

EBT1-xRJ-xxVx

Stratos T1 Fiber Optic Modem, for use with HMA Expanded Beam Optical Connector

Single or Dual T1 (1.544 Mbps),
RJ48 Interface, 850nm Multimode,
Up to 4 Mile Link Distance

PRELIMINARY

FEATURES

- T1 Fiber Optic Modem for Tactical Environments
- Single or Dual T1 Channels (2 or 4 fiber)
- HMA Optical Connector Interface (Optical Modem)
- RJ48 Electrical Interface (ITU-T G.703 T1, 1.544Mbps)
- 3.3V, 12V, 24V DC Power options, 2W max
- Backshell LEDs for Power and Link status
- Industrial Temp Range, Vibration tolerant design
- Compliant with G.703 T1 1.544Mbps
- EN-60825/ IEC-825 / CDRH Class 1 Compliant
- Optional Parylene C Conformal Coating

APPLICATIONS

The EBT1-xRJ-xxVx multimode optical media converter provide ruggedized stand alone conversion solutions for T1 multimode links. The device accepts G.703 T1 electrical signals using standard RJ48 connection, and converts to optical signals. The optical interface allows direct connection to any HMA Expanded Beam fiber cable.

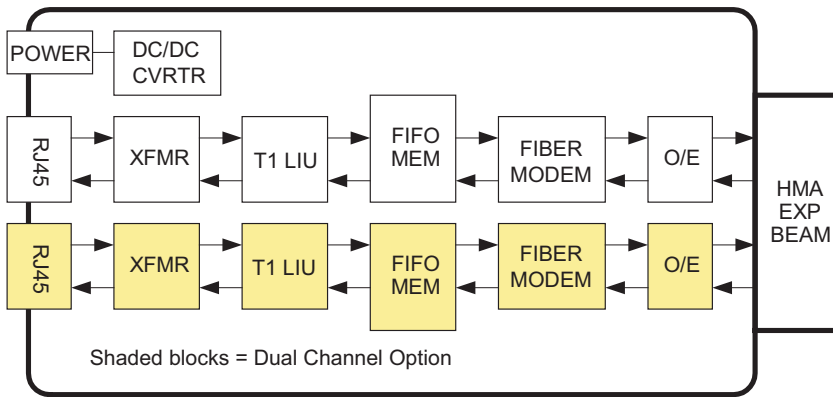
DESCRIPTION

The EBT1-xRJ-xxVx optical Fiber Modem performs all functions necessary to convert DSX-1 (short haul) T1 electrical signals to/from proprietary signals. The electrical signals are transformer coupled into a Line Interface Unit (LIU), buffered, and then modulated into a data stream suitable for transmission over fiber medium. The data stream is then routed to an internal optical transceiver to create a 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 unit will automatically detect local AMI or B8ZS coding on the incoming T1 data stream, and configure the outgoing T1 stream to be compliant. This auto-configuration feature allows the unit to be "plug and play" without requiring any field configurations.

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.

BLOCK DIAGRAM



ORDERING INFORMATION

E B T 1 - X R J - XX V X

Product Family	Application	Interface	Power	Operating Temperature
EB= Stratos Media Converter for HMA Exp Beam	T1= T1 (1.544 Mbps) 850 nm Multimode	1RJ= 1xRJ45 (Single channel)	3V= 3.3 VDC (3.0 -3.6V)	H= -40 to 85 C, No Coating
		2RJ= 2xRJ45 (Dual channel)	12V= 12 VDC (9-18V)	
			28V= 28 VDC (18-32V)	M= -40 to 85 C, Conformal Coating



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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	Minimum	Typical	Maximum	Unit
Storage Temperature	T_s	-55	-	+100	°C
Absolute Operating Temperature ¹	T_{OPA}	-55	-	+100	°C
Supply Voltage ²	V				V
+3.3V Option		-3.6		+3.6	
+12V Option		-18		+18	
+24V Option		-32		+32	

- Survivability, performance not guaranteed.
- Reverse Polarity protected.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature Limit, case	T_c	-40		+85	°C
Supply Voltage ¹	V_s				V
+3.3V Option		+3.0	+3.3	+3.6	
+12V Option		+9	+12	+18	
+24V Option		+18	+24	+32	
Supply Current Draw	P_s	-			W
Single Channel Option			1.5	2.0	
Dual Channel Option			2.0	3.0	

OPTICAL PERFORMANCE

Fiber Type = 62.5/125 μm , T_c = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	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 nm
Transmit Extinction Ratio	ER	8	10		dB
Transmit Rise / Fall Time (10 - 90%)	t_R	-	-	260	ps
Receive Sensitivity ²	P_I	-25	-27	-0	dBm
Receive Wavelength	λ_{IN}	770	-	860	nm

