Foxboro Evo™ Process Automation System

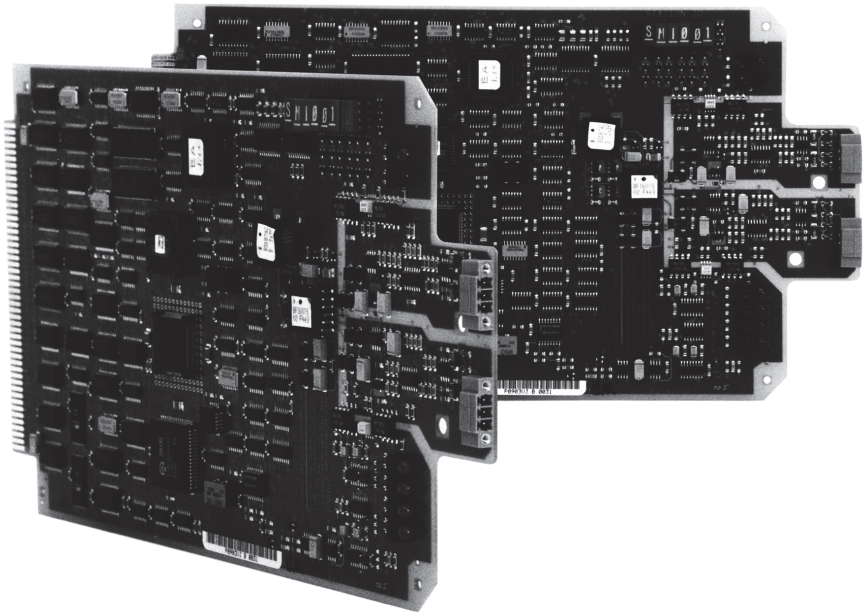
Product Specifications

Foxboro®

by Schneider Electric

PSS 31H-7SMI

SPECTRUM™ Migration Integrators



SPECTRUM™ Migration Integrators integrate SPECTRUM devices into Foxboro Evo™ systems.

OVERVIEW

Each SPECTRUM Migration integrator plugs directly into a corresponding MICROSPEC™ (UCM), Field Input/Output (FIO™), Universal Field Multiplexer (UFM), or Universal Input/Output (UIO) device. UCM uses an FBP11 module, FIO uses an FBP12 module, UFM uses an FBP13 module, and UIO uses an FBP14 module for integration. The Foxboro Evo Fieldbus (optionally redundant) connects to these integrator modules.

The modules act as translators to map SPECTRUM process input and output components into Foxboro Evo Control Processor blocks.

SPECTRUM Migration Integrators provide single point of configuration, integrated system management, and advanced Foxboro Evo system control. These products replace the current processor cards in SPECTRUM I/O products.

SPECTRUM Migration Integrator hardware communicates directly with the process I/O data bus connected to SPECTRUM I/O product interface components (3A2-D3I, and so forth). Integrator modules also connect to single or optionally redundant Foxboro Evo Fieldbus connected to a single or fault-tolerant Foxboro Evo control station: Control Processor 30B (CP30B), Control Processor 40B (CP40B), Control Processor 60 (CP60), Field

Control Processor 270 (FCP270), Field Control Processor 280 (FCP280) Z-Module Control Processor 270 (ZCP270) or Micro-I/A® station. All original process control capability of the original SPECTRUM device is replaced by direct Foxboro Evo control station scanning and control.

Basic Hardware Functionality

SPECTRUM Migration Integrators integrate SPECTRUM devices fully into the Foxboro Evo system. Process data points and control functions performed by SPECTRUM slave devices are replaced by control functions in the control processor (CP). Integrator modules map CP process I/O addressing and data formats into SPECTRUM process I/O addressing and data formats.

MICROSPEC Redundancy

The FBP11 hardware supports optionally redundant Fieldbus. A second FBP11 may be used in redundant configurations. A single or optionally redundant Fieldbus connects to each FBP11 in each MICROSPEC (UCM). The original communication functionality of the FOXNET™ interface to UCM (dual-redundant communication) is maintained using redundant Fieldbus with redundant FBP11 modules. The original control functionality of the FOXNET interface to UCM (redundant processors) is maintained by fault-tolerant CPs.

Each power supply of the redundant UCM individually powers one of the FBP11 modules. FBP11 emulates the redundant Fieldbus logic contained in current Foxboro Evo Fieldbus Modules (FBMs). FBP11 also uses the process I/O bus and maintenance panel arbitration used by the original UCM logic. By utilizing the UCM process I/O bus communication, FBP11 offers continued use of patented (U.S. Pat. 4,351,023, 4,527,271, and 5,006,842) UCM security features.

FIO, UFM and UIO Redundancy

SPECTRUM Migration Integrator hardware supports optionally redundant Fieldbus. A second Fieldbus is attached to a second communications connector on the Integrator module. This directly emulates the redundant communication of the original FIO, UFM, and UIO devices. Integrator modules emulate the redundant Fieldbus logic contained in current FBMs. Integrator modules also utilize the process I/O bus, status display, and maintenance panel arbitration used by the original UIO or UFM logic.

