Foxboro™ DCS

Honeywell Systems Migration Modules

PSS 41H-3MIGHON

Product Specification

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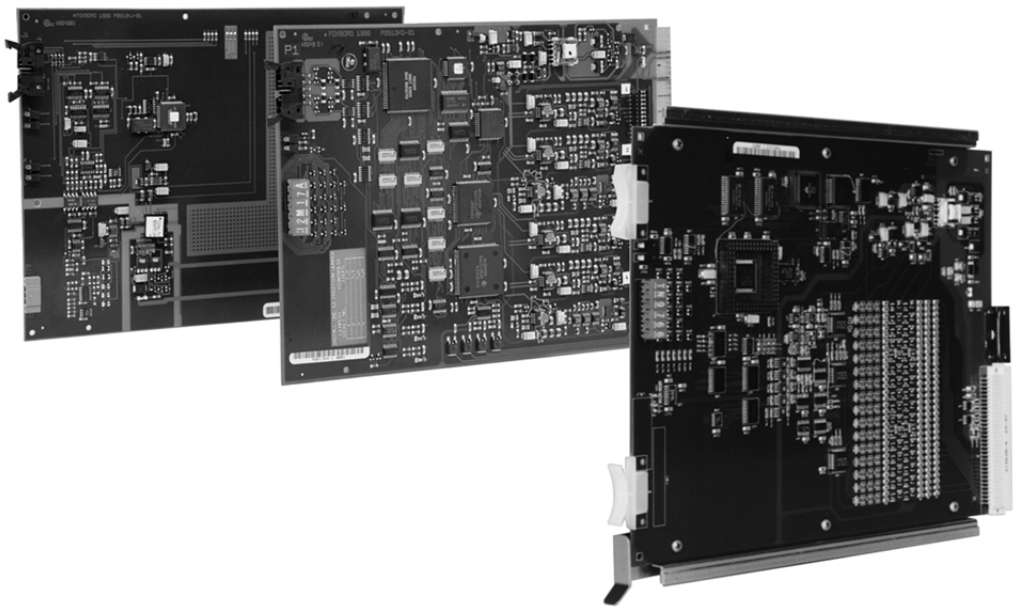

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Legal Information

Overview

Plants with obsolete Honeywell control systems can be upgraded quickly to the EcoStruxure™ Foxboro™ DCS system. The migration strategy is straightforward — remove obsolete Honeywell I/O modules and replace them with Foxboro DCS I/O modules that are form and fit replacements. The replacements perform native Foxboro DCS functions, providing full power and functionality to the plant. A significant advantage of this migration approach is that the cutover time is reduced from days to hours, restoring the plant to full operation much more quickly than with other methods.

The Foxboro DCS Fieldbus Modules (FBM) family provides a migration path from Honeywell process input and output (I/O) components to Foxboro DCS display, control, and supervisory functions. This can save the significant cost of total system replacement by preserving existing process interface and wiring, and reducing installation effort, engineering, and process down time.

No additional communication devices or multi-vendor communication software licensing is required.

The Foxboro DCS FBM family replaces all Honeywell I/O devices. Once integrated, the process is controlled entirely by the advanced Foxboro DCS algorithm set. Honeywell DCS control devices are disconnected upon migration, so there is no undesirable interaction caused by the decommissioned system.

The FBM product includes appropriate connectors to enable integration of original process signals to the Foxboro DCS while keeping the existing field interface and wiring. It provides access to all process signals connected to the Honeywell system by providing the connection between the field terminations and the Foxboro DCS. All process signals become fully integrated into the Foxboro DCS.

Operator functions and engineering configuration are accomplished by the Foxboro DCS at any Foxboro DCS Control workstation. Because all process values become part of the Foxboro DCS, all configuration data is maintained by the system as native Foxboro DCS configurations.

This migration path provides plant operations with all the power and flexibility of the Foxboro DCS. All process values can be used plant wide for control, display, history, alarming, and information management from a single vendor source.

Features

- Foxboro DCS FBMs plug directly into TDC 2000 and TDC 3000 control and I/O card files
- Migration from proprietary DCS to a state-of-the-art open Foxboro DCS
- Advanced Foxboro DCS control with single point of configuration
- More direct control performance than any gateway device can offer
- Single vendor service and supply

Fundamental Principle

Foxboro believes that it is only acceptable to interface with competing manufacturers' operating systems in two ways:

- Through high level public gateways
- At the lowest level, directly to field devices, without communicating with proprietary buses or components

The Foxboro migration product offerings adhere to this principle.

Product Descriptions

The Honeywell migration solution consists of new Foxboro DCS FBMs and new Fieldbus Isolators. This allows migration to Foxboro DCS control, display, and application products while retaining original termination panels and field I/O wiring. All the original process I/O capability of the Honeywell control functions is replaced by direct Foxboro DCS control processor scanning and control.

Foxboro DCS FBMs plug directly into existing Honeywell card files (nests) in place of Honeywell I/O cards. These pass process measurement and output signals to and from a Foxboro DCS control processor (CP). The CP provides control in place of the Honeywell Controllers.

Fieldbus Isolators (H3SFBI and H2HFBI)

Foxboro DCS remote Fieldbus communications signals must be isolated and repeated to a local Fieldbus media for use with the DCS FBMs. The Fieldbus Isolator (H3SFBI and H2HFBI) is a special form factor of the standard Foxboro DCS Fieldbus Isolator. The H3SFBI isolators mount on a carrierboard installed in the original TDC3000 PMM, APM, HPM, or IOP card file along with the Foxboro DCS FBMs. The H2HFBI unit mounts in the CCFA card files of the TDC 2000, Basic, Extended Multifunction, High and Low Level PIUs, and Low Energy PIU.

