PB00099

Dymec Series

Dymec Ethernet and Serial media converters and Dymec Fiber Optical Stars for the networking of multiple serial devices are Certified to IEEE 1613 and Class 1 Div2 for use in hazardous locations.

Dymec Models operate as Links and Repeaters, optically connecting different formats and eliminating the need for converters. Optical Stars operate with multi-mode and/or single-mode optics, providing a full optical budget for each port.

Features

- Operates reliably at temperatures of −40°C to 85°C with no fans
- Packaged in rugged, industrial quality Galva Neal and powder coated shells
- Powered from Station Battery Bus
- Multiple Mounting choices with built-in and optional mounting brackets
- Extended distances of 5km over Multi-mode fiber and 30km over Single-mode fiber Diagnostic LEDs for easier debug of installation
- Certified to IEEE 1613 and Class 1 Div2
- 5 year warrantys

Dymec Ethernet Links 3340/3350 & 3344/3354

DYMEC models 3340, 3350, 3344 and 3354 are hardened fiber optic links that convert 10Base-T Ethernet from twisted pair copper to 10Base-FL or Single-mode fiber optics.

DYMEC models 3440, 3450, 3442, 3452, 3444 and 3454 are hardened fiber optic links that convert 100Base-T Ethernet from twisted pair copper to 100Base-FX, 100Base-SX or Single-mode fiber optics.

These links are stand-alone mounted and require no programming or set up. Simply mount the Link in an appropriate location and connect power.

DYMEC Links are powered from various sources. The standard models accept 90 to 250 Volts ac or dc. Optionally, these Links can also be ordered for 12 or 24 to 48 Volts dc. The power supplies are surge withstand protected to both IEC 63000 and IEEE C37.90 standards.

- IEEE 802.3 compatible
- 2 RJ45 connectors eliminates the worry over crossover or straight cables
- Automatic Polarity detection and correction
- Auto adapts to Half or Full Duplex mode

**Be certain.
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Dymec 5843 and 5844

Dymec models 5843 and 5844 are hardened fiber optic Link/Repeaters that convert RS232 or TTL level copper to amplitude based fiber output. Supports data rates from dc to 250k bps, DCE or DTE port configuration and a diagnostic/test mode that allows testing of the copper and fiber connections before the connected IED is active in the network.

By simply setting a few switches, the Dymec 5843 and 5844 Link/Repeaters can be configured for point-to-point, star, optical bus, or loop networks, and permit quick, easy connection of devices. For example, an extensive multi-drop network—where two or more intelligent electrical devices are connected and communicating can be constructed simply by connecting the devices through Link/Repeaters.

Dymec 5843 and 5844 Link/Repeaters may optically connect devices of different formats, eliminating the need for format converters. For example, an RS232 IED may be connected to a model 5844 which is optically connected to a model 5846, which, in turn, can communicate electrically to its IED in EIA 485.

Dymec 5845 and 5846

Dymec model 5845 and 5846 Serial Fiber Links are link/repeaters for EIA 422 and 485 data connections. The 5845/5846 Links provide reliable serial data connectivity over fiber optic facilities in harsh environments where immunity and signal isolation are critical. Optical connectivity provides flexibility, extended distance, operational safety, reduced equipment outages due to electrical surges, and improved signal quality and network performance.

5845/5846 Links support signal rates from DC to 2 Mbps and operate either full- or half-duplex over single- or multimode fiber. Links are easily field configurable for point-to-point, master/slave, loop, bus or star topologies.

The 5845/5846 also interoperate with 5843/5844 RS232 Links, the Dymec Network Integration System and Optical Star products to costeffectively create highly scaleable data networks with minimum electrical signal exposure.

Dymec Links are substation-hardened to IEEE 1613 specifications. They operate in an extended temperature range and optionally take DC power directly from station battery. Flexible mounting options, diagnostic LEDs and integrated optical and electrical signal test features make turning up Link networks simple.

Dymec Links 5941 and 5942

Dymec 5941 and 5942 Data Links are designed as full duplex four channel devices. Four channels have bandwidth of DC to 64k bps (D4 version), and on the (D1 version) three of the channels have bandwidth of DC to 4k bps.

Used in point-to-point RS232 application, 5941 and 5942 Data Links are designed to pass handshaking or flow control signals along with data. These links do not utilize the flow signals for their operation.

Like all Dymec digital-to-fiber optic products, they are passive to all software protocols, and simply send the communications signals from one node to the other.