- Output Power measured @ 1.544 Mbps, PRBS 2⁷-1, NRZ
- Receive Sensitivity at BER=10⁻¹² @ 1.544 Mbps, PRBS 2⁷-1, NRZ

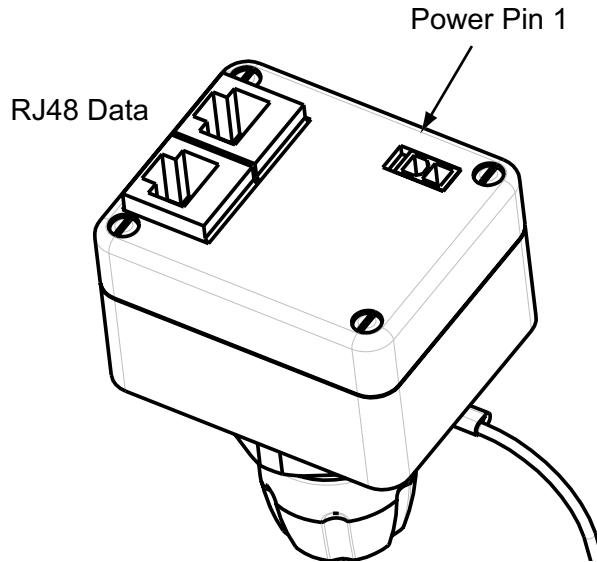


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2-PIN POWER CONNECTOR

Use mating connector and crimp pins Stratos P/N AB-2PWR-KIT

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: +9V to +18 VDC Power +24V Option: +18 to +32 VDC Power

RJ48 DSX-1 Short Haul T1 CONNECTOR

Pin	Symbol	Type ¹	Signal Description
1	RTIP	I	G.703 T1 RX TIP to Active Bulkhead
2	RRING	I	G.703 T1 RX RING to Active Bulkhead
3	N/C		No Connect
4	TTIP	O	G.703 T1 TX TIP from Active Bulkhead
5	TRING	O	G.703 T1 TX RING from Active Bulkhead
6	N/C		No Connect
7	GND	P	Signal Ground
8	GND	P	Signal Ground

Notes:

1. Signal Type P= Power, O = Output (from Bulkhead Media Converter, I = Input (to Bulkhead Media Converter)

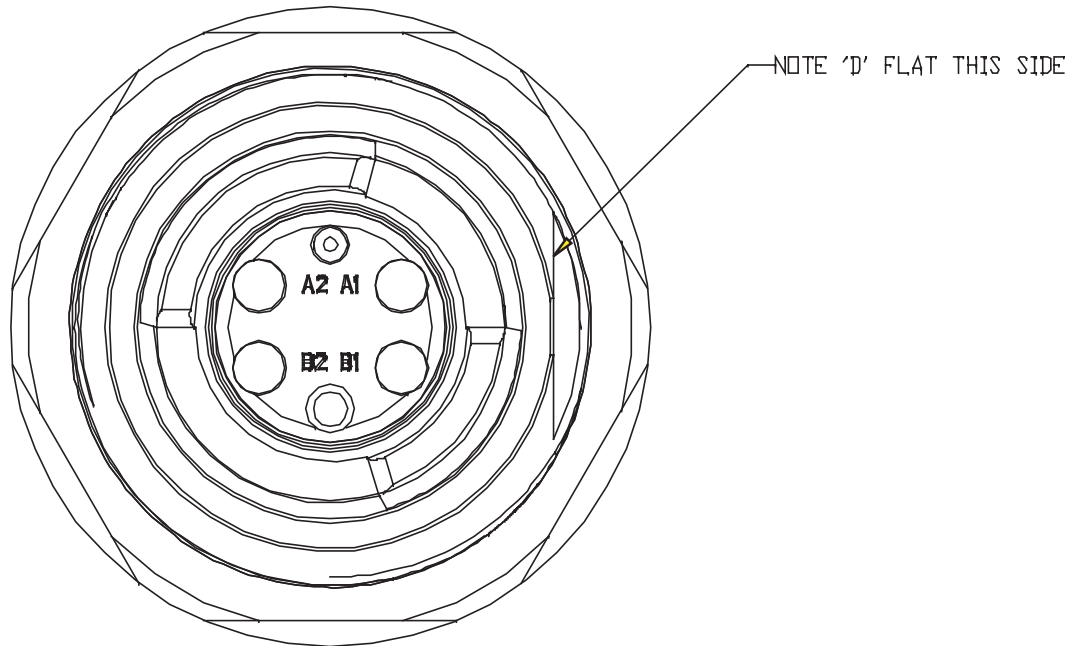


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HMA EXPANDED BEAM OPTICAL CONNECTOR

