mb/s = -89 dBm 11Mb/s = -86 dBm 1Mb/s = -92 dBm
Receive Sensitivity 802.11 a	54Mb/s = -74 dBm 36Mb/s = -80 dBm 36Mb/s = -80 dBm 6Mb/s = -90 dBm
Wireless Security	Open, WEP 64 & 128 bit, WPA-PSK (TKIP), WPA2-PSK (AES), 802.1x (EAP), WPA-Enterprise, WPA2-Enterprise, EAP-TLS/MSCHAPv2, EAP-TTLS/MSCHAPv2, EAP-TTLS (MD5), EAP-PEAPv0/MSCHAPv2, LEAP - Zero host security footprint - Advanced certificate storage and management
Secure Communications	- SSH and SSL tunneling - Encrypted configuration
Transmit Power	802.11b 15 dBm (31.6mW) 802.11g 12.6dBm (18.12mW) 802.11a 17 dBm (50.1mW)

POWER	
Input Voltage	5-36VDC +/-5%, 500mA (MAX)
Power Connection	2-position terminal block, 2.1mm barrel jack; PoE 802.3af
Power Use	2.5W at 5VDC
Supply In-rush Current	3000mA (MAX) for 20ms
PoE	PoE using a 802.3af Class 1 PSE device
LED INDICATORS	
4 LEDs	COMM, LINK, POWER, POST (Power on Self Test)
ENVIRONMENTAL	
Operating Temperature	-40° to +85°C
Storage Temperature	-40° to +85°C
Op. Humidity	5% - 95% (non-condensing)
MECHANICAL	
Antenna	RP-SMA Omni-directional 2dBi 2.4/5 GHz Antenna
Vibration	20G peak-to-peak, 20Hz-2KHz swept
Shock	1500G peak-to-peak, 0.5mS duration
Enclosure	Metal Enclosure
Mounting	Panel mount, optional DIN rail brackets
Dimensions	120.14 x 120.12 x 29.21 mm (4.89 x 4.73 x 1.15in)

REGULATORY APPROVALS

FCC Part 15.247, Class B Sub C Modular Approval
Industry Canada RSS-210
CE
ETSI EN300-328 v1.7.1
ETSI 60950-1
Directive 2004/108/EC
ETSI EN 55022:2006 + A1:2007 (emissions)
ETSI EN 55024:1998 + A1:2001
ETSI EN 55024:1998 + A2:2003 (immunity)
FCC Part 15 Subpart B:2007
- Part 15.107(b) (conducted emissions, Class A)
- Part 15.109(g) (radiated emissions, Class B)
Industry Canada ICES-003:2004, Issue 4
AS/NZS CISPR 11:2004 (Australia/New Zealand)
RoHS and WEEE Compliant

M2M Dual Band (2.4 GHz, 5 GHz) Access Point

AirborneM2M™ Access Point

PRODUCT FEATURES

- RS-232/422/485 or 10/100 Mbps Ethernet to 802.11a/b/g/n (2.4 GHz, 5 GHz)
- Combination Access Point/ Client, one or two serial ports, one Ethernet port
- Supports up to 10 Wi-Fi clients
- Advanced Enterprise class wireless security
- 2 kV serial ESD surge suppression
- Variable DC power (5-36 VDC), PoE 802.3af Power over Ethernet
- Extended operating temperature range (-40°C to +85°C)
- AirborneM2M SpeedLink roaming for enhanced connection reliability
- Supported by Airborne Management Center (AMC) device discovery, management and control application software

The AirborneM2M™ line of industrial wireless access points is built for networking equipment in an array of machine-to-machine (M2M) applications. AirborneM2M™ Access Point features industrial strength packaging and support a wide temperature rating (-40° to 85°C) to withstand challenging M2M environments. Power options include 5-36VDC input or PoE 802.3af (Power over Ethernet) on select models.

Combination Access Point and Client Capability

The AirborneM2M™ Access Point enables M2M equipment to create a self sufficient Wi-Fi network and easy access to equipment data or resources from WiFi enabled devices. The product also has the capability to be switched from an access point to a client; supporting both a single or dual RS-232/422/485 serial ports or a single 10/100 Mbps Ethernet port. The Ethernet port can be placed into either a router or bridge mode.

Dual-Band Wi-Fi

The AirborneM2M™ products establish wireless connections over both 2.4 GHz and 5 GHz bands. Whenever the 2.4 GHz airspace is overcrowded with competing wireless transmission, AirborneM2M™ products can be switched over to 5 GHz band to keep data flowing.

Enterprise Class Security

Security protocols are important to mission critical wireless M2M applications. The AirborneM2M™ Access Point multi-layer security approach addresses the requirements of Enterprise-class networks and corporate IT departments. These advanced security features include wireless security (802.11i/WAP2 enterprise); authentication security using WPA2 (AES-CCMP) and device security (multi-layered encryption). The AirborneM2M™ access point includes a fully functional DHCP server to provide unique addresses for each authenticated client. Up to 10 clients can be supported on the local Wi-Fi network.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
APXN-Q5428	Dual Band; AirborneM2M™ Industrial Access Point; 802.11a/b/g/n; PoE

World-wide.
Check with your local distributor for availability and options.

ACCESSORIES

PS-WDS: 120-240VAC 50/60Hz; 5VDC, 2 A barrel connector power supply

MDR-20-24: 120-240VAC 50/60 Hz to 24VDC 1.0 A DIN rail

ACH2-DBAT-DP002: 2 dBi portable (Rubber duck) 2.4/5 GHz antenna

ACH2-DBAT-DP003: 3.8/5.5 dBi portable (Rubber duck) 2.4 GHz, 5 GHz antenna

AIRBORNEM2M™ INDUSTRIAL PRODUCTS CAN BE INTEGRATED AND DEPLOYED INTO A WIDE RANGE OF APPLICATIONS ACROSS VARIOUS INDUSTRIES INCLUDING:

Vehicle Telematics & Diagnostics
Material Handling & Logistics
Industrial Automation Test & Measurement
Security & Access Control

M2M Ethernet Dual Band (2.4 GHz,5 GHz) Access Point

AirborneM2M™ Access Point

SPECIFICATIONS

TECHNOLOGY	
Wireless Technology	IEEE 802.11 a/b/g/n, Wi-Fi Compliant
Wired Interface	2 ports, RS-232/422/485, (RS-232/422 4 wire or RS-485 2 wire) 10/100 Ethernet port (Bridge, Router (NAT3) Modes) Software selectable
Frequency	2.4~2.4835 GHz (US/Canada/Europe) 2.4~2.497 GHz (Japan) 5.150 ~ 5.350 GHz 5.725 ~ 5.825 GHz
Modulation Technology	DSSS, CCK, OFDM
Modulation Type	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
Network Access Modes	Access Point Infrastructure (Client), Ad Hoc
Channels	US/Canada: 11 Channels 802.11b/g 13 Channels 802.11a Europe: 13 Channels 802.11b/g 19 Channels 802.11a France: 4 Channels 802.11b/g Japan: 14 Channels 802.11b 13 Channels 802.11g 23 Channels 802.11a
Wireless Data Rates	802.11a/g 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11b = 11, 5.5, 2, 1 Mbps 802.11n 65, 58.5, 42, 39, 26, 19.5, 13, 6.5 Mbps
Network Protocols	TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING, HTTP, FTP
Receive Sensitivity 802.11 b/g	54Mb/s = -72 dBm 36Mb/s = -78 dBm 18Mb/s = -84 dBm 6Mb/s = -89 dBm 11Mb/s = -86 dBm 1Mb/s = -92 dBm
Receive Sensitivity 802.11 a	54Mb/s = -74 dBm 36Mb/s = -80 dBm 36Mb/s = -80 dBm 6Mb/s = -90 dBm
Wireless Security	Open, WEP 64 & 128 bit, WPA-PSK (TKIP), WPA2-PSK (AES), 802.1x (EAP), WPA-Enterprise, WPA2-Enterprise, EAP-TLS/MSCHAPv2, EAP-TTLS/MSCHAPv2, EAP-TTLS (MD5), EAP-PEAPv0/MSCHAPv2, LEAP - Zero host security footprint - Advanced certificate storage and management
Secure Communications	- SSH and SSL tunneling - Encrypted configuration
Transmit Power	802.11b 15 dBm (31.6mW) 802.11g 12.6dBm (18.12mW) 802.11a 17 dBm (50.1mW)

POWER	
Input Voltage	5-36VDC +/-5%, 500mA (MAX)
Power Connection	2-position terminal block, 2.1mm barrel jack; PoE 802.3af
Power Use	2.5W at 5VDC
Supply In-rush Current	3000mA (MAX) for 20ms
PoE	PoE using a 802.3af Class 1 PSE device
LED INDICATORS	
4 LEDs	COMM, LINK, POWER, POST (Power on Self Test)
ENVIRONMENTAL	
Operating Temperature	-40° to +85°C
Storage Temperature	-40°to +85°C
Op. Humidity	5% - 95% (non-condensing)
MECHANICAL	
Antenna	RP-SMA Omni-directional 2dBi 2.4/5 GHz Antenna
Vibration	20G peak-to-peak, 20Hz-2KHz swept
Shock	1500G peak-to-peak, 0.5mS duration
Enclosure	Metal Enclosure
Mounting	Panel mount, optional DIN rail brackets
Dimensions	120.14 x 120.12 x 29.21 mm (4.89 x 4.73 x 1.15 in)

REGULATORY APPROVALS

FCC Part 15.247, Class B Sub C Modular Approval
Industry Canada RSS-210
CE
ETSI EN300-328 v1.7.1
ETSI 60950-1
Directive 2004/108/EC
ETSI EN 55022:2006 + A1:2007 (emissions)
ETSI EN 55024:1998 + A1:2001
ETSI EN 55024:1998 + A2:2003 (immunity)
FCC Part 15 Subpart B:2007
- Part 15.107(b) (conducted emissions, Class A)
- Part 15.109(g) (radiated emissions, Class B)
Industry Canada ICES-003:2004, Issue 4
AS/NZS CISPR 11:2004 (Australia/New Zealand)
RoHS and WEEE Compliant

6 Overlooked Places

Wi-Fi can save you Time, Money and Trouble.

1

FLEXIBLE WORK CELLS

Industrial assembly was traditionally done by breaking a process down into individual steps and positioning machinery to maximize the efficiency and throughput of each machine. But that model lacked the flexibility needed for the production of small and customized lot sizes. The solution is the work cell, where the machinery and devices required for a specific project can be temporarily grouped together, and released for other uses as dictated by circumstances. But that means re-cabling the work cells every time there's a change. Wi-Fi makes it easier - and cheaper - to set up and rearrange work cells.

Flexible Work Cells

2

MOBILE CONNECTIONS

Cable connections don't allow for much mobility. In applications like shipping and receiving, where the value of mobile machinery like forklifts is greatly enhanced if those devices have network connections, an industrial-grade Wi-Fi wireless access point like the B&B Electronics' APXN-Q5428 can keep mobile equipment connected to the network even as it moves around a facility. A truck could connect to a forklift to download or upload delivery manifests and shipment details. Inventory systems, printers, scales and other tools can communicate directly with a vehicle to expedite workflow.

Wi-Fi clients like laptops, tablets or smart phones can connect directly to the vehicle. Even vehicle maintenance is simplified, as onboard diagnostics and telematics can be monitored directly or from a remote location.

3

LEGACY DEVICES

The enormous installed base of devices using serial communications isn't going anywhere any time soon. But as newer protocols like Ethernet and Wi-Fi have appeared, it is becoming harder to find laptops or computers equipped with serial ports. One solution is to equip serial devices with wireless Ethernet serial servers. Wireless serial server technology can turn a serial device into one more node on the network and give it communications capabilities that it was never designed to possess.

A serial device could also be equipped with an embedded Wi-Fi access point module like the B&B Electronics' ABDN-ER-DP511, which creates a self-sustaining wireless hotspot much like the one at the corner coffee shop. Handheld Wi-Fi clients can then connect to it using Android, iOS or Windows.

It's worth re-thinking some of the ways industrial data communications have been made considering where Wi-Fi can fit into the mix.

Technological advances like multiple-in-multiple-out (MIMO) transmitting and receiving are making Wi-Fi increasingly useful in industrial applications. Bandwidth and reliability have increased dramatically, and implementation costs have dropped.

4

CABLE VULNERABILITY

Although network cables are commonly run under floors, or through walls or drop ceilings, some portion of the cable must eventually be exposed as it makes the final run to an attached device. That's not a big issue in an office environment, but in industrial applications that final run leaves a cable vulnerable to serious damage. Cables may be crushed by moving machinery, stepped on, pulled, bent, or soaked in damaging fluids like solvents. And when cables fail, installing new cable is often cheaper and easier than tracking down the fault point in the existing installation. If this happens often enough it will ultimately create a confusing rat's nest of old and new wiring.

The problem is magnified in temporary installations at remote locations. Imagine setting up a large generator system for a remote construction site, or to provide temporary power after a natural disaster. You'd need to tie together everything from SCADA to Modbus, and you'd be working in a slightly disorganized environment full of moving vehicles and workmen. Murphy's Law tells us what would happen to any exposed cable. Trenching your cable would help, but it would add time and expense to the project. And the final run would still be highly vulnerable. It would be easier to do the job with Wi-Fi.

5

HARD-TO-WIRE AREAS

Sometimes you just can't wire a widget. The expenses involved in running cable over a river or highway, for example, can be prohibitive. Even an indoor installation can be problematical, depending upon where a device needs to be placed. And moving data any significant distance over cable will call for expensive fiber optic cables, receivers and transceivers. Fiber optic cable provides for enormous bandwidth and, as demonstrated by the telcos, it will carry data across entire continents. But how many applications would actually require that much range or bandwidth? For far less money you can install off-the-shelf Wi-Fi bridges that will create connections with speeds of up to 150 Mbps at distances of up to 15 km, depending upon local conditions.

Hard-To-Wire Locations

6

HAZARDOUS LOCATIONS

In 1989 a solar flare created a magnetic storm that knocked out the power grid for all of Quebec by inducing unexpected current on the power lines. Industrial motors and other high-power devices create magnetic fields that will affect nearby copper cabling in much the same way, though on a smaller scale. With luck, the only result will be data transmission errors and blue screens. But more serious events will damage expensive equipment.

And the greater the distance between connected devices, the more likely it becomes that communicating devices will be getting their power from different building ground references. When they do, copper cable can create a ground loop path. Again, you'll be able to count yourself lucky if the only result is a blue screen.

These problems can't be addressed with ordinary surge suppression, which only tries tries to limit spikes between the signal and ground line. (When the ground line rises, as it does in ground loop situations, surge suppression won't stop it.) You could install isolators, which allow the lines to float while keeping the local side at the proper ground and signal level. And you could invest in fiber optics, which are natively immune to electromagnetic interference (EMI), spikes surges and ground loops.

But if you'd prefer to save yourself some money and trouble, you could just use Wi-Fi.

Secure, Rugged Wi-Fi Modules

WLNN-XX-DP551 Series

PRODUCT FEATURES

- Quick time to market and reduced integration costs
- 802.11a/b/g/n Wi-Fi (2.4 GHz, 5 GHz)
- Airborne PowerSave firmware reduces power consumption and extends battery life in mobile devices
- Extended Operating Temperature Range (-40°C to +85°C) and environmental specifications
- AirborneM2M SpeedLink roaming provides enhanced connection reliability
- Advanced Enterprise Class wireless security
- AirborneM2M PortFlex capability enables any combination of comm ports (UART, SPI, GPIO, Ethernet and 802.11 interfaces)
- FCC Part 15 Class B Sub C Modular Approval minimizes regulatory requirements
- Backwards compatible with previous generations of AirborneM2M embedded modules

AIRBORNEM2M™ EMBEDDED DUAL BAND WIRELESS DEVICE SERVER AND ETHERNET SOLUTION MODULES SERIAL & ETHERNET TO 802.11A/B/G/N (2.4 GHz, 5 GHz)

The AirborneM2M line of highly-integrated 802.11 wireless modules allow OEMs to Wi-Fi enable devices used in an array of machine-to-machine (M2M) applications. B&B delivers all of the necessary RF technology, networking stacks and advanced security features in a compact, single-board package, reducing integration costs for OEMs and providing for a quick time to market.

Big Performance in Small and Ruggedized Package

The AirborneM2M series delivers the industry's most rugged, highly-integrated, embedded Wi-Fi module solution. AirborneM2M modules meet extended operating temperature and shock/vibration specifications of the most demanding M2M applications.

Utilizing a 32bit ARM9 processor and the high-performance Atheros AR6203 802.11 radio, the new AirborneM2M modules deliver increased transmit power and receive sensitivity, contributing to superior range performance.

SpeedLink™ Roaming

The new AirborneM2M SpeedLink roaming feature provides enhanced connection reliability, enabling OEM devices to roam freely within a wireless network without loss of data or connection.

Flexible & Easy to Integrate

AirborneM2M incorporates support for both serial and Ethernet to Wi-Fi 802.11 2.4 or 5 GHz communications. Utilizing AirborneM2M PortFlex capability, OEMs may configure via software any combination of UART, SPI, Ethernet, GPIO and 802.11 interfaces. Each individual port can be independently configured.

The AirborneM2M modules are footprint and pin-compatible with their predecessors. Our commitment to maintaining hardware and software compatibility assures OEMs of a simple, future-proof migration path even as wireless technology evolves.

Enterprise Class Security

Security protocols are important to mission-critical wireless M2M applications. AirborneM2M multi-layered security approach addresses the requirements of Enterprise-class networks and corporate IT departments. These advanced security features include wireless security (801.11i/WPA2 Enterprise); network security (EAP authentication and certificate support); communication security (SSH functuionality and fully encrypted data tunnels); and device security (multi-level encryption capability to protect configuration data.)

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
WLNN-ER-DP551	802.11a/b/g/n, 10/100 Ethernet adapter, Advanced Enterprise Security
WLNN-AN-DP551	802.11a/b/g/n, UART interface, Advanced Enterprise Security
WLNN-SE-DP551	802.11a/b/g/n, UART with RS-232/422/485 Driver Control, Advanced Enterprise Security
WLNN-SP-DP551	802.11a/b/g/n, SPI interface, Advanced Enterprise Security
WLNN-EK-DP551	Design and Development Kit

World-wide.
Check with your local distributor for availability and options.

ACCESSORIES

ACH2-DBAT-DP002 - 2 dBi portable (Rubber duck) 2.4/5 GHz antenna

ACH2-DBAT-DP003 - 3.8/5.5 dBi portable (Rubber duck) 2.4 GHz, 5 GHz antenna

SPECIFICATIONS

TECHNOLOGY	
Technology	IEEE 802.11a/b/g/n, Wi-Fi compliant
Frequency	2.4 ~ 2.4835 GHz (US/Canada/Europe) 5.150 ~ 5.350 GHz 5.725 ~ 5.825 GHz
Modulation Technology	DSSS, CCK, OFDM
Modulation Type	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
Network Access Modes	Infrastructure (Client), Ad Hoc
Channels	US/Canada: 11 Channels 802.11b/g 13 Channels 802.11a Europe: 13 Channels 802.11b/g 19 Channels 802.11a France: 4 Channels 802.11b/g Japan: 14 Channels 802.11b 13 Channels 802.11g 23 Channels 802.11a
Wireless Data Rate	802.11b:11, 5.5, 2, 1 Mbps 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: 65, 58.5, 42, 39, 26, 19.5, 13, 6.5 Mbps
MAC	CSMA/CA with ACK, RTS, CTS
Network Protocols	TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING
Receive Sensitivity 802.11 b/g	54Mb/s = -72 dBm 36Mb/s = -78 dBm 18Mb/s = -84 dBm 6Mb/s = -89 dBm 11Mb/s = -86 dBm 1Mb/s = -92 dBm
Receive Sensitivity 802.11 a	54Mb/s = -74 dBm 36Mb/s = -80 dBm 18Mb/s = -86 dBm 6Mb/s = -90 dBm
Transmit Power 802.11a/b/g	802.11b 15 dBm 802.11g 12.6 dBm 802.11a 17 dBm
Security Protocols (Client mode)	Disabled, WEP 64 & 128bit, WPA (TKIP), WPA (AES), WPA2 (AES), 802.1x (EAP) Supplicant 802.11I, WPA & WPA2 Enterprise supplicants (EAP-TLS, EAP-TTLS(MSCHAPv2), EAPTTLS(MDS5), EAP-PEAPv0(MSCHAPv2, LEAP), EAP-FAST, LEAP) Supports Certificates and Private Key Upload and Storage (Multiple)
Antenna	Two (2) U.FL coaxial connectors, 50 Ohms Max gain @ 5 GHz = 5.5 dBi Max gain @ 2.4 GHz = 4.1 dBi
Supply	3.3VDC +/-5%, 650 mA (MAX)
Supply In-rush Current	1500mA (MAX) for 400us
DC Characteristics	Operating Current (Tx, 802.11g) = 370mA Typ. Operating Current (Rx, 802.11g) = 200mA Typ.
Environmental	Operating Temperature: -40° to +85°C Storage Temperature: -40° to +85°C Relative humidity: 5% - 95% (non-condensing) Vibration: 20G peak-to-peak, 20Hz-2KHz swept Shock: 1500G peak-to-peak, 0.5mS duration
Interfaces	Dual UART (960KBAUD), RS232/ 422/ 485, SPI (1bit/8MHz), 10/100 Ethernet, PortFlex
Digital I/O	8 GPIO
LED Indicators	4 indicator LED signals (RF ACT, POST, CONNECT, RF LINK), Signal Strength
Connector	36 pin High Density SMT connector from Hirose (DF12-36DS-0.5V), 4mm Height
Agency Approvals	North America: FCC Title 47 Part 15 Class B Sub C Intentional Radiator, IOC RSS210 Europe: CE ETSI EN300 328 RoHS & WEEE compliant

SMARTPHONES & M2M

CONNECTING MADE EASY, FINALLY.

by Bill Conley

You could argue that wireless data communications began in 1782, when Claude Chappe used semaphore towers to send messages between Paris, France, and the city of Lille, 220 km away. Called the 'Telegraph," Chappe's system was the origin of the word used for electrical messaging systems developed in the following century. It didn't work in bad weather, it didn't work at night, there was no network security and the data rate between Paris and Lille was roughly one symbol per minute. But it was the cutting edge of technology in its day, and an instant success. New telegraph lines soon sprang up all over Europe. When Morse code and electrical signaling came along they were faster and more efficient than the Chappe Telegraph, but the name stuck.

Data communications have continued to improve ever since. And just as happened with Chappe's telegraph, it would seem that new technologies must automatically supplant their predecessors.

But sometimes that's impractical. For example, in spite of the improvements of things like USB and Wi-Fi, there are still millions of perfectly serviceable serial devices in the world. And new serial devices are still coming on line. Serial technology is reliable, it's still very useful and so many people have so much invested in existing serial devices that the standard won't be disappearing any time soon. But as tablets and smart phones become more ubiquitous in the corporate and M2M business world, connecting to serial ports has become a bit more complicated. Tablets and smart phones don't have serial ports. In fact they tend to have limited wired connectivity of any kind, largely relying upon wireless communications for their interaction with the rest of the world. They're wonderful devices, but they're not natively designed to interact with serial equipment. Manufacturers, suppliers and integrators 2M equipment – as well as their customers - have a continuing need for serial communications.
So what can they do about the communications gap?

HOW IT WORKS

Serial device servers can be wired or wireless. The most popular types are network or TCP/IP device servers. In either case, wired or wireless, the serial server translates the serial data into an Internet Protocol (IP) format that can be transmitted across a network.

Wired serial device servers use Ethernet cable to connect to the local area network (LAN).

Wireless device servers contain a Wi-Fi client similar to the one in your laptop and connect via Wi-Fi, or 802.11. (The most common standards are 802.11b/g and 802.11b/g/n.) Wireless servers can connect to either an infrastructure network or to an AdHoc network.

When the Serial Device Server (SDS) network interface is connected to a LAN it provides an IP address that all other network devices can use for sending and receiving information. This address is unique to the SDS. Since this address is the location for all interactions, a secondary reference is used to locate the information or resource required for the specific interaction. This is called a port number.

Using the combination of IP address and port number it is possible to uniquely locate any serial port on the network.

It works like this: A serial device server has a physical serial port connected to port 8023 on the network interface. The network interface connects to the network and gets an IP address of 192.168.2.100. After combining the two pieces of information the full address of the serial port would be 192.168.2.100:8023. Any network-connected device capable of accessing that address can receive data from, or send data to, the serial port.

So what's the problem?
Current network SDS devices are designed to be used with an existing network infrastructure. If you have a manufacturing facility, warehouse or office, odds are that you already have a network installed - wired, wireless or both. Connecting to these networks has become much easier with the latest versions of SDS technology.

But what happens when you want to talk to a device that isn't covered by an existing wireless network? A large portion of the desired serial data may come from remote locations that are out of the coverage range of the corporate Wi-Fi network, or in an area where access to the available network is restricted because of IT policy and security rules. How can users access the data from these devices?

EMBEDDED HOTSPOTS

There is emerging technology that supports embedded Access Point functionality without changing the SDS functionality. As an example, B&B Electronics' SDS technology features an embedded AP device that creates a small, self-sustaining Wi-Fi network around the remote equipment that isn't all that different from the hotspot in a coffee shop. As your technician comes into range of the network, his Wi-Fi tablet or smart phone sees the network, connects to it and receives an IP address from the embedded AP. His device can then access the serial port on the AP using the appropriate IP address and port number. It doesn't change the way the SDS devices are used, it just makes them easily accessible to tablets and phones. Benefits of embedded AP:

- Tablets and smart phones will be able to access serial data in addition to existing network devices like laptops.
- Network devices won't need reconfiguring to use static IP addresses.
- A self-maintaining network won't lose devices or compromise their access.
- Users can simultaneously add and access wireless and wired devices on the embedded hotspot.
- There is no change to the existing use paradigm of networked serial device servers.

The example B&B device can support up to two serial devices, an Ethernet 10/100 network and multiple wireless clients simultaneously. It provides WPA/WPA2 security and an embedded DHCP server. Both external box and embedded module versions are available.

Serial ports have been around for a long time, and they represent an earlier generation in communications engineering. But that doesn't mean that tablets and smart phones shouldn't talk to them. They still have a lot of information to share.

TALK BACK!
Visit Bill's wireless blog and chat it up!
We'd love to hear from you!
www.bb-elec.com/Tech-Support/Bill

Secure, Rugged Wi-Fi Access Point Modules

APMN-Q551 Series

PRODUCT FEATURES

- Quick time to market and reduced integration costs
- 802.11a/b/g/n Wi-Fi radio (2.4 GHz, 5 GHz)
- AirborneM2M Power Save firmware reduces power consumption and extends battery life in mobile devices
- Extended operating temperature Range (-40°C to +85°C) and environmental specifications
- AirborneM2M Speed Link roaming provides enhanced connection reliability
- AirborneM2M PortFlex capability enables any combination of communication ports (UART, SPI, GPIO, Ethernet and 802.11 interfaces)
- FCC Part 15 Class B Sub C Modular Approval minimizes regulatory requirements
- Backwards compatible with previous generations of AirborneM2M embedded modules

AIRBORNEM2M EMBEDDED DUAL BAND ACCESS POINT MODULE OR CLIENT 802.11A/B/G/N (2.4 GHz, 5 GHz)

The AirborneM2M line of highly-integrated 802.11 wireless access point modules allow OEMs to Wi-Fi enable devices used in an array of machine-to-machine (M2M) applications. B&B delivers all of the necessary RF technology networking stacks and advanced security features in a compact, single-board package, reducing integration costs for OEMs and providing for a quick time to market.

Big Performance in Small and Ruggedized Package

The AirborneM2M series delivers the industry's most rugged, highly integrated, embedded wireless access point Wi-Fi module solution AirborneM2M modules meet extended operating temperature and shock vibration specifications of the most demanding M2M applications.

Utilizing a 32bit ARM9 processor and the high-performance Atheros AR6203 802.11 radio, the new AirborneM2M modules deliver increased transmit power and receive sensitivity, contributing to superior range performance.

SpeedLink™ Roaming

The new AirborneM2M Speed Link roaming feature provides enhanced connection reliability, enabling OEM devices to roam freely within a wireless network without loss of data or connection.

Flexible & Easy to Integrate

AirborneM2M incorporates support for both wireless access point and serial to Wi-Fi communications. Utilizing AirborneM2M Port Flex capability, OEMs may configure via software any combination of UART, SPI, Ethernet, GPIO and 802.11 interfaces. Each individual port can be independently configured.

The AirborneM2M modules are footprint and pin-compatible with their predecessors. Our commitment to maintaining Hardware and software compatibility assures OEMs of a simple, future-proof migration path even as wireless technology evolves.

Enterprise Class Security

Security protocols are important to mission critical wireless M2M applications. The AirborneM2M™ Access Point multi-layer security approach addresses the requirements of Enterprise-class networks and corporate IT departments. These advanced security features include wireless security (802.11i/WAP2 enterprise), authentication security using WPA2 (AES-CCMP) and device security (multi-layered encryption). The AirborneM2M™ Access Point includes a fully functional DHCP server to provide unique addresses for each authenticated client. Up to 10 clients can be supported on the local Wi-Fi network.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
APMN-Q551	802.11a/b/g/n, 10/100 Industrial wireless access point/ router/client: UART, SPI and RS-232/422/485 wired interfaces
WLNN-EK-DP551	Design and Development Kit

World-wide.
Check with your local distributor for availability and options.

ACCESSORIES

ACH2-DBAT-DP002 - 2 dBi portable (Rubber duck) 2.4/5 GHz antenna

ACH2-DBAT-DP003 - 3.8/5.5 dBi portable (Rubber duck) 2.4 GHz, 5 GHz antenna

Secure, Rugged Wi-Fi Access Point Modules

APMN-Q551 Series

SPECIFICATIONS

TECHNOLOGY	
Technology	IEEE 802.11a/b/g/n, Wi-Fi compliant
Frequency	2.4 ~ 2.4835 GHz (US/Canada/Europe) 5.150 ~ 5.350 GHz 5.725 ~ 5.825 GHz
Modulation Technology	DSSS, CCK, OFDM
Modulation Type	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
Network Access Modes	Access Point, Infrastructure (Client), Ad Hoc
Channels	US/Canada: 11 Channels 802.11b/g 13 Channels 802.11a Europe: 13 Channels 802.11b/g 19 Channels 802.11a France: 4 Channels 802.11b/g Japan: 14 Channels 802.11b 13 Channels 802.11g 23 Channels 802.11a
Wireless Data Rate	802.11b: 11, 5.5, 2, 1 Mbps 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: 65, 58.5, 42, 39, 26, 19.5, 13, 6.5 Mbps
MAC	CSMA/CA with ACK, RTS, CTS
Network Protocols	TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING
Receive Sensitivity 802.11 b/g	54Mb/s = -72 dBm 36Mb/s = -78 dBm 18Mb/s = -84 dBm 6Mb/s = -89 dBm 11Mb/s = -86 dBm 1Mb/s = -92 dBm
Receive Sensitivity 802.11 a	54Mb/s = -74 dBm 36Mb/s = -80 dBm 18Mb/s = -86 dBm 6Mb/s = -90 dBm
Transmit Power	802.11b 15 dBm (31.6mW) 802.11g 12.6dBm (18.12mW) 802.11a 17 dBm (50.1mW)
Security Protocols (AP and AdHoc modes)	Disabled, WEP 64 & 128bit, WPA-PSK(TKIP), WPA2-PSK(AES)
Security Protocols (Client mode)	Disabled, WEP 64 & 128bit, WPA-PSK(TKIP), WPA2-PSK(AES), WPA & WPA2 Enterprise (EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-FAST, LEAP) and a suite of Migration modes (wpa-leap64, wpa-leap128, wpa-psk64, wpa-psk128, wpa-psk128-tkip, wpa2-psk-tkip) Supports Certificates and Private Key Upload and Storage (Multiple)
Antenna	Two (2) U.FL coaxial connectors, 50 ohms Max gain @ 5 GHz = 5.5 dBi Max gain @ 2.4 GHz = 4.1 dBi
Supply	3.3VDC +/-5%, 650mA (MAX)
Supply In-rush Current	1500mA (MAX) for 400us
DC Characteristics	Operating Current (Tx, 802.11g) = 370mA Typ. Operating Current (Rx, 802.11g) = 200mA Typ.
Environmental	Operating Temperature: -40° to +85°C Storage Temperature: -40° to +85°C Relative humidity: 5% - 95% (non-condensing) Vibration: 20G peak-to-peak, 20Hz-2KHz swept Shock: 1500G peak-to-peak, 0.5mS duration
Interfaces	Dual UART (960KBAUD), RS232/ 422/ 485, SPI (1bit/8MHz), 10/100 Ethernet, PortFlex
Digital I/O	8 GPIO
LED Indicators	4 indicator LED signals (RF_ACT, POST, CONNECT, RF_LINK), Signal Strength
Connector	36 pin High Density SMT connector from Hirose (DF12-36DS-0.5V), 4mm Height
Agency Approvals	North America: FCC Title 47 Part 15 Class B Sub C Intentional Radiator, IOC RSS210 Europe: CE ETSI EN300 328 RoHS & WEEE compliant

High Performance Wireless Ethernet Bridge

GHOSTBRIDGE

PRODUCT FEATURES

- Long Range, High Speed Wireless Ethernet Link
- Point and play setup
- Outdoor rated, UV stabilized enclosure
- Integrated 80 degree sector antenna
- Maximum data rate of 150 Mbps
- Up to 15 km line of sight range
- Wide temperature range of -30° to 80°C
- Power, Link and Signal Strength LED's provide instant view of status
- Includes both DC and AC powered PoE adapters
- PoE pass-through Ethernet port to connect local devices such as IP camera (24V Passive)
- Preconfigured WPA2 128 bit security

Seamlessly connect remote devices to your network, or bridge two LAN's together. The GhostBridge provides a high speed wireless Ethernet bridge with zero configuration required. Units are sold as a preconfigured pair and require no further setup. Simply mount it, aim it and plug it in to your network or device using the included
PoE adapters.

Swivel wall-mount bracket

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
GhostBridge5	5 GHz Secure Wireless Ethernet Bridge (sold in preconfigured pairs)
GhostBridge5-EU	5 GHz Indoor/Outdoor Wireless Ethernet Bridge (sold in preconfigured pairs EU Power Supply)
GhostBridge5-UK	5 GHz Indoor/Outdoor Wireless Ethernet Bridge (sold in preconfigured pairs) UK Power Supply)
GhostBridge2-EU2	2.4 GHz Indoor/Outdoor Wireless Ethernet Bridge (sold in preconfigured pairs EU Power Supply)
GhostBridge2-UK	2.4 GHz Indoor/Outdoor Wireless Ethernet Bridge (sold in preconfigured pairs) UK Power Supply)

World-wide.
Check with your local distributor for availability and options.

ACCESSORIES

GMT25 Swivel wall-mount bracket

IASFST MOCAP tape - 36 ft/11 m roll, 1 in/2.5 cm wide

APPLICATIONS

Water and Waste-water treatment
Warehouse automation
Security - IP cameras
Monitoring and Instrumentation

High Performance Wireless Ethernet Bridge

GHOSTBRIDGE

SPECIFICATIONS

ETHERNET INTERFACE	
Ethernet Port 1	RJ45
Ethernet Port 2	RJ45
LED's	Power, LAN1, LAN2, 4 wireless signal strength
POWER	
PoE Power	24V PoE powered device through Ethernet port + pins 4,5, - pins 7, 8
Included PoE Injectors	(2) 100-240VAC input @ 50-60 Hz 24V out, 0.5A out PoE injectors (2) DC input PoE injector with 1m power jack to stripped wires
Power	8 Watts maximum power consumption
RF	
Operating Frequency	5470 – 5825 GhostBridge5
TX Power (Avg)	21 – 27 dBm +/- 2dB (varies by mode/conditions)
RX Sensitivity	-74 – 96 dBm +/- 2dB (varies by mode/conditions)
Antenna Type	Integrated 2x2 MIMO. 80 degree sector
Antenna gain	14.6 – 16.1 dBi over 4.9 – 5.9 GHz
Security	Each pair is preconfigured to WPA2 128 bit
MECHANICAL	
Dimensions	11 x 3.2 x 1.2 in (28 x8 x 3 cm) body 11 x 3.2 x 2.4 in (28 x8 x 6 cm) including built-in brackets
Weight per unit	0.86 lbs (0.4 kg)
Shipping weight	3.0 lbs (1.4 kg)
Mounting	Integrated pole mount, wire ties included Optional wall/pole mount swivel bracket sold separately
Enclosure	IP54. UV Stabilized plastic.

ENVIRONMENTAL	
Operating Temperature	-30 to 80°C (-40 to 176°F)
Storage Temp	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95 % (Non-condensing)
APPROVALS / CERTIFICATIONS	
Emissions	FCC Class B, CISPR Class B (EN55022)
CE	EN61000-6-1:2007
	EN61000-4-2:2008 Electrostatic Discharge
	EN61000-4-3:2006 Radiated Immunity
	EN61000-4-4:2004 Electrical Fast Transients - Burst
	EN61000-4-6:2005 Conducted Immunity
	EN61000-4-11:2004 Voltage Dips and Interruptions
	EN 301 489-1 V1.4.1: 2002-08 Electromagnetic Compatibility
	EN 301 489-17 V1.2.1: 2002-08 Electromagnetic Compatibility
	EN 301 893-1 V1.4.1: 2007 Directive for 5 GHz Radio Equipment
	EN 50385: 002 RF Exposure Limits
	EN 60950-1: 2006 Safety for Information Technology Equipment

B&B ELECTRONICS
SPECTRE RT
PWR
OUT
IN
USR
RST
I/O
USB
PORT2
PORT1
ETH
STA
LNK
SPD
Fault

ETHERNET SWITCHES, ROUTERS, & EXTENDERS

THAT EXTEND YOUR INDUSTRIAL NETWORK TO THE EDGE

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Ethernet Routers

Managed Industrial 2 port Ethernet Routers - ERT310 series.....88 - 89

Ethernet Switches

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Managed PoE & Gigabit 8, 10, 18 port Ethernet Switches - EIRP600 series ....114 - 115
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Ethernet Extenders

Industrial Copper Ethernet Extenders - EIR-EXTEND-x series.....126 - 129
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ACCESS AND CONTROL AT THE NETWORK'S EDGE

As networks get more complex and specialized, B&B Electronics works harder to make networking easier for you. Our products help customers access their data information and control equipment – whether nearby or at remote distances. We provide a broad selection of rugged and reliable Ethernet devices designed with the most demanding industrial applications and environments in mind.

- *Energy & Remote Powering*
- *Alternative Energy Sources*
- *Water/Wastewater Management*
- *Government/Defense*
- *Telecommumications/Enterprise IT*
- *Security/Camera Surveillance*
- *Building Control*
- *Instrumentation/testing*
- *Transportation*

ETHERNET SWITCHES

ESW100 series & ESW200 series

- **Class 1 Division 2 rated**
- 5 and 8 port unmanaged switches
- IEEE 802.3, 802.3u, IEC802.3x, Level 3 61000-6-2 EMC
- IEC 60068 (shock, vibration, free fall)
- Standard operating temperature: -10 to 60°C
- Fiber distances: 2km (multi-mode) and 20km (single-mode)
- Redundant power inputs: 12 to 36 VDC, 10 to 24 VAC
- 10/100M, full/half duplex, MDI/MDI-X (auto-negotiate)
- 2K MAC addresses; Broadcast storm control
- Industrial IP30 DIN rail case (6 panel mount options)
- ESW100 series:
  Ultra compact design, less than 25mm (<1") wide
  LC fiber port options
- ESW200 series:
  Class 1/Division 2 options; NEMA TS2 options
  ST, SC single and multi-mode fiber ports options
  Wide temperature options, -40 to 75°C (-T models)
  12 to 36VDC and 24VAC capable

EIR400 series

- **Class 1 Division 2 rated (#EIR408-T)**
- 5 to 18 port, unmanaged Gigabit (1000Base) Ethernet
- Input voltage: dual 12 to 48 VDC, reverse polarity protection
- Power connection: removable terminal block
- Fault output: relay output
- Fiber options via SFP modules
- Wide temperature: -40 to 75°C
- NEMA TS2 options

EIRP300 series & EIRP400 series

- **Class 1 Division 2 rated (#EIRHP305-T, #EIRP305-24V-T)**
- PoE (15.4W and 25.5W options) unmanaged Ethernet switches
- Gigabit speeds for high throughput, high bandwidth
- Rugged IP30 case, DIN or panel mount
- Dual power inputs and alarm output
- Wide temperature: -40 to 75°C

EIRP600 series

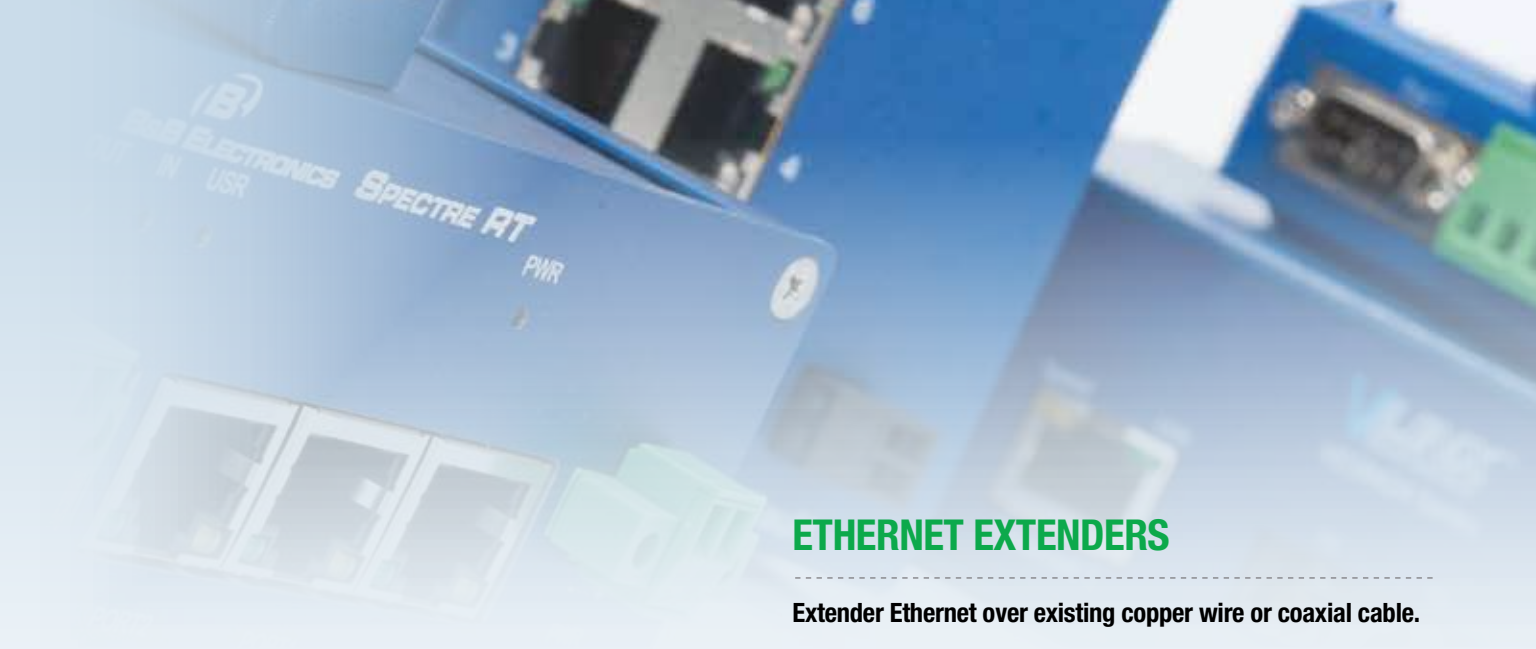
- Managed PoE Gigabit switches
- Gigabit speeds for high throughput, high bandwidth
- Power-over-Ethernet (PoE), PSE ports power IEEE802.3af PD devices
- SFP ports for network flexibility
- Auto MDI/MDI-X, store-and-forward
- Dual power inputs and alarm output
- Wide temperature (-T models)
- Rugged IP30 metal DIN rail or panel mount case
- NEMA TS2 options

EIR600 series

- Gigabit (1000Base) Ethernet managed switches
- IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX
- Redundant ring recovery time: <20ms
- Redundant dual power inputs and relay alarm output
- IGMP snooping with query mode
- Port based VLAN 802.1 Q Tag VLAN
- Auto MDI/MDI-X and negotiation
- Store-and-forward switching architecture
- Secure configuration, management, operation via web, SNMP or CLI
- Wide temperature
- NEMA TS2 options

ESW500 series

- Managed 6 to 16 port Ethernet switches
- IEC 61000-6-1, IEC 60068 (shock, vibration, free fall)
- Temperature: -10 to 60°C
- Wide temperature: -40 to 75°C (-T models)
- Gigabit options with copper and SFP combination ports
- Multi-mode, single-mode SC fiber port options
- IGMP snooping with query mode
- Port based VLAN / 802.1 Q Tag VLAN
- Power inputs & relay alarm output
- 12 to 36VDC (10 to 24VAC for ESW508 & ESW516 series)
- NEMA TS2 options



ETHERNET ROUTERS

ERT300 series - Spectre RT

- NEMA TS1 & TS2 rated for traffic control equipment
- VPN security - IPsec, OpenVPN, LP2T
- Firewall support
- NAT/PAT address & port translation
- SNMP management
- Wide temperature: -40 to 75°C

POE SPLITTER

EPSG202

- UL 508
- 10/100/1000T for PoE in and data out
- Output power up to 25W at 24VDC
- Wide temperature: -40 to 75°C
- Power isolation and short circuit protection for power output
- Auto disconnect for over-power voltage input
- 3k VDC EFT power line protection
- 6k VDC ESD Ethernet protection

Class 1/Division 2 Certified For Hazardous Locations

Switches (ESW100 series, ESW200 series)
Gigabit Switch (EIR408-T)
PoE Switches (EIRHP305-T, EIRP305-24V-T)
Unmanaged Extender (EIR-EXTEND)

For applications requiring Class 1/Division 2 certification, B&B Electronics has a range of connectivity and communication solutions designed to operate in hazardous environments.

- see page 470 for a complete listing of C1D2 products.

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ETHERNET EXTENDERS

Extender Ethernet over existing copper wire or coaxial cable.

EIR-EXTEND-x series

- **Class 1 Division 2 rated (#EIR-EXTEND)**
- UL508, NEMA TS1/TS2, IEC61000-6-2 EMC (#EIR-EXTEND-4)
- Extender interface: RJ-11 or terminal block
- Ethernet port: 10/100Base TX RJ-45
- Wide temperature: -40 to 75°C

EIS-EXTEND-x series

- Ethernet port: 10/100Base TX (TX) RJ-45
- IEEE 802.3 10BaseT and IEEE 802.3u 100BaseTX compliant
- RJ-11 line port auto senses 1/3/5/10/15/20/25/30/40/50Mbps
- DIP switch setup as local or remote device
- Status LED's for monitoring and connection

EIS-EXTEND-C series & EIR-EXTEND-C series

- BNC or F-Type connector line port link
- 10/100Base TX (TX) RJ-45 Ethernet port
- IEEE 802.3 10BaseT and IEEE 802.3u 100BaseTX compliant
- DIP switch setup as local or remote device
- Status LEDs for monitoring and connection

EIRP-EXTEND-x series

- EN61000-6-2 EMC heavy industrial standards
- IEC600068-2-27 (shock) and 600068-2-6 (vibration) tested
- NEMA TS1/TS2 requirements for traffic control equipment
- PoE+ ports for cameras and PoE devices
- Status LEDs for monitoring and connection
- Wide temperature: -40 to 75°C

EIRM-EXTEND-x series

- Complies with NEMA TS1 & TS2 Environmental requirements for Traffic control equipment
- Complies with IEC61000-6-2 EMC Generic standard immunity for Industrial environments
- Web, CLI, SNMP management and monitoring of connected devices
- Ethernet port: 10/100Mbps-Full/Half-duplex, Auto-Negotiation, Auto-MDI/MDIX
- Ethernet extender ports: RJ-11 and terminal block
- Ten communication speeds with speed indicator LEDs
- Link status (VDSL, Ethernet); External hardware watch dog
- -40 to 75°C (-40 to 167°F) operating range

ETHERNET SWITCHES, ROUTERS, & EXTENDERS

WHICH IS RIGHT FOR YOU?

ETHERNET ROUTERS	UNMANAGED ETHERNET SWITCHES			
PRODUCT FAMILY	**Industrial Ethernet Routers**	**Compact Industrial Ethernet Switches**	**Wide Temp Industrial Ethernet Switches**	**Industrial Gigabit Ethernet Switches**	**PoE Industrial Ethernet Switches**
PRODUCT SERIES	**ERT31x Routers**	**ESW100 SERIES**	**ESW200 SERIES**	**EIR400 series**	**EIRP300 series**
Function	Managed	Unmanaged	Unmanaged	Unmanaged	Unmanaged
10/100 Base	✔	✔	✔	✔	✔
Gigabit				✔	
PoE					✔
Ports					
Total Port Count	2	5, 8	5, 8	5, 8, 10, 18	5
Built-in Fiber Option		✔	✔		
SFP Fiber Option				✔	
Specifications					
Temperature - Low	-40°C	-10°C	-10°C	-40°C	-40°C
Temperature - High	+75°C	+60°C	+60°C	+75°C	+75°C
Wide Temperature Option	Standard	-10 to 60°C	-40°C to 75°C	Standard	Standard
Power - Low	10 VDC	12 VDC	12 VDC	12 VDC	24 VDC
Power - High	30 VDC	36 VDC	36 VDC	48 VDC	48 VDC
Dual Power Inputs		✔	✔	✔	✔
Relay Outputs				✔	✔
Mounting Options	Standalone or Desktop (DIN rail option)	DIN Rail (panel mount option)	DIN Rail (panel mount option)	DIN Rail (panel mount option)	DIN Rail (panel mount option)
NEMA TS2 Options	✔		✔	✔	
Class 1 / Division 2		✔	✔	EIR408-T	EIRHP305, EIRP305-24V-T
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	PoE SPLITTER	MANAGED ETHERNET SWITCHES		
PoE & GB Industrial Ethernet Switches	Industrial Power-over-Ethernet Splitter	PoE Industrial Ethernet Switches (GB, SFP)	Industrial Gigabit Ethernet Switches	Industrial Ethernet Switches
EIRP400 series	**EPSG202**	**EIRP600 series**	**EIR600 series**	**ESW500 series**
Unmanaged	Splitter	Managed	Managed	Managed
✔	✔	✔	✔	✔
✔	✔	✔	✔	✔
✔	✔	✔		
10	2	8, 10, 18	8, 10, 18	8, 16
				✔
✔		✔	✔	✔
-40°C	-40°C	-40°C	-10°C	-10°C
+75°C	+75°C	+75°C	+60°C	+60°C
Standard	Standard	Standard	-40°C to 75°C	-40°C to 75°C
48 VDC	24 VDC	12 VDC	12 VDC	12 VDC
48 VDC	24 VDC	48 VDC	48 VDC	36 VDC
✔		✔	✔	✔
✔		✔	✔	✔
DIN Rail (panel mount option)	DIN Rail (panel mount option)	DIN Rail (panel mount option)	DIN Rail (panel mount option)	DIN Rail (panel mount option)
		✔		✔
			✔	
110	**112**	**114**	**116**	**122**

ETHERNET SWITCHES, ROUTERS, & EXTENDERS

WHICH IS RIGHT FOR YOU?

ETHERNET EXTENDERS

PRODUCT FAMILY	Industrial Ethernet Extenders	Commercial Ethernet Extenders	Industrial Ethernet Extenders
PRODUCT SERIES	**EIR-EXTEND-x series**	**EIS-EXTEND-x SERIES**	**EIR-EXTEND-C SERIES**
Function	Industrial Grade	Commercial Grade	Industrial Grade
Unmanaged	✔	✔	✔
Managed			
Copper Extender	✔	✔	
Coaxial Extender			✔
Specifications			
Maximum Distance/Resulting Speed	1900 m/1Mbps	1900 m/1Mbps	2600 m/1-5Mbps
Resulting Distance/Maximum Speed	300m/50Mbps	300m/50Mbps	200m/85Mbps
Temperature - low	-40°C	0°C	-40°C
Temperature - high	+75°C	+60°C	+75°C
Wide Temperature	✔		✔
Power - low	12 or 24 VDC	12 VDC (power supply included)	12 VDC
Power - high	30 or 48 VDC	12 VDC (power supply included)	32 VDC
Dual Power Inputs	✔		✔
Extender Port	RJ-11, Terminal Block	RJ-11	BNC or F Style
Extender Port Count	1	1	1
Ethernet Ports	1 or 4	1	1
PoE Ports			
Mounting Options	DIN or Panel Mount	Desktop or Rack Mount	DIN or Panel Mount
Class 1 / Division 2	✔ (EIR-EXTEND)		
NEMA TS2 Options	✔		
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Commercial Ethernet Extenders	Industrial PoE+ Ethernet Extenders	Industrial Managed Ethernet Extenders
EIS-EXTEND-C series	**EIRP-EXTEND-x series**	**EIRM-EXTEND-x series**
Commercial Grade	Industrial Grade	Industrial Grade
✔	✔	
		✔
	✔	✔
✔		
2600 m/1-5Mbps	1900 m/1Mbps	1900 m/1Mbps
200m/85Mbps	300m/50Mbps	300m/50Mbps
-10°C	-40°C	-40°C
+60°C	+75°C	+75°C
✔	✔	✔
12 VDC (power supply included)	24 VDC	12 VDC
12 VDC (power supply included)	48 VDC	30 VDC
	✔	✔
BNC or F Style	RJ-11, Terminal Block	RJ-11, Terminal Block
1	1	1 or 2
1	1 or 2	1 or 8
	1 or 2	
Desktop or Rack Mount	DIN or Panel Mount	DIN or Panel Mount
134	136	140 - 143

Spectre RT Industrial Routers

ERT31x Series

PRODUCT FEATURES

- VPN security
- Firewall support
- NAT/PAT address & port translation
- SNMP management
- Wide temperature range -40 to 75°C
- Complies with NEMA TS1 & TS2

The Spectre RT industrial router connects Ethernet equipment in tough environments where office-grade equipment can't handle the job. With Ethernet, USB, I/O and auxiliary ports it's a flexible device with the built-in ability to handle multiple data communications protocols and to fit into virtually any network topology.

The Spectre RT supports the creation of VPN tunnels using IPsec, OpenVPN and L2TP. It supports DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS, and numerous other functions, as well as additional software. A password-protected Web interface allows users to configure and manage the Spectre RT from remote locations. The router can automatically upgrade its configuration and firmware from the operator's central server, allowing for simultaneous mass reconfiguration of every router on the network.

Users may insert Linux scripts and they can create up to four different configurations for the same router. Examples would include binary input configurations. Users may switch from one configuration to another at any time.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
ERT310	1 WAN, 1 LAN
ERT312	1 WAN, 1 LAN (RS-232)

ACCESSORIES

C5UMB7FBG - Category 5e, 7 ft. (2.1 M), Grey

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

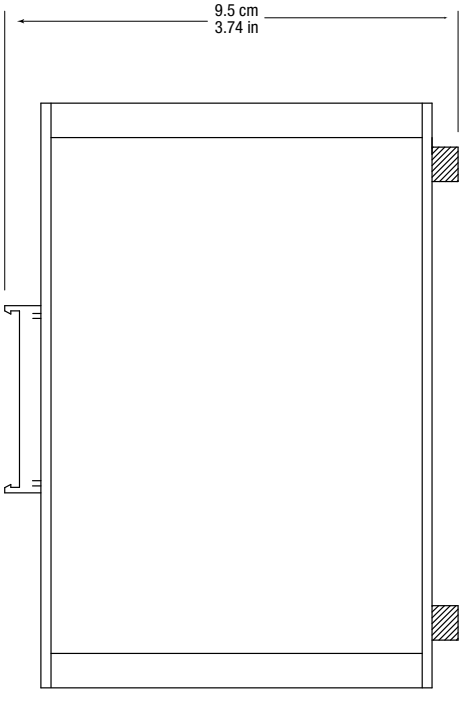
MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

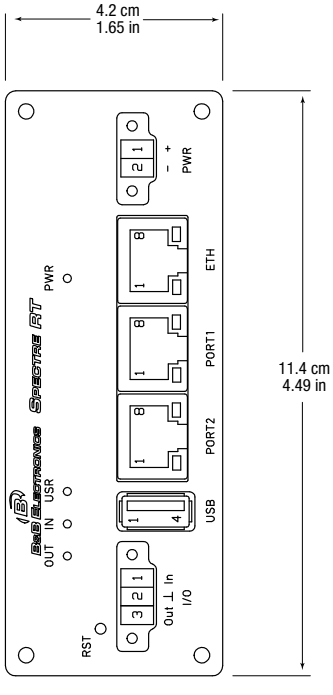
SPECIFICATIONS

INTERFACES	
Standard	
Ethernet	10/100 Mb
USB	USB Type A Host
Binary I/O	1 input/1 output
Port Options	
Port 1	Ethernet 10/100, RS-232, RS-422/485, Modbus, CNT (I/O)
Port 2	RS-232, RS-422/485, Modbus, CNT (I/O)
I/O CNT	4 Binary inputs, 1 Binary output (2 inputs maybe configured as counters) 2 Analog inputs, I Binary output
INTERNAL	
32b ARM microprocessor	
512 Mb DDR SDRAM	
128 Mb Flash	
1 Mb MRAM	
POWER	
Source	10 – 30 VDC
Consumption	Max. 200 mA (12 VDC)
MECHANICAL	
Dimensions	11.4 x 9.5 x 4.2 cm (4.49 x 3.74 x 1.65 in)
Enclosure	Metal
Weight	150 g
ENVIRONMENTAL	
Operating Temperature	-40 to 75°C
Storage Temperature	-40 to 85°C

FEATURES	
Networking	DHCP – automatic IP addressing in LAN network NAT – IP address and ports translation between inside/outside network Firewall: filtering of addresses, ports, protocols VRRP – virtual backup router function DynDNS client – access to the router with a dynamic IP address VLAN 802.11Q: virtual LAN QoS: quality of service Dial-in – Communicate via CSD call NTP client, NTP Server: time synchronization PPPoE Bridge – PPP frames encapsulation inside ETH frames
VPN Tunneling	IPsec, OpenVPN, L2TP – secure encrypted tunnels GRE tunnel – simple tunnel without security measures
Configuration and Diagnostics	HTTP server – configuration via web server Telnet – configuration and access to the file system SNMP – router diagnostics, communication with I/O and M-BUS Remote router group configuration change, switching among configuration profiles SSH – encrypted configuration and access to the file system
Additional Functions	Linux based: program your own applications AT commands on RS232, Ethernet and I/O M-RAM memory inside – router statistic saved into memory
APPROVALS / CERTIFICATIONS	
	CE, FCC, NEMA TS2 EN 301 511, v9.0.2 EN 301 908-1&2, v3.2.1 ETSI EN 301 489-1 V1.8.1 EN 60950-1:06 ed.2 + A11:09 + A1:10
	IEC60068-2-27, Shock 50G peak, 11ms, 3 axes
	IEC60068-2-6, Vibration 10-500Hz, 4G, 3 axes

MECHANICAL DIAGRAM





5 & 8 Port, Ultra Compact Industrial Ethernet Switches

ESW105 & ESW108 Series

PRODUCT FEATURES

- Ultra compact design - less than 1 inch wide
- UL/cUL Class I/Division 2 Groups A,B,C, and D
- Designed to meet Level 3 (Heavy) industrial environments - EN61000-6-2 Certifications
- Shock, vibration, free fall tested
- LC single and multi mode fiber ports
- 10/100M, full/half duplex, MDI/MDI-X (Auto-negotiate)
- Supports IEEE 802.3, 802.3u, and 802.3x standards
- IP30 rated DIN rail case with 6 different panel mount options
- Dual power inputs, 12 to 36 VDC and 10 to 24 VAC
- 2K MAC addresses

Designed to fit many applications, the ESW105 and ESW108 series are more than just an Ethernet switch with low pricing. They are plug-and-play industrial Ethernet Switches with an ultra compact IP30 DIN rail case, 6 way mountable panel brackets, LEDs for Power, (Link / Speed / Activity for each port), 12 to 36 VDC and 10 to 24 VAC power inputs with removable terminal blocks. These switches are perfect for any applications that require special protection from hash environments.

Choose a switch with five or eight copper ports, or a combination of copper and fiber ports. Multi-mode fiber models extend range up to 2 km. Single-mode fiber models extend range up to 20 km. All models require an external power supply (sold separately).

The switch ships with 4 panel mount clips giving the user 6 different ways to panel mount the unit.

ORDERING INFORMATION

MODEL NUMBER	10/100 COPPER	MULTI-MODE FIBER	SINGLE-MODE FIBER
ESW105	5		
ESW105-ML	4	1 (LC)	
ESW105-SL	4		1 (LC)
ESW108	8		
ESW108-ML	7	1 (LC)	
ESW108-SL	7		1 (LC)

ACCESSORIES

DFMM-SCSC-1M - Multi-Mode Duplex Fiber Cable, SC to SC, 1 Meter

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

EIRSP1 - Industrial DIN rail mount Ethernet Surge Suppressor

5 & 8 Port, Ultra Compact Industrial Ethernet Switches

ESW105 & ESW108 Series

SPECIFICATIONS

TECHNOLOGY	
Standards:	IEEE802.3, 802.3u, 802.3x
Processing Type:	Store and forward with IEEE802.3x full duplex, non-blocking flow control
Flow Control:	IEEE802.3x flow control, back pressure flow control
Packet Buffer Memory:	64K bytes
Address Table Size	2K MAC Addresses
INTERFACE	
RJ45 Ports:	10/100BaseT(X) auto negation, Full/Half duplex, auto MDI/MD-X
Fiber Ports:	100BaseFX, (multi-mode or single–mode with LC connectors)
LED Indicators:	Power, (Link / Speed / Activity for each port)
POWER	
Input Voltage	12 to 36 VDC and 10 to 24 VAC
Power Consumption	4.00 W Max
Input Connection	Removable Terminal Block
Protection	Reverse Polarity Protection
ENVIRONMENTAL	
Operating Temperature	-10 to 60°C (14 to 140°F)
Storage Temperature	-40 to 80°C (-40 to 176°F)
Humidity	10 to 95% Non-condensing
MTBF	200,000 hours
MTBF Calculation	Parts count reliability prediction
MECHANICAL	
Enclosure	IP30 DIN mount metal case
Dimensions (5 ports)	H 10.0 x W 2.5 x D 7.5 mm (3.94 x 0.98 x 2.95in)
Dimensions (8 ports)	H 145 x W 24 x D 75mm (5.71 X 0.94 x 2.95in)
Installation	35 mm DIN or 6 way panel mount

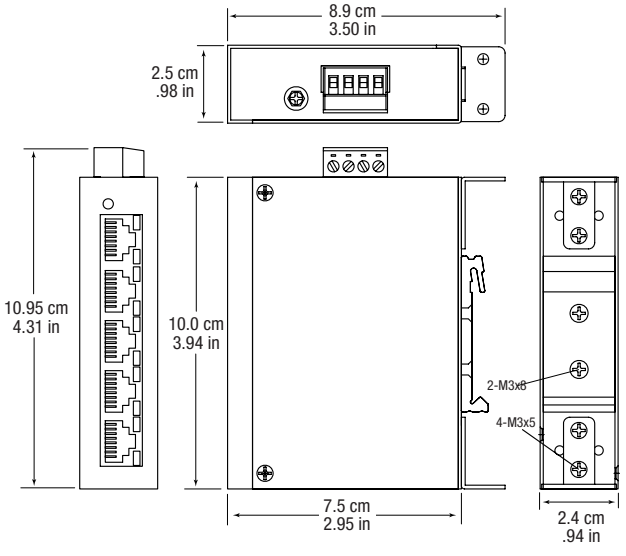
FIBER OPTICS				
Fiber Type	**Distance**	**Wavelength**	**Transmit Power**	**Receive Sensitivity**
Multi-mode	2 km	1310 nm	-. 23.5 to -. 14 dBm	≤ -. 35 dBm
Single-mode	20 km	1310 nm	-. 15 to -. 8 dBm	≤ -. 35 dBm
REGULATORY APPROVALS				
CE, FCC, RoHS				
HAZARDOUS LOCATIONS				
UL/cUL Class I Div 2 Groups A,B,C, and D				

SPECIFICATIONS–LEVEL 3, EN 61000-6-2: 2006 GENERIC STANDARDS FOR (HEAVY) INDUSTRIAL ENVIRONMENTS				
Test	**Description**	**Test Level**		**Level**
EN 55022: 2006 + A1:2007	Class B Emissions			
EN 61000-4-2: 2009	Electro-Static Discharge (ESD)	Enclosure Contact Enclosure Air	6kV 8kV	3 3
EN61000-4-3:2006+A1:2008	Radiated Field Immunity (RFI)	Enclosure Ports	10V/m	3
EN61000-4-4:2004	Burst (Fast Transient)	Signal Ports DC Ports	1kV@2.5Khz 2kV	3 3
EN61000-4-5:2006	Surge	Signal Ports DC Power Ports	1kV 2kV	3 3
EN61000-4-6: 2009	Induced (Conductive) RFI	Signal Ports DC Power Ports	10 V RMS 10 V RMS	3 3

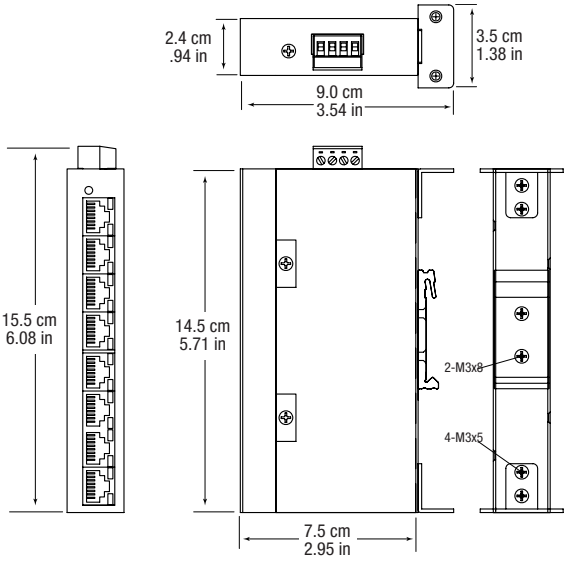
ENVIRONMENTAL SPECIFICATIONS

TEST	DESCRIPTION	TEST LEVEL		LEVEL
IEC60068-2-6	Vibration	Test Fc	2G	-----
IEC60068-2-27	Shock	Test Ea	30G	-----
IEC 60068-2-32	Free Fall			-----

MECHANICAL DIAGRAM 5 PORT MODEL



MECHANICAL DIAGRAM 8 PORT MODEL



5 & 8 Port, Compact Industrial Ethernet Switches

ESW205 & ESW208 Series

PRODUCT FEATURES

- UL/cUL Class I Division 2 Groups A,B,C, and D
- EN61000-6-2 - Generic standard for (heavy) industrial environments
- NEMA TS2 options
- Shock, vibration, tested
- Operating temperature
  -10° to 60°C (Standard)
  -40° to 75°C (-T models)
- 10/100M, full/half duplex, MDI/MDI-X (Auto-negotiate)
- Supports IEEE 802.3, 802.3u, and 802.3x standards
- Industrial IP30 rated DIN rail case with 6 way panel mount options
- Dual power inputs, 12 to 36 VDC and 10 to 24 VAC
- 2K MAC addresses

Designed to fit many applications, the ESW205 and ESW208 series are more than just an Ethernet switch with low pricing. They are plug-and-play industrial Ethernet Switches with an compact IP30 DIN rail case, 6 way mountable panel brackets, LEDs for Power, (Link / Speed / Activity for each port), 12 to 36 VDC and 10 to 24 VAC power inputs with removable terminal blocks. These switches are perfect for any applications that require special protection from hash environments.

Choose a switch with five or eight copper ports, or a combination of copper and fiber ports. Multi-mode fiber models extend range up to 2 km. Single-mode fiber models extend range up to 20 km. All models require an external power supply (sold separately).

The switch ships with 4 panel mount clips giving the user 6 different ways to panel mount the unit.

ACCESSORIES

DFMM-SCSC-1M - Multi-Mode Duplex Fiber Cable, SC to SC, 1 Meter

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

EIRSP1 - Industrial DIN rail mount Ethernet Surge Suppressor

ORDERING INFORMATION

MODEL NUMBER	10/100 COPPER	MULTI-MODE FIBER	SINGLE-MODE FIBER
ESW205	5		
ESW205-MT	4	1 (ST)	
ESW205-MC	4	1 (SC)	
ESW205-ST	4		1 (ST)
ESW205-SC	4		1 (SC)
ESW205-T*	5		
ESW205-MT-T*	4	1 (ST)	
ESW205-MC-T*	4	1 (SC)	
ESW205-ST-T	4		1 (ST)
ESW205-SC-T*	4		1 (SC)
ESW208	8		
ESW208-2MT	6	2 (ST)	
ESW208-2MC	6	2 (SC)	
ESW208-2ST	6		2 (ST)
ESW208-2SC	6		2 (SC)
ESW208-T*	8		
ESW208-2MT-T*	6	2 (ST)	
ESW208-2MC-T	6	2 (SC)	
ESW208-2ST-T*	6		2 (ST)
ESW208-2SC-T*	6		2 (SC)
ESW208-4MT-T*	4	4 (ST)	
ESW208-4MC-T*	4	4 (SC)	
ESW208-4ST-T*	4		4 (ST)
ESW208-4SC-T*	4		4 (SC)

-T Models available in wide temperature
* NEMA TS2 models

5 & 8 Port, Compact Industrial Ethernet Switches

ESW205 & ESW208 Series

SPECIFICATIONS

TECHNOLOGY	
Standards:	IEEE802.3, 802.3u, 802.3x
Processing Type:	Store and forward with IEEE802.3x full duplex, non-blocking flow control
Flow Control:	IEEE802.3x flow control, back pressure flow control
Packet buffer memory:	64K bytes
Address Table Size	2K MAC Addresses
INTERFACE	
RJ45 Ports:	10/100BaseT(X) auto negation, Full/Half duplex, auto MDI/MD-X
Fiber Ports:	100BaseFX, (multi-mode or single–mode with LC connectors)
LED Indicators:	Power, (Link / Speed / Activity for each port)
POWER	
Input Voltage	12 to 36 VDC and 10 to 24 VAC
Power Consumption	4.00 W Max
Input Connection	Removable Terminal Block
Protection	Reverse Polarity Protection
ENVIRONMENTAL	
Operating Temperature	-10 to 60°C (14 to 140°F)
Wide Temperature (-T Model)	-40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 80°C (-40 to 176°F)
Humidity	10 to 95% Non-condensing
MTBF	200,000 hours
MTBF Calculation	Parts count reliability prediction
MECHANICAL	
Enclosure	IP30 DIN mount metal case
Dimensions (5 ports)	H 112mm x W 30mm x D 75.2 mm (4.41 in x 1.18 in x 2.96 in)
Dimensions (8 ports) 8 copper, 6 copper/2 fiber ports	H 130 mm x W 44 mm x D 105 mm (5.1 in x 1.73 in x 4.13 in)
Dimensions (8 ports) 4 copper/4 fiber ports	H 130mm x W 44mm x D 105mm (5.1 in X 1.7 in x 4.13 in)
Installation	35 mm DIN or 6 way panel mount

FIBER OPTICS				
Fiber Type	**Distance**	**Wavelength**	**Transmit Power**	**Receive Sensitivity**
Multi-mode	2 km	1310 nm	Neg. 23.5 to Neg. 14 dBm	≤ Neg. 35 dBm
Single-mode	20 km	1310 nm	Neg. 15 to Neg. 8 dBm	≤ Neg. 35 dBm
REGULATORY APPROVALS				
CE, FCC, RoHS				
HAZARDOUS LOCATIONS				
UL/cUL Class I Div 2 Groups A,B,C, and D				

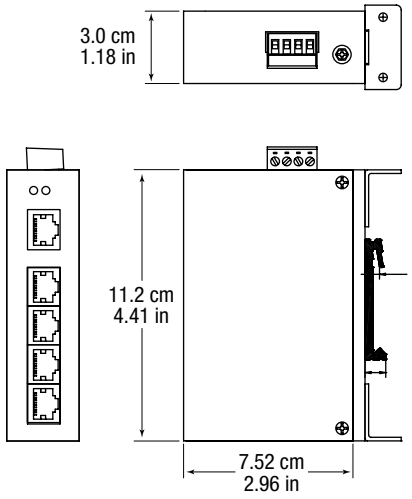
SPECIFICATIONS–LEVEL 3, EN 61000-6-2: 2006 GENERIC STANDARDS FOR (HEAVY) INDUSTRIAL ENVIRONMENTS

Test	Description	Test Level		Level
EN 55022: 2006 + A1:2007	Class B Emissions			
EN 61000-4-2: 2009	Electro-Static Discharge (ESD)	Enclosure	6kV	
		Contact		3
		Enclosure Air	8kV	3
EN61000-4-3:2006+A1:2008	Radiated Field Immunity (RFI)	Enclosure	10V/m	
		Ports		3
EN61000-4-4:2004	Burst (Fast Transient)	Signal Ports	1kV@2.5Khz	3
		DC Ports	2kV	3
EN61000-4-5:2006	Surge	Signal Ports	1kV	3
		DC Power Ports	2kV	3
EN61000-4-6: 2009	Induced (Conductive) RFI	Signal Ports	10 V RMS	3
		DC Power Ports	10 V RMS	3

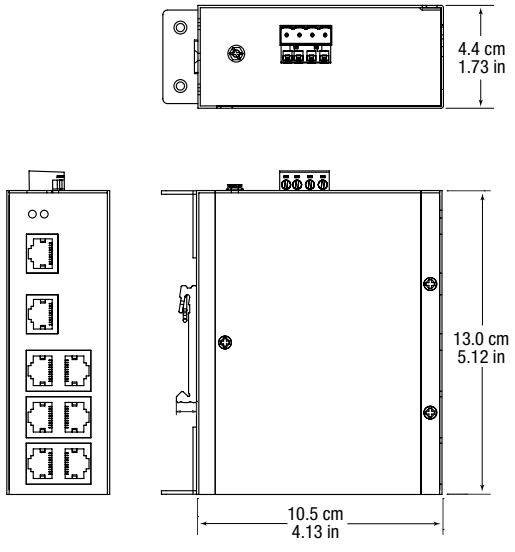
ENVIRONMENTAL SPECIFICATIONS

TEST	DESCRIPTION	TEST LEVEL		LEVEL
IEC60068-2-6	Vibration	Test Fc	2G	-----
IEC60068-2-27	Shock	Test Ea	30G	-----
IEC 60068-2-32	Free Fall			-----

MECHANICAL DIAGRAM - ESW205 MODEL



MECHANICAL DIAGRAM - ESW208 MODEL



5 Port Gigabit Industrial Ethernet Switch

EIR405-T

PRODUCT FEATURES

- 5 10/100/1000 Base-T Ethernet ports
- 3000V EFT & 6000V ESD protection
- Dual 12 to 48 VDC power inputs
- Wide operating temperature
- DIN or panel mount options
- NEMA TS2

The EIR405-T is a 5 Port Unmanaged Industrial Gigabit Ethernet Switch. Packed full of rugged features, this switch is perfect for your high speed industrial network.

High-Speed Transmissions: The EIR405-T includes a switch controller that automatically senses transmission speed (10/100/1000 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIR405-T provides two 12 to 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features a space saving IP30 metal enclosure that can be DIN or Panel mounted.

Transient Protection: The power line input on the EIR405-T offers protection from up to 3,000 V EFT. The Ethernet ports offer up to 6,000 V ESD protection. These features make the switch reliable and suitable for use in harsh electrical environments.

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch can be used in harsh industrial environments.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR405-T	5 Port Industrial Gigabit Switch

ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power
MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power
C5UMB7FBG - Category 5e, 7 ft. (2.1 M), Grey
EIRSP1 - Industrial DIN rail mount Ethernet Surge Suppressor

5 Port Gigabit Industrial Ethernet Switch

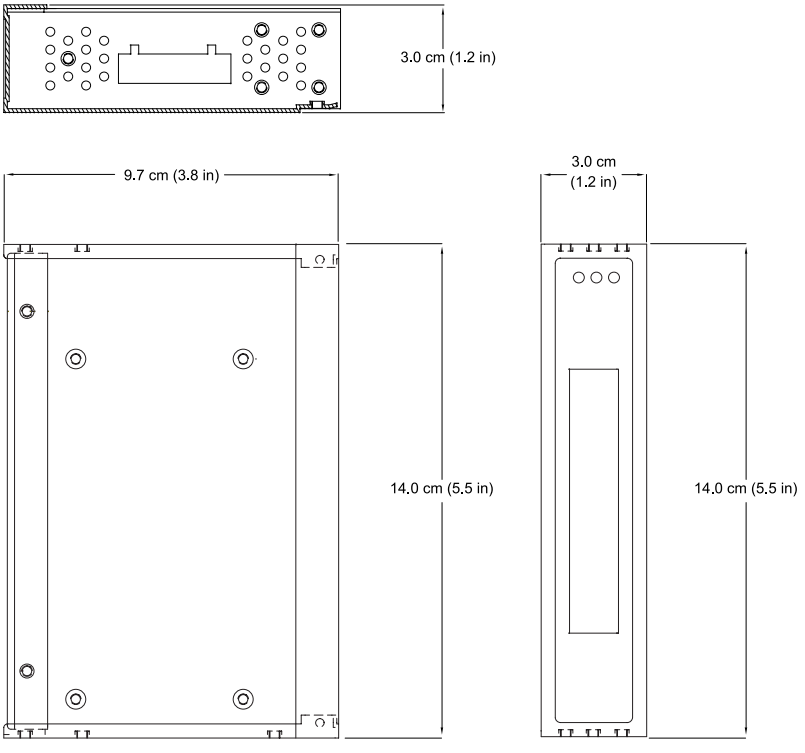
EIR405-T

SPECIFICATIONS

INTERFACE	
RJ-45 Ports	5 x 10/100/1000BaseT, Auto MDI/MDI-X
ESD Protection	6000V ESD Protection
LED Indicators	P1 (Power 1), P2 (Power 2), Fault (Power Fault), RJ-45 Ports have 2 LED's to indicate LINK and ACTIVITY
POWER	
Input Voltage	Dual 12 to 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	4.6 Watts
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35mm DIN Rail or Panel Mount Attachments
Dimensions	3.0 x 9.7 x 14.0 cm (1.2 x 3.8 x 5.5 in)

REGULATORY	
Approvals	FCC, CE, UL, NEMA TS2 UL File Number: E173795
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
IEEE STANDARDS	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3ab	1000Base-T
IEEE 802.3x	Flow Control and Back Pressure
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 10Gbps Throughput (Full-dux): 14.88Mpps@64bytes
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port
Buffer	136 Kbits
MAC Table	8K
Jumbo Frame	9Kbytes
Other	Broadcast Storm Filtering CSMA/CD

MECHANICAL DIAGRAM



5 Port Industrial Ethernet Switch, with SFP Port for Gigabit Fiber

EIR405-SFP-T

PRODUCT FEATURES

- 4 10/100/1000 Base-T Ethernet ports
- 1 SFP slot for Gigabit fiber
- 3000V EFT & 4000V ESD protection
- Dual 12 to 48 VDC power inputs
- Wide operating temperature
- NEMA TS2

The EIR405-SFP-T is a 5 Port Unmanaged Industrial Gigabit Ethernet Switch. In addition to 4 standard copper RJ-45 ports, it has an SFP slot to accommodate Gigabit Fiber.

Small Form-factor Pluggable (SFP) Port: The SFP Port provides flexibility when planning a network. The slot can accept any SFP fiber module. Modules are available in multiple formats.

High-Speed Transmissions: The EIR405-SFP-T includes a switch controller that automatically senses transmission speed (10/100/1000 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIR405-SFP-T provides two 12 to 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features a space saving IP30 metal enclosure that can be DIN or Panel mounted.

Transient Protection: The power line input on the EIR405-SFP-T offers protection from up to 3,000 V EFT. The Ethernet ports offer up to 4,000 V ESD protection. These features make the switch more reliable and suitable for use in harsh electrical environments.

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch is suitable for use in some of the harshest industrial environments that exist.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR405-SFP-T	Industrial Gigabit Switch (4 Copper, 1 SFP)

ACCESSORIES

808-38201 - IE-SFP/1250-ED, MM850-LC, 550M

808-38200 - IE-SFP/1250-ED, SM1310-LC, 20KM

808-38203 - IE-SFP-1250-ED, SM1310/PLUS-LC, 30KM

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

5 Port Industrial Ethernet Switch, with SFP Port for Gigabit Fiber

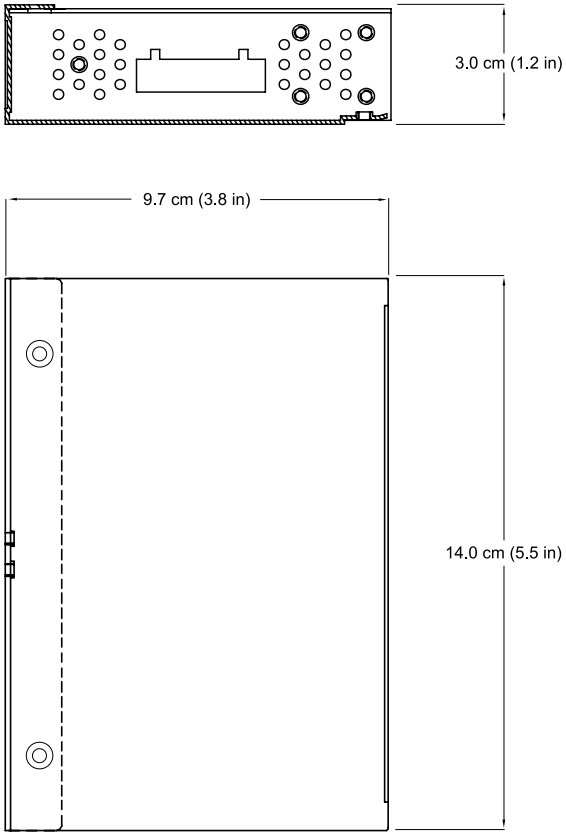
EIR405-SFP-T

SPECIFICATIONS

INTERFACE	
RJ-45 Ports	4 x 10/100/1000BaseT, Auto MDI/MDI-X
ESD Protection	4000V ESD Protection
SFP	1 x Mini-GBIC SFP Socket
LED Indicators	P1 (Power 1), P2 (Power 2), Fault (Power Fault), LINK/ACT (SFP Port) RJ-45 Ports have 2 LED's to indicate LINK and activity
POWER	
Input Voltage	Dual 12 to 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	5.5 Watts
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35 mm DIN Rail or Panel Mount Attachments
Dimensions	3.0 x 9.7 x 14.0 cm (1.2 x 3.8 x 5.5 in)

REGULATORY	
Approvals	FCC, CE, UL, NEMA TS2 UL File Number: E173795
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
IEEE STANDARDS	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3ab	1000Base-T
IEEE 802.3x	Flow Control and Back Pressure
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 10Gbps Throughput (Full-dux): 14.88Mpps@64bytes
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port 1,488,000 pps Gigibit Fiber Ethernet
Buffer	136 Kbits
MAC Table	8K
Jumbo Frame	9Kbytes
Other	Broadcast Storm Filtering CSMA/CD

MECHANICAL DIAGRAM



8 Port Gigabit Industrial Ethernet Switch

EIR408-T

PRODUCT FEATURES

- 8 10/100/1000 Base-T Ethernet ports
- UL Class 1/Division 2
- NEMA TS2
- Dual 12 to 48 VDC power inputs
- Wide operating temperature (-40 to 75°C)

The EIR408-T is an 8 Port Unmanaged Industrial Gigabit Ethernet Switch. Packed full of rugged features, this switch is perfect for your high speed industrial network.

High-Speed Transmissions: The EIR408-T includes a switch controller that automatically senses transmission speed (10/100/1000 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIR408-T provides two 12 to 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features a space saving IP30 metal enclosure that can be DIN or Panel mounted.

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch can be used in harsh industrial environments.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR408-T	8 Port Industrial Gigabit Switch

ACCESSORIES

C5UMB7FBG - Category 5e, 7 ft. (2.1 M), Grey
EIRSP1 - Industrial Ethernet Surge Suppressor
MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power
MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power
MDR-60-24 - DIN rail mount power supply 24VDC, 2.5 A output power

8 Port Gigabit Industrial Ethernet Switch

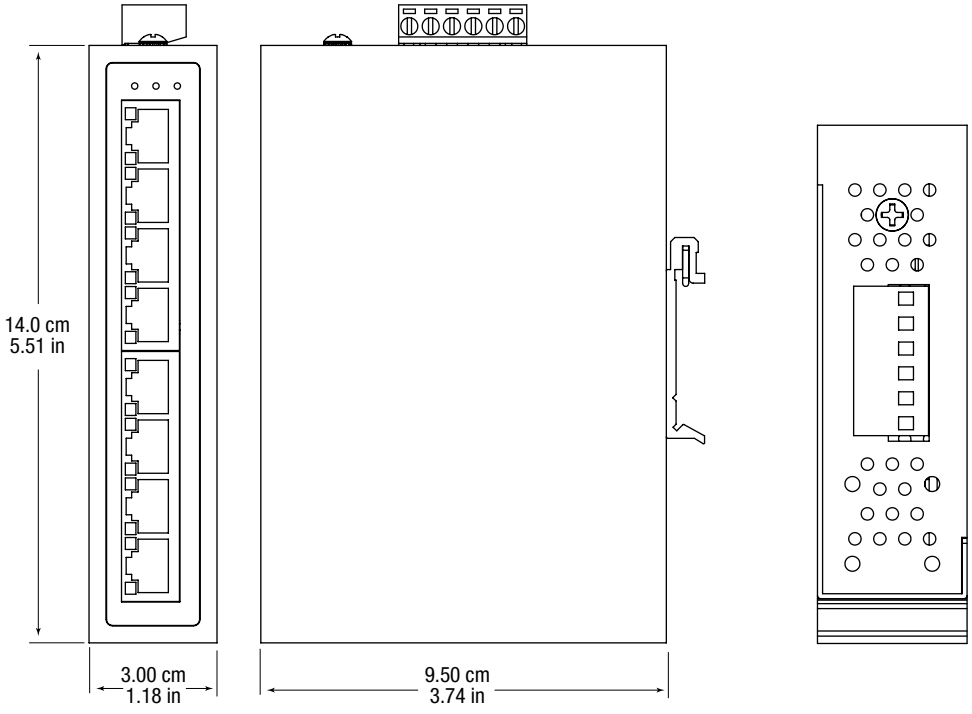
EIR408-T

SPECIFICATIONS

IEEE STANDARDS	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3ab	1000Base-T
IEEE 802.3x	Flow Control and Back Pressure
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 10Gbps Throughput (Full-dux): 14.88Mpps@64bytes
Transmission Speed	Up to 1000 Mbps
Buffer	136 Kbits
MAC Table	8K
Jumbo Frame	9.6Kbytes
Other	Broadcast Storm Protection
INTERFACE	
RJ-45 Ports	8 x 10/100/1000BaseT, Auto MDI/MDI-X
LED Indicators	P1 (Power 1), P2 (Power 2), Fault (Power Fault), RJ-45 Ports have 2 LED's to indicate LINK and activity
POWER	
Input Voltage	Dual 12 to 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	7.788 Watts
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection

ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35mm DIN Rail or Panel Mount Attachments
Dimensions	3.0 x 14.0 x 9.5 cm (1.18 x 5.51 x 3.74 in)
CERTIFICATIONS	
Safety	CE EN60950-1
Hazardous Location	UL/cUL Class I, Division 2, Groups A, B, C and D
EMC	FCC Class A, CE EN61000-4-2 (ESD) CE EN61000-4-3 (RS) CE EN61000-4-4 (EFT) CE EN61000-4-5 (Surge) CE EN61000-4-6 (CS) CE EN61000-4-8 CE EN61000-6-2 CE EN61000-6-4
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
NEMA TS2	

MECHANICAL DIAGRAM



10 Port Industrial Ethernet Switch, with GB, 2 RJ-45/SFP Ports

EIR410-2SFP-T

PRODUCT FEATURES

- 8 10/100 Base-T Ethernet ports
- 2 RJ-45/SFP combo ports for Gigabit Ethernet
- 3000V EFT & 6000V ESD protection
- Dual 12 to 48 VDC power inputs
- Wide operating temperature
- DIN Rail or Panel Mount

The EIR410-2SFP-T is a 10 Port Unmanaged Industrial Gigabit Ethernet Switch. In addition to 8 standard copper RJ-45 ports, it has 2 CU/SFP Combo slots to accommodate Gigabit Fiber.

Small Form-factor Pluggable (SFP) Port: The SFP Port provides flexibility when planning a network. The slot can accept any SFP fiber module. Modules are available in multiple formats. If an SFP module is not inserted, the associated combo port can be used with standard RJ-45 copper.

High-Speed Transmissions: The EIR410-2SFP-T includes a switch controller that automatically senses transmission speed (10/100/1000 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIR410-2SFP-T provides two 12 to 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features an IP30 metal enclosure that can be DIN or Panel mounted.

Transient Protection: The power input on the EIR410-2SFP-T offers protection up to 3,000 V EFT. The Ethernet ports offer up to 6,000 V ESD protection. These features make the switch reliable and suitable for use in harsh electrical environments.

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch is suitable for use in some of the harshest industrial environments that exist.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR410-2SFP-T	Industrial Gigabit Switch (8 CU, 2 CU/SFP)

ACCESSORIES

MDR-60-48 - DIN Rail Power supply 48VDC, 60W

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

DFMM-LCLC-1M - Multi-Mode Duplex Fiber Cable, LC To LC, 1 Meter

DFSM-LCLC-1M - Single-Mode Duplex Fiber Cable, LC To LC, 1 Meter

SFP-1000SX-M-550M-T - SFP Module, 1000Base-SX, Multi-mode 550m, LC Connector (-40 to 85°C)

SFP-100FX-M-2KM-T - SFP Module, 100Base-FX, Multi-mode 2km, LC Connector (-40 to 85°C)

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-LX, Single-mode 10km, LC Connector (-40 to 85°C)

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-LX, Single-mode 20km, LC Connector (-40 to 85°C)

SFP-100FX-S-30KM-T - SFP Module, 100Base-FX, Single-mode 30km, LC Connector (-40 to 85°C)

10 Port Industrial Ethernet Switch, with GB, 2 RJ-45/SFP Ports

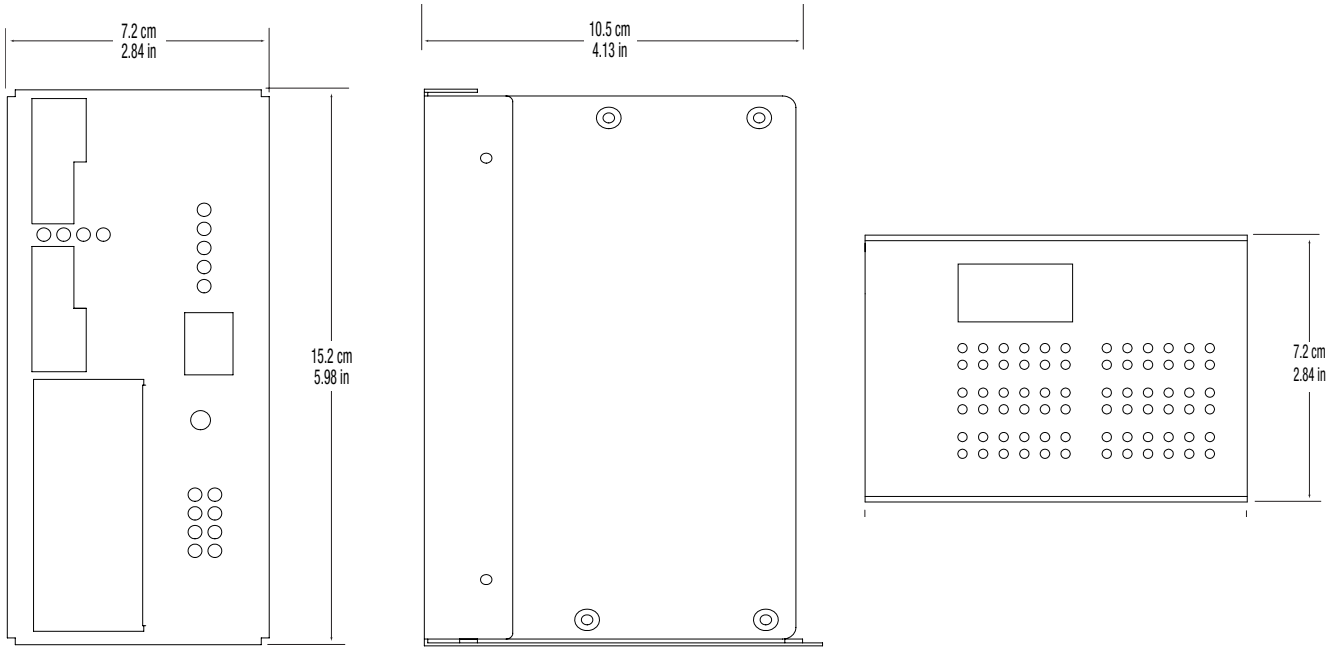
EIR410-2SFP-T

SPECIFICATIONS

REGULATORY	
Approvals	FCC, CE, UL UL File Number: E173795
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
SPECIFICATIONS	
IEEE Standards	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3ab	1000Base-T
IEEE 802.3x	Flow Control and Back Pressure
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 5.6Gbps Throughput (Full-dux): 8.3Mpps@64bytes
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port 1,488,000 pps Gigibit Fiber Ethernet
Buffer	1 MB
MAC Table	8K
Other	Broadcast Storm Filtering CSMA/CD

INTERFACE	
RJ-45 Ports	8 x 10/100 Base T, Auto MDI/MDI-X
ESD Protection	6000V ESD Protection
CU/SFP	2 x Mini-GBIC SFP Combo Ports
LED Indicators	P1 (Power 1), P2 (Power 2), Fault (Power Fault), LINK/ACT (SFP Ports) RJ-45 Ports have 2 LED's to indicate LINK and activity
POWER	
Input Voltage	Dual 12 to 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	6.76 Watts
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35mm DIN Rail or Panel Mount Attachments
Dimensions	7.26 x 10.64 x 15.39 cm (2.86 x 4.19 x 6.06 in)

MECHANICAL DIAGRAM



18 Port Industrial Ethernet Switch with 2 RJ-45/SFP Combo Ports for Gigabit Ethernet

EIR418-2SFP-T

PRODUCT FEATURES

- 16 10/100 Base-T Ethernet ports
- 2 RJ-45/SFP combo ports for Gigabit Ethernet
- 3000V EFT & 6000V ESD protection
- Dual 12 to 48 VDC power inputs
- Wide operating temperature
- DIN Rail or Panel Mount

The EIR418-2SFP-T is an 18 Port Unmanaged Industrial Gigabit Ethernet Switch. In addition to 16 standard copper RJ-45 ports, it has 2 CU/SFP Combo slots to accommodate Gigabit Fiber.

Small Form-factor Pluggable (SFP) Port: The SFP Port provides flexibility when planning a network. Modules are available in multiple fiber formats. If an SFP module is not inserted, the associated combo port can be used with standard RJ-45 copper.

High-Speed Transmissions: The EIR418-2SFP-T includes a switch controller that automatically senses transmission speed (10/100/1000 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIR418-2SFP-T provides two 12 to 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features an IP30 metal enclosure that can be DIN or Panel mounted.

Transient Protection: The power line input on the EIR418-2SFP-T offers protection from up to 3,000 V EFT. The Ethernet ports offer up to 6,000 V ESD protection. These features make the switch reliable and suitable for use in harsh electrical environments.

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch is suitable for use in harsh industrial environments.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR418-2SFP-T	Industrial Gigabit Switch (16 CU, 2 CU/SFP)

ACCESSORIES

MDR-60-24 - DIN Rail Power supply 24VDC, 2.5A, 60W

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

DFMM-LCLC-1M - Multi-Mode Duplex Fiber Cable, LC To LC, 1 Meter

DFSM-LCLC-1M - Single-Mode Duplex Fiber Cable, LC To LC, 1 Meter

SFP-1000SX-M-550M-T - SFP Module, 1000Base-SX, Multi-mode 550m, LC Connector (-40 to 85°C)

SFP-100FX-M-2KM-T - SFP Module, 100Base-FX, Multi-mode 2km, LC Connector (-40 to 85°C)

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-LX, Single-mode 10km, LC Connector (-40 to 85°C)

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-LX, Single-mode 20km, LC Connector (-40 to 85°C)

SFP-100FX-S-30KM-T - SFP Module, 100Base-FX, Single-mode 30km, LC Connector (-40 to 85°C)

18 Port Industrial Ethernet Switch with 2 RJ-45/SFP Combo Ports for Gigabit Ethernet

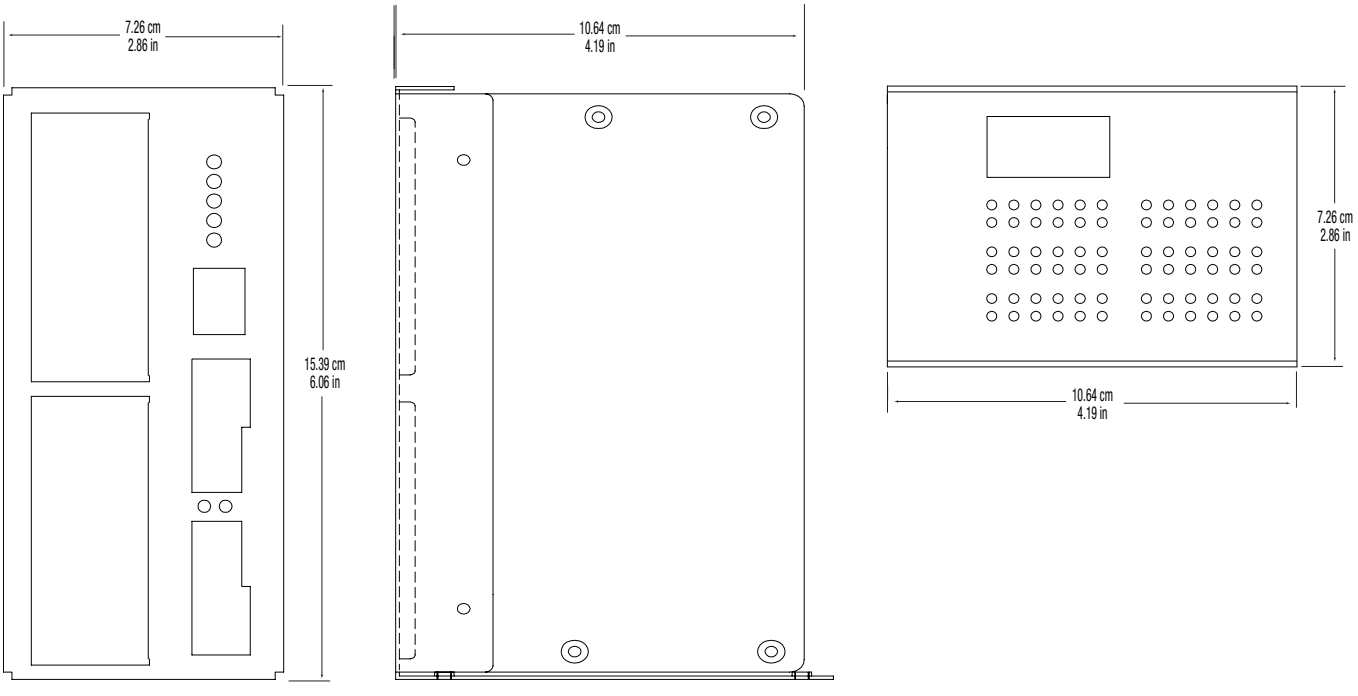
EIR418-2SFP-T

SPECIFICATIONS

INTERFACE	
RJ-45 Ports	16 x 10/100 BaseT, Auto MDI/MDI-X
ESD Protection	6000V ESD Protection
CU/SFP	2 x Mini-GBIC SFP Combo Ports (or 2 RJ-45 10/100/1000 BaseT)
LED Indicators	P1 (Power 1), P2 (Power 2), Fault (Power Fault), LINK/ACT (SFP Ports) RJ-45 Ports have 2 LED's to indicate LINK and activity
POWER	
Input Voltage	Dual 12 to 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	9.0 Watts
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35 mm DIN Rail or Panel Mount Attachments
Dimensions	7.26 x 10.64 x 15.39 cm (2.86 x 4.19 x 6.06 in)

REGULATORY	
Approvals	FCC, CE, UL UL File Number: E173795
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
SPECIFICATIONS	
IEEE Standards	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3ab	1000Base-T
IEEE 802.3x	Flow Control and Back Pressure
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 7.2 Gbps Throughput (Full-dux): 10.7 Mpps@64bytes
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port 1,488,000 pps Gigibit Fiber Ethernet
Buffer	1 MB
MAC Table	8K
Other	Broadcast Storm Filtering CSMA/CD

MECHANICAL DIAGRAM



5 Port Industrial Ethernet Switch with 4 PoE Injector Ports

EIRP305-T

PRODUCT FEATURES

- Five 10/100 Base-T Ethernet ports
- Four 802.3af end-point PoE injector ports
- 3000V EFT & 6000V ESD protection
- Dual 48 VDC power inputs
- Wide operating temperature
- DIN Rail or Panel Mount

The EIRP305-T is a five Port Unmanaged Industrial Ethernet Switch with four 802.3af (Alternative A) end-point Power-Over-Ethernet injector ports. As power sourcing equipment (PSE), these ports can be used to power 802.3af compliant powered devices (PD). This eliminates the need for a separate power line to each end device.

High-Speed Transmissions: The EIRP305-T includes a switch controller that automatically senses transmission speed (10/100 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIRP305-T provides two 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features a space saving IP30 metal enclosure that can be DIN or Panel mounted.

Transient Protection: The power line input on the EIRP305-T offers protection from up to 3,000 V EFT. The Ethernet ports offer up to 6,000 V ESD protection. These features make the switch reliable and suitable for use in harsh electrical environments.

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch is suitable for use in some of the harshest industrial environments that exist.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. FWD LED's for each PoE port indicate if the switch is providing power to the end-point device. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRP305-T	5 Port Industrial Switch (4 PoE Ports)

ACCESSORIES

MDR-60-48 - DIN Rail Power supply 48VDC, 60W

ERS35 - DIN Rail 1 Meter 35 mm Steel

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

5 Port Industrial Ethernet Switch with 4 PoE Injector Ports

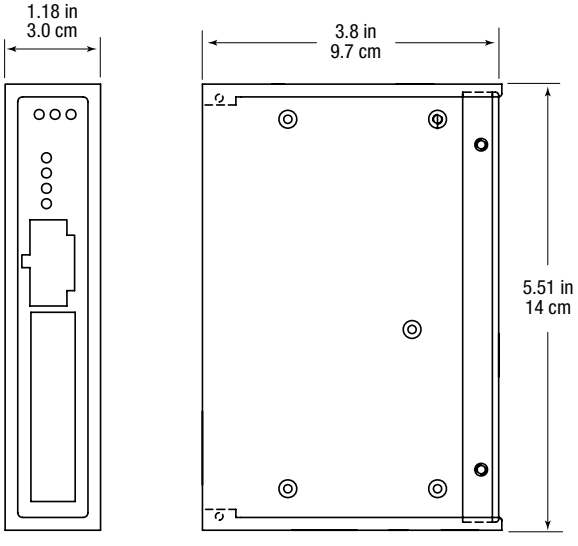
EIRP305-T

SPECIFICATIONS

INTERFACE	
RJ-45 Ports	5 x 10/100BaseT, Auto MDI/MDI-X
ESD Protection	6000V ESD Protection
PoE	802.3af End-point Alternative A (4 Ports) Positive (VCC+): Pins 1 and 2 Negative (VCC-): Pins 3 and 6 Data: Pins 1, 2, 3, and 6
LED Indicators	P1 (Power 1), P2 (Power 2), Fault (Power Fault), RJ-45 Ports have 2 LED's to indicate LINK and activity. FWD LEDs for PoE status.
POWER	
Input Voltage	Dual 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	3.4 Watts (without PoE) 67 Watts (full load PoE)
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35 mm DIN Rail or Panel Mount Attachments
Dimensions	3.0 x 9.7 x 14.0 cm (1.2 x 3.8 x 5.5 in)

REGULATORY	
Approvals	FCC, CE, UL UL File Number: E173795
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
IEEE STANDARDS	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3x	Flow Control and Back Pressure
IEEE802.3af	Power over Ethernet
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 1.0 Gbps Throughput (Full-dux): 1.488 Mpps@64bytes
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port
Buffer	448 Kbits
MAC Table	2K
Other	Broadcast Storm Filtering CSMA/CD

MECHANICAL DIAGRAM



5 Port Industrial Ethernet Switch with 4 PoE Ports

EIRP305-24V-T

PRODUCT FEATURES

- Five 10/100 Base-T Ethernet ports
- Four 802.3af end-point PoE injector ports
- Class 1/Division 2
- Wide operating temperature (-40 to 75°C)
- 3000V EFT & 6000V ESD protection
- Dual 24 or 48 VDC power inputs
- DIN Rail or Panel Mount

The EIRP305-24-T is a five Port Unmanaged Industrial Ethernet Switch with four 802.3af (Alternative A) end-point Power-Over-Ethernet ports. As power sourcing equipment (PSE), these ports can be used to power 802.3af compliant powered devices (PD). This eliminates the need for a separate power line to each end device.

High-Speed Transmissions: The EIRP305-24-T includes a switch controller that automatically senses transmission speed (10/100 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIRP305-24-T provides two 24 or 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features a space saving IP30 metal enclosure that can be DIN or Panel mounted.

Transient Protection: The power line input on the EIRP305-24-T offers protection from up to 3,000 V EFT. The Ethernet ports offer up to 6,000 V ESD protection. These features make the switch reliable and suitable for use in harsh electrical environments.

Wide Operating Temperature: With an operating temperature of -40 to 75C (-40 to 167F), this switch is suitable for use in some of the harshest industrial environments that exist.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. FWD LED's for each PoE port indicate if the switch is providing power to the end-point device. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRP305-24V-T	5 Port Industrial Switch (4 PoE Ports)

ACCESSORIES

SDR-240-24 - DIN Rail Power Supply, 10A, 240W, 24V

ERS35 - DIN Rail 1 Meter 35 mm Steel

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

5 Port Industrial Ethernet Switch with 4 PoE Ports

EIRP305-24V-T

SPECIFICATIONS

INTERFACE	
RJ-45 Ports	5 x 10/100BaseT, Auto MDI/MDI-X
ESD Protection	6000V ESD Protection
PoE	802.3af End-point Alternative A (4 Ports) Positive (VCC+): Pins 1 and 2 Negative (VCC-): Pins 3 and 6 Data: Pins 1, 2, 3, and 6
LED Indicators	P1 (Power 1), P2 (Power 2), Fault (Power Fault), RJ-45 Ports have 2 LED's to indicate LINK and activity. FWD LEDs for PoE status.
POWER	
Input Voltage	Dual 24 / 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	3.4 Watts (without PoE) 67 Watts (full load PoE)
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35 mm DIN Rail or Panel Mount Attachments
Dimensions	4.86 x 14 x 9.5 cm (1.91 x 5.51 x 3.74 in)

REGULATORY	
Safety/Hazardous Location	UL/cUL Class I, Division 2, Groups A, B, C and D
EMC	FCC Class A CE EN61000-6-2 CE EN61000-6-4 CE EN61000-4-2 (ESD) CE EN61000-4-3 (RS) CE EN61000-4-4 (EFT) CE EN61000-4-5 (Surge) CE EN61000-4-6 (CS) CE EN61000-4-8 (Magnetic Field)
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
IEEE STANDARDS	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3x	Flow Control and Back Pressure
IEEE802.3af	Power Over Ethernet
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 1.0 Gbps
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port
Buffer	448 Kbits
MAC Table	2K
Other	Broadcast Storm Filtering CSMA/CD

5 Port Industrial Ethernet Switch with 4 25W High Power PoE Ports

EIRHP305-T

PRODUCT FEATURES

- Five 10/100 Base-T Ethernet ports
- Class 1/Division 2
- Four 25 W high powered 802.3af end-point PoE ports
- Dual 48 VDC power inputs
- Wide operating temperature (-40 to 75°C)
- DIN Rail or Panel Mount

The EIRHP305-T is a five Port Unmanaged Industrial Ethernet Switch with four 802.3af (Alternative A) end-point Power-Over-Ethernet injector ports. As power sourcing equipment (PSE), these ports can be used to power 802.3af compliant powered devices (PD). This eliminates the need for a separate power line to each end device.

High-Speed Transmissions: The EIRHP305-T includes a switch controller that automatically senses transmission speed (10/100 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the EIRHP305-T provides two 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: The switch features a space saving IP30 metal enclosure that can be DIN or Panel mounted.

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch is suitable for use in some of the harshest industrial environments that exist.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. FWD LED's for each PoE port indicate if the switch is providing power to the end-point device. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRHP305-T	5 Port Industrial Switch (4 - 25 Watt PoE Ports)

ACCESSORIES

SDR-240-48 - DIN Rail Power Supply, 10A, 240W, 48V
ERS35 - DIN Rail 1 Meter 35 mm Steel
C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

5 Port Industrial Ethernet Switch with 4 25W High Power PoE Ports

EIRHP305-T

SPECIFICATIONS

INTERFACE	
RJ-45 Ports	5 x 10/100BaseT, Auto MDI/MDI-X
ESD Protection	6000V ESD Protection
PoE	802.3af End-point Alternative A (4 Ports) Positive (VCC+): Pins 1 and 2 Negative (VCC-): Pins 3 and 6 Data: Pins 1, 2, 3, and 6
LED Indicators	P1: (Power 1 Green) P2: (Power 2 Green) P-Fail: (Red) RJ-45: Ports have 2 LED's to indicate LINK / Activity (Green), Full duplex/collision.(Amber) PoE: Feeding Power (Green)
POWER	
Input Voltage	Dual 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	110 Watts (full load PoE)
Fault Output	1 Relay Output – Normally Closed
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35 mm DIN Rail or Panel Mount Attachments
Dimensions	48.6 x 95 x 140 mm (1.91 x 3.74 x 5.51 in)

REGULATORY	
Approvals	FCC, CE, UL UL File Number: E173795
Hazardous Locations	UL/cUL Class I, Division 2, Groups A, B, C and D
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
SPECIFICATIONS	
IEEE Standards	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3x	Flow Control and Back Pressure
IEEE 802.3af	Power Over Ethernet
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 1.0 Gbps
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port
Buffer	56 K bytes
MAC Table	2K
Other	Broadcast Storm Filtering CSMA/CD

10 Port Industrial Ethernet Switch with 2 RJ-45/SFP Combo Ports for Gigabit Ethernet

EIRP410-2SFP-T

PRODUCT FEATURES

- Eight 10/100 BaseT 802.3af End Point PoE Ports
- Two RJ-45/SFP 100/1000 Combo Slots for Gigabit Ethernet
- UL, cUL CE/EN 60950
- Wide Operating Temperature (-40 to 75C)
- DIN Rail or Panel Mount

The EIRP410-2SFP-T is a 10 Port unmanaged Industrial Ethernet Switch. In addition to 8 PoE copper RJ-45 ports, it has 2 RJ-45/SFP Combo ports to accommodate Gigabit Ethernet.

Small Form-factor Pluggable (SFP) Port: The SFP Ports provide flexibility when planning a network. Modules are available in multiple fiber formats. If an SFP module is not inserted, the associated combo port can be used with standard RJ-45 copper.

High-Speed Transmissions: The switch includes a switch controller that automatically senses transmission speed (10/100/1000 Mbps). The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.

Dual Power Input: To reduce the risk of power failure, the switch has two 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.

Flexible Mounting: IP30 metal enclosure - DIN or Panel mounted. Power Over Ethernet (PoE); The eight 10/100 ports are classified as power sourcing equipment (PSE) . These ports can be used to power IEEE 802.3af compliant powered devices (PD), eliminating the need for a separate power supply for each device. (15.4W per port)

Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch is suitable for use in harsh industrial environments.

Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. FWD LEDs on each PoE port indicate when a powered device is connected. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRP410-2SFP-T	Industrial Gigabit Switch (8 PoE, 2 CU/SFP) Power Over Ethernet Sourcing

ACCESSORIES

SDR-240-48 - DIN-Rail Power Supply, 10A, 240W, 48V

C5UMB3FBL - 3 ft. (1 M)- Blue - Category 5e UTP Patch Cord

DFMM-LCLC-1M - Multi-Mode Duplex Fiber Cable, LC To LC, 1 Meter

DFSM-LCLC-1M - Single-Mode Duplex Fiber Cable, LC To LC, 1 Meter

SFP-1000SX-M-550M-T - SFP Module, 1000Base-SX, Multi-mode 550m, LC Connector (-40 to 85°C)

SFP-100FX-M-2KM-T - SFP Module, 100Base-FX, Multi-mode 2km, LC Connector (-40 to 85°C)

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-LX, Single-mode 10km, LC Connector (-40 to 85°C)

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-LX, Single-mode 20km, LC Connector (-40 to 85°C)

SFP-100FX-S-30KM-T - SFP Module, 100Base-FX, Single-mode 30km, LC Connector (-40 to 85°C)

10 Port Industrial Ethernet Switch with 2 RJ-45/SFP Combo Ports for Gigabit Ethernet

EIRP410-2SFP-T

SPECIFICATIONS

REGULATORY	
Safety	UL, cUL CE/EN60950-1
EMC	FCC Class A CE EN61000-6-2 CE EN61000-6-4 CE EN61000-4-2 (ESD) CE EN61000-4-3 (RS) CE EN61000-4-4 (EFT) CE EN61000-4-5 (Surge) CE EN61000-4-6 (CS) CE EN61000-4-8 (Magnetic Field)
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
IEEE STANDARDS	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3ab	1000Base-T
IEEE 802.3z	Gigabit Fiber
IEEE 802.3x	Flow Control and Back Pressure
IEEE802.3af	Power over Ethernet
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 5.6Gbps Throughput (Full-dux): 8.3Mpps@64bytes
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port 1,488,000 pps Gigibit Fiber Ethernet
Buffer	1 MB
MAC Table	8K
Misc	Broadcast Storm Filtering CSMA/CD
INTERFACE	
RJ-45 Ports	8 x 10/100BaseT, 2 x10/100/1000, Auto MDI/MDI-X
CU/SFP	2 x Mini-GBIC SFP Combo Ports
LED	Per unit: Power (Green), Power 1 (Green), Power 2 (Green), Fault (Red), 8 port 10/100: Link/Activity (Green), Full duplex/ Collision (Amber), Power Feeding (Green) Gigabit port: Link/Activity

POE	
Ports	1 through 8
Standard	802.3af End Point Alternative A Power Source Equipment (PSE)
Capacity	15.4W per port
Pin Assignment	1 & 2 – VCC(+), 3 & 6 – VCC(-)
POWER	
Input Voltage	Dual 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	9.6 Watts (Without PoE Load) 140 Watts (Full PoE Load)
Fault Output	1 Relay Output – Normally Closed
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35mm DIN Rail or Panel Mount Attachments
Dimensions	(72mm (W) x 105mm (D) x 152mm (H) 2.84 x 4.13 x 5.98 inch

Industrial High Power PoE Splitter for 10/100/1000T

EPSG202

PRODUCT FEATURES

- Supports 10/100/1000T for PoE in and data out
- Power isolation and short circuit protection for power output
- Auto disconnection for over power voltage input
- Supports Output power up to 25W at 24VDC
- Temperature - 40°C to 75°C
- IP-30 protection
- DIN rail or panel mount
- Provides EFT protection 3,000VDC for power line
- Supports 6,000 VDC Ethernet ESD protection

The Industrial Power over Ethernet Splitter receives a unified PoE signal (data and power) via UTP/STP cable, and then separates the data from the power. The power is applied to two different outputs for non PoE devices which are not compliant with the IEEE802.3af standard.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EPSG202	Industrial PoE Splitter for 10 /100/1000T High Power PoE

ACCESSORIES

MDR-60-48 - DIN Rail Power supply 48VDC, 60W

ERS35 - DIN Rail 1 Meter 35 mm Steel

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

Industrial High Power PoE Splitter for 10/100/1000T

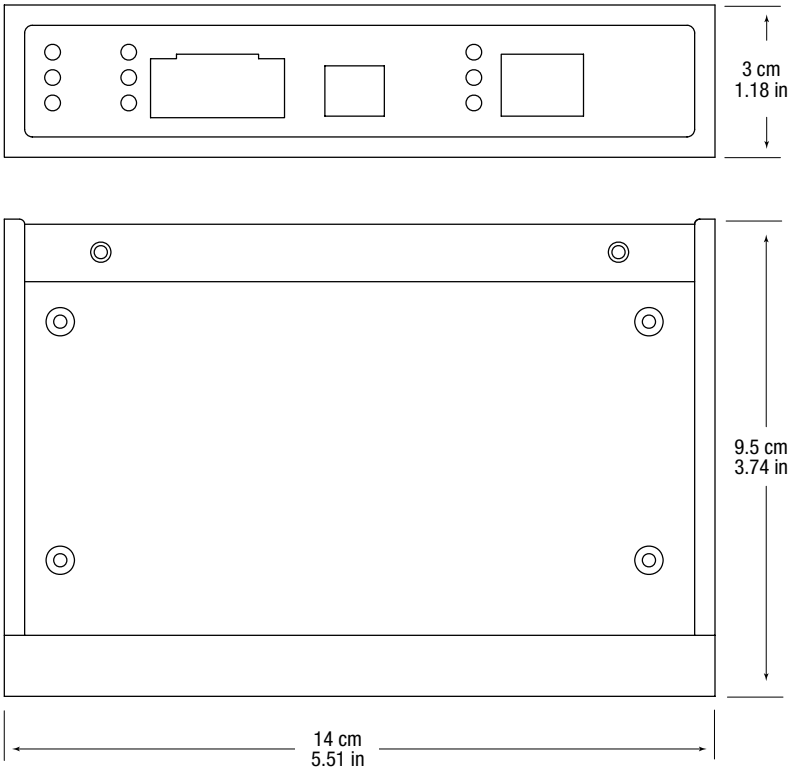
EPSG202

SPECIFICATIONS

IEEE STANDARD COMPLIANCE	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3x	Flow Control and Back Pressure
IEEE 802.3af	Power Over Ethernet
INTERFACE	
Connector	Data and power in: 1 x RJ-45. Data pin 1, 2, 3, 6, 4, 5, 7, 8 Power pin: 4,5(V+) , 7,8(V-) or 1,2(V+) , 3,6(V-) Data out: 1 x RJ-45, Data pin 1, 2, 3, 6, 4, 5, 7, 8 Power out: 1x 6 pin Terminal Block
ESD Protection	6000V ESD Protection
LED Indicators	System Power (Green)
REGULATORY	
Safety	UL / cUL 508 / CE/EN60950-1
EMC	CE EN61000-6-2 CE EN61000-6-4 CE EN61000-4-2 (ESD) CE EN61000-4-3 (RS) CE EN61000-4-4 (EFT) CE EN61000-4-6 (CS) CE EN61000-4-8 (Magnetic Field)
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6

POWER	
Input Voltage	17.6 W @ 48 VDC
Power Output Protection	Power Isolation, Short Circuit Protection
Power Connection	Removable Terminal Block (output power)
Wire Size	12 to 24 AWG
Power Use	30.8 Watts
EFT Protection	3000 V EFT Protection
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	5 to 95% (Non-condensing)
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35 mm DIN Rail or Panel Mount Attachments
Dimensions	3 cm (W) x 9.5 cm (D) x 14 cm (H) 1.18 x 3.74 x 5.51 inches

MECHANICAL DIAGRAM



Managed Industrial Ethernet Switch 2 GB RJ-45/SFP Ports, 8 PoE Ports

EIRP610-2SFP-T

PRODUCT FEATURES

- Eight 10/100 BaseT 802.3af end point PoE injector ports
- Two RJ-45/SFP combo slots for Gigabit Ethernet
- Redundant ring technology for fast recovery
- Wide operating temperature
- DIN Rail or Panel Mount
- NEMA TS2

The EIRP610-2SFP-T is a 10 Port Managed Industrial Gigabit Ethernet Switch. In addition to 8 PoE copper RJ-45 ports, it has 2 RJ-45/SFP Combo ports to accommodate Gigabit Ethernet.

Small Form-factor Pluggable (SFP) Port: The SFP Ports provide flexibility when planning a network. Modules are available in multiple fiber formats. If an SFP module is not inserted, the associated combo port can be used with standard RJ-45 copper.
High-Speed Transmissions: The switch includes a switch controller that automatically senses transmission speed (10/100/1000 Mbps on two RJ45/SFP combo ports; 10/100 on eight PoE RJ45 copper ports).
The RJ-45 interface also auto-detects MDI or MDI-X, eliminating the requirement for a crossover cable. Each port is buffered and supports store-and-forward protocol.
Dual Power Input: To reduce the risk of power failure, the switch has two 48 VDC power inputs. If the power fails, the switch will automatically use the secondary power input. Also, if the power goes out the corresponding P1 or P2 LED will go out and the Fault LED will light. The contacts for the alarm output will also open.
Flexible Mounting: IP30 metal enclosure - DIN or Panel mounted.
Managed: Powerful management functions including SNMP, LACP, VLAN, Port Trunking, Port Mirroring, Redundant Ring Technology, and Spanning Tree/Rapid Spanning Tree Protocol.
Power Over Ethernet (PoE): The eight 10/100 ports are classified as power sourcing equipment (PSE). These ports can be used to power IEEE 802.3af compliant powered devices (PD), eliminating the need for a separate power supply for each device.
Wide Operating Temperature: With an operating temperature of -40 to 75°C (-40 to 167°F), this switch is suitable for use in harsh industrial environments.
Easy Troubleshooting: There are two LED indicators for each port that display the link status and transmission speed. Three LED indicators for power (P1, P2 and Fault) show power status. FWD LEDs on each PoE port indicate when a powered device is connected. These indicators allow you to quickly diagnose and correct problems and ensure your network remains reliable.

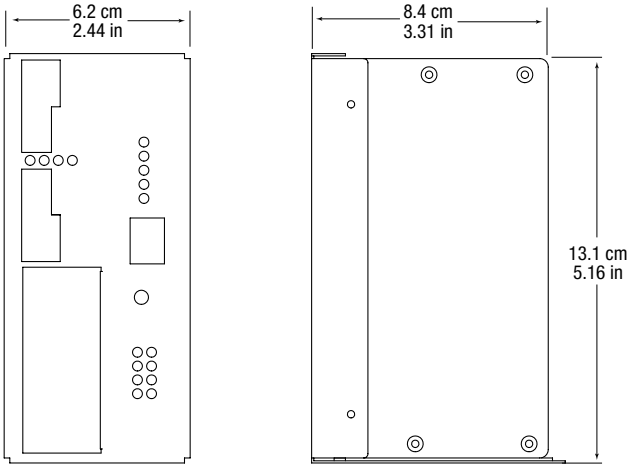
ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRP610-2SFP-T	Industrial Gigabit Switch (8 CU, 2 CU/SFP) Power Over Ethernet Sourcing

ACCESSORIES

SDR-240-48 - DIN-Rail Power Supply, 10A, 240W, 48V
C5UMB3FBL - 3 ft. - Blue - Category 5e UTP Patch Cord
DFMM-LCLC-1M - Multi-Mode Duplex Fiber Cable, LC To LC, 1 Meter
DFSM-LCLC-1M - Single-Mode Duplex Fiber Cable, LC To LC, 1 Meter
SFP-1000SX-M-550M-T - SFP Module, 1000Base-SX, Multi-mode 550m, LC Connector (-40 to 85°C)
SFP-100FX-M-2KM-T - SFP Module, 100Base-FX, Multi-mode 2km, LC Connector (-40 to 85°C)
SFP-1000LX-S-10KM-T - SFP Module, 1000Base-LX, Single-mode 10km, LC Connector (-40 to 85°C)
SFP-1000LX-S-20KM-T - SFP Module, 1000Base-LX, Single-mode 20km, LC Connector (-40 to 85°C)
SFP-100FX-S-30KM-T - SFP Module, 100Base-FX, Single-mode 30km, LC Connector (-40 to 85°C)

MECHANICAL DIAGRAM



Managed Industrial Ethernet Switch
2 GB RJ-45/SFP Ports, 8 PoE Ports

EIRP610-2SFP-T

SPECIFICATIONS

REGULATORY	
Approvals	FCC, CE, UL, NEMA TS2 UL File Number: E173795
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
IEEE STANDARDS	
IEEE 802.3	802.3. 10Base-T Ethernet
IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
IEEE 802.3ab	1000Base-T
IEEE 802.3z	Gigabit Fiber
IEEE 802.3x	Flow Control and Back Pressure
IEEE 802.3ad	Port trunk with LACP
IEEE 802.3f	Power over Ethernet
IEEE 802.3d	Spanning Tree Protocol
IEEE 802.1w	Rapid Spanning Tree Protocol
IEEE 802.1p	Class of Service
IEEE 802.1Q	VLAN Tag
IEEE 802.1x	User Authentication (RADIUS)
IEEE 802.1ab	LLDP
NETWORK SPECIFICATIONS	
Architecture	Back-plane (Switching Fabric): 5.6Gbps Throughput (Full-dux): 3.3Mpps@64bytes
Transfer Rate	14,880 pps Ethernet Port 148,800 pps Fast Ethernet Port 1,488,000 pps Gigibit Fiber Ethernet
Buffer	1 MB
MAC Table	8K
Flash ROM	4 MB
DRAM	32 MB
Other	Broadcast Storm Filtering CSMA/CD
INTERFACE	
RJ-45 Ports	8 x 10/100BaseT, 2 x10/100/1000, Auto MDI/MDI-X
CU/SFP	2 x Mini-GBIC SFP Combo Ports
LED	P1, P2 (Green) to indicate power Fault (Red) to indicate fault Mater (Green) to indicate ring master Link Activity on 10/100 ports (Green) Full Duplex / Collision (Amber) SFP LNK/ACT (Green) 1000T LNK/ACT (Green) 1000M (Green) FWD on PoE ports to indicate if a powered device is connected
POE	
Ports	1 through 8
Standard	802.3af End Point Alternative A Power Source Equipment (PSE)
Capacity	15.4W per port
Pin Assignment	1 & 2 – VCC(+), 3 & 6 – VCC(-)
SOFTWARE FEATURES	
Management	SNMP v1, v2C, v3, Web, Telnet, CLI
SNMP MIB	RFC 1215 Trap, RFC1213 MIBII, RFC 1157 SNMP MIB, RFC 1493 Bridge MIB, RFC 2674 VLAN MIB, RFC 1643, RFC 1757, RSTP MIB, Private MIB, LLDP MIB
VLAN	Port Based VLAN IEEE 802.1Q Tag VLAN (256 entries) VLAN ID (1 to 4096), GVRP (256 groups)
Port Trunk w/LACP	4 trunk groups / 4 trunk members
LLDP	Allows the switch to advertise its Identification and capabilities on the LAN
Spanning Tree	802.1d Spanning Tree 802.1w Rapid Spanning Tree
X-Ring	Dual Homing, Ring Coupling, Dual Ring topologies. Recovery time below 20mS
Quality of Service	Determined by port, tag, IPv4 type of service, and IPv4/IPv6 different service
Class of Service	802.1p class of service, 4 priority queues per port
Port Security	Supports 100 static MAC entries and 100 MAC Filter entries
Port Mirror	Supports TX, RX, and both packet
IGMP	IGMP Snooping v1, v2 (256 multi-cast groups and IGMP Query
IP Security	10 IP address entries for permission to access management functions
Login Security	802.1X Authentication / RADIUS
Bandwidth Control	Ingress Packet Filter and Egress Packet Limit. The egress rate control supports all packet types. Limit rates are: 100K to 102400 Kbps (10/100) and 100 K to 256000 Kbps (1000). Ingress packet Filter Type combination rules are Broadcast, Multi-Cast, Unknown Unicast, Broadcast/Multi-cast, Broadcast only, and all packets.
Flow Control	Flow control full-dux, backpressure half-dux
System Log	System Log and remote system log server
SMTP	SMPT SVR and 6 e-mail accounts for alerts
SNMP Trap	Cold Start, Link Down, Link Up, Authorization Fail, PD Disconnect (PoE port event)
DHCP	Client, Server, Port and IP Binding
DNS	DNS client with primary and secondary DNS server
SNTP	SNTP to synchronize system clock
Firmware Update	TFTP update, backup and restore
POWER	
Input Voltage	Dual 48 VDC Inputs Reverse Polarity Protection
Power Connection	Removable Terminal Block
Wire Size	12 to 24 AWG
Power Use	9.6 Watts (Without PoE Load) 116 Watts (Full PoE Load)
Fault Output	1 Relay Output – Normally Closed
ENVIRONMENTAL	
Operating Temperature	- 40 to 75°C (-40 to 167°F)
Storage Temperature	- 40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95%
MECHANICAL	
Enclosure	IP30 Metal Enclosure
Mounting	35 mm DIN Rail or Panel Mount Attachments
Dimensions	6.2 x 8.4 x 13.1 cm (2.44 x 3.31 x 5.16 in)

8 Port Managed GB Industrial Ethernet Switches

EIR608-2SFP & EIR608-4SFP

PRODUCT FEATURES

- X-Ring automatic recovery
- Up to 8 10/100/1000TX RJ45 ports with MDI/MDI-X
- (2 or 4) 100/1000 SFP ports
- Dual 12 to 48 VDC power inputs
- Relay alarm output
- DIN Rail or Panel Mount Option Included
- Automatic e-mail notification for system events
- SNMP, CLI, or web management
- Port mirror and port trunk with LACP

The Elinx™ EIR608-xSFP series Industrial Gigabit Managed Ethernet Switches provide powerful functionality in a small package Designed for industrial applications, these switches contain all the standard features of other switches, such at IGMP Snooping, Port Based VLAN, 802.1Q Tag VLAN, RJ-45 automatic MDI/MDI-X, auto negotiation, store and forward switching, STP, RSTP, Web Based Management, Ingress Packet Filtering, and Egress Rate Control.

These managed switches also come with important industrial features to ensure reliability in an industrial application. X-Ring technology with coupling ring and dual homing allows automatic recovery in less than 300 MS. Dual power inputs ensure reliability. A relay alarm output for port failure notification. DIN Rail and Panel Mounting options on the same IP30 case. Another important feature is automatic e-mail notification for system events such as a cold start, change in network topology, power status or SNMP authentication failure. The EIR608-xSFP is also Gigabit capable and comes with 2 or 4 SFP ports which allow the addition of fiber optic ports.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR608-2SFP	8 Port Gigabit Industrial Managed Switch w/ 6 copper & (2) copper or SFP Combo ports
EIR608-4SFP	8 Port Gigabit Industrial Managed Switch w/ 4 copper ports and 4 SFP ports

ACCESSORIES

MDR-60-24 - DIN Rail Power supply 24VDC, 2.5A, 60W

C5UMB3FBL - 3 ft. - Blue - Category 5e UTP Patch Cord

DFMM-LCLC-1M - Multi-Mode Duplex Fiber Cable, LC To LC, 1 Meter

DFSM-LCLC-1M - Single-Mode Duplex Fiber Cable, LC To LC, 1 Meter

SFP-1000SX-M-550M-T - SFP Module, 1000Base-SX, Multi-mode 550m, LC Connector (-40 to 85°C)

SFP-100FX-M-2KM-T - SFP Module, 100Base-FX, Multi-mode 2km, LC Connector (-40 to 85°C)

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-LX, Single-mode 10km, LC Connector (-40 to 85°C)

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-LX, Single-mode 20km, LC Connector (-40 to 85°C)

SFP-100FX-S-30KM-T - SFP Module, 100Base-FX, Single-mode 30km, LC Connector (-40 to 85°C)

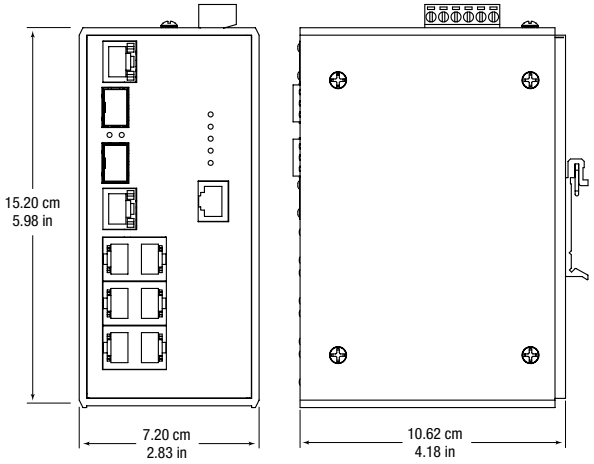
8 Port Managed GB Industrial Ethernet Switches

EIR608-2SFP & EIR608-4SFP

SPECIFICATIONS

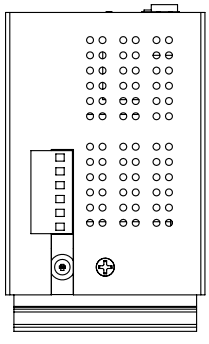
TECHNOLOGY	
IEEE Standards	802.3 10Base-T Ethernet, 802.3u 100Base-TX and 100Base-FX Fast Ethernet, 802.3ab 1000Base-TX; 802.3x Flow Control and Back Pressure, 802.1d Spanning Tree, 802.1w Rapid Spanning Tree; 802.1p Class of Service, 802.1Q VLAN Tag, 802.3z Gigabit fiber, 802.3ad Port Trunk with LACP, 802.1x User Authentication
Processing Type	Store and Forward
Flow Control	Flow control on full duplex, Back Pressure on half duplex
MAC Address Table Size	8 KB
Packet Buffer	1M bit
Flash ROM	4M byte
DRAM	32M byte
Protocol	CSMA/CD
Management	SNMP (v2, v2C, V3), Web GUI, TELNET, CLI.
Management Security	Up to 10 IP addresses can have permission to manage the switch. 802.1x (RADIUS) Authentication
Transfer Rate	14,880 pps 10BaseT, 148,800 100BaseTX/FX, 1,488,000 Gigabit
Packet throughput ability	23.8 Mbps @ 64 bytes
X-Ring	2 ports for X-Ring provide redundant backup with a recovery time below 300 MS.
Packet Filter	4 Selection Rules to filter combinations of Broadcast , Multicast, Unicast, and Unknown packets.
VLAN	Port based / Tag (256 entries) / VLAN ID (up to 4K) / GRVP (256 groups) / Double Tag VLAN (Q in Q) Private VLAN
Port Trunk	LACP Port Trunk. 4 Trunk Groups. Maximum 4 Trunk Members
Class of Service	4 priority queues per port
Quality of Service	Port based, Tag and IPv4 Type of Service, IPv4 / IPv6 Different Service
IGMP	IGMP snooping v1, v2. 256 multicast groups and IGMP query
Clock Synchronization	SNTP
Port Mirror	TX packet only or TX and RX packet
Firmware Update	TFTP
DHCP	DHCP Client Function to obtain addresses from DHCP server
Bandwidth Control	Ingress Packet Filter rules and Egress Rate Control

MECHANICAL DIAGRAM



INTERFACE	
LAN/WAN Ports	EIR608-2SFP: (6) RJ45 10/100/1000, (2) RJ-45 10/100/1000 or SPF Mini-GBIC Combo (RJ45 disabled when SFP installed), (SFP ports are 100/1000); EIR608-4SFP: (4) RJ45 10/100/1000, (4) SPF Mini-GBIC (SFP ports are 100/1000)
Console Port	RS-232 RJ-45 (Adapter Cable Included)
Port Indicators (each port)	Green LED for Link / Activity, Green LED for speed 1000M, Green LED for SFP Link Activity
System Indicators	Green LEDs for Power, Power 1, Power 2, and Master. Yellow LED for Fault.
POWER	
Input Voltage	12 to 48 VDC, dual source
Power Consumption	11.2 W max
Input Connection	Terminal Block
Relay Alarm	1A @ 24V
ENVIRONMENTAL	
Operating Temperature	14 to 140°F (-10 to 60°C)
Storage Temperature	-40 to 185°F (-40 to 85°C)
Operating Humidity	0 to 95% NC
MTBF EIR608-2SFP	220593
MTBF EIR608-4SFP	286945
MECHANICAL	
Enclosure	IP30 Aluminum Case
Mount	35 mm DIN or Panel
Dimensions	7.4 x 10.7 x 16.3 cm (2.9 x 4.2 x 6.4 in)
REGULATORY APPROVALS	
EMI	FCC Class A EN6100-4-2, -4-3, -4-4, EN6100-4-5, -4-6
Safety	EN60950
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6

SNMP MIB	SNMP TRAP
RFC 1213 MIBII	Up to 3 Trap Stations
RFC 1493 Bridge MIB	Cold Start
RMON RFC 1757	Port link up
RFC 2674 VLAN MIB	Port link down
RFC 1643 Ethernet like MIB	Authentication Failure
RFC 1215 Trap MIB	Power status
RFC 1157 SNMP MIB	Port Alarm
RSTP MIB	Fault Alarm
Private MIB for switch info	X-Ring



10 Port Managed Industrial Ethernet Switches, 3 SFP Combo Ports

EIR610-3SFP-T

PRODUCT FEATURES

- X-Ring automatic recovery
- 7 10/100TX RJ45 ports with MDI/MDI-X
- 3 combo ports (10/100/1000 RJ45 or 100/1000 SFP Mini-GBIC Ports)
- Dual 12 to 48 VDC power inputs
- Wide operating temperature
- Relay alarm output
- IP30 DIN rail or panel mount
- Automatic e-mail notification for system events
- SNMP, CLI, or web management
- port mirror and port trunk with LACP

The Elinx™ EIR610-3SFP-T Industrial Managed Ethernet Switch provides powerful functionality in a small package. Designed for industrial applications, this switch contain all the standard features of other switches, such at IGMP Snooping, Port Based VLAN, 802.1Q Tag VLAN, RJ-45 automatic MDI/MDI-X, auto negotiation, store and forward switching, STP, RSTP, Web Based Management, Ingress Packet Filtering, and Egress Rate Control.

These managed switches also come with important industrial features to ensure reliability in an industrial application. X-Ring technology with coupling ring and dual homing allows automatic recovery in less than 300 MS. Dual power inputs ensure reliability. A relay alarm output for port failure notification. DIN Rail and Panel Mounting options on the same IP30 case. Another important feature is automatic e-mail notification for system events such as a cold start, change in network topology, power status or SNMP authentication failure.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR610-3SFP-T	Industrial Managed Ethernet Switch, 7 RJ45 Ports, (3) 10/100/1000 RJ45 or SFP Ports

ACCESSORIES

MDR-60-24 - DIN Rail Power supply 24VDC, 2.5A, 60W

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

DFMM-LCLC-1M - Multi-Mode Duplex Fiber Cable, LC To LC, 1 Meter

DFSM-LCLC-1M - Single-Mode Duplex Fiber Cable, LC To LC, 1 Meter

SFP-1000SX-M-550M-T - SFP Module, 1000Base-SX, Multi-mode 550m, LC Connector (-40 to 85°C)

SFP-100FX-M-2KM-T - SFP Module, 100Base-FX, Multi-mode 2km, LC Connector (-40 to 85°C)

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-LX, Single-mode 10km, LC Connector (-40 to 85°C)

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-LX, Single-mode 20km, LC Connector (-40 to 85°C)

SFP-100FX-S-30KM-T - SFP Module, 100Base-FX, Single-mode 30km, LC Connector (-40 to 85°C)

10 Port Managed Industrial Ethernet Switches, 3 Combo Ports

EIR610-3SFP-T

SPECIFICATIONS

TECHNOLOGY	
IEEE Standards	802.3 10Base-T Ethernet, 802.3u 100Base-TX and 100Base-FX Fast Ethernet; 802.3x Flow Control and Back Pressure, 802.1d Spanning Tree, 802.1w Rapid Spanning Tree; 802.1p Class of Service, 802.1Q VLAN Tag, 802.3ad Port Trunk with LACP, 802.1x RADIUS
Processing Type	Store and Forward
Flow Control	Flow control on full duplex, Back Pressure on half duplex
MAC Address Table Size	8 KB
Memory	4MB Flash ROM, 32MB DRAM
Protocol	CSMA/CD
Management	SNMP v1, v2c, v3, Web GUI, TELNET, CLI, Menu Driven Interface
Management Security	Up to 10 IP addresses can have permission to manage the switch. 802.1x (RADIUS) Authentication
Transfer Rate	14,880 bps for 10Base-T Ethernet ports, 148,800 for 100Base-TX/FX Fast Ethernet ports
Packet throughput ability	8.3 Mbps @ 64 bytes
X-Ring	2 ports for X-Ring provide redundant backup with a recovery time below 300 MS.
Packet Filter	4 Selection Rules to filter combinations of Broadcast , Multicast, Unicast, and Unknown packets.
VLAN	Port based and Tag. Up to 256 VLAN groups
Port Trunk	LACP Port Trunk. 4 trunk groups / maximum of 4 trunk members.
Class of Service	4 priority queues per port
Quality of Service	Port based, Tag based, or IPv4 Type of Service, IPv6 Different Service
IGMP	IGMP Snooping v1, v2, and v3. 256 multicast groups and IGMP query
Clock Synchronization	SNTP
Management Security	IP Address
Port Mirror	TX packet only, RX packet only, or TX and RX packet
Firmware Update	TFTP, TFTP backup and restore
DHCP	DHCP Client / DHCP Server
Bandwidth Control	Ingress packet filter and Egress packet limit
INTERFACE	
LAN/WAN Ports	7 RJ45 10/100TX, 3 Combo RJ45 10/100/1000 or 100/1000 SFP Mini-GBIC Combo (On Combo ports the RJ45 is disabled when an SFP module is installed)
Console Port	RS-232 RJ-45 (DB9 to RJ-45 adapter cable included)
Port Indicators (each port)	10/100: Link/Activity (Green), Full-duplex/Collision (Yellow); Giga Copper: Link/Activity (Green), Speed (1000Mbps Green); SFP: Link/Activity (Green)
System Indicators	Green LEDs for Power, Power 1, Power 2, and Master. Orange LED for Fault.

POWER	
Input Voltage	12 to 48 VDC, dual source
Current Consumption	0.84 A max.
Input Connection	Terminal Block
Relay Alarm	1A @ 24VDC
ENVIRONMENTAL	
Operating Temperature	-40 to 167°F (-40 to 75°C)
Storage Temperature	-40 to 185°F (-40 to 85°C)
Operating Humidity	10 to 95% Non-condensing
MTBF	260818 hours
MECHANICAL	
Enclosure	IP30 DIN mount metal case
Mount	35 mm DIN or Panel
Dimensions	7.4 x 10.7 x 16.3 cm (2.7 x 4.2 x 6.4 in)
REGULATORY APPROVALS	
EMI	FCC Class A EN6100-4-2, -4-3, -4-4, EN6100-4-5, -4-6
Safety	EN60950
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6

RFC STANDARDS	SNMP TRAP
RFC1215 Trap	Up to 3 Trap Stations
RFC1213 MIBII	Cold Start
RFC1157 SNMP MIB	Port link up
RFC1493 Bridge	Port link down
RFC2674 VLAN MIB	Authentication Failure
RFC1643	Power status
RFC 757	Port Alarm
RSTP MIB	Fault Alarm
Private MIB	X-Ring Change

18 Port Managed Industrial Ethernet Switches with SFP Gigabit Ports

EIR618-2SFP-T

PRODUCT FEATURES

- X-Ring automatic recovery
- 16 10/100 TX RJ45 ports with MDI/MDI-X
- 2 combo 10/100/1000TX RJ45 or 100/1000 SFP ports
- Dual 12 to 48 VDC power inputs
- Wide operating temperature
- Relay alarm output
- IP30 DIN rail or panel mount
- Automatic e-mail notification for system events
- SNMP, CLI, or web management
- Port mirror and port trunk with LACP

The Elinx™ EIR618-2SFP-T Industrial Managed Ethernet Switch provides powerful functionality in a small package. Designed for industrial applications, this switch contain all the standard features of other switches, such at IGMP Snooping, Port Based VLAN, 802.1Q Tag VLAN, RJ-45 automatic MDI/MDI-X, auto negotiation, store and forward switching, STP, RSTP, Web Based Management, Ingress Packet Filtering, and Egress Rate Control.

These managed switches also come with important industrial features to ensure reliability in an industrial application. X-Ring technology with coupling ring and dual homing allows automatic recovery in less than 300 MS. Dual power inputs ensure reliability. A relay alarm output for port failure notification. DIN Rail and Panel Mounting options on the same IP30 case. Another important feature is automatic e-mail notification for system events such as a cold start, change in network topology, power status or SNMP authentication failure.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR618-2SFP-T	Industrial Managed Ethernet Switch, 16 10/100 RJ45 Ports, plus 2 Combo 10/100/1000 RJ45 or SFP Mini-GBIC Ports

ACCESSORIES

MDR-60-24 - DIN Rail Power supply 24VDC, 2.5A, 60W

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

DFMM-LCLC-1M - Multi-Mode Duplex Fiber Cable, LC To LC, 1 Meter

DFSM-LCLC-1M - Single-Mode Duplex Fiber Cable, LC To LC, 1 Meter

SFP-1000SX-M-550M-T - SFP Module, 1000Base-SX, Multi-mode 550m, LC Connector (-40 to 85°C)

SFP-100FX-M-2KM-T - SFP Module, 100Base-FX, Multi-mode 2km, LC Connector (-40 to 85°C)

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-LX, Single-mode 10km, LC Connector (-40 to 85°C)

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-LX, Single-mode 20km, LC Connector (-40 to 85°C)

SFP-100FX-S-30KM-T - SFP Module, 100Base-FX, Single-mode 30km, LC Connector (-40 to 85°C)

18 Port Managed Industrial Ethernet Switches with SFP Gigabit Ports

EIR618-2SFP-T

SPECIFICATIONS

TECHNOLOGY	
IEEE Standards	802.3 10Base-T Ethernet, 802.3u 100Base-TX and 100Base-FX Fast Ethernet, 802.3x Flow Control and Back Pressure, 802.1d Spanning Tree, 802.1w Rapid Spanning Tree, 802.1p Class of Service, 802.1Q VLAN Tag, 802.3ad Port Trunk with LACP, 802.1x RADIUS, 802.3ab 1000BaseT, 802.3z Gigabit fiber
Processing Type	Store and Forward
Flow Control	Flow control on full duplex, Back Pressure on half duplex
MAC Address Table Size	8 KB
Memory	4MB Flash ROM, 32MB DRAM
Protocol	CSMA/CD
Management	SNMP v1, v2c, v3, Web GUI, TELNET, CLI, Menu Driven Interface
Management Security	Up to 10 IP addresses can have permission to manage the switch. 802.1x (RADIUS) Authentication
Transfer Rate	14,880 bps for 10Base-T Ethernet ports, 148,800 for 100Base-TX/FX Fast Ethernet ports 1,488,000 bps for Gigabit Fiber Ethernet ports
Packet throughput ability	10.7 Mbps @ 64 bytes
X-Ring	2 ports for X-Ring provide redundant backup with a recovery time below 300 MS.
Packet Filter	4 Selection Rules to filter combinations of Broadcast , Multicast, Unicast, and Unknown packets.
VLAN	Port based and Tag. Up to 256 VLAN groups. GVRP (256 Groups)
Port Trunk	LACP Port Trunk. 4 trunk groups / maximum of 4 trunk members.
Class of Service	4 priority queues per port
Quality of Service	Port based, Tag based, or IPv4 Type of Service, IPv6 Different Service
IGMP	IGMP Snooping v1, v2, and v3. 256 multicast groups and IGMP query
Clock Synchronization	SNTP
Management Security	IP Address, 802.1x RADIUS
Port Security	Static MAC (100 entries) / MAC Filter (100 entries)
Port Mirror	TX packet only, RX packet only, or TX and RX packet
Firmware Update	TFTP, TFTP backup and restore
DHCP	DHCP Client / DHCP Server
Bandwidth Control	Ingress packet filter and Egress packet limit

INTERFACE	
LAN/WAN Ports	16 RJ45 10/100TX, 2 Combo RJ45 10/100/1000 or SFP ports (RJ45 ports disabled when SFP installed)
Console Port	RS-232 RJ45 (DB9 to RJ45 adapter cable included)
Port Indicators (each port)	10/100: Link/Activity (Green), Full-duplex/Collision (Yellow), Giga Copper: Link/Activity (Green), Speed (1000Mbps Green), SFP: Link/Activity (Green)
System Indicators	Green LEDs for Power, Power 1, Power 2, and Master. Orange LED for Fault.
POWER	
Input Voltage	12 to 48 VDC, dual source
Current Consumption	1.1 A max.
Input Connection	Terminal Block
Relay Alarm	1A @ 24VDC
ENVIRONMENTAL	
Operating Temperature	-40 to 167°F (-40 to 75°C)
Storage Temperature	-40 to 185°F (-40 to 85°C)
Operating Humidity	0 to 95% Non-condensing
MTBF	243301 hours
MECHANICAL	
Enclosure	IP30 DIN mount metal case
Mount	35 mm DIN or Panel
Dimensions	7.4 x 10.7 x 16.3 cm (2.9 x 4.2 x 6.4 in)
REGULATORY APPROVALS	
EMI	FCC Class A EN6100-4-2, -4-3, -4-4, EN6100-4-5, -4-6
Safety	EN60950
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6

Industrial Managed Ethernet Switches

ESW500 Series

PRODUCT FEATURES

- Light industrial design EN61000-6-1 specifications
- NEMA TS2 (ESW508-T)
- Shock and vibration tested
- -10 to 60°C or -40 to 75°C (-T models) temperature rating
- Supports IEEE 802.3 10Base-T,802.3u 100Base-TX
- RJ-45 port supports auto MDI/MDI-X function
- SC single mode and multi mode fiber connectors
- Gigabit options with copper and SFP combo ports
- Web browser management and configuration
- Ring On redundant rapid recovery system, 15 mS
- Rapid spanning tree protocol recover system
- IGMP with query mode for multimedia application
- Port based VLAN / 802.1 Q Tag VLAN
- Relay alarm output for system events
- Port mirroring for diagnostics
- 256K bytes packet buffer
- 8k MAC address table

The Elinx™ family of Managed DIN rail mount Ethernet switches have been designed to meet light Industrial and commercial communication requirements.

