Foxboro Evo™ Process Automation System

Product Specifications

Foxboro
by Schneider Electric

PSS 31H-2S207

FBM207/b/c Voltage Monitor/Contact Sense Input Modules



Discrete inputs can be sensed across all the usual voltage levels found in industrial facilities. The FBM207/b/c uses one of the several termination assemblies to match to the externally powered voltage level. In cases where the inputs are critical to the plant's control scheme, the FBM 207/b/c may be installed as a redundant pair with standard control blocks used to manage the redundancy.

OVERVIEW

The FBM207/b/c Voltage Monitor/Contact Sense Input Module functions as a 16-channel DC voltage monitor or 16-channel contact sensor. Each channel accepts a 2-wire input from a DC voltage source (FBM207) or pair of contacts or solid state switches (FBM207b/ FBM207c). Associated termination assemblies (TAs) support discrete input signals at voltages of 60 V DC, 120 V AC/125 V DC, or 240 V AC. For voltages higher than 60 V DC, the TAs have additional signal conditioning hardware that provides voltage attenuation and optical isolation.

The module is available in three distinct types, and each type with its associated TA supports discrete inputs as shown below:

FBM207	Provides voltage monitoring at: –60 V DC –120 V ac/125 V DC –240 V AC Provides switch inputs with: –External 120 V AC/125 V DC –External 240 V AC
FBM207b	24 V DC Contact Sense
FBM207c	48 V DC Contact Sense

Each discrete input is galvanically isolated from other channels and ground. Group isolated when used with external excitation.

The module performs signal conversion required to interface electrical input signals from field sensors to the redundant module Fieldbus. In addition, it executes programs for Discrete Input, Ladder Logic, Pulse Count, and Sequence of Events, with configurable options of Input Filter Time.

The module can be used as a single unit, or as a redundant pair (two FBM207s). When used as a redundant pair, the modules combine to provide redundancy at the Fieldbus Module (FBM) level, with field input signals received from one common termination assembly though a redundant adapter affixed to the FBMs' baseplate. The input current for redundant modules is doubled. A redundant digital input block in the Foxboro Evo™ Control Software validates each input in conjunction with information to/from the module, and selects the input with the highest quality for processing in the control strategy.

In a redundant configuration, contact sense power from each module is diode OR'd together in the redundant adapter to assure redundant power.

A redundant contact input function block, CINR, is used for each redundant pair of inputs. The CINR block handles input reads and initialization logic for the redundant channels. On each execution cycle of the CINR block, identical reads are sent to both modules, fully exercising the fieldbus and the logic circuitry of each module.

FEATURES

Key features of the FBM207/b/c modules are:

- Sixteen discrete inputs
- Supports discrete input signals at voltages of:
  - 15 to 60 V DC - contact sense
  - 120 V ac/125 V DC - voltage monitoring or switch inputs
  - 240 V ac - voltage monitoring or switch inputs
- Each input is galvanically isolated. Group isolated with external excitation
- Single or redundant modules
- Rugged design suitable for enclosures in Class G3 (harsh) environments
- Executes programs for Discrete Input, Ladder Logic, Pulse Count, and Sequence of Events with configurable Input Filter Time option
- Termination Assemblies (TAs) for locally or remotely connecting field wiring to the FBM207
- Termination Assemblies for per channel internally and/or externally loop powered devices
- Various Termination Assemblies (TAs) have additional signal conditioning hardware that provides voltage attenuation and optical isolation.

STANDARD DESIGN

FBM207/b/c 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 (Class G3), per ISA Standard S71.04.

VISUAL INDICATORS

Light-emitting diodes (LEDs) incorporated into the front of the module provide visual indication of the Fieldbus Module operational status, as well as the discrete states of the individual input points.

EASY REMOVAL/REPLACEMENT

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

When redundant, either module may be replaced without upsetting field input signals to the good module. The module can be removed/replaced without removing field device termination cabling, power, or communications cabling.

SEQUENCE OF EVENTS

The Sequence of Events (SOE) software package (for use with I/A Series® software V8.x and Control Core Services software v9.0 or later) is used for acquisition, storage, display, and reporting of events associated with digital input points in a control system. SOE, using the optional GPS based time synchronization capability, supports data acquisition across control processors at intervals of up to one millisecond, depending on the signal source.

Refer to *Sequence of Events* (PSS 31S-2SOE) to learn more about this package, and to *Time Synchronization Equipment* (PSS 31H-4C2) for a description of the optional time synchronization capability.

I/A Series systems with software earlier than V8.x can support SOE through ECB6 and EVENT blocks. However, these systems do not support GPS time synchronization and use a timestamp sent by the Control Processor which is only accurate to the nearest second and is not synchronized between different Control Processors.