Pin	Symbol	Type ¹	Signal Description
B1	TX1	O	Optical Transmit Chan 1 Fiber Modem optical output from bulkhead
A1	RX1	I	Optical Receive Chan 1. Fiber Modem optical input to bulkhead
B2	TX2 ²	O	Optical Transmit Chan 2 Fiber Modem optical output from bulkhead
A2	RX2 ²	I	Optical Receive Chan 2. Fiber Modem optical input to bulkhead

Notes:

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>



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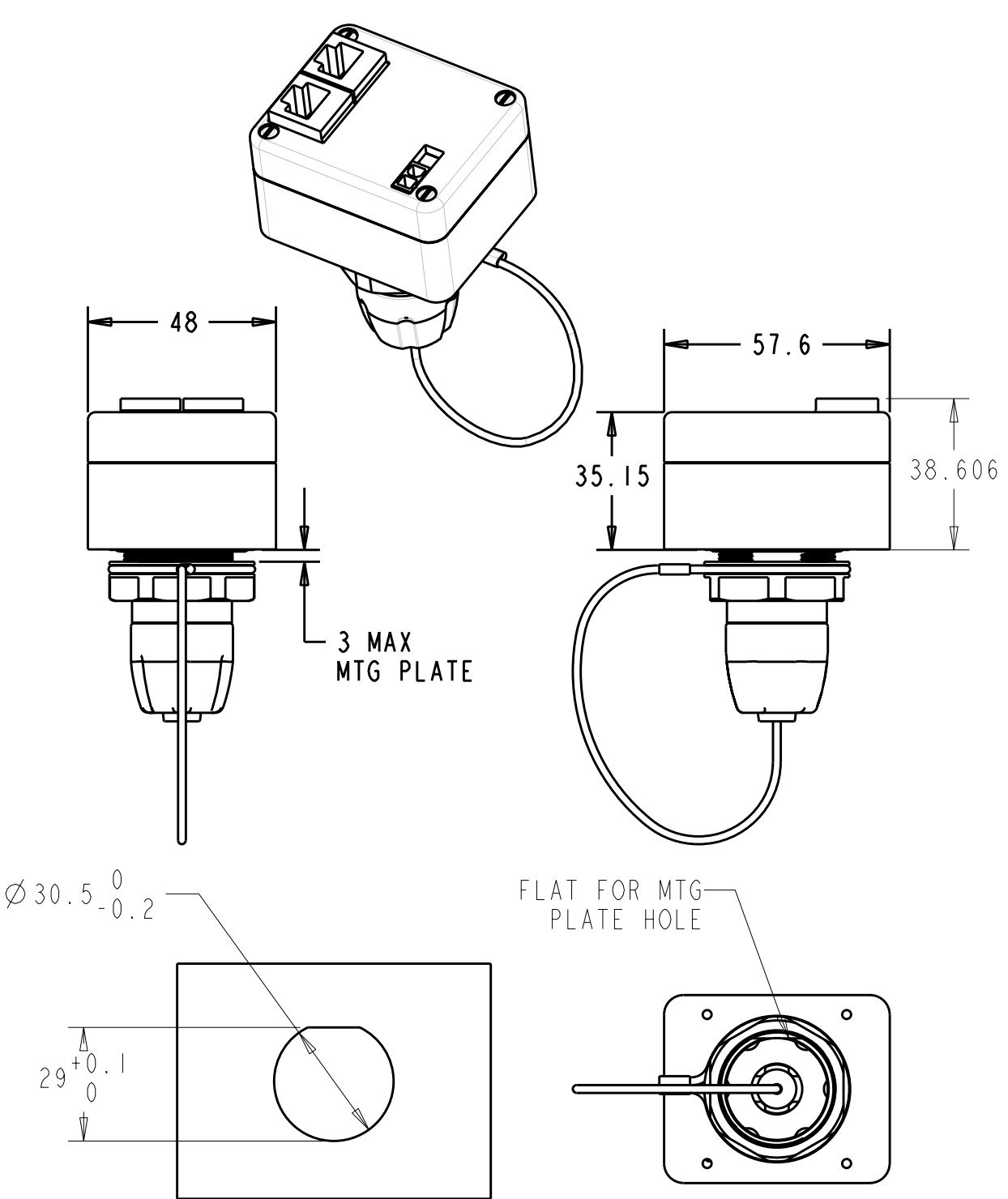
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BULKHEAD MECHANICAL DIMENSIONS