Switch configurations range from 8 ports to 16 ports featuring all RJ45 copper to RJ45 copper with multi mode, single mode, and or SFP Gigabit ports.

RingOn Technology

Two ports can be used for network redundancy by implementing RingOn technology providing a rapid recovery system for industrial networks. If any part of the ring disconnects the network communications will automatically be restored.

Web-based Management

Each switch has an embedded HTML web site residing in flash memory, offering advanced management features allowing users to manage the switch from anywhere on the network via a standard web browser.

VLAN Configuration

A Virtual LAN (VLAN) is a logical network grouping that limits the broadcast domain. This allows you to isolate network traffic so that members of a VLAN will only receive traffic from other members of the same VLAN. Creating a VLAN from a switch is the logical equivalent of reconnecting a group of network devices to another Layer 2 switch. However, since it is a virtual network, the network devices remain connected to the same switch physically. Both port-based and 802.1Q (tagged-based) VLAN are supported.

ORDERING INFORMATION

MODEL	10/100	10/100/1000	SFP 1000	MULTI-MODE FIBER	SINGLE-MODE FIBER	TEMPERATURE
ESW508	8					-10 to 60°C
ESW516	16					-10 to 60°C
ESW508-T*	8					-40 to 75°C
ESW508-2MC-T	6			2 (SC)		-40 to 75°C
ESW508-2SC-T	6				2 (SC)	-40 to 75°C
ESW516-T	16					-40 to 75°C

*NEMA TS2

ACCESSORIES

MDR-60-24 - DIN Rail Power supply 24VDC, 2.5A, 60W

C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

DFMM-STST-1M - Multi-Mode Duplex Fiber Cable, ST To ST, 1 Meter

DFSM-SCSC-1M - Single-Mode Duplex Fiber Cable, SC To SC, 1 Meter

Industrial Managed Ethernet Switches

ESW500 Series

SPECIFICATIONS

TECHNOLOGY	
Standards and Managed Protocols	IEEE802.3, 802.3u,802.3ab,802.3z, 802.3x • IEEE802.1D STP • IEEE802.1W RSTP • IEEE802.1p Class of Service • IEEE802.1Q VLAN Tagging • IEEE802.1ad Port Trunk with LACP • IEEE802.1x Port-Based Access Control • Protocols: SNMP V1/V2/V3, DHCP Server, SNTP, SMTP, IGMP Snooping/GMRP, LACP, RMON, HTTPS, Telnet, Syslog, HTTP • Priority Queues: 4 • IGMP Groups: 64 • Maximum VLANs:256
Processing Type	Store and forward with IEEE802.3x full duplex, non-blocking flow control
Flow Control	IEEE802.3x flow control, back pressure flow control
MAC Address Table Size	8 KB
Packet Buffer Memory	256 K bytes
Address Table Size	8K MAC Addresses
INTERFACE	
RJ45 Ports	10/100BaseT(x) auto negation, Full/Half duplex, auto MDI/MDI-connection
Fiber Ports	100BaseFX ports (multi-mode or single-mode with SC connector) Mini-GBIC SFP Combo Ports
LED Indicators	Power, Link, Speed, System Status

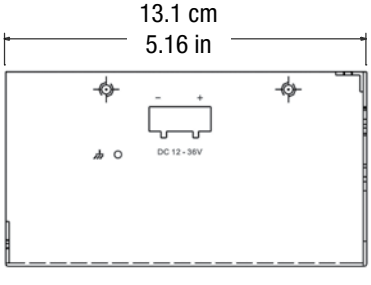
FIBER OPTICS				
Fiber Type	**Distance**	**Wavelength**	**Output Power**	**Sensitivity**
Multi-mode	2 km	1310 nm	-20 to -14 dBm	≤ - 33.9 dBm
Single mode	20 km	1310 nm	-15 to -14 dBm	≤ - 31 dBm

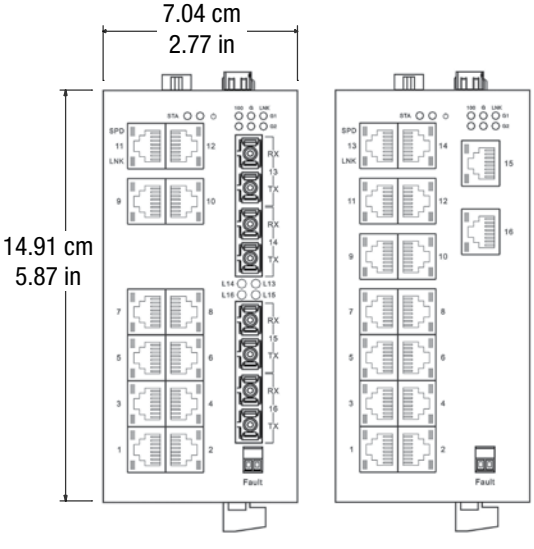
POWER	
Input Voltage	18 to 36 VDC (All Models) 10 to 24 VAC (ESW508, ESW516 Models)
Power Consumption	20W Max
Input Connection	Terminal Block
Protection	Reverse Polarity Protection
ENVIRONMENTAL	
Operating Temperature	-10 to 60C or -40 to 75C (Wide Temperature Models)
Storage Temperature	-40 to 80 °C
Operating Humidity	0 to 95% Non-condensing
MTBF	200,000 hours
MECHANICAL	
Enclosure	IP 30 Metal
Dimensions	See drawings
Installation	DIN rail and Panel mount
REGULATORY APPROVALS	
CE, FCC, RoHS - Yes, NEMA TS2 (ESW508-T)	
EN61000-6-1 Shock & Vibration Tested	

SPECIFICATIONS - EN 61000-6-1: 2006
GENERIC STANDARDS FOR COMMERCIAL, LIGHT INDUSTRIAL ENVIRONMENTS

TEST	DESCRIPTION	TEST LEVEL		LEVEL
EN55022: 2006 + A1:2007	Class B Emissions			
EN61000-4-2: 2009	Electro-Static Discharge (ESD)	Enclosure Contact Enclosure Air	6kV 8kV	3 3
EN61000-4-3:2006+A1:2008	Radiated Field Immunity (RFI)	Enclosure Ports	10V/m	3
EN61000-4-4:2004	Burst (Fast Transient)	Signal Ports DC Ports	0.5kV@2.5Khz 1kV	2 2
EN61000-4-5:2006	Surge	Signal Ports DC Power Ports	1kV 2kV	3 3
EN61000-4-6: 2009	Induced (Conductive) RFI	Signal Ports DC Power Ports	10 V RMS 10 V RMS	3 3
ENVIRONMENTAL				
IEC60068-2-6	Vibration	Test Fc	2G	-
IEC60068-2-27	Shock	Test Ea	30G	-

MECHANICAL DIAGRAM





The 5 **Best Ways** to EXTEND **ETHERNET**

by Mike Fahrion
Director of Product Management

When TCP/IP networking moves out of the home and office environment and into the real world, the 100-meter range limitation of copper Ethernet cable becomes a problem. The remote sensors along an oil pipeline, for example, are going to require a bit more range than that. Fortunately, there are ways to provide it. With conversion and extension, networks can cover distances that are measured in kilometers rather than meters.

1 THE ETHERNET EXTENDER

One easy solution is the Ethernet extender. An Ethernet extender uses DSL technology to extend range up to 1900 meters; or nearly two kilometers. And they'll work with all sorts of copper wire, which makes them very cost-effective. The labor and cabling involved in a network installation normally represent a significant part of the expense, but Ethernet extenders will make use of any legacy cable that is already in place, like Cat5 cable or even old telephone lines. The savings can be substantial.

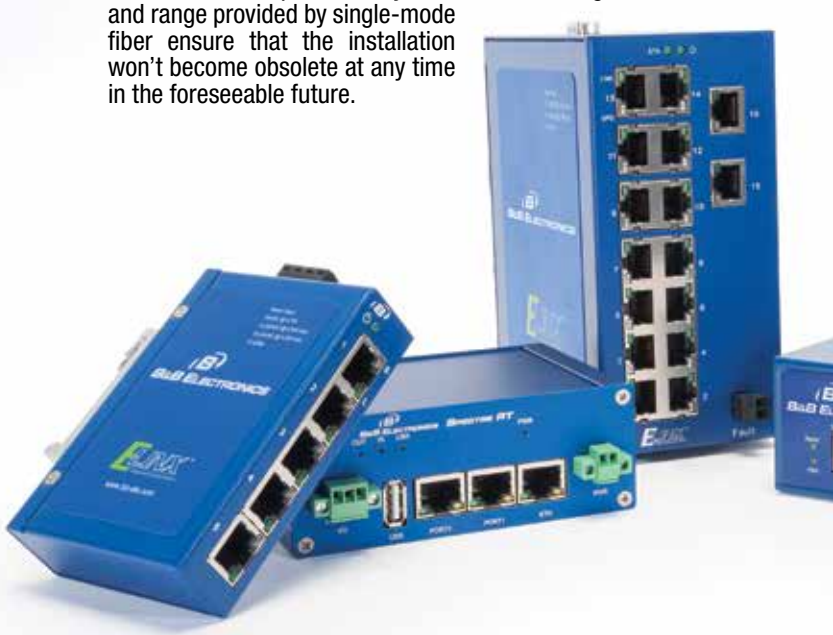
Ethernet extenders are set up in pairs. The first extender converts the Ethernet data for transmission over DSL. The second converts it back again. Throughput may be up to 50 Mbps, depending upon the range. Data signals attenuate over copper wire, of course but, even at the full 1900 meters, Ethernet extenders can still provide throughputs of 1 Mbps. Some Ethernet extenders are also equipped to provide Power over Ethernet (PoE), which overcomes the challenge of powering remote devices placed away from a power source by providing power directly from the extended Ethernet port.

For best performance, be sure that the extender wire is free of load coils, filters and splitters.

2 FIBER OPTICS, SINGLE-MODE OR MULTI-MODE

When 1900 meters isn't enough, or enormous bandwidth is required, larger networks will typically employ fiber optic cable. There are two kinds. The cheaper option, multi-mode fiber optic cable, uses LED light and can carry data several kilometers. It is often used as the backbone infrastructure for office building and factory networks.

The telephone and cable companies, with their need for great range, are more likely to use single-mode fiber optic cable. Single-mode cable transmits with a laser rather than an LED, and it lets the telcos transmit data across entire continents. Just as multi-mode fiber and its associated equipment is more expensive than copper wire, single-mode fiber optic installations are more costly than multi-mode. But many network designers still specify the more expensive single-mode fiber optics at the outset, reasoning that labor costs will represent a large part of the installation expense in any case, and that the great bandwidth and range provided by single-mode fiber ensure that the installation won't become obsolete at any time in the foreseeable future.



3 RADIO

Copper or fiber optic installations may not make economic sense when data has to cross barriers like rivers or highways. But advances in radio technology are letting Wi-Fi do the job.

Radio waves can be absorbed or reflected by anything from the walls of a building to the vehicles in the parking lot. Called multi-path propagation, the phenomenon means that transmitted signals arrive at the receiver at different times and out of sequence. The higher the radio frequency; the worse the problem becomes. Low frequencies, on the other hand, provide less bandwidth and need larger antennas and more power to produce useful gain. As a result, the most popular of the unlicensed frequencies was traditionally the 2.4 GHz band, which lies somewhere in the middle. But the 2.4 GHz band is used by everything from cordless telephones to microwave ovens, and has gotten very crowded.

Wi-Fi developers have responded to these issues with the new 802.11n standard. 802.11n Wi-Fi incorporates multiple-input multiple-output (MIMO) technology that uses multiple antennas at both the transmitting and receiving sides of the wireless connection. The data is split into numerous spatial streams, which are then transmitted through separate antennas and collected by corresponding antennas in the receiving devices. Onboard software uses signal processing algorithms to correct and interpret the incoming data.

MIMO 802.11n devices also use precoding and postcoding techniques like spatial beamforming. Spatial beamforming modifies the phase and relative amplitude of the signal to create a pattern of constructive and destructive interference in the wavefront, which simplifies interpretation on the receiving side. The 802.11n standard also adds frame aggregation to the MAC layer. By grouping several data frames into a single, larger frame, the ratio of payload data to total data volume is higher, as management information is specified less frequently. This allows for improved throughput. The 802.11n standard also adds 40 MHz channels to the physical layer (PHY), twice the bandwidth that was available under the older 20 MHz standard.

Using the 802.11n standard, a wireless network bridge like the B&B Electronics Ghostbridge™ can create high-speed (up to 150Mbps) point-to-point links between two remote devices or networks over line of sight distances of up to 15 km. 3

4 CELLULAR NETWORKING

Virtually everyone has a cell phone these days, and you could say that machines are starting to acquire them as well. Talk time has flattened out, and the wireless carriers know that cellular M2M networking will have to be one of their strategic growth markets. As a result, cellular data plans are becoming very M2M-friendly. Both Verizon and AT&T have recently announced shared-data plans that are designed to encourage the networking of devices like industrial control systems, water meters and ATMs.

When the cellular network serves as your Internet backbone, Ethernet's original 100-meter range seems rather quaint. Using technology from companies like Czech Republic-based Conel (subsidiary of B&B Electronics) which connects machines through cellular networks to Ethernet, serial and other data networks, users are creating networks of virtually unlimited size, with increasingly complex topologies. The systems support multiple protocols and encryption, the network remains under the user's own control, and any station on the network can serve as an end or retranslation station. The use of multiple SIM cards in a single device establishes redundancy, as the device is equipped to connect to more than one cellular provider at the same time. Cellular networking extends the network's edge to any location that has cellular service.

5 EXTENSION'S RISKS

Fiber optics are immune to electromagnetic interference (EMI), spikes, surges and ground loops. The data isn't traveling along a copper wire; it's carried by a beam of light. This is invaluable in industrial applications, for example, where the electric motors on the machinery can generate powerful magnetic fields. Wi-Fi and cellular networking confer similar advantages.

But remember that extending your data communications range via copper wire increases the risk for unwanted electrical events. The greater the distance between connected devices, the more likely it is that they will have different building ground references and the associated risk for ground loops. If the cable is installed in an industrial environment and passing machinery along the way, greater range also creates more opportunities for EMI.

So, copper wire network installations should be protected with surge suppression and isolation. Surge suppressors limit spikes between the signal and ground line and should be deployed as a first line of defense on power supply lines. Current models can be DIN rail mounted or connected directly to a cabinet, with surge protection ratings of up to 39 kA and less than 1 ns response time. But when the ground line rises, as it does in ground loop events, you'll need isolation. Isolators convert data signals either to pulses of light or an electrical field, and then back again. Spikes and surges are stopped at the isolation zone. Isolators protect power lines by transforming VDC power to AC, then back again.

Ethernet cable still has an effective range of 100 meters, just as it always has. But when used in combination with the technologies described above, there's no reason you can't extend your network to include just about any device, just about anywhere.

Industrial DIN Rail Mount Ethernet Extender

EIR-EXTEND

PRODUCT FEATURES

- Redundant power inputs
- Wide operating temperature
- Extend Ethernet up to 6232 ft. (1.9 km) over standard copper wires
- Ethernet port: RJ-45 10/100Mbps
- Full/Half-duplex, Auto-negotiation / Auto-MDI/MDX
- Ethernet extend port: RJ-11 50Mbps full duplex VDSL
- UL/CUL Class 1/Division 2 Groups A, B, C, D
- NEMA TS2

The EIR-EXTEND is a point-to-point Ethernet Extender designed to operate in harsh environments. Functioning at temperatures from -40 to 75º C, it has been tested for functional operation up to 85º C. Using existing copper wire runs, it allows the extension of Ethernet signals. The EIR-EXTEND is the perfect solution for installing Ethernet connectivity on the factory floor. Used in pairs, configuration is easy. Configure one unit as the local device, and the other one as the remote device. External power supplies are required (not included).

ORDERING INFORMATION

MODEL NUMBER	ETHERNET PORTS
EIR-EXTEND	DIN Rail Mount Ethernet Extender

ACCESSORIES

MDR-40-24 - DIN Rail Power supply 24VDC 40 Watt
PS12VDC3P - Hardened AC Power Supply, 12VDC, 36W, 3A, 90-264VAC input, DC jack
C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

IN THE FIELD

Government Remote Site Metering
Industry: Energy and Natural Resources
Product: Ethernet Extender

www.bb-elec.com/Metering

EIR-EXTEND

Carrier data charges may apply.

IN THE FIELD

Recording Wastewater Chlorine and PH Levels
Industry: Energy and Natural Resources
Product: Ethernet Extender

www.bb-elec.com/Wastewater

EIR-EXTEND

Carrier data charges may apply.

Industrial DIN Rail Mount Ethernet Extender

EIR-EXTEND

SPECIFICATIONS

TECHNOLOGY	
Standards	802.3 10BaseT 802.3u 100BaseTx 802.3x Ethernet over VDSL
Protocol	Transparent to higher level Protocols
Processing	Half-duplex: backpressure Full-duplex: 802.3x
POWER	
Input Voltage	12 VDC – Power Jack 12 – 30 VDC Terminal Block
Input Connection	350 mA (Power Jack) 175 mA (Terminal Block)
Power Consumption	4.2 W Max
MECHANICAL	
Case	DIN Mount IP30 Aluminum
Dimensions	5.0 x 11.12 x 13.5 cm (1.97 x 4.38 x 5.31 in)
Weight	0.8 kg (1.76 lbs)
ETHERNET INTERFACE	
Port	RJ-45, 10/100BaseTX Full/Half Duplex Auto-Negotiation Auto-MDI/MDX
Speed	10/100 Mbps
Distance	320 ft. (100 m)
Cable	CAT 5

EXTENDER INTERFACE	
Port	RJ-11 or Terminal Block
Speed	Up to 50 Mbps
Distance	Up to 6,232 ft. (1.9 km)
Cable	24 AWG Copper Pair 100 Ohm Impedance
ENVIRONMENT	
Operating Temperature	-40 to 75ºC Tested to 85ºC
Storage Temperature	-40 to 85ºC
Operating Humidity	0 to 95% Non-condensing
REGULATORY APPROVALS	
Emissions	FCC Part 15, Class A, NEMA TS2
CE	EN61000-6-(2,3) EN6100004-(2,3,4,5,6,8,11) UL/CUL Class 1/Division 2 Groups A, B, C, D

TOP LEDS (BNC LINE CONNECTIONS)

	LED	Speed	Distance
1	Green	1 Mbps	6232 ft. (1.9 km)
	Amber	3 Mbps	5904 ft. (1.8 km)
2	Green	5 Mbps	5249 ft. (1.6 km)
	Amber	10 Mbps	4593 ft. (1.4 km)
3	Green	15 Mbps	3936 ft. (1.2 km)
	Amber	20 Mbps	3280 ft. (1.0 km)
4	Green	25 Mbps	2624 ft. (0.8 km)
	Amber	30 Mbps	2296 ft. (0.7 km)
5	Green	40 Mbps	1968 ft. (0.6 km)
	Amber	50 Mbps	984 ft. (0.3 km)

4 Port Industrial Ethernet Switch and Extender

EIR-EXTEND-4

PRODUCT FEATURES

- Complies with UL508 and NEMA TS1 & TS2 Environmental requirements for traffic control equipment
- Complies with IEC61000-6-2 EMC generic standard immunity for heavy industrial environment
- Redundant power inputs
- Wide operating temperature
- Extend Ethernet up to 6232 ft. (1.9 km) over standard copper wires
- Ethernet ports: 4 RJ-45 10/100Mbps Full/Half-duplex, Auto-negotiation / Auto-MDI/MDX
- Ethernet extend port: 1 RJ-11 and terminal block 50Mbps Full Duplex VDSL
- Port compatible with EIS-EXTEND, EIR-EXTEND, EIRM-EXTEND-x, EIRP-EXTEND

The EIR-EXTEND-4 is a 4 port Ethernet switch and point-to-point Ethernet Extender designed to operate in harsh environments. Designed to operate at temperatures from -40 to 75° C, it has been tested for functional operation up to 85° C. Using existing copper wire runs, it allows the extension of Ethernet signals. The EIR-EXTEND-4 is the perfect solution for installing Ethernet connectivity on the factory floor. Used with a 2nd extender the configuration is easy. Configure one unit as the local device, and the other one as the remote device. External power supplies are required (not included).

ORDERING INFORMATION

MODEL NUMBER	ETHERNET PORTS
EIR-EXTEND-4	DIN Rail Mount Ethernet Extender and switch

ACCESSORIES

MDR-40-24 - DIN Rail Power supply 24VDC 40 Watt
PS12VDC3P - Hardened AC Power Supply, 12VDC, 36W, 3A, 90-264VAC input, DC jack
C5UMB3FBL - 3 ft. (1 M) - Blue - Category 5e UTP Patch Cord

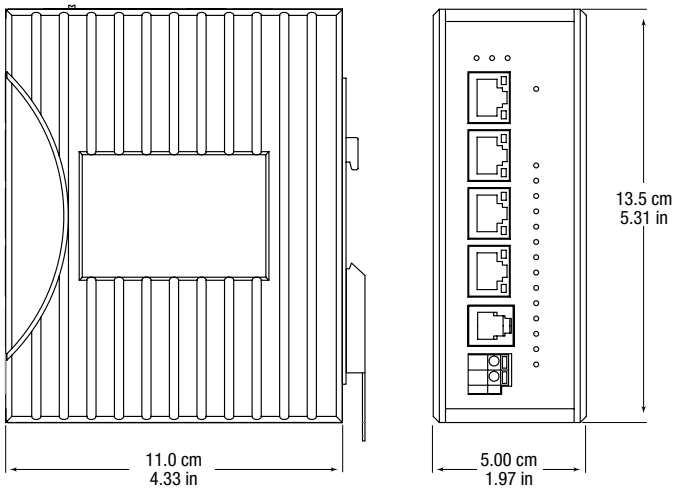
4 Port Industrial Ethernet Switch and Extender

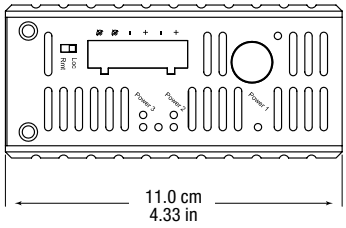
EIR-EXTEND-4

SPECIFICATIONS

TECHNOLOGY	
Standards	802.3 10BaseT 802.3u 100BaseTx 802.3x Ethernet over VDSL
Protocol	Transparent to higher level Protocols
Processing	Half-duplex: backpressure Full-duplex: 802.3x
POWER	
Input Voltage	48 VDC – Power Jack 24 - 48 VDC Terminal Block
Power Consumption	8.4 W Max., 0.18A@48VDC
MECHANICAL	
Case	DIN Mount IP30 Aluminum
Dimensions	50mm (W) x 110mm (D) x 135mm (H) (1.97" (W) x 4.33" (D) x 5.31" (H))
Weight	0.8 kg (1.76 lbs)
ETHERNET INTERFACE	
Ports	4 - RJ-45, 10/100BaseTX Full/Half Duplex Auto-Negotiation Auto-MDI/MDX
Speed	10/100 Mbps
Distance	320 ft. (100 m)
Cable	CAT 5
EXTENDER INTERFACE	
Port	One RJ-11 or Terminal Block
Speed	Up to 50 Mbps
Distance	Up to 6,232 ft. (1.9 km)
Cable	24 AWG Copper Pair (0.5mm diameter, 1 pair wire) or larger, 100 Ohm Impedance
ENVIRONMENT	
Operating Temperature	-40 to 75° C (-40 to 167°F) Tested to 85° C
Storage Temperature	-40 to 85° C
Operating Humidity	5% to 95% Non-condensing

MECHANICAL DIAGRAM





LEDS CHART

	LED	Speed	Distance
1	Green	1 Mbps	6,232m (1.9 km)
	Amber	3 Mbps	5,904m (1.8 km)
2	Green	5 Mbps	5,249m (1.6 km)
	Amber	10 Mbps	4,593m (1.4 km)
3	Green	15 Mbps	3,936m (1.2 km)
	Amber	20 Mbps	3,280m (1.0 km)
4	Green	25 Mbps	2,624m (0.8 km)
	Amber	30 Mbps	2,296m (0.7 km)
5	Green	40 Mbps	1,968m (0.6 km)
	Amber	50 Mbps	984m (0.3 km)

Note: All speed selections are Symmetrical on DSL and Full-duplex on the Ethernet side.

REGULATORY APPROVALS	
ISO	Manufactured in an ISO9001 facility
Safety	UL508
EMI	FCC Part 15, Class A EN61000-6-4 • EN55022 • EN61000-3-2 • EN61000-3-3
EMS	EN61000-6-2 • EN61000-4-2 (ESD Standards) - Contact: + / - 4KV; Criteria B - Air: + / - 8KV; Criteria B • EN61000-4-3 (Radiated RFI Standards) - 10V/m, 80 to 1000MHz; 80% AM Criteria A • EN61000-4-4 (Burst Standards) - Signal Ports: + / - 4KV; Criteria B - D.C. Power Ports: + / - 4KV; Criteria B • EN61000-4-5 (Surge Standards) - Signal Ports: + / - 1KV; Line-to-Line; Criteria B - D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B • EN61000-4-6 (Induced RFI Standards) - Signal Ports: 10Vrms @ 0.15 - 80MHz; 80% AM Criteria A - D.C. Power Ports: 10Vrms @ 0.15 - 80MHz; 80% AM - Criteria A • EN61000-4-8 (Magnetic Field Standards) - 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	• IEC60068-2-6 Fc (Vibration Resistance) - 5g @ 10 - 150Hz, Amplitude 0.35mm (Operation/Storage/Transport) • IEC60068-2-27 Ea (Shock) - 25g @ 11ms (Half-Sine Shock Pulse; Operation) - 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) • IEC60068-2-32 Ed (Free Fall) - 1M (3.281ft.)

Installation:
- DIN Rail (35mm) mount, Panel mount, or Rack mount with optional kit.

Industrial 10/100BASE-TX Ethernet Copper Extender

EIS-EXTEND

19-inch rack system with power supply

Optional, additional power supply

PRODUCT FEATURES

- Extend Ethernet Copper up to 1900 meters (6200 feet) over existing copper wire (common copper, telephone, Cat5e)
- One 10/100Base TX (TX) Ethernet port with RJ-45 connector
- Auto negotiation of speed and duplex mode on TX port
- Auto MDIX on Ethernet port
- IEEE 802.3 10BaseT and IEEE 802.3u 100BaseTX compliant
- Line port uses common RJ-11 connector
- Line port auto senses the speed of 1/3/5/10/15/20/25/30/50Mbps
- One DIP switch for configuring local or remote mode
- Status LED's for speed, monitoring and connection status
- External AC to DC power adapter included
- Used as a stand-alone device or with a 19-inch rack chassis
- Hot-swappable when used in 19 inch rack chassis

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION	POWER SUPPLY (INCLUDED)
EIS-EXTEND	Industrial 10/100BASE-TX Ethernet Extender	USA
EIS-EXTEND-EU	Industrial 10/100BASE-TX Ethernet Extender	European
EIS-EXTEND-UK	Industrial 10/100BASE-TX Ethernet Extender	United Kingdom

The model EIS-EXTEND extends your copper Ethernet connections up to 1900 meters (6200 feet) over twisted pair wire. The Ethernet Extender fully complies with IEEE 802.3 10BaseT and IEEE 802.3u 100BaseTX standards. Two EIS-EXTEND models are required for the Ethernet extension, (one at each end of your extension points). This product can be used with included power supply or in the EIS-RACK-16, 19-inch rack mount chassis used to house up to 16 EIS-EXTEND units.

ACCESSORIES

EIS-PS-US - Replacement Power supply 12V US Plug
EIS-PS-EU - Replacement Power supply 12V EU plug
EIS-PS-UK - Replacement Power supply 12V UK plug
EIS-RACK-PS - Power Supply For EIS-RACK-16, 84 Watts
EIS-RACK-16 - Media Converter 19 Inch 2U Rack Chassis - 16 Slots
C5UMB3FBG - 3 ft. (1 M) - Beige - Category 5e UTP Patch Cord

Industrial 10/100BASE-TX Ethernet Copper Extender

EIS-EXTEND

SPECIFICATIONS

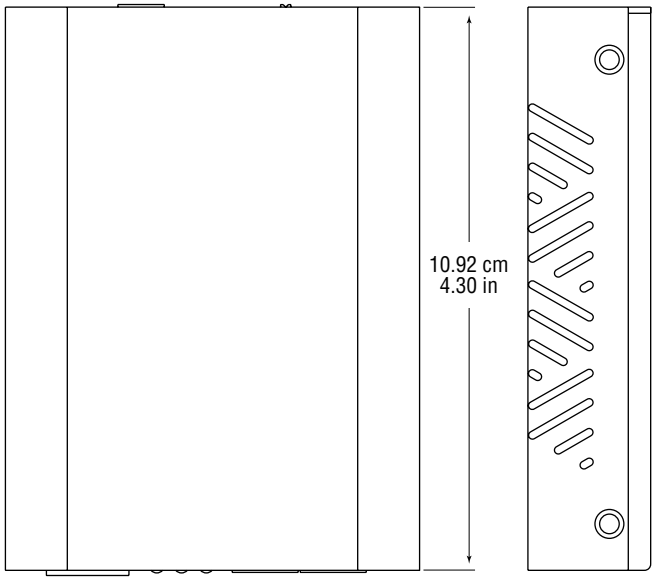
TECHNOLOGY	
Standards	IEEE802.3 10BASE-T, IEEE802.3u 100BASE-TX, IEEE802.3x
Protocols	Transparent to higher layer protocols
Processing Type	Half-duplex back-pressure and IEEE802.3x Full-duplex flow control
Forward and Filtering Rate	14,880pps for 10Mbps; 148,810pps for 100Mbps
INTERFACE	
Ethernet Port	Port: One RJ-45 port, 10/100BASE-TX Full/Half-duplex Auto-Negotiation, Auto-MDI/MDIX Speed: 10/100Mbps Distance: 100meters (328 ft.) Cable: 10BASE-T: UTP CAT. 3, 4, 5 (2-pair wire) 100BASE-TX: UTP CAT. 5 (4-pair wire)
Extender Port	Port: One RJ-11 Speed: 1/3/5/10/15/20/25/30/40/50mbps Distance: 1900 meters (6,232 ft.) Cable: 10BASE-T: UTP CAT. 3, 4, 5 (2-pair wire) 100BASE-TX: UTP CAT. 5 (4-pair wire) 100 Ohm impedance
DIP Switch	One DIP Switch: Local (CO) or Remote (CPE) configuration
LED Indicators	Per Unit: Power Status (Power) Per Port: 10/100TX: Link/Activity, Full-duplex Line: Error, Link, Local, Remote
POWER	
Input Voltage	12 VDC
Power Consumption	2.4 W Max. 0.2A @ 12VDC
MECHANICAL	
Enclosure	Aluminum case
Dimensions	8.03W x 10.92D x 2.38H cm (3.16W x 4.30D x 0.94H in)
Weight	150g (0.33 lb.)
Installation	Desktop or 19 inch rack mount chassis system

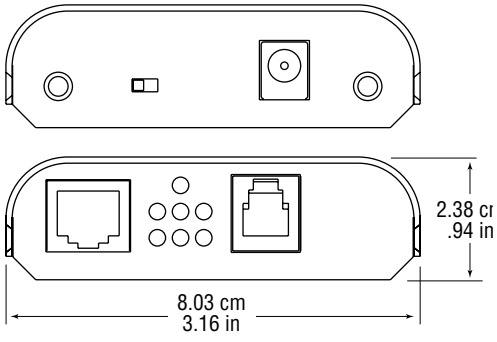
ENVIRONMENTAL	
Operating Temperature	0°C to 60°C (32°F to 140°F)
Tested Temperature	-20°C to 70°C (-4°F to 158°F)
Storage Temperature	-25°C to 70°C (-13 to 158°F)
Ambient Relative Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
ISO	Manufactured in an ISO9001 facility
Safety	UL60950-1
EMI/EMS	CE FCC Part 15, Class A VCCI Class A EN55022 EN61000-3-2, -3-3, -4-3, -4-4, -4-5, -4-6, -4-8, -6-2, 6-3
Environmental	IEC60068-2-6 Fc IEC60068-2-27 Ea FED STD 101C Method 5007.1

PERFORMANCE

MAXIMUM EXTENSION SPEED	MAXIMUM EXTENSION DISTANCE
1 Mbps	1900 m (6200 ft.)
10 Mbps	1400 m (4500 ft.)
20 Mbps	1000 m (3200 ft.)
30 Mbps	700 m (2550 ft.)
50 Mbps	300 m (980 ft.)

MECHANICAL DIAGRAM





Ethernet Coaxial Extender for 10/100 Networks

EIR-EXTEND-C

PRODUCT FEATURES

- One 10/100Base TX (TX) Ethernet port with RJ-45 connector
- Auto negotiation of speed and duplex mode on TX port
- Auto MDI/MDIX on Ethernet port
- IEEE 802.3 10BaseT and IEEE 802.3u 100BaseTX compliant
- Line port uses BNC connector or F-Type connector
- Line port link is full-duplex up to 85Mbps over existing coaxial cable
- One DIP switch for configuring local or remote mode
- Status LED's for monitoring and connection status
- Redundant power inputs with terminal block and DC jack

The EIR-EXTEND-C is a point-to-point Ethernet Extender designed to operate in harsh environments. Ethernet connections can be made up 8,530 feet (2600 meters) using existing coaxial cable.

The perfect solution for legacy surveillance infrastructure upgrades moving from analog to IP-based, as no new cable is needed - saving time, money and labor cost. Installation is easy with a single switch setting; one end is set for local and the other remote. The EIR-EXTEND-C is used in pairs, one at each end of your existing coaxial cable.

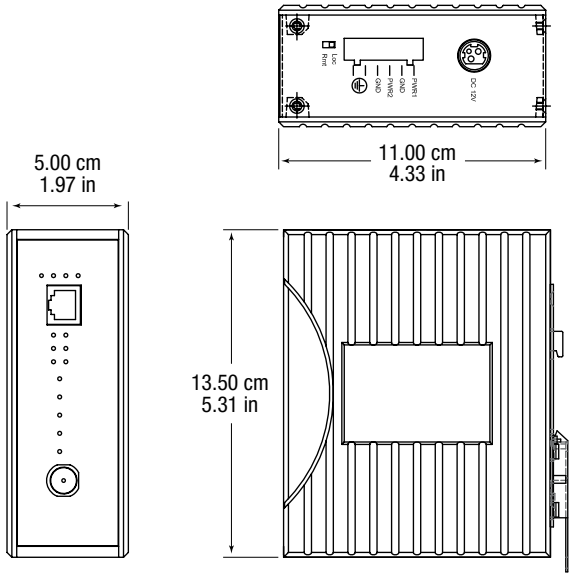
ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR-EXTEND-C	Hardened 10/100BASE-TX Ethernet Copper Extender Over Coaxial Cable

ACCESSORIES

PS12VDC3P - Hardened AC Power Supply, 12VDC, 36W, 3A, 90-264VAC input, DC jack
MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power
C5UMB3FBG - 3 ft. (1 M) - Beige - Category 5e UTP Patch Cord

MECHANICAL DIAGRAM



Ethernet Coaxial Extender for 10/100 Networks

EIR-EXTEND-C

SPECIFICATIONS

ETHERNET TECHNOLOGY	
Standards	IEEE802.3 10Base-T, IEEE802.3u 100Base-T, IEEE802.3x, Ethernet over SHDSL
Protocols	Transparent to higher layer protocols
Processing Type	Half-duplex back-pressure and IEEE802.3x Full-duplex flow control
INTERFACE	
Ethernet Port	RJ-45, 10/100Base-TX Full/Half-duplex Auto-Negotiation, Auto-MDI/MDIX
Speed	10/100Mbps
Distance	328 ft. (100meters)
Cable	10Base-T: UTP CAT. 3, 4, 5 (2-pair wire), 100Base-TX: UTP CAT. 5 (2-pair wire)
Extender Line Port	BNC Coaxial
Speed	1/5/10/20/30/40/50/60/70/75Mbps
Distance	8,530 ft. (2,600meters)
Cable	Coaxial Cable (5C2V / RG6AU)
POWER	
Input Voltage	12 to 48VDC (Terminal Block); 12VDC (DC Jack)
Power Consumption	7.2W Max. 0.6A@12VDC, 0.15A@48VDC
Overload Protection	Present
Reverse Polarity Protection	Present
ENVIRONMENTAL	
Operating Temperature:	-40°C to 75°C (-40°F to 167°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% (non-condensing)
MTBF	265,154 hours
MTBF Calculation	Parts count reliability prediction @ 25°C
MECHANICAL	
Enclosure	Aluminum case, IP30
Dimensions	5.0cm (W) x 11.0cm (D) x 13.5cm (H) 1.97" (W) x 4.33" (D) x 5.31" (H)
Weight	800g (1.76 lbs.)
Installation	DIN-Rail (Top hat type 35mm), Panel Rack Mounting

FRONT PANEL LEDS (ETHERNET AND LINE CONNECTIONS)

Port	LEDs	Status	Description
	Power1	Steady	Power on (Pwr stands for POWER)
	Power2 Power3	Off	Power off
Ethernet (RJ-45)	Lnk/Act	Steady	Valid Ethernet connection established
		Flashing	Transmitting or receiving Ethernet data (ACT stands for ACTIVITY)
		Off	No valid Ethernet connection nor transmitting/receiving Ethernet data
	Fdx	Steady	Ethernet connection in full duplex mode (FDX stands for FULL-DUPLEX)
		Flashing	Collision occurred
		Off	Ethernet connection in half-duplex mode
Line (BNC)	Remote	Steady	Operating in remote mode
	Local	Steady	Operating in local mode
	Error	Steady	Error occurred
	Link	Steady	A valid connection established between local & remote

REGULATORY APPROVALS	
RoHS - Yes	
Safety	UL508
EMI	FCC Part 15, Class A EN61000-6-4 N55022, EN61000-3-2, EN61000-3-3
EMS	EN61000-6-2 EN61000-4-2 (ESD Standards) Contact: + / - 4KV; Criteria B Air: + / - 8KV; Criteria B EN61000-4-3 (Radiated RFI Standards) 10V/m, 80 to 1000MHz; 80% AM Criteria A EN61000-4-4 (Burst Standards) Signal Ports: + / 2KV; Criteria B D.C. Power Ports: + / 2KV; Criteria B EN61000-4-5 (Surge Standards) Signal Ports: + / - 1KV; Line-to-Line; Criteria B D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B EN61000-4-6 (Induced RFI Standards) Signal Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A D.C. Power Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A EN61000-4-8 (Magnetic Field Standards) 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	IEC60068-2-6 Fc (Vibration Resistance) 5g @ 10~150KHz, Amplitude 0.35mm (Operation/Storage/Transport) IEC60068-2-27 Ea (Shock) 25g @ 11ms (Half-Sine Shock Pulse; Operation) 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) IEC60068-2-32 Ed (Free Fall) 1M (3.281 ft.)

TOP LEDS (BNC LINE CONNECTIONS)

LEDs	Status	Speed	Distance
1	Green	1~ 5Mbps	up to 2600M
	Amber	6~10Mbps	up to 2400M
2	Green	11~16Mbps	up to 2000M
	Amber	17~20Mbps	up to 1800M
3	Green	21~29Mbps	up to 1600M
	Amber	30~43Mbps	up to 1400M
4	Green	44~54Mbps	up to 1200M
	Amber	55~63Mbps	up to 1000M
5	Green	64~74Mbps	up to 600M
	Amber	75~85Mbps	up to 200M

Ethernet Coaxial Extender for 10/100 Networks

EIS-EXTEND-C

PRODUCT FEATURES

- One 10/100Base TX (TX) Ethernet port with RJ-45 connector
- Auto negotiation of speed and duplex mode on TX port
- Auto MDI/MDIX on Ethernet port
- IEEE 802.3 10BaseT and IEEE 802.3u 100BaseTX compliant
- Line port uses BNC connector or F-Type connector
- Line port link is full-duplex up to 85Mbps over existing coaxial cable
- One DIP switch for configuring local or remote mode
- Status LED's for monitoring and connection status
- External AC to DC power adapter included
- Used as a stand-alone device or with a 19 inch rack chassis
- Hot-swappable when used in 19 inch rack chassis

The model EIS-EXTEND-C allows your existing coaxial cable to be used to extend Ethernet connections up to 8530 feet (2,600 M).

Two EIS-EXTEND-C models are required for the Ethernet extension, (one at each end of your extension points). This product can be used with included power supply or in a 19 inch rack mount chassis, which can house up to 16 EIS-EXTEND-C units or EIS Media Converters.

ORDERING INFORMATION

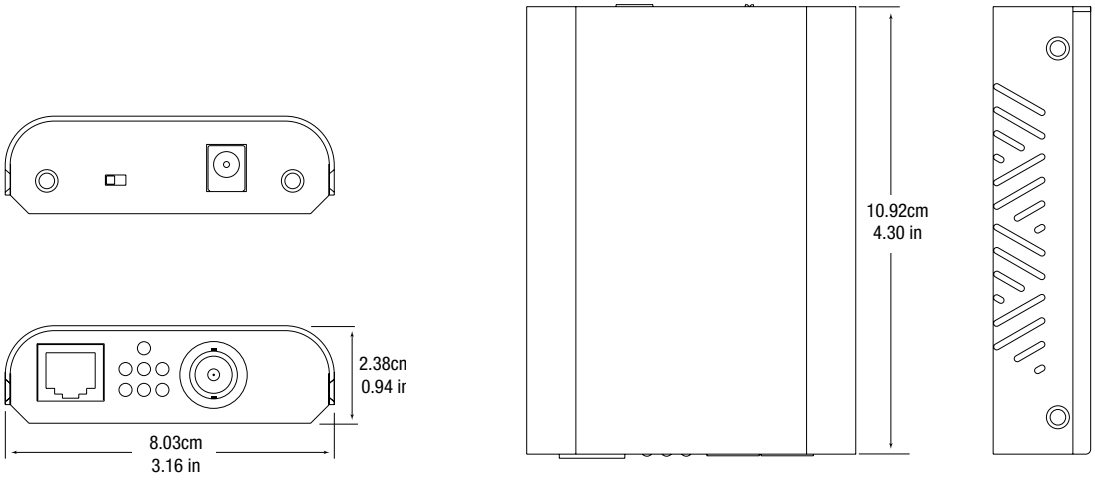
MODEL NUMBER	DESCRIPTION
EIS-EXTEND-C	10/100-TX Ethernet Copper Extender w/USA Power Adaptor
EIS-EXTEND-C-UK	10/100-TX Ethernet Copper Extender w/USA Power Adaptor
EIS-EXTEND-C-EU	10/100-TX Ethernet Copper Extender w/EU Power Adaptor

ACCESSORIES

EIS-RACK-PS - Power Supply For EIS-Rack-16, 84 Watts

EIS-RACK-16 - Media Converter 19 Inch 2U Rack Chassis - 16 Slots

MECHANICAL DIAGRAM



Ethernet Coaxial Extender for 10/100 Networks

EIS-EXTEND-C

SPECIFICATIONS

ETHERNET TECHNOLOGY	
Standards	IIEEE802.3 10Base-T, IEEE802.3u 100Base-TX, IEEE802.3x, Ethernet over VDSL
Protocols	Transparent to higher layer protocols
Processing Type	IEEE802.3x Full-duplex flow control
INTERFACE	
Ethernet Port	RJ-45, 10/100Base-TX Full/Half-duplex Auto-Negotiation, Auto-MDI/MDIX
Speed	10/100Mbps
Distance	328 ft. (100meters)
Cable	10Base-T: UTP CAT. 3, 4, 5 (2-pair wire), 100Base-TX: UTP CAT. 5 (2-pair wire)
Extender Line Port	BNC Coaxial
Speed	1/5/10/20/30/40/50/60/70/75Mbps
Distance	8,530 ft. (2,600meters)
Cable	Coaxial Cable (5C2V / RG6AU)
POWER	
Input Voltage	12 VDC
Power Consumption	5.76W Max. 0.48A@12VDC
ENVIRONMENTAL	
Operating Temperature:	-10°C to 60°C (14°F to 140°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	5% to 95% (non-condensing)
MTBF	57,515 hours
MTBF Calculation	Parts count reliability prediction
MECHANICAL	
Enclosure	Aluminum case
Dimensions	8.03cm (W) x 10.92cm (D) x 2.38cm (H) 3.16" (W) x 4.30" (D) x 0.94" (H)
Weight	150g (0.33 lb.)

TOP LEDS (BNC LINE CONNECTIONS)			
LEDs	**Status**	**Speed**	**Distance**
1	Green	1~ 5Mbps	up to 2600M
	Amber	6~10Mbps	up to 2400M
2	Green	11~16Mbps	up to 2000M
	Amber	17~20Mbps	up to 1800M
3	Green	21~29Mbps	up to 1600M
	Amber	30~43Mbps	up to 1400M
4	Green	44~54Mbps	up to 1200M
	Amber	55~63Mbps	up to 1000M
5	Green	64~74Mbps	up to 600M
	Amber	75~85Mbps	up to 200M

REGULATORY APPROVALS	
RoHS - Yes	
Safety	UL60950-1, EN60950-1, IEC60950-1
EMI	FCC Part 15, Class A VCCI, Class A EN61000-6-3 EN55022, EN61000-3-2, EN61000-3-3
EMS	EN61000-6-2 EN61000-4-2 (ESD Standards) Contact: + / - 4KV; Criteria B Air: + / - 8KV; Criteria B EN61000-4-3 (Radiated RFI Standards) 10V/m, 80 to 1000MHz; 80% AM Criteria A EN61000-4-4 (Burst Standards) Signal Ports: + / 2KV; Criteria B D.C. Power Ports: + / 2KV; Criteria B EN61000-4-5 (Surge Standards) Signal Ports: + / - 1KV; Line-to-Line; Criteria B D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B EN61000-4-6 (Induced RFI Standards) Signal Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A D.C. Power Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A EN61000-4-8 (Magnetic Field Standards) 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	IEC60068-2-6 Fc (Vibration Resistance) 5g @ 10~150KHz, Amplitude 0.35mm (Operation/Storage/Transport) IEC60068-2-27 Ea (Shock) 25g @ 11ms (Half-Sine Shock Pulse; Operation) 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) IEC60068-2-32 Ed (Free Fall) 1M (3.281 ft.)

FRONT PANEL LEDS (ETHERNET AND LINE CONNECTIONS)			
Port	**LEDs**	**Status**	**Description**
Ethernet (RJ-45)	Pwr	Steady	Power on (Pwr stands for POWER)
		Off	Power off
	Lnk/Act	Steady	Valid Ethernet connection established (Lnk stands for LINK)
		Flashing	Transmitting or receiving Ethernet data (Act stands for ACTIVITY)
		Off	No valid Ethernet connection nor transmitting/receiving Ethernet data
	Fdx	Steady	Ethernet connection in full duplex mode (Fdx stands for FULL-DUPLEX)
		Flashing	Collision occurred
		Off	Ethernet connection in half-duplex mode
Line (BNC)	Rmt	Steady	The device operates in remote mode
	Loc	Steady	The device operates in local mode
	Err	Steady	Error occurred
	Lnk	Steady	A valid connection established between local & remote units

Industrial PoE Ethernet Extender

EIRP-EXTEND

PRODUCT FEATURES

- IEEE802.3at 30W PoE + /PSE power for last mile applications
- Complies with UL508 and NEMA TS1 & TS2 environmental requirements for traffic control equipment
- Complies with IEC61000-6-2 EMC generic standard immunity for heavy industrial environment
- Redundant 24 or 48 VDC Power Inputs
- Wide operating temperature
- Extend Ethernet up to 6232 ft. (1.9 km) over standard copper wires
- Ethernet port: PoE Plus + RJ-45 10/100Mbps Full/Half-duplex, Auto-negotiation / Auto-MDI/MDX
- Ethernet extend port: 1 RJ-11 and terminal block 50Mbps full duplex VDSL
- Extender port compatible with models EIS-EXTEND, EIR-EXTEND-x, EIRM-EXTEND-x

Extending Ethernet to allow the PoE+ port to reach IP cameras, IP phones, and Ethernet connected control devices is simple and reliable with B&B Electronics' Ethernet Extenders. The EIRP series extenders offer built-in PoE+ technology which allows the end device, such as an IP camera, to be powered directly from the extended Ethernet port. Used with a 2nd extender the configuration is easy. Configure one unit as the local device, and the other one as the remote device. External power supplies are required (not included).

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRP-EXTEND	PoE Plus DIN Rail Mount Ethernet Extender

ACCESSORIES

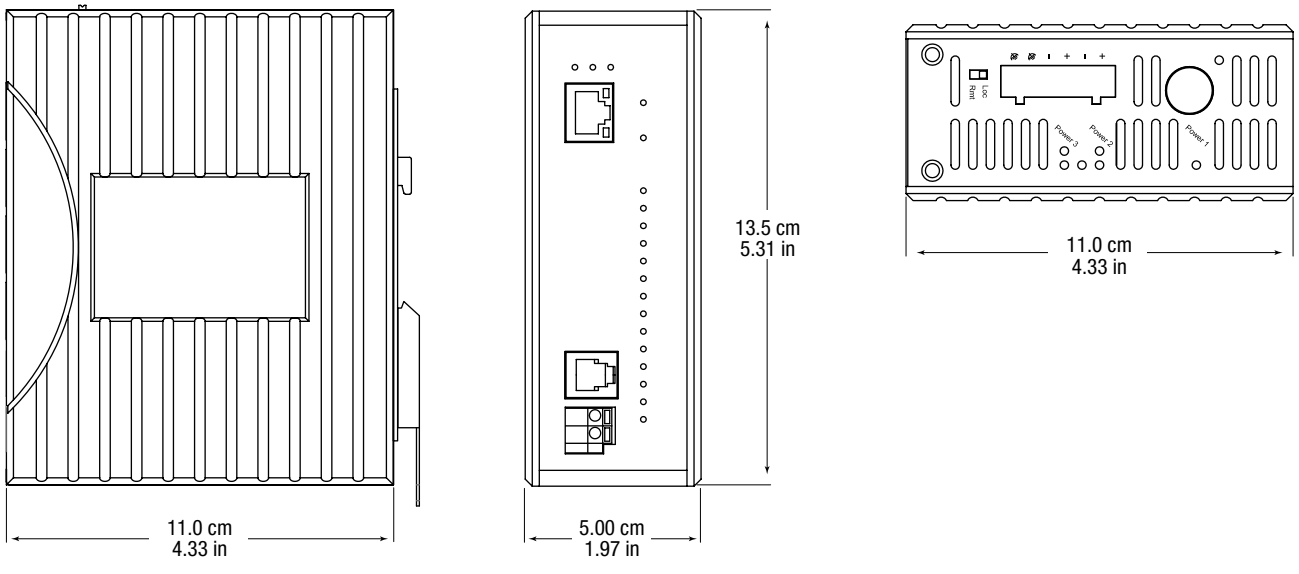
PS12VDC3P - Hardened AC Power Supply, 12VDC, 36W, 3A, 90-264VAC input, DC jack

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-48 - DIN rail mount power supply 48VDC, 0.83 A output power

C5UMB3FBG - 3 ft. (1 M) - Beige - Category 5e UTP Patch Cord

MECHANICAL DIAGRAM



Industrial PoE Ethernet Extender

EIRP-EXTEND

SPECIFICATIONS

TECHNOLOGY	
Standards:	802.3 10BaseT
	802.3u 100BaseTx
	802.3x
	Ethernet over VDSL
Protocol	Transparent to higher level
	Protocols
Processing	Half-duplex: back pressure
	Full-duplex: 802.3x
POWER	
Input Voltage	48 VDC – Power Jack
	24 - 48 VDC Terminal Block
Power Consumption	38.4 W Max, 0.8A@48VDC
MECHANICAL	
Case	DIN Mount IP30 Aluminum
Dimensions	50 mm (W) x 110 mm (D) x 135 mm (H) 1.97" (W) x 4.33" (D) x 5.31" (H))
Weight	0.8 kg (1.76 lbs)
ETHERNET INTERFACE	
Ports	PoE RJ-45, 10/100BaseTX
	Full/Half Duplex
	Auto-Negotiation
	Auto-MDI/MDX
PoE Plus	Complies with IEEE802.3af / 802.3at standard
Speed	10/100 Mbps
Distance	320 ft. (100 m)
Cable	100Base-TX UTPCAT 5 (4 pair)
EXTENDER INTERFACE	
Port	One RJ-11 or Terminal Block
Speed	Up to 50 Mbps
Distance	Up to 6,232 ft. (1.9 km)
Cable	24 AWG Copper Pair (0.5mm diameter, 1 pair wire) or larger 100 Ohm impedance
ENVIRONMENT	
Operating Temperature	-40 to 75° C
	Tested to 85° C
Storage Temperature	-40 to 85° C
Operating Humidity	5% to 95% Non-condensing

LED CHART			
1	Green	1 Mbps	6232 ft. (1.9 km)
	Amber	3 Mbps	5904 ft. (1.8 km)
2	Green	5 Mbps	5249 ft. (1.6 km)
	Amber	10 Mbps	4593 ft. (1.4 km)
3	Green	15 Mbps	3936 ft. (1.2 km)
	Amber	20 Mbps	3280 ft. (1.0 km)
4	Green	25 Mbps	2624 ft. (0.8 km)
	Amber	30 Mbps	2296 ft. (0.7 km)
5	Green	40 Mbps	1968 ft. (0.6 km)
	Amber	50 Mbps	984 ft. (0.3 km)

REGULATORY APPROVALS	
ISO	Manufactured in an ISO9001 facility
Safety	UL508
EMI	• FCC Part 15, Class A • EN61000-6-4 • EN55022 • EN61000-3-2 • EN61000-3-3
EMS	EN61000-6-2 • EN61000-4-2 (ESD Standards) - Contact: + / - 4KV; Criteria B - Air: + / - 8KV; Criteria B • EN61000-4-3 (Radiated RFI Standards) - 10V/m, 80 to 1000MHz; 80% AM Criteria A • EN61000-4-4 (Burst Standards) - Signal Ports: + / - 4KV; Criteria B - D.C. Power Ports: + / - 4KV; Criteria B • EN61000-4-5 (Surge Standards) - Signal Ports: + / - 1KV; Line-to-Line; Criteria B - D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B • EN61000-4-6 (Induced RFI Standards) - Signal Ports: 10Vrms @ 0.15 - 80MHz; 80% AM Criteria A - D.C. Power Ports: 10Vrms @ 0.15 - 80MHz; 80% AM - Criteria A • EN61000-4-8 (Magnetic Field Standards) - 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	• IEC60068-2-6 Fc (Vibration Resistance) - 5g @ 10 - 150Hz, Amplitude 0.35mm (Operation/Storage/Transport) • IEC60068-2-27 Ea (Shock) - 25g @ 11ms (Half-Sine Shock Pulse; Operation) - 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) • IEC60068-2-32 Ed (Free Fall) - 1M (3.281ft.)

Installation:

• DIN Rail (35mm) Panel Mount, Rack Mounting with optional kit.

Industrial 2 & 4 port 10/100BaseTX PoE Ethernet Extender

EIRP-EXTEND-2 and EIRP-EXTEND-4

PRODUCT FEATURES

- Extend Ethernet up to 6232 ft. (1.9 km) over existing copper wires
- IEEE802.3at 30W PoE/PSE power for last mile applications
- Complies with UL508 and NEMA TS1/ TS2 environmental requirements for traffic control equipment
- Complies with IEC61000-6-2 EMC generic standard immunity for heavy industrial environment
- Redundant 24 or 48 VDC power inputs
- Wide operating temperature
- Ethernet port: PoE Plus (25W) RJ-45 10/100Mbps Full/Half-duplex, Auto-negotiate/Auto-MDI/MDX
- Ethernet extender port: 1 RJ-11 50Mbps full duplex VDSL
- Port compatible with EIS-EXTEND, EIR-EXTEND-x, EIRM-EXTEND-x

Extending Ethernet to reach IP cameras, IP phones, and Ethernet connected control devices is simple and reliable with B&B Electronics' Ethernet Extenders. The EIRP series extenders offer built-in PoE+ technology which allows the end device, such as an IP camera, to be powered directly from the extended Ethernet port. Used with a second extender the configuration is easy. Configure one unit as the local device, and the other one as the remote device. External power supplies are required (not included).

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRP-EXTEND-2	2-port 10/100BASE-TX IEEE802.3at PoE/PSE Ethernet Extender
EIRP-EXTEND-4	4-port 10/100BASE-TX with 2-port IEEE802.3at PoE/PSE Ethernet Extender

ACCESSORIES

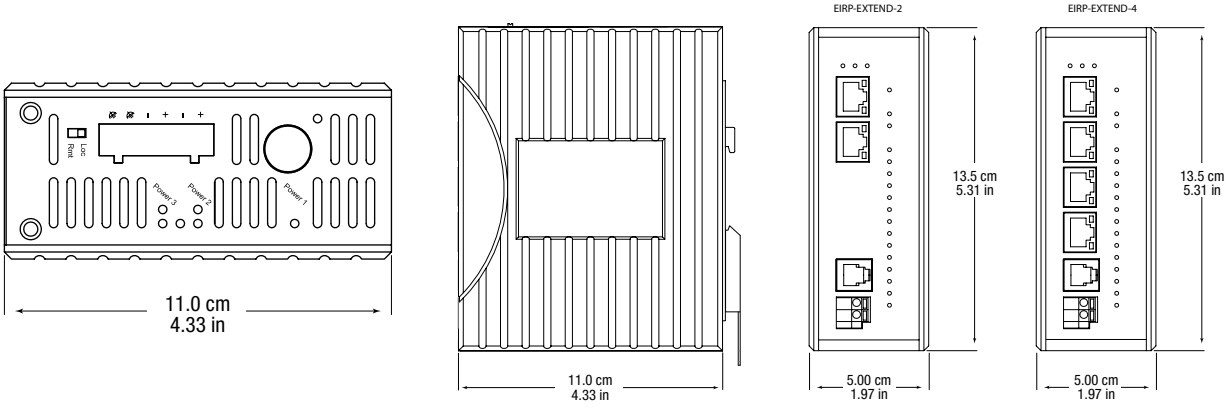
PS12VDC3P - Hardened AC Power Supply, 12VDC, 36W, 3A, 90-264VAC input, DC jack

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-48 - DIN rail mount power supply 48VDC, 0.83 A output power

C5UMB3FBG - 3 ft. (1 M) - Beige - Category 5e UTP Patch Cord

MECHANICAL DIAGRAM



Industrial 2 & 4 port 10/100BaseTX PoE Ethernet Extender

EIRP-EXTEND-2 and EIRP-EXTEND-4

SPECIFICATIONS

TECHNOLOGY	
Standards:	802.3 10BaseT
	802.3u 100BaseTx
	802.3x
	Ethernet over VDSL
Protocol	Transparent to higher level
	Protocols
Processing	Half-duplex: back pressure
	Full-duplex: 802.3x
POWER	
Input Voltage	48 VDC – Power Jack
	24 - 48 VDC Terminal Block
Power Consumption	69.12 W Max, 1.44A@48VDC, when 2 PoE link with PD Class 0 devices. Each PSE Port allows Max. 30W power consumption.
MECHANICAL	
Case	DIN Mount IP30 Aluminum
Dimensions	50 mm (W) x 110 mm (D) x 135 mm (H) 1.97" (W) x 4.33" (D) x 5.31" (H)
Weight	0.8 kg (1.76 lbs)
ETHERNET INTERFACE	
Ports	2 or 4 port 10/100BaseTX, 2 with PoE Plus RJ-45, 10/100BaseTX
	Full/Half Duplex
	Auto-Negotiation
	Auto-MDI/MDX
PoE	Complies with IEEE802.3af / 802.3at standard
Speed	10/100 Mbps
Distance	320 ft. (100 m)
Cable	100Base-TX UTP CAT 5 (4 pair) 100 Ohm impedance
EXTENDER INTERFACE	
Port	One RJ-11 or Terminal Block
Speed	Up to 50 Mbps
Distance	Up to 6,232 ft. (1.9 km)
Cable	24 AWG Copper Pair (0.5mm diameter, 1 pair wire) or larger
*see LED Chart for distance/speed combinations	
ENVIRONMENT	
Operating Temperature	-40 to 75° C Tested to 85° C
Storage Temperature	-40 to 85° C
Operating Humidity	5% to 95% Non-condensing

LED CHART			
1	Green	1 Mbps	6232 ft. (1.9 km)
	Amber	3 Mbps	5904 ft. (1.8 km)
2	Green	5 Mbps	5249 ft. (1.6 km)
	Amber	10 Mbps	4593 ft. (1.4 km)
3	Green	15 Mbps	3936 ft. (1.2 km)
	Amber	20 Mbps	3280 ft. (1.0 km)
4	Green	25 Mbps	2624 ft. (0.8 km)
	Amber	30 Mbps	2296 ft. (0.7 km)
5	Green	40 Mbps	1968 ft. (0.6 km)
	Amber	50 Mbps	984 ft. (0.3 km)

REGULATORY APPROVALS	
ISO	Manufactured in an ISO9001 facility
Safety	UL508
EMI	• FCC Part 15, Class A • EN61000-6-4 • EN55022 • EN61000-3-2 • EN61000-3-3
EMS	EN61000-6-2 • EN61000-4-2 (ESD Standards) - Contact: + / - 4KV; Criteria B - Air: + / - 8KV; Criteria B • EN61000-4-3 (Radiated RFI Standards) - 10V/m, 80 to 1000MHz; 80% AM Criteria A • EN61000-4-4 (Burst Standards) - Signal Ports: + / - 4KV; Criteria B - D.C. Power Ports: + / - 4KV; Criteria B • EN61000-4-5 (Surge Standards) - Signal Ports: + / - 1KV; Line-to-Line; Criteria B - D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B • EN61000-4-6 (Induced RFI Standards) - Signal Ports: 10Vrms @ 0.15 - 80MHz; 80% AM Criteria A - D.C. Power Ports: 10Vrms @ 0.15 - 80MHz; 80% AM - Criteria A • EN61000-4-8 (Magnetic Field Standards) - 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	• IEC60068-2-6 Fc (Vibration Resistance) - 5g @ 10 - 150Hz, Amplitude 0.35mm (Operation/Storage/Transport) • IEC60068-2-27 Ea (Shock) - 25g @ 11ms (Half-Sine Shock Pulse; Operation) - 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) • IEC60068-2-32 Ed (Free Fall) - 1M (3.281ft.)

Installation:

• DIN Rail (35mm) Panel Mount, Rack Mounting with optional kit.

Managed Hardened 10/100BASE-TX Ethernet Extender

EIRM-EXTEND

PRODUCT FEATURES

- Extends Ethernet communications up to 1900 meters
- Complies with NEMA TS1 & TS2 environmental requirements for traffic control equipment
- Complies with IEC61000-6-2 EMC generic standard immunity for industrial environments
- Supports SNMP management and monitoring of connected devices.
- Operates transparent to higher layer protocols such as TCP/IP
- Ethernet port: 10/100Mbps-Full/Half-duplex, Auto-Negotiation, Auto-MDI/MDIX
- Ethernet extender (RJ-11 and Terminal Block) ports
- Supports DIN rail panel rack mounting installation
- Ten communications speeds with speed indicator LEDs on front panel of unit. From 50Mbps@about 300 meters (984 ft.) to 1Mbps@ about 1,900 meters (6,232 ft.)
- Supports external hardware watch dog
- Supports web, CLI, SNMP management interface
- Link status (for VDSL, Ethernet),
- Redundant power inputs: 12 to 32VDC (terminal block);12VDC (DC jack)
- -40°C to 75°C (-40°F to 167°F) operating temperature range
- Hardened IP30 aluminum case; DIN or panel mount

B&B Electronics' Industrial Hardened EIRM-EXTEND is a point-to-point Managed Ethernet Extender designed to operate in harsh environments. It efficiently extends 10/100 Ethernet circuits to over 300 meters (984 feet) at 50Mbps using existing cross-over pair copper wire.

The EIRM-EXTEND allows Ethernet connectivity in existing facilities over existing voice grade copper wire – no pulling extra cable. This is the perfect solution to Ethernet on the factory floor where systems have been upgraded from slower serial communications to Ethernet networking.

The EIRM-EXTEND is used in pairs. Installation is easy with a single switch setting; one end is set for local and the other remote. The EIRM-EXTEND also provides several advanced functions such as System, SNMP, F/W upgrade, and Load Default setting through the Web based browser to enhance total networking performance.

ORDERING INFORMATION

MODEL NUMBER	ETHERNET PORTS	MAX DISTANCE	MAX SPEED	VDSL PORTS
EIRM-EXTEND	1	1900m	50 Mbps	RJ-11 and Terminal Block

ACCESSORIES

PS12VDC3P - Hardened AC Power Supply, 12VDC, 36W, 3A, 90-264VAC input, DC jack

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

C5UMB3FBG - 3 ft. (1 M) - Beige - Category 5e UTP Patch Cord

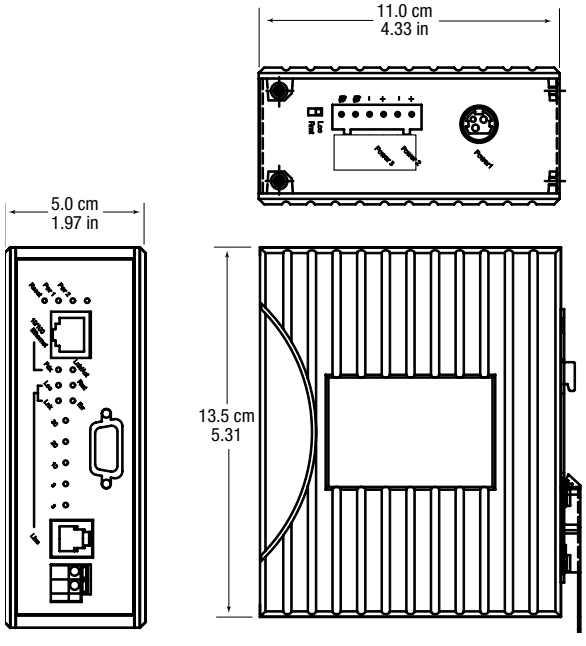
Managed Hardened 10/100BASE-TX Ethernet Extender

EIRM-EXTEND

SPECIFICATIONS

TECHNOLOGY	
Standards	IEEE802.3 10BASE-T, IEEE802.3u 100BASE-TX, IEEE802.3x, Ethernet over VDSL
Protocols	Transparent to higher layer protocols
Flow Control	Half-duplex back-pressure and IEEE802.3x Full-duplex flow control
ETHERNET PORT	
RJ45 Ports	One Ethernet 10/100BASE-TX Full/Half-duplex Auto-Negotiation, Auto-MDI/MDIX
RJ45 Distance	100 meters (328 ft.)
LED Indicators	LNK/ACT, Duplex
ETHERNET VDSL EXTENDER PORT	
Port	One RJ-11 and Terminal Block Port
Speed	1/3/5/10/15/20/25/30/40/50Mbps
Distance	1900meters (6,232 ft.)
Cable	24 AWG (0.5mm diameter, (pair wire) or larger100 Ohm impedance
CONSOLE PORT	
Port One	DB9 RS232 port
POWER	
Input Voltage	12 to 32VDC
Power Use	5.76W Max. 0.48A@12VDC, 0.24A@24VDC
Input Connection	(Terminal Block);12VDC (DC Jack)
Protection	Reverse Polarity Protection
ENVIRONMENTAL	
Operating Temperature:	-40°C to 75°C (-40°F to 167°F) Tested @ -40°C to 85°C (-40°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Operating Humidity	5% to 95% (non-condensing)
MTBF	844,028.71

MECHANICAL DIAGRAM



LED CHART			
LEDs	**Status**	**Speed**	**Distance**
1	Green	1 Mbps	1,900m (6,232 ft.)
	Amber	3 Mbps	1,800m (5,904 ft.)
2	Green	5 Mbps	1,600m (5,249 ft.)
	Amber	10 Mbps	1,400m (4,593 ft.)
3	Green	15 Mbps	1,200m (3,936 ft.)
	Amber	20 Mbps	1,000m (3,280 ft.)
4	Green	25 Mbps	800m (2,642 ft.)
	Amber	30 Mbps	700m (2,296 ft.)
5	Green	40 Mbps	600m (1,968 ft.)
	Amber	50 Mbps	300m (984 ft.)

Per Input: Power Status LED
Per Port: 10/100TX: Link/Activity, Full-duplex
Line: Error, Link, Local, Remote

Note: All speed selections are Symmetrical on the DSL and Full-duplex on the Ethernet.

REGULATORY APPROVALS	
ISO	Manufactured in an ISO9001 facility
Safety	UL508
EMI	• FCC Part 15, Class A • VCCI, Class A • EN61000-6-4 • EN55022 • EN61000-3-2 • EN61000-3-3
EMS	EN61000-6-2 • EN61000-4-2 (ESD Standards) - Contact: + / - 4KV; Criteria B - Air: + / - 8KV; Criteria B • EN61000-4-3 (Radiated RFI Standards) - 10V/m, 80 to 3000MHz; 80% AM Criteria A • EN61000-4-4 (Burst Standards) - Signal Ports: + / - 4KV; Criteria B - D.C. Power Ports: + / - 4KV; Criteria B • EN61000-4-5 (Surge Standards) - Signal Ports: + / - 1KV; Line-to-Line; Criteria B - D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B • EN61000-4-6 (Induced RFI Standards) - Signal Ports: 10Vrms @ 0.15 - 80MHz; 80% AM Criteria A - D.C. Power Ports: 10Vrms @ 0.15 - 80MHz; 80% AM Criteria A • EN61000-4-8 (Magnetic Field Standards) - 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	• IEC60068-2-6 Fc (Vibration Resistance) - 5g @ 10 - 150Hz, Amplitude 0.35mm (Operation/Storage/Transport) • IEC60068-2-27 Ea (Shock) - 25g @ 11ms (Half-Sine Shock Pulse; Operation) - 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) • IEC60068-2-32 Ed (Free Fall) - 1M (3.281ft.) • NEMA TS1/2 Environmental requirements for Traffic control equipment

Managed Hardened 8 port 10/100BASE-TX Ethernet Extender

EIRM-EXTEND-8

PRODUCT FEATURES

- Extends Ethernet communications up to 1900 meters
- Compiles with NEMA TS1 & TS2 Environmental requirements for traffic control equipment
- Complies with IEC61000-6-2 EMC Generic standard immunity for industrial environment
- Ethernet Port: 10/100Mbps-Full/Half-duolex, Auto-Negotiation, Auto-MDI/MDIX
- Proprietary "-ring" support for network redundancy; recovery time < 15ms
- IEEE802.1w RSTP, IEEE802.1S MSTP and IEEE802.1D STP compatible
- IP Multicast Filtering through IGMP Snooping V1, V2 & V3
- Supports port-based VLAN and IEEE802.1Q VLAN Tagging and GVRP
- IEEE802.1p QoS with four priority queues
- MAC-based Trunking with automatic link fail-over
- RS-232 console, Telnet, SSL/SSH, SNMP V1, V2c & V3, RMON, Web Browser, and TFTP Management
- Supports IEEE802.1x Security
- Bandwidth Rate Control
- Per-port programmable MAC address locking
- Up to 24 Static Secure MAC addresses per port
- Port mirroring
- Full wire-speed forwarding rate
- Redundant power inputs with Terminal Block and DC Jack
- -40°C to 75°C (-40°F to 167°F) operating temperature range
- Supports NTP

Designed for rugged environments, the EIRM-EXTEND-8 series switch comes with eight 10/100BASE-TX plus two VDSL ports in one package. It efficiently extends 10/100 Ethernet circuits to over 300 meters (984 feet) at 50Mbps by using an existing pair of copper wire. Installation is easy with a single switch setting - one end is set for local and the other for remote. The EIRM-EXTEND-8 is used in pairs (compatible with other EIS, EIR and EIRM models) to extend Ethernet connectivity over existing voice grade copper wire.

The EIRM-EXTEND-8 functions at temperatures ranging from -40°C to 75°C (-40°F to 167°F) and is tested for functional operation @ -40°C to 85°C (-40°F to 185°F). The EIRM-EXTEND-8 is fully managed via SNMP, Web Browser, Telnet or Console Port and is designed to integrate 10/100 Mbps networks into VDSL backbones. The EIRM-EXTEND-8 series supports advanced features such as 802.1Q VLAN, MAC-based Trunking, IP Multicast IGMP Snooping, Rapid Spanning Tree for Redundancy, QoS for priority queuing, and port mirrroring. Users may choose among SNMP/RMON, Web browser, or Telnet for remote monitoring and configuration. It also supports rate control, which allows users to set the maximum bandwidth in each port individually.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIRM-EXTEND-8	Managed Hardened 8 port 10/100BASE-TX Ethernet Extender

ACCESSORIES

PS12VDC3P - Hardened AC Power Supply, 12VDC, 36W, 3A, 90-264VAC input, DC jack

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

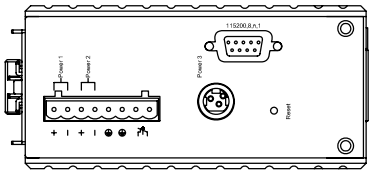
C5UMB3FBG - 3 ft. (1 M) - Beige - Category 5e UTP Patch Cord

Managed Hardened 8 port 10/100BASE-TX Ethernet Extender

EIRM-EXTEND-8

SPECIFICATIONS

TECHNOLOGY	
Standards	IEEE802.3 10Base-T, IEEE802.3u 100Base-TX, IEEE802.3x, Ethernet over VDSL
Forward and Filtering Rate	14,880pps for 10Mbps 148,810pps for 100Mbps
Packet Buffer Memory	2M bits
Processing Type	Store-and-Forward Half-duplex back-pressure and IEEE802.3x full duplex flow control
Address Table Size	8192 MAC addresses
ETHERNET PORTS	
RJ45 Ports	Eight Ethernet 10/100BASE-TX Full/Half-duplex Auto-Negotiation, Auto-MDI/MDIX
RJ45 Distance	100 meters (328 ft.)
LED Indicators	LNK/ACT, Duplex
ETHERNET VDSL EXTENDER PORTS	
Port	Two RJ-11 and Terminal Block Ports
Speed	1/3/5/10/15/20/25/30/40/50Mbps
Distance	1900 meters (6,232 ft.)
Cable	24 AWG (0.5mm diameter, (pair wire) or larger100 Ohm impedance
CONSOLE PORT	
	One DB9 RS232 port
POWER	
Input Voltage	12 to 48VDC
Power Use	11W Max. 0.92A@12VDC, 0.46A@24VDC
Input Connection	(Terminal Block); 12VDC (DC Jack)
Protection	Reverse Polarity Protection
MECHANICAL	
Enclosure	Aluminum IP30
Dimensions	60mm (W) x 125mm (D) x 145mm (H) 2.36" (W) x 4.92" (D) x 5.7" (H)
Installation	DIN Rail or optional Panel mount
ENVIRONMENTAL	
Operating Temperature	-40°C to 75°C (-40°F to 167°F) Tested @ -40°C to 85°C (-40°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Operating Humidity	5% to 95% (non condensing)
MTBF	844,028.71
Alarm Contact	One relay output with current 1A@24VDC

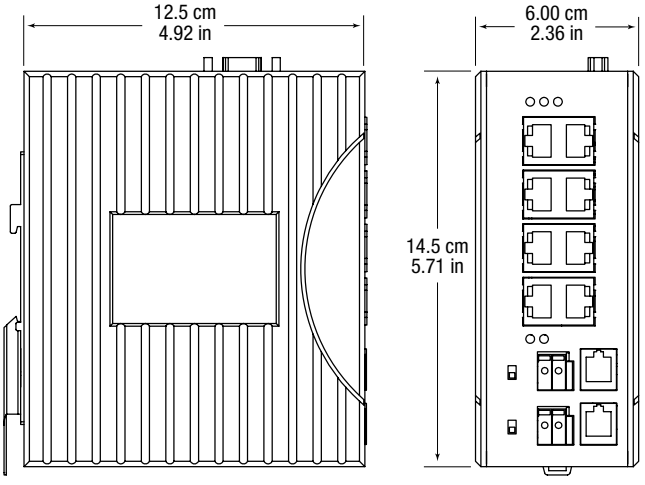


LED INDICATORS			
LEDs		**Speed**	**Distance**
1	Green	1 Mbps	1,900m (6,232 ft.)
	Amber	3 Mbps	1,800m (5,904 ft.)
2	Green	5 Mbps	1,600m (5,249 ft.)
	Amber	10 Mbps	1,400m (4,593 ft.)
3	Green	15 Mbps	1,200m (3,936 ft.)
	Amber	20 Mbps	1,000m (3,280 ft.)
4	Green	25 Mbps	800m (2,642 ft.)
	Amber	30 Mbps	700m (2,296 ft.)
5	Green	40 Mbps	600m (1,968 ft.)
	Amber	50 Mbps	300m (984 ft.)

Note: All speed selections are Symmetrical on the DSL and Full-duplex on Ethernet.

REGULATORY APPROVALS	
ISO	Manufactured in an ISO9001 facility
EMI	FCC Part 15, Class A VCCI, Class A EN61000-6-4, EN55022, EN61000-3-2, EN61000-3-3
EMS	EN61000-6-2 EN61000-4-2 (ESD Standards) Contact: + / - 4KV; Criteria B Air: + / - 8KV; Criteria B EN61000-4-3 (Radiated RFI Standards) 10V/m, 80 to 1000MHz; 80% AM Criteria A EN61000-4-4 (Burst Standards) Signal Ports: + / 2KV; Criteria B D.C. Power Ports: + / 2KV; Criteria B EN61000-4-5 (Surge Standards) Signal Ports: + / - 1KV; Line-to-Line; Criteria B D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B EN61000-4-6 (Induced RFI Standards) Signal Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A D.C. Power Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A EN61000-4-8 (Magnetic Field Standards) 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	IEC60068-2-6 Fc (Vibration Resistance) 5g @ 10~150KHz, Amplitude 0.35mm (Operation/Storage/Transport) IEC60068-2-27 Ea (Shock) 25g @ 11ms (Half-Sine Shock Pulse; Operation) 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) IEC60068-2-32 Ed (Free Fall) 1M (3.281 ft.)
NEMA	NEMA TS1/2 Environmental requirements for Traffic control equipment

MECHANICAL DIAGRAM



B&B ELECTRONICS
SPECTRE AT
PWR
USB
PORT2
PORT1
ETH
Fault
Ethernet 1

ETHERNET SERIAL SERVERS & GATEWAYS

THAT EXTEND YOUR INDUSTRIAL NETWORK TO THE EDGE

Introduction

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Ethernet Serial Device Servers

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Modbus Gateways & Protocol Converters

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EXTEND YOUR INDUSTRIAL NETWORK TO THE EDGE

Connect legacy serial-equipped machines to your Ethernet LAN or WAN easily with B&B Electronics' Ethernet serial device servers. Data from serial devices located in the farthest corners of your facility will be displayed on your office PC quickly and accurately.

- *ITS/Traffic Management*
- *Transaction Management*
- *Security*
- *Laboratory*
- *Industrial PLC/Drives/Process*
- *Energy (Solar, Wind, Sub Metering)*

ETHERNET SERIAL DEVICE SERVERS

VESP211 Series

- Mini, compact design that fits just about anywhere
- Wide temperature, heavy industrial design
- Panel mount (DIN mount option)
- 1 port series supports RS-232 only, RS-422/485 only or RS-232/422/485 all in one

VESR900 Series

- Rugged DIN mount design
- Wide temperature industrial design
- **Class 1/Division 2** rated for oil and gas industries
- 1 and 2 port serial designs include support for RS-232/422/485
- Two Ethernet port options for easy installation
- Multi-mode and single-mode fiber port options for long run or high noise applications
- NEMA TS2 options

VESR321 Series

- Three-way, 2 kV isolation
- Wide temperature, heavy industrial design built for rugged applications
- DIN or panel mount design
- Two Ethernet ports
- Fiber optic port options for Ethernet connectivity
- 1 port series supports RS-232/422/485
- NEMA TS2 options

VESR400 Series

- Wide temperature, heavy industrial design built for rugged applications
- 4 independent serial ports supporting RS-232/422/485
- DIN or panel mount design
- Two Ethernet port options
- Fiber optic port options for Ethernet connectivity
- NEMA TS2 options

SSE/DSE/QSE/ESE 100/400 Series

- 1, 2, 4, or 8 serial ports - RS-232 only, RS-422/485 only and RS-232/422/485 all in one
- Optional surge protection
- Optional 5V out on serial port
- Two Ethernet port options
- 1 and 2 port designs with Wi-Fi capability available

PROTOCOL CONVERTERS

MESP211 Series

- Modbus TCP Ethernet, ASCII
- Modbus flexibility – serial & Ethernet, masters & slaves
- View messaging status in real time
- Wide operating temperature (-40 to 80 °C)
- Wide Voltage input 10 to 30 VDC
- Ultra compact IP30 metal enclosure
- Heavy industrial 61000-6-2 EMC Level 3

MESR900 Series

- Modbus/TCP, Modbus ASCII, Modbus RTU support
- Rugged wide temperature
- DIN mount design
- **Class 1/Division 2** rated for oil and gas industries
- 1 and 2 port serial designs include support for RS-232/422/485
- Two Ethernet port options for easy installation
- Multi-mode and single-mode fiber port options for long run or high noise applications
- NEMA TS2 options

MESR321 Series

- Three-way isolation on data ports
- Modbus/TCP, Modbus ASCII, Modbus RTU support
- Wide temperature, heavy industrial design built for rugged applications
- DIN or panel mount design
- Two Ethernet port options
- Fiber optic port options for Ethernet connectivity

MESR400 Series

- Ethernet-enable Modbus RS-232/422/485
- Modbus TCP, ASCII & RTU
- Modbus flexibility – serial & Ethernet, masters & slaves
- Modbus messaging priority control
- Ethernet fiber options
- NEMA TS2 options

VFG Series

- Protocol converter for Modbus, BACnet, Devicenet, Ethernet/IP, Profibus, CANOpen and more
- Supports up to 9 protocols simultaneously (with optional expansion card)
- **Class 1/Division 2**
- Industrial DIN mount design
- Web server VFG2000/3000 only
- Data logger VFG2000/3000 only
- Virtual HMI VGA 640 x 480 (VFG3000 only)
  Virtual HMI VGA 320 x 240 (VFG2000 only)

Class 1/Division 2 Certified For Hazardous Locations

VESR900 series Serial Servers
MESR900 series Protocol Converters
VFG series Protocol Converters

For applications requiring Class 1/Division 2 certification, B&B Electronics has a range of connectivity and communication solutions designed to operate in hazardous environments.

- see page 470 for a complete listing of C1D2 products.

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ETHERNET SERIAL SERVERS & PROTOCOL GATEWAYS

WHICH IS RIGHT FOR YOU?

ETHERNET SERIAL DEVICE SERVERS

PRODUCT FAMILY	1 port Ethernet to Serial Servers	1 and 2 port Ethernet to Serial Servers	1 port Isolated Serial Servers	4 port Ethernet to Serial Servers	1, 2, & 4 port Ethernet to Serial Servers
PRODUCT SERIES	**VESP211 Series**	**VESR900 Series**	**VESR321 Series**	**VESR400 Series**	**SSE, DSE, QSE Series**
Environment	Commercial	Rugged, Industrial	Rugged, Industrial	Rugged, Industrial	Commercial
Number of Serial Ports	1	1 or 2	1	4	1, 2, 4
Number of Ethernet Ports	1	1 or 2 (fiber option)	2 (fiber option)	1 or 2 (fiber option)	1
RS-232/422/485 Modes	By model	✔	✔	✔	By model
Power	10 to 30 VDC, 12VDC supplied	10 to 48 VDC	10 to 48 VDC	10 to 48 VDC	5 VDC
Isolated Serial (2KV)			✔		
Ethernet (1.5KV)	✔	✔	✔	✔	✔
Temperature Rating	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	0 to 70°C
Direct IP Mode	✔	✔	✔	✔	✔
Tunneling	✔	✔	✔	✔	✔
VCOM Mode	✔	✔	✔	✔	✔
Mounting Options	Panel, DIN Rail option	DIN Rail, Panel Option	Panel, DIN Rail option	Panel, DIN Rail option	Wall Mount, DIN Rail or Rack Mount Option
Modbus TCP, RTU, ASCII					
FCC, CE	✔	✔	✔	✔	✔
UL	✔	✔			
UL Class 1, Division II		✔			
NEMA TS2 Options		✔	✔	✔	
Heavy Industrial	✔		✔	✔	
Page	**150**	**152 - 155**	**156**	**158**	**160**

	PROTOCOL GATEWAYS				
8 port Ethernet to Serial Servers	1 port Modbus Gateways	1 & 2 port Modbus Protocol Gateways	1 port Isolated Gateways	4 port Modbus Gateways	Protocol Fieldbus Gateways
ESE Series	**MESP211 Series**	**MESR900 Series**	**MESR321 Series**	**MESR400 Series**	**VFG Series**
Commercial	Rugged, Industrial	Rugged, Industrial	Rugged, Industrial	Rugged, Industrial	Rugged, Industrial
8	1	1 or 2	1	4	2
1	1	1 or 2 (fiber option)	2 (fiber option)	2 (fiber option)	1
By model	✔	✔	✔	✔	(1) 232, (1) 422/485
5 VDC	10 to 30 VDC, 12 VDC	10 to 48 VDC	10 to 48 VDC	10 to 48 VDC	24 VDC
			✔		
✔	✔	✔	✔	✔	
0 to 70°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 85°C	-0 to 50°C
✔		✔	✔		✔
✔		✔	✔		
✔		✔	✔		
Rack Mount	Panel, DIN Rail option	DIN Rail, Panel Option	Panel Mount, DIN Rail Option	Panel, DIN Rail option	DIN Rail Option
	✔	✔	✔	✔	✔
✔	✔	✔	✔	✔	✔
		✔			✔
		✔			✔
		✔		✔	
	✔		✔	✔	
162	**164**	**166 - 169**	**170**	**172**	**174**

Ultra Compact Ethernet Serial Servers

VESP211 Series

PRODUCT FEATURES

- Ultra compact design fits into the tightest spaces
- RS-232, RS-422/485, and RS-232/422/485 models
- Wide operating temperature (-40 to 80°C)
- Wide voltage input (10 to 30VDC)
- IP30 metal enclosure
- Heavy industrial 61000-6-2 EMC Level 3 tested for harsh environments

VESP211 Serial Servers connect serial devices (RS-232, RS-422 or RS-485) to Ethernet networks, allowing the serial device to become a node on the network. The serial port can be accessed over a LAN/WAN using Direct IP Mode, Virtual COM Port, or Paired Mode connections. VESP211 Serial Servers feature 10BaseT or 100BaseTX copper network. The product is built for use in industrial environments, featuring a heavy duty metal enclosure that is panel (standard) or DIN rail mountable (with optional adapter). The product operates from a range of DC power supply voltages and features a barrel connector.

Ease of Use

Configuration, upgrades and monitoring are simple, easy tasks with Vlinx™ Manager Software. It installs right on your PC giving you access to the serial server via your desktop. Manage remotely over a LAN or WAN via the built-in web server. This is helpful for off-site troubleshooting and can be done with a simple web browser.

ORDERING INFORMATION

MODEL NUMBER	SERIAL PROTOCOL	SERIAL PORT	ETHERNET PORTS	ETHERNET CONNECTOR
US Power Supply				
VESP211	RS-232/422/485	DB9M	1	RJ45
VESP211-232	RS-232	DB9M	1	RJ45
VESP211-485	RS-422/485	Removable Terminal Block	1	RJ45
European Power Supply - (EU)				
VESP211-EU	RS-232/422/485	DB9M	1	RJ45
VESP211-232-EU	RS-232	DB9M	1	RJ45
VESP211-485-EU	RS-422/485	Removable Terminal Block	1	RJ45
United Kingdom Power Supply - (UK)				
VESP211-UK	RS-232/422/485	DB9M	1	RJ45
VESP211-232-UK	RS-232	DB9M	1	RJ45
VESP211-485-UK	RS-422/485	Removable Terminal Block	1	RJ45

ACCESSORIES

EIRSP1 - Industrial Ethernet Surge Suppressor

232NM9 - Null Modem Crossover Cable for DTE to DTE connection

DRAD35 - DIN Rail Adaptor Clip (pair)

PS12VDC1A - Replacement Power Supply

Ultra Compact Ethernet Serial Servers

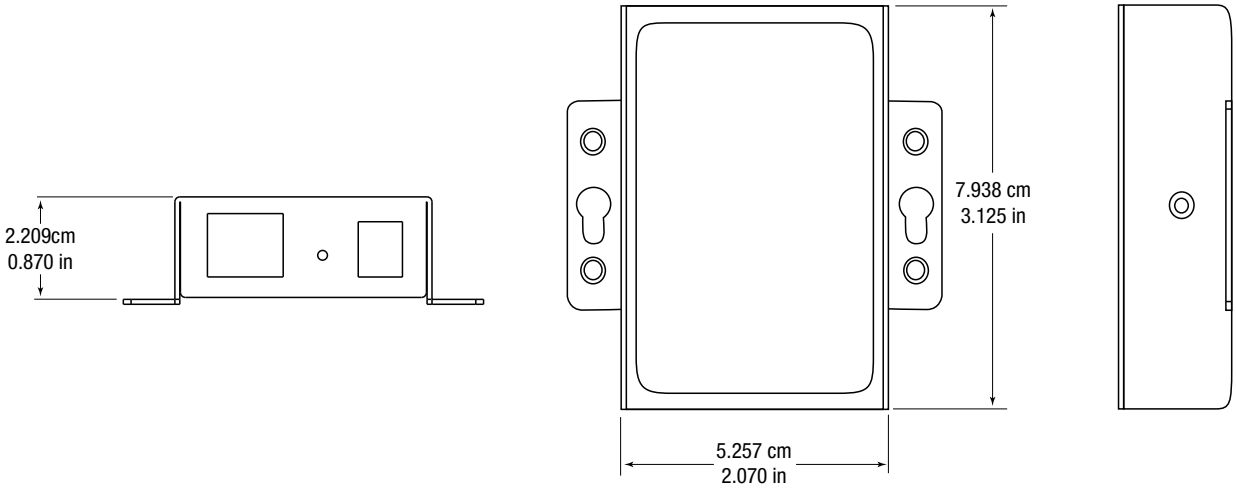
VESP211 Series

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232 (DB9)	TD, RD, DTR, DSR, RTS, CTS, DCD plus Signal Ground
RS-485 2-Wire	Data A(-), Data B(+), GND
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
Serial Connector RS-422	DB9M or Removable Terminal Blocks (RS-422/485 models)
Data Rate	Up to 230.4 Kbps
POWER	
Source	Power supply included
Input Voltage	10 to 30 VDC
Connector	Power Connector 5.5 X 2.1 mm
Power Consumption	2.5 Watts Max.
MECHANICAL	
LED Indicators	Serial Port, Ethernet, Ready LED's
Switches	Reset Button
Dimensions	VESP211 - 7.938 x 5.257 x 2.209 cm (3.125 x 2.070 x 0.870 in)
Enclosure	Metal, IP 30
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	10 to 95% Non-condensing
MTBF	VESP211 – 186,310 hours
MTBF Calc Method	Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	4 KB
LAN	10/100 Mbps Auto-detecting, 10BaseT or 100BaseTX
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDI-X, 10BaseT and 100Base TX

PROTOCOLS	
Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
IP Mode	Static, DHCP
TCP/UDP UDP	User definable Unicast or Multicast
OTHER	
Connection Mode	Server, Client, VCOM, Paired
Client Connection	At power up or upon data arrival
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, test VCOM
Firmware Upgrade	Vlinx Manager
CONFIGURATION SOFTWARE	
Vlinx Manager	Windows XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit)
REGULATORY / CERTIFICATIONS / SAFETY	
Compliance	FCC Part 15 Class A, CE
EMC	Industrial-Hardened, 15,000 volt-protected, 61000-6-2 certified switch
UL	60950

MECHANICAL DIAGRAM



Ultra Compact Ethernet Serial Servers

VESR900 Series - Copper Models

PRODUCT FEATURES

- Ethernet enable serial devices
- Direct IP, virtual COM port, or paired mode
- Ethernet pass-through port available
- Serial RS-232/RS-422/485 ports
- UL Class 1 Division 2
- NEMA TS2 (VESR901)

Take control of your serial devices with Vlinx™ VESR9xx Industrial Ethernet Serial Servers. If it has a Serial Port, it can be monitored and controlled from anywhere on your Ethernet LAN or WAN. Keep it at maximum productivity without leaving your office. Even troubleshoot it from outside your LAN via the Internet. The easy to use Vlinx™ Manager software puts access to your whole shop on your desk. Configure devices, upgrade firmware and monitor activity. Configuration changes can also be made using a web browser.

VESR92x series servers also feature an additional copper RJ45 port that allows you to connect another Ethernet device or PC work-station. This Pass-through port functions much like an unmanaged switch.

Heartbeat connectivity keeps the serial server online. If connectivity is lost it attempts to reconnect every five seconds until connection is regained. A manual reboot is not needed when communications are restored.

ORDERING INFORMATION

MODEL NUMBER	SERIAL PORTS	SERIAL CONNECTORS	ETHERNET MEDIA	ETHERNET CONNECTORS
VESR901†	1	DB9 & TB	CAT 5	RJ45
VESR902D	2	DB9	CAT 5	RJ45
VESR902T	2	TB	CAT 5	RJ45
VESR921	1	DB9 & TB	CAT 5	Two RJ45
VESR922T	2	TB	CAT 5	Two RJ45

** For fiber options please see page 154.*

† *NEMA TS2*

ACCESSORIES

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

ERS35 - 1 M 35mm DIN rail, steel

DRPM25 - 35mm DIN Rail to Panel Mount Bracket

TBKT2 - Replacement Terminal Block, One 5 Position 5.08 mm

TBKT1 - Replacement Terminal Block, One 2 Position 5.08 mm

Ultra Compact Ethernet Serial Servers

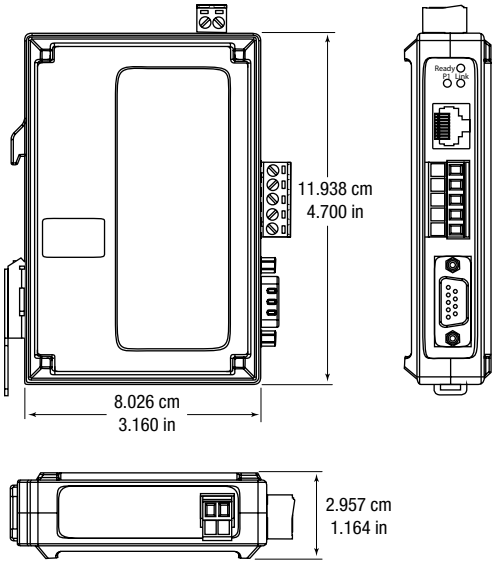
VESR900 Series - Copper Models

SPECIFICATIONS

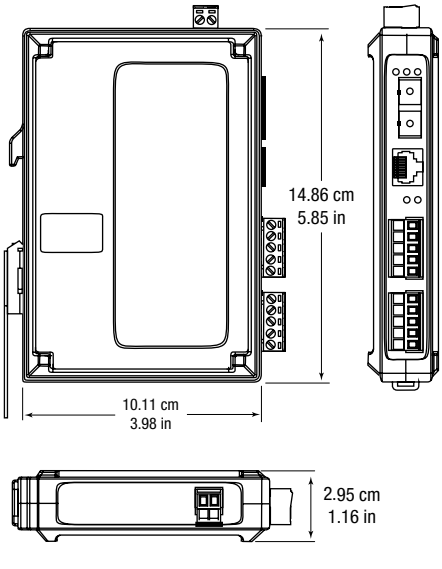
SERIAL TECHNOLOGY	
RS-232	TD, RD, RTS, CTS, DTR, DSR, DTD, GND
RS-485 2-Wire	Data A(-), Data B(+), GND
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
Serial Connector	DB9M or Removable Terminal Blocks
Data Rate	Up to 230.4 Kbps
POWER	
Source	External
Input Voltage	10 to 48 VDC (58 VDC Maximum)
Connector	Removable Terminal Block (12 – 28 AWG)
Power Consumption	VESR90x: 4.0 Watts Max. VESR92x: 6.0 Watts Max.
MECHANICAL	
LED Indicators	Serial Port, Ethernet Link, Ready
Switches	Reset Button
Dimensions	VESR90x: 11.94 x 8.03 x 2.96 cm (4.70 x 3.16 x 1.16 in) VESR92x: 14.86 x 10.11 x 2.96 cm (5.85 x 3.98 x 1.16 in)
Enclosure	35mm DIN mount, Plastic, IP 30
Weight	VESR90x: 149.7 g (0.33 lbs) VESR92x: 204.1 g (0.45 lbs)
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	10 to 95% Non-condensing
MTBF	VESR90x: ~ 132309 hours VESR92x: ~ 102593 hours
MTBF Calc Method	Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	4 KB
NETWORK COMMUNICATIONS	
LAN	10/100 Mbps Auto-detecting , 10BaseT or 100BaseTX

NETWORK PHYSICAL LAYER STANDARDS	
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX, 10BaseT and 100Base TX
PROTOCOLS	
Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
IP Mode	Static, DHCP
TCP/UDP	User definable
OTHER	
Connection Mode	Server, Client, VCOM, Paired
Client Connection	At power up or upon data arrival
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, test VCOM, save test config (text readable)
Firmware Upgrade	Vlinx Manager
ETHERNET PASS-THROUGH PORT (VESR92X)	
Standards	IEEE 802.3, 802.3u, 802.3x
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control
Flow Control	IEEE 802.3x flow control, back pressure flow control
MAC Address Table	2K
CONFIGURATION SOFTWARE	
Vlinx Manager	Windows 2000, XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Win 7 (32/64 bit)
REGULATORY / CERTIFICATIONS / SAFETY	
Compliance	FCC, CE, NEMA TS2 (VESR901)
	UL Listed, File E222870 UL Class 1 Division 2 Groups A, B, C, D (HAZLOC) File E245458

MECHANICAL DIAGRAM - VESR90X MODELS



MECHANICAL DIAGRAM - VESR92X MODELS



Ultra Compact Ethernet Serial Servers

VESR900 Series - Fiber Models

PRODUCT FEATURES

- Ethernet enable serial devices
- Direct IP, virtual COM port, or paired mode
- Ethernet pass-through port available
- Ethernet fiber options
- Serial RS-232/RS-422/485 ports
- UL Class 1 Division 2

Take control of your serial devices with Vlinx™ VESR9xx Industrial Ethernet Serial Servers. If it has a serial port, it can be monitored and controlled from anywhere on your Ethernet LAN or WAN. Keep it at maximum productivity without leaving your office. Even troubleshoot it from outside your LAN via the Internet. The easy to use Vlinx™ Manager software puts access to your whole shop on your desk. Configure devices, upgrade firmware and monitor activity. Configuration changes can also be made using a web browser.

Multiple fiber optic options make integration into any existing network quick. No need to purchase an extra media converter when you can choose from multi-mode SC/ST, 15km single-mode SC/ST, 40 km single-mode SC/ST, or 80 km single-mode SC/ST.

VESR92x series servers also feature an additional copper RJ45 port that allows you to connect another Ethernet device or PC work-station. This Pass-through port functions much like an unmanaged switch.

Heartbeat connectivity keeps the serial server on-line. If connectivity is lost it will attempt to reconnect every five seconds until a connection is regained. A manual reboot is not required when communications are restored.

ORDERING INFORMATION

MODEL NUMBER	SERIAL PORTS	SERIAL CONNECTORS	ETHERNET MEDIA	ETHERNET CONNECTORS
VESR901-MC	1	DB9 & TB	Multi-mode Fiber	SC
VESR901-MT	1	DB9 & TB	Multi-mode Fiber	ST
VESR901-SC*	1	DB9 & TB	Single Mode Fiber	SC
VESR901-ST*	1	DB9 & TB	Single Mode Fiber	ST
VESR902D-MC	2	DB9	Multi-mode Fiber	SC
VESR902D-MT	2	DB9	Multi-mode Fiber	ST
VESR902D-SC*	2	DB9	Single Mode Fiber	SC
VESR902D-ST*	2	DB9	Single Mode Fiber	ST
VESR902T-MC	2	TB	Multi-mode Fiber	SC
VESR902T-MT	2	TB	Multi-mode Fiber	ST
VESR902T-SC*	2	TB	Single Mode Fiber	SC
VESR902T-ST*	2	TB	Single Mode Fiber	ST
VESR921-MC	1	DB9 & TB	CAT 5, Multi-mode Fiber	One RJ45, One SC
VESR921-MT	1	DB9 & TB	CAT 5, Multi-mode Fiber	One RJ45, One ST
VESR921-SC*	1	DB9 & TB	CAT 5, Single Mode Fiber	One RJ45, One SC
VESR921-ST*	1	DB9 & TB	CAT 5, Single Mode Fiber	One RJ45, One ST
VESR922T-MC	2	TB	CAT 5, Multi-mode Fiber	One RJ45, One SC
VESR922T-MT	2	TB	CAT 5, Multi-mode Fiber	One RJ45, One ST
VESR922T-SC*	2	TB	CAT 5, Single Mode Fiber	One RJ45, One SC
VESR922T-ST*	2	TB	CAT 5, Single Mode Fiber	One RJ45, One ST

+ All serial ports are software configurable for RS-232, RS-422, or RS-485.
* 40km and 80km options available.

For Copper options please see page 152.

ACCESSORIES

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

ESR35 - DIN Rail 1 Meter 35mm Steel

DRPM25 - 35mm DIN Rail to Panel Mount Bracket

TBKT2 - Replacement Terminal Block, One 5 Position 5.08 mm

TBKT1 - Replacement Terminal Block, One 2 Position 5.08 mm

Ultra Compact Ethernet Serial Servers

VESR900 Series - Fiber Models

SPECIFICATIONS

FIBER OPTIC TECHNOLOGY

	VESR9xx-Mx	VESR9xx-Sx	VESR9xx-Sx40 (available)	VESR9xx-Sx80 (available)
Type / Wavelength	Multi-mode / 1310 nm	Single-mode / 1310 nm	Single-mode / 1310 nm	Single-mode / 1510 nm
Output Power	(-) 19 to (-) 14 dBm	(-) 15 to (-) 8 dBm	(-) 5 to 0 dBm	(-) 5 to 0 dBm
Receive Sensitivity	~ (-) 32 dBm	~ (-) 32 dBm	~ (-) 34 dBm	~ (-) 34 dBm
Cable	62.5 / 125 µm	9 / 125 µm	9 / 125 µm	9 / 125 µm
Connector	SC or ST	SC or ST	SC or ST	SC or ST
Range	2 km (1.2 miles)	15 km (9.3 miles)	40 km (25 miles)	80 km (49.7 miles)

SERIAL TECHNOLOGY

RS-232	TD, RD, RTS, CTS, DTR, DSR, DTD, GND
RS-485 2-Wire	Data A(-), Data B(+), GND
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
Serial Connector	DB9M or Removable Terminal Blocks
Data Rate	Up to 230.4 Kbps

POWER

Source	External
Input Voltage	10 to 48 VDC (58 VDC Maximum)
Connector	Removable Terminal Block (12 – 28 AWG)
Power Consumption	VESR90x: 4.0 Watts Max. VESR92x: 6.0 Watts Max.

MECHANICAL

LED Indicators	Serial Port, Ethernet Link, Ready
Switches	Reset Button
Dimensions	VESR90x:17.145 x 11.237 x 4.572 cm (6.750 x 4.424 x 1.800 in) VESR92x: 14.86 x 10.11 x 2.96 cm (5.85 x 3.98 x 1.16 in)
Enclosure	35mm DIN mount, Plastic, IP 30
Weight	VESR90x: 149.7 g (0.33 lbs) VESR92x: 204.1 g (0.45 lbs)

ENVIRONMENTAL

Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	10 to 95% Non-condensing
MTBF	VESR90x: ~ 132309 hours VESR92x: ~ 102593 hours
MTBF Calc Method	Parts Count Reliability Prediction

NETWORK

Serial Memory	8 KB per port
Network Memory	4 KB

NETWORK COMMUNICATIONS

LAN	10/100 Mbps Auto-detecting , 10BaseT or 100BaseTX

NETWORK PHYSICAL LAYER STANDARDS

Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX, 10BaseT and 100Base TX

PROTOCOLS

Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
IP Mode	Static, DHCP
TCP/UDP	User definable

OTHER

Connection Mode	Server, Client, VCOM, Paired
Client Connection	At power up or upon data arrival
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, test VCOM, save test config (text readable)
Firmware Upgrade	Vlinx Manager

ETHERNET PASS-THROUGH PORT (VESR92X)

Standards	IEEE 802.3, 802.3u, 802.3x
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control
Flow Control	IEEE 802.3x flow control, back pressure flow control
MAC Address Table	2K

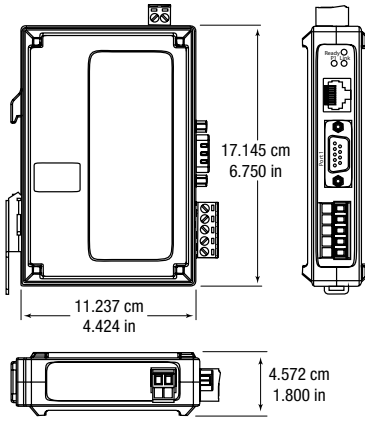
CONFIGURATION SOFTWARE

Vlinx Manager	Windows 2000, XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Win 7 (32/64 bit)

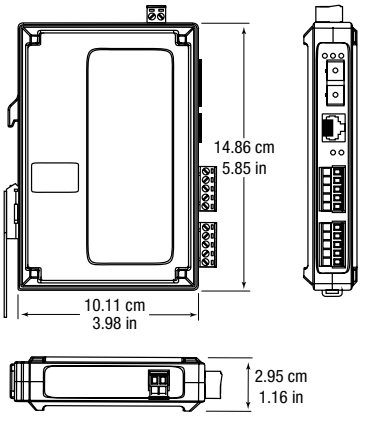
REGULATORY / CERTIFICATIONS / SAFETY

Compliance	FCC, CE, NEMA TS2
	UL Listed, File E222870 UL Class 1 Division 2 Groups A, B, C, D (HAZLOC) File E245458

MECHANICAL DIAGRAM - VESR90X MODELS



MECHANICAL DIAGRAM - VESR92X MODELS



Isolated Industrial Ethernet Serial Servers

VESR321 Series

PRODUCT FEATURES

- Three-way, 2 kV isolation
- Ethernet enable serial devices
- Direct IP, virtual COM port, or paired mode
- Ethernet pass-through port available
- Ethernet fiber options
- Serial RS-232/422/485 port
- NEMA TS2 (VESR321)

Take control of your serial devices with Vlinx™ VESR321 Isolated Industrial Ethernet Serial Servers.

Easy to use Vlinx™ Manager software puts access to your whole shop right on your desktop. Configure your serial devices, upgrade firmware and monitor activity from a single location. The data ports are isolated from one another and also from the power supply.

Multiple fiber optic options make integration into any existing network quick and easy. Choose from Multi-mode LC and Single-mode LC.

VESR321 series servers also feature an additional copper pass-through RJ45 port that functions like an unmanaged switch, allowing you to connect another Ethernet device or PC work-station.

Heartbeat connectivity keeps the serial server on-line. If connectivity is lost it attempts to reconnect every five seconds until a connection is regained. A manual reboot is not required when communications are restored.

ORDERING INFORMATION

MODEL NUMBER	ETHERNET PORT	ETHERNET FIBER PORTS
VESR321 †	2 RJ45	0
VESR321-ML	1 RJ45	1 LC multi-mode optical
VESR321-SL	1 RJ45	1 LC single-mode optical

All Models RS-232/422/485
All Models DB9 or Removable Terminal Block
Includes DIN Rail clips and Panel Mount Brackets
† NEMA TS2

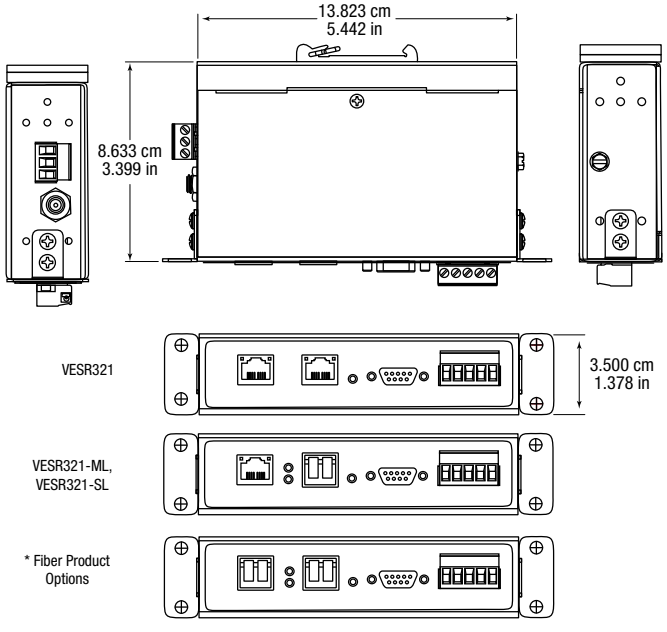
ACCESSORIES

PS12BVLB-INT-MED - Medical Power supply 24VDC 1.7A

TBKT2 - Replacement Terminal block, 5 position

ERS35 - 1M DIN Rail 35mm

MECHANICAL DIAGRAM



Isolated Industrial Ethernet Serial Servers

VESR321 Series

SPECIFICATIONS

PORT TO PORT ISOLATION	
Serial to Ethernet	2 kV
Serial to Power	2 kV
Ethernet to Power	1.5 kV
POWER	
Source	External
Input Voltage	10 to 48 VDC (58 VDC Maximum)
Connector	Removable Terminal Block (12 – 28 AWG and barrel connector)
Power Consumption	4 W
MECHANICAL	
LED Indicators	Ready, Power, Serial Data, Ethernet Speed, Ethernet Link
Switches	Reset Button (Mode)
Dimensions	13.823 x 8.633 x 3.500 cm (5.442 x 3.399 x 1.378 in)
Enclosure	DIN Rail, Panel, metal, IP30
Weight	635 g (1.4 lbs)
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	10 to 95% Non-condensing
Storage Temperature	-40 to 85°C
MTBF	86,882 hours
MTBF Calc Method	Based on MIL 217F using Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	8 KB
LAN	10/100 Mbps Auto-detecting, 10BaseT or 100BaseTX
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX, 10BaseT and 100Base TX
PROTOCOLS	
Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
IP Mode	Static, DHCP
TCP/UDP	User definable
OTHER	
Connection Mode	Server, Client, VCOM, Paired
Client Connection	At power up or upon data arrival
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, test VCOM, save test config (text readable)
Firmware Upgrade	Vlinx Manager

CONFIGURATION SOFTWARE			
Vlinx Manager	Win XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Win 7 (32/64 bit), Windows 2008 Server		
ETHERNET PASS-THROUGH PORT			
Standards	IEEE 802.3, 802.3u, 802.3x		
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control		
Flow Control	IEEE 802.3x flow control, back pressure flow control		
MAC Address Table	2K		
SERIAL TECHNOLOGY			
RS-232	TD, RD, RTS, CTS, DTR, DSR, DTD, GND		
RS-485 2-Wire	Data A(-), Data B(+), GND		
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND		
Serial Connector	DB9M RS-232, Terminal Block RS-422/485		
Data Rate	Up to 230.4 Kbps		
APPROVALS / CERTIFICATIONS			
Emissions	FCC Class B, CISPR Class B (EN55022), NEMA TS2 (VESR321)		
CE	EN61000-6-2:2005	(Heavy Industrial)	
	EN61000-4-2:2008	(ESD)	+/-8kV Contact, +/-15kV Air
	EN61000-4-3:2006	(RI)	10V/m, 80-1000MHz; 3V/m, 1.3 to 2.7 GHz
	EN61000-4-4:2004	(EFT Burst)	+/-2kV DC ports; +/-1kV signal ports
	EN61000-4-5:2005	(Surge)	+/- 0.5 kV DC Ports, +/- 1 kV Signal Ports
	EN61000-4-6:2005	(CI)	10 VRMS, 0.15 to 80 MHz
	EN61000-4-8:2001	(Magnetic)	10A/m, 50Hz & 60Hz
Shock	IEC60068-2-27	50G peak, 11ms, 3 axes	
Vibration	IEC60068-2-6	10-500Hz, 4G, 3 axes	
Freefall (Drop)	IEC60068-2-32	10 total drops from sides, corner and edges, 1M	

FIBER OPTIC SPECIFICATIONS

MODE AND DISTANCE	WAVELENGTH	OUTPUT POWER	RECEIVE SENSITIVITY
Multi-mode (2 km)	1310 nm	-23 to -14 dBm	</= -31 dBm
Single-mode (15 km)	1310 nm	15 to -8 dBm	</= -34 dBm
Single-mode (40 km)	1310 nm	-5 to 0 dBm	</= -35 dBm
Single-mode (80 km)	1550 nm	-5 to 0 dBm	</= -34 dBm

*** Full Fiber Product Options**

These options are possible for large projects:

- Models with 2 fiber optic ports
- Models with long-range fiber optic ports such as 40km and 80km single-mode

Contact B&B Electronics for more information.

Four Port Industrial Ethernet Serial Servers

VESR400 Series

PRODUCT FEATURES

- Ruggedized for extreme applications
- Heavy industrial 61000-6-2 EMC tested
- IEC600068-2-27 (shock) and 600068-2-6 (vibration) tested
- Wide operating temperature (-40 to 80°C)
- Independent serial port selection for RS-232, RS-422, or RS-485
- Wide voltage input 10 to 48VDC, via terminal block or locking barrel plug
- NEMA TS2 (VESR424D)

Vlinx™ VESR4x4 Serial Servers connect serial devices (RS-232, RS-422 or RS-485) to Ethernet networks, allowing the serial device to become a node on the network. The serial ports can be accessed over a LAN/WAN using Direct IP Mode, Virtual COM Port, or Paired Mode connections. VESR4x4 Serial Servers feature 10BaseT or 100BaseTX copper network media and several fiber optic media options, depending on the model. Many models also feature an additional copper Ethernet pass-through port. VESR4x4 Serial Servers are built for use in industrial environments and feature heavy duty metal enclosures that are panel and DIN rail mountable. The product operates from a range of DC power supply voltages and features pluggable terminal block power connectors as well as a locking barrel connector that facilitates redundant power sources.

Fiber Optic Ethernet Ports

Choose a serial server with fiber optic Ethernet ports when the application requires long distance runs or high RFI/EMI noise is present. Many applications require a high level of noise immunity and fiber eliminates this problem between devices. Fiber optic connections far exceed the 100m limitation of standard Ethernet copper ports. Multi-mode fiber can be extended up to 2km distance while single-mode fiber can run as far as 20km.

Ease of Use

Configuration, upgrades and monitoring of the serial server are simple, Easy tasks with Vlinx™ Manager Software. It installs right on your PC giving you access to the serial server via your desktop. Remotely manage the serial server over a LAN or WAN via the build-in web server. This is helpful for off-site troubleshooting and can be done with a simple web browser.

ORDERING INFORMATION

MODEL NUMBER	ETHERNET PORTS	ETHERNET CONNECTOR 1	ETHERNET CONNECTOR 2	SERIAL CONNECTOR (X4)
VESR414D	1	RJ-45	---	DB9 Male
VESR414T	1	RJ-45	---	Terminal Block
VESR424D †	2	RJ-45	RJ-45	DB9 Male
VESR424D-MC	2	Multi-mode SC	RJ-45	DB9 Male
VESR424D-MT	2	Multi-mode ST	RJ-45	DB9 Male
VESR424D-SC	2	Single-mode SC	RJ-45	DB9 Male
VESR424D-ST	2	Single-mode ST	RJ-45	DB9 Male
VESR424T	2	RJ-45	RJ-45	Terminal Block
VESR424T-MC	2	Multi-mode SC	RJ-45	Terminal Block
VESR424T-MT	2	Multi-mode ST	RJ-45	Terminal Block
VESR424T-SC	2	Single-mode SC	RJ-45	Terminal Block
VESR424T-ST	2	Single-mode ST	RJ-45	Terminal Block

Mounting included: DIN Rail Kit and Panel Mount Kit

† *NEMA TS2*

ACCESSORIES

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

ERS35 - 1 M DIN Rail, 35MM STEEL

Four Port Industrial Ethernet Serial Servers

VESR400 Series

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232 (DB9)	TD, RD, DTR, DSR, RTS, CTS, DCD plus Signal Ground
RS-232 (terminal block)	TD, RD, RTS, CTS, plus Signal Ground
RS-485 2-Wire	Data A(-), Data B(+), GND
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
Serial Connector	DB9M or Removable Terminal Blocks
Data Rate	Up to 230.4 Kbps

FIBER OPTIC TECHNOLOGY		
	VESR424x-Mx	**VESR424-Sx**
Type / Wavelength	Multi-mode / 1310 nm	Single-mode / 1310 nm
Output Power	(-) 19 to (-) 14 dBm	(-) 15 to (-) 8 dBm
Receive Sensitivity	< / = (-) 32 dBm	< / = (-) 32 dBm
Cable	62.5 / 125 µm	9 / 125 µm
Connector	SC or ST	SC or ST
Range	2 km (1.2 miles)	20 km (12.4 miles)

POWER	
Source	External
Input Voltage	10 to 48 VDC (58 VDC maximum)
Connector	Removable Terminal Block (16 – 28 AWG)
Power Consumption	6.0 Watts Max.

MECHANICAL	
LED Indicators	Serial Port, Ethernet Link, Speed
Switches	Reset Button
Dimensions	17.145 x 11.237 x 4.572 cm (6.750 x 4.424 x 1.800 in)
Enclosure	35 mm DIN Rail, Panel Mount, metal, IP30

ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	10 to 95% Non-condensing
MTBF	VESR4x4: 70273 hours
MTBF Calc Method	Parts Count Reliability Prediction

NETWORK	
Serial Memory	8 KB per port
Network Memory	4 KB

NETWORK COMMUNICATIONS	
LAN	10/100 Mbps Auto-detecting, 10BaseT or 100BaseTX

NETWORK PHYSICAL LAYER STANDARDS	
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX, 10BaseT and 100Base TX

PROTOCOLS	
Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/ BOOTP
IP Mode	Static, DHCP
TCP/UDP	User definable

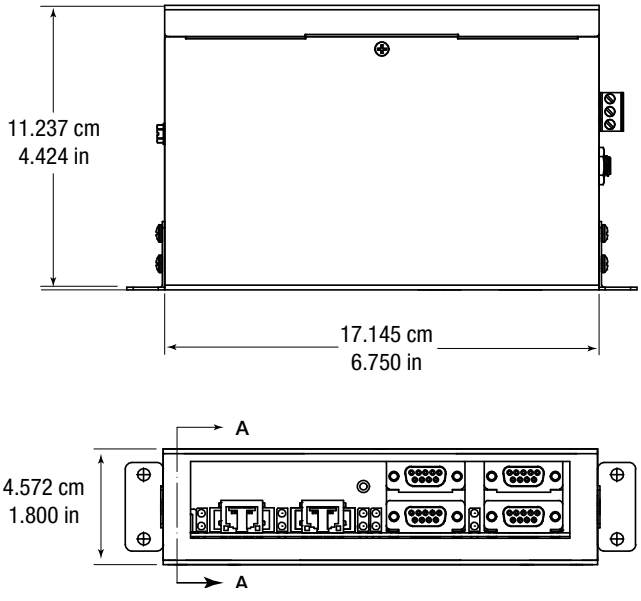
OTHER	
Connection Mode	Server, Client, VCOM, Paired
Client Connection	At power up or upon data arrival
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, test VCOM
Firmware Upgrade	Vlinx Manager

ETHERNET PASS-THROUGH PORT (VESR424)	
Standards	IEEE 802.3, 802.3u, 802.3x
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control
Flow Control	IEEE 802.3x flow control, back pressure flow control

CONFIGURATION SOFTWARE	
OS Compatibility	Windows 2000, XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit)

REGULATORY / CERTIFICATIONS / SAFETY	
Compliance	FCC, Part 15 Class A, CE, NEMA TS2 (VESR424D)
	Shock IEC 600068-2-27
	Vibration IEC 600068-2-6

MECHANICAL DIAGRAM



Serial Device Servers -1, 2 & 4 Ports

100 series: RS-232 to Ethernet (LAN)
400 series: RS-232/422-485 to Ethernet (LAN)

PRODUCT FEATURES

- Built-in web server for convenient browser-based configuration and support
- Fast serial baud rates up 921 kbps and auto-negotiating 10/100 Ethernet speed
- Serial tunneling, IP multicast, virtual COM port modes for flexibility and easy integration
- SNMP support for simple network management
- Surge suppression and +5V Out options

Industry-leading, Device Networking Performance
When you need the ultimate in performance, ease of use and reliability, Quatech™ Serial Device Servers provide the highest throughput and lowest latency available. With budget-friendly prices, you won't find a better price-to-performance ratio!

Overcome Serial Limitations By Network Enabling Devices
Serial devices are used in virtually all industries and are proven to be reliable and robust. But there are drawbacks – cable lengths are limited and costly, COM ports are often in short supply, and attached serial devices are not remotely accessible for monitoring and support. A Quatech™ Device Server overcomes all these limitations. Hardware and drivers are invisible to connected serial devices and their software applications, routing data through an IP network to "virtual" COM ports installed on the host PC.

Installation Wizard Makes It Easy To Get Started
An intuitive Installation Wizard gets you up and running quickly, automatically searching local and remote subnets for installed device servers in seconds. Network settings automatically assigned by DHCP networks are displayed for confirmation. Or enter a static IP address – no bother with telnet sessions, MAC address data entry or special cables. Quatech™ device servers may be managed through the Windows® Device Manager interface or a Web browser, so you can count on trouble-free configuration and maintenance long after the initial installation is completed. Models use the same drivers, manuals and installation wizard to simplify deployment and use.

ORDERING INFORMATION

MODEL NUMBER	NUMBER OF PORTS	INTERFACE	CONNECTOR
SSE-100D	1	RS-232	DB9 male
SSE-100D-5V	1	RS-232	DB9 male
SSE-100D-SS	1	RS-232	DB9 male
SSE-400D	1	RS-232/422-485 (MEI)	DB9 male
SSE-400D-SS	1	RS-232/422-485 (MEI)	DB9 male
DSE-100D	2	RS-232	DB9 male
DSE-100D-5V	2	RS-232	DB9 male
DSE-400D	2	RS-232/422-485 (MEI)	DB9 male
QSE-100D	4	RS-232	DB9 male
QSE-100D-SS	4	RS-232	DB9 male
QSE-100M	4	RS-232	RJ-45 female
QSE-400D	4	RS-232/422-485 (MEI)	DB9 male
QSE-400M	4	RS-232/422-485 (MEI)	RJ-45 female
QSE-400D-SS	4	RS-232/422-485 (MEI)	DB9 male

400 models: MEI (Multi-Electrical Interface) supports RS-232, RS-422/485 on all serial ports.

SS models: Surge suppression of 40-A peak, 8x20 Joules transient surges, clamping voltage of 30V (RS-232) or 15.5V (RS-422/485), peak energy dissipation of 0.1 Joules

5V models: +5V Out at pin 9 to power external devices

ACCESSORIES

PS-SDS - Replacement Wall transformer 120VAC/DC Power Supply 5VDC @ 3W, 2.1 MM plug (NA Kit)

DS-RACK-BLK - Rack Mount Kit for QSE models-Black

Serial Device Servers
1, 2 & 4 Ports

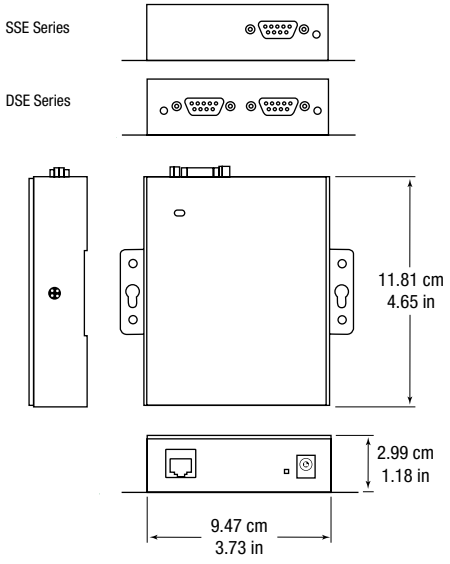
100 series: RS-232 to Ethernet (LAN)
400 series: RS-232/422-485 to Ethernet (LAN)

SPECIFICATIONS

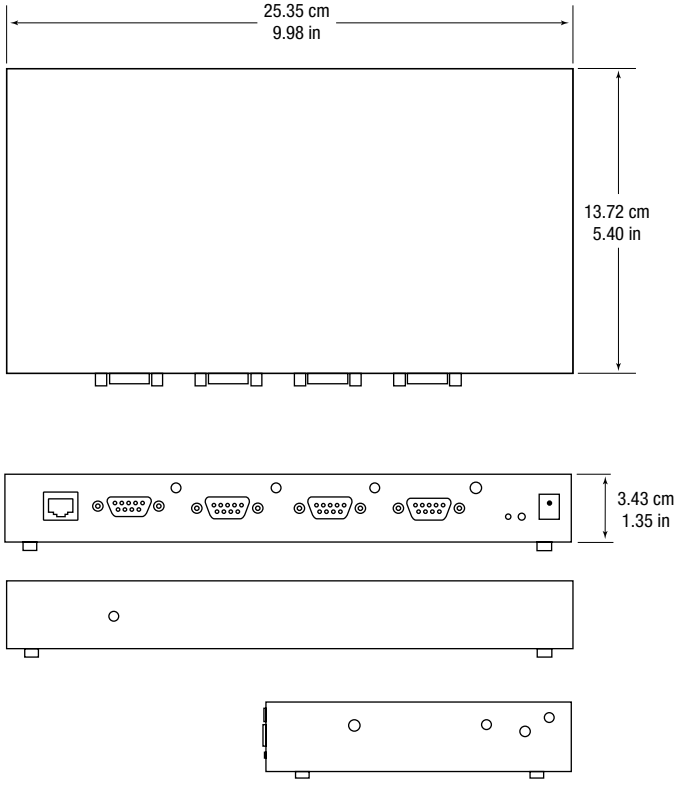
SERIAL TECHNOLOGY	
RS-232	DCD, RxD, TxD, DTR, GND, DSR, RTS, CTS, RI
RS-485 2-Wire	Data +, Data -, GND
RS-422/485 4-Wire	AuxIn-, RxD+, TxD+, AuxOut-, GND, RxD-, AuxOut+, AuxIn+, TxD-
Data Rate	Up to 921.6k bps (-SS models: up to 115.2k bps)
POWER	
Source	Power supply included
Input Voltage	5 VDC
Connector	Barrel
Power Consumption	4W (typical), 10W maximum
MECHANICAL	
LED Indicators	Power, Link, Speed, Data, Status
Switches	Reset button
Dimensions, SSE/DSE	11.81 x 9.47 x 2.99 cm (4.65 x 3.73 x 1.18 in)
Dimensions, QSE	25.35 x 13.72 x 3.43 cm (9.98 x 5.40 x 1.35 in)
Enclosure	Metal
ENVIRONMENTAL	
Operating Temperature	0 to +70°C (-40 to +70°C, storage)
Operating Humidity	10% to 90% non-condensing
NETWORK	
SDRAM	8 MB
FLASH Memory	2 MB

NETWORK COMMUNICATIONS	
LAN	10/100 Base T
NETWORK PHYSICAL LAYER STANDARDS	
Ethernet	IEEE 802.3 auto-negotiating, auto MDI/MDIX
PROTOCOLS	
Protocols	UDP, TCP/IP, HTTP, DHCP, ARP, ICMP, SNMP (MIB II)
IP Mode	DHCP, static IP, custom UDP
TCP/UDP UDP	User definable Unicast, Multicast
OTHER	
Connection Mode	Normal, Tunneling, Raw TCP, Auto TCP, Raw UDP
Client Connection	Supported
Diagnostics	Port Status, Ping Test
Firmware Upgrade	Via web interface
CONFIGURATION SOFTWARE	
OS Compatibility	Windows supported up to and including 32-bit/64-bit Win7 (WHQL signed), Linux (four 2.6.27 kernel)
REGULATORY / CERTIFICATIONS / SAFETY	
Compliance	FCC, CE, IC

MECHANICAL DIAGRAM
SSE/DSE MODELS



MECHANICAL DIAGRAM
QSE MODELS



Serial Device Servers - 8 port

100 series: RS-232 to Ethernet (LAN)
400 series: RS-232/422-485 to Ethernet (LAN)

PRODUCT FEATURES

- Built-in web server for convenient browser-based configuration and support
- Fast serial baud rates up 921 kbps and auto-negotiating 10/100 Ethernet speed
- Serial tunneling, IP multicast, virtual COM port modes for flexibility and easy integration
- SNMP support for simple network management
- Surge suppression and +5V Out options

Industry-leading, Device Networking Performance
When you need the ultimate in performance, ease of use and reliability, Quatech™ Serial Device Servers provide the highest throughput and lowest latency available. With budget-friendly prices, you won't find a better price-to-performance ratio!

Overcome Serial Limitations By Network Enabling Devices
Serial devices are used in virtually all industries and are proven to be reliable and robust. But there are drawbacks – cable lengths are limited and costly, COM ports are often in short supply, and attached serial devices are not remotely accessible for monitoring and support. A Quatech™ Device Server overcomes all these limitations. Hardware and drivers are invisible to connected serial devices and their software applications, routing data through an IP network to "virtual" COM ports installed on the host PC.

Installation Wizard Makes It Easy To Get Started
An intuitive Installation Wizard gets you up and running quickly, automatically searching local and remote subnets for installed device servers in seconds. Network settings automatically assigned by DHCP networks are displayed for confirmation. Or enter a static IP address – no bother with telnet sessions, MAC address data entry or special cables. Quatech™ device servers may be managed through the Windows® Device Manager interface or a Web browser, so you can count on trouble-free configuration and maintenance long after the initial installation is completed. Models use the same drivers, manuals and installation wizard to simplify deployment and use.

ORDERING INFORMATION

MODEL NUMBER	NUMBER OF PORTS	INTERFACE	CONNECTOR
ESE-100D	8	RS-232	DB9 male
ESE-100D-SS	8	RS-232	DB9 male
ESE-100M	8	RS-232	RJ-45 female
ESE-100M-SS	8	RS-232	RJ-45 female
ESE-400D	8	RS-232/422-485 (MEI)	DB9 male
ESE-400D-SS	8	RS-232/422-485 (MEI)	DB9 male
ESE-400M	8	RS-232/422-485 (MEI)	RJ-45 female
ESE-400M-SS	8	RS-232/422-485 (MEI)	RJ-45 female

-400 models: Supports RS-232, RS-422/485 on all serial ports.

-SS models: Surge suppression of 40-A peak, 8x20 Joules transient surges, clamping voltage of 30V (RS-232) or 15.5V (RS-422/485), peak energy dissipation of 0.1 Joules

-Includes: CD with custom datagram utility with command line interface.

ACCESSORIES

PS-SDS - Replacement Wall transformer 120VAC/DC Power Supply, 5VDC @ 3W, 2.1 MM plug (NA Kit)

DS-RACK-BLK - Rack Mount Kit for ESE models-Black

Serial Device Servers
8 port

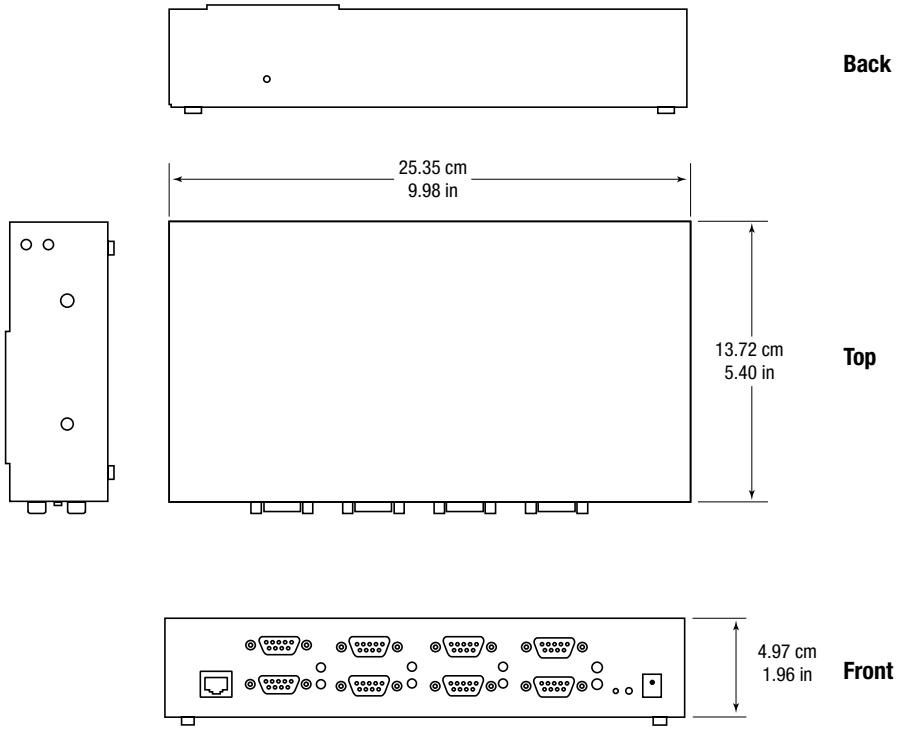
100 series: RS-232 to Ethernet (LAN)
400 series: RS-232/422-485 to Ethernet (LAN)

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	DCD, RxD, TxD, DTR, GND, DSR, RTS, CTS, RI
RS-485 2-Wire	Data +, Data -, GND
RS-422/485 4-Wire	AuxIn-, RxD+, TxD+, AuxOut-, GND, RxD-, AuxOut+, AuxIn+, TxD-
Serial Connector	DB9M or RJ45
Data Rate	Up to 921.6k bps (-SS models: up to 115.2k bps)
POWER	
Source	Power supply included
Input Voltage	5 VDC
Connector	Barrel
Power Consumption	4W (typical)
MECHANICAL	
LED Indicators	Power, Link, Speed, Data, Status
Switches	Reset button
Dimensions	25.35 x 13.72 x 4.97 cm (9.98 x 5.40 x 1.96 in)
Enclosure	Metal
ENVIRONMENTAL	
Operating Temperature	0 to +70°C (-40 to +70°C, storage)
Operating Humidity	10% to 90% non-condensing
NETWORK	
SDRAM	8 MB
FLASH Memory	2 MB

NETWORK COMMUNICATIONS	
LAN	10/100 Base T
NETWORK PHYSICAL LAYER STANDARDS	
Ethernet	IEEE 802.3 auto-negotiating, auto MDI/MDIX
PROTOCOLS	
Protocols	UDP, TCP/IP, HTTP, DHCP, ARP, ICMP, SNMP (MIB II)
IP Mode	DHCP, static IP, custom UDP
TCP/UDP UDP	User definable Unicast, Multicast
OTHER	
Connection Mode	Normal, Tunneling, Raw TCP, Auto TCP, Raw UDP
Client Connection	Supported
Diagnostics	Port Status, Ping Test
Firmware Upgrade	Via web interface
CONFIGURATION SOFTWARE	
OS Compatibility	Windows supported up to and including 32-bit/64-bit Win7 (WHQL signed), Linux (four 2.6.27 kernel)
REGULATORY / CERTIFICATIONS / SAFETY	
Compliance	FCC, CE, IC

MECHANICAL DIAGRAM



Ultra Compact Modbus Gateways

MESP211 Series

PRODUCT FEATURES

- Modbus TCP Ethernet, Modbus ASCII & RTU RS-232/422/485
- Modbus Flexibility – Serial & Ethernet, Masters & Slaves
- View Messaging Status in Real Time
- Wide Operating Temperature (-40 to 80 °C)
- Wide Voltage input 10 to 30 VDC
- Ultra Compact IP30 Metal Enclosure
- Heavy industrial 61000-6-2 EMC Level 3 for harsh environments

Vlinx™ MESP211 series Modbus Gateways connect Modbus devices to Ethernet networks and let you monitor and control Modbus devices from anywhere on the Ethernet LAN or WAN. Supporting up to 16 masters and 32 slaves, the gateways feature an auto-detecting 10/100 Ethernet copper RJ-45 port and a serial port that supports RS-232/422/485 communications via a DB9 male or a terminal block connection. The product is built for use in industrial environments with a heavy duty metal enclosure that is panel (standard) or DIN rail mountable (with optional adapters). The product can be supplied with a DC power source ranging from 10 to 30VDC and features a barrel connector.

Ease of Use

Configuration, upgrades and monitoring of the serial server are simple, easy tasks with Vlinx Manager Software. It installs on your PC giving access to the serial server via your desktop. Remotely manage the Modbus Gateway over a LAN or WAN via the build-in web server. This is helpful for off-site troubleshooting and can be done with an ordinary web browser.

Software Support

Windows XP (32/64 bit), 2003 Server (32/64 bit), Vista 32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit), Windows 8 (32/64 bit).

ORDERING INFORMATION

MODEL NUMBER	PROTOCOL	SERIAL PORT	ETHERNET PORT	ETHERNET CONNECTOR
MESP211D	RS-232/422/485	DB9 Male	1	RJ45
MESP211T	RS-232/422/485	Removable Terminal Block	1	RJ45

ACCESSORIES

MDR-40-24 - 24VDC, 40 W DIN rail mount power supply

DRAD35 - DIN rail adapter clip (pair)

232NM9 - Null modem crossover cable

Ultra Compact Modbus Gateways

MESP211 Series

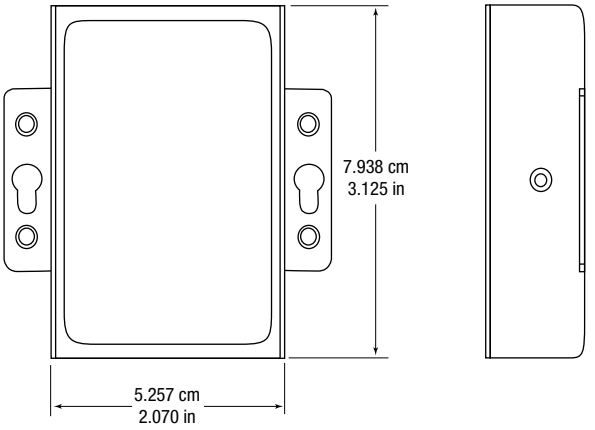
SPECIFICATIONS

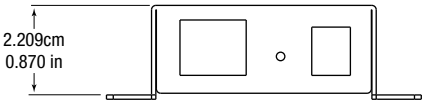
POWER	
Source	External power supply included
Input Voltage	10 to 30 VDC
Connector	Barrel connector
Power Consumption	2.5 W
MECHANICAL	
LED Indicators	Serial Port, Ethernet Link, Ready LEDs
Switches	Reset Button
Dimensions	7.9 x 2.2 x 5.3 (with ears 7.3) cm (3.1 x 0.9 x 2.1 [with ears 2.89] in)
Enclosure	Panel mount, Metal, IP30, (Optional Din Rail Mount)
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	10 to 95% Non-condensing
MTBF	186,310 hours
MTBF Calc Method	Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	4 KB
LAN	10/100 Mbps Auto-detecting , 10BaseT or 100BaseTX
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX, 10BaseT and 100Base TX

SERIAL TECHNOLOGY	
RS-232	TD, RD, DTR, DSR, RTS, CTS, DCD plus Signal Ground
RS-485 2-Wire	Data A(-), Data B(+), Signal Ground
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), Signal Ground
Serial Connector	DB9M or Removable Terminal Blocks
Data Rate	Up to 230.4 Kbps
PROTOCOLS	
Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
IP Mode	Static, DHCP
TCP/UDP	User definable
UDP	Unicast or Multicast
OTHER	
Connection Mode	Server, Client, VCOM, Paired
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, save test config (text readable)
Firmware Upgrade	Vlinx Manager
CONFIGURATION SOFTWARE	
Vlinx Manager	Windows XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit), Windows 8 (32/64 bit)

APPROVALS / CERTIFICATIONS		
CE	EN61000-6-2:2005	(Heavy Industrial)
	EN61000-4-2:2008	(ESD) +/-8kV Contact, +/-15kV Air
	EN61000-4-3:2006	(RI) 10V/m, 80-1000MHz; 3V/m, 1.3 to 2.7 GHz
	EN61000-4-4:2004	(EFT Burst) +/-2kV DC ports; +/-1kV signal ports
	EN61000-4-5:2005	(Surge) +/- 0.5 kV DC Ports, +/- 1 kV Signal Ports
	EN61000-4-6:2005	(CI) 10 VRMS, 0.15 to 80 MHz
	EN61000-4-8:2001	(Magnetic) 10A/m, 50Hz & 60Hz
	Shock	IEC60068-2-27 50G peak, 11ms, 3 axes
	Vibration	IEC60068-2-6 10-500Hz, 4G, 3 axes
	Freefall (Drop)	IEC60068-2-32 10 total drops from sides, corner and edges, 1M

MECHANICAL DIAGRAM





Industrial Modbus Ethernet to Serial Gateways

MESR900 Series - Copper Models

PRODUCT FEATURES

- Ethernet enable Modbus RS-232/422/485
- Modbus TCP, ASCII & RTU
- Modbus flexibility – serial & Ethernet, Masters & slaves
- Modbus messaging priority control
- View messaging status in real time
- Easy configuration software
- UL Class 1 Division 2
- NEMA TS2 (MESR901)

MESR900 Modbus Gateways bridge devices on Modbus serial networks (RS-232, RS-422 or RS-485) with those on Modbus TCP networks, allowing seamless integration. Serial ports can be accessed over a LAN or WAN using Direct IP Mode connections. Supporting up to 16 masters and 32 slaves, these gateways feature autodetecting10/100 copper and fiber optic options. Easy-to-use software is designed for Windows 2000, 2003 Server, XP, Vista, 2008 Server and Windows 7. Serial data rates up to 230 kbps ensure maximum network flexibility.

MESR9xx gateways are built for use in industrial environments, featuring a slim IP30 DIN rail mountable case. They operate from a range of DC power supply voltages and have pluggable terminal block connectors. An external power supply, sold separately, is required. The MESR92x units have an additional Ethernet port which functions much like an Ethernet Switch, allowing pass-through connectivity for other Ethernet devices. This port can also be used to "daisy chain" multiple gateways. MESR90x units have one Ethernet port. B&B Electronics' Vlinx™ is your number one choice for Ethernet to Serial conversion.

IN THE FIELD

Teaming Data Systems for Portable Power

Industry: Power & Energy
Product: Modbus Gateways

www.bb-elec.com/PortablePower

MESR901

Carrier data charges may apply.

IN THE FIELD

Transwestern Pipeline Maximizes Gas Chromatography Investment

Industry: Petroleum, Oil & Gas
Product: Modbus Gateways

www.bb-elec.com/Pipeline

MESR901, MESR902T

Carrier data charges may apply.

ORDERING INFORMATION

MODEL NUMBER	SERIAL PORTS	SERIAL CONNECTOR	ETHERNET PORT	ETHERNET CONNECTOR
MESR901 †	1	DB9 or Terminal Block	(1) Copper	RJ45
MESR902T	2	Terminal Block	(1) Copper	RJ45
MESR921	1	DB9 or Terminal Block	(2) Copper	(2) RJ45
MESR922T	2	Terminal Block	(2) Copper	(2) RJ45

** For fiber options please see page 168.*

† *NEMA TS2*

ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

DRPM25 - 35mm DIN Rail to Panel Mount Bracket, 25mm wide

ERS35 - DIN Rail 1 Meter 35mm Steel

Industrial Modbus Ethernet to Serial Gateways

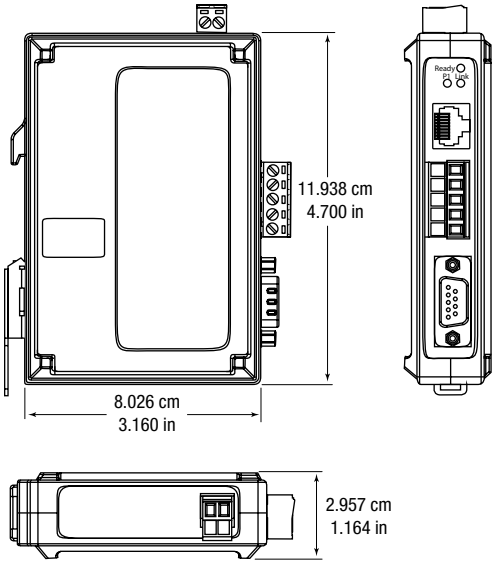
MESR900 Series - Copper Models

SPECIFICATIONS

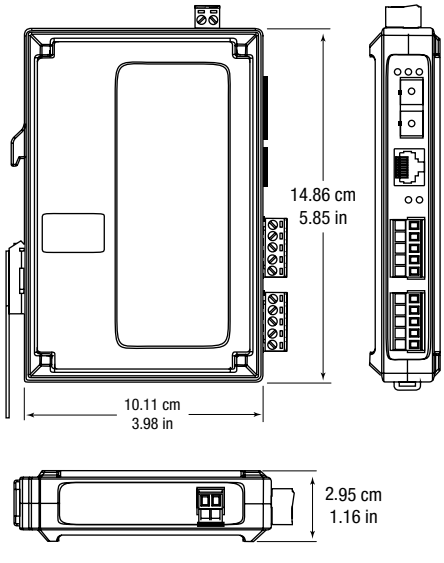
SERIAL TECHNOLOGY	
RS-232	TD, RD, RTS, CTS, DTR, DCR, DTD, GND
RS-485 2-Wire	Data A(-), Data B(+), GND
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
Serial Connector	DB9M or Removable Terminal Blocks; 12 to 28 AWG
Data Rate	Up to 230.4 Kbps
POWER	
Source	External
Input Voltage	10 to 48 VDC (58 VDC Maximum)
Connector	Removable Terminal Block (12 – 28 AWG)
POWER CONSUMPTION	
MESR90X	4.0 Watts
MESR92X	6.0 Watts
MECHANICAL	
LED Indicators	Serial Port, Ethernet Link, Ready
Switches	Reset Button
Dimensions	MESR90x: 11.94 x 8.03 x 2.96 cm (4.70 x 3.16 x 1.16 in) MESR92x: 14.86 x 10.11 x 2.96 cm (5.85 x 3.98 x 1.16 in)
Weight	MESR90x: 149.7 g (0.33 lbs) MESR92x: 204.1 g (0.45 lbs)
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	0 to 95% Non-condensing
MTBF MESR90X	~ 132309 hours
MTBF MESR92X	~ 102593 hours
MTBF Calc Method	Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	4 KB
LAN	10/100 Mbps Auto-detecting
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX 10/100

PROTOCOLS	
Protocols	TCP, IPv4, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
IP Mode	Static, DHCP
TCP	User definable
OTHER	
Mode	Modbus RTU Master / Slave Modbus ASCII Master/Slave
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, test VCOM, save test config. (text readable)
Firmware Upgrade	Vlinx Manager
ETHERNET PASS-THROUGH PORT (MESR92X)	
Standards	IEEE 802.3, 802.3u, 802.3x
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control
Flow Control	IEEE 802.3x flow control, back pressure flow control
MAC Address Table	2K
CONFIGURATION SOFTWARE	
Vlinx Manager	Windows 2000, XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Win 7 (32/64 bit)
REGULATORY / CERTIFICATIONS / SAFETY	
Compliance	FCC, CE, NEMA TS2 (MESR901)
	UL Listed, File E222870 UL Class 1 Division 2 Groups A, B, C, D (HAZLOC), File E245458

MECHANICAL DIAGRAM - MESR90X MODELS



MECHANICAL DIAGRAM - MESR92X MODELS



Industrial Modbus Ethernet to Serial Gateways

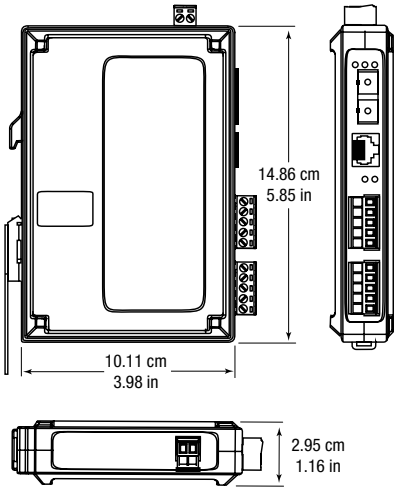
MESR900 Series - Fiber Models

PRODUCT FEATURES

- Ethernet enable Modbus RS-232/422/485
- Modbus TCP, ASCII & RTU
- Modbus flexibility – serial & Ethernet, Masters & slaves
- Modbus messaging priority control
- View messaging status in real time
- Complete Ethernet fiber options
- Easy configuration software

MESR Modbus Gateways bridge devices on Modbus serial networks (RS-232, RS-422 or RS-485) with those on Modbus TCP networks, allowing seamless integration. Serial ports can be accessed over a LAN or WAN using Direct IP Mode connections. Supporting up to 16 masters and 32 slaves, these gateways feature autodetecting10/100 copper and fiber optic options. Easy-to-use software is designed for Windows 2000, 2003 Server, XP, Vista, 2008 Server and Windows 7. Serial data rates up to 230 kbps ensure maximum network flexibility. MESR9xx gateways are built for use in industrial environments, featuring a slim IP30 DIN rail mountable case. They operate from a range of DC power supply voltages and have pluggable terminal block connectors. An external power supply, sold separately, is required. The MESR92x units have an additional Ethernet port which functions much like an Ethernet Switch, allowing pass-through connectivity for other Ethernet devices. This port can also be used to "daisy chain" multiple gateways. MESR90x units have one Ethernet port. B&B Electronics' Vlinx™ is your number one choice for Ethernet to Serial conversion.