Local Fieldbus connections are accomplished using existing backplane wiring or quick disconnect connectors on each unit. The remote Fieldbus connects using an appropriate quick disconnect terminal block on each unit. This allows the remote Fieldbus to be disconnected for servicing while maintaining remote Fieldbus continuity.

Honeywell TDC 3000 System Migration

You can migrate to Foxboro DCS control by replacing Process Manager (PM), Advanced Process Manager (APM), and High Performance Process Manager (HPM) modules and I/O Processor (IOP) cards in the Honeywell TDC 3000 system with Foxboro DCS Fieldbus Isolators (H3SFBI) and Foxboro DCS FBMs. The Foxboro DCS FBMs replace I/O Processor (IOP) card types as shown in the tables below:

Table 1 - Foxboro DCS FBM Models Replacing I/O Processor (IOP) Card Types

Original Module	Replacement Model	Description
HLAI	H3M01	1 to 5 V dc Input (16)
LLAI	H3M03	TC/mV/RTD Input (8)
PI	H3M06	Pulse Input (8)
DI DISOE	H3M07	Logic Level Input (32) Sequence of Events (32)
DO	H3M09	Logic Level Output (16)
AO	H3M37	4 to 20 mA Output (8)
SDI	Choose one of the following to replace the functionality of the Serial Device Interface: FBM230 or FBM231.	Serial Device Interface

Schneider Electric also offers replacements for the LLMUX cards as described in the table below.

Table 2 - Schneider Electric Replacements for LLMUX Cards

Honeywell Devices			
Device	**FTA**	**Model**	**Notes**
LLMUX/2	MC-TAMT03/TAMT04	51309223-175 /51308905-175	Replace with FBM202
LLMUX	MC-TAMR03/TAMR04	51309218-125/ 51305907-175	Replace with FBM203
Replacement Migration Schneider Electric Devices			
Format/type	**Termination Assembly (TA) Direct Connect**	**2–, 4–, or 8–Position Baseplate Part Number**	**Replacement Fieldbus Module**
T/C	P0928CN	RH926KE/HM/HT	FBM202 (RH926EQ) / FBM212 (RH914XL)
RTD	P0924WN	RH926KE/HM/HT	FBM203 (RH914SV)

The Honeywell maximum is 40 IOP modules per PM/AM/HPM. These can be supported directly by FBM replacement and can be expanded to 128 FBMs per Foxboro DCS FCP280. (See *Functional Specifications – Common to All Foxboro DCS FBMs, page 16*).

Up to 40 Migration Foxboro DCS FBMs can be located behind an H3SFIBI or a redundant pair of H3SFBIs with a maximum of two redundant pairs of H3FBIs.

Honeywell TDC 2000 System Migration

Foxboro DCS FBMs are used in conjunction with the following Honeywell TDC 2000 equipment:

- Basic Controller — Migration Kit P0923JV
- Extended Controller — Migration Kit P0923JW
- Multifunction Controller — Migration Kit P0923JX
- High Level Process Interface Unit — Migration Kit P0923JY
- Low Level Process Interface Unit — Migration Kit P0923JZ
- Low Energy Process Interface Unit — Migration Kit – CCFA P0915XQ
- LEPIU Mux Box TC — Migration Kit P0915XR
- LEPIU Mux Box RTD — Migration Kit P0915XS

Honeywell Basic Controller (BC)

The BC is structured to support up to eight interactive analog process control loops in the Common Card File Assembly (CCFA). Inputs and outputs are directed to the CCFA from the I/O termination panel.

The I/O termination panel, CCFA (logic nest), rack, and power system are reused. All I/O wiring remains connected to the I/O termination panel. The CCFA processor cards are removed and replaced by the four I/O modules listed below, a pair of redundant Fieldbus Isolators (H2HFBI), and connect directly to the original rack 24 V dc power bus similar to the original CCFA power bus connection:

- 2 x H2241A AI HART Compatible
- 1 X H2215A AO HART Compatible
- 1 x H2242 DIO

Migration is accomplished using the BC Migration Kit (P0923JV). This kit replaces the logic cards in the card file assembly. The I/O modules listed above provide support for up to eight control loops.

Honeywell Extended Controller (EC)

The EC is structured to support up to eight interactive analog process control loops and up to 16 digital inputs in the CCFA. Inputs and outputs are directed to the CCFA from an I/O termination panel and a digital input termination panel.

The termination panels, CCFA (logic nest), rack and power system are reused. All I/O wiring remains connected to the termination panels. The CCFA processor cards are removed and replaced by the four I/O modules listed below, one H2M07E, a pair of redundant Fieldbus Isolators (H2HFBI) and connect directly to the original rack 24 V dc power bus similar to the original CCFA power bus connection:

- 2 x H2241A AI HART Compatible
- 1 X H2215A AO HART Compatible
- 1 x H2242 DIO

Migration is accomplished using the EC Migration Kit (P0923JW). This kit replaces the logic cards in the card file assembly. The four I/O modules listed above provide support for up to eight control loops.

Honeywell Multifunction Controller (MFC)

The MFC is structured to support up to eight interactive process control loops and two point card files each with up to eight point cards to control continuous and discontinuous processes. The MFC performs four main control functions:

- Sequence control
- Modulating control
- Logic control
- I/O monitoring

Inputs and outputs are directed to the CCFA from an I/O termination panel and to the point card file assemblies from two separate point card termination panels.

