MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

FOXBORO

FBM215

FIELDBUS I/O MODULE

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

FBM215 HART® Communication Output Module

PSS 41H-2S215

Product Specification

May 2025



Overview

The HART Communication Output Module (FBM215) contains eight channel-isolated outputs. The FBM215 supports any mix of standard 4 to 20 mA devices and HART devices (the signals are electrically compatible).

The FBM215 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 FBM215 provides an isolated power supply for each channel.

Features

- 8 channel-isolated output channels, each providing one of the following outputs:
  - Standard 4 to 20 mA analog output signal
  - Digital HART Frequency Shift Keying (FSK) signal superimposed on a 4 to 20 mA analog output signal
- FSK modem dedicated to each output channel for bi-directional digital communications with a HART field device
- Galvanic isolation of all output channels from each other, and from ground and module logic
- Support for HART universal commands necessary to interface the field device with the Foxboro DCS database
- Rugged design suitable for enclosure in Class G3 (harsh) environments
- Termination Assemblies (TAs) for locally or remotely connecting field wiring to the FBM215

Standard Design

The FBM215 has a rugged extruded aluminum exterior for physical protection of the circuits. Enclosures specially designed for mounting the Foxboro DCS Fieldbus Modules (FBMs) provide various levels of environmental protection, up to harsh environments per ISA Standard S71.04.

Visual Indicators

Light-emitting diodes (LEDs) incorporated into the front of the module provide visual indication of the module's operational status, and communication activity of the channels.

Easy Removal/Replacement

The module can be removed/replaced without removing field device termination cabling, power, or communications cabling.

Fieldbus Communication

A Fieldbus Communication Module or a Control Processor interfaces the redundant 2 Mbps module Fieldbus used by the FBMs. The FBM215 module accepts communication from either path (A or B) of the redundant 2 Mbps fieldbus. If one path is unsuccessful or is switched at the system level, the module continues communication over the active path.

Modular Baseplate Mounting

The module mounts on a modular baseplate, which accommodates up to four or eight FBMs. 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.

Termination Assemblies

Field output signals connect to the FBM subsystem via DIN rail mounted Termination Assemblies (TAs). The TAs used with the FBM215 are described in Termination Assemblies and Cables, page 10.

Functional Specifications

Field Device Channels	• Supported HART Instrument Types: HART instruments compliant to Version 5, 6, or 7 of the HART specifications may be used • Interface: 8 isolated output channels • Communications to the Device: Point-to-point, master/slave, asynchronous, half-duplex, at 1200 baud • Error Checking: Parity on each byte, and one CRC check byte on each message • Speed: 2 messages per second • Fastest Allowed ECB Block Period: 100 ms; however, we recommend that you see the *Sizing Guidelines and Excel Workbook* appropriate for your Control Processor to determine the optimal loading for a 100 msec Block Processing Cycle (BPC). • Maximum Distance (FBM215 to Field Device): Meets HART FSK physical layer specification HCF_SPEC-54, Revision 8.1 [up to 3030 m (10000 ft)] **NOTE:** The maximum allowable distance decreases when the loop is operated through an intrinsic safety barrier. The maximum distance of the field device from the FBM is a function of compliance voltage (19 VDC at 20.4 mA), wire and load resistance, and voltage drop at the field device. • Current Outputs: ◦ Analog Accuracy (Includes Linearity): ±0.05% of span (between 4 mA and 20 mA) ◦ Output Load: 750 Ω maximum ◦ Maximum Rate of Change: 20 mA in 60 milliseconds ◦ Resolution: 13 bits • Loop Power Supply Protection: Each channel is channel-to-channel galvanically isolated, current limited, and voltage regulated. All analog outputs are limited by their design to about 25 mA. If the output FET shorts, the output current could increase up to 100 mA. In normal operation, the FBM outputs a constant current into a 0 to 750 Ω load. • Isolation: The channels are galvanically isolated (both optical and transformer isolation) from each other, and from ground and module logic. The module withstands, without damage, a potential of 600 VAC applied for one minute between the isolated channels and earth (ground).

	⚠⚠DANGER **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** Although the module can withstand a maximum of 600 VAC applied for one minute between any channel, DO NOT apply voltages beyond the published input ranges. The channels are NOT intended for permanent connection to hazardous voltage circuits. Understand that connection of these channels to voltages greater than 30 VAC or 60 VDC violates electrical safety code requirements and may expose users to electric shock. **Failure to follow these instructions will result in death or serious injury.**
Fieldbus Communication	Communicates with its associated FCM or FCP via the redundant 2 Mbps module Fieldbus
Power Requirements	• Input Voltage Range (Redundant): 24 VDC +5% • Consumption: 7 W (maximum) • Heat Dissipation: 5 W (maximum)
Calibration Requirements	Calibration of the module and termination assembly (TA) is not required.
Regulatory Compliance: Electromagnetic Compatibility (EMC)	• *European EMC Directive 2004/108/EC (Prior to April 20, 2016) and 2014/30/EU (Beginning April 20, 2016)*: Meets: EN61326-1:2013 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 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 2006/95/EC (Prior to April 20, 2016) and 2014/35/EU (Beginning April 20, 2016) and Explosive Atmospheres (ATEX) directive 94/9/EC (Prior to April 20, 2016) and 2014/34/EU (Beginning April 20, 2016)*: DEMKO certified as Ex nA IIC T4 for use in certified Zone 2 enclosure when connected to specified processor modules as described in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). Also, see Table 2.
RoHS Compliance	Complies with European RoHS Directive 2011/65/EU, including amending Directives 2015/863 and 2017/2102.
IECEx Certification	IECEx Certified