



HighFive PLC
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Foxboro™ DCS

FBM206 Pulse Input Module

PSS 41H-2S206

Product Specification

August 2019



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Legal Information

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Overview

FBM206 Pulse Input Module

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Measurement of a machine's rotational speed is often accomplished using a device that transmits high speed pulses. The FBM206 provides the means to accept up to eight of these pulse signals (up to 25kHz) and provide the values to the Foxboro™ DCS. The FBM206b accepts up to four pulse inputs and provides up to four 0 to 20 mA outputs for associated controls.

The FBM206 contains eight pulse input channels, and the FBM206b provides four pulse input channels and four 0 to 20 mA analog output channels. Each input channel accepts a 2-wire, pulse input signal from a sensor. Input devices include vortex and turbine meters, solid state or electromechanical contacts, and other sensors with similar pulse outputs.

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

Features

- For the FBM206, eight 7 to 27 V dc, configurable, pulse input channels
- For the FBM206b, four 7 to 27 V dc, configurable, pulse input channels and four 0 to 20 mA analog output channels
- Each input channel accepts a pulse input with a maximum rate of 25 kHz
- Each channel is galvanically isolated from the other channels and ground
- Rugged design suitable for enclosure in Class G3 (harsh) environments
- Execution of the pulse input application program with configurable options for Pulse Rate Totalization and Resolution (on a per module basis) and Meter Scaling Factor
- Termination Assemblies (TAs) for locally or remotely connecting field wiring to the FBM206/206b
- TAs for per channel internally and/or externally loop powered devices

Standard Design

The FBM206/206b module 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 harsh environments, per ISA Standard S71.04.

Visual Indicators

Light-emitting diodes (LEDs) incorporated into the front of the module provide visual status indications of FBM functions.

Easy Removal/Replacement

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

Fieldbus Communication

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A Fieldbus Communication Module or a Control Processor interfaces the 2 Mbps module Fieldbus used by the FBMs. FBM206 accepts communication from either path (A or B) of the redundant 2 Mbps Module Fieldbus. If one path is unsuccessful or is switched at the system level, the module continues communication over the active path.

Modular Module Mounting

The modules mount on a modular 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 FBM206 are described in *Functional Specifications - Termination Assemblies*, page 12.

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Functional Specifications sales@5gplc.com

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Input/Output Channels	<ul style="list-style-type: none">• FBM206: 8 isolated independent pulse input channels• FBM206b: 4 isolated independent pulse input channels
Process I/O Communications	Communicates with its associated FCM or FCP via the redundant 2 Mbps module Fieldbus
Input Pulse Rate	10 Hz to 25 kHz
Input Channels (4 or 8)	<ul style="list-style-type: none">• Accuracy:<ul style="list-style-type: none">◦ Pulse Count: No missing pulses for pulse rate 10 to 25 kHz◦ Pulse Rate: 0.01% of reading, independent of rate• Field Device Cabling Distance: Maximum distance of the field device from the FBM is a function of compliance voltage (22.8 V dc), wire resistance, and voltage drop at the field device.• Input Pulse Characteristics: See <i>Figure 1</i>• Input Duty Cycle: Minimum pulse width on/off (see <i>Figure 1</i>)• Input Channel Impedance: 10 kΩ• Loop Power Supply Protection: Each channel is channel-to-channel galvanically isolated, current limited, and voltage regulated.• Channel Power Supply Input: 24 V dc ±10% at 30 mA maximum to field device

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Functional Specifications

Output Channels (4 - FBM206b Only)	<ul style="list-style-type: none">• Output Range (Each Channel): 4 isolated independent 0 to 20.4 mA dc analog output channels• Output Load: 735 Ω• Compliance Voltage: 18.6 V nominal at 20 mA dc at I/O field terminals• Accuracy: $\pm 0.05\%$ of span (@25°C)• Output Temperature Coefficient: 100 ppm/°C• Communication: Via a redundant Fieldbus• Settling Time: 100 ms to settle within a 1% band of steady state for a 10 to 90% input step change.• Linearity Error: $\pm 0.025\%$ of span (monotonic)• Resolution: 12 bits
Power Requirements	<ul style="list-style-type: none">• Input Voltage Range (Redundant): 24 V dc +5%, -10%• Consumption: 7 W (maximum)• Heat Dissipation: 5 W (maximum)
Calibration Requirements	Calibration of the module and termination assembly is not required.
Regulatory Compliance: Electromagnetic Compatibility (EMC)	<ul style="list-style-type: none">• <i>European EMC Directive 2004/108/EC (Prior to April 20, 2016) and 2014/30/EU (Beginning April 20, 2016):</i> Meets: EN61326-1:2013 Class A Emissions and Industrial Immunity Levels