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES (CONTINUED)

FBM Type	Input Signal	TA Part No.[a] PA	Termination Type[b]	TA Cable Type[c]	TA Certification Type[d]
FBM207	16 channel, voltage monitor 240 V AC with external excitation Logic Zero 0 to 40 V AC Logic One 160 to 280 V AC Input Current for Logic One; 1.6 mA maximum Group isolation provided by termination assembly	RH916PM (supersedes P0916PM)	C	4	1
FBM207b	16 channel, contact sense 24 V DC contact wetting from FBM207b FBM207b channel isolation	RH916XT (supersedes P0916XT, P0916JS)[e]	C	4	1, 2
FBM207c	16 channel, contact sense 48 V DC contact wetting from FBM207c FBM207c channel isolation	RH917MG (supersedes P0917MG, P0917MF)[e]	C	4	1, 2
		P0917MJ (supersedes P0917MH)[e]	RL		

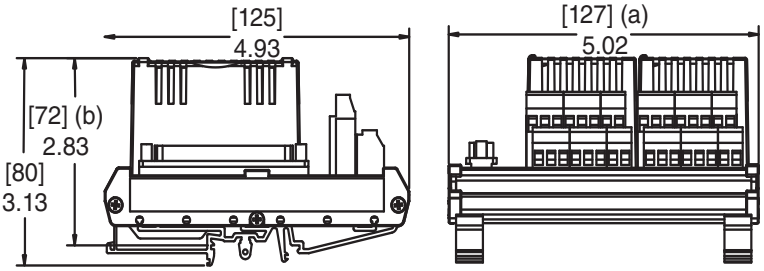
(a) PA (polyamide) termination assemblies rated from -20 to +70°C (-4 to +158°F).
(b) C= TA with compression terminals; RL = TA with ring lug terminals.
(c) See to Table 2 for cable part numbers and specifications.
(d) See to Table 1 Termination Assembly certification definitions.
Note: To avoid false tripping of AC type inputs, care should be taken in routing long wiring or bundled runs to minimize coupling from adjacent signals and/or noise from heavy equipment. When possible, DC excitation of input circuits is recommended for runs greater than 305 m (1000 ft).
(e) Polyamide RL supersedes the PVC RL, note this is not a RoHS part.

DIMENSIONS–NOMINAL

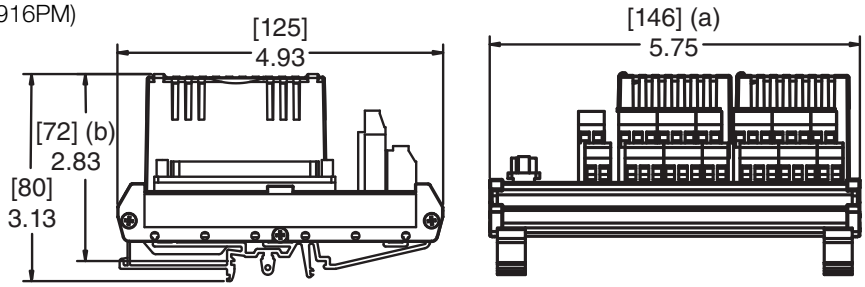
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Compression Termination Assemblies

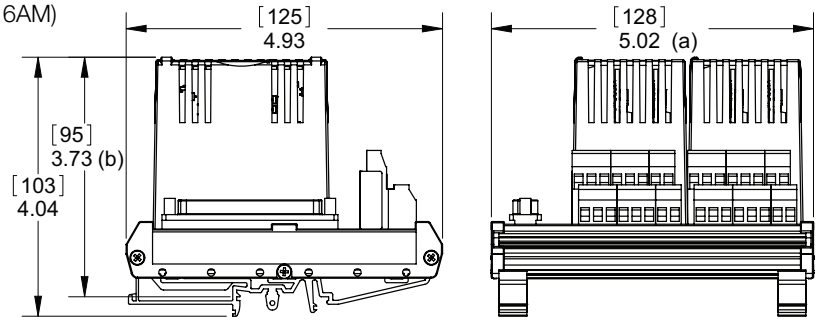
RH916XN (supersedes P0916XN, P0916AL), RH916XT (supersedes P0916XT, P0916JS), RH916XP (supersedes P0916XP), RH916PH (supersedes P0916PH), RH917MG (supersedes P0917MG, P0917MF)



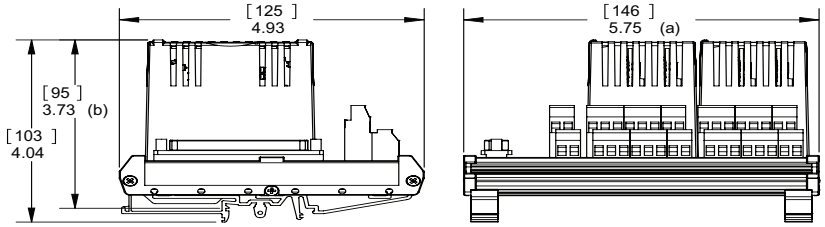
RH916PM (supersedes P0916PM)



RH916XP (supersedes P0916AM)



RH916PK (supersedes P0916PK)



(a) Overall width – for determining DIN rail loading.
(b) Height above DIN rail (add to DIN rail height for total).