The termination panels, CCFA (logic nest), rack and power system are reused. All I/O wiring remains connected to the termination panels. The CCFA processor cards are removed and replaced by the four I/O modules listed below, a pair of redundant Fieldbus Isolators (H2HFBI) and connect directly to the original rack 24 V dc power bus similar to the original CCFA power bus connection:

- 2 x H2241A AI HART Compatible
- 1 X H2215A AO HART Compatible
- 1 x H2242 DIO

The Point Card File assemblies and Point Card termination panels remain in place. All associated I/O point cards are removed and replaced with Foxboro DCS FBMs. The Fieldbus Isolators (H2HFBI) are connected to the point card files through the original I/O bus cables and point card file backplanes.

Migration is accomplished using the MFC Migration Kit (P0923JX). This kit replaces the logic cards in the card file assembly. All of the point card file assembly I/O cards are removed and replaced by Foxboro DCS FBMs.

The following are optional Foxboro DCS FBM selections for MFC (16 max. per MFC, any combination):

Table 3 - Foxboro DCS FBM Selections for MFC

Original Module	Replace-ment Model	Description	HART Model
PXIA11,12,41,42	H2M01A	8AI (1 to 5 V, 0 to 5 V, ±5 V)	H2214B
PXIA21,22	H2M01B	8AI (4 to 20 mA)	H2214B
PXIA31,32	H2M01C	8AI (4 to 20 mA) plus Transmitter Power	H2214B
PXOA21	H2M04	4AO (4 to 20 mA)	H2215B
PXIP11,21	H2M06	4PI	
PXIP31	H2M06A	4PI (125 V dc)	
PXID51	H2M07	16DI TTL	
PXOD21,41	H2M09	8DO (SS)	
PXID11,21,31,41	H2M24	16DI (125 V)	
PXOD11,31	H2M26	8DO (125 V)	

Low Energy Process Interface Unit (LEPIU)

The LEPIU provides termination and processing for high level and low level analog inputs for process data acquisition in remote locations. The LEPIU is modular in construction, consisting of a CCFA and up to 16 multiplexer (MUX) boxes. Each MUX box provides termination for up to 16 inputs. Two types of MUX boxes are available Basic (TC/Volts) and RTD. The MUX box is a NEMA 4 enclosure.

The CCFA processor cards are removed and replaced with a pair of redundant Fieldbus Isolators (H2SFBI) and a Fieldbus Extender card (H2FBE1) to interconnect the Fieldbus Isolators to the original MUX box field communication wiring. The original MUX box field communication wiring is reused to connect the isolated fieldbus to each of the MUX boxes. The MUX box termination assembly and connected field input wiring stays in place.

Migration is accomplished using the LEPIU Migration Kit (P0915XQ). This kit replaces the logic cards in the CCFA.

Foxboro DCS FBMs replace the relay multiplexer card in the MUX box. This table lists the optional MUX Box Migration Kit selections for the Basic (TC/Volts) and RTD MUX boxes:

Table 4 - Optional MUX Box Migration Kit Selections for Basic (TC/Volts) and RTD MUX Boxes

MUX Card	Replacement Migration Kit	Description
Basic (TC/Volts)	P0915XR	Basic MUX Migration Kit with two H2M02E Modules
RTD	P0915XS	RDT MUX Migration Kit with two H2M03 Modules

NOTE: The Low Energy Process Interface Unit (LEPIU) MUX Box Migration Kit selections for the Basic (TC/Volts) and RTD MUX boxes (P0915XR and P0915XS) are not compatible with the Honeywell MUX model code POIM11 or POIM17 Intrinsically Safe FM/1st Pass T/C MUX termination boards.

High Level Process Interface Unit (HLPIU)

The HLPIU interfaces high level analog and digital inputs, and analog and digital outputs. Inputs and outputs are connected to the HLPIU from I/O termination panels that are hard wired to each of the four point card file assemblies. The point card file assemblies and termination panels, rack, and power system are reused. All I/O wiring remains connected to the termination panels. The CCFA stays in place, however, all associated processor cards are removed and replaced by a pair of redundant Foxboro Fieldbus Isolators. The Fieldbus Isolators (H2HFBI) are connected to the point card files through the original I/O bus cables and point card file backplanes. All of the point card assembly I/O cards are removed and replaced by Foxboro DCS FBMs.

Migration is accomplished using the HLPIU Migration Kit (P0923JY). This kit replaces the logic cards in the card file assembly. Foxboro DCS FBMs replace HLPIU point cards. This table lists the optional Foxboro DCS FBM selections for HLPIU (32 max. per HLPIU, any combination):

Table 5 - Foxboro DCS FBM Selections for HLPIU

Original Module	Replace-ment Model	Description	HART Model
PXIA11,12,41,42	H2M01A	8AI (1 to 5 V, 0 to 5 V, ±5 V)	H2214B
PXIA21,22	H2M01B	8AI (4 to 20 mA)	H2214B
PXIA31,32	H2M01C	8AI (4 to 20 mA) plus Transmitter Power	H2214B
PXOA21	H2M04	4AO (4 to 20 mA)	H2215B
PXIP11,21	H2M06	4PI	
PXIP31	H2M06A	4PI (125 V dc)	
PXID51	H2M07	16DI TTL	
PXOD21,41	H2M09	8DO (SS)	
PXI-D11,21,31,41,61,62	H2M24	16DI (125 V)	
PXOD11,31	H2M26	8DO (125 V)	

Low Level Process Interface Unit (LLPIU)

The LLPIU interfaces low level analog inputs. Inputs are connected to the LLPIU from I/O termination panels that are hard wired to each of the four point card file assemblies. The point card file assemblies and termination panels, rack, and power system are reused. All I/O wiring remains connected to the termination panels. The CCFA stays in place, however, all associated processor cards are removed and replaced by a pair of redundant Foxboro Fieldbus Isolators. The Fieldbus Isolators (H2HFBI) are connected to the point card files through the original I/O bus cables and point card file backplanes. All of the point card assembly I/O cards are removed and replaced by Foxboro DCS FBMs.

