

EOTec 2000 Expandable ControlNet™ Fiber/Coax Communications Modules

With Support for Enhanced Physical Media Layer



Key Features:

- **Industrial Design for High Reliability**
 - Fully compliant with ControlNet specification
 - Modular, flexible, scaleable
 - FM approved for hazardous locations
 - Stand alone 35 mm DIN-rail mounting
 - Operating temperature range -40° to +85°C
- **Enhanced Physical Layer Attributes**
 - Single/Multi-mode conversion possible
 - Real-time 4-20 mA diagnostic output (available as an option)
 - 850 nm and 1300 nm optical wavelength
 - High/Low optical power settings
 - Long lifetime – Class 1 LED
- **Flexible Network Topologies**
 - Point-to-point (Branch)
 - Daisy-chain (Linear)
 - Copper/Fiber Star
 - Cascading Tree
- **Universal Power Supply Modules**
 - 90-260 VAC 50/60 Hz and 120-260 VDC or 15-30 VDC power input
 - UL/cUL Recognized (2A06/2A16)
 - UL/cUL Listed (2A08/2A18)
- **Optional accessories available**
 - Fiber optic expansion modules (Multi-mode and Single mode)
 - Redundant power supplies
 - Power Supply with alarm relays
 - Optical power level diagnostic ports (4-20 mA)



Overview

Weed Instrument's EOTec 2000 ControlNet communications modules are designed to provide networking solutions in harsh industrial environments. The 2C20 ControlNet electrical interface module can be used alone for electrical communications on the physical media layer of a ControlNet trunk line, or with any EOTec 2000 optical interface module for greater distances and higher reliability between ControlNet devices. Problems such as ground loops, EMI/RFI noise and lightning strikes are eliminated by using fiber optic cables in lieu of copper coaxial cables. Create your own "stack" to build a ControlNet repeater, extend the length of a ControlNet network via copper or fiber, create a STAR or daisy-chain topology using copper

or fiber, or, combine all three topologies in one network.

Each EOTec 2000 communications module features a truly scalable DIN-rail mount package that allows for up to five modules to be snapped together on one stack powered by one or several power supply modules.

Communications takes place through its unique "backplane port" with no external wiring between modules. LED indicators are provided for local determination of communication failures. In addition, Weed offers optional modules with enhanced

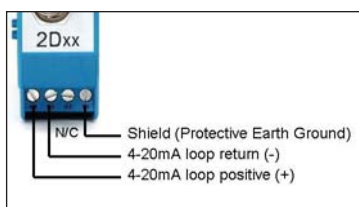
diagnostics that can be wired to provide failure information at a remote location.



Easy Plug-In Connector

Enhanced Diagnostics Modules for Real-Time Fault Prediction

A ControlNet communications stack can be equipped with up to four standard optical interface modules (2Exx series) or optical interface modules with enhanced diagnostics (2Dxx series). Optical interface modules with diagnostic outputs have an internally powered 4-20 mA output, which provides indication of the received optical power level (light intensity) from the fiber.