Dimensions in millimeters



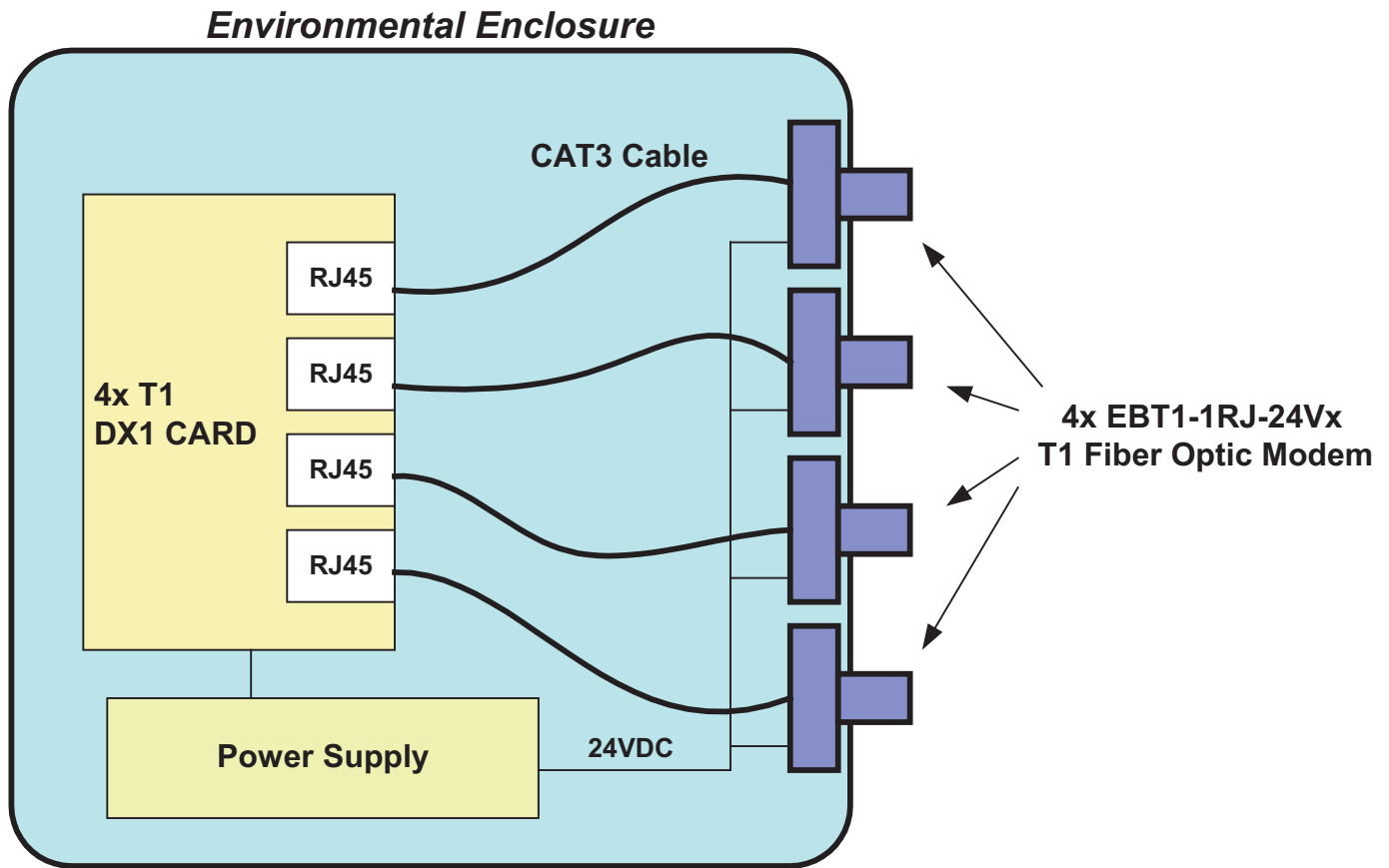
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APPLICATION EXAMPLE



Harsh Environment 4 Port T1 Switch

Harsh environment Ethernet Switch

This application uses a standard DSX-1 CSU enclosed in an environmental chassis along with a Power Supply. The Stratos Fiber Modem assemblies are mounted through the environmental chassis, and are connected to the Switch using standard CAT3 RJ48 modular jack cabling. The Bulkhead units are powered using Bus Power ranging from 18V to 32V.

The Stratos Fiber Modem bulkhead assemblies offer 850nm multimode connectivity for G.703 T1 signals, supporting link distances up to 4 miles per link. The Stratos Fiber Modem bulkhead contains all the circuitry necessary to convert the T1 signal from the DSX-1 CSU to the optical domain. The Stratos Fiber Modem 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 Oper 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		15,000 feet
MTBF	MIL-HDBK-217FN2	2.8M hours, 30C GB environment

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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