Migration is accomplished using the LLPIU Migration Kit (P0923JZ). This kit replaces the logic cards in the card file assembly. This table lists the Foxboro DCS FBM module types replace the LLPIU cards (32 max. per LLPIU, any combination):

Table 6 - Foxboro DCS FBM Module Types Replacing LLPIU Cards

Original Module	Replacement Model	Description
PXIA81	H2M02	8AI (TC, mV)

PXIA91 (Analog Input FBMs) may be installed with various signal level combinations and are implemented in groups of four channels.

Table 7 - PXIA91 (Analog Input FBMs)

Model	Channel 1-4	Channel 5-8	Description
H2C02A	PXSC11	PXSV11	4 (4 to 20 mA) 4 (0 to 5 V dc)
H2C02B	PXSC11	PXSV21	4 (4 to 20 mA) 4 (0 to 40 V dc)
H2C02D	PXSC11	PXSC21	4 (4 to 20 mA) 4 (0 to 1 mA)
H2C02E	PXSC11	PXSC32	4 (4 to 20 mA) 4 (0 to 10 mA)
H2C02F	PXSC11	PXSD11	4 (4 to 20 mA) 4 (TC, mV)
H2C02G	PXSC11	38000032	4 (4 to 20 mA) 4 (0 to 1 V dc)
H2C02H	PXSC11	PXSR11,21,31	4 (4 to 20 mA) 4 (RTD)
H2C02J	PXSC21	PXSV11	4 (0 to 1 mA) 4 (0 to 5 V dc)
H2C02K	PXSC21	PXSV21	4 (0 to 1 mA) 4 (0 to 40 V dc)
H2C02L	PXSC21	PXSC11	4 (0 to 1 mA)

Table 7 - PXIA91 (Analog Input FBMs) (Continued)

			4 (4 to 20 mA)
H2C02M	PXSC21	PXSC21	8 (0 to 1 mA)
H2C02N	PXSC21	PXSC32	4 (0 to 1 mA) 4 (0 to 10 mA)
H2C02P	PXSC21	PXSD11	4 (0 to 1 mA) 4 (TC, mV)
H2C02Q	PXSC21	38000032	4 (0 to 1 mA) 4 (0 to 1 V dc)
H2C02R	PXSC21	PXSR11,21,31	4 (0 to 1 mA) 4 (RTD)
H2C02S	PXSC32	PXSV11	4 (0 to 10 mA) 4 (0 to 5 V dc)
H2C02T	PXSC32	PXSV21	4 (0 to 10 mA) 4 (0 to 40 V dc)
H2C02U	PXSC32	PXSC11	4 (0 to 10 mA) 4 (4 to 20 mA)
H2C02V	PXSC32	PXSC21	4 (0 to 10 mA) 4 (0 to 1 mA)
H2C02W	PXSC32	PXSC32	8 (0 to 10 mA)
H2C02X	PXSC32	PXSD11	4 (0 to 10 mA) 4 (TC, mV)
H2C02Y	PXSC32	38000032	4 (0 to 10 mA) 4 (0 to 1 V dc)
H2C02Z	PXSC32	PXSR11,21,31	4 (0 to 10 mA) 4 (RTD)
H2D02A	PXSD11	PXSV11	4 (TC, mV) 4 (0 to 5 V dc)
H2D02B	PXSD11	PXSV21	4 (TC, mV) 4 (0 to 40 V dc)
H2D02C	PXSD11	PXSC11	4 (TC, mV) 4 (4 to 20 mA)
H2D02D	PXSD11	PXSC21	4 (TC, mV) 4 (0 to 1 mA)
H2D02E	PXSD11	PXSC32	4 (TC, mV) 4 (0 to 10 mA)

Table 7 - PXIA91 (Analog Input FBMs) (Continued)

H2D02G	PXSD11	38000032	4 (TC, mV) 4 (0 to 1 V dc)
H2D02H	PXSD11	PXSR11,21,31	4 (TC, mV) 4 (RTD)
H2J02A	PXSJ11	PXSV11	4 (TC Reference) 4 (0 to 5 V dc)
H2J02B	PXSJ11	PXSV21	4 (TC Reference) 4 (0 to 40 V dc)
H2J02C	PXSJ11	PXSC11	4 (TC Reference) 4 (4 to 20 mA)
H2J02D	PXSJ11	PXSC21	4 (TC Reference 4 (0 to 1 mA)
H2J02E	PXSJ11	PXSC32	4 (TC Reference) 4 (0 to 10 mA)
H2J02F	PXSJ11	PXSD11	4 (TC Reference) 4 (TC, mV)
H2J02G	PXSJ11	38000032	4 (TC Reference 4 (0 to 1 V dc)
H2J02H	PXSJ11	PXSR11,21,31	4 (TC Reference) 4 (RTD)
H2M01D	PXSC11	PXSC11	8 (4 to 20 mA)
H2M02	PXSD11	PXSD11	8 (TC, mV)
H2M02B	PXSV21	PXSV21	8 (0 to 40 V dc)
H2M03	PXSR11	PXSR11,21,31	8 (RTD)
H2M03A	PXSR11,21,31	PXSV11	4 (RTD) 4 (0 to 5 V dc)
H2M03B	PXSR11,21,31	PXSV21	4 (RTD) 4 (0 to 40 V dc)
H2M03C	PXSR11,21,31	PXSC11	4 (RTD) 4 (4 to 20 mA)
H2M03D	PXSR11,21,31	PXSC21	4 (RTD) 4 (0 to 1 mA)
H2M03E	PXSR11,21,31	PXSC32	4 (RTD) 4 (0 to 10 mA)
H2M03F	PXSR11,21,31	PXSD11	4 (RTD) 4 (TC, mV)