Control Block Processing

The Foxboro® CP provides full control capability through the SPECTRUM process I/O using SPECTRUM Migration Integrator modules. Traditional SPECTRUM process I/O devices like FIO, UIO, and UFM do not have control processing capability. The CP adds direct control capability to these devices.

Control block processing within the CP allows implementation of advanced control immediately upon SPECTRUM device integration.

In addition to advanced control schemes, CP control also allows batch control processing to be ported from traditional SPECTRUM host processors like FOX 1/A and Multistation.

Scan Block Processing

The Foxboro CP provides full scanning capability through the SPECTRUM process I/O using SPECTRUM Migration Integrators.

Process Control Alarms

Process alarms are generated by control blocks in the CP using SPECTRUM Migration Integrator logical FBMs in the same manner as those using Foxboro Evo FBMs. Alarms are presented in the same format as other Foxboro Evo Control, Gateway, and Integrator products.

All devices, printers, workstations, and alarm historians are supported by the CP.

System Management Functionality

SPECTRUM system and device management is accomplished with Foxboro Evo system Management software.

SPECTRUM Management

All SPECTRUM devices appear as functional elements of the hosting CP. Management functions support device status control and reporting of Fieldbus devices including SPECTRUM Migration Integrators. Any required EEPROM updates or other SPECTRUM Migration Integrator module support functions are also administered by management software.

System Management Alarms

All SPECTRUM I/O device status appears on Foxboro Evo management displays. SPECTRUM Migration Integrator module status is displayed as a Fieldbus device. All SPECTRUM process I/O components are represented on management displays in a recognizable orientation, as standard Foxboro Evo FBMs.

System Configuration Functionality

Process scanning and control configuration is accomplished by the Foxboro Evo Control Editors, I/A Series® Integrated Control Configurator (ICC) or I/A Series Configuration Component (IACC) software.

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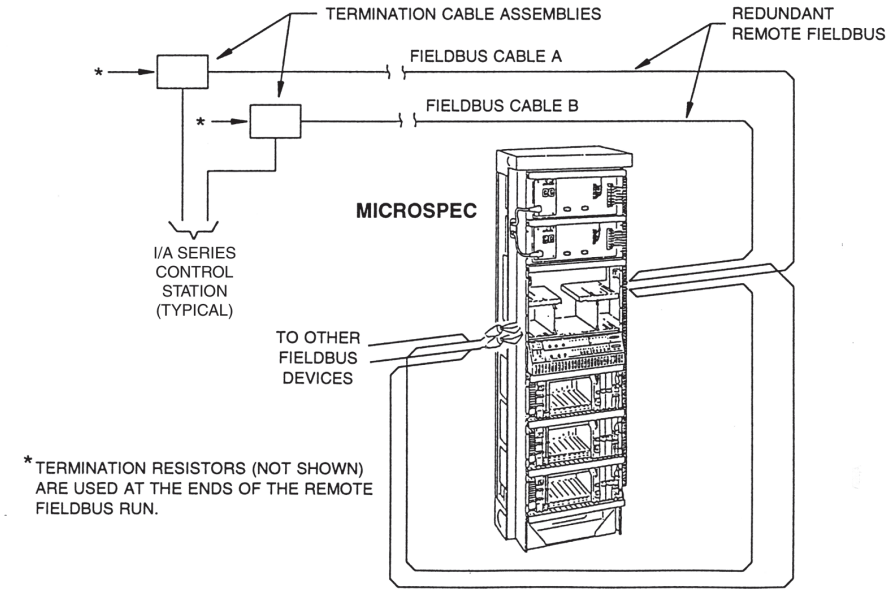

FEATURES

Key features of the SPECTRUM Migration Integrators are:

- When used with the Field Control Processor 280 (FCP280), Field Control Processor 270 (FCP270), or Z-Module Control Processor 270 (ZCP270), integrates SPECTRUM devices into the Foxboro Evo Control Network
- Integrators plug directly into an existing SPECTRUM racks in place of logic nest cards to interface with Foxboro Evo control processors
- Enables integration of original process signals to the Foxboro Evo system while keeping the field interface and wiring
- Advanced Foxboro Evo system control with single point of configuration.

MICROSPEC (UCM) SPECTRUM MIGRATION INTEGRATOR (FBP11)

Product Description

The UCM SPECTRUM Migration Integrator (FBP11) plugs directly into the logic nest of a SPECTRUM UCM and connects to the Foxboro Evo Remote Fieldbus. FBP11 responds to the CP in the same manner as FBMs via unique letterbug for each SPECTRUM I/O card. All original process display and control capability of the SPECTRUM device is replaced by direct Foxboro Evo display and CP scanning and control.

Product Configurations

FBP11 provides a migration path from SPECTRUM control and communication components to Foxboro Evo Display, Control, and Supervisory Functions. FBP11 redundancy provides two independent communication cards each with two Foxboro Evo Fieldbus communications channels. Each FBP11 card has it's own processor, memory, and redundant Foxboro Evo Fieldbus interface. Process I/O components as in the original UCM are not redundant.