MECHANICAL DIAGRAM - MESR92X MODELS



ORDERING INFORMATION

MODEL NUMBER	SERIAL PORTS	SERIAL CONNECTOR	ETHERNET PORTS	ETHERNET CONNECTOR
MESR901-MC	1	DB9 or Terminal Block	Multi-mode Fiber	(1) SC
MESR901-MT	1	DB9 or Terminal Block	Multi-mode Fiber	(1) ST
MESR901-SC*	1	DB9 or Terminal Block	Single-mode Fiber	(1) SC
MESR901-ST*	1	DB9 or Terminal Block	Single-mode Fiber	(1) ST
MESR902T-MC	2	Terminal Block	Multi-mode Fiber	SC
MESR902T-MT	2	Terminal Block	Multi-mode Fiber	ST
MESR902T-SC*	2	Terminal Block	Single-mode Fiber	SC
MESR902T-ST*	2	Terminal Block	Single-mode Fiber	ST
MESR921-MC	1	DB9 or Terminal Block	Multi-mode Fiber, Copper	(1) SC, (1) RJ45
MESR921-MT	1	DB9 or Terminal Block	Multi-mode Fiber, Copper	(1) ST, (1) RJ45
MESR921-SC*	1	DB9 or Terminal Block	Single-mode Fiber, Copper	(1) SC, (1) RJ45
MESR921-ST*	1	DB9 or Terminal Block	Single-mode Fiber, Copper	(1) ST, (1) RJ45
MESR922T-MC	2	Terminal Block	Multi-mode Fiber, Copper	(1) SC, (1) RJ45
MESR922T-MT	2	Terminal Block	Multi-mode Fiber, Copper	(1) ST, (1) RJ45
MESR922T-SC*	2	Terminal Block	Single-mode Fiber, Copper	(1) SC, (1) RJ45
MESR922T-ST*	2	Terminal Block	Single-mode Fiber, Copper	(1) ST, (1) RJ45

+ All serial ports are software configurable for RS-232, RS-422, or RS-485.
* 40km and 80km options available.
For Copper options please see page 166.

ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

DRPM25 - 35mm DIN Rail to Panel Mount Bracket, 25mm wide

ERS35 - DIN Rail 1 Meter 35mm Steel

Industrial Modbus Ethernet to Serial Gateways

MESR900 Series - Fiber Models

SPECIFICATIONS

SERIAL TECHNOLOGY		
RS-232	TD, RD, RTS, CTS, DTR, DSR, DTD, GND	
RS-485 2-Wire	Data A(-), Data B(+), GND	
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND	
Serial Connector	DB9M or Removable Terminal Blocks, 12 to 28 AWG	
Data Rate	Up to 230.4 Kbps	
FIBER OPTIC TECHNOLOGY		
	MESR9xx-Mx	**MESR9xx-Sx**
Type / Wavelength	Multi-mode / 1310 nm	Single-mode / 1310 nm
Output Power	(-) 19 to (-) 14 dBm	(-) 15 to (-) 8 dBm
Receive Sensitivity	~ (-) 32 dBm	~ (-) 32 dBm
Cable	62.5 / 125 µm	9 / 125 µm
Connector	SC or ST	SC or ST
Range	2 km (1.2 miles)	15 km (9.3 miles)
	MESR9xx-Sx40	**MESR9xx-Sx80**
Type / Wavelength	Single-mode / 1310 nm	Single-mode / 1510 nm
Output Power	(-)5 to 0 dBm	(-) 5 to 0 dBm
Receive Sensitivity	~ (-) 34 dBm	~ (-) 34 dBm
Cable	9 / 125 µm	9 / 125 µm
Connector	SC or ST	SC or ST
Range	40 km (5 miles)	80 km (49.7 miles)
POWER		
Source	External	
Input Voltage	10 to 48 VDC (58 VDC Maximum)	
Connector	Removable Terminal Block (12 – 28 AWG)	
POWER CONSUMPTION		
MESR90x	4.0 Watts	
MESR92x	6.0 Watts	
MECHANICAL		
LED Indicators	Serial Port, Ethernet Link, Ready	
Switches	Reset Button	
Dimensions	MESR90x: 11.94 x 8.03 x 2.96 cm (4.70 x 3.16 x 1.16 in) MESR92x: 14.86 x 10.11 x 2.96 cm (5.85 x 3.98 x 1.16 in)	
Enclosure	35mm DIN mount, Plastic, IP 30	
Weight	MESR90x: 0.33 lbs (149.7 g) MESR92x: 0.45 lbs (201.4 g)	
eDrawing	Available on website	

ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	0 to 95% Non-condensing
MTBF MESR90X	~ 132309 hours
MTBF MESR92X	~ 102593 hours
MTBF Calc Method	Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	4 KB
IP Port Addresses	5300 – Heartbeat and configuration Setting in TCP Mode (paired mode) 8899 – MESR 9xx Update
LAN	10/100 Mbps Auto-detecting
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX 10/100
PROTOCOLS	
TCP, IPv4, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP	
IP Mode	Static, DHCP
TCP	User definable
OTHER	
Mode	Modbus RTU Master / Slave Modbus ASCII Master / Slave
Search	Serial direct COM and Ethernet Auto search or specific IP
Diagnostics	Display PC IP, ping, save test config. (text readable)
Firmware Upgrade	Vlinx Manager
ETHERNET PASS-THROUGH PORT (MESR92X)	
Standards	IEEE 802.3, 802.3u, 802.3x
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control
Flow Control	IEEE 802.3x flow control, back pressure flow control
MAC Address Table	2K
CONFIGURATION SOFTWARE	
Vlinx Manager	Windows 2000, XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Win 7 (32/64 bit)
REGULATORY	
Compliance	FCC, CE, NEMA TS2
	UL Listed, File E222870 UL Class 1 Division 2 Groups A, B, C, D (HAZLOC), File E245458

Isolated Industrial Modbus Ethernet to Serial Gateways

MESR321 Series

PRODUCT FEATURES

- Three-way isolation
- Ethernet-enable Modbus RS-232/422/485
- Modbus TCP, ASCII & RTU
- Modbus flexibility – serial & Ethernet, masters & slaves
- View messaging status in real time
- Ethernet fiber options
- Easy configuration software

Vlinx™ MESR321 series Modbus Gateways connect Modbus devices to Ethernet networks and let you monitor and control your Modbus devices from anywhere on your Ethernet LAN or WAN. Supporting up to 16 masters and 32 slaves, the gateways feature auto-detecting SP 10/100 copper and/or fiber optic options that include multi-mode LC and single-mode LC. The data ports are isolated from one another and also from the power supply.

The easy to use Vlinx software is compatible with Windows 2003 Server, XP, Vista, Win 7 and Windows Server 2008. It features Modbus messaging priority control and allows management through multiple TCP/IP client sessions. Serial data rates of up to 230 kbps ensure maximum network flexibility.

Featuring a slim IP30 DIN rail mountable case, MESR321 series gateways are built for use in industrial environments. They can be powered via a barrel connector or a terminal block. (An external power supply is required; sold separately.) The MESR321 has an additional Ethernet port which functions much like an Ethernet Switch, allowing pass-through connectivity for other Ethernet devices. This port can also be used to "daisy chain" multiple gateways.

ORDERING INFORMATION

MODEL NUMBER	SERIAL PORT WITH DB9 AND TERMINAL BLOCK	ETHERNET PORTS	FIBER PORTS
MESR321	1	2 (RJ45)	0
MESR321-ML	1	1 (RJ45)	1 LC multi-mode optical
MESR321-SL	1	1 (RJ45)	1 LC single-mode optical

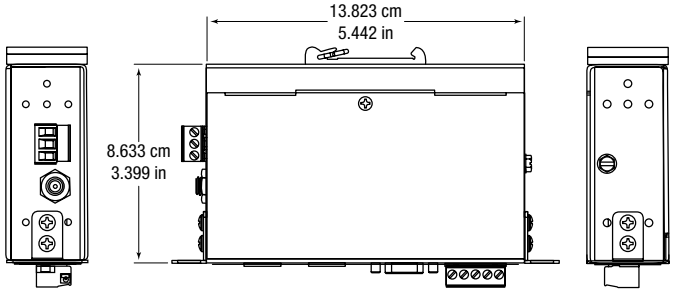
ACCESSORIES

C5UMB7FBG - Category 5e, 7 ft. (2.1 m), Grey cable

PS12VLB-INT-MED - Power Supply 12Vdc, Medical Grade - US, EU, UK

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

MECHANICAL DIAGRAM



Isolated Industrial Modbus Ethernet to Serial Gateways

MESR321 Series

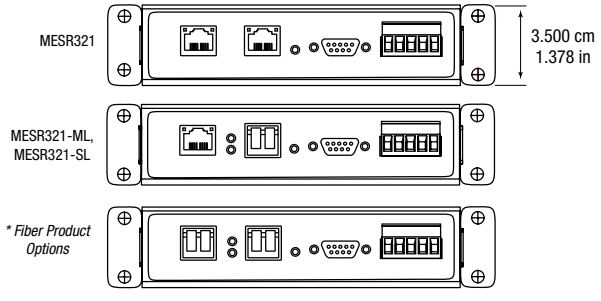
SPECIFICATIONS

PORT TO PORT ISOLATION	
Serial to Ethernet	2 kV
Serial to Power	2 kV
Ethernet to Power	1.5 kV
POWER	
Source	External
Input Voltage	10 to 48 VDC (58 VDC Maximum)
Connector	Removable Terminal Block (12 – 28 AWG and barrel connector
Power Consumption	4 W
MECHANICAL	
LED Indicators	Ready, Power, Serial Data, Ethernet Speed, Ethernet Link
Switches	Reset Button (Mode)
Dimensions	13.823 x 8.633 x 3.500 cm (5.442 x 3.399 x 1.378 in)
Enclosure	IP 30, Metal
WEIGHT	**635 G (1.4 LBS)**
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	10 to 95% Non-condensing
Storage Temperature	-40 to 85°C
MTBF	86,882 hours
MTBF Calc Method	Based on MIL 217F using Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	8 KB
IP Port Addresses	Setting in TCP Mode (paired mode) 8899 – MESR321x Update
LAN	10/100 Mbps Auto-detecting, 10BaseT or 100BaseTX
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX, 10BaseT and 100Base TX
PROTOCOLS	
Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
IP Mode	Static, DHCP
TCP	User definable
OTHER	
Connection Mode	Modbus RTU Master/Slave, Modbus ASCII Master/Slave
Search	Serial direct COM and Ethernet Auto Search or specific IP
Diagnostics	Display PC IP, ping, test VCOM, save test config (text readable)
Firmware Upgrade	Vlinx Manager

SOFTWARE CONFIGURATION		
Vlinx Manager	Win XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Win 7 (32/64 bit), Windows 2008 Server	
ETHERNET PASS-THROUGH PORT		
Standards	IEEE 802.3, 802.3u, 802.3x	
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	2K	
SERIAL TECHNOLOGY		
RS-232	TD, RD, RTS, CTS, DTR, DSR, DTD, Signal Ground	
RS-485 2-Wire	Data A(-), Data B(+), Signal Ground	
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), Signal Ground	
Serial Connector	DB9M RS-232, Terminal Block Rs-422/485	
Data Rate	Up to 230.4 Kbps	
APPROVALS / CERTIFICATIONS		
Emissions	FCC Class B, CISPR Class B (EN55022)	
CE	EN61000-6-2:2005	(Heavy Industrial)
	EN61000-4-2:2008	(ESD)
	EN61000-4-3:2006	(RI)
	EN61000-4-4:2004	(EFT Burst)
	EN61000-4-5:2005	(Surge)
	EN61000-4-6:2005	(CI)
	EN61000-4-8:2001	(Magnetic)
Shock	IEC60068-2-27	50G peak, 11ms, 3 axes
Vibration	IEC60068-2-6	10-500Hz, 4G, 3 axes
Freefall (Drop)	IEC60068-2-32	10 total drops from sides, corner and edges, 1M

FIBER OPTIC SPECIFICATIONS

MODE AND DISTANCE	WAVELENGTH	OUTPUT POWER	RECEIVE SENSITIVITY
Multi-mode (2 km)	1310 nm	-23 to -14 dBm	</= -31 dBm
Single-mode (15 km)	1310 nm	15 to -8 dBm	</= -34 dBm
Single-mode (40 km)	1310 nm	-5 to 0 dBm	</= -35 dBm
Single-mode (80 km)	1550 nm	-5 to 0 dBm	</= -34 dBm



*** Full Fiber Product Options**

These options are possible for large projects:

- Models with 2 fiber optic ports
- Models with long-range fiber optic ports such as 40km and 80km single-mode

Contact B&B Electronics for more information.

Four Port Industrial Modbus Gateways

MESR400 series

PRODUCT FEATURES

- Ethernet-Enable Modbus RS-232/422/485
- Modbus TCP, ASCII & RTU
- Modbus Flexibility – Serial & Ethernet, Masters & Slaves
- Modbus Messaging Priority Control
- View Messaging Status in Real Time
- Ethernet Fiber Options
- NEMA TS2 (MESR424D)

The MESR400 series Modbus Gateways bridge devices on Modbus serial networks (RS-232, RS-422 or RS-485) with those on Modbus TCP networks, allowing seamless integration. The serial ports can be accessed over a LAN or WAN using Direct IP Mode connections. Supporting up to 16 masters and 32 slaves, the gateways feature autodetecting10/100 copper and fiber optic options. The easy to use software is designed for Win XP, Vista, Win 7 and Windows 2003/2008 Server, features Modbus messaging priority control and allows management through multiple TCP/IP client sessions. Serial data rates up to 230 kbps ensure maximum network flexibility. MESR gateways are built for use in industrial environments, featuring a slim IP30 DIN rail mountable case. They operate from a range of DC power supply voltages and have pluggable terminal block connectors.

MESR400 series gateways can be powered via a barrel connector or a terminal block. (An external power supply is required; sold separately.) An additional Ethernet port functions much like an Ethernet switch, allowing pass-through connectivity for other Ethernet devices. This port can also be used to “daisy chain” multiple gateways.

ORDERING INFORMATION

MODEL NUMBER	ETHERNET PORT 1	ETHERNET PORT 2	SERIAL PORTS
MESR424D †	RJ45	10/100 RJ45	RS-232/422/485 (DB9 male)
MESR424D-MT	RJ45	Multi-mode (ST)	RS-232/422/485 (DB9 male)
MESR424D-SC	RJ45	Single-mode (SC)	RS-232/422/485 (DB9 male)
MESR424T	RJ45	10/100 RJ45	RS-232/422/485 (Terminal Block)
MESR424T-MT	RJ45	Multi-mode (ST)	RS-232/422/485 (Terminal Block)
MESR424T-SC	RJ45	Single-mode (SC)	RS-232/422/485 (Terminal Block)

All Models 10/100 Mbps

† *NEMA TS2*

ACCESSORIES

MDR-40-24 - 24VDC, 40W, DIN rail mount, power supply

PS12VLB-INT-MED - 12 VDC power supply, locking barrel

232NM9 - Null modem crossover cable, 3.1 m or 10 ft.

C5UMB7FBG - Ethernet cable

Four Port Industrial Modbus Gateways

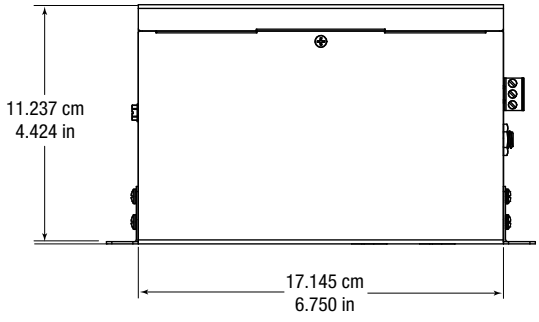
MESR400 series

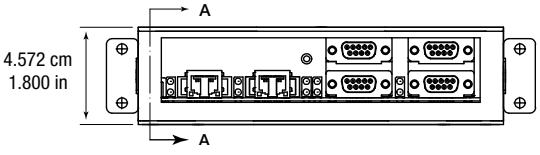
SPECIFICATIONS

POWER	
Source	**External**
Input Voltage	10 to 48 VDC (58 VDC max)
Connector	Removable terminal block (12 – 28 AWG) and barrel connector
Power Consumption	6 W
MECHANICAL	
LED Indicators	Serial Port, Ethernet Link, Speed
Switches	Reset Button
Dimensions	4.57 x 12.2 x 17.1 cm (1.8 x 4.4 x 6.75 in)
Enclosure	Panel Mount, Metal, IP 30, (Optional 35mm DIN Rail mount)
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176° F)
Operating Humidity	10 to 95% Non-condensing
Storage Temperature	-40 to 85°C
MTBF	70,273 hours
MTBF Calc Method	Parts Count Reliability Prediction
NETWORK	
Serial Memory	8 KB per port
Network Memory	8 KB
LAN	10/100 Mbps Auto-detecting , 10BaseT or 100BaseTX
Ethernet	IEEE 802.3 auto detecting & auto MDI/MDX, 10/100

SERIAL TECHNOLOGY		
RS-232 (DB9)	TD, RD, DTR, DSR, RTS, CTS, DCD plus Signal Ground	
RS-232 (terminal block)	TD, RD, RTS, CTS plus Signal Ground	
RS-485 2-Wire	Data A(-), Data B(+), GND	
RS-422/485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND	
Serial Connector	DB9M or removable terminal blocks	
Data Rate	Up to 230.4 Kbps	
FIBER OPTIC TECHNOLOGY		
Type / Wavelength	Multi-mode / 1310 nm	Single-mode / 1310 nm
Output Power	(-)19 to (-) 14 dBm	(-) 15 to (-) 8 dBm
Receive Sensitivity	< (-) 32 dBm	<(-) 32 dBm
Cable	62.5 / 125 µm	9 / 125 µm
Connector	SC or ST	SC or ST
Range	2 km (1.2 mi)	12.4 miles (20 km)
PROTOCOLS		
Protocols	TCP, IPv4, UDP, ARP, HTTP 1.0, HTTP 1.1, ICMP/PING, DHCP/BOOTP	
IP Mode	Static, DHCP	
TCP	User definable	
OTHER		
Connection Mode	Server, Client, VCOM, Paired	
Search	Serial direct COM and Ethernet Auto Search or specific IP	
Diagnostics	Display PC IP, ping, save test config (text readable)	
Firmware Upgrade	Vlinx Manager	
SOFTWARE CONFIGURATION		
OS Compatibility	Windows XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Win 7 (32/64 bit), Windows 2008 Server	
ETHERNET PASS-THROUGH PORT		
Standards	IEEE 802.3, 802.3u, 802.3x	
Processing Type	Store and Forward with 802.3x full duplex, non blocking flow control	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
APPROVALS / CERTIFICATIONS		
Emissions	FCC Part 15 Class A CE NEMA TS2 (MESR424D)	
Shock	IEC60068-2-27	
Vibration	IEC60068-2-6	

MECHANICAL DIAGRAM





ConnectPro Gateways

VFG1000/2000/3000

PRODUCT FEATURES

- Converts multiple serial and Ethernet protocols simultaneously
- Extensive built-in driver list for easy mapping to PLCs, PCs, and SCADA systems
- 10Base-T/100Base-TX Ethernet port supports four simultaneous protocols; up to nine (with expansion card)
- Independent serial ports provide unlimited integration methods

The Vlinx™ ConnectPro Gateway provides the functionality of a Protocol Converter, a Data Logger, a Virtual HMI and an Ethernet Gateway all in one powerful package. Three built-in independent serial ports and a 10/100 Base-TX Ethernet port allow discrete devices to communicate seamlessly. CompactFlash card slot allows configuration files to be created at a central location and distributed to field-installed units. The USB port may be used for fast file downloads, or mounting a CompactFlash card as a PC external drive. DIN rail mounting saves time and panel space and makes industrial installation easy.

PROTOCOLS SUPPORTED

For complete list, visit **www.bb-elec.com/ConnectPro**

ABB Com
ACTech Simple Servo, UDP
ADAM4000 Modules
Allen Bradley DF1
Allen Bradley DF1 TCP
Allen Bradley DF1 PCC/EIP
Allen Bradley DH485
Allen Bradley Ethernet IP
Allen Bradley Ultra 3000
BACnet 802.3, MS/TP, UDP/IP
Bannor PresencePlus
CANOpen
Control Techniques
Device Net
GE SNP, SNP-X, TCP/IP
Hitachi H
Honeywell IPC620 PLC
IDEC Micro 3 Series / ONC
IDEC Micro Smart Series
IMO G Series, K Series
IMO PLC-CNET
Icron Modline
Kollmorgen AC Drives
Encapsulated Modbus over Ethernet
Modbus TCP/IP, RTU, ASCII
Omron C Series PLC
Omron FINS Ethernet, Serial
Phoenix Contact nanoLC Serial, TCP/IP
Schneider Uni-Telway, TSX-47
Siemens S5, S7 200, S7 300/400
Siemens TI500
Square D Symax
Toshiba PL

ORDERING INFORMATION

MODEL NUMBER	WEB SERVER WITH VIRTUAL HMI	DATA LOGGING	ONBOARD SDRAM
VFG1000	No	No	2 MB
VFG2000	QVGA (320x240)	Yes	2 MB
VFG3000	VGA (640x480)	Yes	8 MB
EXPANSION CARD OPTIONS	**INTERFACE**	**CONNECTOR**	**BAUD/FREQUENCY**
VFG9000-CAN	CANopen	Terminal Block	up to 1Mbps
VFG9000-SERIAL	RS-232/422/485 & DH485	RJ45 - RS-422/285 & RJ12 - RS-232	up to 500Kbps
VFG9000-CEL	GSM/GPRS Cellular	SMA male	850/1900, 900/1800
VFG9000-PBDP	Profibus DP	DB9 female	up to 12Mbps
VFG9000-DN	DeviceNet	Terminal Block	up to 500Kbps
VFG9000-ENET	Ethernet	RJ-45	10/100Mbps

ConnectPro Gateways

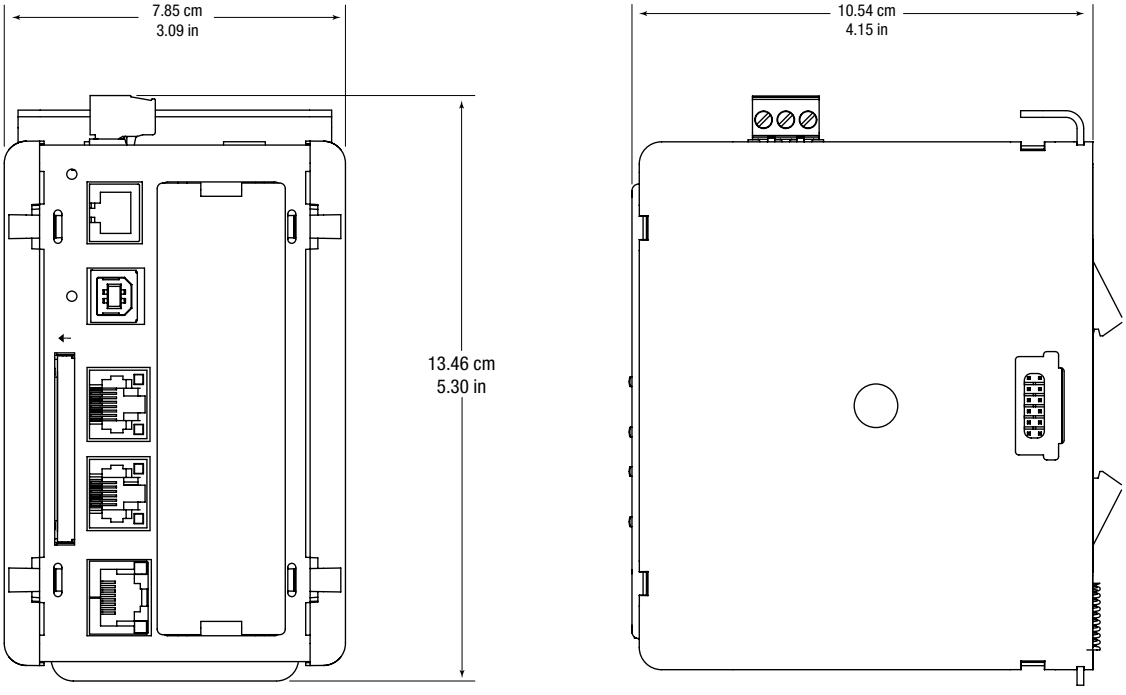
VFG1000/2000/3000

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	RJ-45
RS-485 2-Wire	RJ-45, TxA, TxB, TxEN, GND
RS-422/485 4-Wire	RJ-45, TxA, TxB, RxA, RxB, TxEN, GND
Serial Connector	RS-422/485 (RJ-45)
Programming	USB 1.1 (type B) and RS-232 (RJ-12)
Data Rate	Up to115,200 bps, software selectable
POWER	
Source	External
Input Voltage	24 VDC
Connector	Removable terminal block
MECHANICAL	
LED Indicators	STS, TX/RX, Ethernet, CF
Dimensions	13.46 x 10.54 x 7.85 cm (5.30 x 4.15 x 3.09 in)
Enclosure	High-impact plastic, stainless steel (DIN mountable)
ENVIRONMENTAL	
Operating Temperature	0° to 50°C
Operating Humidity	80% relative, noncondensing
NETWORK	
Onboard user memory	4MB of non-volatile flash memory
Onboard SDRAM	2MB, 8MB (VFG3000)
Memory Cards	Compact Flash, Type II slot for Type 1 and Type II cards Used for optional data base storage only

NETWORK COMMUNICATIONS	
LAN	10/100 MB
Network Physical Layer Standards	
Ethernet	10Base-T, 100Base-TX (wired as NIC), RJ-45
PROTOCOLS	
Protocols	See supported protocol list on first page
IP Mode	DHCP
	TCP/IP
REGULATORY / CERTIFICATIONS / SAFETY	
Certifications/ Compliances	FCC, CE, cUL Listed, Class 1 Division 2 (Groups A, B, C, D) UL Listed, File #E222870, UL508, CSA 22.2 No. 14-M05 and File #E245458, ANSI/ISA 12.12.01-2007, CSA 22.2 No. 213-M1987; LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards IEC 61010-1, EN 61010-1
EMC	EN 61326: 2006; EN 61000-4 (-2, -3, -4, -5, -6); EN 55011

MECHANICAL DIAGRAM



B&B ELECTRONICS
PWR1
PWR2
FAULT
10/100TX
FDX/COL
LINK/ACT
LFP
10/100
FDX/COL
LINK/ACT
TX
100FX
RX
ELINX
www.bb-elec.com
B&B ELECTRONICS
MiniMc-Gig
PoE-

ETHERNET MEDIA CONVERTERS

THAT EXTEND YOUR INDUSTRIAL NETWORK TO THE EDGE

Introduction

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Ethernet Media Converters

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Hardened Ethernet Media Converters - EIR series ..... 268 - 269
Gigabit SFP Ethernet Media Converters - EIS-G-SFP series ..... 270 - 271
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Chassis Products

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EXTEND YOUR INDUSTRIAL NETWORK TO THE EDGE

Media converters provide an important role in the connectivity of network equipment in local and wide area networks (LAN, WAN). Network devices may have serial, copper or fiber interfaces. Media Converters can provide the necessary connections, and B&B Electronics offers an extensive product line. Media Converters support a number of protocols, including Ethernet, RS-232/422/485, Modbus, and Telco.

- *ISPs*
- *Security*
- *Telcos*
- *Military Installations*
- *Traffic Control*
- *SCADA*

ETHERNET MEDIA CONVERTERS

FTTx Optical Ethernet

- SNMP Manageable
- SFP Option on many models (Fiber, Copper)
- RS-232 CLI Command Line Interface) Console
- Allows Management traffic segregation from data traffic
- Multiport copper to fiber models

Unmanaged Media Converters

- Copper to Fiber Ethernet media converters
- Offers diagnostic features such as LFPT, Link Loss
- Unmanaged Plug-N-Play devices
- Supports 10, 100, 10/100, 10/100/1000 and 1000 Mbps
- Small Form factor or 1U high standalone design

Ethernet Media Converters - EIS series

- UL/CUL 60950, EN60950, IEC 609050, IEC6100-6-2
- 10/100Base models
- Multi- or single-mode, SC or ST
- Auto negotiation of data rate and duplex modes
- MDI/MDI-X (auto-cross feature)
- Desktop, wall or rack mount options

Hardened Ethernet Media Converters - EIR series

- Class 1/Division 2 listed
- NEMA TS1/TS2 rated for traffic control equipment
- IEC61000-6-2 EMC, IEC60068 (shock, vibration, free fall)
- Multi- or single-mode, SC or ST
- Wide operating temperature range
- Alarm for power or port link failure - via relay output
- Redundant 10 to 48 VDC inputs - via terminal blocks
- DIN, panel or rack mount

Gigabit SFP Ethernet Media Converters - EIS-G-SFP series

- IEEE802.3ab 1000Base-T, 1000Base-SX/LX, 802.3x
- DIP switch setup for link-fault-pass-through, fiber auto/force mode
- 1000 Mbps full-duplex, auto-negotiation, auto-MDI/MDIX
- Full wire-speed forwarding rate
- SFP socket for Gigabit fiber optic expansion

Hardened Gigabit SFP Ethernet Media Converter - EIR-G-SFP-T

- NEMA TS1/TS2 rated for traffic control equipment
- IEC61000-6-2 EMC, IEC 60068 (shock, vibration, free fall)
- DIP switch setup for link-fault-pass-through, fiber auto/force mode
- Gigabit (1000 Mbps) full-duplex, auto-negotiation, auto-MDI/MDIX
- Full wire-speed forwarding rate
- Redundant power inputs
- Wide operating temperature range
- SFP socket for Gigabit fiber optic expansion

Managed Media Converters

- Single or Dual-wide modules
- SNMP Manageable
- Copper to Fiber converters, including support for SFPs
- Install in single or multiport chassis
- Provides Configuration Control

Fiber Mode Converters

- Provides conversion of one fiber type to another
- Modules supporting up to 155Mbps, Gigabit or 10G
- Modular or compact form factor
- No configuration necessary
- SFP support on some models

CHASSIS PRODUCTS

Managed Chassis

- SNMP Manageable
- Power options: AC, DC or ACDC
- Offered in 3, 6, or 20 Slot
- Optional SNMP management Module
- Single and Dual power supply modules

Unmanaged Chassis

- 1 or 2U High standalone chassis
- Standard and wide temperature
- Supports all iMcV-Modules
- Power options: AC or DC

Certified For Hazardous Locations

Ethernet Media Converters (#EIR-M-ST, #EIR-M-SC, #EIR-S-SC)

For applications requiring Class 1/Division 2 certification, B&B Electronics has a range of connectivity and communication solutions designed to operate in hazardous environments.

- see page 470 for a complete listing of C1D2 products.

c UL US LISTED

OPTICAL ACCESS FTTx

WHICH IS RIGHT FOR YOU?

- SNMP Management
- 10/100 or Gigabit
- Link Fault Pass Through
- Last Gasp
- Telco (-48 VDC)

OPTICAL ACCESS FTTX SOLUTIONS

PRODUCT SERIES	IE-MultiWay	AccessEtherLinX/4	Giga-Access EtherLinX-II AC	Giga-Access EtherLinX-II DC	iMcV-FiberLinX-II
Speed	10/100/1000 to 1000	10/100	10/100/1000	10/100/1000	10/100
Wide Temperature	✓				
Power supply (external or internal)	External	Internal	Internal	Internal	Internal (Chassis)
Frame size	10240	1916	9600	9600	1916
SNMP Managable Directly	✓	✓	✓	✓	✓
Host/Remote / Standalone	Standalone	Standalone, Remote	Standalone, Remote	Standalone, Remote	Host/Remote, Standalone
Fiber Type (SFP, 1x9)	SFP	1x9, SFP	1x9, SFP	1x9, SFP	1x9, SFP
Number of Fiber Ports	2	1	1	1	1
Number of Ethernet Ports	2	4	4	4	2
Power: AC and or DC	AC, DC TB	AC	AC	DC	AC, DC(Chassis based)
LFPT	✓	✓	✓	✓	✓
OAM	✓				
Bandwidth Scalability	✓	✓	✓	✓	✓
FCC Class B	✓	✓	✓	✓	✓
UL	✓	✓	✓	✓	✓
Mounting Options	DIN, Bracket	Rackmount Bracket	Rackmount Bracket	Rackmount Bracket	Chassis
Page	**196**	**198**	**200**	**202**	**204**

iMcV-Giga-FiberLinX-II	iMcV-Giga-FiberLinX-III	IE-MiniFiberLinX-II	IE-MiniFiberLinX-II Telco	IE-MiniFiberLinX-II LastGasp
10/100/1000	10/100/1000	10/100	10/100	10/100
		✓	✓	✓
Internal (Chassis)	Internal (Chassis)	External	External	External
12196	10240	1916	1916	1916
✓	✓	✓	✓	✓
Host/Remote, Standalone	Host/Remote, Standalone	Remote, Standalone	Remote, Standalone	Remote, Standalone
1x9, SFP	1x9, SFP	1x9	1x9	1x9
1	1	1	1	1
2	2	1	1	1
AC, DC(Chassis based)	AC, DC(Chassis based)	AC, DC TB	AC, DC TB	AC, DC TB
✓	✓	✓	✓	✓
✓	✓			
✓	✓	✓	✓	✓
✓	✓	Class A	Class A	Class A
✓	✓	✓	✓	✓
Chassis	Chassis	DIN, Bracket	DIN, Bracket	DIN, Bracket
206	208	210	212	214

UNMANAGED MEDIA CONVERTER SOLUTIONS

WHICH IS RIGHT FOR YOU?

- *Wide Temperature*
- *10/100 or Gigabit*
- *Link Fault Pass Through*
- *PoE or PoE+*

UNMANAGED MEDIA CONVERTERS

PRODUCT SERIES	MiniMc & MiniMc SFP	MiniMc LFPT	MiniMc-Gigabit	Giga-MiniMc & Giga-MiniMc SFP	Giga-MiniMc LFPT
Speed	10/100	10/100	1000	10/100/1000	10/100/1000
Wide Temperature					
Power supply (External or Internal)	External	External	External	External	External
Frame size	1916	1916	10K	10240	10240
PoE / PoE+					
Fiber Type (SFP, 1x9)	1x9, SFP	1x9, SFP	1x9	1x9, SFP	1x9, SFP
Number of Fiber Ports	1	1	1	1	1
Number of Ethernet Ports	1	1	1	1	1
Power: AC and or DC	AC	AC	AC	AC	AC
LFPT		✓			✓
FCC Class B	✓	✓	✓	✓	✓
UL	✓	✓	✓	✓	✓
Mounting Options	DIN, Bracket, Tray	DIN, Bracket, Tray	DIN, Bracket, Tray	DIN, Bracket, Tray	DIN, Bracket, Tray
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IE-MiniMc	IE-Giga-MiniMc	IE-Giga-MiniMc LFPT	IE-MiniMc LFPT & IE-MiniMc TELCO LFPT	PoE Giga-MiniMc & PoE+ Giga-MiniMc LFPT	PoE-McBasic LFPT
10/100	10/100/1000	10/100/1000	10/100	10/100/1000	10/100
✓	✓	✓	✓		
External	External	External	External	External	Internal
1916	10240	10240	1916	10240	10240
				✓	✓
1x9	1x9	1x9, SFP	1x9	1x9, SFP	1x9
1	1	1	1	1	1
1	1	1	1	2	2
AC, DC TB	AC, DC TB	AC, DC TB	AC, DC TB	AC, DC TB	AC
		✓	✓		
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
DIN, Bracket, Tray	DIN, Bracket, Tray	DIN, Bracket, Tray	DIN, Bracket, Tray	DIN, Bracket	Standalone, Shelf
226	**228**	**230**	**232**	**234**	**236**

UNMANAGED MEDIA CONVERTER SOLUTIONS

WHICH IS RIGHT FOR YOU?

- Compact or 1U High Form Factor
- 10 Mbps to Gigabit models
- Link Fault Pass Through
- PoE or PoE+

UNMANAGED MEDIA CONVERTERS

PRODUCT SERIES	PoE & PoE+ Giga-McBasic LFPT	McBasic TP/FO	McBasic TX/FX	McBasic 10/100	McBasic Gigabit LFPT
Speed	10/100/1000	10	100	10/100	1000
Wide Temperature					
Power supply (External or Internal)	Internal	Internal	Internal	Internal	Internal
Frame size	10240	10K	10K	10K	10K
PoE / PoE+	✓				
Fiber Type (SFP, 1x9)	1x9, SFP	1x9	1x9	1x9	1x9
Number of Fiber Ports	1	1	1	1	1
Number of Ethernet Ports	2	1	1	1	1
Power: AC and or DC	AC	AC	AC	AC	AC
LFPT	✓				
FCC Class B	✓	Class A	Class A	Class A	Class A
UL	✓	✓	✓	✓	✓
Mounting Options	Standalone, Shelf	Standalone, Shelf	Standalone, Shelf	Standalone, Shelf	Standalone, Shelf
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PD-Switch	AccessConverter	McPIM TP/FO	McLIM TX/FX	McLIM TP/TX/FX	McGigabit
10/100 to 100	10/100	10	100	10/100	1000
N/A	External	Chassis-Bsed	Chassis-Bsed	Chassis-Bsed	Chassis-Bsed
1916	1916	10K	10K	1916	10K
1x9	1x9	1x9	1x9	1x9	1x9
Up to 2	1	1	1	1	1
Up to 5	3	1	1	1	1
No Power, PD Device	AC, DC TB	Chassis-Based	Chassis-Based	Chassis-Based	Chassis-Based
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
DIN, Bracket	DIN, Bracket	N/A	N/A	N/A	N/A
250	**252**	**254**	**256**	**258**	**260**

UNMANAGED MEDIA CONVERTER SOLUTIONS

WHICH IS RIGHT FOR YOU?

- *Wide Temperature*
- *10/100 Mbps to Gigabit*
- *Link Fault Pass Through*
- *PoE or PoE+*

UNMANAGED MEDIA CONVERTERS

PRODUCT SERIES	**McPC TX/FX** PC Installed	**McPC 10/100 Mbps** PC Installed	**McPC Gigabit** PC Installed	**McPC MediaLinX** PC Installed	**McPC Giga-MediaLinX** PC Installed
Speed	100	10/100	1000	10/100	10/100/1000
Wide Temperature					
Power supply (external or internal)	N/A	N/A	N/A	N/A	N/A
Frame size	10K	10K	10K	1916	
SFP or 1X9	1x9	1x9	1x9	1x9	1x9
Number of Fiber Ports	1	1	1	1	1
Number of Ethernet Ports	1	1	1	1	1
Power: AC and or DC	SATA Cable	SATA Cable	SATA Cable	SATA Cable	SATA Cable
LFPT					
FCC Class B	✓	✓	✓	✓	✓
UL	✓	✓	✓	✓	✓
Mounting Options	N/A	N/A	N/A	N/A	N/A
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EIS	EIR	EIS-G-SFP	EIR-G-SFP-T
10/100	10/100	10/100/1000	10/100/1000
	✓		✓
External (rack/chassis, redundant PS option)	External	External (rack/chassis, redundant PS option)	External
1x9	1x9	SFP	SFP
1	1	1	1
1	1	1	1
DC TB (rack/chassis option)	DC TB)	DC TB (rack/chassis option)	DC TB
	✓		
Class A	Class A	Class A	Class A
✓	C1/D2, NEMA TS1 & TS2		NEMA TS1 & TS2
Desk, Wall, Rack/chassis	DIN, Panel	Wall, Rack/chassis	DIN, Rack/chassis
266	268	270	272

MANAGED MEDIA CONVERTER SOLUTIONS

WHICH IS RIGHT FOR YOU?

- *Wide Temperature*
- *10 Mbps up to Gigabit*
- *Link Fault Pass Through*
- *SNMP Manageable*

MANAGED MEDIA CONVERTERS

PRODUCT SERIES	IE-iMcV-2xLIM	iMcV-PIM	iMcV-LIM	iMcV-LIM 10/100	iMcV-Gigabit & IE-iMcV-Gigabit
Speed	100	10	100	10/100	1000
Wide Temperature	✓				✓ (IE Version Only)
Modular	✓	✓	✓	✓	✓
Frame size	10K	10K	10K	10K	10K
SNMP Manageable	✓	✓	✓	✓	✓
Configuration Control	✓		✓		✓ (IE Version Only)
SFP or 1X9	SFP	1x9	1x9	1x9	1x9, SFP
Number of Fiber Ports	2	1	1	1	1
Number of Ethernet Ports	2	1	1	1	1
Power: AC and or DC	Chassis Based	Chassis Based	Chassis Based	Chassis Based	Chassis Based
LFPT	✓				✓
FCC Class B	✓	✓	✓	✓	✓
UL	✓	✓	✓	✓	✓
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iMcV-MediaLinX & IE-iMcV-MediaLinX	iMcV-Giga-MediaLinX	iMcV-T1/E1/J1 Repeater	iMcV-T1/E1/J1 LineTerm	iMcV-DS3/E3/STS Repeater	iMcV-DS3/E3/STS LineTerm
10/100	10/100/1000	1.54/2.048	1.54/2.048	34/45/52	34/45/52
✓ (IE Version Only)					
✓	✓	✓	✓	✓	✓
1532	1632	N/A	N/A	N/A	N/A
✓	✓	✓	✓	✓	✓
✓ (IE Version Only)	✓		✓		✓
1x9, SFP	1x9	1x9	1x9	1x9	1x9
1	1	1	1	1	1
1	1	1	1	1 BNC Pair	1 BNC Pair
Chassis Based	Chassis Based	Chassis Based	Chassis Based	Chassis Based	Chassis Based
✓ (IE Version Only)	✓				
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
284	**286**	**288**	**290**	**292**	**294**

MANAGED MEDIA CONVERTER SOLUTIONS

WHICH IS RIGHT FOR YOU?

- *Wide Temperature*
- *Gigabit*
- *Link Fault Pass Through*
- *SNMP Manageable*

MANAGED MEDIA CONVERTERS

PRODUCT SERIES	IE-iMcV-E1-Mux/4 + Ethernet	IE-iMcV-T1-Mux/4 + Ethernet	iMcV-SwitchTX/5	iMcV-Switch TX3/2SFP	iMcV-Switch TX4/SFP
Speed	2.048 to 10/100	1.54 to 10/100	10/100 to 100	1000 Mbps	10/100 Mbps
Wide Temperature	✓	✓			
Modular	✓	✓	✓	✓	✓
Frame size	10K	10K	1916	1916	1916
SNMP Manageable (yes or no)	✓	✓	✓	✓	✓
Configuration Control					
SFP or 1X9	SFP	SFP		SFP	SFP
Number of Fiber Ports	2	2		2	1
Number of Ethernet Ports	1 (+ 4 E1)	1 (+ 4 T1)	5	3	4
Power: AC and or DC	Chassis Based	Chassis Based	Chassis Based	Chassis Based	Chassis Based
LFPT	✓	✓			
FCC Class B	✓	✓	✓	✓	✓
UL	✓	✓	✓	✓	✓
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iMcV-Switch TX3/FX	IE-iMcV-MultiWay	iMcV-10G Converter XFP	iMcV-10G Converter SFP+	IE-iMcV-VDSL2 LANextender
10/100 Mbps	10/100/1000	10G	10G	Asynchronous Speed to 10/100
	✓			✓
✓	✓	✓	✓	✓
1916	10204	10K	10K	1536
✓	✓	✓	✓	✓
		✓	✓	
1x9	SFP	XFP	SFP+	
1	2	2	2	
3	2			1
Chassis Based	Chassis Based	Chassis Based	Chassis Based	Chassis Based
	✓			✓
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
300	**302**	**304**	**306**	**308**

FIBER MODE CONVERTER SOLUTIONS

WHICH IS RIGHT FOR YOU?

- Mode Conversion
- 155 Mbps, Gigabit, 10G
- SNMP Manageable
- Wide Temperature

FIBER MODE CONVERTERS

PRODUCT SERIES	iMcV-S2MM	iMcV-S2SM	iMcV-M2MM	IE-ModeConverter
Speed	155 Mbps, 1.25 Mbps	155 Mbps, 1.25 Mbps	155 Mbps, 1.25 Mbps	155 Mbps, 1.25 Mbps, 2.4 Gbps
Wide Temperature				✓
Power supply (external or internal)				External
Frame size	10K	10K	10K	10K
SNMP Manageable (yes or no)	✓	✓	✓	
SFP or 1X9	1x9	1x9	1x9	SFP
Number of Fiber Ports	2	2	2	2
Number of Ethernet Ports	0	0	0	0
Power: AC and or DC	Chassis-Based	Chassis-Based	Chassis-Based	AC, DC TB
FCC Class B	✓	✓	✓	✓
UL	✓	✓	✓	✓
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IE-iMcV-ModeConverter	iMcV-WDM	IE-iMcV-MuxDemux/4
155 Mbps, 1.25 Mbps, 2.4 Gbps	Unlimited, up to 10G	Unlimited, up to 10G
✓		✓
10K	10K	10K
✓	✓	✓
SFP	1x9	1x9
2	2	6
0	0	0
Chassis-Based	NA	NA
✓	✓	✓
✓	✓	✓
318	**320**	**322**

What is FIber Mode Conversion

Fiber Mode Converters provide a conversion of one fiber type to another, such as MM to SM. They can also provide an extension of the same type over a longer distance, such as SM to SM.

Fiber Mode Converters offer a less expensive solution to replacing expensive fiber-based switches.

A typical application is MM fiber installed in two buildings which are more than 2Km apart in distance. Installing an MM to SM Fiber Mode Converter is the most cost-effective solution.

CHASSIS PRODUCT SOLUTIONS

WHICH IS RIGHT FOR YOU?

- *3, 6, 20 Slot Chassis*
- *Rack Mount Infrastructure*
- *SNMP Management Card, Optional*
- *Any Mc-Module installs in a 1,4,8 or 12 slot MediaConverter Chassis*
- *Any iMcV-Module installs in all iMediaChassis or MediaChassis*

MANAGED CHASSIS

PRODUCT SERIES	iMediaChassis/20	iMediaChassis/6	iMediaChassis/3	MediaChassis/1 AC IE-MediaChassis/1 DC
Wide Temperature				✓ (IE-MediaChassis/1 DC)
Power supply (Dual or Single)	Dual, Single	Dual, Single	Single	Single
SNMP Manageable (yes or no)	✓	✓	✓	
Number of Slots	20 + 1 SNMP	6 + 1 SMNP	3 + 1 SNMP	1
Power: AC and or DC	AC, DC, ACDC	AC, DC	AC, DC, ACDC	AC, DC
FCC Class B	✓	✓	✓	✓
UL	✓	✓	✓	✓
Mounting Options	Rack Ears	Rack Ears	Shelf	Rack Ears, Shelf
Page	**324**	**326**	**328**	**330**

UNMANAGED CHASSIS

MediaChassis/2 AC IE-MediaChassis/2 AC IE-MediaChassis/2 DC	IE-MediaChassis/1-AC	MediaConverter/1	MediaConverter/4	MediaConverter/8	MediaConverter/12
✓ (IE-MediaChassis/2 AC and DC)	✓				
Single	AC external , DC TB	Single	Single	Single	Dual, Single
2	1	1	4	8	12
AC, DC	AC, DC TB	AC	AC	AC	AC
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
Rack Ears, Shelf	DIN, Wallmt. Bracket	Shelf		Rack Ears	Rack Ears
332	334	336	338	340	342

10/100/1000 Mbps Optical Ethernet Demarcation Unit

IE-Multiway

PRODUCT FEATURES

- Versatile 4 port device
- SNMP Manageable
- Supports SFP fibers
- Extended Temperature
- Supports OAM, VLAN, 1+1 Revertive
- RS-232 CLI (Command Line Interface) Console Port

The IE-MultiWay is a value-based, Carrier-class managed Gigabit Ethernet solution that is ideal for use as a CPE device at the customer's network edge as well as in a fiber infrastructure. The IE-MultiWay comes standard with two SFP uplink ports for the providers' network connection and two 10/100/1000Base-T copper ports.

There are four distinct DIP Switch selectable configurations that the IE-MultiWay supports. Among them are a 1+1 Uplink Protection revertive mode, 1+1 Uplink Protection non-revertive mode, a 4-port Gigabit Switch, and a Dual Copper to Fiber SFP Media/Mode Converter (two gigabit fiber media converters in one).

The IE-MultiWay is an ideal solution for service providers' fiber networks because it combines media conversion with an advanced features set for network management and trouble shooting, including port based VLAN and VLAN trunks, IEEE 802.1ad (Q-in-Q) and a user definable EtherType. Information such as interface statistics, RMON1 statistics, and OAM status and control are a few of the many accessible features from the Serial CLI, Telnet CLI and SNMP Management Software.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

825-39951 - Serial Cable, MiniJack to DB9 (female)

895-39229 - Wall Mount Bracket

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	ETHERNET PORTS	ETHERNET CONNECTOR
IE-Multiway With AC to DC Power Adapter				
858-11121	*SFP	2	2	RJ45
IE-Multiway With Out AC to DC Power Adapter				
854-11121	*SFP	2	2	RJ45

* SFP modules are sold separately. Two (2) SFP transceivers are needed for full device functionality.

IE-SFP MODULES: 100 TO 155 MBPS

MODEL NUMBER	DESCRIPTION	FIBER TYPE	RANGE	POWER BUDGET
808-38101	MM850	LC	2 km	14.5 (db)
808-38103	SM1310	LC	15 km	13 (db)
808-38104	SM1310/PLUS	LC	40 km	31 (db)
808-38105	SM1550/LONG	LC	80 km	31 (db)

IE-SFP MODULES: 1 GBPS GIGABIT ETHERNET

MODEL NUMBER	DESCRIPTION	FIBER TYPE	RANGE	POWER BUDGET
808-38201	MM850	LC	550 m	7.5 (db)
808-38202	SM1310	LC	10 km	13 (db)
808-38203	SM1310/PLUS	LC	30 km	17 (db)
808-38204	SM1550/LONG	LC	40 km	17 (db)
808-38205	SM1550/XLONG	LC	70 km	23 (db)

iView: Windows 2000/XP/Vista/Win7

IN THE FIELD

Intelligent Facilities: Controlling Access & Security

Industry: Security

Product: IE-MultiWay Ethernet Media Converter

www.bb-elec.com/Access

Carrier data charges may apply.

10/100/1000 Mbps Optical Ethernet Demarcation Unit

IE-Multiway

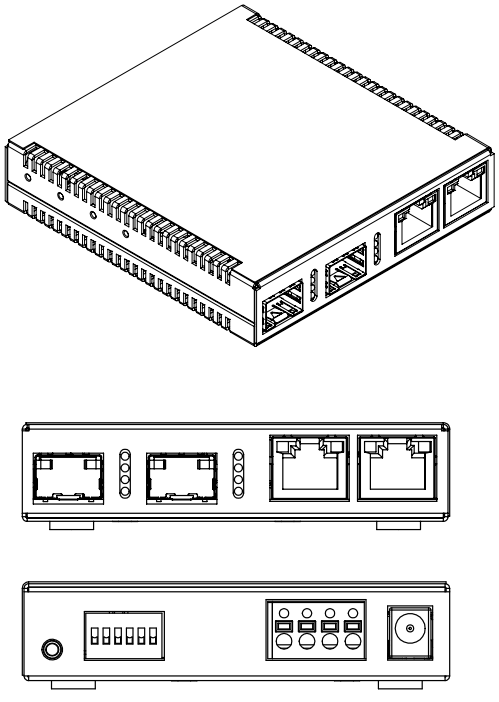
SPECIFICATIONS

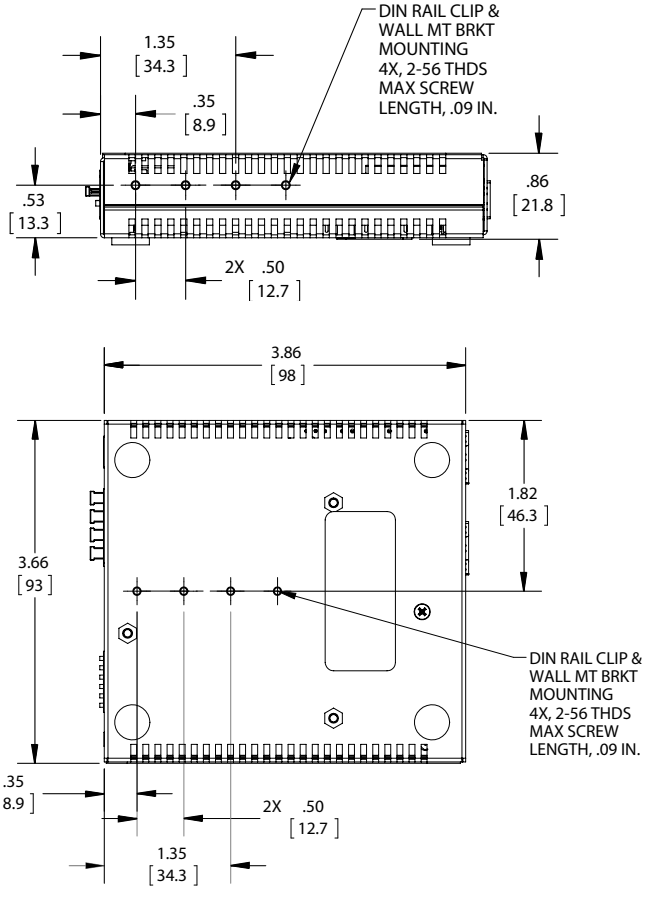
TECHNICAL
Plug-and-Play Operation
2 x RJ-45 and 2 x SFP ports (SFPs sold separately)
IEEE 802.3i 10Base-T over twisted pair
IEEE 802.3u 100Base-TX over twisted pair
IEEE 802.3u 1000Base-T over twisted pair
IEEE 802.3u 100Base-FX
IEEE 802.3u 1000Base-X
Jumbo Frames support (up to 10240 bytes)
Auto Negotiation, Auto-Cross for MDI/MDIX
Includes diagnostic LEDs
1+1 uplink protection (< 50 mSecs)
Extended temperature range from -40° to +85° C
-48 VDC terminal for Telco applications
Compatible with all standard MSA compliant SFP transceivers
STANDARDS COMPLIANCE
IEEE 802.3ah
IEEE 802.1ag
Y.1731
SFP-MSA SFP standard (September 14, 2000)
SFF-8472 DDMI standard (Revision 1.0)

MECHANICAL	
Dimensions	0.86"H x 3.66"W x 3.88"D (2.2 x 9.38 x 9.94 cm)
Enclosure	Metal
Shipping Weight	1.0 lbs (0.45 kg)
POWER	
5 to 24 VDC (Barrel)	
48 VDC Telco (Terminal	
POWER INFORMATION	
Min: 3.15W (1 optic SFP [1 Gbps], 1 Tx [100 Mbps])	
Max: 7.0W (2 Cu SFP [1 Gbps], 2 Tx [1 Gbps])	
* Power consumption is based on SFP types	
ENVIRONMENTAL	
Operating Temperature w/ Franmar AC Wall Adapter	+14° to +122° F (-10° to +50° C)
Operating Temperature w/DC Configuration	-40° to +185° F (-40° to +85° C)
Storage Temperature	-49° to +185° F (-45° to +85° C)
Operating Humidity	10 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class A (Using 48V Telco-type power)	
FCC Class B (Using all other power options)	
UL/cUL, CE	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)





10/100 Mbps Managed Multi-port Optical Demarcation Device

AccessEtherLinX/4

PRODUCT FEATURES

- Independent RJ45 ports for flexible configuration
- SNMP Manageable
- Read/Write IEEE 802.1Q VLAN-tags
- Bi-directional Bandwidth control
- Linkloss and FiberAlert
- Selective Advertising

The AccessEtherLinX/4 enables service providers to offer differentiated, "Transparent LAN" services to multi-tenant building and business customers. Residing at the customer premises, the AccessEtherLinX/4 provides a VLAN-based, Layer 2 entry point to the last mile fiber network, trunking, differentiating and separating customer traffic.

Featuring SNMP management, 802.1Q VLAN, 802.1p QoS, traffic prioritization, bandwidth control and multicast pruning/snooping (using IGMP v1, v2), the AccessEtherLinX/4 is perfect for a wide range of Fiber to-the-Home, Fiber-to-the-Curb and Fiber-to-the-Business (collectively "FTTx") services, and is an ideal solution for delivering those Ethernet based services to customers quickly and cost-effectively. Designed with a small footprint, the AccessEtherLinX/4 facilitates easy installation inside the premises.

Bandwidth control and 802.1Q VLAN compatibility built-in:
The AccessEtherLinX/4 accepts traffic containing VLAN tags on the Uplink port and directs traffic to the twisted pair downlink ports or to management based on VLAN ID. In addition to assigning 802.1Q VLAN-tags on a per-port basis, priority can be defined for each port and SNMP tag; traffic is divided into a hi/low level for packet prioritization in the queue. The AccessEtherLinX/4 also includes bi-directional bandwidth control, and supports IGMP multicast pruning to ensure the necessary amount of IP multicast packets are bridged.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39949 - Rackmount Shelf

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

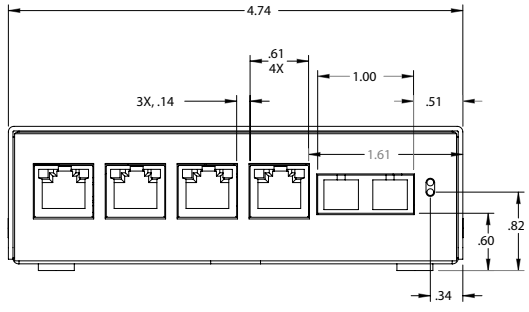
MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
AccessEtherLinX/4					
852-13120			100m	5	RJ45
852-13121	MM1300-ST	1	5 km	4	RJ45
852-13122	MM1300-SC	1	5 km	4	RJ45
852-13123	SM1310/PLUS-ST	1	40 km	4	RJ45
852-13124	SM1310/PLUS-SC	1	40 km	4	RJ45
852-13125	SM1310/LONG-ST	1	80 km	4	RJ45
852-13126	SM1310/LONG-SC	1	80 km	4	RJ45
852-13127	SM1550/LONG-SC	1	80 km	4	RJ45
SINGLE STRAND FIBER *					
852-10133	SSFX-SM1310-SC	1	20 km	4	RJ45
852-10134	SSFX-SM1550-SC	1	20 km	4	RJ45
852-10135	SSFX-SM1310/ PLUS-SC	1	40 km	4	RJ45
852-10136	SSFX-SM1550/ PLUS-SC	1	40 km	4	RJ45
852-10137	SSFX-SM1310/ LONG-SC	1	60 km	4	RJ45
852-10138	SSFX-SM1550/ LONG-SC	1	60 km	4	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

AccessEtherLinX/4 also available in CWDM Fiber. Call for details.

MECHANICAL DIAGRAM

(dimensions in inches)

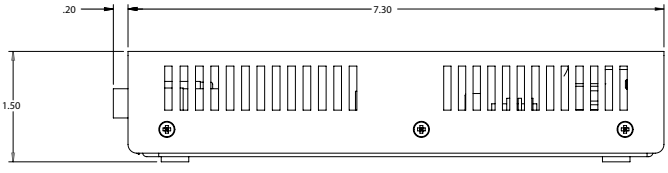


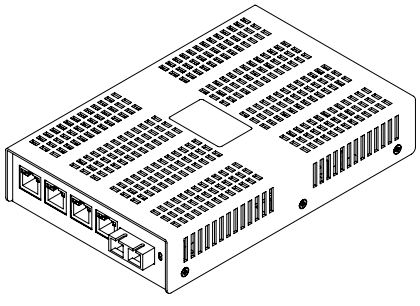
10/100 Mbps Managed Multi-port Optical Demarcation Device

AccessEtherLinX/4

SPECIFICATIONS

ETHERNET TYPES SUPPORTED
IEEE 802.3i Ethernet 10Base-T
IEEE 802.3u Fast Ethernet (100Base-TX and 100Base-FX)
Features Auto Negotiation and Selective Advertising
Supports Half and Full-Duplex operation
Includes bi-directional bandwidth control
Read/write IEEE 802.1Q VLAN-tags
QoS - IEEE 802.1p-based packet prioritization (two queues [high/low] with eight priority levels)
Supports IGMP multicast pruning (v1/v2)
Layer 2 packet switching, store and forward operation
Includes LinkLoss and FiberAlert
Forwarding rate: 14,881 pps for 10 Mbps; 148,810pps for 100 Mbps
1024 MAC address learning
MTU: Supports over-sized packets up to 1916 bytes
MANAGEMENT
Includes GUI-based iView² software
SNMP V1 and V2c compatible
Supports Telnet and RS-232 Craft
Managed through uplink
IEEE 802.3x compliant for Flow Control
Includes DHCP and TFTP clients for remote management and upgrades
Includes diagnostic LEDs
IMC MIB
Traps (Cold Start, Warm Start, Link Up, Link Down, Authentication Failure)
Link Status of Ports
Port Type
Fiber Type
User-Definable Name of Product
User-Definable ID/Name for Ports
Enable/Disable Ports
Enable/Disable FiberAlert
Set for Auto Negotiation/Selective Advertising
Force speed and Duplex Mode for twisted pair ports





MIB-II (RFC 1213)
Packets Transmitted
Packets Received
Octets (bytes) Transmitted
Octets (bytes) Received
Unicast Packets Transmitted
Unicast Packets Received
Non-Unicast Packets Transmitted
Non-Unicast Packets Received
Errors Received
Plus All Standard MIB II Objects
RMON STATISTICS
Drop Events
Collisions
Total Bytes
Total Packets
Fragments
Jabbers
Broadcast Packets
Multicast Packets
CRC Align Errors
Under & oversize Packets
Distribution of Frame Size
TRANSMISSION DOT 3 (RFC1643)
Alignment Errors
Single Collision Frames
CRC Errors
SQE Test Errors
Late Collisions
Frame Too Long
Excessive Collisions
Deferred Transmissions
Multiple Collision Frames

MECHANICAL	
Dimensions	1.5" H x 4.75" W x 7.25" D (3.18 cm x 12.07 cm x 18.42 cm)
Enclosure	Metal
Shipping Weight	1.6 lbs. (0.6 kg)
POWER RATING	
100-240 VAC, 50/60Hz, 1.0A	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature	-13° to +158° F (-25° to +70° C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

10/100/1000 Mbps Managed Multi-port Optical Demarcation Device

Giga-AccessEtherLinX-II AC Version

PRODUCT FEATURES

- 802.1Q VLAN-tags on per-port basis, based on DiffServ or PRI values
- SNMP Manageable
- QoS - 802.1p-based packet prioritization
- Per-port bi-directional Bandwidth control
- VLAN-tagging and Q-in-Q (double-tagging) segregates customer traffic
- Up and running in less then five minutes

The Giga-AccessEtherLinX-II enables service providers to offer differentiated "Transparent LAN" services to multi-tenant building and business customers without the need for costly remote routers. Residing at the customer premises, the Giga-AccessEtherLinX-II provides a VLAN-based, Layer 2 entry point to the last mile fiber network to support trunking, differentiating and separating customer traffic. Featuring SNMP management with per-port 802.1Q VLAN, 802.1p QoS, traffic prioritization, bandwidth control and multicast pruning/snooping (using IGMP v1, v2), the Giga-AccessEtherLinX-II is perfect for a wide range of Fiber-to-the-Home, Fiber-to-the-Curb and Fiber-to-the-Business (FTTx) services, and is an ideal solution for delivering Ethernet-based services to customers quickly and cost effectively. Designed with a small footprint, the Giga-AccessEtherLinX-II facilitates easy installation inside the premises. It features four 10/100/1000 twisted pair Ethernet downlink ports (for connecting users/LANs), with either a 1000Base-FX fiber or SFP uplink port, and is powered from an internal AC or DC power supply.

The Giga-AccessEtherLinX-II accepts traffic containing VLAN tags on the Uplink port and directs that traffic to the twisted pair downlink ports based on the VLAN ID. In addition to assigning 802.1Q VLAN-tags on a per-port basis, users can also "Qualify" the different VLAN TAGS to assign based on the DiffServ or PRI value of the incoming frame. Traffic priority for each port is supported with a hi/low prioritization queues. The Giga-AccessEtherLinX-II includes per port bi-directional bandwidth control, and supports IGMP multicast pruning which ensures only the necessary amount of IP multicast packets are bridged.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
Giga-AccessEtherLinX-II AC					
852-10302	SFP	1	Various	4	RJ45
852-10303	SX-MM850-SC	1	550 m	4	RJ45
852-10304	LX-SM1310-SC	1	15 km	4	RJ45
852-10305	LX-SM1310/PLUS-SC	1	40 km	4	RJ45
852-10306	LX-SM1550/PLUS-SC	1	80 km	4	RJ45
852-10307	LX-SM1550/XLONG-SC	1	100 km	4	RJ45
SINGLE STRAND FIBER *					
852-10310	SSLX-SM1310-SC	1	15 km	4	RJ45
852-10311	SSLX-SM1550-SC	1	15 km	4	RJ45
852-10312	SSBX-SM1310-SC	1	10 km	4	RJ45
852-10313	SSBX-SM1490-SC	1	10 km	4	RJ45
852-10314	SSLX-SM1310/PLUS-SC	1	40 km	4	RJ45
852-10315	SSLX-SM1550/PLUS-SC	1	40 km	4	RJ45
852-10316	SSBX-SM1310/PLUS-SC	1	30 km	4	RJ45
852-10317	SSBX-SM1490/PLUS-SC	1	30 km	4	RJ45
852-10318	SSLX-SM1490/LONG-SC	1	70 km	4	RJ45
852-10319	SSLX-SM1550/LONG-SC	1	70 km	4	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

Giga-AccessEtherLinX-II also available in CWDM Fiber. Call for details.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39949 - Rackmount Shelf

iView: Windows 2000/XP/Vista/Win7

10/100/1000 Mbps Managed Multi-port Optical Demarcation Device

Giga-AccessEtherLinX-II AC Version

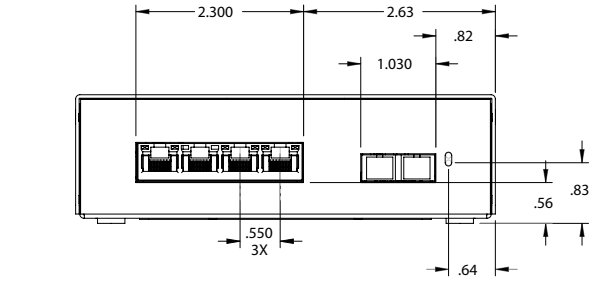
SPECIFICATIONS

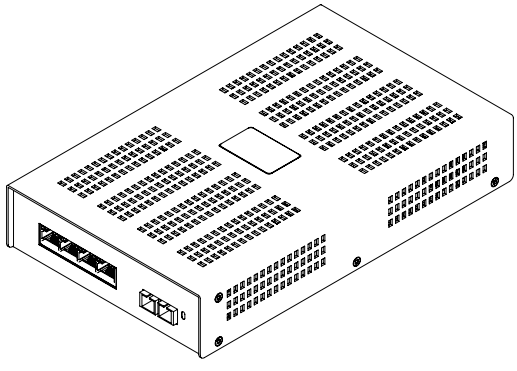
GENERAL
Monitors (remote) status without a physical presence or separate “IP” connection through UMA
Maintains security; all management traffic can remain isolated from the data traffic
Read/write IEEE 802.1Q VLAN-tags
Q-in-Q (double-tagging) to further segregate customer VLAN traffic
Can assign different TAGS based on DiffServ or PRI values of incoming frames.
QoS: IEEE 802.1p-based or DSCP packet prioritization (2 queues [high/low] with 8 levels of priority)
VLAN Tag-based on DSCP or priority of incoming frame (“traffic grooming”)
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps; 1,488,100 pps for 1000 Mbps
Includes per-port bi-directional bandwidth control
AutoCross for MDI/MDIX
Features Auto Negotiation and Selective Advertising
MTU: Supports packets up to 9600 bytes
Supports Half- and Full-Duplex operation
Supports IEEE 802.3x Flow Control
MANAGEMENT
Includes GUI-based iView² software, featuring iConfig utility for rapid IP configuration
SNMP V1 and V2c compatible
Includes DHCP client for IP address assignment
Features TFTP client for remote upgrades
Supports Telnet - Includes DB-9 connector for serial configuration
Includes per port loopback test modes
Includes diagnostic LEDs
ETHERNET PROTOCOLS SUPPORTED
802.3 10Base-T twisted pair
802.3u 100Base-TX twisted pair
802.3ab 1000Base-T twisted pair
802.3z 1000Base-LX or SX fiber

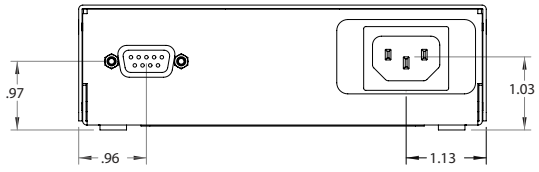
MECHANICAL	
Dimensions	1.64” H x 5.64” W x8.95” D (4.2 cm x 14.3 cm x 22.7 cm)
Enclosure	Metal
Shipping Weight	1.6 lbs. (0.6 kg)
POWER RATING	
100-240V AC, 50/60Hz, 0.5/0.25A	
ENVIRONMENTAL	
Operating Temperature	+32° to 122° F (0° to +50° C)
Storage Temperature	-13° to +158°F (-25° to +70°C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CE, CB	

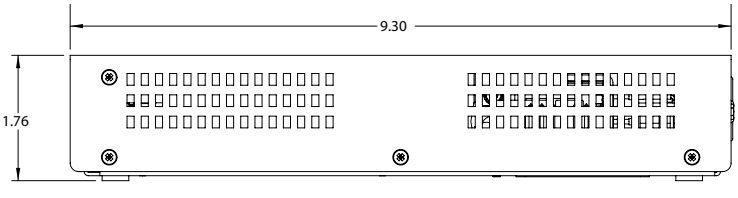
MECHANICAL DIAGRAM

(dimensions in inches)









10/100/1000 Mbps Managed Multi-port Optical Demarcation Device

Giga-AccessEtherLinX-II DC Version

PRODUCT FEATURES

- 802.1Q VLAN-tags on per-port basis, based on DiffServ or PRI values
- SNMP Manageable
- QoS - 802.1p-based packet prioritization
- Per-port bi-directional Bandwidth control
- VLAN-tagging and Q-in-Q (double-tagging) segregates customer traffic
- Up and running in less then five minutes

The Giga-AccessEtherLinX-II enables service providers to offer differentiated "Transparent LAN" services to multi-tenant building and business customers without the need for costly remote routers. Residing at the customer premises, the Giga-AccessEtherLinX-II provides a VLAN-based, Layer 2 entry point to the last mile fiber network to support trunking, differentiating and separating customer traffic. Featuring SNMP management with per-port 802.1Q VLAN, 802.1p QoS, traffic prioritization, bandwidth control and multicast pruning/snooping (using IGMP v1, v2), the Giga-AccessEtherLinX-II is perfect for a wide range of Fiber-to-the-Home, Fiber-to-the-Curb and Fiber-to-the-Business (FTTx) services, and is an ideal solution for delivering Ethernet-based services to customers quickly and cost effectively. Designed with a small footprint, the Giga-AccessEtherLinX-II facilitates easy installation inside the premises. It features four 10/100/1000 twisted pair Ethernet downlink ports (for connecting users/LANs), with either a 1000Base-FX fiber or SFP uplink port, and is powered from an internal AC or DC power supply.

The Giga-AccessEtherLinX-II accepts traffic containing VLAN tags on the Uplink port and directs that traffic to the twisted pair downlink ports based on the VLAN ID. In addition to assigning 802.1Q VLAN-tags on a per-port basis, users can also "Qualify" the different VLAN TAGS to assign based on the DiffServ or PRI value of the incoming frame. Traffic priority for each port is supported with a hi/low prioritization queues. The Giga-AccessEtherLinX-II includes per port bi-directional bandwidth control, and supports IGMP multicast pruning which ensures only the necessary amount of IP multicast packets are bridged.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
Giga-AccessEtherLinX-II DC					
852-32302	SFP	1	Various	4	RJ45
852-32303	SX-MM850-SC	1	550 m	4	RJ45
852-32304	LX-SM1310-SC	1	15 km	4	RJ45
852-32305	LX-SM1310/PLUS-SC	1	40 km	4	RJ45
852-32306	LX-SM1550/PLUS-SC	1	80 km	4	RJ45
852-32307	LX-SM1550/XLONG-SC	1	100 km	4	RJ45
SINGLE STRAND FIBER *					
852-32310	SSLX-SM1310-SC	1	15 km	4	RJ45
852-32311	SSLX-SM1550-SC	1	15 km	4	RJ45
852-32312	SSBX-SM1310-SC	1	10 km	4	RJ45
852-32313	SSBX-SM1490-SC	1	10 km	4	RJ45
852-32314	SSLX-SM1310/PLUS-SC	1	40 km	4	RJ45
852-32315	SSLX-SM1550/PLUS-SC	1	40 km	4	RJ45
852-32316	SSBX-SM1310/PLUS-SC	1	30 km	4	RJ45
852-32317	SSBX-SM1490/PLUS-SC	1	30 km	4	RJ45
852-32318	SSLX-SM1490/LONG-SC	1	70 km	4	RJ45
852-32319	SSLX-SM1550/LONG-SC	1	70 km	4	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

Giga-AccessEtherLinX-II DC also available in CWDM Fiber. Call for details.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39949 - Rackmount Shelf

iView: Windows 2000/XP/Vista/Win7

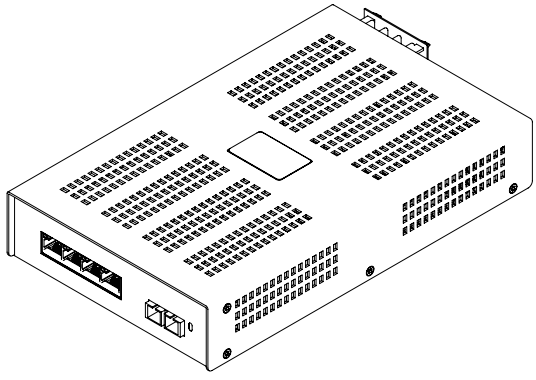
10/100/1000 Mbps Managed Multi-port Optical Demarcation Device

Giga-AccessEtherLinX-II DC Version

SPECIFICATIONS

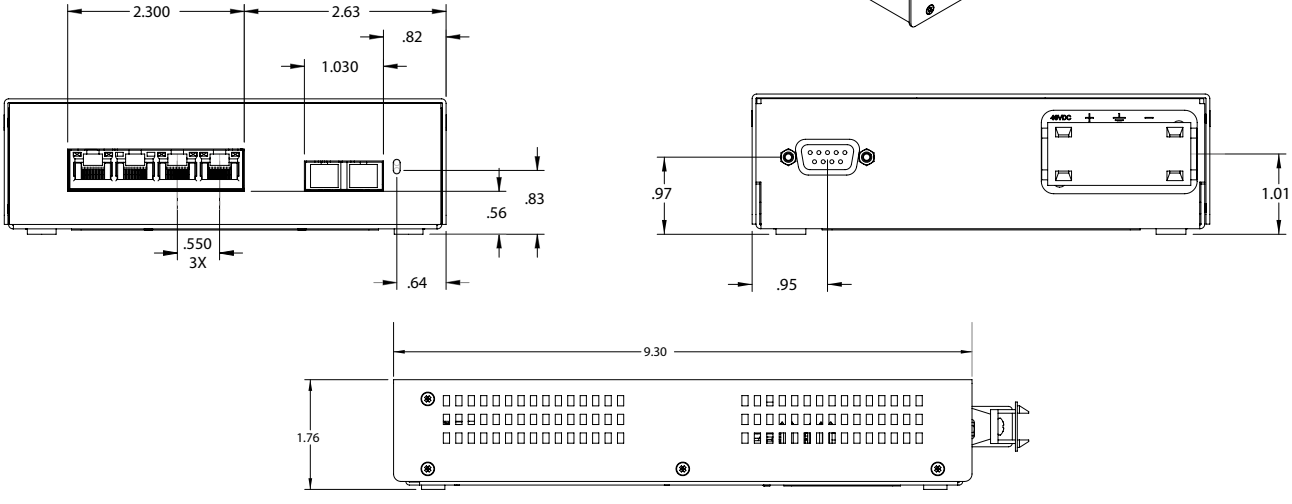
GENERAL
Monitors (remote) status without a physical presence or separate “IP” connection through UMA
Maintains security; all management traffic can remain isolated from the data traffic
Read/write IEEE 802.1Q VLAN-tags
Q-in-Q (double-tagging) to further segregate customer VLAN traffic
Can assign different TAGS based on DiffServ or PRI values of incoming frames.
QoS: IEEE 802.1p-based or DSCP packet prioritization (2 queues [high/low] with 8 levels of priority)
VLAN Tag-based on DSCP or priority of incoming frame (“traffic grooming”)
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps; 1,488,100 pps for 1000 Mbps
Includes per-port bi-directional bandwidth control
AutoCross for MDI/MDIX
Features Auto Negotiation and Selective Advertising
MTU: Supports packets up to 9600 bytes
Supports Half- and Full-Duplex operation
Supports IEEE 802.3x Flow Control
MANAGEMENT
Includes GUI-based iView² software, featuring iConfig utility for rapid IP configuration
SNMP V1 and V2c compatible
Includes DHCP client for IP address assignment
Features TFTP client for remote upgrades
Supports Telnet - Includes DB-9 connector for serial configuration
Includes per port loopback test modes
Includes diagnostic LEDs
ETHERNET PROTOCOLS SUPPORTED
802.3 10Base-T twisted pair
802.3u 100Base-TX twisted pair
802.3ab 1000Base-T twisted pair
802.3z 1000Base-LX or SX fiber

MECHANICAL	
Dimensions	1.64” H x 5.64” W x8.95” D (4.2 cm x 14.3 cm x 22.7 cm)
Enclosure	Metal
Shipping Weight	1.6 lbs. (0.6 kg)
POWER RATING	
100-240V AC, 50/60Hz, 0.5/0.25A	
ENVIRONMENTAL	
Operating Temperature	+32° to 122° F (0° to +50° C)
Storage Temperature	-13° to +158°F (-25° to +70°C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CE, CB	



MECHANICAL DIAGRAM

(dimensions in inches)



10/100 Mbps Managed Optical Demarcation Module

iMcV-FiberLinX-II

PRODUCT FEATURES

- Q-in-Q Extra/Tagging
- SNMP Manageable
- OAM 802.3ag/ah (Operation, Administration & Management)
- Per-port bi-directional Bandwidth control
- Features powerful LinkLoss, FiberAlert and loopback troubleshooting
- All management traffic remains isolated from the remote LAN

The iMcV-FiberLinX-II intelligent media converter connects a Host/Remote Ethernet network over a fiber optic or CAT 5 copper connection. It combines media conversion with an advanced-feature set for network management and troubleshooting, including OAM (Operations, Administration and Maintenance), Extra-Tagging and EtherType control functionality. With the iMcV-FiberLinX-II, administrators can observe the end-points over the fiber segment between them, as a single management entity. Bandwidth scalability and support for MIBs II makes this modular device a cost-effective solution.

iMcV-FiberLinX-II allows for remote configuration and alerts administrators to any potential problems on the long-haul fiber run, provides vital information on link condition and reports data traffic statistics.. In addition to the iMcV-FiberLinX-II's support for Host/Remote environments, the product also has built-in support for the Unified Management Agent (UMA). With UMA, the central location can manage all Host/Remote pairs installed in an iMediaChassis with the single IP address of the chassis.

Optional single- or dual-SFP port versions or all copper (RJ-45) port versions are also available for complete network flexibility. The iMcV-FiberLinX-II SFP requires one or two MSA-compliant fiber optic SFP modules (sold separately) to operate. [Copper SFPs are not supported.]

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-FiberLinX-II TX/SFP, TX/TX					
856-14500	SFP	1	Various	2	RJ45
856-14501	SFP	2	Various	1	RJ45
856-14010			100 m	3	RJ45
iMcV-FiberLinX-II TX/FX					
856-14011	MM1300-ST	1	5 km	2	RJ45
856-14012	MM1300-SC	1	5 km	2	RJ45
856-14015	SM1310/PLUS-ST	1	40 km	2	RJ45
856-14016	SM1310/PLUS-SC	1	40 km	2	RJ45
856-14017	SM1310/LONG-ST	1	80 km	2	RJ45
856-14018	SM1310/LONG-SC	1	80 km	2	RJ45
856-14021	SM1550/LONG-SC	1	80 km	2	RJ45
856-14022	SM1550/XLONG-SC	1	100 km	2	RJ45
SINGLE STRAND FIBER *					
856-14039	SSFX-MM1310-SC	1	2 km	2	RJ45
856-14040	SSFX-MM1550-SC	1	2 km	2	RJ45
856-14043	SSFX-SM1310-SC	1	20 km	2	RJ45
856-14044	SSFX-SM1550-SC	1	20 km	2	RJ45
856-14045	SSFX-SM1310/PLUS-SC	1	40 km	2	RJ45
856-14046	SSFX-SM1550/PLUS-SC	1	40 km	2	RJ45
856-14047	SSFX-SM1310/LONG-SC	1	60 km	2	RJ45
856-14048	SSFX-SM1550/LONG-SC	1	60 km	2	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-FiberLinX-II also available in CWDM Fiber. Call for details.

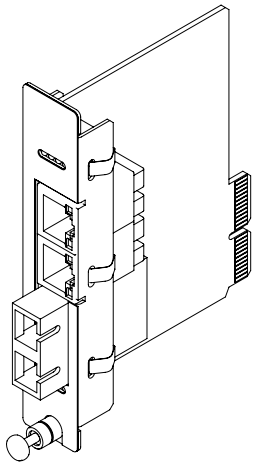
10/100 Mbps Managed Optical Demarcation Module

iMcV-FiberLinX-II

SPECIFICATIONS

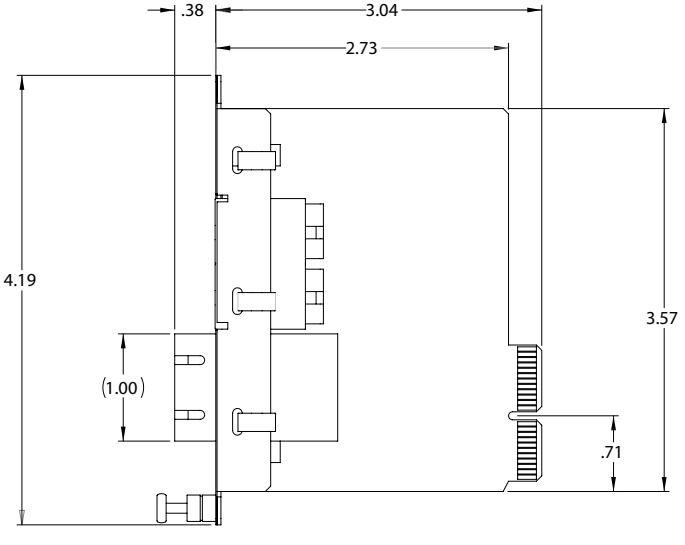
GENERAL
Preserves complete end-to-end fiber connection integrity
Broadcast Storm Protection
Supports Extra Tagging (Q-in-Q) and selectable EtherTypes
Bi-directional bandwidth control
Supports 802.3ag/ah OAM (Operation, Administration & Management)
ITU-T Y.1731 End-to-end service
Read/write IEEE 802.1Q VLAN-tags
QoS: IEEE 802.1p-based packet prioritization (2 queues [high/low] with 8 levels of priority)
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps
AutoCross for MDI/MDIX
Features Auto Negotiation and Selective Advertising
Supports Half and Full-Duplex operation
MTU: Supports over-sized (Jumbo) packets up to 1916 bytes per packet
MANAGEMENT
SNMP V1 and V2c compatible
Includes GUI-based iView² software for remote management and upgrades
Monitors far-end (remote) status without a physical presence or separate connection
IEEE 802.3x Flow Control
Includes DHCP and TFTP clients
Supports Telnet
Includes loopback test modes (MAC swap)
Includes LinkLoss and FiberAlert
Supports the Unified Management Agent (UMA)
ETHERNET PROTOCOLS SUPPORTED
IEEE 802.3i 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3u 100Base-FX or SX fiber

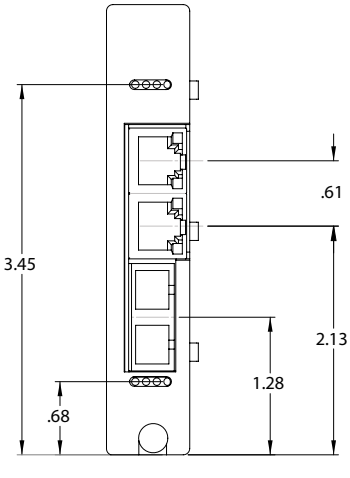
MECHANICAL	
Dimensions	Standard single-slot chassis module
Shipping Weight	4 oz.
POWER CONSUMPTION	
850mA at 3.3V	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature	0° to +160° F (-20° to +70° C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CE, CSA, CB	

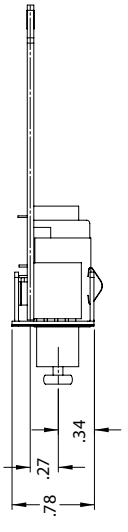


MECHANICAL DIAGRAM

(dimensions in inches)







10/100/1000 Mbps Managed Optical Demarcation Module

iMcV-Giga-FiberLinX-II

PRODUCT FEATURES

- VLAN-Tagging and Q-in-Q Extra/Tagging
- SNMP Manageable
- OAM 802.3ah (Operation, Administration & Management)
- Bi-directional Bandwidth control
- Features powerful LinkLoss, FiberAlert and loopback troubleshooting
- All management traffic remains isolated from the remote LAN

The iMcV-Giga-FiberLinX-II intelligent media converter connects a Host/Remote Ethernet network over a fiber optic or CAT 5 copper connection. It combines media conversion with an advanced-feature set for network management and troubleshooting, including OAM (Operations, Administration and Maintenance), Extra-Tagging and EtherType control functionality. With the iMcV-Giga-FiberLinX-II, administrators can observe the end-points over the fiber segment between them, as a single management entity. Bandwidth scalability and support for MIBs II makes this modular device a versatile gigabit solution, now available as a single wide module.

iMcV-Giga-FiberLinX-II allows for remote configuration and alerts administrators to any potential problems on the long-haul fiber run, provides vital information on link condition and reports data traffic statistics.. In addition to the iMcV-Giga-FiberLinX-II's support for Host/Remote environments, the product also has built-in support for the Unified Management Agent (UMA). With UMA, the central location can manage all Host/Remote pairs installed in an iMediaChassis with the single IP address of the chassis.

Optional single- or dual-SFP port versions or all copper (RJ-45) port versions are also available for complete network flexibility. The iMcV-Giga-FiberLinX-II SFP requires one or two MSA-compliant fiber optic SFP modules (sold separately) to operate. [Copper SFPs are not supported.]

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-Giga-FiberLinX-II TX/SFP					
856-14760	SFP	1	Various	2	RJ45
856-14761	SFP	2	Various	1	RJ45
iMcV-Giga-FiberLinX-II TX/SX, TX/LX					
856-14869	MM850-SC	1	220/550 m	2	RJ45
856-14870	SM1310-SC	1	15 km	2	RJ45
856-14871	SM1310/PLUS-SC	1	40 km	2	RJ45
856-14872	SM1550/LONG-SC	1	80 km	2	RJ45
856-14881	SM1550/XLONG-SC	1	100 km	2	RJ45
SINGLE STRAND FIBER *					
856-14873	SSLX-SM1310-SC	1	15 km	2	RJ45
856-14874	SSLX-SM1550-SC	1	15 km	2	RJ45
856-14890	SSBX-SM1310-SC	1	10 km	2	RJ45
856-14891	SSBX-SM1490-SC	1	10 km	2	RJ45
856-14892	SSBX-SM1310/PLUS-SC	1	30 km	2	RJ45
856-14893	SSBX-SM1490/PLUS-SC	1	30 km	2	RJ45
856-14875	SSLX-SM1310/PLUS-SC	1	40 km	2	RJ45
856-14876	SSLX-SM1550/PLUS-SC	1	40 km	2	RJ45
856-14877	SSLX-SM1490/LONG-SC	1	70 km	2	RJ45
856-14878	SSLX-SM1550/LONG-SC	1	70 km	2	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-Giga-FiberLinX-II also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

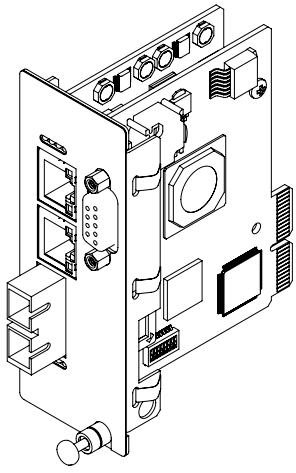
10/100/1000 Mbps Managed Optical Demarcation Module

iMcV-Giga-FiberLinX-II

SPECIFICATIONS

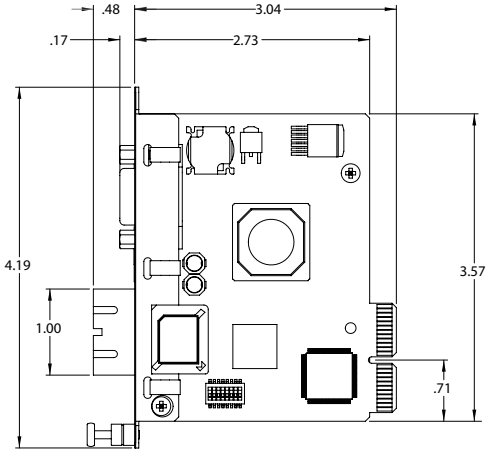
GENERAL
Preserves complete end-to-end fiber connection integrity
Supports Extra Tagging (Q-in-Q)
Supports 802.3ah OAM (Operation, Administration & Management)
Bi-directional bandwidth control
Read/write IEEE 802.1Q VLAN-tags
QoS: IEEE 802.1p-based packet prioritization (2 queues [high/low] with 8 levels of priority)
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps; 1,488,100 pps for 1000 Mbps
Auto-Cross for MDI/MDIX
Features Auto Negotiation and Selective Advertising
Supports Half and Full-Duplex operation
MTU: Supports over-sized (Jumbo) packets up to 12196 bytes
SECURITY
Password Control
Multiple Access Levels: User Assigned Accounts & Access Levels
MANAGEMENT
SNMP V1 and V2c compatible
Includes GUI-based iView² software for remote management and upgrades
Monitors far-end (remote) status without a physical presence or separate connection
IEEE 802.3x Flow Control
Includes DHCP and TFTP clients
Supports Telnet
Includes loopback test modes (MAC swap)
Includes LinkLoss and FiberAlert
Supports the Unified Management Agent (UMA)
Includes status LEDs
ETHERNET PROTOCOLS SUPPORTED
IEEE 802.3i 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3x Flow Control
IEEE 802.3z 1000Base-X fiber
IEEE 802.ab 1000Base-T twisted pair

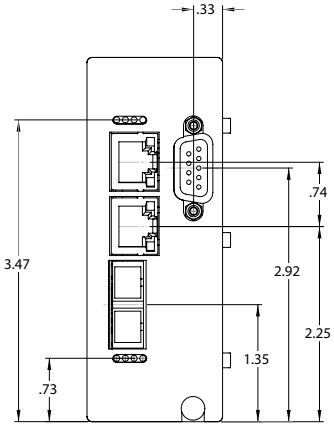
MECHANICAL	
Dimensions	Double Wide Module
Shipping Weight	0.8 lbs (0.36 kg)
POWER CONSUMPTION	
580mA at 5V	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature	-13° to +158° F (-25° to +70° C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CE, CSA	

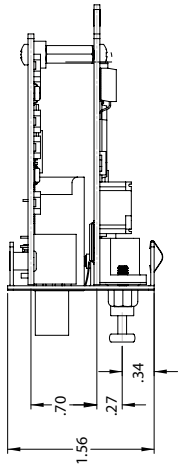


MECHANICAL DIAGRAM

(dimensions in inches)







10/100/1000 Mbps Managed Optical Demarcation Module

iMcV-Giga-FiberLinX-III

PRODUCT FEATURES

- Single wide module, allowing maximum use of slots in multi-port chassis
- 3 mode of Operation, to ease the use of installation
- SFP port model supports both copper and fiber SFPs
- Backwards compatible with the iMcV-Giga-FiberLinX-II
- Offers up to 64 VLANs

The iMcV-Giga-FiberLinX-III intelligent media converter connects a Host/Remote Ethernet network over a fiber optic or CAT 5 copper connection. It combines media conversion with an advanced-feature set for network management and troubleshooting, including OAM (Operations, Administration and Maintenance), Extra-Tagging and EtherType control functionality. With the iMcV-Giga-FiberLinX-III, administrators can observe the end-points over the fiber segment between them, as a single management entity. Bandwidth scalability and support for MIBs II makes this modular device a versatile gigabit solution, now available as a single wide module.

iMcV-Giga-FiberLinX-III allows for remote configuration and alerts administrators to any potential problems on the long-haul fiber run, provides vital information on link condition and reports data traffic statistics.. In addition to the iMcV-Giga-FiberLinX-III's support for Host/Remote environments, the product also has built-in support for the Unified Management Agent (UMA). With UMA, the central location can manage all Host/Remote pairs installed in an iMediaChassis with the single IP address of the chassis.

Optional single- or dual-SFP port versions or all copper (RJ-45) port versions are also available for complete network flexibility. The iMcV-Giga--FiberLinX-III SFP requires one or two MSA-compliant fiber optic SFP modules (sold separately) to operate. [Copper SFPs are not supported.]

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-Giga-FiberLinX-III TX/SFP					
856-14201	TX/SFP	1	Various	2	RJ45
iMcV-Giga-FiberLinX-II TX/SX, TX/LX					
856-14201	SX-MM850-SC	1	220/550 m	2	RJ45
856-14206	LX-SM1310-SC	1	10 km	2	RJ45
856-14207	LX-SM1310/PLUS-SC	1	40 km	2	RJ45
856-14208	LX-SM1550/LONG-SC	1	80 km	2	RJ45
856-14209	LX-SM1550/XLONG-SC	1	100 km	2	RJ45
SINGLE STRAND FIBER *					
856-14220	SSLX-SM1310-SC (1550 rcv)	1	15 km	2	RJ45
856-14221	SSLX-SM1550-SC (1310 rcv)	1	15 km	2	RJ45
856-14222	SSBX-SM1310-SC (1490 rcv)	1	10 km	2	RJ45
856-14223	SSBX-SM1490-SC (1310 rcv)	1	10 km	2	RJ45
856-14224	SSBX-SM1310/PLUS-SC (1490 rcv)	1	80 km	2	RJ45
856-14225	SSBX-SM1550/PLUS-SC (1310 rcv)	1	40 km	2	RJ45
856-14226	SSLX-SM1310/PLUS-SC (1550 rcv)	1	30 km	2	RJ45
856-14227	SSLX-SM1490/PLUS-SC (1310 rcv)	1	30 km	2	RJ45
856-14228	SSLX-SM1490/LONG-SC (1550 rcv)	1	70 km	2	RJ45
856-14229	SSLX-SM1550/LONG-SC (1490 rcv)	1	70 km	2	RJ45
856-14230	SSLX-SM1490/XLONG-SC (1550 rcv)	1	80 km	2	RJ45
856-14231	SSLX-SM1550/XLONG-SC (1490 rcv)	1	80 km	2	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-Giga-FiberLinX-III also available in CWDM Fiber. Call for details.

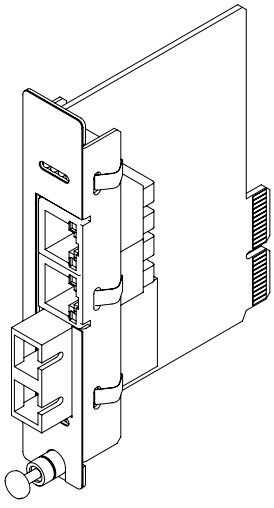
10/100/1000 Mbps Managed Optical Demarcation Module

iMcV-Giga-FiberLinX-III

SPECIFICATIONS

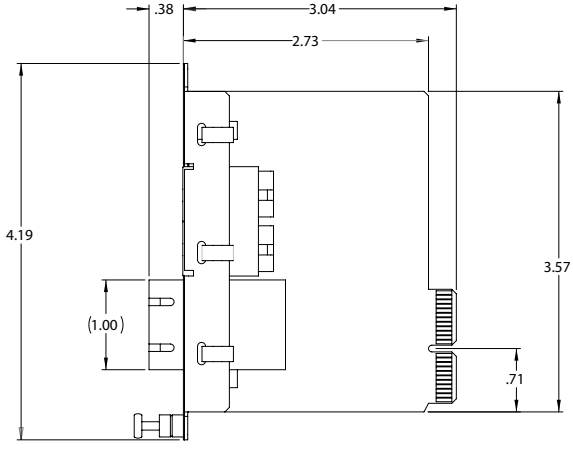
GENERAL
Preserves complete end-to-end fiber connection integrity
Supports Extra Tagging (Q-in-Q)
Supports 802.3ah OAM (Operation, Administration & Management)
Support 802.1ag
Bi-directional bandwidth control
Read/write IEEE 802.1Q VLAN-tags
QoS: IEEE 802.1p-based packet prioritization (2 queues [high/low] with 8 levels of priority)
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps; 1,488,100 pps for 1000 Mbps
Features Auto Negotiation and Selective Advertising
Supports up to 64 VLANs operation
MTU: Supports over-sized (Jumbo) packets up to 10240 bytes
SECURITY
Password Control
Multiple Access Levels: User Assigned Accounts & Access Levels
MANAGEMENT
SNMP V1 and V2c compatible
Includes GUI-based iView² software for remote management (WIN and WebServer versions)
Monitors far-end (remote) status without a physical presence or separate connection
IEEE 802.3x Flow Control
Includes DHCP and TFTP clients
Supports Telnet
Includes loopback test modes (MAC swap)
Includes Link Fault Pass Through
Supports Unified Management Agent (UMA)
Includes status LEDs
ETHERNET PROTOCOLS SUPPORTED
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-X fiber
IEEE 802.3x Flow Control
IEEE 802.3i 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair

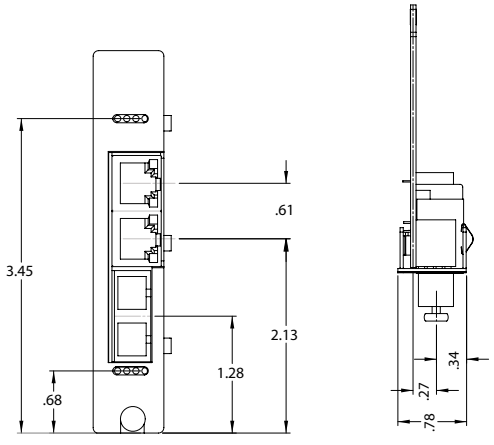
MECHANICAL	
Dimensions	Standard single-slot chassis module
Shipping Weight	0.3 lbs (0.136078 kg)
POWER CONSUMPTION	
731mA at 5V	
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Humidity:	5% - 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	



MECHANICAL DIAGRAM

(dimensions in inches)





10/100 Mbps Managed Optical Demarcation Compact CPE Device

IE-MiniFiberLinX-II

PRODUCT FEATURES

- Loopback troubleshooting
- SNMP Manageable
- Power options: AC, DC and 802.3af Power over Ethernet (PoE)
- Bi-directional Bandwidth control
- MTU: Supports over-sized packets up to 1916
- Supports passive 802.3ah OAM (Operation, Administration & Management

The compact IE-MiniFiberLinX-II provides point-to-point fiber optic connections with a unique management tool to monitor the entire link between two locations. IE-MiniFiberLinX-II CPE for fiber optic networks allows service providers to deliver "triple-play" voice, video and data services to customer premises.

As a copper-to-fiber converter, the IE-MiniFiberLinX-II supports multiple fiber types including multi-mode, single-mode, single-strand fiber (SSF), and Course Wavelength Division Multiplexing (CWDM) functionality to increase the capacity of existing fiber. As a remote, CPE device, it can be connected via the fiber segment to an iMcV-FiberLinX-II Host module to support Host/Remote management.

Equipped with one 100 Mbps fiber data port, one 10/100 twisted pair port for data and management, as well as an auxiliary port designed to function as a serial port (when used with the included adapter), the IE-MiniFiberLinX-II also offers multiple powering options: AC power (with included adapter), DC (through a 4-terminal power block), as well as Power over Ethernet, acting as a Powered Device (PD) to draw power when connected to 802.3af compliant Power Sourcing Equipment (PSE). Telco versions that support -48 VDC are also available.

Combining copper-to-fiber conversion, extended temperature performance, plug-and-play operation, miniature size and multiple power options, the IE-MiniFiberLinX-II is one of the most versatile fiber optic CPE devices available.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

806-39753 - IE-Power/5V Module, AC to DC DIN Rail Power Adapter

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-MiniFiberLinX-II **					
856-19717	MM850-ST	1	2 km	1	RJ45
856-19718	MM850-SC	1	2 km	1	RJ45
856-19722	MM1300-ST	1	5 km	1	RJ45
856-19723	MM1300-SC	1	5 km	1	RJ45
856-19724	SM-1310/PLUS-SC	1	40 km	1	RJ45
856-19725	SM1310/PLUS-SC	1	40 km	1	RJ45
856-19726	SM1310/LONG-SC	1	80 km	1	RJ45
856-19727	SM1310/LONG-SC	1	80 km	1	RJ45
856-19730	SM1550/LONG-SC	1	80 km	1	RJ45
856-19728	SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER *					
856-19750	SSFX-MM1310-SC	1	2 km	1	RJ45
856-19751	SSFX-MM1550-SC	1	2 km	1	RJ45
856-19752	SSFX-SM1310-SC	1	20 km	1	RJ45
856-19753	SSFX-SM1550-SC	1	20 km	1	RJ45
856-19754	SSFX-SM1310/ PLUS-SC	1	40 km	1	RJ45
856-19755	SSFX-SM1550/ PLUS-SC	1	40 km	1	RJ45
856-19756	SSFX-SM1310/ LONG-SC	1	60 km	1	RJ45
856-19757	SSFX-SM1550/ LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

** For a complete list of modules without an AC Adapter, contact IMC Networks

IE-MiniFiberLinX-II also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

10/100 Mbps Managed Optical Demarcation Compact CPE Device

IE-MiniFiberLinX-II

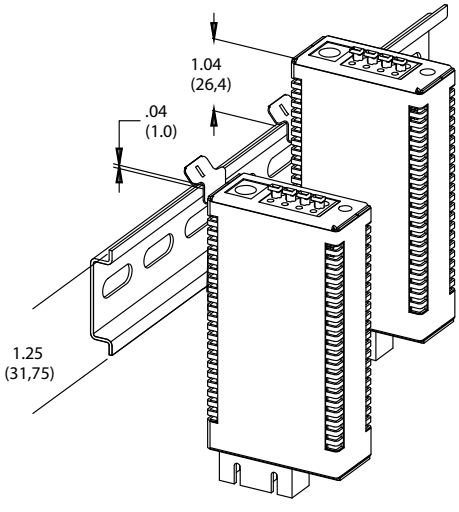
SPECIFICATIONS

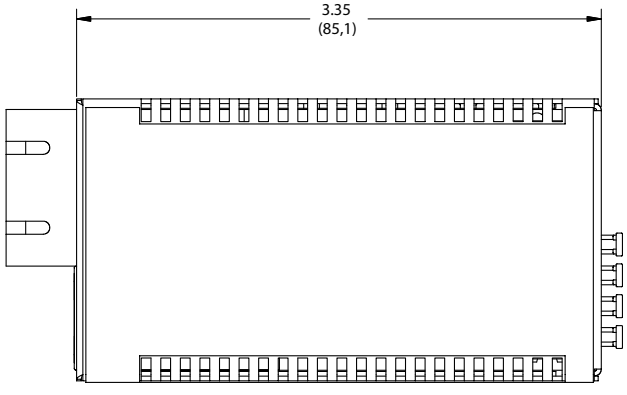
GENERAL
Preserves complete end-to-end fiber connection integrity
Bi-directional bandwidth control (per port, per direction, per VLAN)
Read/write IEEE 802.1Q VLAN-tags
Extra Tagging with Q-in-Q mode (802.1p)
Supports passive 802.3ah OAM (Operation, Administration & Management)
QoS: IEEE 802.1p-based packet prioritization (2 queues [high/low] with 8 levels of priority)
VLAN filtering up to 32 values
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps
AutoCross for MDI/MDIX
Features Auto Negotiation and Selective Advertising
Supports Half and Full-Duplex operation
MTU: Supports over-sized packets up to 1916 bytes per packet
SECURITY
Password Control
Multiple Access Levels: User Assigned Accounts & Access Levels
MANAGEMENT
SNMP V1 and V2c compatible
Includes GUI-based iView² software for remote management and upgrades
Monitors far-end (remote) status without a physical presence or separate connection
IEEE 802.3x Flow Control
Includes DHCP and TFTP clients
Supports Telnet
Includes loopback test modes (MAC swap)
Includes LinkLoss and FiberAlert
Remote capabilities with built-in support for UMA (IP-less management)
RS-232 (Craft) interface for local management
Serial cable for direct connection to a PC's Serial Port

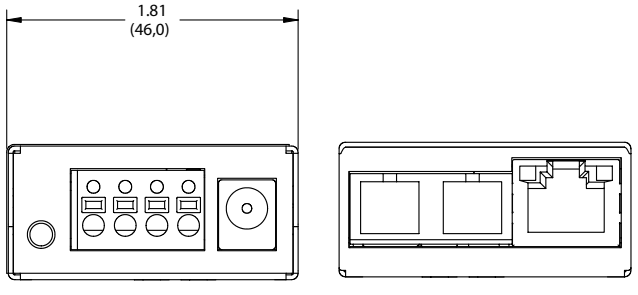
ETHERNET PROTOCOLS SUPPORTED	
EEE 802.3i 10Base-T twisted pair	
IEEE 802.3u 100Base-TX twisted pair	
IEEE 802.3u 100Base-FX or SX fiber	
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
POWER	
AC Wall Adapter: 100 to 240 VAC ±10% input, 5 VDC output, 2A max.	
DC Input Voltage: 12 to 48 VDC *, 1 to .02A, 7 to 50 VDC, 1 to 0.1A	
IEEE 802.3af Power over Ethernet	
ENVIRONMENTAL	
Operating Temperature	+14° to +122°F (-10° to +50°C) AC Adapter -13° to +167°F (-25° to +75°C) DC Adapter
Storage Temperature	-49° to +185° F (-45° to +85° C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CE, CSA, CB	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







10/100 Mbps Managed Optical Demarcation Compact CPE Device

IE-MiniFiberLinX-II/Telco

PRODUCT FEATURES

- Loopback troubleshooting
- SNMP Manageable
- Power options: AC, DC
- Bi-directional Bandwidth control
- MTU: Supports over-sized packets up to 1916
- Supports passive 802.3ah OAM (Operation, Administration & Management

The compact IE-MiniFiberLinX-II/Telco is one of the most versatile fiber optic NID devices available on the market today. It provides point-to-point fiber optic connections with a unique management tool to monitor the entire link between two locations. IE-MiniFiberLinX-II/Telco was designed to work with -48 VDC power that is compliant with the Bellcore GR-499 specification, supporting the minimum and maximum transient voltages, typically required by transport equipment used in Telco environments. Other key features include; carrier grade remote SNMP management, extra tagging using Q-in-Q, and PoE (Power over Ethernet).

As a copper-to-fiber converter, the IE-MiniFiberLinX-II/Telco supports multiple fiber types including multimode, single-mode, single-strand fiber (SSF), and Course Wavelength Division Multiplexing (CWDM) functionality to increase the capacity of existing fiber. As a remote, CPE device, it can be connected via the fiber segment to an iMcV-FiberLinX-II Host module to support Host/Remote management.

Equipped with one 100 Mbps fiber data port, one 10/100 twisted pair port for data and management, as well as an auxiliary port designed to function as a serial port (when used with the included adapter), the IE-MiniFiberLinX-II/Telco also offers multiple powering options: AC power (with included adapter), DC (through a 4-terminal power block).

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-MiniFiberLinX-II/Telco					
856-17620	MM850-ST	1	2 km	1	RJ45
856-17621	MM850-SC	1	2 km	1	RJ45
856-17622	MM1300-ST	1	5 km	1	RJ45
856-17623	MM1300-SC	1	5 km	1	RJ45
856-17626	SM1310/PLUS-ST	1	30 km	1	RJ45
856-17627	SM1310/PLUS-SC	1	30 km	1	RJ45
856-17628	SM1310/LONG-ST	1	80 km	1	RJ45
856-17629	SM1310/LONG-SC	1	80 km	1	RJ45
856-17631	SM1550/LONG-SC	1	80 km	1	RJ45
856-17632	SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER *					
856-17640	SSFX-MM1310-SC	1	2 km	1	RJ45
856-17641	SSFX-MM1550-SC	1	2 km	1	RJ45
856-17642	SSFX-SM1310-SC	1	20 km	1	RJ45
856-17643	SSFX-SM1550-SC	1	20 km	1	RJ45
856-17644	SSFX-SM1310/ PLUS-SC	1	40 km	1	RJ45
856-17645	SSFX-SM1550/ PLUS-SC	1	40 km	1	RJ45
856-17646	SSFX-SM1310/ LONG-SC	1	60 km	1	RJ45
856-17647	SSFX-SM1550/ LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

IE-MiniFiberLinX-II/Telco also available in CWDM Fiber. Call for details.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

806-39753 - IE-Power/5V Module, AC to DC DIN Rail Power Adapter

iView: Windows 2000/XP/Vista/Win7

IN THE FIELD

Chilean Telecommunications Delivers Services Via Fiber

Industry: Enterprise IT

Product: Optical Ethernet Demarcation Module

www.bb-elec.com/ChileCable

Carrier data charges may apply.

10/100 Mbps Managed Optical Demarcation Compact CPE Device

IE-MiniFiberLinX-II/Telco

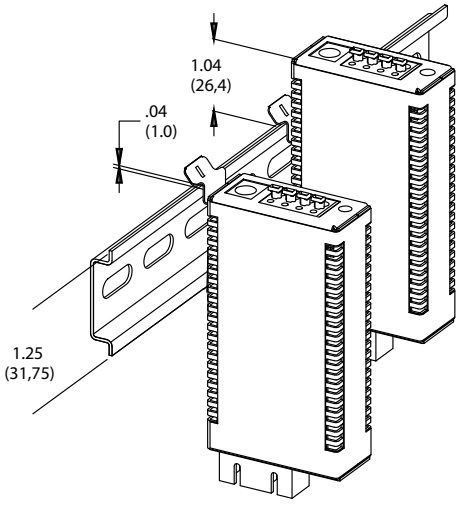
SPECIFICATIONS

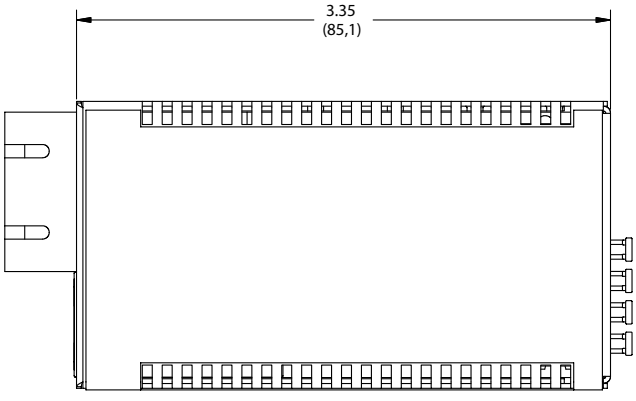
GENERAL
Preserves complete end-to-end fiber connection integrity
Bi-directional bandwidth control (per port, per direction, per VLAN)
Read/write IEEE 802.1Q VLAN-tags
Extra Tagging with Q-in-Q mode (802.1p)
Supports passive 802.3ah OAM (Operation, Administration & Management)
QoS: IEEE 802.1p-based packet prioritization (2 queues [high/low] with 8 levels of priority)
VLAN filtering up to 32 values
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps
AutoCross for MDI/MDIX
Features Auto Negotiation and Selective Advertising
Supports Half and Full-Duplex operation
MTU: Supports over-sized packets up to 1916 bytes per packet
SECURITY
Password Control
Multiple Access Levels: User Assigned Accounts & Access Levels
MANAGEMENT
SNMP V1 and V2c compatible
Includes GUI-based iView² software for remote management and upgrades
Monitors far-end (remote) status without a physical presence or separate connection
IEEE 802.3x Flow Control
Includes DHCP and TFTP clients
Supports Telnet
Includes loopback test modes (MAC swap)
Includes LinkLoss and FiberAlert
Remote capabilities with built-in support for UMA (IP-less management)
RS-232 (Craft) interface for local management
Serial cable for direct connection to a PC's Serial Port

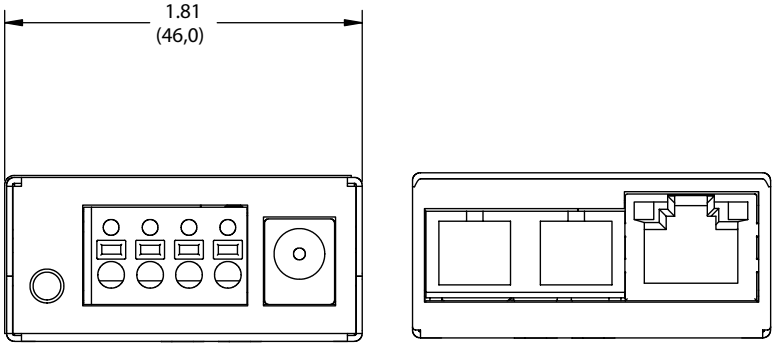
ETHERNET PROTOCOLS SUPPORTED	
EEE 802.3i 10Base-T twisted pair	
IEEE 802.3u 100Base-TX twisted pair	
IEEE 802.3u 100Base-FX or SX fiber	
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
POWER	
AC Wall Adapter: 100 to 240 VAC ±10% input, 5 VDC output, 2A max.	
DC Input Voltage: 12 to 48 VDC *, 1 to .02A, 7 to 50 VDC, 1 to 0.1A	
ENVIRONMENTAL	
Operating Temperature	+14° to +122° F (-10° to +50° C) AC Adapter -13° to +167° F (-25° to +75° C) DC Adapter -49° to +185° F (-45° to +85° C) DC Telco
Storage Temperature	-49° to +185° F (-45° to +85° C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CE, CSA, CB	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







10/100 Mbps Managed Optical Demarcation Compact CPE Device

IE-MiniFiberLinX-II/LastGasp

PRODUCT FEATURES

- Loopback troubleshooting
- SNMP Manageable
- Power options: AC, DC and 802.3af Power over Ethernet (PoE)
- Bi-directional Bandwidth control
- MTU: Supports over-sized packets up to 1916
- Supports passive 802.3ah OAM (Operation, Administration & Management

The compact IE-MiniFiberLinX-II/LastGasp is one of the most versatile fiber optic NID devices available on the market today. It provides point-to-point fiber optic connections with a unique management tool to monitor the entire link between two locations. IE-MiniFiberLinX-II/Last Gasp was designed to work with -48 VDC power that is compliant with the Bellcore GR-499 specification, supporting the minimum and maximum transient voltages, typically required by transport equipment used in Telco environments. Additionally, the product offers Last Gasp, a Trap notification feature that identifies when the power lines are down or of a possible power supply failure. Other key features include; carrier grade remote SNMP management, extra tagging using Q-in-Q, and PoE (Power over Ethernet).

As a copper-to-fiber converter, the IE-MiniFiberLinX-II/LastGasp supports multiple fiber types including multimode, single-mode, single-strand fiber (SSF), and Course Wavelength Division Multiplexing (CWDM) functionality to increase the capacity of existing fiber. As a remote, CPE device, it can be connected via the fiber segment to an iMcV-FiberLinX-II Host module to support Host/Remote management.

Equipped with one 100 Mbps fiber data port, one 10/100 twisted pair port for data and management, as well as an auxiliary port designed to function as a serial port (when used with the included adapter), the IE-MiniFiberLinX-II/LastGasp also offers multiple powering options: AC power (with included adapter), DC (through a 4-terminal power block).

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

806-39753 - IE-Power/5V Module, AC to DC DIN Rail Power Adapter

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-FiberLinX-II/LastGasp TX/SFP					
856-17720	MM850-ST	1	2 km	1	RJ45
856-17721	MM850-SC	1	2 km	1	RJ45
856-17722	MM1300-ST	1	5 km	1	RJ45
856-17723	MM1300-SC	1	5 km	1	RJ45
856-17724	SM1310-SC	1	10 km	1	RJ45
856-17726	SM1310/PLUS-ST	1	30 km	1	RJ45
856-17727	SM1310/PLUS-SC	1	30 km	1	RJ45
856-17728	SM1310/LONG-ST	1	80 km	1	RJ45
856-17729	SM1310/LONG-SC	1	80 km	1	RJ45
856-17730	SM1310/XLONG-SC	1	100 km	1	RJ45
856-17731	SM1550/LONG-SC	1	80 km	1	RJ45
856-17732	SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER *					
856-17740	SSFX-MM1310-SC	1	2 km	1	RJ45
856-17741	SSFX-MM1550-SC	1	2 km	1	RJ45
856-17742	SSFX-SM1310-SC	1	20 km	1	RJ45
856-17743	SSFX-SM1550-SC	1	20 km	1	RJ45
856-17744	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
856-17745	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45
856-17746	SSFX-SM1310/LONG-SC	1	60 km	1	RJ45
856-17747	SSFX-SM1550/LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

IE-MiniFiberLinX-II also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

10/100 Mbps Managed Optical Demarcation Compact CPE Device

IE-MiniFiberLinX-II/LastGasp

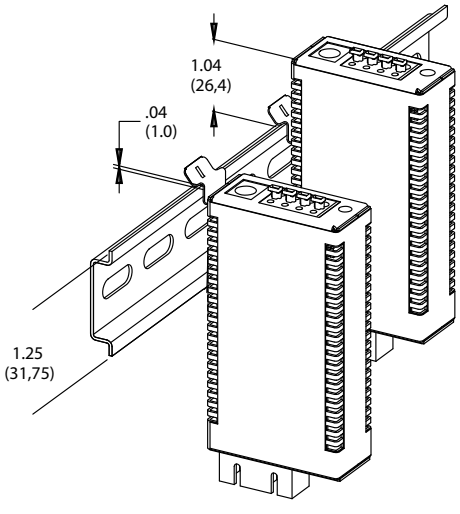
SPECIFICATIONS

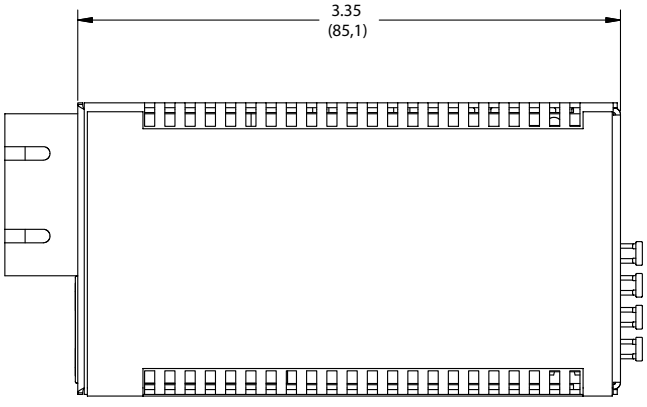
GENERAL
Preserves complete end-to-end fiber connection integrity
Bi-directional bandwidth control (per port, per direction, per VLAN)
Read/write IEEE 802.1Q VLAN-tags
Extra Tagging with Q-in-Q mode (802.1p)
Supports passive 802.3ah OAM (Operation, Administration & Management)
QoS: IEEE 802.1p-based packet prioritization (2 queues [high/low] with 8 levels of priority)
VLAN filtering up to 32 values
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps
AutoCross for MDI/MDIX
Features Auto Negotiation and Selective Advertising
Supports Half and Full-Duplex operation
MTU: Supports over-sized packets up to 1916 bytes per packet
SECURITY
Password Control
Multiple Access Levels: User Assigned Accounts & Access Levels
MANAGEMENT
SNMP V1 and V2c compatible
Includes GUI-based iView² software for remote management and upgrades
Monitors far-end (remote) status without a physical presence or separate connection
IEEE 802.3x Flow Control
Includes DHCP and TFTP clients
Supports Telnet
Includes loopback test modes (MAC swap)
Includes LinkLoss and FiberAlert
Remote capabilities with built-in support for UMA (IP-less management)
RS-232 (Craft) interface for local management
Serial cable for direct connection to a PC's Serial Port
ETHERNET PROTOCOLS SUPPORTED
EEE 802.3i 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3u 100Base-FX or SX fiber

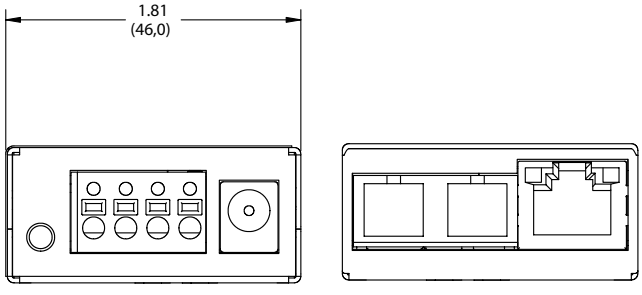
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
POWER	
AC Wall Adapter: 100 to 240 VAC ±10% input, 5 VDC output, 2A max.	
DC Input Voltage: 12 to 48 VDC *, 1 to .02A, 7 to 50 VDC, 1 to 0.1A	
ENVIRONMENTAL	
Operating Temperature	+14° to +122° F (-10° to +50° C) AC Adapter -13° to +167° F (-25° to +75° C) DC Adapter -49° to +185° F (-45° to +85° C) DC Telco
Storage Temperature	-49° to +185° F (-45° to +85° C)
Operating Humidity	5 to 95% Non-condensing
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CE, CSA, CB	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







Smallest, Most Reliable Switching Media Converter

MiniMc & MiniMc SFP

PRODUCT FEATURES

- One 100 Mbps FDX fiber port or 1 SFP fiber port
- One 10/100 Base-TX twisted pair port
- AutoCross automatic selection between crossover or straight-through connection
- Status LEDs
- 18 connections in the 1.5U high IE-PowerTray/18 Chassis

Media conversion is the most cost-effective solution for extending the productive life of legacy wiring plants and equipment while allowing implementation of new technologies. Media conversion's greatest benefits are flexibility and cost savings.

Measuring less than 3.5 inches deep and 2 inches wide, the MiniMc is the industry's smallest media converter with both data connections on the same side of the unit, and at a fraction of the cost of other alternatives. Plug-and-play operation with a variety of model types and powering options make the MiniMc series easy and convenient to use.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39628 - USB 36"/.9m Power Cable (for MiniMc only)

806-39629 - USB 12"/.3m Power Cable (for MiniMc only)

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
MiniMc SFP *					
855-10619	SFP	1	Various	1	RJ45

* SFP Fiber sold separately

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
MiniMc TP-TX/FX					
855-10620	MM850-ST	1	2 km	1	RJ45
855-10621	MM850-SC	1	2 km	1	RJ45
855-10622	MM1300-ST	1	5 km	1	RJ45
855-10623	MM1300-SC	1	5 km	1	RJ45
855-10624	SM1310/PLUS-ST	1	40 km	1	RJ45
855-10625	SM1310/PLUS-SC	1	40 km	1	RJ45
855-10626	SM1310/LONG-ST	1	80 km	1	RJ45
855-10627	SM1310/LONG-SC	1	80 km	1	RJ45
855-10641	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE STRAND FIBER *					
855-10650	SSFX-MM1300-SC	1	2 km	1	RJ45
855-10651	SSFX-MM1550-SC	1	2 km	1	RJ45
855-10652	SSFX-SM1310-SC	1	20 km	1	RJ45
855-10653	SSFX-SM1550-SC	1	20 km	1	RJ45
855-10654	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-10655	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45
855-10656	SSFX-SM1310/LONG-SC	1	60 km	1	RJ45
855-10657	SSFX-SM1550/LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

MiniMc TP-TX/FX also available in CWDM Fiber. Call for details.

Smallest, Most Reliable Switching Media Converter

MiniMc & MiniMc SFP

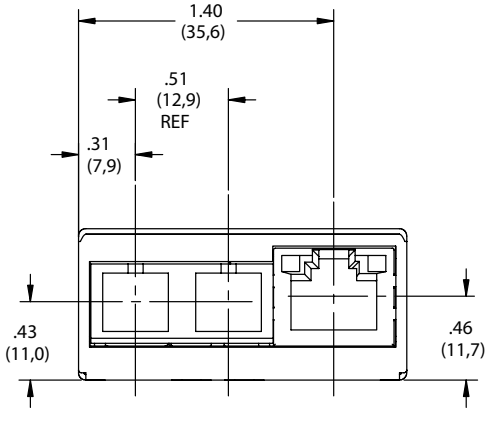
SPECIFICATIONS

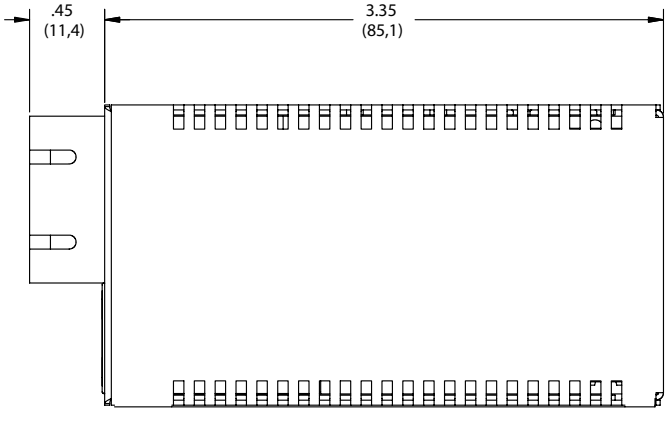
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
Supports jumbo packets up to 1916 bytes
Plug-and-play operation
RJ45, ST or SC connectors and SFPs available
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available with single-strand fiber support
Country-specific, high-reliability power adapter
Auto Negotiation, Auto-Cross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 14,881 pps for 10 Mbps, 148,100 pps for 100 Mbps)
Status LEDs

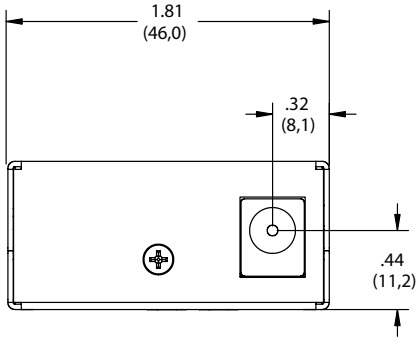
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
POWER	
5 VDC, 500mA	
AC Adapter: +32° F to +122° F (0° C to +50° C)	
ENVIRONMENTAL	
Operating Temperature:	+32° F to +122° F (0° C to +50° C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

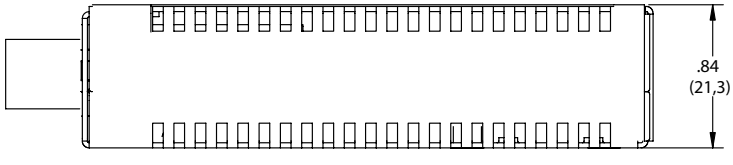
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)









Smallest, Most Reliable Switching Media Converter

MiniMc LFPT

PRODUCT FEATURES

- One 100 Mbps FDX fiber port or 1 SFP fiber port
- One 10/100 Base-TX twisted pair port
- AutoCross automatic selection between crossover or straight-through connection
- Supports Link Fault Pass Through

Media conversion is the most cost-effective solution for extending the productive life of legacy wiring plants and equipment while allowing implementation of new technologies. Measuring less than 3.5 inches deep and 2 inches wide, the MiniMc LFPT is one of the industry's smallest media converters with both data connections on the same side of the unit. An optional fiber SFP port gives network operators the flexibility to upgrade network equipment to different fiber interfaces. Link Fault Pass Through (LFPT) can be enabled/disabled via a DIP Switch on the unit, and is a useful diagnostic feature that assists the network administrator in indicating a fault condition on a given segment between the interfaces.

Designed and manufactured in the USA, the MiniMc LFPT extends 10 and 100 Mbps twisted pair network segments up to 80 km over fiber Both a media and data rate converter, the MiniMc LFPT features 10/100 Auto Negotiation on the copper port while the fiber port operates at 100 Mbps full duplex. MiniMc LFPT 10/100 switching fiber converters are ideal for all premises, FTTD, LAN-to-LAN or LAN-to-MAN fiber networking applications.

Multiple powering options include a country-specific AC wall adapter or USB-power cord. The unit can also be installed into the IE-PowerTray/18-AC which allows for 18 conversions in only 1.5U of rack space, DIN Rail mounted, or with a rack mount bracket.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39628 - USB 36"/.9m Power Cable (for MiniMc only)

806-39629 - USB 12"/.3m Power Cable (for MiniMc only)

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
MiniMc LFPT SFP *					
855-11619	SFP	1	Various	1	RJ45

* SFP Fiber sold separately

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
MiniMc LFPT, TP-TX/FX					
855-11620	MM850-ST	1	2 km	1	RJ45
855-11621	MM850-SC	1	2 km	1	RJ45
855-11622	MM1300-ST	1	5 km	1	RJ45
855-11623	MM1300-SC	1	5 km	1	RJ45
855-11624	SM1310/PLUS-ST	1	40 km	1	RJ45
855-11625	SM1310/PLUS-SC	1	40 km	1	RJ45
855-11626	SM1310/LONG-ST	1	80 km	1	RJ45
855-11627	SM1310/LONG-SC	1	80 km	1	RJ45
855-11641	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE STRAND FIBER *					
855-11650	SSFX-MM1300-SC	1	2 km	1	RJ45
855-11651	SSFX-MM1550-SC	1	2 km	1	RJ45
855-11652	SSFX-SM1310-SC	1	20 km	1	RJ45
855-11653	SSFX-SM1550-SC	1	20 km	1	RJ45
855-11654	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-11655	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45
855-11656	SSFX-SM1310/LONG-SC	1	60 km	1	RJ45
855-11657	SSFX-SM1550/LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

MiniMc TP-TX/FX also available in CWDM Fiber. Call for details.

Smallest, Most Reliable Switching Media Converter

MiniMc LFPT

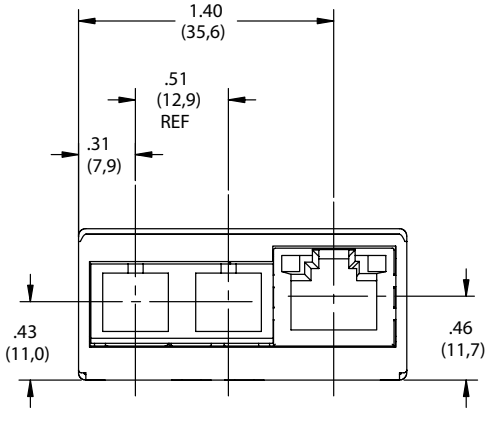
SPECIFICATIONS

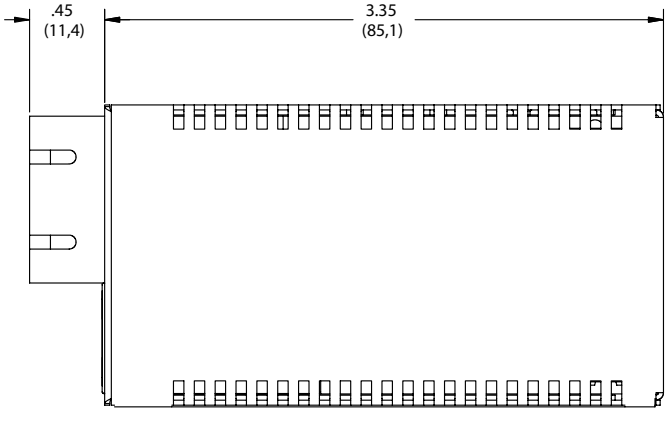
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
Supports jumbo packets up to 1916 bytes
Plug-and-play operation
RJ-45, ST or SC and SFP connectors available 50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available with single-strand fiber support
Country-specific, high-reliability power adapter
Auto Negotiation, Auto-Cross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 14,881 pps for 10 Mbps, 148,100 pps for 100 Mbps)
Status LEDs
Link Fault Pass Through

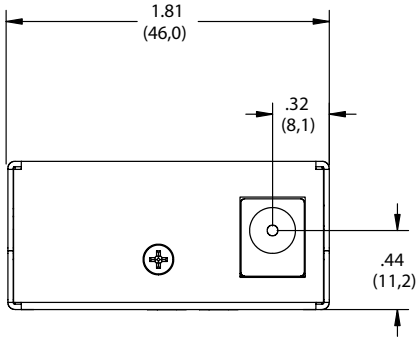
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
POWER	
5 VDC, 500mA	
AC Adapter: +32° F to +122° F (0° C to +50° C)	
ENVIRONMENTAL	
Operating Temperature:	+32° F to +122° F (0° C to +50° C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

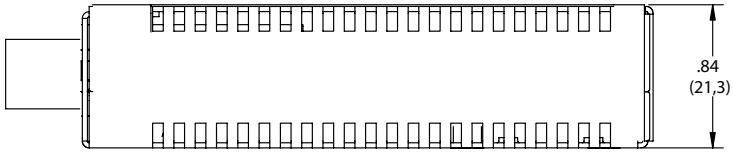
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)









Smallest, Most Reliable Gigabit Media Converter

MiniMc Gigabit

PRODUCT FEATURES

- One 1000Base-SX or 1000Base-LX fiber Port
- One 1000Base-T twisted pair port
- AutoCross automatic selection between crossover or straight-through connection
- Status LEDs
- 18 connections in the 1.5U high IE-PowerTray/18 Chassis

Media conversion is the most cost-effective solution for extending the productive life of legacy wiring plants and equipment while allowing implementation of new technologies. Media conversion's greatest benefits are flexibility and cost savings.

Measuring less than 3.5 inches deep and 2 inches wide, the MiniMc-Gigabit is the industry's smallest gigabit media converter with both data connections on the same side of the unit, and at a fraction of the cost of other alternatives. Plug-and-play operation with a variety of model types and powering options make the MiniMc-Gigabit easy and convenient to use.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
MiniMc-Gigabit					
855-10730	SX-MM850-SC	1	220/550 m	1	RJ45
855-10731	LX-SM1310-SC	1	10 km	1	RJ45
855-10732	LX-SM1310/ PLUS-SC	1	40 km	1	RJ45
855-10733	LX-SM15150/ LONG-SC	1	80 km	1	RJ45
SINGLE STRAND FIBER *					
855-10734	SSLX-SM1310-SC	1	15 km	1	RJ45
855-10735	SSLX-SM1550-SC	1	15 km	1	RJ45
855-10742	SSBX-SM1310-SC	1	10 km	1	RJ45
855-10743	SSBX-SM1490-SC	1	10 km	1	RJ45
855-10736	SSLX-SM1310/ PLUS-SC	1	40 km	1	RJ45
855-10737	SSLX-SM1550/ PLUS-SC	1	40 km	1	RJ45
855-10744	SSBX-SM1310/ PLUS-SC	1	30 km	1	RJ45
855-10745	SSBX-SM1490/ PLUS-SC	1	60 km	1	RJ45
855-10738	SSLX-SM1490/ LONG-SC	1	70 km	1	RJ45
855-10739	SSLX-SM1550/ LONG-SC	1	70 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

MiniMc-Gigabit TX/SX and TX/LX also available in CWDM Fiber. Call for details.

Smallest, Most Reliable Gigabit Media Converter

MiniMc Gigabit

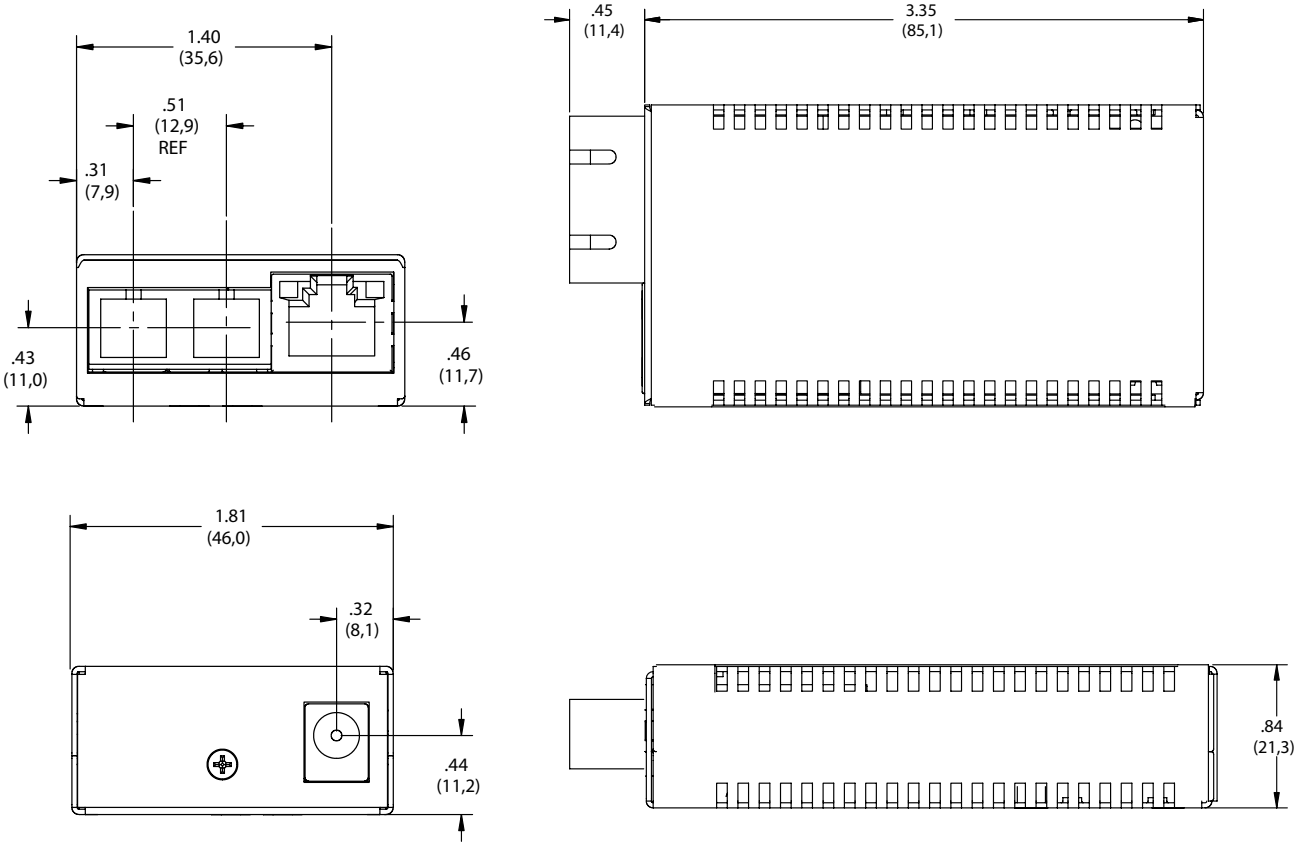
SPECIFICATIONS

TECHNICAL
Plug-and-play operation
RJ45 and SC or SFP connectors
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
MTU: Supports Jumbo Frames up to 10,000 bytes
Country-specific, high-reliability power adapter
Layer 2 packet switching, store and forward (forwarding rate: 1,488,096 pps for 1000 Mbps)
Auto-Cross for MDI/MDIX
Status LEDs

MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
POWER	
5 VDC, 400mA	
120 VAC, 0.1A	
ENVIRONMENTAL	
Operating Temperature:	+32° F to +122° F (0° C to +50° C)
Storage Temperature:	-13° F to +158° F (-25° C to +70° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)



Smallest, Most Reliable Gigabit Switching Media Converter

Giga-MiniMc & Giga-MiniMc SFP

PRODUCT FEATURES

- One 1000Base-SC or 1000Base-LX fiber port
- One 10/100/1000 Mbps twisted pair port
- Status LEDs
- AutoCross automatic selection between crossover or straight-through connection
- 18 connections in the 1.5U high IE-PowerTray/18 Chassis
- SFP available

Media conversion is the most cost-effective solution for extending the productive life of legacy wiring plants and equipment while allowing implementation of new technologies. Media conversion's greatest benefits are flexibility and cost savings.

Measuring less than 3.5 inches deep and 2 inches wide, the Giga-MiniMc is the industry's smallest gigabit media converter with both data connections on the same side of the unit, and at a fraction of the cost of other alternatives. Plug-and-play operation with a variety of model types and powering options make the Giga-MiniMc easy and convenient to use.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
MiniMc Gigabit SFP w/LFPT *					
856-10747	SFP	1	Various	1	RJ45
MiniMc-Gigabit TX/SX and TX/LX					
856-10730	SX-MM850-SC	1	220/550 m	1	RJ45
856-10728	LX-MM1300-SC	1	2 km	1	RJ45
856-10731	LX-SM1310-SC	1	10 km	1	RJ45
856-10732	LX-SM1310/PLUS-SC	1	40 km	1	RJ45
856-10733	LX-SM1550/LONG-SC	1	80 km	1	RJ45
856-10729	LX-SM1550/ XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER **					
856-10734	SSLX-SM1310-SC	1	15 km	1	RJ45
856-10735	SSLX-SM1550-SC	1	15 km	1	RJ45
856-10742	SSBX-SM1310-SC	1	10 km	1	RJ45
856-10743	SSBX-SM1490-SC	1	10 km	1	RJ45
856-10736	SSLX-SM1310/ PLUS-SC	1	40 km	1	RJ45
856-10737	SSLX-SM1550/ PLUS-SC	1	40 km	1	RJ45
856-10744	SSBX-SM1310/ PLUS-SC	1	30 km	1	RJ45
856-10745	SSBX-SM1490/ PLUS-SC	1	60 km	1	RJ45
856-10738	SSLX-SM1490/ LONG-SC	1	70 km	1	RJ45
856-10739	SSLX-SM1550/ LONG-SC	1	70 km	1	RJ45

* SFP Fiber sold separately

** These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

Giga-MiniMc also available in CWDM Fiber. Call for details.

Smallest, Most Reliable Gigabit Switching Media Converter

Giga-MiniMc & Giga-MiniMc SFP

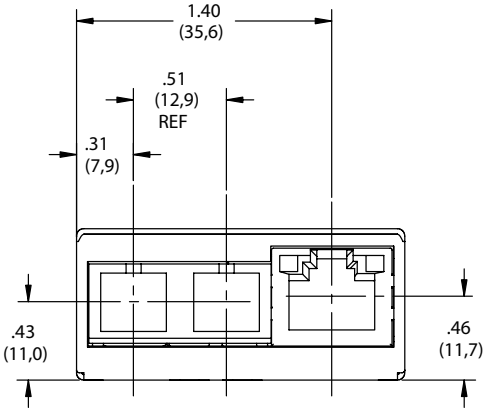
SPECIFICATIONS

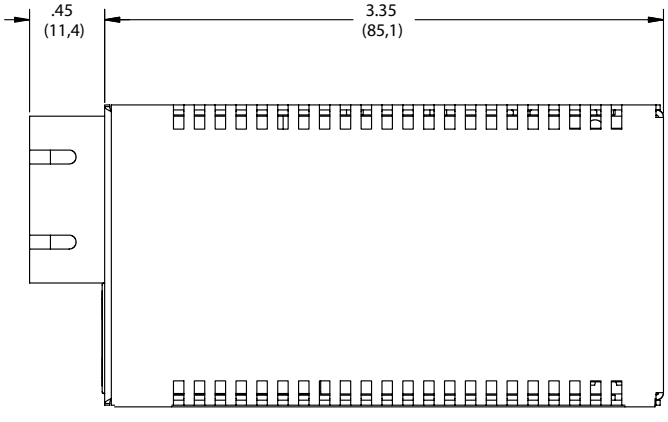
TECHNICAL
Plug-and-play operation
RJ45 and SC or SFP connectors
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
MTU: Supports Jumbo Frames up to 1536 bytes
MTU: Supports Jumbo Frames up to 10240 bytes (Giga-MiniMc SFP)
Country-specific, high-reliability power adapter
Layer 2 packet switching, store and forward (forwarding rate: 14,881 pps for 10 Mbps, 148,810 pps for 100 Mbps, 1,488,096 pps for 1000 Mbps)
Auto-Cross for MDI/MDIX
Status LEDs

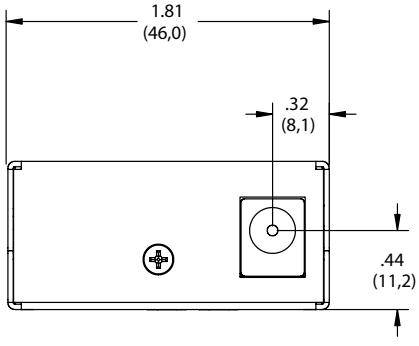
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
POWER	
5 VDC, 400mA	
120 VAC, 0.1A	
ENVIRONMENTAL	
Operating Temperature:	+32° F to +122° F (0° C to +50° C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

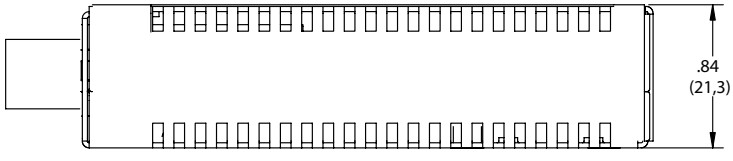
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)









Smallest, Most Reliable Gigabit Switching Media Converter

Giga-MiniMc LFPT

PRODUCT FEATURES

- One 1000Base-SX or SFP fiber port
- One 10/100/1000 Mbps twisted pair port
- AutoCross automatic selection between crossover or straight-through connection
- Status LEDs
- LFPT
- 18 connections in the 1.5U high PowerTray/18 Chassis

Media conversion is the most cost-effective solution for extending the productive life of legacy wiring plants and equipment while allowing implementation of new technologies. Media conversion's greatest benefits are flexibility and cost savings.

