Foxboro™ DCS

FBI200A Fieldbus Isolator/Filter

PSS 41H-2Y17

Product Specification

August 2019

Legal Information

Overview

For a single HDLC module Fieldbus for communications from a Foxboro™ DCS Field Control Processor (FCP) 280, the FBI200A Fieldbus Isolator/Filter provides galvanic isolation over a single full speed (2 Mbps) HDLC module Fieldbus between the Control Processor and 200 Series Fieldbus Modules (FBMs) used in 100 Series solutions to upgrade 100 Series FBMs.

The FBI200A is intended for use as part of the 100 Series Fieldbus Module Upgrade subsystem. It maintains 2 Mbps HDLC module Fieldbus communications with galvanic isolation between the 200 Series FBMs in the conversion mounting structures and their associated Control Processors .

It accepts the termination connectors on 100 Series FBI Termination Cable Assemblies (TCAs) (i.e. nosecones) from existing 100 Series FBIs.

A redundant FBI200A pair must be installed on an FBI200A mounting adapter mounted in the first Termination Assembly Adapter (TAA) slot of a conversion mounting structure, which is discussed in *Standard 200 Series Baseplates* (PSS 41H-2SBASPLT).

The FBI200A supports up to 305 m (1000 ft) of twinaxial Fieldbus cabling to its associated FCP280.

When used in a 100 Series conversion mounting structure, the 200 Series FBM slot associated with the first TAA slot (that is, the top-most left-hand 200 Series FBM slot in the mounting structures) must be left vacant, as shown in *Figure 1, page 4*.

Features

- Provide galvanically isolated drivers on the 200 Series (2 Mbps) module Fieldbus, supporting twinaxial cabling from the FBI200A to the 200 Series FBMs up to 305 m (1000 ft).
- Harsh (Class G3 - ISA S71.04) contamination protection.
- Support for existing 100 Series FBI Termination Cable Assemblies (TCAs) - no need to replace field wiring.
- FBI200A mounting adapter, required to mount redundant FBI200A modules on the conversion mounting structures, provides power to both FBI200As and directs FBI200A communications to the “A” and “B” buses.

FBI200A on 2 MBPS HDLC Module Fieldbus

Remote 200 Series FBMs (used to replace 100 Series FBMs) can be located up to 305 m (1000 ft) from their associated FCP280 when used with FBI200As, as shown in *Figure 1*.

A redundant pair of FBI200As in an FBI200A mounting adapter support up to thirty-one 200 Series FBMs in a baseplate chain. However, they can enable their associated FCP280, FCP270, or ZCP270 to support up to one hundred twenty-four 200 Series FBMs, as described below:

- An FCP280 can connect up to four 200 Series FBM baseplate chains directly to its baseplate. Each baseplate chain may have one FBI200A pair with up to thirty-one 200 Series FBMs or equivalent modules in the chain, for a total of 124 FBMs. See *Figure 2*. The FCP280 baseplate supports the Expanded Fieldbus without the use of any additional support hardware.

Several configurations are possible where FBI200As are used to extend the Fieldbus. Refer to the *100 Series Fieldbus Module Upgrade User's Guide*(B0700BQ) for a list of these FBI200A configurations.

Figure 1 - FBI200A Connections on 2 Mbps HDLC Module Fieldbus (Conceptual)