UCM Maintenance Panel

The maintenance panel allows I/O components to be examined and changed. It can be switched on at any time. The maintenance panel functionality is retained with FBP11 implementation.

Security

The following security features of the original UCM are supported:

- Optional redundant power supplies and communications reduce the risk of a single point of failure
- Self contained and independent I/O components so failure on one does not affect others
- Self-checks and status indicators are used so that no additional diagnostics, test tools, and so forth, are required for normal maintenance
- HOLD and FLUNK capability is provided at output component level so that the output to the process can be held or flunked to a safe operating condition
- Fail-safe capability is provided at the control scheme level so that alternate control modes can be forced by a CP command, communication failure, or a CP failure
- Loss of an FBP11 causes outputs to go to their pre-configured HWFLUNK states. Original process I/O cards offer HWFLUNK states that are jumper selectable on a per-card basis

- Replacement of an FBP11 in a non-redundant configuration causes the process outputs to remain in their pre-configured HWFLUNK states until the FBP11 is properly downloaded and initialized. The original jumper selectable HWFLUNK state, configured as hold or zero on each I/O card is maintained after integration.

Redundancy

FBP11 redundancy provides two independent FBP11 Integrators, each with two Foxboro Evo Fieldbus communications channels. Each FBP11 has a processor, memory, and redundant Foxboro Evo Fieldbus interface process I/O components as in the original UCM are not redundant.

Switchover from one FBP11 to the other is bumpless because the backup FBP11 tracks the main FBP11 database. Database configuration tracking is accomplished by the original UCM data buffer card.

Process I/O measurement tracking is accomplished by the ability of both the main and backup FBP11 cards to read the PIO bus allowing both to maintain up to date I/O measurement values. Each FBP11 monitors the health of the other to determine when to take over if necessary.

Replacement of a failed FBP11 is also bumpless. The redundant FBP11 transfers the latest database configuration information to the replaced FBP11 through the data buffer card. The replaced FBP11 then reads the PIO bus to establish I/O measurement tracking with the Main FBP11 for full backup support.

Readback of outputs is done in a manner consistent with current Foxboro Evo FBMs. Three modules share the PIO Bus: The Main FBP11, the backup FBP11, and the I/O Maintenance Panel. Since only one of these modules use the PIO Bus at one time, arbitration logic controls contention for the bus. The I/O Maintenance Panel scans the PIO Bus twice every half-second (once for each of the I/O points selected).

The FBP11 modules scan all of the I/O components every half-second during normal operation, with only one controller reading and writing I/O values, while the other remains in a tracking mode reading I/O points. Arbitration logic ensures that only one FBP11 or the panel can access the I/O components at any given time. A Select latch determines which FBP11 can actually output to the I/O components (if it is “OK” and FLUNK or HOLD is not set). If the Maintenance Panel key switch is on, the FBP11 can still read the I/O points, but only the panel can write outputs.

I/O components, as in the original UCM, are not redundant.

Foxboro Evo System Hardware Support

FBP11 can be configured to interface with a Foxboro Evo single- or fault-tolerant control station: CP30B, CP40B, CP60, FCP270, FCP280, ZCP270 or Micro-I/A station. It can be configured to interface with any standard Foxboro Evo Remote Fieldbus wiring and can coexist on the remote Fieldbus with Foxboro Evo FBMs and other Foxboro Evo Fieldbus processor types. Remote Foxboro Evo Fieldbus communications signals are isolated from the local SPECTRUM UCM nest by the FBP11.

Foxboro Evo Application Processor 10 (AP10), Control Processor 10 (CP10), Display Processor 10 (DP10) and the Application Processor 20 (AP20) do not support the FBP11.

FBP11 Hardware

FBP11 is a printed circuit board which replaces the present UCM logic nest processor, RAM, ROM, and FOXNET interface cards and uses the existing security card to interface to the existing UCM process I/O components. A second optional FBP11 can be configured to replace the optional second processor, RAM, ROM, and FOXNET interface card in a redundant configuration.

All existing UCM logic nest cards are removed, except for the security card, maintenance panel interface, data buffer, and optional alarm contact card, leaving all power supplies, I/O components, and all original field wiring in place.

The FBP11 connects the Foxboro Evo Remote Fieldbus with the local SPECTRUM I/O bus. The remote Fieldbus cable (i.e., the twinaxial cable) attaches to the FBP11 through a quick disconnect terminal block using screw type terminals. The assembly disconnects from the FBP11 module to allow each individual FBP11 card to be disconnected for servicing while maintaining remote Fieldbus continuity. The FBP11 can drive up to 30 UCM I/O cards.

Power Sources

Power for the FBP11 is provided by the original UCM Rack power supplies. Power connection to the FBP11 is via the UCM logic nest backplane. In redundant power configurations, the Main power supply powers the main FBP11 card while the backup power supply powers the backup FBP11.

Redundant UCM On-Line Upgrade

A redundant UCM may be upgraded while running a process using either of two procedures:

- Complete Unit UCM to Foxboro Evo system Control Switchover
- Loop-by loop UCM to Foxboro Evo system Control Switchover.

