

FBI200A Fieldbus Isolator/Filter



For a single HDLC module Fieldbus for communications from an FCP280, FCP270 or ZCP270/FCM100E, the FBI200A Fieldbus Isolator/Filter provides galvanic isolation over a single full speed (2 Mbps) HDLC module Fieldbus between the Control Processor/FCM100E and 200 Series FBMs used in 100 Series solutions to upgrade 100 Series FBMs.

FEATURES

Key features of the FBI200A are:

- ▶ 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.
- ▶ When the FBI200A connects to an FCP270, the FBI200A mounting adapter also provides FBM address range expansion to support the Expanded Fieldbus, enabling an FCP270 to support up to one hundred twenty-four 200 Series FBMs.

OVERVIEW

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 (FCP280, FCP270, or ZCP270). Unlike the 100 Series FBIs, or the FBI100, the FBI200A allows the CP270s to communicate with FBMs at the full 2 Mbps network speed.

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 *DIN Rail Mounted Modular Baseplates* (PSS 21H-2W6 B4).

The FBI200A supports up to 305 m (1000 ft) of twinaxial Fieldbus cabling to its associated FCP280, FCP270, or ZCP270/FCM100E pair.

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.

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, FCP270, or ZCP270/FCM100E pair when used with FBI200As, as shown in Figure 1.

A redundant pair of FBI200As in a 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:

- ▶ A 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. This is shown in Figure 2. The FCP280 baseplate supports the Expanded Fieldbus without the use of any additional support hardware.
- ▶ FBI200As and their FBI200A mounting adapters enable up to four baseplate chains to be connected to a FCP270, increasing the maximum number of 200 Series FBMs connected to the CP from 31 to 124. This is referred to as an Expanded Fieldbus. The FBI200A mounting adapters provide the expanded addressing capabilities required to host multiple baseplate chains over the same HDLC Fieldbus. This is shown in Figure 3.
- ▶ A ZCP270 can connect to up to four baseplate chains, each with one FCM100E pair connected to one FBI200A pair in a baseplate chain with up to thirty-two FBMs or equivalent modules, increasing the maximum number of 200 Series FBMs connected to the CP from 31 to 124. This is shown in Figure 4.

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.

100 SERIES FIELDBUS MODULE UPGRADE SUBSYSTEM WITH FBI200A MODULES ONLY

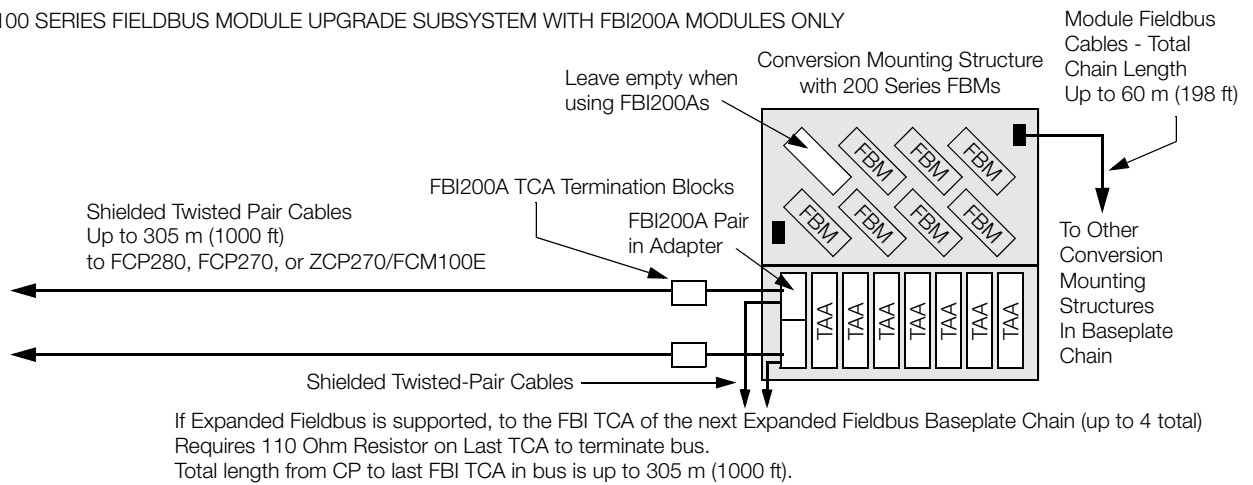


Figure 1. FBI200A Connections on 2 Mbps HDLC Module Fieldbus (Conceptual)

