Apter Power

Foxboro Evo™ Process Automation System Hardware

Product Specifications

Foxboro® by Schneider Electric

PSS 31H-2Z3

FBM203/b/c/d Platinum/Nickel/Copper RTD Input Module



The FBM203/b/c/d Platinum/Nickel/Copper RTD Input Modules contain eight resistance temperature detector (RTD) input channels.

OVERVIEW

Each input channel of the FBM203/b/c modules accept a 2- or 3-wire RTD sensor input, within a 0 to 320 ohm (FBM203), 0 to 640 ohm (FBM203b), or 0 to 30 ohm (FBM203c) resistance range. Each input channel of the FBM203d accepts a 4-wire RTD sensor input, within a 0 to 320 ohm resistance range. Each analog input is galvanically isolated from other channels and ground.

The modules perform the signal conversion required to interface the electrical input signals from the field sensors to the optionally redundant fieldbus.

The FBM203/b/c/d modules execute an analog input application program, which provides conversion time (on a per module basis) and configurable options for Rate of Change Limits.

Two types of passive termination assemblies are available for the FBM203/b/c modules:

- DIN rail mounted TAs, similar to those used with the other 200 Series FBMs
- Baseplate-mounted TA, which mounts directly onto the field I/O connectors of the 200 Series baseplate. These TAs provide field I/O wiring

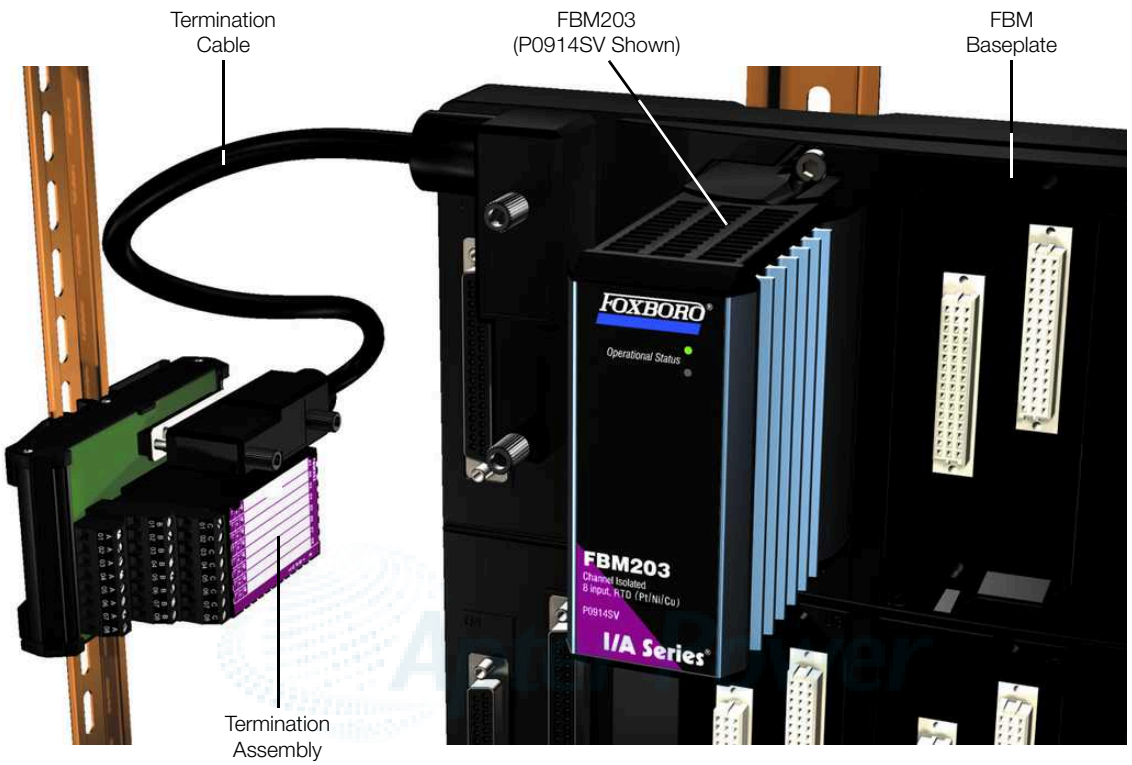

Figure 2. FBM203/b/c/d and DIN Rail Mounted Termination Assembly Installation

FUNCTIONAL SPECIFICATIONS

Input Channels
8 resistance temperature detector (RTD) input channels. Each channel is isolated and independent.

Input Range (Each Channel)

FBM203/203d
0 to 320 ohms. 320 ohms equals 64000 counts. Minimum overrange value is 327.675 ohms at a count of 65535.

FBM203b
0 to 640 ohms. 640 ohms equals 64000 counts. Minimum overrange value is 655.35 ohms at a count of 65535.

FBM203c
0 to 30 ohms. 30 ohms equals 64000 counts. Minimum overrange value is 30.72 ohms at a count of 65535.