The procedure selected depends upon requirements of the user and of the process under control.

Complete Unit Switchover

The complete unit switchover decommissions one side of the redundant UCM while the other side remains in control of the process. Unneeded SPECTRUM cards are replaced by the Foxboro Evo system FBP11 card. The Foxboro Evo system control is then started, checked, and then put into control of the process. Once the process is under Foxboro Evo system control, the remaining SPECTRUM side is converted. A step-by-step procedure is available in the document *SPECTRUM Migration Integrator User's Guide* (B0193RC).

Loop-by-Loop Switchover

The loop-by-loop switchover decommissions one side of the redundant UCM while the other side remains in control of the process. Unneeded SPECTRUM cards are replaced by the Foxboro Evo system FBP11 card. The Foxboro Evo system control is then started.

When the FBP11 is started, it is not in control, but is allowed to read and write process inputs and outputs. Control loops are then turned off individually on the SPECTRUM side and turned on in the Foxboro Evo system. Once all loops are under Foxboro Evo system control, the remaining SPECTRUM side is converted.

NOTE

The following special security card set is required for loop-by-loop migration:

- For UCM I:P0912PZ
- For UCM II-IV: B0195KC

A step-by-step procedure is available in the document *SPECTRUM Migration Integrator User's Guide* (B0193RC).

FBP11 (UCM SPECTRUM MIGRATION INTEGRATOR) FUNCTIONAL SPECIFICATIONS	
Power Requirements **INPUT VOLTAGE** +5 V dc **CONSUMPTION** 5 W (maximum) **HEAT DISSIPATION** 5 W (maximum)	**Communication** Redundant IEEE P1118 Fieldbus
Analog Input Card Types Supported	
Dual input 4 to 20 mA isolated	3A2-I2D
Dual input 4 to 20 mA non-isolated	3A2-I3D
Dual input 10 to 50 mA non-isolated	3A2-H3D
Dual input 0 to 10 V ac isolated	3A2-E2D
Dual input 0 to 10 V dc isolated	3A2-V2D
Dual input 0 to 10 V dc non-isolated	3A2-V3D
Dual input thermocouple isolated	3A2-T2DJ1 3A2-T2DJ2 3A2-T2DK1 3A2-T2DK2
Dual input resistance isolated	3A2-R2DP 3A2-R2DN 3A2-R2DC
Quad input millivolt isolated	3A4-M2DA1 3A4-M2DA2 3A4-M2DA3 3A4-M2DA4 3A4-M2DA5 3A4-M2DA6 3A4-M2DA7
Quad Input 4 to 20 mA isolated	3A4-I2D
Pulse Input Card Types Supported	
Dual input pulse rate isolated	3A2-F2D
Dual input pulse count isolated	3A2-Q2D
Digital Input Card Types Supported	

FBP11 (UCM SPECTRUM MIGRATION INTEGRATOR) FUNCTIONAL SPECIFICATIONS	
Octal input dc contact non-isolated	3C8-C3D
Octal input ac logic isolated	3C8-E2D
Input/Output Card Types Supported	
Single I/O 4 to 20 mA non-isolated	3AS-I3IA
Single I/O 4 to 20 mA isolated	3AS-I2IA
Dual I/O 4 to 20 mA non-isolated	3AD-I3I
Analog Output Card Types Supported	
Dual output 4 to 20 mA isolated	3A2-D2I
Dual output 4 to 20 mA non-isolated	3A2-D3I
Dual output 0-10 V dc non-isolated	3A2-D3V
Quad Output 4-20 mA non-isolated	3A4-D3I
Pulse Output Card Types Supported	
Quad output dc pulse isolated	3C4-D2CP
Quad output dc pulse isolated	3C4-D2VP
Quad output ac pulse isolated	3C4-D2KP
Digital Output Card Types Supported	
Octal output dc contact isolated	3C8-D2CS
Quad output dc contact isolated	3C4-D2CS
Quad output dc supply isolated	3C4-D2VS
ac Output Card Types Supported	
Quad output ac contact isolated	3C4-D2KS

FBP11 (UCM SPECTRUM MIGRATION INTEGRATOR) PHYSICAL SPECIFICATIONS

Mounting
Directly replaces existing processor card in main UCM logic nest. Optional second card replaces backup UCM processor card for redundancy

Connections
Two quick disconnect, 3 terminal remote Fieldbus connectors

Indicators
AMBER LIGHT-EMITTING DIODE (LED)
Remote Fieldbus activity

RED LED
SPECTRUM Migration Integrator fail

GREEN LED
Power OK and SPECTRUM Migration Integrator operational

FIELD INPUT/OUTPUT (FIO) SPECTRUM MIGRATION INTEGRATOR (FBP12)

Product Description

The FIO SPECTRUM Migration Integrator (FBP12) plugs directly into the logic nest of a SPECTRUM FIO and connects to the Foxboro Evo Remote Fieldbus. It responds to the CP in the same manner as current Foxboro Evo FBMs via unique letterbug address for each SPECTRUM I/O card. All original process display and control capability of the SPECTRUM device is replaced by direct Foxboro Evo display and CP scanning and control.