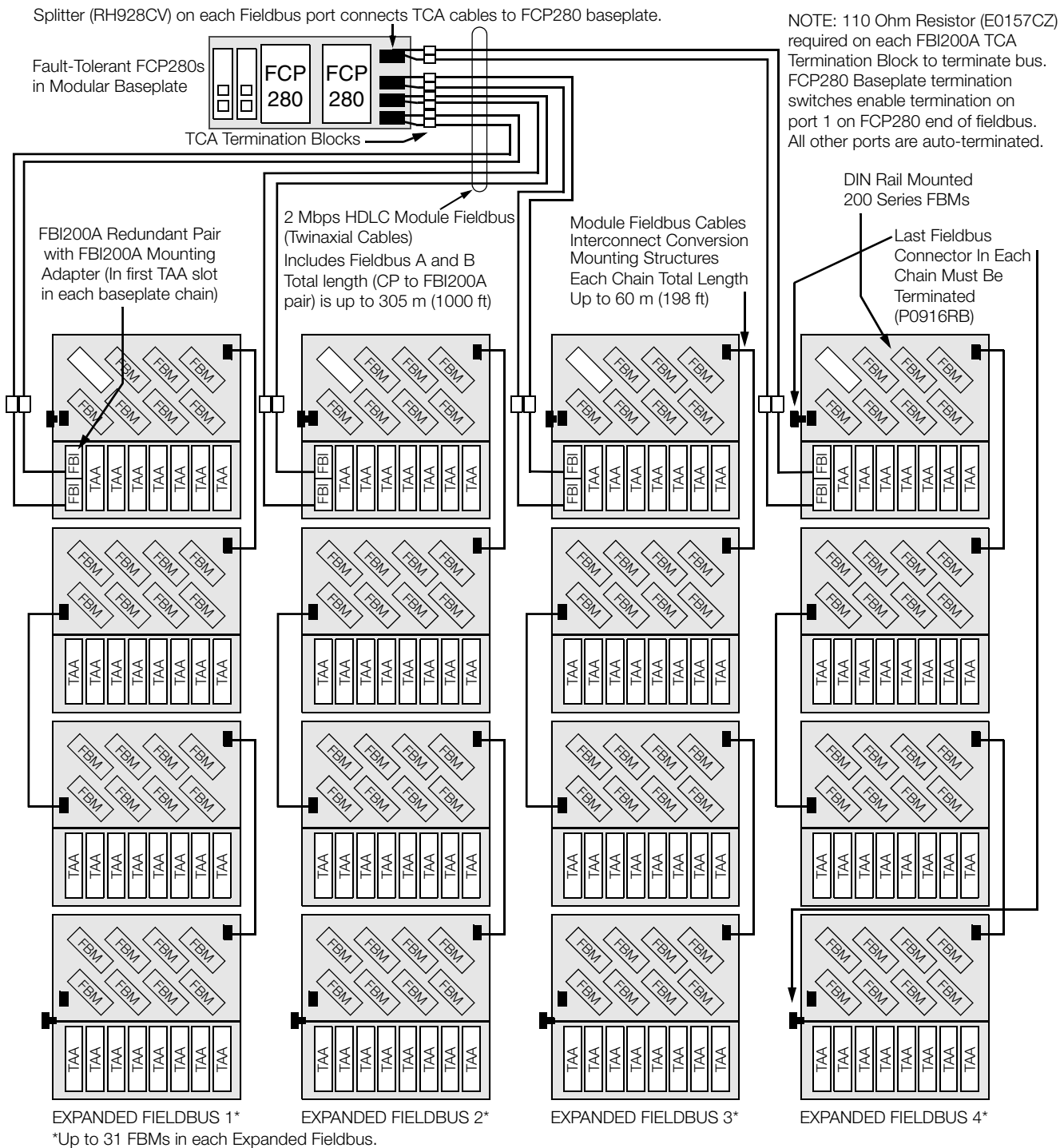
