

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

FOXBORO

FBM216b

REDUNDANT READY HART INPUTS

Used with the applicable Foxboro I/A Series DCS configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Schneider Electric / Foxboro official product specification



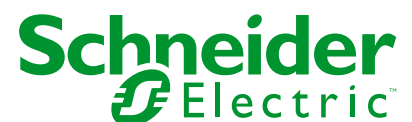
Foxboro™ DCS

FBM216b Redundant HART® Communication Input Module

PSS 41H-2S216

Product Specification

May 2025



Overview

The FBM216b HART Communication Redundant Input Interface Module contains eight individually isolated input channels. It supports any mix of standard 4 to 20 mA devices and HART devices (the signals are electrically compatible).

A pair of modules combines to provide redundancy at the fieldbus module (FBM) level, with field inputs wired to one common termination assembly (TA) (see Figure 1, page 5). In this configuration, one FBM216b is the Master, and the other is the Tracker.

The FBM216b can serve as a HART communications field device host, enabling Foxboro™ DCS to request and receive two digital messages per second from the field device. The message pass-through capability can be used to support HART universal, common practice, and device-specific commands, but it cannot support the burst communication mode. These commands are implemented using the Foxboro DCS Field Device Expert for HART. For details, see *Field Device Expert for HART Devices Control and I/O* (PSS 41S-10FDMHRT).

The FBM216b provides individually isolated power supplies to power each of the eight channels.

Optionally, the channels for this module can be powered by an external power supply. However, when a common external power supply is used with two or more channels, a Cable Balun module is required to help prevent HART communication channel crosstalk.

Features

- 8 individually isolated analog input channels. Each channel accepts one of the following inputs:
 - Standard 4 to 20 mA analog sensor signal
 - Digital HART Frequency Shift Keying (FSK) signal superimposed on a 4 to 20 mA analog signal
- Module pair offers redundancy at the FBM level
- FSK modem dedicated to each input channel for bi-directional digital communications with a HART field device
- Analog to digital conversion of each of the 4 to 20 mA input signal from the HART devices
- Support for the HART universal commands necessary to interface the field device with the Foxboro DCS database
- Per channel galvanic isolation of each of the eight input channels from each other, ground and module logic
- Rugged design suitable for enclosure in Class G3 (harsh) environments per ISA Standard S71.04
- High accuracy achieved by sigma-delta conversions for each channel
- Termination Assembly (TA) for locally or remotely connecting field wiring to the FBM216b
- TA provide for per channel internally and/or externally loop powered transmitters

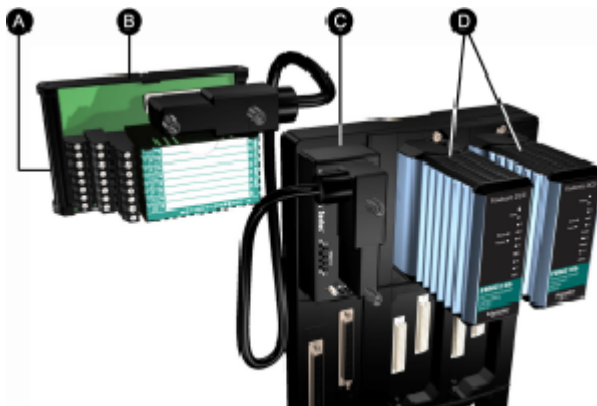
High Accuracy

For high accuracy, the module incorporates a sigma-delta analog-to-digital converter which can provide new analog input values for each channel every 100 milliseconds.

Standard Design

The FBM216b has a rugged extruded aluminum exterior for physical protection of the circuits. Enclosures specially designed for mounting the FBMs provide various levels of environmental protection.

Figure 1 - FBM216b Redundant Module Configuration



Legend	
A	To/From Intelligent Field Devices
B	Termination Assembly (TA)
C	FBM216b Redundant Adapter
D	Two FBM216b Fieldbus Modules

High Reliability

The redundancy of the module pair, coupled with the high coverage of detected faults, provides very high subsystem availability time.

Either module may be replaced without upsetting field input signals to the other module. A module can be removed or replaced without removing field device termination cabling or power or communications cabling.

Redundant Analog Inputs

For each input operation, identical signals are sent to both redundant modules, fully exercising the Fieldbus and the logic circuitry of each module. Each input channel accepts an analog sensor input or a self-powered 4 to 20 mA source. Device power from each module is diode OR'd together in the redundant adapter to help ensure redundant power.

The microprocessor of each module executes the analog I/O application program, plus security routines that validate the health of the FBM. Input channel availability is enhanced by redundantly powering the input current loop from per-channel power supplies in each module of the pair.

Visual Indicators

Light-emitting diodes (LEDs) incorporated into the front of the module provide visual indication of the module's operational and master or tracker status and communication activity on the channels. Red and green LEDs indicate module power and boot status. Two yellow LEDs indicate Redundancy (Master/Tracker) status.

Fieldbus Communication

A Fieldbus Communication Module or a Control Processor interfaces the redundant 2 Mbps module Fieldbus used by the FBMs. The Compact FBM216b accepts communication from either path (A or B) of the redundant 2 Mbps fieldbus. If one path is unsuccessful or is switched off at the system level, the module continues communication over the active path.

The use of an external power supply common to two or more loops requires a Cable Balun module to maintain communication signal line balance.

Modular Baseplate Mounting

The module mounts on a modular baseplate. The modular baseplate is either DIN rail mounted or rack mounted, and includes signal connectors for redundant fieldbus, redundant independent DC power, and termination cables.

Easy Removal/Replacement

The module can be removed or replaced without removing field device termination cabling or power or communication cabling. Redundant modules must be located in adjacent positions on the baseplate, with the first module located in an odd-numbered position (for example, the positions labelled "3" and "4").

To achieve redundancy, a redundant adapter module is placed on the two adjacent baseplate termination cable connectors to provide termination for a single cable (see Figure 1, page 5). A single termination cable connects from the redundant adapter to the associated TA. When redundant, either module may be replaced without upsetting field input signals to the good module. Each module can be removed/replaced without removing field termination cabling or power or communications cabling.

Termination Assemblies

Field input signals connect to the FBM subsystem via DIN rail mounted Termination Assemblies (TAs). The TA used with the Compact FBM216b is described in Termination Assemblies and Cables, page 14.