Measuring less than 3.5 inches deep and 2 inches wide, and having both data connections on the same side of the unit—the Giga- MiniMc-LFPT is the industry's smallest media converter at a fraction of the cost of other alternatives. Link Fault Pass Through (LFPT) can be enabled/disabled via a DIP Switch on the unit, and is a useful diagnostic feature that assists the network administrator in indicating a fault condition on a given segment between the interfaces. Plug-and-play operation with a variety of model types and powering options make the Giga-MiniMc LFPT easy and convenient to use.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
MiniMc-Gigabit LFPT SFP					
856-11700	SFP	1	Various	1	RJ45
MiniMc-Gigabit LFPT					
856-11701	SX-MM850-SC	1	220/500 m	1	RJ45

* SFP Fiber sold separately

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

Smallest, Most Reliable Gigabit Switching Media Converter

Giga-MiniMc LFPT

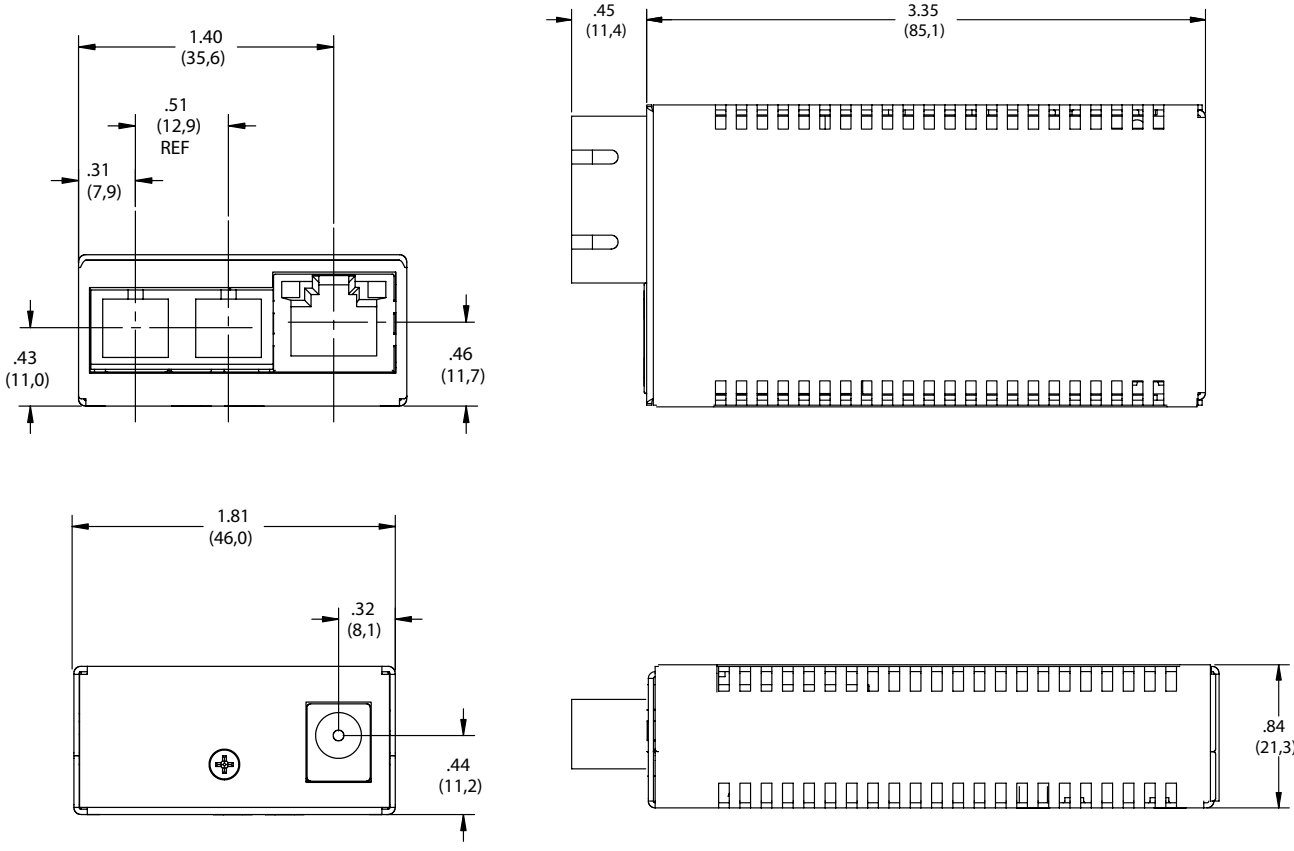
SPECIFICATIONS

TECHNICAL
Plug-and-play operation
RJ45 and SC or SFP connectors
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
MTU: Supports Jumbo Frames up to 10240 bytes
Country-specific, high-reliability power adapter
Auto-Cross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 1,488,096 pps for 1000 Mbps)
Status LEDs

MECHANICAL	
Dimensions	0.83”H x 1.80”W x 3.35”D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
POWER	
5 VDC, 400mA	
120 VAC, 0.1A	
ENVIRONMENTAL	
Operating Temperature:	+32° F to +122° F (0° C to +50° C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)



Industrial Grade 10/100 Miniature Media Converters

IE-MiniMc

PRODUCT FEATURES

- Value-add industrial grade extended temperature performance
- PNP, Auto Negotiation mode
- Auto-Cross feature for the twisted pair port cable
- Stand-alone unit in a small, rugged metal enclosure with a compact, external power supply
- IEEE 802.3af Compliant
- NEMA TS2 (select models)

Measuring less than 3.5 inches deep and 2 inches wide, the IE-MiniMc Series converters are some of the industry's smallest copper-to-fiber media converters, with both data connections on the same side. The IE-MiniMc family of media converters are a fraction of the cost of other industrial grade alternatives. These products provide the ease and convenience of plug-and-play operation with features including Auto Negotiation and Auto-Cross.

Multiple powering options include Power over Ethernet (PoE/PD), AC wall adapter and USB, which offers unsurpassed flexibility for a variety of installations.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

806-39753 - IE-Power/5V Module, AC to DC DIN Rail Power Adapter

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-MiniMc TP-TX/FX					
855-19720	MM850-ST	1	2 km	1	RJ45
855-19721	MM850-SC	1	2 km	1	RJ45
855-19722	MM1300-ST	1	5 km	1	RJ45
855-19723	MM1300-SC	1	5 km	1	RJ45
855-19724	SM1310/PLUS-ST	1	30 km	1	RJ45
855-19725	SM1310/PLUS-SC	1	30 km	1	RJ45
855-19726	SM1310/LONG-ST	1	80 km	1	RJ45
855-19727	SM1310/LONG-SC	1	80 km	1	RJ45
855-19730	SM1550/LONG-SC	1	80 km	1	RJ45
IE-MiniMc TP-TX/FX *- NEMA TS2 rated; modular versions without AC adapter*					
854-19722	MM1300-ST	1	5 km	1	RJ45
854-19723	MM1300-SC	1	5 km	1	RJ45
854-19724	SM1310/PLUS-ST	1	30 km	1	RJ45
854-19725	SM1310/PLUS-SC	1	30 km	1	RJ45
SINGLE STRAND FIBER *					
855-19750	SSFX-MM1310-SC	1	2 km	1	RJ45
855-19751	SSFX-MM1550-SC	1	2 km	1	RJ45
855-19752	SSFX-SM1310-SC	1	20 km	1	RJ45
855-19753	SSFX-SM1550-SC	1	20 km	1	RJ45
855-19754	SSFX-SM1310/ PLUS-SC	1	40 km	1	RJ45
855-19755	SSFX-SM1550/ PLUS-SC	1	40 km	1	RJ45
855-19756	SSFX-SM1310/ LONG-SC	1	60 km	1	RJ45
855-19757	SSFX-SM1550/ LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

IE-MiniMc also available in CWDM Fiber. Call for details.

IN THE FIELD

Long Distance Connections in Airport Concourse

Industry: Transaction Management – Retail & Banking

Product: IE-MiniMc Fiber/Copper Media Converter

www.bb-elec.com/Airport

Carrier data charges may apply.

Industrial Grade 10/100 Miniature Media Converters

IE-MiniMc

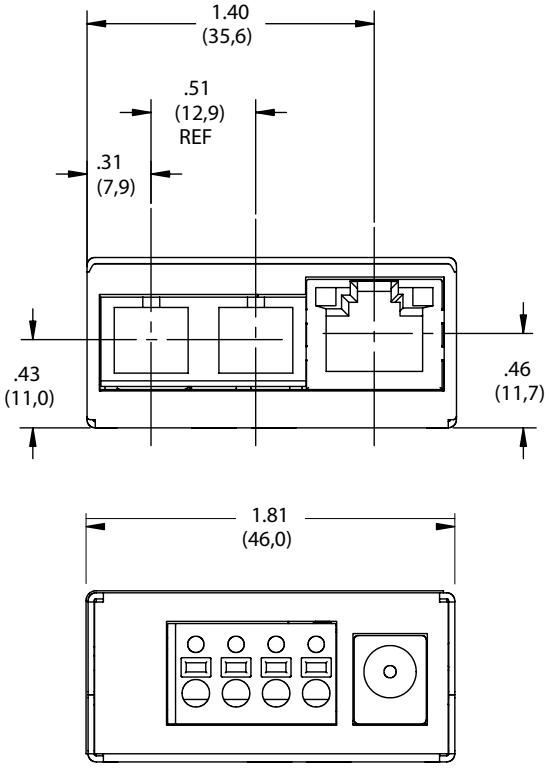
SPECIFICATIONS

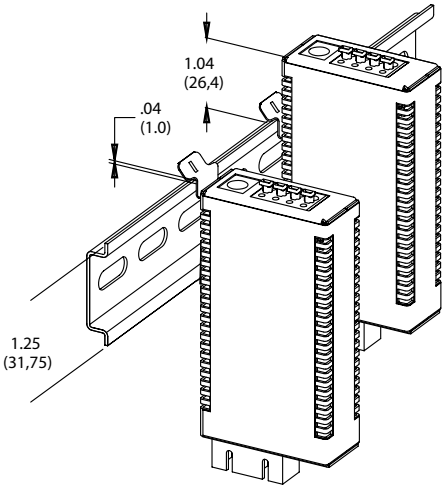
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3u 100Base-FX fiber
IEEE 802.3af Power Over Ethernet
Supports jumbo packets up to 1916 bytes
Plug-and-play operation
RJ45 and ST or SC ports available
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available with single-strand fiber support
Includes terminal DC power block
Country-specific, high-reliability power adapter
Auto Negotiation
Auto-Cross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 14,881 pps for 10 Mbps, 148,100 pps for 100 Mbps)
Status LEDs

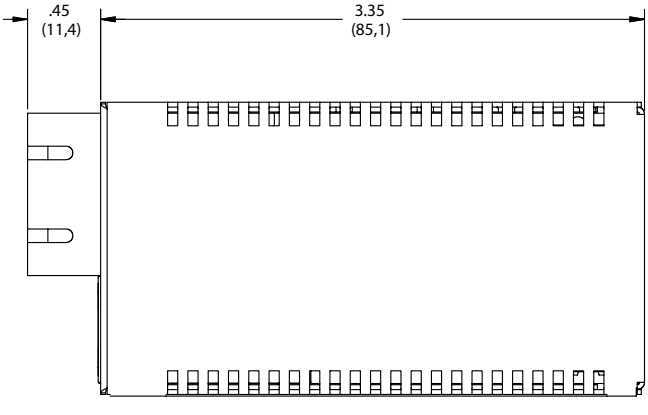
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
INPUT SPECIFICATIONS	
DC Terminal: 7 - 50 VDC, 1A - 0.1A	
Barrel Connector: 5 VDC	
PoE: Maximum supply voltage is 50V	
ENVIRONMENTAL	
Operating Temperature: DC or PoE (PD)	-13° F to 185° F (-25° C to +85° C)
Operating Temperature: AC wall adapter	+14° F to +122° F (-10° C to +50° C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A (using DC terminal or PoE power)	
FCC Class B (using any DC jack, optional)	
UL/cUL, CSA, CE	
NEMA TS2 (select models)	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







Industrial Grade 10/100/1000 Miniature Media Converters

IE-Giga-MiniMc

PRODUCT FEATURES

- Connects 10/100/1000 Mbps copper to 1000 Mbps fiber
- For use in extended temperature environments
- Cascading power on DIN rail installations
- Dual USB power cable (optional)
- NEMA TS2 (select models)

Media conversion is the most cost-effective and flexible solution for implementing new technologies on legacy wiring plants and equipment. But even reasonably-priced media converters can tack on a substantial sum to networking costs. And space constraints can also be an issue when hundreds of conversions are required.

Measuring less than 3.5 inches deep and 2 inches wide, and having both data connections on the same side of the unit — the IE-Giga-MiniMc is the industry's smallest media converter at a fraction of the cost of other alternatives.

With Plug-and-Play, Auto Negotiation and AutoCross operation, extreme operating temperatures (-25° to +85° C), DC or AC power, the IE-Giga-MiniMc miniature media converter is easy and convenient to use.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

806-39753 - IE-Power/5V Module, AC to DC DIN Rail Power Adapter

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-Giga-MiniMc TP-TX/FX SX or LX					
856-18830	MM850-SC	1	220/550 m	1	RJ45
856-18831	SM1310-SC	1	15 km	1	RJ45
856-18832	SM1310/PLUS-SC	1	30 km	1	RJ45
856-18833	SM1550/LONG-SC	1	80 km	1	RJ45
856-18834	SM1550/XLONG-SC	1	100 km	1	RJ45
IE-Giga-MiniMc TP-TX/FX SX or LX *- NEMA TS2 rated; modular versions without AC adapter*					
854-18830	MM850-SC	1	220/550 m	1	RJ45
854-18831	SM1310-SC	1	15 km	1	RJ45
SINGLE STRAND FIBER *					
856-18835	SSLX-SM1310-SC	1	15 km	1	RJ45
856-18836	SSLX-SM1550-SC	1	15 km	1	RJ45
856-18825	SSBX-SM1310-SC	1	10 km	1	RJ45
856-18826	SSBX-SM1490-SC	1	10 km	1	RJ45
856-18837	SSLX-SM1310/ PLUS-SC	1	40 km	1	RJ45
856-18838	SSLX-SM1550/ PLUS-SC	1	40 km	1	RJ45
856-18827	SSBX-SM1310/ PLUS-SC	1	30 km	1	RJ45
856-18828	SSBX-SM1490/ PLUS-SC	1	30 km	1	RJ45
856-18839	SSLX-SM1510/ LONG-SC	1	70 km	1	RJ45
856-18840	SSLX-SM1570/ LONG-SC	1	70 km	1	RJ45
856-18841	SSLX-SM1510/ XLONG-SC	1	80 km	1	RJ45
856-18842	SSLX-SM1570/ XLONG-SC	1	80 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

IE-Giga-MiniMc also available in CWDM Fiber. Call for details.

Industrial Grade 10/100/1000 Miniature Media Converters

IE-Giga-MiniMc

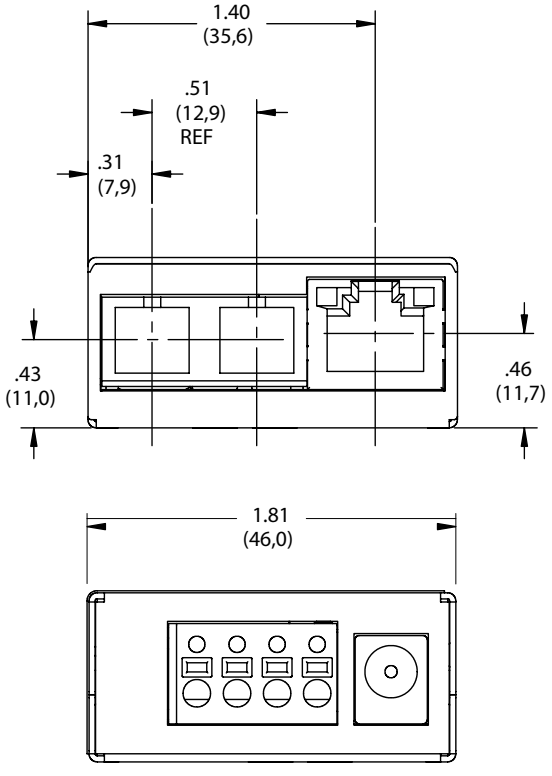
SPECIFICATIONS

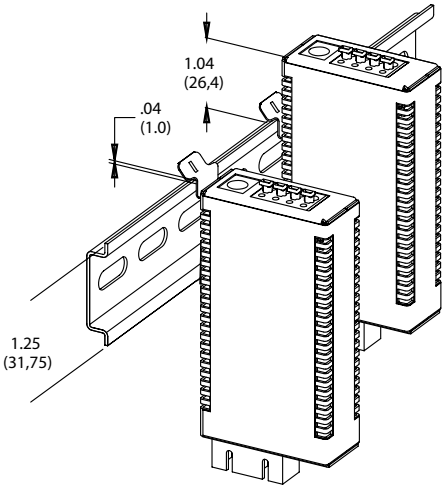
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
MTU: Supports Jumbo Frames up to 10240 bytes
Extended temperature range (DC configuration)
Plug-and-play operation
Accepts RJ45 and SC connectors
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber Single-strand fiber and CWDM models
4-terminal DC power with a pair of input terminals and a pair of output terminals for cascading power on DIN installations
Country-specific, high-reliability power adapter
Auto Negotiation, Auto-Cross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 14,881 pps for 10 Mbps, 148,810 pps for 100 Mbps, 1,488,096 pps for 1000 Mbps)
Status LEDs
Supports DIN Rail mounting

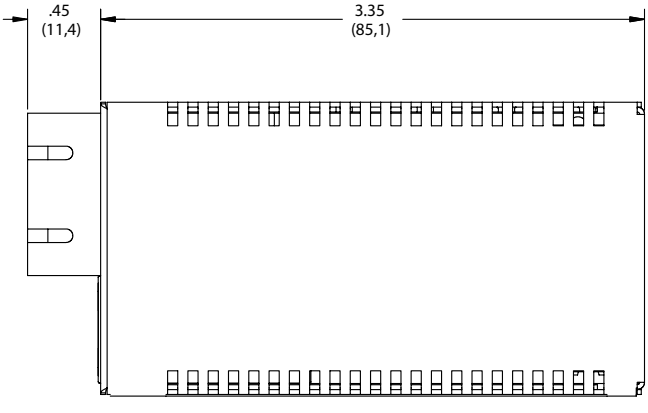
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
POWER	
AC Adapter	100 to 240 ±10% VAC input, 5 VDC @ 2.0 A max
DC Input Voltage	7 to 50 VDC @ 2.5 watts, Chassis grounded to negative terminal
ENVIRONMENTAL	
Operating Temperature: DC terminal block	-13°F to +185°F (-25°C to +85°C)
Operating Temperature: AC Adapter	+14°F to +122°F (-10°C to +50°C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	
NEMA TS2 (select models)	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







Industrial Grade 10/100/1000 Miniature Media Converters

IE-Giga-MiniMc (with LFPT Switch)

PRODUCT FEATURES

- Connects 10/100/1000 Mbps copper to 1000 Mbps fiber
- For use in extended temperatures
- Cascading power on DIN rail installations
- Dual USB power cable (optional)
- Link Fault Pass-Through (LFPT) capability via a DIP Switch

Media conversion is the most cost-effective and flexible solution for implementing new technologies on legacy wiring plants and equipment. But even reasonably-priced media converters can tack on a substantial sum to networking costs. And space constraints can also be an issue when hundreds of conversions are required.

Measuring less than 3.5 inches deep and 2 inches wide, and having both data connections on the same side of the unit—the IE-Giga-MiniMc-LFPT is the industry's smallest media converter at a fraction of the cost of other alternatives. Link Fault Pass Through (LFPT) can be enabled/disabled via a DIP Switch on the unit, and is a useful diagnostic feature that assists the network administrator in indicating a fault condition on a given segment between the interfaces.

With Plug-and-Play, Auto Negotiation and AutoCross operation, extreme operating temperatures (-25° to +85° C), DC or AC power, the IE-Giga-MiniMc-LFPT miniature media converter is easy and convenient to use.

SFP port supports 100 Mbps or 1000 Mbps SFPs (fiber). This allows the customer to utilize the product for a Fast Ethernet circuit and later upgrade to Gigabit.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

806-39753 - IE-Power/5V Module, AC to DC DIN Rail Power Adapter

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-Giga-MiniMc (with LFPT Switch)					
856-18929	SFP	1	Various	1	RJ45
856-18930	MM850-SC	1	220/550 m	1	RJ45
856-18931	SM1310-SC	1	15 km	1	RJ45
856-18932	SM1310/PLUS-SC	1	30 km	1	RJ45
856-18933	SM1550/LONG-SC	1	80 km	1	RJ45
856-18934	SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER *					
856-18935	SSLX-SM1310-SC	1	15 km	1	RJ45
856-18936	SSLX-SM1550-SC	1	15 km	1	RJ45
856-18925	SSBX-SM1310-SC	1	10 km	1	RJ45
856-18926	SSBX-SM1490-SC	1	10 km	1	RJ45
856-18937	SSLX-SM1310/ PLUS-SC	1	40 km	1	RJ45
856-18938	SSLX-SM1550/ PLUS-SC	1	40 km	1	RJ45
856-18927	SSBX-SM1310/ PLUS-SC	1	30 km	1	RJ45
856-18928	SSBX-SM1490/ PLUS-SC	1	30 km	1	RJ45
856-18939	SSLX-SM1490/ LONG-SC	1	70 km	1	RJ45
856-18940	SSLX-SM1550/ LONG-SC	1	70 km	1	RJ45
856-18941	SSLX-SM1550/ XLONG-SC	1	80 km	1	RJ45
856-18942	SSLX-SM1550/ XLONG-SC	1	80 km	1	RJ45

* SFP Fiber sold separately

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

IE-Giga-MiniMc LFPT also available in CWDM Fiber. Call for details.

Industrial Grade 10/100/1000 Miniature Media Converters

IE-Giga-MiniMc (with LFPT Switch)

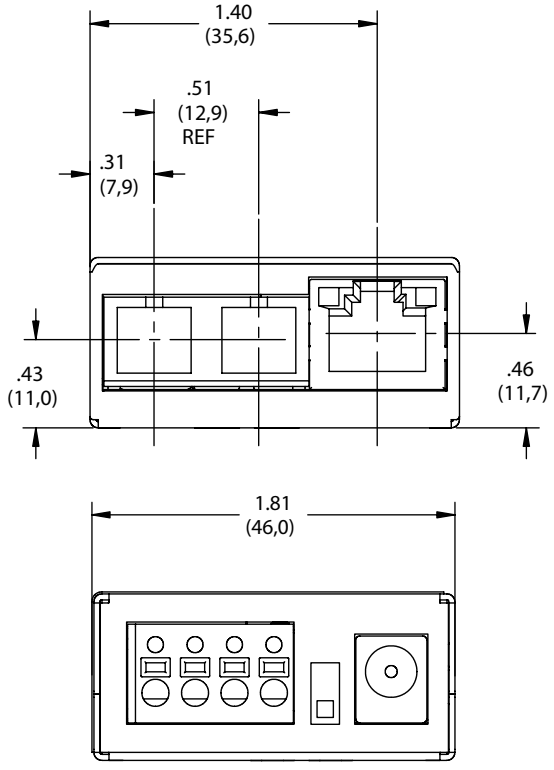
SPECIFICATIONS

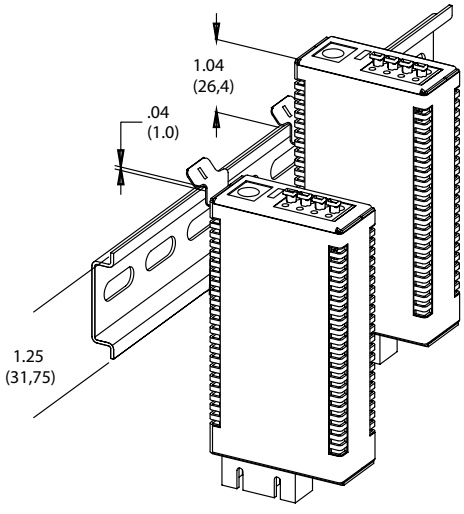
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
MTU: Supports Jumbo Frames up to 10240 bytes
Extended temperature range (DC configuration)
Plug-and-play operation
RJ45, SC and SFP connectors
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber Single-strand fiber and CWDM models
4-terminal DC power with a pair of input terminals and a pair of output terminals for cascading power on DIN installations
Country-specific, high-reliability power adapter
Auto Negotiation, Auto-Cross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 14,881 pps for 10 Mbps, 148,810 pps for 100 Mbps, 1,488,096 pps for 1000 Mbps)
Status LEDs
Supports DIN Rail mounting

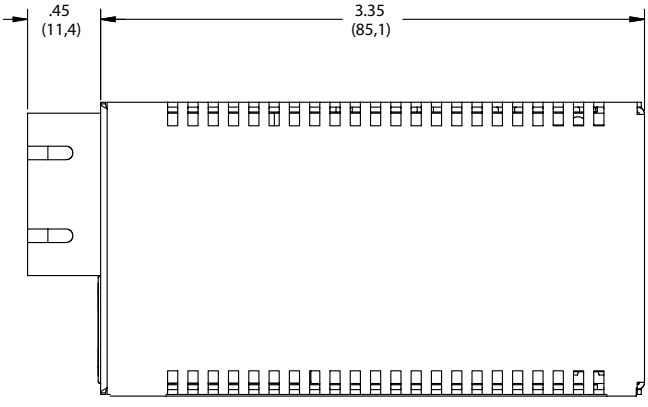
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
POWER	
AC Adapter	100 to 240 ±10% VAC input, 5 VDC @ 2.0 A max
DC Input Voltage	7 to 50 VDC @ 2.5 watts, Chassis grounded to negative terminal
ENVIRONMENTAL	
Operating Temperature: DC terminal block	-13°F to +185°F (-25°C to +85°C)
Operating Temperature: AC Adapter	+14°F to +122°F (-10°C to +50°C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







Industrial Grade 10/100 Miniature Media Converters

IE-MiniMc/LFPT & Telco-LFPT

PRODUCT FEATURES

- Extended operating temperature of -25 to +85° C
- Auto-Cross automatic selection between crossover or straight-through connections
- Status LEDs
- Link Fault Pass-Through (LFPT) capability

Measuring less than 3.5 inches deep and 2 inches wide, the IE-MiniMc Series converters are some of the industry's smallest copper-to-fiber media converters, with both data connections on the same side. The IE-MiniMc family of media converters are a fraction of the cost of other industrial grade alternatives. These products provide the ease and convenience of plug-and-play operation with features including Auto Negotiation and Auto-Cross.

Advanced features such as Link Fault Pass-Through (LFPT) assist operators in identifying breaks in the network when using unmanaged network hardware. Multiple powering options include Power over Ethernet (PoE/PD), -48 VDC for Telco, AC wall adapter and USB, which offers unsurpassed flexibility for a variety of installations.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

806-39753 - IE-Power/5V Module, AC to DC DIN Rail Power Adapter

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-MiniMc/LFPT					
855-19822	MM850-SC	1	2 km	1	1
855-19824	MM1300-SC	1	5 km	1	1
855-19830	SM1310/PLUS-SC	1	30 km	1	1
855-19832	SM1310/LONG-SC	1	80 km	1	1
855-19833	SM1550/LONG-SC	1	80 km	1	1

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-MiniMc/Telco-LFPT					
855-19202	MM850-SC	1	2 km	1	1
855-19204	MM1300-SC	1	5 km	1	1
855-19210	SM1310/PLUS-SC	1	30 km	1	1
855-19212	SM1310/LONG-SC	1	80 km	1	1
855-19213	SM1550/LONG-SC	1	80 km	1	1

Industrial Grade 10/100 Miniature Media Converters

IE-MiniMc/LFPT & Telco-LFPT

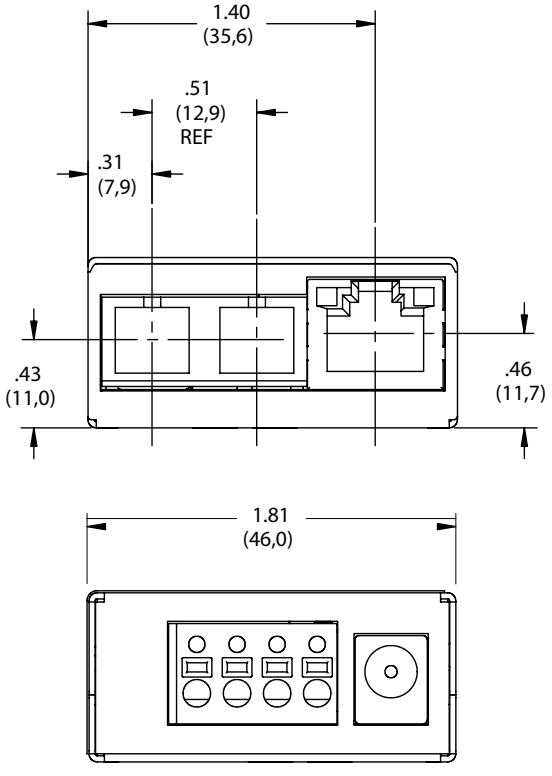
SPECIFICATIONS

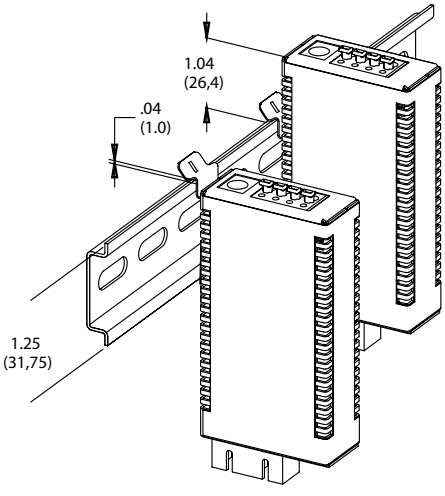
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3u 100Base-FX fiber
IEEE 802.3af Power Over Ethernet
Supports jumbo packets up to 1916 bytes
Plug-and-play operation
RJ45 and ST or SC ports available
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available with single-strand fiber support
Includes terminal DC power block
Country-specific, high-reliability power adapter
Auto Negotiation
Auto-Cross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 14,881 pps for 10 Mbps, 148,100 pps for 100 Mbps)
Status LEDs

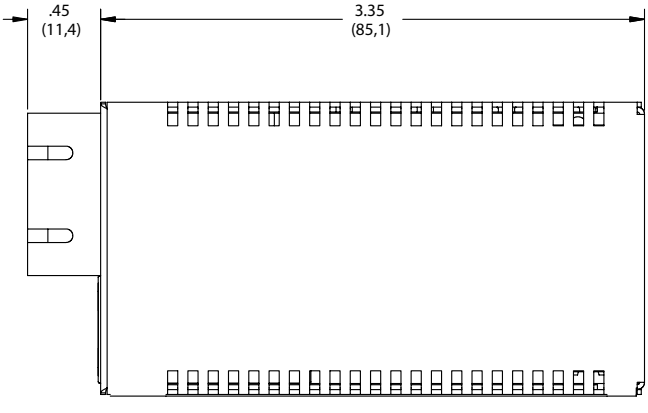
MECHANICAL	
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.7 lbs (.317 kg)
INPUT SPECIFICTAIONS	
DC Terminal (Telco): 12 to 48 VDC	
Barrel Connector: 5 to 24 VDC	
PoE: Maximum supply voltage is 50V	
ENVIRONMENTAL	
Operating Temperature: DC or PoE (PD)	-13° F to 185° F (-25° C to +85° C)
Operating Temperature: AC wall adapter	+14° F to +122° F (-10° C to +50° C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A (using DC terminal or PoE power)	
FCC Class B (using any DC jack, optional)	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







PoE Switching Media Converter 10/100/1000 Mbps

PoE & PoE+ Giga-MiniMc LFPT

PRODUCT FEATURES

- Rugged stand-alone metal enclosure with compact external power supply
- Supports Jumbo Frames (up to 10240 bytes)
- Multiple mounting options (Desktop, DIN Rail or Wall-mount)
- Features configurable PoE Reset on Fiber LOS
- Supports IEEE 802.3af PoE (15.4W) and IEEE 802.3at PoE+ (25.5W) standards
- Link Fault Pass Through

The PoE and PoE+Giga-MiniMc are low-cost, compact, multi-port media converters that support both PoE and PoE+ standards. Utilizing their flexibility and compact size, interior private network applications can further benefit from the ever-expanding versatility of the MiniMc product line.

Featuring 2-10/100/1000Base-T copper UTP ports and one SFP uplink port that supports either a copper or fiber SFP, the PoE and PoE+ Giga-MiniMc are Power Source Equipment (PSE) devices. The PoE+ Giga-MiniMc is capable of powering up to two Powered Devices (PD) over standard CAT5 cable or better, whereas the PoE Giga-MiniMc can power one PD device via a copper port while delivering data over the other copper port. The PoE+ Giga-MiniMc is able to power high-power devices such as touch panels, PTZ (pan-tilt-zoom) IP surveillance cameras, and RFID readers that require more power than the typical 15.4 W provided by standard PSE devices such as the PoE Giga-MiniMc.

The PoE and PoE+ Giga-MiniMc models are fully compatible with the IEEE 802.3af/at standards to ensure a seamless integration into your network. Enhanced features include store-and-forward, Autocross, an LFPT DIP Switch, and PoE reset on fiber loss of signal. PoE reset is an advanced function that, when enabled, will force the PSE output power to reset when LINK state is lost on the SFP port.

ACCESSORIES

806-39105 - DIN Rail Clip

806-39800 - PoE Power Adapter for PoE Giga-MiniMc

895-39229 - Wall Mount Bracket

806-39900 - PoE+ Power Adapter for PoE+ Giga-MiniMc

806-39910 - PoE+ Isolated Power Adapter

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
PoE Giga-MiniMc					
857-11811	SFP *	1	Various	2	RJ45
857-11812	MM850-SC	1	220/550 m	2	RJ45
857-11813	MM1300-SC	1	2 km	2	RJ45
857-11814	SM1310-SC	1	15 km	2	RJ45
857-11815	SM1310/PLUS-SC	1	40 km	2	RJ45
857-11816	SM1550/LONG-SC	1	80 km	2	RJ45
857-11817	SM1550/XLONG-SC	1	100 km	2	RJ45
SINGLE STRAND FIBER SSLX OR SSBX **					
857-11820	SM1310-SC	1	15 km	2	RJ45
857-11821	SM1550-SC	1	15 km	2	RJ45
857-11822	SM1310-SC	1	10 km	2	RJ45
857-11823	SM1490-SC	1	10 km	2	RJ45
857-11824	SM1310/PLUS-SC	1	40 km	2	RJ45
857-11825	SM1550/PLUS-SC	1	40 km	2	RJ45
857-11826	SM1310/PLUS-SC	1	30 km	2	RJ45
857-11827	SM1490/PLUS-SC	1	30 km	2	RJ45
857-11828	SM1490/LONG-SC	1	70 km	2	RJ45
857-11829	SM1550/LONG-SC	1	70 km	2	RJ45

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
PoE+ Giga-MiniMc					
857-11911	SFP	1	Various	2	RJ45
857-11912	MM850-SC	1	220/550 m	2	RJ45
857-11913	MM1300-SC	1	2 km	2	RJ45
857-11914	SM1310-SC	1	15 km	2	RJ45
857-11915	SM1310/PLUS-SC	1	40 km	2	RJ45
857-11916	SM1550/LONG-SC	1	80 km	2	RJ45
857-11917	SM1550/XLONG-SC	1	100 km	2	RJ45
SINGLE STRAND FIBER SSLX OR SSBX **					
857-11920	SM1310-SC	1	15 km	2	RJ45
857-11921	SM1550-SC	1	15 km	2	RJ45
857-11922	SM1310-SC	1	10 km	2	RJ45
857-11923	SM1490-SC	1	10 km	2	RJ45
857-11924	SM1310/PLUS-SC	1	40 km	2	RJ45
857-11925	SM1550/PLUS-SC	1	40 km	2	RJ45
857-11926	SM1310/PLUS-SC	1	30 km	2	RJ45
857-11927	SM1490/PLUS-SC	1	30 km	2	RJ45
857-11928	SM1490/LONG-SC	1	70 km	2	RJ45
857-11929	SM1550/LONG-SC	1	70 km	2	RJ45

* SFP Fiber sold separately

** These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

PoE and PoE+ Giga-MiniMc also available in CWDM Fiber. Call for details.

PoE Switching Media Converter 10/100/1000 Mbps

PoE & PoE+ Giga-MiniMc LFPT

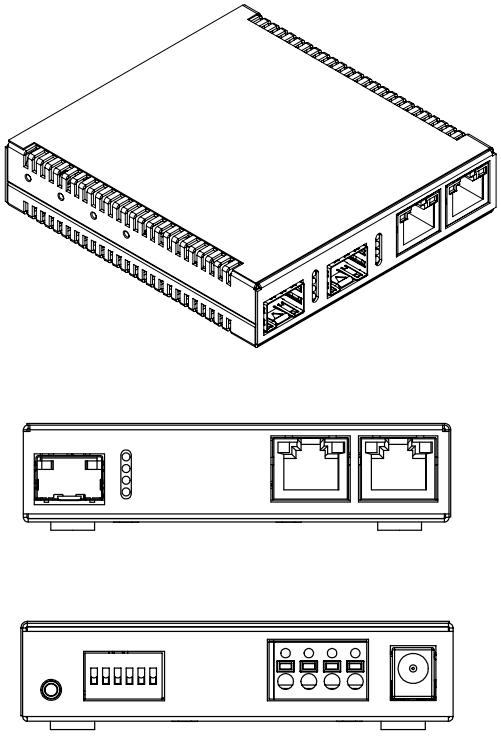
SPECIFICATIONS

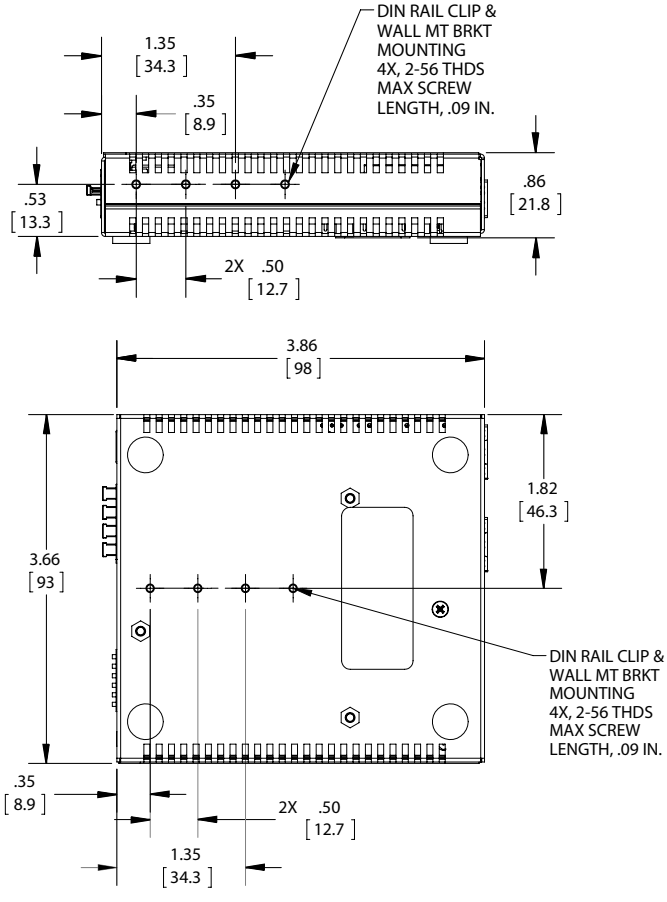
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
IEEE 802.3af Power over Ethernet
IEEE 802.3at Power over Ethernet Plus
IEEE 802.3u Auto-Negotiation
RFC-2474
RFC-2475 DiffServ QoS
Extreme temperature range (DC configuration)
Plug-and-play operation
Accepts RJ45, SC and SFP connectors
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Single-strand fiber and CWDM models
Country-specific, high-reliability power adapter
FX and TX Auto Negotiation
AutoCross for MDI/MDIX
MTU: Supports Jumbo Frames up to 10240 bytes
Supports DIN Rail mounting (DIN clips sold separately)
Link Fault Pass Through DIP Switch

MECHANICAL	
Dimensions	0.80" H x 3.645" W x 3.82" D (2.032 cm x 9.258 cm x 9.7028 cm)
Shipping Weight	1.0 lbs (0.45 kg)
AC ADAPTER	
PoE Giga-MiniMc	Input: 100 to 240 ±10% VAC, 50/60H, 0.7A * Output: 48 VDC, 0.62A
PoE+ Giga-MiniMc	Input: 100 to 240 ±10% VAC, 50/60H, 2A * Output: 52 VDC, 2.31A
* Maximum input power in Watts is calculated by multiplying the input amps by the lowest input voltage.	
DC Input Voltage:	
PoE Giga-MiniMc	45 to 57 VDC on DC terminal block 48 VDC on DC jack
PoE+ Giga-MiniMc	51 to 57 VDC on DC terminal block 51 to 57 VDC on DC jack
ENVIRONMENTAL	
Operating Temperature DC Terminal Block:	+32° F to +158° F (0° C to +70° C)
Operating Temperature AC Adapter:	+32° F to +122° F (0° C to +50° C)
Storage Temperature:	-31° F to +167° F (-35° C to +75° C);
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)





10/100 Mbps PoE Media Converter

PoE McBasic LFPT

PRODUCT FEATURES

- 3 convenient ports - one 100 Mbps fixed fiber uplink port, one 10/100Base-T PoE/PSE port, and one 10/100 Mbps copper port
- Supports Jumbo Frames (up to 10240 bytes)
- Features configurable PoE reset on Fiber Loss of Signal (LOS)
- Supports LFPT, a diagnostic feature that can be enabled to assist the end user in troubleshooting a failed segment
- Supports IEEE 802.3af PoE (15.4W) standards

The PoE McBasic LFPT is the perfect solution for network applications that require Power over Ethernet for locations inside buildings where PoE is required to power an Ethernet device. The PoE McBasic LFPT offers three ports - a 100 Mbps fiber uplink for the network connection, one PoE/PSE 10/100Base-T copper port that provides Power over Ethernet, and one 10/100 Mbps copper port to connect a non-PoE unit to the same fiber uplink.

As a fiber-fed media converter, it provides both power (up to 15.4 Watts) and data to a single remote device over standard CAT5, eliminating the need for additional power to the device. The copper ports Auto Negotiate to the connected device's speed and duplex mode: 10 Mbps or 100 Mbps, and HDX or FDX (including Flow Control). Additionally, the PoE McBasic LFPT supports jumbo frames up to 10240 bytes.

The PoE McBasic's LFPT small, table-top design and durability makes it ideal for installation anywhere space is limited. Additionally, the PoE McBasic comes with an internal AC power supply. A Link Fault Pass Through DIP Switch is located on the bottom of the unit, to enable for link LED troubleshooting.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39227 - Wallmount Brackets

895-39949 - Rackmount Shelf

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
PoE McBasic LFPT					
852-11712	MM850-ST	1	2 km	2	RJ45
852-11713	MM850-SC	1	2 km	2	RJ45
852-11714	MM1300-ST	1	5 km	2	RJ45
852-11715	MM1300-SC	1	5 km	2	RJ45
852-11716	SM1310/PLUS-ST	1	40 km	2	RJ45
852-11717	SM1310/PLUS-SC	1	40 km	2	RJ45
852-11718	SM1310/LONG-ST	1	80 km	2	RJ45
852-11719	SM1310/LONG-SC	1	80 km	2	RJ45
852-11720	SM1550/LONG-SC	1	80 km	2	RJ45
PoE McBasic LFPT Single-Strand Fiber *					
852-11730	SSFX-M1310-SC (1310 xmt/1550 rcv)	1	20 km	2	RJ45
852-11731	SSFX-SM1550-SC (1550 xmt/1310 rcv)	1	20 km	2	RJ45
852-11732	SSFX-SM1310/PLUS-SC (1310 xmt/1550 rcv)	1	40 km	2	RJ45
852-11733	SSFX-SM1550/PLUS-SC (1550 xmt/1310 rcv)	1	40 km	2	RJ45
852-11734	SSFX-SM1310/LONG-SC (1310 xmt/1550 rcv)	1	60 km	2	RJ45
852-11735	SSFX-SM1550/LONG-SC (1550 xmt/1310 rcv)	1	60 km	2	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

PoE McBasic LFPT also available in CWDM Fiber. Call for details.

10/100 Mbps PoE Media Converter

PoE McBasic LFPT

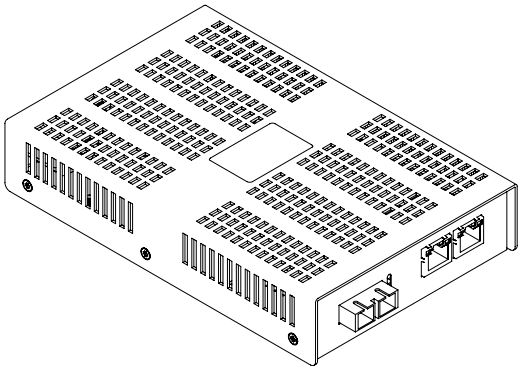
SPECIFICATIONS

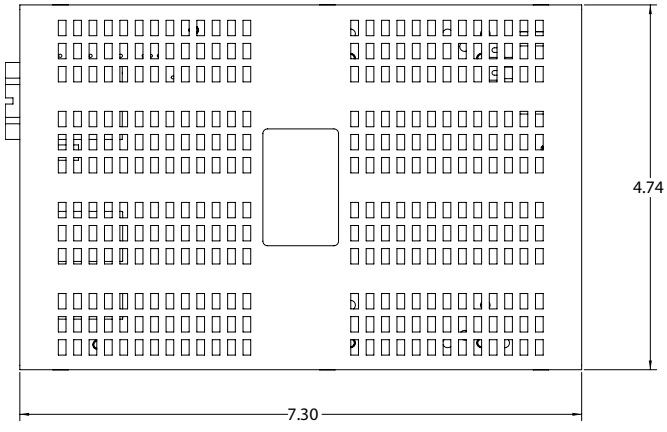
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3af Power over Ethernet
IEEE 802.3u Auto-Negotiation
RFC-2474
RFC-2475 DiffServ QoS
Plug-and-play operation
Accepts RJ-45, SC and ST connectors
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Single-strand fiber and CWDM models
FX and TX Auto Negotiation
AutoCross for MDI/MDIX
MTU: Supports Jumbo Frames up to 10240 bytes
Link Fault Pass Through DIP Switch

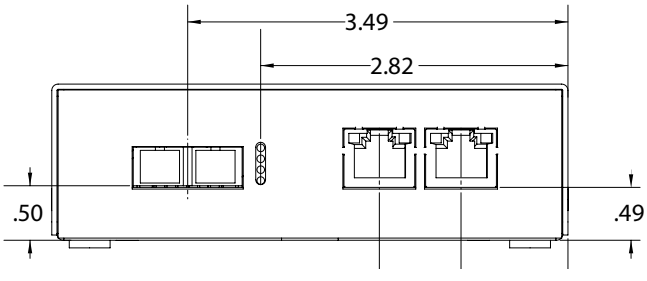
MECHANICAL	
Dimensions	1.46"H x 4.76"W x 7.32"D (3.71 cm x 12.09 cm x 18.59 cm)
Shipping Weight	1.3 lbs (0.58 kg)
INPUT SPECIFICATIONS	
100-240 ±10% VAC, 50/60Hz, 0.5A to 0.2A	
POWER CHARACTERISTICS	
Consumes less than 10 Watts (heating) plus PSE power	
IEEE802.3af Power to field <15.4 Watts	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

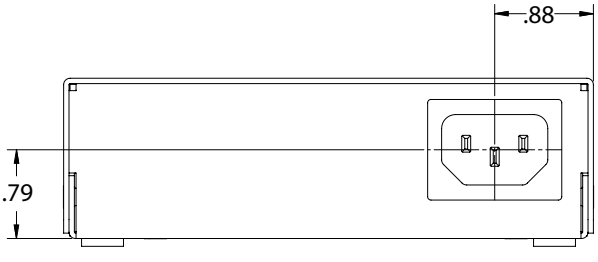
MECHANICAL DIAGRAM

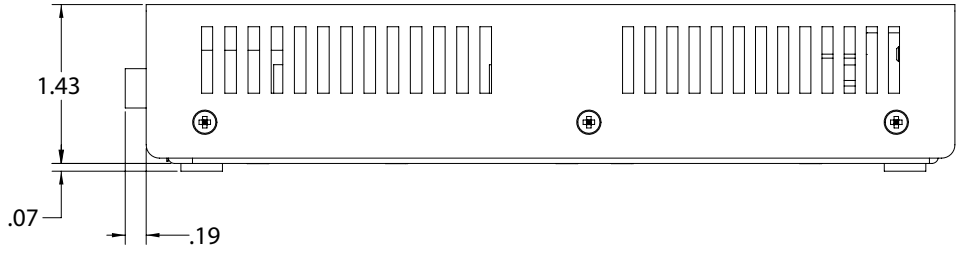
(dimensions in inches)











10/100/1000 Mbps PoE Switching Media Converter

PoE Giga-McBasic LFPT

PRODUCT FEATURES

- Connects 10/100/1000 Mbps copper to 100 or 1000 Mbps fiber SFP or 10/100/1000 Mbps or 1000 Mbps copper SFP
- Supports Jumbo Frames (up to 10240 bytes
- Rugged standalone metal enclosure with internal power supply
- Features configurable PoE reset on Fiber Loss of Signal (LOS)
- Supports LFPT, a diagnostic feature that can be enabled to assist the end user in troubleshooting a failed segment
- Supports IEEE 802.3af PoE (15.4W)

The PoE Giga-McBasic LFPT are the perfect solutions for network applications that require Power over Ethernet for locations inside buildings where PoE is required to power an Ethernet device. Their small, table-top design and durability make them perfect for installation anywhere space is limited. Additionally, both units are manufactured with an internal AC power supply. This feature significantly increases reliability over products that use awkward, external AC/DC power transformers.

The PoE Giga-McBasic LFPT unit comes with one SFP or fixed fiber transceiver, one PoE/PSE 10/100/1000Base-T copper port that provides 15.4 Watts of power with data, and one 10/100/1000 Mbps copper port to connect a non-PoE unit to the same fiber uplink. A Link Fault Pass Through DIP Switch is available, to enable a link LED troubleshooting feature.

As a fiber-fed media converter, it provides both power and data to a remote device over standard CAT5, eliminating the need for additional power to the remote device. The copper ports Auto Negotiate to the connected device's speed and duplex mode: 10 Mbps, 100 Mbps or 1000 Mbps, and HDX or FDX (including Flow Control). Additionally, both models support jumbo frames up to 10240 bytes.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39227 - Wallmount Brackets

895-39949 - Rackmount Shelf

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
PoE Giga-McBasic LFPT *					
852-11811	SFP	1	Various	2	RJ45
852-11812	SX-MM850-SC	1	220/550 m	2	RJ45
852-11813	LX-MM1300-SC	1	2 km	2	RJ45
852-11814	LX-SM1310-SC	1	10 km	2	RJ45
852-11815	LX-SM1310/PLUS-SC	1	40 km	2	RJ45
852-11816	LX-SM1550/LONG-SC	1	80 km	2	RJ45
852-11817	LX-SM1550/XLONG-SC	1	100 km	2	RJ45
PoE Giga-McBasic LFPT Single-Strand Fiber **					
852-11820	SSLX-SM1310-SC (1310 xmt/1550 rcv)	1	15 km	2	RJ45
852-11821	SSLX-SM1550-SC (1550 xmt/1310 rcv)	1	15 km	2	RJ45
852-11822	SSBX-SM1310-SC (1310 xmt/1490 rcv)	1	10 km	2	RJ45
852-11823	SSBX-SM1490-SC (1490 xmt/1310 rcv)	1	10 km	2	RJ45
852-11824	SSLX-SM1310/PLUS-SC (1310 xmt/1550 rcv)	1	40 km	2	RJ45
852-11825	SSLX-SM1550/PLUS-SC (1550 xmt/1310 rcv)	1	40 km	2	RJ45
852-11826	SSBX-SM1490/PLUS-SC (1490 xmt/1310 rcv)	1	30 km	2	RJ45
852-11827	SSBX-SM1310/PLUS-SC (1310 xmt/1490 rcv)	1	30 km	2	RJ45
852-11828	SSLX-SM1490/LONG-SC (1490 xmt/1550 rcv)	1	70 km	2	RJ45
852-11829	SSLX-SM1550/LONG-SC (1550 xmt/1490 rcv)	1	70 km	2	RJ45

* SFP Fiber sold separately

** These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

PoE Giga-McBasic LFPT also available in CWDM Fiber. Call for details.

10/100/1000 Mbps PoE Switching Media Converter

PoE Giga-McBasic LFPT

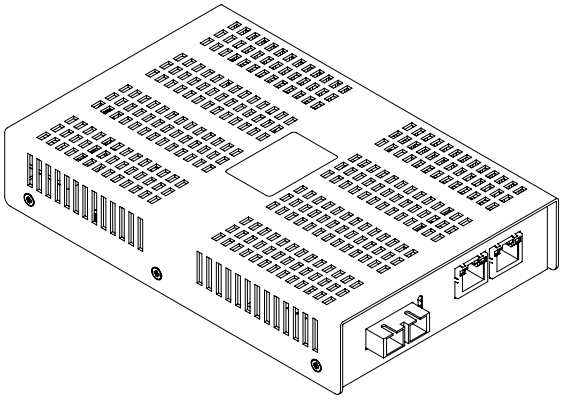
SPECIFICATIONS

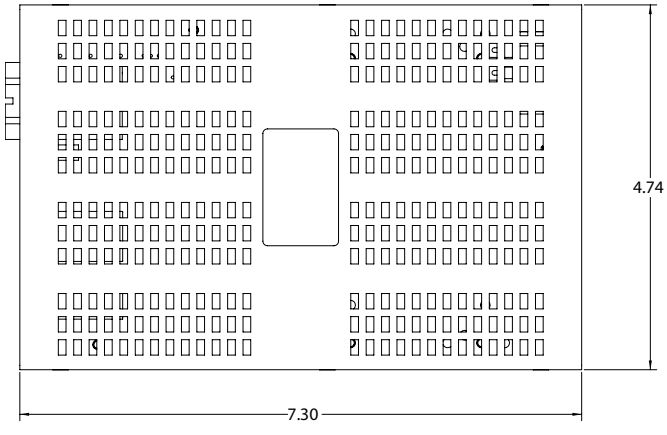
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3af Power over Ethernet
IEEE 802.3at Power over Ethernet Plus
IEEE 802.3u Auto-Negotiation
RFC-2474
RFC-2475 DiffServ QoS
Plug-and-play operation
Accepts RJ-45 and SFP or SC connectors
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Single-strand fiber and CWDM models
FX and TX Auto Negotiation
AutoCross for MDI/MDIX
MTU: Supports Jumbo Frames up to 10240 bytes
Link Fault Pass Through (LFPT)

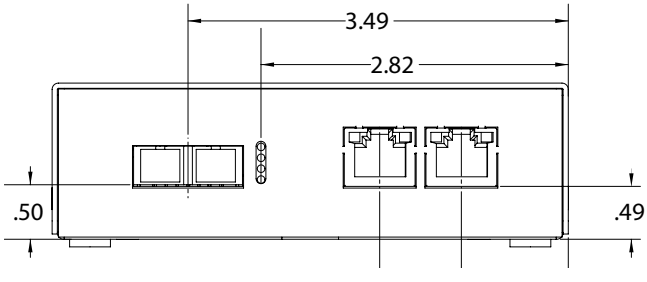
MECHANICAL	
Dimensions	1.46"H x 4.76"W x 7.32"D (3.71 cm x 12.09 cm x 18.59 cm)
Shipping Weight	1.3 lbs (0.58 kg)
INPUT SPECIFICATIONS	
100-240 ±10% VAC, 50/60Hz, 0.5A to 0.2A	
POWER CHARACTERISTICS	
Consumes less than 10 watts (heating) plus PSE power	
IEEE802.3af Power to field < 15.5 watts	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

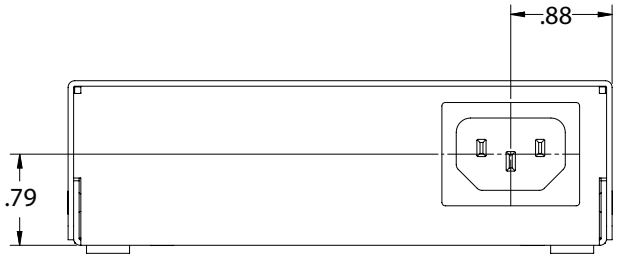
MECHANICAL DIAGRAM

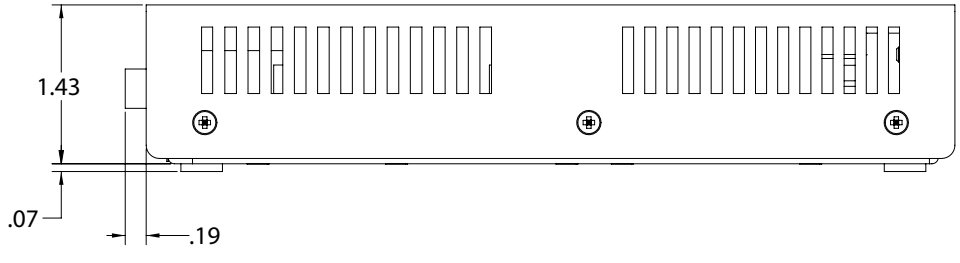
(dimensions in inches)











10/100/1000 Mbps PoE+ Switching Media Converter

PoE+ Giga-McBasic LFPT

PRODUCT FEATURES

- Connects 10/100/1000 Mbps copper to 100 or 1000 Mbps fiber SFP or 10/100/1000 Mbps or 1000 Mbps copper SFP
- Supports Jumbo Frames (up to 10240 bytes)
- Rugged standalone metal enclosure with internal power supply
- Features configurable PoE reset on Fiber Loss of Signal (LOS)
- Supports LFPT, a diagnostic feature that can be enabled to assist the end user in troubleshooting a failed segment
- Supports IEEE 802.3af PoE (15.4W)

The PoE+ Giga-McBasic LFPT are the perfect solutions for network applications that require Power over Ethernet for locations inside buildings where PoE is required to power an Ethernet device. Their small, table-top design and durability make them perfect for installation anywhere space is limited. Additionally, both units are manufactured with an internal AC power supply. An LFPT DIP Switch is available to enable for diagnostic troubleshooting.

The PoE+ Giga-McBasic LFPT unit comes with one SFP or fixed fiber transceiver and two PoE/PSE 10/100/1000Base-T copper. Each port provides 25.5 Watts of power with data.

As a fiber-fed media converter, it provides both power and data to a remote device over standard CAT5, eliminating the need for additional power to the remote device. The copper ports Auto Negotiate to the connected device's speed and duplex mode: 10 Mbps, 100 Mbps or 1000 Mbps, and HDX or FDX (including Flow Control). Additionally, both models support jumbo frames up to 10240 bytes.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39227 - Wallmount Brackets

895-39949 - Rackmount Shelf

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
PoE+ Giga-McBasic LFPT *					
852-11911	SFP	1	Various	2	RJ45
852-11912	SX-MM850-SC	1	220/550 m	2	RJ45
852-11913	LX-MM1300-SC	1	2 km	2	RJ45
852-11914	LX-SM1310-SC	1	10 km	2	RJ45
852-11915	LX-SM1310/PLUS-SC	1	40 km	2	RJ45
852-11916	LX-SM1550/LONG-SC	1	80 km	2	RJ45
852-11917	LX-SM1550/XLONG-SC	1	100 km	2	RJ45
PoE+ Giga-McBasic LFPT Single-Strand Fiber **					
852-11920	SSLX-SM1310-SC (1310 xmt/1550 rcv)	1	15 km	2	RJ45
852-11921	SSLX-SM1550-SC (1550 xmt/1310 rcv)	1	15 km	2	RJ45
852-11922	SSBX-SM1310-SC (1310 xmt/1490 rcv)	1	10 km	2	RJ45
852-11923	SSBX-SM1490-SC (1490 xmt/1310 rcv)	1	10 km	2	RJ45
852-11924	SSLX-SM1310/PLUS-SC (1310 xmt/1550 rcv)	1	40 km	2	RJ45
852-11925	SSLX-SM1550/PLUS-SC (1550 xmt/1310 rcv)	1	40 km	2	RJ45
852-11926	SSBX-SM1490/PLUS-SC (1490 xmt/1310 rcv)	1	30 km	2	RJ45
852-11927	SSBX-SM1310/PLUS-SC (1310 xmt/1490 rcv)	1	30 km	2	RJ45
852-11928	SSLX-SM1490/LONG-SC (1490 xmt/1550 rcv)	1	70 km	2	RJ45
852-11929	SSLX-SM1550/LONG-SC (1490 rcv)	1	70 km	2	RJ45

* SFP Fiber sold separately

** These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

PoE+ Giga-McBasic LFPT also available in CWDM Fiber. Call for details.

10/100/1000 Mbps PoE+ Switching Media Converter

PoE+ Giga-McBasic LFPT

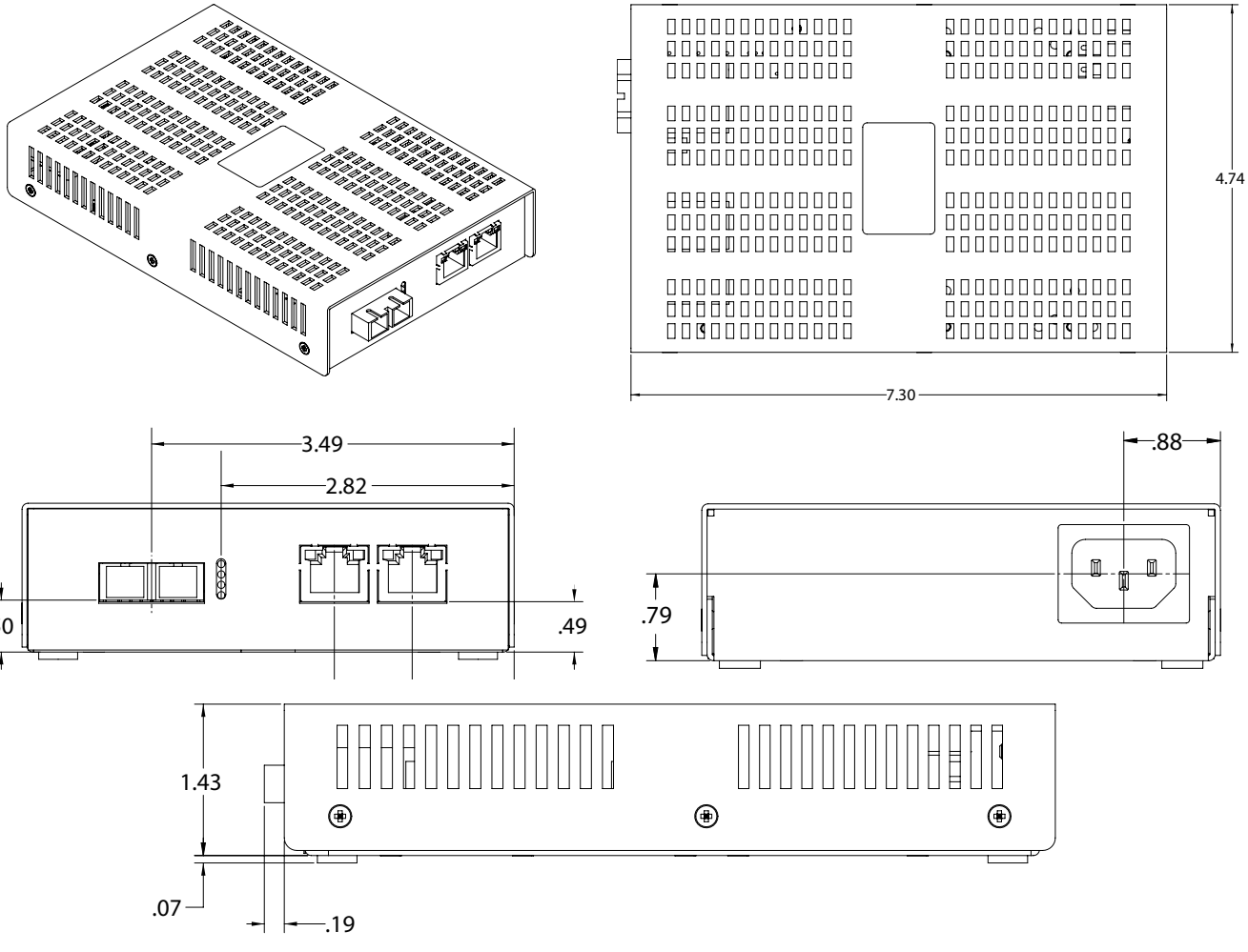
SPECIFICATIONS

TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3af Power over Ethernet
IEEE 802.3at Power over Ethernet Plus
IEEE 802.3u Auto-Negotiation
RFC-2474
RFC-2475 DiffServ QoS
Plug-and-play operation
Accepts RJ-45 and SFP or SC connectors
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Single-strand fiber and CWDM models
FX and TX Auto Negotiation
AutoCross for MDI/MDIX
MTU: Supports Jumbo Frames up to 10240 bytes
Link Fault Pass Through (LFPT)

MECHANICAL	
Dimensions	1.46"H x 4.76"W x 7.32"D (3.71 cm x 12.09 cm x 18.59 cm)
Shipping Weight	1.3 lbs (0.58 kg)
INPUT SPECIFICATIONS	
100-240 ±10% VAC, 50/60Hz, 0.5A to 0.2A	
POWER CHARACTERISTICS	
Consumes less than 10 watts (heating) plus PSE power	
IEEE802.3af Power to field < 15.5 watts	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)



10 Mbps Compact Media Converter

McBasic TP/FO

PRODUCT FEATURES

- Has a small, rugged design offering many advanced features
- Available for multi-mode or single-mode fiber
- LinkLoss and FiberAlert LEDs, assist in diagnosing problems on fiber optic networks
- Convert 10 Mbps twisted pair to 10 Mbps fiber

The McBasic's small, table-top design and durability make it perfect for installation anywhere space is limited. Additionally, the McBasic comes with an internal AC power supply. This feature significantly increases reliability over products that use bulky, external AC/DC power transformers.

The McBasic includes troubleshooting features such as LinkLoss and FiberAlert, that make isolating fiber breaks easier should they occur. The McBasic also features a crossover/pass-through switch on the twisted pair connection for MDI/MDIX connectivity and diagnostic LEDs. The McBasic TP/FO requires a connection to a device set to Force Mode. It is available in multi-mode and single-mode fiber.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McBasic TP/FO					
855-10230	MM850-ST	1	2 km	1	RJ45
855-10231	MM850-SC	1	2 km	1	RJ45
855-10232	MM1300-ST	1	2 km	1	RJ45
855-10233	MM1300-SC	1	2 km	1	RJ45
855-10234	SM1310/PLUS-ST	1	40 km	1	RJ45
855-10235	SM1310/PLUS-SC	1	40 km	1	RJ45
855-10237	SM1310/LONG-ST	1	80 km	1	RJ45
855-10238	SM1310/LONG-SC	1	80 km	1	RJ45
855-10240	SM1550/LONG-SC	1	80 km	1	RJ45

ACCESSORIES

895-39226 - Rackmount Bracket

895-39949 - Rackmount Shelf

10 Mbps Compact Media Converter

McBasic TP/FO

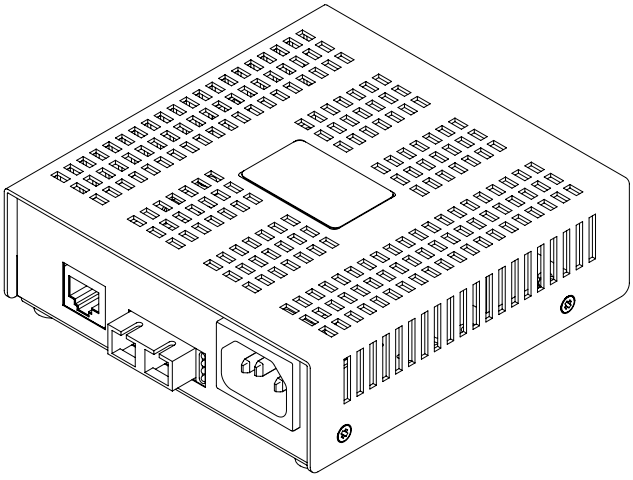
SPECIFICATIONS

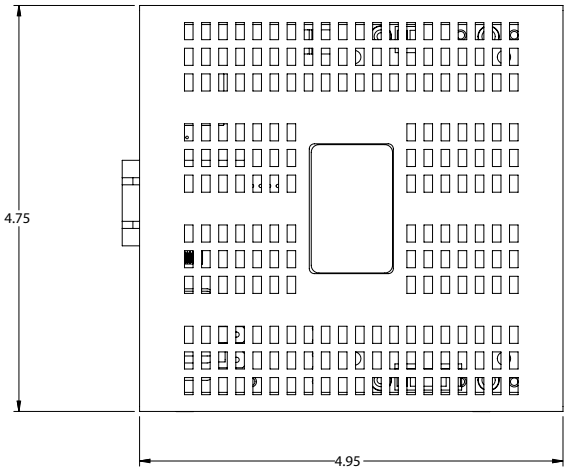
TECHNICAL
Include MDI/MDIX switch
Includes fixed, internal AC power
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Includes diagnostic LEDs
IEEE 802.3 10Base-T twisted pair and 10Base-FL fiber
Features LinkLoss and FiberAlert
CONNECTORS
RJ45 and ST or SC
Supports Half- and Full-Duplex operation

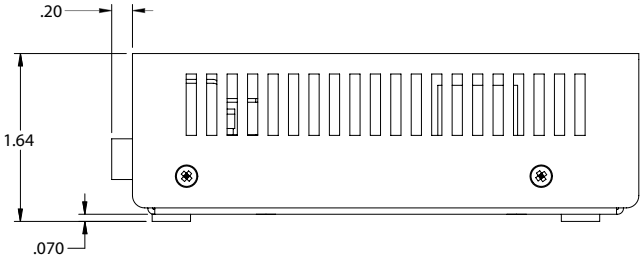
MECHANICAL	
Dimensions	1.64"H x 4.75"W x 4.95"D (4.2 cm x 12.17 cm x 11.64 cm)
Shipping Weight	1.3 lbs (0.58 kg)
POWER RATING	
100-240 VAC, 50/60Hz, 1.0A	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	0° to +160° F (-20° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

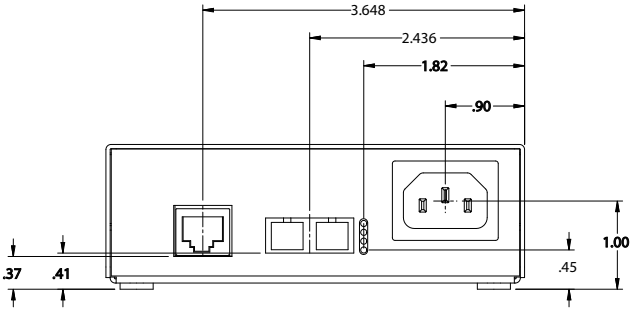
MECHANICAL DIAGRAM

(dimensions in inches)









100 Mbps Compact Media Converter

McBasic TX/FX

PRODUCT FEATURES

- Has a small, rugged design offering many advanced features
- Available for multi-mode or single-mode fiber
- LinkLoss and FiberAlert features, along with LEDs, assist in diagnosing
- Convert 100 Mbps twisted pair to 100 Mbps fiber

The McBasic's small, table-top design and durability make it perfect for installation anywhere space is limited. Additionally, the McBasic comes with an internal AC power supply. This feature significantly increases reliability over products that use bulky, external AC/DC power transformers. The McBasic series includes:

The McBasic includes troubleshooting features such as LinkLoss, FiberAlert, Transparency and Link Fault Detection that make isolating fiber breaks easier should they occur. The McBasic also features AutoCross on twisted pair connections and diagnostic LEDs. Most McBasic units are available with single-strand fiber which can effectively double the capacity of fiber by allowing two individual channels to share one strand of fiber; Full-Duplex data travels on different wavelengths — 1310 nm and 1550 nm, for example.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39949 - Rackmount Shelf

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McBasic TX/FX					
855-10929	MM850-ST	1	2 km	1	RJ45
855-10930	MM850-SC	1	2 km	1	RJ45
855-10927	MM1300-ST	1	5 km	1	RJ45
855-10928	MM1300-SC	1	5 km	1	RJ45
855-10931	SM1310/PLUS-ST	1	40 km	1	RJ45
855-10932	SM1310/PLUS-SC	1	40 km	1	RJ45
855-10933	SM1310/LONG-ST	1	80 km	1	RJ45
855-10934	SM1310/LONG-SC	1	80 km	1	RJ45
855-10937	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE-STRAND FIBER *					
855-10949	SSFX-MM1310-SC	1	2 km	1	RJ45
855-10950	SSFX-MM1550-SC	1	2 km	1	RJ45
855-10951	SSFX-SM1310-SC	1	20 km	1	RJ45
855-10952	SSFX-SM1550-SC	1	20 km	1	RJ45
855-10953	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-10954	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45
855-10955	SSFX-SM1310/LONG-SC	1	60 km	1	RJ45
855-10957	SSFX-SM1550/LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

100 Mbps Compact Media Converter

McBasic TX/FX

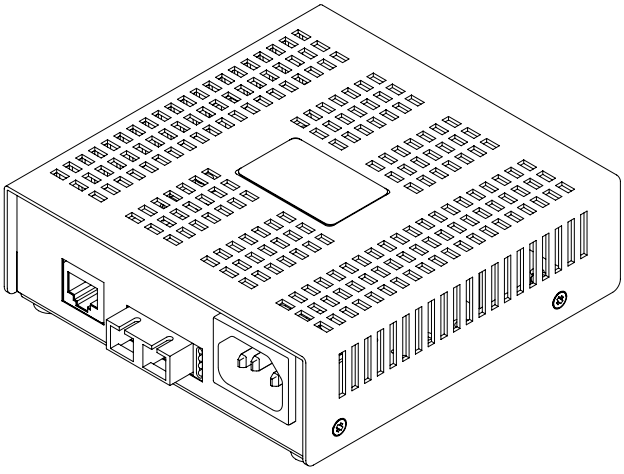
SPECIFICATIONS

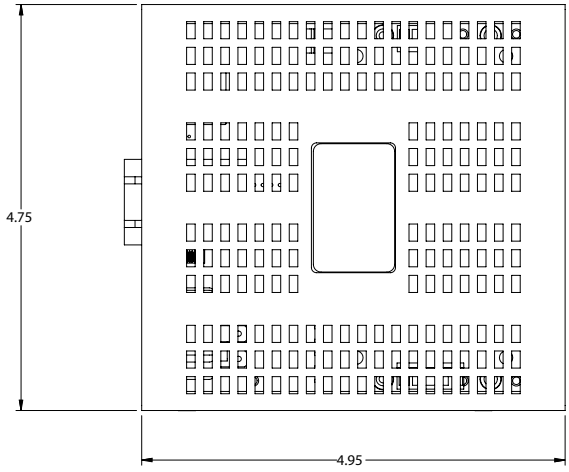
TECHNICAL
Include MDI/MDIX switch
Includes fixed, internal AC power
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Includes diagnostic LEDs
IEEE 802.3u 100Base-TX twisted pair and 100Base-FX or -SX fiber
Features LinkLoss and FiberAlert
Features Auto Negotiation
CONNECTORS
RJ45 and ST or SC
Supports Half- and Full-Duplex operation

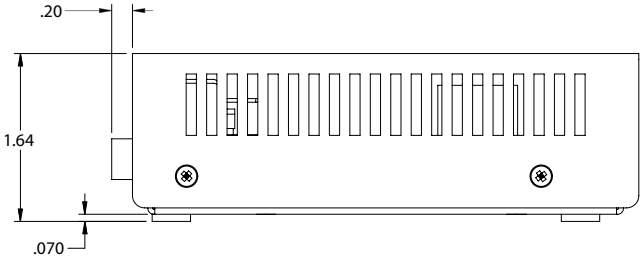
MECHANICAL	
Dimensions	1.64"H x 4.75"W x 4.95"D (4.2 cm x 12.17 cm x 11.64 cm)
Shipping Weight	1.3 lbs (0.58 kg)
POWER RATING	
100-240 VAC, 50/60Hz, 1.0A	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	0° to +160° F (-20° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

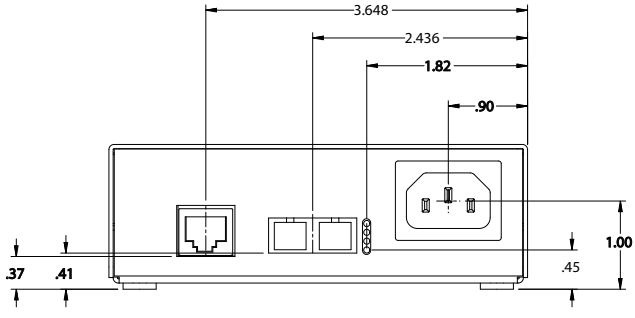
MECHANICAL DIAGRAM

(dimensions in inches)









10/100 Mbps Auto Sensing Compact Media Converter

McBasic 10/100 TX/FX

PRODUCT FEATURES

- Has a small, rugged design offering many advanced features
- Available for multi-mode or single-mode fiber
- LinkLoss, Transparency and Link Fault Detection features, along with LEDs, assist in diagnosing problems on fiber optic networks
- Convert 10 Mbps twisted pair to 10 Mbps fiber OR convert 100 Mbps twisted pair to 100 Mbps fiber

The McBasic's small, table-top design and durability make it perfect for installation anywhere space is limited. Additionally, the McBasic comes with an internal AC power supply. This feature significantly increases reliability over products that use bulky, external AC/DC power transformers.

The McBasic includes troubleshooting features such as LinkLoss, Transparency and Link Fault Detection that make isolating fiber breaks easier should they occur. The McBasic also features a crossover/pass-through switch on the twisted pair connection for MDI/MDIX connectivity and diagnostic LEDs. Most McBasic units are available with single-strand fiber which can effectively double the capacity of fiber by allowing two individual channels to share one strand of fiber; Full-Duplex data travels on different wavelengths — 1310 nm and 1550 nm, for example.

Auto-Sensing 10/100 Mbps McBasic converters offer significant advantages over regular 10 and 100 Mbps converters. An ideal choice for both enterprise and service provider networks, 10/100 converters save time and money when deployed at the host and remote site. Enterprise networks planning a migration path from 10 Mbps to 100 Mbps often deploy Auto Sensing converters, then upgrade when ready and units will automatically adapt to increased speed. Service providers with 10 or 100 Mbps links to customer premises can sell customers more bandwidth without upgrading the converters at the POP and the customer network edge.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39949 - Rackmount Shelf

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McBasic TX/FX					
855-10260	MM850-ST	1	2 km	1	RJ45
855-10261	MM850-SC	1	2 km	1	RJ45
855-10262	MM1300-ST	1	5 km	1	RJ45
855-10263	MM1300-SC	1	5 km	1	RJ45
855-10267	SM1310/PLUS-ST	1	40 km	1	RJ45
855-10268	SM1310/PLUS-SC	1	40 km	1	RJ45
855-10269	SM1310/LONG-ST	1	80 km	1	RJ45
855-10270	SM1310/LONG-SC	1	80 km	1	RJ45
855-10274	SM1550/LONG-SC	1	80 km	1	RJ45

10/100 Mbps Auto Sensing Compact Media Converter

McBasic 10/100 TX/FX

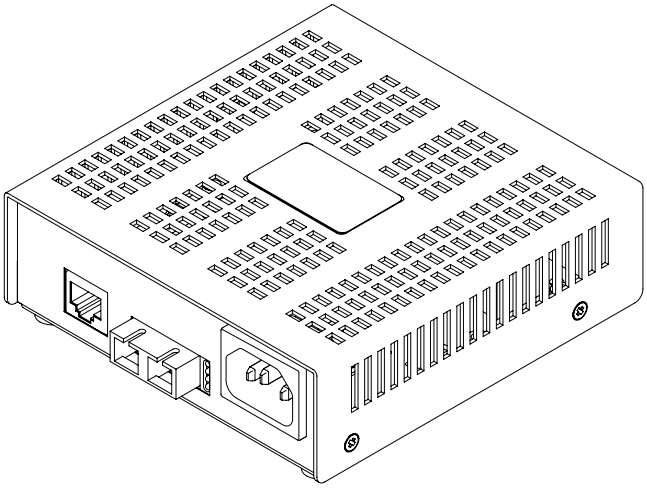
SPECIFICATIONS

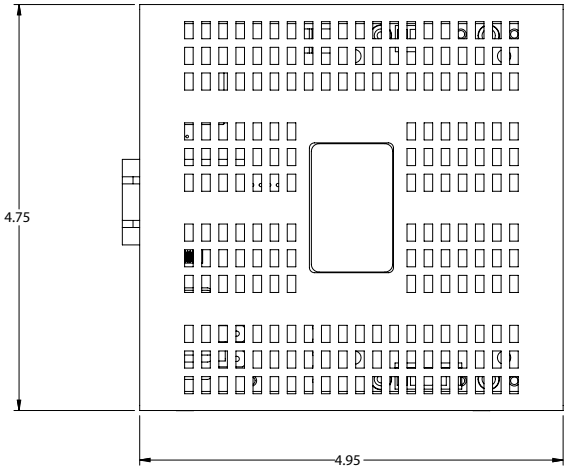
TECHNICAL
Include MDI/MDIX switch
Includes fixed, internal AC power
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Includes diagnostic LEDs
IEEE 802.3 10Base-T twisted pair and 10Base-FL fiber
IEEE 802.3u 100Base-TX twisted pair and 100Base-FX or -SX fiber
Features Link Fault Detection and Transparency
Features Auto Negotiation
CONNECTORS
RJ45 and ST or SC
Supports Half- and Full-Duplex operation

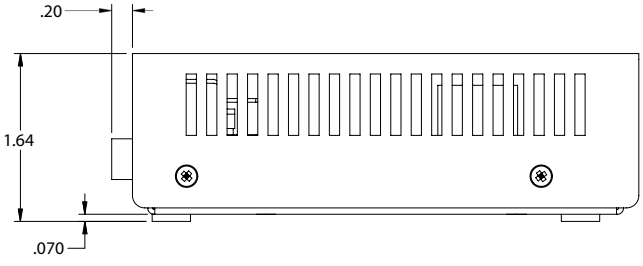
MECHANICAL	
Dimensions	1.64"H x 4.75"W x 4.95"D (4.2 cm x 12.17 cm x 11.64 cm)
Shipping Weight	1.3 lbs (0.58 kg)
POWER RATING	
100-240 VAC, 50/60Hz, 1.0A	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	0° to +160° F (-20° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

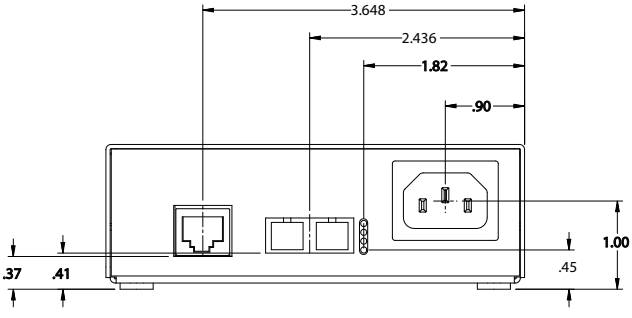
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)



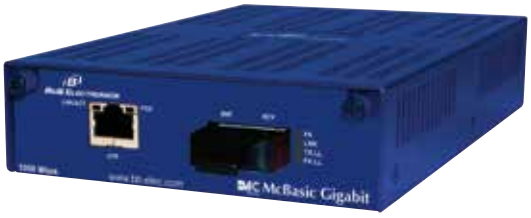






1000 Mbps Compact Media Converter

McBasic Gigabit (LFPT)



PRODUCT FEATURES

- Has a small, rugged design offering many advanced features
- Available for multi-mode or single-mode fiber
- LinkLoss, FiberAlert, and Link Fault Pass Through features, along with LEDs, assist in diagnosing problems on fiber optic networks
- Convert 1000 Mbps twisted pair to 1000 Mbps fiber

The McBasic's small, table-top design and durability make it perfect for installation anywhere space is limited. Additionally, the McBasic comes with an internal AC power supply. This feature significantly increases reliability over products that use bulky, external AC/DC power transformers.

LinkLoss, FiberAlert and Link Fault Pass Through (LFPT) that make isolating fiber breaks easier should they occur. The McBasic also features AutoCross to support crossover/pass-through on the twisted pair connection and diagnostic LEDs. Most McBasic units are available with single-strand fiber which can effectively double the capacity of fiber by allowing two individual channels to share one strand of fiber; Full-Duplex data travels on different wavelengths — 1310 nm and 1550 nm, for example.

ACCESSORIES

895-39226 - Rackmount Bracket

895-39949 - Rackmount Shelf

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McBasic Gigabit (LFPT)					
855-11913	SX-MM850-SC	1	220/550 m	1	RJ45
855-11914	LX-SM1310-SC	1	15 km	1	RJ45
855-11915	LX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-11917	LX-SM1550/LONG-SC	1	80 km	1	RJ45
855-11918	LX-SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE-STRAND FIBER *					
855-11844	SSLX-SM1310-SC	1	15 km	1	RJ45
855-11845	SSLX-SM1550-SC	1	15 km	1	RJ45
855-11824	SSBX-SM1310-SC	1	10 km	1	RJ45
855-11825	SSBX-SM1490-SC	1	10 km	1	RJ45
855-11846	SSLX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-11847	SSLX-SM1550/PLUS-SC	1	40 km	1	RJ45
855-11826	SSBX-SM1310/PLUS-SC	1	30 km	1	RJ45
855-11827	SSBX-SM1491/PLUS-SC	1	30 km	1	RJ45
855-11850	SSLX-SM1490/LONG-SC	1	70 km	1	RJ45
855-11851	SSLX-SM1550/LONG-SC	1	70 km	1	RJ45
855-11852	SSLX-SM1490/XLONG-SC	1	80 km	1	RJ45
855-11853	SSLX-SM1550/XLONG-SC	1	80 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

1000 Mbps Compact Media Converter

McBasic Gigabit (LFPT)

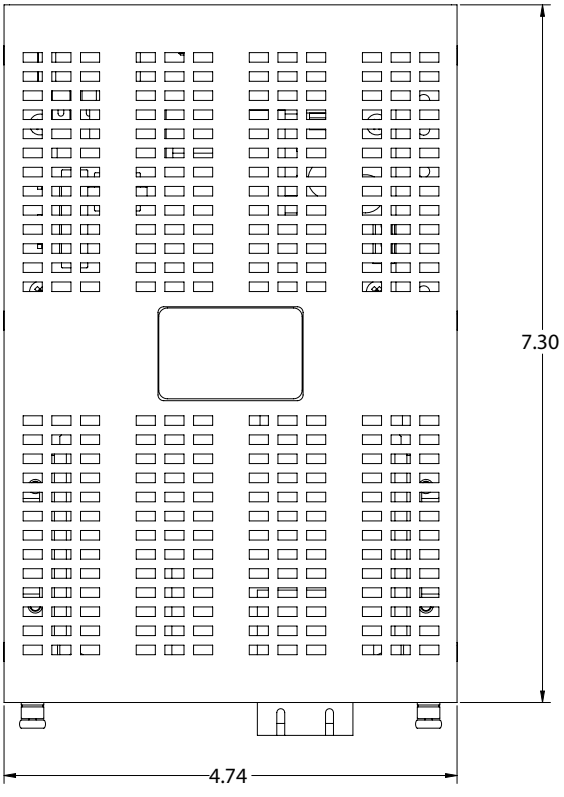
SPECIFICATIONS

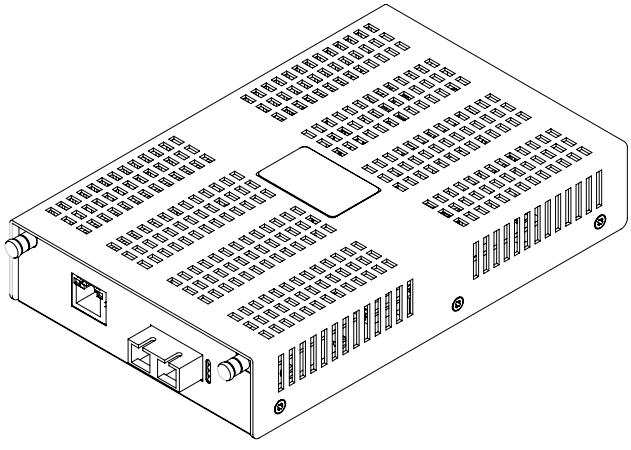
TECHNICAL
Include MDI/MDIX switch
Includes fixed, internal AC power
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Includes diagnostic LEDs
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
Features Link Fault Pass-Through (LFPT) and FiberAlert
CONNECTORS
RJ45 and SC
Supports Half- and Full-Duplex operation

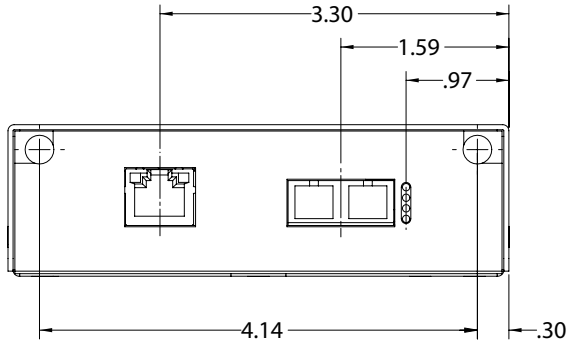
MECHANICAL	
Dimensions	1.64"H x 4.75"W x 7.3"D (4.2 cm x 12.17 cm x 18.71 cm)
Shipping Weight	1.7 lbs (0.77 kg)
POWER RATING	
100-240 VAC, 50/60Hz, 1.0A	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	0° to +160° F (-20° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

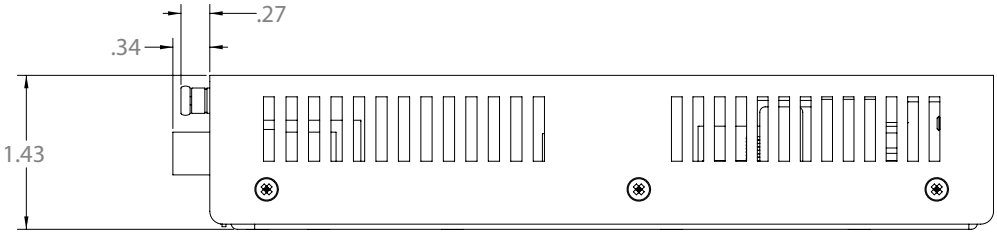
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)









PoE-Powered, Network-Extending 10/100Base-T Multi-Port Switch

PD-Switch

PRODUCT FEATURES

- PD accepts power from any network device providing PsE
- Mulitple ports increase network port density
- SFP and fiber port configurations (optional) for different network environments
- Broadcast Storm Protection helps control excessive broadcast traffic
- Supports 1916 byte packet size
- Far End Fault provides notification of Link Loss on all fiber ports

The (PoE) PD-Switch is a full-featured, 5-port 10/100Base-T switch that extends the range of Ethernet networks, and increases port density, while being powered via IEEE 802.3af-compliant PoE through its “PD-port” (eliminating the need to run a separate power line for the device). Ethernet cabling usually runs only 100 meters; through the use of the PD-Switch, the outer range of an Ethernet network can be extended by an additional 100 meters.

With multiple port configurations, the PD-Switch provides a variety of port options while increasing port density. PD-Switches come equipped with one “PD” RJ45 port and either:

- Four 10/100Base-T RJ45 data ports
- Three 10/100Base-T RJ45 data ports and one SFP data port
- Two 10/100Base-T RJ45 data ports and one 100Base-FX fiber data port

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
PD-Switch					
852-16440			100 m	5	RJ45
852-16441	SFP *	1	Various	4	RJ45
852-16442	MM850-ST	1	2 km	3	RJ45
852-16443	MM850-SC	1	2 km	3	RJ45
852-16444	MM1300-ST	1	5 km	3	RJ45
852-16445	MM1300-SC	1	5 km	3	RJ45
852-16446	SM1310/PLUS-ST	1	40 km	3	RJ45
852-16447	SM1310/PLUS-SC	1	40 km	3	RJ45
852-16448	SM1310/LONG-ST	1	80 km	3	RJ45
852-16449	SM1310/LONG-SC	1	80 km	3	RJ45
852-16450	SM1550/LONG-SC	1	80 km	3	RJ45
SINGLE STRAND FIBER **					
852-16470	SSFX-SM1310-SC	1	20 km	3	RJ45
852-16471	SSFX-SM1550-SC	1	20 km	3	RJ45
852-16472	SSFX-SM1310/ PLUS-SC	1	40 km	3	RJ45
852-16473	SSFX-SM1550/ PLUS-SC	1	40 km	3	RJ45
852-16474	SSFX-SM1310/ LONG-SC	1	60 km	3	RJ45
852-16475	SSFX-SM1550/ LONG-SC	1	60 km	3	RJ45

* SFP Fiber sold separately

** These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

PoE-Powered, Network-Extending 10/100Base-T Multi-Port Switch

PD-Switch

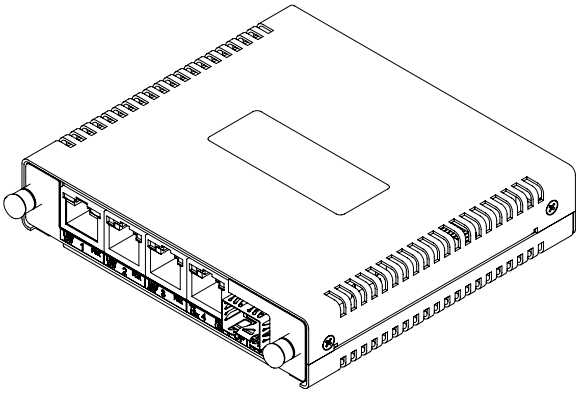
SPECIFICATIONS

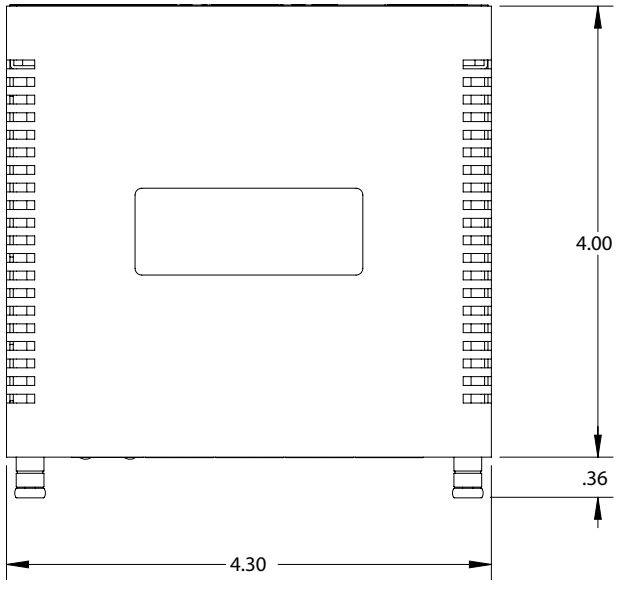
TECHNICAL
RoHS-Compliant
Acts as a PD – Powered Device
IEEE 802.3x 10/100Base-T
IEEE 802.3u Auto-Negotiation
IEEE 802.3af Power Over Ethernet, Powered (PD)
RFC-2474 and RFC-2475 DiffServ/ToS
High Priority port
AutoCross and Auto-Negotiation on all ports
Includes diagnostic LEDs
Maximum 1,916 byte Packet Size
Broadcast Storm Protection
50/125µm or 62.5/125µm multi-mode
9/125µm single-mode
Available for single-strand fiber
Small, rugged design
Supports Half and Full-Duplex operation

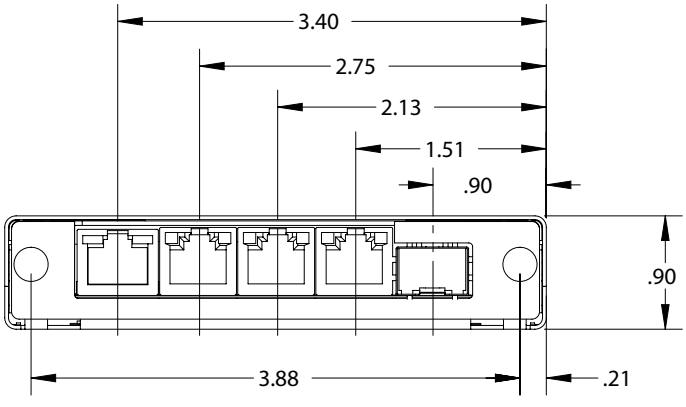
MECHANICAL	
Dimensions	1.55"H x 4.75"L x 7.31"D (3.94cm H x 12.07cm L x 18.57cm D)
Shipping Weight	1.8 lbs (.82 kg)
POWER RATING	
36 to 50 VDC, 56 to 40mA	
ENVIRONMENTAL	
Operating Temperature	+32° F to +122° F (0° C to +50°C)
Storage Temperature:	-13° C to +158° F (-25° C to +70° C
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
CE	

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







Multi-Port, 10/100 Mbps Switching Standalone Media Converter

AccessConverter

PRODUCT FEATURES

- Low cost, high flexibility — same small unit performs media conversion and switching functions
- Offers three downlink connections
- Compact size allows for flexible installation configurations
- Unmanaged

Terminating a fiber run while using various local, copper-based devices such as PCs, printers, VoIP, etc. is essential for the success of Fiber-to-the Business, Curb and other FTTx projects. Remote locations have similar configuration demands. Connecting the multiple copper devices to the fiber, however, typically requires the use of both a media converter and a switch— two pieces of equipment to purchase and two pieces of equipment to monitor and maintain. The AccessConverter streamlines FTTx projects as well as the connection of remote locations as a multi-port, switching media converter.

Best of all, one compact AccessConverter module reduces the amount of required equipment while providing all the features of a switch (store and forward switching mechanics, MAC address learning, protection against broadcast storms, flow control, etc.) and performing the electrical-to-optical conversion. In addition, the unit's small size and wall-mount bracket (included) allow you to install AccessConverter virtually anywhere, including inside a network interface device (NID).

Requiring no configuration, the AccessConverter offers plug-and-play operation:

- Each copper port auto-senses the connected device's speed and duplex mode (10 Mbps or 100 Mbps and HDX or FDX) and includes AutoCross, a feature which automatically selects between a crossover workstation (MDIX) or pass-through (MDI) connection depending on the connected device

- The fiber port always operates at 100 Mbps FDX, and supports distances up to 80 km; single-strand fiber versions are available.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
AccessConverter					
852-10140			100 m	4	RJ45
852-10150	MM850-ST	1	2 km	3	RJ45
852-10151	MM850-SC	1	2 km	3	RJ45
852-10141	MM1300-ST	1	5 km	3	RJ45
852-10142	MM1300-SC	1	5 km	3	RJ45
852-10141-MT	MM1300-MT	1	5 km	3	RJ45
852-10143	SM1310/PLUS-ST	1	40 km	3	RJ45
852-10144	SM1310/PLUS-SC	1	40 km	3	RJ45
852-10145	SM1310/LONG-ST	1	80 km	3	RJ45
852-10146	SM1310/LONG-SC	1	80 km	3	RJ45
852-10147	SM1550/LONG-SC	1	80 km	3	RJ45
SINGLE-STRAND FIBER *					
852-10153	SSFX-SM1310-SC	1	20 km	3	RJ45
852-10154	SSFX-SM1550-SC	1	20 km	3	RJ45
852-10155	SSFX-SM1310/ PLUS-SC	1	40 km	3	RJ45
852-10156	SSFX-SM1550/ PLUS-SC	1	40 km	3	RJ45
852-10157	SSFX-SM1310/ LONG-SC	1	60 km	3	RJ45
852-10158	SSFX-SM1550/ LONG-SC	1	60 km	3	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

Multi-Port, 10/100 Mbps Switching Standalone Media Converter

AccessConverter

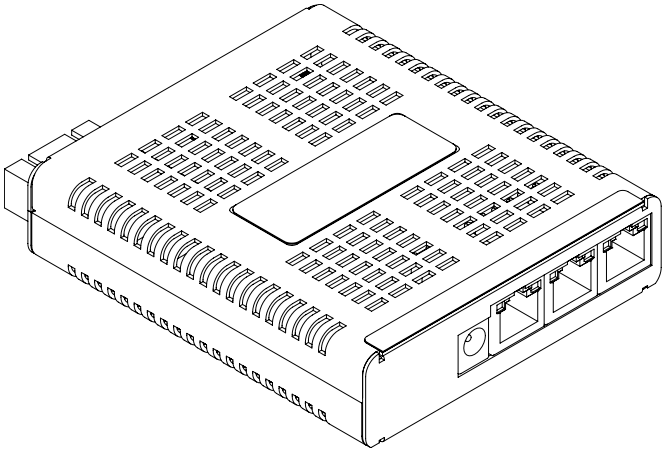
SPECIFICATIONS

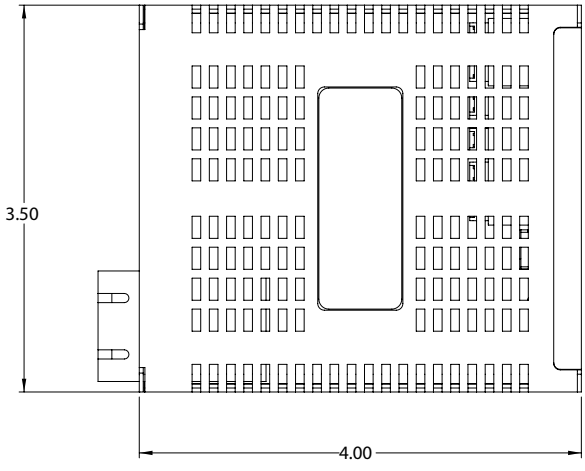
TECHNICAL
Auto Negotiation of speed and duplex (HDX/FDX) on copper ports
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881pps for 10 Mbps; 148,810pps for 100 Mbps
1024 MAC address learning
MTU: Supports over-sized packets up to 1536 bytes
Full wire speed on all ports
Broadcast storm protection
AutoCross for MDI/MDIX
LinkLoss and FiberAlert
Auto Negotiation
Diagnostic LEDs
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Single-strand fiber
All copper version also available (TX/3 + TX)
IEEE 802.3 10Base-T
IEEE 802.3u 100Base-TX
IEEE 802.3u 100Base-FX
IEEE 802.3x Flow Control
CONNECTORS
RJ45, ST, SC and MT-RJ
Supports Half- and Full-Duplex operation

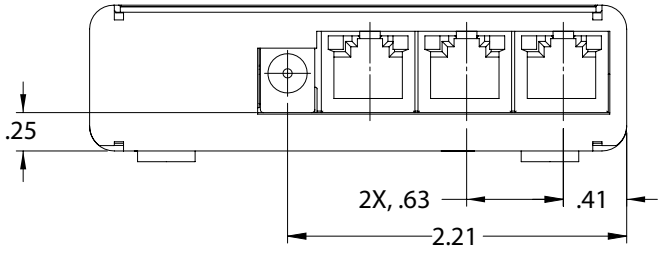
MECHANICAL	
Dimensions	0.92"H x 3.50"W x 4.38"D (2.34 x 8.89 x 11.13 cm)
Shipping Weight	1.1 lbs. (0.50 kg)
POWER RATING	
5V DC, 1A	
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158°F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

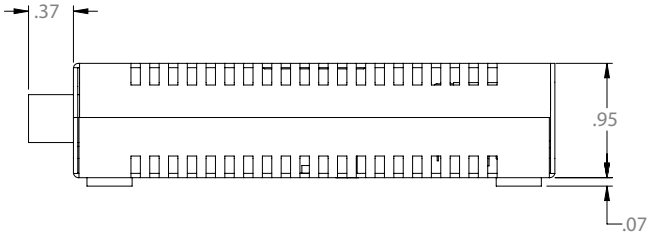
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)









10 Mbps Media Converter Module

McPIM TP/FO

PRODUCT FEATURES

- Modular, hot-swappable architecture reduces operational costs associated with product installations, upgrades and maintenance
- One 10 Mbps twisted pair port with and RJ45 connector
- One 10 Mbps fiber port with ST and SC connectors
- Plug-and-play operation

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber, copper-to-coax or fiber-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter Series is the perfect solution.

MediaConverter Series enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McPIM TP/FO					
855-12840	MM850-ST	1	2 km	1	1
855-12841	MM850-SC	1	2 km	1	1
855-12842	MM1300-ST	1	2 km	1	1
855-12843	MM1300-SC	1	2 km	1	1
855-12844	SM1310/PLUS-ST	1	40 km	1	1
855-12845	SM1310/PLUS-SC	1	40 km	1	1
855-12846	SM1310/LONG-ST	1	40 km	1	1
855-12847	SM1310/LONG-SC	1	40 km	1	1
855-12848	SM1550/LONG-ST	1	80 km	1	1
855-12849	SM1550/LONG-SC	1	80 km	1	1

10 Mbps Media Converter Module

McPIM TP/FO

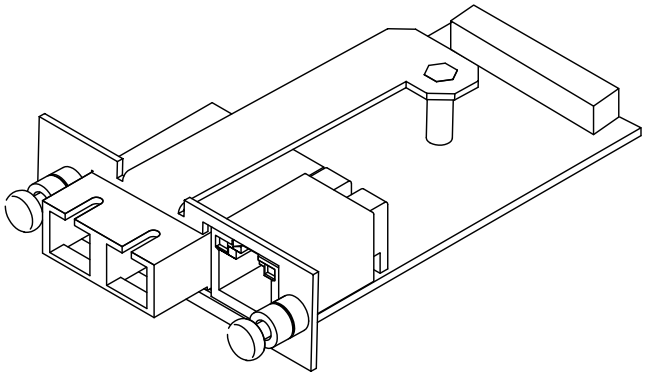
SPECIFICATIONS

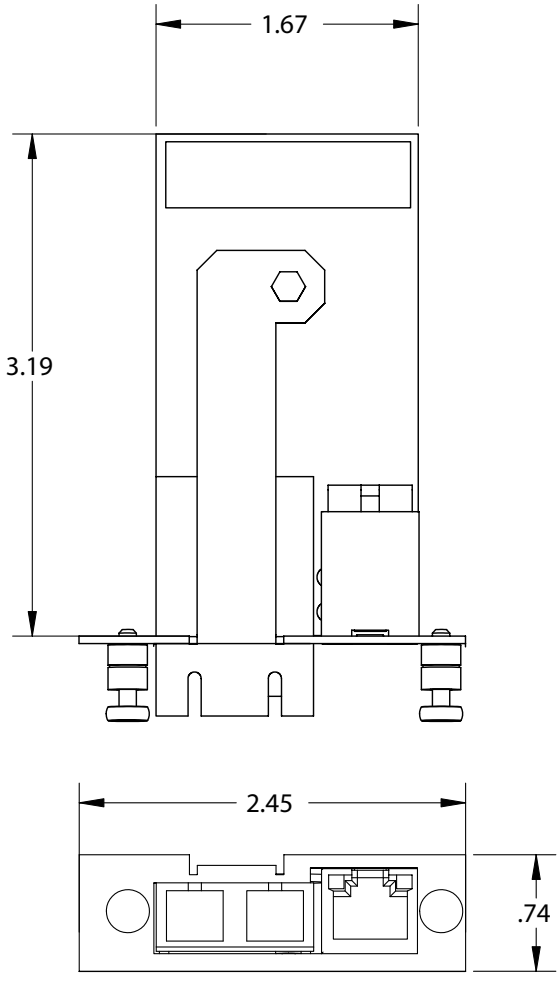
TECHNICAL
Install in any MediaConverter chassis
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Include diagnostic LEDs
Include hot-swappable architecture
10Base-T twisted pair
10Base-FL fiber
Includes MDI/MDIX switch
Features LinkLoss and FiberAlert
CONNECTORS
RJ45, ST and SC
Supports Half- and Full-Duplex operation

MECHANICAL	
Dimensions	0.75"H x 2.50"W x 4"D (2.20 x 6.41 x 10.25 cm)
Shipping Weight	0.7 lbs. (0.3 kg)
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158°F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





100 Mbps Media Converter Module

McLIM TX/FX

PRODUCT FEATURES

- Modular, hot-swappable architecture reduces operational costs associated with product installations, upgrades and maintenance
- One 100 Mbps twisted pair port with and RJ45 connector
- One 100 Mbps fiber port with ST and SC connectors
- Plug-and-play operation

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter Series is the perfect solution.

MediaConverter Series enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McLIM TX/FX					
855-12662	MM850-ST	1	2 km	1	RJ45
855-12663	MM850-SC	1	2 km	1	RJ45
855-12660	MM1300-ST	1	5 km	1	RJ45
855-12661	MM1300-SC	1	5 km	1	RJ45
855-12664	SM1310/PLUS-ST	1	40 km	1	RJ45
855-12665	SM1310/PLUS-SC	1	40 km	1	RJ45
855-12668	SM1310/LONG-SC	1	80 km	1	RJ45
855-12669	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE-STRAND FIBER *					
855-12680	SSFX-SM1310-SC	1	20 km	1	RJ45
855-12681	SSFX-SM1550-SC	1	20 km	1	RJ45
855-12682	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-12683	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45
855-12684	SSFX-SM1310/LONG-SC	1	60 km	1	RJ45
855-12685	SSFX-SM1550/LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

100 Mbps Media Converter Module

McLIM TX/FX

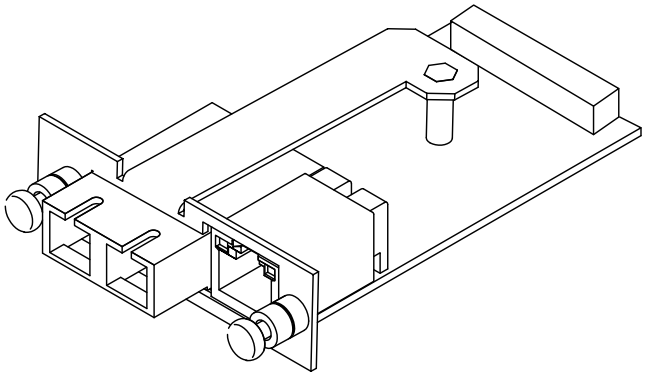
SPECIFICATIONS

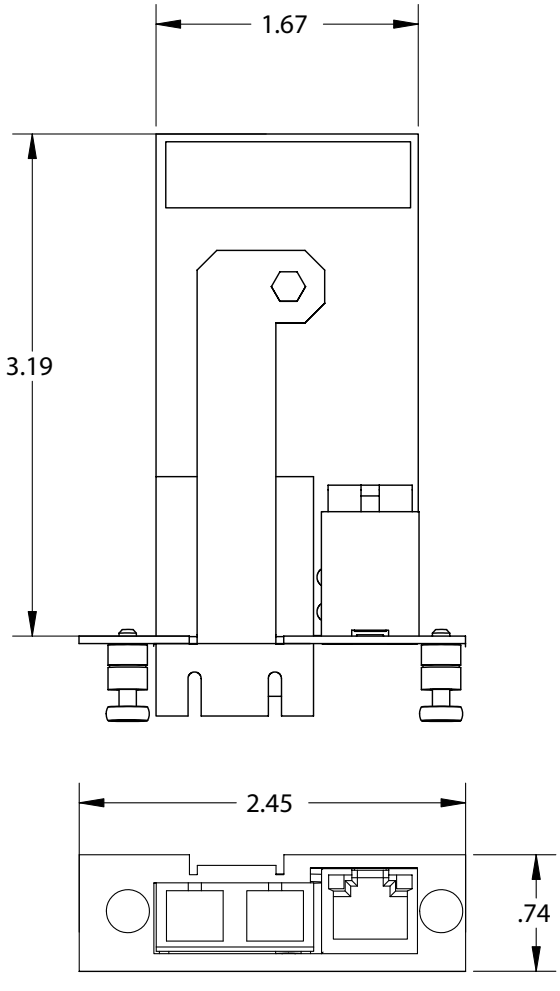
TECHNICAL
Install in any MediaConverter chassis
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Include diagnostic LEDs
Include hot-swappable architecture
100Base-TX twisted pair
100Base-FX or SX fiber
AutoCross for MDI/MDIX
Features LinkLoss and FiberAlert
Features Auto Negotiation
CONNECTORS
RJ45, ST and SC
Supports Half- and Full-Duplex operation

MECHANICAL	
Dimensions	0.75"H x 2.50"W x 4"D (2.20 x 6.41 x 10.25 cm)
Shipping Weight	0.7 lbs. (0.3 kg)
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158°F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





Switching 10/100 Mbps Media Converter Module

McLIM TP-TX/FX

PRODUCT FEATURES

- Modular, hot-swappable architecture reduces operational costs associated with product installations, upgrades and maintenance
- One 10/100 Mbps twisted pair port with and RJ45 connector
- One 100 Mbps fiber port with ST and SC connectors
- Plug-and-play operation

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter Series is the perfect solution.

MediaConverter Series enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McLIM TP-TX/FX					
855-12620	MM850-ST	1	220/550 m	1	RJ45
855-12621	MM850-SC	1	220/550 m	1	RJ45
855-12622	MM1300-ST	1	5 km	1	RJ45
855-12623	MM1300-SC	1	5 km	1	RJ45
855-12624	SM1310/PLUS-ST	1	40 km	1	RJ45
855-12625	SM1310/PLUS-SC	1	40 km	1	RJ45
SINGLE-STRAND FIBER *					
855-12642	SSFX-SM1310-SC	1	20 km	1	RJ45
855-12643	SSFX-SM1550-SC	1	20 km	1	RJ45
855-12644	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-12645	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

Switching 10/100 Mbps Media Converter Module

McLIM TP-TX/FX

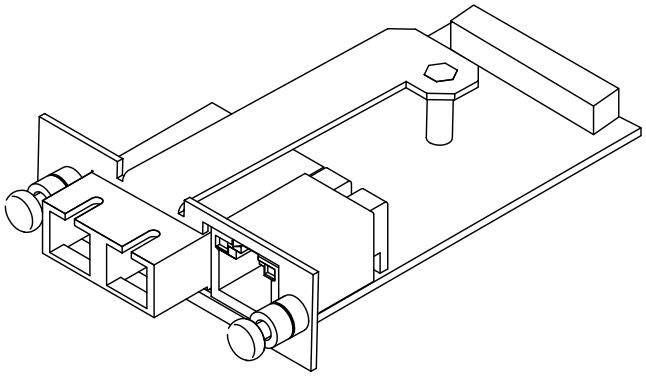
SPECIFICATIONS

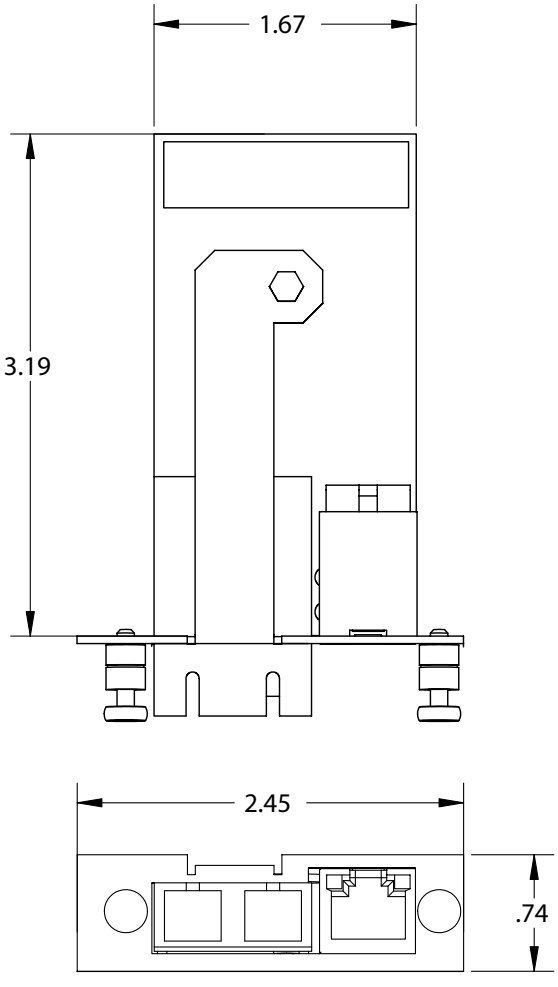
TECHNICAL
Install in any MediaConverter chassis
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Include diagnostic LEDs
Include hot-swappable architecture
10Base-T twisted pair
100Base-TX twisted pair
100Base-FX or SX fiber
AutoCross for MDI/MDIX
Features Auto Negotiation
CONNECTORS
RJ45, ST and SC
Supports Half- and Full-Duplex operation

MECHANICAL	
Dimensions	0.75"H x 2.50"W x 4"D (2.20 x 6.41 x 10.25 cm)
Shipping Weight	0.7 lbs. (0.3 kg)
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158°F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





1000 Mbps Media Converter Module

McGigabit

PRODUCT FEATURES

- Modular, hot-swappable architecture reduces operational costs associated with product installations, upgrades and maintenance
- One 1000 Mbps twisted pair port with and RJ45 connector
- One 1000 Mbps fiber port with SC connector
- Plug-and-play operation

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter Series is the perfect solution.

MediaConverter Series enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McGigabit					
855-12670	MM850-SC	1	220/550 m	1	RJ45
855-12691	MM1300-SC	1	2 km	1	RJ45
855-12671	SM1310-SC	1	15 km	1	RJ45
855-12672	SM1310/PLUS-SC	1	40 km	1	RJ45
855-12673	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE-STRAND FIBER *					
855-12674	SSLX-SM1310-SC	1	15 km	1	RJ45
855-12675	SSLX-SM1550-SC	1	15 km	1	RJ45
855-12694	SSBX-SM1310/ PLUS-SC	1	10 km	1	RJ45
855-12695	SSBX-SM1490/ PLUS-SC	1	10 km	1	RJ45
855-12676	SSLX-SM1310/ PLUS-SC	1	40 km	1	RJ45
855-12677	SSLX-SM1550/ PLUS-SC	1	40 km	1	RJ45
855-12696	SSBX-SM1310/ PLUS-SC	1	30 km	1	RJ45
855-12697	SSBX-SM1490/ PLUS-SC	1	30 km	1	RJ45
855-12686	SSLX-SM1490/ LONG-SC	1	70 km	1	RJ45
855-12687	SSLX-SM1550/ LONG-SC	1	70 km	1	RJ45
855-12688	SSLX-SM1490/ XLONG-SC	1	80 km	1	RJ45
855-12689	SSLX-SM1550/ XLONG-SC	1	80 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

1000 Mbps Media Converter Module

McGigabit

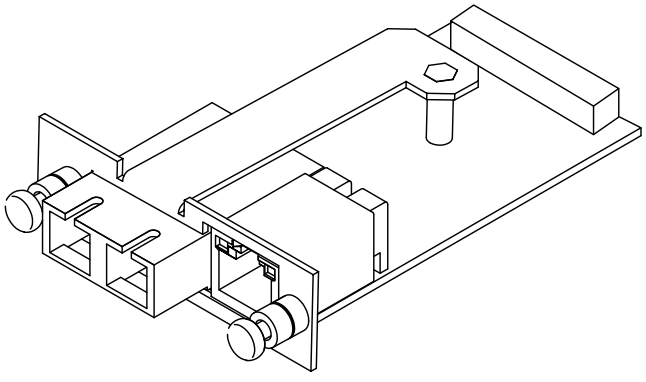
SPECIFICATIONS

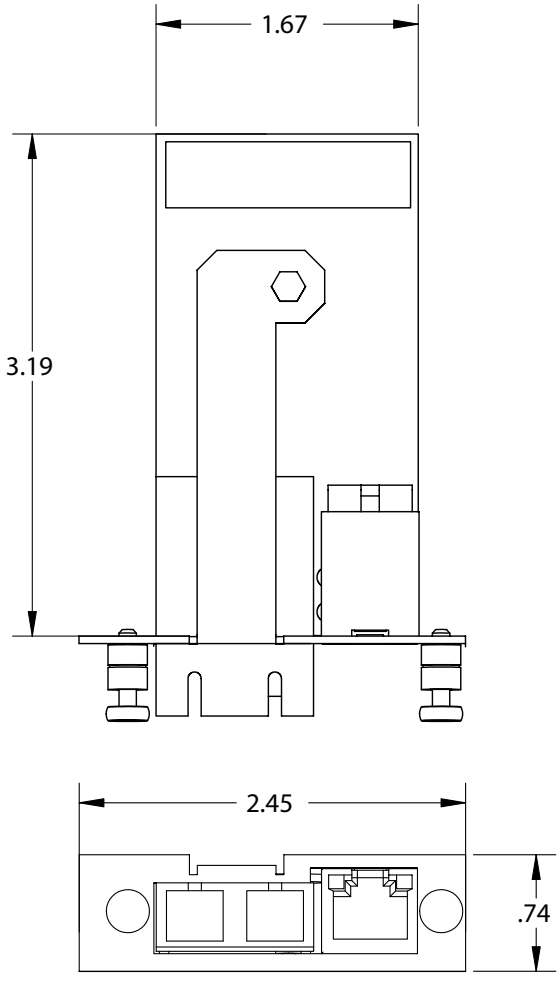
TECHNICAL
Install in any MediaConverter chassis
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Include diagnostic LEDs
Include hot-swappable architecture
1000Base-T twisted pair
1000Base-LX or SX fiber
AutoCross for MDI/MDIX
CONNECTORS
RJ45 and SC
Supports Half- and Full-Duplex operation

MECHANICAL	
Dimensions	0.75"H x 2.50"W x 4"D (2.20 x 6.41 x 10.25 cm)
Shipping Weight	0.7 lbs. (0.3 kg)
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158°F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





PC Card Ethernet Media Converters

McPC Series 100, 10/100 & Gigabit

PRODUCT FEATURES

- Easily installs inside a desktop PC
- No configuration required, connects to existing NIC card
- No drivers to install
- Available in an ISA or PCI style bracket

McPC Series Media Converters are ideal for Fiber-to-the-Desktop (FTTD) applications and for companies with frequent workstation moves and changes. Installing inside a PC or workstation, and plugging into an adjacent network interface card (NIC), these compact units eliminate the need to place Media Converters on top of desks or computers, reducing clutter of cords and adapters at the workspace.

The McPC series includes:

- 100 Mbps Fast Ethernet (TX/FX) - Designed to connect to NIC cards running at Fast Ethernet speeds
- 10/100 Mbps - A media converter that auto-senses the connected device's rate (10 Mbps or 100 Mbps) and duplex mode (Half-Duplex/Full-Duplex)
- 1000 Mbps Gigabit Ethernet (TX/SX or /LX) - Converts 1000 Mbps over copper to 1000 Mbps over fiber. Ideal for bringing Gigabit speed connectivity to the desktop

McPC converters accommodate crossover or pass through cables, with either a pushbutton MDI/MDIX switch or AutoCross, a feature which automatically selects the correct operating mode. Units also feature handy status LEDS to assist in network diagnostics and troubleshooting. In addition, McPC TX/FX and McPC 10/100 include troubleshooting features that make it easy to isolate fiber breaks.

ACCESSORIES

806-39230 - SATA Cable for McPC

IN THE FIELD

High Bandwidth for National Archives

Industry: Enterprise IT

Product: Mc PC Multi-mode Fiber Media Converters

www.bb-elec.com/Archives

Carrier data charges may apply.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McPC TX/FX 100 Mbps ISA					
855-13127	MM1300-ST	1	5 km	1	RJ45
855-13128	MM1300-SC	1	5 km	1	RJ45
855-13328	SM1310/PLUS-SC	1	40 km	1	RJ45
McPC TX/FX 100 Mbps PCI					
855-12127	MM1300-ST	1	5 km	1	RJ45
855-12128	MM1300-SC	1	5 km	1	RJ45
855-12328	SM1310/PLUS-SC	1	40 km	1	RJ45

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McPC 10/100 Mbps ISA					
855-13260	MM850-ST	1	2 km	1	RJ45
855-13261	MM850-SC	1	2 km	1	RJ45
855-13263	MM1300-SC	1	5 km	1	RJ45
McPC 10/100 Mbps PCI					
855-12260	MM850-ST	1	2 km	1	RJ45
855-12261	MM850-SC	1	2 km	1	RJ45
855-12263	MM1300-SC	1	5 km	1	RJ45

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McPC-Gigabit 1.25 Gbps PCI					
855-12900	MM850-SC	1	220/550 m	1	RJ45
855-12901	SM1310-SC	1	15 km	1	RJ45
855-12902	SM1310/PLUS-SC	1	40 km	1	RJ45
855-12903	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE-STRAND FIBER*					
855-12904	SSLX-SM1310-SC	1	15 km	1	RJ45
855-12905	SSLX-SM1550-SC	1	15 km	1	RJ45
855-12906	SSLX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-12907	SSLX-SM1550/PLUS-SC	1	40 km	1	RJ45

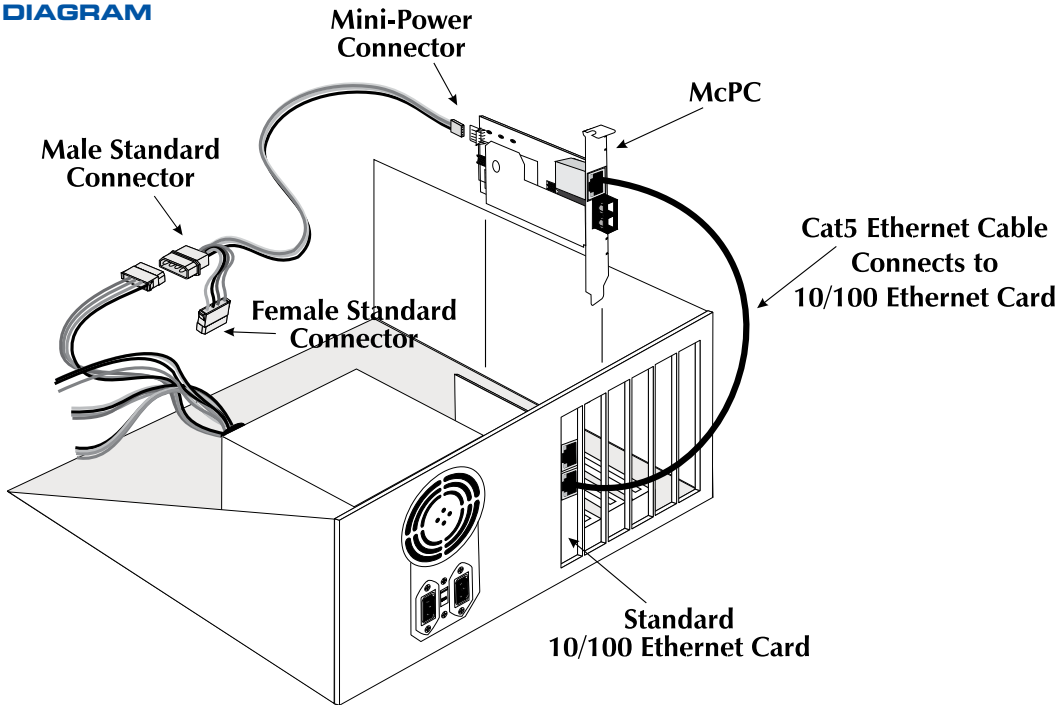
* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

SPECIFICATIONS

TECHNICAL
Save money by keeping existing copper network card (NIC) and converting inside the PC
No drivers to install; McPC mounts inside any PC or workstation with a standard PCI or ISA slot
Includes a standard 4-pin peripheral power connector
AutoCross or push-button selectable MDI/MDIX, depending on the unit
50/125µm or 62.5/125µm multi-mode fiber
Includes status LEDs
RoHS-Compliant
Plug-and-play operation
MCPC 100 MBPS (TXFX)
100 Mbps twisted pair copper to fiber media conversion
IEEE 802.3u 100Base-TX twisted pair
Features LinkLoss and FiberAlert
Features Auto Negotiation
MCPC 10/100 MBPS (TP-TX/FX)
10 Mbps and 100 Mbps to 100 Mbps twisted pair, auto-sensing media conversion
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3u 100Base-FX or SX fiber
Features Auto Negotiation
MCPC GIGABIT
1000 Mbps twisted pair to fiber media conversion
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
Optionally available for single-strand fiber
CONNECTORS
RJ45, ST and SC
Supports Half- and Full-Duplex operation

MECHANICAL	
PCI, ISA Slot Configurations	
Shipping Weight	0.6 lbs (0.22 kg)
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-4° to +158° F (-20° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM



Switching 10/100 and 10/100/1000 Mbps PC Card Ethernet Media Converters

McPC MediaLinX Series

PRODUCT FEATURES

- Easily installs inside a desktop PC
- No configuration required, connects to existing NIC card
- No drivers to install
- Available in PCI, ISA, or low profile PCI slot

McPC MediaLinX Series Media Converters are ideal for Fiber-to-the-Desktop (FTTD) applications and for companies with frequent workstation moves and changes. Installing inside a PC or workstation, and plugging into an adjacent network interface card (NIC), these compact units eliminate the need to place Media Converters on top of desks or computers, reducing clutter of cords and adapters at the workspace.

The McPC MediaLinX series includes:

- 10/100 Mbps Switching Ethernet (MediaLinX)
  - A rate converter as well as a media converter, the McPC MediaLinX converts 10 or 100 Mbps over copper to 100 Mbps over fiber.
- 10/100/1000 Mbps Switching Ethernet (Giga-MediaLinX)
  - A rate converter as well as a media converter, the McPC Giga-MediaLinX converts 10, 100 or 1000 Mbps over copper to 1000 Mbps over fiber.

McPC converters accommodate crossover or pass through connections, with AutoCross, a feature which automatically selects the correct operating mode. Units also feature handy status LEDS to assist in network diagnostics and troubleshooting.

ACCESSORIES

806-39230 - SATA Cable for McPC

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McPC MediaLinX PCI					
855-12731	MM850-SC	1	2 km	1	RJ45
855-12733	MM1300-SC	1	5 km	1	RJ45
855-12735	SM1310/PLUS-SC	1	40 km	1	RJ45
McPC MediaLinX LowPCI					
855-15733	MM1300-ST	1	5 km	1	RJ45
855-15735	SM1310/PLUS-SC	1	40 km	1	RJ45

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McPC Giga-MediaLinX PCI					
855-12920	MM850-SC	1	220/550 m	1	RJ45
855-12921	SM1300-SC	1	15 km	1	RJ45
855-12922	SM1310/PLUS-SC	1	40 km	1	RJ45
855-12924	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE-STRAND FIBER*					
855-12927	SSLX-SM1310-SC	1	15 km	1	RJ45
855-12928	SSLX-SM1550-SC	1	15 km	1	RJ45
855-12929	SSLX-SM1310/PLUS-SC	1	40 km	1	RJ45
855-12930	SSLX-SM1550/PLUS-SC	1	40 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
McPC Giga-MediaLinX LowPCI					
855-15919	SFP	1	Various	1	RJ45
855-15920	MM850-SC	1	220/550 m	1	RJ45
855-15921	SM1310-SC	1	15 km	1	RJ45

* SFP Fiber sold separately

IN THE FIELD

Tight Security: U.S. Joint Forces Command

Industry: Security

Product: McPC TP-TX/FX Multi-Mode Fiber Media Converter

www.bb-elec.com/USJFC

Carrier data charges may apply.

Switching 10/100 and 10/100/1000 Mbps PC Card Ethernet Media Converters

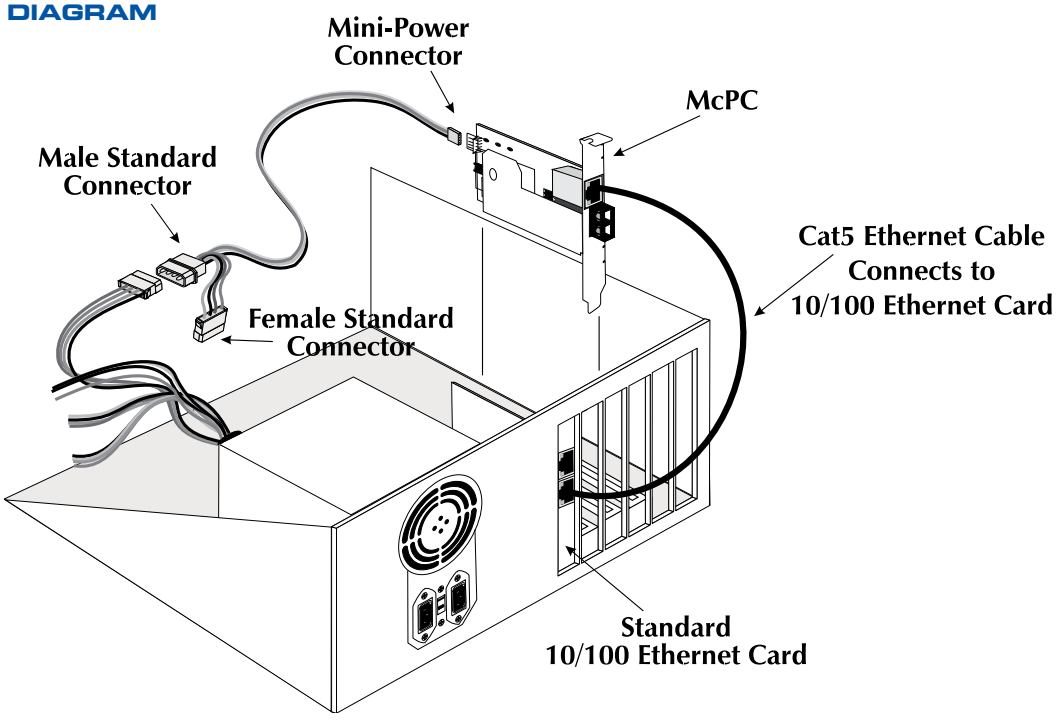
McPC MediaLinX Series

SPECIFICATIONS

TECHNICAL
Save money by keeping existing copper network card (NIC) and converting inside the PC
No drivers to install; McPC mounts inside any PC or workstation with a standard PCI or LowPCI slot
Includes a standard 4-pin peripheral power connector
AutoCross
50/125µm or 62.5/125µm multi-mode fiber
Includes status LEDs
RoHS Compliant
MCPC MEDIALINX
10 Mbps to 10 Mbps, 100 Mbps to 100 Mbps twisted pair to fiber media conversion
IEEE 802.3 10Base-T twisted pair
IEEE 802.3 10Base-FL fiber
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3u 100Base-FX or SX fiber
Features Link Fault Detection
Features Auto Negotiation
MCPC GIGA-MEDIALINX
10/100/1000 Mbps twisted pair copper to 1000 Mbps fiber conversion
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
Features Link Fault Detection
Features Auto Negotiation
CONNECTORS
RJ45, ST, SC and SFP (SFP only on McPC-Giga-MediaLinX LowPCI)
Supports Half- and Full-Duplex operation

MECHANICAL	
PCI and LowPCI Slot Configurations	
Shipping Weight	0.6 lbs (0.22 kg)
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-4° to +158° F (-20° to +70° C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM



10/100 Base-TX to 100Base-FX Media Converters

EIS-x-Sx Series

PRODUCT FEATURES

- 128K bits buffer memory
- DIP switch configuration for "Link-Fault-Pass-Through", speed,
- duplex mode 10/100Mbps-Full/Half-duplex
- Auto-negotiation, Auto-MDI/MDIX
- Full wire-speed forwarding rate
- Ships with12VDC external power supply
- 0°C to +45°C (+32°F to +113°F) operating temperature
- Aluminum case
- Desk, wall mount or optional chassis installation

Media converters do more than just convert copper Ethernet signals to fiber. They allow your LAN to be extended beyond the normal 100 meter limit. By using a pair of media converters, LANs can be extended up to 2km with multimode fiber and up to 20km with single-mode fiber. Since your data is traveling via fiber, it's protected from ground loop problems and electrical interference present along the cable run.

The economical EIS series media converters are stand-alone products that come with a power supply or can be mounted in a 19 inch rack chassis. The optional rack system holds up to 16 of the EIS products and includes one power supply to power installed EIS models via the backplane.

A second power supply for the rack system is available. Two power supplies will provide a load-sharing service to add redundancy to your system. If one power supply goes down, the other takes over immediately.

ORDERING INFORMATION

MODEL NUMBER	10/100 COPPER	FIBER	DISTANCE
US Power Supply			
EIS-M-ST	1 (RJ-45)	Multi-mode (ST)	2 km
EIS-M-SC	1 (RJ-45)	Multi-mode (ST)	2 km
EIS-S-SC	1 (RJ-45)	Single-mode (SC)	20 km
European Power Supply (-EU)			
EIS-M-ST-EU	1 (RJ-45)	Multi-mode (ST)	2 km
EIS-M-SC-EU	1 (RJ-45)	Multi-mode (ST)	2 km
EIS-S-SC-EU	1 (RJ-45)	Single-mode (SC)	20 km
United Kingdom Power Supply (-UK) :			
EIS-M-ST-UK	1 (RJ-45)	Multi-mode (ST)	2 km
EIS-M-SC-UK	1 (RJ-45)	Multi-mode (ST)	2 km
EIS-S-SC-UK	1 (RJ-45)	Single-mode (SC)	20 km

ACCESSORIES

EIS-PS-US - EIS Series External Power Adapter 12V US Plug

EIS-RACK-16 - Media Converter 19 Inch 2U Rack Chassis - 16 Slots

EIS-RACK-PS - Power Supply For EIS-Rack-16, 84 Watts

C5UMB3FBG - 3 ft - Beige - Category 5e UTP Patch Cord Assemblies

EIS-PS-EU - EIS Series External Power Adapter 12V EU Plug

DRT-960-48 - Power Supply, DIN, Metal, 960W, 48V, 340-550Vac 3Phase Input

EIS-PS-UK - EIS Series External Power Adapter 12V UK Plug

10/100 Base-TX to 100Base-FX Media Converters

EIS-x-Sx Series

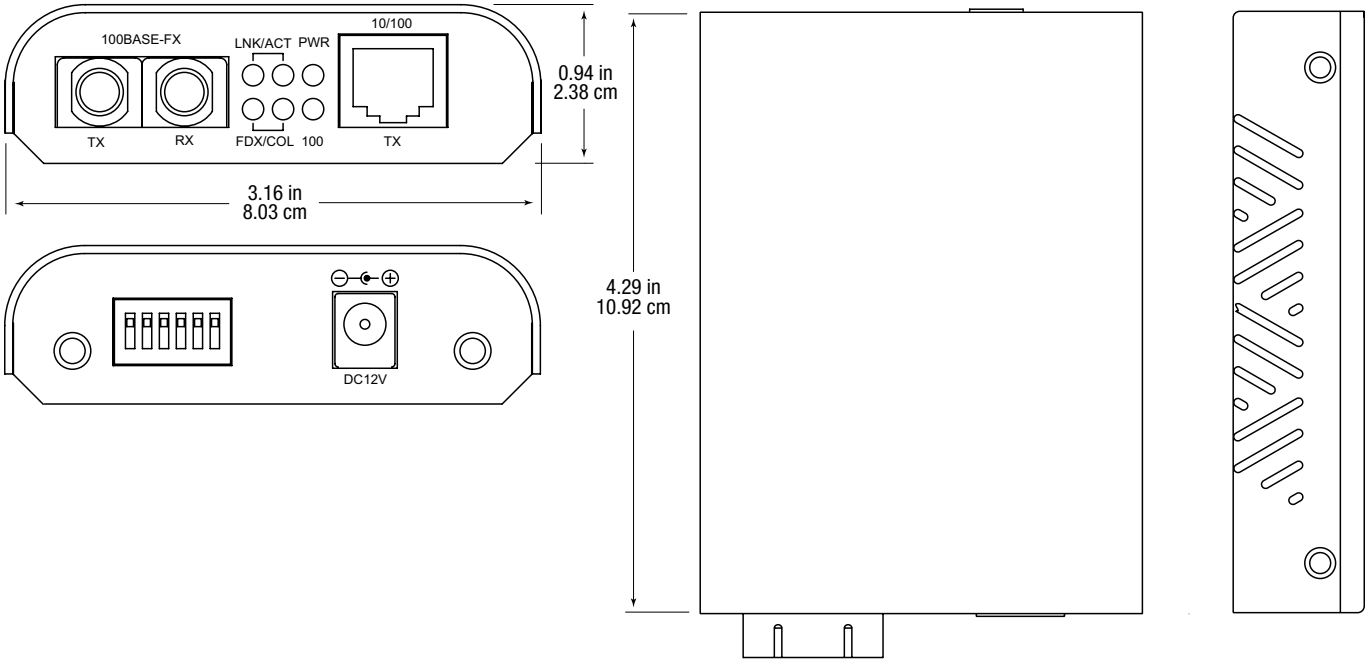
SPECIFICATIONS

TECHNOLOGY	
Standards	IEEE802.3 10BASE-T IEEE802.3u 100BASETX/100BASE-FX, IEEE802.3x
Processing Type	Store-and-Forward Half-duplex back-pressure and IEEE802.3xfull-duplex flow control
Forward and Filtering Rate:	14,880pps for 10Mbps; 148,810pps for 100Mbps
Packet buffer memory:	128K bits
INTERFACE	
Ethernet Port	10/100BASE-TX: 1 port 100BASE-FX: 1 port
LED Indicators:	Per Unit: Power Status (Power) Per port, 10/100T: Link/Activity, Full-duplex/Collision, Speed Per port, 100FX: Link/Activity, Full-duplex/Collision
POWER	
Input Voltage:	12VDC
Consumption	1.92W Max. 0.16A @ 12VDC
ENVIRONMENTAL	
Operating Temperature:	0 to 45°C (32 to 113°F)
Storage Temperature:	-10 to 70°C (14 to 158°F)
Ambient Relative Humidity:	5 to 95% (non-condensing)

MECHANICAL	
Enclosure	Aluminum case
Dimensions:	80.3W x 109.2D x 23.8H mm (3.16W x 4.30D x 0.94H in)
Weight:	150g (0.33lb)
Installation:	chassis system
REGULATORY APPROVALS	
ISO:	Manufactured in an ISO9001 facility
Safety:	UL60950-1
Emission Compliance:	CE Mark Class A FCC Part 15 Class A VCCI Class A

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)



Industrial Hardened 10/100Base-TX to 100Base-FX Media Converters

EIR-x-Sx Series

PRODUCT FEATURES

- Class 1/Division 2
- NEMA TS1/TS2 requirements for traffic control equipment
- IEC61000-6-2 EMC generic standard immunity for industrial environments
- Rugged DIN rail metal cases (panel mount kit available)
- Wide temperature range (-34 to +74 ºC)
- Alarm for power or port link failure via relay output (dry contact)
- Redundant 10 to 48 VDC power inputs (via terminal blocks)
- Vibration Resistance, Shock, Free Fall

Media converters convert twisted pair copper signals to fiber optic signals. LANs can be extended beyond the normal 100 meter limit up to 2km with multimode fiber and up to 20km with single-mode fiber. Since your data is traveling via fiber, it is protected from ground loop problems and electrical interference present along the cable run.

Extension of LAN distances make it possible to communicate with remotely located Ethernet enabled devices. The application could be as simple as getting data from one end of the warehouse to the other, tying two buildings together, enabling communications on a tank farm, or monitoring a SCADA system at a waste water plant.

Extended temperature and voltage specifications allow installation in the toughest environments. Media converters are highly qualified for environmental 10/100BASE Ethernet applications and certified by UL with ISA12.12.01 Class I, Division 2 for use in hazardous locations.

ORDERING INFORMATION

MODEL NUMBER	10/100 COPPER	FIBER	DISTANCE	CLASS 1/ DIVISION 2
EIR-M-ST	1 (RJ-45)	Multi-mode (ST)	2 km	X
EIR-M-SC	1 (RJ-45)	Multi-mode (ST)	2 km	X
EIR-S-SC	1 (RJ-45)	Single-mode (SC)	20 km	X

ACCESSORIES

ERS35 - DIN Rail 1 Meter 35MM Steel

C5UMB3FBG - 3 ft - Beige - Category 5e UTP Patch Cord Assemblies

DR-30-24 - DIN rail mount power supply, 24 VDC, 1.5 A power output

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

Industrial Hardened 10/100Base-TX to 100Base-FX Media Converters

EIR-x-Sx Series

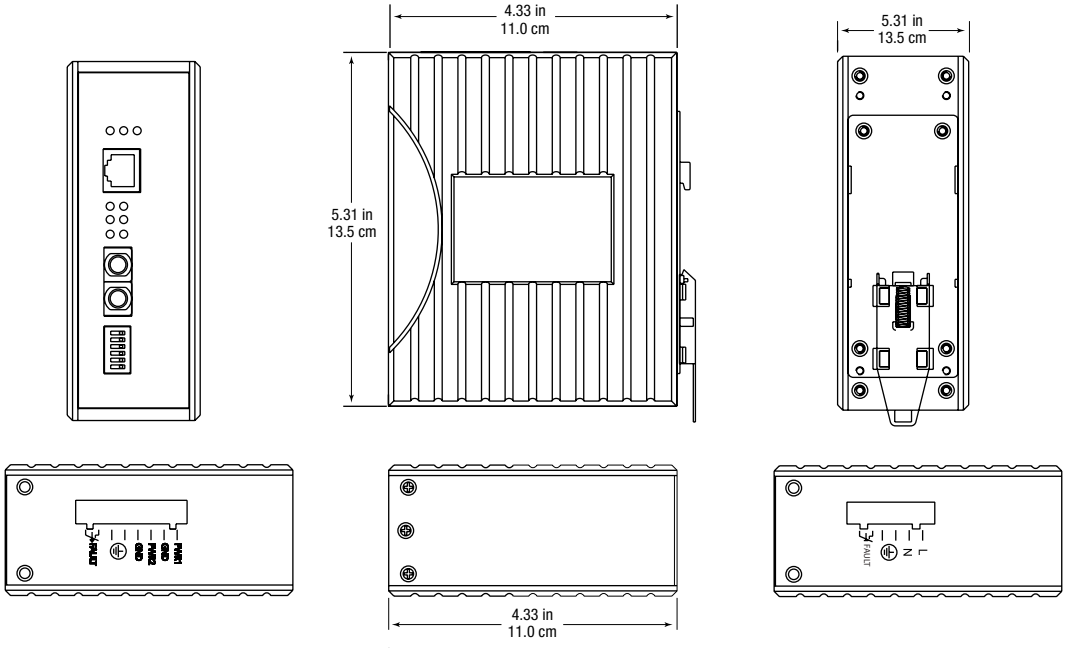
SPECIFICATIONS

TECHNOLOGY	
Standards	IEEE802.3 10Base-T, IEEE802.3u 100Base-TX/100Base-FX, IEEE802.3x
Processing Type	Store-and-Forward Half-duplex back-pressure and IEEE802.3xfull-duplex flow control
Forward and Filtering Rate:	14,880pps for 10Mbps; 148,810pps for 100Mbps
Packet buffer memory:	128K bits
MAC Address	2K
INTERFACE	
Ethernet Port	10/100BASE-TX: 1 port 100BASE-FX: 1 port
LED Indicators:	Per Unit: Power Status (Power 1, Power 2, Fault), Link-Fault-Pass-Through Per Port, 10/100TX: Link/Activity, Full-duplex/Collision, Speed Per Port, 100FX: Link/Activity, Full-duplex/Collision
Relay Contact	Relay contact rating with current 1A @ 30VDC, 0.5A @ 120VAC
Configuration	DIP switch
POWER	
Input Voltage:	Input Voltage: 10 to 48VDC (DC Terminal Block) or 12VDC (DC Jack) or 24VAC, 0.185A (AC Terminal Block)
Consumption	4.32W MAX. 0.36A @ 12VDC, 0.09A @ 48VDC
ENVIRONMENTAL	
Operating Temperature:	-34 to +75°C (-29 to +167°F)
Storage Temperature:	-40 to 85°C (-40 to 185°F)
Test Temperature:	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity:	5% to 95% (non-condensing)

MECHANICAL	
Enclosure	IP30, aluminum case
Dimensions:	50W x 110D x 135H mm (1.97W x 4.33D x 5.31H inches)
Weight:	0.8Kg (1.76lbs.)
Installation:	DIN rail (panel mount option)
REGULATORY APPROVALS	
ISO:	Manufactured in an ISO9001 facility
Safety:	Hazardous locations: Class 1, Division 2 group A,B,C&D UL60950-1, EN60950-1, IEC60950-1
EMS/EMI:	CE Mark FCC Part 15, Class A VCCI Class A EN55022 EN61000-3-2, -3-3, -4-3, -4-4, -4-5, -4-6, -4-8, -6-2, 6-3
Environmental:	NEMA TS1/2

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)



1000Base-T to Gigabit SFP Media Converter Series

EIS-G-SFP

PRODUCT FEATURES

- DIP switch configuration for “Link-Fault-Pass-Through”
- Fiber/auto force mode
- 1000Mbps-Auto/Full-duplex, Auto-Negotiation, Auto-MDI/MDIX
- SFP socket for Gigabit fiber optic expansion
- Full wire-speed forwarding rate
- Aluminum case
- EIS-RACK-16 chassis system compatible

The EIS-G-SFP offers 1000Base-T to 1000Base SFP socket for Gigabit fiber optic expansion for multi-mode or single mode applications. The flexible and easy to use, EIS-G-SFP is one of the most versatile media converters in the world. It is ideal for desktop use, and is also wall mountable. Also available is a 19” rack mountable chassis that holds up to 16 units for central control purposes. The rack holds this unit and other EIS Ethernet and Gigabit Ethernet media converters.

