Stratos
EBK-xRJ-xxVx GE Media Converter

Connectivity for Business Critical Continuity™

For use with HMA Expanded Beam Optical Connector, Single or Dual Gigabit Ethernet (1.25Gbps), RJ45 Interface, 850nm Multimode, Up to 550M Link Distance

Key Features & Benefits

- Gigabit Ethernet Converter for Tactical Environments
- Single or Dual Ethernet Channels (2 or 4 Fiber)
- HMA Optical Connector Interface (1000BSX)
- RJ45 Electrical Interface (1000BT)
- 3.3V, 12V, 24V DC Power Options, 2W Max
- Backshell LEDs for Power and Link Status
- Industrial Temp Range, Vibration Tolerant design
- Compliant with IEEE 802.3 1000BT and 1000BSX
- EN-60825 / IEC-825 / CDRH Class 1 Compliant
- Optional Parylene C Conformal Coating

Ordering Information

EBK -	X	RJ -	XX	V	X

Interface
1=1xRJ45 (Single Channel)
2=2xRJ45 (Dual Channel)

Power
3=3.3 VDC (3.0-3.6V)
12=12 VDC (5-18V)
24=24 VDC (18-32V)

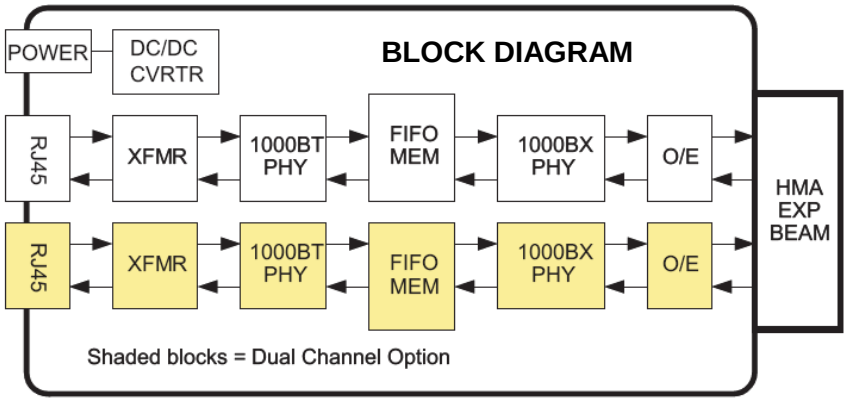
Temperature and Coating
H=-40 to 85C, No Coating
M=-40 to 85C, Conformal Coating

Applications

The EBK-xRJ-xxVx multimode optical media converters provide ruggedized stand alone conversion solutions for Gigabit Ethernet multimode links. The device accepts IEEE 802.3z electrical 1000BT signals using standard RJ45 connection, and converts to 1000BSX optical signals. The optical interface allows direct connection to any HMA Expanded Beam fiber cable.

Product Overview

The **Emerson Network Power Connectivity Solutions** EBK-xRJ-xxVx optical media converter performs all functions necessary to convert 1000BT electrical signals to/from 1000BSX optical signals. The electrical signals are transformer coupled into a Physical Layers device (PHY), buffered, and then regenerated into a 1000BSX compliant data stream. The 1000BSX data stream is then routed to an internal optical transceiver to create an 850nm optical signal. The optical signal is routed into the HMA Expanded Beam compliant connector interface for direct connection to tactical multimode fiber cable. The media conversion process is fully compliant to the IEEE 802.3z/ab specifications for Gigabit Ethernet 1000BT and 1000BSX. The 1000BT electrical connection supports Auto-negotiation for negotiating and achieving 1000BT with 10/100/1000BT multirate interfaces. The 1000BT connection also supports auto-cross to automatically support both crossed and un-crossed Ethernet CAT5 cables. Power is presented to the unit through a latching power connector. An internal DC/DC converter regulates the 3V, 12V or 24V input into voltages used by the converter. The 12V and 24V DC converter option is tolerant to a wide range of input voltages and noise spikes typical for vehicle bus power. The input power is reverse polarity protected to prevent damage in case the power is accidentally reversed.



