Foxboro Evo™ Process Automation System

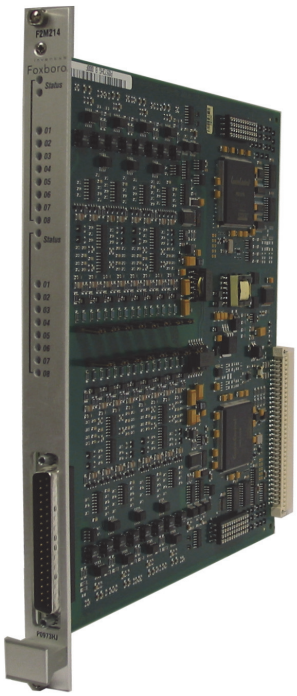
Product Specifications

Foxboro®

by Schneider Electric

PSS 31H-3A2

DCS Fieldbus Module for Migration of Fisher PROVOX® Systems



Foxboro Evo™ distributed control system (DCS) Fieldbus Modules (FBMs) allow migration from Fisher PROVOX® process input and output (I/O) components to a Foxboro Evo process control system.

OVERVIEW

The Foxboro Evo system DCS FBM family provides a migration path from Fisher PROVOX® process input and output components to Foxboro Evo display and supervisory functions. This can save significant cost over total system replacement by preserving existing process interface and wiring and minimizing process downtime.

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

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

The Foxboro Evo system DCS FBM product includes appropriate connectors to enable integration of original process signals to the Foxboro Evo system while keeping the field interface and wiring. It provides access to all process signals connected to the PROVOX system by providing the connection between the Field Termination Assemblies (FTAs) and the Foxboro Evo system. All process signals become fully integrated into the Foxboro Evo system. Process data is used for operator display, history, alarming and control.

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

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

FEATURES

Key features of the Foxboro Evo system DCS FBMs are:

- DCS FBMs plug directly into an existing control I/O nest to replace process I/O module cards
- Migration from proprietary DCS to a state-of-the-art open Foxboro Evo system
- Advanced Foxboro Evo system control with single point of configuration
- More direct control performance than any gateway device offers
- Single vendor service and supply.

FUNDAMENTAL PRINCIPLE

The Company 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 PROVOX migration consists of new Foxboro Evo system DCS FBMs and new Fieldbus Isolators. This allows migration to Foxboro Evo control, display and application products while retaining original process termination and field I/O wiring. All original process I/O capability of the PROVOX Control Units, I/O File Units, and Input/Output Units functions are replaced by FBM cards and direct Foxboro Evo control processor scanning and control.

New Foxboro Evo system DCS FBMs plug directly into existing PROVOX Control Unit Packages and I/O File Units in place of PROVOX I/O Unit cards. These DCS FBMs pass process measurement and output signals to and from an Foxboro Evo control processor. The Foxboro Evo control processor provides control in place of the PROVOX Control Units. This saves customers significant cost over a total system replacement by preserving existing process interfaces and wiring and minimizing process downtime.

PROVOX Series 10 UOC, UOC+, IFC, MUX Subsystems

The I/O card file, used to house I/O cards, is reused to house the Foxboro Evo DCS FBM cards. The original I/O card termination units mounted on the front of the I/O cards are reused. All I/O wiring connected to the I/O card termination units remains in place.

I/O units are removed and their termination assemblies detached. Each unit is replaced by a corresponding Foxboro Evo system DCS FBM. The original termination assembly, including the undisturbed process wiring connections, is reattached to the new DCS FBM. This provides original I/O functionality of the process inputs and outputs. The DCS FBM is powered by the original Controller or Multiplexer Unit power bus. Fieldbus Isolators are housed in depopulated UOC, UOC+, IFC, or MUX nest assemblies. Foxboro Evo Fieldbus provides communication to Foxboro Evo control processors which take over all control and communication functions. Migration is accomplished using the UOC, UOC+, IFC Migration Kit (P0914NT), the MUX Control Nest Migration Kit (P0914NU), and the MUX Card File Migration Kit (P0914NV). The following are optional Foxboro Evo system DCS FBMs.