The EIS-G-SFP features easy to understand diagnostic LEDs. These LEDs show details for Link, Transmit/Receive, Full/Half duplex, and power status.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIS-G-SFP	Media Converter 1000Base-T to Gigabit SFP, US Power Supply
EIS-G-SFP-EU	Media Converter 1000Base-T to Gigabit SFP, EU Power Supply
EIS-G-SFP-UK	Media Converter 1000Base-T to Gigabit SFP, UK Power Supply

ACCESSORIES

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-Lx, SM 20Km, LC Connector, Wt

SFP-1000SX-M-550M-T - SFP Module, 1000Base-Sx, MM 550M, LC Connector, Wt

C5UMB3FBG - 3 ft - Beige - Category 5e UTP Patch Cord Assemblies

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-Lx, SM 10Km

EIS-PS-US - EIS Series External Power Adapter 12V US Plug

EIS-RACK-16 - Media Converter 19 Inch 2U Rack Chassis - 16 Slots

EIS-RACK-PS - Power Supply For EIS-Rack-16, 84 Watts

EIS-PS-EU - EIS Series External Power Adapter 12V EU Plug

EIS-PS-UK - EIS Series External Power Adapter 12V UK Plug

1000Base-T to Gigabit SFP Media Converter Series

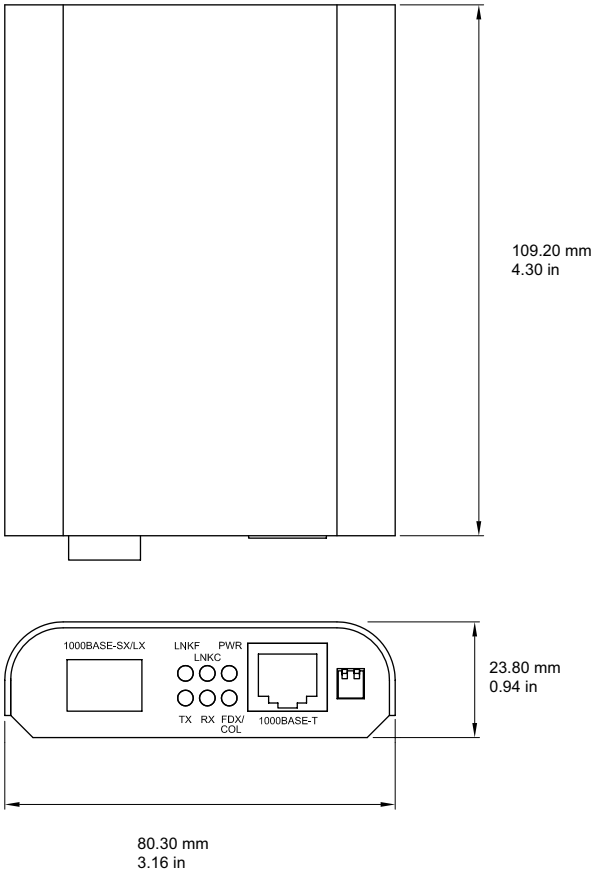
EIS-G-SFP

SPECIFICATIONS

ETHERNET TECHNOLOGY	
Standards	IEEE802.3ab 1000Base-T IEEE802.3z 1000Base-SX/1000Base-LX IEEE802.3x
Forward & Filtering Rate	1,488,100pps for 1000Mbps
INTERFACE	
Ethernet Ports	1 - 1000Base-TX 1 - Gigabit SFP
LED Indicators	Per Unit: Power Status (Power) Per Port: 1000T: Link, Full-duplex/Collision Gigabit SFP: Link, Transmit, Receive
MECHANICAL	
Enclosure	Aluminum case
Dimensions	80.30 mm x 109.20 mm x 23.80 mm (3.16 x 4.3 x 0.94 inches)
Weight	150g (0.33lb.)
Installation	Wall Mounting or use with EIS-RACK-16 media converter chassis system
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-10°C to 70°C (14°F to 158°F)
Ambient Relative Humidity	5% to 95% (non-condensing)
MTBF	381,168 Hours
MTBF Calc. Method	Parts Count Reliability Prediction
POWER	
Input Voltage	12VDC
Power Consumption	2.4W Max. 0.2A@12VDC
REGULATORY APPROVALS	
Emission Compliance	CE Mark Class A
	FCC Part 15, Class A
	VCCI Class A

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)



10/100/1000Base-TX to Gigabit SFP Hardened Media Converter

EIR-G-SFP-T

PRODUCT FEATURES

- Complies with NEMA TS1 & TS2 environmental requirements for traffic control equipment
- Complies with IEC61000-6-2 EMC generic standard immunity for Industrial environment
- DIP switch configuration for “Link-Fault-Pass-Through”, link down alarm
- Fiber/auto force mode
- 1000Mbps-Full-duplex, Auto-Negotiation, Auto-MDI/MDIX
- SFP socket for Gigabit fiber optic expansion
- Full wire-speed forwarding rate
- Alarms for power and port link failure by relay output
- Redundant power inputs with terminal block and DC Jack
- -40°C to 75°C (-40°F to 167°F) operating temperature range
- Hardened aluminum case
- Supports DIN-Rail or Panel Mounting installation

The EIR-G-SFP-T, Gigabit Ethernet media converters are designed to operate in harsh environments. The EIR-G-SFP-T functions at temperatures ranging from -40°C to 75°C (-40°F to 167°F) and is tested for functional operation @ -40°C to 85°C (-40°F to 185°F). Whether on the factory floor or the street corner, the EIR-G-SFP-T will provide flawless communications when you need it most. EIR-G-SFP-T offers 1000Base SFP socket to support multi-mode/single-mode fiber optics. The RJ-45 port on this unit provides Auto-MDIX and auto-negotiation. The link-fault-pass-through feature allows the network management agent on adjacent equipment to react to a broken link. Flexibility is the main feature of the EIR-G-SFP-T, it may be DIN rail or panel mounted, and comes with power options to match the applications that require a tough, environmentally hardened, Gigabit Ethernet media converter.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
EIR-G-SFP-T	IHardened Media Converter 1000Base-T to Gigabit SFP

ACCESSORIES

SFP-1000LX-S-20KM-T - SFP Module, 1000Base-Lx, SM 20Km, LC Connector, Wt

SFP-1000LX-S-10KM-T - SFP Module, 1000Base-Lx, SM 10Km

SFP-1000SX-M-550M-T - SFP Module, 1000Base-Sx, MM 550M, LC Connector, Wt

C5UMB3FBG - 3 ft - Beige - Category 5e UTP Patch Cord Assemblies

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

10/100/1000Base-TX to Gigabit SFP Hardened Media Converter

EIR-G-SFP-T

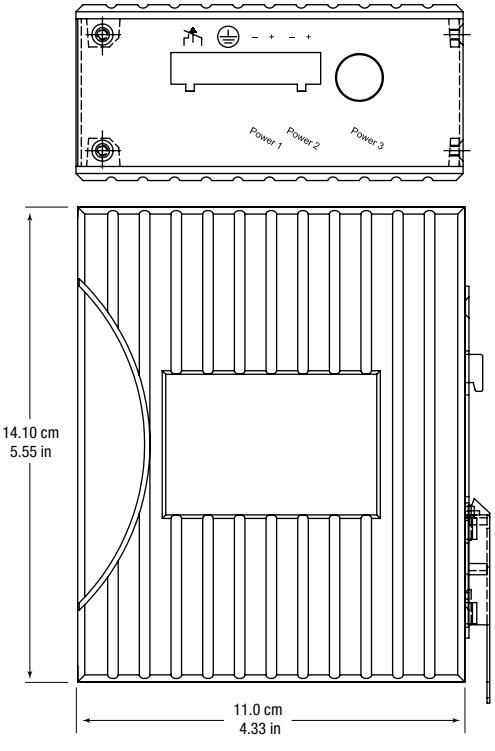
SPECIFICATIONS

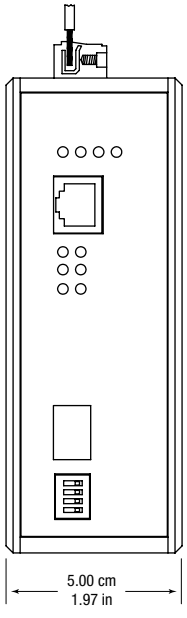
ETHERNET TECHNOLOGY	
Standards	IEEE802.3 10Base-T IEEE802.3u 100Base-TX IEEE802.3ab 1000Base-T IEEE802.3z 1000Base-SX/1000Base-LX IEEE802.3x
Forward & Filtering Rate	1,488,100pps for 1000Mbps
INTERFACE	
Ethernet Ports	1 - 10/100/1000Base-TX 1 - Gigabit SFP
LED Indicators	Per Unit: Power Status (Power1, Power2, Power3, Fault), LFPT Per Port: 10/100/1000TX: Link/Activity, Speed, Full-duplex/Collision Gigabit SFP: Link/Activity
Alarm Contact	One relay output with current 1A @ 30VDC, 0.5A@120VAC
MECHANICAL	
Enclosure	Aluminum case, IP30
Dimensions	5.00 cm x 11.0 cm x 14.10 cm (1.97 x 4.33 x 5.55 inches)
Weight	0.8Kg (1.76lbs.)
Installation	DIN-Rail (Top hat type 35mm), Rack Mounting (Optional)
Operating Temperature	-40°C to 75°C (-40°F to 167°F) Tested @ -40°C to 85°C (-40°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Ambient Relative Humidity	5% to 95% (non-condensing)
MTBF	348,518 Hours
MTBF Calc. Method	Parts Count Reliability Prediction

POWER	
Input Voltage	Dual 12 to 48VDC (Terminal Block); 12VDC (DC Jack)
Power Consumption	10.56W, 0.88A @ 12VDC, 0.44A @ 24VDC, 0.22A @ 48VDC
Overload Current Protection	Present
Reverse Polarity Protection	Present
REGULATORY APPROVALS	
Safety	EN60950-1, IEC60950-1
EMI	FCC Part 15, Class A VCCI, Class A EN61000-6-3: EN55022, EN61000-3-2, EN61000-3-3
EMS	EN61000-6-2 EN61000-4-2 (ESD Standards) Contact: + / - 4KV; Criteria B Air: + / - 8KV; Criteria B EN61000-4-3 (Radiated RFI Standards) 10V/m, 80 to 1000MHz; 80% AM Criteria A EN61000-4-4 (Burst Standards) Signal Ports: + / - 4KV; Criteria B D.C. Power Ports: + / - 4KV; Criteria B EN61000-4-5 (Surge Standards) Signal Ports: + / - 1KV; Line-to-Line; Criteria B D.C. Power Ports: + / - 0.5KV; Line-to-earth; Criteria B EN61000-4-6 (Induced RFI Standards) Signal Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A D.C. Power Ports: 10Vrms @ 0.15~80MHz; 80% AM Criteria A EN61000-4-8 (Magnetic Field Standards) 30A/m @ 50, 60Hz; Criteria A
Environmental Test Compliance	IEC60068-2-6 Fc (Vibration Resistance) 5g @ 10~150KHz, Amplitude 0.35mm (Operation/Storage/Transport) IEC60068-2-27 Ea (Shock) 25g @ 11ms (Half-Sine Shock Pulse; Operation) 50g @ 11ms (Half-Sine Shock Pulse; Storage/Transport) IEC60068-2-32 Ed (Free Fall) 1M (3.281ft.)
NEMA	NEMA TS1/2 Environmental requirements for Traffic control equipment

MECHANICAL DIAGRAM

(dimensions in inches & millimeters)





Dual Port, Extended Temperature (IE), 100 Mbps Ethernet SNMP-Manageable Media Converter

IE-iMcV-2xLIM

PRODUCT FEATURES

- Functions as two independent copper to fiber media converters, doubling port density in the iMediaChassis and MediaChassis product lines Interchangeable SFP modules allow for multiple fiber type conversion options (single-mode, multi-mode, long haul, short haul, etc.)
- 100 Mbps SFPs and 2xLIM modules are hot-swappable; no need to power-down chassis when upgrading or troubleshooting
- Link Fault Pass-Through (LFPT)
- Config Control

The IE-iMcV-2xLIM, TX/SFP is a Fast Ethernet module which provides two conversions of 100Base-TX twisted pair to 100Base-FX/SX single-mode or multi-mode fiber. There are two sets of ports, RJ-45 (copper) and SFP (fiber). The SFP port supports all MSA and Cisco compliant, SC, LC and single-strand fiber (SSF), 155 Mbps SFPs. Designed as a Layer 1 device, the IE-iMcV-2xLIM is entirely transparent to both Layer 2 and Layer 3 protocols. The IE-iMcV-2xLIM is SNMP-manageable and can be installed into the modular, SNMP-manageable iMediaChassis or the MediaChassis series.

Easily configure and manage converters with the GUI-based iView². As an SNMP management application, iView² gives network managers the ability to monitor and control products. iView² runs standalone on Windows 2000/XP/Vista/Win7 or as a Web Server running under IIS.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-iMcV-2xLIM *					
850-18610	SFP	2	Various	2	RJ45

* SFP Fiber sold separately

iView: Windows 2000/XP/Vista/Win7

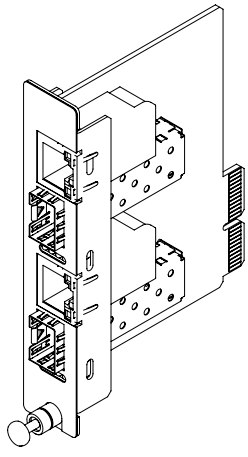
Dual Port, Extended Temperature (IE), 100 Mbps Ethernet SNMP-Manageable Media Converter

IE-iMcV-2xLIM

SPECIFICATIONS

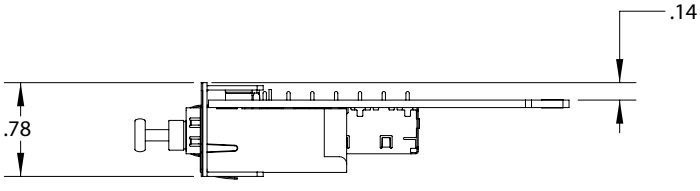
TECHNICAL
2 x RJ-45 and 2 x SFP ports (SFPs sold separately)
IEEE 802.3u 100Base-T over twisted pair
IEEE 802.3u 100Base-FX or SX over twisted pair
AutoCross for MDI/MDIX
LinkLoss, Far End Fault & Auto Negotiation
Link Fault Pass-Through (LFPT)
Supports Config Control
MDI/MDIX switch
DIP Switch selectable Auto Negotiation on copper port
Features low latency
Supports Half- and Full-Duplex operation
Supports Jumbo packets (No size limit)
Install in any iMediaChassis or MediaChassis
Supports GUI-Based iView²
Includes diagnostic LEDs
Hot-swappable architecture
STANDARD COMPLIANCE
SFP-MSA SFP standard (September 14, 2000)
SFF-8472 DDMI standard (Revision 1.0)
IEEE 802.3

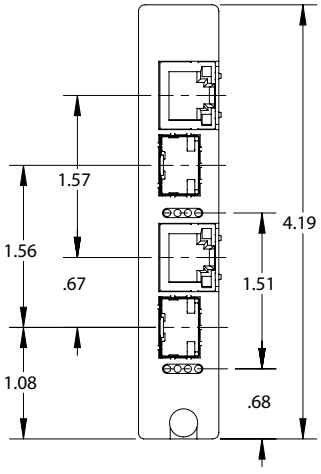
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
INPUT VOLTAGE	
100 to 240 VAC 50/60Hz (External Power Supply) 5 VDC ± 5%	
POWER	
Max Current: 0.80A	
ENVIRONMENTAL	
Operating Temperature:	-40° F to +176° F (-40° C to +80° C)
Storage Temperature:	-40° F to +176° F (-40° C to +80° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
UL, CSA, CE	
TUV	

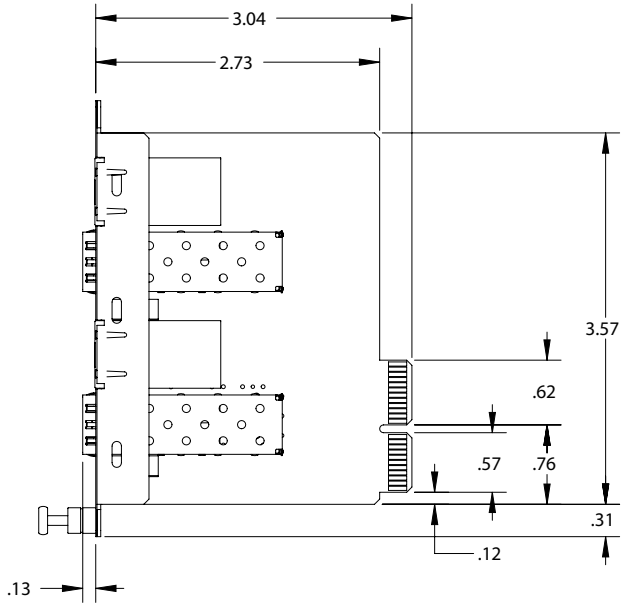


MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







10 Mbps Ethernet Media Converter

iMcV-PIM

PRODUCT FEATURES

- Available for multi-mode or single-mode fiber
- Double fiber capacity with single-strand fiber versions
- Monitor links and receive vital traffic and health information and notification should problems occur
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance
- SNMP Manageable
- Convert 10 Mbps Copper to 10 Mbps Fiber

Satisfying today's networking needs while preparing for tomorrow's cabling requirements can make designing and installing the physical layer of networks a daunting task. The decreasing cost of fiber optic cabling and switching equipment makes all-optical LANs the obvious choice when future-proofing network equipment. Replacing legacy equipment and wiring infrastructure is a costly choice. Managed media conversion allows implementation of new technologies on existing networks, while monitoring all connections, to keep networks running and up-to-date.

B&B Electronics offers a wide range of SNMP-managed Ethernet copper to fiber media converters, with a choice of fixed rate or rate conversion capabilities. The "iMcV-" modules also include troubleshooting features and LEDs to assist in network diagnostics as well as make isolating cable breaks easier. In addition, replacing the hot-swappable modules won't disable other modules services running within the same chassis during product upgrades or maintenance and troubleshooting.

All converters feature an RJ-45 copper port and a fiber port, with a choice of SC or ST connectors.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-PIM 10 Mbps					
850-14940	MM850-ST	1	2 km	1	RJ45
850-14941	MM850-SC	1	2 km	1	RJ45
850-14942	MM1300-ST	1	2 km	1	RJ45
850-14943	MM1300-SC	1	2 km	1	RJ45
850-14944	SM1310/PLUS-ST	1	40 km	1	RJ45
850-14945	SM1310/PLUS-SC	1	40 km	1	RJ45
850-14946	SM1310/LONG-ST	1	40 km	1	RJ45
850-14947	SM1310/LONG-SC	1	40 km	1	RJ45
850-14949	SM1550/LONG-SC	1	80 km	11	RJ45

iMcV-PIM also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

10 Mbps Ethernet Media Converter

iMcV-PIM

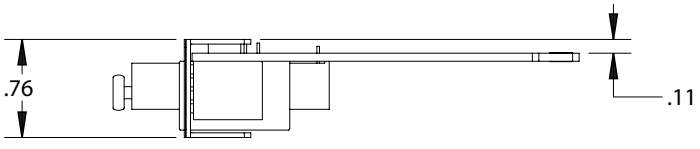
SPECIFICATIONS

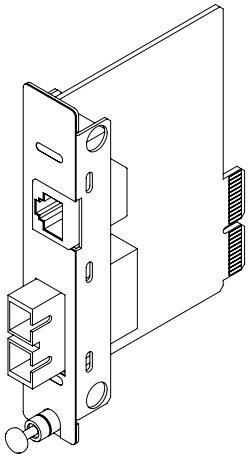
TECHNICAL
10Base-T twisted pair
10Base-FL fiber
MDI/MDIX switch
Features LinkLoss and FiberAlert
Connectors: RJ-45 and ST, SC
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Install in any iMediaChassis or MediaChassis
Support GUI-Based iView²
Support Half- and Full-Duplex operation
Include diagnostic LEDs
Include hot-swappable architecture

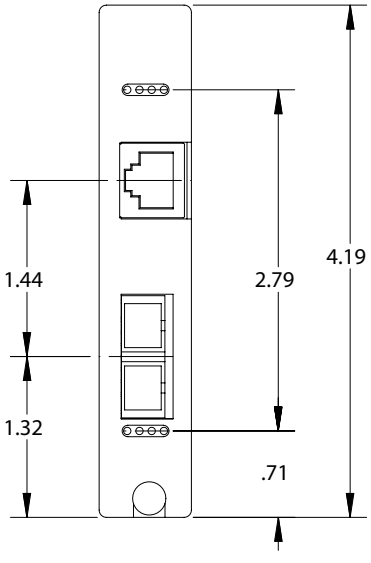
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
CE	

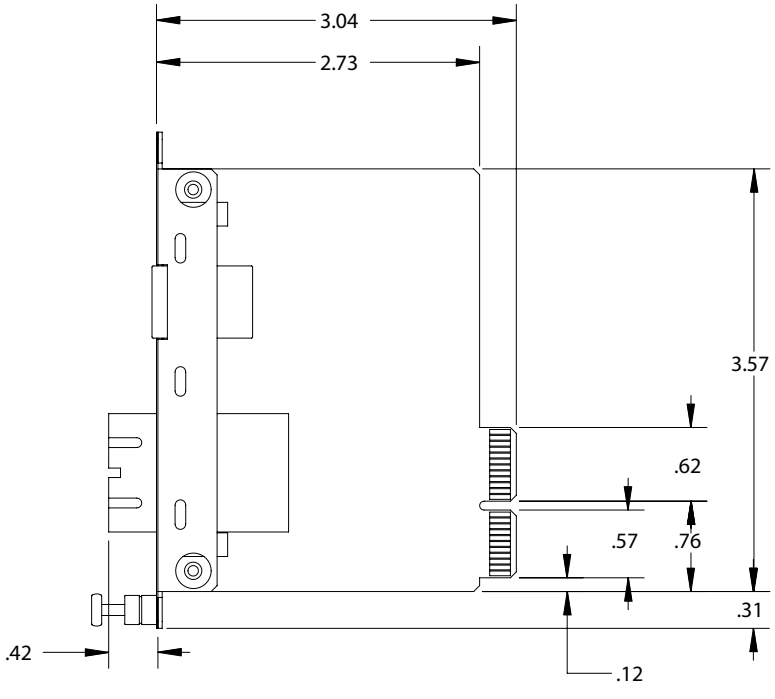
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)









100 Mbps Ethernet Media Converter

iMcV-LIM with LFPT and Config Control

PRODUCT FEATURES

- Available for multi-mode or single-mode fiber
- Double fiber capacity with single-strand fiber versions
- Monitor links and receive vital traffic and health information and notification should problems occur
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance
- SNMP Manageable
- Convert 100 Mbps Copper to 100 Mbps Fiber
- LFPT and Config Control

Satisfying today's networking needs while preparing for tomorrow's cabling requirements can make designing and installing the physical layer of networks a daunting task. The decreasing cost of fiber optic cabling and switching equipment makes all-optical LANs the obvious choice when future-proofing network equipment. Replacing legacy equipment and wiring infrastructure is a costly choice. Managed media conversion allows implementation of new technologies on existing networks, while monitoring all connections, to keep networks running and up-to-date.

B&B Electronics offers a wide range of SNMP-managed Ethernet copper to fiber media converters, with a choice of fixed rate or rate conversion capabilities. The "iMcV-" modules also include troubleshooting features and LEDs to assist in network diagnostics as well as make isolating cable breaks easier. The 100 Mbps iMcV-Lim also features Link Fault Pass-Through. In addition, the modules provide Configuration Control.

All converters feature an RJ-45 copper port and a fiber port, with a choice of SC or ST connectors, and are hot-swappable.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-LIM TX/FX and TX/SX					
850-15611	SX-MM850-ST	1	2 km	1	RJ45
850-15612	SX-MM850-SC	1	2 km	1	RJ45
850-15613	FX-MM1300-ST	1	5 km	1	RJ45
850-15614	FX-MM1300-SC	1	5 km	1	RJ45
850-15617	FX-SM1310/PLUS-ST	1	40 km	1	RJ45
850-15618	FX-SM1310/PLUS-SC	1	40 km	1	RJ45
850-15619	FX-SM1310/LONG-ST	1	80 km	1	RJ45
850-15620	FX-SM1310/LONG-SC	1	80 km	1	RJ45
850-15622	FX-SM1550/LONG-SC	1	80 km	1	RJ45
850-15623	FX-SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER *					
850-15631	SSFX-MM1310-SC	1	2 km	1	RJ45
850-15632	SSFX-MM1550-SC	1	2 km	1	RJ45
850-15633	SSFX-SM1310-SC	1	20 km	1	RJ45
850-15634	SSFX-SM1550-SC	1	20 km	1	RJ45
850-15635	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
850-15636	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45
850-15637	SSFX-SM1310/LONG-SC	1	60 km	1	RJ45
850-15638	SSFX-SM1550/LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-LIM also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

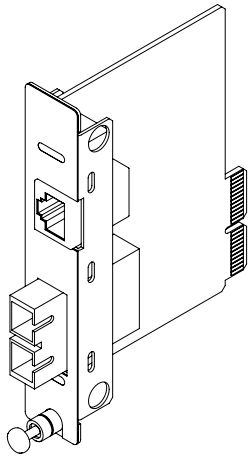
100 Mbps Ethernet Media Converter

iMcV-LIM with LFPT and Config Control

SPECIFICATIONS

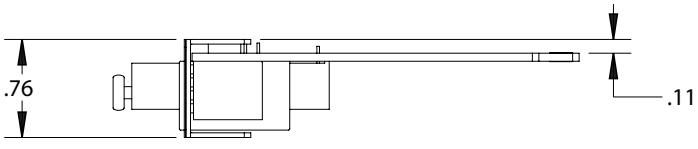
TECHNICAL
100Base-TX twisted pair
100Base-FX or SX fiber
AutoCross for MDI/MDIX
Features LinkLoss, FiberAlert & Auto Negotiation
Features Link Fault Pass-Through (LFPT)
Supports Config Control
Connectors: RJ-45 and ST, SC
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Install in any iMediaChassis or MediaChassis
Support GUI-Based iView²
Support Half- and Full-Duplex operation
Include diagnostic LEDs
Include hot-swappable architecture

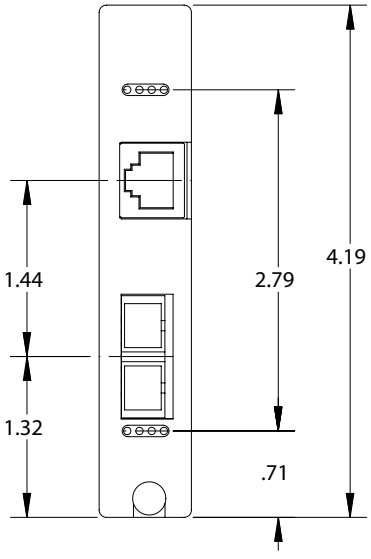
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
CE	

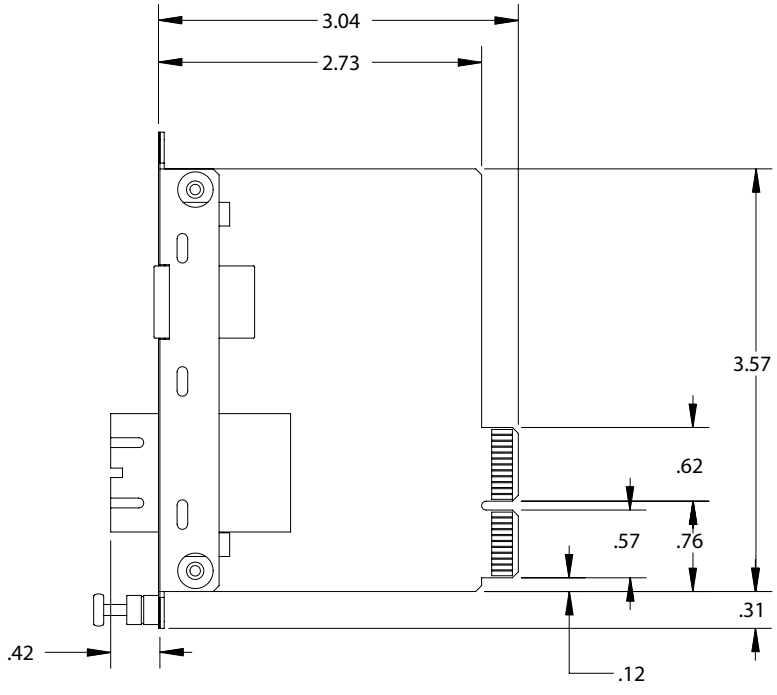


MECHANICAL DIAGRAM

(dimensions in inches & millimeters)

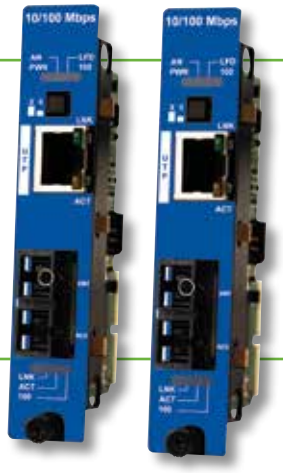






10/100 Mbps Switching Media Converter

iMcV-LIM 10/100 Mbps



PRODUCT FEATURES

- Has a small, rugged design offering many advanced features
- Available for multi-mode or single-mode fiber
- LinkLoss, Transparency and Link Fault Detection features, along with LEDs, assist in diagnosing problems on fiber optic networks
- Convert 10 Mbps twisted pair to 10 Mbps fiber OR convert 100 Mbps twisted pair to 100 Mbps fiber

The iMcV-LIM 10/100 includes troubleshooting features such as LinkLoss, Transparency and Link Fault Detection that make isolating fiber breaks easier should they occur. The iMcV-LIM 10/100 also features a crossover/pass-through switch on the twisted pair connection for MDI/MDIX connectivity and diagnostic LEDs. Most iMcV-LIM 10/100 modules are available with single-strand fiber which can effectively double the capacity of fiber by allowing two individual channels to share one strand of fiber; Full-Duplex data travels on different wavelengths — 1310 nm and 1550 nm, for example.

Auto-Sensing 10/100 Mbps iMcV-LIM 10/100 converters offer significant advantages over regular 10 and 100 Mbps converters. An ideal choice for both enterprise and service provider networks, 10/100 converters save time and money when deployed at the host and remote site. Enterprise networks planning a migration path from 10 Mbps to 100 Mbps often deploy Auto Sensing converters, then upgrade when ready and units will automatically adapt to increased speed. Service providers with 10 or 100 Mbps links to customer premises can sell customers more bandwidth without upgrading the converters at the POP and the customer network edge.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-LIM 10/100 TX/FX					
850-14260	MM850-ST	1	2 km	1	RJ45
850-14261	MM850-SC	1	2 km	1	RJ45
850-14262	MM1300-ST	1	5 km	1	RJ45
850-14263	MM1300-SC	1	5 km	1	RJ45
850-14267	SM1310/PLUS-ST	1	40 km	1	RJ45
850-14268	SM1310/PLUS-SC	1	40 km	1	RJ45
850-14269	SM1310/LONG-ST	1	80 km	1	RJ45
850-14270	SM1310/LONG-SC	1	80 km	1	RJ45
850-14274	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE STRAND FIBER *					
850-14240	SSFX-MM1310-SC	1	2 km	1	RJ45
850-14243	SSFX-MM1550-SC	1	2 km	1	RJ45
850-14244	SSFX-SM1310-SC	1	20 km	1	RJ45
850-14245	SSFX-SM1550-SC	1	20 km	1	RJ45
850-14246	SSFX-SM1310/PLUS-SC	1	40 km	1	RJ45
850-14247	SSFX-SM1550/PLUS-SC	1	40 km	1	RJ45
850-14248	SSFX-SM1310/LONG-SC	1	60 km	1	RJ45
850-14249	SSFX-SM1550/LONG-SC	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-LIM 10/100 Mbps also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

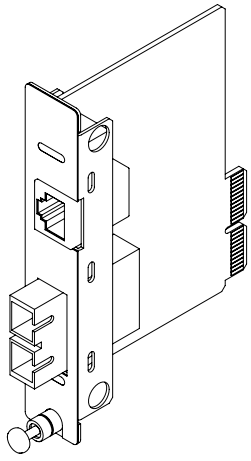
10/100 Mbps Switching Media Converter

iMcV-LIM 10/100 Mbps

SPECIFICATIONS

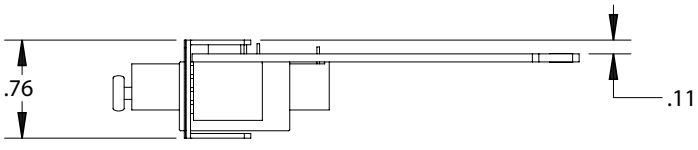
TECHNICAL
10Base-T twisted pair
10Base-FL fiber
100Base-TX twisted pair
100Base-FX or SX fiber
MDI/MDIX switch
Features Link Fault Detection and Transparency
Features Auto Negotiation
Connectors: RJ-45 and ST, SC
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Install in any iMediaChassis or MediaChassis
Support GUI-Based iView²
Support Half- and Full-Duplex operation
Include diagnostic LEDs
Include hot-swappable architecture

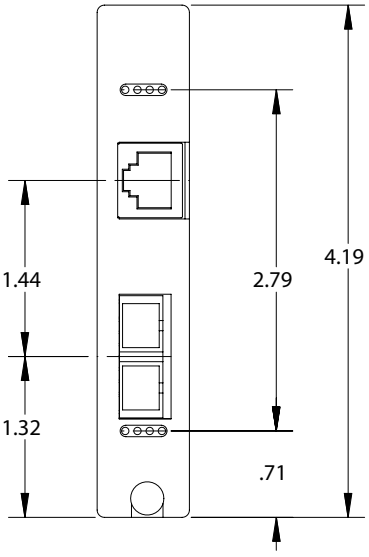
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
CE	

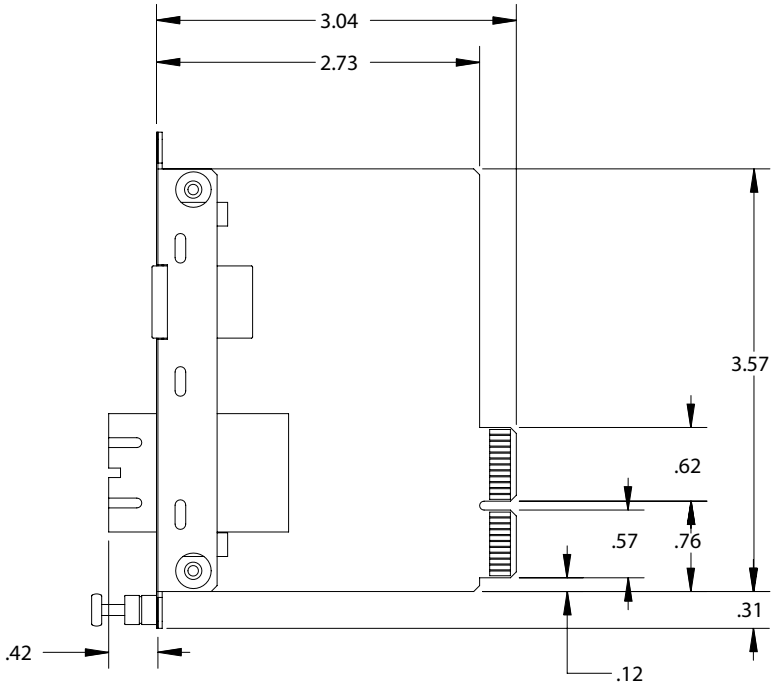


MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







1000Mbps Ethernet Media Converter

iMcV-Gigabit & IE-iMcV-Gigabit

PRODUCT FEATURES

- Available for multi-mode or single-mode fiber
- Double fiber capacity with single-strand fiber versions
- Monitor links and receive vital traffic and health information and notification should problems occur
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance
- SNMP Manageable
- Converts 1000 Mbps Copper to 1000 Mbps Fiber
- Supports Configuration Control
- Features Link Fault Pass-Through (LFPT)

Satisfying today's networking needs while preparing for tomorrow's cabling requirements can make designing and installing the physical layer of networks a daunting task. The decreasing cost of fiber optic cabling and switching equipment makes all-optical LANs the obvious choice when future-proofing network equipment. Replacing legacy equipment and wiring infrastructure is a costly choice. Managed media conversion allows implementation of new technologies on existing networks, while monitoring all connections, to keep networks running and up-to-date.

B&B Electronics offers a range of SNMP-managed Ethernet copper to fiber media converters, with a choice of fixed rate or rate conversion capabilities. The "iMcV-" modules also include troubleshooting features and LEDs to assist in network diagnostics as well as make isolating cable breaks easier. Configuration Control, a feature to use under SNMP is available.

All converters feature an RJ-45 copper port and a fiber port with SC connectors, and hot-swappable.

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-iMcV-Gigabit TX/SFP 1000 Mbps with Link Fault Pass-Through (LFPT) and Config Control **					
850-18510	SFP	1	Various	1	RJ45
iMcV-Gigabit TX/SX or TX/LX 1000 Mbps with (LFPT) and Config Control					
850-15511	SX-MM850-SC	1	220/550 m	1	RJ45
850-15512	LX-SM1310-SC	1	10 km	1	RJ45
850-15513	LX-SM1310/PLUS-SC	1	40 km	1	RJ45
850-15514	LX-SM1550/LONG-SC	1	80 km	1	RJ45
850-15515	LX-SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER *					
850-15521	SSLX-SM1310-SC (1310xmt/1550rcv)	1	10 km	1	RJ45
850-15522	SSLX-SM1550-SC (1550xmt/1310rcv)	1	10 km	1	RJ45
850-15523	SSBX-SM1310-SC (1310xmt/1490rcv)	1	10 km	1	RJ45
850-15524	SSBX-SM1490-SC (1490xmt/1310rcv)	1	10 km	1	RJ45
850-15525	SSLX-SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	1	RJ45
850-15526	SSLX-SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	1	RJ45
850-15527	SSBX-SM1310/PLUS-SC (1310xmt/1490rcv)	1	30 km	1	RJ45
850-15528	SSBX-SM1490/PLUS-SC (1490xmt/1310rcv)	1	30 km	1	RJ45
850-15529	SSLX-SM1490/LONG-SC (1490xmt/1550rcv)	1	70 km	1	RJ45
850-15530	SSLX-SM1550/LONG-SC (1550xmt/1490rcv)	1	70 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

** SFP Fiber sold separately

iMcV-Gigabit Mbps also available in CWDM Fiber. Call for details.

1000Mbps Ethernet Media Converter

iMcV-Gigabit & IE-iMcV-Gigabit

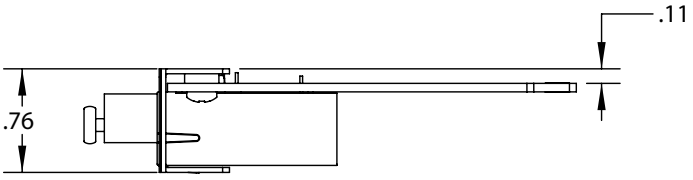
SPECIFICATIONS

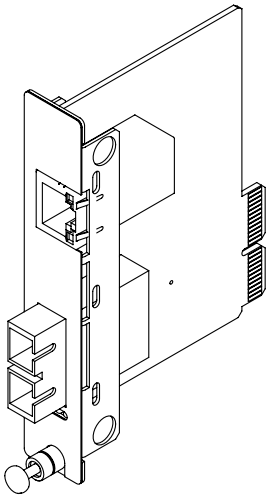
TECHNICAL
1000Base-T twisted pair
1000Base-LX or SX fiber
AutoCross for MDI/MDIX
Features FiberAlert, LinkLoss & Link Fault Pass-Through
Supports Config Control
IE-SFP 1250 Mbps/1.25 Gbps (IE-iMcV-Gigabit)
Connectors: RJ-45 and ST, SC or SFP
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Install in any iMediaChassis or MediaChassis
Support GUI-Based iView²
Support Half- and Full-Duplex operation
Include diagnostic LEDs
Include hot-swappable architecture

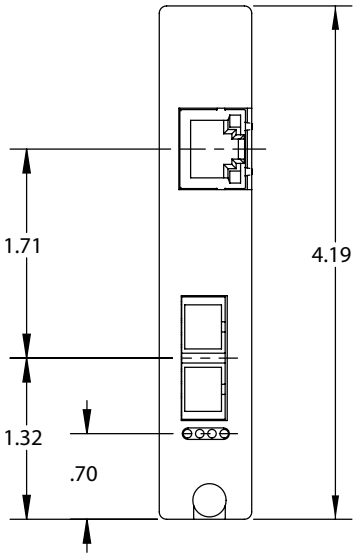
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C) -40° to +185° F (-40° to +85° C) IE-iMcV-Gigabit;
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
CE	

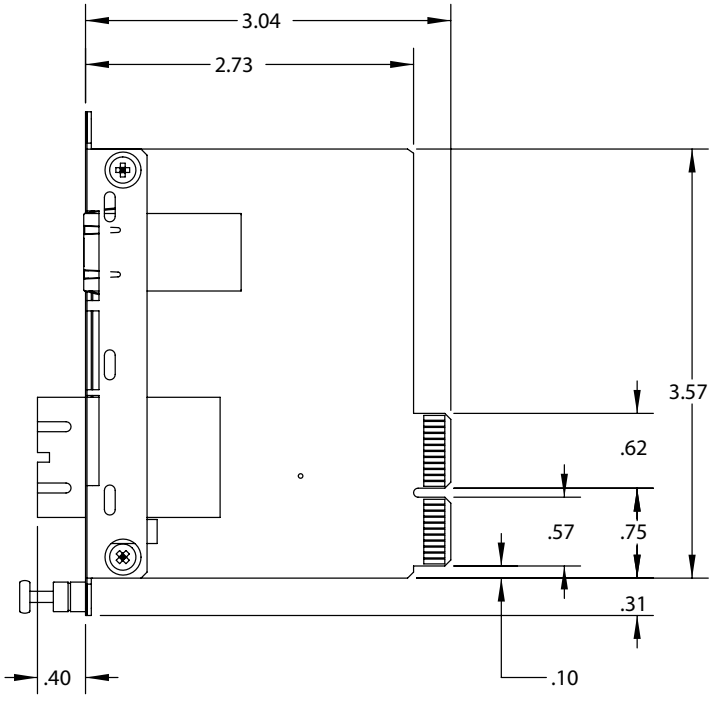
MECHANICAL DIAGRAM

(dimensions in inches)









10/100 Mbps Ethernet Media Converter

iMcV-MediaLinX & IE-iMcV-MediaLinX

PRODUCT FEATURES

- Available for multi-mode or single-mode fiber
- Double fiber capacity with single-strand fiber versions
- IE-iMcV-MediaLinX supports SFP transceivers and extended operating temperatures
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance
- SNMP Manageable
- Converts 10 or 100 Mbps Copper to 100 Mbps Fiber
- Supports Configuration Control
- Features Link Fault Pass-Through (LFPT)

Satisfying today's networking needs while preparing for tomorrow's cabling requirements can make designing and installing the physical layer of networks a daunting task. The decreasing cost of fiber optic cabling and switching equipment makes all-optical LANs the obvious choice when future-proofing network equipment. Replacing legacy equipment and wiring infrastructure is a costly choice. Managed media conversion allows implementation of new technologies on existing networks, while monitoring all connections, to keep networks running and up-to-date.

B&B Electronics offers a wide range of SNMP-managed Ethernet copper to fiber media converters, with a choice of fixed rate or rate conversion capabilities. The "iMcV-" modules also include troubleshooting features and LEDs to assist in network diagnostics as well as make isolating cable breaks easier. The iMcV-MediaLinX and IE-iMcV-MediaLinX also features Link Fault Pass-Through. In addition, the IE-Module provides support for Config Control if using SNMP management.

All converters feature an RJ-45 copper port and a fiber port, with a choice of SC, ST or SFP (IE-iMcV-MediaLinX only) connectors, and are hot-swappable.

Rate converters employ Auto Negotiation functionality on the twisted pair port for plug-and-play operation, or they can be manually configured for the desired speed and duplex mode.

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-iMcV-MediaLinX TX/SFP 10/100 Mbps with (LFPT) and Config Control * **					
856-18700	SFP	1	Various	1	RJ45
iMcV-MediaLinX TX/FX 10/100 Mbps with (LFPT) and Config Control					
856-15711	MM850-ST	1	2 km	1	RJ45
856-15712	MM850-SC	1	2 km	1	RJ45
856-15713	MM1300-ST	1	5 km	1	RJ45
856-15714	MM1300-SC	1	5 km	1	RJ45
856-15717	SM1310/PLUS-ST	1	40 km	1	RJ45
856-15718	SM1310/PLUS-SC	1	40 km	1	RJ45
856-15719	SM1310/LONG-ST	1	80 km	1	RJ45
856-15720	SM1310/LONG-SC	1	80 km	1	RJ45
856-15723	SM1550/LONG-SC	1	80 km	1	RJ45
SINGLE STRAND FIBER *					
856-15731	SSFX-SM1310-SC (1310xmt/1550rcv)	1	20 km	1	RJ45
856-15732	SSFX-SM1550-SC (1550xmt/1310rcv)	1	20 km	1	RJ45
856-15733	SSFX-SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	1	RJ45
856-15734	SSFX-SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	1	RJ45
856-15735	SSFX-SM1310/LONG-SC (1310xmt/1550rcv)	1	60 km	1	RJ45
856-15736	SSFX-SM1550/LONG-SC (1550xmt/1310rcv)	1	60 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

** SFP Fiber sold separately

iMcV-MediaLinX 10/100 Mbps also available in CWDM Fiber. Call for details.

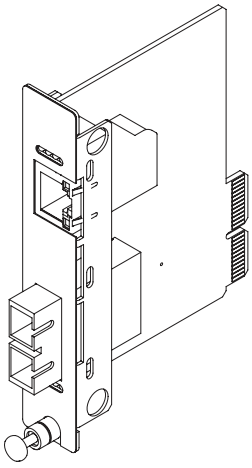
10/100 Mbps Ethernet Media Converter

iMcV-MediaLinX & IE-iMcV-MediaLinX

SPECIFICATIONS

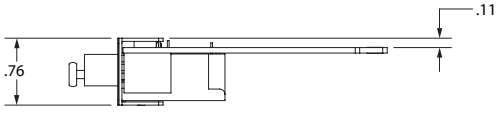
TECHNICAL
IEEE 802.3 10Base-T
IEEE 802.3u 100Base-TX
IEEE 802.3u 100Base-FX or SX fiber
IE-SFP 100/155 Mbps (OC-3) (IE-iMcV-MediaLinX)
Supports jumbo packets up to 1916 bytes
Supports Config Control
Connectors: RJ-45 and ST, SC, LC or SFP
IEEE 802.3x Flow Control
AutoCross for MDI/MDIX
Features LinkLoss and FiberAlert
Features Link Fault Pass-Through (LFPT)
Features Auto Negotiation and Selective Advertising
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps; 1,488,100 pps for 1000 Mbps (Gig only)
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber
Installs in any iMediaChassis or MediaChassis
Supports GUI-Based iView²
Supports Half- and Full-Duplex operation
Includes diagnostic LEDs
Includes hot-swappable architecture

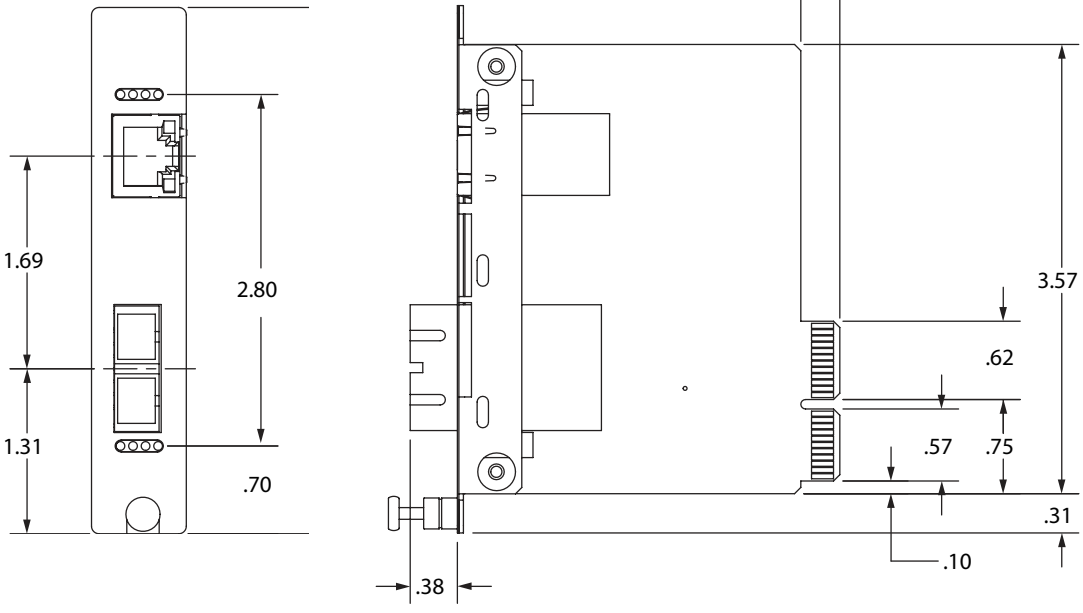
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C) -40° to +185° F (-40° to +85° C) IE-iMcV-MediaLinX
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
CE	



MECHANICAL DIAGRAM

(dimensions in inches)





10/100/1000 Mbps Ethernet Media Converter

iMcV-Giga-MediaLinX

PRODUCT FEATURES

- Available for multi-mode or single-mode fiber
- Double fiber capacity with single-strand fiber versions
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance
- SNMP Manageable
- Converts 10,100 or 1000 Mbps Copper to 1000 Mbps Fiber
- Supports Configuration Control
- Features Link Fault Pass-Through (LFPT)

Satisfying today's networking needs while preparing for tomorrow's cabling requirements can make designing and installing the physical layer of networks a daunting task. The decreasing cost of fiber optic cabling and switching equipment makes all-optical LANs the obvious choice when future-proofing network equipment. Replacing legacy equipment and wiring infrastructure is a costly choice. Managed media conversion allows implementation of new technologies on existing networks, while monitoring all connections, to keep networks running and up-to-date.

B&B Electronics offers a wide range of SNMP-managed Ethernet copper to fiber media converters, with a choice of fixed rate or rate conversion capabilities. The "iMcV-" modules also include troubleshooting features and LEDs to assist in network diagnostics as well as make isolating cable breaks easier. The iMcV-Giga-MediaLinX and IE-iMcV-Giga-MediaLinX also features Link Fault Pass-Through. In addition, support for Config Control is available if using SNMP management.

All converters feature an RJ-45 copper port and a fiber port, with a choice of SC or SFP (IE-iMcV-Giga-MediaLinX only) connectors, and are hot-swappable.

Rate converters employ Auto Negotiation functionality on the twisted pair port for plug-and-play operation, or they can be manually configured for the desired speed and duplex mode.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-Giga-MediaLinX TX/LX or SX 10/100/1000 Mbps with (LFPT) and Config Control					
856-11959	SX-MM850-ST	1	220/550 m	1	RJ45
856-11950	SX-MM850-SC	1	220/550 m	1	RJ45
856-11951	LX-SM1310-SC	1	15 km	1	RJ45
856-11952	LX-SM1310/PLUS-SC	1	40 km	1	RJ45
856-11953	LX-SM1550/LONG-SC	1	80 km	1	RJ45
856-11958	LX-SM1550/XLONG-SC	1	100 km	1	RJ45
SINGLE STRAND FIBER *					
856-11940	SSLX-SM1310-SC (1310xmt/1550rcv)	1	10 km	1	RJ45
856-11941	SSLX-SM1550-SC (1550xmt/1310rcv)	1	10 km	1	RJ45
856-11933	SSBX-SM1310-SC (1310xmt/1490rcv)	1	10 km	1	RJ45
856-11935	SSBX-SM1490-SC (1490xmt/1310rcv)	1	10 km	1	RJ45
856-11942	SSLX-SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	1	RJ45
856-11943	SSLX-SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	1	RJ45
856-11937	SSBX-SM1310/PLUS-SC (1310xmt/1490rcv)	1	30 km	1	RJ45
856-11939	SSBX-SM1490/PLUS-SC (1490xmt/1310rcv)	1	30 km	1	RJ45
856-11954	SSLX-SM1490/LONG-SC (1490xmt/1550rcv)	1	70 km	1	RJ45
856-11955	SSLX-SM1550/LONG-SC (1550xmt/1490rcv)	1	70 km	1	RJ45

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-Giga-MediaLinX 10/100/1000Mbps also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

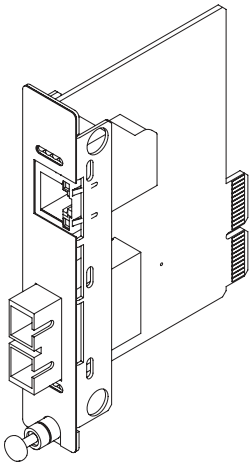
10/100/1000 Mbps Ethernet Media Converter

iMcV-Giga-MediaLinX

SPECIFICATIONS

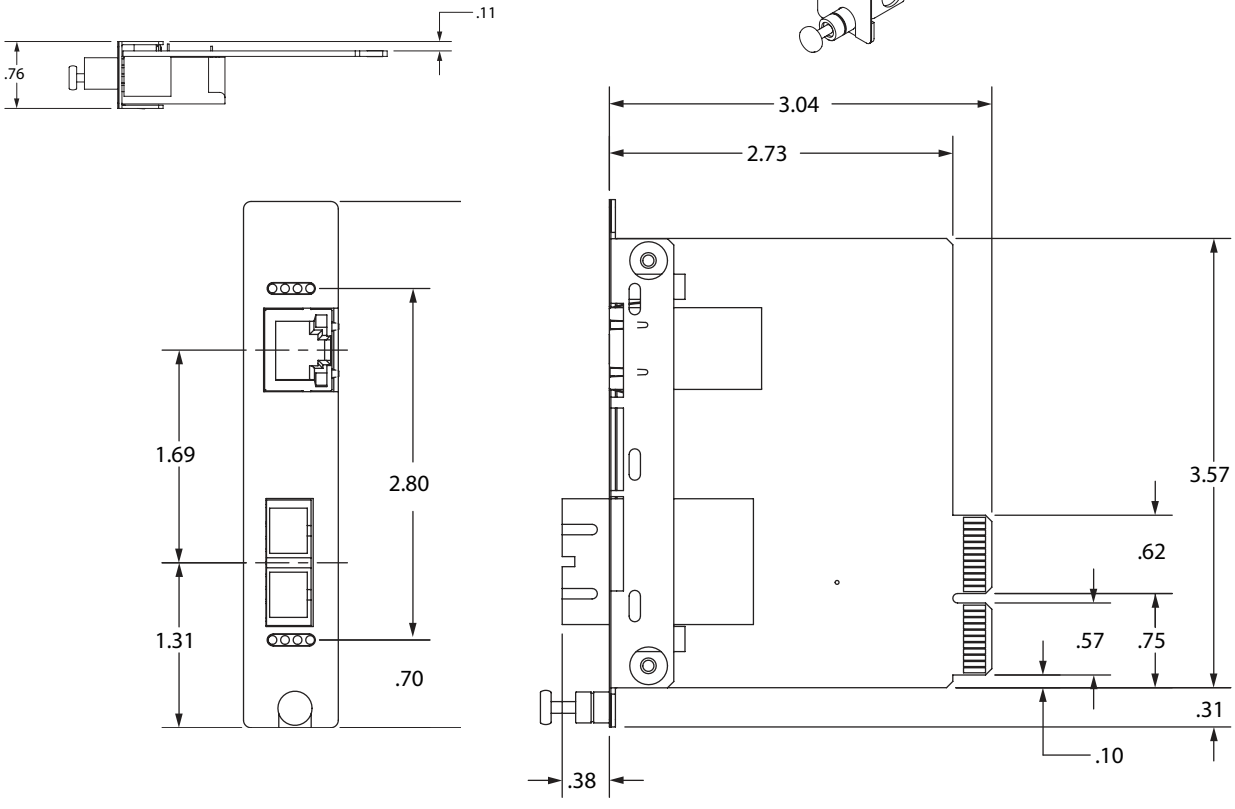
TECHNICAL
IEEE 802.3 10Base-T
IEEE 802.3u 100Base-TX
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
Supports packets up to 1632 bytes
Connectors: RJ-45 and ST, SC, LC or SFP
IEEE 802.3x Flow Control
AutoCross for MDI/MDIX
Features LinkLoss and FiberAlert
Features Link Fault Pass-Through (LFPT)
Features Auto Negotiation and Selective Advertising
Layer 2 packet switching, store and forward operation
Forwarding rate: 14,881 pps for 10 Mbps; 148,810 pps for 100 Mbps; 1,488,100 pps for 1000 Mbps (Gig only)
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber
Installs in any iMediaChassis or MediaChassis
Supports GUI-Based iView²
Supports Half- and Full-Duplex operation
Includes diagnostic LEDs
Includes hot-swappable architecture

MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
CE	



MECHANICAL DIAGRAM

(dimensions in inches)



T1/E1/J1 Media Converter

iMcV-T1/E1/J1 Repeater

PRODUCT FEATURES

- Operates at (T1/J1 1.544 Mbps) and (E1 2.048 Mbps)
- Conduct Loopback tests, monitor/manage units via GUI-based iView2
- Remote unit supports secure, out-of-band management
- Available for multi-mode, single-mode, or single-strand fiber
- Supports fiber and copper remote loopback control
- Layer 1 modules
- LED display for monitoring of line diagnostics

SNMP-manageable, the iMcV-T1/E1/J1 converter series of modules extend 1.544 Mbps T1/J1 and 2.048 Mbps E1 copper-based PBX, router and switch circuits over regular duplex fiber or single-strand fiber optics. Supporting fiber distances of up to 80 km, the iMcV-T1/E1/J1 series of converters include built-in jitter removal, line integrity testing, diagnostic tools (Loopback mode and Transmit Data Source) and remote management features.

Select from the iMcV-T1/E1/J1, offering standard repeater-like functionality, or the IE-iMcV-T1/E1/J1-LineTerm which incorporates advanced features such as Line Terminating functionality and config control, support for both Alarm Indication Signals (AIS) and Remote Alarm Indications (RAI).

Both versions are installed as a HOST-REMOTE pair and can be remotely managed when the HOST is installed in an iMediaChassis with an SNMP–Management Module. This enables network managers to conduct loopback testing, to monitor, and to manage units located up to 80 km away.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-T1/E1/J1 Repeater					
850-14198	MM850-ST	1	2 km	1	RJ48
850-14199	MM850-SC	1	2 km	1	RJ48
850-14200	MM1300-ST	1	5 km	1	RJ48
850-14201	MM1300-SC	1	5 km	1	RJ48
850-14202	SM1310/PLUS-ST	1	40 km	1	RJ48
850-14203	SM1310/PLUS-SC	1	40 km	1	RJ48
850-14204	SM1310/LONG-ST	1	80 km	1	RJ48
850-14205	SM1310/LONG-SC	1	80 km	1	RJ48
850-14206	SM1550/LONG-SC	1	80 km	1	RJ48
SINGLE STRAND FIBER *					
850-14288	MM1310-SC (1310xmt/1550rcv)	1	2 km	1	RJ48
850-14289	MM1550-SC (1550xmt/1310rcv)	1	2 km	1	RJ48
850-14290	SM1310-SC (1310xmt/1550rcv)	1	20 km	1	RJ48
850-14291	SM1550-SC (1550xmt/1310rcv)	1	20 km	1	RJ48
850-14292	SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	1	RJ48
850-14293	SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	1	RJ48
850-14294	SM1310/LONG-SC (1310xmt/1550rcv)	1	60 km	1	RJ48
850-14295	SM1550/LONG-SC (1550xmt/1310rcv)	1	60 km	1	RJ48

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-T1/E1/J1 also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

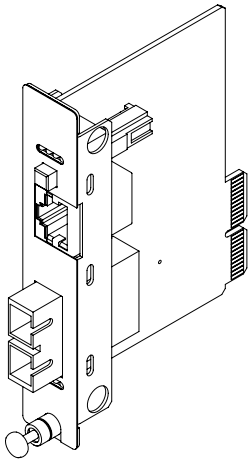
T1/E1/J1 Media Converter

iMcV-T1/E1/J1 Repeater

SPECIFICATIONS

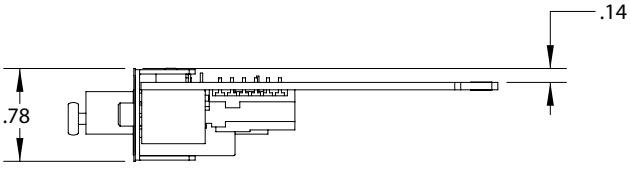
TECHNICAL
Protocol-Selectable — Operates at T1/J1 (1.544 Mbps) and E1 (2.048 Mbps) protocols
Supports Alarm Indication Signals (AIS)
Internal Test Head Function (PRBS, 1/0, All 1's)
Ability to manage remote unit from host end
Supports fiber and copper Loopback
Selectable line buildout (0 - 655 ft.)
Includes DTE/DCE switch on converter
Installs in any iMediaChassis or MediaChassis chassis*
Supports GUI-Based iView²
CSU Line Gain (7.5, 15, 22.5 db)
Monitor Boost (20, 26, 32 db)
Supports secondary line protection
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber
Connectors: RJ-48 and ST, SC
STANDARDS COMPLIANCE:
ANSI T1.102-1993
ANSI T1.107-1995
GR-820-CORE

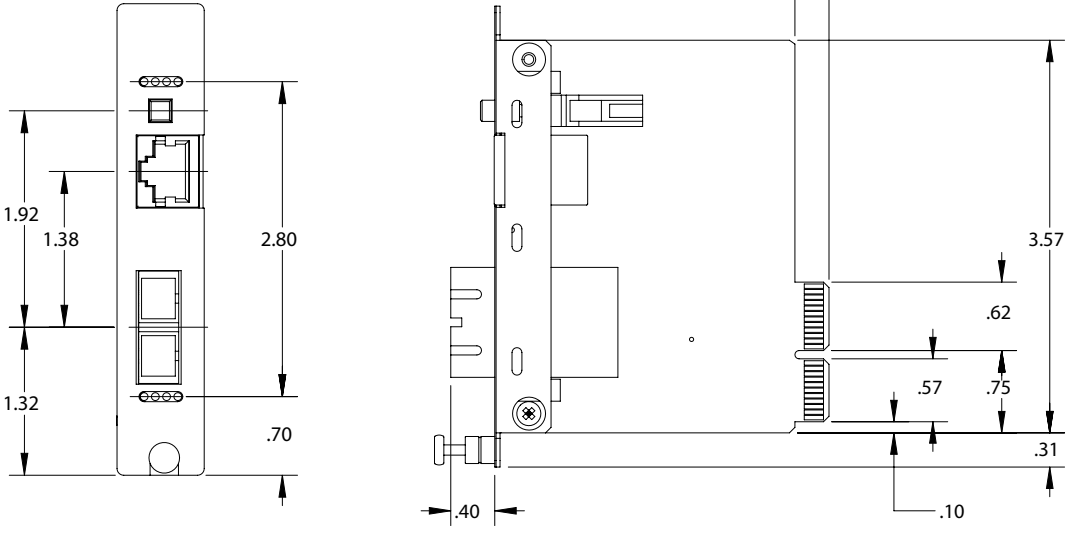
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (0.11 kg)
POWER	
0.55A @ 5V (Typical)	
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL	
CSA	
CE	



MECHANICAL DIAGRAM

(dimensions in inches & millimeters)





T1/E1/J1 Media Converter

IE-iMcV-T1/E1/J1 LineTerm

PRODUCT FEATURES

- Operates at (T1/J1 1.544 Mbps) and (E1 2.048 Mbps)
- Conduct Loopback tests, monitor/manage units via GUI-based iView2
- Remote unit supports secure, out-of-band management
- Available for multi-mode, single-mode, or single-strand fiber
- Layer 1 modules
- Supports fiber and copper remote loopback control
- Transmit Data Source diagnostic tool sends data as unframed all ones, a pattern of alternating ones and zeros, or a Pseudorandom Bit Sequence (PRBS). A built-in PRBS signal detector makes testing even easier.
- LED display for monitoring of line diagnostics

SNMP-manageable, the iMcV-T1/E1/J1 converter series of modules extend 1.544 Mbps T1/J1 and 2.048 Mbps E1 copper-based PBX, router and switch circuits over regular duplex fiber or single-strand fiber optics. Supporting fiber distances of up to 80 km, the iMcV-T1/E1/J1 series of converters include built-in jitter removal, line integrity testing, diagnostic tools (Loopback mode and Transmit Data Source) and remote management features.

Select from the iMcV-T1/E1/J1, offering standard repeater-like functionality, or the IE-iMcV-T1/E1/J1-LineTerm which incorporates advanced features such as Line Terminating functionality and config control, support for both Alarm Indication Signals (AIS) and Remote Alarm Indications (RAI).

Both versions are installed as a HOST-REMOTE pair and can be remotely managed when the HOST is installed in an iMediaChassis with an SNMP–Management Module. This enables network managers to conduct loopback testing, to monitor, and to manage units located up to 80 km away.

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-iMcV-T1/E1/J1-LineTerm, With Config Control TP/SFP *					
850-18100	SFP	1	Various	1	RJ48
IE-iMcV-T1/E1/J1 Line Terminating with Config Control					
850-18101	MM850-ST	1	2 km	1	RJ48
850-18102	MM850-SC	1	2 km	1	RJ48
850-18103	MM1300-ST	1	5 km	1	RJ48
850-18104	MM1300-SC	1	5 km	1	RJ48
850-18105	SM1310/PLUS-ST	1	40 km	1	RJ48
850-18106	SM1310/PLUS-SC	1	40 km	1	RJ48
* 850-18107	SM1310/LONG-ST	1	80 km	1	RJ48
* 850-18108	SM1310/LONG-SC	1	80 km	1	RJ48
850-18111	SM1550/LONG-ST	1	80 km	1	RJ48
SINGLE STRAND FIBER **					
850-18120	MM1310-SC (1310xmt/1550rcv)	1	2 km	1	RJ48
850-18121	MM1550-SC (1550xmt/1310rcv)	1	2 km	1	RJ48
850-18122	SM1310-SC (1310xmt/1550rcv)	1	20 km	1	RJ48
850-18123	SM1550-SC (1550xmt/1310rcv)	1	20 km	1	RJ48
850-18124	SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	1	RJ48
850-18125	SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	1	RJ48
850-18126	SM1310/LONG-SC (1310xmt/1550rcv)	1	60 km	1	RJ48
850-18127	SM1550/LONG-SC (1550xmt/1310rcv)	1	60 km	1	RJ48

* Certified at 40 km, 80 km is achievable

** These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-T1/E1/J1 also available in CWDM Fiber. Call for details.

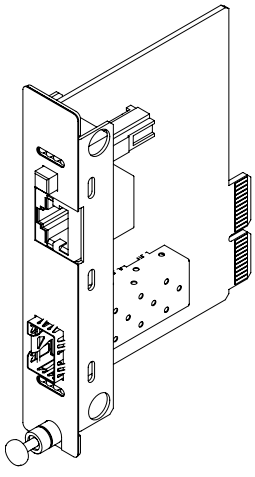
T1/E1/J1 Media Converter

IE-iMcV-T1/E1/J1 LineTerm

SPECIFICATIONS

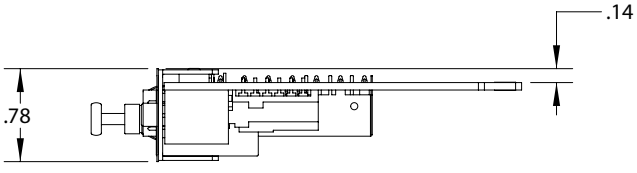
TECHNICAL
Protocol-Selectable — Operates at T1/J1 (1.544 Mbps) and E1 (2.048 Mbps) protocols
Supports Alarm Indication Signals (AIS)
Internal Test Head Function (PRBS, 1/0, All 1's)
Ability to manage remote unit from host end
Supports fiber and copper Loopback
Selectable line buildout (0 - 655 ft.)
Includes DTE/DCE switch on converter
Installs in any iMediaChassis or MediaChassis chassis*
Supports GUI-Based iView²
CSU Line Gain (7.5, 15, 22.5 db)
Monitor Boost (20, 26, 32 db)
Supports secondary line protection
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber
Connectors: RJ-48 and ST, SC
STANDARDS COMPLIANCE:
ANSI T1.102-1993
ANSI T1.107-1995
GR-820-CORE

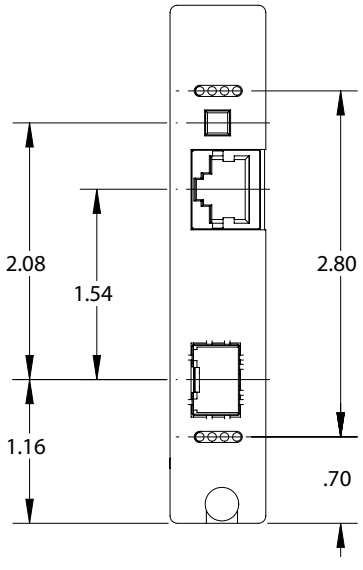
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (0.11 kg)
POWER	
0.55A @ 5V (Typical)	
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL	
CSA	
CE	

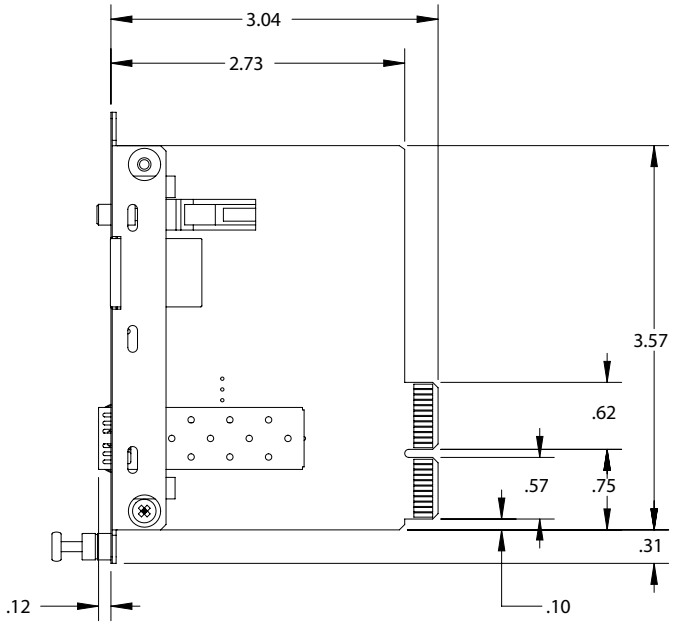


MECHANICAL DIAGRAM

(dimensions in inches & millimeters)







DS3/E3 Repeaters with Remote Management

iMcV-DS3/E3/STS Repeater

PRODUCT FEATURES

- Operates at 45 Mbps (DS3), 34 Mbps (E3) or 52 Mbps (STS-1)
- Conduct Loopback tests, monitor/manage units via GUI-based iView2
- Remote unit supports secure, out-of-band management
- Available for multi-mode, single-mode, or single-strand fiber
- Layer 1 modules
- Supports fiber and coax remote loopback control
- LED Line Diagnostics

iMcV-DS3/E3/STS converters are perfect for service providers and enterprise campus networks utilizing DS3/E3/STS coaxial circuits. The modules enable users to convert coax media to single-mode fiber and extend the distance of data transmissions over MAN access networks up to 80 km. The modules support premises networking applications to convert the incoming circuit to fiber for distribution into the structured cabling system.

Choose from versions offering repeater-like functionality or Line-Terminating functionality; all models are Layer 1 devices.

All versions of modules are installed as a HOST-REMOTE pair and can be remotely managed when the HOST is installed in an iMediaChassis with an SNMP–Management Module. This enables network managers to conduct loopback testing, to monitor, and to manage units located up to 80 km away. Since B&B Electronics' management technology functions transparently to the user data, real-time, end-to-end management is provided at all times.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	BNC PORTS
iMcV-DS3/E3/STS Repeater				
850-14338	MM850-ST	1	2 km	2
850-14339	MM850-SC	1	2 km	2
850-14300	MM1300-ST	1	5 km	2
850-14301	MM1300-SC	1	5 km	2
850-14302	SM1310/PLUS-ST	1	40 km	2
850-14303	SM1310/PLUS-SC	1	40 km	2
850-14304	SM1310/LONG-ST	1	80 km	2
850-14305	SM1310/LONG-SC	1	80 km	2
850-14306	SM1550/LONG-SC	1	80 km	2
SINGLE STRAND FIBER *				
850-14310	SSFX-SM1310-SC (1310xmt/1550rcv)	1	20 km	2
850-14311	SSFX-SM1550-SC (1550xmt/1310rcv)	1	20 km	2
850-14312	SSFX-SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	2
850-14313	SSFX-SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	2
850-14314	SSFX-SM1310/LONG-SC (1310xmt/1550rcv)	1	60 km	2
850-14315	SSFX-SM1550/LONG-SC (1550xmt/1310rcv)	1	60 km	2

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-DS3/E3/STS also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

DS3/E3 Repeaters with Remote Management

iMcV-DS3/E3/STS Repeater

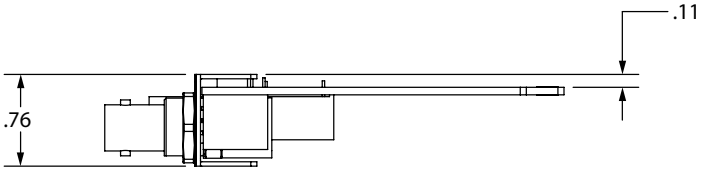
SPECIFICATIONS

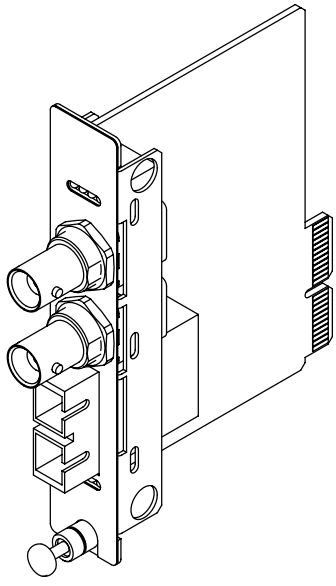
TECHNICAL
Protocol-Selectable — Operates at DS3 (45 Mbps), E3 (34 Mbps) or STS-1 (52 Mbps) protocols
Ability to manage remote unit
Two types of loopback tests
Full bit rate for customer traffic
Jitter attenuation
Line build out
Installs in iMediaChassis or MediaChassis chassis*
Supports GUI-Based iView²
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber

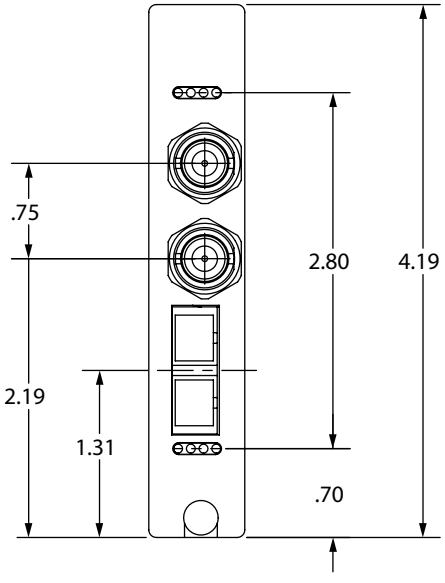
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (0.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL	
CE	

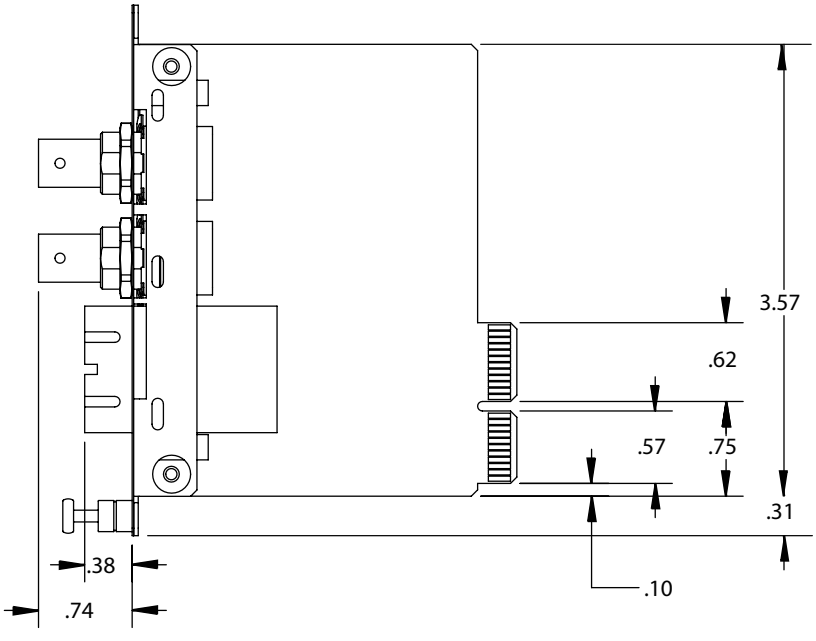
MECHANICAL DIAGRAM

(dimensions in inches)









DS3/E3 Repeaters with Remote Management

iMcV-DS3/E3/STS LineTerm

PRODUCT FEATURES

- Operates at 45 Mbps (DS3), 34 Mbps (E3) or 52 Mbps (STS-1)
- Conduct Loopback tests, monitor/manage units via GUI-based iView2
- Remote unit supports secure, out-of-band management
- Available for multi-mode, single-mode fiber, and single-strand fiber
- Layer 1 modules
- PRBS test patterns
- Supports "Telco" features, including Alarm Indication Signals (AIS)
- LED Line Diagnostics

iMcV-DS3/E3/STS converters are perfect for service providers and enterprise campus networks utilizing DS3/E3/STS coaxial circuits. The modules enable users to convert coax media to single-mode fiber and extend the distance of data transmissions over MAN access networks up to 80 km. The modules support premises networking applications to convert the incoming circuit to fiber for distribution into the structured cabling system.

The Line Term modules include standards compliant for Alarm Indication Signals (AIS) for signal loss condition propagation, and are Layer 1 modules.

The LineTerm modules are installed as a HOST-REMOTE pair and can be remotely managed when the HOST is installed in an iMediaChassis with an SNMP–Management Module. This enables network managers to conduct loopback testing, to monitor, and to manage units located up to 80 km away. Since B&B Electronics' management technology functions transparently to the user data, real-time, end-to-end management is provided at all times.

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	BNC PORTS
iMcV-DS3/E3/STS LineTerm				
850-14438	MM850-ST	1	2 km	2
850-14439	MM850-SC	1	2 km	2
850-14400	MM1300-ST	1	5 km	2
850-14401	MM1300-SC	1	5 km	2
850-14402	SM1310/PLUS-ST	1	40 km	2
850-14403	SM1310/PLUS-SC	1	40 km	2
850-14404	SM1310/LONG-ST	1	80 km	2
850-14405	SM1310/LONG-SC	1	80 km	2
850-14406	SM1550/LONG-SC	1	80 km	2
SINGLE STRAND FIBER *				
850-14410	SSFX-SM1310-SC (1310xmt/1550rcv)	1	20 km	2
850-14411	SSFX-SM1550-SC (1550xmt/1310rcv)	1	20 km	2
850-14412	SSFX-SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	2
850-14413	SSFX-SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	2
850-14414	SSFX-SM1310/LONG-SC (1310xmt/1550rcv)	1	60 km	2
850-14415	SSFX-SM1550/LONG-SC (1550xmt/1310rcv)	1	60 km	2

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

iMcV-DS3/E3/STS also available in CWDM Fiber. Call for details.

DS3/E3 Repeaters with Remote Management

iMcV-DS3/E3/STS LineTerm

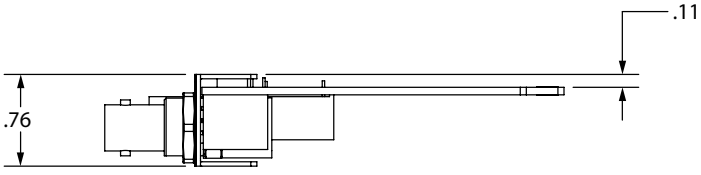
SPECIFICATIONS

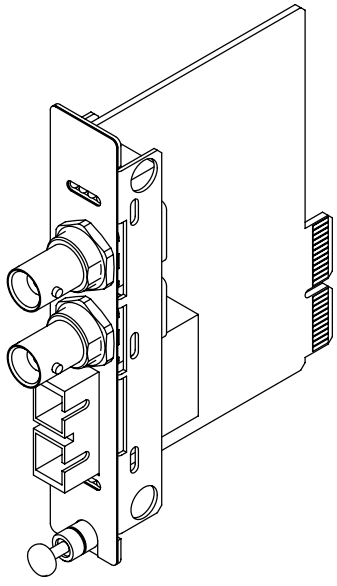
TECHNICAL
Protocol-Selectable — Operates at DS3 (45 Mbps), E3 (34 Mbps) or STS-1 (52 Mbps) protocols
Ability to manage remote unit
Two types of loopback tests
Full bit rate for customer traffic
Jitter attenuation
Line build out
Installs in iMediaChassis or MediaChassis chassis*
Supports GUI-Based iView²
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber

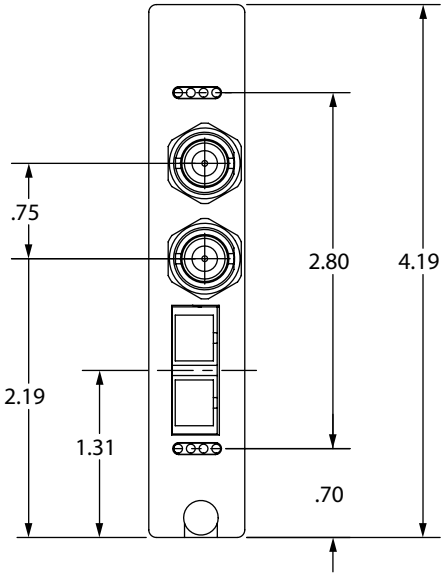
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (0.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL	
CE	

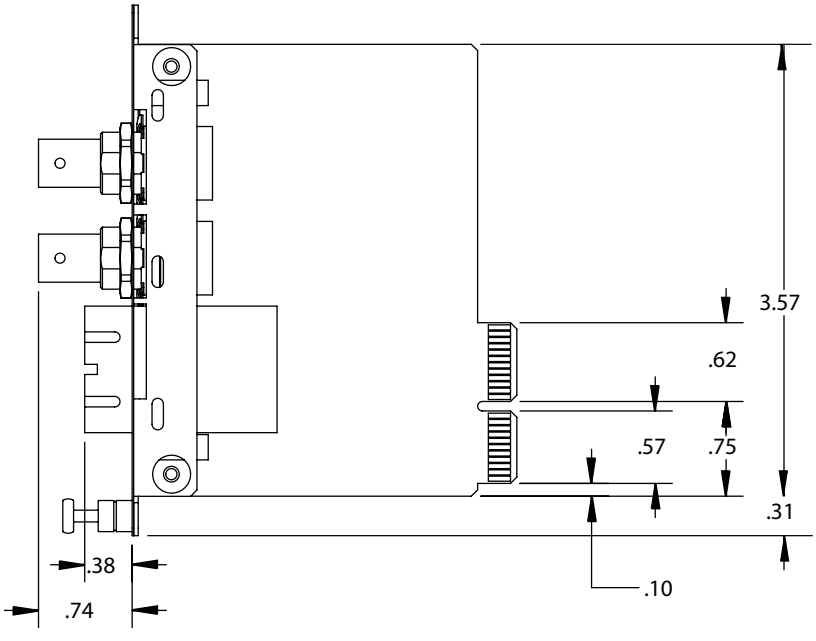
MECHANICAL DIAGRAM

(dimensions in inches & millimeters)









Modular, Managed Four E1 Plus Data Extension Over Fiber

IE-iMcV-E1-Mux/4+Ethernet (Enhanced)

PRODUCT FEATURES

- Four independent E1 ports on RJ-48 connectors with surge protection
- AIS generation on signal loss on all E1 and fiber interfaces
- Supports local and remote loopback functions
- Supports the Link Fault Pass-Through Function (LFPT)
- Dual SFP fiber ports with 1+1 protection switching
- One RS-232 interface to support low speed data up to 120 kbps via MiniJack adapter
- Both Host/Remote are managed from the Host unit
- Command Line Interface (CLI) management provided via one MiniJack RS-232 console port
- Remote Graphical User Interface (GUI) management through a managed iMediaChassis
- SNMP Alarm TRAP reporting in managed chassis, including Last Gasp
- Full LED diagnostics on front panel

The IE-iMcV-E1-Mux/4 is a managed modular media converter, installed as a Host/Remote pair, that transports four independent E1 lines over a single or dual fiber optic line plus one 10/100 ethernet port. The module is ideal for applications requiring TDM extension, such as remote office PABX connectivity, with support for a full bandwidth 10/100BaseT Ethernet connection over the same optical link.

The IE-iMcV-E1-Mux/4 allows for Bandwidth Limiting control in 32 Kbps increments up to 100 Mbps. It also detects Ethernet, AIS, E1 and fiber LOS events as well as degraded lines with full LED indications including a Remote Alarm Indicator (RAI) over the fiber link. E1 ports can also be enabled or disabled via the CLI, Telnet or SNMP management software, allowing the user to perform maintenance on a particular line without affecting others.

Fiber redundancy (1+1) on removable SFP modules offers the enhanced reliability of a protected fiber link while supporting the complete range of optical types and distances. The 1+1 protection system automatically switches to the best fiber line within 50 milliseconds, should one line become impaired or fail.
The module also features an independent serial link (RS-232) which is carried over the same fiber link(s), and can be used for transporting serial traffic from other equipment located at the remote point of presence (POP) back to the central office. The RS-232 console port is useful for local monitoring and configuration of the unit by technical support personnel.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	E PORTS	ETHERNET PORT	RS-232	RS-232 MINIJACK
*** iMcV-E1-Mux/4+Ethernet (Enhanced)**							
857-18111	SFP	1 or 2	Various	4 - RJ48	1 - RJ45	1 - RJ45	1
*** iMcV-E1-Mux/4+Ethernet**							
857-14400	SFP	1 or 2	Various	4 - RJ48	1 - RJ45	1 - RJ45	1
*** IE-iMcV-E1-Mux/4+Ethernet**							
857-18400	SFP	1 or 2	Various	4 - RJ48	1 - RJ45	1 - RJ45	1

* SFPs Sold Separately

ACCESSORIES

825-39951 - Serial Cable, MiniJack to DB9 (female)

iView: Windows 2000/XP/Vista/Win7

Modular, Managed Four E1 Plus Data Extension Over Fiber

IE-iMcV-E1-Mux/4+Ethernet (Enhanced)

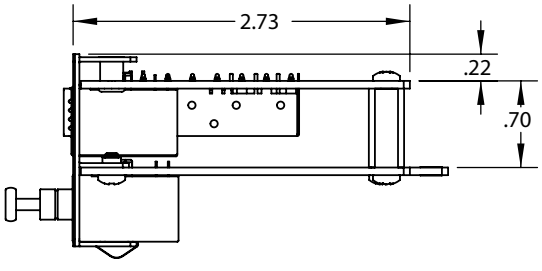
SPECIFICATIONS

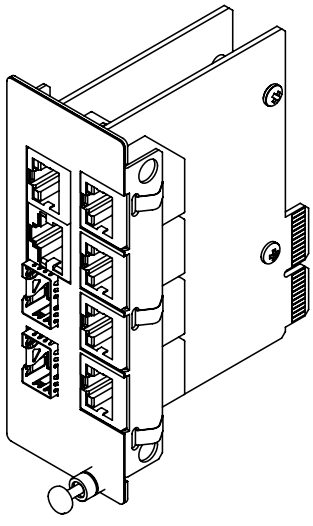
TECHNICAL
2 x MSA compliant optical SFP slots
4 x E1 (RJ-48) copper ports
Local RS-232 Console port
RS-232 transparent to 120 Kbps
IEEE 802.3x Flow Control
IEEE 802.3i 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3u 100Base-FX or SX fiber
ITU G.775
GR-820-CORE
Supports over-sized packets up to 1916 bytes per packet
Configurable as Host/ Remote pairs (DIP Switch selection)
SNMP management via GUI-based iView2 application software
10/100BaseT Full Bandwidth (144,800 fps/FDX)
RoHS compliant
Last Gasp Trap

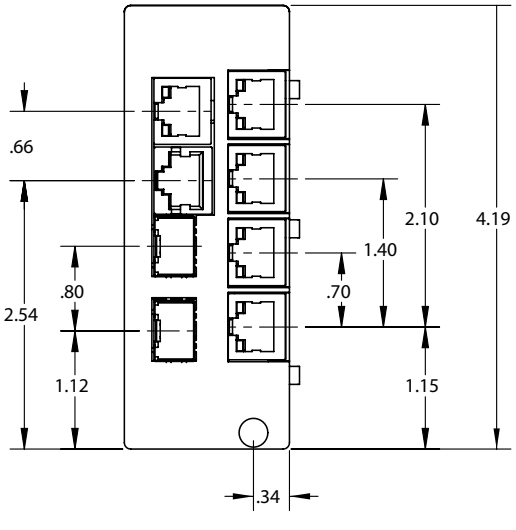
MECHANICAL	
Dimensions	Double-wide chassis module
Shipping Weight	1.1 lbs. (0.50 kg)
POWER CONSUMPTION	
0.96A @ +5 VDC	
ENVIRONMENTAL	
Operating Temperature:	-40°F to 158°F (-40°C to +70°C)
Storage Temperature:	-40°F to 158°F (-40°C to +70°C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
IEEE-802.3u	
ITU G.775 (AIS, LOS)	
GR-820-CORE	

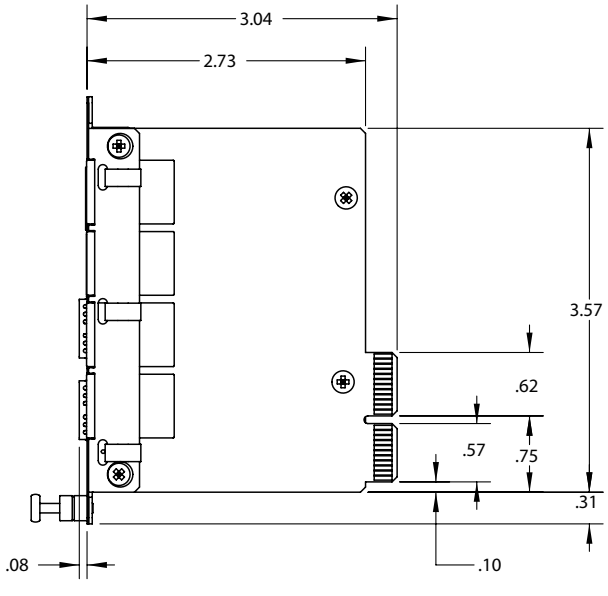
MECHANICAL DIAGRAM

(dimensions in inches)









Modular, Managed Four T1 Plus Data Extension Over Fiber

IE-iMcV-T1-Mux/4+Ethernet

PRODUCT FEATURES

- Four independent T1 ports on RJ-48 connectors
- T1 ports can be remotely disabled by user
- AIS generation on signal loss on all T1 and fiber interfaces
- Supports local and remote loopback functions
- One full bandwidth, 10/100BaseT Ethernet port
- Auto Negotiation or forced modes on the Ethernet port
- Supports Jumbo Ethernet frames to 1916 on the ethernet port
- User defined bandwidth limiting on Ethernet port
- Supports the Link Fault Pass-Through Function (LFPT) on the Ethernet port
- Dual SFP fiber ports with 1+1 protection switching
- B8ZS or AMI T1 line code (T1 ports)

The IE-iMcV-T1-Mux/4 is a managed modular media converter, installed as a Host/Remote pair, that transports four independent T1 lines over a single or dual fiber optic line. The module is ideal for applications requiring TDM extension, such as remote office PABX connectivity, with support for a full bandwidth 10/100BaseT Ethernet connection over the same optical link.

The iMcV-T1-Mux/4 detects, Ethernet, T1 and fiber LOS events as well as degraded lines with full LED indications including a Remote Alarm Indicator (RAI) over the fiber link.

Fiber redundancy (1+1) on removable SFP modules offers the enhanced reliability of a protected fiber link while supporting the complete range of optical types and distances. The 1+1 protection system automatically switches to the best fiber line within 50 milliseconds, should one line become impaired or fail.

The IE-iMcV-T1-Mux/4 features an independent serial link (RS-232) which is carried over the same fiber link(s), and can be used for transporting serial traffic from other equipment located at the remote point of presence (POP) back to the central office. The RS-232 console port is useful for local monitoring and configuration of the unit by technical support personnel.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	T1 PORTS DTE, 120 Ω	ETHERNET PORT	RS-232	RS-232 MINIJACK
*** IE-iMcV-T1-Mux/4 + Ethernet**							
857-18110	SFP	1 or 2	Various	4 - RJ48	1 - RJ45	1 - RJ45	1

* SFPs Sold Separately

ACCESSORIES

825-39951 - Serial Cable, MiniJack to DB9 (female)

iView: Windows 2000/XP/Vista/Win7

Modular, Managed Four T1 Plus Data Extension Over Fiber

IE-iMcV-T1-Mux/4+Ethernet

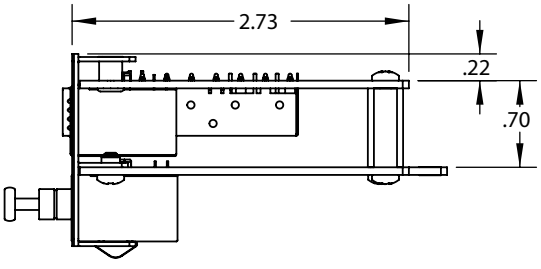
SPECIFICATIONS

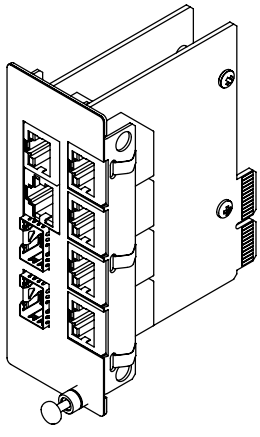
TECHNICAL
Configured as Host/ Remote pairs (DIP Switch selection)
RoHS-Compliant
Double-wide module for iMediaChassis, MediaChassis and IE-MediaChassis chassis (2 slots required)
SNMP management via the GUI-based iView2 application software
Last Gasp Trap
Local RS-232 Console port
10/100BaseT Full Bandwidth (144,800 fps/FDX)
Two MSA compliant optical SFP slots
Four T1 copper ports
RS-232 (Transparent to 125 Kbps)

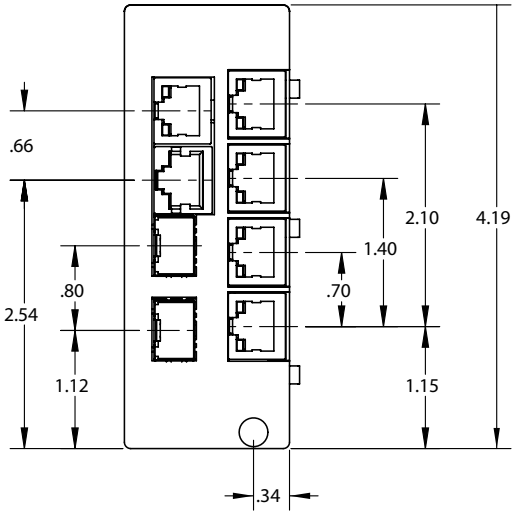
MECHANICAL	
Dimensions	Double-wide chassis module
Shipping Weight	1.1 lbs. (0.50 kg)
POWER RATING	
4.2W Typical 5.5W Max	
ENVIRONMENTAL	
Operating Temperature:	32° to 160°F (0° to +70°C)
Storage Temperature:	-40° to +160°F (-40° to +70°C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
CE	
IEEE-802.3u	
ITU-T G.703 (Pulse Shape)	
ITU-T G.824 (Jitter)	
ITU-T-G.775 (AIS, LOS)	

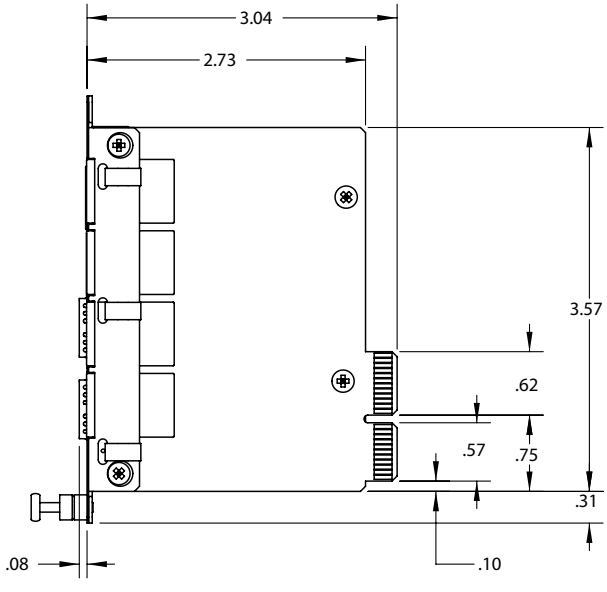
MECHANICAL DIAGRAM

(dimensions in inches)



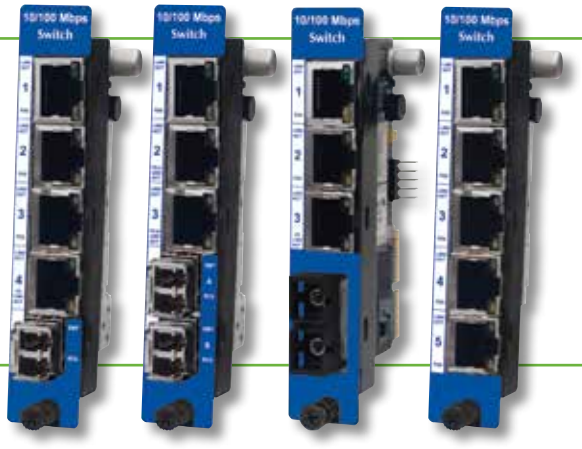






10/100Base-T Multi-Port Switch Module

iMcV-Switch



PRODUCT FEATURES

- Multi-port 10/100Base-T
- Available in multi-mode, single-mode, single-strand fiber and SFPs
- Supports up to 1000 MAC address learning
- Transparent to VLAN tags
- Grants priority for all frames with PRI>4 or DSCP>32
- Supports Auto Cross and Auto Negotiation on all copper ports
- Supports Flow Control
- Features Collision Detection

The iMcV-Switch is a multi-port, 10/100 Ethernet module that allows the user to increase port density and the service area of Ethernet networks. The store and forward switch function allows the end user to extend Ethernet service to locations for a total of 100 meters from the Ethernet source. All RJ-45 ports Auto Negotiate 10/100Base-T, half/full duplex, and automatically configure for MDI or MDIX operation. Each port allows a maximum frame size of up to 1916 bytes and supports Flow Control and priority queuing.

The iMcV-Switch is available in four different models, some offering a configuration of copper and fiber ports, copper and fiber SFP ports and an all copper port version.

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
iMcV-Switch *					
852-14440			100 m	5	RJ45
852-14441	SFP	1	Various	4	RJ45
852-14442	SFP	2	Various	3	RJ45
852-14443	MM850-ST	1	2 km	3	RJ45
852-14444	MM850-SC	1	2 km	3	RJ45
852-14445	MM1300-ST	1	5 km	3	RJ45
852-14446	MM1300-SC	1	5 km	3	RJ45
852-14449	SM1310/PLUS-ST	1	40 km	3	RJ45
852-14450	SM1310/PLUS-SC	1	40 km	3	RJ45
852-14451	SM1310/LONG-ST	1	80 km	3	RJ45
852-14452	SM1310/LONG-SC	1	80 km	3	RJ45
852-14453	SM1550/LONG-SC	1	80 km	3	RJ45
852-14454	SM1550/XLONG-SC	1	100 km	3	RJ45
SINGLE STRAND FIBER **					
852-14470	SSFX-SM1310-SC (1310xmt/1550rcv)	1	20 km	3	RJ45
852-14471	SSFX-SM1550-SC (1550xmt/1310rcv)	1	20 km	3	RJ45
852-14472	SSFX-SM1310/PLUS-SC (1310xmt/1550rcv)	1	40 km	3	RJ45
852-14473	SSFX-SM1550/PLUS-SC (1550xmt/1310rcv)	1	40 km	3	RJ45
852-14474	SSFX-SM1310/LONG-SC (1310xmt/1550rcv)	1	60 km	3	RJ45
852-14475	SSFX-SM1550/LONG-SC (1550xmt/1310rcv)	1	60 km	3	RJ45

* SFPs Sold Separately

* These products have single-strand fiber technology. Deploy in pairs or connect another compatible B&B IMC LLC single-strand fiber product.

10/100Base-T Multi-Port Switch Module

iMcV-Switch

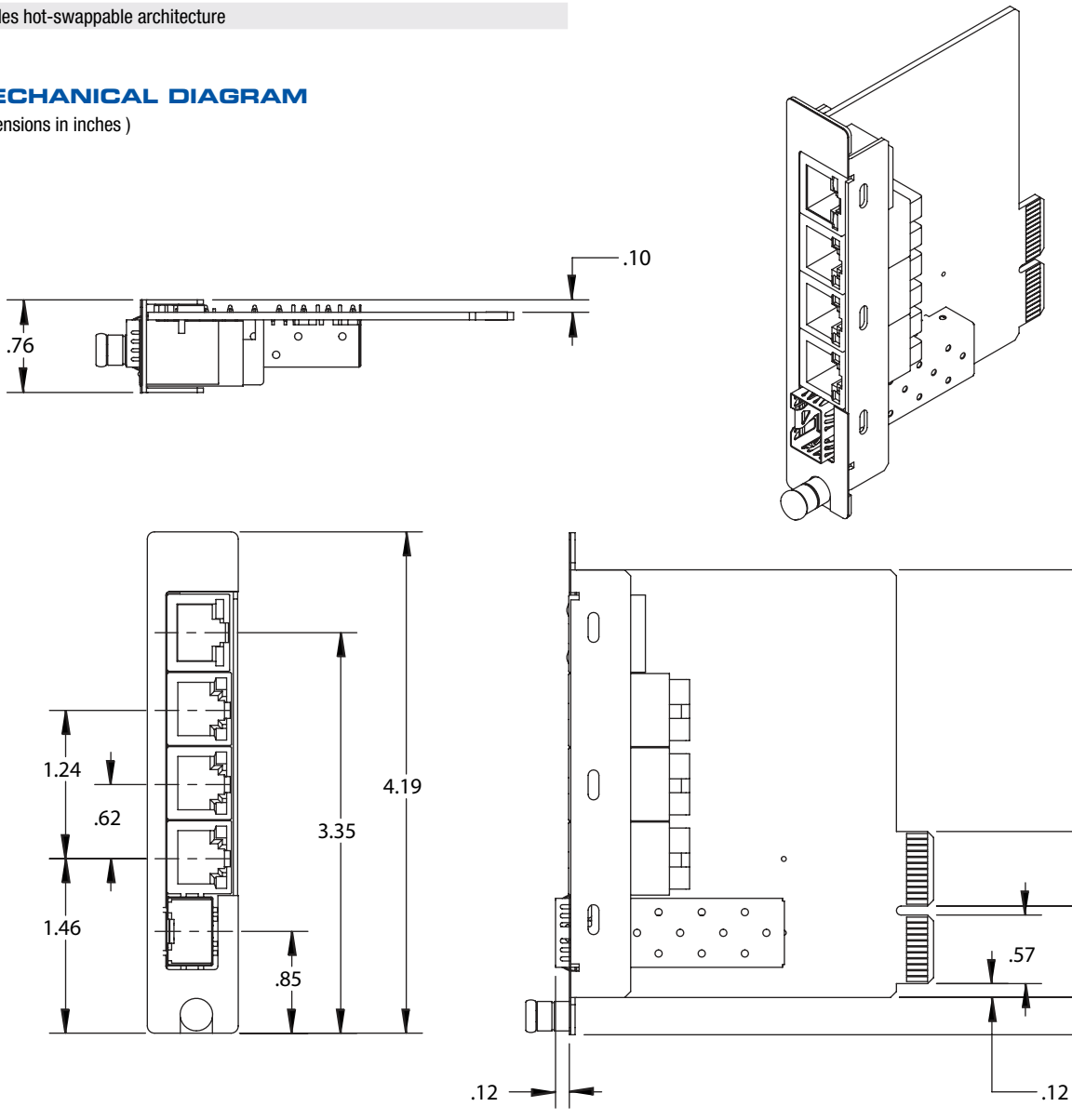
SPECIFICATIONS

TECHNICAL
IEEE 802.3x 10/100Base-T
IEEE 802.3u Auto Negotiation
RFC-2474 and RFC-2475 DiffServ/ToS
Includes diagnostic LEDs
AutoCross and Auto Negotiation on all ports
Maximum 1916 byte packet size
Supports Half and Full-Duplex operation
Connectors: RJ-45 and SC, ST, LC or SFP
Installs in any iMediaChassis, MediaChassis or IE-MediaChassis
Supports GUI-Based iView²
Supports Half- and Full-Duplex operation
Includes diagnostic LEDs
Includes hot-swappable architecture

MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-4° to +158° F (-20° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
UL/cUL	
CE	

MECHANICAL DIAGRAM

(dimensions in inches)



Modular 10/100/1000 Mbps Ethernet Media/ Mode Converter

IE-iMcV-MultiWay

PRODUCT FEATURES

- Four devices in one unit
- Supports 3R's (Re-amplify, Re-shape, Re-time) optical signal regeneration
- 1+1 uplink protection (< 50 mSec)
- Supports per port service VLAN
- SNMP manageable
- Jumbo Frames support (up to 10240 bytes)
- Support for daisy chain expansion
- Supports IEEE 802.3ah OAM (active/passive), 802.1ag CFM (Connectivity Fault Management) and Y.1731 on all ports
- Discovery, Link Monitoring, Performance Monitoring and Remote Loopback
- Features Bandwidth Management including Limiting anad Traffic Shaping with burst capability and priority queuing

The IE-iMcV-MultiWay is a modular, CPE device providing two fixed 10/100/1000Base-T copper ports and 2 SFP ports. The SFP ports support fiber or copper SFPs. A console port and on-board DIP Switches provide configuration and mode options for the module. The IE-iMcV-MultiWay provides OAM functionality with 802.3ah and 802.1ag support on each port. As an Industrial Ethernet device, it supports an extended temperature range of -40° to +85° C.

There are four distinct DIP Switch-selectable configurations that the IE-iMcV-MultiWay supports:

- 1+1 Uplink Protection, revertive
- 1+1 Uplink Protection, non-revertive
- A four port gigabit switch
- A dual copper to fiber SFP media/mode converter

As a 4-port device, it can be deployed with fiber redundancy (with or without 1+1 uplink protection) and status monitoring with management on all ports via SNMP, which now offers OAM for mission-critical applications. It can also be installed as dual 10/100/1000 Mbps copper to fiber media converter (utilized as two separate converters).

The IE-iMcV-MultiWay supports 10/100/1000 Mbps and 1 Gbps copper and 100 Mbps and 1 Gbps optical SFP modules, to provide greater flexibility in the network environment. The hot-swappable nature of SFPs and the numerous fiber modes and types that are available allow for easy configuration and future upgrading as network demands evolve.

The IE-iMcV-MultiWay offers a full feature set including Auto Negotiation, Selective Advertising, AutoCross (on copper ports), VLANs, loopback testing and OAM. Software updates can be downloaded through TFTP or iView2 (iConfig view).

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE	ETHERNET PORTS	ETHERNET CONNECTOR
IE-iMcV-MultiWay *					
858-18121	SFP	2	Various	2	RJ45

* SFPs Sold Separately

iView: Windows 2000/XP/Vista/Win7

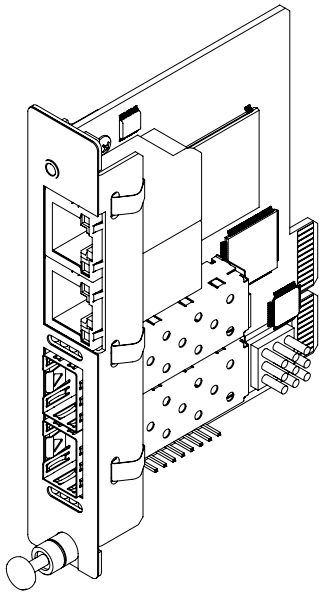
Modular 10/100/1000 Mbps Ethernet Media/Mode Converter

IE-iMcV-MultiWay

SPECIFICATIONS

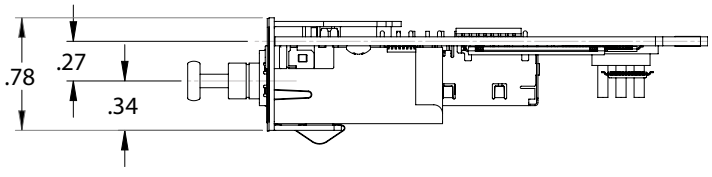
TECHNICAL
IEEE 802.3 10Base-T twisted pair
IEEE 802.3u 100Base-TX twisted pair
IEEE 802.3ab 1000Base-T twisted pair
IEEE 802.3z 1000Base-LX or SX fiber
Extended temperature range
Plug-and-play operation
Accepts RJ-45 and SFP connectors
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Single-strand fiber and CWDM models
FX and TX Auto Negotiation
AutoCross for MDI/MDIX
Layer 2 packet switching, store and forward (forwarding rate: 14,880 pps for 10 Mbps, 148,000 pps for 100 Mbps, 1,480,000 Mbps for 1,000 Mbps)
Jumbo Frames support (up to 10240) at Gigabit speed
STANDARD COMPLIANCE
IEEE 802.3ah
IEEE 802.1ag
IEEE 802.1q VLAN
SFP-MSA SFP standard (September 14, 2000)
SFF-8472 DDMI standard (Revision 1.0)

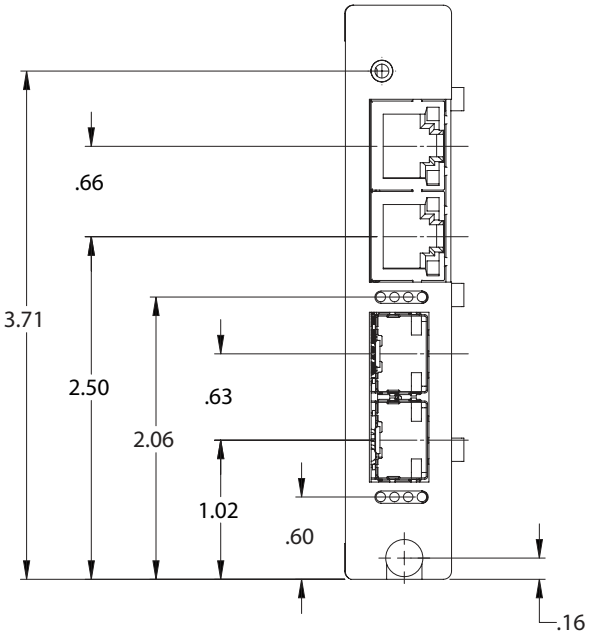
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	-40° F to +185° F (-40° C to +85° C)
Storage Temperature:	-67 F to +257° F (-55° C to +125° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL, cUL, CE	

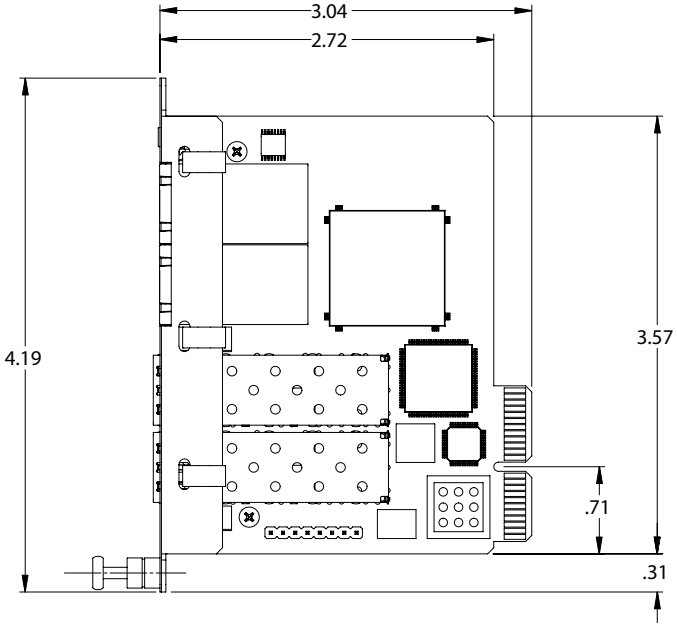


MECHANICAL DIAGRAM

(dimensions in inches)







Modular Protocol-Independent, 10 Gbps XFP Fiber Mode Converter

iMcV-10G Converter XFP

PRODUCT FEATURES

- Interchangeable XFP modules allow for multiple fiber mode/type conversion options (single-mode, multi-mode) as well as support for copper XFPs
- DDMI capable XFPs are supported through SNMP when installed in a compatible managed chassis
- Supports 3R's signal regeneration - Re-amplify, Re-shape, Re-time
- Supports a wide range of XFP Modules with transmission speeds from 9.9 Gbps to 11.3 Gbps
- User selectable FX LinkLoss enables the operator to identify a cable fault/failure when the unit is not used in a managed chassis
- Supports Config Control, a feature that retains the latest configuration of a module regardless of how the initial configuration was setup; whether by DIP Switch or SNMP Management Module
- Supports XFP Loopback (Lineside & SFI) and Loss Carry Forward (XFP dependent)

The iMcV-10G-Converter is a dual-wide SNMP manageable module that allows network operators to convert multiple fiber types and wavelengths, as well as copper XFPs, within a network. It installs in the modular, SNMP-manageable iMediaChassis series and in the unmanaged MediaChassis series.

The iMcV-10G-Converter uses 10 Gbps XFP modules which are capable of moving large amounts of data over long distances, for applications such as ISPs, Data Storage, Fiber Channel and others. The hot-swappable nature of XFPs and the numerous fiber modes and types that are available allow for easy configuration and future upgrading as network demands evolve.

The iMcV-10G-Converter is protocol-independent with dual XFP ports which can provide a single conversion between copper, different wavelengths or single-mode and multi-mode fiber, single-mode to single-mode fiber or multi-mode to single-strand single-mode fiber. The iMcV-10G-Converter module supports a variety of user-configurable features such as LinkLoss, LoopBack and variable speed XFPs.

Easily configure and manage converters with the GUI-based iView². As an SNMP management application, iView² gives network managers the ability to monitor and control B&B Electronic's products. iView² runs standalone on Windows NT/XP/2000/7 or as a Web Server running under IIS.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE
IE-iMcV-10G-Converter XFP/XFP*			
860-12100	SFP	2	Various

* SFPs Sold Separately

ORDERING INFORMATION

MODEL NUMBER	FIBER	RANGE	FIBER BUDGET (DB)
IE-XFP Modules: 10 Gbps Ethernet (OC-192) with DDMI			
808-38610	IE-XFP SR/10G-ED, MM850, LC	33 m	2.8
808-38611	IE-XFP LR/10G-ED, SM1310, LC	10 km	8.4
808-38612	IE-XFP ER/10G-ED, SM1550, LC	40 km	15
808-38612	IE-XFP ZR/10G-ED, SM1550/PLUS, LC	80 km	23

iView: Windows 2000/XP/Vista/Win7

Modular Protocol-Independent, 10 Gbps XFP Fiber Mode Converter

iMcV-10G Converter XFP

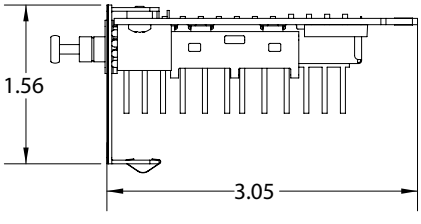
SPECIFICATIONS

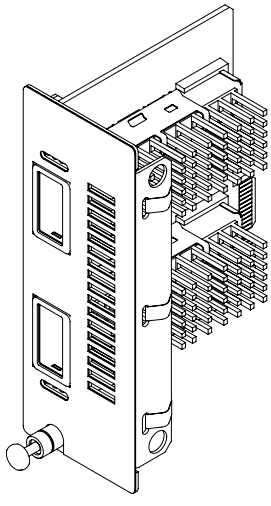
TECHNICAL
2 x XFP ports
Supports copper and fiber XFP transceivers
Protocol-independent operation
Converts between dissimilar fiber modes and wavelengths
Includes diagnostic LEDs
Hot-swappable architecture
Modular Form Factor
Compatible with IMC Networks' XFPs and all standard XFP transceivers
STANDARD COMPLIANCE
SFF-8472 DDMI standard (Revision 1.0)

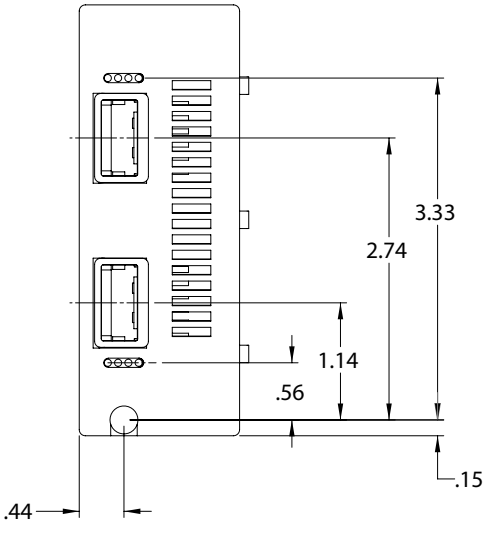
MECHANICAL	
Dimensions	Dual-wide iMcV-module
Shipping Weight	0.25 lbs (0.11 kg)
ENVIRONMENTAL	
Operating Temperature:	-4° to +158° F (-20° to +70° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
POWER CONSUMPTION	
637mA @ +70° C (Typical @ 5V)	
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CE	

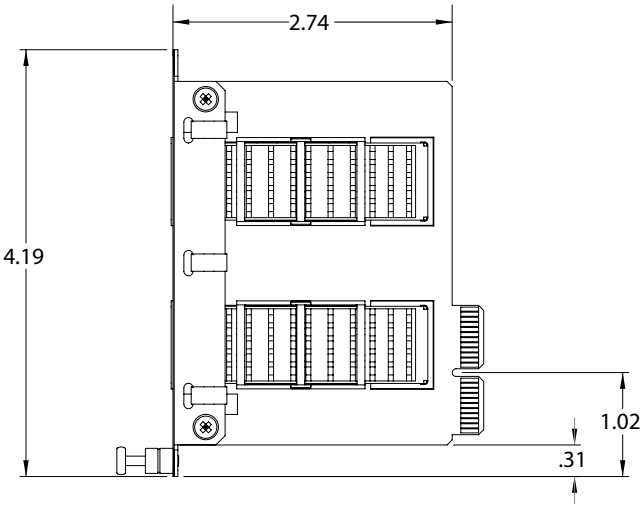
MECHANICAL DIAGRAM

(dimensions in inches)









Modular Protocol-Independent, 10 Gbps XFP Fiber Mode Converter

iMcV-10G Converter SFP+

PRODUCT FEATURES

- Interchangeable SFP+ modules allow for multiple fiber mode/type conversion options (single mode, multi-mode)
- DDMI enabled XFPs are supported through SNMP when installed in a compatible managed chassis
- Supports 3R's signal regeneration - Re-amplify, Re-shape, Re-time
- Supports a wide range of SFP+ Modules with transmission speeds from 9.9 Gbps to 11.3 Gbps
- Modules are hot-swappable; no need to power-down chassis when upgrading or trouble-shooting a single module
- User selectable FX LinkLoss enables the operator to identify a cable fault failure when the unit is not installed in a managed chassis
- Supports Config Control, a feature that retains the latest configuration of a module regardless of how the initial configuration was setup, whether by DIP Switch or SNMP Management Module
- Supports Internal Test Head functionality

The iMcV-10G-Converter SFP+ is a single-wide SNMP manageable module that allows network operators to convert an array of fiber types within a network. It installs in the modular, SNMP-manageable iMediaChassis series and in the unmanaged MediaChassis series.

The iMcV-10G-Converter SFP+ uses 10 Gbps SFP+ modules which are capable of moving large amounts of data over long distances for applications such as ISPs, Data Storage, Fiber Channel, and others. The hot-swappable nature of SFP+ and the numerous fiber protocols and types that are available allow for easy configuration and future upgrading as network demands evolve.

The iMcV-10G-Converter SFP+ is protocol-independent with dual SFP+ ports which can provide a single conversion between single-mode and multi-mode fiber, single-mode to single-mode fiber or multi-mode to single-strand single-mode fiber. The iMcV-10G-Converter SFP+ module supports a variety of user-configurable features such as Loss Carry Forward (LCF) and Internal Test Head feature.

Easily configure and manage converters with the GUI-based iView². As an SNMP management application, iView² gives network managers the ability to monitor and control B&B Electronics products. iView² runs standalone on Windows NT/XP/2000/7 or as a Web Server running under IIS.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	RANGE
IE-iMcV-10G-Converter SFP+/SFP+*			
860-12104	SFP+	2	Various

* SFPs Sold Separately

ORDERING INFORMATION

MODEL NUMBER	FIBER	RANGE	FIBER BUDGET (DB)
IE-SFP+ Modules: 10 Gbps Ethernet (OC-192) with DDMI			
808-38600	IE-SFP+ SR/10G-ED, MM850, LC	33 m	2.8
808-38601	IE-SFP+ LR/10G-ED, SM1310, LC	10 Km	8.4

iView: Windows 2000/XP/Vista/Win7

Modular Protocol-Independent, 10 Gbps XFP Fiber Mode Converter

iMcV-10G Converter SFP+

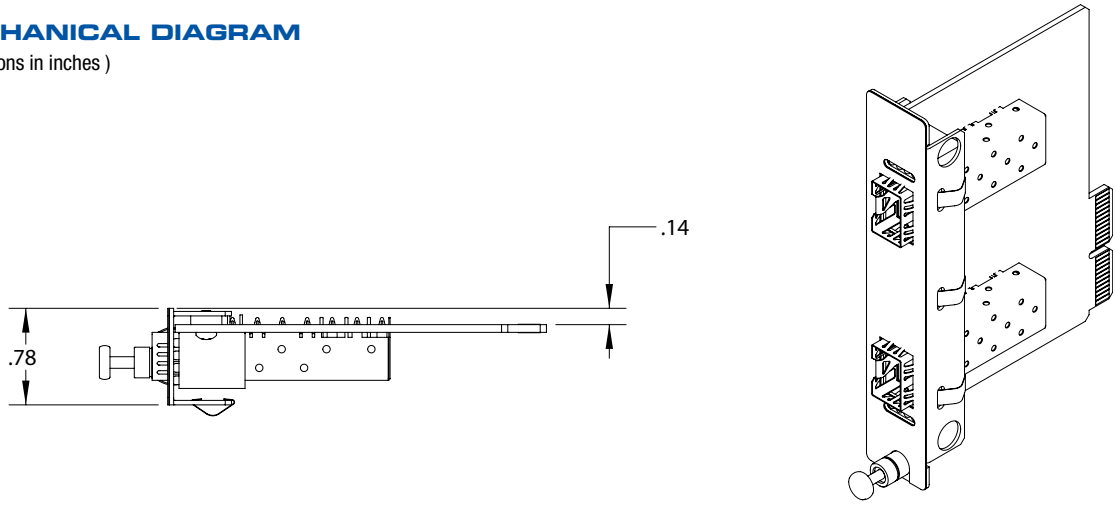
SPECIFICATIONS

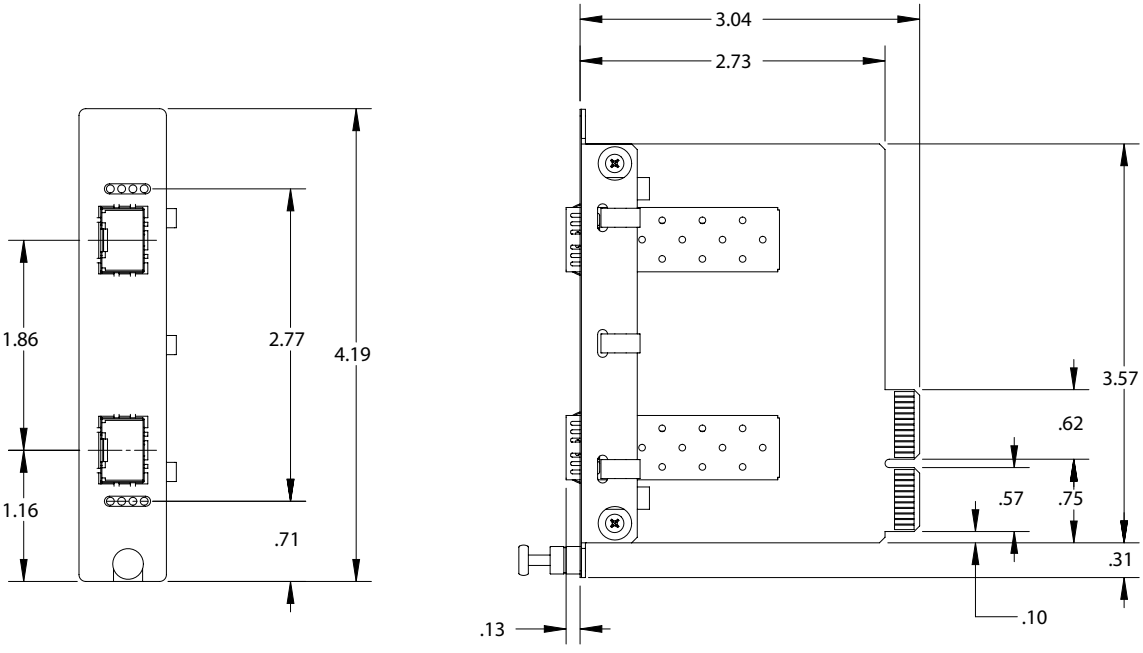
TECHNICAL
2 x SFP+ ports
Supports an array of 10G protocols
Converts between dissimilar fiber modes and wavelengths
Includes diagnostic LEDs
Hot-swappable architecture
Modular Form Factor
Compatible with B&B Electronics SFP+ and all standard SFP+ transceivers
Does not support Copper SFPs
STANDARD COMPLIANCE
Meets MSA Standards

MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.25 lbs (0.11 kg)
ENVIRONMENTAL	
Operating Temperature:	-4° to +158° F (-20° to +70° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
POWER CONSUMPTION	
637mA @ +70° C (Typical @ 5V)	
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





10/100Base-T, Ethernet over VDSL

IE-iMcV-VDSL2 LANextender

PRODUCT FEATURES

- Media and protocol converter - converts 10/100BaseT to VDSL
- Operates over existing CAT3 or other telephone cabling
- Supports VDSL2 for Band Plan 997/998, symmetrical and asymmetrical transmission per ITU-T G.993.2 standard
- Extended operating temperature of -40° C to +85° C
- Features Flow Control, Link Loss, Link Fault Pass-Through (LFPT) & Remote Alarm Indication (RAI)
- Link Quality LED displays maximum supported bandwidth
- Overflow LED to display congestion on the VDSL line

IE-iMcV-VDSL2 Ethernet LAN extenders enable LAN and campus network managers and service providers to use an existing phone-grade wiring plant to extend 10 Mbps and 100 Mbps Ethernet twisted pair interfaces by using Ethernet over VDSL; the 100 meter distance limitation of twisted pair data cabling is no longer a challenge.

Designed with Second Generation VDSL (Very high-bit-rate Digital Subscriber Line) technology, the IE-iMcV-VDSL2-LANextender allows the transmission of data over sub-standard CAT3 and other telephone cabling to achieve higher data rates than comparable VDSL converters at short distances (less than 100 meters), while supporting asymmetrical data rates on substantially longer lines (greater than 2 km).

IE-iMcV-VDSL2-LANextender module includes:

One VDSL port with an RJ-11 connector
One 10/100 twisted pair Ethernet port with a RJ-45 connector
Auto MDI/MDIX, Auto Negotiation and Selective Advertising with Flow Control on the 10/100 port

ORDERING INFORMATION

MODEL NUMBER	RANGE	VDSL PORTS	VDSL CONNECTOR	ETHERNET PORTS	ETHERNET CONNECTOR
IE-iMcV-VDSL2 LANextender					
851-18200	Refer to Matrix	1	RJ11	1	RJ45

DISTANCE	UPSTREAM DATA RATE*	DOWNSTREAM DATA RATE*	UPSTREAM DATA RATE*	DOWNSTREAM DATA RATE*
	Asymmetrical		Symmetrical	
300 FT.	58 Mbps	100 Mbps	84 Mbps	98 Mbps
1,000 FT.	43 Mbps	85 Mbps	61 Mbps	63 Mbps
2,000 FT.	14 Mbps	50 Mbps	25 Mbps	37 Mbps
5,000 FT.	0.3 Mbps	16 Mbps	0.3 Mbps	16 Mbps

* Distances and speeds are approximate; actual distances depend on wiring quality and gauge. The distances are less than or equal to the values listed.

* The actual Ethernet speeds are lower than the speeds listed above due to VDSL overhead.

iView: Windows 2000/XP/Vista/Win7

10/100Base-T, Ethernet over VDSL

IE-iMcV-VDSL2 LANextender

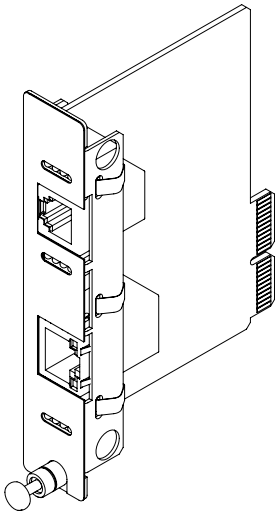
SPECIFICATIONS

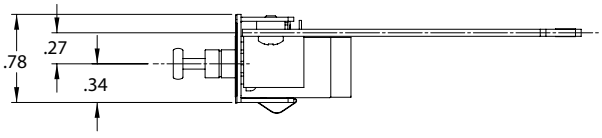
TECHNICAL
Operates over existing telephone twisted pair cabling (CAT3)
IEEE 802.3 10Base-T; IEEE 802.3u 100Base-TX
Asymmetric/symmetric data rates (Band Plan 997/998)
IEEE 802.3x Flow Control
Auto Negotiation of speed and duplex (HDX/FDX) on Ethernet port
Includes Link Fault Propagate
Supports packets up to 1536 bytes
Installs in any iMediaChassis or MediaChassis
Supports GUI-Based iView²
Connectors: RJ-45 and RJ-11
Includes diagnostic LEDs
Include hot-swappable architecture

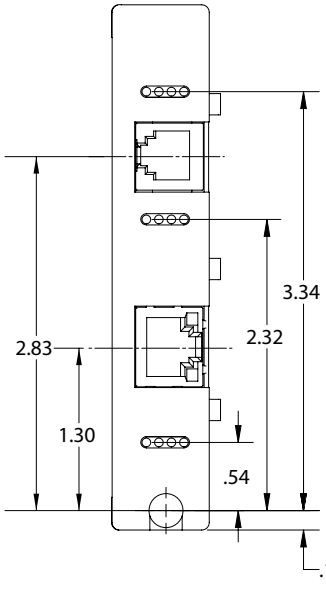
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	-40° to 185° F (-40° to +85° C)
Storage Temperature:	-67° to 257° F (-55° to +125° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B	
UL/cUL, CSA, CE	

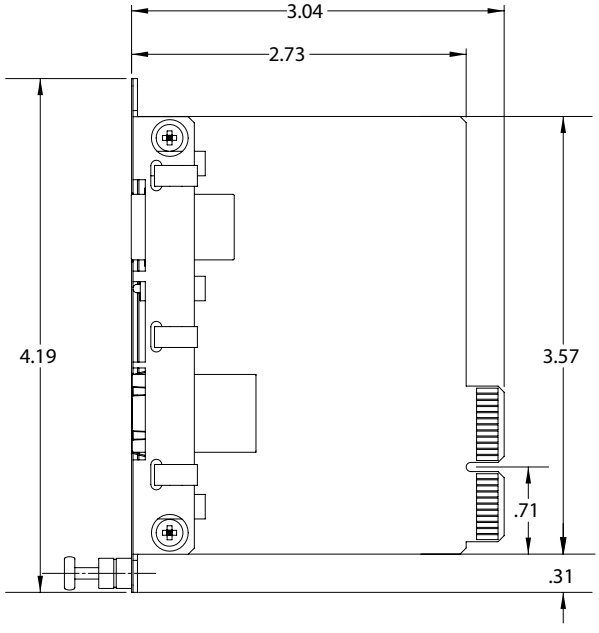
MECHANICAL DIAGRAM

(dimensions in inches)









Protocol-Independent, SNMP-Manageable Fiber Mode Conversion Modules

iMcV-S2MM

PRODUCT FEATURES

- Includes protocol-independent operation
- Converts multi-mode to single-mode fiber
- Supports 10 Mbps Ethernet to 155 Mbps or 1.25 Gbps Gigabit Ethernet

In today's dynamic networks, changing requirements are a fact of life. The multi-mode fiber products and cabling which were the most cost-effective and sound choice for your network yesterday may no longer give you the flexibility you require when adding remote offices today. Easily overcome the distance limitations inherent to multi-mode fiber by converting to single-mode fiber. Fiber mode converters are the solution.

Extend the reach of your network without replacing multi-mode fiber equipment. As an economical alternative to using a switch with single-mode fiber ports, simply install an IMC Networks fiber mode converter into your multi-mode fiber network. This enables you to easily connect to single-mode cabling and achieve distances up to 80 km. Our fiber mode converters also give you the flexibility to add single-mode fiber links only where needed. The iMcV-S2MM fiber mode conversion modules includes:

- Converts multi-mode to single-mode fiber
- Supports 10 Mbps Ethernet to 155 Mbps or 1.25 Gbps Gigabit Ethernet

Hot-swappable fiber mode conversion modules significantly reduce operation costs by allowing other modules within the same chassis to remain up and running during product upgrades, maintenance and troubleshooting.

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION PORT 1	DISTANCE PORT 1	DESCRIPTION PORT 2	DISTANCE PORT 2
iMcV-S2MM/155 (Single-mode to Multi-mode)				
850-14520	SM1310/PLUS-ST	40 km	MM1300-ST	5 km
850-14530	SM1310/PLUS-SC	40 km	MM1300-SC	5 km
850-14540	SM1310/LONG-ST	40 km	MM1300-ST	5 km
850-14550	SM1310/LONG-SC	40 km	MM1300-SC	5 km
850-14555	SM1550/LONG-SC	80 km	MM1300-SC	5 km
850-14560	SM1310/PLUS-ST	40 km	MM850-ST	2 km
850-14570	SM1310/PLUS-SC	40 km	MM850-SC	2 km
850-14580	SM1310/LONG-ST	40 km	MM850-ST	2 km
850-14590	SM1310/LONG-SC	40 km	MM850-SC	2 km
850-14595	SM1550/LONG-SC	80 km	MM850-SC	2 km
Single-Strand Fiber				
850-14532	SSFX-SM1310-SC (1310xmt/1550rcv)	20 km	MM1300-SC	5 km
850-14533	SSFX-SM1550-SC (1550xmt/1310rcv)	20 km	MM1300-SC	5 km
850-14535	SSFX-SM1310/PLUS-SC (1310xmt/1550rcv)	40 km	MM1300-SC	5 km
850-14536	SSFX-SM1550/PLUS-SC (1550xmt/1310rcv)	40 km	MM1300-SC	5 km

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION PORT 1	DISTANCE PORT 1	DESCRIPTION PORT 2	DISTANCE PORT 2
iMcV-S2MM/1250 (Single-mode to Multi-mode)				
859-14799	LX-SM1310-SC	15 km	SX-MM850-SC	220/550 m
859-14800	LX-SM1310/PLUS-SC	40 km	SX-MM850-SC	220/550 m
859-14801	LX-SM1550/LONG-SC	80 km	SX-MM850-SC	220/550 m
Single-Strand Fiber				
859-14806	SSLX-SM1310-SC (1310xmt/1550rcv)	15 km	SX-MM850-SC	220/550 m
859-14807	SSLX-SM1550-SC (1550xmt/1310rcv)	15 km	SX-MM850-SC	220/550 m
859-14808	SSLX-SM1310/PLUS-SC (1310xmt/1550rcv)	40 km	SX-MM850-SC	220/550 m
859-14809	SSLX-SM1550/PLUS-SC (1550xmt/1310rcv)	40 km	SX-MM850-SC	220/550 m

iMcV-S2MM also available in CWDM Fiber. Call for details.

Protocol-Independent, SNMP-Manageable Fiber Mode Conversion Modules

iMcV-S2MM

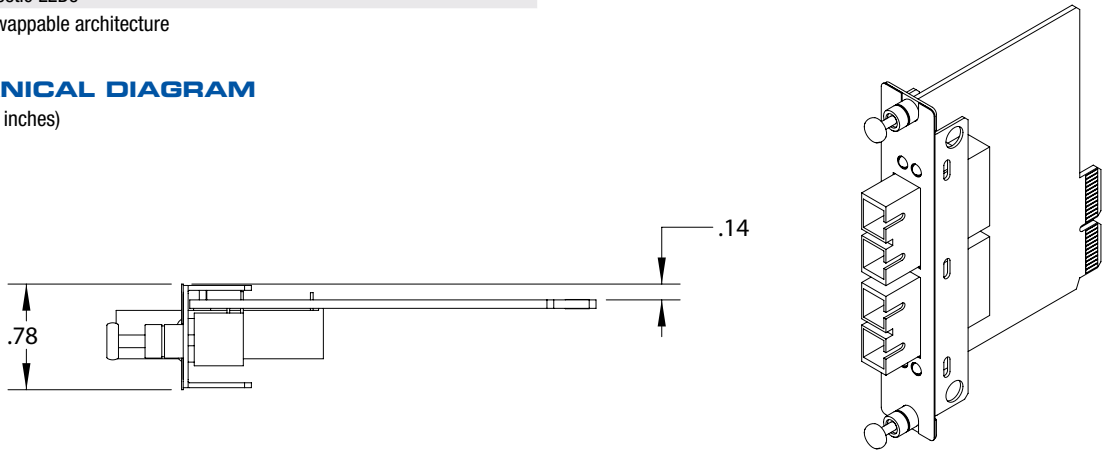
SPECIFICATIONS

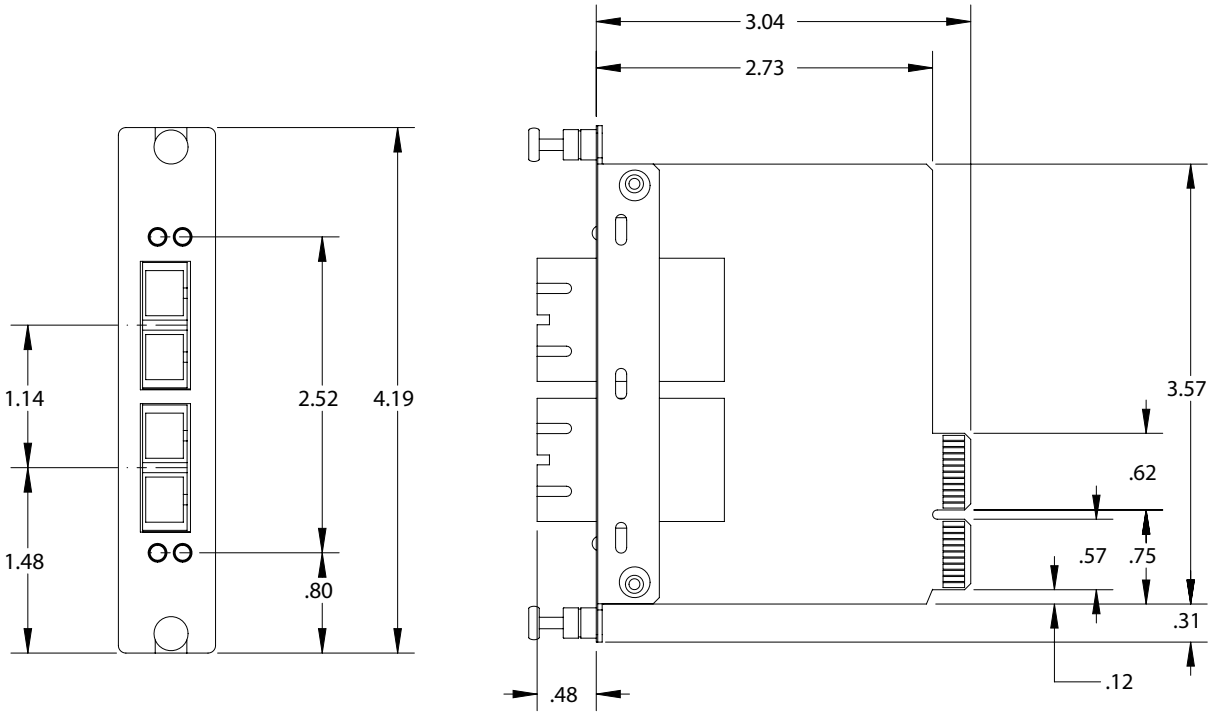
TECHNICAL
Includes protocol-independent operation
Converts between dissimilar fiber modes and wavelengths: Single-Mode to Multi-Mode
Ethernet, Fast Ethernet
OC-12, Gigabit Ethernet and FibreChannel
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber
Connectors: ST, SC or MT-RJ
Installs in any iMediaChassis or MediaChassis
Supports GUI-Based iView²
Includes diagnostic LEDs
Includes hot-swappable architecture

MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





Protocol-Independent, SNMP-Manageable Fiber Mode Conversion Modules

iMcV-S2SM

PRODUCT FEATURES

- Includes protocol-independent operation
- Converts single-mode to single-mode fiber
- Supports 10 Mbps Ethernet to 155 Mbps or 1.25 Gbps Gigabit Ethernet

In today's dynamic networks, changing requirements are a fact of life. The multi-mode fiber products and cabling which were the most cost-effective and sound choice for your network yesterday may no longer give you the flexibility you require when adding remote offices today. Extend a single mode conversion to another single mode fiber segment, using an S2SM.

As an economical alternative to using a switch with single-mode fiber ports, simply install an fiber mode converter into your multi-mode fiber network. This enables you to easily connect to single-mode cabling and achieve distances up to 80 km. Our fiber mode converters also give you the flexibility to add single-mode fiber links only where needed. The iMcV-S2SM fiber mode conversion modules includes:

- Converts Single-Mode to Single-Sode fiber
- Supports 10 Mbps Ethernet to 155 Mbps or 1.25 Gbps Gigabit Ethernet

Hot-swappable fiber mode conversion modules significantly reduce operation costs by allowing other modules within the same chassis to remain up and running during product upgrades, maintenance and troubleshooting.

iView: Windows 2000/XP/Vista/Win7

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION PORT 1	DISTANCE PORT 1	DESCRIPTION PORT 2	DISTANCE PORT 2
iMcV-S2SM (Single-mode to Single-mode)				
850-14519	SM1310/PLUS-SC	40 km	SM1310/ PLUS-SC	40 km
850-14505	SM1310/LONG-SC	40 km	SM1310/ LONG-SC	40 km
850-14513	SM1550/LONG-SC	80 km	SM1310/ PLUS-SC	40 km
850-14514-LC	SM1550/LONG-SC	80 km	SM1310/ LONG-LC	40 km
Single-Strand Fiber				
850-14515	SSFX-SM1310-SC (1310xmt/1550rcv)	20 km	SM1310/ PLUS-SC	40 km
850-14516	SSFX-SM1550-SC (1550xmt/1310rcv)	20 km	SM1310/ PLUS-SC	40 km
850-14517	SSFX-SM1310/PLUS-SC (1310xmt/1550rcv)	40 km	SM1310/ LONG-SC	40 km
850-14518	SSFX-SM1550/PLUS-SC (1550xmt/1310rcv)	40 km	SM1310/ LONG-SC	40 km

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION PORT 1	DISTANCE PORT 1	DESCRIPTION PORT 2	DISTANCE PORT 2
iMcV-S2SM/1250 (Single-mode to Single mode)				
859-14803	LX-SM1310/PLUS-SC	40 km	LX-SM1310/ PLUS-SC	40 km
859-14804	LX-SM1310/PLUS-SC	40 km	LX-SM1550/ LONG-SC	80 km
Single-Strand Fiber				
859-14820	SSLX-SM1310-SC (1310xmt/1550rcv)	15 km	LX-SM1310/ PLUS-SC	40 km
859-14821	SSLX-SM1550-SC (1550xmt/1310rcv)	15 km	LX-SM1310/ PLUS-SC	40 km
859-14822	SSLX-SM1310/PLUS-SC (1310xmt/1550rcv)	40 km	LX-SM1310/ PLUS-SC	40 km
859-14823	SSLX-SM1550/PLUS-SC (1550xmt/1310rcv)	40 km	LX-SM1310/ PLUS-SC	40 km

iMcV-S2SM also available in CWDM Fiber. Call for details.

Protocol-Independent, SNMP-Manageable Fiber Mode Conversion Modules

iMcV-S2SM

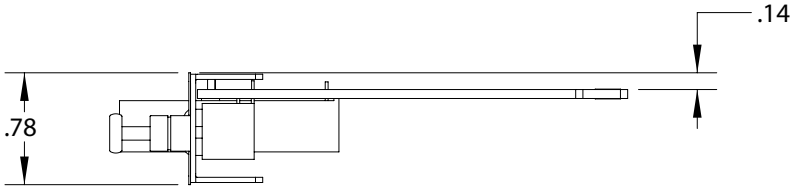
SPECIFICATIONS

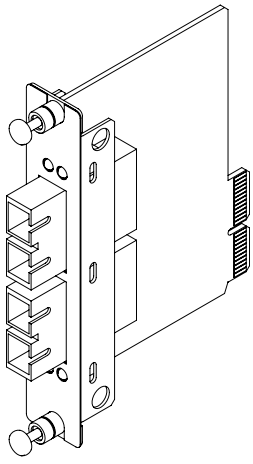
TECHNICAL
Includes protocol-independent operation
Converts between dissimilar fiber modes and wavelengths: Single-Mode to Single-Mode
Ethernet, Fast Ethernet and ATM
OC-12, Gigabit Ethernet and FibreChannel
50/125µm or 62.5/125µm multi-mode fiber
9/125µm single-mode fiber
Available for single-strand fiber
Connectors: ST, SC or MT-RJ
Installs in any iMediaChassis or MediaChassis
Supports GUI-Based iView²
Includes diagnostic LEDs
Includes hot-swappable architecture

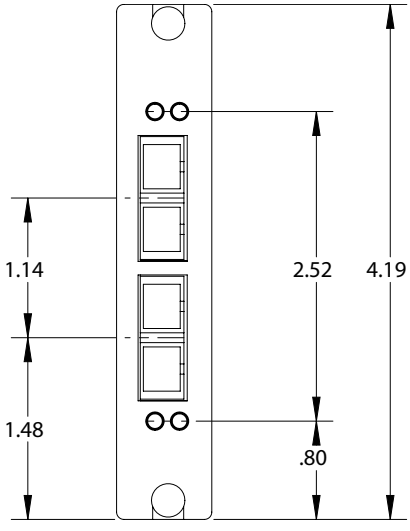
MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

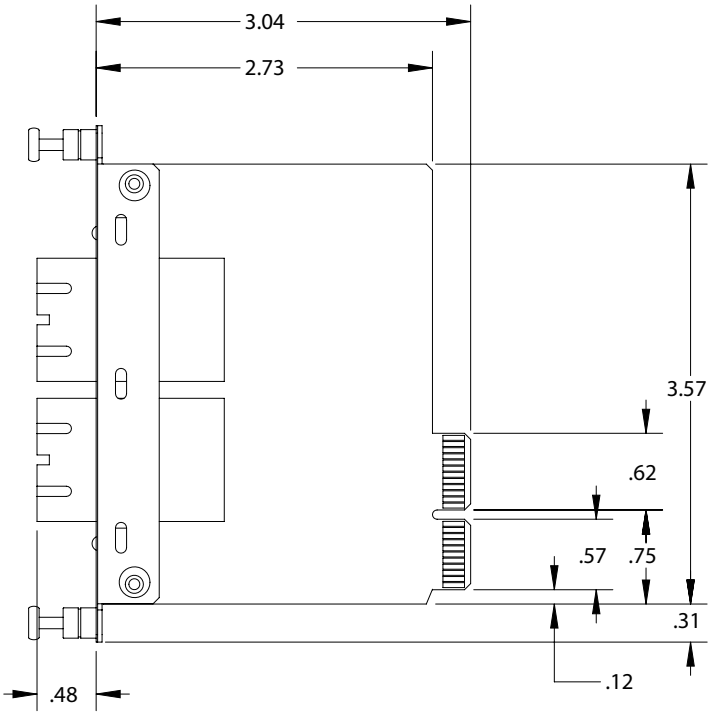
MECHANICAL DIAGRAM

(dimensions in inches)









Protocol-Independent, SNMP-Manageable Fiber Mode Conversion Modules

iMcV-M2MM

PRODUCT FEATURES

- Includes protocol-independent operation
- Converts multi-mode to multi-mode fiber
- 10 Mbps Ethernet to 155 Mbps ATM
- Supports 10 Mbps Ethernet to 155 Mbps or 1.25 Gbps Gigabit Ethernet

In today's dynamic networks, changing requirements are a fact of life. The multi-mode fiber products and cabling which were the most cost-effective and sound choice for your network yesterday may no longer give you the flexibility you require when adding remote offices today. Easily overcome the distance limitations inherent to multi-mode fiber by extending it with a fiber mode converter.