Absolute Maximum Ratings

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	MIN	Typical	MAX	Unit
Storage Temperature	T_S	-55		+100	°C
Absolute Operating Temperature[1]	T_{OPA}	-55		+100	°C
Supply Voltage[2] +3.3V Option +12V Option +24V Option	V	 -3.6 -18 -32		 +3.6 +18 +32	V

1. Survivability, performance not guaranteed
2. Reverse Polarity protected

Recommended Operating Conditions

Parameter	Symbol	MIN	Typical	MAX	Unit
Operating Temperature Limit, case	T_C	-40		+85	°C
Supply Voltage +3.3V Option +12V Option +24V option	V_S	 +3.0 +5 +18	 +3.3 +12 +24	 +3.6 +18 +32	V
Supply Current Draw Single Channel Option Dual Channel Option	P_S		 1.5 2.0	 2.0 3.0	W

Optical Performance: Fiber Type = 62.5/125 μm, T_C = Operating Temperature Range

Parameter	Symbol	MIN	Typical	MAX	Unit
Output Power[1]	P_O	-10		-4	dBm
Output Center Wavelength	λ_{OUT}	830	850	860	nm
Output Spectral Width	$\Delta\lambda_{RMS}$ $\Delta\lambda_{FWHM}$			0.85 4	nm
Transmit Extinction Ratio	ER	8	10		dB
Transmit Rise/Fall Time (10 – 90%)	t_R			260	ns
Receive Sensitivity[2]	P_I	-19	-20	-0	dBm
Receive Wavelength	λ_{IN}	770		860	nm

1. Output Power measured @ 1.25Gbps, PRBS 2^7-1, NRZ
2. Receive Sensitivity at BER=10^{-12} @ 1.25Gbps, PRBS 2^7-1, NRZ

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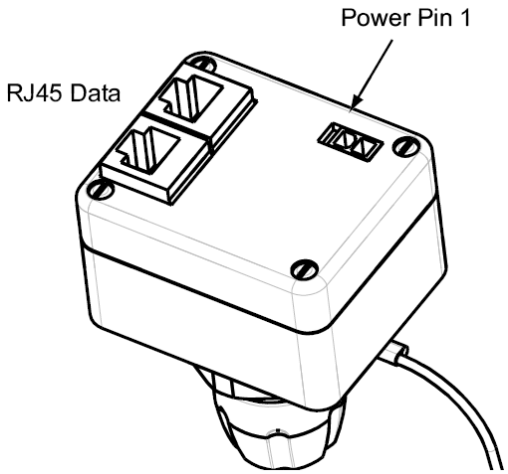

2-Pin Power Connector

Use mating connector and crimp pins Stratos P/N AB-2PWR-KIT, included with each unit

Pin	Symbol	Type[1]	Signal Description
1	GND	P	**Power Return:** Connect to Power Ground
2	VDCIN	P	**+3.3V Option:** 3.0 to 3.6 VDC Power (3.3V Nominal) **+12V Option:** +5 to +18 VDC Power **+24V Option:** +18 to +32 VDC Power

RJ45 Ethernet Connector (Ethernet Hub Pinout), Auto-Cross Compliant

Pin	Symbol	Type[1]	Signal Description
1	TP0+	I/O	**Twisted Pair 0 Positive:** IEEE 802.3ab signal I/O
2	TP0-	I/O	**Twisted Pair 0 Negative:** IEEE 802.3ab signal I/O
3	TP1+	I/O	**Twisted Pair 1 Positive:** IEEE 802.3ab signal I/O
4	TP2+	I/O	**Twisted Pair 2 Positive:** IEEE 802.3ab signal I/O
5	TP2-	I/O	**Twisted Pair 2 Negative:** IEEE 802.3ab signal I/O
6	TP1-	I/O	**Twisted Pair 1 Negative:** IEEE 802.3ab signal I/O
7	TP3+	I/O	**Twisted Pair 3 Positive:** IEEE 802.3ab signal I/O
8	TP3-	I/O	**Twisted Pair 3 Negative:** IEEE 802.3ab signal I/O

1. Signal Type P=Power, O-Output (from Bulkhead Media Converter), I=Input (to Bulkhead Media Converter)
2. Auto-Cross allows MDI or MDI-X configuration to allow use of crossed or un-crossed Ethernet cables