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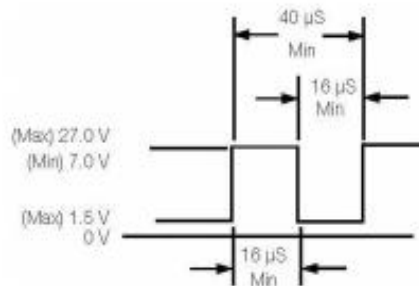
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<p>Regulatory Compliance: Product Safety</p>	<ul style="list-style-type: none"> <p><i>Underwriters Laboratories (UL) for U.S. and Canada:</i></p> <p>UL/UL-C listed as suitable for use in UL/UL-C listed Class I, Groups A-D; Division 2; temperature code T4 enclosure based systems when connected to specified Foxboro DCS processor modules. Communications circuits comply with 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 <i>Standard and Compact 200 Series Subsystem User's Guide (B0400FA)</i>.</p> <p><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></p> <p>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 (B0400FA)</i>.</p> <p>Also, see <i>Table 1</i>.</p>
<p>RoHS Compliance</p>	<p>Complies with European RoHS Directive 2011/65/EU, including amending Directives 2015/863 and 2017/2102.</p>
<p>Marine Certification</p>	<p>ABS Type Approved and Bureau Veritas Marine certified for Environmental Category EC31.</p>

Figure 1 - Input Pulse Characteristics



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FBM206 Pulse Input Module

Environmental Specifications

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	Operating	Storage
Temperature	<ul style="list-style-type: none">Module: -20 to +70°C (-4 to +158°F)Termination Assembly — PA: -20 to +70°C (-4 to +158°F)	-40 to +70°C (-40 to +158°F)
Relative Humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Altitude	-300 to +3,000 m (-1,000 to +10,000 ft)	-300 to +12,000 m (-1,000 to +40,000 ft)
Vibration	7.5 m/s ² (5 to 500 Hz)	
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.	

NOTE: 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) that describes the type of enclosure to be used.

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Physical Specifications

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Mounting	<ul style="list-style-type: none">• Module: FBM206/206b mounts on a modular baseplate. The baseplate can be mounted on a DIN rail (horizontally or vertically), or horizontally on a 19-inch rack using a mounting kit. Alternatively, FBM206b can be mounted on a 100 Series conversion mounting structure as a direct replacement for a 100 Series FBM06. See <i>Standard 200 Series Modular Baseplates</i> (PSS 41H-2SBASPLT) or <i>100 Series Conversion Mounting Structures</i> (PSS 41H-2W8) for details.• Termination Assembly: The TA mounts on a DIN rail and accommodates multiple DIN rail styles including 32 mm (1.26 in) and 35 mm (1.38 in).
Weight	<ul style="list-style-type: none">• Module: 284 g (10 oz) approximate• Termination Assemblies:<ul style="list-style-type: none">• Compression: 181 g (0.40 lb) approximate• Ring Lug: 249 g (0.55 lb) approximate
Dimensions - Module	<ul style="list-style-type: none">• 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)
Dimensions - Termination Assemblies	See <i>Dimensions - Nominal, page 14</i>
Part Numbers	<ul style="list-style-type: none">• FBM206 Module: RH916CQ• FBM206b Module: RH927AB• Termination Assemblies: See <i>Functional Specifications - Termination Assemblies, page 12</i>

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Termination Cables	<ul style="list-style-type: none">• Cable Lengths: Up to 30 m (98 ft)• Cable Materials: Polyurethane or Low Smoke Zero Halogen (LSZH)• Termination Cable Type: Type 1 — See <i>Table 2</i>• Baseplate to Main TA Cable Connection:<ul style="list-style-type: none">◦ FBM Baseplate End: 37-pin D-subminiature◦ Termination Assembly End: 25-pin D-subminiature
Termination Assembly Construction	<ul style="list-style-type: none">• Material: Polyamide (PA), compression
Field Termination Connections	<ul style="list-style-type: none">• Compression-Type Accepted Wiring Sizes:<ul style="list-style-type: none">◦ Solid/Stranded/AWG: 0.2 to 4 mm²/0.2 to 2.5 mm²/24 to 12 AWG◦ Stranded with Ferrules: 0.2 to 2.5 mm² with or without plastic collar• Ring-Lug Type Accepted Wiring Sizes: #6 size connectors (0.375 in (9.5 mm)) 0.5 to 4 mm²/22 AWG to 12 AWG