Extend the reach of your network without replacing multi-mode fiber equipment. Fiber pulled within a building is typically mulit-mode. If a network device or test equipment offers 850nm multi-mode fiber ports, and has to connect to a 1300nm multi-mode NIC or router, a mode converter is required.

The iMcV-M2mm fiber mode converter includes:

- Converts multi-mode to multi-mode fiber
- Supports 10 Mbps Ethernet to 155 Mbps or 1.25 Gbps Gigabit Ethernet

Hot-swappable fiber mode conversion modules significantly reduce operation costs by allowing other modules within the same chassis to remain up and running during product upgrades, maintenance and troubleshooting.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION PORT 1	DISTANCE PORT 1	DESCRIPTION PORT 2	DISTANCE PORT 2
iMcV-M2MM/155 (Multi-mode to Multi-mode)				
859-14803	MM1300-ST	5 km	MM850-ST	2 km
859-14804	MM1300-SC	5 km	MM850-SC	2 km
850-14510	MM1300-ST	2 km	MM850-ST	2 km
850-14511	MM1300-SC	2 km	MM850-SC	2 km

iMcV-M2MM also available in CWDM Fiber. Call for details.

iView: Windows 2000/XP/Vista/Win7

Protocol-Independent, SNMP-Manageable Fiber Mode Conversion Modules

iMcV-M2MM

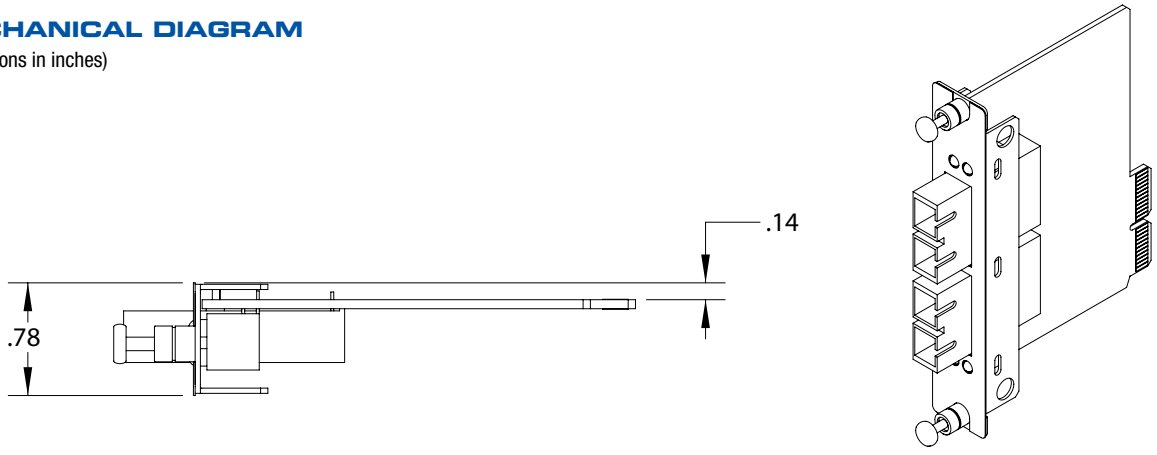
SPECIFICATIONS

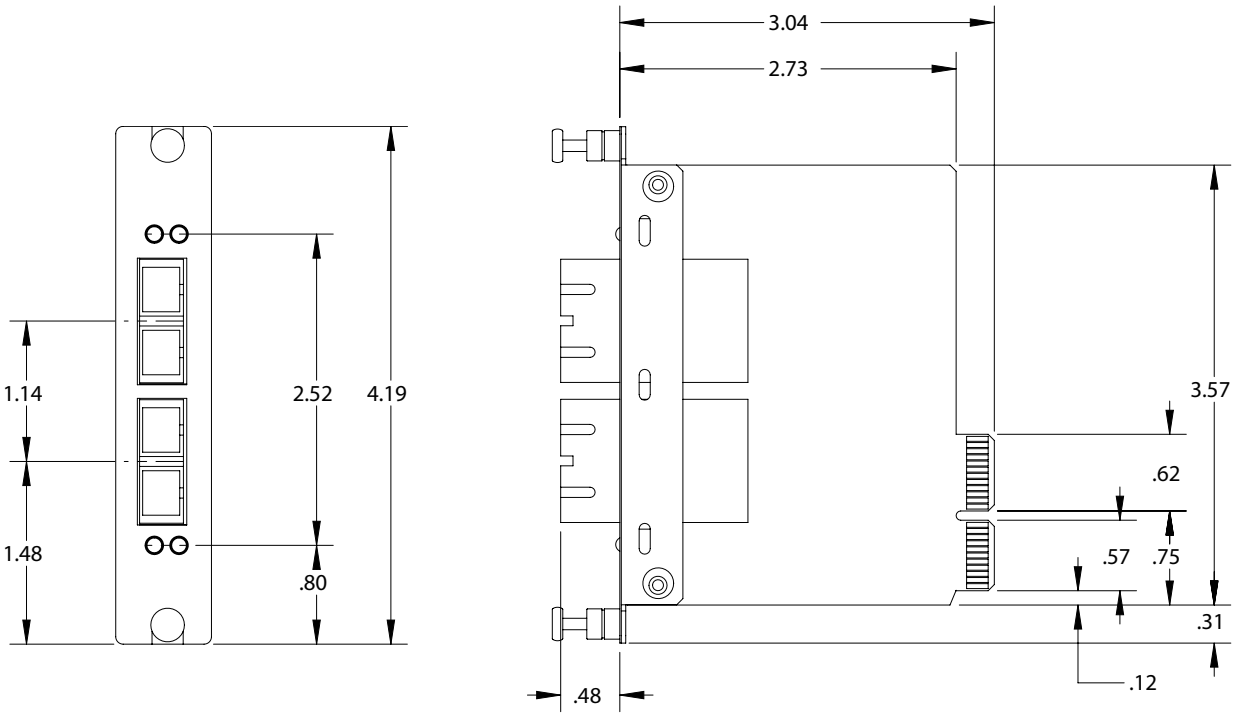
TECHNICAL
Includes protocol-independent operation
Converts between dissimilar fiber modes and wavelengths: Multi-Mode to Multi-Mode
Ethernet, Fast Ethernet and ATM
50/125µm or 62.5/125µm multi-mode fiber
Available for single-strand fiber
Connectors: ST, SC or MT-RJ
Installs in any iMediaChassis or MediaChassis
Supports GUI-Based iView²
Includes diagnostic LEDs
Includes hot-swappable architecture

MECHANICAL	
Dimensions	4.19"H x 0.78"W x 2.75"D (10.74 x 2 x 7.05 cm)
Shipping Weight	0.30 lbs (.11 kg)
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





Protocol-Independent, Fiber Mode Conversion via SFP Modules

IE-ModeConverter

PRODUCT FEATURES

- Interchangeable SFP modules allow for multiple fiber mode/type conversion options (single-mode, multi-mode, long haul, short haul, etc.)
- Extended operating temperatures
- Multiple mounting options (Desktop, DIN Rail, IE-PowerTray/18-AC [for high-density installations])
- Compact size conserves space
- AC or DC powering options
- Supports a full range of fiber SFP Modules in various transmission speeds, from 10 Mbps up to 2.4 Gbps*
- Wallmount Bracket

Mode converters allow network operators to incorporate multiple fiber types within a network. The IE-ModeConverter provides the ability to accomplish this by working with existing equipment and thus, eliminating replacement costs. With the flexibility to convert fiber between single-mode, multi-mode, single-strand and various wavelengths, one can easily extend network range to reach more remote locations. Additionally, since the IE-ModeConverter is an Industrial Equipment device (IE), the unit operates in environments that demand extended operating temperatures.

The IE-ModeConverter uses SFP modules to provide greater fiber flexibility in the network environment. The hot-swappable nature of the SFPs and the numerous fiber modes and types available allow for easy configuration and future upgrading as network demands evolve.

The SFP modules must be MSA compliant and support the same speed range. The IE-ModeConverter operates as a mode converter only and not as a rate or media converter.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION	FIBER PORTS	DISTANCE
IE-ModeConverter SFP/SFP with AC Adapter **			
855-19619	SFP	2	Various
IE-ModeConverter SFP/SFP without AC Adapter **			
854-19619	SFP	2	Various

* Certified at 1.25 Gbps, 2.4 Gbps is achievable

** SFP fibers sold separately

ACCESSORIES

806-39105 - DIN Rail Clip

806-39638 - Double-USB Power Cable, 36"/.9m

806-39650 - 12"/.3m Barrel-Connector Power Cable

850-13086 - IE-PowerTray/18-AC (-20°C to +70°C), 18-slot AC powered chassis

895-39229 - Wall Mount Bracket

Protocol-Independent, Fiber Mode Conversion via SFP Modules

IE-ModeConverter

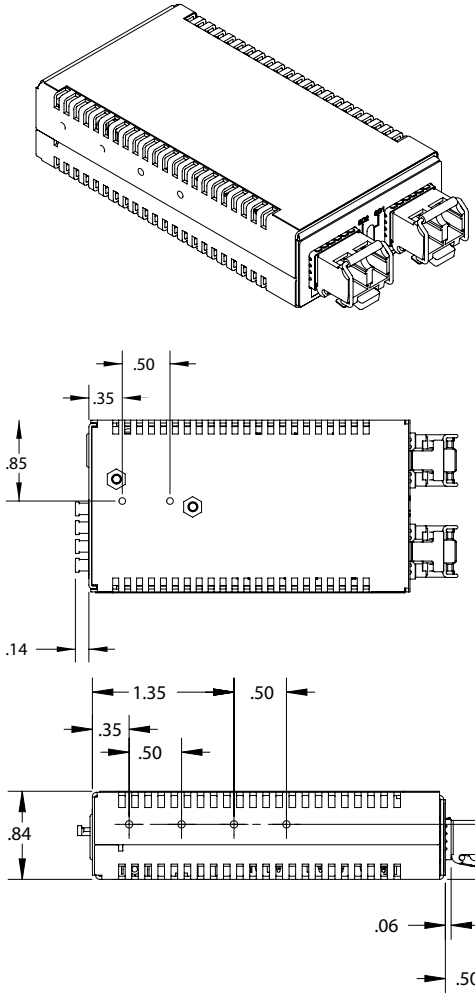
SPECIFICATIONS

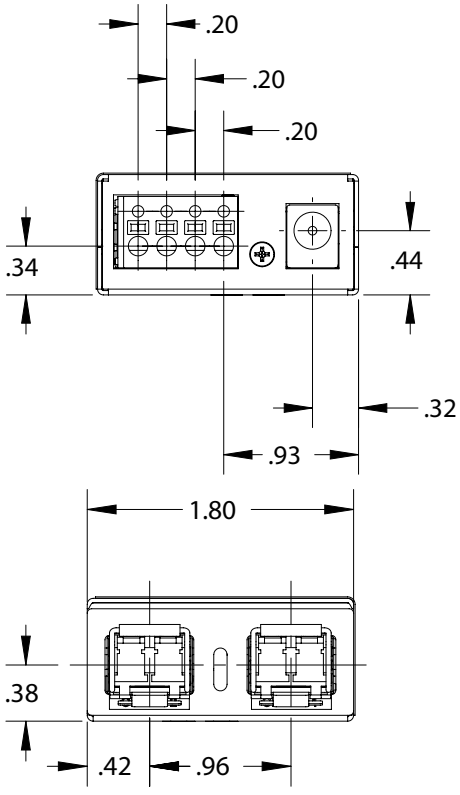
TECHNICAL
Two SFP ports
Protocol-independent operation
Converts between dissimilar fiber modes and wavelengths
Includes diagnostic LEDs
Hot-swappable architecture
Small Form Factor
7 VDC to 50 VDC terminal block powering option
Supports an external 5 VDC power module (not extended temperature)
Extended temperature range from -10° to +50° C
Compatible with IMC Networks SFPs and all standard MSA compliant SFP transceivers
Supports DIN Rail mounting
DC terminal block has dual inputs and supports cascading power
Standard Compliance
SFP-MSA SFP standard (September 14, 2000)
SFF-8472 DDMI standard (Revision 1.0)

MECHANICAL	
Dimensions	0.83”H x 1.80”W x 3.35”D (2.11 x 4.57 x 8.51 cm)
Shipping Weight	0.25 lbs (0.11 kg)
AC WALL ADAPTER	
100 to240 ±10% VAC input, 5 VDC output, 2A max.	
DC INPUT VOLTAGE	
+7 to +50 VDC @ 2.5 Watts (chassis grounded to negative terminal)	
POWER	
Maximum 3.3 Watts of combined power to both SFPs	
ENVIRONMENTAL	
Operating Temperature:	-13°F to +185°F (-25°C to +85°C) DC configuration -4°F to +158°F (-20°C to +70°C) DIN Railmount power supply +14°F to +122°F (-10°C to +50°C) with AC wall adapter
Storage Temperature:	-49°F to +185°F (-45°C to +85°C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

MECHANICAL DIAGRAM

(dimensions in inches)





Modular Protocol-Independent, Fiber Mode Converter via SFP Modules

IE-iMcV-ModeConverter

PRODUCT FEATURES

- Interchangeable SFP modules allow for multiple fiber mode/type conversion options (single-mode, multi-mode, single-strand, long haul, short haul, etc.)
- Extended operating temperatures
- DDMI enabled SFPs support SNMP when installed in a compatible managed chassis
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance
- Ideal for use with B&B Electronics' SFPs
- Supports a full range of SFP modules offering various transmission speeds, from 10 Mbps up to 2.4 Gbps*

The IE-iMcV-ModeConverter is an SNMP manageable module that allows network operators to incorporate multiple fiber types and wavelengths within a network. It installs in the modular, SNMP-manageable iMediaChassis series and in the unmanaged MediaChassis series.

The IE-iMcV-ModeConverters are protocol-independent with dual SFP ports which can provide a single conversion between different wavelengths or single-mode and multimode fiber, single-mode to single-mode fiber or multimode to single-strand single-mode fiber. The IE-iMcVModeConverter modules support a variety of user configurable features such as LinkLoss forcing a gigabit SFP to 100Mbps. Additionally, since the IE-iMcV-ModeConverter is an Industrial Equipment (IE) device, the unit operates in environments that demand extended operating temperatures.

The IE-iMcV-ModeConverter uses MSA Compliant SFP modules to provide greater fiber flexibility in the network environment. The hot-swappable nature of SFPs and the numerous fiber modes and types that are available allow for easy configuration and future upgrading as network demands evolve.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION	FIBER PORTS	DISTANCE
IE-ModeConverter SFP/SFP with AC Adapter **			
850-19500	SFP	2	Various

* Certified at 1.25 Gbps, 2.4 Gbps is achievable

** SFP fibers sold separately

iView: Windows 2000/XP/Vista/Win7

IN THE FIELD

High Bandwidth for Dubai Mall

Industry: Enterprise IT

Product: IE-Mode Converters w/ SFP modules; IE-PowerTray/18 High-density Chassis

www.bb-elec.com/DubaiMall

Carrier data charges may apply.

Modular Protocol-Independent, Fiber Mode Converter via SFP Modules

IE-iMcV-ModeConverter

SPECIFICATIONS

TECHNICAL
Includes two SFP ports
Protocol-independent operation
Converts between dissimilar fiber modes and wavelengths
Includes diagnostic LEDs
Hot-swappable architecture
Modular Form Factor
Extended temperature range from -40° to +85° C
Compatible with IMC Networks' SFPs and all standard MSA compliant SFP devices

STANDARD COMPLIANCE
SFP-MSA SFP standard (September 14, 2000)
SFF-8472 DDMI standard (Revision 1.0)

MECHANICAL	
Dimensions	4.19" x 0.78" x 2.75" (10.6 cm x 1.98 cm x 6.99 cm)
Shipping Weight	0.25 lbs (0.11 kg)

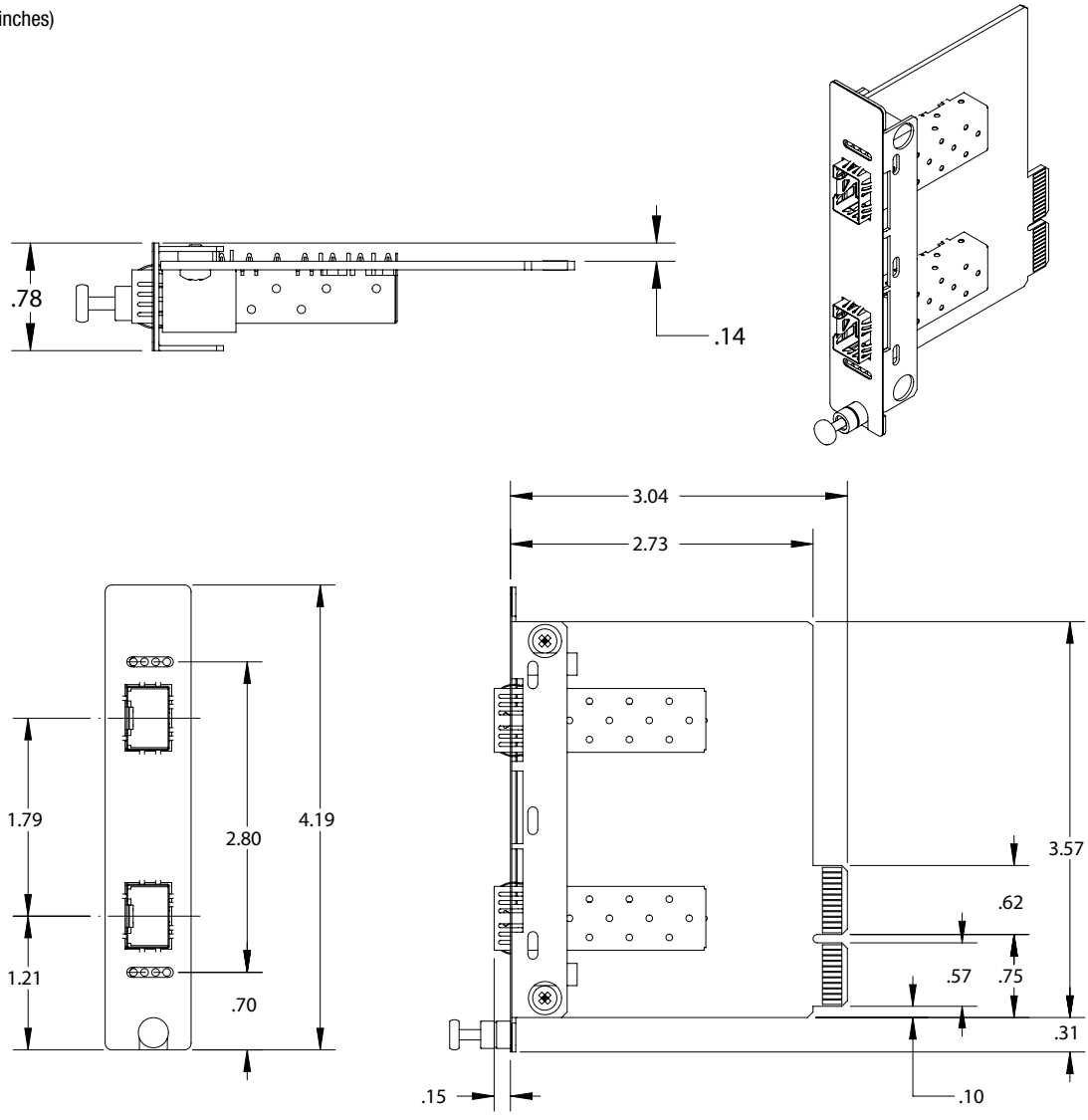
POWER
422mA with SFP ports populated (Typical @ 5V)

ENVIRONMENTAL	
Operating Temperature:	-40° to +185° F (-40° to +85° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude

REGULATORY APPROVALS
FCC Class A
UL/cUL, CE

MECHANICAL DIAGRAM

(dimensions in inches)



Protocol-Independent Wavelength Division Multiplexing for High Volume Optical Networking Applications

IE-iMcV-WDM/2 Series

PRODUCT FEATURES

- WDM/2 and iMcV-WDM/2 double the capacity of installed fiber by transmitting two wavelengths on one strand of fiber
- WDM/2 and iMcV-WDM/2 are speed and protocol-independent, and support 1310 nm and 1550 nm single-mode fiber
- WDM/2 chassis performs multiplexing with NO outside power requirement
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance

Wavelength Division Multiplexing (WDM) is a technology that enables the transmitting of multiple, optical signals on different wavelengths over one strand of fiber. Suited for installations where fiber is limited in terms of availability, service providers and enterprise network managers can easily double their fiber capacity without incurring the costs associated with installing new fiber. Campus area network managers can deploy the WDM/2 solution, for example, to combine voice and data traffic over the same duplex fiber between company facilities.

WDM/2 and iMcV-WDM/2 are two-channel, passive, protocol and speed-independent Wavelength Division Multiplexers which allow two individual wavelengths to share one fiber pair; Full-Duplex data travels on 1310 nm and 1550 nm to virtually double the capacity of installed fiber. Deploy WDM/2 products in pairs so that the host site will multiplex 1310 nm and 1550 nm onto the fiber and the remote site will then separate the signals by the wavelength. Available in standalone and modular versions, the protocol-independent WDM/2 products enable the transmitting of any protocol and any speed over 1310 nm or 1550 nm single-mode fiber.

Support a variety of protocols; easy installation

As passive, protocol-independent Wavelength Division Multiplexers, WDM/2 and iMcV-WDM/2 comply with a wide range of communications protocols including Ethernet (10/100/ 1000 Mbps), SONET/SDH (OC-3, OC-12 OC-48), FDDI, ATM, ESCON, T1/E1, E3, DS3, FibreChannel, and 10G. Installing WDM/2 products is easy— standalone WDM/2 chassis come ready to install and iMcV-WDM/2 modules slide into any iMediaChassis or MediaChassis/2. There is no configuration required for either version.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS
iMcV-WDM/2		
849-14100	SC	4
WDM/2 Stand Alone Chassis		
849-10100	SC	4

iView: Windows 2000/XP/Vista/Win7

Protocol-Independent Wavelength Division Multiplexing for High Volume Optical Networking Applications

IE-iMcV-WDM/2 Series

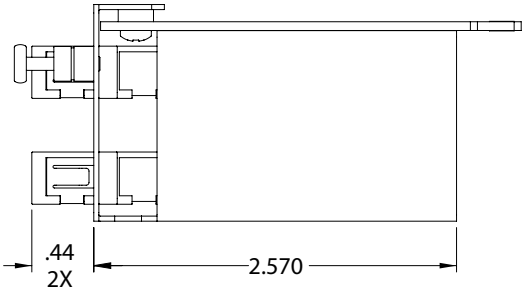
SPECIFICATIONS

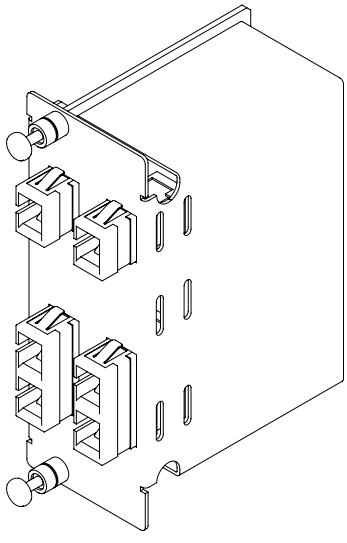
TECHNICAL
Doubles the capacity of installed fiber by transmitting two wavelengths on one strand of fiber
Speed-independent
Protocol-independent; complies with a wide range of communications protocols including Ethernet (10/100/1000 Mbps), SONET/SDH (OC-3, OC-12 OC-48), FDDI, ATM, ESCON, T1/E1, E3, DS3 and FibreChannel
Supports GUI-Based iView²
Connectors: SC
Supports Half- and Full-Duplex operation
IMCV-WDM/2
Requires two slots in a chassis; modules are double-wide
Installs in any iMediaChassis or MediaChassis/2
WDM/2 STANDALONE CHASSIS
iMcV-WDM/2 module ships from factory in a standalone chassis

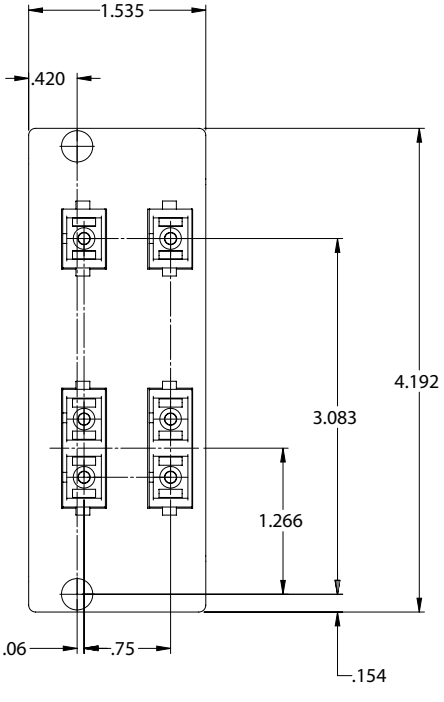
MECHANICAL	
Shipping Weight iMcV-WDM/2	0.9 lbs (0.34 kg)
Shipping Weight WDM/2 Chassis	1.1 lbs. (0.50 kg)
ENVIRONMENTAL	
Operating Temperature	+32° to +122° F (0° to +50° C)
Storage Temperature:	-13° to +158°F (-25° to +70°C)
Operating Humidity	5% to 95% (non-condensing)
REGULATORY APPROVALS	
FCC Class A	
UL/cUL, CSA, CE	

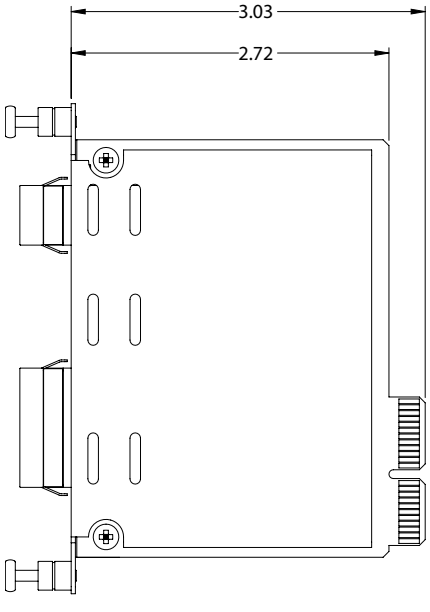
MECHANICAL DIAGRAM

(dimensions in inches)









Modular 4 Channel CWDM Multiplexer/Demultiplexer

IE-iMcV-MuxDemux/4

PRODUCT FEATURES

- Add up to 8 CWDM channels to an existing 1310nm network
- Speed and protocol independent (up to 10 Gbps)
- Install the IE-iMcV-MuxDemux/4 into a compatible chassis and match the fiber connectors with the 1470nm through 1610nm wavelengths
- Daisy chain 2 modules together for 8 CWDM channels + one 1310nm over duplex fiber
- No outside power requirement

Coarse Wavelength Division Multiplexing (CWDM) is a technology that enables the transmission of multiple optical signals on different wavelengths over one strand of fiber. Suited for installations where fiber is limited in terms of availability, service providers and enterprise network managers can easily multiply their fiber capacity without incurring the costs associated with installing new fiber. For customers deploying high-end gigabit switches, the IE-iMcV-MuxDeMux/4 is ideal for supplying the growing need for greater bandwidth over fiber.

The IE-iMcV-MuxDemux/4 is a dual-wide module that provides 4 channels (8 channels using two modules) of CWDM, a network port for connecting two modules back-to-back, and an expansion port that can accommodate an existing 1310nm fiber network and for cascading a second unit.

The IE-iMcV-MuxDemux/4 modules are entirely passive, requiring no external power to function. The IE-MuxDemuxChassis/2 is an unpowered, 1U high chassis, specially designed to house the IE-iMcV-MuxDemux/4, although it is compatible with the MediaChassis and iMediaChassis chassis lines. When the IE-iMcV-MuxDemux/4 is installed in an iMediaChassis in conjunction with a SNMP Management Module, iView^2 will identify the card allowing network operators to view its status and edit port descriptions.

ORDERING INFORMATION

MODEL NUMBER	FIBER	FIBER PORTS	NETWORK FIBER PORT	EXPANSION FIBER PORT
IE-iMcV-MuxDemux/4				
844-18147	1470-1530-LC	4	1-LC	1-LC
844-18155	1550-1610-LC	4	1-LC	1-LC

iView: Windows 2000/XP/Vista/Win7

Modular 4 Channel CWDM Multiplexer/Demultiplexer

IE-iMcV-MuxDemux/4

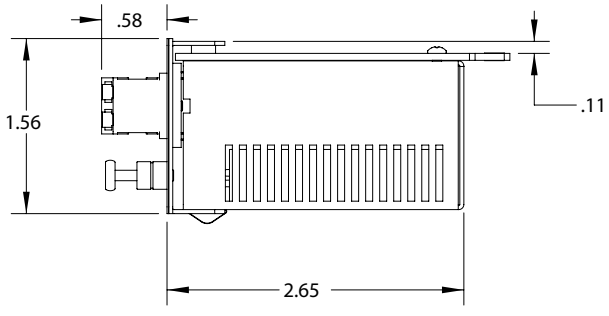
SPECIFICATIONS

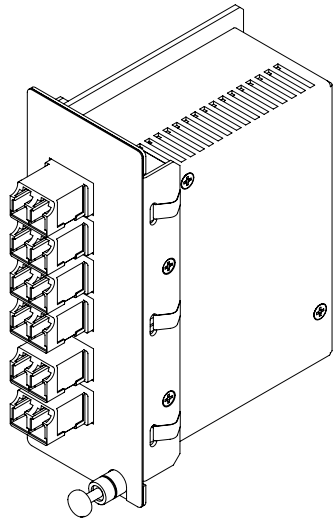
TECHNICAL
1310nm expansion port
Low insertion loss
Speed-independent
Protocol-independent; complies with a wide range of communications protocols including Ethernet (10, 100, 1000 Mbps or 10 Gigabit), SONET/SDH (OC-3, OC-12 OC-48), FDDI, ATM, ESCON, T1/E1, E3, DS3 and FibreChannel
Supports GUI-Based iView²
Connectors: LC
Supports Half- and Full-Duplex operation
INSERTION LOSS:
Expansion to network: 3 dB
Port to network: 2.5 dB

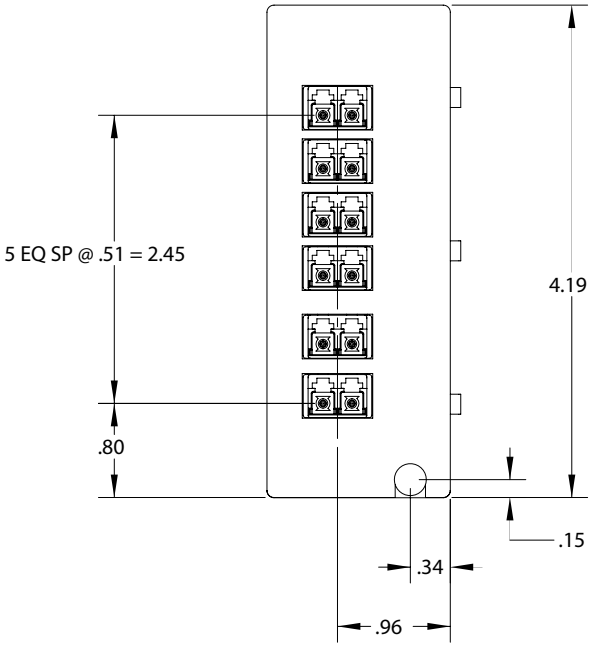
MECHANICAL	
Dimensions	Dual-wide, two slot chassis module
Shipping Weight WDM/2 Chassis	0.9 lbs (0.34 kg)
ENVIRONMENTAL	
Operating Temperature	-40°F to +185°F (-40°C to +85°C)
Storage Temperature:	-40°F to +185°F (-40°C to +85°C)
Operating Humidity	5% to 95% (non-condensing)

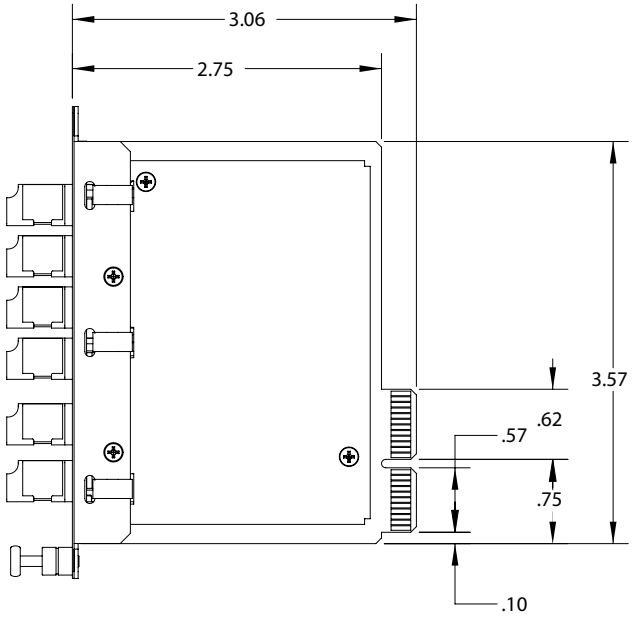
MECHANICAL DIAGRAM

(dimensions in inches)









SNMP-Manageable Chassis for "iMcV" Series Modular Media Converters

iMediaChassis/20

PRODUCT FEATURES

- 20-slot supporting low to high density deployment
- Install wide varieties of IMC Networks' media conversion and optical demarcation modules
- SNMP management using optional SNMP management module
- 19" Rack or rack shelf mountable
- 20-slot chassis: Dual (redundant) AC or DC and AC/DC power supplies and fans

The iMediaChassis/20 is an intelligent, carrier-class optical access platform that supports conversion of Ethernet to fiber and a variety of other telco networking technologies, including VDSL, T1/E1, DS3/E3/STS-1 and WDM. The iMediaChassis/20 enables network operators to drastically reduce the capital and operational expenses by providing all copper-to-fiber and multi-mode to single-mode conversions, network distance extensions and Ethernet Private Line services from the same managed chassis platform. Having the highest port density in the industry - along with a robust design, hot-swappable architecture, SNMP-management, and redundant power supplies for fault tolerance - makes the iMediaChassis ideal for installing in the Central Office (CO) where a multitude of diverse applications, using a variety of protocols, is required. Pair this multi-slot chassis with a MediaChassis or other standalone B&B Electronics unmanaged device at the customer premises, for complete end-to-end management.

- An independent SNMP-management slot to isolate management data from user traffic
- Fans on the 20-slot chassis can be remotely controlled via SNMP
- Remote temperature monitoring on all chassis

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
iMediaChassis/20 *	
850-10960-2AC	Includes 2 AC power supply modules
850-10952-AC	Includes single fixed AC power supply module
850-10960-2DC	Includes 2 DC power supply modules
850-10960-ACDC	Includes 1 AC, 1 DC power module

*An SNMP module is required to utilize full SNMP functionality in the iMediaChassis family.

ACCESSORIES

806-39960-AC - Power Supply, 960-AC Power Module (100-240V AC)

806-39960-DC - Power Supply, 960-DC Power Module (300 Watt, -48V DC)

850-39950 - iMediaChassis SNMP Management Module

SNMP Module, Optional

Power Supply, Optional

SNMP-Manageable Chassis for "iMcV" Series Modular Media Converters

iMediaChassis/20

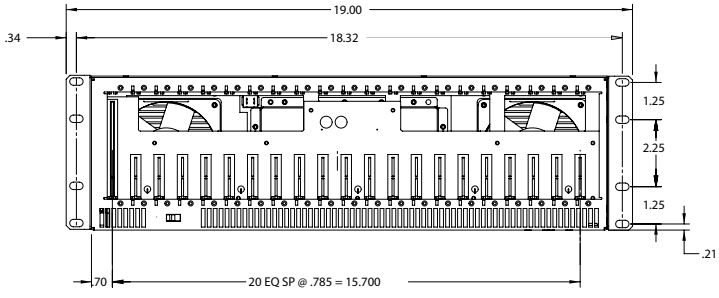
SPECIFICATIONS

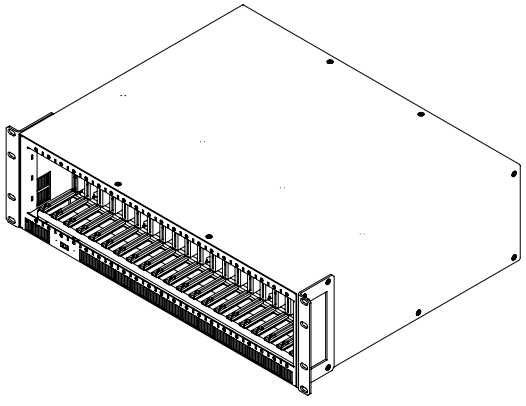
TECHNICAL
SNMP-manageable with use of SNMP module
SNMP Write Lock switch protects the SNMP-configured settings
Built to NEBS-III specicfications
Last Gasp feature sends notification of AC line failures and power supply failures
Available with AC or DC power
Available with redundant power
Highest port density, 20 slots
Includes fan tachometers
MIB:
Port Type
Fan speeds
Traps
Fiber Type
Module Type
Link Status of Ports
Chassis temperature
Power Supply Type/Status
User-Definable Name/ID of Product and Each Port
Enable/Disable Ports
Enable/Disable FO/FX LinkLoss, TP/TX LinkLoss
Enable/Disable FiberAlert, Auto Negotiation

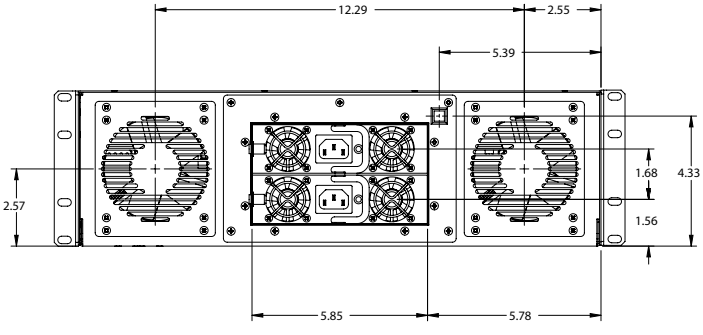
MECHANICAL	
Dimensions	5.17"H x 19.0"W x 14"D (13.13cm H x 48.26cm W x 35.56cm D)
Shipping Weight	30 lbs (13.60 kg)
AC INPUT LOAD: DUAL AC	
100 to 240V AC±10%, 50-60Hz, 3.5/1.5A	
AC INPUT LOAD: AC/DC	
100 to 240V AC±10%, 50-60Hz, 2A	
DC INPUT LOAD: DUAL DC	
-48V DC, 5A Max (per module)	
DC INPUT LOAD: AC/DC	
-48V DC, 4.4A Max, per module	
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-4° to +176° F (-20° to +80° C): Dual AC, AC/DC -4° to +140° F (-20° to +60° C): Dual DC
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
Dual AC: FCC Class B	
Dual DC: FCC Class B	
AC/DC: FCC Class B	
UL/cUL, CSA, CE	

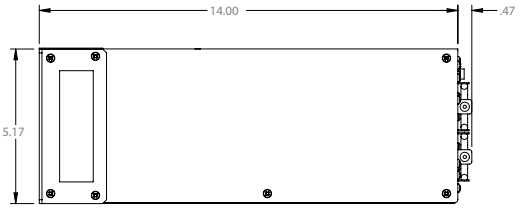
MECHANICAL DIAGRAM

(dimensions in inches)









SNMP-Manageable Chassis for "iMcV" Series Modular Media Converters

iMediaChassis/6

PRODUCT FEATURES

- 6-slot supporting low to high density deployment
- Install wide varieties of IMC Networks' media conversion and optical demarcation modules
- SNMP management using optional SNMP management module
- 19" Rack or rack shelf mountable
- 6-slot chassis: Select any combination of up to two AC and DC fixed power supplies - mix and match
- Fan test featured on 6-slot chassis

The iMediaChassis/6 is an intelligent, carrier-class optical access platform that supports conversion of Ethernet to fiber and a variety of other telco networking technologies, including VDSL, T1/E1, DS3/E3/STS-1 and WDM. The iMediaChassis/6 enables network operators to drastically reduce the capital and operational expenses by providing all copper-to-fiber and multi-mode to single-mode conversions, network distance extensions and Ethernet Private Line services from the same managed chassis platform. Having the highest port density in the industry - along with a robust design, hot-swappable architecture, SNMP-management, and redundant power supplies for fault tolerance - makes the iMediaChassis ideal for installing in the Central Office (CO) where a multitude of diverse applications, using a variety of protocols, is required. Pair this multi-slot chassis with a MediaChassis or other standalone B&B Electronics unmanaged device at the customer premises, for complete end-to-end management.

- An independent SNMP-management slot to isolate management data from user traffic
- Temperature controlled fans in the 6-slot chassis activates only when chassis reaches a certain temperature, thereby extending the life of the fans

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
iMediaChassis/6 *	
850-10953-AC	Includes 1 AC power supply module with option for 2nd power supply
850-10953-2AC	Includes 2 AC power supply modules
850-10953-DC	Includes 1 DC power supply module with option for 2nd power supply
850-10953-2DC	Includes 2 power supply modules

*An SNMP module is required to utilize full SNMP functionality in the iMediaChassis family.

ACCESSORIES

806-39125-AC - Power Supply, 125-AC Module (125 Watt, 100-240V DC)

806-39125-DC - Power Supply, 125-DC Module (125 watt, -48V DC)

850-39950 - iMediaChassis SNMP Management Module

SNMP Module, Optional

Power Supply, Optional

SNMP-Manageable Chassis for "iMcV" Series Modular Media Converters

iMediaChassis/6

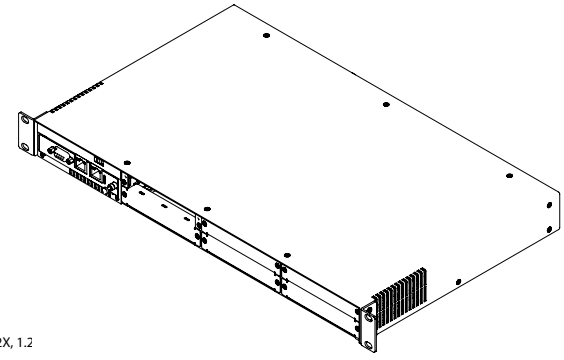
SPECIFICATIONS

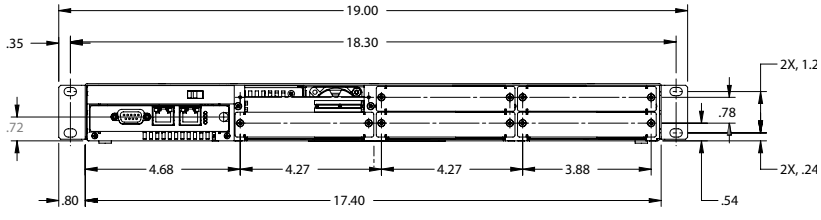
TECHNICAL
SNMP-manageable with use of SNMP module
SNMP Write Lock switch protects the SNMP-configured settings
Built to NEBS-III specicfications
Last Gasp feature sends notification of AC line failures and power supply failures
Available with AC or DC power
Available with redundant power
Only 1U high
True load sharing with dual, end-user replaceable power supplies
Temperature controlled fans
MIB:
Port Type
Fan speeds
Traps
Fiber Type
Module Type
Link Status of Ports
Chassis temperature
Power Supply Type/Status
User-Definable Name/ID of Product and Each Port
Enable/Disable Ports
Enable/Disable FO/FX LinkLoss, TP/TX LinkLoss
Enable/Disable FiberAlert, Auto Negotiation

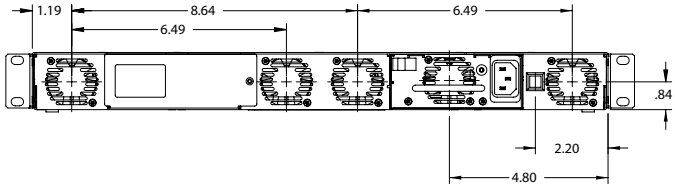
MECHANICAL	
Dimensions	1.8"H x 19"W x 10.65"D (4.57cm H x 48.26cm W x 27.05cm D)
Shipping Weight	13 lbs (5.90 kg)
AC Input Load:	
100 to 240V AC, 50-60Hz, 1.0A	
DC INPUT LOAD:	
-48V DC, 2.0A	
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-4° to +176° F (-20° to +80° C): Dual AC, AC/DC -4° to +140° F (-20° to +60° C): Dual DC
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
Single AC: FCC Class A	
Dual AC: FCC Class A	
Single DC: FCC Class B	
Dual DC: FCC Class B	
UL/cUL, CSA, CE	

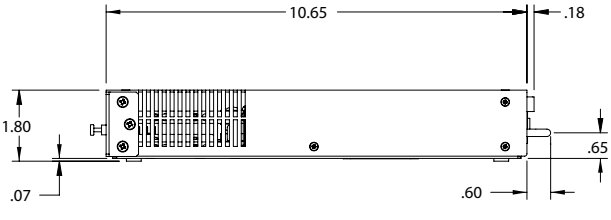
MECHANICAL DIAGRAM

(dimensions in inches)









SNMP-Manageable Chassis for "iMcV" Series Modular Media Converters

iMediaChassis/3

PRODUCT FEATURES

- 3-slot supporting low to high density deployment
- Install wide varieties of IMC Networks' media conversion and optical demarcation modules
- SNMP management using optional SNMP management module
- 19" Rack or rack shelf mountable
- 3-slot chassis: Select any combination of up to two AC and DC fixed power supplies - mix and match
- Fan test featured on 6-slot chassis

The iMediaChassis/3 is an intelligent, carrier-class optical access platform that supports conversion of Ethernet to fiber and a variety of other telco networking technologies, including VDSL, T1/E1, DS3/E3/STS-1 and WDM. The iMediaChassis/3 enables network operators to drastically reduce the capital and operational expenses by providing all copper-to-fiber and multi-mode to single-mode conversions, network distance extensions and Ethernet Private Line services from the same managed chassis platform. Having the highest port density in the industry - along with a robust design, hot-swappable architecture, SNMP-management, and redundant power supplies for fault tolerance - makes the iMediaChassis ideal for installing in the Central Office (CO) where a multitude of diverse applications, using a variety of protocols, is required. Pair this multi-slot chassis with a MediaChassis or other standalone B&B Electronics unmanaged device at the customer premises, for complete end-to-end management.

- An independent SNMP-management slot to isolate management data from user traffic
- Temperature controlled fans in the 3-slot chassis activates only when chassis reaches a certain temperature, thereby extending the life of the fans

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
iMediaChassis/3 *	
850-10949-AC	1 fixed AC power supply
850-10949-2AC	2 fixed AC power supplies
850-10949-DC	1 fixed DC power supply
850-10949-2DC	2 fixed DC power supplies
850-10949-ACDC	1 fixed AC and 1 fixed DC power supply

*An SNMP module is required to utilize full SNMP functionality in the iMediaChassis family.

ACCESSORIES

850-39950 - iMediaChassis SNMP Management Module

SNMP Module, Optional

SNMP-Manageable Chassis for "iMcV" Series Modular Media Converters

iMediaChassis/3

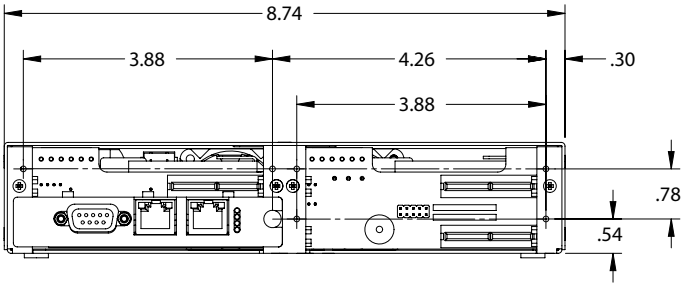
SPECIFICATIONS

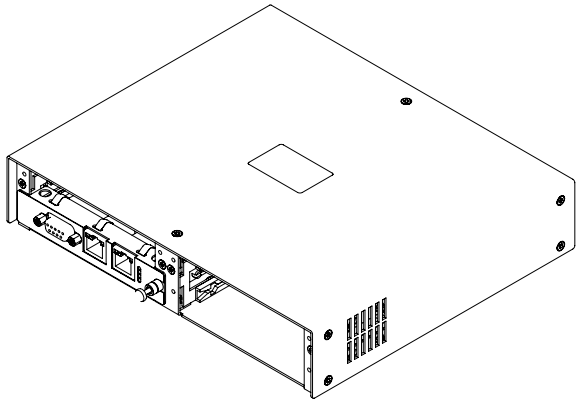
TECHNICAL
SNMP-manageable with use of SNMP module
SNMP Write Lock switch protects the SNMP-configured settings
Built to NEBS-III specicfications
Last Gasp feature sends notification of AC line failures and power supply failures
Available with AC or DC power
Available with redundant power
Only 1U high
Temperature controlled fans
MIB:
Port Type
Fan speeds
Traps
Fiber Type
Module Type
Link Status of Ports
Chassis temperature
Power Supply Type/Status
User-Definable Name/ID of Product and Each Port
Enable/Disable Ports
Enable/Disable FO/FX LinkLoss, TP/TX LinkLoss
Enable/Disable FiberAlert, Auto Negotiation

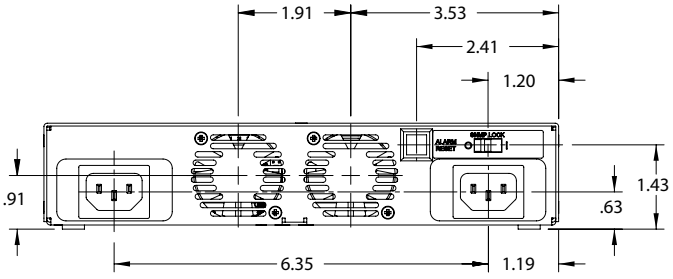
MECHANICAL	
Dimensions	1.8"H x 8.74"W x 7.5"D (4.57cm H x 22.19cm W x 19.05cm D)
Shipping Weight	5 lbs (2.3 kg)
AC INPUT LOAD:	
100 to 240V AC, 50-60Hz, 0.75A	
DC INPUT LOAD:	
35 to 75V DC, 1.6A	
ENVIRONMENTAL	
Operating Temperature:	+32° to +122° F (0° to +50° C)
Storage Temperature:	-4° to +176° F (-20° to +80° C): Dual AC, AC/DC -4° to +140° F (-20° to +60° C): Dual DC
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
Single AC: FCC Class B	
Dual AC: FCC Class B	
Single DC: FCC Class B	
Dual DC: FCC Class B	
AC/DC: FCC Class B	
UL/cUL, CSA, CE	

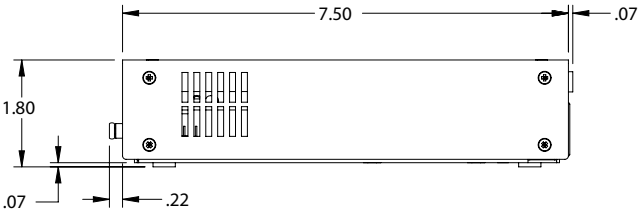
MECHANICAL DIAGRAM

(dimensions in inches)









Chassis for "iMcV" Series Modular Media Converters

MediaChassis/1

PRODUCT FEATURES

- Rugged enclosures designed for a variety of media and mode conversion modules
- Supports a wide range of protocols
- Modular design provides future-proof upgrade path
- Flexible versions designed for a variety of environments
- Ideal for FTTx modules featuring built-in SNMP management
- AC or DC powering

The MediaChassis/1, flexible, table-top chassis support a variety of B&B Electronics media and mode converter modules for 10/100/1000 Ethernet, T1/E1, DS3/E3/STS-1, VDSL and CWDM networking technologies. This modular approach allows network operators to inexpensively change protocols by simply changing the module rather than the entire unit.

Networks utilizing a variety of fiber types will benefit, as well as networks operating multiple protocols such as TDM and Ethernet. With support for AC or DC powering options, the MediaChassis/1 is a cost-effective way to overcome a variety of media and mode conversion challenges.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
MediaChassis/1-AC	
850-13100	1 Slot, AC
IE-MediaChasasis/1-DC	
850-32105	1 Slot, DC

ACCESSORIES

895-39227 - Wallmount Brackets

Chassis for "iMcV" Series Modular Media Converters

MediaChassis/1

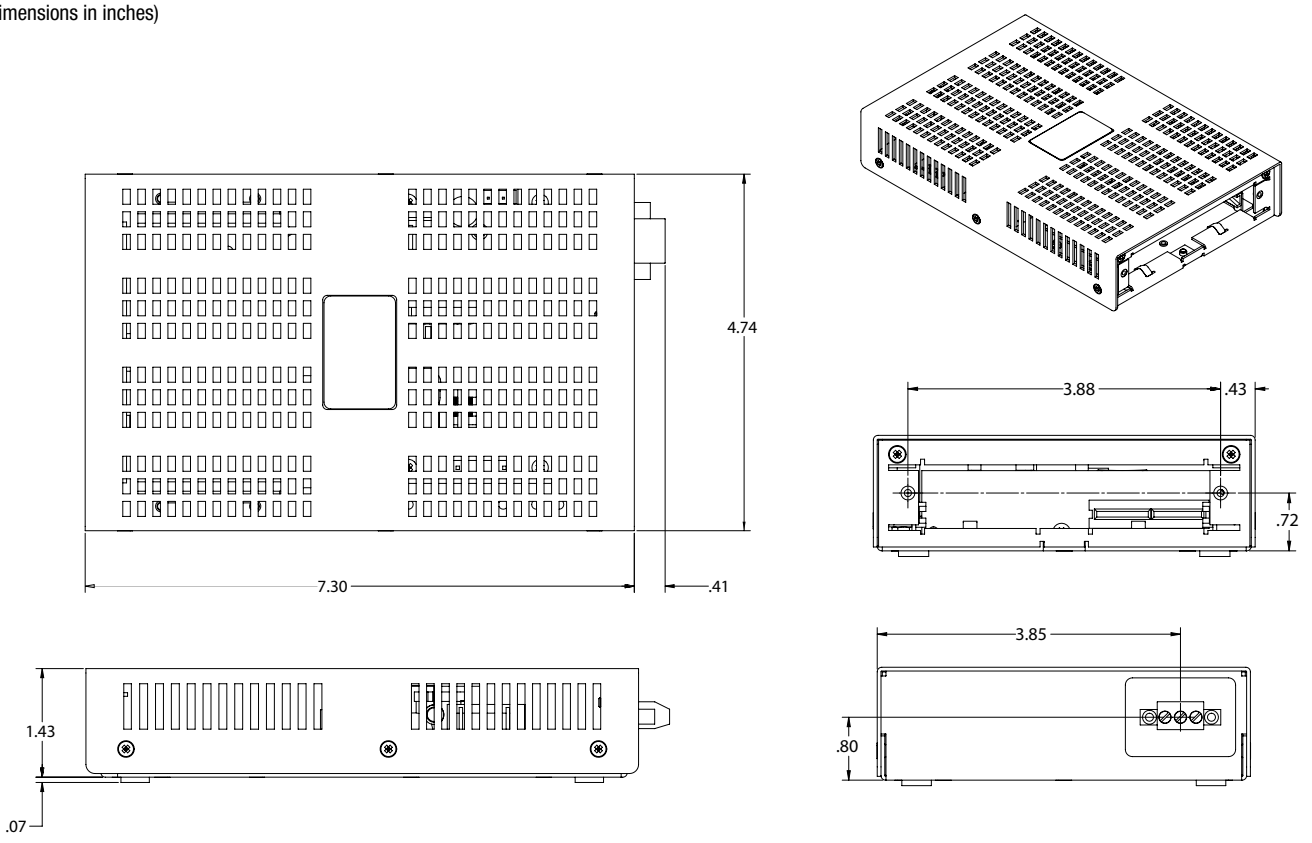
SPECIFICATIONS

TECHNICAL	
Available with AC or DC power	
1 Slot Chassis	
MECHANICAL	
Dimensions	1.5"H x 4.74" W x 7.3"D (3.81 cm H x 12.03 cm W x 18.54 cm D)
Shipping Weight	1.6 lbs (0.73 kg)
INTERNAL AC POWER	
100 to 240 VAC, 50/60Hz, 1.0A	
INTERNAL DC POWER	
35 to 75 VDC, 500mA	

ENVIRONMENTAL	
Operating Temperature: MediaChassis/1-AC	+32° F o +122° F (0° C to +50° C)
Operating Temperature: IE-MediaChassis/1-DC	-31° F to +176° F (-35° C to +80° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS MEDIACHASSIS/1-AC	
FCC Class A, UL/cUL, CE, CSA, CB	
REGULATORY APPROVALS IE-MEDIACHASSIS/1-DC	
FCC Class B, UL/cUL, CE, CSA	

MECHANICAL DIAGRAM

(dimensions in inches)



Chassis for "iMcV" Series Modular Media Converters

MediaChassis/2

PRODUCT FEATURES

- Rugged enclosures designed for a variety of media and mode conversion modules
- Supports a wide range of protocols
- Modular design provides future-proof upgrade path
- Flexible versions designed for a variety of environments
- Ideal for FTTx modules featuring built-in SNMP management
- AC or DC powering

The MediaChassis/2 and IE-MediaChassis/2, flexible, table-top chassis support a variety of B&B Electronics media and mode converter modules for 10/100/1000 Ethernet, T1/E1, DS3/E3/STS-1, VDSL and CWDM networking technologies. This modular approach allows network operators to inexpensively change protocols by simply changing the module rather than the entire unit.

Networks utilizing a variety of fiber types will benefit, as well as networks operating multiple protocols such as TDM and Ethernet. With support for AC or DC powering options, the MediaChassis/2 is a cost-effective way to overcome a variety of media and mode conversion challenges.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
MediaChassis/2-AC	
850-13101	2 Slot, AC
IE-MediaChassis/2-AC and DC	
850-13106	2 Slot, AC
850-32106	2 Slot, DC

ACCESSORIES

895-39227 - Wallmount Brackets

Chassis for "iMcV" Series Modular Media Converters

MediaChassis/2

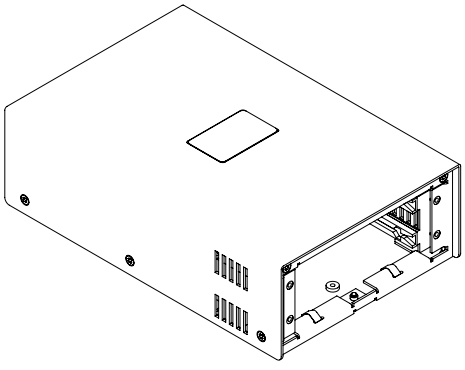
SPECIFICATIONS

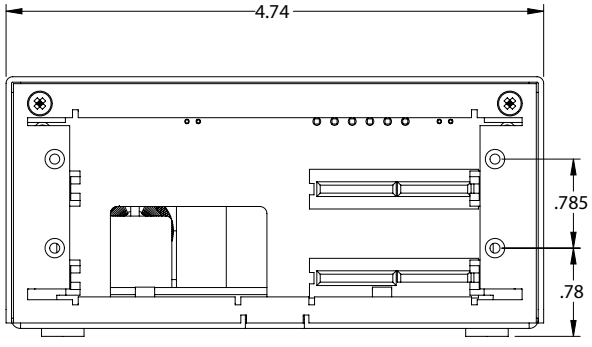
TECHNICAL	
Available with AC or DC power	
2 Slot Chassis	
MECHANICAL	
Dimensions	2.29"H x 4.74" W x 7.3"D (5.81cm H x 12.03cm W x 18.54cm D)
Shipping Weight	1.9 lbs (0.86 kg)
INTERNAL AC POWER	
100 to 240 VAC, 50/60Hz, 1.0A	
INTERNAL DC POWER	
35 to 75 VDC, 1.5A @ 75 VDC	

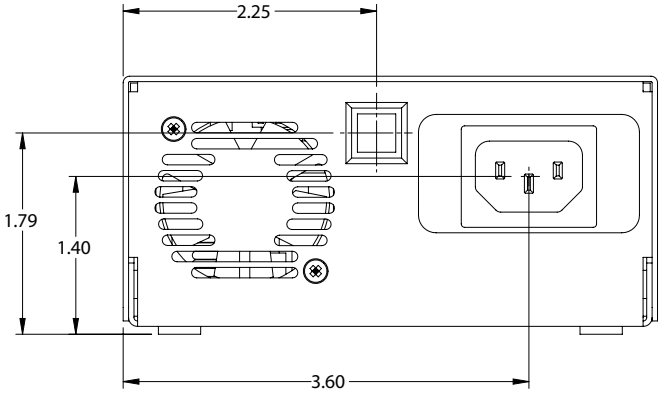
ENVIRONMENTAL	
Operating Temperature: MediaChassis/1-AC	+32° F o +122° F (0° C to +50° C)
Operating Temperature: IE-MediaChassis/1-DC	-31° F to +176° F (-35° C to +80° C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS MEDIACHASSIS/1-AC	
FCC Class B, UL/cUL, CE, CSA	
REGULATORY APPROVALS IE-MEDIACHASSIS/2-AC AND DC	
FCC Class A, UL/cUL, CE, CSA, CB	

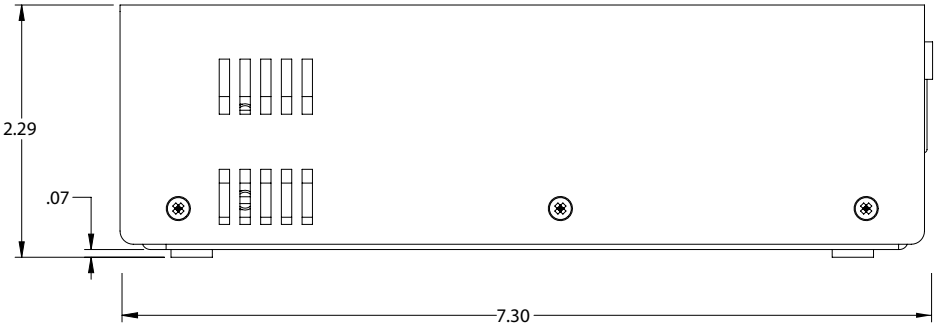
MECHANICAL DIAGRAM

(dimensions in inches)









Chassis for "iMcV" Series Modular Media Converters

IE-MediaChassis/1-AC

PRODUCT FEATURES

- Rugged enclosures designed for a variety of media and mode conversion modules
- Supports a wide range of protocols
- Modular design provides future-proof upgrade path
- Flexible versions designed for a variety of environments
- Ideal for FTTx modules featuring built-in SNMP management
- AC or DC powering
- 1 slot extended temperature versions (up to -40° to +80° C) for installing any "iMcV"-series modules

The IE-MediaChassis/1, flexible, table-top chassis support a variety of B&B Electronics media and mode converter modules for 10/100/1000 Ethernet, T1/E1, DS3/E3/STS-1, VDSL and CWDM networking technologies. This modular approach allows network operators to inexpensively change protocols by simply changing the module rather than the entire unit.

Networks utilizing a variety of fiber types will benefit, as well as networks operating multiple protocols such as TDM and Ethernet. With support for AC or DC powering options, the MediaChassis/1 is a cost-effective way to overcome a variety of media and mode conversion challenges.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
IE-MediaChassis/1-AC	
850-33100	1 Slot, AC

ACCESSORIES

806-39105 - DIN Rail Clip

Chassis for "iMcV" Series Modular Media Converters

IE-MediaChassis/1-AC

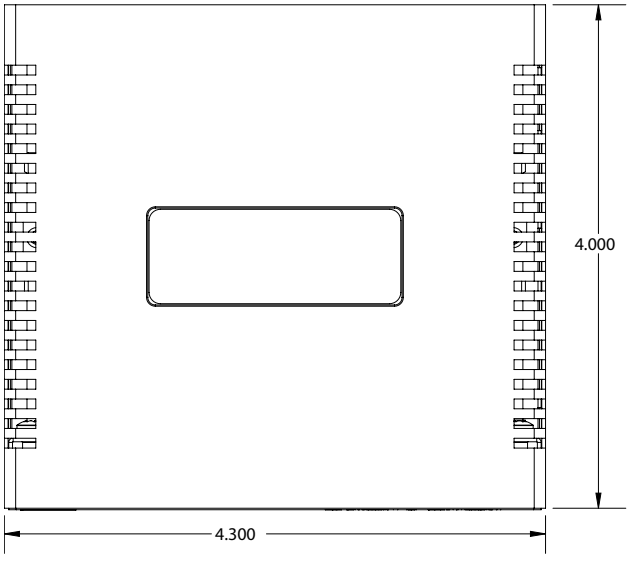
SPECIFICATIONS

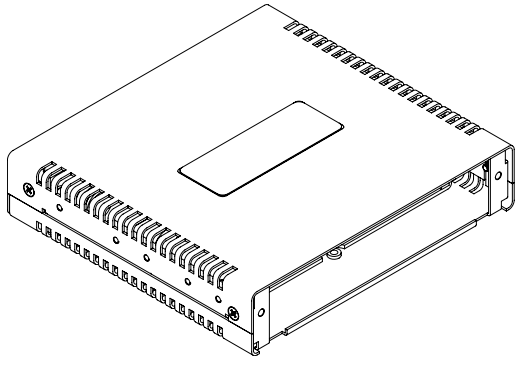
TECHNICAL	
Available with AC or DC power	
1 Slot Chassis	
MECHANICAL	
Dimensions	0.90"H x 4.30" W x 4.00"D (2.28 cm H x 10.92 cm W x 10.16 cm D)
Shipping Weight	0.6 lbs (0.27 kg)
POWER	
DC Terminal: 7-50V DC, 3A-0.1A (Negative ground referenced)	

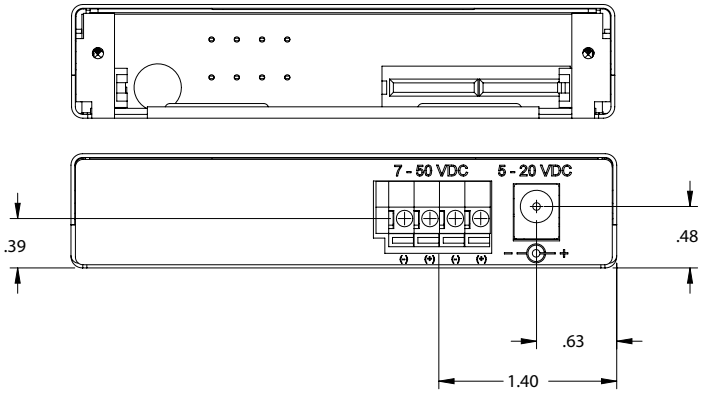
ENVIRONMENTAL	
Operating Temperature: DC Terminal Block	-40° to +158°F (-40° to +70°C))
Operating Temperature: With AC Wall Adapter	+14° to +122°F (-10° to +50°C)
Storage Temperature:	-40° to +185° F (-40° to +85° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class B, UL/cUL, CE, CSA	

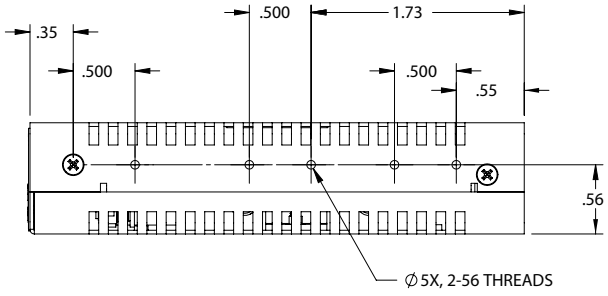
MECHANICAL DIAGRAM

(dimensions in inches)









Ethernet-based, Modular Media Converters Chassis

MediaConverter/1

PRODUCT FEATURES

- Supports Ethernet, Fast Ethernet and Gigabit Ethernet
- Supports McPIMs, McLIMs, and McGigabit modules
- Table-top
- 1-slot chassis
- AC power
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter/1 is the perfect solution.

The unmanaged B&B Electronics' MediaConverter/1 enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
MediaConverter/1	
851-10901	1 Slot, AC

ACCESSORIES

895-39949 - Rackmount Shelf

Ethernet-based, Modular Media Converters Chassis

MediaConverter/1

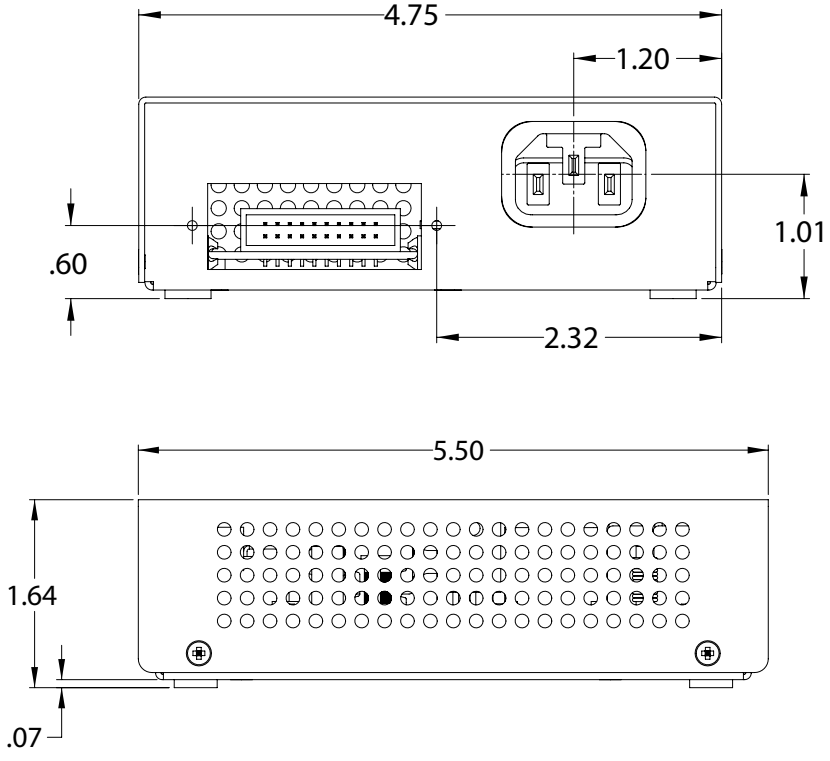
SPECIFICATIONS

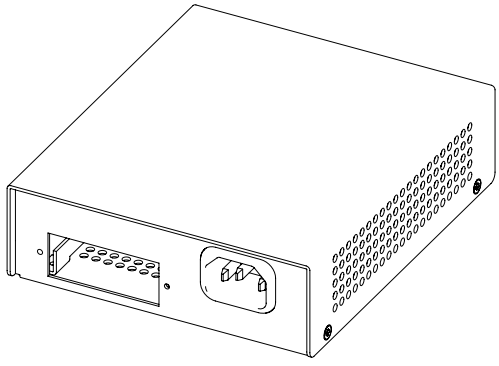
TECHNICAL	
Single slot AC chassis to house the following modules: McPIM, McLIM, McLIM 10/100 and McGigabit	
MECHANICAL	
Dimensions	1.64"H x 4.75"W x 5.5"D (4.16cm H x 12.06cm W x 13.97cm D)
Shipping Weight	2 lbs (.9 kg)
POWER	
115/230 or 120-240 VAC, 50/60Hz, 0.3A/0.15A	

ENVIRONMENTAL	
Operating Temperature: DC Terminal Block	+32° to +122° F (0° to +50° C)
Storage Temperature:	13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A, UL/CUL, CE, CSA	

MECHANICAL DIAGRAM

(dimensions in inches)





Ethernet-based, Modular Media Converters Chassis

MediaConverter/4

PRODUCT FEATURES

- Supports Ethernet, Fast Ethernet, and Gigabit Ethernet
- Supports McPIMs, McLIMs, and McGigabit modules
- Table-top
- 4-slot chassis
- AC power
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter/4 is the perfect solution.

The unmanaged B&B Electronics' MediaConverter/4 enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
MediaConverter/4	
851-10904	4 Slot, AC

ACCESSORIES

895-39949 - Rackmount Shelf

Ethernet-based, Modular Media Converters Chassis

MediaConverter/4

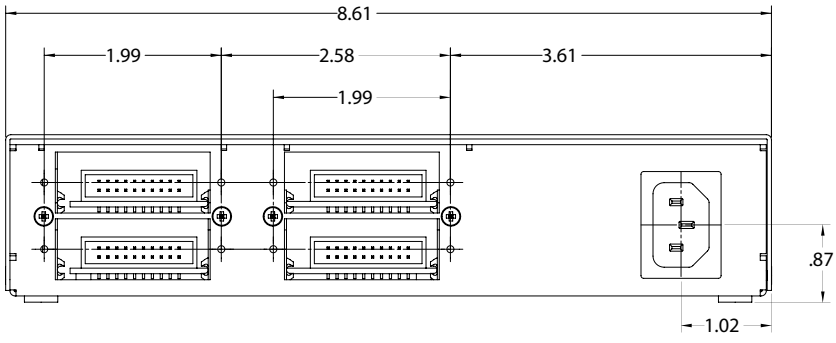
SPECIFICATIONS

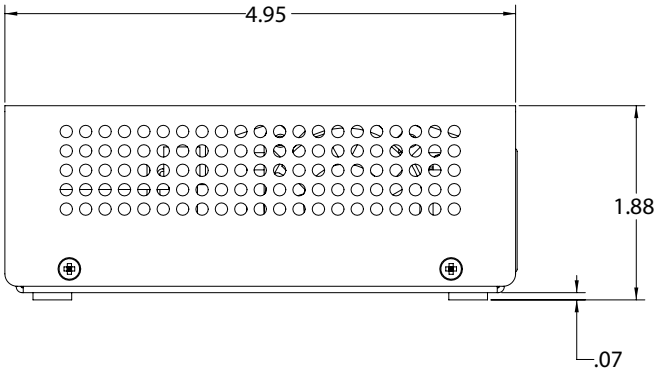
TECHNICAL	
4 slot chassis to house the following modules: McPIM, McLIM, McLIM 10/100, McGigabit	
MECHANICAL	
Dimensions	1.88"H x 8.61"W x 4.95"D (4.77cm H x 21.86cm W x 12.57cm D)
Shipping Weight	3.5 lbs (1.6 kg)
POWER	
120/240 VAC, 50/60Hz, 1A/0.5A	

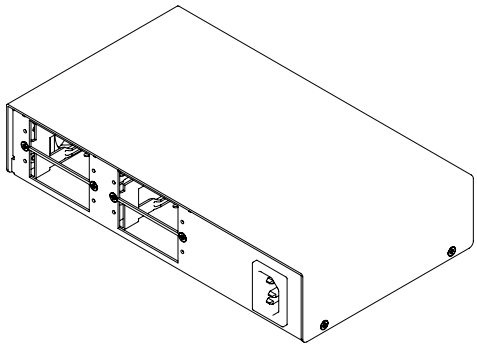
ENVIRONMENTAL	
Operating Temperature: DC Terminal Block	+32° to +122° F (0° to +50° C)
Storage Temperature:	13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A, UL/CUL, CE, CSA	

MECHANICAL DIAGRAM

(dimensions in inches)







Ethernet-based, Modular Media Converters Chassis

MediaConverter/8

PRODUCT FEATURES

- Supports Ethernet, Fast Ethernet, and Gigabit Ethernet
- Supports McPIMs, McLIMs, and McGigabit modules
- Table-top or rackmountable
- 8-slot chassis
- AC power
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter/8 is the perfect solution.

The unmanaged B&B Electronics' MediaConverter/8 enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
MediaConverter/8	
851-10908	8 Slot, AC

Ethernet-based, Modular Media Converters Chassis

MediaConverter/8

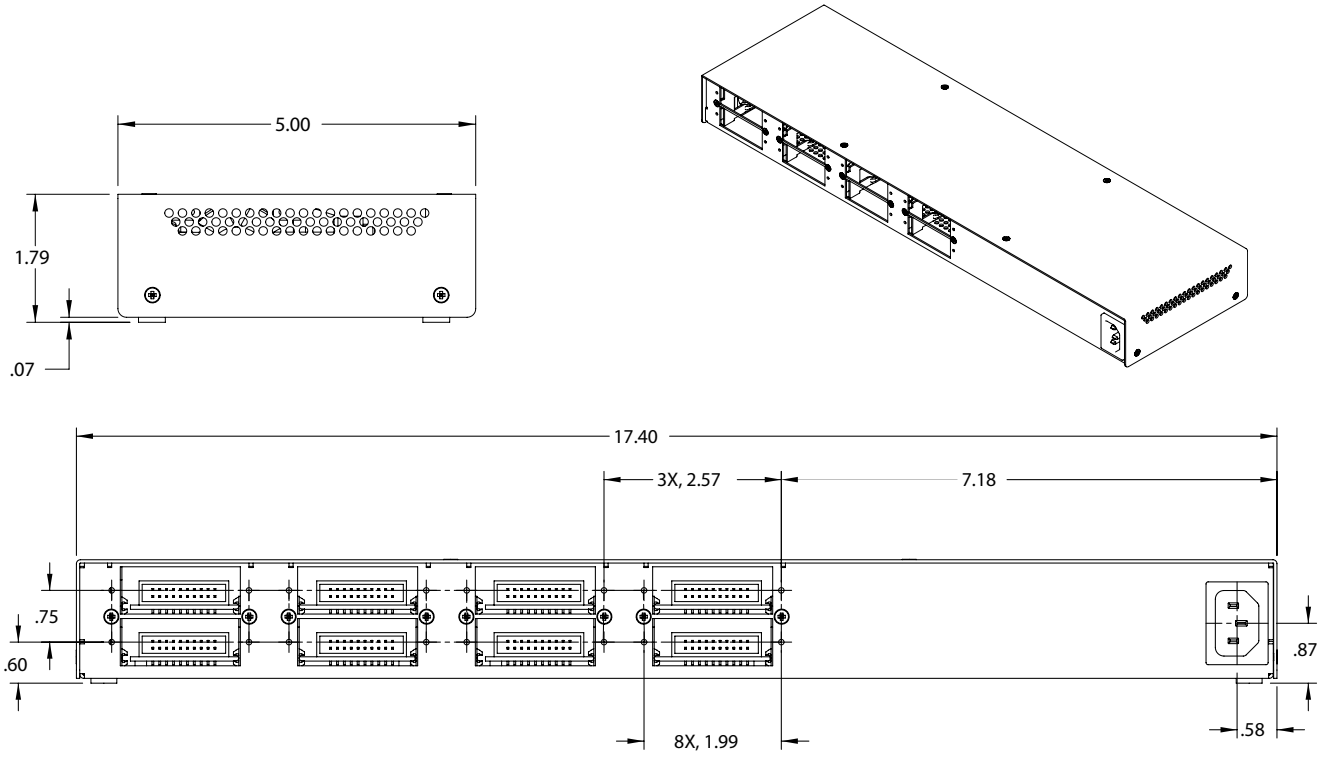
SPECIFICATIONS

TECHNICAL	
8 slot chassis to house the following modules: McPIM, McLIM, McLIM 10/100, McGigabit	
Fits into a 19" Rack	
MECHANICAL	
Dimensions	1.79"H x 17.4"W x 5"D (4.54cm H x 44.19cm W x 12.7cm D)
Shipping Weight	6.25 lbs (2.8 kg)
POWER	
120/240 VAC, 50/60Hz, 1A/0.5A	

ENVIRONMENTAL	
Operating Temperature: DC Terminal Block	+32° to +122° F (0° to +50° C)
Storage Temperature:	13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A, UL/CUL, CE, CSA	

MECHANICAL DIAGRAM

(dimensions in inches)



Ethernet-based, Modular Media Converters Chassis

MediaConverter/12

PRODUCT FEATURES

- Supports Ethernet, Fast Ethernet, and Gigabit Ethernet
- Supports McPIMs, McLIMs, and McGigabit modules
- Table-top or rackmountable
- 12-slot chassis
- AC power (dual)
- Modular, hot-swappable architecture reduces operational costs associated with product installation, upgrades and maintenance

Your network is growing and many new access points, workstations, etc. are required. However, legacy equipment, along with your existing wiring infrastructure, must work with any new equipment you implement in your network. When copper-to-fiber conversions are required, along with advanced troubleshooting features, our MediaConverter/12 is the perfect solution.

The unmanaged B&B Electronics' MediaConverter/12 enables you to easily and cost-effectively connect one type of media to other dissimilar media or networking products. This series increases the functionality and extends the productive life of both your legacy cabling infrastructure and networking equipment when adding fiber to your network.

ORDERING INFORMATION

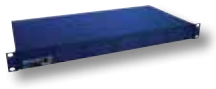
MODEL NUMBER	DESCRIPTION
MediaConverter/12	
851-10912	12 Slot

ACCESSORIES

806-39040 - Power Supply, 40x-AC (40 Watt, 100-240V AC)

Ethernet-based, Modular Media Converters Chassis

MediaConverter/12



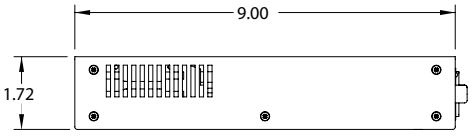
SPECIFICATIONS

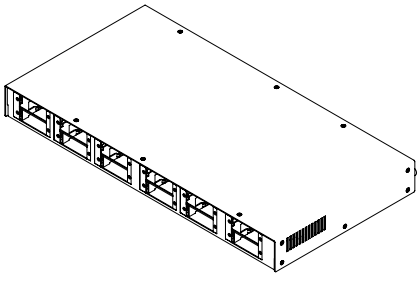
TECHNICAL	
12 slot chassis can house the following modules: McPIM, McLIM, McLIM 10/100, McGigabit	
Dual AC power supplies (included)	
Fits into a 19" Rack	
MECHANICAL	
Dimensions	1.72"H x 17.4"W x 9"D (4.36cm H x 44.19cm W x 22.86cm D)
Shipping Weight	11.0 lbs (5 kg)
POWER AC	
115/230 or 120/240 VAC, 50/60Hz, 1.2A/0.6A	

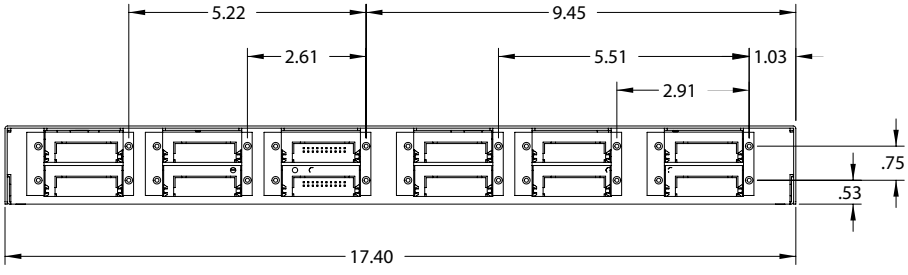
ENVIRONMENTAL	
Operating Temperature: DC Terminal Block	+32° to +122° F (0° to +50° C)
Storage Temperature:	13° to +158° F (-25° to +70° C)
Operating Humidity	5% to 95% (non-condensing), 0 – 10,000 ft. altitude
REGULATORY APPROVALS	
FCC Class A, UL/CUL, CE, CSA	

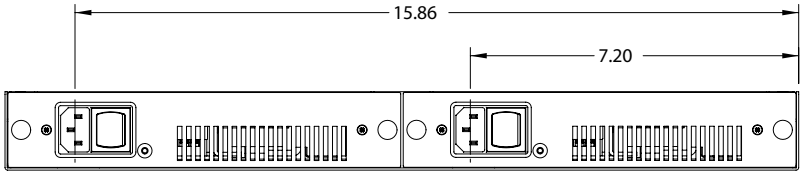
MECHANICAL DIAGRAM

(dimensions in inches)









DC 5V
Ethernet
B&B ELECTRONICS
USB over IP Hub - UE204
USB Host
100mA
Bus Power
Local Power
500mA
Downstream Ports
Model: UHR204
PORT 1
PORT 2
Model: USR602
B&B ELECTRONICS
TD
RD
TDA(-)
TDB(+)
RDA(-)
RDB(+)
GND
USB to USB Isolator

USB CONNECTIVITY

THAT EXTENDS YOUR INDUSTRIAL NETWORK TO THE EDGE

Introduction

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Product Selection Guide.....348 - 351

USB to Serial Converters

Rugged Converters - USR60x.....352 - 353
Panel Mount Converters - USO9ML2-xP, USOPTL4-xP.....354 - 357
Isolated Converters - USO9ML2DR-x, USOPTL4DR-x.....358 - 361
In-line Converters - USO9ML2, USOPTL4, USPTL4 .....362 - 365
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Industrial 4-port High-Speed Hubs - UHRx04 .....374 - 375
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Industrial 4-port Miniature Hub - UH104 .....378 - 379
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Single-Port USB Isolators - UH401x-x .....386 - 387
Compact “Key” Port Isolator - UH201 .....388 - 389

USB Surge Protection

USB Port Surge Protector - USBSSP2 .....390 - 391

PLUG & PLAY CONVENIENCE/ INDUSTRIAL RUGGEDNESS

The Universal Serial Bus (USB) started out as a standardized approach for controlling computer peripherals. Now it has moved off the desktop and out into the real world, where it is used in challenging environments ranging from point-of-sale to medicine and industry. In fact, it is a near-universal solution for device connectivity. B&B Electronics offers a wide range of USB solutions, including USB-to-serial converters, hubs, surge protectors and extenders, all built to keep working flawlessly for years to come, even in the toughest conditions.

B&B Electronics' Technical Support team has field-proven experience in USB communication applications, solutions and installation. They can help you envision, scope, and structure your data communications, solve difficult device connectivity problems and help you select the most appropriate USB solution for your application.

- *Industrial Automation*
- *Manufacturing/Factory Automation*
- *Medical*
- *HVAC*
- *Field Service*
- *Point-of-Sale*
- *OEM Solutions*

USB-TO-SERIAL CONVERTERS

Plug a B&B Electronics' USB-to-Serial converter into a USB port on your computer, laptop, or hub to configure it automatically as an additional COM port. The industrial-strength orange connector lets you stop worrying about unstable connections, even in high vibration applications. Ruggedized designs for industrial environments are shock, vibration, and drop test for high durability and lasting performance.

- TTL, RS-232, RS-422/485 conversion
- Isolated and non-isolated options
- Single-port and multi-port
- In-line, panel mount, DIN rail mount designs
- Miniature inline designs for mobile applications
- Industrial-grade 4-port and 7-port designs
- Locked-serial options

INDUSTRIAL USB HUBS

Industrial USB hubs are designed with high ESD protection, wide operating temperature ranges and high retention USB connectors for instant plug-and-play connectivity.

- Designed and tested to meet heavy industrial EMC standards
- High-retention ports for connections that won't come loose
- Wide operating temperature range (-40 to +80°C)
- Tested to withstand 50G shock and 4G vibration
- 4,000 V isolation between upstream and downstream USB ports
- Rugged metal cases or IP30 plastic
- Versatile mounting options - panel, DIN rail, desk

SURGE PROTECTORS

Our economical single-stage surge protector provides a transient voltage suppressor (TVS) for each protected line.

- 600W surge suppression
- Simple in-line installation
- Ethernet, USB, RS-232, RS-422 and RS-485 versions available

Find More Online… Scan This Code!

Making USB Reliable in Rugged Applications

This Tech Tip video offers advice for using industrial USB in the field. Explains connection types, mounting options and how to choose the right product for your application.

ETHERNET ENABLED USB HUB

USB over Ethernet solutions make it easy to communicate quickly with USB-enabled devices over your LAN.

- Access, monitor, control up to four USB 2.0 devices
- Save time and money – no need for a local PC
- 10/100/1000 Mbps Ethernet
- High-speed USB (480 Mbps)
- Easy-to-use management software
- Compatible with the Windows® 7 operating system

USB ISOLATORS

Protect and isolate USB-enabled devices from noise, surges and spikes with B&B Electronics' rugged isolators – even in the unfriendly electrical environments found near variable frequency drives, motor control centers, welders and other devices with large electrical loads.

- UL 60601-1-2 for medical-grade isolation options
- High retention USB connectors hold tight to ordinary USB cables
- Choose from 1.5 or 12 Mbps data rates to match peripherals
- Wide operating temperature range (-40 to +80°C) options
- Compact design options - #UH201, #UH401 series
- USB bus powered with 100mA downstream power

START SEEING ORANGE!

High-Retention Ports Grip USB Cables Tight!

Now you can forget about annoying cable disconnections due to vibration. B&B Electronics' high retention ports are 50% stronger than conventional USB ports, so they hold on tight to standard USB cable connections.

Class 1/Division 2 Certified For Hazardous Locations

UHRx04 Series USB Hubs

For applications requiring Class 1/Division 2 certification, B&B Electronics has a range of connectivity and communication solutions designed to operate in hazardous environments.

- see page 470 for a complete listing of C1D2 products.

c UL US LISTED

USB CONNECTIVITY

WHICH IS RIGHT FOR YOU?

USB CONVERTERS

PRODUCT FAMILY	Ruggedized Converters	Panel Mount Converters	Isolated Converters
PRODUCT SERIES	**USR60x series**	**USO9ML2-xP series, USOPTL4-xP series**	**USO9ML2DR series, USOPTL4DR series**
USB Port Count	1	1	1
USB Port Type	Type B	Type B	Type B
High Retention USB?	✔	✔	✔
Interface	RS/232/422/485	RS-232 or RS-422/485	RS-232 or RS-422/485
Serial Port Count	2 or 4	2 or 4	1 or 2
Serial Port Type	DB9 male	DB9 male or Terminal block	DB9 male or Terminal block
Data Rate	921.6 kbps	460 or 921.6 kbps	921.6 kbps
Isolation?	✔	✔	✔
Surge Suppression?		✔	
Wide Temperature?	✔		
USB Bus Powered?		✔	✔
Modbus?	✔		
Mounting	DIN rail or 6-way panel	Panel	DIN Rail (panel option)
Additional	UL Listed Class 1/Division 2 Shock, vibration, drop tested	UL Listed	
Page	**352**	**354 - 357**	**358 - 361**

PRODUCT FAMILY	In-line Converters	Miniature Converters	TTL Converters
PRODUCT SERIES	**USO9ML2X, USOPTL4X, USPTL4X**	**485USBx series, 232USBx series**	**TTLxUSB series**
USB Port Count	1	1	1
USB Port Type	Type B	Type B	Type B
High Retention USB?	#USOPTL4, #USPTL4	#485USBTB-2W, #485USBTB-4W	
Interface	RS-232/422/485	RS-485 2 or 4 wire (RS-232, #232USB9M)	TTL 3.3V or 5V
Serial Port Count	1	1	1
Serial Port Type	Terminal block or DB9 male	Terminal block or DB9 male or DB9 female	DB9 male
Data Rate	460 kbps	921.6 kbps (460 kbps, #232USB9M)	460 kbps
Isolation?	#USOPTL4, #USO9ML2		
Surge Suppression?			
Wide Temperature?			
USB Bus Powered?	✔	✔	✔
Modbus?			
Mounting	Inline	Inline	Inline
Additional			
Page	**362 - 365**	**366 - 371**	**372**

USB CONNECTIVITY

WHICH IS RIGHT FOR YOU?

HUBS

PRODUCT FAMILY	Industrial-grade 4-port Hubs	Industrial-grade 7-port Hubs	Industrial-grade 4-port Mini Hub	USB over Ethernet 4-port Hub
PRODUCT SERIES	**UHRx04 series**	**UHRX07 SERIES**	**UH104**	**UE204**
USB Port Count	1 - upstream 4 - downstream	7 - upstream 4 - downstream	1 - upstream 4 - downstream	4
USB Port Type	Type B - upstream port Type A - downstream ports	Type B - upstream port Type A - downstream ports	Type B - upstream port Type A - downstream ports	Type A
High Retention USB?	✔	✔	✔	
Interface	USB 1.1 and 2.0 compatible, full and low speed	USB 1.1 and 2.0 compatible, full and low speed	USB 2.0	USB 1.1 and 2.0 compatible, full and low speed
Ethernet Port				RJ-45 (10/100/1000 Mbps)
Data Rate	1.5 or 12 Mbps (#UHR204 = 480 Mbps also)	1.5 or 12 Mbps (#UHR207 = 480 Mbps also)	480 Mbps	1.5, 12, and 480 Mbps
Isolation?	#UHR304	#UHR307		
Surge Suppression?				
ESD Protection?			✔	✔
Wide Temperature?	✔	✔	✔	
USB Bus Powered?	External (#UHR204: USB bus powered)	External	✔	
Mounting	DIN rail or 6-way panel	DIN rail or 6-way panel	Panel/In-line	Panel/Desktop
Additional	UL Listed Class 1/Division 2 (#UHR304: 60601-1 medical, shock, vibration)	Shock, vibration tested	Compact size	
Page	374	376	378	380

ISOLATORS			SURGE PROTECTION
Rugged Isolators	**Compact Isolators**	**Field "Key"Port Isolator**	**Surge Protector**
UHR40x series	**UH401x series**	**UH201**	**USBSSP2**
1 - upstream 1 or 2 - downstream	1 - upstream 1 - downstream	1 - upstream 1 - downstream	1 - upstream 1 - downstream
Type B - upstream port Type A - downstream port/s	Type B - upstream port Type A - downstream port/s	Type A - upstream port Type A - downstream port	Type A - upstream port Type A - downstream port
✔	✔		
USB 1.1 and 2.0 compatible	USB 2.0	USB 2.0	USB 3.0
12 Mbps	1.5 or 12 Mbps	12 Mbps	480 Mbps
✔	✔	✔	
			✔
✔	✔	✔	✔
	✔	✔	✔
✔	✔		
Panel (DIN rail option)	Inline	Inline	Inline
Shock, vibration, drop tested			
384	**386**	**388**	**390**

Heavy Duty USB to Serial Converters With Port to Port Isolation

USR602 & USR604

PRODUCT FEATURES

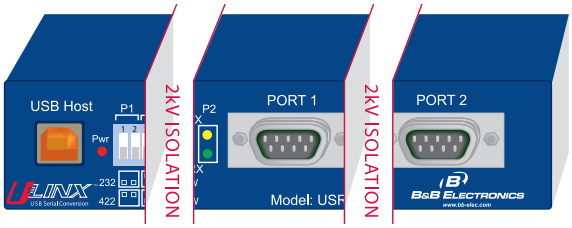
- 2 kV Port to Port Isolation
- ESD Protection - 8 kV Contact, 15 kV Air
- Rugged Metal Case & High Retention USB Connector
- Wide Operating Temperature (-40 to 80°C)
- Redundant Power Inputs
- Modbus ASCII/RTU Compatible
- DIN Rail & Panel Mounting Options

These industrial grade, isolated, USB to serial converters allow you to add two or four RS-232/422/485 ports to your PC. Built to rugged specifications, the USR602 and USR604 offer 2 kV Port to Port isolation. This means that your upstream PC is isolated from the downstream serial devices and the downstream serial devices are isolated from each other and the upstream PC. Additional features such as a heavy duty metal enclosure with panel and DIN Rail mounting options, high ESD protection, shock and vibration testing, and wide operating temperatures, make them ideal for use in harsh environments. Designed for industrial use, they are also suitable for instrumentation, utilities, and laboratory applications. Full speed (480 Mbps) USB 2.0 support allows connectivity with modern computer technology.

The serial ports are configurable for RS-232, RS-422 and RS-485 (2-Wire & 4-Wire). Modbus support enables them to be used with a wide variety of industrial devices. Each unit comes with DIN Rail and panel mounting hardware, giving maximum flexibility for your installation.

WHAT IS PORT TO PORT ISOLATION?

Most isolated USB to Serial Converters isolate the upstream device from the downstream device. This is fine when you are working with a single port unit. However, with multi-port devices, you need the additional protection offered by Port to Port Isolation. Simply put, Port to Port Isolation isolates the upstream device from the downstream devices as well as the downstream devices from each other. This is the only way you can be sure that ground loop or surge can not be transferred through Port 1 to a device connected to Port 2.



ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
USR602	USB to Isolated Converter, 2 port
USR604	USB to Isolated Converter, 4 port

ACCESSORIES

PS12VLB-INT-MED - 12 VDC power supply, locking barrel plug, international blades
MDR-20-24 - 24 VDC, 24 W power supply, DIN rail

Heavy Duty USB to Serial Converters With Port to Port Isolation

USR602 & USR604

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	TD, RD, RTS, CTS, DTR, DSR, DCD, GND
RS-422/485 4-Wire	TDA(-), RDA(-), TDB(+), RDB(+), GND
RS-485 2-Wire	DATA A(-), DATA B(+), GND
Connector	DB9 Male
Data Rate	921.6 Kbps
Isolation	2 kV – Port to Port
Surge Protection	+/- 0.5 kV DC Ports, +/- 1 kV Signal Ports
Industrial Bus	Modbus ASCII/RTU
Bias	1 KΩ on receive lines in RS-422/485 mode
USB TECHNOLOGY	
USB Compatibility	1.1 and 2.0
Speed	1.5, 12, and 480 Mbps
Connector	Type B High Retention (15 N / 3.4 lbs-force withdrawal)
Operating System	Windows 2000, XP (32/64 bit) Vista (32/64 bit), 7 (32/64 bit), 8 (32/64 bit), 2003 & 2008 Server (32/64 bit)
POWER	
Source	External (Dual Input)
Power Connector	Terminal Block Locking Barrel Plug
Input Voltage	10 to 48 VDC
Power Consumption	USR602 – 3.5 Watts Maximum USR604 – 4.5 Watts Maximum
INDICATORS	
Power	Green LED
TD / RD (Each Port)	Green / Amber LED
MECHANICAL	
Dimensions USR602	13.8x3.5x8.8 cm (5.4x1.4x3.5 in)
Dimensions USR604	20.3x3.5x12.0 cm (8.0x1.4x4.7in)
Enclosure	IP 30, Metal
Weight	USR602 = 0.38 kg, USR604 = 0.68 kg
MTBF USR602	90,013 hours
MTBF USR604	51,098 hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C
Storage Temperature	-40 to 85°C
Operating Humidity	0 to 95% Non-condensing

APPROVALS / CERTIFICATIONS			
Emissions	FCC Class B, CISPR Class B (EN55022:2006)		
CE	EN61000-6-1:2007	(Light Industrial)	
	EN61000-4-2:2008	(ESD)	+/-4kV Contact, +/-8kV Air
	EN61000-4-3:2006	(RI)	3V/m, 80-1000MHz; 1V/m, 1.3 to 2.7 GHz
	EN61000-4-4:2004	(EFT Burst)	+/-1kV signal ports
	EN61000-4-6:2005	(CI)	3 VRMS, 0.15 to 80 MHz
	EN61000-4-8:2001	(Magnetic)	10A/m, 50Hz & 60Hz
Shock	IEC60068-2-27	50G peak, 11ms, 3 axes	
Vibration	IEC60068-2-6	10-500Hz, 4G, 3 axes	
Freefall (Drop)	IEC60068-2-32	10 total drops from sides, corner and edges, 1M	

INFORMATION – FCC RULES

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference that may cause undesired operation.

INFORMATION – UL CLASS 1 DIV 2

Suitable for use in Class 1, Division 2, Groups A, B, C and D Hazardous Locations, or Nonhazardous locations only.

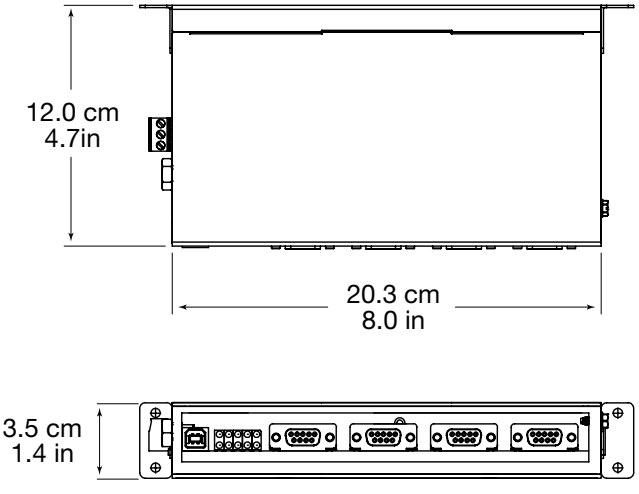
WARNING - EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2

Install in accordance with control drawing number 9340R0.

Ind. Cont. Eq.
For HAZ LOC
3HTV
E245458
Class I, Div. 2, Groups A, B, C & D
Temp. Code: T4A

MECHANICAL DIAGRAM
USR604



Isolated USB 2 or 4 Port RS-232 Converters

USO9ML2-2P & USO9ML2-4P

PRODUCT FEATURES

- Connects multiple RS-232 devices to your USB Port
- 2000 V RMS Port-to-Port Optical Isolation
- 15 KV ESD Surge Protection
- USB Port Powered or External Power
- Supports USB 2.0 (Backward Compatible)
- RS-232 Data Rates up to 460.8 kbps
- LED's to indicate data flow on RS-232 ports
- High retention USB interface ensures a reliable connection
- Automatic Configuration on Windows 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)

Connect legacy RS-232 devices to a USB port and gain 2000 V RMS isolation from voltage spikes and ground loops. Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial ports. However, many commercial and industrial devices still use the RS-232 interface. To connect these devices to modern PCs and provide protection from electrical transients, you need a simple and reliable conversion solution. The USO9ML2-2P and USO9ML2-4P offer this solution. Simply plug the converter into an available USB port on your computer or USB hub and install the drivers supplied on CD ROM. The device will show up as additional COM ports in the Windows Device Manager which are fully compatible with your Windows applications. A one meter USB cable is included.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
USO9ML2-2P	Isolated USB to 2 Port RS-232 Converter
USO9ML2-4P	Isolated USB to 4 Port RS-232 Converter

ACCESSORIES

USBAMBM-3F - 3 ft. (1 M) USB Cable (One Included)
USBAMBM-6F - 2 m (6 ft.) USB Cable
9PAMF6 - 2 m (6 ft.) DB9 Male to DB9 Female Cable
9PAMF10 - 3 m (10 ft.) DB9 Male to DB9 Female Cable
232NM9 - 3 m (6 ft.) DB9 Female to DB9 Female Null Modem Cable
232NM9MF10 - 3 m (10 ft.) DB9 Male to DB9 Female Null Modem Cable
MDR-20-24 - DIN Rail Mount, 24 VDC, 1 A Power Supply
12DC1AST - DC Power supply Unregulated 12VDC@1000mA

Isolated USB 2 or 4 Port RS-232 Converters

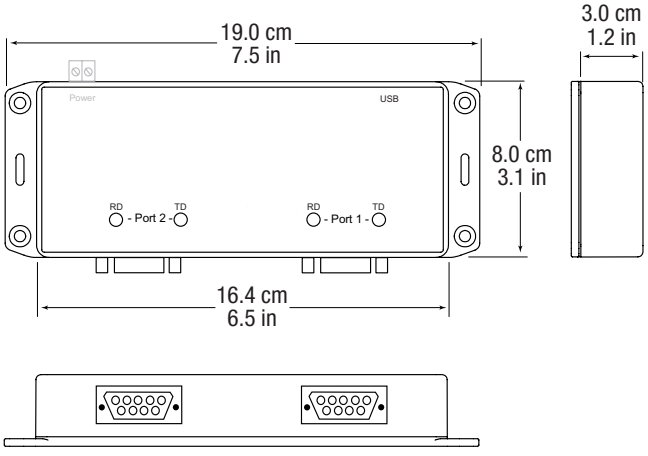
USO9ML2-2P & USO9ML2-4P

SPECIFICATIONS

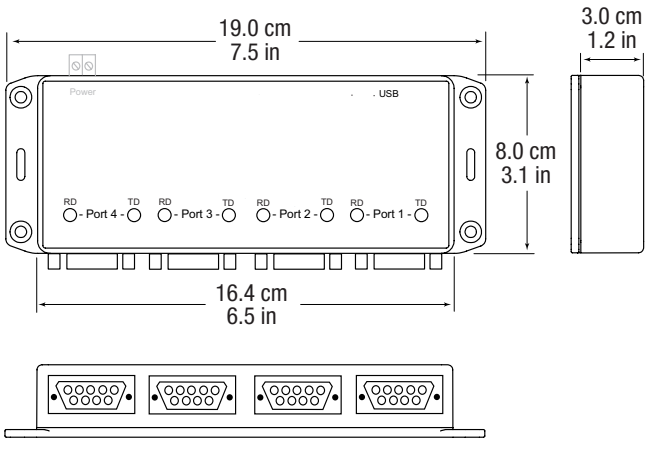
SERIAL TECHNOLOGY	
RS-232 Configuration	DTE
RS-232 Connector	DB9 Male (DTE)
Data Rate	460.8 kbps (max)
Isolation	2000 V (Port-to-Port) Optical
Surge Protection	15 KV ESD
USB TECHNOLOGY	
Connector	USB Type B Female, high retention Withdrawal > 15 N
Standard	1.1 and 2.0 Compatible
Data Rate	12 Mbps
POWER	
Source	USB Port or External Source
Input Voltage	5 VDC from USB Port or 10 - 30 VDC External Power Supply
Consumption	Higher Power Device (>100 mA) USO9ML2-2P: 3 Watts, External Power Supply USO9ML2-4P: 5 Watts, External Power Supply
SOFTWARE	
Driver CD	Windows 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
MECHANICAL	
Dimensions	16.4 x 3.0 x 8.0 cm (6.5 x 1.2 x 3.1 in) without Flanges 19.0 x 3.0 x 8.0 cm (7.5 x 1.2 x 3.1 in) with Flanges
Weight	2 Port 0.73 lbs (331.1 g), 4 Port 0.77 lbs (349.3 g)
ENVIRONMENTAL	
Operating Temp	32 to 158 °F (0 to 70 °C)
Storage Temp	-40 to 185 °F (-40 to 85 °C)
Operating Humidity	0 to 95 % (Non-condensing)
MTBF (USO9ML2-2P)	118245 hours
MTFB (USO9ML2-4P)	61861 hours
MTBF Method	Parts Count Reliability Prediction
REGULATORY	
Approvals	FCC, CE, UL

RS-232 PIN-OUT (DTE / DB9 MALE)		
PIN	**Direction**	**Signal Name**
1	Input	DCD (Receive Line Signal Detector)
2	Input	RD (Receive Data)
3	Output	TD (Transmit Data)
4	Output	DTR (DTE Ready)
5	N/A	SG (Signal Ground)
6	Input	DSR (DCE Ready)
7	Output	RTS (Request to Send)
8	Input	CTS (Clear to Send)
9	Input	RI (Ring Indicator)

MECHANICAL DIAGRAM - USO9ML2-2P



MECHANICAL DIAGRAM - USO9ML2-4P



Isolated USB 2 or 4 Port RS-422/485 Converters

USOPTL4-2P & USOPTL4-4P

PRODUCT FEATURES

- Connects multiple RS-422/485 devices to your USB Port
- 2000 V RMS Port-to-Port Optical Isolation
- 15 KV ESD Surge Protection
- USB Port Powered or External Power
- Supports USB 2.0 (Backward Compatible)
- RS-422/485 Data Rates up to 921.6 kbps
- LED's to indicate data flow on RS-232 ports
- High retention USB interface ensures a reliable connection
- Removable terminal block on serial ports make wiring easy
- Automatic Configuration on Windows 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)

Connect RS-422 and RS-485 (2-Wire and 4-Wire) devices to a USB port and gain 2000 V RMS Isolation from voltage spikes and ground loops. Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial ports. However, many commercial and industrial devices still use the RS-422/485 interface. To connect these devices to modern PCs and provide protection from electrical transients, you need a simple and reliable conversion solution.

The USOPTL4-2P and USOPTL4-4P offer this solution and are great for any application that requires long range or multi-drop capabilities. Both models offer a high retention USB interface, removable terminal blocks on the serial side and have LED's to indicate data flow. Simply plug the converter into an available USB port on your computer or USB hub and install the drivers supplied on CD ROM. The device will show up as additional COM ports in the Windows Device Manager, which are fully compatible with your Windows applications. A one meter USB cable is included.

ORDERING INFORMATION

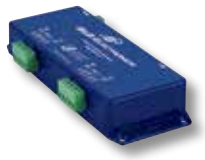
MODEL NUMBER	DESCRIPTION
USOPTL4-2P	Isolated USB to 2 Port RS-422/485 Converter
USOPTL4-4P	Isolated USB to 4 Port RS-422/485 Converter

ACCESSORIES

USBAMBM-3F - 3 ft. (1 M) USB Cable (One Included)
USBAMBM-6F - 2 m (6 ft.) USB Cable
MDR-20-24 - DIN Rail Mount, 24 VDC, 1 A Power Supply
12DC1AST - DC Power supply Unregulated 12VDC@1000mA

Isolated USB 2 or 4 Port RS-422/485 Converters

USOPTL4-2P & USOPTL4-4P



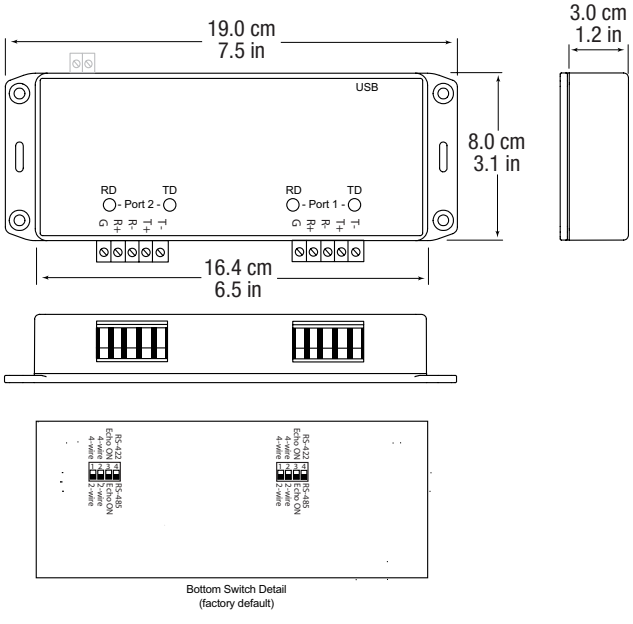
SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-422/485 Connectors	Removable Terminal Blocks
RS-422/485 Data Rate	921.6 kbps (Max)
Isolation	2000 V (Port-to-Port) Optical
Surge Protection	15 KV ESD
USB TECHNOLOGY	
Connector	USB Type B Female, High Retention Withdrawal > 15 N
Standard	1.1 and 2.0 Compatible
Data Rate	12 Mbps
POWER	
Source	USB Port or External Source
Input Voltage	5 VDC from USB Port or 10 - 30 VDC External Power Supply
Consumption	Higher Power Device (>100 mA) USOPTL4-2P: 3 Watts, External Power Supply USOPTL4-4P: 5 Watts, External Power Supply
SOFTWARE	
Driver CD	Windows 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
MECHANICAL	
Dimensions	16.4 x 3.0 x 8.0 cm (6.5 x 1.2 x 3.1 in) without Flanges 19.0 x 3.0 x 8.0 cm (7.5 x 1.2 x 3.1 in) with Flanges
Weight	2 Port 0.75 lbs (340.2 g), 4 Port 0.80 lbs (362.9 g)
ENVIRONMENTAL	
Operating Temp	32 to 158 °F (0 to 70 °C)
Storage Temp	-40 to 185 °F (-40 to 85 °C)
Operating Humidity	0 to 95 % (Non-condensing)
MTBF (USOPTL4-2P)	125224 hours
MTFB (USOPTL4-4P)	72749 hours
MTBF Method	Parts Count Reliability Prediction
REGULATORY	
Approvals	FCC, CE, UL

DIP SWITCH LEGEND		
Position	**OFF**	**ON**
1	RS-422	RS-485
2	Echo ON	Echo OFF
3	4-Wire	2-Wire
4	4-Wire	2-Wire
Factory default = all switches off		

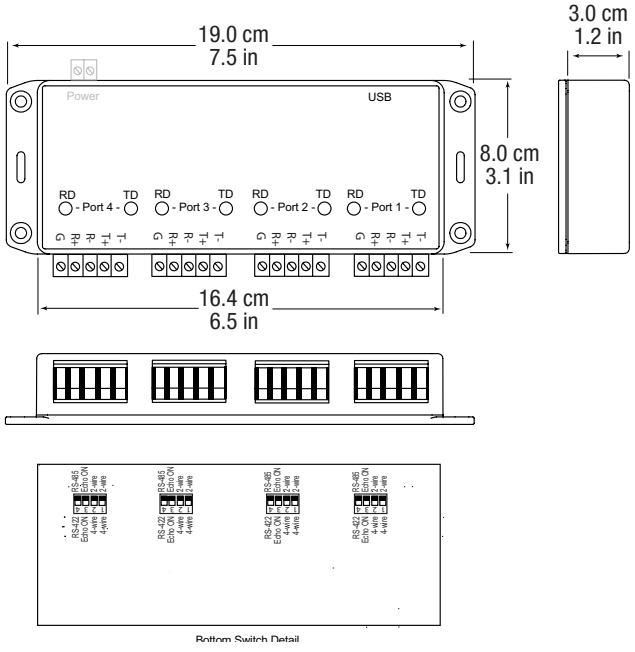
TERMINAL BOARD LAYOUT	
TB Position	**Signal Name**
1	TDA(-)
2	TDB(+)
3	RDA(-)
4	RDB(+)
5	Ground

MECHANICAL DIAGRAM - USOPTL4-2P



Bottom Switch Detail
(factory default)

MECHANICAL DIAGRAM - USOPTL4-4P



Bottom Switch Detail

Isolated USB/RS-232 Converters

USO9ML2DR-x

PRODUCT FEATURES

- Connects 1 or 2 RS-232 devices to your USB port
- 3000 V RMS port-to-port optical isolation
- 15 KV ESD surge protection
- USB port powered
- RS-232 data rates up to 460.8 kbps
- LEDs indicate data flow on RS-232 ports
- High retention USB interface ensures reliable connection

Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial port. However, many commercial and industrial devices still use serial interfaces. To connect these devices to modern PCs, you need a simple and reliable conversion solution.

The USO9ML2DR USB/RS-232 converter series offers this solution in an industrial DIN mount enclosure. Connect legacy RS-232 devices to a USB port and gain 3000 V RMS isolation from voltage spikes and ground loops.

These devices are perfect for industrial automation, SCADA, point of sale, or medical. Simply plug the converter into an available USB port on your computer or USB hub and install the drivers supplied on CD ROM. The device will show up as additional COM ports in the Windows Device Manager which are fully compatible with your Windows applications. A one meter USB cable is included.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
USO9ML2DR	Isolated USB to RS-232 Converter, 1 port
USO9ML2DR-2	Isolated USB to RS-232 Converter, 2 port
USO9ML2DR-LS	Locked Serial Number version of USO9ML2DR

ACCESSORIES

USBAMBM-3F - 1 m (3 ft.) USB cable (one included)
USBAMBM-6F - 2 m (6 ft.) USB cable
9PAMF6 - 2 m (6 ft.) DB9 male to DB9 female serial cable
9PAMF10 - 3 m (10 ft.) DB9 male to DB9 female serial cable
232NM9 - 3 m (6 ft.) DB9 female to DB9 female null modem cable
232NM9MF10 - 3 m (10 ft.) DB9 male to DB9 female null modem cable
DRPM25 - Panel mount adapter

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. "Locked serial" format uses the same serial number that is associated with a model type.

If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

When ordering Locked Serial Number versions, add a "-LS" to the item number. Serialized and Lock Serial Number versions sell for the same price.

Isolated USB/RS-232 Converters

USO9ML2DR-x

SPECIFICATIONS

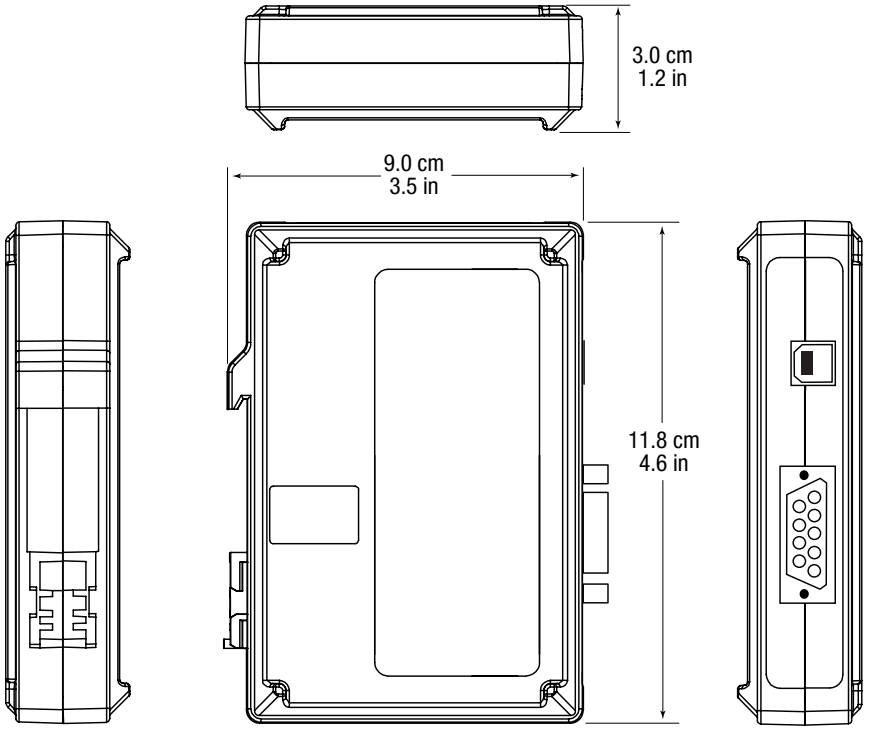
SERIAL TECHNOLOGY	
RS-232	DCD, RD, TD, DTR, SG, DSR, RTS, CTS, RI
Connector	DB9 male (DTE)
Data Rate	Up to 460.8 Kbps (maximum)
Isolation	3 KV port-to-port optical isolation
Surge Protection	15 KV ESD
USB TECHNOLOGY	
USB Compatibility	2.0 (backward compatible)
USB Data Rate	12 Mbps
Connector	Type B female, high retention (15 Newtons / 3.4 lbs-force withdrawal)
Driver CD	Windows 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
POWER	
Source	USB port
Input Voltage	5 VDC
Consumption	Lower power device (<100 mA)
MECHANICAL	
Dimensions	11.8 x 3.0 x 9.0 cm (4.6 x 1.2 x 3.5 in)
Enclosure	IP30 plastic case
ENVIRONMENTAL	
Operating Temperature	0 to 70°C (32 to 158°F)
Operating Humidity	0 to 95% non-condensing
MTBF USO9ML2x	118,048 hours
MTBF Calc. Method	Parts Count Reliability Prediction

APPROVALS / CERTIFICATIONS		
Emissions	FCC Class B, CISPR Class B (EN55022:2006)	
CE	EN 61000-6-1: 2007	Generic Standards for Residential, Commercial and Light-Industrial Environments
	EN 61000-4-2: 2009	Electro-Static Discharge (ESD)
	EN 61000-4-3: 2006	+A1 +A2 +IS1 Radiated Field Immunity (RFI)
	EN 61000-4-4: 2012	Electrical Fast Transients-Burst Immunity (EFT)
	EN 61000-4-6: 2009	Conducted Immunity

INFORMATION – FCC RULES

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference that may cause undesired operation.

MECHANICAL DIAGRAM - USO9ML2DR



Isolated USB/RS-422/485 Converters

USOPTL4DR-x

PRODUCT FEATURES

- 3000 Volts optical isolation
- 15 KV ESD protection
- USB bus powered
- RS-422/485 data rates up to 921.6 Kbps
- High retention USB connector
- Removable terminal blocks
- DIN rail mount (panel mount option)

Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial port. However, many commercial and industrial devices still use serial interfaces. To connect these devices to modern PCs, you need a simple and reliable conversion solution.

The USOPTL4DR-x series offers this solution. Specifically designed for industrial applications, they offer 3000V optical isolation with 15 KV ESD protection. The slim-line DIN rail mountable enclosure has a small footprint and, since it draws power from your computer's USB bus, an additional power supply is not required. Simply plug the converter into an available USB port on your computer or USB hub and install the drivers supplied on CD ROM. The device will show up as an additional COM port in the Windows Device Manager which is fully compatible with your Windows applications.

One and two port versions are available. The single port version is also available with a "locked serial number" that allows you to interface your PC with multiple converters without having to load a driver for each one - perfect for field service applications. A one meter USB cable is included.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
USOPTL4DR	Isolated USB to RS-422/485 Converter, 1 port
USOPTL4DR-2	Isolated USB to RS-422/485 Converter, 2 port
USOPTL4DR-LS	Locked Serial Number version of USOPTL4DR

ACCESSORIES

USBAMBM-3F - 1 m (3 ft.) USB cable (one included)

DRPM25 - Panel mount adapter

TB5P508SR-2PK - Optional terminal block with strain relief, 2 pack

7466 - Standard terminal block replacement (Unit comes with one or two factory installed depending on model number.)

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. "Locked serial" format uses the same serial number that is associated with a model type.

If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

When ordering Locked Serial Number versions, add a "-LS" to the item number. Serialized and Lock Serial Number versions sell for the same price.

Isolated USB/RS-422/485 Converters

USOPTL4DR-x

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-485 2-Wire	Data A(-), Data B(+), Ground
RS-485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), Ground
Connector	Removable terminal block, 12 to 28 AWG
Data Rate	Up to 921.6 Kbps
Isolation	3000 V optical isolation
Surge Protection	15 KV ESD
USB TECHNOLOGY	
USB Compatibility	2.0 (backward compatible)
USB Data Rate	12 Mbps
Connector	Type B female, high retention (15 Newtons / 3.4 lbs-force withdrawal)
Driver CD	Windows 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
POWER	
Source	USB port
Input Voltage	5 VDC
Consumption	~2.5 W (high power device, draws >500 mA
MECHANICAL	
Dimensions	9.7 x 11.9 x 3.1 cm (3.8 x 4.7 x 1.2 in)
Enclosure	DIN rail mountable, plastic
Weight	222.3 g (0.49 lbs) with USB cable
ENVIRONMENTAL	
Operating Temperature	0 to 70°C (32 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95% Non-condensing
MTBF USOPTL4DR	184,556 hours
MTBF USOPTL4DR-2	79,551 hours
MTBF Calc. Method	Parts Count Reliability Prediction

APPROVALS / CERTIFICATIONS		
Emissions	FCC Class B, CISPR Class B (EN55022:2006)	
CE	EN 61000-6-1: 2007	Generic Standards for Residential, Commercial and Light-Industrial Environments
	EN 61000-4-2: 2009	Electro-Static Discharge (ESD)
	EN 61000-4-3: 2006	+A1 +A2 +IS1 Radiated Field Immunity (RFI)
	EN 61000-4-4: 2012	Electrical Fast Transients-Burst Immunity (EFT)
	EN 61000-4-6: 2009	Conducted Immunity

INFORMATION – FCC RULES

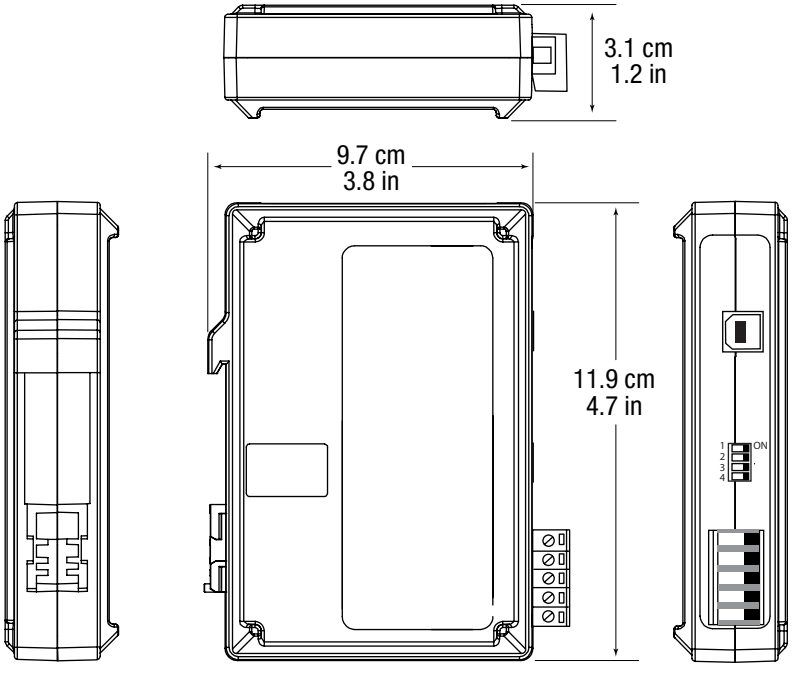
This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference that may cause undesired operation.

TERMINAL BLOCK

The terminal block layout is top to bottom (as viewed from a DIN rail installation). The signal names on the front label are only visible when the terminal block is removed. The USOPTL4DR-2 has two terminal blocks. In both configurations, the TB layout is the same.

TB POSITION	LABEL	FUNCTION
A	T-	TDA(-)
B	T+	TDB(+)
C	R-	RDA(-)
D	R+	RDA(+)
E	G	Ground

MECHANICAL DIAGRAM



USB to RS-232 Converter With Isolation

USO9ML2

PRODUCT FEATURES

- 2 kV Isolation
- ESD Protection - 4 kV Contact, 8 kV Air
- Compact In-Line Case
- USB 2.0 Full Speed Compatible (12 Mbps)
- RS-232 Data Rates up to 460.8 Kbps
- USB Bus Powered

This compact, isolated USB to RS-232 converter allows you to add an RS-232 port to your USB only PC. Built to rugged specifications with two kilovolts of isolation, it will protect your PC from hazardous ground loops. The compact size makes it perfect for field service use but it is also great for instrumentation and laboratory applications. Full speed (12 Mbps) USB 2.0 support allows connectivity with modern computer technology.

The RS-232 port is a DB9 Male connector wired as a DTE with full hardware handshake support. It can handle standard RS-232 data rates up to 460.8 Kbps.

Each unit comes with 1 meter USB cable and a driver disk. Drivers support Windows platforms up to Windows 8 in 32 and 64 bit implementations.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
USO9ML2	USB to Isolated RS-232 Converter
USO9ML2-LS	USB to Isolated RS-232 Converter Locked Serial Number version of USO9ML2

ACCESSORIES

USBAMBM-3F - 3 foot (1M) Type A Male to Type B Male (Gray)

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. “Locked serial” format uses the same serial number that is associated with a model type.

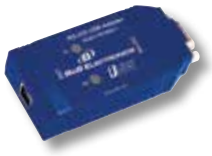
If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

When ordering Locked Serial Number versions, add a “-LS” to the item number. Serialized and Lock Serial Number versions sell for the same price.

USB to RS-232 Converter With Isolation

USO9ML2

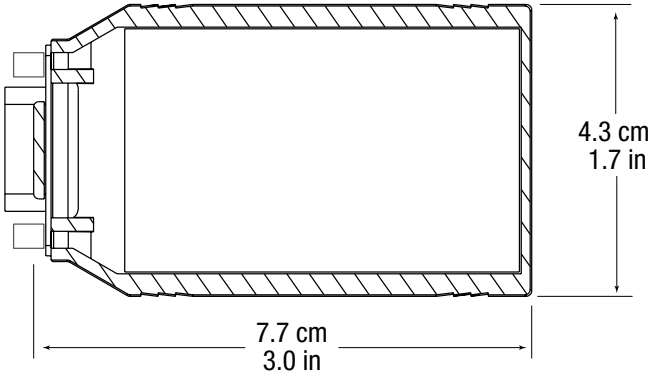


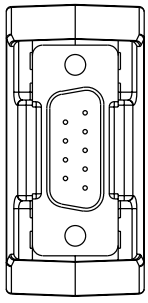
SPECIFICATIONS

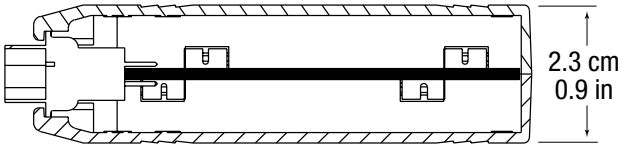
SERIAL TECHNOLOGY	
RS-232	TD, RD, RTS, CTS, DTR, DSR, DCD, GND
Connector	DB9 Male
Data Rate	460.8 Kbps
Isolation	2 kV
USB TECHNOLOGY	
USB Compatibility	1.1 and 2.0 (at full speed)
Speed	12 Mbps (Full)
Connector	Type B
Operating System	Windows 2000, XP (32/64 bit), Vista (32/64 bit), Windows 7 (32/64 bit), 8 (32/64 bit), 2003 & 2008 Server (32/64 bit)
POWER	
Source	USB Bus Powered
Power Consumption	Low Power Device (Less than 100 mA)
INDICATORS	
TD / RD (RS-232)	Red LED
MECHANICAL	
Dimensions	7.7 x 4.3 x 2.3 cm (3.0 x 1.7 x 0.9 in)
Enclosure	IP 30, Plastic
Weight	6.4 oz (0.18 kg)
MTBF	247,713 hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	0 to 70°C
Storage Temperature	-40 to 85°C
Operating Humidity	0 to 95% Non-condensing

APPROVALS / CERTIFICATIONS		
Emissions	EN 55022: 2010 + AC:2011 Class B Emissions	
CE	EN 61000-6-1:2007	Generic Standards for Residential, Commercial and Light-Industrial Environments
	EN 61000-4-2: 2009	Electro-Static Discharge (ESD)
	EN 61000-4-3: 2006	+A1 +A2 +IS1 Radiated Field Immunity (RFI)
	EN 61000-4-4: 2012	Electrical Fast Transients-Burst Immunity (EFT
	EN 61000-4-6: 2009	Conducted Immunity

MECHANICAL DIAGRAM







In-line USB Converters

USOPTL4 & USPTL4

PRODUCT FEATURES

- 2000 V RMS optical isolation
- 15KV ESD surge protection
- Adds a COM port to your PC
- LEDs for transmit and receive lines
- USB 1.0, 1.1 and 2.0 compatible (12 Mbps)
- Automatic configuration on Windows 98, ME, 2000, XP, Vista. 7 (32/64 bit), 8 (32/64 bit)
- No power supply required (powered from USB bus)

Models USOPTL4 and USPTL4 are USB to one port RS-422/485 converters. Supporting 2-wire RS-485 or 4-wire RS-422/485 communications, these devices are great for applications requiring long range or multi-drop capabilities. Both models use pluggable terminal blocks on the RS-422/485 side. Two LEDs indicate data transmit or receive. Model USOPTL4 includes circuitry with 2000 Volts isolation protection against ground loops and voltage spikes. Both products draw power from the USB port so no power supply is required.

Simply install the drivers supplied on CD ROM and plug the converter into an available USB port on your computer or USB hub. The device show ups as an additional COM port in the Windows Device Manager, and is compatible with Windows applications.

Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing classic serial ports. But many commercial and industrial devices still use RS-422/485 interfaces. To connect these devices to modern PCs you need robust and reliable conversion solutions. USB ports are becoming more common on commercial and industrial equipment such as point-of-sale peripherals, medical devices, scientific instrumentation, laboratory equipment and other devices or in environments where surges, spikes and ground loops are likely to occur.

RS-485 Control

No special software is required to control the RS-485 receiver or transmit line driver. The driver is automatically enabled during each byte transmitted in RS-485 mode. The transmitter is always enabled in RS-422 mode. The receiver is tri-stated during each byte transmitted in the echo-off mode. The receiver is always enabled in the echo-on mode. There are 4.7k Ohm pull-up/pull-down resistors on the RDA and RDB lines. A termination resistor may be added to R16 if needed. See B&B's RS-422/RS-485 Application Note (available on our website) for more information on termination and DC biasing of an RS-485 network.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
USOPTL4	Isolated RS-422/485 Inline USB Converter
USOPTL4-LS	Locked Serial Number Version of USOPTL4
USPTL4	Non-isolated RS-422/485 Inline USB Converter
USPTL4-LS	Locked Serial Number Version of USPTL4

ACCESSORIES

9PAMF6 - DB9 to DB9 serial cable, male to female, 6 ft. (1.8 m)
TB5P508SR-2PK - 5-position terminal block with strain relief paddle board, 2 pack

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. "Locked serial" format uses the same serial number that is associated with a model type.

If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

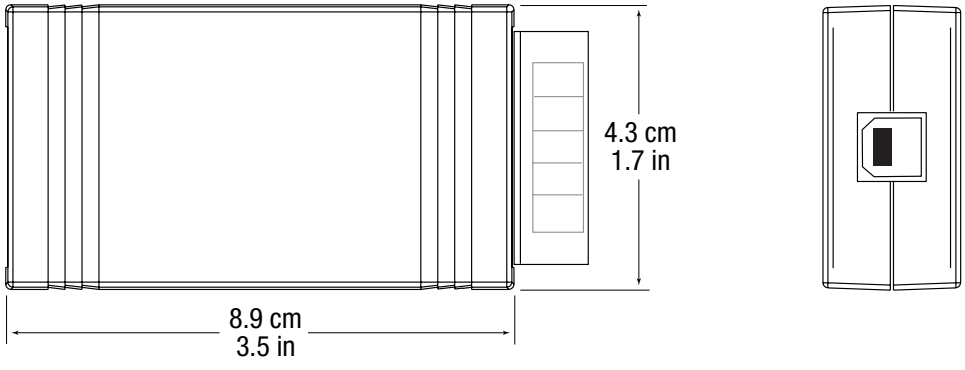
When ordering Locked Serial Number versions, add a "-LS" to the item number. Serialized and Lock Serial Number versions sell for the same price.

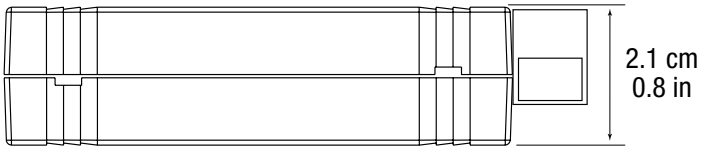
SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-422/485 4-Wire	TDA(-), RDA(-), TDB(+), RDB(+), GND
RS-485 2-Wire	DATA A(-), DATA B(+), GND
Connector	Terminal block
Data Rate	460.8 Kbps
Isolation	2 kV RMS
Surge Protection	15kV ESD
Industrial Bus	Modbus ASCII/RTU
Bias	4.7 KΩ on receive lines in RS-422/485 mode
USB TECHNOLOGY	
USB Compatibility	1.1 and 2.0
Speed	1.5, 12 Mbps
Connector	Type B High Retention (15 N / 3.4 lbs-force withdrawal)
Operating System	Windows 2000, XP (32/64 bit), Vista (32/64 bit), 7 (32/64 bit), 8 (32/64 bit), 2003 & 2008 Server (32/64 bit)
POWER	
USB	Low power device (draws <100 mA)
INDICATORS	
LEDs	Transmit data, Receive data
MECHANICAL	
Dimensions	8.9 x 4.3 x 2.1 cm (3.5 x 1.7 x 0.8 in)
Enclosure	IP 30, Plastic
MTBF USOPTL4	311,327 hours
MTBF USPTL4	1,012,584 hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	0 to 70°C (32 to 158°F)
Operating Humidity	0 to 95% Non-condensing

APPROVALS / CERTIFICATIONS		
Emissions	EN 55022: 2010 + AC:2011 Class B Emissions	
CE	EN 61000-6-1: 2007	Generic Standards for Residential, Commercial and Light-Industrial Environments
	EN 61000-4-2: 2009	Electro-Static Discharge (ESD)
	EN 61000-4-3: 2006	+A1 +A2 +IS1 Radiated Field Immunity (RFI)
	EN 61000-4-4: 2012	Electrical Fast Transients-Burst Immunity (EFT)
	EN 61000-4-6: 2009	Conducted Immunity

MECHANICAL DIAGRAM





USB to RS-485 Mini-Converters

485USB9F-2W & 485USB9F-4W

PRODUCT FEATURES

- Connect RS-485 Devices to your USB Port
- Perfect for Field Service Applications
- Small – Fits easily into any laptop bag
- USB Port Powered
- USB 2.0 (12 Mbps) Compatible
- RS-485 Data rates up to 921.6 Kbps
- Supports Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)

Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial ports. However, many commercial and industrial devices still use the RS-485 interface. To connect these devices to modern PCs, you need a simple and reliable conversion solution. The 485USB9F-2W and 485USB9F-4W offer this solution in a space saving, USB Port powered package.

Simply install the drivers supplied on CD ROM and plug the converter into an available USB port on your computer or USB hub. The device will show up as an additional COM port in the Windows Device Manager which is fully compatible with your Windows applications. Choose the 485USB9F-2W for RS-485 2-wire applications or the 485USB9F-4W for RS-485 4-wire applications. Locked serial number versions are also available. A one meter USB cable is included.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
485USB9F-2W	USB to RS-485 2-Wire Converter
485USB9F-4W	USB to RS-485 4-Wire Converter
485USB9F-2W-LS	USB to RS-485 2-Wire Converter (Locked Serial Number)
485USB9F-4W-LS	USB to RS-485 4-Wire Converter (Locked Serial Number)

ACCESSORIES

USBAMBM-3F - 3 ft. (1 M) USB Cable (One Included)
7372 - Replacement TB (One Included)
Contact Customer Service for ordering information.

IN THE FIELD

Monitoring Laboratory Equipment
Industry: Industrial Automation
Product: USB Miniature Converter

www.bb-elec.com/USBLab

485USB9F-2W

Carrier data charges may apply.

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. "Locked serial" format uses the same serial number that is associated with a model type.

If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

When ordering Locked Serial Number versions, add a "-LS" to the item number. Serialized and Lock Serial Number versions sell for the same price.

USB to RS-485 Mini-Converters

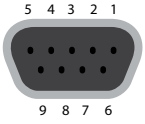
485USB9F-2W & 485USB9F-4W

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-485 2-Wire	Data A(-), Data B(+), Ground
RS-485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), Ground
Connector	DB9 Female
Data Rate	Up to 921.6 Kbps
USB TECHNOLOGY	
Connector	USB Type B Female
Standard	2.0 (Backward Compatible)
Data Rate	12 Mbps
POWER	
Source	USB Port
Input Voltage	5 VDC
Consumption	~ 0.5 W (Low power device, draws less than 100 mA)
SOFTWARE	
Driver CD	Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
MECHANICAL	
Dimensions	5.8 x 3.2 x 1.6 cm (2.3 x 1.3 x .6 in)
Enclosure	In-line mounted, plastic
Weight	0.23 lbs (104.3 g) with USB Cable
ENVIRONMENTAL	
Operating Temp	32 to 158°F (0 to 70 °C)
Storage Temp	-40 to 185 °F (-40 to 85 °C)
Op Humidity	0 to 95 % (Non-condensing)
MTBF 2-Wire	2130833 hours
MTBF 4-Wrie	1869313 hours
MTBF Method	Parts Count Reliability Prediction
REGULATORY	
Approvals	FCC, CE

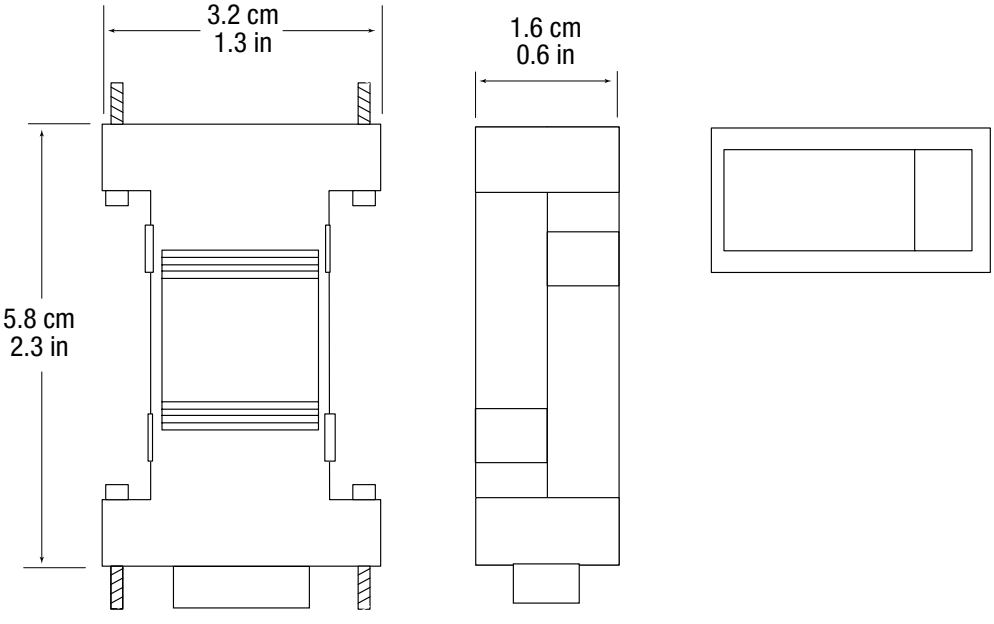
APPROVALS / CERTIFICATIONS		
Emissions	EN 55022: 2010 + AC:2011 Class B Emissions	
CE	EN 61000-6-1:2007	Generic Standards for Residential, Commercial and Light-Industrial Environments
	EN 61000-4-2: 2009	Electro-Static Discharge (ESD)
	EN 61000-4-3: 2006	+A1 +A2 +IS1 Radiated Field Immunity (RFI)
	EN 61000-4-4: 2012	Electrical Fast Transients-Burst Immunity (EFT
	EN 61000-4-6: 2009	Conducted Immunity

PINOUT: DB9 FEMALE CONNECTOR



PIN	485USB9F-2W	485USB9F-4W
1	Not Used	Not Used
2	Data A(-)	RDA(-)
3	Data B(+)	TDB(+)
4	Ground	Ground
5	Not Used	Not Used
6	Ground	Ground
7	Data B(+)	RDB(+)
8	Data A(-)	TDA(-)
9	Not Used	Not Used

MECHANICAL DIAGRAM



USB to RS-485 Mini-Converters

485USBTB-2W & 485USBTB-4W

PRODUCT FEATURES

- Connect RS-485 Devices to your USB Port
- Perfect for Field Service Applications
- Small – Fits easily into any laptop bag
- USB Port Powered
- USB 2.0 (12 Mbps) Compatible
- RS-485 Data rates up to 921.6 Kbps
- Removable Terminal Block for Easy Wiring
- High Retention USB Connector
- Supports Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)

Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial ports. However, many commercial and industrial devices still use the RS-485 interface. To connect these devices to modern PCs, you need a simple and reliable conversion solution. The 485USBTB-2W and 485USBTB-4W offer this solution in a space saving, USB Port powered package.

Simply install the drivers supplied on CD ROM and plug the converter into an available USB port on your computer or USB hub. The device will show up as an additional COM port in the Windows Device Manager which is fully compatible with your Windows applications. Select the 485USBTB-2W for RS-485 2-wire applications or the 485USBTB-4W for RS-485 4-wire applications. Locked serial number versions are also available (see the installation notes in the driver section). A one meter USB cable is included.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
485USBTB-2W	USB to RS-485 2-Wire Converter
485USBTB-4W	USB to RS-485 4-Wire Converter
485USBTB-2W-LS	USB to RS-485 2-Wire Converter (Locked Serial Number)
485USBTB-4W-LS	USB to RS-485 4-Wire Converter (Locked Serial Number)

ACCESSORIES

USBAMBM-3F - 3 ft. (1 M) USB Cable (One Included)
7372 - Replacement TB (One Included)
Contact Customer Service for ordering information.

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. "Locked serial" format uses the same serial number that is associated with a model type.

If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

When ordering Locked Serial Number versions, add a "-LS" to the item number. Serialized and Lock Serial Number versions sell for the same price.

USB to RS-485 Mini-Converters

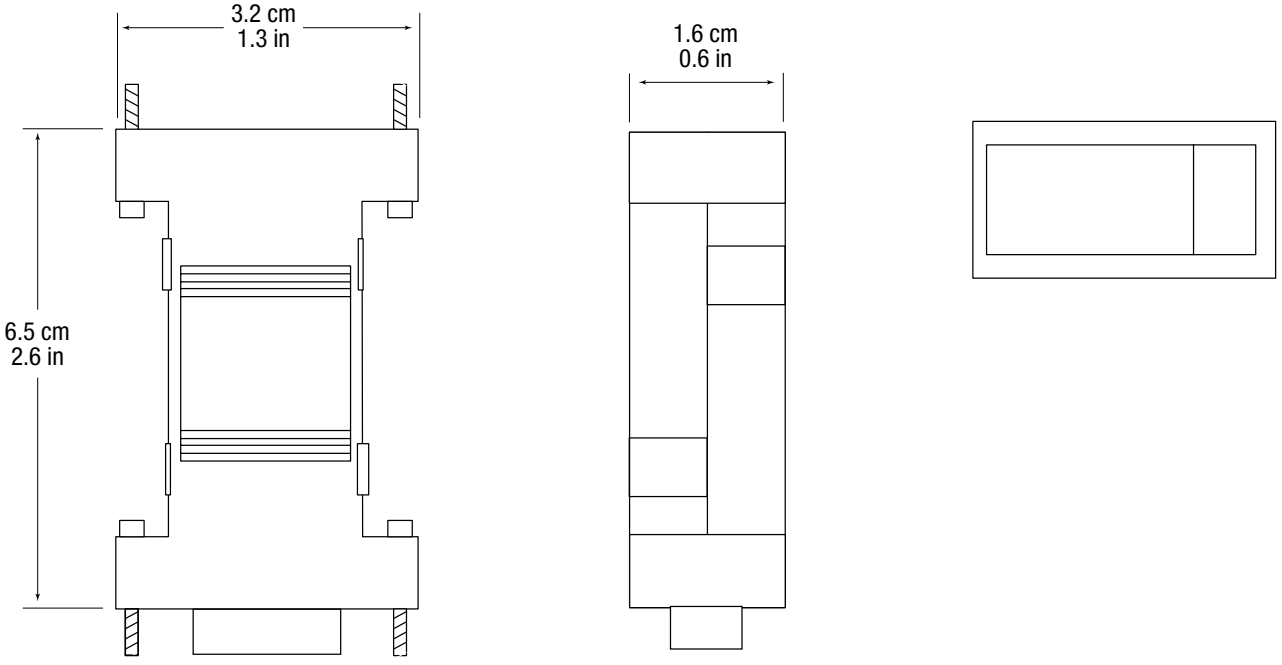
485USBTB-2W & 485USBTB-4W

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-485 2-Wire	Data A(-), Data B(+), Ground
RS-485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), Ground
Connector	Removable Terminal Block (28 to 16 AWG)
Data Rate	Up to 921.6 Kbps
USB TECHNOLOGY	
Connector	USB Type B Female (High Retention)
Standard	2.0 (Backward Compatible)
Data Rate	12 Mbps
POWER	
Source	USB Port
Input Voltage	5 VDC
Consumption	~ 0.5 W (Low power device, draws less than 100 mA)
SOFTWARE	
Driver CD	Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
MECHANICAL	
Dimensions	6.5 x 3.2 x 1.6 cm (2.6 x 1.3 x .6 in)
Enclosure	In-line mounted, plastic
Weight	0.23 lbs (104.3 g) with USB Cable
ENVIRONMENTAL	
Operating Temp	32 to 158°F (0 to70 °C)
Storage Temp	-40 to 185 °F (-40 to 85 °C)
Op Humidity	0 to 95 % (Non-condensing)
MTBF	1869313 hours
MTBF Method	Parts Count Reliability Prediction
REGULATORY	
Approvals	FCC, CE

CERTIFICATIONS				
Test	**Description**		**Test Level**	**Level**
IEC 61000-4-2	ESD	Contact Air	±8kV ±15kV	±8kV ±15kV
IEC 61000-4-3	Radiated Immunity		3 v/m	3 v/m
IEC 61000-4-4	Burst (Fast Transient)	Serial USB	±500 ±500	±500 ±500
IEC 61000-4-6	Induced (Conductive) RFI	Serial USB	3 V RMS 3 V RMS	3 V RMS 3 V RMS
EN 55022/CISPR 22	Emissions		3 meters	Class B

MECHANICAL DIAGRAM



USB to RS-232 Mini-Converter

232USB9M

PRODUCT FEATURES

- Connect RS-232 Devices to your USB Port
- Perfect for Field Service Applications
- Small – Fits easily into any laptop bag
- USB Port Powered
- USB 2.0 (12 Mbps) Compatible
- RS-232 Data rates up to 460.8 Kbps
- Supports Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)

Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial ports. However, many commercial and industrial devices still use the RS-232 interface. To connect these devices to modern PCs, you need a simple and reliable conversion solution. The 232USB9M offers this solution in a space saving, USB Port powered package.