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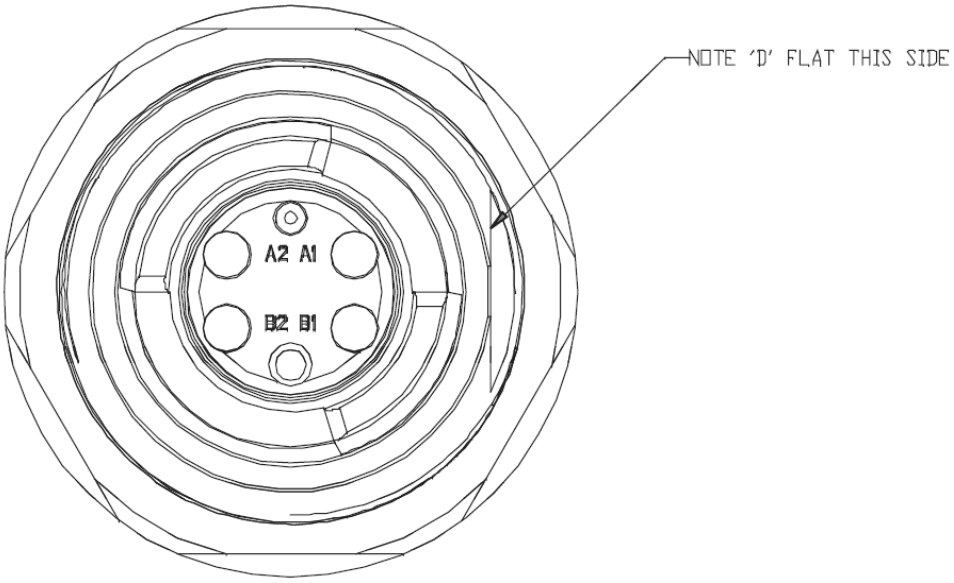

HMA Expanded Beam Optical Connector

Pin	Symbol	Type[1]	Signal Description
B1	TX1	O	**Optical Transmit Channel 1:** IEEE 802.3z 1000BSX Output from Bulkhead
A1	RX1	I	**Optical Receive Channel 1:** IEEE 802.3z 1000BSX Input to Bulkhead
B2	TX2[2]	O	**Optical Transmit Channel 2:** IEEE 802.3z 1000BSX Output from Bulkhead
A2	RX2[2]	I	**Optical Receive Channel 2:** IEEE 802.3z 1000BSX Input to Bulkhead

1. Signal Type P=Power, O=Output (from Bulkhead Media Converter), I=Input (to Bulkhead Media Converter)
2. Channel 2 signals only on the Dual Channel version, otherwise the A2/B2 optical ports are not connected

Mating HMA Expanded Beam connector can be found on the Stratos website at:
http://www.stratoslightwave.com/PDF/347-HMA.pdf

LED Status Indicators

LED Label	Description
POWER	Solid Green – indicates unit is powered
CHAN1	TBD
CHAN2	TBD