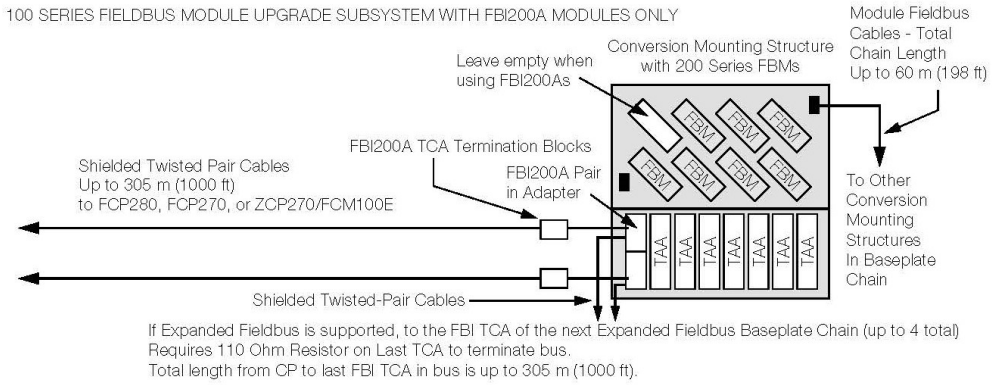
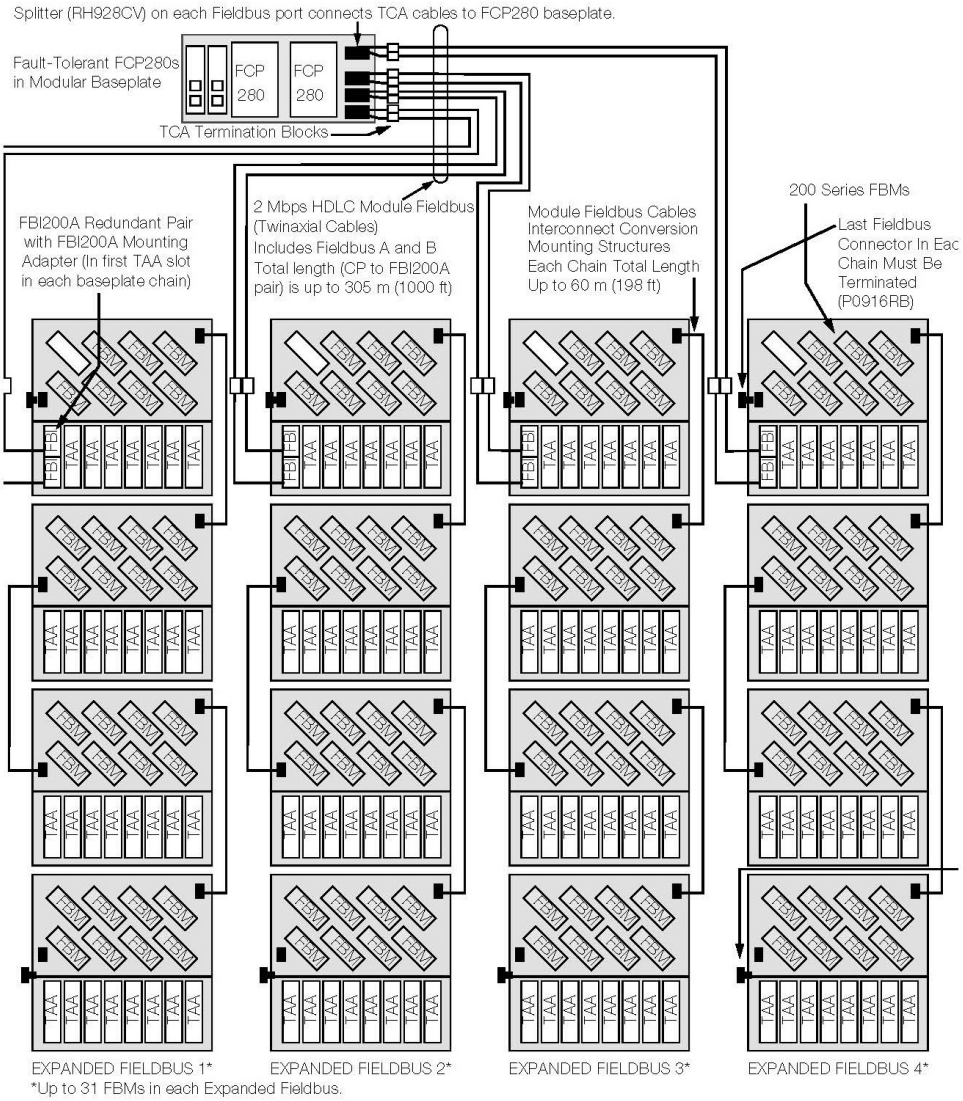