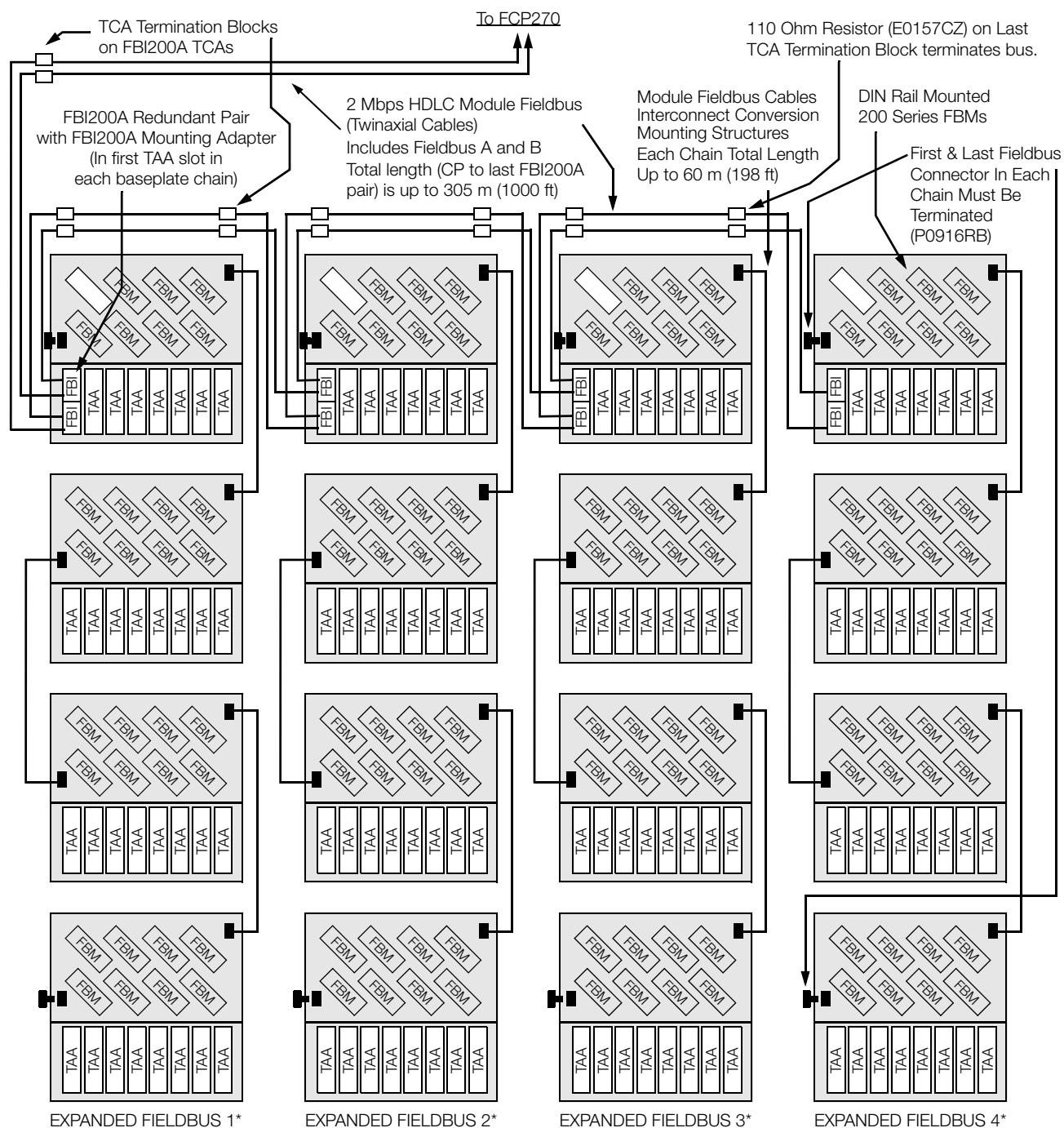
