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EcoStruxure™

Foxboro™ DCS

Fieldbus Communications Module, FCM2F2/FCM2F4/FCM2F10

PSS 41H-2FCM

Product Specification

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Schneider Electric™

www.schneider-electric.com

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Overview

Plant installation costs can be significantly reduced by placing the rugged standard 200 Series Foxboro™ DCS Fieldbus Modules (FBMs) much closer to their corresponding field devices. Long runs of signal cables can then be replaced by one or two fiber optic pairs carrying multiplexed I/O signals. The 200 Series Fieldbus Communications Modules (FCMs) support this capability over nominal distances of 2, 4, or 10 kilometers.

FCMs are fiber optic communications extenders that permit 200 Series FBMs to be installed remotely and closely to the plant processes.

The three versions, FCM2F2 (RH914YZ), FCM2F4 (RH917JA), and FCM2F10 (RH916TQ), offer nominally maximum baseplate-to-baseplate fiber optic cabling distances: up to 2 km (1.24 mi), up to 4 km (2.48 mi), and up to 10 km (6.21 mi), respectively.

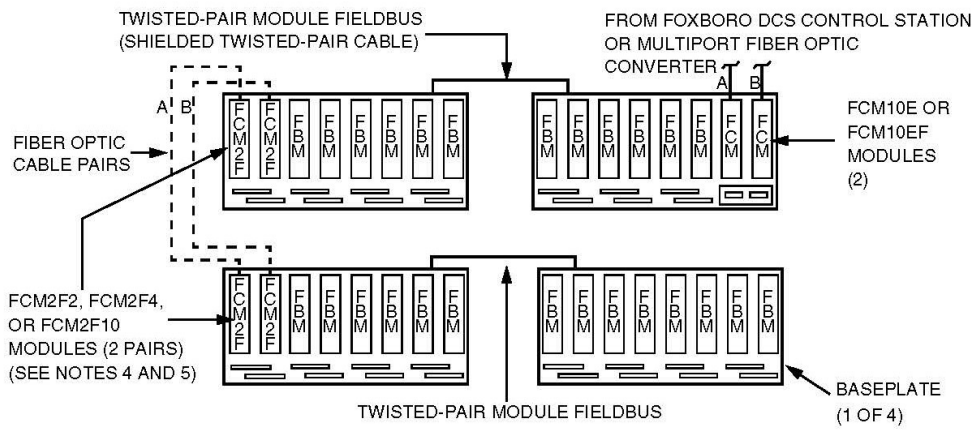
The FCMs are mounted on standard baseplates in pairs for redundancy. Non-redundant configurations require only a single FCM.

Unaffected by electrical noise (EMI, RFI, and lightning), fiber optic cabling provides a versatile means of extending signal communications. It can be used in areas containing rotating machinery, arc welders, and so forth, and can be installed in cable trays containing high voltage power lines, or in outdoor areas exposed to lightning hazards. Its electrical isolation characteristics provide protection from voltage differentials and ground loops.

Figure 1 shows an example of redundant configuration with baseplates (containing FCMs) linked point-to-point with fiber optic cabling. This cabling configuration shows a single fiber optic segment, interconnecting two baseplates. However, up to three fiber optic segments can be used to interconnect the (maximum) four baseplates.

Maximum fiber optic cabling distance between any two baseplates is 10 km (using FCM2F10s (RH916TQ)), with the total fiber optic cabling distance between the baseplates (all cable segments) not to exceed 20 km (10.42 mi).

Figure 1 - Point-to-Point Fiber Optic Extension of the Module Fieldbus Using FCMs



NOTE:

- Maximum baseplate quantity is four.
- Redundant configuration is shown. Non-redundant configuration uses one FCM in a baseplate slot.
- Fiber optic extension can be made between two or more baseplates (up to three extensions).
- Three versions of the FCM provide three different fiber optic distances:
  - FCM2F2 = 2 km (1.24 mi)
  - FCM2F4 = 4 km (2.48 mi)
  - FCM2F10 = 10 km (6.2 mi)
- FCMs at either end of the fiber optic cable must be identical types (for example, two FCM2F2s).
- Redundant FCMs must be mounted in the first or last adjacent slots on the baseplate.

Features

- Converts 2 MB HDLC Fieldbus to MMF or SMF fiber optics
- Rugged design suitable for enclosure in Class G3 (harsh) environments

FCM Design

FCMs have a rugged extruded aluminum exterior for physical protection of the circuits. Enclosures specially designed for mounting of the FBMs and FCMs can provide various levels of environmental protection for the FCMs, up to harsh environments (Class G), per ISA Standard S71.04.