Sensor Current

FBM203/203d
0.19 mA dc nominal

FBM203b
0.10 mA dc nominal

FBM203c
0.54 mA dc nominal

Lead Resistance

FBM203/FBM203b
50 ohms maximum each lead. Any imbalance in extension leads will decrease accuracy.

ENVIRONMENTAL SPECIFICATIONS(1)

Operating

TEMPERATURE

Module
0 to +70°C (32 to +158°F)
Termination Assemblies
Polyamide TA
0 to +70°C (32 to +158°F)
PVC TA
0 to +50°C (32 to +122°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing)

ALTITUDE

-300 to +3,000 m (-1,000 to +10,000 ft)

Storage

TEMPERATURE

-40 to +70°C (-40 to +158°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing)

ALTITUDE

-300 to +12,000 m (-1,000 to +40,000 ft)

Contamination

Suitable for use in Class G3 (Harsh) environments as defined in ISA Standard S71.04, based on exposure testing according to EIA Standard 364-65, Class III.

Vibration

7.5 m/S^2 (0.75 g) from 5 to 500 Hz

PHYSICAL SPECIFICATIONS

Mounting

MODULES

FBM203/b/c/d modules mount on a Modular Baseplate.The Modular Baseplate can be mounted horizontally or vertically on a DIN rail, or mounted horizontally in a 19-inch rack using a mounting kit. Alternatively, FBM203/c/d mount on a 100 Series conversion mounting structure. Refer to *Standard 200 Series Baseplates* (PSS 31H-2SBASEPLT) or *100 Series Conversion Mounting Structures* (PSS 31H-2W8) for details.

TERMINATION ASSEMBLIES

The DIN rail mounted TA mounts on a DIN rail and accommodates multiple DIN rail styles including 32 mm (1.26 in) and 35 mm 1.38 in) The baseplate-mounted TA mounts on the two field I/O connectors associated with its two FBM203/b/cs on a 200 Series baseplate.

Weight

MODULE

284 g (10 oz) approximate

TERMINATION ASSEMBLIES

Compression Type (DIN rail mounted):
181 g (0.40 lb) approximate
Compression Type (Baseplate Mounted):
245 g (0.57 lb) approximate
Ring Lug Type: 249 g (0.55 lb) approximate

Dimensions

MODULE

HEIGHT
102 mm (4 in)
114 mm (4.5 in) including mounting lugs
WIDTH
45 mm (1.75 in)
DEPTH
104 mm (4.11 in)

TERMINATION ASSEMBLIES

See page 13 and page 14.

(1) The environmental limits of this module may be enhanced by the type of enclosure containing the module. [Refer to the applicable Product Specification Sheet (PSS) which describes the specific type of enclosure that is to be used.]

PHYSICAL SPECIFICATIONS (CONTINUED)

Part Numbers

MODULE

FBM203
P0914SV
FBM203b
P0922UA
FBM203c
P0922UD
FBM203d
P0927AM

TERMINATION ASSEMBLIES

Compression Screw TAs
Polyamide (DIN rail mounted): P0916XJ
Polycarbonate/Acrylonitrile Butadiene Styrene (Baseplate Mounted): P0924WN
PVC: P0916AE
FBM203d Compression Screw TA
Polyamide: P0924EX
Ring Lug TA
Polyamide: P0917JM
PVC: P0916AF

Termination Cables

CABLE LENGTHS
Up to 30 m (98 ft)

CABLE MATERIALS
Polyurethane or Low Smoke Zero Halogen (LSZH)

TERMINATION CABLE TYPE

FBM203/b/c
Type 1 - Refer to Table 2
FBM203d
Type 4 - Refer to Table 3

CABLE CONNECTION

FBM Baseplate End
37-pin D-subminiature
Termination Assembly End
FBM203/b/c
25-pin D-subminiature
FBM203d
37-pin D-subminiature

Construction - Termination Assembly

MATERIAL

DIN Rail Mounted TAs
Poly Vinyl Chloride (PVC), compression and ring lug
Polyamide (PA), compression and ring lug
Baseplate-Mounted TAs
Polycarbonate/Acrylonitrile Butadiene Styrene (PC/ABS), compression

Field Termination Connections

COMPRESSION - ACCEPTED WIRING SIZES

Solid/Stranded/AWG
0.2 to 4 mm^2/0.2 to 2.5 mm^2/24 to 12 AWG
Stranded with Ferrules
0.2 to 2.5 mm^2 with or without plastic collar

RING-LUG - ACCEPTED WIRING SIZES
#6 size connectors (0.375 in (9.5 mm)
0.5 to 4 mm^2/22 AWG to 12 AWG