Figure 2 - FCP280 Expanded Fieldbus Support With FBI200A and FBI200A Mounting Adapter

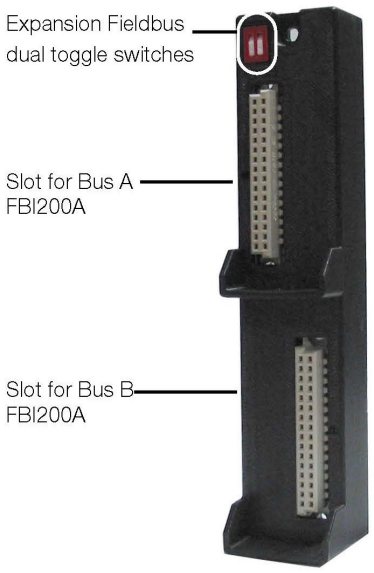


NOTE: The FBI200A Mounting Adapter switches in this configuration can be set to the same port.

Expanded Fieldbus Support with FBI200A Mounting Adapter

The FBI200A mounting adapter (P0923XM) is required to mount the FBI200A modules to the conversion mounting structures. It provides power to both FBI200As and directs FBI200A communications to the “A” and “B” busses. It attaches between a redundant pair of FBI200A modules and their conversion mounting structure.

Figure 3 - FBI200A Mounting Adapter



In an Expanded Fieldbus, each FBI200A pair is connected to the next FBI200A pair via their TCAs using twinaxial cabling.

FBI200A Module Design

FBI200A modules have a compact design, with a molded plastic exterior for physical protection of the electronics. Enclosures specially designed for mounting of DIN rail mounted Fieldbus equipment provide various levels of environmental protection for the FBI200A modules, up to harsh environments per ISA Standard S71.04.

The FBI200A can be removed/replaced from their conversion mounting structure without removing power. Light-emitting diodes (LEDs) incorporated into the nosecone of the FBI200A indicate Fieldbus communications activity and module status.

FBI200A Module Fieldbus Communication

The FBI200A supports 2 Mbps module Fieldbus communications to all 200 Series FBMs. The 2 Mbps module Fieldbus is redundant and all 200 Series modules can receive/transmit messages over both A and B buses.

LED Indicators

Light-emitting diodes (LEDs) on the front of the Termination Cable Assembly (TCA) that is affixed to the front of the FBI200A module provides visual indication of the:

- Operational status - red and green LEDs indicate health of the internal clock.
- 2Mbps CP Fieldbus (receive) - amber LED indicates data traffic received from the FCP280 Fieldbus. The blinking of this LED indicates that data is being received from the CP and is being retransmitted on the HDLC module Fieldbus.
- 2Mbps FBM Fieldbus (receive) - amber LED indicates data traffic received from the FBM's Fieldbus is being sent to the FCP280.