- Sending four RS232 non-handshaking signals together on a single pair of fibers (provided at least three of the signals are at 4000 baud or slower for the D1 version).
- Interfacing RTUs to radios that require push-to talk control
- Passing up four contacts bi-directionally or KYZ meter contacts.
- Transmitting data and IRIG-B timing signals with a single Link.
- 1 or 2 Synchronous data ports (D4 model only). 5941 and 5942 Data Links feature a power-on light, a "SYNC" LED, and eight diagnostic
- LEDs.the celllular port, a WAN port can be configured for T1/E1 or DDS circuits.

Optical Stars

OS9HRT Optical Stars provide network designers with a convenient "hub and spoke" topology capability. Optical Stars are available with nine ports, with multi-mode and/or single-mode optics providing a full optical budget on each port. To further provide flexibility the Master port (port one) can be configured with an RS232 copper interface. The OpticalStar can in addition support Master/Slave or Peer-to-Peer mode and be cascaded by simply connecting a port from one Optical Star to a port of the next (in Master/Slave mode it must be a slave port connected to the next master).

DYMEC Optical Stars are ideal for Master/Slave polling applications such as multiple meters, relays and other statistical devices as well as broadcasting IRIG-B to multiple devices where fiber offers extended range and isolation from interference. Optical Stars also allow you to take one or more devices out of service while all others continue to operate. This is invaluable in most applications.

Optical Stars are passive to all software protocols, and ports cannot be addressed by software. Data rates from dc to 2M bps are supported. Optical Stars are optically compatible with DYMEC models 5843, 5844, 5845 and 5846, as well as all 3900 Chassis serial cards and all serial optical ports of the DynaStar products. Optical Stars are also compatible with most IEDs with embedded optical ports using amplitude modulation. These units are available in 19-inch rack mount and can be configured for panel mounting.

Product Specifications

Optical Paramaters	3340/3350	3440/3450	5843/5844	5845/5846	5941/5942	0S9
Optical Budget Typical						
Multi-mode	13.5 dB (min)	9.0 dB (min)	19.5dB			19.5 dB
Single-mode	8.6 dB (min)	8.6 dB (min)	19dB			18 dB
Output Power Typical						
Multi-mode	-16 dB	-19 dB	-10.5 dBm peak			-10.5 dBm peak
Single-mode	-19.9 dB	-19.9 dB	-14.5 dBm peak			-11.5 dBm peak
Receiver Sensitivity Typical						
Multi-mode			-30 dBm peak			-30 dBm peak
Single-mode			-33.5 dBm peak			-33.5 dBm peak
Wavelength						
Multi-mode	850nm	1310nm	850nm (62.5µ/125)			
Single-mode	1310nm (9µ/125)					
Connector Type	ST					
Compatible Fiber Type						
Multi-mode			50-200µm			
Single-mode			9-13µm			
Configuration (Switches)	Link Pass-Through/ Link Fail		DTE/DCE AC/DC Coupled Link/Repeat Pin 8 Drive Current Pin 6 +5 Vdc (DSR or CTS pull up) Diagnostic Mode	Half/Full Duplex AC/DC Coupled Link/Repeat Biasing Resistors In/Out Data Inversion Mode Enable Holdover Diagnostic Mode	Channel 3 IRIG-B Output/ Standard Channel 3 Drive Current Select Channel 4 Sync Indicator/ Data Out	Master/Slave or Peer to Peer
Data Rate	10Mbs	100Mbs	DC to 250kbps	DC to 2M bps	DC to 64kbps Channel 1, DC to 4kbps Channels 2,3,4 (D1) DC to 64kbps all 4 channels (D4)	DC to 2M bps DC to 250kbps (RS232 Copper Master Port)
Data Transmission	Half or Full Duplex		Asynchronous, simplex or Full Duplex		Asynchronous, simplex Half or Full Duplex	Asynchronous, simplex or Half Duplex
Transmission Distance						
Multi-mode	Up to 2000 meters (62.5µ/125 Cable@3dB/km)		Up to 5000 meters (62.5µ/125 Cable@3dB/km)			
Single-mode	Up to 10K meters (9µ/125 Cable@.5dB/km)		Up to 30K meters (9µ/125 Cable@.5dB/km)			
Bit Rate Error	10-E9 Max.					
Point to Point Latency	500 nsec Max		4µS	500 nsec Max	100µS Channels 2,3,4 (D1) 1µS 12µS Channels 2,3,4 (D4)	300 nsec Max
Repeat Latency			400 nsec Max			

Product Specifications (continued)

