MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

FOXBORO

FBM211

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

FBM211, 0 to 20 mA Input Module

PSS 41H-2S211

Product Specifications

May 2025



https://www.se.com

Overview

The FBM211, 0 to 20 mA Input Module contains sixteen 20 mA DC analog input channels, each channel accepting a 2-wire analog sensor input such as a 4 to 20 mA transmitter, a line-monitored digital input signal with end of line resistors, or a self-powered 20 mA source. The input channels are galvanically isolated from ground and module logic. The module performs the signal conversion required to interface the electrical input signals from the field sensors to the redundant module Fieldbus.

FBM211 executes an analog input application program, which provides configurable options for Conversion Time and Rate of Change Limits.

Features

- Sixteen 20 mA DC analog input channels
- Each group of eight input channels is group isolated
- Rugged design suitable for enclosure in Class G3 (harsh) environments
- Execution of an analog input application program that provides conversion time and configurable options for Rate of Change Limits
- High accuracy achieved by sigma-delta data conversions for each channel
- Termination Assemblies (TAs) for locally or remotely connecting field wiring to the FBM211
- Termination Assemblies for external or fieldbus module (FBM) powered transmitters

High Accuracy

For high accuracy, the module incorporates a multiplexed Sigma-Delta converter shared by all channels, which can provide new analog input readings every 100 ms, and a configurable integration period to remove any process noise and power line frequencies. Each time period, the FBM converts each analog input to a digital value, averages these values over the time period and provides the averaged value to the controller.

Standard Design

FBM211 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, up to harsh environments, per ISA Standard S71.04.

Visual Indicators

Red and green light-emitting diodes (LEDs) incorporated into the front of the module provide visual status indications of FBM functions.

Easy Removal / Replacement

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

Fieldbus Communication

A Fieldbus Communications Module or a Control Processor interfaces to the redundant 2 Mbps module Fieldbus used by the FBMs. The FBM211 accepts communication from either path (A or B) of the 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 200 Series 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 I/O signals connect to the FBM subsystem via DIN rail mounted TAs. The TAs used with the FBM211 are described in Termination Assemblies and Cables, page 10.

Functional Specifications

Input	16 group isolated and independent channels
Input Range (each channel)	0 to 20.4 mA DC (each channel current limited to 33 mA)
Accuracy (includes linearity)	±0.03% of span Accuracy temperature coefficient: ±50 ppm/° C
Input Signal A/D Conversion	Each channel performs A/D signal conversion using a multiplexed Sigma-Delta converter.
Integration Period	Software configurable
Common Mode Rejection	>100 dB at 50 or 60 Hz
Normal Mode Rejection	>35 dB at 50 or 60 Hz
Input Channel Impedance	61.9 Ω nominal
Field Device Cabling Distance	Maximum distance of the field device from the FBM is a function of compliance voltage (23 V for internal power), wire gauge, and voltage drop at the field device.
Loop Power Supply Protection	Each channel is current limited and voltage regulated when used with TA RH916BT or P0916BU that limits short circuit current to 35 mA. If the current limit circuit shorts out, the current is limited to about 385 mA.
HART® Protocol Compatibility	The channels meet the impedance requirements for a HART High Impedance Device and can be used in a HART loop without interfering with the HART signals between the field device and a Hand-Held Communicator (HHC). If a FoxCom of HART transmitter is used with FBM211, a 200 ohm in-line resistor (assembly part number RH902VY) must be added in series with the transmitter.
Input Channel Isolation	The channels are not galvanically isolated from each other, but are galvanically isolated from ground and module logic. Group isolated inputs use the FBM subsystem power supply for field power. The module withstands, without damage, a potential of 600 applied for one minute between the group 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.**
Communication	Communicates with its associated FCM or FCP via the redundant 2 Mbps module Fieldbus
Power Requirements	• Input voltage range (redundant) 24 VDC +5%, -10%

	• Consumption: 7 W (maximum) at 24 VDC 11 W (maximum) at 24 VDC with all inputs at 20.4 mA (internal power) • Heat Dissipation: 3 W (maximum) at 24 VDC
Calibration Requirements	Calibration of the module and termination assembly 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 I/A Series processor modules as described in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). Also, see Table 1, page 11.
RoHS Compliance	Complies with European RoHS Directive 2011/65/EU, including amending Directives 2015/863 and 2017/2102.
IECEx Certification	IECEx Certified