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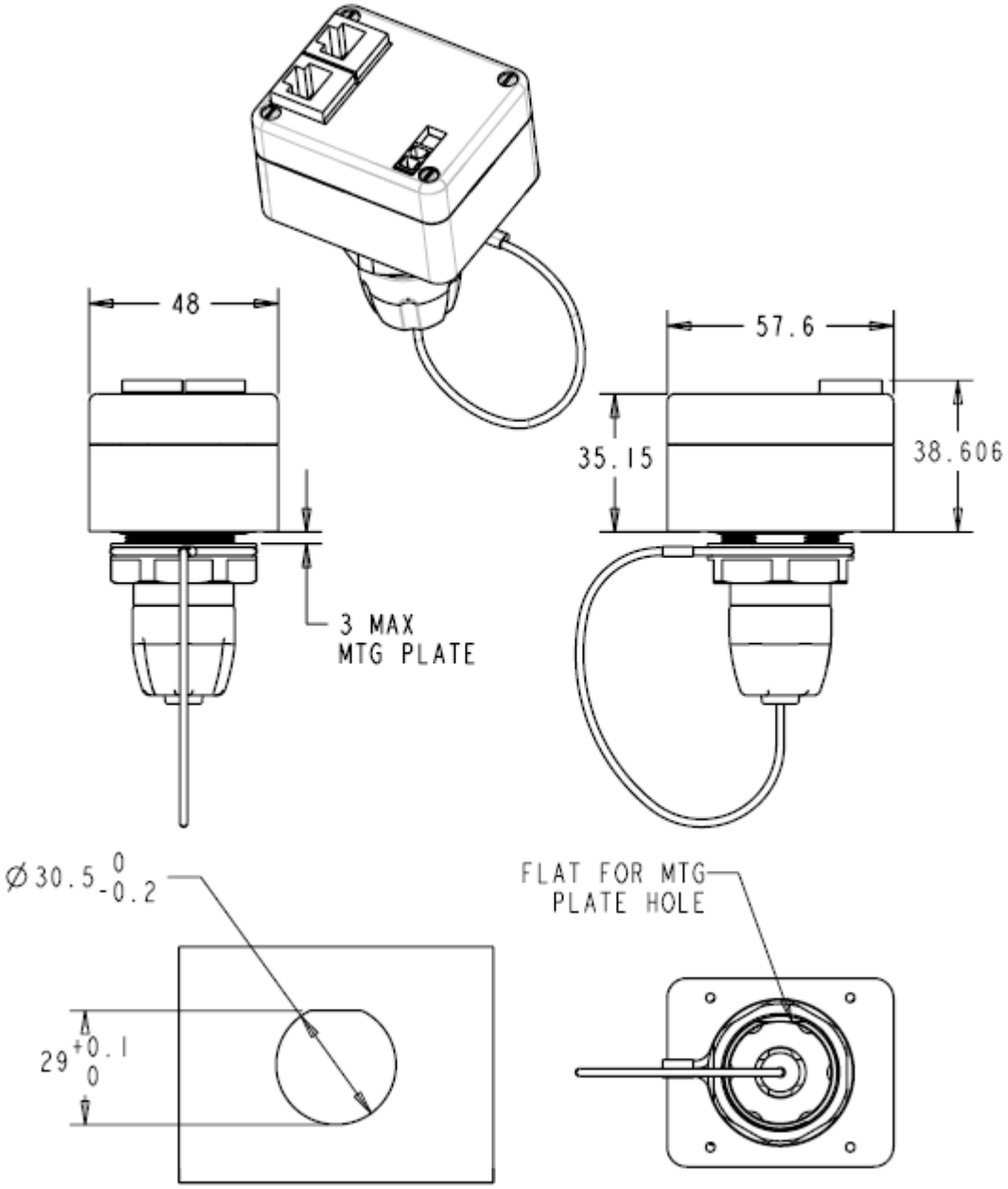
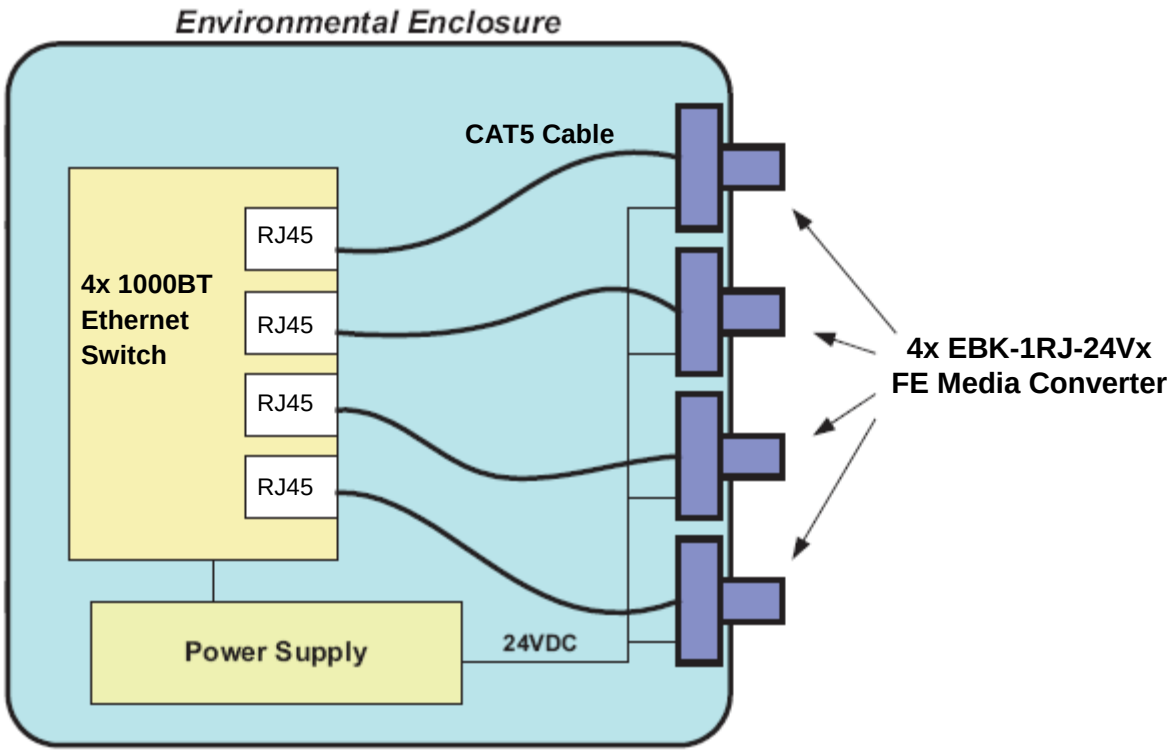
Bulkhead Mechanical Dimensions