Table 7 - PXIA91 (Analog Input FBMs) (Continued)

H2M03G	PXSR11,21,31	38000032	4 (RTD) 4 (0 to 1 V dc)
H2V02B	PXSV11	PXSV21	4 (0 to 5 V dc) 4 (0 to 40 V dc)
H2V02C	PXSV11	PXSC11	4 (0 to 5 V dc) 4 (4 to 20 mA)
H2V02D	PXSV11	PXSC21	4 (0 to 5 V dc) 4 (0 to 1 mA)
H2V02E	PXSV11	PXSC32	4 (0 to 5 V dc) 4 (0 to 10 mA)
H2V02F	PXSV11	PXSD11	4 (0 to 5 V dc) 4 (TC, mV)
H2V02G	PXSV11	38000032	4 (0 to 5 V dc) 4 (0 to 1 V dc)
H2V02H	PXSV11	PXSR11,21,31	4 (0 to 5 V dc) 4 (RTD)
H2V02J	PXSV21	PXSV11	4 (0 to 40 V dc) 4 (0 to 5 V dc)
H2V02L	PXSV21	PXSC11	4 (0 to 40 V dc) 4 (4 to 20 mA)
H2V02M	PXSV21	PXSC21	4 (0 to 40 V dc) 4 (0 to 1 mA)
H2V02N	PXSV21	PXSC32	4 (0 to 40 V dc) 4 (0 to 10 mA)
H2V02P	PXSV21	PXSD11	4 (0 to 40 V dc) 4 (TC, mV)
H2V02Q	PXSV21	38000032	4 (0 to 40 V dc) 4 (0 to 1 V dc)
H2V02R	PXSV21	PXSR11,21,31	4 (0 to 40 V dc) 4 (RTD)
H2X02A	38000032	PXSV11	4 (0 to 1 V dc) 4 (0 to 5 V dc)
H2X02B	38000032	PXSV21	4 (0 to 1 V dc) 4 (0 to 40 V dc)
H2X02C	38000032	PXSC11	4 (0 to 1 V dc) 4 (4 to 20 mA)

Table 7 - PXIA91 (Analog Input FBMs) (Continued)

H2X02D	38000032	PXSC21	4 (0 to 1 V dc) 4 (0 to 1 mA)
H2X02E	38000032	PXSC32	4 (0 to 1 V dc) 4 (0 to 10 mA)
H2X02F	38000032	PXSD11	4 (0 to 1 V dc) 4 (TC, mV
H2X02G	38000032	38000032	8 (0 to 1 V dc)
H2X02H	38000032	PXSR11,21,31	4 (0 to 1 V dc) 4 (RTD)

Functional Specifications – Common to All Foxboro DCS FBMs

Calibration Requirements	Calibration of the modules is not required.
Communication	Redundant IEEE P1118 Fieldbus
Process I/O Capacity	**Field Control Processor 280 (FCP280)**: 128 Foxboro DCS FBMs maximum (depending on scan periods). Up to 40 Migration Foxboro DCS FBMs behind H3SFBI or a redundant pair of H3SFBIs.

H2C02 (Analog Input) Functional Specifications

Power Requirements	• Input Voltage Range: 22.5 to 30 V dc • Consumption: 7.0 W • Heat Dissipation: 7.0 W
Input Channel	• Signal and Rated Mean Accuracy: Each multiple range input channel individually jumper selectable. See *H2C02 (Analog Input) Signal Ranges, page 18* and *Table 8. H2C02 (Analog Input) Rated Mean Accuracy, page 19*. • Resolution: 12 to 15 bits, programmable • Isolation: 600 V ac between any channel and earth (ground), or between channels. **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** The channel isolation statement does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

Table 8 - H2C02 (Analog Input) Signal Ranges

Model	Signal	
	Channel 1–4	**Channel 5–8**
H2C02A	4 to 20.4 mA	0 to 5 V dc or ±5 V dc
H2C02B	4 to 20.4 mA	0 to 40 V dc or ±40 V dc
H2C02D	4 to 20.4 mA	0 to 1 mA
H2C02E	4 to 20.4 mA	0 to 10 mA
H2C02F	4 to 20.4 mA	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc
H2C02G	4 to 20.4 mA	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt
H2C02H	4 to 20.4 mA	0 to 1 V dc or ±1 V dc
H2C02J	0 to 1 mA	0 to 5 V dc or ±5 V dc
H2C02K	0 to 1 mA	0 to 40 V dc or ±40 V dc
H2C02L	0 to 1 mA	4 to 20.4 mA
H2C02M	0 to 1 mA	0 to 1 mA
H2C02N	0 to 1 mA	0 to 10 mA
H2C02P	0 to 1 mA	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc
H2C02Q	0 to 1 mA	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt
H2C02R	0 to 1 mA	0 to 1 V dc or ±1 V dc
H2C02S	0 to 10 mA	0 to 5 V dc or ± 5 V dc
H2C02T	0 to 10 mA	0 to 40 V dc or ± 40 V dc
H2C02U	0 to 10 mA	4 to 20.4 mA
H2C02V	0 to 10 mA	0 to 1 mA
H2C02W	0 to 10 mA	0 to 10 mA
H2C02X	0 to 10 mA	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc
H2C02Y	0 to 10 mA	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt
H2C02Z	0 to 10 mA	0 to 1 V dc or ±1 V dc