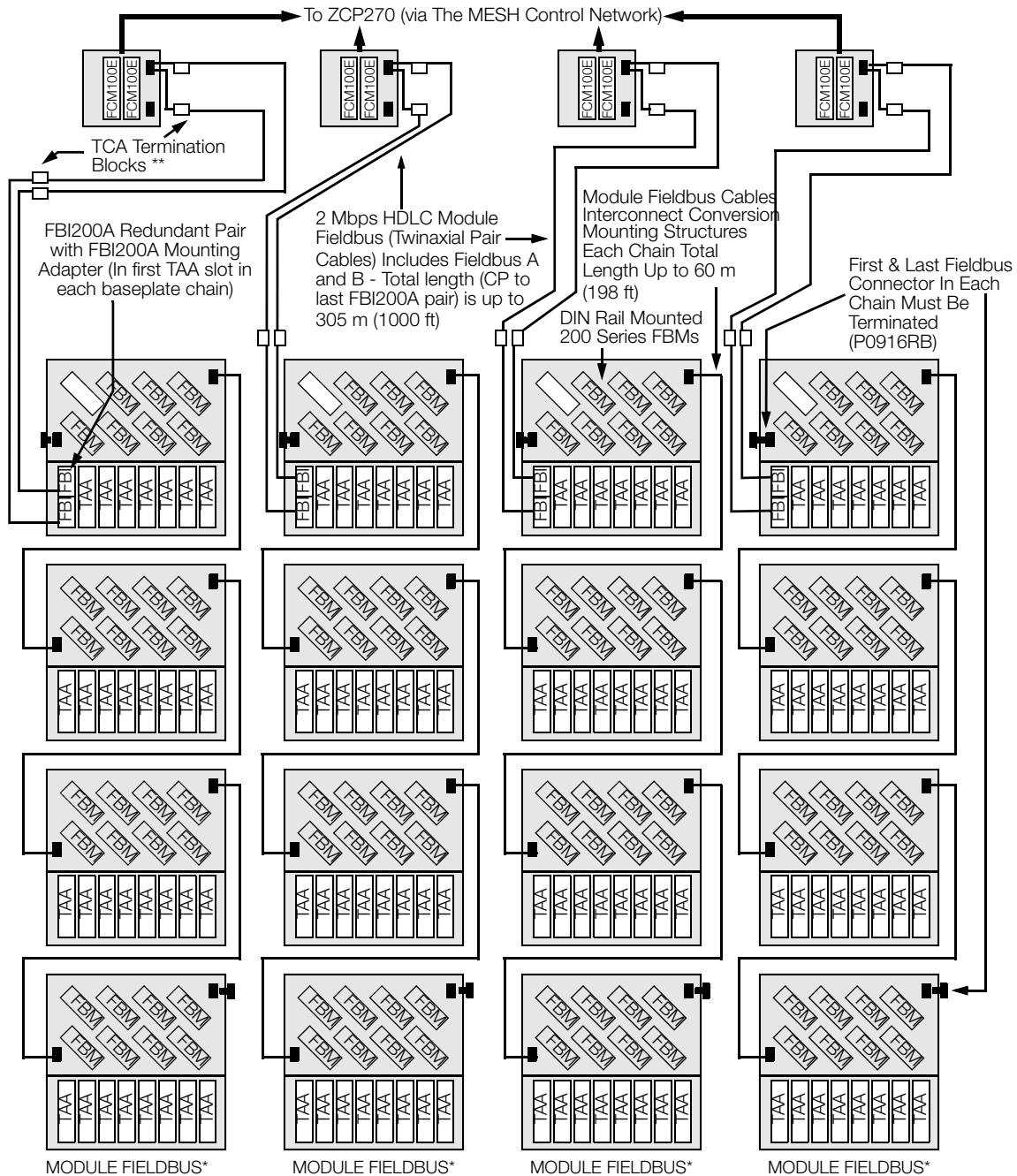