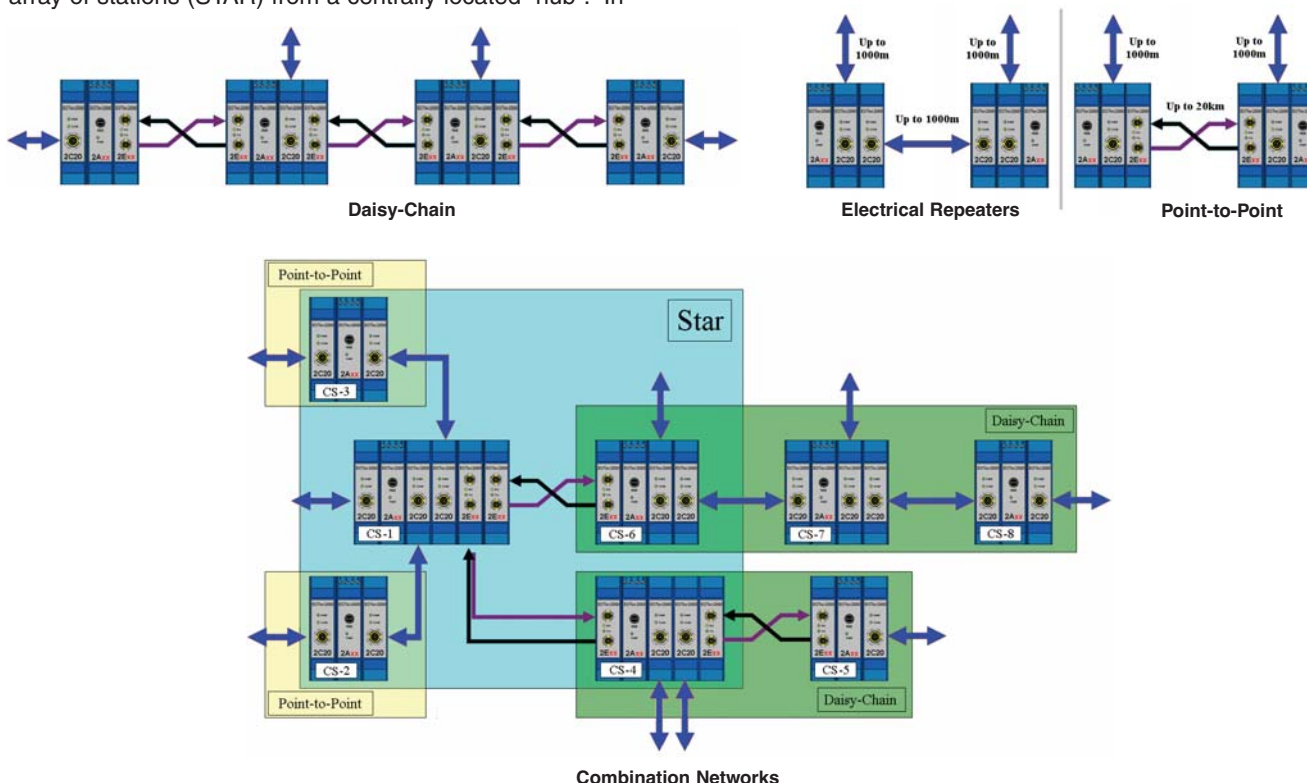
EOTec 2000 Optical Module with Diagnostic Output

The output is calibrated for each model so that a reading of 4mA means the optical receiver is at its threshold for recovering the optical signal (optical link failure is imminent). A reading of 20mA corresponds to the full optical budget being available at the optical receive port (very healthy optical link).

Multiple ControlNet Network Structures Possible

The EOTec 2000 system can be used to create many different network topologies using copper coax cable or glass fiber cable. Adding additional modules provides users with a string of communication stations or communication to an array of stations (STAR) from a centrally located "hub". In

the simplest case, the modules can be used to convert a copper line to a fiber optic cable to increase the noise immunity of the system. Depending on the application other networks are possible.



Technical Specifications:

2C20 Electrical Interface Module (EIM)

Cabling and Operation ControlNet Specifications /Requirements Apply

Maximum nodes

48 (using coax cable length of 250m)

Maximum coax cable length

1000m (when connected to only 1 node)

Trunk connection

Anywhere on the trunk via ControlNet Tap with 1m drop cable required

Coax cable connection

BNC

Data rate

5M baud

Propagation delay

1µs maximum per modem pair

Fiber propagation delay

5µs/km

1.5µs/1000ft

Power indicator

Green LED illuminates with power applied

Com indicator

Green LED illuminates with data from the coax cable input

Environmental

DIN rail mounting

Power input

Nominal 9 VDC via Interconnection Bus

Input power, maximum

1.8 W

Operating temperature range

-40 to +85 °C

Storage temperature range

-40 to +85 °C

Humidity (non-condensing)

5 to 95% RH

EMC immunity

IEC61326-1:1998

Hazardous locations

UL/cUL and FM; Class I, Division 2, Groups A, B, C, D, T4

Packaging (polyamide)

UL 94V-0

Optical Interface Modules (OIM)

Optical Wavelength

See table following

Communications Data Range

9.6K to 12 Mbps

Optical Port Connection

ST Compatible

Optical Dynamic Range

See table following

Optical Transmit Indicator

Green LED

Optical Receive Indicator

Amber LED

Environmental

DIN rail mounting

Power input

Nominal 9 VDC via Interconnection Bus

Operating temperature range

-40 to +85 °C

Storage temperature range

-40 to +85 °C

Humidity (non-condensing)

5 to 95% RH

EMC immunity

IEC61326-1:1998

Hazardous locations

UL/cUL and FM; Class I, Division 2, Groups A, B, C, D, T4

Packaging (polyamide)

UL 94V-0

Power Supply Modules (PSM)

Power Requirements:

Input Voltage

90-260 VAC 50/60 Hz and
120-260 VDC (2A06/2A16)
15-30 VDC (2A08/2A18)