Table 9 - Table 8. H2C02 (Analog Input) Rated Mean Accuracy

Model	Rated Mean Accuracy	
	Channel 1–4	**Channel 5–8**
H2C02A	±0.05% of span	±0.05% of span
H2C02B	±0.05% of span	±0.05% of span
H2C02D	±0.05% of span	±0.05% of span
H2C02E	±0.05% of span	±0.05% of span
H2C02F	±0.05% of span	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)
H2C02G	±0.05% of span	±0.025% of span (±0.08)
H2C02H	±0.05% of span	±0.05% of span
H2C02J	±0.05% of span	±0.05% of span
H2C02K	±0.05% of span	±0.05% of span
H2C02L	±0.05% of span	±0.05% of span
H2C02M	±0.05% of span	±0.05% of span
H2C02N	±0.05% of span	±0.05% of span
H2C02P	±0.05% of span	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)
H2C02Q	±0.05% of span	±0.025% of span (±0.08)
H2C02R	±0.05% of span	±0.05% of span
H2C02S	±0.05% of span	±0.05% of span
H2C02T	±0.05% of span	±0.05% of span
H2C02U	±0.05% of span	±0.05% of span
H2C02V	±0.05% of span	±0.05% of span
H2C02W	±0.05% of span	±0.05% of span
H2C02X	±0.05% of span	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)
H2C02Y	±0.05% of span	±0.025% of span (±0.08)
H2C02Z	±0.05% of span	±0.05% of span

H2D02 (Analog Input) Functional Specifications

Power Requirements	• Input Voltage Range: 22.5 to 30 V dc • Consumption: 7.0 W • Heat Dissipation: 7.0 W
Input Channel	• Signal and Rated Mean Accuracy: See *H2D02 (Analog Input) Signal Ranges, page 21* and *H2D02 (Analog Input) Rated Mean Accuracy, page 21*. • Resolution: 12 to 15 bits, programmable • Isolation: 600 V ac between any channel and earth (ground), or between channels. **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** The channel isolation statement does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

Table 10 - H2D02 (Analog Input) Signal Ranges

Model	Signal	
	Channel 1–4	**Channel 5–8**
H2D02A	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc	0 to 5 V dc or ±5 V dc
H2D02B	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc	0 to 40 V dc or ±40 V dc
H2D02C	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc	4 to 20.4 mA
H2D02D	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc	0 to 1 mA
H2D02E	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc	0 to 10 mA
H2D02G	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 V dc	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt
H2D02H	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc	0 to 1 V dc or ±1 V dc

Table 11 - H2D02 (Analog Input) Rated Mean Accuracy

Model	Rated Mean Accuracy	
	Channel 1–4	**Channel 5–8**
H2D02A	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)	±0.05% of span
H2D02B	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)	±0.05% of span
H2D02C	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)	±0.05% of span
H2D02D	±0.035% of span (0.5% or 0 to 100 mV and ±100 mV)	±0.05% of span
H2D02E	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV	±0.05% of span
H2D02G	±0.035% of span (0.5% or 0 to 100 mV and ±100 mV)	±0.025% of span (±0.08 Ω)
H2D02H	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)	±0.05% of span

H2J02 (Analog Input) Functional Specifications

Power Requirements	• Input Voltage Range: 22.5 to 30 V dc • Consumption: 7.0 W • Heat Dissipation: 7.0 W
Input Channel	• Signal and Rated Mean Accuracy: See *H2J02 (Analog Input) Signal Ranges, page 23* and *H2J02 (Analog Input) Rated Mean Accuracy, page 23*. • Resolution: 12 to 15 bits, programmable • Isolation: 600 V ac between any channel and earth (ground), or between channels. **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** The channel isolation statement does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

Table 12 - H2J02 (Analog Input) Signal Ranges

Model	Signal	
	Channel 1–4	**Channel 5–8**
H2J02A	Reference RTD for TC cold junction compensation	0 to 5 V dc or ±5 V dc
H2J02B	Reference RTD for TC cold junction compensation	0 to 40 V dc or ±40 V dc
H2J02C	Reference RTD for TC cold junction compensation	4 to 20.4 mA
H2J02D	Reference RTD for TC cold junction compensation	0 to 1 mA
H2J02E	Reference RTD for TC cold junction compensation	0 to 10 mA
H2J02F	Reference RTD for TC cold junction compensation	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc
H2J02G	Reference RTD for TC cold junction compensation	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt
H2J02H	Reference RTD for TC cold junction compensation	0 to 1 V dc or ±1 V dc

Table 13 - H2J02 (Analog Input) Rated Mean Accuracy

Model	Rated Mean Accuracy	
	Channel 1–4	**Channel 5–8**
H2J02A	±0.025% of span (±0.08 Ω)	±0.05% of span
H2J02B	±0.025% of span (±0.08 Ω)	±0.05% of span
H2J02C	±0.025% of span (±0.08 Ω)	±0.05% of span
H2J02D	±0.025% of span (±0.08 Ω)	±0.05% of span
H2J02E	±0.025% of span (±0.08 Ω)	±0.05% of span
H2J02F	±0.025% of span (±0.08 Ω)	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)
H2J02G	±0.025% of span (±0.08 Ω)	±0.025% of span (±0.08 Ω)
H2D02H	±0.025% of span (±0.08 Ω)	±0.05% of span