Product Configuration

FBP12 provides a migration path from SPECTRUM control and communication components to Foxboro Evo Display, Control, and Supervisory Functions.

FIO Local Status Panel

The FIO Local Status Panel (LSP) is not used with the FBP12. Functions provided by the LSP are no longer required with the new FBP12.

The Field Service Panel Interface (3AT-SRP1) Hand-Held (unit that plugs into the Master or satellite nest) as well as the Diagnostic Panel Interface Diagnostic Terminal (stand-alone 12-inch CRT terminal) are no longer needed.

Security and Maintenance

The original FIO security and maintenance features are retained as described below:

- Optional redundant power supplies and communications to reduce the risk of a single point of failure
- Self-contained and independent I/O components so a failure on one does not affect others
- Self-checks and status indicators are included so that no additional diagnostics test tools, and so forth, are required for normal maintenance
- HOLD and FLUNK capability is provided at the output component level so that the output to the process can be held or flunked to a safe operating condition.

Fail-safe capability is provided at the control scheme level so that alternate control modes can be forced by a CP command, communication failure, or a CP failure.

- Loss of an FBP12 causes the outputs to go to their pre-configured HWFLUNK states
- Replacement of an FBP12 module causes the outputs to remain in their pre-configured HWFLUNK states until the FBP12 is properly downloaded and initialized.

Redundancy

The FBP12 redundancy provides two Foxboro Evo Fieldbus communications channels on a single FBP12 card. Process I/O components, as in the original FIO, are not redundant.

Foxboro Evo System Hardware Support

FBP12 can be configured to interface with a Foxboro Evo single- or fault-tolerant control station: CP30B, CP40B, CP60, FCP270, FCP280, ZCP270 or Micro-I/A station. It can be configured to interface with any standard Foxboro Evo Remote Fieldbus wiring and can coexist on the remote Fieldbus with Foxboro Evo FBMs and other Foxboro Evo Fieldbus processor types. Remote Foxboro Evo Fieldbus communications signals are isolated from the local SPECTRUM FIO nest by the FBP12 card.

Foxboro Evo Application Processor 10 (AP10), Control Processor 10 (CP10), Display Processor 10 (DP10) and the Application Processor 20 (AP20) do not support the FBP12.

FBP12 Hardware

The FBP12 is a printed circuit board which replaces the present FIO master nest primary and secondary processor cards, to interface with existing FIO process I/O.

All existing FIO logic nest cards, except rack bus interface, ROM, RAM (when a high or low speed satellite is used), and optional high-speed and low-speed satellite cards are removed. Power supplies, I/O components, and all original field wiring are left in place.

The FBP12 connects the Foxboro Evo Remote Fieldbus with the local SPECTRUM I/O bus. The remote Fieldbus cable (for example, the twinaxial cable) attaches to the FBP12 through a quick disconnect terminal block using screw type terminals. The assembly disconnects from the FBP12 module to allow each individual FBP12 card to be disconnected for servicing while maintaining remote Fieldbus continuity. The FBP12 can drive up to 128 FIO I/O cards.

Power Sources

Power for the FBP12 is provided by the original FIO Rack power supplies. Power connection to the FBP12 is via the Master nest backplane.

FBP12 FUNCTIONAL SPECIFICATIONS

Power Requirements **INPUT VOLTAGE** +5 V dc **CONSUMPTION** 5 W (maximum) **HEAT DISSIPATION** 5 W (maximum)	**Communication** **Redundant IEEE P1118 Fieldbus**	**FIO I/O Nests** **Each I/O nest can contain up to 16 I/O components. Up to 8 I/O nests can be supported by the original FIO.**

Analog Input Card Types Supported	
Octal Thermo -10 to +10 mV	3F8-T2DA1
Octal Thermo -2.4 to +25 mV	3F8-T2DA2
Octal Thermo -2.4 to +50 mV	3F8-T2DA3
Octal Thermo -2.4 to +67 mV	3F8-T2DA4
Octal High Level 0 to 1 V dc	3F8-V2DA1
Octal High Level 0 to 5 V dc	3F8-V2DA2
Octal High Level 0 to 10 V dc	3F8-V2DA
Octal High Level 0 to 20 mA dc	3F8-I2DA
Octal High Level 0 to 50 mA dc	3F8-H2DA
Quad 0 to 20 mA dc, 16 V	3F4-I2DlA
Quad 0 to 20 mA dc Self-Powered	3F4-I2D2A