Model	Replaces	Termination Type	Description
F1M01A	DM6311X1-A1-B1	A	8AI 1 to 5 V dc, single-ended
	DM6321	A (C to V)	8AI 4 to 20 mA, single-ended
	DM6321	C	8AI 4 to 20 mA, single-ended (with two wire transmitter power)
F1M01E	DM6311X1-A2-B1	A	8AI 0 to 10 V dc, single-ended
F1M01C	DM6312X1-A1-B1	B	4AI 1 to 5 V dc, (isolated channels)
	DM6322X1-A1-B1	B (C to V)	4AI 4 to 20 mA, (isolated channels
F1M01F	DM6312X1-A2-B1	B	4AI 0 to 10 V dc (isolated channels)
F1M02	DM6341	B	4AI -10 to 70 mV (isolated channels)
	DM6351	BJ	4TC Type J (isolated channels)
	DM6352	BK	4TC Type K (isolated channels)
	DM6353	BT	4TC Type T (isolated channels)
	DM6354	BE	4TC Type E (isolated channels)
	DM6355	BR	4TC Type R (isolated channels)
F1M03	DM6331	A	4RTD 0 to 320 Ω
F1M04A	DM6411	A	4AO 1 to 5 V dc
F1M04B	DM6421	A	4AO 4 to 20 mA

Model	Replaces	Termination Type	Description
F1M06	DM6371	A	4PI 4 to 30 V dc, pulse input
	DM6372	D	4PI dry contact pulse input
	DM6373	F	4PI field transmitter pulse input
F1M07	DM6361	A	8DI 0 to 30 V dc
	DM6362	D	8DI dry contact
	DM6363	G	8DI 120 V ac
F1M09	DM6461	A	8DO 0 to 30 V dc at 100 mA
	DM6462	Internal Relay	8DO internal relay
	DM6463	External Relay	8DO external relay

PROVOX Regulatory Controller Units

Controller types consist of:

- Configurable
- Computing
- Interactive Two Wide
- Interactive Three Wide PIO
- Interactive Three Wide DIO
- Interactive Four Wide.

Foxboro Evo DCS FBM Migration Kits replace the indicated controller card sets and are housed in the original controller files. Original I/O wiring to the controller file terminator panels stays in place. Power is derived from the original rack power supply. Each DCS FBM is powered by its own dc to dc converter. Fieldbus Isolators are housed in the controller file nest assemblies. Foxboro Evo Fieldbus provides communication to Foxboro Evo control processors which take over all control and communication functions. Migration is accomplished using the Regulatory Controller Migration Kit (P0915XT).

The following are optional Foxboro Evo system DCS FBMs.

Model	Replaces	Description
FRM701	CL7001 Configurable Controller	4AI, 1AO, 2DI, 7DO
FRM711	CL7011 Computing Controller	5AI, 2AO, 4DI, 2DO
1-FRMMPU 1-FRMJMP	Two Wide Interactive Controller	10AI, 3AO, 4DI, 4DO
2-FRMMPU 1-FRMJMP	Three Wide Interactive Controller with Discrete I/O	10AI, 3AO, 4DI, 8DO
2-FRMMPU 1-FRMJMP	Three Wide Interactive Controller with Process I/O	15AI, 5AO, 4DI, 8DO
2-FRMMPU 2-FRMJMP	Four Wide Interactive Controller with Process I/O	20AI, 6AO, 8DI, 8DO

PROVOX 20 Series microPROVOX (SR90)

The PROVOX Series 20 (SR90) Controller is made up of three devices:

- Model 30 microPROVOX (MUX) Multiplexer Controller for monitoring of discrete, analog I/O and motor control through Discrete Control Devices (DCDs)
- Model 50 microPROVOX Integrated Function Controller (IFC) for continuous control applications
- Model 70 microPROVOX Unit Operations Controller (UOC) for batch applications.

Note that the above controllers are decommissioned with migration.

Controller I/O Card File

The original PROVOX 20 Series control I/O subsystem cards interface the above controllers to the various process termination panels. The I/O cards interface to the termination panels through D-shell

connectors on the edge of the I/O card. The cards are installed in CP6701 I/O Card Files.

