

FBI100 Fieldbus Isolator/Filter



For a Field Control Processor 270 (FCP270) which communicates with 100 Series and 200 Series Fieldbus Modules (FBMs) over a single HDLC module Fieldbus, the FBI100 Fieldbus Isolator/Filter ensures that the 100 Series FBMs only receive the 268kbps communications intended for them, and not the 2 Mbps communications intended for the 200 Series FBMs. It also extends the total length of the 100 Series FBMs' 268 Kbps Fieldbus.

FEATURES

- ▶ Filters the FCP270's 2 Mbps signals out, to ensure only the intended 268 Kbps signals reach the 100 Series FBMs, SPECTRUM, Fieldbus Cluster I/O cards and other 100 Series-based competitive migration devices.
- ▶ Provides galvanically isolated drivers on the 100 Series module Fieldbus, supporting twinaxial cabling from the FBI100 to the 100 Series FBMs up to 1830 ms (6000 ft).
- ▶ Two-Slot vertical baseplate for FBI100 accommodates two FBI100 modules - supports 268 Kbps HDLC module Fieldbus for 100 Series FBMs and other migration devices.
- ▶ Harsh (Class G3 - ISA S71.04) contamination protection

OVERVIEW

The FBI100 Fieldbus Isolator/Filter is designed to filter and isolate 2 Mbps communications from an I/A Series® Field Control Processor 270 to the Fieldbus Isolator (FBI) which requires 268 Kbps signals for 100 Series FBMs and similar Migration modules. The FCP270 can communicate with both 200 Series FBMs (over 2 Mbps signals) and 100 Series FBMs (over 268 Kbps signals) simultaneously and safely when the FBI100 is installed as specified.

The FBI100 outputs a 268 Kbps output signal identical to the typical 268 Kbps source from the FCP270.

In addition, the FBI100 extends the 268 Kbps module Fieldbus up to 1830 m (6000 ft) over a twinaxial Fieldbus cable.

The FBI100s are installed in a DIN rail mounted Modular Two-Slot vertical Baseplate for FBI100, which supports twinaxial cabling to the FBIs for the 100 Series FBMs (see Figure 1).



Figure 1. 2-Slot Vertical Baseplate for FBI100 (P0923LR)

SIGNAL FILTERING/DUAL BAUD RATE

The FCP270 transmits data to FBMs at their appropriate rate - 2 Mbps for 200 Series and 268 Kbps for 100 Series - over a common HDLC module Fieldbus which can have FBMs from both series on it at the same time.

The FBI100 filters and isolates the 268 Kbps messages for the 100 Series FBMs, ensuring their proper operation.

An example system which uses FBI100s is shown in Figure 2.