Simply install the drivers supplied on CD ROM and plug the converter into an available USB port on your computer or USB hub. The device will show up as an additional COM port in the Windows Device Manager which is fully compatible with your Windows applications. Locked serial number versions are also available. A one meter USB cable is included.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
232USB9M	USB to RS-232 Mini-Converter
232USB9M-LS	USB to RS-232 Mini-Converter (Locked Serial Number)

ACCESSORIES

USBAMBM-3F - 3 ft. (1 M) USB Cable (One Included)

Learn More!

READ ON!

Ten Commandments of USB

www.bb-elec.com/USB10

*Carrier data charges may apply.

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. "Locked serial" format uses the same serial number that is associated with a model type.

If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

When ordering Locked Serial Number versions, add a "-LS" to the item number. Serialized and Lock Serial Number versions sell for the same price.

USB to RS-232 Mini-Converter

232USB9M

SPECIFICATIONS

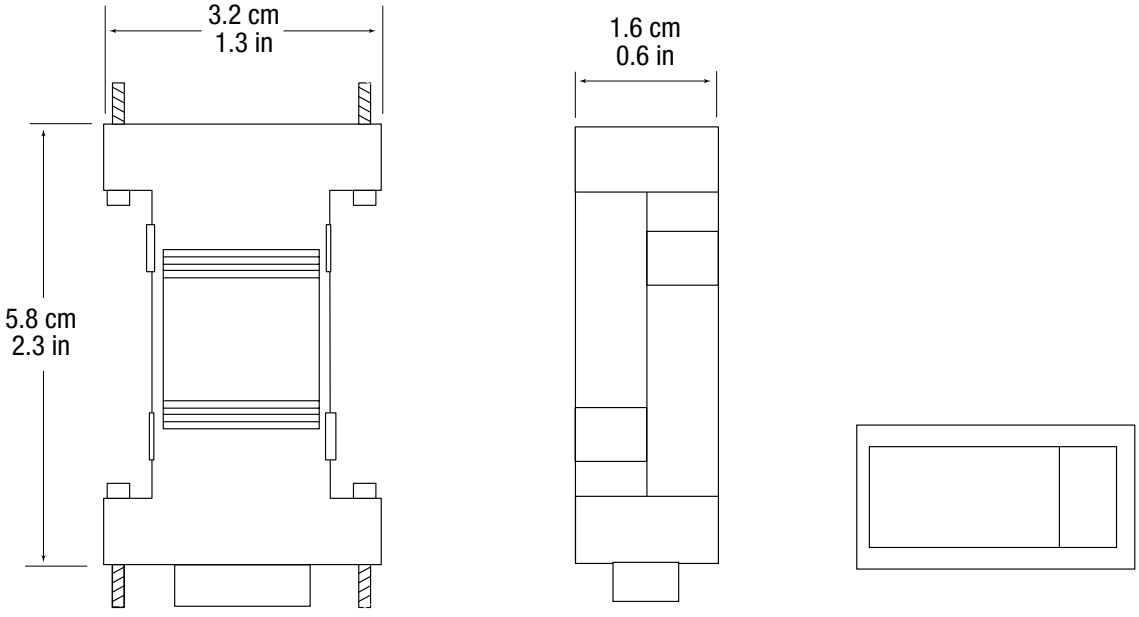
SERIAL TECHNOLOGY	
RS-232	TD, RD, DCD, DTR, GND, SDR, RTS, CTS, RI
Connector	DB9 Male (DTE)
Data Rate	Up to 460.8 Kbps
USB TECHNOLOGY	
Connector	USB Type B Female
Standard	2.0 (Backward Compatible)
Data Rate	12 Mbps
POWER	
Source	USB Port
Input Voltage	5 VDC
Consumption	~ 0.5 W (Low power device, draws less than 100 mA)
SOFTWARE	
Driver CD	Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
MECHANICAL	
Dimensions	5.8 x 3.2 x 1.6 cm (2.3 x 1.3 x .6 in)
Enclosure	In-line mounted, plastic
Weight	0.23 lbs (104.3 g) with USB Cable
ENVIRONMENTAL	
Operating Temp	32 to 158°F (0 to70 °C)
Storage Temp	-40 to 185 °F (-40 to 85 °C)
Op Humidity	0 to 95 % (Non-condensing)
MTBF	1946086 hours
MTBF Method	Parts Count Reliability Prediction
REGULATORY	
Approvals	FCC, CE

CERTIFICATIONS				
Test	**Description**		**Test Level**	**Level**
IEC 61000-4-2	ESD	Contact Air	±8kV ±15kV	±8kV ±15kV
IEC 61000-4-3	Radiated Immunity		3 v/m	3 v/m
IEC 61000-4-4	Burst (Fast Transient)	Serial USB	±500 ±500	±500 ±500
IEC 61000-4-6	Induced (Conductive) RFI	Serial USB	3 V RMS 3 V RMS	3 V RMS 3 V RMS
EN 55022/CISPR 22	Emissions		3 meters	Class B

PINOUT:
RS-232 DB9 MALE DTE CONNECTOR

PIN	DIRECTION	SIGNAL NAME
1	Input	DCD (Receive Line Signal Detector)
2	Input	RD (Receive Data)
3	Output	TD (Transmit Data)
4	Output	DTR (DTE Ready)
5	N/A	SG (Signal Ground)
6	Input	DSR (DCE Ready)
7	Output	RTS (Request to Send)
8	Input	CTS (Clear to Send)
9	Input	RI (Ring Indicator)

MECHANICAL DIAGRAM



USB to TTL Mini-Converters

TTL5USB9M & TTL3USB9M

PRODUCT FEATURES

- Connect 5 & 3.3V TTL Devices to your USB Port
- Perfect for Field Service Applications
- Small – Fits easily into any laptop bag
- USB Port Powered
- USB 2.0 (12 Mbps) Compatible
- TTL Data rates up to 460.8 Kbps
- Supports Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)

Universal Serial Bus (USB) has become the connectivity workhorse of today's PCs, replacing the familiar serial ports. However, many commercial and industrial devices still use the TTL interface. To connect these devices to modern PCs, you need a simple and reliable conversion solution. The TTL5USB9M and TTL3USB9M offer this solution in a space saving, USB Port powered package.

Simply install the drivers supplied on CD ROM and plug the converter into an available USB port on your computer or USB hub. The device will show up as an additional COM port in the Windows Device Manager which is fully compatible with your Windows applications. Choose the TTL5USB9M for 5V TTL and the TTL3USB9M for 3.3V TTL. Locked serial number versions are also available. A one meter USB cable is included.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
TTL5USB9M	USB to 5V TTL Mini-Converter
TTL3USB9M	USB to 3.3V TTL Mini-Converter
TTL5USB9M-LS	USB to 5V TTL Mini-Converter (Locked Serial Number)
TTL3USB9M-LS	USB to 3.3V TTL Mini-converter (Locked Serial Number)

ACCESSORIES

USBAMBM-3F - 3 ft. (1 M) USB Cable (One Included)

Locked Serial Numbers Explained

We configure our single-port USB to serial converters in two ways. In standard format, each product has a unique serial number. "Locked serial" format uses the same serial number that is associated with a model type.

If your converter will always be used with the same computer, the standard serialized model is all you need. If the converter is shared among several computers, like field service laptops, the locked serial number model lets you plug and play without having to worry about matching the two.

Description	Serialized	Locked Serial Number
Every unit is assigned a unique COM port	✔	-
Same type model numbers shares the same COM port	-	✔
Ideal applications	Fixed Locations	Field Service

When ordering Locked Serial Number versions, add a "-LS" to the item number. Serialized and Lock Serial Number versions sell for the same price.

USB to TTL Mini-Converters

TTL5USB9M & TTL3USB9M

SPECIFICATIONS

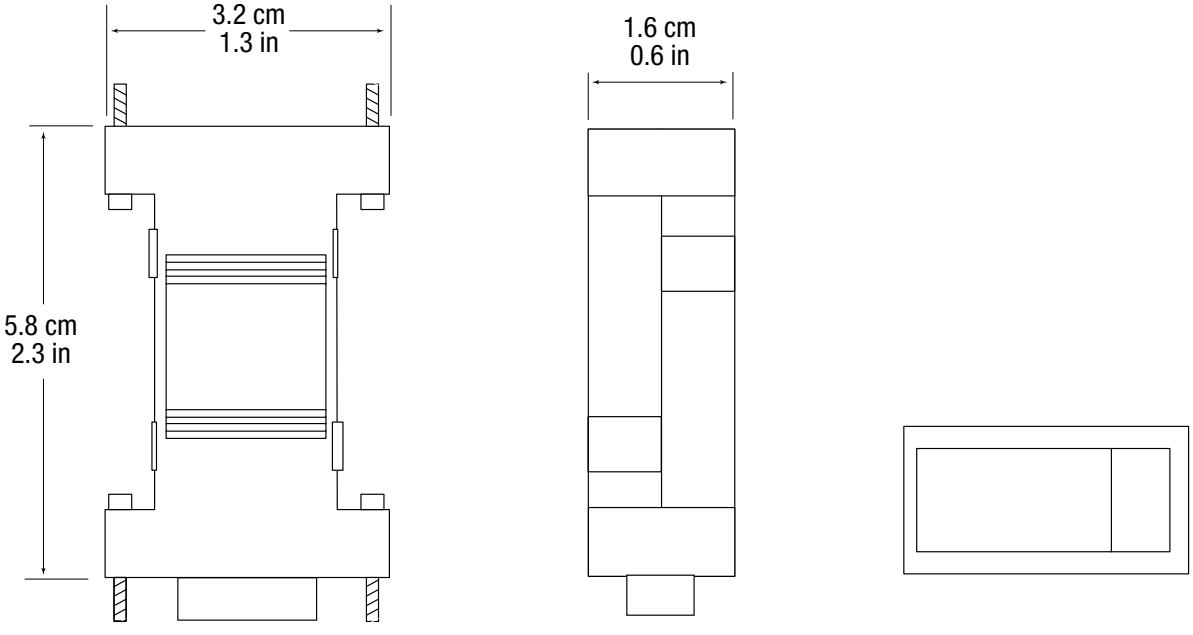
SERIAL TECHNOLOGY	
TTL	TD, RD, CTS, RTS, GND
Level	5V or 3.3V (See Ordering Information)
Connector	DB9 Male
Data Rate	Up to 460.8 Kbps
USB TECHNOLOGY	
Connector	USB Type B Female
Standard	2.0 (Backward Compatible)
Data Rate	12 Mbps
POWER	
Source	USB Port
Input Voltage	5 VDC
Consumption	~ 0.5 W (Low power device, draws less than 100 mA)
SOFTWARE	
Driver CD	Windows 98, ME, 2000, XP, Vista, 7 (32/64 bit), 8 (32/64 bit)
MECHANICAL	
Dimensions	5.8 x 3.2 x 1.6 cm (2.3 x 1.3 x .6 in)
Enclosure	In-line mounted, plastic
Weight	0.23 lbs (104.3 g) with USB Cable
ENVIRONMENTAL	
Operating Temp	32 to 158°F (0 to70 °C)
Storage Temp	-40 to 185 °F (-40 to 85 °C)
Op Humidity	0 to 95 % (Non-condensing)
MTBF	
TTL5USB9M	1981564 hours
TTL3USB9M	1981564 hours
MTBF Method	Parts Count Reliability Prediction
REGULATORY	
Approvals	FCC, CE

CERTIFICATIONS				
Test	**Description**		**Test Level**	**Level**
IEC 61000-4-2	ESD	Contact Air	±8kV ±15kV	±8kV ±15kV
IEC 61000-4-3	Radiated Immunity		3 v/m	3 v/m
IEC 61000-4-4	Burst (Fast Transient)	Serial USB	±500 ±500	±500 ±500
IEC 61000-4-6	Induced (Conductive) RFI	Serial USB	3 V RMS 3 V RMS	3 V RMS 3 V RMS
EN 55022/CISPR 22	Emissions		3 meters	Class B

PINOUT:
RS-232 DB9 MALE DTE CONNECTOR

PIN	DIRECTION	SIGNAL NAME
1	---	Not Used
2	Input	RD (Receive Data)
3	Output	TD (Transmit Data)
4	---	Not Used
5	N/A	SG (Signal Ground)
6	---	Not Used
7	Output	RTS (Request to Send)
8	Input	CTS (Clear to Send)
9	---	Not Used

MECHANICAL DIAGRAM



Four Port Rugged USB Hubs

UHR304 & UHR204

PRODUCT FEATURES

- 4 kV Isolation (Model UHR304)
- High Retention USB Connectors
- Level 4 ESD Protection – 15kV
- Rugged Metal Case – Panel & DIN Rail Mount
- Wide Operating Temperature (-40 to 80°C)
- USB 2.0 – Full Speed (12 Mbps) Model UHR304
- USB 2.0 – High Speed (480 Mbps) Model UHR204

The UHR304 and UHR204 are Industrial Grade Four Port USB Hubs. They are designed and tested to meet heavy industrial EMC standards and are UL listed for Class 1 Division 2 hazardous locations. High retention USB connectors hold standard USB cables tight and are perfect for high vibration applications - requiring up to 3.2 lbs-force to disconnect them. Model UHR304 has 4 kV Isolation between the upstream and downstream USB ports to protect expensive equipment from dangerous ground loops and to help ensure data integrity.

The Heavy Industrial EMC specifications allow these hubs to operate where standard office grade hubs fail – such as near variable frequency drives, motor control centers, welding, and other large electrical loads.

They are powered from an external 10 to 30 VDC source. The non-isolated UHR204 may also be powered from the USB bus. Two power connectors are provided - terminal block or threaded / lockable barrel plug. Refer to ordering information for power supply recommendation. Each downstream port provides up to 500 mA of power to connected USB devices. Refer to the specification table for additional information concerning downstream power. Panel Mount Brackets and a DIN Rail Clip are included.

ORDERING INFORMATION

MODEL NUMBER	USB SPEED
UHR304	4 Port Industrial USB Hub, Isolated
UHR204	4 Port Industrial USB Hub

ACCESSORIES

PS12VLB-INT-MED - Power Supply 12VDC, Medical Grade - US, EU, UK Blades

MDR-20-24 - DIN Rail Mount Power Supply 24VDC, 1.0A

USBAMBM-15F - Type A Male to Type B Male, 15 ft. (4.6 m)

USBAMBM-3F - Type A Male to Type B Male, 3 ft. (0.9 M) (Grey)

USBAMBM-6F - Type A Male to Type B Male, 6 ft. (1.8 m) (Grey)

Learn More!

WATCH A DEMO!

USB Hubs -
Built for Industrial Applications

www.bb-elec.com/USBHubs

*Carrier data charges may apply.

Four Port Rugged USB Hubs

UHR304 & UHR204

SPECIFICATIONS

USB INTERFACE	
Standards	USB 1.1 & 2.0
Upstream Port	(1) Type B Female – High Retention
Downstream Port	(4) Type A Female – High Retention
Speed	12 Mbps – Model UHR304 480 Mbps – Model UHR204 Multi-transaction Translator, 1 per port
Isolation	4 kV – Upstream to Downstream Model UHR304
Surge Protection	+/- 0.5 kV DC Ports, +/- 1 kV Signal Ports
ESD	15 kV Air, 8 kV Contact
High Retention	USB Ports require 15 N (3.2 lbs-force) withdrawal force using standard USB Cable
POWER	
Source	External (Required for Model UHR304) Model UHR204 may be bus powered. See Downstream power limitations
Power Connector	Terminal Block or threaded barrel jack
Input Voltage	10 to 30 VDC
Power	UHR204 – 16 Watts (External Source) UHR304 – 16 Watts (External Source)
Power TB	3 Position, 5.08 mm spacing, 28-12 AWG, Solid Wire
Barrel Jack	Locking / Threaded, 5.5 mm, Center Positive
Downstream Power	500 mA per port 100 mA per port when bus powered.
INDICATORS	
Power	Green LED (External Power) Yellow LED (Bus Power)
Port Ready	Green LED

MECHANICAL	
Dimensions	13.9 x 8.7 x 3.5 cm (5.5 x 3.5 x 1.4 in)
Enclosure	IP 30, Metal
Weight	1.4 lbs (635 g)
MTBF UHR204	211,773 Hours
MTBF UHR304	190,999 Hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C
Storage Temperature	-40 to 85°C
Operating Humidity	0 to 95% Non-condensing
APPROVALS/CERTIFICATIONS	
Emissions	FCC Class B, CISPR Class B (EN55022)
CE	EN61000-6-2:2005 (Heavy Industrial) EN61000-4-2:2008 (ESD) +/- 8kV contact, +/-15 kV air EN61000-4-3:2006 (RI) 10 V/m, 80-1000 Mhz; 3 V/m 1.3 to 2.7 GHz EN61000-4-4:2004 (EFT Burst) +/- 2kV DC ports; +/- 1 kV signal ports EN61000-4-5:2005 (Surge) +/- 2 kV com; +/- 1 kV differential EN61000-4-6:2008 (CI) 10 Vrms, 0.15 to 80 MHz EN61000-4-8:2001 (Magnetic) 10 A/m, 50 Hz & 60 Hz
Other	IEC60068-2-27 (Shock) 50G Peak, 11 ms, 3 axes IEC60068-2-6 (Vibration) 140-500 Hz, 4G, 3 axes IEC60068-2-32 (Drop) 10 total drops from sides, corner, edges
UL	Class 1 Division 2 Listed File: E245458

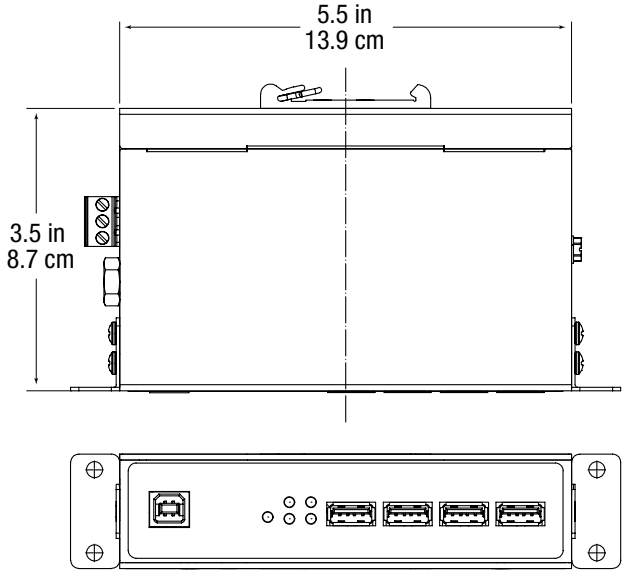
UL INFORMATION

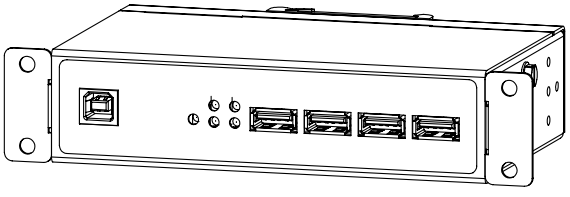
LISTED

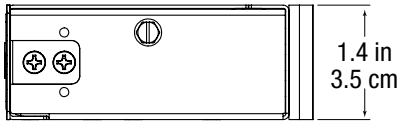
Suitable for use in Class 1, Division 2, Groups A, B, C and D Hazardous Locations, or Nonhazardous locations only.
WARNING - EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.
WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2
Install in accordance with control drawing number 9340R0.

Ind. Cont. Eq.
For HAZ LOC
3HTV
E245458
Class I, Div. 2, Groups A, B, C & D
Temp. Code: T4A

MECHANICAL DIAGRAM







Seven Port Industrial Grade USB Hubs

UHR207 & UHR307

PRODUCT FEATURES

- 4 kV Isolation (UHR307)
- High Retention USB Connectors
- ESD Protection – 15 kV Air
- Rugged Metal Case
- Wide Operating Temperature (-40 to 80°C)
- USB 2.0 – Refer to Specification Table
- Panel Mount Brackets & DIN Rail clip

The UHR207 and UHR307 are Industrial Grade Seven Port USB Hubs. Model UHR307 includes 4 kV isolation. They are designed and tested to meet heavy industrial EMC standards. High retention USB connectors hold standard USB cables tight and are perfect for high vibration applications – requiring up to 3.2 lbs-force to disconnect them.

The Heavy Industrial EMC specifications allow these hubs to operate where standard office grade hubs fail – such as near variable frequency drives, motor control centers, welding, and other large electrical loads.

4 kV Isolation (UHR307) between the upstream and downstream USB ports protects expensive equipment from dangerous ground loops and helps ensure data integrity.

They are powered from an external 10 to 30 VDC source. Two power connectors are provided – terminal block or threaded / lockable barrel plug. Refer to ordering information for power supply recommendation. Each downstream port provides up to 500 mA of power to connected USB devices.

ORDERING INFORMATION

MODEL NUMBER	USB SPEED
UHR307	Rugged 7 Port USB Hub, Isolated
UHR207	Rugged 7 Port USB Hub

ACCESSORIES

PS12VLB-INT-MED - Power Supply 12VDC, Medical Grade - US, EU, UK Blades

MDR-20-24 - DIN Rail Mount Power Supply 24VDC, 1.0A

USBAMBM-15F - Type A Male to Type B Male, 15 ft. (4.6 m)

USBAMBM-3F - Type A Male to Type B Male, 3 ft. (0.9 m) (Grey)

USBAMBM-6F - Type A Male to Type B Male, 6 ft. (1.8 m) (Grey)

Learn More!

WATCH A DEMO!

Reliable USB Connectivity in Industrial Applications

www.bb-elec.com/USBTips

*Carrier data charges may apply.

Seven Port Industrial Grade USB Hubs

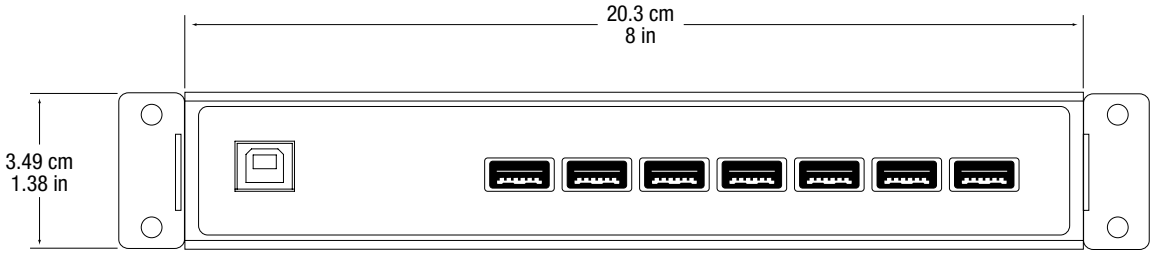
UHR207 & UHR307

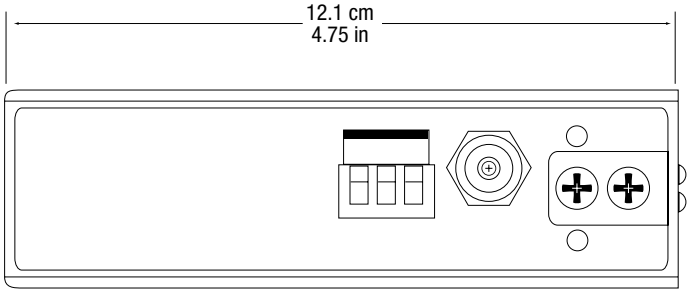
SPECIFICATIONS

USB INTERFACE	
Standards	USB 1.1 & 2.0
Upstream Port	(1) Type B Female – High Retention
Downstream Port	(7) Type A Female – High Retention
Speed	12 Mbps – Model UHR304 480 Mbps – Model UHR204 Multi-transaction Translator, 1 per port
Isolation	UHR307 - 4 kV – Upstream to Downstream
Surge Protection	+/- 0.5 kV DC Ports, +/- 1 kV Signal Ports
ESD	15 kV Air, 8 kV Contact
High Retention	USB Ports require 15 N (3.2 lbs-force) withdrawal force using standard USB Cable
POWER	
Source	External
Power Connector	Terminal Block or threaded barrel jack
Input Voltage	10 to 30 VDC
Power	30 Watts
Power TB	3 Position, 5.08 mm spacing, 28-12 AWG, Solid Wire
Barrel Jack	Locking / Threaded, 5.5 mm, Center Positive
Downstream Power	500 mA per port
INDICATORS	
Power	Green LED
Port Ready	Green LED

MECHANICAL	
Dimensions	20.3x12.1x3.49 cm (8 x 4.75 x 1.38 in)
Enclosure	IP 30, Metal
Weight	1.4 lbs – 0.64 kilograms
MTBF	UHR307 - 143330 Hours UHR207 - 151173 Hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C 0 to 40°C when using wall plug power supply
Storage Temperature	-40 to 85°C
Operating Humidity	0 to 95% Non-condensing
APPROVALS/CERTIFICATIONS	
Emissions	FCC Class B, CISPR Class B (EN55022)
CE	EN61000-6-2:2005 (Heavy Industrial) EN61000-4-2:2008 (ESD) +/- 8kV contact, +/-15 kV air EN61000-4-3:2006 (RI) 10 V/m, 80-1000 Mhz; 3 V/m 1.3 to 2.7 GHz EN61000-4-4:2004 (EFT Burst) +/- 2kV DC ports; +/- 1 kV signal ports EN61000-4-5:2005 (Surge) +/- 2 kV com; +/- 1 kV differential EN61000-4-6:2008 (CI) 10 Vrms, 0.15 to 80 MHz EN61000-4-8:2001 (Magnetic) 10 A/m, 50 Hz & 60 Hz
Other	IEC60068-2-27 (Shock) 50G Peak, 11 ms, 3 axes IEC60068-2-6 (Vibration) 140-500 Hz, 4G, 3 axes IEC60068-2-32 (Drop) 10 total drops from sides, corner, edges

MECHANICAL DIAGRAM





Four Port Industrial USB Hub

UH104

PRODUCT FEATURES

- High Retention USB Connectors
- 15 kV ESD Protection
- Rugged Panel Mount Case
- Wide Operating Temperature (-40 to 80°C)
- USB 2.0 – High Speed (480 Mbps)

USB Connectivity Where You Need It

The UH104 is a compact, Industrial Grade Four Port USB 2.0 Hub. It has High Retention USB connectors that work with standard USB cables to ensure a tight connection in high vibration applications – requiring up to 3.4 lbs-force to disconnect them. It provides true USB 2.0 data transmission through each port, even during heavy load applications. The UH104 is a plug-and-play device, meaning that there are no additional drivers to load.

Bus Power

The hub is powered entirely by your high power USB port, leaving your installation uncluttered by power cabling. As a bus powered device, it provides 100 mA of power to downstream peripherals. This is adequate for most applications.

Mount it Anywhere

The compact polycarbonate plastic enclosure comes equipped with mounting brackets that you can use to secure it to a panel, counter top, or other flat surface. A standard USB cable is required to connect it to your PC.

Industrial Specifications

Industrial EMC specifications make this hub more robust than other office grade products. See the chart to the right to view the complete list of CE and FCC certifications.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
UH104	4 Port Industrial USB Hub

ACCESSORIES

USBAMBM-3F - 3 ft. (0.9 m) USB Extension Cable

Four Port Industrial USB Hub

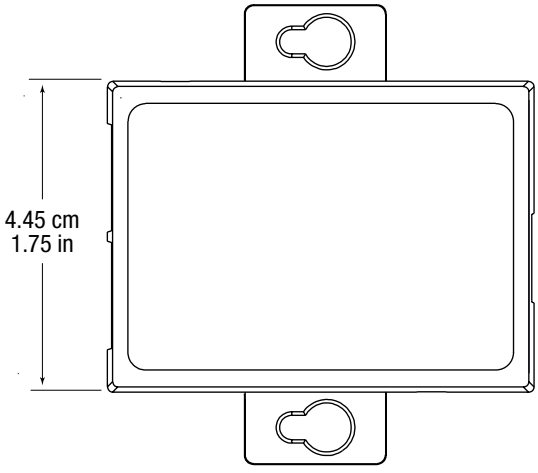
UH104

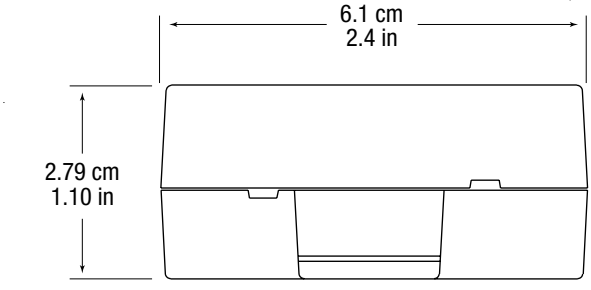
SPECIFICATIONS

USB INTERFACE	
Standards	USB 2.0
Upstream Port	(1) Type B Female – High Retention
Downstream Port	(4) Type A Female – High Retention
Speed	480 Mbps on each port Multi-transaction Translator, 1 per port
ESD	15 kV Air, 8 kV Contact
High Retention	USB Ports require 15 N (3.4 lbs-force) withdrawal force using standard USB Cable
POWER	
Source	5 VDC from USB Bus
Downstream Power	100 mA per port
MECHANICAL	
Dimensions	6.1 x 4.45 x 2.79 cm (2.4 x 1.75 x 1.10 in)
Enclosure	IP 30, Polycarbonate Plastic
Weight	0.11 lbs (49.90 g)
MTBF	552,747 Hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Storage Temperature	-40 to 85°C
Operating Humidity	0 to 95% Non-condensing

APPROVALS / CERTIFICATIONS		
CE		
EN61000-6-1	(Light Industrial)	
EN61000-4-2	(ESD)	+/- 8kV contact, +/-15 kV air
EN61000-4-3	(RI)	3 V/m
EN61000-4-4	(EFT Burst)	+/- 1 kV DC ports +/- 0.5 kV signal ports
EN61000-4-5	(Surge)	+/- 0.5 kV Power
EN61000-4-6	(CI)	3 V/m
OTHER		
IEC60068-2-32	(Drop)	10 total drops from sides, corner, edges
Emissions	FCC Class B, CISPR Class B (EN55022)	

MECHANICAL DIAGRAM





Four Port USB Over Ethernet Server

UE204

PRODUCT FEATURES

- 10/100/1000 Mbps Ethernet
- USB 2.0 @ 480 Mbps
- Compact Size
- 15 kV ESD Protection
- International Power Supply Included

The UE204 USB over IP Server / Hub allows multiple PCs to interact with USB peripheral devices over your local area network. Simply load the free software on your PC and it will locate the USB hub on the network and allow you to use peripheral devices as if they were attached locally. They are ideal for applications in which a installing a local PC would be to cumbersome or expensive, such as kiosks or security applications.

High speed USB 2.0 (480 Mbps) and Gigabit Ethernet allows you to use high bandwidth devices such as IP cameras and some isochronous devices. The easy to use software allows for simple installation and easy setup.

The UE204 is a simple solution for accessing remote USB devices.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
UE204	4-port USB over Ethernet Server

ACCESSORIES

USBAMBM-3F - 3 ft. (0.9 m), Type A Male to Type B Male (Grey)

USBAMBM-6F - 6 ft. (1.8 m) Type A Male to Type B Male (Grey)

USBAMBM-15F - 15 ft. (4.6 m) Type A Male to Type B Male (Gray)

Four Port USB Over Ethernet Server

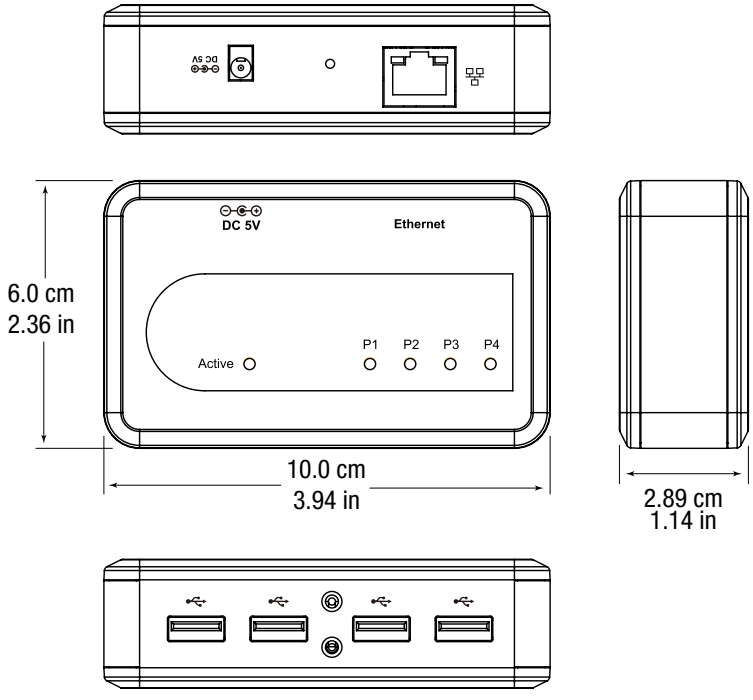
UE204

SPECIFICATIONS

USB & ETHERNET TECHNOLOGY	
USB Compatibility	1.1 and 2.0
USB Speed	1.5, 12, and 480 Mbps
USB Connector	4 x USB Type A Female
Ethernet	10/100/1000 Base T
Ethernet Connector	RJ-45
IP Address	Default = DHCP 169.254.10.10 if DHCP Not Available User Configurable
Operating System	Window 8, 32 & 64 bit Windows 7, 32 & 64 bit Windows 2008 Server, 32 & 64 bit Windows Vista, 32 & 64 bit Windows Server 2003 32 and 64 bit Windows XP 32 and 64 bit
Configuration Software	Included with User Manual on CD
POWER	
Source	External PSU
Power Connector	5.5 mm Barrel Plug, Center Positive
Input Voltage	5 VDC
Power Consumption	2.5 A
USB Downstream Power	500 mA per Port
PSU Input	100 to 240 VAC, 50 / 60 Hz, 0.8 A
AC Input Blades	US, EU, UK Included
PSU Output	5 VDC, 3A

INDICATORS	
Power / Active	Green LED – ON when power applied
P1 – P4	Green LED – ON when USB Port connected
MECHANICAL	
Dimensions	10.0 x 6.0 x 28.9 cm (3.9 x 2.4 x 1.1 in)
Enclosure	Plastic with panel mount slots on back
Weight	UE204 – 0.21 lbs, 95.3 g PSU – 0.38 lbs, 172.4 g
MTBF UE204	63,124 Hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	0° to 60°C
Storage Temperature	0° to 70°C
Operating Humidity	0 to 95% Non-condensing
APPROVALS / CERTIFICATIONS	
Emissions	FCC Class B, CISPR Class B (EN55022)
	EN61000-4-2:2008 (ESD) +/-8kV Contact, +/-15kV Air
	EN61000-4-3:2006 (RI) 10V/m, 80-1000MHz; 3V/m, 1.3 to 2.7 GHz
	EN61000-4-4:2004 (EFT Burst) ±0.5V Power, ±1kV Data
	EN61000-4-5:2005 (Surge) ±0.5kV DC, 2kV AC ±1kV Data
	EN61000-4-6:2005 (CI) 10Vrms all ports
	EN61000-4-8:2001 (Magnetic) 30 A/m

MECHANICAL DIAGRAM



ISOLATE, CONVERT, EXTEND & CONNECT

USB was a great leap forward. Its convenience, flexibility, and interoperability have simplified everything from cabling to device installation. You can connect up to 127 devices using a single port. You can connect new peripherals without opening your computer to insert an expansion card. Devices are hot swappable. Cables are interchangeable. USB will even supply power to a downstream device.

But as good as it is, USB was originally designed with safe office and IT environments in mind. When it moves out into the real world, as it is currently doing in industries ranging from manufacturing to health care, USB reveals a number of inherent weaknesses. USB has an effective range limitation of only 30 meters, even when using hubs. It is susceptible to ground loops, electromagnetic interference (EMI), and electrostatic discharges (ESD). It can provide 500 mA power to downstream devices, but that same capability can lead to arcing and fire when cables come loose. And it's not designed to communicate with older protocols. When you take USB off the desktop you'll need to consider each of those issues.

USB'S RANGE LIMITATION: CONVERSION AND EXTENSION

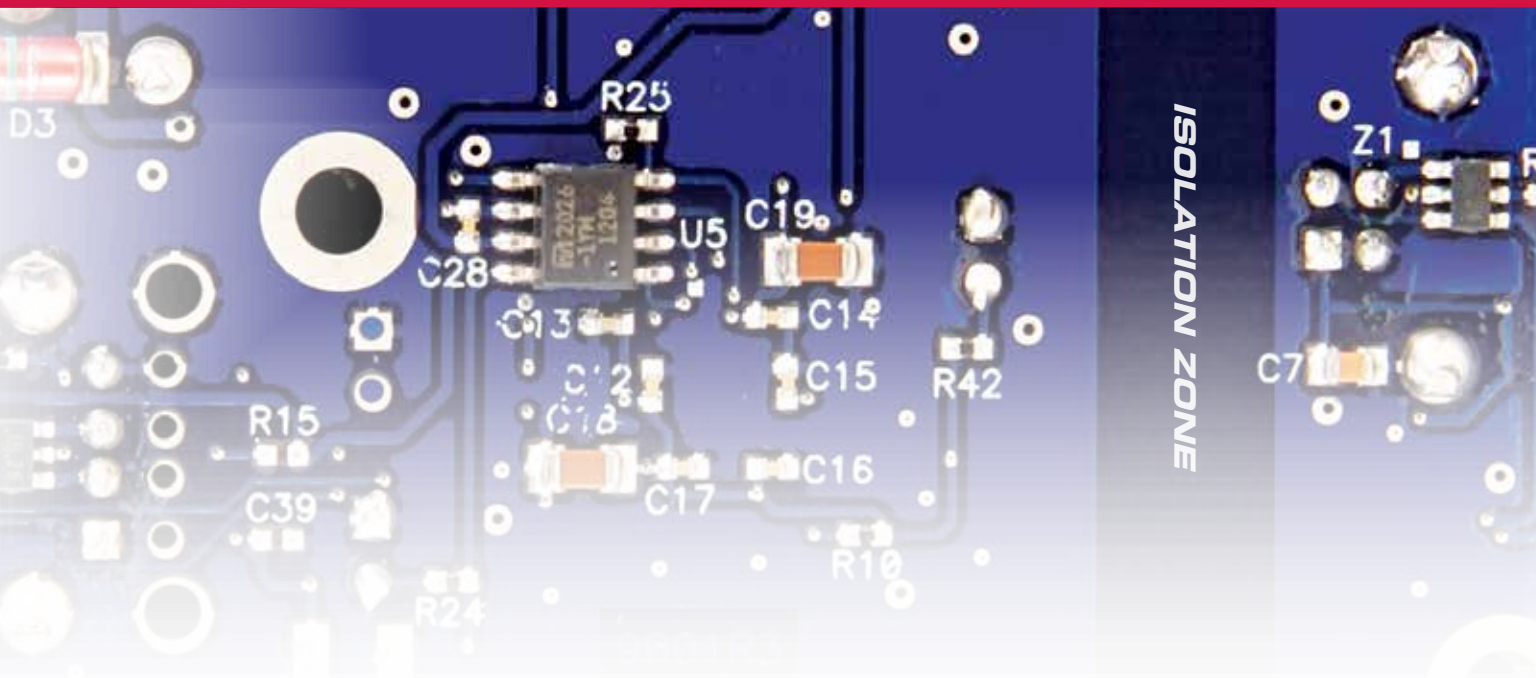
In a straight line, USB's 30 meter range is roughly the height of a nine-story building. At first glance, that sounds pretty good. But data communications cables rarely get to travel in a straight line. They are normally laid above, below and around working spaces, so it can easily require 30 meters of cable to connect two pieces of equipment that are, in actuality, only 10 meters apart. Thirty meters may be adequate for home/office environments, but for industry it is not enough.

You can address the USB range limitation through extension and conversion. For example, in situations where installing a local PC would be impractical, as in kiosks or security applications, a USB-over-Ethernet server would let you connect multiple USB devices at a remote location, convert the data stream for TCP/IP transmission over Ethernet, and then control the devices from a central office. The intervening Ethernet connection can be Category 5 cable, fiber optics, or radio. In each case the data stream will be converted to a different protocol, but the data itself will move smoothly.

In some situations there is another conversion option. If, as often happens, there is already a legacy coaxial or telephone cable system in place you can eliminate the labor and material costs of a Cat 5 cable installation by deploying a pair of Ethernet extenders. Ethernet extenders use DSL technology to convert your data for transmission over the legacy copper cable, and to convert it back again at the other end. The savings can be quite substantial.

EXPLOIT THE BENEFITS OF USB WHILE ELIMINATING ITS WEAKNESSES

And although serial communications protocols pre-date USB by decades, there is no need to leave your legacy serial devices out of the loop. You can acquire USB-to-serial converters for virtually any application, from heavy-duty, multi-port, DIN rail mounted converters to simple inline converters that USB-enable just a single device.



SPIKES, SURGES AND GROUND LOOPS: THE NEED FOR ISOLATION

USB cables behave well enough in the home office, but in industrial environments they are the weakest link in the USB specification. For example, a powerful magnetic field like those found around industrial motors can induce current on the USB cable and burn out expensive components in connected PLCs and machinery. Ordinary surge suppressors will not protect you.

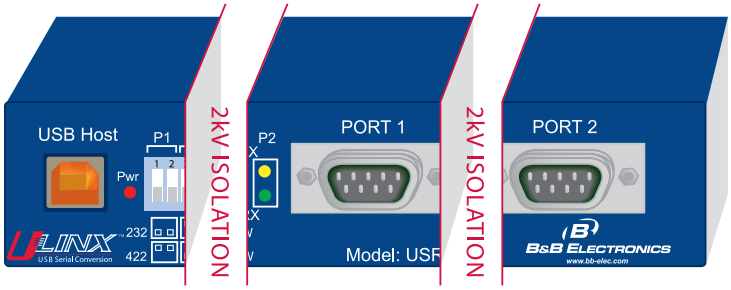
Surge suppression tries to limit spikes between the signal and ground line. But if the ground line rises, as it does in ground loop situations, then surge suppression is powerless to intervene. The answer is USB isolation.

USB cable contains four wires: two are for data and two carry 5 VDC power for downstream devices. Isolation works by changing the nature of the signal on the two USB data lines and transforming the 5 VDC power on the other pair. The isolator protects the data lines by converting the signal to either pulses of light or an electrical field, then back to an electrical signal again. It allows data to pass through, but it stops power surges and ESDs at the isolation zone. The isolator controls surges and ESD on the power line by transforming the 5 VDC USB power to AC, then back to DC.

Note that isolators will limit the USB data rate to "Full Speed", or 12 Mbps. This happens because USB devices default to Full Speed until they are able to negotiate a higher connection rate with the USB hub. The negotiation is initiated by the device, which drives 17.78 mA into the D- data line for at least a millisecond, creating what is called a K-chirp. If the hub is "High Speed" (480 Mbps) capable, it will respond by alternately injecting 17.78 mA into the D- and the D+ lines. When the device has detected at least 3 of these chirp pairs it will decide that the hub is High Speed Capable, and it will establish the connection at the higher data rate. Unfortunately, isolators interfere with this negotiation when they convert the DC signal to AC at the isolation zone. So the negotiation for a higher data rate fails, and the connected devices default to Full Speed. That is more than ample for most industrial applications, but it does mean that unprotected, non-isolated High Speed USB connections will normally be faster.

THE RIGHT WAY TO CONNECT.

Older cables were connected with exposed pins that could be bent or broken. USB cables protect their pins inside the connector housing. You may connect and disconnect them over and over again without doing any harm. The design has proven to be quite reliable in desktop applications.



But industrial environments are less benign. Vibration can cause USB cables to work themselves loose, and minor tugging will do the same thing. When that happens in a home office a typical result might be that the printer seems to have stopped working. It is an easy fix. But, in industrial applications, it can mean serious data loss and downtime. And if flammable substances are present, USB's 5 VDC power is enough to pose a risk for fire and explosion. It would be impractical to abandon USB, so some manufacturers are addressing the problem by developing high retention USB ports. They closely resemble the ports you see in office-grade equipment, and plugging in a USB cable feels almost as effortless, but the difference in industrial safety is enormous. A typical high retention port can grip a cable firmly enough to resist 3.4 lbs (1.54 kg) of force.

USB may have been designed for the office environment, but it does not have to stay there. Just isolate, convert, extend and connect. If you do it correctly you can take USB all the way out to the network edge.

One and Two Port Ruggedized USB Isolators

UHR401 & UHR402

PRODUCT FEATURES

- 4 kV Isolation
- High Retention USB Connectors
- ESD Protection – 15 kV Air
- Heavy Duty Case – Panel Mount or optional DIN rail adaptor clips
- USB 2.0 – Full Speed
- One and Two Port Version

The UHR401 and UHR402 are One and Two Port Ruggedized Isolators. They are designed and tested to meet heavy industrial EMC standards. High retention USB connectors hold standard USB cables tight and are perfect for high vibration applications – requiring up to 3.2 lbs-force to disconnect them. They have 4 kV Isolation between the upstream and downstream USB ports to protect expensive equipment from dangerous ground loops and to help ensure data integrity. They are also suitable for integration into medical applications requiring 60601-1 certification.

The Heavy Industrial EMC specifications allow these isolators to operate in unfriendly electrical environments – such as near variable frequency drives, motor control centers, welding, and other large electrical loads.

They are powered from an external 10 to 30 VDC power supply unit. The product comes with an international power supply that has US, EU, and UK blades.

The downstream port(s) provides up to 500 mA of power to connected USB devices.

ORDERING INFORMATION

MODEL NUMBER	USB SPEED
UHR401	1 Port Rugged USB Isolator
UHR402	2 Port Rugged USB Isolator

Both models include a 12 VDC Wall Plug In Power Supply and 6 ft. (1.8 m) USB cable.

ACCESSORIES

PS12VLB-INT-MED - Replacement Power Supply 12Vdc, Medical Grade - US, EU, UK Blades.

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

PSPT-LB - Stripped and Tinned Power connector for use with industrial power supply. Locking Barrel Connector.

USBAMBM-6F - 6 ft. (1.8 m), Type A Male to Type B Male (Grey)

DRAD35 - DIN rail adapter clip

Learn More!

READ ON!

Ruggedized USB Connections for Tough Environments

www.bb-elec.com/USBTough

*Carrier data charges may apply.

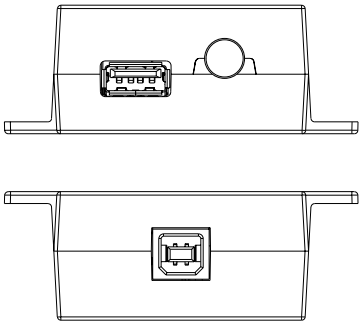
One and Two Port Ruggedized USB Isolators

UHR401 & UHR402

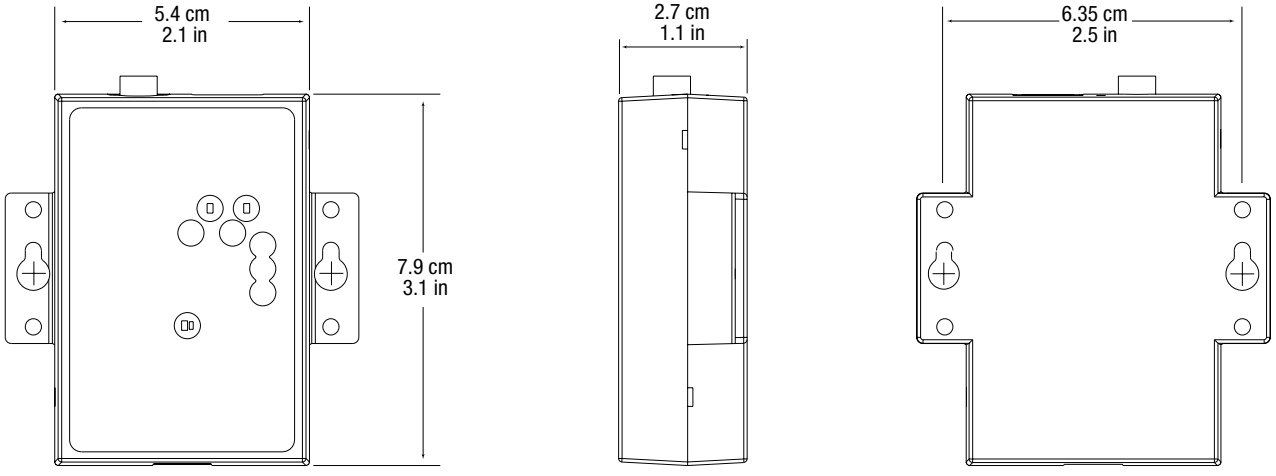
SPECIFICATIONS

USB INTERFACE	
Standards	USB 1.1 & 2.0 (12 Mbps)
Upstream Port	(1) Type B Female – High Retention
Downstream Port	(1 or 2) Type A Female – High Retention
Speed	12 Mbps Multi-transaction Translator, 1 per port
Isolation	4 kV – Upstream to Downstream
ESD	15 kV Air, 8 kV Contact
High Retention	USB Ports require 15 N (3.2 lbs-force) withdrawal force using standard USB Cable
INTERFACE	
USB Ports	High Retention USB Type B (Upstream) , Type A (Downstream), Minimum withdrawal force of 15 Newtons (~3.4 lbs-force)
LED Indicators	Power from USB bus
POWER	
Source	External
Power Connector	Threaded barrel jack
Input Voltage	10 to 30 VDC
PSU	Input :110 – 240 VAC, 50 / 60 Hz US, EU, UK Blades Included Output: 12 VDC
Barrel Jack	Barrel Jack, Center Positive
Power	UHR401 – 4 Watts (External Source) UHR402 – 7 Watts (External Source) Locking / Threaded, Center Positive
Downstream Power	500 mA per port
INDICATORS	
Power	Green LED
Port Ready	Green LED

MECHANICAL	
Dimensions	7.9 x 5.4 x 2.7 cm (3.1 x 2.1 x 1.1 in)
Enclosure	IP 30, Plastic
Weight	0.15 lbs (80 g)
MTBF UHR401	375842 Hours
MTBF UHR402	353807 Hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	0 to 50°
Storage Temperature	-40 to 85°C
Operating Humidity	0 to 95% Non-condensing
APPROVALS/CERTIFICATIONS	
Emissions	FCC Class B, CISPR Class B (EN55022)
CE	EN61000-6-2:2005 (Heavy Industrial) EN61000-4-2:2008 (ESD) +/- 8kV contact, +/-15 kV air EN61000-4-3:2006 (RI) 10 V/m, 80-1000 Mhz; 3 V/m 1.3 to 2.7 GHz EN61000-4-4:2004 (EFT Burst) +/- 2kV DC ports; +/- 1 kV signal ports EN61000-4-5:2005 (Surge) +/- 2 kV com; +/- 1 kV differential EN61000-4-6:2008 (CI) 10 Vrms, 0.15 to 80 MHz EN61000-4-8:2001 (Magnetic) 10 A/m, 50 Hz & 60 Hz
Other	IEC60068-2-27 (Shock) 50G Peak, 11 ms, 3 axes IEC60068-2-6 (Vibration) 140-500 Hz, 4G, 3 axes IEC60068-2-32 (Drop) 10 total drops from sides, corner, edges



MECHANICAL DIAGRAM



Single Port USB Isolators

UH401 Series

PRODUCT FEATURES

- UL 60601-1 Recognized (UH401 & UH401SL)
- 15 kV ESD Protection
- -40 to 80°C Operating Temperature
- High Retention USB Connectors
- Ultra-Compact
- USB Bus Powered
- USB Cable Included

These little isolators pack a powerful punch against electrical noise, surges and spikes – up to 4kV isolation. Protect expensive PCs and equipment from damaging electrical storms, power surges and other high EMI/RFI disturbances. This isolation barrier eliminates ground loops which are disruptive in measurement applications. Model UH401 and UH401SL provide 4 kV Isolation and are UL 60601-1 Recognized, which makes them appropriate for use with medical equipment. UH401-2KV and UH401SL-2KV provide 2 kV Isolation.

All models are USB bus powered and provide up to 100mA of current to attached downstream devices when they are attached to a full power (500 mA) USB host port.

They comply with the USB 1.1 standard and transfer data at either 12 Mbps or 1.5 Mbps. These data rates are preconfigured at the factory. You should select a model that is appropriate for your USB peripheral (low speed or full speed).

Four models are available to choose from. Select a low speed version, UH401SL or UH401SL-2KV if you are using a low speed device. Low Speed devices are typically human interface devices such as a mouse or keyboard. Use the full speed version, UH401 or UH401-2KV for full speed USB device.

ORDERING INFORMATION

MODEL NUMBER	USB SPEED	ISOLATION
UH401	Full (12 Mbps)	4 kV
UH401SL	Low (1.5 Mbps)	4 kV
UH401-2KV	Full (12 Mbps)	2 kV
UH401SL-2KV	Low (1.5 Mbps)	2 kV

IN THE FIELD

Protecting Laptops on Field Service Calls

Industry: Industrial Automation
Product: USB Isolators

www.bb-elec.com/USBField

UH401, UH401-2KV

Carrier data charges may apply.

IN THE FIELD

USB Isolation in Medical Applications

Industry: Industrial Automation
Product: USB Isolators

www.bb-elec.com/USBMedical

UH401, UH401-2KV

Carrier data charges may apply.

Single Port USB Isolators

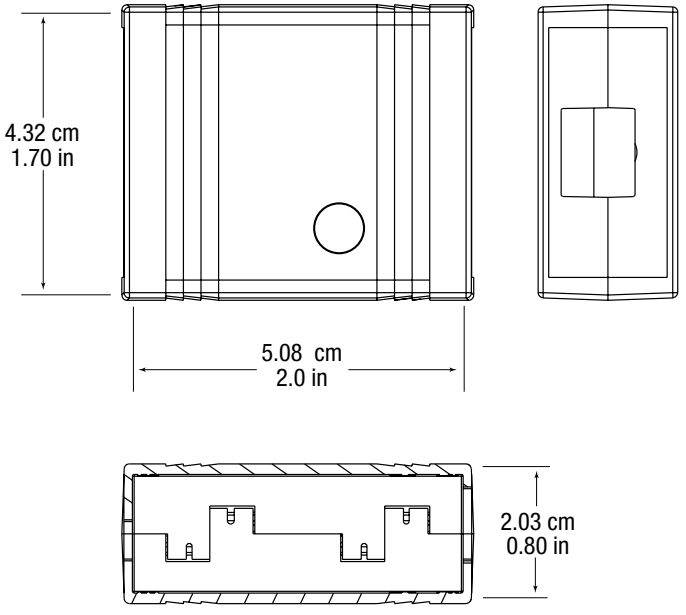
UH401 Series

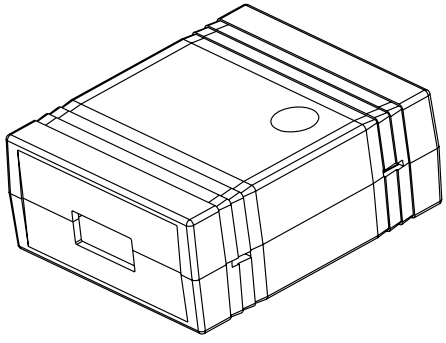
SPECIFICATIONS

TECHNOLOGY	
Standards	USB 1.1, 12 Mbps (UH401 & UH401-2KV) or 1.5 Mbps (UH401SL & UH401SL-2KV) Note: These devices are transparent to the operating system, require no software drivers and will not be enumerated in device manager.
INTERFACE	
USB Ports	High Retention USB Type B (Upstream) , Type A (Downstream), Minimum withdrawal force of 15 Newtons (~3.4 lbs-force)
LED Indicators	Power from USB bus
POWER	
Input Voltage	Standard USB bus power (5VDC)
Downstream Power Provided	Up to 100mA with full power upstream connection
Isolation UH401-2KV Isolation UH401SL-2KV Isolation UH401 Isolation UH401SL	2KV 2KV, 4KV 4KV

ENVIRONMENTAL	
Operating Temperature	-40 to 80° C (-40 to 176° F)
MTBF	1,049,851 hours
MTBF Calculation	MIL 217F Parts count reliability prediction
MECHANICAL	
Enclosure	IP30 plastic case
Dimensions	4.32 x 5.08 x 2.03 cm (1.7 x 2.0 x 0.8 in)
APPROVALS/CERTIFICATIONS	
Emissions	FCC Class A, CISPR Class A (EN55022)
CE	EN61000-6-2:2005 (Heavy Industry) EN61000-4-2:2008 (ESD +/-8kV Contact, +/-15kV Air EN61000-4-3:2006 (RI) 10V/m, 80-1000MHz; 3V/m, 1.3 to 2.7 GHz EN61000-4-4:2004 (EFT Burst) +/-2kV DC ports; +/-1kV signal ports EN61000-4-5:2005 (Surge) +/-500V DC ports ; +/-1kV signal ports EN61000-4-6:2005 (CI) 10Vrms, 0.15 to 80 MHz EN61000-4-8:2001 (Magnetic) 10A/m, 50Hz & 60Hz

MECHANICAL DIAGRAM





Compact USB Port Isolator

UH201

PRODUCT FEATURES

- 2000 Volt isolation
- ESD protection – 4 kV contact
- Compact, portable USB “key style” enclosure
- USB 2.0 – full speed (12 Mbps)
- Wide operating temperature (-40 to 80 C°)

USB has become the standard for connecting everything from sensors to controllers and motor drives to your PC or hand held computer. But USB was not intended for use outside of the electrically clean office or home environment. This can lead to expensive problems when you need to access data from a device installed in the field or in the factory.

Any time you connect remote I/O equipment to your computer there will be a risk for electrostatic discharge (ESD), power surges, ground loops, and electromagnetic interference /radio frequency interference (EMI/RFI). Any one of these events could damage your USB port or your entire PC. Why take a chance? Protect your investment with isolation technology from B&B Electronics.

The compact UH201 fits easily inside your laptop case or pocket. It has male and female type A USB connectors. It connects directly to your USB port and provides protection up to 2000 Volts. Its high speed digital isolation chip electrically separates your PC from the remote I/O device while allowing full speed USB 2.0 communications at data rates up to 12 Mbps – the top of the line for isolation products.

Note: High speed, 480 Mbps USB 2.0 devices cannot be isolated with today’s technology.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
UH201	Compact USB Port Isolator

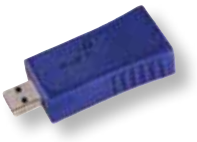
ACCESSORIES

USBAMBM-3F - 3 ft. (0.9 m), Type A Male to Type B Male (Grey)

USBAMBM-6F - 6 ft. (1.8 m) Type A Male to Type B Male (Grey)

Compact USB Port Isolator

UH201



SPECIFICATIONS

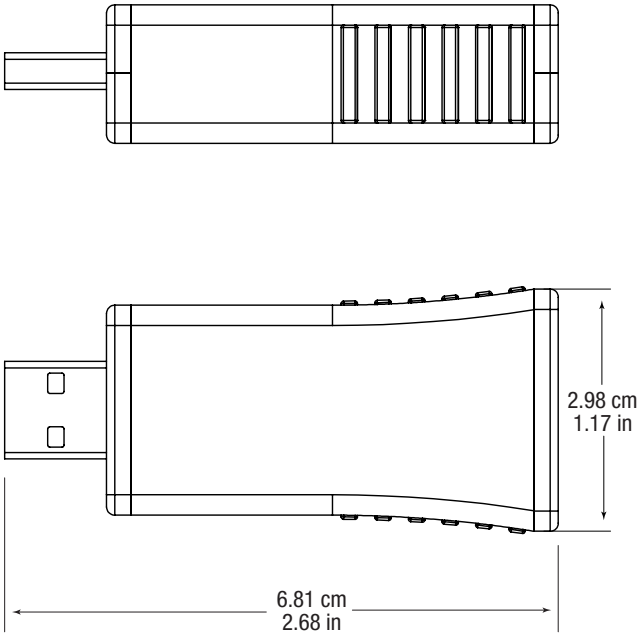
USB INTERFACE	
Standards	USB 2.0 (at USB 1.1 speed)
Upstream Port	Type A Male
Downstream Port	Type A Female
Speed	12 Mbps Note: High speed 480 Mbps not possible with existing isolation technology.
Isolation	2.0 kV
ESD	Level 2, ± 4 kV
POWER	
Source	Bus powered
Downstream Power	400 mA when connected to a high
MECHANICAL	
Dimensions	6.8 x 3.0 x 1.7 cm (2.7 x 1.2 x 0.7 in)
Enclosure	IP 30, plastic overmolded
Weight	22.7 g (0.05 lbs)
MTBF	2,624,561 hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95% non-condensing

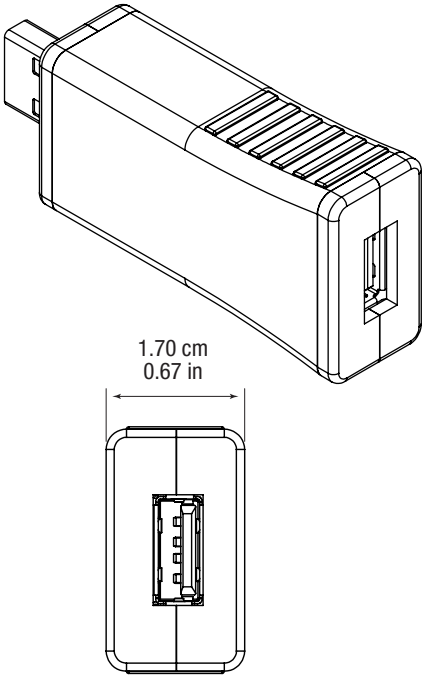
APPROVALS / CERTIFICATIONS			
Emissions	FCC Class A, CISPR Class A (EN55022)		
CE	EN61000-6-2:2005	(Light Industrial)	
	EN61000-4-2:2008	(ESD)	+/-4kV Air
	EN61000-4-3:2006	(RI)	3V/m
	EN61000-4-4:2004	(EFT Burst)	500V
	EN61000-4-6:2005	(CI)	3 VRMS

INFORMATION – FCC RULES

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference that may cause undesired operation.

MECHANICAL DIAGRAM





USB 3.0 Surge Protector

Model USBSSP2

PRODUCT FEATURES

- USB 3.0 data transfer rates of up to 5 Gbps
- USB 2.0 backwards compatible
- 5.0 VDC clamping voltage on data lines
- 5.6 VDC clamping voltage on power line
- Compact form factor

USB Connectivity In Tough Environments
USB was not intended for use outside of the electrically clean office or home environment. This can lead to expensive problems when you need to access data from a device installed in the field or in the factory.

Any time you connect remote I/O equipment to your computer there will be a risk for electrostatic discharge (ESD) or transient surges. Either of these events could damage your USB port or your entire PC. Why take a chance? Protect your investment with the USB Sentinel surge suppressor.

Easy to Use
The compact USB Sentinel fits easily inside your laptop case or pocket. It is transparent to the operating system, host computer or hub. It requires no drivers.

The USB Sentinel protects the USB port on your computer against power surges and other types of voltage disturbances on your USB cables at USB 2.0 and USB 3.0 speeds.

Rugged Specifications
The USB signals have a clamping voltage of 5.0 volts. The power line has a clamping voltage of 5.6 volts. Clamping time is 20 µs.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
USBSSP2	USB 3.0 Surge Protector (with USB 3.0 cable)

ACCESSORIES

520-00071-00 - USB 3.0 Cable (included)

USB 3.0 Surge Protector

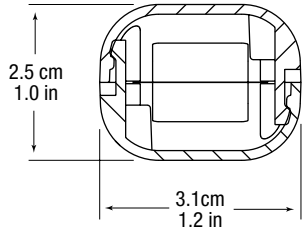
Model USBSSP2

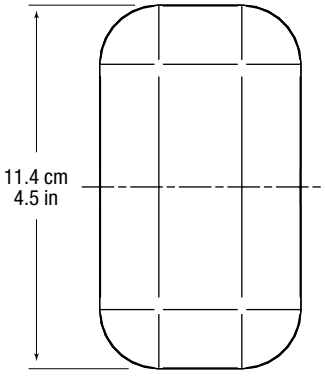
SPECIFICATIONS

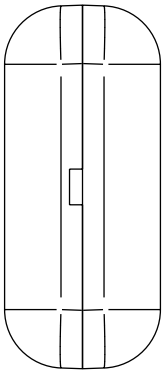
USB INTERFACE	
Standards	USB 3.0
Upstream Port	USB 3.0 Micro Type B
Downstream Port	USB 3.0 Type A Female
Clamping Time	20 µs
Clamping Voltage Data Lines	5.0 VDC
Clamping Voltage Power Lines	5.6 VDC
Surge	700 V data, 1000 V power
MECHANICAL	
Dimensions	11.4 x 3.1 x 2.5 cm (4.50 x 1.22 x 0.96 in)
Enclosure	IP 30, Polycarbonate Plastic
Weight	.8 oz (22.7 g)
MTBF	2,624,561 Hours
MTBF Calc. Method	MIL 217F Parts Count Reliability
ENVIRONMENTAL	
Operating Temperature	0 to 80°C (32 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 176°F)
Operating Humidity	0 to 95% non-condensing

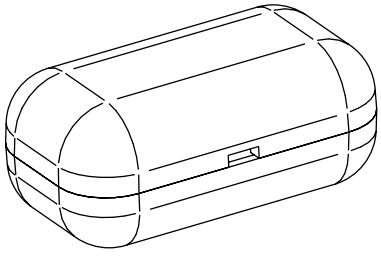
APPROVALS / CERTIFICATIONS		
CE	EN 61000-6-2	(Heavy Industrial)
	EN 61000-4-2	(ESD) ±8 kV/±15 kV (contact/air) 80-1000MHz 10 V/m
	EN 61000-4-3	(RFI) 1.4 - 2.0 GHz, 3 V/m 2.0 GHz – 2.7 GHz, 1V/m
	EN 61000-4-4	(EFT) ±2 kV Power, ±1 kV Data
	EN 61000-4-6	(CI) 10 Vrms all ports
	EN 55022	Emissions FCC Class A, CISPR Class A

MECHANICAL DIAGRAM









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TD B (+)
TD A (-)
RS-232 Optical Isolator/Repeater
Model 485HES

SERIAL CONVERSION

THAT EXTENDS YOUR INDUSTRIAL NETWORK TO THE EDGE

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CONNECT LEGACY SERIAL ASSETS TO NEW NETWORK TECHNOLOGIES

Process improvements continually bring new equipment and technologies to the market. But leveraging the benefits of new systems with costly legacy equipment relies on effective data communications. With the industry's widest selection of serial and fiber conversion devices, B&B Electronics has the tools and guidance you need to make the most of all your equipment investments - old or new.

People have been predicting the demise of serial communications for years. Yet, there are millions of serial ports still performing in the field today. B&B Electronics keeps perfectly good, even costly old equipment operating and data flowing with serial and fiber optic conversion and isolation products.

- *Industrial automation & process control*
- *Warehouse and building automation*
- *Petroleum, natural gas, mining*
- *Electric utilities, smart grids, submetering*
- *Water/wastewater*
- *Alternative energy sources*
- *Security*
- *Traffic control*
- *In-cabinet conversion*
- *Motors and drives*

SERIAL CONVERTERS & REPEATERS

Hardened Converter & Repeaters
- UL, Class 1/Division 2 listed
- NEMA TS1/TS2 requirements for transportation
- IEC 61850-3 rated for electrical substations
- Shock and vibration tested
- 3-way, 2 kV optical isolation - input/output/power
- Level 4 ESD protection, 15 kV air, 8 kV contact
- Wide operating temperature range
- Modbus compatible
- Removable terminal blocks
- Automatic Send Data Control

Isolated Converters
- UL, Class 1/Division 2 listed
- UL Recognised
- UL 508 certification, EMX rated
- Isolated and non-isolated versions
- ESD protection - 8 kV contact, 15 kV Air
- Built-in switchable bias & termination
- Wide operating temperature range
- Modbus compatible
- Automatic Send Data Control
- Up to 1,200 meter (4,000 ft.) range
- Address up to 32 nodes
- DIN rail, inline, or panel mount
- NEMA TS2 options

Fiber Optic Converters
- UL, Class 1/Division 2 listed
- UL Listed
- UL Recognised
- IEC 61850-3 rated for electrical substations
- Shock and vibration tested
- Optical isolation
- Single- and multi-mode, SC or ST
- High bandwidths
- Impervious to noise and ground differentials
- Modbus compatibility
- Wide operating temperature range

Fiber Optic Modems
- Optical isolation
- Connectors: multi-mode ST fiber; 9-pin serial
- Modbus compatible
- Up to 4 km (2.5 mi) range
- Port-powered

Port Powered Converters
- Port powered (battery or external options)
- Up to 1,200 meter (4,000 ft.) range
- Automatic Send Data Control
- Modbus compatibility

TTL Converters
- UL Listed
- 2-channel TTL to RS-232/422 bi-directional
- Isolated and non-isolated versions
- 3.3 or 5 V versions
- Port powered or external power supply

Current Loop Converters
- Optical isolation
- 20 mA current loop
- Transmit (T+, T-) and Receive (R+, R-) loop; active or passive
- UL Recognised
- Wide operating temperature range

CAN/Fiber Converter
- CAN (Controller Area Network)
- Optical isolation to 2 kV
- Terminal block connections
- Extend network node capacity
- DIN rail mount

REPEATERS

- UL, Class 1/Division 2 listed
- UL Recognised
- Shock and vibration tested
- Optical isolation
- Surge suppression
- Wide operating temperature range
- Modbus compatible
- Automatic Send Data Control
- Up to 1,200 meter (4,000 ft.) range
- DIN rail, panel, inline mounting
- NEMA TS2 options

SURGE PROTECTORS & ISOLATORS

Heavy-duty, 3-stage Surge Protectors

- IEEE 1000-4-5: 1995 and IEEE C62.41-1991 rated
- 3 stages: 1) gas discharge tube, 2) series resistor, 3) transient voltage suppressor
- Protected Signal Ground connection
- Dedicated chassis #10 grounding screw
- NEMA TS2 options

1-stage Surge Protectors

- 600W surge suppression
- Fast-acting 125 mA PCB fuses (disposable)

SERIAL CARDS

PCI Cards

- Add multiple serial ports to PCs
- RS-232, RS-422/485
- Optical isolation
- Data rates up to 2.5 Gbps
- 5 and 3.3 V PCI bus compatible
- Full height or low-profile options
- 16550 or 16750 UARTS, 16 or 64-byte or 1024FIFOs
- Hot swapping, plug-and-play

DATA TOOLS & ADAPTERS

Port Combiners, Splitters, Data Taps, Mini Tester

- Port combiners - monitor, control multiple serial devices via one PC port
- Port splitters - multiple PCs share peripheral serial devices
- Data taps - monitor and record RS-232 serial data lines transparently
- Mini tester - check RS-232 lines for data activity or device failures

Class 1/Division 2 Certified For Hazardous Locations

485DRCi-PH
232OPDRi-PH
485OPDRi-PH
FOSTCDRi-PH-xx series

For applications requiring Class 1/Division 2 certification, B&B Electronics has a range of connectivity and communication solutions designed to operate in hazardous environments.

- see page 470 for a complete listing of C1D2 products.

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SERIAL CONVERSION

WHICH IS RIGHT FOR YOU?

SERIAL CONVERTERS & REPEATERS

PRODUCT FAMILY	Hardened Converters & Repeaters	Isolated Converters	Fiber Optic Converters
Features:			
Serial to [protocol]	RS-232/422/485, Fiber Optic	RS-232, RS-422/485	Fiber Optic
Isolation?	✔	✔	✔
RS-232 Connector	DB9 female	DB9 female, DB25 female, terminal block	Terminal block
RS-422/485 Connector	Terminal block	Terminal block	
Fiber Connector	SC or ST, Single- or multi-mode		SC or ST, Single- or multi-mode
Fiber Range	4 or 15 km (2.5 or 9 mi)		4 or 15 km (2.5 or 9 mi)
TTL Connector			
Current Loop Connector			
CAN Connector			
Data Rate	Up to 115.2 kbps	Up to 460.8 kbps	Up to 115.2 kbps
Automatic Send Data Control?		✔	✔
Modbus?	✔	✔	✔
Wide Temperature?	✔	✔	✔
Power	10-48 VDC, external	10-30 VDC or 10-48 VDC, external	10-30 VDC or 10-48 VDC, external
Mounting	Panel (DIN rail option)	DIN rail, inline, panel	DIN rail (panel option)
Additional Features *(may vary by model)*	UL Listed C1/D2. IEC 61850-3/electrical substations. Shock, vibration tested. NEMA TS2/transportation (repeater models).	UL Recognized. UL Listed C1/D2. NEMA TS2 Built-in switchable bias & termination.	UL 508. UL Recognized. UL Listed C1/D2. IEC 61850-3/electrical substations. Shock, vibration tested.
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PRODUCT FAMILY	Fiber Optic Modems	Port Powered Converters	TTL Converters
Features:			
Serial to [protocol]	Fiber Optic	RS-422, RS-485, RS-422/485	RS-232/TTL (bidirectional)
Isolation?	✔		✔
RS-232 Connector	DB9 female	DB9 female	DB9 female, DB25 male, DB25 female
RS-422/485 Connector		DB9 female, RJ11, terminal block	
Fiber Connector	Multi-mode ST		
Fiber Range	4 km (2.5 mi)		
TTL Connector			DB9 male, DB25 female, DB25 male
Current Loop Connector			
CAN Connector			
Data Rate	Up to 115.2 kbps	Up to 115.2 kbps	38.4 up to 115.2 kbps
Automatic Send Data Control?		✔	✔
Modbus?			
Wide Temperature?			
Power	Port-powered	Port-powered (battery and external options)	Port-powered (external option)
Mounting	Inline	Inline	Inline
Additional Features *(may vary by model)*			
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SERIAL CONVERSION

WHICH IS RIGHT FOR YOU?

SERIAL CONVERTERS & REPEATERS

PRODUCT FAMILY	Current Loop Converters	CAN Converter	Optically Isolated Repeaters
Features:			
Serial to [protocol]	20 mA Current Loop	CAN (bidirectional)	RS-232, RS-422/485
Isolation?	✔	✔	✔
RS-232 Connector	DB9 female, Terminal block		DB9 male, DB9 female, Terminal block
RS-422/485 Connector			Terminal block
Fiber Connector		ST	
Fiber Range			
TTL Connector			
Current Loop Connector	Terminal block		
CAN Connector		Terminal block	
Data Rate	19.2 kbps	250 kbps	230.4 kbps
Automatic Send Data Control?			✔
Modbus?			✔
Wide Temperature?	✔		✔
Power	Port-powered or external	10-30 VDC, external	10-12-14 VDC, external
Mounting	DIN rail, inline	DIN rail	DIN rail, Inline, panel
Additional Features *(may vary by model)*			UL Recognized. UL Listed C1/D2. Shock, vibration tested. NEMA TS2
Page	442	445	446 - 452

SURGE PROTECTORS

PRODUCT FAMILY	Heavy Duty, 3-Stage	Single-stage
Features:		
Protection *(may vary by model)*	3 Stages for each line: 1 - gas discharge tube 2 - series resistor 3 - transient voltage suppressor Protected Signal Ground connection Dedicated chassis #10 grounding screw	500W surge suppression (500 W for 485FPP) Transient voltage suppressor Fast-acting 125 mA PCB fuses (disposable) #10 grounding screw
Connectors	Terminal blocks	Terminal blocks
Protocol	RS-232, or RS-422/485	RS-422/485
Lines Protected	5 lines - RS-232, or 3 lines - RS-422/485, or 5 lines - RS-422/485	4 lines - RS-422/485
Enclosure	Metal or molded platic	Open board
Mounting	DIN rail, panel	Inline
Additional Features *(may vary by model)*	IEEE1000-4-5:1995, IEEEC62.41-1991, NEMA TS2	
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Heavy Industrial RS-232 to RS-422/485 Isolated Converter

485DRCI-PH

PRODUCT FEATURES

- IEEE-61850-3, IEEE-1613
- NEMA TS2
- -40 to 85°C Operating Temperature
- Rugged IP30 Metal Panel Mount Case
- 50G Shock, 4G Vibration
- 2kV Triple Isolation
- 10 to 48 VDC Input Power

The ILinx™ 485DRCI-PH is our premium Heavy Industrial RS-232 to RS-422/485 Isolated Converter. Designed for rugged industrial environments, it has been put through some of the most exacting compliance tests in the industry. Meeting the requirements of IEC 61850-3 and IEEE 1613, it is suitable for installation in electrical substations. These specifications are more stringent than the NEMA TS1/TS2 requirements for transportation applications. Powerful isolation on both data ports protects your equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits adds a third degree of protection.

Packaged in a rugged IP30 metal case, it converts unbalanced, full or half-duplex RS-232 signals to balanced RS-422/485 signals. Featuring Automatic Send Data Control circuitry, it does not require special software control of handshake signals in RS-485 mode. Our bit-wise enabled circuitry automatically detects the data rate without setting a DIP switch.

ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
485DRCI-PH	Heavy Industrial RS-232 to RS-422/485 Isolated Converter

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	TD, RD, GND
RS-422	TDA(-), TDB(+), RDA(-), RDB(+)
RS-485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+)
RS-485 2-Wire	Data A(-), Data B(+)
RS-232 Connector	DB9 Female (DCE)
RS-422/485 Connector	5 Position, Removable Terminal Block
Data Rate	1.2 to 115.2 Kbps
Isolation	2 KV RMS, 1 minute
Surge Protection	600 W Peak Power Dissipation Clamping time < 1 pico-second
Industrial Bus	MODBUS ASCII / RTU
Bias	Built-in, switchable 1.2KΩ XMT/RCV
Termination	Built-in, switchable 120Ω
POWER	
Source	External
Power Connector	2 Position Removable Terminal Block
Input Voltage	10 to 48 VDC (56 VDC Maximum)
Power Consumption	0.5 W typical (1.9 W with termination)
TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG, Copper wire only.
Pitch	5.08 mm
Insulation Resistance	≥500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm
INDICATORS	
Power	Red LED
TD / RD (Each Port)	Green LED
MECHANICAL	
Dimensions	5.2 x 3.7 x 1.3 in 132.4 x 92.9 x 33.0 mm
Enclosure	IP30 Metal, Panel Mount
Weight	0.46 lbs (208.65 grams)
MTBF	163611 Hours
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	-40 to 85°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 176°F)
Operating Humidity	0 to 95% Non-condensing
REGULATORY	
Approvals	FCC, CE, IEC 61850-3, IEEE 1613 UL C1 D2, File: E245458, NEMA TS2

Heavy Industrial RS-232 to RS-422/485 Isolated Converter

485DRCI-PH

IEC 61850-3 ELECTRO MAGNETIC INTERFERENCE SPECIFICATIONS

TEST	DESCRIPTION		TEST LEVEL	LEVEL
61000-4-2	ESD	Enclosure Contact	8 kV	4
		Enclosure Air	15 kV	4
61000-4-3	Radiated RFI	Enclosure Ports	10 V/m	3
61000-4-4	Burst (Fast Transient)	Signal Ports	4 kV @ 2.5 Khz	------
		DC Power Ports	4 kV	4
61000-4-5	Surge	Signal Ports	2 kV line to earth, 1 kV line to line	4
		DC Power Ports	2 kV line to earth, 1 kV line to line	3
61000-4-6	Induced (Conductive) RFI	Signal Ports	10 V RMS	3
		DC Power Ports	10 V RMS	3
61000-4-12	Damped Oscillatory	Signal Ports	2.5 kV common, 1 kV diff mode @ 1MHz	3
		DC Power Ports	2.5 kV common, 1 kV diff mode @ 1MHz	3
61000-4-16	Mains Frequency Voltage	Signal Ports	30 V Continuous, 300 V for 1 s	4
		DC Power Ports	30 V Continuous, 300 V for 1 s	4
61000-4-17	Ripple on DC Power Supply	DC Power Ports	10%	3

IEEE 1613 C37.90 ELECTROMAGNETIC INTERFERENCE SPECIFICATIONS

TEST	DESCRIPTION		TEST LEVEL	LEVEL
C37.90.3	ESD	Enclosure Contact	8 kV	------
		Enclosure Air	15 kV	------
C37.90.2	Radiated RFI	Enclosure Ports	10 v/m	------
C37.90.1	Fast Transient	Signal Ports	4 kV @ 2.5 kHz	------
		DC Power Ports	4 kV	------

ENVIRONMENTAL SPECIFICATIONS

TEST	DESCRIPTION		TEST LEVEL	LEVEL
60068-2-1	Cold Temperature	Test Ad	(-)40 C, 16 Hours	------
60068-2-2	Dry Heat	Test Bd	(+)85 C, 16 Hours	------
60068-2-30	Humidity (damp heat cycle)	Test Dd	90% (non-condensing) (+)55C, 6 Cycles	------
IEC 60068-2-6	Vibration	Test Fc	4G	Class 2
IEC 60068-2-27	Shock	Test Ea	50G	Class 2
IEC 60068-2-32	Drop	------	6 faces, 3 edges, 1 corner total 10 drops at 1 m	------

Heavy Industrial RS-232/422/485 to Fiber Optic Converters

FOSTCDRI-PH-MC, FOSTCDRI-PH-MT, FOSTCDRI-PH-SC

PRODUCT FEATURES

- IEEE-61850-3, IEEE-1613
- NEMA TS2 (FOSTCDRI-PH-MT)
- Multi or Single Mode, ST or SC Versions
- -40 to 85°C Operating Temperature
- Rugged, IP30 Metal Panel Mount Case
- 50G Shock, 4G Vibration
- 2kV Triple Isolation

The FOSTCDRI-PH-xx series are premium heavy industrial serial to fiber optic converters. Designed for rugged industrial environments, they have been put through most exacting compliance testing in the industry. Meeting IEC 61850-3 and IEEE 1613 requirements, they are suitable for installation in electrical substations. These specifications are more stringent than the NEMA TS1/TS2 requirements for transportation applications. Powerful isolation protects equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits adds a third degree of protection.

Packaged in a rugged IP30 metal case, these converters convert serial signals to multi-mode or single-mode fiber optic. Bit-wise enabled circuitry automatically detects the data rate without setting a DIP switch.

In addition to direct point-to-point connectivity, operation in multi-drop mode is possible. This enables serial devices to communicate with up to 31 others in a fiber ring. Supporting mixed standards, you can replace other converters and add the EMI / RFI protection inherent to fiber optic communications.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
FOSTCDRI-PH-MC	Serial to Multi-mode SC Converter
FOSTCDRI-PH-MT	Serial to Multi-mode ST Converter
FOSTCDRI-PH-SC	Serial to Single-mode SC Converter

ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

DRAD35 - DIN Rail Mounting Kit 35mm

Heavy Industrial RS-232/422/485 to Fiber Optic Converters

FOSTCDRI-PH-MC, FOSTCDRI-PH-MT, FOSTCDRI-PH-SC

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	TD, RD, GND
RS-422	TDA(-), TDB(+), RDA(-), RDB(+)
RS-485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+)
RS-485 2-Wire	Data A(-), Data B(+)
Serial Connector	5-position, removable terminal block
Data Rate	9.6 to 115.2 Kbps
Isolation	2 KV RMS, 1 minute
Surge Protection	600 W peak power dissipation Clamping time < 1 pico-second
Industrial Bus	Modbus ASCII / RTU
Bias	Built-in, switchable 1.2KΩ XMT/RCV
Termination	Built-in, switchable 120Ω
FIBER OPTIC TECHNOLOGY	
Type / Wavelength	Multi-mode or Single-mode 1310 nM
Output Power (MM)	-19 (min), -14 (max) dBm
Output Power (SM)	-15 (min), -8 (max) dBm
RCV Sensitivity	≤ -32 dBm
Cable	62.5 / 125 µM (MM), 9 / 125µM (SM)
Data Rate	9.6 to 115.2 kbps
Distance	2 kM (MM), 15 kM (SM)
Fiber Light	Modulated
POWER	
Source	External
Power Connector	2-position, removable terminal block
Input Voltage	10 to 48 VDC (56 VDC maximum)
Power Consumption	0.9 W typical (2.6W with termination)

TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG, copper wire only
Pitch	5.08 mm
Insulation Resistance	≥500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm
INDICATORS	
Power	Red LED
TD / RD (Each Port)	Green LED
MECHANICAL	
Dimensions	13.24 x 9.29 x 3.0 cm (5.2 x 3.7 x 1.3 in)
Enclosure	IP30 metal, panel mount
Weight	0.46 lbs (208.65 grams)
MTBF	127,103 hours
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	-40 to 85°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 176°F)
Operating Humidity	0 to 95% Non-condensing
REGULATORY	
Approvals	FCC, CE, IEC 61850-3, IEEE 1613 UL C1 D2, File: E245458, • NEMA TS2 (FOSTCDRI-PH-MT)

IEC 61850-3 ELECTRO MAGNETIC INTERFERENCE SPECIFICATIONS				
Test	**Description**		**Test Level**	**Level**
61000-4-2	ESD	Enclosure Contact Enclosure Air	8 kV 15 kV	4 4
61000-4-3	Radiated RFI	Enclosure Ports	10 V/m	3
61000-4-4	Burst (Fast Transient)	Signal Ports DC Power Ports	4 kV @ 2.5 Khz 4 kV	- 4
61000-4-5	Surge	Signal Ports DC Power Ports	2 kV line to earth, 1 kV line to line 2 kV line to earth, 1 kV line to line	4 3
61000-4-6	Induced (Conductive) RFI	Signal Ports DC Power Ports	10 V RMS 10 V RMS	3 3
61000-4-12	Damped Oscillatory	Signal Ports DC Power Ports	2.5 kV common, 1 kV diff mode @ 1MHz 2.5 kV common, 1 kV diff mode @ 1MHz	3 3
61000-4-16	Mains Frequency Voltage	Signal Ports DC Power Ports	30 V Continuous, 300 V for 1 s 30 V Continuous, 300 V for 1 s	4 4
61000-4-17	Ripple on DC Power Supply	DC Power Ports	10%	3
IEEE 1613 C37.90 ELECTROMAGNETIC INTERFERENCE SPECIFICATIONS				
C37.90.3	ESD	Enclosure Contact Enclosure Air	8 kV 15 kV	-
C37.90.2	Radiated RFI	Enclosure Ports	10 v/m	-
C37.90.1	Fast Transient	Signal Ports DC Power Ports	4 kV @ 2.5 kHz 4 kV	-
ENVIRONMENTAL SPECIFICATIONS				
60068-2-1	Cold Temperature	Test Ad	(-)40 C, 16 Hours	-
60068-2-2	Dry Heat	Test Bd	(+)85 C, 16 Hours	-
60068-2-30	Humidity (damp heat cycle)	Test Dd	90% (non-condensing) (+)55C, 6 Cycles	-
IEC 600068-2-6	Vibration	Test Fc	4g	Class 2
IEC 600068-2-27	Shock	Test Ea	50g	Class 2
IEC 60068-2-32	Drop	-	6 faces, 3 edges, 1 corner, total 10 drops at 1 m	-

Heavy Industrial RS-422/485 Isolated Repeater

485OPDRI-PH

PRODUCT FEATURES

- IEEE-61850-3, IEEE-1613
- NEMA TS2
- -40 to 85°C Operating Temperature
- Rugged IP30 Metal Panel Mount Case
- 50G Shock, 4G Vibration
- 2kV Triple Isolation
- 10 to 48 VDC Input Power

The ILinx™485OPDRI-PH is our premium Heavy Industrial RS-422/485 Isolated Repeater. Designed for rugged industrial environments, it has been put through some of the most exacting compliance tests in the industry. Meeting the requirements of IEC 61850-3 and IEEE 1613, it is suitable for installation in electrical substations. These specifications are more stringent than the NEMA TS1/TS2 requirements for transportation applications. Powerful isolation on both data ports protects your equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits adds a third degree of protection.

Packaged in a rugged IP30 metal case, it extends full or half-duplex RS-422/485 signals an additional 4000 feet and allows you to add another 32 nodes to your network. Our bit-wise enabled circuitry automatically detects the data rate without setting a DIP switch.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
485OPDRI-PH	Heavy Industrial RS-232 to RS-422/485 Isolated Repeater

ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

DRAD35 - DIN Rail Mounting Kit 35mm

TBKT1 - Replacement Term Block, 2

Heavy Industrial RS-422/485 Isolated Repeater

485OPDRI-PH

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-422	TDA(-), TDB(+), RDA(-), RDB(+)
RS-485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+)
RS-485 2-Wire	Data A(-), Data B(+)
RS-422/485 CON.	5 Position, Removable Terminal Block
Data Rate	1.2 to 115.2 Kbps
Isolation	2 KV RMS, 1 minute
Surge Protection	600 W Peak Power Dissipation Clamping time < 1 pico-second
Industrial Bus	MODBUS ASCII / RTU
Bias	Built-in, switchable 1.2KΩ XMT/RCV
Termination	Built-in, switchable 120Ω
POWER	
Source	External
Power Connector	2 Position Removable Terminal Block
Input Voltage	10 to 48 VDC (56 VDC Maximum)
Power Consumption	0.5 W typical (2.3 W with termination)
TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG, Copper wire only.
Pitch	5.08 mm
Insulation Resistance	≥500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm
Temperature rating of field installed conductors 105°C minimum.	

INDICATORS	
Power	Red LED
TD / RD (Each Port)	Green LED
MECHANICAL	
Dimensions	13.24 x 9.29 x 3.30 cm 5.2 x 3.7 x 1.3 in
Enclosure	IP30 Metal, Panel Mount
Weight	0.46 lbs (208.65 grams)
MTBF	122832 Hours
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	-40 to 85°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 176°F)
Operating Humidity	0 to 95% Non-condensing
REGULATORY	
Approvals	FCC, CE, IEC 61850-3, IEEE 1613, UL C1 D2, File: E245458, NEMA TS2

IEC 61850-3 ELECTRO MAGNETIC INTERFERENCE SPECIFICATIONS				
Test	**Description**		**Test Level**	**Level**
61000-4-2	ESD	Enclosure Contact Enclosure Air	8 kV 15 kV	4 4
61000-4-3	Radiated RFI	Enclosure Ports	10 V/m	3
61000-4-4	Burst (Fast Transient)	Signal Ports DC Power Ports	4 kV @ 2.5 Khz 4 kV	- 4
61000-4-5	Surge	Signal Ports DC Power Ports	2 kV line to earth, 1 kV line to line 2 kV line to earth, 1 kV line to line	4 3
61000-4-6	Induced (Conductive) RFI	Signal Ports DC Power Ports	10 V RMS 10 V RMS	3 3
61000-4-12	Damped Oscillatory	Signal Ports DC Power Ports	2.5 kV common, 1 kV diff mode @ 1MHz 2.5 kV common, 1 kV diff mode @ 1MHz	3 3
61000-4-16	Mains Frequency Voltage	Signal Ports DC Power Ports	30 V Continuous, 300 V for 1 s 30 V Continuous, 300 V for 1 s	4 4
61000-4-17	Ripple on DC Power Supply	DC Power Ports	10%	3
IEEE 1613 C37.90 ELECTROMAGNETIC INTERFERENCE SPECIFICATIONS				
C37.90.3	ESD	Enclosure Contact Enclosure Air	8 kV 15 kV	-
C37.90.2	Radiated RFI	Enclosure Ports	10 v/m	-
C37.90.1	Fast Transient	Signal Ports DC Power Ports	4 kV @ 2.5 kHz 4 kV	-
ENVIRONMENTAL SPECIFICATIONS				
60068-2-1	Cold Temperature	Test Ad	(-)40 C, 16 Hours	-
60068-2-2	Dry Heat	Test Bd	(+)85 C, 16 Hours	-
60068-2-30	Humidity (damp heat cycle)	Test Dd	90% (non-condensing) (+)55C, 6 Cycles	-
IEC 600068-2-6	Vibration	Test Fc	4g	Class 2
IEC 600068-2-27	Shock	Test Ea	50g	Class 2
IEC 60068-2-32	Drop	-	6 faces, 1 corner, 3 edges, total 10 drops at 1 m	-

Heavy Industrial RS-232 Isolated Repeater

2320PDRI-PH

PRODUCT FEATURES

- IEEE-61850-3, IEEE-1613
- NEMA TS2
- -40 to 85°C Operating Temperature
- Rugged IP30 Metal Panel Mount Case
- 50G Shock, 4G Vibration
- 2kV Triple Isolation
- 10 to 48 VDC Input Power

The 2320PDRI-PH is our premium Heavy Industrial RS-232 Isolated Repeater. Designed for rugged industrial environments, it has been put through some of the most exacting compliance tests in the industry. Meeting the requirements of IEC 61850-3 and IEEE 1613, it is suitable for installation in electrical substations. These specifications are more stringent than the NEMA TS1/TS2 requirements for transportation applications. Powerful isolation on both data ports protects your equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits adds a third degree of protection.

Packaged in a rugged IP30 metal case, this repeater operates in wide temperature extremes. The panel mount form factor with DIN Rail mount option makes it easy to integrate into your control panel or other industrial equipment.

Installation and configuration is easy. Data is connected with a DB9 female connector (DCE) and a DB9 male connector (DTE). Power is connected through terminal block that accepts 10 to 48 VDC from any external source.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
2320PDRI-PH	Heavy Industrial RS-232 Isolated Repeater

ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

DRAD35 - DIN Rail Mounting Kit 35mm

TBKT1 - Replacement Term Block, 2

Heavy Industrial RS-232 Isolated Repeater

2320PDRI-PH

SPECIFICATIONS

SERIAL TECHNOLOGY	
Serial Connector	DB9 F (DCE), DB9 M (DTE)
Data Rate	Up to 115.2 Kbps
Isolation	2 KV RMS, 1 minute
POWER	
Source	External (Not Included)
Power Connector	2 Position Removable Terminal Block
Input Voltage	10 to 48 VDC (56 VDC Maximum)
Power Consumption	0.55 W (typical), 1.5 W (maximum)
TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG
Pitch	5.08 mm
Insulation Resistance	≥500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm
INDICATORS	
Power	Red LED
Data	Green LED TD, RD, CTS, RTS

MECHANICAL	
Dimensions	13.24 x 9.29 x 3.30 cm 5.2 x 3.7 x 1.3 in
Enclosure	IP30 Metal, Panel Mount
Weight	0.46 lbs (208.65 grams)
MTBF	194712 Hours
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	-40 to 85°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 176°F)
Operating Humidity	0 to 95% Non-condensing
REGULATORY	
Approvals	FCC, CE, IEC 61850-3, IEEE 1613 UL C1 D2, File: E245458, NEMA TS2

IEC 61850-3 ELECTRO MAGNETIC INTERFERENCE SPECIFICATIONS				
Test	**Description**		**Test Level**	**Level**
61000-4-2	ESD	Enclosure Contact Enclosure Air	8 kV 15 kV	4 4
61000-4-3	Radiated RFI	Enclosure Ports	10 V/m	3
61000-4-4	Burst (Fast Transient)	Signal Ports DC Power Ports	4 kV @ 2.5 Khz 4 kV	- 4
61000-4-5	Surge	Signal Ports DC Power Ports	2 kV line to earth, 1 kV line to line 2 kV line to earth, 1 kV line to line	4 3
61000-4-6	Induced (Conductive) RFI	Signal Ports DC Power Ports	10 V RMS 10 V RMS	3 3
61000-4-12	Damped Oscillatory	Signal Ports DC Power Ports	2.5 kV common, 1 kV diff mode @ 1MHz 2.5 kV common, 1 kV diff mode @ 1MHz	3 3
61000-4-16	Mains Frequency Voltage	Signal Ports DC Power Ports	30 V Continuous, 300 V for 1 s 30 V Continuous, 300 V for 1 s	4 4
61000-4-17	Ripple on DC Power Supply	DC Power Ports	10%	3
IEEE 1613 C37.90 ELECTROMAGNETIC INTERFERENCE SPECIFICATIONS				
C37.90.3	ESD	Enclosure Contact Enclosure Air	8 kV 15 kV	-
C37.90.2	Radiated RFI	Enclosure Ports	10 v/m	-
C37.90.1	Fast Transient	Signal Ports DC Power Ports	4 kV @ 2.5 kHz 4 kV	-
ENVIRONMENTAL SPECIFICATIONS				
60068-2-1	Cold Temperature	Test Ad	(-)40 C, 16 Hours	-
60068-2-2	Dry Heat	Test Bd	(+)85 C, 16 Hours	-
60068-2-30	Humidity (damp heat cycle)	Test Dd	90% (non-condensing) (+)55C, 6 Cycles	-
IEC 600068-2-6	Vibration	Test Fc	4g	Class 2
IEC 600068-2-27	Shock	Test Ea	50g	Class 2
IEC 60068-2-32	Drop	-	6 faces, 1 corner, 3 edges, total 10 drops at 1 m	-

Industrial Isolated Converter

485LDRC9

PRODUCT FEATURES

- Extend data up to 1.2 km (4,000 ft.)
- 2 kV optical isolation on input/output
- Wide operating temperature (-40 to +80 °C)
- Modbus compatible
- UL Recognized, NEMA TS2
- Automatic Send Data Control

The 485LDRC9 is an optically isolated RS-232 to RS-422/485 converter. RS-232 signals interface through a DB9 female connector or a terminal block. RS-422/485 signals and power inputs connect to the terminal block. Terminal blocks are arranged to allow easy wiring inside a control panel.

Built-in Automatic Send Data Control circuitry allows quick set-up and eliminates the need for external software drivers to control handshake signals. The converter operates on externally sourced 10-30 VDC power.

Optically isolated data lines (2,000 V on input/output) with 500W surge suppression ensure that connected equipment is protected even in the harshest environments. DIN rail mount design snaps on standard 35mm rail and a small form factor fits neatly into tight cabinets.

The 485LDRC9 is ideal for critical industrial communications, factory automation, in-cabinet conversion, warehouse automation, security, and many other applications.

Learn More!

READ ON!

RS-485 Problem Solver

www.bb-elec.com/485ProblemSolver

*Carrier data charges may apply.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-422/485 CONNECTOR
485LDRC9	DB9 Female or Terminal Block	Terminal Blocks

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232 - 2 options	
Option 1: Connector	DB9 Female (DCE)
Option 1: Signals	TD, RD, GND
Option 2: Connector	Terminal block
Option 2: Signals	TD, RD, GND
RS-422	
Connector	Terminal block
Signals	TDA(-), TDB(+), RDA(-), RDB(+), GND
Termination	120 (switchable)
RS-485	
Connector	Terminal Block
Signals	TDA(-), TDB(+), RDA(-), RDB(+), GND
Modes	2-wire and 4-wire
Termination	120 (switchable)
ISOLATION	
Lines Protected	Data lines
Method	Optical
Rating	2,000 V
SURGE SUPPRESSION	
Lines Protected	Data lines
Method	TVS
Rating	7.5V bi-directional avalache breakdown device 500W peak power dissipation
Response Time	< 1 pico-second
INDUSTRIAL BUS	
Modbus	ASCII/RTU

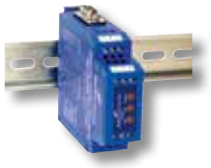
ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

9PAMF6 - 6 ft. (1.8 m) 232 DB9 male to DB9 female serial cable

Industrial Isolated Converter

485LDRC9



SPECIFICATIONS

POWER	
Connector	Terminal block
Voltage	10-30 VDC
Consumption	0.5 W
Source	External powering required
TERMINAL BLOCKS	
Wire Size	24 to 14 AWG
Torque	4 kfg-cm
LED INDICATORS	
Power (RED)	On when power applied
TD (RED)	Flashes when RS-422/485 data is transmitted
RD (RED)	Flashes when RS-422/485 data is received
ENCLOSURE	
Material	Plastic
IP Rating	20
Dimensions	2.5 x 7.9 x 9.5 cm (1.0 x 3.1 x 3.7 in)
Mounting	35 mm DIN rail (panel mount adapter available)

ENVIRONMENTAL	
Operating Temperature	-40 to +80 °C (-40 to +176 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing
MTBF, 485LDRC9	257448 hours
MTBF Calculation Method	Parts Count Reliability Prediction

APPROVALS / CERTIFICATIONS - 485LDRC9

cULus Recognized, File Number: E222870, NEMA TS2

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions

CE

EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments

EN 61000-4-2: 2009 Electro-Static Discharge (ESD)

EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)

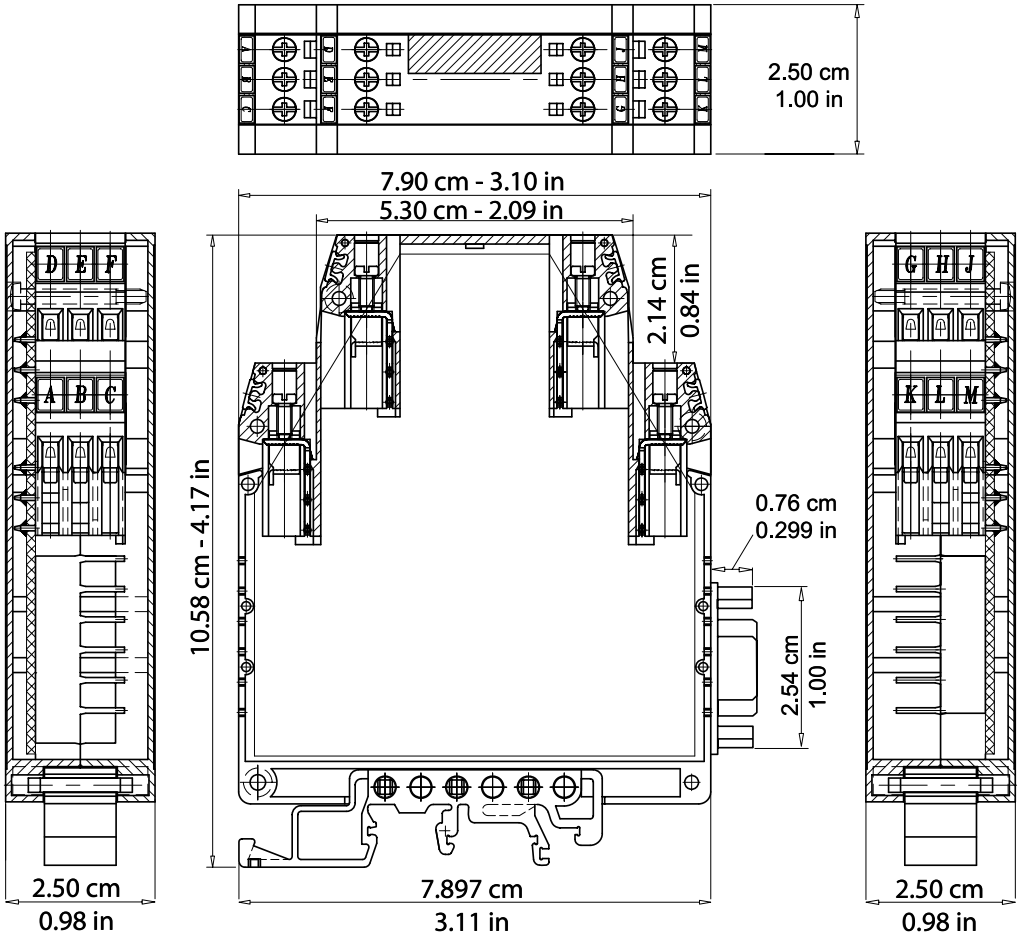
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)

EN 61000-4-6: 2009 Conducted Immunity

Download complete Declaration of Conformity at www.bb.elec.com

MECHANICAL DIAGRAM

Dimensional Diagram of 485LDRC9



Isolated Serial Converter

485OI9TB

PRODUCT FEATURES

- 1,500 Volts optical isolation
- Converts RS-232 to RS-422/485
- 4-wire, full-duplex RS-485
- 2-wire, half-duplex RS-485

Model 485OI9TB is a basic, isolated converter. It converts unbalanced, full duplex RS-232 signals to balanced full-duplex (4-wire) RS-422/485 or half-duplex (2-wire) RS-485 signals.

The converter provides 1,500 Volts RMS optical isolation of the data lines and ground (and connected devices) between the RS-232 and RS-422/485 signals. RS-232 port has a female DB9 connector. RS-422/485 port has a 6-position terminal block.

The RS-232 side of the converter draws power from the handshake lines (DTR, RTS). At least one handshake line must be asserted (raised high) to power the RS-232 side.The RS-422/485 side must be powered by an external 12 VDC power supply (sold separately).

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-422/485 CONNECTOR
485OI9TB	DB9 Female	Terminal Block

ACCESSORIES

485PS2 - 12VDC@100mA wall transformer power supply, tinned stripped leads

9PAMF6 - 6 ft. (1.8 m) RS-232 Serial Cable

E1250BL-BB3 - 12VDC @ 500MA European wall transformer power supply, tinned stripped leads

MMNM9 - DB9 male to DB9 male Null Modem Adapter

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	9600 bps
RS-232	
Connector	DB9 Female (DCE)
Signals	TD, RD, GND
RS-422/485	
Connector	Terminal block
RS-485, 2-Wire	Data A (-), Data B (+), GND
RS-422/485, 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
ISOLATION	
Lines Protected	Data lines
Method	Optical
Rating	1,500 V
POWER	
Note: Requires 2 Power Sources	
RS-232	
Source	Port-powered from DTR and RTS handshake lines
RS-422/485	
Connector	Terminal block
Voltage	10-14 VDC
Consumption	0.9 W
Source	External

TERMINAL BLOCK	
Wire Size	26 to 16 AWG
Torque	2.0 lb fin
ENCLOSURE	
Material	Plastic
Dimensions	5.5 x 8.3 x 1.7 cm (2.2 x 3.3 x 0.7 in)
Mounting	Inline
ENVIRONMENTAL	
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing
MTBF	272581 hours
MTBF Calculation Method	MIL 217F Parts Count Reliability Prediction
APPROVALS / CERTIFICATIONS - 485OI9TB	
cULus, File Number: E222870	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)	
Download complete Declaration of Conformity at www.bb.elec.com	

Isolated In-line Serial Converters

4WSD90TB, 4WSD250TB

PRODUCT FEATURES

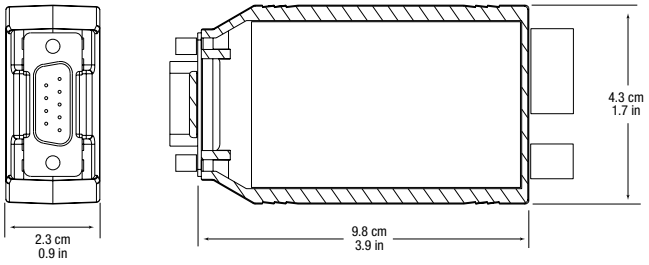
- Modbus compatible serial conversion
- Removable terminal blocks for RS-422/485
- 2,000V two-way optical isolation
- Automatic Send Data Control - no software drivers necessary
- Accepts external power from 10-48 VDC

Isolated Models 4WSD90TB and 4WSD250TB convert RS-232 to RS-422 or RS-485 (2 or 4-wire). 2,000V two-way optical isolation protects devices from power surges, spikes and ground loops in harsh electrical environments.

These in-line converters support distances up to 1,200 m (4000 ft.) and data rates up to 115.2 kbps. Switchable modes support 2-wire RS-485, 4-wire RS-485, and full duplex RS-422. Available with female DB9 or DB25 RS-232 inputs.

Removable terminal blocks for RS-422/485 and external power make wiring easy. Accepts external power from 10-48 VDC.

MECHANICAL DIAGRAM



ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-485 CONNECTOR
4WSD90TB	DB9 Female	Removable Terminal Blocks
4WSD250TB	DB25 Female	Removable Terminal Blocks

ACCESSORIES

485PS2 - 12VDC@100mA wall transformer power supply, tinned stripped leads

7175 - 2 position 3.5MM Replacement Terminal Block (power, included)

7372 - 5 position 3.5MM Replacement Terminal Block (data, included)

TBKT4 - 5 position 3.5MM Replacement Terminal Block

9PAMF6 - 6 ft. (1.8 m) RS-232 Serial Cable

E1250BL-BB3 - 12VDC @ 500MA European wall transformer power supply, tinned stripped leads

MMNM9 - DB9 male to DB9 male Null Modem Adapter

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
LED Indicators	TD and RD
RS-232	
Connectors	4WSD90TB: DB9 female 4WSD250TB: DB25 female
Signals	TD, RD, GND
RS-422/485	
Connector	4WSD90TB: Terminal block, removable 4WSD250TB: Terminal block, removable
RS-485, 2-wire	Data A(-), Data B (+), GND
RS-422/485, 4-wire	TDA(-), TDB(+), RDA (-), RDB(+), GND
POWER	
Input Required	10-48 VDC
Current Draw	28 mA at 12 VDC (typical)

MECHANICAL	
Dimensions, 4WSD90TB	9.8 x 4.3 x 2.3 cm (3.9 x 1.7 x 0.9 in)
Dimensions, 4WSD250TB	9.8 x 5.5 x 2.3 cm (3.9 x 2.2 x 0.9 in)
MTBF	179604
MTBF Calculation Method	MIL 217F Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
APPROVALS / CERTIFICATIONS - 4WSD90TB, 4WSD250TB	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)	

Industrial RS-232 to RS-422/485 Converter

485DRCi

PRODUCT FEATURES

- Data rates up to 115.2 kbps
- Three-way 2,000V optical isolation (input, output, power)
- Wide operating temperature
- UL Class 1/Division 2
- Modbus ASCII/RTU compatible
- 10–48 VDC input power range

Model 485DRCi industrial-grade isolated serial converter changes RS-232 signals to RS-422 for increased range, or to RS-485 for increased range plus multi-drop capability.

Designed for rugged industrial use, the 485DRCi is UL approved and certified for operation in Class 1/Division 2 environments and also offers 2,000V 3-way optical isolation on input, output, and power lines. In addition to optical isolation, the unit has surge suppression on the RS-422/485 lines. This DIN rail mountable converter optically isolates and converts unbalanced, full or half-duplex, RS-232 signals to balanced RS-422/485 signals at baud rates up to 115.2 kbps. Configuration is made via a 12-position DIP switch on the bottom of the converter.

Featuring Automatic Send Data Control circuitry, the converter does not require special software control of handshake signals in RS-485 mode. Removable terminal blocks for power and RS-422/485 signals make wiring easy. It is powered by a supply voltage of 10 to 48 VDC which is isolated from all data and signal ground lines.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-422/485 CONNECTOR	ISOLATION
485DRCi	DB9 Female (DCE)	Removable Terminal Block	2,000 V

ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

EK-CLIP-MPC - Replacement DIN Rail Clip

TBKT1 - Replacement Term Block, 2 position 5.08mm

TBKT2 - Replacement Term Block, 5 position 5.08mm

Automatic Send Data Control Explained

As operating systems become more complex, it is increasingly difficult to control an RS-485 driver with standard software and the RTS line. This is especially true in Windows and multi-tasking operating systems. With B&B Electronics' Automatic Send Data Control circuit, driver control is in the converter hardware, so you do not have to work with software at all.

The circuit monitors data flow and enables the driver during transmission and automatically disables it when no data is being sent. There is no need to rework software or install new drivers. Most B&B Electronics RS-232 to RS-485 converters and RS-485 serial cards include Automatic Send Data Control.

IN THE FIELD

Resolving Electrical Substation Data Glitches

Industry: Energy & Natural Resources Utilities

Product: Optically Isolated Converter

www.bb-elec.com/Substation

485DRCi

Carrier data charges may apply.

Industrial RS-232/422/485 Converter

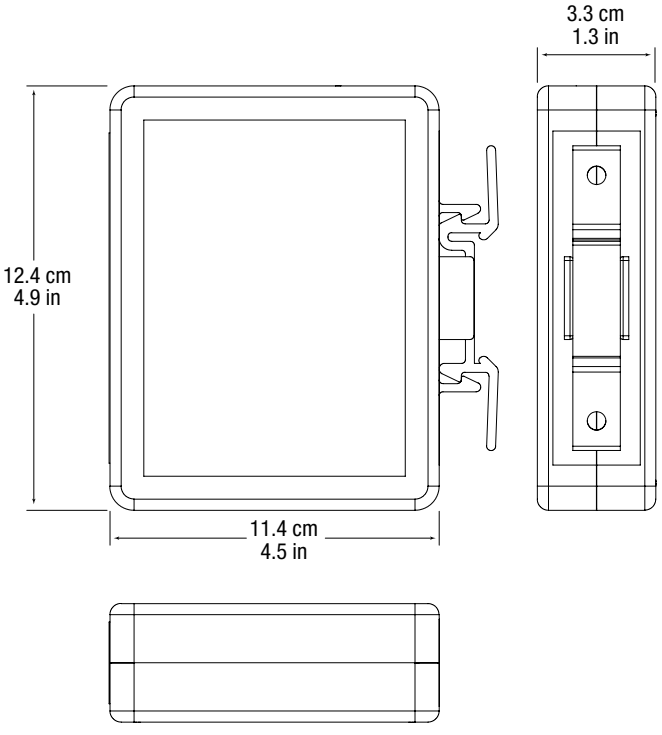
485DRCi

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	1.2 to 115.2 kbps
RS-232	
Connector	DB9 female (DCE)
Signals	TD, RD, GND
RS-422/485	
Connector	Removable terminal block, 28 to 14 AWG
RS-485, 2-wire	Data A(-), Data B (+), GND
RS-422/485, 4-wire	TDA(-), TDB(+), RDA (-), RDB(+), GND
ISOLATION	
Rating	2,000 V
Lines Protected	3-way (input, output, power lines)
Method	Optical
SURGE SUPPRESSION	
Lines Protected	Data lines
Rating	600W peak power dissipation
Clamping/Response Time	< 1 pico-second
INDUSTRIAL BUS	
Modbus	ASCII/RTU
POWER	
Connector	Removable terminal block, 28 to 14 AWG
Voltage	10-48 VDC
Consumption	960 mW
Source	External
MECHANICAL	
LED Indicators	Transmit, Receive, and Power
Dimensions	11.4 x 3.3 x 12.4 cm (4.5 x 1.3 x 4.9 in)
Enclosure	35mm DIN mount, plastic, IP30
Weight	204.12 g (0.45 lbs)

ENVIRONMENTAL	
Operating Temperature	-40 to +80 °C (-40 to +176 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing
MTBF	254617 hours
MTBF Calculation Method	Parts Count Reliability Prediction
CLASS 1/DIVISION 2 WIRING	
Type	Solid copper only
Size	28 to 14 AWG
Temperature	105 °C (221 °F) minimum
Terminal Torque	0.5 Nm (Newton-meters)
APPROVALS / CERTIFICATIONS - 485DRCI	
cUL 508, File Number: E222870 (C1 D2 E245458)	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

MECHANICAL DIAGRAM



RS-232 to RS-422/485 Converters

SCP211 & SCP311

PRODUCT FEATURES

- Isolated and Non-Isolated Models
- ESD Protection - 8 kV Contact, 15 kV Air
- Rugged Metal Case
- Wide Operating Temperature Models
- Panel Mount with Available DIN Rail Adapters
- Built in Switchable Bias & Termination

The SCP series RS-232 to RS-422/485 serial converters are compact and tough. Each model is designed and tested to meet heavy industrial EMC standards. The RS-232 signal is connected through a female DB9 connector. The RS-422/485 (2-Wire and 4-Wire) signal is connected through a removable terminal block, making wiring easy. Power is connected through a two position removable terminal block. Bit-wise enabled circuitry automatically detects the character time-out eliminating the need to set DIP switches for the baud rate.

Basic model SCP211-DFTB3 is non-isolated and made for less demanding temperature extremes. If you need a wider operating temperature but do not require isolation, model SCP211T-DFTB3 is available. These models should be used when isolation is not required, such as applications in which the data line does not exit the control cabinet.

Model SCP311T-DFTB3 offers 2 kV Isolation and will stand up to -40 to 80° C temperature variations. This is our most rugged model in this series. The SCP311 is an excellent investment for protecting your expensive control equipment.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
SCP211-DFTB3	RS-232 to 422/485 Converter
SCP211T-DFTB3	Wide-Temp, RS-232 to RS-422/485 Converter
SCP311T-DFTB3	Wide-Temp, Isolated, RS-232 to 422/485 Converter

ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

DRAD35 - DIN Rail Mounting Clips 35mm

TBKT1 - Replacement Term Block, 2 position 5.08mm

TBKT2 - Replacement Term Block, 5 position 5.08mm

TBKT4 - (2) Replacement Term Block, 5 position 5.08mm

9PAMF6 - RS-232 serial cable DB9 Male To DB9 Female, 6 ft. (1.8 m)

232AMF500 - RS-232 serial cable DB25 Male To DB25 Female, 6 ft. (1.8 m)

RS-232 to RS-422/485 Converters

SCP211 & SCP311

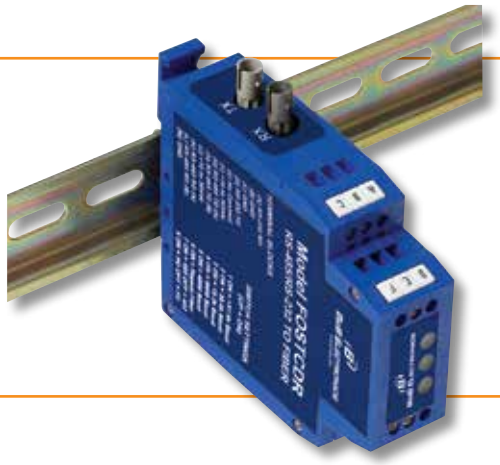
SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	TD, RD, GND
RS-422/485 4W	TDA(-), RDA(-), TDB(+), RDB(+), GND
RS-485 2W	DATA A(-), DATA B(+), GND
Data Rate	460.8 Kbps
Isolation	2 kV (SCP311T-DFTB3)
Surge Protection	+/- 0.5 kV DC Ports, +/- 1 kV Signal Ports
Industrial Bus	Modbus ASCII/RTU
Bias	1 KΩ Switchable
Termination	120 Ω Switchable
Connectors	RS-232 – DB9F (DCE) RS-422/485 – Removable Terminal Block
POWER	
Source	External
Power Connector	Terminal Block
Input Voltage	10 to 30 VDC
Power Consumption	1.0 Watt Maximum
INDICATORS	
TD / RD	Green LED (Also used to indicate power)
MECHANICAL	
Dimensions	99x22.9x73.7 mm (3.9x0.9 x2.9 in)
Enclosure	IP 30, Metal
Weight	0.33 lbs, 0.15 kg
MTBF SCP211 Series	313926 Hours
MTBF SCP311-DFTB3	217576 Hours
MTBF Calc. Method	MIL 217F Parts Count Reliability

ENVIRONMENTAL	
Operating Temperature	
SCP211-DFTB3	0 to 70°C
SCP211T-DFTB3	-40 to 80°C
SCP311T-DFTB3	-40 to 80°C
Storage Temperature	-40 to 85°C
Operating Humidity	0 to 95% Non-condensing
APPROVALS / CERTIFICATIONS	
Regulatory	UL Listed, UL File Number: E222870
Emissions	FCC Class B, CISPR Class B (EN55022)
CE	EN61000-6-2:2005 (Heavy Industrial) EN61000-4-2:2008 (ESD) 8kV contact, 15kV air EN61000-4-3:2006 (RI) 10 V/m EN61000-4-4:2004 (EFT Burst) 1kV signal, 2kV power EN61000-4-5:2005 (Surge) 1kV signal, 500V DC, 1kV AC EN61000-4-6:2005 (CI) 10 Vrms

Standard Serial to Fiber Optic Converters

FOSTCDR, FOSTCDRKT, FOSTCDR-INV



PRODUCT FEATURES

- Data rates up to 115.2 kbps
- 4 km (2.5 mi) range
- 10 to 30 VDC input voltage
- Wide operating temperature
- 2000V, 2-way isolation
- Modbus ASCII/RTU compatible
- EMI/RFI protection
- TD, RD and Power LED's

The FOSTCDRx line of fiber optic converters are suitable for standard industrial installations. These converters extend data communications up to 4 km (2.5 mi) and provide two-way optical isolation on the input and output lines.

Model FOSTCDR industrial serial to multimode fiber optic converter, provides the most versatile connection possible between any asynchronous full or half-duplex serial equipment. In addition to direct point-to-point connectivity, it is capable operating in a multi-drop mode. This allows one serial device to communicate with up to 31 other devices around a fiber optic ring. Since the FOSTCDR supports mixed serial standards, you can replace other converters and isolators and add the EMI/RFI immunity inherent to fiber optic communications.

An Automatic Send Data Control circuit controls the RS-422/485 driver chip, eliminating the requirement for special software. Easy to install and configure, it has an 8-position DIP switch to set up the RS-422/485 parameters and terminal blocks to connect serial signals and power. In RS-232 mode, it supports Transmit and Receive data. Handshaking signals are not passed through.

A kit option, Model FOSTCDRKT, conveniently bundles two FOSTCDR converters with two matched power supplies.

Model FOSTCDR-INV features an “inverted fiber state” and is suitable for applications requiring the fiber optic light to be Off in the idle state.

ORDERING INFORMATION

MODEL NUMBER	SERIAL CONNECTOR	FIBER CONNECTOR	ISOLATION
FOSTCDR	Terminal Block	Multi-mode ST	2,000 V
FOSTCDR-INV	Terminal Block	Multi-mode ST	2,000 V
FOSTCDRKT	Bundled Kit Version, includes: (2) FOSTCDR Converters, (2) MDR-20-24 Power Supplies, (1) DFMM-STST-1M Fiber Optic 1-Meter Cable		

ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

DFMM-STST-1M - Multimode fiber patch cable ST-ST connectors

What is the difference between Model FOSTCDR and Model FOSTCDR-INV?

The FOSTCDR keeps the light in the fiber turned On when no data is transmitted and the input signal is in the MARK state (idle). If light is lost or too low, the electrical signals go to the SPACE state. The input signal turns the light Off/On in step with the data. This model has an indicator for Transmit and Receive, if no light is received, the RD LED will come on, the RD output will be positive relative to GND (normally negative), and in RS-422 or RS-485 mode, no light will set the TD(A)- line high relative to TD(B)+. The usual voltage with light in the fiber and no signal sets the B line high relative to A (about 4.4 Volts DC no termination).

The FOSTCDR-INV is the opposite. The fiber is Off in the idle state.

Standard Serial/Fiber Optic Converters

FOSTCDR, FOSTCDRKT, FOSTCDR-INV

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	RS-232: 115.2 Kbps maximum RS-422/485: 460.8 Kbps maximum
RS-232	
Connector	Terminal block (24 to 14 AWG)
RS-232	TD, RD, GND
RS-422/485	
Connector	Terminal block (24 to 14 AWG)
RS-485, 2-wire	Data A(-), Data B(+), GND
RS-422/485, 4-wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
ISOLATION	
Rating	2KV RMS, 1 minute
Lines Protected	2-way (input, output lines)
Method	Optical
FIBER OPTIC TECHNOLOGY	
Type / Wavelength	Multi-mode / 820 nm
Output Power	(-) 17 to (-) 10 dBm
Receive Sensitivity	(-) 25.4 dBm to (-) 24 dBm
Cable	62.5/125 micro-meter
Connector	ST
Data Rate	9.6 to 115.2 kbps
Maximum Distance	4 km (2.5 mi)
Idle State	Transmitter light ON
POWER	
Source	External
Input Voltage	10 to 30 VDC
Consumption	1.7 Watts
Connector	Terminal block, (24 to 14 AWG)

INDUSTRIAL BUS	
Modbus	ASCII/RTU
MECHANICAL	
LED Indicators	Serial TD, RD, and Power
Dimensions	10.6 x 7.9 x 2.5 cm (4.3 x 2.3 x 0.95 in)
Enclosure	35mm DIN mount, plastic
Weight	182 g (0.4 lbs)
ENVIRONMENTAL	
Operating Temperature	-40 to +80 °C (-40 to +176 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing

APPROVALS / CERTIFICATIONS - FOSTCDR

cULus Recognized, File Number: E222870

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions

CE

EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments

EN 61000-4-2: 2009 Electro-Static Discharge (ESD)
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)
EN 61000-4-6: 2009 Conducted Immunity

Download complete Declaration of Conformity at www.bb.elec.com

APPROVALS / CERTIFICATIONS - FOSTCDR -INV

UL 508, File Number: E222870

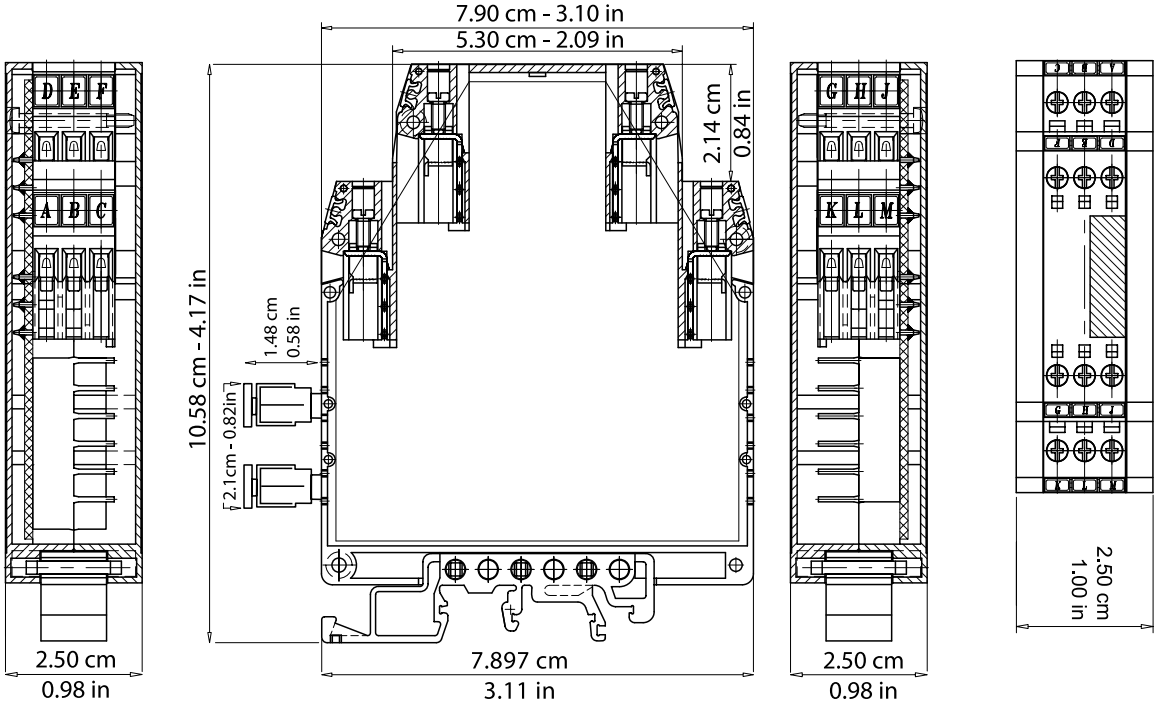
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions

CE

MTBF	
FOSTCDR	460854 hours
FOSTCDR-INV	138904 hours
Calculation Method	MIL 217F Parts Count Reliability Prediction

MECHANICAL DIAGRAM

Dimensional Diagram of FOSTCDR



Industrial Serial to Fiber Optic Converters

FOSTCDRI, FOSTCDRI-INV

PRODUCT FEATURES

- Data rates up to 115.2 kbps
- 10 – 48 VDC input power range
- Wide operating temperature
- 2,000V, 3-way optical isolation
- Modbus ASCII/RTU compatible
- EMI / RFI protection
- UL Class 1/Division 2
- Inverted fiber state option (Model FOSTCDRI-INV)
- TD, RD and Power LED's

Model FOSTCDRI is B&B Electronics' premium industrial serial to multi-mode fiber optic converter. Its rugged design is UL approved and certified for Class 1/Division 2 industrial environments. It extends data communications up to 4km (2.5 miles) . It provides three-way optical isolation on the input, output and power lines.

In addition to direct point-to-point connectivity, it is capable of operating in a multi-drop mode. This allows one serial device to communicate with up to 31 other devices around a fiber ring. Since it supports mixed standards, you can replace other converters and isolators and add the EMI / RFI protection inherent to fiber optic communications.

In RS-232 mode, the converter supports Transmit and Receive data. Handshaking signals are not passed through. An Automatic Send Data Control circuit controls the RS-422/485 driver chip, eliminating the requirement for external software.

Easy to install and configure, it has a 12-position DIP switch on the bottom to configure RS-422/485 parameters. Serial data and power cables connect to removable terminal blocks. ST connectors are used for the fiber.

Model FOSTCDRI-INV features an "inverted fiber state" and is suitable for applications requiring the fiber optic transmit light to be Off in the idle state.

ORDERING INFORMATION

MODEL NUMBER	SERIAL CONNECTOR	FIBER CONNECTOR	ISOLATION
FOSTCDRI	Terminal Block	Multi-mode ST	2,000 V
FOSTCDRI-INV	Terminal Block	Multi-mode ST	2,000 V

ACCESSORIES

MDR-40-24 - 24 VDC, 1A, slim-line DIN rail power supply

DFMM-STST-1M - Multi-mode fiber optic cable with ST/ST connectors (62.5/125 micro-meter), 1 meter

TBKT1 - Replacement 2-position terminal block, 5.08 mm

TBKT2 - Replacement 5-position terminal block, 5.08 mm

What is the difference between Model FOSTCDRI and Model FOSTCDRI-INV?

The FOSTCDRI keeps the light in the fiber turned On when no data is transmitted and the input signal is in the MARK state (idle). If light is lost or too low, the electrical signals go to the SPACE state. The input signal turns the light Off/On in step with the data. This model has an indicator for Transmit and Receive, if no light is received, the RD LED will come on, the RD output will be positive relative to GND (normally negative), and in RS-422 or RS-485 mode, no light will set the TD(A)- line high relative to TD(B)+. The usual voltage with light in the fiber and no signal sets the B line high relative to A (about 4.4 Volts DC no termination).

The FOSTCDRI-INV is the opposite. The fiber is Off in the idle state.

Industrial Serial/Fiber Optic Converters

FOSTCDRI, FOSTCDRI-INV

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	9.6 to 115.2 kbps
RS-232	
Connector	Removable terminal block
Signals	TD, RD, GND
RS-422/485	
Connector	5-position, removable terminal block
RS-485, 2-wire	Data A(-), Data B(+), GND
RS-422/485, 4-wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
Bias	Built-in, switchable, 1.2KΩ
Termination	Built-in, switchable, 120Ω

ISOLATION	
Rating	2KV RMS, 1 minute
Surge Protection	600 W peak power dissipation
Clamping Time	< 1 pico-second
Lines Protected	2-way (input, output lines)
Method	Optical

FIBER OPTIC TECHNOLOGY	
Type / Wavelength	Multi-mode / 820 nm
Output Power	-16dBm min, -12dBm typical, -9dBm maximum
Receive Sensitivity	-24dBm min, -25.4dBm maximum
Cable	62.5/125 micro-meter
Connector	ST
Data Rate	9.6 to 115.2 kbps
Maximum Distance	4 km (2.5 mi)
Idle State, FOSTCDRI	Transmitter light ON
Idle State, FOSTCDRI-INV	Transmitter light OFF

INDUSTRIAL BUS	
Modbus	ASCII/RTU

POWER	
Source	External
Input Voltage	10 to 48 VDC (56 VDC maximum)
Consumption	0.5 W (typical), 1.3W (with termination)
Connector	2-position, removable terminal block, 24 to 14 AWG

TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG
Pitch	5.08 mm
Insulation Resistance	≥ 500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm

LED INDICATORS	
Power	Red LED
FO Receive	Red LED
FO Transmit	Red LED

MECHANICAL	
Dimensions	12.3 x 11.3 x 3.2 cm (4.9 x 4.5 x 1.3 in)
Enclosure	IP 20 plastic, 35 mm DIN mount
Weight	199.6 g (0.44 lbs)

ENVIRONMENTAL	
Operating Temperature	-40 to +80 °C (-40 to +176 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing
MTBF	138904 hours
MTBF Calculation Method	Parts Count Reliability Prediction

APPROVALS / CERTIFICATIONS - FOSTCDRI

UL Class 1 Division 2, Groups A, B, C, D
File Number: E222870 (HAZLOC E245458)

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions

CE

EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)
EN 61000-4-6: 2009 Conducted Immunity

Download complete Declaration of Conformity at www.bb.elec.com

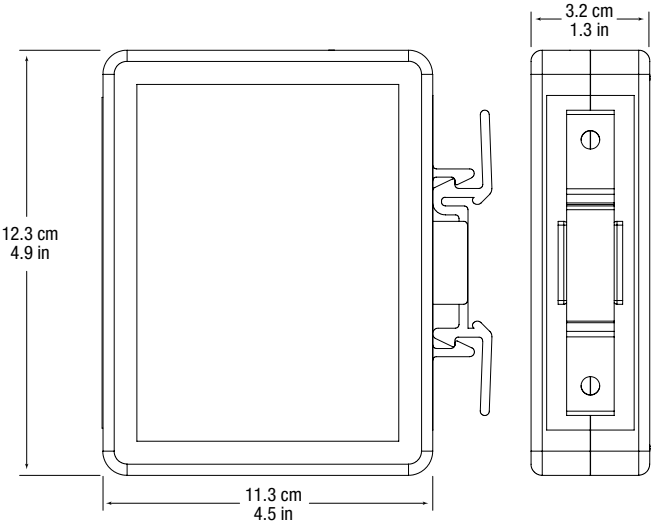
APPROVALS / CERTIFICATIONS - FOSTCDRI-INV

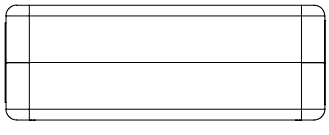
UL 508, File Number: E222870

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions

CE

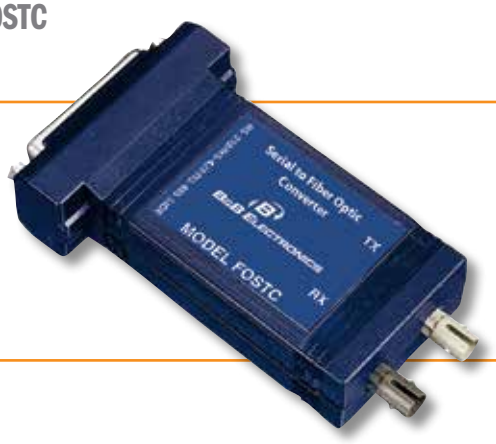
MECHANICAL DIAGRAM





In-line Fiber Optic Modem

FOSTC



PRODUCT FEATURES

- Inherent EMI/RFI immunity from surges, spikes, ground loops
- Extend serial signals up to 4 km (2.5 mi) with Multimode Fiber
- Point-to-point or multi-drop ring configuration
- Converts RS-232 to RS-422/485
- RS-232 data rates up to 115.2 kbps; RS-422/485, 500 kbps
- RS-485 Automatic Send Data Control

Fiber optic cabling has inherent resistance to EMI/RFI and transient immunity, making it ideal for industrial and utility data communication applications.

Model FOSTC provides the most versatile connection possible between asynchronous serial equipment using fiber optic cable. Any two pieces of asynchronous serial equipment can communicate full or half-duplex over two fibers at distances up to 4 km (2.5 mi). The converter can be used for point-to-point communications between serial devices. It can also be used to create a multi-drop master/slave configuration, allowing one serial device to talk to multiple slave devices around a fiber ring.

RS-232, RS-422, or RS-485 data signals are supported. Different standards can be mixed and matched to allow RS-232 devices to connect to RS-422 or RS-485 systems. This means the FOSTC can replace converters and isolators when connecting remote devices, while providing the EMI/RFI and transient immunity of optical fiber.

Supports both the Transmit Data and Receive Data lines, and provides full hardware control of the RS-485 driver with B&B Electronics' Automatic Send Data Control circuit. All serial connections are provided on the same DB25 female connector, while the multi-mode fiber is connected via two ST connectors. Powered by 12 VDC at 140 mA max. An external power supply is available.

ORDERING INFORMATION

MODEL NUMBER	SERIAL CONNECTOR	FIBER CONNECTOR	MODBUS?
FOSTC	DB25 female	Multi-mode ST	✔

ACCESSORIES

232PS3 - 12 VDC DIN rail mount power supply, USA

PS1EU-1000 - 220-240 VAC to 12 VDC wall power supply, jack, Euro CEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC wall power supply, jack, UK BS-1363 plug

232CAM - PC-AT serial computer to modem cable, 6 ft. (1.8 m)

Automatic Send Data Control Explained

As operating systems become more complex, it is increasingly difficult to control an RS-485 driver with standard software and the RTS line. This is especially true in Windows and multi-tasking operating systems. With B&B Electronics' Automatic Send Data Control circuit, driver control is in the converter hardware, so you do not have to work with software at all.

The circuit monitors data flow and enables the driver during transmission and automatically disables it when no data is being sent. There is no need to rework software or install new drivers. Most B&B Electronics RS-232 to RS-485 converters and RS-485 serial cards include Automatic Send Data Control.

In-line Fiber Optic Modem

FOSTC

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	RS-232: 115.2 kbps maximum RS-422/485: 500 kbps maximum
RS-232	
Connector	DB25 female (DCE)
Signals	TD, RD, GND
RS-422/485	
Connector	DB25 female (DCE)
RS-485, 2-wire	Data A(-), Data B(+), GND
RS-422/485, 4-wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
FIBER OPTIC TECHNOLOGY	
Transmission Line	Dual, multi-mode glass optical cable
Connector	ST
Wavelength	820 nm
Size Options	50/125, 62.5/125, 100/140, 200 µm
Output Power	(-) 17 to (-) 10 dBm
Receive Sensitivity	(-) 25.4 dBm to (-) 24 dBm
Cable	62.5/125 micro-meter
Data Rate	9.6 to 115.2 kbps
Maximum Distance	4 km (2.5 mi)
FIBER COMMUNICATION MODES	
Point-to-Point Transmission	Asynchronous, half or full-duplex
Multi-Drop Transmission	Asynchronous, half duplex fiber ring
POWER	
Source	External
Input Voltage	12 VDC
Range DC	10- 14 VDC
Connections	2.5mm phone jack (Tip Positive) or DB25 pins 25(+) & 12(-)
Power Consumption	1.7 W max 1 W typical

MECHANICAL	
Dimensions	11 x 5.9 x 2.5 cm (4.3 x 2.3 x 0.95 in)
Enclosure	Plastic, Inline
ENVIRONMENTAL	
Operating Temperature	-40 to +80 °C (-40 to +176 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
MTBF	570522
MTBF Calculation Method	Parts Count Reliability Prediction
APPROVALS / CERTIFICATIONS - FOSTC	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

FIBER OPTIC CABLES

MULTI-MODE DUPLEX FIBER		LENGTH							
MODEL NUMBER	**CONNECTOR TYPE**	**1M**	**2M**	**3M**	**5M**	**10M**	**15M**	**20M**	**30M**
DFMM-LCLC-XX	LC TO LC	✔	✔	✔	✔				
DFMM-SCLC-XX	SC TO LC	✔	✔	✔	✔	✔			
DFMM-SCSC-XX	SC TO SC	✔	✔	✔	✔	✔			
DFMM-STLC-XX	ST TO LC	✔	✔	✔	✔	✔			
DFMM-STSC-XX	ST TO SC	✔	✔	✔	✔	✔			
DFMM-STST-XX	ST TO ST	✔	✔	✔	✔	✔	✔	✔	
SINGLE-MODE DUPLEX FIBER		**LENGTH**							
MODEL NUMBER	**CONNECTOR TYPE**	**1M**	**2M**	**3M**	**5M**	**10M**	**15M**	**20M**	**30M**
DFSM-LCLC-XX	LC TO LC	✔	✔	✔	✔	✔			
DFSM-SCLC-XX	SC TO LC	✔	✔	✔	✔	✔			
DFSM-SCSC-XX	SC TO SC	✔	✔	✔	✔	✔			
DFSM-STLC-XX	ST TO LC	✔	✔	✔	✔	✔			
DFSM-STSC-XX	ST TO SC	✔	✔	✔	✔	✔			
DFSM-STST-XX	ST TO ST	✔	✔	✔	✔	✔	✔		✔

Note: Model Number change the xx to its fiber length number for the actual Model Number.
Example: If ou want a 1M Multi-Mode LC to LC Fiber the part number would be DFMM-LCLC-1M.

Heavy Industrial RS-232/422/485 to Fiber Optic Converters

FOSTCDRI-PH-MC, FOSTCDRI-PH-MT, FOSTCDRI-PH-SC

PRODUCT FEATURES

- IEEE-61850-3
- IEEE 1613
- Multi or Single Mode, ST or SC Versions
- -40 to 85°C Operating Temperature
- Rugged, IP30 Metal Panel Mount Case
- 50G Shock, 4G Vibration
- 2kV Triple Isolation

The FOSTCDRI-PH-xx series are premium heavy industrial serial to fiber optic converters. Designed for rugged industrial environments, they have been put through most exacting compliance testing in the industry. Meeting IEC 61850-3 and IEEE 1613 requirements, they are suitable for installation in electrical substations. These specifications are more stringent than the NEMA TS1/TS2 requirements for transportation applications. Powerful isolation protects equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits adds a third degree of protection.

Packaged in a rugged IP30 metal case, these converters convert serial signals to multi-mode or single-mode fiber optic. Bit-wise enabled circuitry automatically detects the data rate without setting a DIP switch.

In addition to direct point-to-point connectivity, operation in multi-drop mode is possible. This enables serial devices to communicate with up to 31 others in a fiber ring. Supporting mixed standards, you can replace other converters and add the EMI / RFI protection inherent to fiber optic communications.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
FOSTCDRI-PH-MC	Serial to Multi-mode SC Converter
FOSTCDRI-PH-MT	Serial to Multi-mode ST Converter
FOSTCDRI-PH-SC	Serial to Single-mode SC Converter

ACCESSORIES

MDR-20-24 - DIN Rail Mount Power Supply 24VDC, 1.0 A output power

Heavy Industrial RS-232/422/485 to Fiber Optic Converters

FOSTCDRI-PH-MC, FOSTCDRI-PH-MT, FOSTCDRI-PH-SC

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	9.6 to 115.2 kbps
RS-232	
Connector	Removable terminal block
Signals	TD, RD, GND
RS-422/485	
Connector	5-position, removable terminal block
RS-485, 2-wire	Data A(-), Data B(+), GND
RS-422/485, 4-wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
Bias	Built-in, switchable, 1.2KΩ
Termination	Built-in, switchable, 120Ω

ISOLATION	
Rating	2KV RMS, 1 minute
Surge Protection	600 W peak power dissipation
Clamping Time	< 1 pico-second
Lines Protected	2-way (input, output lines)
Method	Optical

FIBER OPTIC TECHNOLOGY	
Type / Wavelength	Multi-mode / 820 nm
Output Power	-16dBm min, -12dBm typical, -9dBm maximum
Receive Sensitivity	-24dBm min, -25.4dBm maximum
Cable	62.5/125 micro-meter
Connector	ST
Data Rate	9.6 to 115.2 kbps
Maximum Distance	4 km (2.5 mi)
Idle State, FOSTCDRI	Transmitter light ON
Idle State, FOSTCDRI-INV	Transmitter light OFF

INDUSTRIAL BUS	
Modbus	ASCII/RTU

POWER	
Source	External
Input Voltage	10 to 48 VDC (56 VDC maximum)
Consumption	0.5 W (typical), 1.3W (with termination)
Connector	2-position, removable terminal block, 24 to 14 AWG

TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG
Pitch	5.08 mm
Insulation Resistance	≥ 500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm

LED INDICATORS	
Power	Red LED
FO Receive	Red LED
FO Transmit	Red LED

MECHANICAL	
Dimensions	12.3 x 11.3 x 3.2 cm (4.9 x 4.5 x 1.3 in)
Enclosure	IP 20 plastic, 35 mm DIN mount
Weight	199.6 g (0.44 lbs)

ENVIRONMENTAL	
Operating Temperature	-40 to +80 °C (-40 to +176 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing
MTBF	138904 hours
MTBF Calculation Method	Parts Count Reliability Prediction

APPROVALS / CERTIFICATIONS - FOSTCDRI

UL Class 1 Division 2, Groups A, B, C, D
File Number: E222870 (HAZLOC E245458)

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions

CE

EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments

EN 61000-4-2: 2009 Electro-Static Discharge (ESD)
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)
EN 61000-4-6: 2009 Conducted Immunity

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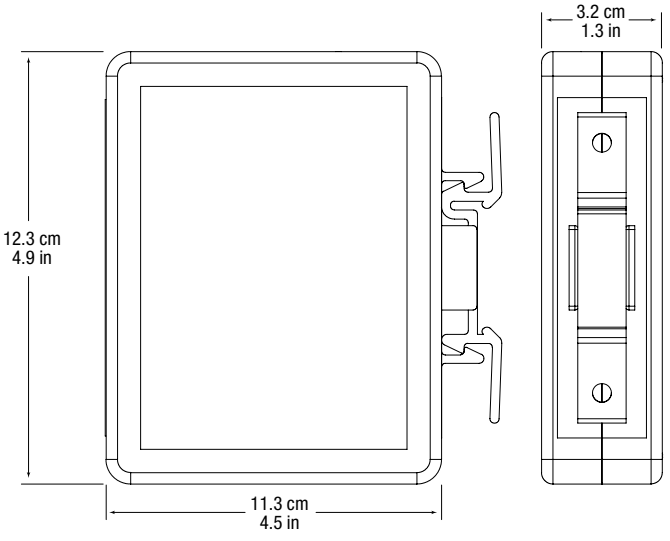
APPROVALS / CERTIFICATIONS - FOSTCDRI-INV

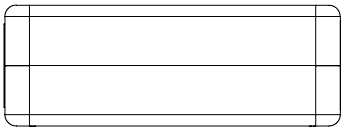
UL 508, File Number: E222870

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions

CE

MECHANICAL DIAGRAM





Serial to Single-mode Fiber Converter

FOSTCDRi-ST, FOSTCDRi-SC

PRODUCT FEATURES

- Data rates up to 115.2 kbps
- 15 km (9 mi) range
- 10 to 48 VDC power input
- Wide operating temperature
- 2000V isolation
- Modbus ASCII/RTU compatible
- EMI/RFI protection

B&B Electronics' ILinx™ fiber converters designed with functionality required for heavier industrial environments. Model FOSTCDRi-Sx industrial-grade isolated converter changes RS-232, RS-422, or RS-485 to single-mode fiber optics.

Designed for industry, FOSTCDRi-Sx extends serial data ranges up to 15 km (9 mi) and provides the most versatile connection possible between asynchronous full or half-duplex serial equipment. In addition to direct point-to-point connectivity, it is capable operating in a multi-drop mode. This allows one serial device to communicate with up to 31 others around a fiber optic ring. Since it supports mixed serial standards, it can replace other converters and isolators and add the EMI/RFI immunity inherent to fiber optic communications. Fiber optic connectors are SC or ST.

B&B Electronics' Automatic Send Data Control circuit controls the RS-422/485 driver chip, eliminating the requirement for special software. Easy to install and configure, it has a 12-position DIP switch to set up the RS-422/485 parameters and removable terminal blocks to connect serial signals and power. In RS-232 mode, the FOSTCDRI-SC supports Transmit Data and Receive Data. Handshaking signals are not passed through.