H2M01A,B,C,D (Analog Input) Functional Specifications

Power Requirements	• Input Voltage Range: 22.5 to 30 V dc • Consumption: 6.5 W • Heat Dissipation: 6.5 W
Input Channel (8 Channels)	• H2M01A: 0 to 5 V dc, 1 to 5 V dc, or ±5 V (jumper selectable per channel) • H2M01B: 4 to 20.4 mA • H2M01C: 4 to 20.4 mA (Powered) • H2M01D: 4 to 20.4 mA (individually isolated channels) • Rated Mean Accuracy: ±0.05% of span • Resolution: 12 to 15 bits, programmable

H2M02,B,E (Analog Input) Functional Specifications

Power Requirements	• Input Voltage Range: 22.5 to 30 V dc • Consumption: 8.0 W • Heat Dissipation: 8.0 W
Input Channel	• Signal and Rated Mean Accuracy: See *H2M02,B,E (Analog Input) Signal Ranges, page 25* and *H2M02,B, E (Analog Input) Rated Mean Accuracy, page 26*. • Resolution: 12 to 15 bits, programmable • Isolation: 600 V ac between any channel and earth (ground), or between channels. **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** The channel isolation statement does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

Table 14 - H2M02,B,E (Analog Input) Signal Ranges

Model	Signal	
	Channel 1–4	**Channel 5–8**
H2M03	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	0 to 320 Ω Pt, 0 to 30 Ω Cu, 120 Ω Ni,
H2M03A	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	0 to 5 V dc or ±5 V dc
H2M03B	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	0 to 40 V dc or ±40 V dc
H2M03C	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	4 to 20.4 mA
H2M03D	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	0 to 1 mA
H2M03E	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	0 to 10 mA
H2M03F	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	-10.5 to 71.419 mV dc or 0 to 100 mV dc or ±100 mV dc
H2M03G	0 to 30 Ω Cu, 120 Ω Ni, 0 to 320 Ω Pt	0 to 1 V dc or ±1 V dc

Table 15 - H2M02,B,E (Analog Input) Rated Mean Accuracy

Model	Rated Mean Accuracy	
	Channel 1–4	**Channel 5–8**
H2M03	±0.025% of span (±0.08 Ω)	±0.025% of span (±0.08 Ω)
H2M03A	±0.025% of span (±0.08 Ω)	±0.05% of span
H2M03B	±0.025% of span (±0.08 Ω)	±0.05% of span
H2M03C	±0.025% of span (±0.08 Ω)	±0.05% of span
H2M03D	±0.025% of span (±0.08 Ω)	±0.05% of span
H2M03E	±0.025% of span (±0.08 Ω)	±0.05% of span
H2M03F	±0.025% of span (±0.08 Ω)	±0.035% of span (0.5% for 0 to 100 mV and ±100 mV)
H2M03G	±0.025% of span (±0.08 Ω)	±0.05% of span

H2M04 (Analog Output) Functional Specifications

Power Requirements	• Input Voltage Range: 22.5 to 30 V dc • Consumption: 6.5 W • Heat Dissipation: 5.2 W
Output Channel (4 Channels)	0 to 20.4 mA dc • Rated Mean Accuracy: ±0.05% of span • Linearity Error: ±0.025% (monotonic) • Resolution: 12 bits • Output Load (Maximum): 750 Ω • Compliance Voltage: 18 V dc nominal at 20 mA at I/O field terminals • Settling Time: 100 ms to settle within a 1% band of steady state for a 10 to 90% output step change

H2M06, H2M06A (Pulse Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 4.5 W • Heat Dissipation: 4.5 W
Input Channel (4 Channels)	Contact Input • Contact Range: Open (off) and Closed (on) • Open Circuit Voltage: ◦ *H2M06*: 24 V dc or 48 V dc (externally supplied) ◦ *H2M06A*: 125 V dc (externally supplied) • Short Circuit Current: ◦ *H2M06*: 4.5/9 mA (24/48 V dc) ◦ *H2M06A*: 15 mA (125 V dc) • On-State Resistance: 1 kΩ (maximum) • Off-State Resistance: 100 kΩ (minimum) • Isolation (Input to Earth (Ground)): ◦ *H2M06*: 500 V ac ◦ *H2M06A*: 600 V ac **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** This does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac, 60 V dc (for H2M06), or 125 V dc (for H2M06A) violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.** • Counter Range: ◦ *H2M06*: 0 to 12.5 K counts per second

	◦ *H2M06A*: 0 to 12.5 K counts per second

H2M07 (Digital Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 2.5 W • Heat Dissipation: 2.5 W
Input Channel (16 Channels)	Contact Input • Contact Range: Open (off) and Closed (on) • Open Circuit Voltage: 5 V dc (jumper select input source or power bus) • Short Circuit Current: 2.5 mA • On-State Resistance: 1 kΩ (maximum) • Off-State Resistance: 100 kΩ (minimum) • Filter Time: Configurable (4, 8, 16, or 32 ms) • Isolation: 600 V ac inputs to earth (ground) **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** This does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

H2M07E (Digital Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 2.5 W • Heat Dissipation: 2.5 W
Input Channel (16 Channels)	Contact Input • Contact Range: Open (off) and Closed (on) • Open Circuit Voltage: 24 V dc (supplied at termination panel) • Short Circuit Current: 2.5 mA • On-State Resistance: 1 kΩ (maximum) • Off-State Resistance: 100 kΩ (minimum) • Filter Time: Configurable (4, 8, 16, or 32 ms) • Isolation: Input to earth (ground), 500 V ac **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** This does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

H2M09 (Digital Output) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 4.0 W • Heat Dissipation: 4.0 W
Output Channel (8 Channels)	Contact output, solid state switch • Applied Voltage: 60 V dc (maximum) • Load Current: 145 mA (maximum) • Off-State Leakage Current: 0.1 mA