FBP12 FUNCTIONAL SPECIFICATIONS (CONTINUED)	
Pulse Input Card Types Supported	
Quad Pulse Rate, Self-Powered	3F4-F2DA
Quad Pulse Total, Self-Powered	3F4-Q2DA
Digital Input Card Types Supported	
Octal Contact (switch)	3F8-C2DCA
Octal High Level Digital	3F8-E2DA
Octal DIN Proximity Sensor	3F8-C2DNA
Analog Output Card Types Supported	
Quad High Level -.2 to 10 V dc	3F4-D2VA
Quad High Level 0 to 20 mA	3F4-D2IA
Octal Thermo +15 to +39 mV	3F8-T2DA5
Octal Thermo +25 to +49 mV	3F8-T2DA6
Octal Thermo +42 to +67 mV	3F8-T2DA7
Octal Millivolt -10 to +10 mV	3F8-M2DA1
Octal Millivolt -2.5 to +25 mV	3F8-M2DA2
Octal Millivolt -2.5 to +50 mV	3F8-M2DA3
Octal Millivolt 0 to +102 mV	3F8-M2DA4
Octal Millivolt +15 to +39 mV	3F8-M2DA5
Octal Millivolt +25 to +49 mV	3F8-M2DA6
Octal Millivolt +42 to +67 mV	3F8-M2DA7
Octal Resistance 4 to 20 Ω Cu	3F8-R2DCA
Octal Resistance 192 to 448 Ω Ni	3F8-R2DNA
Octal Resistance 16 to 176 Ω Pt	3F8-R2DPA1
Octal Resistance 86 to 246 Ω Pt	3F8-R2DPA2
Octal Resistance 156 to 316 Ω Pt	3F8-R2DPA3
Pulse Output Card Types Supported	
Octal dc Pulsed Switch 3F8-D2CPA (5 to 40 V dc at 0.5 A)	3F8-D2CPA
Octal ac Pulsed Switch (120/240 V ac at 2 A)	3F8-D2KPA

FBP12 FUNCTIONAL SPECIFICATIONS (CONTINUED)	
Digital Output Card Types Supported	
Octal Switch (5 to 40 V dc at 0.5 A)	3F8-D2CSA
Octal Solenoid Valve Driver	3F8-D2ZA
Quad ASCO Solenoid Valve Drive	3F4-D2WA
NOTE 3F4-D2YA Stepper Motor Drive must be replaced by 3F4-D2KSA and appropriate Foxboro Evo control scheme	

FBP12 PHYSICAL SPECIFICATIONS

Mounting
Directly replaces the present FIO master nest primary

Connections
Two quick disconnect, 3 terminal remote Fieldbus

Indicators

AMBER LED
Remote Fieldbus activity

RED LED
SPECTRUM Migration Integrator fail

GREEN LED
Power OK and SPECTRUM Migration Integrator operational

UNIVERSAL FIELD MULTIPLEXER (UFM) SPECTRUM MIGRATION INTEGRATOR (FBP13)

Product Description

The UFM SPECTRUM Migration Integrator (FBP13) plugs into the UFM Master Logic Nest and connects to the Foxboro Evo Remote Fieldbus. The FBP13 responds to the CP in the same manner as current Foxboro Evo FBMs via unique letterbug address for each UFM input card. All original process display and control capability of the SPECTRUM device is replaced by direct Foxboro Evo display and CP scanning and control.

Product Configurations

FBP13 provides a migration path from SPECTRUM control and communication components to Foxboro Evo Display, Control, and Supervisory Functions. FBP13 installs into the UFM logic nest in place of the UFM Processor card. It interfaces through the Memory Security and Scan Interface Card with up to the maximum 96 input cards.

UFM Local Readout Panel

The UFM Local Readout Panel is reused with the FBP13. The panel allows the user to access and display any point in the UFM system. A readout for the analog points is provided by a four-digit floating point decimal display which is updated once a second. A “Contact Open” and “Contact Closed” display is provided for indicating digital inputs. Digi-switches on the panel provide input point and display mode selection. Other status lamps display power on, memory or processor failure and display mode error. A restart switch resets and initializes the system.

Security and Maintenance

Original UFM security and maintenance functionality is retained:

- Optional redundant communications reduces the risk of a single communication point of failure
- Self-contained and independent input components so a failure on one does not affect others
- Self-checks and status indicators are included so that no additional diagnostics, test tools, and so forth, are required for normal maintenance.

Redundancy

The FBP13 redundancy provides two Foxboro Evo Fieldbus communications channels on a single FBP13 card.

Input components, as in the original UFM, are not redundant.

Foxboro Evo System Hardware Support

The FBP13 can be configured to interface with a Foxboro Evo single- or fault-tolerant control station: CP30B, CP40B, CP60, FCP270, FCP280, ZCP270 or Micro-I/A station. It can be configured to interface with any standard Foxboro Evo Remote Fieldbus wiring and can coexist on the remote Fieldbus with Foxboro Evo FBMs and other Foxboro Evo Fieldbus processor types. Remote Foxboro Evo Fieldbus communications signals are isolated from the local SPECTRUM UFM nest input cards by the FBP13 Integrator.

Foxboro Evo Application Processor 10 (AP10), Control Processor 10 (CP10), Display Processor 10 (DP10) and the Application Processor 20 (AP20) do not support the FBP13.

FBP13 Hardware

The FBP13 is a printed circuit board which replaces the present UFM Processor card. It interfaces through the Memory Security and Scan Card to the existing UFM process input components.

All existing UFM logic nest cards, except the Memory Security and Scan Card, are removed leaving all power supplies input components and all original field wiring in place.