Functional Specifications

Process I/O Communications	2 Mbps for 200 Series FBMs (used to upgrade 100 Series FBMs)
Process I/O Capacity (2Mbps Fieldbus)	Cable Lengths: • Between FCP280 and Conversion Mounting Structure Chains with FBI200As: ◦ Fieldbus Cabling Between All Mounting Structures In Chain: 60 m (198 ft) maximum (using module fieldbus cables listed in the table “Module Fieldbus Cables” in the *Standard and Compact 200 Series Subsystem User’s Guide* (B0400FA)) ◦ Over Twinaxial Cabling with 100 Series FBI TCA Termination Blocks: 305 m (1000 ft) maximum • 200 Series FBMs: 31 FBMs per FBI200A pair on one baseplate chain maximum, depending on control processor sizing constraints. See *Field Control Processor 280 (FCP280) Sizing Guidelines and Excel Workbook* (B0700FY).
Power Requirements	• Voltage - Normal Operating Range: 24 V (+5%, -10%) • Power Dissipation: 3.5 W, maximum
Regulatory Compliance: Electromagnetic Compatibility (EMC)	• *European EMC Directive 89/336/EEC*: Meets: ◦ EN 50081-2 Emission standard ◦ EN 50082-2 Immunity standard ◦ EN 61326 Annex A (Industrial Levels) • *CISPR 11, Industrial Scientific and Medical (ISM) Radio-frequency Equipment - Electromagnetic Disturbance Characteristics - Limits and Methods of Measurement*: Meets: Class A Limits • *IEC 61000-4-2 ESD Immunity*: 6 kV current discharge • *IEC 61000-4-3 Radiated Field Immunity*: 10 V/m at 26 to 1000 MHz • *IEC 61000-4-4 Electrical Fast Transient/Burst Immunity*: 2 kV on I/O, dc power and communication lines • *IEC 61000-4-5 Surge Immunity: 2kV on ac and dc power lines*: 1kV on I/O and communications lines • *IEC 61000-4-6 Immunity to Conducted Disturbances Induced by Radio-frequency Fields*: 3 V (rms) at 150 kHz to 80 MHz on I/O, dc power and communication lines • IEC 61000-4-8 Power Frequency Magnetic Field Immunity: 30 A/m at 50 and 60 Hz

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 1, Groups A-D; Division 2; temperature code T5 enclosure based systems. These modules are also UL and UL-C listed as associated apparatus for supplying non-incendive communication circuits for Class 1, Groups A-D hazardous locations 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 73/23/EEC and Explosive Atmospheres (ATEX) directive 94/9/EC*: CENELEC (DEMKO) certified as EEx nA IIC T4 for use in CENELEC certified Zone 2 enclosure certified as associated apparatus for supplying non-incendive field circuits for Zone 2, Group IIC, potentially explosive atmospheres when connected to specified Foxboro DCS processor modules as described in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA).
Calibration Requirements	Calibration of the module is not required.

Environmental Specifications

	Operating	Storage
Temperature	0 to 60°C (32 to 140°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	Suitable for Class G3 (Harsh) environments as defined in ISA Standard S71.04. Pollution degree 2 as defined in IEC 664-1.	
Vibration	7.5 m/s^2 (0.75 g) from 5 to 500 Hz	

Physical Specifications

Mounting	The redundant installation consists of two modules. FBI200A modules must be used in pairs, installed in an FBI200A mounting adapter. An FBI200A pair mounts in the left-most Termination Assembly Adapter (TAA) slot in any 100 Series conversion mounting structure. See *Standard 200 Series Baseplates* (PSS 41H-2SBASPLT) for details.
Weight	• FBI200A: 0.3 kg (0.7 lb) approximate (each module) • FBI200A Mounting Adapter: 0.07 kg (0.16 lb)
Part Number	• FBI200A: P0923XL • FBI200A Mounting Adapter: P0923XM
FBI200A Dimensions	• Height: 2.63 in (69 mm) • Width: 1.4 in (36 mm) • Depth: 17.9 in (413 mm)

Related Product Documents

Document Number	Description
PSS 41H-1FCP280	*Field Control Processor 280 (FCP280)*
PSS 31H-2S200	*Standard 200 Series Subsystem Overview*
PSS 41H-2W100	*100 Series Fieldbus Module Upgrade Subsystem Overview*
PSS 41H-2CERTS	*Standard and Compact 200 Series I/O - Agency Certifications*
PSS 41H-2SBASPLT	*Standard 200 Series Baseplates*
PSS 41H-2W8	*100 Series Conversion Mounting Structures*
B0400FA	*Standard and Compact 200 Series Subsystem User's Guide*

WARNING: This product can expose you to chemicals including lead and lead compounds, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.p65warnings.ca.gov/.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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