FUNCTIONAL SPECIFICATIONS - TERMINATION ASSEMBLIES

FBM Type	Input Signal	TA Part Number[a]			Termination Type[b]	TA Cable Type[c]	TA Certification Type[d]
		PVC	PA	PC/ABS[e]			
FBM203	8 channels, 0 to 320 ohm, passive feedthrough with FBM203 channel isolation	P0916AE P0916AF	P0916XJ P0917JM		C RL	1	1, 2
	Two sets of 8 channels, 0 to 320 ohm, passive feedthrough with FBM203 channel isolation			P0924WN	C (Baseplate-mounted)	n/a	1, 2
FBM203b	8 channels, 0 to 640 ohm, passive feedthrough with FBM203b channel isolation	P0916AE P0916AF	P0916XJ P0917JM		C RL	1	1, 2
	Two sets of 8 channels, 0 to 640 ohm, passive feedthrough with FBM203b channel isolation			P0924WN	C (Baseplate-mounted)	n/a	1, 2
FBM203c	8 channels, 0 to 30 ohm, passive feedthrough with FBM203c channel isolation	P0916AE P0916AF	P0916XJ P0917JM		C RL	1	1, 2
	Two sets of 8 channels, 0 to 30 ohm, passive feedthrough with FBM203c channel isolation			P0924WN	C (Baseplate-mounted)	n/a	1, 2
FBM203d	8 channels, 0 to 320 ohm, passive feedthrough with FBM203d channel isolation		P0924EX		C	4	1, 2

(a) PVC is polyvinyl chloride rated from -20 to +50°C (-4 to +122°F); PA is polyamide rated from -20 to +70°C (-4 to +158°F).
(b) C = TA with compression terminals; RL = TA with ring lug terminals.
(c) See Table 2 and Table 3 for cable part numbers and specifications.
(d) See Table 1 for Termination Assembly certification definitions.
(e) PC/ABS is Polycarbonate/Acrylonitrile Butadiene Styrene (PC/ABS) rated from-20 to +70°C (-4 to +158°F).

Table 1. Certification for Termination Assemblies

Type	Certification[a]
Type 1	TAs are UL/UL-C listed as suitable for use in Class I; Groups A-D; Division 2 temperature code T4 hazardous locations. They are CENELEC (DEMKO) certified EEx nA [nL] IIC T4 for use in Zone 2 potentially explosive atmospheres.
Type 2	TAs are UL/UL-C listed as associated apparatus for supplying non-incendive field circuits Class I; Groups A-D; Division 2 hazardous locations when connected to specified 200 Series FBMs and field circuits meeting entity parameter constraints specified in *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). They are also CENELEC (DEMKO) certified as associated apparatus for supplying field circuits for Group IIC, Zone 2 potentially explosive atmospheres. Field circuits are also Class 2 limited energy (60 V dc, 30 V ac, 100 VA or less) if customer-supplied equipment meets Class 2 limits.

(a) All TAs are UL/UL-C listed to comply with applicable ordinary location safety standards for fire and shock hazards. Hazardous location types comply with ATEX directive for II 3 G use. They also comply with the requirements of the European Low Voltage Directive. All listings/certifications require installation and use within the constraints specified in *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA) and the conditions stated in UL and DEMKO reports.

Apter Power

Table 3. Cable Types and Part Numbers

Cable Length m (ft)	Type 4 P/PVC[a]	Type 4 LSZH[b]	Type 4 H/XLPE[c]
0.5 (1.6)	P0916FG	P0928BA	P0916WD
1.0 (3.2)	P0916FH	P0928BB	P0916WE
2.0 (6.6)	P0931RQ	P0928BC	P0931RU
3.0 (9.8)	P0916FJ	P0928BD	P0916WF
5.0 (16.4)	P0916FK	P0928BE	P0916WG
10.0 (32.8)	P0916FL	P0928BF	P0916WH
15.0 (49.2)	P0916FM	P0928BG	P0916WJ
20.0 (65.6)	P0916FN	P0928BH	P0916WK
25.0 (82.0)	P0916FP	P0928BJ	P0916WL
30.0 (98.4)	P0916FQ	P0928BK	P0916WM

(a) P/PVC is polyurethane outer jacket and semi-rigid PVC primary conductor insulation. PVC is rated from -20 to +50°C (-4 to 122°F).
(b) Low smoke zero halogen or low smoke free of halogen (LSZH) is a material classification used for cable jacketing. LSZH is composed of thermoplastic or thermoset compounds that emit limited smoke and no halogen when exposed to high sources of heat. Temperature range; -40 to +105°C (-40 to +221°F)
(c) H/XLPE is Hypalon outer jacket and XLPE (cross-linked polyethylene) primary conductor insulation. H/XLPE is rated from -40 to +90°C (-40 to 194°F). Hypalon cables are no longer available for purchase.

Use of Termination Assemblies in 100 Series Upgrade Subsystem

When an FBM203/c/d is used to replace a 100 Series FBM, it may use any of the appropriate termination assemblies listed above for the FBM's field I/O wiring. Alternatively, the FBM203/c/d can accept this field wiring through a Termination Assembly Adapter (TAA) instead of a termination assembly. This is discussed in *Termination Assembly Adapter Modules for 100 Series Upgrade* (PSS 31H-2W4).