There are 14 I/O cards per card file and up to 16 card files per controller. The CP6701 I/O card files are reused to house the Foxboro Evo DCS FBM cards.

There are four I/O card types used in the original system:

- Discrete I/O Card
- Analog I/O Card
- Analog Input Card
- External Interface Card.

The external interface card interfaces to serial devices such as PLCs and weight scales. In the current implementation of the PROVOX system, this function is handled by Field Device System Integrator (FDSI) modules (FBM233). In the original implementation of this system, this function was handled by the I/A Series® Integrator 30 (IG30) within a separate enclosure. Standard software for the IG30 supports over 100 different devices and various interfaces.

The discrete I/O, analog I/O, and analog input cards are replaced with Foxboro Evo DCS FBM cards. All I/O wiring connected to the I/O card termination panels remain in place. Power is derived from the optionally redundant F2MDOR Diode/Jumper cards which replace the original rack power supply. Each DCS FBM has a dc to dc converter. Original I/O card file power converters are not used. Fieldbus Isolators, mounted in a F2DFBC Dual Baud Fieldbus Isolator Carrier Board, are housed in the CP6701 I/O card file nest assemblies.

NOTE

The F2DFBI Fieldbus Isolator, F2DFBC Dual Baud Fieldbus Isolator Carrier Board (P0973HN) and the F2MDOR Diode/Jumper card are ordered together as part of the DCS Fieldbus Module subsystem migration kit (P0973KB).

The Foxboro Evo Fieldbus provides communication to the Foxboro Evo system CPs which take over all control and communications functions.

Migration is accomplished using the following Foxboro Evo system DCS FBMs, and their supported hardware.

Model	Replaces	Description
F2M214	CL6821	16AI
F2M215[(a)]		8AO
F2M239	CL6721	16DI, 16DO, 8DI/8DO

(a) F2M215 must be ordered as part of kit P0973JY, as this kit includes an F2MAOA Analog Output Adapter which is installed between the analog output termination panel and its output cable to the F2M215, to provide an additional connection to the panel's Power Supply Common (PSC). F2M215 requires this connection to the PSC.

F2M214 and F2M215 include a digital HART™ Frequency Shift Keying (FSK) modem dedicated to, respectively, each input or output channel for bi-directional digital communications with HART field devices, such as HART transmitters and other HART output devices.

F2M214 and F2M215 serve as a HART communications field device hosts, enabling the Foxboro Evo system to request and receive two digital messages per second from the field device. The message pass-through capability can be used to support HART universal, common practice, and device-specific commands, but not the burst communication mode. These commands are implemented using the Intelligent Field Device Configurator Foxcom™ and HART™ Protocols (IFDC — refer to PSS 21S-8A3 B3 for details).

FUNCTIONAL SPECIFICATIONS – COMMON TO ALL DCS FBMs

Calibration Requirements
Calibration of the DCS Fieldbus Modules is not required.

Communication
Redundant IEEE P1118 Fieldbus

Process I/O Capacity

FIELD CONTROL PROCESSOR 270 (FCP270)
128 DCS FBMs maximum (depending on scan periods)

Z-MODULE CONTROL PROCESSOR 270 (ZCP270) WITH FCM100E
128 DCS FBMs maximum (depending on scan periods)

F2M214 ANALOG/HART INPUT FBM FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
24 V dc ±5% maximum

CONSUMPTION
5.4 W

HEAT DISSIPATION
5.4 W

Part Number
P0973HJ

Analog Input Channels
Sixteen single-ended group isolated input channels

SIGNAL RANGE
0 to 20 mA dc (0 to 64,000 counts)

RATED MEAN ACCURACY
± 0.13% of full scale (module is +/- 0.03%, the sense resistor is +/- 0.1%)

OVER-RANGE CAPABILITY
20.4 mA dc (65,280 counts), 36 mA without damage when using external power.

TEMPERATURE COEFFICIENT
0.005% per degree C (50 PPM/C)

RESOLUTION
15 bits

UPDATE RATE
100 msec

INTEGRATION TIME
500 msec

INPUT SIGNAL A/D CONVERSION
A multiplexed Sigma-Delta A to D converter performs signal conversion sequentially under module software control.