FBP13 connects the Foxboro Evo Remote Fieldbus with the local SPECTRUM I/O bus. The Foxboro Evo Remote Fieldbus cable attaches to the FBP13 through a quick disconnect terminal block using screw type terminals. The assembly disconnects from the FBP13 module to allow each individual FBP13 card to be disconnected for servicing while maintaining remote Fieldbus continuity. FBP13 can read up to 96 UFM input cards.

Power Sources

Power for the FBP13 is provided by the original UFM Rack power supplies. Power connection to the FBP13 is via the Master nest backplane.

FBP13 (UFM SPECTRUM MIGRATION INTEGRATOR) FUNCTIONAL SPECIFICATIONS	
Power Requirements **INPUT VOLTAGE** +5 V dc **CONSUMPTION** 5 W (maximum) **HEAT DISSIPATION** 5 W (maximum) **Communication** Redundant IEEE P1118 Fieldbus	**UFM I/O Nests** Each I/O nest can contain up to12 I/O components. Up to 8 I/O nests can be supported by the original UFM. **Connections** **Two quick disconnect, 6 terminal remote Fieldbus connectors**
Analog Input Card Types Supported	
Octal Thermocouple -10 to +10 mV	3A8-T2D1
Octal Thermocouple 0 to +25 mV	3A8-T2D2
Octal Thermocouple 0 to +50 mV	3A8-T2D3
Octal Millivolt -10 to +10 mV	3A8-M2D1
Octal Millivolt 0 to +25 mV	3A8-M2D2
Octal Millivolt 0 to +50 mV	3A8-M2D3
Octal Resistance 4 to 20 Ω Cu	3A8-R2DC1
Octal Resistance 192 to 448 Ω Ni	3A8-R2DN1
Octal Resistance 16 to 176 Ω P	3A8-R2DP1
Octal Resistance 86 to 246 Ω Pt Octal Resistance 156 to 316 Ω Pt Octal High Level 0 to 10 V dc	3A8-R2DP2 3A8-R2DP3 3A8-V2D1
Octal High Level 0 to 20 mA dc	3A8-I2D1
Digital Input Card Types Supported	
Octal Contact (switch)	3D8-C2D1

FBP13 (UFM SPECTRUM MIGRATION INTEGRATOR) PHYSICAL SPECIFICATIONS

Mounting
Directly replaces the present UFM master nest processor card.

Connections
Two quick disconnect, 3 terminal remote Fieldbus connectors

Indicators
AMBER LED
Remote Fieldbus activity

RED LED
SPECTRUM Migration Integrator fail

GREEN LED
Power OK and SPECTRUM Migration Integrator operational

UNIVERSAL INPUT/OUTPUT (UIO) SPECTRUM MIGRATION INTEGRATOR (FBP14)

Product Description
The UIO SPECTRUM Migration Integrator (FBP14) plugs directly into the logic nest of a SPECTRUM or INTERSPEC™ UIO and connects to the Foxboro Evo Remote Fieldbus. It responds to the CP in the same manner as current Foxboro Evo FBMs via a unique letterbug address for each SPECTRUM I/O card.

All original process display and control capability of the SPECTRUM or INTERSPEC device is replaced by direct Foxboro Evo display and CP scanning and control.

Product Configurations
FBP14 provides a migration path from SPECTRUM or INTERSPEC Control and Communication Components to Foxboro Evo Display, Control and Supervisory Functions.

UIO Service Panel
The Service Panel allows I/O Component values to be examined and changed. It is normally used only when the controller has failed. However, it can be key switched ON at any time. The service panel may read I/O cards at any time. If the key switch is switched to LOCAL, only the panel may access the I/O cards as the FBP14 is locked out. The Service Panel requires a Panel Interface card in order to operate.

Security
Original UIO security and maintenance functionality is retained as described below:

- Optional redundant power supplies and communications reduce the risk of a single point of failure
- Self-contained and independent I/O components so a failure on one does not affect others
- Self-checks and status indicators are included so that no additional diagnostics test tools, and so forth, are required for normal maintenance
- An UIO panel allow manual control of I/O components if necessary
- HOLD and FLUNK capability is provided at output component level so that the output to the process can be held or flunked to a safe operating condition should all else fail
- Fail-safe capability is provided at the control scheme level so that alternate control modes can be forced by a CP command or failure
- Loss of an FBP14 causes the outputs to go to their pre-configured HWFLUNK states
- Replacement of an FBP14 module causes the outputs to remain in their pre-configured HWFLUNK states until the FBP14 is properly downloaded and initialized.

Redundancy

The FBP14 redundancy philosophy provides two Foxboro Evo Fieldbus communications channels on a single FBP14 card. This is consistent with the original UIO capability.

I/O components, as in the original UIO, are not redundant.

Foxboro Evo System Hardware Support

The UIO SPECTRUM Migration Integrator can be configured to interface with any standard Foxboro Evo single- or fault-tolerant control station: CP30B, CP40B, CP60, FCP270, FCP280, ZCP270 or Micro-I/A station. It can be configured to interface with any standard Foxboro Evo Remote Fieldbus wiring and can coexist on the remote Fieldbus with Foxboro Evo FBMs and other Foxboro Evo Fieldbus processor types.

