

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

FOXBORO

FBM239

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

FBM239, Discrete 16DI/16DO Module

PSS 41H-2S239

Product Specification

August 2019



Overview

The FBM239 contains 16 discrete input and 16 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 FBM239 Discrete 16DI/16DO Module provides 16 digital inputs with 16 digital output channels. Associated Termination Assemblies (TAs) and Termination Assembly Adapters (TAAs) provide for discrete nominal inputs of 30 V dc, 60 V dc, 120 V ac/125 V dc, or 240 V ac and nominal outputs of 60 V dc, 120 V ac/125 V dc, or 240 V ac. 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.

When connected to the appropriate Termination Assembly Adapters (TAAs) or TAs, the FBM239 module provides functionality formerly provided by the 100 Series Fieldbus Module (FBM) I/O subsystem. TAAs and TAs are available which support the functionality of the main FBM09, FBM10, FBM11, FBM26 and FBM41 (8 input/8 output main FBMs). These main FBMs may be used with expansion FBM14, FBM15, FBM16, FBM27, or FBM42 (8 input/8 output expansion FBMs).

Features

- 16 digital input channels, used for either contact sensing, or dc voltage monitoring
- 16 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 V dc/60 V dc
 - 120 V ac/125 V dc
 - 240 V ac
- Supports output switching at voltages of:
 - 60 V dc
 - 120 V ac/125 V dc
 - 240 V ac
- Executes the programs for Digital I/O (ECB5), and Ladder Logic (ECB8)
- Various TAs provide for per-channel isolation and 100 Series I/O upgrade, and contain:
 - High voltage attenuation and optical isolation for inputs
 - External power connection for device excitation
 - Output current limiting

Standard Design

FBM239 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

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 FBM239 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 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 the FBM239 are described in *Termination Assemblies And Cables*, page 11.

Functional Specifications

Input/Output Channels	16 group isolated digital input channels and 16 group isolated digital output channels
Filter/Debounce Time	Configurable (No Filtering, 4, 8, 16, or 32 ms)
Voltage Monitor (FBM239 with feed through TA RH924VJ (supersedes P0924VJ))	• Input: 30 V dc maximum applied voltage • On-State Voltage: 15 to 30 V dc • Off-State Voltage: 0 to 5 V dc • Current Input for On-State: 2.3 mA maximum at 30 V dc • Source Resistance Limits: ◦ On-State: 1 kΩ (maximum) at 15 V dc ◦ Off-State: 100 kΩ (minimum) at 30 V dc
Contact Sense (FBM239 with feed through TA RH924VM (supersedes P0924VM))	• Contact Supply: 24 V dc nominal (supplied by FBM through the TA) • Contact Current: 1.8 mA dc nominal • Source Resistance Limits: ◦ On-State: 1 kΩ (maximum) at 15 V dc ◦ Off-State: 100 kΩ (minimum) at 30 V dc
Output (FBM239 with feed through TAs RH924VJ (supersedes P0924VJ) or RH924VM (supersedes P0924VM))	• Applied Voltage (External): 60 V dc (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, refer to the <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA). The module/TA withstands, without damage, a potential of 600 V ac 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 This does not imply that these channels are intended for permanent connection to voltages of these levels. Exceeding the limits for input voltages, as stated elsewhere in this specification, violates electrical safety codes 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 V dc +5%, -10% - Module Consumption: 2.65 W (maximum) at 24 V dc - Module Heat Dissipation (including contribution from field power supply): 5.3 W (maximum) at 2 A total load and all inputs at 30 V dc
Calibration Requirements	Calibration of the module is not required.
Regulatory Compliance: Electromagnetic Compatibility (EMC)	<i>European EMC Directive 2004/108/EC:</i> Meets: EN61326-1:2013 Class A Emissions and Industrial Immunity Levels <i>CISPR 11, Industrial Scientific and Medical (ISM) Radio-frequency Equipment - Electromagnetic Disturbance Characteristics - Limits and Methods of Measurement:</i> Meets Class A Limits <i>IEC 61000-4-2 ESD Immunity:</i> Contact 4 kV, air 8 kV <i>IEC 61000-4-3 Radiated Field Immunity:</i> 10 V/m at 80 to 1000 MHz <i>IEC 61000-4-4 Electrical Fast Transient/Burst Immunity:</i> 2 kV on I/O, V DC power and communication lines <i>IEC 61000-4-5 Surge Immunity:</i> 2kV on AC and DC power lines; 1kV on I/O and communications lines <i>IEC 61000-4-6 Immunity to Conducted Disturbances induced by Radio-frequency Fields:</i> 3 V (rms) at 150 kHz to 80 MHz on I/O, V DC power and communication lines <i>IEC 61000-4-8 Power Frequency Magnetic Field Immunity:</i> 30 A/m at 50 and 60 Hz