Electrical Paramaters	3340/3350	3440/3450	5843/5844	5845/5846	5941/5942	OS9
I/O Data Format	802.3 Ethernet	802.3 Ethernet	EIA RS232; CCITT v.24	EIA 422/485	EIA RS232; CCITT v.24	
Data Connector	2 RJ45	2 RJ45	9 pin D-Type Female			9 Pin D-Type Female Fixed DCE only
Input Impedance			>300Ohms	75Ohms	>300Ohms	>300Ohms
Input voltage			+/-30 Volts Max	+12 to -7 Volts Max referenced to signal common +/-6 Volts differential Max	+/-30 Volts Max	+/-30 Volts Max
Output Impedance			>30Ohms	>250 Ohms	>30Ohms	>30Ohms
Driver Output			+/-5Volts into 300Ohms	50 mA	+/-5Volts into 300Ohms	+/-5Volts into 300Ohms
Pin 8 Output			0 to 5V 67 or 207 Ohm Source Impedance	n/a	n/a	n/a
Channel 3			n/a	n/a	0 to 2.5V @10mA 0 to 3V @ 20mA	n/a
Ambient Temperature						
Operating Temperature						
Multi-mode	-40°c to +85°c					
Single-mode	-40°c to +70°c					
Storage Temperature	-40°c to +85°c					
Power Required						
Multi-mode	4.0 Watts 333 mA @ 12Vdc / 5.4 Watts 60 mA @ 90-250V 300 mA @ 18-60V		3.0 Watts 250mA @ 12Vdc / 4.0 Watts 35 mA @ 90-250V 250 mA @ 18-60V	3.0 Watts 250mA @ 12Vdc / 6.0 Watts 45 mA @ 90-250V 250 mA @ 18-60V	2.4 Watts 200mA @ 12Vdc / 2.4 Watts 35 mA @ 90-250V 170 mA @ 18-60V	~27.5 Watts 250 mA @ 90-250V 1.25 A @ 18-60V
Single-mode	4.0 Watts 333 mA @ 12Vdc / 5.4 Watts 60 mA @ 90-250V 300 mA @ 18-60V		4.1 Watts 340mA @ 12Vdc / 5.5 Watts 50 mA @ 90-250V 340 mA @ 18-60V	4.0 Watts 340mA @ 12Vdc / 8.0 Watts 60mA @ 90-250V 3400mA @ 18-60V	3.0 Watts 250mA @ 12Vdc / 3.6 Watts 40 mA @ 90-250V 200 mA @ 18-60V	
Power Dissipation						
Multi-mode	13.7 BTU / 18.4 BTU		8.2 BTU/hr / 10.9 BTU/hr	10 BTU/hr / 20 BTU/hr	8.2 BTU/hr / 10.2 BTU/hr	9 BTU
Single-mode	13.7 BTU / 18.4 BTU		10.2 BTU/hr / 12.3 BTU/hr	14 BTU/hr / 27 BTU/hr	10.9 BTU/hr / 12.3 BTU/hr	9 BTU
Physical Parameters						
Weight	9 oz. / 17 oz.					~11 lbs
Dimensions (Inches)	2.0W x 5.1L X 1.3H / 4.1W x 5.1L X 1.3H					19W X 9D X 3.5H
Indicators	Power Fiber Link Electrical Link Fiber Data Electrical Data		Power Transmit Fiber Transmit Electrical Receive Fiber Receive Electrical		Power Sync Status Transmit Each Ch Receive Each Ch	Power Data Collision Master/Slave Mode Peer to Peer Mode Master Port Transmit Each Port Receive Each Port

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Dymec Series Ordering Information

3340/3350

Model	Input	Fiber Type	Input Power	802.3 Standard
3340HRT R	10 Base-T	Multi-mode	9 - 15VDC	10Base-FL
3350HRT-H R	10 Base-T	Multi-mode	90-250V AC/DC	10Base-FL
3350HRT-L R	10 Base-T	Multi-mode	24 to 48VDC	10Base-FL
3344HRT R	10 Base-T	Single-Mode	9 - 15VDC	Single-Mode
3354HRT-H R	10 Base-T	Single-Mode	90-250V AC/DC	Single-Mode
3354HRT-L R	10 Base-T	Single-Mode	24 to 48VDC	Single-Mode

3440/3450

Model	Input	Fiber Type	Input Power	802.3 Standard
3440HRT R	100 Base-TX	Multi-mode	9 - 15VDC	100Base-SX
3450HRT-H R	100 Base-TX	Multi-mode	90-250V AC/DC	100Base-SX
3450HRT-L R	100 Base-TX	Multi-mode	24 to 48VDC	100Base-SX
3442HRT R	100 Base-TX	Multi-mode	9 - 15VDC	100Base-SX
3452HRT-H R	100 Base-TX	Multi-mode	90-250V AC/DC	100Base-SX
3452HRT-L R	100 Base-TX	Multi-mode	24 to 48VDC	100Base-FX
3444HRT R	100 Base-TX	Single-Mode	9 - 15VDC	Single-Mode
3454HRT-H R	100 Base-TX	Single-Mode	90-250V AC/DC	Single-Mode
3454HRT-L R	100 Base-TX	Single-Mode	24 to 48VDC	Single-Mode