The FCM can be removed/replaced from the baseplate without removing power. Six light-emitting diodes (LEDs) incorporated into the front of the FCMs indicate the status of network activity to/from the module Fieldbus and fiber link, and the FCMs operational status.

Baseplate Module Mounting

FCMs mount on a standard baseplate. The baseplate includes signal connectors for Fieldbus, power, and I/O cable connections. A baseplate can support up to eight FBMs, or a combination of FBMs and FCMs.

When connecting two baseplates (with redundancy) with fiber optic cable, a pair of FCMs is required for each baseplate (for a total of four FCMs).

For non-redundant configurations, each baseplate requires only a single FCM.

Multiple baseplates in the same enclosure do not necessarily require FCMs and fiber optic cabling. Any baseplates within 60 m (196.85 ft) can link together with the standard, twinax-pair cable.

Fiber Optic Cabling

Fiber optic cabling used in these module Fieldbus connections is purchased by the customer. The required fiber optic cable for FCM2F2 (RH914YZ) and FCM2F4 (RH917JA) connections is a multimode, graded-index glass fiber with a 62.5 micron core and 125 micron cladding, with 0.275 NA (numerical aperture). Maximum allowable signal loss is 1 dB per km at a wavelength of 1300 nm, and 3.6 dB per km at a wavelength of 850 nm. The cables must be terminated with ST-type connectors. Cables with different characteristics may not be used.

The required cable for the FCM2F10 (RH916TQ) connection is standard, single-mode fiber cable with ST-type connectors.

Other cable requirements (such as flexibility, or durability) depend on the particular application. Check with your cable vendor/installer for a listing of application-specific cable characteristics.

Functional Specifications

Power Requirements	• Input Voltage Range (Redundant): 24 V dc +5%, -10% • Consumption: 5 W (maximum) at 24 V dc • Heat Dissipation: 5 W (maximum) at 24 V dc
Calibration Requirements	Calibration of the module is not required.
Vibration	0.75 g (5 to 200 Hz)
Regulatory Compliance: Electromagnetic Compatibility (EMC)	• *European EMC Directive 2004/108/EC* Meets: EN61326:2013 Class A Emissions and Industrial Immunity Levels
Regulatory Compliance: Product Safety	• *Underwriters Laboratories (UL) for U.S. and Canada* UL/UL-C listed as suitable for use in UL/UL-C listed Class I, Groups A-D; Division 2; temperature code T4 enclosure based systems and supply non-incendive communication circuits when connected to specified Foxboro DCS processor modules. Communications circuits also meet the requirements for Class 2 as defined in Article 725 of the National Electrical Code (NFPA No.70) and Section 16 of the Canadian Electrical Code (CSA C22.1). For more information, see *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). • *European Low Voltage Directive 2006/35/EU and Explosive Atmospheres (ATEX) directive 94/9/EC.* DEMKO certified as Ex nA IIC T4 for use in certified Zone 2 enclosure when connected to specified Foxboro DCS processor modules as described in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA).
RoHS Compliance	Complies with European RoHS Directive 2011/65/EU, including amending Directives 2015/863 and 2017/2102.

Environmental Specifications

	Operating	Storage
Temperature	-20 to +70°C (-4 to +158°F)	-40 to +70°C (-40 to +158°F)
Relative Humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Altitude	-300 to +3,000 m (-1,000 to +10,000 ft)	-300 to +12,000 m (-1,000 to +40,000 ft)
Contamination	Class G3 (Harsh) as defined in ISA Standard, S71.04. Pollution degree 2 as defined in IEC 664-1.	

(1) The environmental limits of this module may be enhanced by the type of enclosure containing the module. Refer to the applicable Product Specification Sheet (PSS) that describes the specific type of enclosure that is to be used.

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Physical Specifications

Mounting	FCM2F2 (RH914YZ), FCM2F4 (RH917JA), and FCM2F10 (RH916TQ) mount on 200 Series FBM baseplates. The baseplate can be mounted on a DIN rail (horizontally or vertically), or horizontally on a 19inch rack using a mounting kit. See *Standard 200 Series Baseplates* (PSS 41H-2SBASPLT) for details.
Weight	284 g (10 oz) approximate
Dimensions	• Height: 102 mm (4 in) 114 mm (4.5 in) including mounting lugs • Width: 45 mm (1.75 in) • Depth: 104 mm (4.11 in)
Indicators (mounted on front of module)	Red and green light-emitting diodes (LEDs) provide indication of the FCM operational status. Amber LEDs indicate data traffic and direction.

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Related Product Documents

Document Number	Description
B0400FA	*Standard and Compact 200 Series Subsystem User's Guide*
PSS 41H-2SOV	*Standard 200 Series Subsystem Overview*
PSS 41H-2SBASPLT	*Standard 200 Series Baseplates*

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