

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

FOXBORO

FBM238

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



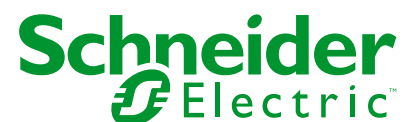
Foxboro™ DCS

FBM238, 24DI/8DO Module

PSS 41H-2S238

Product Specification

May 2025



Overview

Many plant situations, such as Motor Control Center controls, require several inputs for each output. The FBM238 contains 24 discrete input and eight discrete output channels that are compatible with voltages and currents commonly found in industrial plants. An external power supply is used to energize the field circuits.

The FBM238 24DI/8DO Module provides twenty-four digital inputs with eight digital output channels. Associated Termination Assemblies (TAs) and Termination Assembly Adapters (TAAs) provide for discrete nominal inputs of 30 VDC, 60 VDC, 120 VAC/125 VDC or 240 VAC and nominal outputs of 60 VDC, 120 VAC/125 VDC or 240 VAC. The module performs signal conversion required to interface the electrical input signals from the field sensors to the Module Fieldbus.

Depending on the type of I/O signal required, the TAs or TAAs support current limiting devices, high voltage attenuation circuits, optical isolation and external power source connections.

Features

- 24 digital input channels, used for either contact sensing, or DC voltage monitoring
- 8 digital output channels, used for either DC output switching with an external source (e.g. to control powering of various external loads), or DC output switching with an internal source only (e.g. to power external solid state relays or other similar devices)
- Rugged design suitable for enclosure in Class G3 (harsh) environments
- Supports discrete input signals at voltages of:
 - 30 VDC/60 VDC
 - 120 VAC/125 VDC
 - 240 VAC
- Supports output switching at voltages of:
 - 60 VDC
 - 120 VAC/125 VDC
 - 240 VAC
- Executes the programs for Digital I/O (ECB5), and Ladder Logic (ECB8)
- Various Termination Assemblies (TAs) provide for per-channel isolation and contain:
 - High voltage attenuation and optical isolation for inputs
 - External power connection for device excitation
 - Output current limiting

Standard Design

FBM238 has a rugged extruded aluminum exterior for physical protection of the circuits. Enclosures specially designed for mounting the Fieldbus Modules (FBMs) provide various levels of environmental protection, up to Class G3 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 FBM operational status, as well as the discrete states of the individual input/output points.

Easy Removal/Replacement

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

Fieldbus Communication

A Fieldbus Communications Module or a Control Processor interfaces to the 2 Mbps module Fieldbus used by the FBMs. The FBM238 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 DIN rail mounted 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.

Field I/O Signals

Field I/O signals connect to the FBM subsystem via DIN rail mounted TAs or Termination Assembly Adapters (TAAs) mounted on the conversion mounting structures. TAAs are discussed in *Termination Assembly Adapter Modules for 100 Series Upgrade* (PSS 41H-2W4).

The TAs used with FBM238 are described in *Termination Assemblies and Cables*, page 10.

Functional Specifications

I/O Channels	24 group isolated digital input channels and eight group isolated digital output channels
Filter/Debounce Time	Configurable (No Filtering, 4, 8, 16, or 32 ms)
Voltage Monitor (FBM238 with feed through TA RH924VD (supersedes P0924VD))	• Input: 30 VDC maximum applied voltage • On-State Voltage: 15 to 30 VDC • Off-State Voltage: 0 to 5 VDC • Current Input for On-State: 2.3 mA maximum at 30 VDC • Source Resistance Limits: ◦ On-State: 1 k Ω (maximum) at 15 VDC ◦ Off-State: 100 k Ω (minimum) at 60 VDC
Contact Sense (FBM238 with feed through TA RH924VG (supersedes P0924VG))	• Contact Supply: 24 VDC nominal (supplied by FBM through the TA) • Contact Current: 1.8 mA DC nominal • Source Resistance Limits: ◦ On-State: 1 k Ω (maximum) at 15 VDC ◦ Off-State: 100 k Ω (minimum) at 60 VDC
Output (FBM238 with feed through TAs RH924VD (supersedes P0924VD) or RH924VG (supersedes P0924VG))	• Applied Voltage (External): 60 VDC (maximum) • Load Current: 0.24 A DC maximum per channel 2.0 A DC maximum per TA • Inductive Loads: Outputs may require a protective diode or MOV connected across the load

Isolation	Input and output channels are group isolated from each other and earth (ground). For details, see the <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA). The module withstands, without damage, a potential of 600 VAC applied for one minute between the group isolated channels or between either set of group isolated channels and 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 module Fieldbus
Power Requirements	- Input Voltage Range: 24 VDC +5%, -10% - Module Consumption: 7 W (maximum) at 24 VDC - Module Heat Dissipation: 3 W (maximum) at 2 A total load and all inputs at 30 VDC
Calibration Requirements	Calibration of the module is not required.
Regulatory Compliance: Electromagnetic Compatibility (EMC)	<i>European EMC Directive 2014/30/EU:</i> Meets: EN61326-1:2013 Class A Emissions and Industrial Immunity Levels
Regulatory Compliance: Product Safety	<i>Underwriters Laboratories (UL) for U.S. and Canada:</i> 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 the <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA). <i>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)</i> DEMKO certified as Ex nA IIC T4 for use in certified Zone 2 enclosure when connected to specified processor modules as described in the <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA).
IECEx Certification	IECEx Certified
RoHS Compliance	Complies with European RoHS Directive 2011/65/EU, including amending Directives 2015/863 and 2017/2102.