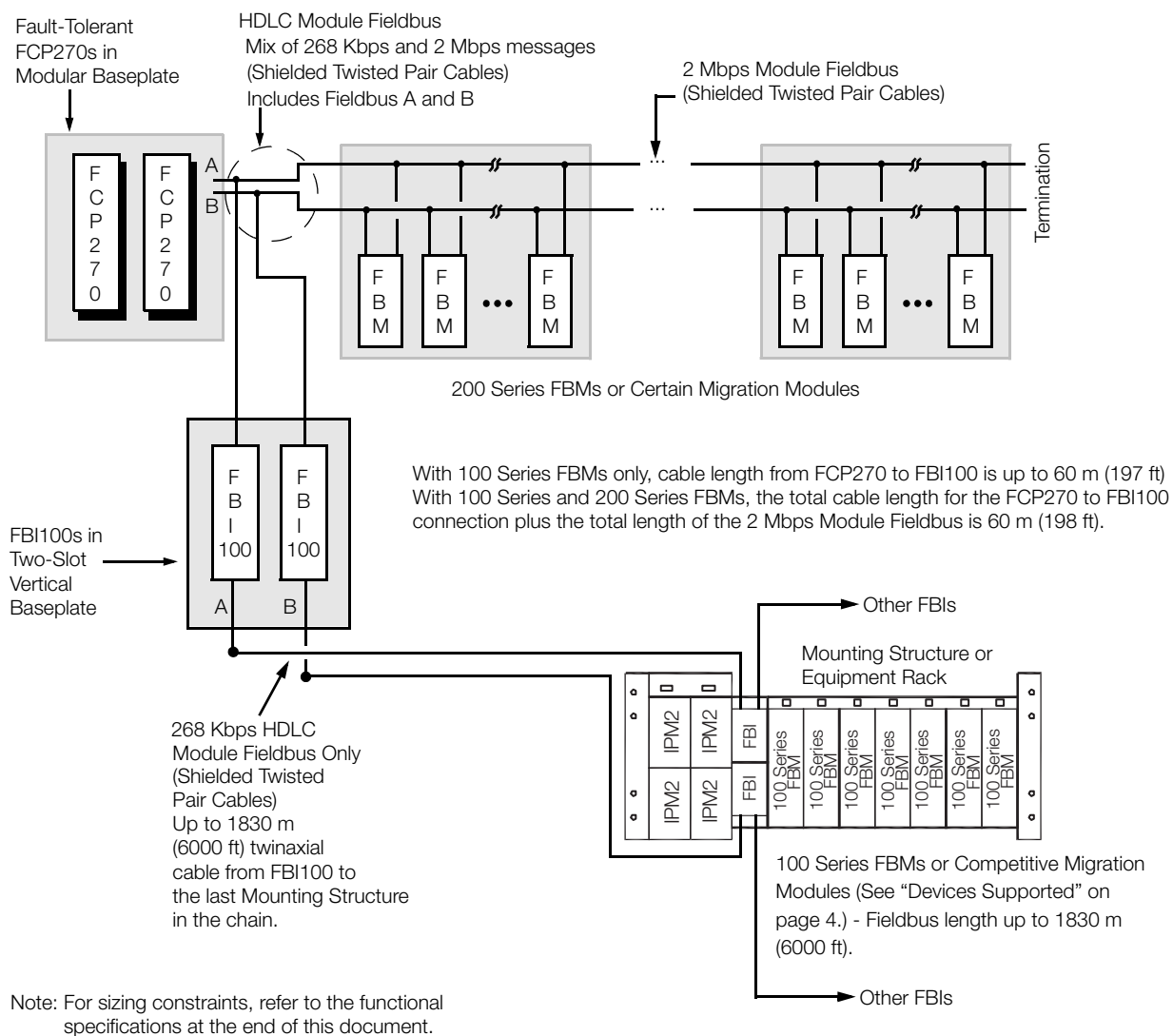


Figure 2. Dual Baud Rate System (Conceptual)

268 KBPS HDLC MODULE FIELDBUS EXTENSION

Remote 100 Series FBMs can be located up to 1830 m (6000 ft) from an FCP270 when used with FBI100s. This is the same distance as the CP30/40 controllers can drive their Fieldbus signals. Due to this distance and other factors, it is necessary to galvanically isolate the 100 Series FBMs from the 200 Series FBMs. The FBI100 provides this isolation.

Each FBI100's RS-485 HDLC module Fieldbus output is able to drive up to 1830 m (6000 ft) of twinaxial cable which connects to a FBI in a remote 100 Series Mounting Structure or migration rack. For a typical redundant module Fieldbus configuration, two FBI100s are needed; one for the A fieldbus and another for the B fieldbus. Figure 2 above illustrates this redundancy and Fieldbus extension.

FBI100 MODULE DESIGN

FBI100 modules have a compact design, with a rugged extruded aluminum 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 FBI100 modules, up to harsh environments per ISA Standard S71.04.

The FBI100 can be removed/replaced from their Baseplate without removing power. Light-emitting diodes (LEDs) incorporated into the front of the FBI100 indicate module Fieldbus communications activity and module status.

FBI100 BASEPLATE MOUNTING

The FBI100 modules for the A and B buses mount on the Two-Slot vertical Baseplate for FBI100. This baseplate is DIN rail mounted and vertically oriented only. This baseplate includes signal connectors for the FBI100s, redundant independent dc power connections, and two cable connections to the 268 Kbps HDLC module Fieldbus (A and B),

compatible with the standard twinaxial termination assembly (P0903VY).

The Two-Slot vertical Baseplate includes a redundant I/O cable connection to the FCP270s. One connector supports both A and B buses, while the other is terminated. Alternatively, both connectors can be used in conjunction with a fieldbus splitter.