H2M17 (AI/AO/DO) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 5.75 W • Heat Dissipation: 4.6 W
Analog Input Channels (4 Channels)	• Range: 0 to 5 V dc • Rated Mean Accuracy: ±0.05% of span • Resolution: 12 to 15 bits, programmable
Analog Output Channels (2 Channels)	0 to 20.4 mA dc • Rated Mean Accuracy: ±0.05% of span • Linearity Error: ±0.025% of span (monotonic) • Resolution: 12 bits • Output Load (Maximum): 750 Ω • Compliance Voltage: 18 V dc nominal at 20 mA at I/O field terminals • Settling Time: 100 ms to settle within a 1% band of steady
Contact Output Channels (4 Channels)	• Applied Voltage: 60 V dc (maximum) • Load Current: 50 mA (maximum) • Off-State Leakage Current: 0.25 mA

H2M24 (Digital Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 3.0 W • Heat Dissipation: 6.0 W
Input Channel (16 Channels)	Contact input • Contact Range: Open (off) and Closed (on) • Open Circuit Voltage: 125 V dc maximum, externally supplied • Short Circuit Current: 2.5 mA at 24 V; 5.5 mA at 48 V; 14.2 mA at 125 V • On-State Resistance: 10 kΩ at 24 V; 30 kΩ at 48 V; 90 kΩ at 125 V • Off-State Resistance: 20 kΩ at 24 V; 40 kΩ at 48 V; 120 kΩ at 125 V • Filter Time: Configurable (4, 8, 16, or 32 ms) • Isolation: Input to earth (ground), 600 V ac **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** This does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 125 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

H2M26 (Digital Output) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 3.0 W • Heat Dissipation: 3.0 W
Output Channel (8 Channels)	Relay output • Applied Voltage: 125 V dc (maximum) • Load Current: 1.0 A (maximum) • Off-State Leakage Current: 0 mA • Isolation: Output to earth (ground), 1000 V ac; output to output, 2000 V ac **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** This does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 125 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

H2SFBI (Fieldbus Isolator) Functional Specifications

Maximum Number of Foxboro DCS FBMs Driven	40
Maximum Length of Local Bus	9 m (30 ft)
Maximum Input Power Voltage	+30 V dc
Maximum Operating Current	100 mA
Maximum Power Dissipation	2.75 W
Minimum Isolation Voltage	2500 V rms
Holdup Time at 24 V dc	250 ms (as provided by the Honeywell power supply)

H3M01 (Analog Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 4.0 W • Heat Dissipation: 4.0 W
Input Channel (16 Channels)	0 to 5 V dc, 1 to 5 V dc • Rated Mean Accuracy: ±0.05% of span • Resolution: 12 bits

H3M02A (Analog Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 4.0 W • Heat Dissipation: 4.0 W
Input Channel (16 Channels)	-10.5 to 71.4 mV, 0 to 100 mV (jumper selectable) • Thermocouple Types: J, K, E, T, B, S, R, N • Rated Mean Accuracy: ±0.035% of span • Resolution: 12 bits • Isolation: Input to earth (ground), 600 V ac; input to input, 600 V ac **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** This does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

H3M03 (Analog Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 8.0 W • Heat Dissipation: 8.0 W
Input Channel (16 Channels)	-10.5 to 71.4 mV, 0 to 5 V dc, 0 to 100 mV • Thermocouple Types: J, K, E, T, B, S, R, N • RTD (3 Wire): ◦ Platinum 100 Ω DIN (4376) ◦ Platinum 100 Ω JIS (C-1604) ◦ Nickel 120 Ω Ed #7 ◦ Copper 10 Ω ◦ Each channel jumper selectable • Rated Mean Accuracy: ◦ ±0.035% of span (TC) ◦ ±0.025% of span (RTD Channels) ◦ ±0.05% of span (mV and 0 to 5 V Channels) • Resolution: 12 to 15 bits, programmable • Isolation: Input to earth (ground), 600 V ac; input to input, 600 V ac **⚠⚠DANGER** **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** This does not imply that these channels are intended for connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electrical shock. **Failure to follow these instructions will result in death or serious injury.**

H3M06 (Pulsed Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 5.0 W • Heat Dissipation: 5.0 W
Input Channel (8 Channels)	Designed to be compatible with Honeywell Pulse Input FTAs **Rate**: Up to 25 kHz (jumper selectable.

H3M07 (Digital Input) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 4.0 W • Heat Dissipation: 4.0 W
Input Channel (32 Channels)	Designed to be compatible with Honeywell Pulse Input FTAs

H3M09 (Digital Output) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 4.0 W • Heat Dissipation: 4.0 W
Output Channel (16 Channels)	Designed to be compatible with Honeywell Pulse Input FTAs • Applied Voltage: 21 to 27 V dc • Load Current: 0.25 A (maximum) • Off-State Leakage Current: 0.10 mA

H3M37 (Analog Output) Functional Specifications

Power Requirements	• Input Voltage: 22.5 to 30 V dc • Consumption: 5.0 W • Heat Dissipation: 5.0 W
Output Channel (8 Channels)	0 to 20.4 mA dc (Designed to be compatible with Honeywell Redundant and Non-Redundant Analog Output FTAs.) • Rated Mean Accuracy: ±0.05% of span • Resolution: 12 bits

H3SFBI (Fieldbus A/B Switch Extender) Functional Specifications

Maximum Number of Foxboro DCS FBMs Driven	40
Maximum Length of Local Bus	9 m (30 ft)
Maximum Input Power Voltage	+30 V dc
Maximum Operating Current	500 mA
Maximum Power Dissipation	3.0 W
Minimum Isolation Voltage	2500 V rms
Holdup Time at 24 V dc	250 ms (as provided by the Honeywell power supply)

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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