Analog Input Channels (Continued)

INPUT CHANNEL IMPEDANCE
250 Ω (minimum)

CURRENT SENSE RESISTOR
250 Ω

COMMUNICATIONS
Non-redundant, point-to-point, master/slave, asynchronous, half-duplex at 1200 baud (each channel).

ERROR CHECKING
Refer to HART Data Link Layer Specification, HCF_SPEC-81.

SPEED
2 messages per second (each channel)

MAXIMUM DISTANCE (INTERFACE TO FIELD DEVICE)
Meets HART FSK Physical Layer Specification HCF_SPEC-54, Revision 8.1 (up to 3048 m (10000 ft))

ANALOG INPUT TERMINATION PANELS
Compatible with the following termination panels:
CL6861 (Single) and CL6862 X1-A2 (Redundant) with analog input only
CL6863 and CL6864 with analog input (no HART)
CL6895-A1 and CL6896 with cubes
CL6859-X1-A5 for analog input and HART
NOTE: CL6881 and CL6882 are not compatible with the F2M214.

F2M215 ANALOG OUTPUT/HART FBM FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
24 V dc ±5% maximum

CONSUMPTION
7.5 W

HEAT DISSIPATION
3.0 W

Part Number

P0973HK

NOTE

The F2M215 is ordered as part of the F2M215 DCS Fieldbus Module migration kit (P0973JY), which includes the F2MAOA Analog Output Adapter cable (P0973JZ).

Analog Output Channels

Eight single-ended isolated channels

RANGE
0 to 20 mA dc

OVER-RANGE CAPABILITY
20.4 mA dc

Analog Output Channels (Continued)

RATED MEAN ACCURACY
±0.05% of span outputs (0.1 to 20 mA)

OUTPUT LOAD
750 Ω maximum

TEMPERATURE COEFFICIENT
50 PPM/C

OUTPUT RESOLUTION
13 bits

OUTPUT PROCESSING DELAY
30 msec. maximum

LOOP POWER SUPPLY PROTECTION
Loop power (per channel) is galvanically isolated channel-to-channel and to logic and ground. No external power option available.

ANALOG OUTPUT TERMINATION PANELS
Compatible with the following termination panels:
CL6871 and CL6872 with analog output and HART
CL6885 and CL6886 X1-A1 with analog output and HART

F2M239 DISCRETE FBM I/O FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
24 V dc ±5% maximum

CONSUMPTION
2.6 W

HEAT DISSIPATION
3.0 W

Part Number

P0973HL

Discrete Input Channels

Zero, eight or sixteen group isolated input channels

APPLIED VOLTAGE
24 V dc ±1%

ON-STATE
24 V dc ±1% maximum

SHORT CIRCUIT CURRENT
2.5 mA maximum

OFF-STATE LEAKAGE
0.1 mA maximum leakage current

INPUT SAMPLE TIME
1 msec

INPUT RANGE
0 to 30 V dc

INPUT LOGIC THRESHOLDS

Logic Zero (ON-State)
0 to 5 V dc

Logic One (OFF-State)
15 to 30 V dc

Current Input for Logic One
1 mA minimum at 15 V dc,
2.3 mA maximum at 30 V dc

Discrete Input Channels (Continued)

INPUT SOURCE RESISTANCE LIMITS

ON-State
1 kΩ (maximum) at 15 V dc

Off-State
100 kΩ (minimum) at 30 V dc

DISCRETE INPUT TERMINATION PANELS
Compatible with the following termination panels: CL6781, CL6783 and CL6784 I/O termination panels with plugin cubes CL6751-A7 input and CL6752-A2 output

Discrete Output Channels

Zero, eight or sixteen single-ended group isolated channels

APPLIED VOLTAGE
24 V dc maximum

ON-STATE LOAD CURRENT
60 mA maximum

ON-STATE VOLTAGE
0.2 V dc max. at 0.25 A dc (at card cable connector)