Figure 2. FCP280 Expanded Fieldbus Support With FBI200A and FBI200A Mounting Adapter



*Up to 31 FBMs in each Expanded Fieldbus.

Figure 3. FCP270 Expanded Fieldbus Support With FBI200A and FBI200A Mounting Adapter



*Up to 31 FBMs in each Expanded Fieldbus.

**110 Ohm Resistor (E0157CZ) must be installed on all TCA Termination Blocks to terminate bus.

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

Figure 4. ZCP270 - Fieldbus Support With FBI200A and FBI200A Mounting Adapter

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.

When the FBI200A connects to an FCP270, the FBI200A mounting adapter also provides FBM address range expansion to support the Expanded Fieldbus, which enables an FCP270 to support up to one hundred twenty-four 200 Series FBMs. The Expanded Fieldbus is implemented by FBI200A pairs daisy-chained as shown in Figure 3.

For the FCP270, the adapter has a dual toggle switch that indicates on which Expanded Fieldbus (1-4) the baseplate chain is located, as shown in Figure 5. (For the FCP280, set to Expanded Fieldbus position “1”, as explained in “FBI200A Mounting Adapter (P0923XM) and Switch Settings” in B0700BQ.)

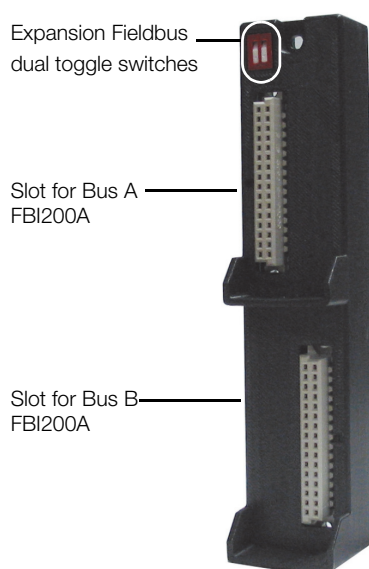


Figure 5. FBI200A Mounting Adapter

In an Expanded Fieldbus, each FBI200A pair is connected to the next FBI200A pair via their TCAs using twinaxial cabling, as shown in Figure 3.

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) which 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/CP270 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/CP270.

FUNCTIONAL SPECIFICATIONS

Process I/O Communications

MODULE FIELDBUS COMMUNICATIONS

2 Mbps for 200 Series FBMs (used to upgrade 100 Series FBMs)

Process I/O Capacity (2 Mbps Fieldbus)

CABLE LENGTH

Between FCP280, FCP270, ZCP270/FCM100E 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 *DIN Rail Mounted FBM Subsystem User’s Guide* (B0400FA))
Over Twinaxial Cabling with 100 Series FBI TCA Termination Blocks
305 m (1000 ft) maximum

200 SERIES FBMS

FBI200A
31 FBMs per FBI200A pair on one baseplate chain maximum, depending on control processor sizing constraints. (Refer to *Field Control Processor 280 (FCP280) Sizing Guidelines and Excel Workbook* [B0700FY] or *FCP270 Sizing Guidelines* [B0700AV]).

Power Requirements

FBI200A

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

FUNCTIONAL SPECIFICATIONS (CONTINUED)

Regulatory Compliance (Cont.)

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 I/A Series® processor modules as described in the *I/A Series DIN Rail Mounted Subsystem User's Guide* (B0400FA). 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). Conditions for use are as specified in the *I/A Series DIN Rail Mounted Subsystem User's Guide* (B0400FA).

PRODUCT SAFETY (CONT.)

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 I/A Series processor modules as described in the *I/A Series DIN Rail Mounted Subsystem User's Guide* (B0400FA).

Calibration Requirements

Calibration of the module is not required.

ENVIRONMENTAL SPECIFICATIONS⁽¹⁾

Operating

TEMPERATURE

0 to 60°C (32 to 140°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing)

ALTITUDE

-300 to +3,000 m (-1,000 to +10,000 ft)

Storage

TEMPERATURE

-40 to +85°C (-40 to +185°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing)

ALTITUDE

-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/s² (0.75g) from 5 to 500 Hz

(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) which describes the specific type of enclosure that is to be used.

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. Refer to PSS 21H-2W6 B4 for details.

Mass

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

Dimensions

FBI200A

Height

2.63 in (69 mm)

Width

1.4 in (36 mm)

Depth

17.9 in (413 mm)

FOR MORE INFORMATION

For more information refer to the following Product Specification Sheets (PSS):

PSS Number	Description
PSS 21H-1B9 B3	Field Control Processor 270 (FCP270)
PSS 21H-1B10 B3	Z-Module Control Processor 270 (ZCP270)
PSS 31H-1B11 B3	Field Control Processor 280 (FCP280)
PSS 21H-2W1 B3	DIN Rail Mounted FBM Subsystem Overview
PSS 21H-2W1 B4	100 Series Fieldbus Module Upgrade Subsystem Overview
PSS 31H-2W2 B3	DIN Rail Mounted FBM Equipment, Agency Certification
PSS 21H-2W6 B4	DIN Rail Mounted Modular Baseplates
PSS 21H-2W8 B4	100 Series Conversion Mounting Structures