Remote Foxboro Evo Fieldbus communications signals are isolated from the local SPECTRUM PIO bus and I/O Cards by the FBP14 card.

Foxboro Evo Application Processor 10 (AP10), Control Processor 10 (CP10), Display Processor 10 (DP10) and the Application Processor 20 (AP20) do not support the FBP14.

FBP14 Hardware

The FBP14 is a printed circuit board which replaces the present UIO logic nest processor cards. It interfaces through the security card to the existing UIO process I/O components. All existing UIO logic nest cards are removed except for Security and Panel Interface cards, leaving all power supplies, I/O components and all original field wiring in place.

The FBP14 connects the Foxboro Evo Remote Fieldbus with the local SPECTRUM I/O bus.

The remote Fieldbus cable (for example, the twinaxial cable) attaches to the FBP14 through a quick disconnect terminal block using screw type terminals. The assembly disconnects from the FBP14 module to allow each individual FBP14 card to be disconnected for servicing while maintaining remote Fieldbus continuity. The FBP14 can drive up to 30 UIO I/O cards.

Power Sources

Power for the FBP14 is provided by the original UIO Rack power supplies.

FBP14 (UIO SPECTRUM MIGRATION INTEGRATOR) FUNCTIONAL SPECIFICATIONS	
Power Requirements **INPUT VOLTAGE** +5 V dc **CONSUMPTION** 5 W (maximum) **HEAT DISSIPATION** 5 W (maximum)	**Communication** Redundant IEEE P1118 Fieldbus
Analog Input Card Types Supported	
Dual input 4 to 20 mA isolated	3A2-I2D
Dual input 4 to 20 mA isolated	3A2-I2DA

FBP14 (UIO SPECTRUM MIGRATION INTEGRATOR) FUNCTIONAL SPECIFICATIONS (CONTINUED)	
Dual input 4 to 20 mA non-isolated	3A2-I3D
Dual input 4 to 20 mA non-isolated	3A2-I3DA
Dual input 10 to 50 mA non-isolated	3A2-H3D
Dual input 0 to 10 V dc isolated	3A2-V2D
Dual input 0 to 10 V dc non-isolated	3A2-V3D
Dual input thermocouple isolated	3A2-T2DJ1 3A2-T2DJ2 3A2-T2DK1 3A2-T2DK2
Dual input resistance isolated	3A2-R2DP 3A2-R2DN 3A2-R2DC
Digital Input Card Types Supported	
Octal input dc contact non-isolated	3C8-C3D
Octal input ac logic isolated	3C8-E2D
Dual input 0 to 10 V dc isolated	3A2-V2D
Dual input 0 to 10 V dc non-isolated	3A2-V3D
Dual input 0 to 10 V ac isolated	3A2-E2D
Pulse Input Card Types Supported	
Dual input pulse rate isolated	3A2-F2D
Dual input pulse count isolated	3A2-Q2D
Input/Output Card Types Supported	
Single input/output 4 to 20 mA non-isolated	3AS-I3IA
Single input/output 4 to 20 mA isolated	3AS-I2IA
Analog Output Card Types Supported	
Dual output 4 to 20 mA isolated	3A2-D2I
Dual output 4 to 20 mA non-isolated	3A2-D3I
Dual output 0 to 10 V dc non-isolated	3A2-D3V
Digital Output Card Types Supported	

FBP14 (UIO SPECTRUM MIGRATION INTEGRATOR) FUNCTIONAL SPECIFICATIONS (CONTINUED)	
Octal output dc contact isolated	3C8-D2CS
Quad output dc contact isolated	3C4-D2CS
Quad output ac contact isolated	3C4-D2KS
Quad output dc supply isolated	3C4-D2VS
Pulse Output Card Types Supported	
Quad output dc pulse isolated	3C4-D2CP
Quad output ac pulse isolated	3C4-D2KP
Quad output dc supply isolated	3C4-D2VS

FBP14 (UIO SPECTRUM MIGRATION INTEGRATOR) PHYSICAL SPECIFICATIONS

Mounting
Directly replaces existing processor card in main UIO logic nest

Connections
Two quick disconnect, 3 terminal remote Fieldbus connectors

Indicators
AMBER LED
Remote Fieldbus activity

RED LED
SMI fail

GREEN LED
Power OK and SPECTRUM Migration Integrator operational

COMMON ENVIRONMENTAL SPECIFICATIONS

Operating
TEMPERATURE
5 to 50°C (41 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 +85°C (-40 to 185°F)

RELATIVE HUMIDITY
5 to 95% (noncondensing)

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

Contamination
ISA Standard S74.04 Class G1 (Mild)

Radio Frequency Interference
RFI SUSCEPTIBILITY
10 V/M (.026-1 GHz)

RFI EMISSIONS
Per CES 278, Rev L

Electrostatic Discharge (ESDI)
6 KV (current discharge)

High Frequency Transients
1 KV (I/O)

Surge Withstand Transients
2kV on ac and dc power lines; 1kV on I/O and communications lines

Mechanical Vibration
0.5 G, 5 to 500 Hz

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