OFF-STATE LEAKAGE
0.1 mA maximum leakage current

OUTPUT SUPPLY VOLTAGE
30 V dc maximum output range

OUTPUT CONSTANT CURRENT
0.25 A dc maximum

OUTPUT INRUSH CURRENT
1.0 A dc max. for 20 msec

DISCRETE OUTPUT TERMINATION PANELS
Compatible with the following termination panels: CL6781, CL6783 and CL6784 I/O termination panels with plugin cubes CL6751-A7 input and CL6752-A2 output

F2DFBI (FIELDBUS ISOLATOR) FUNCTIONAL SPECIFICATIONS

Maximum Number of DCS FBMs Driven
14

Maximum Length of Fieldbus from Control Processor
305 m (1000 feet) (galvanically isolated) using twinaxial cable

Maximum Input Power Voltage
24 V dc +/-5%

Power Consumption
3.0 W (typical)

Power Dissipation
3.0 W (typical)

Data Rate
268 Kbps and 2 Mbps - Combines 268 Kbps and 2 Mbps data from I/O cards for transmission to control processor

Part Number
P0973HM

NOTE

The F2DFBI is ordered as part of the DCS Fieldbus Module subsystem migration kit (P0973KB), which includes the F2DFBC Dual Baud Fieldbus Isolator Carrier Board (P0973HN) and the F2MDOR Diode/Jumper Card (P0973HP).

No I/O cards (such as the F2M214, F2M215 and F2M239) are included in this kit. They must be ordered separately.

F1M01A, E, C, F (ANALOG INPUT) FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
7.7 W

HEAT DISSIPATION
7.7 W

Input Channels

FBM MODEL

F1M01A
Eight channels, single-ended; 1 to 5 V dc, when used with PROVOX termination type A; 4 to 20 mA, when used with PROVOX termination type A (C-V); 4 to 20 mA, with two wire transmitter power when used with PROVOX termination type C

FBM MODEL (CONTINUED)

F1M01E
Eight channels, single-ended; 0 to 10 V dc, when used with PROVOX termination type A

F1M01C
Four channels, isolated; 1 to 5 V dc, when used with PROVOX termination type B; 4 to 20 mA, when used with PROVOX termination type B (C-V)

F1M01F
Four channels, isolated; 0 to 10 V dc, when used with PROVOX termination type B

RATED MEAN ACCURACY
±0.05% of span

RESOLUTION
12 to 15 bits, programmable

F1M02 (ANALOG INPUT) FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE
21.0 to 29.0 V dc

CONSUMPTION
7.7 W

HEAT DISSIPATION
7.7 W

Input Channels

APPLIED VOLTAGE
–10 to 71.419 mV dc, when used with PROVOX termination type B

Thermocouples
E, J, K, T, R; when used with PROVOX termination panels BE, BJ, BT, BR, respectively

RATED MEAN ACCURACY
±0.05% of span

Input Channels (Continued)

RESOLUTION
12 to 15 bits, programmable

ISOLATION
The module withstands, without damage, a potential of 600 V ac applied for one minute between any channel and earth (ground), or between a given channel and any other channel.

CAUTION

This does not imply that these channels are intended for permanent 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 electric shock.

F1M03 (ANALOG INPUT, 4 RTD) FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
7.5 W

HEAT DISSIPATION
7.5 W

Input Channels

APPLIED RESISTANCE:
0 to 320 Ω, when used with PROVOX termination panel type A

RATED MEAN ACCURACY
±0.05% of span

Input Channels (Continued)

RESOLUTION
12 to 15 bits, programmable

ISOLATION
The module withstands, without damage, a potential of 600 V ac applied for one minute between any channel and earth (ground), or between a given channel and any other channel.

CAUTION

This does not imply that these channels are intended for permanent 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 electric shock.