Input Current

250 mA (2A06/2A16)
400 mA (2A08/2A18)

Input Fuse

400 mA Slow-Blow

Nominal Output

9 VDC, 1.1A Max.
to backplane connector

Alarm Relay

Form C, 175 VDC, 1A Continuous
(2A16 and 2A18 only)

Indicators

Power On (Green LED)

Environmental and Safety:

DIN rail mounting

Operating temperature range

-40 to +85 °C

Storage temperature range

-40 to +85 °C

Humidity (non-condensing)

5 to 95% RH

Electrical Safety

UL Recognized (2A06/2A16 only)
CE Approved

Hazardous locations (2A08/2A18 only)

UL/cUL and FM; Class I, Division 2, Groups A, B, C, D, T4

Packaging (polyamide)

UL 94V-0

Optical Interface Modules (OIM)

OIM Model	Wavelength	Fiber Type	Fiber Connector	Max Optical Dynamic Range, Fiber Size	Typical Max Distance
2E07, 2D07	850nm	Multimode	ST*	12dB, 62.5/125µm	2mi/3.4km
2E09, 2D09	1300nm	Multimode	ST*	12dB, 62.5/125µm	5mi/8km
2E10, 2D10	850nm	Multimode	ST*	17dB, 62.5/125µm	3mi/4.8km
2E19, 2D19	850nm	Multimode	ST*	17dB, 62.5/125 µm	7mi/11.3km
2E36, 2D36	1300nm	Single-mode	ST*	10dB, 9/125µm	12mi/20km
2E46, 2D46	1300nm	Single-mode	ST*	16db, 9/125µm	12mi/20km*

Ordering Information:

Electrical Interface Module (EIM):

- 2C20 Electrical Interface Module, ControlNet, BNC

Optical Interface Modules (OIM):

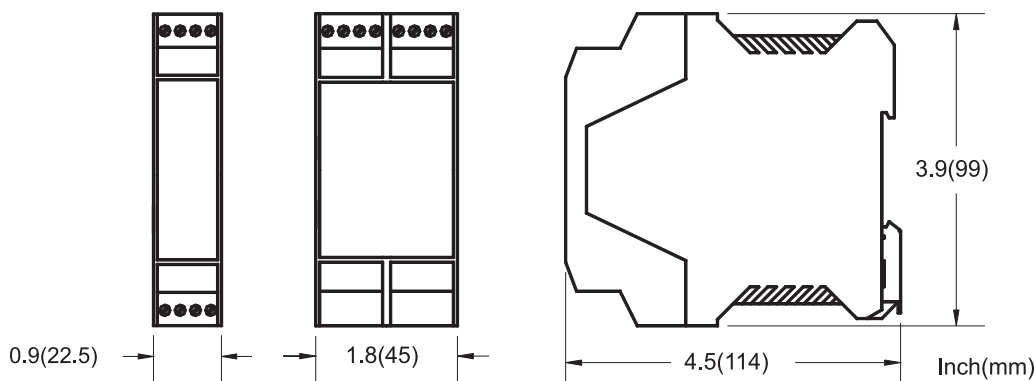
- 2E07 Optical Interface Module, 850nm, MM, ST
- 2D07 Optical Interface Module, 850nm, MM, ST, w/ diagnostics
- 2E10 Optical Interface Module, 850nm, MM, ST, Hi power
- 2D10 Optical Interface Module, 850nm, MM, ST, Hi power, w/ diagnostics
- 2E09 Optical Interface Module, 1300nm, MM, ST
- 2D09 Optical Interface Module, 1300nm, MM, ST, w/ diagnostics
- 2E19 Optical Interface Module, 1300nm, MM, ST, Hi power
- 2D19 Optical Interface Module, 1300nm, MM, ST, Hi power, w/ diagnostics

- 2E36 Optical Interface Module, 1300nm, SM, ST
- 2D36 Optical Interface Module, 1300nm, SM, ST, w/ diagnostics
- 2E46 Optical Interface Module, 1300nm, SM, ST, Hi power
- 2D46 Optical Interface Module, 1300nm, SM, ST, Hi power, w/ diagnostics

Power Supply Modules (PSM):

- 2A06 Power Supply Module, 90-260VAC 50/60Hz, 120-260VDC
- 2A16 Power Supply Module, 90-260VAC 50/60Hz, 120-260VDC, w/ alarm
- 2A08 Power Supply Module, 24VDC
- 2A18 Power Supply Module, 24VDC, w/ alarm

Mechanical Dimensions:



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