Dimensions in millimeters



Application Example



Harsh Environment 4 Port Fast Ethernet Switch

Harsh Environment Ethernet Switch

This application uses a standard Ethernet Switch enclosed in an environmental chassis along with a Power Supply. The Stratos Converter assemblies are mounted through the environmental chassis, and are connected to the Switch using standard CAT5 RJ45 modular jack cabling. The Bulkhead units are powered using Bus Power ranging from 18V to 32V.

The Stratos Media Converter bulkhead assemblies offer 850nm multimode connectivity for Gigabit Ethernet, supporting link distances up to 550 meters per link. The Stratos Media Converter bulkhead contains all the circuitry necessary to convert the 1000BT signal from the Ethernet Switch to the optical domain. The Stratos Media Converter bulkhead assembly is designed to support Harsh Environments for the portion of the bulkhead that protrudes through the D-Hole panel.

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Conformal Coating Option

Parameter	Value
Specification	MIL-I-46058C, Type XY
Coating	Parylene type C
Deposition	Vacuum deposited
Film Thickness	1 MIL +/- 0.0002

Environmental Compliance

Category	Standard	Conditions
Thermal Cycle	MIL-STD-883E, section 1010.7	1000 cycles, -40C to +85C
Thermal Shock	MIL-STD-883E, section 1011.9	20 cycles, 0C to 100C
High Temp Operating Life	MIL-STD-202G, section 108A	2000 hours at 85C
Vibration	MIL-STD-810F, section 514.5	16.9grms, 3 axis, 1 hour per axis
Shock	MIL-STD-883E, section 2002	1500g peak, 0.5ms
Humidity	MIL-STD-202G, section 103B	85%/85C, 500 hours
Altitude	MIL-STD-810D, section 500.2	15,000 feet
Immersion[1]	MIL-STD-810D, section 512.2	2 hrs at 1.0m depth
MTBF	MIL-HDBK-217FN2	2.8M hours, 30C GB environment

1. Immersion rating is for optical Connector side only, mounted in panel with either Dust Plug or mating HMA cable installed

Regulatory Compliance

Requirement	Feature	Condition	Notes
MIL-STD-883-3015.7	ESD	Class II	2200V
IEC-801-2	ESD	Human Body Model	25KV
IEC-801-3	EMI	Immunity	10V/M
FCC	EMI	Class B	>20dB
EN 55022 (CISPR 22A)	EMI	Class B	10V/M
IEC-825 Issue 1993-11	Eye Safety	Class 1	TUV Certificate Number PENDING
FDA CDRH 21-CFR 1040	Eye Safety	Class 1	CDRH Accession Number PENDING

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