F1M04A, B (ANALOG OUTPUT) FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
7.7 W

HEAT DISSIPATION
7.7 W

Output Channels

FBM MODEL

F1M04A
Four channels, single-ended, 1 to 5 V dc, when used with PROVOX termination panel type A

F1M04B
Four channels, single-ended, 4 to 20.4 mA, when used with PROVOX termination panel type A

RATED MEAN ACCURACY
±0.05% of span
LINEARITY ERROR
±0.025% of span

Output Channels (Continued)

RESOLUTION
12 bits

OUTPUT LOAD

F1M04A
750 Ω maximum

F1M04B
1000 Ω minimum

COMPLIANCE VOLTAGE
18.6 V dc nominal 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

F1M06 (PULSE INPUT) FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
4.4 W

HEAT DISSIPATION
4.4 W

Input Channels
Four channels, optically isolated

ON PULSE
3.5 to 30 V dc or contact closed

OFF PULSE
0.0 to 1.6 V dc or contact open
Compatible with PROVOX termination types: A, 0 to 30 V dc; D, dry contacts; F, field transmitter input

ON-STATE RESISTANCE
1.0 KΩ (maximum)

OFF-STATE RESISTANCE
100 KΩ (minimum)

Input Channels (Continued)

COUNTER RANGE
0 to 12.5 K counts per second

ISOLATION
The module withstands, without damage, a potential of 600 V ac applied for one minute between any channel and earth (ground), or between a given channel and any other channel.

CAUTION
This does not imply that these channels are intended for permanent 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 electric shock.

F1M07 (DISCRETE INPUT) FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
4.4 W

HEAT DISSIPATION
4.4 W

Input Channels

Eight channels, optically isolated

0 TO 30 V dc, WHEN USED WITH PROVOX TERMINATION TYPE A

Logic High
3.5 to 30 V dc
Logic Low
0 to 1.6 V dc

DRY CONTACT, WHEN USED WITH PROVOX TERMINATION TYPE D

Contact Range
Open (off) Closed (on)
On-State Resistance
1.0 KΩ (maximum)
Off-state Resistance
100 KΩ (minimum)

Input Channels (Continued)

120 V ac, WHEN USED WITH PROVOX TERMINATION TYPE G

Logic High
50 to 150 V ac
Logic Low
0 to 10 V ac

ISOLATION
The module withstands, without damage, a potential of 600 V ac applied for one minute between any channel and earth (ground), or between a given channel and any other channel.

CAUTION
This does not imply that these channels are intended for permanent 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 electric shock.

F1M09 (DIGITAL OUTPUT) FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
4.4 W

HEAT DISSIPATION
4.4 W

Output Channels

EIGHT INDEPENDENT CHANNELS
Compatible with PROVOX types A, internal relay and external relay termination panels. Specifications below are when used with type A termination panel.

APPLIED VOLTAGE
30 V dc (maximum) at type A termination panel

LOAD CURRENT
100 mA, steady state with type A termination panel

Output Channels (Continued)

OFF-STATE LEAKAGE CURRENT
0.25 mA (maximum) with type A termination panel

ISOLATION
The module withstands, without damage, a potential of 600 V ac applied for one minute between any channel and earth (ground), or between a given channel and any other channel.

CAUTION
This does not imply that these channels are intended for permanent 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 electric shock.

F1SFIA/F1SFIB (FIELDBUS ISOLATOR) FUNCTIONAL SPECIFICATIONS

Maximum Number of DCS FBMs Driven
40

Maximum Length of Local Bus
9 m (30 ft)

Maximum Input Power Voltage
30 V dc

Maximum Power Dissipation
2.75 W

Minimum Isolation Voltage
2500 V rms

FRM711 COMPUTING CONTROLLER FBM FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
3.8 W

HEAT DISSIPATION
3.8 W

Analog Input Channels
Five single-ended input channels

SIGNAL RANGE
1 to 5 V dc, 4 to 20 mA

RATED MEAN ACCURACY
±0.05% of span

RESOLUTION
12 bits

Discrete Input Channels
Four channels, optically isolated

APPLIED VOLTAGE
24 V dc nominal

ON-STATE
24 V dc nominal

ON-STATE RESISTANCE
1.0 KΩ (maximum)

OFF-STATE RESISTANCE
100 KΩ (minimum)

Analog Output Channels
Two channels

RANGE
0 to 20.4 mA (one channel)
1 to 5 V dc (one channel)

RATED MEAN ACCURACY
±0.05% of span

RESOLUTION
12 bits

OUTPUT LOAD

Current
735 Ω (maximum)

