

I/A Series[®] Hardware Fiber Optic LAN Converter



The Fiber Optic LAN Converter provides bidirectional conversion between coaxial and fiber optic media. The converter is compatible with existing I/A Series system hardware, utilizes industry standard fiber optic cabling and connectors and supports fiber optic only as well as coaxial/fiber optic combination topologies.

The Fiber Optic LAN cable fiber is unaffected by electrical noise (i.e., EMI, RFI, and lightning), can be installed in areas containing rotating machinery, arc welders, etc., can be installed in cable trays containing high voltage power lines as well as in outdoor areas exposed to lightning hazards. Its electrical isolation characteristics provide protection from voltage differentials and ground loops and permits installation where intrinsically safe operation is required. Like the coaxial Carrierband LAN, fiber optic cabling supports redundant cable paths for added reliability. As symbolized by the "CE" marking, this Fiber Optic LAN Converter conforms to the European Union directives.

Fiber Optic LAN Converter

The converter is a self-contained unit that mounts in a standard 19-inch EIA rack or in an optionally available enclosure. It connects between the passive tap drop cable and the fiber optic cable. The converter supports employment of any one, or combination, of the following Fiber Optic LAN topologies:

- Point-to-point
- Passive star
- Redundant Point-to-point
- Redundant Passive star



In non-redundant fiber optic topologies, a minimum of two Fiber Optic LAN Converters are required to complete the bidirectional conversion from coaxial to fiber optic to coaxial media. Where redundant fiber optic communication is specified, a minimum of four converters - two for each optical fiber pair - are required. The two optical fibers between converters provide separate communication paths for transmission and reception. During transmission, the Fiber Optic LAN Converter converts electrical signals received via the drop cables from the coaxial passive tap into light pulses and transmits these pulses over one of the optical fibers; during reception, it performs the operation in reverse, converting light pulses from the optical fiber into electrical signals. The signal conversion performed by the Fiber Optic LAN Converter provides the necessary wave shaping, bit timing, and signal amplitude functions for stable, reliable communications.

Fiber Optic LAN Enclosures

The optional Fiber Optic LAN Enclosures provide dedicated housing for the Fiber Optic LAN Converters. The enclosures are made of steel, have front and rear doors with slotted locks (which are actuated by a supplied key or standard flat-blade screwdriver) and are provided with leveling feet on the bottom. In addition, the interior is equipped with frontto-back adjustable 19-inch EIA rails for mounting the converters, a power strip which accepts the converter power cord plugs and a junction box for connecting customer ac power wiring. Redundant power configurations have two, independently-powered power strips. The enclosures are available in three sizes to accommodate 4, 6, or 8 Fiber Optic LAN Converters.

Fiber Optic Cabling

Fiber optic cabling is purchased by the customer from a fiber optics vendor/installer. Two optical fibers are required for basic (non-redundant) fiber optic communication; one for transmission and the other for reception. The cables must be terminated with ST type connectors (to match those on the Fiber Optic LAN Converter). Other cable requirements (flexibility, durability, etc.) depend on the particular application. Check with a cable vendor/installer for a listing of application-specific cable characteristics.

The total combined Carrierband LAN and Fiber Optic LAN cabling distances permitted is 20 km (12.4 mi). The number of nodes allowed and the maximum allowable cabling distance for a particular installation depend on various hardware and software constraints. Consult your Foxboro representative for more information.

ENVIRONMENTAL SPECIFICATIONS

Fiber Optic LAN Converter

TEMPERATURE Operating 0 to 60°C (32 to 140°F) Storage -40 to 70°C (-40 to 158°F) **RELATIVE HUMIDITY** 5 to 95 % (noncondensing) at 30°C (86°F) CONTAMINATION Class G2 (Moderate) as defined in ISA Standard S71.04 POWER DISSIPATION 10 W (typical) **RFI SUSCEPTIBILITY** 10 V/m at 26 to 1000 Mhz ELECTROSTATIC DISCHARGE (ANY SURFACE) 6 kV current discharge HIGH FREQUENCY TRANSIENTS (REF. IEC 801-4) Main Power Lines 2 kV common mode Control/Signal Lines 1 kV

SWITCHING/INDIRECT LIGHTNING TRANSIENTS (REF. IEC 801-5) Impulse [1.2 x 50, 8 x 20] ac Connected Lines (direct coupling) 2 kV common mode; 1 kV normal mode **Control/Signal Lines** 1 kV common mode; 500 V normal mode RINGING WAVE [0.5 µS, 100 KHZ] (REF. ANSI/IEEE C62.41) ac Connected Lines 2 kV common mode; 1 kV normal mode SURGE WITHSTAND CAPABILITY [1 MHZ OSCILLATORY WAVE] (REF. ANSI/IEEE C37.90.1) ac Connected Lines 2.5 kV common mode; 1.25 kV normal mode MECHANICAL VIBRATION 0.5 g at 5 to 200 Hz Fiber Optic LAN Enclosures **OPERATING TEMPERATURE** 0 to 40°C (32 to 104°F) external to enclosure