5941/5942

Model	Input	Fiber Type	Input Power	64K Baud Data Rate
5941D1HRT R	RS232/TTL	Multi-Mode	9-15 Vdc	1 Channel
5942D1HRT-H R	RS232/TTL	Multi-Mode	90-250V AC/DC	1 Channel
5942D1HRT-L R	RS232/TTL	Multi-Mode	24-48 Vdc	1 Channel
5941SD1HRT R	RS232/TTL	Single-Mode	9-15 Vdc	1 Channel
5942SD1HRT-H R	RS232/TTL	Single-Mode	90-250V AC/DC	1 Channel
5942SD1HRT-L R	RS232/TTL	Single-Mode	24-48 Vdc	1 Channel
5941D4HRT R	RS232/TTL	Multi-Mode	9-15 Vdc	4 Channels
5942D4HRT-H R	RS232/TTL	Multi-Mode	90-250V AC/DC	4 Channels
5942D4HRT-L R	RS232/TTL	Multi-Mode	24-48 Vdc	4 Channels
5941SD4HRT R	RS232/TTL	Single-Mode	9-15 Vdc	4 Channels
5942SD4HRT-H R	RS232/TTL	Single-Mode	90-250V AC/DC	4 Channels
5942SD4HRT-L R	RS232/TTL	Single-Mode	24-48 Vdc	4 Channels

5845/5846

Model	Input	Fiber Type	Input Power
5845HRT R	RS-422/485	Multi-Mode	9 - 15VDC
5846HRT-H R	RS-422/485	Multi-Mode	90-250V AC/DC
5846HRT-L R	RS-422/485	Multi-Mode	24 to 48VDC
5845SHRT R	RS-422/485	Single-Mode	9 - 15VDC
5846SHRT-H R	RS-422/485	Single-Mode	90-250V AC/DC
5846SHRT-L R	RS-422/485	Single-Mode	24 to 48VDC

OS9

Model	Ports	Input Power
OS9HRT-H-1M R	1 MM . 8 SM	90-250V AC/DC
OS9HRT-H-9M R	9 MM	90-250V AC/DC
OS9HRT-H-9S R	9 SM	90-250V AC/DC
OS9HRT-H-CM R	1 RS232 / 8MM	90-250V AC/DC
OS9HRT-H-CS	1 RS232 / 8SM	90-250V AC/DC
OS9HRT-L-1M R	1 MM / 8 SM	24 to 48VDC
OS9HRT-L-1S	8 MM / 1 SM	24 to 48VDC
OS9HRT-L-9M R	9 MM	24 to 48VDC
OS9HRT-L-9S R	9 SM	24 to 48VDC
OS9HRT-L-CM R	1 RS232 / 8 MM	24 to 48VDC
OS9HRT-L-CS R	1 RS232 / 8 SM	24 to 48VDC

Choose Options and Extras

Model	Description
ACC-LCS	Link Cantilever Mounting Bracket
ACC-CBL1	DB9 Male/Tinned Lead 10 Foot Cable/Pigtail
ACC-CBL2	DB9 Male/4 DB9 Female 1 X 4 Interface Cable 1 Foot
ACC-SWMB	Optional Wall Mount Bracket for OS9
ACC-SRMB	Rack Mount Bracket for OS9

5843/5844

Model	Input	Fiber Type	Input Power
5843HRT R	RS232/TTL	Multi-Mode	9 - 15VDC
5844HRT-H R	RS232/TTL	Multi-Mode	90-250V AC/DC
5844HRT-L R	RS232/TTL	Multi-Mode	24 to 48VDC
5843SHRT R	RS232/TTL	Single-Mode	9 - 15VDC
5844SHRT-H R	RS232/TTL	Single-Mode	90-250V AC/DC
5844SHRT-L R	RS232/TTL	Single-Mode	24 to 48VDC

Belden Competence Center

As the complexity of communication and connectivity solutions has increased, so have the requirements for design, implementation and maintenance of these solutions. For users, acquiring and verifying the latest expert knowledge plays a decisive role in this. As a reliable partner for end-to-end solutions, Belden offers expert consulting, design, technical support, as well as technology and product training courses, from a single source: Belden Competence Center. In addition, we offer you the right qualification for every area of expertise through the world's first certification program for industrial networks. Up-to-date manufacturer's expertise, an international service network and access to external specialists guarantee you the best possible support for products. Irrespective of the technology you use, you can rely on our full support – from implementation to optimization of every aspect of daily operations.

About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

For more information, visit us at www.belden.com and follow us on Twitter @BeldenIND.

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