Voltage
3 KΩ (minimum)

COMPLIANCE VOLTAGE
18.6 V dc nominal at 20 mA at FTA terminals

SETTLING TIME
100 ms to settle within a 1% band of steady state for a 10 to 90% input step change

Discrete Output Channels
Two channels, optically isolated

APPLIED VOLTAGE RANGE
21 to 29 V dc, 24 V dc nominal

ON-STATE LOAD CURRENT
60 mA maximum

OFF-STATE LEAKAGE
0.25 mA maximum

FRM701 CONFIGURABLE CONTROLLER FBM FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
3.8 W

HEAT DISSIPATION
3.8 W

Analog Input Channels

Four single-ended input channels

SIGNAL RANGE
1 to 5 V dc, 4 to 20 mA

RATED MEAN ACCURACY
±0.05% of span

RESOLUTION
12 bits

Discrete Input Channels

0, 1, or 2 Channels, optically isolated, configured by on-board jumpers

APPLIED VOLTAGE
24 V dc nominal

ON-STATE
24 V dc nominal

ON-STATE RESISTANCE
1.0 KΩ (maximum)

OFF-STATE RESISTANCE
100 KΩ (minimum)

Analog Output Channels

One channel

RANGE
0 to 20.4 mA (one channel)

RATED MEAN ACCURACY
±0.05% of span

RESOLUTION
12 bits

OUTPUT LOAD
Current 735Ω (maximum)

COMPLIANCE VOLTAGE
18.6 V dc nominal at 20 mA at FTA terminals

SETTLING TIME
100 ms to settle within a 1% band of steady state for a 10 to 90% input step change

Discrete Output Channels

Three to seven channels, optically isolated, configured by on-board jumpers

APPLIED VOLTAGE RANGE
21 to 29 V dc, 24 V dc nominal

ON-STATE LOAD CURRENT
60 mA maximum

OFF-STATE LEAKAGE
0.25 mA maximum

FRMMPU FUNCTIONAL SPECIFICATIONS

Power Requirements

INPUT VOLTAGE RANGE
21.0 to 29.0 V dc

CONSUMPTION
3.8 W

HEAT DISSIPATION
3.8 W

Analog Input Channels

Ten single-ended input channels

SIGNAL RANGE
1 to 5 V dc, 4 to 20.4 mA

RATED MEAN ACCURACY
±0.05% of span

RESOLUTION
12 bits

Discrete Input Channels

Four channels, optically isolated

APPLIED VOLTAGE
24 V dc nominal

ON-STATE
24 V dc nominal

ON-STATE RESISTANCE
1.0 KΩ (maximum)

OFF-STATE RESISTANCE
100 KΩ (minimum)

Analog Output Channels

Three channels

RANGE
4 to 20.4 mA (two channel)
1 to 5 V dc (one channel)

RATED MEAN ACCURACY
±0.05% of span

RESOLUTION
12 bits

OUTPUT LOAD

Current
735 Ω (maximum)

Voltage
3 KΩ (minimum)

COMPLIANCE VOLTAGE
18.6 V dc nominal at 20 mA at FTA terminals

SETTLING TIME
100 ms to settle within a 1% band of steady state

Discrete Output Channels

Four channels, optically isolated

APPLIED VOLTAGE RANGE
21 to 29 V dc, 24 V dc nominal

ON-STATE LOAD CURRENT
60 mA maximum

OFF-STATE LEAKAGE
100 µA maximum leakage current

FRSFBI (FIELDBUS ISOLATOR) FUNCTIONAL SPECIFICATIONS

Maximum Number of DCS FBMs Driven
40

Maximum Length of Local Bus
9 m (30 ft)

Maximum Input Power Voltage
30 V dc

Maximum Power Dissipation
2.75 W

Minimum Isolation Voltage
2500 V rms

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature
0 to 60°C

Operating Relative Humidity
5 to 95% non-condensing

Storage Temperature
-40 to 70°C

Storage Relative Humidity
5 to 95% non-condensing

NOTE
These specifications are for all PROVOX FBM migration products.

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