For more information on these baseplates, refer to *DIN Rail Mounted Modular Baseplates* (PSS 21H-2W6 B4).

MODULE FIELDBUS COMMUNICATION

The Two-Slot vertical Baseplate accepts redundant FBI100 modules for communications over the 268 Kbps module Fieldbus. They support communications to all 100 Series DIN I/O FBMs and 100 Series-based competitive migration devices, such as Honeywell, Bailey, and Fisher Provox® devices (see "Devices Supported" on page 4).

The 268 Kbps module Fieldbus is redundant and all 100 Series modules can receive/transmit messages over both A and B buses.

DEVICES SUPPORTED

The FBI100 supports the following devices on the 268 Kbps module Fieldbus:

- ▶ All 100 Series DIN rail mounted FBMs (FBM01, FBM02, and so forth)
- ▶ SPECTRUM cards
- ▶ Fieldbus Cluster I/O cards
- ▶ Other 100 Series competitive migration devices including Honeywell, Bailey, and Fisher Provox.

LED INDICATORS

Light-emitting diodes (LEDs) on the front of the FBI100 module provide visual indication of the:

- ▶ FBI100 operational status - red and green LEDs indicate health of the module, watch dog timer and internal clock.
- ▶ 268Kbps CP Fieldbus (receive) - amber LED indicates data traffic received from the FCP270 Fieldbus. The blinking of this LED indicates that 268 Kbps data is being received from the CP and is being retransmitted on the 100-Series FBM Fieldbus.
- ▶ 268Kbps FBM Fieldbus (receive) - amber LED indicates data traffic received from the FBM's 268 Kbps Fieldbus is being sent to the FCP270.

FUNCTIONAL SPECIFICATIONS

Process I/O Communications

MODULE FIELDBUS COMMUNICATIONS

Transmission Rate

268 Kbps for 100 Series DIN I/O FBMs

Process I/O Capacity (268 Kbps Fieldbus)

CABLE LENGTH

With FCP270 and 100 Series FBMs Only

Between FCP270 and FBI100

60 m (198 ft) maximum

From FBI100s to 100 Series FBMs

1830 m (6000 ft) maximum (see Figure 2)

With FCP270, 100 Series and 200 Series FBMs

Total Length of Cabling Between

FCP270 and FBI100 Plus the 2 Mbps

Module Fieldbus (for 200 Series FBMs)

60 m (198 ft) maximum

From FBI100s to 100 Series FBMs

1830 m (6000 ft) maximum (see Figure 2)

100 SERIES FBMS

64 FBMs with FBI100 maximum, depending on control processor sizing constraints. When an FCP270 uses a FBI100 in conjunction with 200 Series FBMs, the total FBM count for typical usage may vary but must not exceed 64. (Refer to *FCP270 Sizing Guidelines* [B0700AV]).

COMPETITIVE MIGRATION MODULES

Refer to the device specific Product Specification Sheets

Power Requirements

INPUT VOLTAGE RANGE

24V Nominal, range of -10% to +5%

CURRENT

75 mA (maximum) per module

CONSUMPTION

1.5 W (maximum) dissipation per module

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

FUNCTIONAL SPECIFICATIONS (CONTINUED)

Regulatory Compliance

ELECTROMAGNETIC COMPATIBILITY (EMC) (CONTINUED)

IEC 61000-4-6 Immunity to Conducted Disturbances Induced by Radio-frequency Fields

10 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

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).

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

-20 to +70°C (-4 to +158°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. A single module can also be used.

FBI100 mounts on a Two-Slot vertical Baseplate (P0923LR). This baseplate can be mounted on a vertical DIN rail.

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

Dimensions

HEIGHT

99 mm (3.9 in)

114 mm (4.5 in) including mounting lugs

WIDTH

44.6 mm (1.75 in)

DEPTH

105 mm (4.12 in)

Mass

0.36 kg (0.8 lb) approximate (each module)

Part Number

P0923LN

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-2W1 B3	DIN Rail Mounted Subsystem Overview
PSS 21H-2W6 B4	DIN Rail Mounted Modular Baseplates
PSS 21H-2Y18 B4	FBI200 Fieldbus Isolator/Filter