0 to 40°C (32 to 104°F) external to enclosure MECHANICAL VIBRATION 0.1 g at 5 to 200 Hz

FUNCTIONAL SPECIFICATIONS

LAN Cables (Customer Supplied) FIBER OPTIC Maximum Length Point-to-Point 10 km (6.2 mi.) between converters Maximum Length Passive Star Star dependent Loss 1 dB/km at 1300 nm wavelength COAXIAL CARRIERBAND DROP 75 Ω impedance Fiber Optic LAN Converter INPUT POWER Voltage 80-264 VRMS (Autoranging) Frequency 47 to 63 Hz Power Consumption 10 W maximum Harmonic Distortion 10% (up to third harmonic) Interruption Tolerance (Ridethrough Time) 100 ms **Overcurrent Protection** Fuse, 1 A COAXIAL CARRIERBAND DROP CABLE PORT Input [Receive] Signal Level +10 dBmV (minimum) to 56 dBmV (maximum) Output [Transmit] Signal Level 63 to 66 dBmV FIBER OPTIC CABLE PORTS Input Power Range -33 dBm to -9 dBm peak Output Transmit Level, HI -13 dBm to -9 dBm peak Transmit Level, LO -22 dBm to -18 dBm peak Center Wavelength 1250 nm to 1335 nm Spectral Width 145 nm (maximum) **Rise/Fall Time** 10 ns (maximum)

DATA TRANSFER RATE 5 Mbits per second DATA DELAY 4 Octets CONTROLS (All controls are mounted on the rear panel except the reset switch is recessed in the front panel.) Fiber Optic Mode Selection Switch Echo/Non-Echo (Star/Point-to-Point) Transmit Power Level Switch HI/LO (LO for Point to Point < 3 km (1.9 mi); HI for all other Configurations.) Reset Initiates Power-On Restart **INDICATORS** Power On (Green) Fiber Optic Port Receive (Green), Transmit (Green), Check (Yellow), Active (Green) Coaxial Carrierband Drop Port Receive (Green), Transmit (Green), Check (Yellow), Active (Green) Diagnostic Output Form A N.O. relay contact for remote monitoring of "active" status Enclosures INPUT POWER Voltage 100, 120, 200 or 240 Vrms, +10/-15% Frequency 47 to 63 Hz CAPACITY Fiber Optic LAN Enclosure 4 4 Fiber Optic LAN Converters Fiber Optic LAN Enclosure 6 6 Fiber Optic LAN Converters Fiber Optic LAN Enclosure 8 8 Fiber Optic LAN Converters

PHYSICAL SPECIFICATIONS

LAN Cables (Customer Supplied) FIBER OPTIC Multimode graded-index glass fiber; 62.5 micron core, 125 micron cladding COAXIAL CARRIERBAND DROP RG-6, 8 mm O.D.

Fiber Optic LAN Converter

(All connections are on the rear panel) CONNECTORS Coaxial Carrierband LAN Drop F type Fiber Optic ST type (2) INPUT POWER CABLE LENGTH 1 meter (3.3 feet) TERMINAL BLOCK Diagnostic Output 4 Pos Pluggable MOUNTING Standard 483 mm (19 inch) wide rack Standard EIA rack, configuration 1U SIZE See Figure 1 MASS 3.2 kg (7 lbs)

Enclosures

SIZES See Figure 2

CONSTRUCTION

Exterior

Painted steel, front and rear doors with keylocks, doors hinged left or right, removable sides

Interior

Full-height EIA rails adjustable front to back; junction box (Noryl) and outlet strip(s) mounted on side

FIELD CONNECTIONS

Junction Box Screw-clamp socket terminals for wire size of 13 AWG (2.5 sq. mm)

Outlet Strip

Four IEC 320 sockets with a single 6.25 A, slowblow, style 3AG, $6.3 \times 31.75 \text{ mm} (0.25 \times 1.25 \text{ in.})$ fuse; sockets accept plugs for Fiber Optic Lan Converters. For redundant configurations, a second junction box and outlet strip are added.

MASS (FULLY LOADED)

Fiber Optic LAN Enclosure 4 73 kg (160 lbs)

Fiber Optic LAN Enclosure 6 83 kg (182 lbs)

Fiber Optic LAN Enclosure 8 106 kg (234 lbs)



DIMENSIONS – NOMINAL

Figure 2. Fiber Optic LAN Enclosures

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