ORDERING INFORMATION

MODEL NUMBER	SERIAL CONNECTOR	FIBER CONNECTOR	MODBUS?
FOSTCDRi-SC	Terminal Blocks, removable	Single-mode SC	✔
FOSTCDRi-ST	Terminal Blocks, removable	Single-mode ST	✔

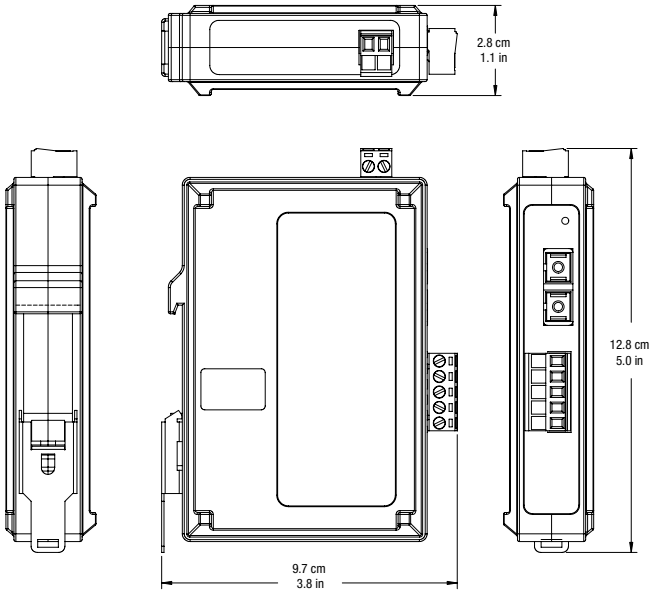
ACCESSORIES

MDR-20-24 - 24 VDC @ 1.0 A DIN rail mount power supply, slim-line

TBKT1 - Replacement Terminal Block, 2-position, 5.08mm

TBKT2 - Replacement Terminal Block, 5-position, 5.08mm

MECHANICAL DIAGRAM - FOSTCDRI-SC



Fiber Optic Benefits

Fiber optic cable carries serial data up to 15 kilometers (9 miles), much farther and reliably than conventional copper lines.

Power surges, spikes and groupd loops are created by electrical equipment, by nearby lightning strikes, and from other sources. They are easily picked up by copper data lines and transmitted to connected devices, garbling data communications and damaging equipment.

However, fiber optic data transmission uses light in glass fiber cable as a communication medium. Being inherently non-electric, fiber optic cable will not pick up noise and provides the most reliable system possible – ideal for spanning areas with severe interference, such as near heavy electrical equipment, welding or radio transmissions. It does not transmit power spikes or surges and prevents ground loops by not providing a conductive path for the ground.

Serial/Single-mode Fiber Converter

FOSTCDRi-ST, FOSTCDRi-SC

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	9.6 to 115.2 kbps
RS-232	
Connector	Removable Terminal Block (12 to 28 AWG)
Signals	TD, RD, GND
RS-422/485	
Connector	Removable Terminal Block (12 to 28 AWG)
RS-485, 2-wire	Data A(-), Data B(+), GND
RS-422/485, 4-wire	TDA(-), TDB(+), RDA(-), RDB(+), GND
ISOLATION	
Isolation	2KV RMS, 1 minute
Surge Protection	600 W peak power dissipation
Clamping Time	< 1 pico-second
FIBER OPTIC TECHNOLOGY	
Connector	ST
Type / Wavelength	Single-mode / 1310 nm
Output Power	(-) 15 to (-) 8 dBm
Receive Sensitivity	Less than or equal to (-) 32 dBm
Cable	9/125 micro-meter
Data Rate	9.6 to 115.2 kbps
Maximum Distance	15 km (9 mi)
POWER	
Source	External
Input Voltage	10 to 48 VDC (Class 2)
Power Consumption	1.4 Watts
Connector	Removable terminal block (12 to 28 AWG)

INDUSTRIAL BUS	
Modbus	ASCII/RTU
MECHANICAL	
LED Indicators	FO Receive, FO Transmit, Power
Dimensions	12.8 x 9.7 x 2.8 cm (5.0 x 3.8 x 1.1 in)
Enclosure	35mm DIN Mount, Plastic, IP30
Weight	149.7 g (0.3 lbs)
ENVIRONMENTAL	
Operating Temperature	-40 to +80 °C (-40 to +176 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing
MTBF	88423 hours
MTBF Calculation Method	Parts Count Reliability Prediction

APPROVALS / CERTIFICATIONS - FOSTCDRI-SC

UL 508, File Number: E222870

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions

CE

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EN 61000-4-6: 2009 Conducted Immunity

Download complete Declaration of Conformity at www.bb.elec.com

FIBER OPTIC CABLES

MULTI-MODE DUPLEX FIBER		LENGTH							
MODEL NUMBER	**CONNECTOR TYPE**	**1M**	**2M**	**3M**	**5M**	**10M**	**15M**	**20M**	**30M**
DFMM-LCLC-XX	LC TO LC	✔	✔	✔	✔				
DFMM-SCLC-XX	SC TO LC	✔	✔	✔	✔	✔			
DFMM-SCSC-XX	SC TO SC	✔	✔	✔	✔	✔			
DFMM-STLC-XX	ST TO LC	✔	✔	✔	✔	✔			
DFMM-STSC-XX	ST TO SC	✔	✔	✔	✔	✔			
DFMM-STST-XX	ST TO ST	✔	✔	✔	✔	✔	✔	✔	
SINGLE-MODE DUPLEX FIBER		**LENGTH**							
MODEL NUMBER	**CONNECTOR TYPE**	**1M**	**2M**	**3M**	**5M**	**10M**	**15M**	**20M**	**30M**
DFSM-LCLC-XX	LC TO LC	✔	✔	✔	✔	✔			
DFSM-SCLC-XX	SC TO LC	✔	✔	✔	✔	✔			
DFSM-SCSC-XX	SC TO SC	✔	✔	✔	✔	✔			
DFSM-STLC-XX	ST TO LC	✔	✔	✔	✔	✔			
DFSM-STSC-XX	ST TO SC	✔	✔	✔	✔	✔			
DFSM-STST-XX	ST TO ST	✔	✔	✔	✔	✔	✔		✔

Note: Model Number change the xx to its fiber length number for the actual Model Number.
Example: If you want a 1M Multi-Mode LC to LC Fiber the part number would be DFMM-LCLC-1M.

Fiber Optic Modem

9PFLST, 232FLST

PRODUCT FEATURES

- Transparent asynchronous RS-232 at 115.2 Kbps
- Full or half-duplex
- Range up to 4 km (2.5 mi)
- TD, RD, RTS and CTS supported
- EMI/RFI transient immunity to surges, spikes, ground loops
- Port powered, no external power required

These port-powered fiber optic modem allows two RS-232 serial devices to communicate transparently over longer distances and with greater reliability. The inherent immunity of fiber optic protects data from line surges, spikes and ground loops.

They transmit RS-232 data, full or half duplex, over two fibers at distances up to 4 km (2.5 mi) and data rates up to 115.2 kbps.They have a DCE female serial connector and multi-mode ST fiber connectors. TD, RD, and RTS/CTS handshake lines are supported.

The modem is powered from the RS-232 data and handshake lines. A power jack is provided for connecting an optional +12 VDC supply (not included) for use with low powered ports such as laptops and PCs.

ORDERING INFORMATION

MODEL NUMBER	SERIAL CONNECTOR	FIBER CONNECTOR	OUTPUT
9PFLST	DB9 Female	Multi-mode ST	RS-232
232FLST	DB25 Female	Multi-mode ST	RS-232

Note: Must be used in pairs

ACCESSORIES

232PS - 12VDC@1000ma, Wall Transformer Power Supply, 2.5 mm male plug

E1250BL-BB3 - 230 VAC to 12 VDC Wall Transformer Power Supply, 2.5 mm male plug

9PAMF6 - RS-232 serial cable DB9 Male To DB9 Female, 6 ft. (1.8 m)

232AMF5 - RS-232 serial cable DB25 Male To DB25 Female, 6 ft. (1.8 m)

DFMM-STST-3M - Multi-Mode Duplex Fiber Cable, ST To ST, 9.8 ft. (3 m)

Fiber Optic Benefits

Fiber optic cable carries serial data up to 4 kilometers (2.5 miles), much farther and reliably than conventional copper lines.

Power surges, spikes and groupd loops are created by electrical equipment, by nearby lightning strikes, and from other sources. They are easily picked up by copper data lines and transmitted to connected devices, garbling data communications and damaging equipment.

However, fiber optic data transmission uses light in glass fiber cable as a communication medium. Being inherently non-electric, fiber optic cable will not pick up noise and provides the most reliable system possible – ideal for spanning areas with severe interference, such as near heavy electrical equipment, welding or radio transmissions. It does not transmit power spikes or surges and prevents ground loops by not providing a conductive path for the ground.

Fiber Optic Modem

9PFLST, 232FLST

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232	
Connector	DB9 female
Signals	TD, RD, RTS, CTS, GND
FIBER OPTIC TECHNOLOGY	
Connector	Multi-mode ST
Typical Range	Up to 4 km (2.5 mi) on multi-mode glass fiber
Transmission Line	Dual multi-mode optical cable
Transmission Mode	Asynchronous, half or full-duplex, point-to-point
POWER	
Source	Port-powered from serial port TD, RTS, and DTR lines
Optional	External 10–16 VDC @ .5 Watt max
Coupled Power Budget	12.1 dB
Optic Wavelength	820 nm
MECHANICAL	
9PFLST Dimensions	10.9 x 4.3 x 2.4 cm (1.3 x 1.7 x 1.0 in)
232FLST Dimensions	10.9 x 5.8 x 2.4 cm (4.3 x 2.3 x 1.0 in)
Enclosure	Plastic, inline
MTBF	404846
MTBF Calc. Method	Parts Count Reliability Prediction

ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
APPROVALS / CERTIFICATIONS - 9PFLST	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)	
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)	
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)	
EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

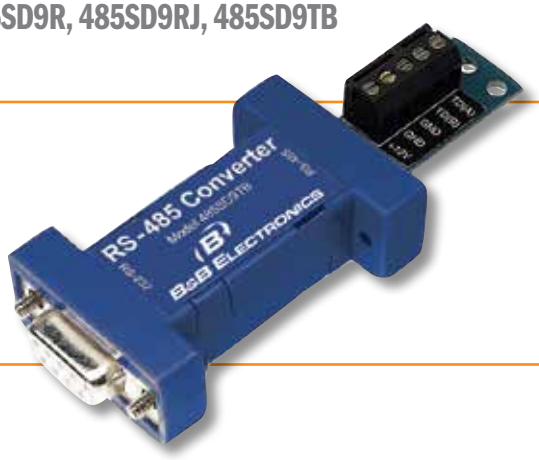
FIBER OPTIC CABLES

MULTI-MODE DUPLEX FIBER		LENGTH							
MODEL NUMBER	**CONNECTOR TYPE**	**1M**	**2M**	**3M**	**5M**	**10M**	**15M**	**20M**	**30M**
DFMM-LCLC-XX	LC TO LC	✔	✔	✔	✔				
DFMM-SCLC-XX	SC TO LC	✔	✔	✔	✔	✔			
DFMM-SCSC-XX	SC TO SC	✔	✔	✔	✔	✔			
DFMM-STLC-XX	ST TO LC	✔	✔	✔	✔	✔			
DFMM-STSC-XX	ST TO SC	✔	✔	✔	✔	✔			
DFMM-STST-XX	ST TO ST	✔	✔	✔	✔	✔	✔	✔	
SINGLE-MODE DUPLEX FIBER		**LENGTH**							
MODEL NUMBER	CONNECTOR TYPE	1M	2M	3M	5M	10M	15M	20M	30M
DFSM-LCLC-xx	LC to LC	✔	✔	✔	✔	✔			
DFSM-SCLC-xx	SC to LC	✔	✔	✔	✔	✔			
DFSM-SCSC-xx	SC to SC	✔	✔	✔	✔	✔			
DFSM-STLC-xx	ST to LC	✔	✔	✔	✔	✔			
DFSM-STSC-xx	ST to SC	✔	✔	✔	✔	✔			
DFSM-STST-xx	ST to ST	✔	✔	✔	✔	✔	✔		✔

Note: Model Number change the xx to its fiber length number for the actual Model Number.
Example: If you want a 1M Multi-Mode LC to LC Fiber the part number would be DFMM-LCLC-1M.

Port Powered RS-232/485 Converters

485SD9R, 485SD9RJ, 485SD9TB



PRODUCT FEATURES

- Extend RS-232 data signals up to 1.2 km (4,000 ft.)
- Change RS-232 TD and RD to RS-485 signals
- Automatic Send Data Control - no software drivers necessary
- Baud rates up to 115.2 kbps
- Powered from RS-232 handshake lines - no power supply required

These port-powered, two channel converters allow your computer to communicate longer distances by converting TD and RD RS-232 lines to RS-485 signals. RS-485 also provides multi-drop capability.

All converters feature Automatic Send Data Control which enables the driver when data is present on the RS-232 side. Control of the driver is automatic at speeds up to 115.2 kbps.

Converters are powered by the RS-232 port DTR and RTS handshake lines, or by an optional external 12 VDC power supply. When port powered, at least one of these handshake lines must be asserted (high) to power the unit. By raising RTS, the RS-485 driver is enabled and the RS-485 receiver is disabled. By lowering RTS, the RS-485 driver is disabled and the RS-485 receiver is enabled.

These converters are suitable for field service, where a power supply would add clutter, or anywhere you need compact, easy-to-use, economically priced serial conversion.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-485 CONNECTOR	OUTPUT	OPTIONAL POWER SUPPLY
485SD9R	DB9 Female	DB9 Female	RS-485 2-wire	
485SD9RJ	DB9 Female	RJ11	RS-485 2-wire	
485SD9TB	DB9 Female	Terminal Block	RS-485 2-wire	✔

ACCESSORIES

485PS2 - 120 VAC to 12 VDC power supply, 100 mA, tinned leads, USA

PS1EU-1000 - 220-240 VAC to 12 VDC power supply, 1A, tinned leads, Euro CEEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC power supply, 1A, tinned leads, UK BS-1353 plug

9PAMF6 - DB9 male to DB9 female adapter cable, 6 ft. (1.8 m)

Why use an "optional" power supply with a port-powered converter?

Simply put, all RS-232 ports are not created equal. Many laptop PC's, for example, deliberately reduce power to the RS-232 port to save the battery. And, if you are working at the distance limits of RS-422 or 485, you might need an extra boost. For the majority of applications though, the converter's port powering is sufficient to accomplish the task.

Automatic Send Data Control Explained

As operating systems become more complex, it is increasingly difficult to control an RS-485 driver with standard software and the RTS line. This is especially true in Windows and multi-tasking operating systems. With B&B Electronics' Automatic Send Data Control circuit, driver control is in the converter hardware, so you do not have to work with software at all.

The circuit monitors data flow and enables the driver during transmission and automatically disables it when no data is being sent. There is no need to rework software or install new drivers. Most B&B Electronics RS-232 to RS-485 converters and RS-485 serial cards include Automatic Send Data Control.

Learn More!

READ ON!

Port Powered Converter FAQ

www.bb-elec.com/PortPowerFAQ

*Carrier data charges may apply.

Port Powered RS-232/485 Converters

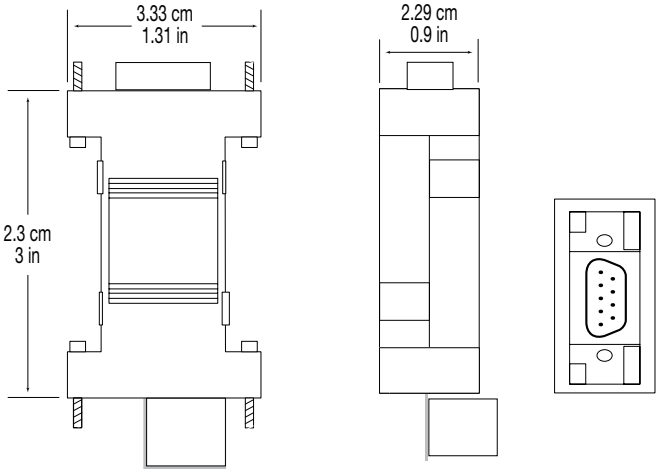
485SD9R, 485SD9RJ, 485SD9TB

SPECIFICATIONS

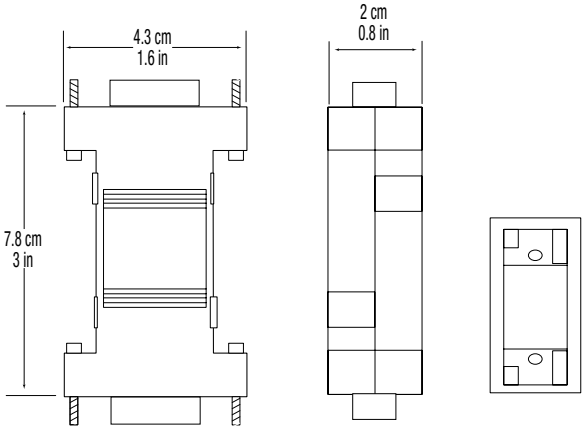
SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232	
Connector	485SD9R: DB9 female 485SD9RJ: DB9 female 485SD9TB: DB9 female
RS-485	
	485SD9R: DB9 female 485SD9RJ: RJ11 485SD9TB: Terminal block
Biasing Resistors	4.7k Ohms
POWER	
Source	Port-powering: from RS-232 handshake lines. External 12-16 VDC power supply, optional.
Power Connector	485SD9TB only (terminal block)
Input Voltage	485SD9TB only (12VDC)
Power Consumption	40mA max
MECHANICAL	
Dimensions	485SD9R: 7.8 x 4.3 x 2.0 cm (3.0 x 1.6 x 0.8 in) 485SD9RJ: 2.3 x 3.3 x 2.29 cm (3.0 x 1.3 x 0.9 in) 485SD9TB: 8.9 x 3.4 x 1.7 cm (3.50 x 1.34 x 0.67 in)
Enclosure	plastic
Weight	.18 lbs (81.6 g)
MTBF	485SD9R: 986473 485SD9RJ: 897656 485SD9TB: 968410
MTBF Calc. Method	Parts Count Reliability Prediction

ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% non condensing
APPROVALS / CERTIFICATIONS - 485SD9R, 485SD9RJ, 485SD9TB	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

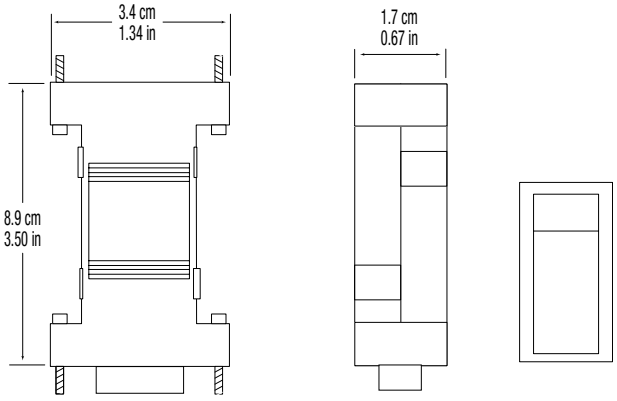
MECHANICAL DIAGRAM - 485SD9RJ



MECHANICAL DIAGRAM - 485SD9R MODEL



MECHANICAL DIAGRAM - 485SD9TB



Port Powered RS-232/485 Converters

4WSD9R, 4WSD9TB

PRODUCT FEATURES

- Extend RS-232 data signals up to 1.2 km (4,000 ft.)
- Change RS-232 TD and RD to RS-485 signals
- Automatic Send Data Control
- Baud rates up to 115.2 kbps
- RS-232 Port Power or External 12 VDC Power Jack
- Dipswitch selectable RS-422 or RS-485

The 4WSD9TB and 4WSD9R Universal Converter provides RS-232 to RS-422/RS-485 conversion using either port-power or an external power supply. The 4WSD9TB has a Terminal Block RS-485 connector, and the 4WSD9R has a DB9 Female connector.

Data is converted in both directions, RS-232 Transmit data is converted to balance RS-422 or RS-485 Transmit, and Received RS-422/485 signals are converted to RS-232. Unlike converters which require programing hardware handshaking signals to control RS-485 or RS-422 operation, the 4WSD9TB and 4WSD9R provides automatic Send Data Control. In RS-485 mode, the RS-485 driver is enabled by circuitry which senses the RS-232 TD input. In half duplex RS-485 mode, the receiver is enabled when not transmitting. For full duplex operation, the receiver is set always enabled. In RS-422 mode, the transmitter and receiver are always enabled. The operating mode is set with 4 switches (Table 1). The converters are powered by the RS-232 signal lines whether they are set high or low. If not enough power is available from the port, or no handshaking lines are available, a DC Jack is provided to connect a 12VDC supply. The DB9 female connector for RS-232 is wired as DCE (like a modem).

No external power is required if two RS-232 output handshake lines are available and the cable run is short. If the handshake lines are raised and no termination is used, the power efficiency is greatly increased. Less than 3mA is required to operate the 4WSD9R plus the load current. For applications that do not have handshake lines or require a large load current, power may be externally supplied with a +12VDC power supply with a 2.5mm plug (tip positive).

The RS-232 port has a female DB9 connector with pins 2 (RD), 3 (TD), and 5 (Signal Ground) supported. Pins 7 (RTS) and 8 (CTS) are tied together, and pins 6 (DSR), 1 (DCD), and 4 (DTR) are also tied together. Any incoming data lines in either the high or low state are used to port power the 4WSD9R. The more handshake lines available, the more likely the unit can be port powered. Table 2 shows the RS-232 pinout.

Although handshake lines can be used to power the converter, no handshaking is required to control the RS-422/RS-485 driver. With switch 1 set to RS-422, the driver is always enabled. When switch 1 is in the RS-485 position, the RS-485 driver is automatically enabled during each spacing state on the RS-232 side. During the marking or idle state, the RS-485 driver is disabled and the data lines are held in the marking state by the 4.7K Ohm pull-up and pull-down resistors. The value of these resistors may need to be changed to a different value when termination is used in order to maintain the proper DC bias during the idle state.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-485 CONNECTOR	OUTPUT	OPTIONAL POWER SUPPLY
4WSD9R	DB9 Female	DB9 Female	RS-485 2 or 4-wire or RS-422	✔
4WSD9TB	DB9 Female	Terminal Block	RS-485 2 or 4-wire or RS-422	✔

ACCESSORIES

485PS - 12 VDC power supply, 100 mA, 2.5 mm plug, USA

E1250BL-BB3 - 220-240 VAC to 12 VDC wall power supply, 2.5 mm plug, Euro CEE7/7 plug

9PAMF6 - DB9 male to DB9 female adapter cable, 6 ft. (1.8 m)

Port Powered RS-232/485 Converters

4WSD9R, 4WSD9TB

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232	
Connector	4WSD9R: DB9 female 4WSD9TB: DB9 female
Signals	RD, TD, GND, DCD, DTR, DSR, RTS, CTS
Port Power **	Pins 7 (RTS) and 8 (CTS) are tied together, and pins 6 (DSR), 1 (CD), and 4 (DTR) are also tied together.
RS-422/485	
Connector	4WSD9R: DB9 female 4WSD9TB: Terminal block
Biasing Resistors	4.7k Ohms
Signals	TDA (-), TDB (+), RDA (-), RDB (+), GND
Termination	None
Operation	Dipswitch selectable RS-422 or RS-485 4WSD9R: RS-485 2 or 4-wire or RS-422 4WSD9TB: RS-485 2 or 4-wire or RS-422

POWER	
Source	Port-powered: from RS-232 handshake lines. External 12-16 VDC power supply, optional.
**	Port-powered requires 7 to 12 VDC supplied on at least one handshake line.
Power Connector	2.5 mm plug (tip positive)
Input Voltage	12 VDC @ 100 mA

MECHANICAL	
Dimensions,	4WSD9R: 7.8 x 4.3 x 2.0 cm (3.0 x 1.6 x 0.8 in) 4WSD9TB: 9.0 x 4.3 x 2.3 cm (3.6 x 1.7 x 0.9 in)
Enclosure	Plastic, Inline
Weight	4WSD9R: 0.10 lbs. (49 g); 4WSD9TB: 0.11 lbs. (50 g)
MTBF	4WSD9R: 880179 4WSD9TB: 345242
MTBF Calc. Method	Parts Count Reliability Prediction

ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 - 95% Non-condensing

APPROVALS / CERTIFICATIONS - 4WSD9R, 4WSD9TB

FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions (4WSD9R)
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions (4WSD9TB)
CE
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)
EN 61000-4-6: 2009 Conducted Immunity
Download complete Declaration of Conformity at www.bb.elec.com

Battery Powered Serial Converter

485BAT3

PRODUCT FEATURES

- 3 Power Options: Battery (2-AAA), RS-232 handshake lines, or external power supply
- Extend RS-232 data signals up to 1.2 km (4,000 ft.)
- Change RS-232 TD and RD to RS-485 signals
- Automatic Send Data Control - no software drivers necessary
- Baud rates up to 115.2 kbps

Three Versatile Powering Options

Model 485BAT3 features power versatility, making it perfect for field testing solutions. It can be powered in three ways: batteries, port powered, or external power supply.

Use the battery power option with a low power RS-232 port (found on many laptops) or no handshake lines or when it is inconvenient to use a power supply. The 485BAT3 will draw as much power as possible from the RS-232 port and get any additional current necessary from the batteries.

If you have a full power port and all your handshake lines, turn off the battery switch. This allows you to run full port powering and saves the batteries for emergencies. Note: The battery On-Off switch conserves battery life. It does not turn on and off all power to the unit.

Lastly, a stripped and tinned +12VDC external power supply may be used. Simply attach it to the terminal blocks and plug it in.

485BAT3 converts unbalanced RS-232 signals to balanced RS-422 or RS-485 signals. RS-485 is an enhanced version of the RS-422 standard, allowing multiple drivers and receivers on a 2-wire system.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-485 CONNECTOR	OUTPUT	OPTIONAL POWER SUPPLY
485BAT3	DB9 Female	Terminal Block	RS-485 2 or 4-wire or RS-422	(2) AAA batteries or port powered or external source

ACCESSORIES

485PS2 - 12 VDC (wired) power supply, 100 mA, USA

PS1EU-1000 - 220-240 VAC to 12 VDC power supply, 1A, tinned leads, Euro CEEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC wall power supply, jack, UK BS-1363 plug

9PAMF6 - DB9 male to DB9 female adapter cable, 1.8 m (6 ft.)

9PMTT - RS-232 mini tester

Why use an "optional" power supply with a port-powered converter?

Simply put, all RS-232 ports are not created equal. Many laptop PC's, for example, deliberately reduce power to the RS-232 port to save the battery. And, if you are working at the distance limits of RS-422 or 485, you might need an extra boost. For the majority of applications though, the converter's port powering is sufficient to accomplish the task.

Automatic Send Data Control Explained

As operating systems become more complex, it is increasingly difficult to control an RS-485 driver with standard software and the RTS line. This is especially true in Windows and multi-tasking operating systems. With B&B Electronics' Automatic Send Data Control circuit, driver control is in the converter hardware, so you do not have to work with software at all.

The circuit monitors data flow and enables the driver during transmission and automatically disables it when no data is being sent. There is no need to rework software or install new drivers. Most B&B Electronics RS-232 to RS-485 converters and RS-485 serial cards include Automatic Send Data Control.

Battery Powered Serial Converter

485BAT3

SPECIFICATIONS

SERIAL TECHNOLOGY		
Data Rate		115.2 kbps maximum
RS-232		
	Connector	DB9 Female (DCE)
	Signals	RD, TD, GND, DCD, DTR, DSR, RTS, CTS
	Port Power **	Pins 7 (RTS) and 8 (CTS) are tied together, and pins 6 (DSR), 1 (CD), and 4 (DTR) are also tied together.
RS-422/485		
	Connector	Terminal Block
	Signals	TDA (-), TDB (+), RDA (-), RDB (+), GND
Operation		Dipswitch selectable RS-422 or RS-485 RS-485, 2 or 4-wire RS-422, 4-wire
Biasing Resistors		4.7k Ohms
Termination		None
POWER		
Source, 3 options		(2) AAA batteries (not included). Port-powered from RS-232 handshake lines. External 12-16 VDC power supply, optional.
	**	Port-powered requires 7 to 12 VDC supplied on at least one handshake line.
Power Connector		Terminal Block
Input Voltage		12 VDC @ 100 mA
Battery Life		7 hours fully loaded wtih no port power available 100 to 250 hours, typical

MECHANICAL	
Dimensions	9.0 x 6.5 x 2.8 cm (3.6 x 2.6 x 1.1 in)
Enclosure	Plastic, ABS Inline
Weight	0.23 lbs. (104.3 g)
MTBF	241370
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	95% Non-Condensing
APPROVALS / CERTIFICATIONS - 485BAT3	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)	
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)	
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)	
EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

Port Powered RS-232/422 Converters

422PP9R, 422PP9TB

PRODUCT FEATURES

- Extend RS-232 data signals up to 1.2 km (4,000 ft.)
- Change RS-232 TD and RD to balanced RS-422 signals
- Automatic Send Data Control - no software drivers necessary
- Baud rates up to 115.2 kbps
- Powered from RS-232 handshake lines - no power supply required

These port-powered, two-channel converters change TD and RD RS-232 lines to balanced RS-422 signals extending communication distances up to 1.2 km (4,000 ft.). Automatic Send Data Control feature enables the RS-422 driver when data is present on the RS-232 side. Control of the driver is automatic at rates up to 115.2 kbps. The RS-422 driver and receiver are always enabled.

With port-powering, no power supply is required. Power is derived from the DTR and RTS RS-232 handshake control lines. If port-powering the unit, at least one handshake line must be present, in either the positive or negative voltage state. This permits use in applications without worrying about software control of the handshake lines. Can also be powered externally.

Converters are configured to transmit both directions in an RS-232 and RS-422 system. RS-232 pinout connects directly to a computer's COM port or any other DTE device. Connections to the RS-422 side are made through the terminal blocks.

These converters are suitable for field service, where a power supply would add clutter, or anywhere you need compact, easy-to-use, economically priced serial conversion.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-422 CONNECTOR	OUTPUT	OPTIONAL POWER SUPPLY
422PP9R	DB9 Female	DB9 Female	RS-422	
422PP9TB	DB9 Female	Terminal Block	RS-422	✔

ACCESSORIES

422PS2 - 12 VDC (wired) power supply, 100 mA, USA

PS1EU-1000 - 220-240 VAC to 12 VDC power supply, 1A, tinned leads, Euro CEEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC wall power supply, jack, UK BS-1363 plug

9PAMF6 - DB9 male to DB9 female adapter cable, 1.8 m (6 ft.)

Why use an "optional" power supply with a port-powered converter?

Simply put, all RS-232 ports are not created equal. Many laptop PC's, for example, deliberately reduce power to the RS-232 port to save the battery. And, if you are working at the distance limits of RS-422 or 485, you might need an extra boost. For the majority of applications though, the converter's port powering is sufficient to accomplish the task.

Automatic Send Data Control Explained

As operating systems become more complex, it is increasingly difficult to control an RS-485 driver with standard software and the RTS line. This is especially true in Windows and multi-tasking operating systems. With B&B Electronics' Automatic Send Data Control circuit, driver control is in the converter hardware, so you do not have to work with software at all.

The circuit monitors data flow and enables the driver during transmission and automatically disables it when no data is being sent. There is no need to rework software or install new drivers. Most B&B Electronics RS-232 to RS-485 converters and RS-485 serial cards include Automatic Send Data Control.

Port Powered RS-232/422 Converters

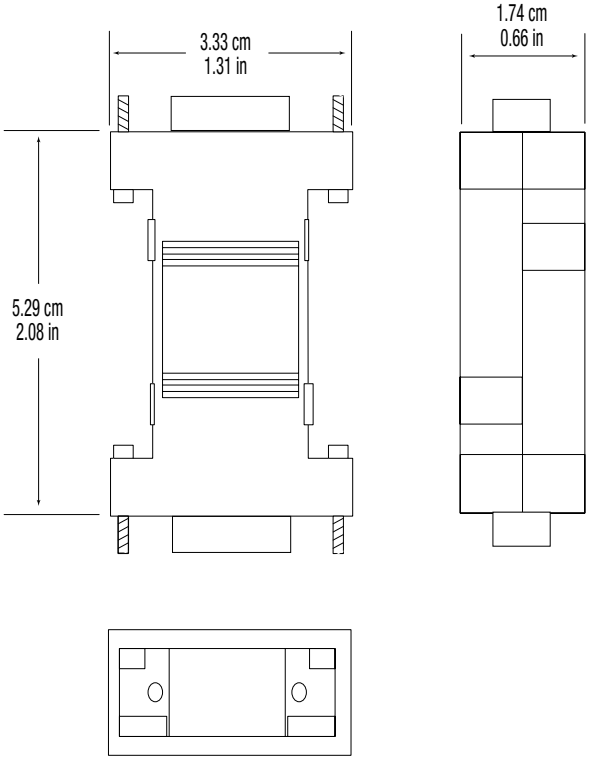
422PP9R, 422PP9TB

SPECIFICATIONS

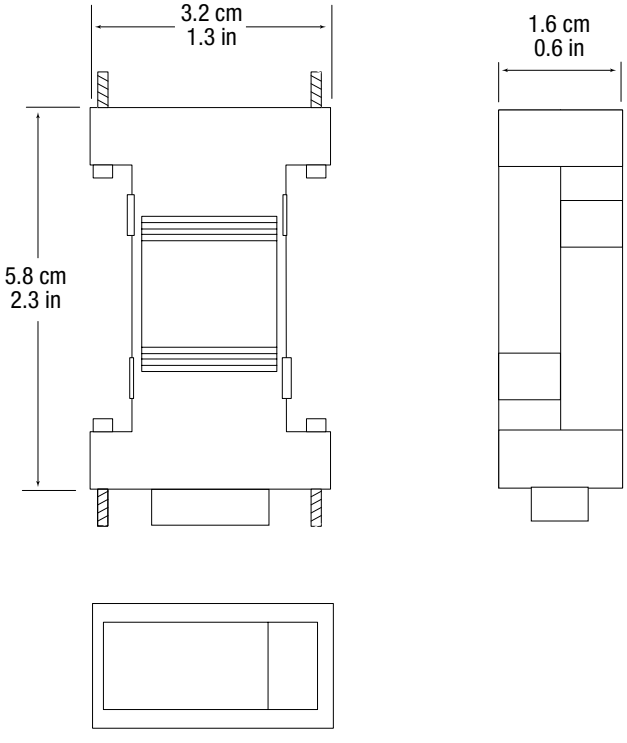
SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232	
Connector	422PP9R: DB9 female 422PP9TB: DB9 female
Signals	
RS-422	
Connector	422PP9R: DB9 female 422PP9TB: Terminal block
Signals	
Operation	RS-422, 4-wire
Biasing Resistors	4.7k Ohms
Termination	None
POWER	
Source	Port-powered from RS-232 handshake lines. (422PP9TB Only) Optional, external 12-16 VDC power supply.
Power Connector	Terminal Block
Input Voltage	12 VDC @ 100 mA

MECHANICAL	
Dimensions	422PP9R: 6.1 x 3.3 x 1.7 cm (2.4 x 1.3 x 0.66 in)
Dimensions	422PP9TB: 8.9 x 3.3 x 1.7 cm (3.5 x 1.3 x 0.7 in)
Enclosure	Plastic, In-line
Weight	0.10 lbs (45.3 g)
MTBF	422PP9R: 2094328 422PP9TB: 849670
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0-95% Non-Condensing
APPROVALS / CERTIFICATIONS - 422PP9R, 422PP9TB	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)	
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)	
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)	
EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

MECHANICAL DIAGRAM - 422PP9R

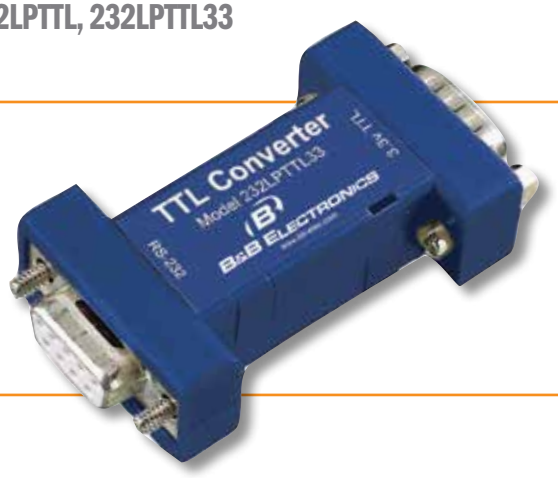


MECHANICAL DIAGRAM - 422PP9TB



Port Powered TTL/RS-232 Converters

232LPTTL, 232LPTTL33



PRODUCT FEATURES

- Convert 2 channels in each direction from TTL ("Transistor Transistor Logic)" to RS-232
- Automatic Send Data Control - no software drivers necessary
- 5V and 3.3V TTL options
- Baud rates up to 115.2 kbps
- Powered from RS-232 data/handshake lines - no power supply required

These non-isolated, four channel TTL/CMOS converters make easy connections between TTL equipment and RS-232 ports and run at a maximum baud rate speed of 115.2 kbps. All models convert two channels (TX and RX) in each direction (bi-directional) from TTL to RS-232. Use these converters with almost any micro controller or programmable logic controller that supports TTL.

Model 232LPTTL converts RS-232 to 5VDC TTL/CMOS competitive levels. Model 232LPTTL33 converts RS-232 to 3.3VDC TTL/CMOS compatible levels. Two channels are used to convert from RS-232 to TTL/CMOS signals and two channels are used to convert from TTL/CMOS signals to RS-232. These converters support TD, RD, RTS, and CTS. DB9S female connector on the RS-232 side. DB9P male connector on the TTL/CMOS side. This unit is powered from the
RS-232 data and handshake lines, whether the lines are high or low.

Pins used are:

RS-232 DB9S Female Pin	Function	TTL/CMOS DB9P Male Pin
3 (input)	TD	3 (output)
2 (output)	RD	2 (input)
7 (input)	RTS	7 (output)
8 (output)	CTS	8 (input)
5 (signal gnd)	GND	5 (signal gnd)

Pin 5 is signal ground for both connectors. Both models are powered by the signals on pins 7(RTS), 4 (DTR), and 3(TD). These handshake lines can be in either the high or low condition, but must be present to power the converter. The unit can work at baud rates up to 115.2 kbps.

It is important that TTL/CMOS logic, and only TTL/CMOS logic (0 to +5 VDC for the 232LPTTL, and 0 to +3.3 VDC for the 232LPTTL33) is used for the TTL/CMOS side of the converter. The maximum sinking current for one TTL/CMOS output is 3.2 mA. The maximum source current for one TTL/CMOS is 1 mA. Signal levels are inverted by the converters. Please refer to the table under Specifications.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	TTL CONNECTOR	TTL VDC
232LPTTL	DB9 Female	DB9 Male	5V
232LPTTL33	DB9 Female	DB9 Male	3.3V

ACCESSORIES

9PAMF6 - DB9 Male to DB9 Female, 1.8 m (6 ft.)

MMNM9 - Null Modem Adapter - DB9 Male / DB9 Male

Automatic Send Data Control Explained

As operating systems become more complex, it is increasingly difficult to control an RS-485 driver with standard software and the RTS line. This is especially true in Windows and multi-tasking operating systems. With B&B Electronics' Automatic Send Data Control circuit, driver control is in the converter hardware, so you do not have to work with software at all.

The circuit monitors data flow and enables the driver during transmission and automatically disables it when no data is being sent. There is no need to rework software or install new drivers. Most B&B Electronics RS-232 to RS-485 converters and RS-485 serial cards include Automatic Send Data Control.

Port Powered TTL/RS-232 Converters

232LPTTL, 232LPTTL33

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232	
Connector	DB9 female
Signals	TD, RD, RTS, CTS
TTL	
Connector	DB9 male
Signals	2 Input/2 Output Channels, GND
Logic	CMOS
VDC Level	232LPTTL: 5V 232LPTTL33: 3.3V
POWER	
Source	Port-powered: from RS-232 handshake lines
MECHANICAL	
Dimensions	5.29 x 3.33 x 1.74 cm (2.08 x 1.31 x 0.66 in)
Enclosure	Plastic, In-line
Weight	0.08 lbs (36.2 g)
MTBF, 232LPTTL33	1674682
MTBF Calc. Method, 232LPTTL33	Parts Count Reliability Prediction

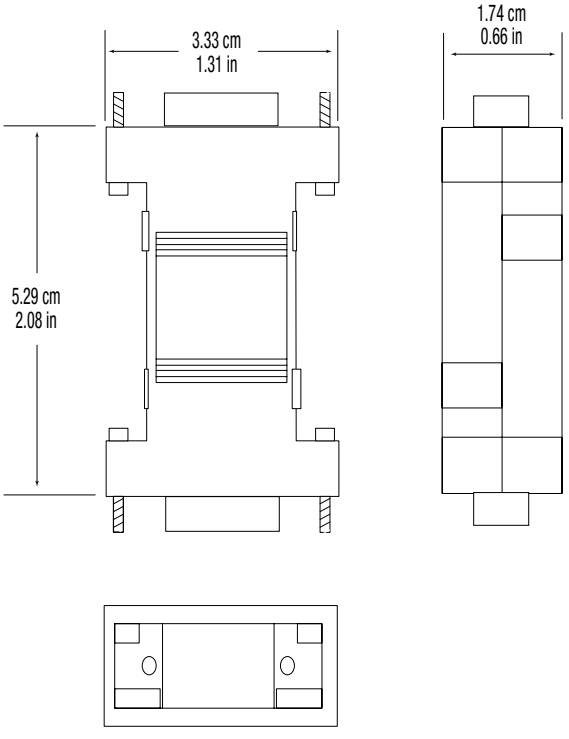
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing

APPROVALS / CERTIFICATIONS - 232LPTTL
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions
CE
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)
EN 61000-4-6: 2009 Conducted Immunity
Download complete Declaration of Conformity at www.bb.elec.com

POLARITY

5VDC TTL/CMOS Input	3.3VDC TTL/CMOS Input	RS-232 Output
Low (< .8V)	Low (< .8V)	+5V minimum, +9V typical
High (> 2V)	High (> 2V)	-5V minimum, -+9V typical
5VDC TTL/CMOS Output	**3.3VDC TTL/CMOS Output**	**RS-232 Input**
+3.45V minimum, +4.6V typical	+2.4V minimum, +3.0V typical	Low (< .2V)
+.55V maximum, +.1V typical	+.55V maximum, +.1V typical	High (> 2.4V)

MECHANICAL DIAGRAM – 232LPTTL, 232LPTTL33



Port Powered TTL/RS-232 Converters

232TTL, 2320TTL

PRODUCT FEATURES

- Convert 2 channels in each direction from TTL to RS-232
- Baud rates up to 115.2 kbps (38.4 kbps on isolated model)
- Powered from RS-232 data/handshake lines - no power supply required
- Optically isolated version (Model 2320TTL)

Models 232TTL and 2320TTL convert RS-232 signals to 0-5 VDC TTL levels. The 2320TTL provides 1500V optical isolation. Two channels are used to convert from RS-232 to TTL signals and two channels are used to convert fomr TTL signals to RS-232.

These converters support RD, TD, RTS, and CTS. The DB25P male connector (DCE) is for the RS-232 side. The DB25S female connector is for the TTL side. The 232TTL supports baud rates up to 115K baud, the 2320TTL supports up to 38.4K baud.

It is important that only TTL logic (0 to +5V) is used for the TTL side of the converter. The maximum sinking current for one TTL output is 8 mA. The maximum source current for one TTL is 0.8 mA. Signal levels are inverted by the converter in its standard configuration as shown in Table 1.

Table 1: Standard inverted Outputs

TTL Input	RS-232 Output
high (>2.0V)	-5 V maximum, -9V typical
low (<0.8V)	+5 V minimum, +9V typical

TTL Output	RS-232 Input
high (>2.0V)	-5 V maximum, -9V typical
low (<0.8V)	+5 V minimum, +9V typical

The 2320TTL has the option for non-inverted outputs. See table 2, "Operations Requiring Modification" if non-inverted outputs are desired.

Power

The 232TTL requires an external +12VDC power supply connected either through 2.5mm jack or pins 12(GND) and 25 (+12VDC) on the TTL side.

The 2320TTL requires both Port Power on the RS-232 side, and external +12VDC power supply connected either through 2.5mm jack or pins 12(GND) and 25 (+12VDC) on the TTL side.

Port power is derived from the outputs of the host RS-232 port. TD, RTS, and DTR lines may be used to port power the RS-232 side. A minimum of two of these lines in either high or low states is required for proper operation. To externally power the RS-232 side, connect the positive lead of the +12VDC power supply to pin 25 and the GND lead to pin 12 of the DB25 female connector.

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	TTL CONNECTOR	TTL VDC	ISOLATION
232TTL	DB25 Male	DB25 Female	5V	
2320TTL	DB25 Female	DB25 Male	5V	1500V

ACCESSORIES

232PS - 12VDC@100mA wall transformer power supply, 2.5mm plug

E1250BL-BB3 - 220-240 VAC to 12 VDC wall power supply, 2.5mm plug Euro CEE7/7 plug

232CAMS - DB25 male to DB9 female adapter cable, 15.24 cm/6 in

232SGF - 25-pin gender reverser - changes male port to female

Options Requiring Modification

The 2320TTL may be modified to non-inverted signals as shown in Table 2 by placing a jumper wire across JP1:A labeled "NI"

Table 2: Modified to Non-Inverted Outputs

TTL Input	RS-232 Output
high (>2.0V)	-5 V maximum, -9V typical
low (<0.8V)	+5 V minimum, +9V typical

TTL Output	RS-232 Input
high (>2.0V)	-5 V maximum, -9V typical
low (<0.8V)	+5 V minimum, +9V typical

The 2320TTL may also be modified to accept a +5V supply on the TTL side. Remove the 0 ohm surface mount resister labeled R13 and place a jumper wire across JP1:B labeled +5V. A +4.75 to +5.25V at a maximum of 25mA is necessary to power the TTL side of the converter when this modification is made.

Port Powered TTL/RS-232 Converters

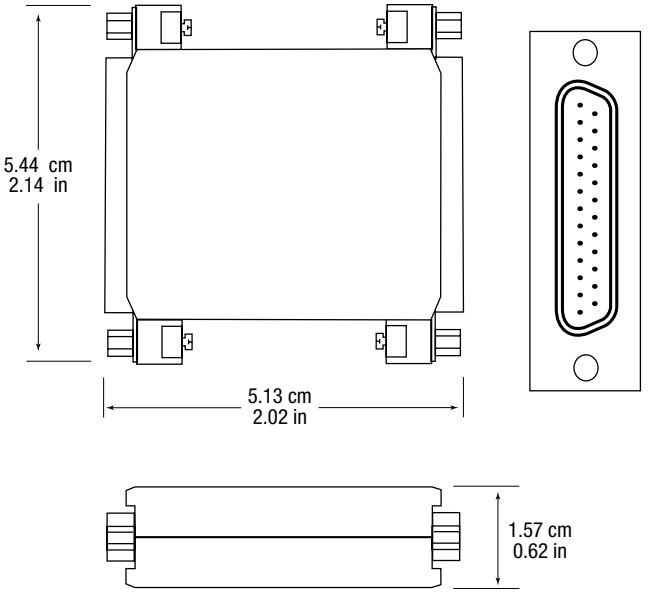
232TTL, 2320TTL

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	232TTL: 115.2 kbps maximum 2320TTL: 38.4 kbps maximum
RS-232	
Connector	232TTL: DB25 male (DCE) 2320TTL: DB25 female (DCE)
Signals	TD, RD, RTS, CTS, GND
TTL	
Connector	232TTL: DB25 female 2320TTL: DB25 male
Signals	2 Input/2 Output Channels, GND
Logic	CMOS
VDC Level	5V
ISOLATION	
Isolation	2,000 V optical
POWER	
232TTL Source	232TTL: External +12VDC power supply on 2.5mm jack for pins 25 (+) and 12 (-) on TTL DB25
2320TTL Source	RS-232: port-powered from RS-232 handshake lines TTL: requires +12 VDC external power supply
Input Voltage	12 VDC (<100 mA)

MECHANICAL	
Dimensions,	232TTL: 5.4 x 5.6 x 1.7 cm (2.1 x 2.2 x 0.7 in) 2320TTL: 7.8 x 5.4 x 2.1 cm (3.1 x 2.1 x 0.8 in)
Enclosure	232TTL: GE LEXAN POLYCARBONATE GRADE 920 2320TTL: Plastic, ABS - Inline
Weight	.011 lbs (49.9 g)
MTBF	232TTL: 1367614 2320TTL: 517206
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMEN TAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing
APPROVALS / CERTIFICATIONS - 232TTL	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	
APPROVALS / CERTIFICATIONS - 2320TTL	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
Download complete Declaration of Conformity at www.bb.elec.com	

MECHANICAL DIAGRAM



TTL to RS-422 Converters

422TTL, 422TTL33

PRODUCT FEATURES

- Convert 2 channels in each direction from TTL (“Transistor Transistor Logic)” to RS-422
- Baud rates up to 115.2 kbps
- 5V and 3.3V TTL options
- Open pads to change pin conf iguration

Models 422TTL and 422TTL33 convert RS-422 or EIA-530 signals to TTL at data rates up to 115.2 Kbps. Two channels are used to convert RS-422 to TTL and two channels are used to convert TTL to RS-422.

Select Model 422TTL for 5 VDC TTL or select Model 422TTL33 for 3.3 VDC TTL. A DB25 male connector is used on the TTL side and a DB25 female connector is used on the RS-422 / EIA-530 side. The converters support RD, TD, RTS, and CTS. Pin 7 is signal ground for both connectors.

These units can work at baud rates up to 115.2 Kbps. Open pads are provided for each line. Therefore, if you choose to, you can change the pin connectors for any of the 4 channels.

When converting a second RS-422 channel, use the corresponding RTS A and RTS B pins (refer to the Quick Start Guide).

These converters invert the TTL signal. Refer to the specifications table to determine polarity. An external +12 VDC power supply is required (not included).

ORDERING INFORMATION

MODEL NUMBER	RS-422 CONNECTOR	TTL CONNECTOR	TTL VDC	POWER SUPPLY REQUIRED
422TTL	DB25 Female	DB25 Male	5V	✔
422TTL33	DB25 Female	DB25 Male	3.3V	✔

ACCESSORIES

422PS - 12VDC@100mA wall transformer power supply, 2.5mm plug

E1250BL-BB3 - 220-240 VAC to 12 VDC wall power supply, 2.5mm plug Euro CEE7/7 plug

232CAMS - DB25 male to DB9 female adapter cable, 15.24 cm/6 in

PS1EU-1000 - 220-240 VAC to 12 VDC Power Supply, jack, Euro CEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC wall power supply, jack, UK BS-1363 plug

TTL to RS-422 Converters

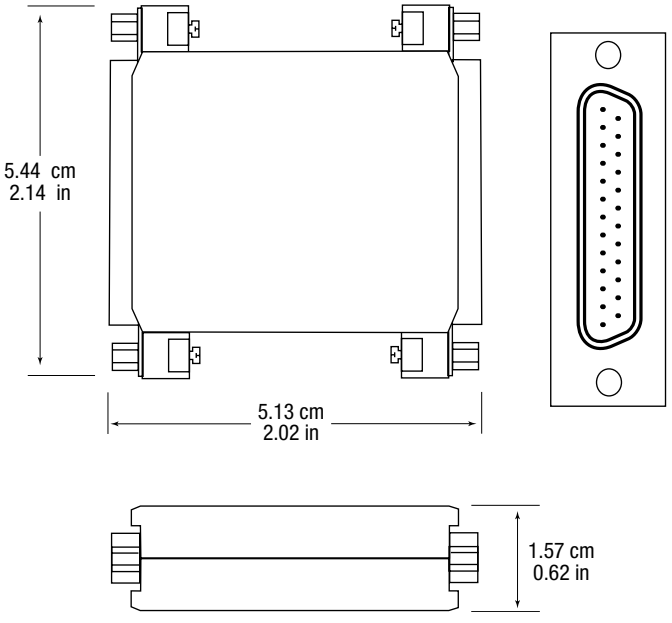
422TTL, 422TTL33

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-422	
Connector	DB25 female
Signals (EIA-530 pinout)	TDA(-), TDB(+), RDA (-), RDB (+), RTS A(-), RTS B (+), CTS A (-), CTS B (+)
TTL	
Connector	DB25 male
Signals	TD, RD, RTS, CTS
VDC Level	422TTL: 5V 422TTL33: 3.3V
POLARITY (VOLTS)	
TTL Input	**RS-422 / EIA-530 Output – V(A)-V(B)**
High	Negative
Low	Positive
TTL Output	**RS-422 / EIA-530 Input – V(A)-V(B)**
High	Negative
Low	Positive
POWER	
Source	External (2.5 mm positive tip)
Input Voltage	12 VDC (<100 mA)

MECHANICAL	
Dimensions	5.4 x 5.6 x 1.7 cm (2.1 x 2.2 x 0.7 in)
MTBF, 422TTL	1539882
MTBF Calc. Method, 422TTL	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
APPROVALS / CERTIFICATIONS - 422TTL	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

MECHANICAL DIAGRAM - 422TTL33



UL Rated Current Loop Converter

232CLDR

PRODUCT FEATURES

- Converts RS-232 to 20mA current loop
- 2000V optical isolation protection from transients
- One Transmit current loop & Receive current loop
- Current loops can be set to Active or Passive
- -40 to 80°C operating temperature

The 232CLDR is a DIN rail mountable RS-232 to current loop converter. It is wide temperature rated and UL Recognized for industrial applications. It has one optically isolated 20 mA transmit loop and one optically isolated receive loop. Each loop can be set to either "Active" or "Passive." When set to "Active" an isolated 20 mA current is supplied for each loop (Transmit and Receive). One 10 to 30 VDC power supply (not included) provides power to the converter and both current loops.

The 232CLDR communicates at baud rates up to 19.2 kbps and can extend communications up to 600 meters (2,000 ft.). 2,000V optical isolation protects equipment from damaging ground loops and surges. Two LED's indicate data flow. Connections are made on terminal blocks.

ORDERING INFORMATION

MODEL NUMBER	SERIAL CONNECTOR	CURRENT LOOP CONNECTOR	POWER SOURCE FOR SERIAL SIDE
232CLDR	Terminal Block	Terminal Block	External power supply

ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-20-12 - DIN rail mount power supply 12VDC, 1.7 A output power

DRPM25 - 35mm DIN Rail to Panel Mount Bracket, 25mm wide

Current Loop Explained

Current loop devices use Current On or Current Off to transmit binary digits. Current loop signals can often transmit over circuits that serial signals can't traverse reliably, due to distance, marginal conductors and electrical noise.

Current loop converters from B&B Electronics interface RS-232 or RS-422/485 to the most common current loop ports – 20mA with open circuit voltages up to 30 V – at a maximum baud rate of 19.2 kbps. High speed optical isolators couple and isolate Transmit and Receive data. All B&B Electronics' current loop converters have a transmit (T+ and T-) loop and a Receive (R+ and R-) loop. Each loop may be operated as an active or passive loop. When the converter needs to provide the loop current, a 12 VDC power supply is required for the current loop side.

Contact B&B Electronics' Technical Support for information on modifications for higher loop currents and voltages.

Additional Reading

Current Loop Application Note

www.bb-elec.com/CurrentLoop

UL Rated Current Loop Converter

232CLDR

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	19.2 kbps maximum
RS-232	
Connector	Terminal block
Signals	TD, RD, GND
Current Loop	
Connector	Terminal block
Signals	T+, T-, R+, R-, GND

ISOLATION	
Method	Optical
Rating	2,000 V

POWER	
Connector	Terminal block
Input Voltage	10-30 VDC
Power Consumption	2.5 W
Source	External

TERMINAL BLOCKS	
Wire Size	24 to 14 AWG
Torque	4 kfg-cm

LED INDICATORS	
Data LEDs	RS-232 & Current Loop flash red when data is transmitted

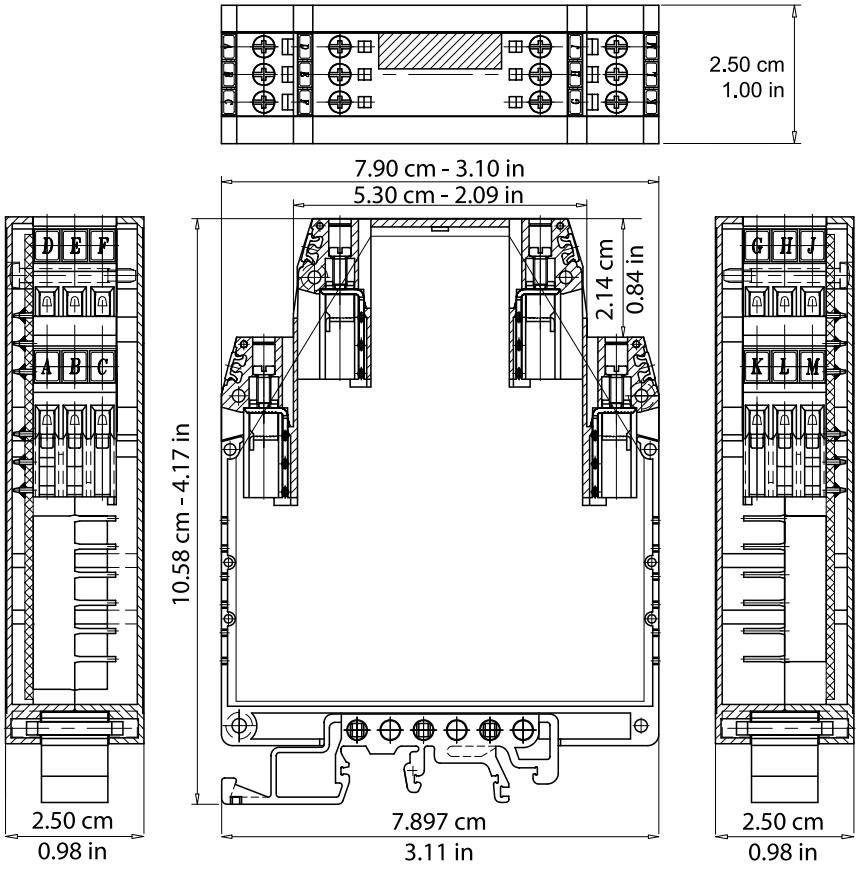
ENCLOSURE	
Material	Plastic
IP Rating	20
Dimensions	2.5 x 7.9 x 9.5 cm (1.0 x 3.1 x 3.7 in)
Mounting	35 mm DIN (panel mount adapter option)
MTBF	401834
MTBF Calc. Method	Parts Count Reliability Prediction

ENVIRONMENTAL	
Operating Temperature	-40 to +80°C (-40 to +176 °F)
Storage Temperature	-40 to +85°C (-40 to +185 °F)
Operating Humidity	0 to 95% non-condensing

APPROVALS / CERTIFICATIONS - 232CLDR
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions
CE
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)
EN 61000-4-6: 2009 Conducted Immunity
Download complete Declaration of Conformity at www.bb.elec.com

MECHANICAL DIAGRAM

Dimensional Diagram of 232CLDR



Current Loop to Serial Converter

232CL9R

PRODUCT FEATURES

- Optically isolated digital current loop to serial conversion
- Baud rates up to 19.2 kbps
- Transmit (T+ and T-) loop and Receive (R- and R-) loop
- Each current loop may be operated active or passive
- Designed for 20mA digital current loop (other values available)

Model 232CL9R is a port-powered RS-232 to current loop converter. No external power required for passive loop installations, but a power supply is required to generate an active loop.

Current Loop Explained

Current loop devices use Current On or Current Off to transmit binary digits. Current loop signals can often transmit over circuits that serial signals can't traverse reliably, due to distance, marginal conductors and electrical noise.

Current loop converters from B&B Electronics interface RS-232 or RS-422/485 to the most common current loop ports – 20mA with open circuit voltages up to 30 V – at a maximum baud rate of 19.2 kbps. High speed optical isolators couple and isolate Transmit and Receive data. All B&B Electronics' current loop converters have a transmit (T+ and T-) loop and a Receive (R+ and R-) loop. Each loop may be operated as an active or passive loop. When the converter needs to provide the loop current, a 12 VDC power supply is required for the current loop side.

Contact B&B Electronics for information on modifications for higher loop currents and voltages.

ORDERING INFORMATION

MODEL NUMBER	SERIAL CONNECTOR	CURRENT LOOP CONNECTOR	POWER SOURCE FOR SERIAL SIDE
232CL9R	DB9 Female	Terminal Block	Port-powered or external power supply

ACCESSORIES

232PS2 - 12VDC @ 100 mA wall transformer power supply, tinned stripped leads

MDR-20-12 - DIN rail mount power supply 12VDC, 1.7 A output power

PS1UK-1000 - 220-240 VAC to 12 VDC Power Supply, jack, UK BS-1363 plug

PS1EU-1000 - 220-240 VAC to 12 VDC Power Supply, jack, Euro CEE7/7 plug

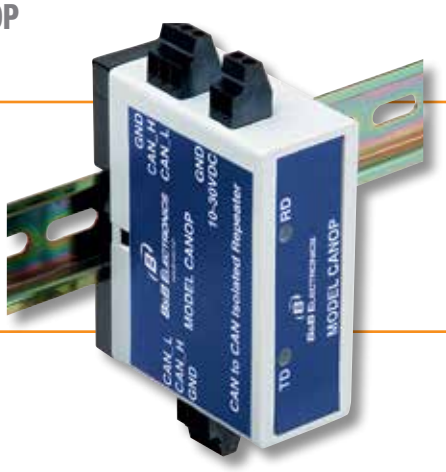
SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	19.2 kbps maximum
RS-232	
Connector	DB9 female
Signals	TD, RD, GND
Current Loop	
Connector	Terminal block
Signals	T+, T-, R+, R-, GND
POWER	
Source	Terminal Block
Input Voltage	12VDC @ 100 mA
MECHANICAL	
MTBF	714354
MTBF Calc. Method	Parts Count Reliability Prediction

ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +185 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing
APPROVALS / CERTIFICATIONS - 232CL9R	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

Serial to CAN to Fiber Isolated Repeater

CANOP



PRODUCT FEATURES

- Convert CAN signals to fiber, and fiber to CAN
- Boosts signals to increase number of nodes
- Extend the node capacity of your CAN network
- 2,000 V optical isolation protection from surges and spikes
- Terminal Block & ST Fiber Optic Connectors

Model CANOP copper to fiber converter extends the node capacity of CAN (Control Area Network) systems while protecting CAN networks from component killing surges and transients. This optically isolated CAN repeater provides 2,000 VDC of optical isolation, allowing you to separate and protect critical segments of the system from the rest of the CAN network.

Connections are made by terminal blocks or ST fiber. Fiber optic cable offers natural resistance to EMI/RFI noise and surges that commonly interfere with electrical networks on factory floors and in industrial environments.

Model CANOP is housed in a rugged DIN rail mountable enclosure, making it easy to install in an industrial cabinet. A power supply of 10-30 VDC is required.

ORDERING INFORMATION

MODEL NUMBER	FIBER OPTIC CONNECTOR	CAN (COPPER)
CANOP	ST	Terminal Blocks

ACCESSORIES

MDR-40-12 - DIN rail mount power supply 12VDC, 3.4 A output power

DR-30-12 - DIN rail mount power supply 12VDC, 2 A output power

FOP3MST - 3m Ready-To-Use Duplex (ST) Fiber Optic Cable Assembly

CAN in Industrial Automation

The multi-layer structure of Controller Area Network (CAN) allows any station on a serial bus to communicate with any other station. There are also benefits in central control and selfdiagnosis and correction of transmission errors. A number of CAN-based higher level protocols have been developed for use in industrial automation applications. CAN Application Layer (CAL), CAN Kingdom, CAN-open, DeviceNet and Smart Distributed System are just a few of these variations.

SPECIFICATIONS

SERIAL TECHNOLOGY		
Baud Rate		250 kbps maximum
CAN		
	Connector	Terminal blocks
Fiber Optic		
	Connector	ST
	Signals	MultiMode
Turnaround		< 2 µ seconds
LEDs		TD, RD (may be difficult to see at high baud rates)
ISOLATION		
		2,000 VDC
POWER		
Power		150 mA @ 12V, fully loaded
Source		External, 10-30 VDC

MECHANICAL	
Dimensions	9.3 x 8.6 x 3.6 cm (4.0 x 3.4 x 1.4 in)
Enclosure	35mm DIN mount
MTBF	269297
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)

High-Speed, Isolated, RS-422/485 Repeater

485OPDR-HS

PRODUCT FEATURES

- 2 kV Isolation
- IEC Level 2, ± 4 kV contact ESD protection, IEC Level 3, ± 8 kV air ESD Protection
- 1.5 Mbps Data Rate
- -40 to 80°C Operating Temperature
- USB 2.0 – High Speed (480 Mbps)
- NEMA TS2

485OPDR-HS
The 485OPDR-HS is a high speed, optically isolated RS-422/485 repeater that supports data rates up to 1.5 Mbps, making it suitable for use in fieldbus systems such as Profibus.

Isolation
The 485OPDR-HS provides 2 kV digital Isolation with 8 kV air ESD protection and 600 W transient voltage suppression on the data lines.

Range Extension
The 485OPDR-HS can be used to extend the range of a network up to 4000 ft. (1.2 km), depending on data rates, and to add additional nodes. 2-Wire RS-485, 4-Wire RS-485 and RS-422 are supported. Data signals and the power inputs connect to built-in terminal blocks.

Enclosure
The repeater operates on externally sourced 10 to 30 VDC power. The enclosure has a DIN rail mount that is designed to fit easily on a standard 35mm rail.

ORDERING INFORMATION

MODEL NUMBER	
485OPDR-HS	High Speed Isolated RS-422/485 Repeater

ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

Profibus Overview

PROFIBUS "Process Field Bus" is communication standard for automation technologies and applications.

PROFIBUS DP ("Decentralized Peripherals") is the most common version of Profibus. It is used for deterministic communication between Profibus masters and their remote I/O slaves and supports numerous standard diagnostic options. Applications include production automation processes and operating sensors/actuators via centralized controllers.

PROFIBUS PA ("Process Automation") is less prevalent and tends to be application specific. It is often used to monitor measurement equipment via process control systems. PA and DP can be used together to help bridge application networks. PA uses the same protocol as DP so it can be linked to a faster DP backbone network to better transmit process signals from equipment to controllers. PA can also be used in hazardous areas. The IEC 61158-2 rated physical layer can bus-power instruments and limit current flow to prevent explosive conditions.

PROFIBUS FMS ("Field Bus Message Specification") is a complex communication protocol for more sophisticated communication needs. It supports non-deterministic data communication between Profibus masters.

High-Speed, Isolated, RS-422/485 Repeater

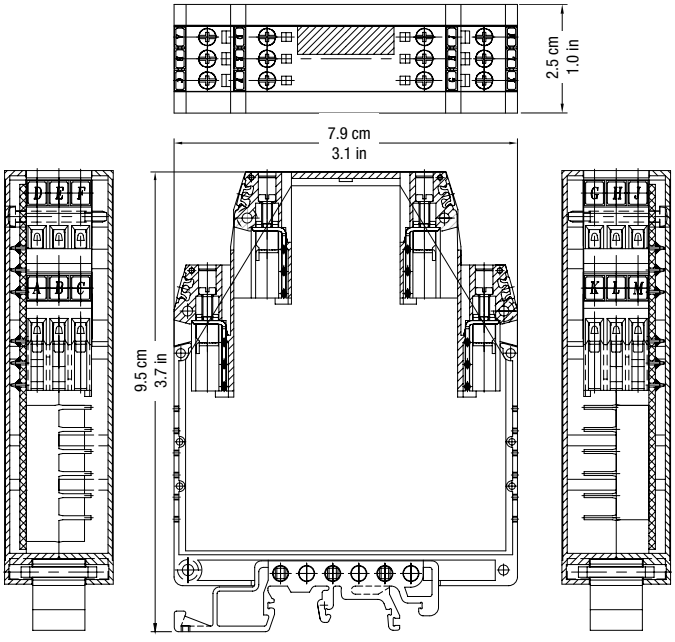
4850PDR-HS

SPECIFICATIONS

RS-422/485	
Connector	Terminal Block
SIGNALS	
	TDA(-), TDB(+), RDA(-), RDB(+), GND
	RS-422
	RS-485 2-Wire and 4-Wire
	Protected GND on Isolated Side
DATA RATE	
Bit-Wise Enabled	Up to 1.5 Mbps
ISOLATION	
Method	Optical
Rating	2000 V
SURGE SUPRESSION	
Method	TVS
Rating	12 V bi-directional avalanche breakdown device 600 W peak power dissipation
Response Time	< 1 pico-second
POWER	
Connector	Terminal Block
Voltage	10 to 30 VDC
Power Consumption	0.7 W
Source	External
TERMINAL BLOCKS	
Wire Size	24 to 14 AWG
Torque	4 kgf-cm

LED INDICATORS	
2 DATA LEDs (Green)	Data LED for each side of isolator Flashes when data transmitted
ENCLOSURE	
Material	Plastic
IP Rating	20
Dimensions	1.0 x 3.1 x 3.7 in (2.5 x 7.9 x 9.5 cm)
Mounting	35 mm DIN (Panel Mount Adapter is available)
ENVIRONMENTAL	
Operating Temperature	-40 to 80 C (-40 to 176 F)
Storage Temperature	-40 to 85 C (-40 to 185 F)
Operating Humidity	0 to 95% Non-condensing
MTBF	117316
MTBF Calculation Method	MIL217F Parts Count Reliability
APPROVALS AND CERTIFICATIONS	
Agency Approvals	CE, FCC, NEMA TS2
	EN61000-6-2 (Heavy Industrial)
	EN61000-4-2 (ESD) ± 4 kV contact, ± 8 kV air
	EN61000-4-3 (RI) 10 V/m, 80-1000 MHz; 3 V/m 1.3 to 2.7 GHz
	EN61000-4-4 (EFT Burst) ± 2 kV DC ports; ± 1 kV signal ports
	EN61000-4-5 (Surge) ± 2 kV common; ± 1 kV differential
	EN61000-4-6 (CI) 10 Vrms, 0.15 to 80 MHz
	EN61000-4-8 (Magnetic) 10 A/m, 50 Hz & 60 Hz
Other	IEC60068-2-27 (Shock) 50 G Peak, 11 ms, 3 axes
	IEC60068-2-6 (Vibration) 140-500 Hz, 4G, 3 axes
	IEC60068-2-32 (Drop) 10 total drops from sides, corner, edges
	Emissions FCC Class B, CISPR Class B (EN55022)

MECHANICAL DIAGRAM



RS-422/485 Isolated Repeater

4850PDR

PRODUCT FEATURES

- Extend data up to 1.2 km (4000 ft.)
- 2000V optically isolated data lines
- -40 to 80°C operating temperature
- Modbus ASCII/RTU

The 4850PDR is an optically isolated RS-422/485 isolated line repeater that can be used to isolate a piece of equipment from the rest of the network. As a repeater, it extends the distance of an existing network an additional 1.2 km (4000 ft.) and expands it beyond the typical 32-node limitation. Data signals and the power inputs connect to the terminal block. 600W surge suppression ensures that the connected equipment is protected even in the harshest of environments. 2-wire RS-485, 4-wire RS-485 and RS-422 are supported.

The repeater operates on externally sourced 10 to 30 VDC power. The enclosure has a DIN rail mount that is designed to fit easily on a standard 35mm rail.

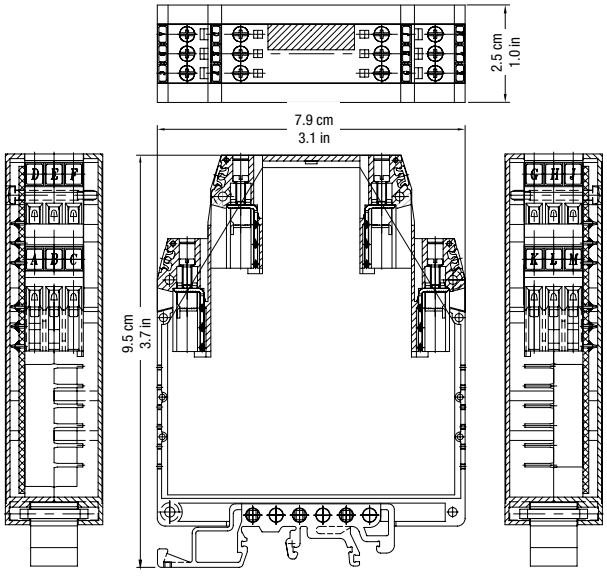
ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

DRPM25 - 35mm DIN Rail to Panel Mount Bracket, 25mm wide

EK-CLIP-MPC - DIN rail clip for enclosure



ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
4850PDR	RS-422/485 Isolated Repeater

SPECIFICATIONS

RS-422/485	
Connector	Terminal Block
Signals	TDA(-), TDB(+), RDA(-), RDB(+), GND RS-422 4-wire, RS-485 2- and 4-wire Protected GND on Isolated Side
ISOLATION	
Method	Optical
Rating	2000 V
SURGE SUPPRESSION	
Method	TVS
Rating	6.5V bi-directional avalanche breakdown device 500W peak power dissipation
Response Time	< 1 pico-second
INDUSTRIAL BUS	
	Modbus ASCII/RTU
POWER	
Connector	Terminal block
Voltage	10 to 30 VDC
Power Consumption	0.7 W
Source	External source required
TERMINAL BLOCKS	
Wire Size	24 to 14 AWG
Torque	4 kgf-cm
LED INDICATORS	
2 DATA LEDs (RED)	Data LED for each side of isolator Flashes when data transmitted
ENCLOSURE	
Material	Plastic
IP Rating	20
Dimensions	2.5 x 7.9 x 9.5 cm (1.0 x 3.1 x 3.7 in)
Mounting	35 mm DIN (Panel Mount Adapter is available)
ENVIRONMENTAL	
Operating Temperature	-40 to 80 C (-40 to 176 F)
Storage Temperature	-40 to 85 C (-40 to 185 F)
Operating Humidity	0 to 95% Non-condensing
MTBF	225299 hours
MTBF Calculation Method	MIL217F Parts Count Reliability
Agency Approvals	CE, FCC cULus Recognized, File E222870

Industrial RS-422/485 Isolated Repeater

485OPDRI

PRODUCT FEATURES

- Supports data rates up to 115.2 Kbps
- Extends signal 1,200 m (4,000 feet)
- Wide -40 to +80°C temperature range
- 10 to 48 VDC input power range
- 2000 V, 3-way optical isolation
- UL Class 1/Division 2 Listed
- Built-in, switchable termination & bias

The 485OPDRI isolated RS-422/485 repeater is designed for rugged industrial environments. It is UL listed and certified for use in Class 1/ Division 2 locations. Powerful optical isolation on both data ports protects your equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits add a third degree of protection.

Packaged in a rugged ABS plastic case, this repeater operates in wide temperature extremes. With a 35mm DIN rail mounting bracket, it easily integrates into control panels or other industrial equipment.

Installation and configuration is easy with DIP switches to set up baud rate and serial communications mode. Removable terminal blocks make wiring a snap. Power is connected through separate terminal block that accepts 10 to 48 VDC from any external source.

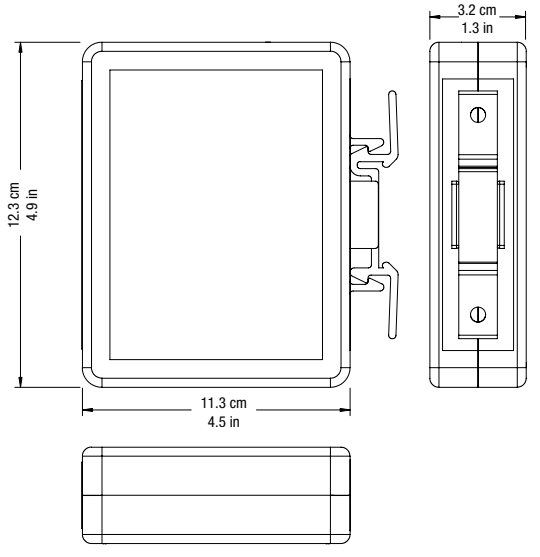
ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

DRPM25 - 35mm DIN Rail to Panel Mount Bracket, 25mm wide

EK-CLIP-MPC - DIN rail clip for enclosure



ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
485OPDRI	Industrial RS-422/485 Isolated Repeater

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-422	TDA(-), TD(B+), RDA(-), RDB(+)
RS-485 4-Wire	TDA(-), TD(B+), RDA(-), RDB(+)
RS-485 2-Wire	Data A(-), Data B(+)
Serial Connector	5 Position, Removable Terminal Block
Data Rate	2.4 to 115.2 Kbps
Isolation	2KV RMS, 1 Minute
Surge Protection	600 W Peak Power Dissipation Clamping time < 1 pico-second
Industrial Bus	Modbus ASCII / RTU
Bias	Built-in, Switchable, 1.2KΩ XMT/RCV
Termination	Built-in, Switchable, 120Ω
POWER	
Source	External power required
Power Connector	2 Position, Removable Terminal Block
Input Voltage	10 to 48 VDC (56 VDC Maximum)
Power Consumption	0.5 W (typical), 1.3 W (termination on both sides)
TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG
Pitch	5.08 mm
Insulation Resistance	≥500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm
INDICATORS	
Power	Red LED
Data	Red LED for Each Data Port
MECHANICAL	
Dimensions	12.3 x 11.3 x 3.2 cm (4.9 x 4.5 x 1.3 in)
Enclosure	IP 20 Plastic, 35 mm DIN Mount
Weight	222 g (0.49 lbs)
MTBF	114696 Hours
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95% Non-condensing
REGULATORY	
Approvals	FCC, CE, UL, UL Class 1 DIV 2, Groups A, B, C, D
UL File	E222870 (HAZLOC E245458)

RS-232 2kV Isolated Repeater

232OPDR

PRODUCT FEATURES

- Extend RS-232 data another 15.2 m (50 ft.)
- 2,000V optically isolated data lines
- -40 to +80°C operating temperature
- Terminal block connections
- UL Recognized
- NEMA TS2

The 232OPDR is a DIN rail mountable RS-232 optical isolator and repeater. It provides 2,000 V isolation for four RS-232 signal lines (two in each direction). The isolator has four LED's to show data flow and one LED to indicate power. Connections are made to a terminal block. The isolation provides protection for computer equipment from ground loops and induced currents caused by lightning or heavy electrical loads. It also functions as a repeater to extend RS-232 signals another 15.2 meters (50 ft.). The 232OPDR can support two data pairs or one data pair plus control signals in both directions.

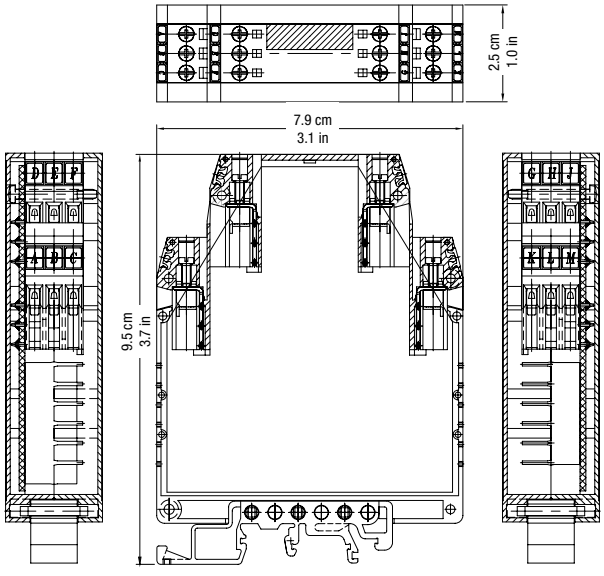
ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

DRPM25 - 35mm DIN rail to Panel Mount Bracket, 25mm wide

EK-CLIP-MPC - DIN rail clip for enclosure



ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
232OPDR	RS-232 2kV Isolated Repeater

SPECIFICATIONS

RS-232	
Connector	Terminal Block
Signals	4 signal lines in each direction. Protected ground on isolated side.
ISOLATION	
Method	Optical
Rating	2,000 V
POWER	
Connector	Terminal block
Voltage	10 to 30 VDC
Power Consumption	1.2 W
Source	External
TERMINAL BLOCKS	
Wire Size	24 to 14 AWG
Torque	4 kgf-cm
LED INDICATORS	
DATA LEDs (RED)	Data LED for each side of isolator Flashes when data transmitted
Power LED (RED)	ON when power applied
ENCLOSURE	
Material	Plastic
IP Rating	30
Dimensions	2.5 x 7.9 x 9.5 cm (1.0 x 3.1 x 3.7 in)
Mounting	35 mm DIN (panel mount adapter available)
ENVIRONMENTAL	
Operating Temperature	-40 to 80 °C (-40 to 176 °F)
Storage Temperature	-40 to 85 °C (-40 to 185 °F)
Operating Humidity	0 to 95% Non-condensing
MTBF	244689 hours
MTBF Calculation Method	MIL217F Parts Count Reliability
REGULATORY	
Approvals	CE, FCC, NEMA TS2 cULus Recognized, File E222870

Industrial RS-232 Isolated Repeater

2320PDRI

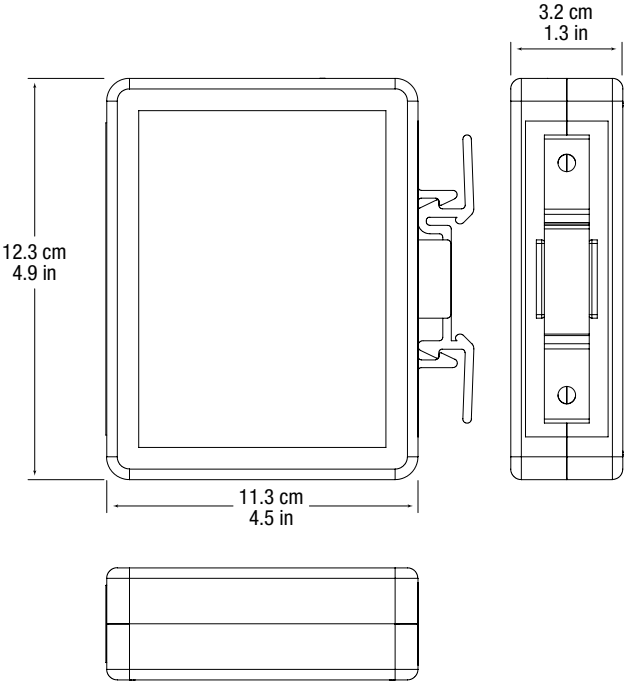
PRODUCT FEATURES

- Supports Data Rates up to 115.2 Kbps
- Wide -40 to 80°C Temperature Range
- 10 to 48 VDC Input Power Range
- 2000 V 3-Way Optical Isolation
- UL Class 1 Division 2 Listed

The 2320PDRI is our premium Industrial RS-232 Isolated Repeater. Designed for rugged industrial environments, it is UL listed and certified for use in Class 1 Division 2 locations. Powerful Optical Isolation on both data ports protects your equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits adds a third degree of protection.

Packaged in a rugged plastic case, the 2320PDRI operates in wide temperature extremes. With a 35mm DIN rail mounting bracket, it is easy to integrate into a control panel or other industrial equipment.

Installation and configuration is easy. Data is connected with a DB9 female connector (DCE) and a DB9 male connector (DTE). Power is connected through terminal block that accepts 10 to 48 VDC from any external source.



ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
2320PDRI	Industrial RS-232 Isolated Repeater

ACCESSORIES

MDR-20-24 - DIN rail mount power supply 24VDC, 1.0 A output power

MDR-40-24 - DIN rail mount power supply 24VDC, 1.7 A output power

DRPM25 - 35mm DIN Rail to Panel Mount Bracket, 25mm wide

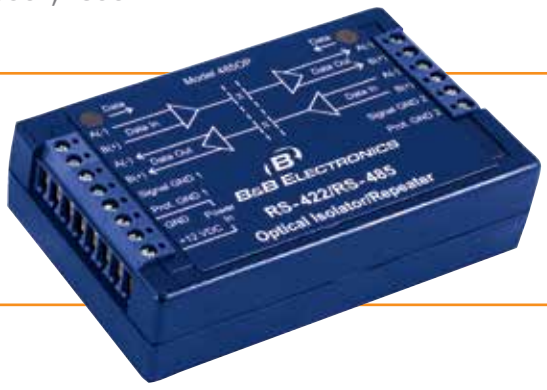
EK-CLIP-MPC - DIN rail clip for enclosure

SPECIFICATIONS

SERIAL TECHNOLOGY	
Serial Connector	DB9 F (DCE), DB9 M (DTE)
Data Rate	Up to 115.2 Kbps
Isolation	2 KV RMS, 1 minute
POWER	
Source	External
Power Connector	2 Position Removable Terminal Block
Input Voltage	10 to 48 VDC (56 VDC Maximum)
Power Consumption	0.6 W typical
TERMINAL BLOCKS	
Wire Size Accepted	28 to 12 AWG, Copper wire only.
Pitch	5.08 mm
Insulation Resistance	≥500 MΩ @ 500 VDC
Maximum Torque	5 Kg / cm
INDICATORS	
Power	Red LED
TD / RD	Red LED TD, RD, CTS, RTS
MECHANICAL	
Dimensions	12.3 x 11.3 x 3.2 cm (4.9 x 4.5 x 1.3 in)
Enclosure	IP 30 Plastic, 35 mm DIN Mount
Weight	0.43 lbs (195 g)
MTBF	177250 Hours
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95% Non-condensing
REGULATORY	
Approvals	FCC, CE, IEC 61850-3, IEEE 1613 UL C1 D2, File: E245458

Optically Isolated RS-422/485 Repeaters

485OP, 485OPB



PRODUCT FEATURES

- 2 KV isolation
- Add up to 32 nodes to RS-485 network
- RS-422 2-wire, RS-485 2 or 4-wire
- Modbus
- UL Recognized

Model 485OP is an optically isolated RS-422/485 signal repeater. In addition to 2KV isolation on the data lines, it can be used to extend RS-422/485 circuits an additional 1.2 km (4,000 ft.), thereby doubling the range. An added benefit is the ability to add another 32 nodes to an RS-485 network and join 2 and 4 wire systems.

The compact design fits almost anywhere. Terminal blocks allow easy installation. Wiring schematic on the label eliminates guesswork. A 12 VDC power supply is required.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION	POWER SUPPLY
485OP	RS-422/485 Fiber Optic Isolated Repeater	USA (included)
485OPB	RS-422/485 Fiber Optic Isolated Repeater	EU or UK (sold separately)

ACCESSORIES

PS1EU-1000 - 220-240 VAC to 12 VDC power supply, jack, Euro CEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC power supply, jack, UK BS-1363 plug

485HESP - RS-485 surge protector

485PS4 - 12VDC @ 500 mA, wall power supply, tinned stripped leads

SPECIFICATIONS

SERIAL PROTOCOLS	
	RS-422 4-wire
	RS-485 2-wire
	RS-485 4-wire
ISOLATION	
Lines Protected	Data lines
Method	Optical
Rating	2000 V
SURGE SUPPRESSION	
Lines Protected	Data lines
Method	TVS
Rating	6.5V bi-directional 600W peak power dissipation
INDUSTRIAL BUS	
	Modbus ASCII/RTU
POWER	
Connector	Terminal block
Voltage	10 to 14 VDC
Power Consumption	1.0 W
Source	Included wall transformer or other 10 to 14 VDC source
POWER SUPPLY	
Input Voltage	120 VAC (USA); 220-240 VAC (EU, UK)
Output Voltage	12 VDC
Output Connection	USA: Stripped and tinned leads EU: UK BS-1363 plug, jack UK: Euro CEE7/7 plug, jack
TERMINAL BLOCKS	
Wire Size	22 to 14 AWG
Torque	0.5 Nm
LED INDICATORS	
2 x DATA (RED)	Flashes when data received
ENCLOSURE	
Material	Plastic
IP Rating	30
Dimensions	9.7 x 6.1 x 2.5 cm (3.8 x 2.4 x 1.0 in)
Mounting	In line
ENVIRONMENTAL	
Operating Temperature	0 to 55 °C (32 to 131 °F)
Operating Humidity	0 to 95% non-condensing
MTBF	453103 hours
MTBF Calculation Method	Parts Count Reliability Prediction
AGENCY APPROVALS	
	CE, FCC
	cULus Recognized, File E222870
	Declaration of Conformity available for download at www.bb.elec.com

RS-232 Optical Isolator

9POP4

PRODUCT FEATURES

- 2.5 kV isolation
- ESD protection - 15 kV
- Protects up to 4 channels
- 230.4 kbps
- Ideal for laptops, lower power serial ports

The 9POP4 isolates and protects RS-232 equipment from lightning surges, accidental high voltage shorts, and ground loops. RS-232 data signals TD, RD, RTS, and CTS are supported at up to 230.4 kbps. Isolation circuits are 2.5 kV rated and protects valuable equipment while maintaining maximum uptime.

Each side of the isolator receives power from a single 12 VDC power supply to maintain the isolation. This powering configuration allows the device to be used in a system with only one power supply, regardless of the power provided by the RS-232 ports.

The isolator uses DB9 male and DB9 female connectors. The female connector is wired as a DCE and should be connected to a DTE port. The male connector is a DTE and should be connected to a DCE port. If you are connecting a DTE to a DTE or a DCE to a DCE, you will need a null modem adapter.

Power supplies recommended and available from B&B Electronics have been tested and certified. Using any other power supply may bypass or degrade the isolation barrier.

ACCESSORIES

232PS2 - 12VDC@100mA wall transformer power supply, tinned stripped leads

MMNM9 - Null Modem Adapter – DB9 Male / DB9 Male

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
9POP4	RS-232 4-Channel Optical Isolator

SPECIFICATIONS

SERIAL TECHNOLOGY			
RS-232	TD, RD, RTS, CTS, GND		
Data Rate	230.4 kbps		
Isolation	2.5 kV		
ESD	15 kV Air Discharge, 8 kV Contact		
Connectors	DB9 female (DCE) DB9 male (DTE)		
POWER			
Source	External required		
Power Connector	2.5 mm jack		
Input Voltage	12 VDC		
Power Consumption	731 mW		
MECHANICAL			
Dimensions	10.4 x 4.3 x 2.0 cm (4.1 x 1.7 x 0.86 in)		
Enclosure	IP 30, plastic		
Weight	54.4 g (0.12 lbs)		
MTBF	262084 hours		
MTBF Calc. Method	MIL 217F Parts Count Reliability		
ENVIRONMENTAL			
Operating Temperature	0 to 70°C		
Storage Temperature	-40 to 85°C		
Operating Humidity	0 to 95% Non-condensing		
APPROVALS / CERTIFICATIONS			
Emissions	FCC Class B, CISPR Class B (EN55022)		
CE	EN61000-6-1:2007	(Light Industrial)	
	EN61000-4-2:2008	(ESD)	ESD, ±8kV/±15kV (contact/air)
	EN61000-4-3:2006	(RFI)	RFI, 80-1000MHz 3V/m, 1.3 - 2.7 GHz, 3V/m
	EN61000-4-4:2004	(EFT Burst)	EFT, ±1kV Power, ±500V Data Lines
	EN61000-4-5: Ed2, 2005	(Surge)	Surge, ±2kV Power (AC), N/A on Data Lines
	EN61000-4-6:2005	(CI)	CI, 3Vrms all ports

2.5 kV RS-232 Optical Isolator

9SPOP2

PRODUCT FEATURES

- 2,500V, 2-way optical isolation
- RS-232 on DB9 male and female connectors
- Port-powered on both sides, no external power supply required

Model 9SPOP2 is a port powered two-channel isolator with a 2,500 Volt protection level. It optically isolates both the RS-232 Transmit and Receive data lines and RS-232 equipment from lightning surges, accidental high voltage shorts, and ground loops. RS-232 data signals TD and RD are supported at up to 115.2 kbps.

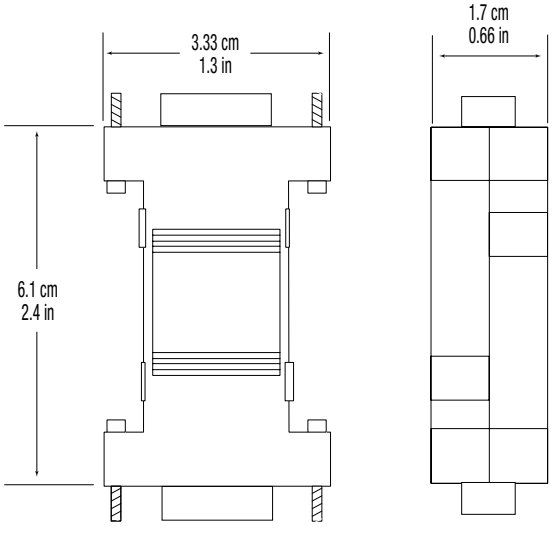
Surge Protection Standards

IEC 1000-4-5: 1995 “Surge Immunity Test” and IEEE C62.41-1991 “IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits” are the recognized standards for surge protection. B&B Electronics’ heavy duty surge protectors have been tested at 6 kV to meet these two specifications.

Learn more about surge suppression & isolation
www.bb-elec.com/TechLibrary

- “Isolation: Your Best Investment for Reliability”
- “Dataline Isolation Theory”
- “Dataline Surge Protection”

MECHANICAL DIAGRAM



ORDERING INFORMATION

MODEL NUMBER	CHANNELS PROTECTED	DTE CONNECTOR	DCE CONNECTOR	ISOLATION
9SPOP2	2	DB9 Female	DB9 Male	2,500 V

ACCESSORIES

9PAMF6 - DB9 Male To DB9 Female, 1.8 m (6 ft.)

MMNM9 - Null Modem Adapter – DB9 Male / DB9 Male

232HESP - RS-232 Surge Protector

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	9600 baud rate
RS-232	
Connector	DB9 female (DTE)
Connector	DB9 male (DCE)
Signals	TD, RD
Transmission Mode	Asynchronous, half or full duplex, point-to-point
POWER	
Source	Port Powered from both sides. DTE side - DTR & RTS lines. DCE side - DCD, DSR & CTS lines.
Weight	0.08 lb (36.3 g)
ISOLATION	
Volts/Duration	2,500 Volts RMS isolation for 1 minute
MECHANICAL	
Dimensions	6.1 x 3.3 x 1.7 cm (2.4 x 1.3 x 0.66 in)
MTBF	674717
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C
Storage Temperature	-55° to 125°C
Operating Humidity	0 to 95% Non-Condensing
MTBF	674717.4
MTBF Calc. Method	Parts Count Reliability Protection
APPROVALS / CERTIFICATIONS - 9SPOP2	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

4kV RS-232 Optical Isolator

232SPHI4

PRODUCT FEATURES

- 4,000V, 2-way optical isolation
- DB25 male and DB25 female connectors
- Can be used in 60601-1 applications
- Port-powered OR use optional external power supply

The 232SPHI4 isolates and protects RS-232 equipment from lightning surges, accidental high voltage shorts, and ground loops. RS-232 data signals at up to 115.2K bps as well as the RTS and CTS handshake lines are supported. The 232SPHI4 provides 4000 Volts of isolation between sides, and maintains creepage and air clearances required for double or reinforced insulation by IEC 60601-1.

Model 232SPHI4 has 4000 Volts of isolation — twice the rating of most isolators — to protect RS-232 equipment from lightning strikes, accidental high voltage shorts and ground loops.

DTE device connections are made through a DB-25 female. DCE device connections are made through a DB-25 male. The two sides of the isolator are powered independently to maintain isolation. Both sides can draw power from the RS-232 data and handshake lines, eliminating external powering requirements in nearly all systems.

If the isolator is to be used with low power ports or when no handshake lines are available, external power can be supplied to either side. This versatile powering configuration minimizes the number of supplies required by the overall system.

ACCESSORIES

232PS2 - 12VDC@100mA wall transformer power supply, tinned stripped leads

PS1EU-1000 - 220-240 VAC to 12 VDC Power Supply, jack, Euro CEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC wall power supply, jack, UK BS-1363 plug

232CAMR - DB9 Male to DB25 Female, 6 in (15.2 cm)

232CAMS - DB9 Female to DB25 Male, 6 in (15.2 cm)

ORDERING INFORMATION

MODEL NUMBER	CHANNELS PROTECTED	DTE CONNECTOR	DCE CONNECTOR	ISOLATION
232SPHI4	4	DB25 Female	DB25 Male	4,000 V

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232	
Connector	DB25 female (DTE)
Connector	DB25 male (DCE)
Signals	TD, RD, RTS, CTS
Transmission Mode	Asynchronous, half or full duplex, point-to-point
POWER	
Source	Port-powered from RS-232 data and handshake lines
Optional External Source	+10 to +16 VDC @ 40 mA max
External Connections	2.5mm power jacks (tip positive) or DB25 connectors pins 11 (+) and 12 (-)
ISOLATION	
Volts/Duration	4,000 Volts RMS isolation for 1 minute (may be limited by external supply)
MECHANICAL	
Dimensions	10.4 x 5.8 x 2.4 cm (4.1 x 2.3 x 0.95 in)
Minimum Air Clearance between DTE & DCE Sides:	5 mm (0.197 in)
Minimum Creepage Distance between DTE & DCE Sides:	8 mm (0.315 in)
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C
Storage Temperature	-55° to 125°C
Operating Humidity	10 to 90% Non-Condensing
MTBF	351896
MTBF Calc. Method	Parts Count Reliability Prediction
APPROVALS / CERTIFICATIONS - 232SPHI4	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
IEC 60601-1-2:2007 Medical Electrical Equipment, Electromagnetic Compatibility	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-2: 2009 Electro-Static Discharge (ESD)	
EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI)	
EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT)	
Download complete Declaration of Conformity at www.bb.elec.com	

Three-stage DIN Rail Surge Protector

HESP4DR

PRODUCT FEATURES

- Three stages of protection on every data line
  1) Gas discharge tube
  2) Series resistor
  3) Transient voltage suppressor
- Protected signal ground connection
- Rugged terminal block connections
- Dedicated chassis ground lug
- Wide operating Temperature
- NEMA TS2

Model HESP4DR meets IEEE 1000-4-5: 1995 and IEEE C62.41-1991 recognized standards for premium surge protectors. It protects against lightning strikes, power surges, and other types of voltage disturbances with three stages of protection for each supported line: a gas discharge tube followed by a series resistor and finally a Transient Voltage Suppresser (TVS). Five RS-232 signals on terminal blocks are supported with a clamping voltage of 6.8 Volts.

The HESP4DR is housed in a sturdy DIN rail mount case with a #10 grounding screw. In order to work properly, it is important to have a good connection between the #10 screw and a solid earth ground.

ORDERING INFORMATION

MODEL NUMBER	INTERFACE	LINES PROTECTED	MOUNTING
HESP4DR	RS-422/485	(5) RS-422/485	DIN Rail Mount

ACCESSORIES

CU15B - Copper Grounding Strap

IN THE FIELD

Parking Lot Security

Industry: Transportation – Intelligent Parking
Product: High Energy Surge Protector

www.bb-elec.com/Parking

HESP4DR

Carrier data charges may apply.

Surge Protection Standards

IEC 1000-4-5: 1995 “Surge Immunity Test” and IEEE C62.41-1991 “IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits” are the recognized standards for surge protection. B&B Electronics’ heavy duty surge protectors have been tested at 6 kV to meet these two specifications.

Learn more about surge suppression & isolation
www.bb-elec.com/TechLibrary

- “Isolation: Your Best Investment for Reliability”
- “Dataline Isolation Theory”
- “Dataline Surge Protection”

Three-stage Surge Protector

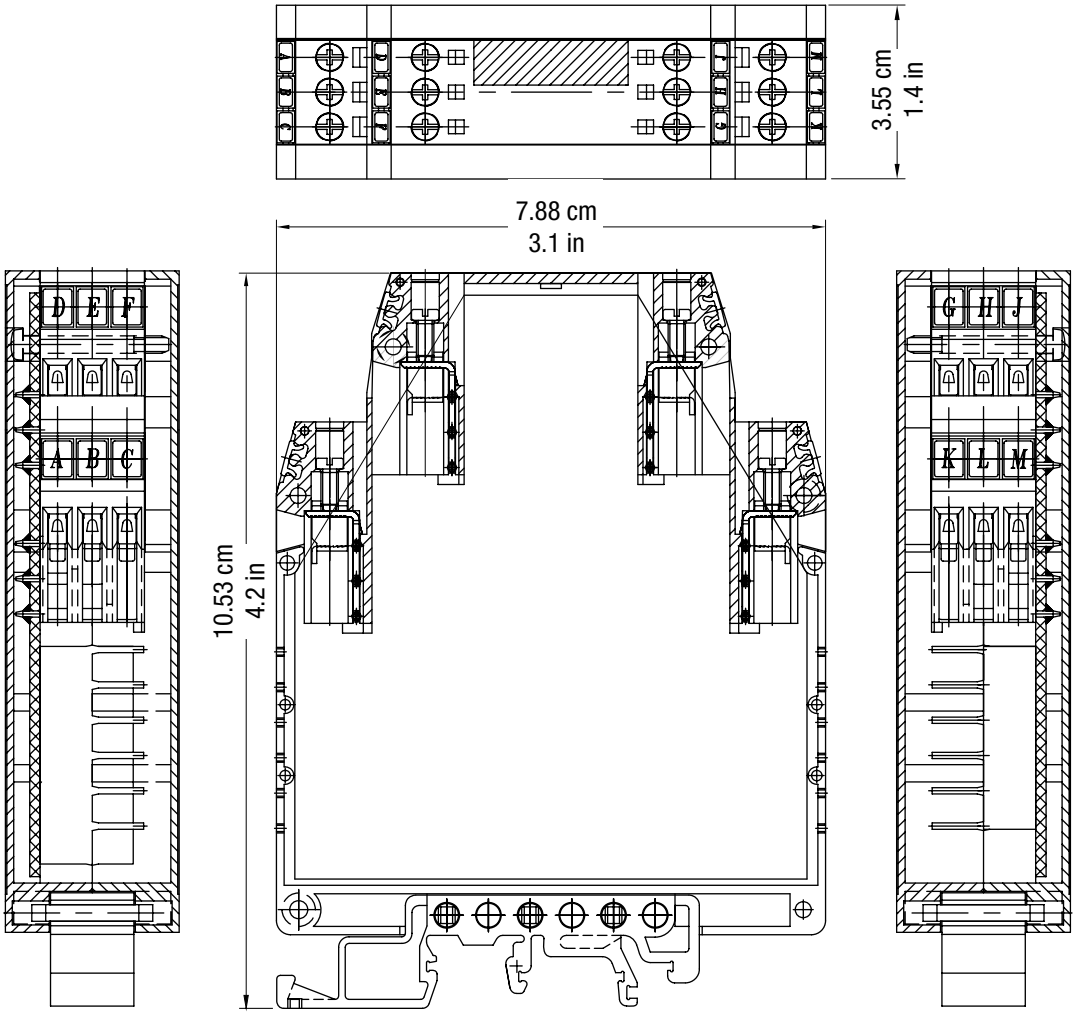
HESP4DR

SPECIFICATIONS

SERIAL TECHNOLOGY	
Connectors, line	5 position terminal blocks
Connectors, equipment	5 position terminal blocks
SURGE SUPPRESSION	
Clamping Voltage - stage 1	72 VDC, minimum 108 VDC, maximum
Series Resistance - stage 2	2.7 Ohms
Clamping Voltage - stage 3	6.45 VDC, minimum 7.14 VDC, maximum
Clamping Time	Less than 5 $x10^{-9}$ seconds
Dimensions	3.55 x 7.88 x 10.53 cm (1.4 x 3.1 x 4.2 in)
Installation	DIN rail mount
Weight	0.114 kg (4.02 oz)

ENVIRONMENTAL	
Operating Temperature	-40 to 80°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95% Non-condensing
APPROVALS / CERTIFICATIONS - HESP4DR	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE, NEMA TS2	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-5: 2006 Electrical Surges	
Download complete Declaration of Conformity at www.bb.elec.com	

MECHANICAL DIAGRAM



Three-stage RS-422/485 Surge Protectors

485HESP, 422HESP, 232HESP

PRODUCT FEATURES

- Three stages of protection on every data line
  1) Gas discharge tube
  2) Series resistor
  3) Transient voltage suppressor
- Protected signal ground connection
- Rugged terminal block connections
- Dedicated chassis ground lug

These three-stage surge protectors meet IEEE 1000-4-5: 1995 and IEEE C62.41-1991 recognized standards for premium surge protectors. It protects against lightning strikes, power surges, and other types of voltage disturbances with three stages of protection for each supported line: a gas discharge tube followed by a series resistor and finally a Transient Voltage Suppresser (TVS). Three RS-422/485 signals on terminal blocks are supported with a clamping voltage of approximately 6.8 Volts.

These surge protectors housed in a tough metal, panel mount case with a protected signal ground connection and dedicated chassis ground lug.In order to work properly, it is important to have a good connection between the #10 screws and a solid earth ground. The 485HESP provides two terminal posts and two metal mounting brackets to provide a good ground connection.

Surge Protection Standards

IEC 1000-4-5: 1995 “Surge Immunity Test” and IEEE C62.41-1991 “IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits” are the recognized standards for surge protection. B&B Electronics’ heavy duty surge protectors have been tested at 6 kV to meet these two specifications.

Learn more about surge suppression & isolation
www.bb-elec.com/TechLibrary

- “Isolation: Your Best Investment for Reliability”
- “Dataline Isolation Theory”
- “Dataline Surge Protection”

ORDERING INFORMATION

MODEL NUMBER	INTERFACE	LINES PROTECTED	MOUNTING
485HESP	RS-422/485	(3) RS-422/485	Panel Mount
422HESP	RS-422/485	(5) RS-422/485	Panel Mount
232HESP	RS-232	(5) RS-232	Panel Mount

ACCESSORIES

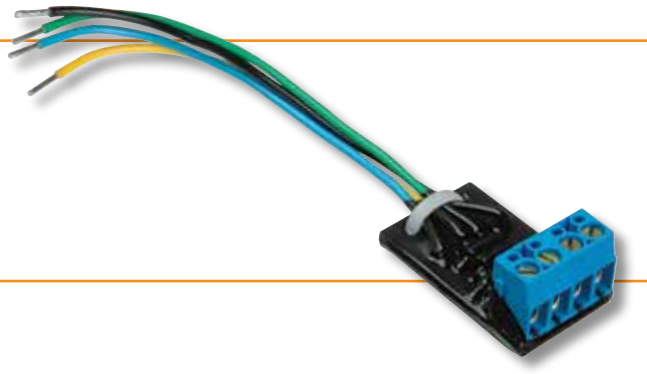
CU15B - Copper Grounding Strap

SPECIFICATIONS

SERIAL TECHNOLOGY	
485HESP	
Connectors, line	3 position terminal blocks
Connectors, equipment	3 position terminal blocks
422HESP/232HESP	
Connectors, line	5 position terminal blocks
Connectors, equipment	5 position terminal blocks
SURGE SUPPRESSION	
Clamping Voltage - stage 1	72 VDC, minimum 108 VDC, maximum
Series Resistance - stage 2	2.7 Ohms
Clamping Voltage - stage 3	6.45 VDC, minimum 7.14 VDC, maximum
Clamping Time	Less than 5 $x10^{-9}$ seconds
Dimensions	11.4 x 8.4 x 4.6 cm (4.5 X 3.3 x 1.8 in)
Installation	In-line
Weight	0.19 kg (6.7 oz)
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +185 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing
APPROVALS / CERTIFICATIONS - 485HESP	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
EN 61000-4-5: 2006 Electrical Surges	
Download complete Declaration of Conformity at www.bb.elec.com	

Fused RS-422/485 Surge Protector

485FPP



PRODUCT FEATURES

- Protects RS-422 or RS-485 ports
- 600W serial circuit surge suppression
- 125 mA fast-acting PCB fuses
- Simple in-line installation
- One time use, disposable unit

Single stage surge protectors offer a high degree of protection with Transient Voltage Suppressors (TVS) for each protected line.

Model 485FPP has 600W Transient Voltage Suppressors to clamp voltages without adversely affecting normal RS-422/485 data. Fast-acting 125 mA PCB fuses to protect RS-422 and RS-485 circuits against transient voltages that are too long or too large for normal suppression.

The 485FPP has 4 wires and terminal blocks for easy installation inline between the data cables – as close as possible to the serial port. Once a fuse is blown, the unit should be disposed and replaced.

ORDERING INFORMATION

MODEL NUMBER	PROTECTION	CONNECTORS	LINES PROTECTED
485FPP	RS-422/485 (disposable, fused)	Terminal Blocks (4) wire leads	(4) RS-422/485 data lines

ACCESSORIES

485HESP - RS-485 Surge Protector

485OP - RS-485 Optical Isolator

SPECIFICATIONS

SERIAL TECHNOLOGY	
Connectors	Terminal blocks RS-422/485: (4) wire leads
SURGE SUPPRESSION	
Surge Suppressors	7.5 Volts, bi-directional avalanche breakdown device
Clamping Voltage	< 1 x 10 -12 seconds, theoretical
Fuses	125 mA fast-acting type
Peak Power	500 Watts dissipation
Series Resistance	7.2 Ohms, maximum
Capacitance	6,000 picofarads, maximum
Installation	In-line
Weight	0.05 lbs (22.7 g)
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +185 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing
APPROVALS / CERTIFICATIONS - 485FPP	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
Download complete Declaration of Conformity at www.bb.elec.com	

Serial Modem Data Splitters

9PMDS, 232MDS

PRODUCT FEATURES

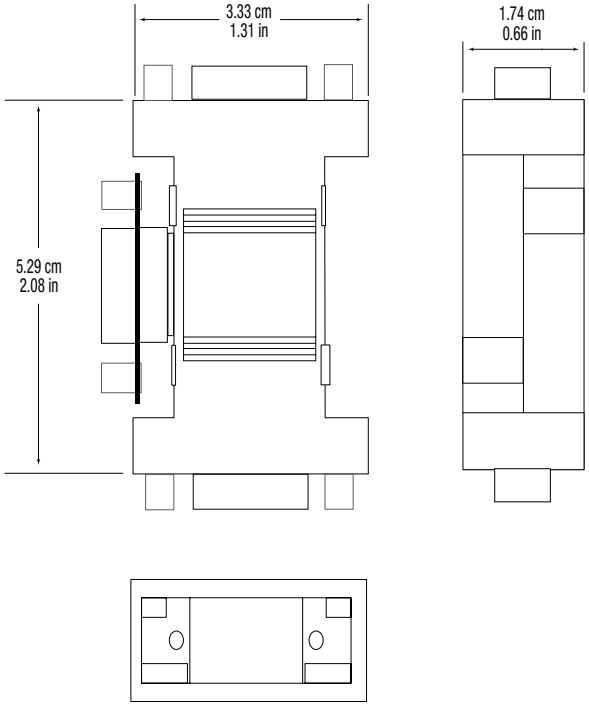
- Computers & terminals use one modem without switching
- Connect two or three PCs to one peripheral
- Use with modems, scanners, scales, other serial devices
- Quick plug-and-play installation – no configuration required
- Port powered – no external power required
- May be left permanently installed

With B&B Electronics' serial port splitters you gain reliability by capturing data from one peripheral on redundant PCs. These serial RS-232 splitters can improve a system's economy by sharing multiple PCs on a single peripheral,

Model **9PMDS** connects two computers or terminals to one modem without switching. The modem data splitter can combine two 9-pin DTE ports to one 9-pin DCE port.

Model **232MDS** can be connected so two computers or terminals can use one modem without switching. This modem data splitter can combine two 25-pin DTE ports and connect them to a 25-pin DCE port.

MECHANICAL DIAGRAM - 9PMDS



ORDERING INFORMATION

MODEL NUMBER	PC PORTS	PERIPHERAL PORTS
9PMDS	(2) DB9 Female	(1) DB9 Male
232MDS	(2) DB25 Female	(1) DB25 Male

ACCESSORIES

9PAMF6 - DB9 Male To DB9 Female, 6 ft. (1.8 m)

232CAM - DB9 Female to DB25 Male, 6 ft. (1.8 m)

232CAMS - DB9 Female to DB25 Male, 6 in (15.2 cm)

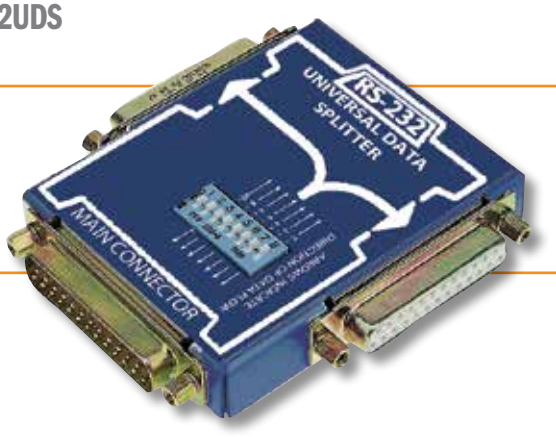
232AMF5 - DB25 Male to DB25 Female, 6 ft. (1.8 m)

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	
9PMDS - Connectors	Straight Through Ports: (2) DB9 Female Monitoring Port: (1) DB9 Male
232MDS - Connectors	Straight Through Ports: (2) DB25 Female Monitoring Port: (1) DB25 Male
Installation	In-line
MECHANICAL	
Weight	9PMDS: 81.7 grams (0.18 lbs) 232MDS: 176.9 grams (0.39 lbs)
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +185 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing
MTBF	9PMDS: 2595488 232MDS: 1133093
MTBF Calc. Method	Parts Count Reliability Prediction
APPROVALS / CERTIFICATIONS - 9PMDS, 232MDS	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class A Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
Download complete Declaration of Conformity at www.bb.elec.com	

RS-232 Universal Data Splitter

232UDS



PRODUCT FEATURES

- Share your printer or modems
- Use as either a modem or printer data splitter
- Program data flow via DIP switch

Model **232UDS** universal serial data splitter,can be connected so that any two RS-232 devices can connect to any one RS-232 device. For example, two computers can share the same modem or serial printer at the same time and each can remain connected at all times.

The 232UDS can function as either an modem data splitter or a printer data splitter. It allows you to switch select which lines are OR'd together and which lines are passed straight through. This unit is self-powered from the RS-232 line and can be left permanently installed.

ORDERING INFORMATION

MODEL NUMBER	CONNECTOR	MAIN CONNECTOR	CONNECTOR
232UDS	DB25 Female	DB25 Male	DB25 Female

ACCESSORIES

232SGM - DB25 Gender Reverser – Changes Female Port to Male (M to M)

232SGF - DB25 Gender Reverser – Changes Male Port to Female (F to F)

232AMF5 - DB25 Male to DB25 Female, 6 ft. (1.8 m)

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	
Connectors	DB25 female DB25 male DB25 female
Pins Supported	Pins 1 through 8, 20. (Pins 1 and 7 connected between all 3 connectors.) (Other pins programmable for data flow direction.)
Installation	In-line
ISOLATION	
	2,000 VDC
POWER	
Power	Port-powered
Source	RS-232 handshake lines
MECHANICAL	
Weight	176.9 grams (0.39 lbs)
MTBF	400449
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing

RS-232 Two Port Combiner

232PTC9

PRODUCT FEATURES

- Two or more serial devices can share a PC serial port
- Cascade combiners to connect many devices
- Automatic or software PC access control
- Quick, easy installation – may be left in place

Monitor and control multiple scales, scanners, terminals or other serial devices with a single PC. Economizes systems by connecting a PC port to several data sources – ideal for devices requiring only intermittent access. The first device to send captures the data path, locking out other lines.

Data flow may also be software controlled using the RTS line. Data from the host PC is sent to all attached devices. Port combiners can be cascaded by connecting the master port of each successive unit to one of the slave ports of the preceding unit. Each additional port combiner adds one slave port to the system. Model 232PTC9 requires external 12 VDC @ 100 mA power (included).

ORDERING INFORMATION

MODEL NUMBER	HOST PC PORT	PERIPHERAL PORTS
232PTC9	(1) DB25 Female	(2) DB9 Female

ACCESSORIES

232PS - 12VDC@100mA wall transformer power supply, 2.5mm plug

PS1EU-1000 - 220-240 VAC to 12 VDC Power Supply, jack, Euro CEE7/7 plug

PS1UK-1000 - 220-240 VAC to 12 VDC wall power supply, jack, UK BS-1363 plug

9PAMF6 - DB9 Male To DB9 Female, 6 ft. (1.8 m)

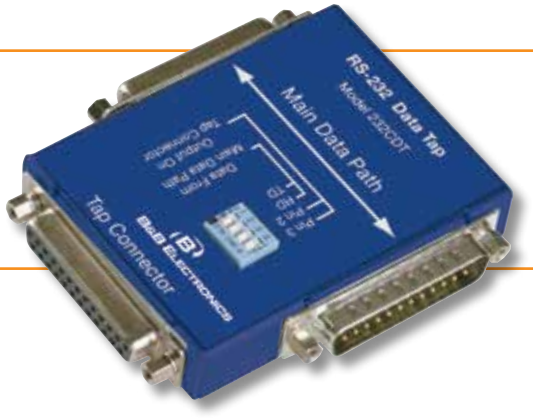
9SGM - DB9 Gender Reverser – Changes Female Port to Male (M to M)

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	
Connectors	Host PC Port: (1) DB9 Female Peripheral Ports: (2) DB9 Female
Signals	TD, RD, RTS (slave to master only) CTS indicates open channel (slave only)
Configuration	DCE
Installation	In-line
MECHANICAL	
Dimensions	10.19 x 5.08 x 2.29 cm (4.01 x 2.00 x 0.9 in)
Weight	0.26 lbs (117.9 g)
POWER	
Input Required	12-17 VDC
Current Draw	95 mA
ENVIRONMENTAL	
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing
MTBF	938745
MTBF Calc. Method	Parts Count Reliability Prediction
APPROVALS / CERTIFICATIONS - 232PTC9	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments EN 61000-4-2: 2009 Electro-Static Discharge (ESD) EN 61000-4-3: 2006 +A1 +A2 +IS1 Radiated Field Immunity (RFI) EN 61000-4-4: 2012 Electrical Fast Transients-Burst Immunity (EFT) EN 61000-4-6: 2009 Conducted Immunity	
Download complete Declaration of Conformity at www.bb.elec.com	

RS-232 Data Taps

9PCDT, 232CDT



PRODUCT FEATURES

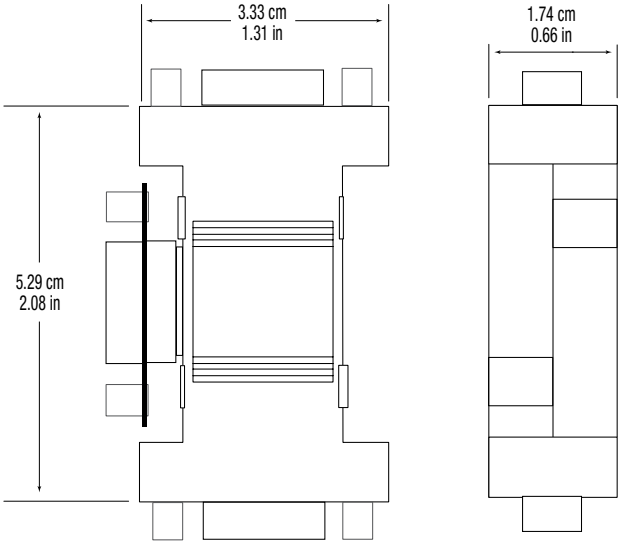
- Monitor and record serial data streams
- Easy to install, may be left in place
- Transparent connections
- No external power required

Tap in on a serial data stream and transparently feed another monitor, printer or other device.

Model **9PCDT** allows an RS-232 port to tap into and check data being transmitted between two other RS-232 ports. DIP switches set programming to monitor the main Transmit and Receive lines individually or together. Choose between monitoring the DCE or DTE port. Also allows the monitoring port to be either DTE or DCE. The DTE connector is male, and DCE and TAP connectors are female.

Model **232CDT** has DIP switches that allow programming to monitor the main Transmit and Receive lines individually or together. The male RS-232 connector on the top and the female RS-232 connector on the bottom are connected straight through, pin for pin. These connectors are used to connect the device – in series – with the RS-232 line to be tapped.

MECHANICAL DIAGRAM - 9PCDT



ORDERING INFORMATION

MODEL NUMBER	STRAIGHT THROUGH CONNECTORS	MONITORING PORT
9PCDT	(1) DB9 Male, (1) DB9 Female	DB9 Female
232CDT	(1) DB25 Male, (2) DB25 Female	DB25 Female

ACCESSORIES

9PAMF6 - DB9 Male To DB9 Female, 6 ft.

232CAMS - DB9 Female to DB25 Male, 6 in

232AMF5 - DB25 Male to DB25 Female, 6 ft.

232SGM - DB25 Gender Reverser – Changes Female Port to Male (M to M)

232SGF - DB25 Gender Reverser – Changes Male Port to Female (F to F)

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	
9PCDT	Straight Through Ports: (1) DB9 Male, (1) DB9 Female Monitoring Port: DB9 Female
232CDT	Straight Through Ports: (1) DB25 Male, (2) DB25 Female Monitoring Port: (1) DB25 Female
Installation	In-line
MECHANICAL	
Weight	9PCDT: 63.5 grams (0.14 lbs) 232CDT: 90.7 grams (0.2 lbs)
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +185 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing
MTBF, 232CDT	1637197
MTBF Calc. Method	Parts Count Reliability Prediction
APPROVALS / CERTIFICATIONS - 9PCDT	
FCC Part 15, CISPR, EN 55022: 2010 + AC:2011 Class B Emissions	
CE	
EN 61000-6-1: 2007 Generic Standards for Residential, Commercial and Light-Industrial Environments	
Download complete Declaration of Conformity at www.bb.elec.com	

RS-232 Mini Tester

9PMTT

PRODUCT FEATURES

- Test for RS-232 data line or equipment failures
- Convenient LEDs for line status
- Can be permanently installed in-line

Which RS-232 data lines are active? Find out with this RS-232 mini tester. It makes troubleshooting easy by helping to check interface connections, equipment, cable problems or failures.

Model **9PMTT** RS-232 mini tester is designed to connect with any RS-232 interface. The tester may be left in the line permanently. It is transparent to data transfer. Bright red or green LED signals clearly show which lines are active. The LEDs' color indicates Negative or Positive voltage (red meaning Negative; green meaning Positive).

ORDERING INFORMATION

MODEL NUMBER	RS-232	RS-232
9PMTT	DB9 Male	DB9 Female

ACCESSORIES

9SGF - DB9 Gender Reverser – Changes Male Port to Female (F to F)

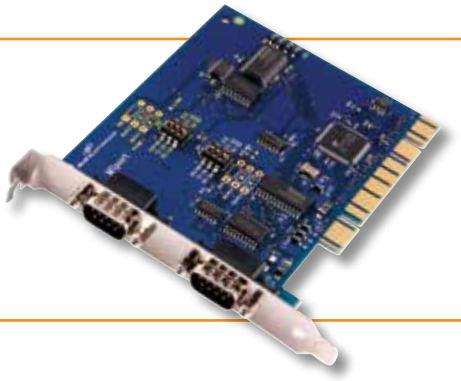
9SGM - DB9 Gender Reverser – Changes Female Port to Male (M to M)

SPECIFICATIONS

SERIAL TECHNOLOGY	
RS-232	
Connectors	DB9 male DB9 female
Signals	TD, RD, RTS, CTS, DSR, CD, DTR
Installation	In-line
LEDS	
Line Status	TD, RD, RTS, CTS, DSR, CD, DTR RED = negative voltage (mark) GREEN = positive voltage (space)
POWER	
Power	Port-powered from RS-232 handshake lines
Source	DTR & RTS
MECHANICAL	
Dimensions	5.0 x 5.4 x 1.6 cm (2.0 x 2.14 x .63 in)
Enclosure	Plastic
Weight	63.5 grams (0.14 lbs)
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +185 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95% Non-Condensing

MIPort™ Universal PCI Cards

One to Four Port RS-232/422/485 Cards



PRODUCT FEATURES

- Add 1, 2, or 4 Serial Ports to your PC
- Optical Isolation Available
- RS-232/422/485 Selectable on Each Port
- 5 and 3.3 V PCI Bus Compatible
- PCI-X Compatible
- Data Rates up to 460.8 Kbps

MIPort ™ Universal PCI Cards suit most any application. Outputs are independently configurable for RS-232, RS-422, or RS-485. Optically isolated cards offer 2000 VDC port-to-port isolation. Compare B&B's cards to others – B&B's premium Isolation Zone along with optical couplers and our unique isolated DC-DC converter design protect your PC from voltage surges and ground loops. DB9M connectors offer positive thumbscrew locking, more robust than phone jack connectors. Four port models include fan-out cables. Four port isolated model 3PCIOU4 has two RS-232/422/485 ports and two RS-422/485 ports. All models support data rates up to 460.8 kbps. MIPort™ cards are plug-and-play compatible and have adjustable FIFO trigger thresholds for input and output. RS-485 operation supports both 2-Wire and 4-Wire (full and half-duplex), and Automatic Send Data Control. All models include a comprehensive technical manual and CD ROM with drivers .

Whether you're application is Industrial Monitoring and control, SCADA, Point of Sale, Medical, or Security, MIPort™ Universal PCI Cards are your number one choice.

ACCESSORIES

9PAMF6 - DB9 Male To DB9 Female, 6 ft. (1.8 m)
9SGF - DB9 Gender Reverser – Changes Male Port to Female (F to F)
9SGM - DB9 Gender Reverser – Changes Female Port to Male (M to M)

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION	
Isolated		
3PCIOU1	1 RS-232/422/485	1 DB9 M
3PCIOU2	2 RS-232/422/485	2 DB9 M
3PCIOU4	2 RS-232/422/485 2 RS-422/485	2 DB9 M on card, 2 DB9 M on second exp slot (cable and bracket included)
Standard		
3PCIU2	2 RS-232/422/485	DB9 M
3PCIU4	4 RS-232/422/485	DB37 F (DB37 to 4 x DB9 M cable included)

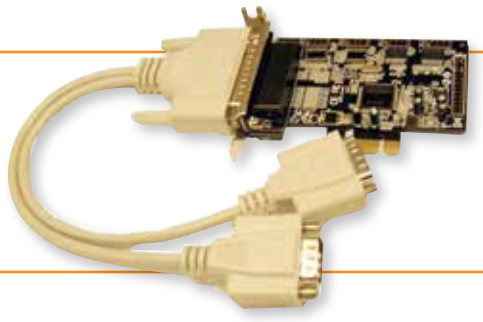
SPECIFICATIONS

Operating Systems	Windows XP, Windows 2008 Server (32/64 bit), Windows Vista (32/64 Bit), Windows 7 (32/64 Bit), Linux Kernel 2.6.x in the following distributions: Ubuntu 10.04 Desktop Edition (32/64 Bit) and Ubuntu 10.04 Server Edition (32/64 Bit).
BUS	PCI (33 MHz/32-bit)
Data Rate	Up to 460.8 kbps (RS-232/422/485)
UARTs	XR17D15X (16C550 Compatible)
Buffer	64 byte FIFO Buffer
Character Length	5, 6, 7, or 8 bits
Parity	Even, Odd, None, Space or Mark
Stop Bits	1, 1.5, or 2
*Isolation	2K V Optical. Ports are isolated From PC Power, Ground, and other ports on the same card
**RS-232 Signals	TD, RD, and all handshake signals
RS-422 Signals	TDA(-), TDB(+), and GND
RS-485 Signals	Data A(-), Data B(+), and GND
Operating Temperature	32 to 122 F (0 to 50 C)
Operating Humidity	0 to 95% Non-condensing
Dimensions	12.2 x 9.6 cm (4.8 x 3.8 in) Card Edge
Mounting Bracket	1.2 x 12.1 x 0.9 cm(0.5 x 4.8 x 0.4 in)
Approvals	FCC, CE

***Note: Isolated Models Only**
****Note: Model 3PCIOU4 supports RS-232 TD, RD, RTS, CTS, and Ground only**

PCI Express Low Profile Serial Card

DSLP-PCIE-100



PRODUCT FEATURES

- Supports serial data transfer rates to 230.4 kbps
- Advanced architecture utilises point-to-point technologies
- Data bus transfer rate of up to 2.5 Gbps under one-lane operation
- Compliant with PCI Express Base Specification 1.0a

PCI Express low profile serial cards offer a high-speed, serial I/O bus that maintains backwards capability with PCI applications and drivers. The layered architecture supports existing PCI applications and drivers by maintaining compatibility with the existing PCI model. Defined by high performance, scalable, serial bus, PCI Express Cards are dedicated to the device while multiple PCI Express devices can be active without interfering with each other.

The DSLP-PCIE-100 is configured to fit into low profile systems using one PC slot. It has a fanout cable to connect two serial devices, supports hot swapping, plug-n-play connections.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
DSLP-PCIE-100	2-port Serial RS-232 to DB9, Low Profile, PCI Express Board

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Transfer Rate	Up to 230.4 kbps
Interface	RS-232
Bus	PCI-Express X1
Ports/Connectors	(2) DB-9 serial fan out cable, requires 1 PC bracket slot
Machine Compatibility	Low profile systems, standard height configuration with low profile orb installed
O/S Support	Windows 2000/XP/Server 2003/Vista/Win7 32/64 bit
ENVIRONMENTAL	
Operating Temperature	-30 to 75°C (-30 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% Non-condensing
APPROVALS / CERTIFICATIONS	
Certifications	CE, FCC, Compliant with PCI Express Base Specifications 1.0a

About PCI Express Card Technology

B&B Electronics' Quatech brand PCI Express Serial Cards are the breaking edge standard in serial card PCI technology and the successor for server- and client system I/O interconnects. In addition to bus technology upgrades, such as faster speeds and deeper FIFO rates, PCI Express cards have many advantages over traditional PCI cards including point-to-point link dedicated to each device (instead of PCI shared bus); lower latency in server architectures due to a more direct connection to the chip set; small connectors with easier implementation for system designers and advanced features via isochronous channels for guaranteed bandwidth delivery, advanced power management and hot swap support.

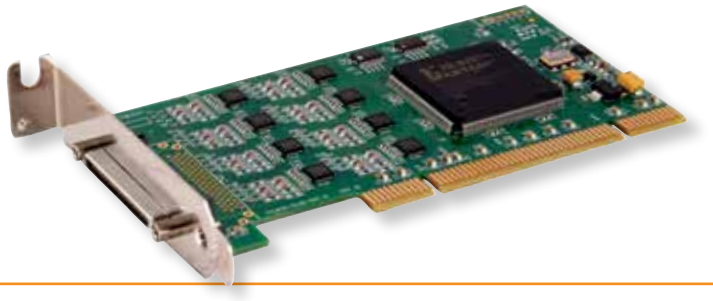
Advanced Features - As client system boards migrate from the PCI connector to the PCI Express connector, Quatech PCI Express cards maximise advanced features such as:

- Advanced power management
- Support for real-time data traffic
- Hot plug and hot swappability
- Data integrity and error handling

PCI Express vs. Universal PCI - Although PCI and UPCI Cards can be used in a variety of platforms, PCI Express reflects an industry trend to replace legacy shared parallel buses with high-speed serial buses. They both have the same dimensions and are equipped with rear brackets. But, the difference lies in the I/O connectors. PCI Express has 36 pins versus the 120 pins on a standard PCI connector.

Low Profile Universal PCI Serial Cards

DSCLP-100, ESCLP-100, QSCLP-100, SSCLP-100/-200/300



PRODUCT FEATURES

- 1, 2, 4 or 8 independent RS-232 ports
- RS-232 speeds up to 921.6 kbps (100 series)
- RS-422 or 485 configurable, full or half duplex (excludes ESCLP-100)
- RS-422/485 speeds up to 460.8 kbps (200/300 series)
- Auto enable/disable of RS-422/485 transmitter
- 16550 UARTs with 16-byte FIFOs (1, 2, 4 port boards)
- 16750 UARTs with 64-byte FIFOs (8 port boards)

These Low Profile Universal PCI Serial Cards utilise a single PCI slot to provide two independent asynchronous serial ports sharing a single interrupt. Multi-port versions require only one slot to connect. The cards include a fan out cable with independent DB-9 male connectors. All PCI registers are properly implemented, so you can be assured that these boards will be good citizens on the PCI bus. These models use a universal PCI connector compatible with both the 3.3V connector key required by PCI 2.3 and later specifications and the 5V connection used by older systems. Full modem control and hardware and software flow control

Serial port connections are made via DB-9 male connectors with 16550 UARTs containing 16-byte FIFOs. To maintain maximum signal integrity, the four-layer board design ensures maximum protection versus noise propagation throughout the communication lines.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
SSCLP-100	1 Port, RS-232, DB9, Low Profile, Universal PCI
SSCLP-200/300	1 Port, RS-422/485, DB9, Low Profile, Universal PCI
DSCLP-100	2 Port, RS-232, DB9, Low Profile, Universal PCI
QSCLP-100	4 Port, RS-232, DB9, Low Profile, Universal PCI
ESCLP-100	8 Port, RS-232, DB9, Low Profile, Universal PCI

About Low Profile Universal Cards

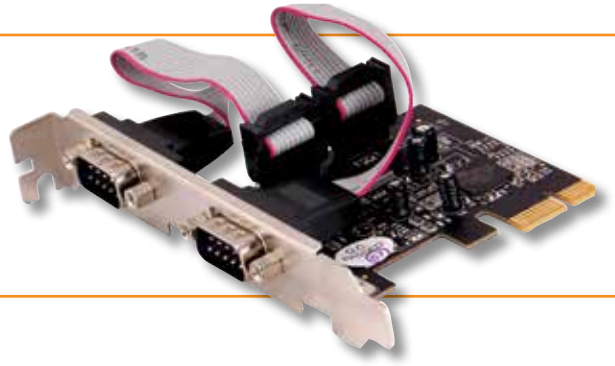
Low Profile Universal PCI cards add serial connectivity to a variety of desktop, thin client, embedded systems, and server environments. These boards provide true universal connectivity, enabling a single product to be used to implement systems with dramatically different resource requirements. This makes Quatech boards the most robust, flexible, and economical choice for any application requiring multiple serial ports. These cards are mechanically similar to standard PCI cards, but use a shorter board and a different mounting bracket. With greater flexibility, they are designed on the smallest MD1 low profile footprint, but come with both a full size ORB for standard systems, and a smaller ORB for use in low profile backplanes to fit even 2U racks without riser cards. A wide range of OS options facilitates system upgrades and multiplatform installations.

SPECIFICATIONS

SERIAL TECHNOLOGY	
Bus Interface	32-bit, 33 MHz PCI Bus specification 2.3 compliant
O/S Support	Windows 95/98/Me/2000/XP/Vista/7, Linux, DOS
Data Rate	Up to 460.8 kbps (200/300 series) Up to 921.6 kbps (100 series)
RS-232 Connectors/Ports	SSCLP: 1 DB-9 male DSCLP: DB-25 male to cable with 2 DB-9 male QSCLP: HD-44 female to cable with 4 DB-9 male ESCLP: VHDCI-68 male to cable with 8 DB-9 male
RS-422/485 Connectors/Ports	SSCLP: 1 DB-9 female DSCLP: DB-25 female to cable with 2 DB-9 female QSCLP: HD-44 female to cable with 4 DB-9 female Each RS-422 or RS-485 configurable, full or half duplex
RS-232 UARTs	S/ D/ QSCLP: 16550 UARTs; 16-byte FIFOs (1 per port) ESCLP: 16750 UARTs; 64-byte FIFOs (1 per port)
RS-422/485 UARTs	S/ DSCLP: 16550 UARTs; 64-byte FIFOs (1 per port) QSCLP: 16750 UARTs; 64-byte FIFOs (1 per port)
RS-232 Transceiver	ICL3245CA or compatible
RS-422/485 Transceiver	MAX3076E or compatible
RS-232 Drivers	High Level Output: +5V (min), +5.4V (typical) Low Level Output: -5V (min), -5.4V (typical) Transition Time (THL-TLH): 25ns (typical)
RS-422/485 Drivers	Differential Voltage: ±3.3V Transition Time (TLH): 52ns (typical) Transition Time (THL): 60ns (typical)
RS-232 Receive Buffers	Voltage Range: -25V (max), -25V(minimum) Transition Time (THL-TLH): 50ns (typical)
RS-422/485 Receive Buffers	Differential Input Threshold: ±0.2V Voltage Range: -7V to +12V Common Mode Input Transition Time (THL-TLH): 65ns (typical)
Dimensions	MD1 board, fits 2U racks: 6.36 x 11.99 cm (2.5 x 4.72 in) Low profile PCI bracket: 7.92H cm (3.12 in) (Standard PCI bracket also included)
POWER	
Requirements	+5V, 260mA (typical)
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C
Storage Temperature	-50 to +80 °C
Operating Humidity	10 to 80%
APPROVALS / CERTIFICATIONS	
Certifications	CE, FCC Class B RoHS and WEEE compliant

PCI Express Serial/Parallel Cards

DS-PCIE-100, QS-PCIE-100, HS-PCIE-100



PRODUCT FEATURES

- Supports serial data transfer rates to 115.2 kbps
- Data bus transfer rate of up to 2.5 Gbps under one-lane operation
- Configuration options: serial, parallel with serial
- Advanced architecture making use of point-to-point technologies
- Compliant with PCI Express Base Specification 1.0a

These boards support serial data transfer rates up to 115.2 kbps plus hot swapping, plug-n-play connection availability. PCIe Express serial/ parallel boards has many advantages over traditional PCI cards, including a point-to-point link dedicated to each device instead of the PCI's shared bus; lower latency in server architectures due to a more direct connection to the chip set; small connectors with easier implementation for system designers and advanced features via isochronous channels for guaranteed bandwidth delivery, advanced power management and hot swap support.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
DS-PCIE-100	2-port Serial RS-232 to DB-9 (requires 1 PC bracket slot)
QS-PCIE-100	4-port Serial RS-232 to DB-9 (requires 1 PC bracket slot)
HS-PCIE-100	6-port Serial RS-232 to DB-9 (requires 3 PC bracket slots)

About PCI Express Card Technology

These PCI Express Serial Cards are the breaking edge standard in PCI card technology for server and client system I/O interconnects. In addition to bus technology upgrades, such as faster speeds and deeper FIFO rates, PCI Express card advantages include a point-to-point link to each device (instead of PCI's shared bus); lower latency in server architectures due to a more direct connection to the chip set; and small connectors with easier implementation for system designers.

Advanced Features - As client system boards migrate from PCI connectors to PCI Express connectors, Quatech PCI Express cards maximise advanced features such as advanced power management, support for real-time data traffic, hot plug and hot swappability, and data integrity and error handling.

PCI Express vs. Universal PCI - Although PCI and UPCI Cards can be used in a variety of platforms, PCI Express reflects an industry trend to replace legacy shared parallel buses with high-speed serial buses. They both have the same dimensions and rear brackets. But, the difference is in the I/O connectors: PCI Express has 36 pins versus the 120 pins on a standard PCI connector.

SPECIFICATIONS

SERIAL TECHNOLOGY	
Compliance	Compliant with PCI Express Base Specification 1.0a
UART/FIFO	Built-in 16C550 compatible UART with 16 byte transmit-receive FIFO
Serial Data Rate	Up to 115.2 kbps
Interface	RS-232
Machine Compatibility	Full height systems
Bus	PCI-Express X1
O/S Support	Windows 2000/XP/Server 2003/Vista/Win7
DS-PCIE-100 Ports/Connectors	2 DB-9 serial on orb bracket, requires 1 PC bracket slot
QS-PCIE-100 Ports/Connectors	4 DB-9 serial, requires 1 PC bracket slot, fan out cable
HS-PCIE-100 Ports/Connectors	6 DB-9 serial, requires 3 PC bracket slots
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C
Storage Temperature	-50° to +80°C
Operating Humidity	10 to 90% Non-Condensing
APPROVALS / CERTIFICATIONS	
Agency Approvals	FCC, CE Compliant with PCI Express Base Specification 1.0a

Serial Express Cards

DSPXP-100

PRODUCT FEATURES

- I/O notebook expansion - adds PCIe serial ports
- Built-in 1024-byte FIFOs buffers boost data transmit/receive speed
- Baud rates up to 921.6 Kbps
- Hot plug & play, hot swapping capabilities
- Installs in any 34mm and 54mm Expresscard slots
- Supports PCI Express Base Specification Revision 1.1a

PCI ExpressCard technology is emerging with faster speeds and better efficiency than typical PC cards, connecting high-bandwidth peripherals to notebooks and other portables. The serial ExpressCard's credit-card form factor provides a smaller, faster and more desktop-friendly format.

Since laptops often do not provide the number and variety of built-in serial I/O ports available on a desktop PC, these one, two and four port cards can support I/O expansion and connectivity to serial devices in mobile laptop applications.

This 34mm PCI ExpressCard can be used in either 34 or 54mm slots. An included 54mm adapter improves the fit and durability of 34mm cards in larger 54mm slots and helps the card withstand normal or accidental stress and dislodging from the slot.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
DSPXP-100	2-port RS-232 Express Card

SPECIFICATIONS

SERIAL TECHNOLOGY	
Bus Interface	ExpressCard Standard, PCI Express-based Designs Specification, Revision 1.1 compliant interface
Baud Rate	921.6 kbps per port
UART	16450/550/750-compatible register set
Data FIFO	1024-bytes
Data Bits	Supports 5, 6, 7, 8. Supports even, odd, mark, space & no parity. Supports 1, 1.5 & 2 stop bits
O/S Support	Windows XP/Vista/7, 32 & 64 bit
Ports/Connectors	DSPXP-100: 2, RS-232, DB9 Male
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C
Storage Temperature	-50 to +80 °C
Operating Humidity	10 to 90%
APPROVALS / CERTIFICATIONS	
DSPXP -100	TIA-232-F (RS-232) compliant
Agency Approvals	FCC, CE, RoHS

About PCI ExpressCards

The PXP card series was designed with a PCI Express (PCIe) interface rather than using USB controller interfaces. The PXP series is a great solution to connect to existing peripherals and maintain compatibility and functionality with current application software.

Advantages of a PCIe-based ExpressCard design are in the interface to the laptop's motherboard. The PCIe bus interface is the successor to the PCI bus, which in turn was the successor to the ISA bus to which built-in ports were originally attached. As such, the ExpressCard adapter utilises a PCIe-based design and can still directly use I/O space addresses and interrupts, thus more closely emulating built-in ports than can be done via USB-based design.

Moreover, because there is no USB stack for the drivers to contend with, throughput can be higher and latency will be lower (significantly in many cases). Due to improved data transfer rate, the ExpressCard is more efficient for multi-tasking operations. The PXP series supports data rates of up to 921.6 Kbps, providing steady flow of data throughput.

For applications that require C1/D2 certification, B&B Electronics has a range of connectivity and communication solutions designed to operate in hazardous environments.

ETHERNET SWITCHES

Elinx™ Managed & Unmanaged Ethernet Switches

(ESW100, ESW200 series)

- 5 or 8 ports; copper, LC, SC, ST fiber options
- Redundant AC/DC power inputs
- IP30 metal case is DIN or 6-way panel mountable
- Ultra compact, slimline (ESW100 series)
- Wide temperature (ESW200 series)
- Certifications: C1/D2, NEMA TS2, 61000-6-2/ Level 3, IEC60068-2 shock/vibration, FCC, CE, RoHS

ETHERNET GIGABIT SWITCH

Elinx™ Unmanaged GB Switch

(EIR408-T)

- Gigabit speed for higher throughput in high bandwidth networks
- Eight 10/100/1000 Base-T Ethernet ports
- Dual 12 to 48 VDC power inputs
- Wide temperature
- IP30 case is DIN or panel mountable
- Certifications: C1/D2, UL/cUL 60950, NEMA TS2, IEC60068-2 shock/vibration, FCC, CE, RoHS

POWER-OVER-ETHERNET SWITCHES

Ethernet PoE Switches

(EIRHP305-T, EIRP305-24V-T)

- Simplifies powering of remotely located devices
- Dual power inputs and alarm output
- IP30 case is DIN or panel mountable
- Wide temperature
- 24 or 48VDC power input (Model EIRP305-24V-T)
- 48VDC power input (Model EIRHP305-T)
- Certifications: C1/D2, UL/cUL/us, PoE (IEEE802.3x), FCC, CE, RoHS

ETHERNET EXTENDER

Elinx™ Unmanaged Extender

(EIR-EXTEND)

- Extend Ethernet to 6232 ft (1.9 km) over standard copper wire
- Dual power inputs via terminal block
- DIP switch set-up as local or remote (sold as single units, two required for operation)
- Stand-alone/desktop or rack mount
- Wide temperature
- Certifications: C1/D2, NEMA TS2, 61000-6-2 Level 3, FCC, CE, RoHS

ETHERNET MEDIA CONVERTERS

Elinx™ Media Converters

(EIR-M-ST, EIR-M-SC, EIR-S-SC)

- Convert copper signals to fiber
- 10/100Base
- Redundant 10-48 power inputs
- Auto negotiation for data rate and duplex modes
- MDI/MDI-X (auto cross-over)
- Wide temperature
- Certifications: C1/D2, NEMA TS2, IEC61000-6-2 , FCC, CE, RoHS

SERIAL CONVERTERS & REPEATERS

Ilinx™ Industrial Hardened Serial Converters & Repeaters

(485DRCi-PH, 232OPDRi-PH, 485OPDRi-PH, FOSTCDRi-PH-xx series)

- 3-way isolation
- Wide temperature
- Modbus compatible
- IP30 case
- Shock and vibration tested
- Certifications: C1/D2, UL508, NEMA TS2,, IEEE1613, IEC61850-3, IEC60068, FCC, CE, RoHS

USB HUBS

Ulinx™ USB Hubs

(UHRx04 series)

- Industrial-grade USB hubs
- High retention USB connectors
- Level 4 ESD protection - 15kV
- Wide temperature
- 4kV isolation (UHR204)
- IP30 metal case
- USB 1.0/2.0
- Certifications: C1/D2, UL, IEC60068-2, FCC, CE, RoHS

Certified For Hazardous Locations

ETHERNET SERIAL SERVERS

Vlinx™ Ethernet Serial Servers

(VESR90x series)

- Total fiber, multi-serial (MEI), Ethernet port options
- Automatically monitors, reconnects communications
- Ethernet pass-through port option
- Wide temperature
- Certifications: C1/D2, UL Listed, FCC, CE, RoHS

ETHERNET MODBUS GATEWAYS

Vlinx™ Modbus Ethernet to Serial Gateways

(MESR90x series)

- Modbus TCP, RTU & ASCII
- Total fiber, serial/Ethernet, master/slave flexibility
- Up to 16 TCP masters
- Wide temperature
- Second Ethernet port option
- Certifications: C1/D2, UL, FCC, CE, RoHS

ETHERNET GATEWAYS

Ethernet Protocol Gateways

(VFG series)

- Protocol converter, data logger, web interface with virtual HMI - all in one
- Integrate multi-vendor systems, devices, and protocols
- Built-in driver list for mapping to PLCs, PCs, SCADA systems
- Converts multiple protocols simultaneously (up to 9 protocols with expansion card)
- Certifications: C1/D2, cUL/US Listed, FCC, CE, RoHS

IP67 RADIO MODEMS & I/O

Zlinx® *Xtreme* Radio Modems & I/O

(ZXT series)

- IP67 rated for outdoor applications
- Instant plug-n-play set-up
- 1-to-1 or 1-to-multipoint
- AES encryption security
- Modbus compatible
- Wide temperature
- IP67 case
- Certifications: C1/D2, UL/cULIP67, NEMA TS2, FCC, CE, RoHS

RADIO MODEMS & KITS

Zlinx® Standard Long-range Radio Modem

(ZP9D-115RM-LR)

- Transmits up to 14mi/22km (40mi/64km with optional antenna)
- AES encryption security
- Modbus compatible
- Wide temperature
- Dual power supply
- IP30 case
- Certifications: C1/D2, UL, cUL, FCC, CE, RoHS

WIRELESS I/O

Zlinx® Standard Wireless I/O

(ZZxD series)

- Low latency 15mS response rate
- 128/256-bit AES encryption
- Software selectable: RF transmit power & over-the-air data rates
- Modbus compatible
- Wide temperature
- Monitor & control analog and digital I/Os with C1/D2 snap-on modules
- Certifications: C1/D2, UL, cUL, FCC, CE, RoHS

ACCESSORIES

C1/D2 Rated Accessories

- Power supplies
- NEMA enclosures & back panels
- Cabling
- Terminal blocks
- DIN rail
- Contact B&B Electronics, your distributor or channel partner for complete details.

FIND B&B PRODUCTS IN MORE THAN 60 COUNTRIES AROUND THE WORLD

NETWORKING PRODUCTS BACKED BY GLOBAL COMMUNICATIONS EXPERTISE

Global Reach for Global Support

In addition to our U.S. manufacturing, distribution, and customer support operations, we have a manufacturing facility located in the Czech Republic. Our European headquarters in Ireland provides service, support and product availability for customers in Europe, the Middle East, and Africa through a network of qualified distributors. Our global network of distributors helps ensure fast, comprehensive and local customer service and support. B&B Electronics' products are also available around the world through our network of world class channel partners, including value-added resellers and system integrators.

Our Technical Support team has field-proven experience in serial communication applications, connectivity solutions, network design and product installation. Whether you have a simple application question, a complex project installation, or an outside-the-box problem, B&B Electronics' engineers won't just troubleshoot problems after the fact - they can actually prevent and anticipate system design and integration problems before they begin. All of our data communications solutions are backed by our comprehensive Quality Assurance program and a full life-time limited warranty.

Learn how B&B Electronics can create the right networking solution for you by visiting us online or contacting us directly.

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