

FOUNDATION™ Fieldbus Interface (ROC800-Series)

The Foundation™ Fieldbus Interface (FFI) allows a Series 2 ROC800 Remote Operations Controller (ROC800) to support bi-directional multi-drop digital communication between fieldbus devices on an H1 bus and host communication on a High-Speed Ethernet (HSE) network.

FOUNDATION™ Fieldbus

FOUNDATION fieldbus (FF) provides a worldwide industry standard open architecture that allows process automation systems to maximize the use of intelligent field devices. The utilization of digital field devices brings the power of asset management to improve plant performance by delivering higher data quality to those making operational decisions.

FF consists of two separate bus networks. The first is the 31.25 Kb (H1) bus for multi-drop connection to 2-wire field devices. The second is the 10/100 Mbps Ethernet control network backbone with HSE protocol which passes fieldbus data bi-directionally to a ROC800 or to the AMS™ Suite for integration within the PlantWeb® architecture.

The FFI brings the benefits of digital field devices to a wide range of industry applications including oil & gas and water & wastewater.

Benefits

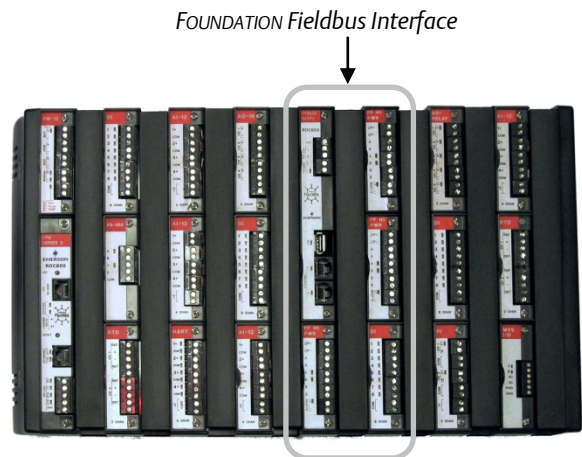
- Improved field-wide digital connectivity
- Enables proactive management of operational and maintenance decisions
- Integrated and standalone designs compatible with all Series 2 ROC800 family products with Ethernet connectivity
- Interoperability with dozens of field devices from multiple manufacturers
- High reliability with back-up link active schedule (LAS) support
- Asset optimization with Emerson AMS Suite

The FFI consists of the following components: the FFBUS INTFC (FFI CPU) and up to four H1 segment modules (H1 modules). Utilizing the same form factor as the ROC800 platform, these components can be installed in the following three configurations:

- Mounted in any Series 2 ROC827 I/O expansion backplane and power is obtained from the Series 2 ROC800 backplane,
- Mounted in any Series 2 ROC827 I/O expansion backplane and power is obtained independently,
- Mounted as a completely stand-alone external device.



*FOUNDATION Fieldbus Interface
(installed as a stand-alone device)*



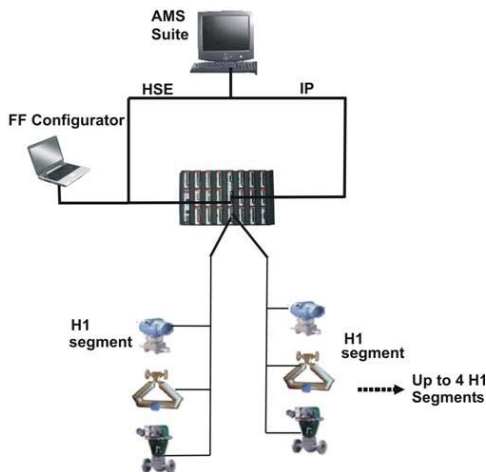
*FOUNDATION Fieldbus Interface
(installed in a ROC827)*

The FFI CPU does not replace the ROC800 CPU, but is mounted in two slots of a Series 2 I/O expansion backplane. The FFI CPU supports up to four H1 segment modules. The H1 segment modules are offered with or without conditioned power for the H1 segment. The ATEX version of the FFI must be installed in an IP54 or better enclosure (or equivalent location).

FFI CPU

The FFI CPU includes a high performance processor. The FFI CPU supports an HSE server and data management software that exchanges data between the low-speed H1 segments and high-speed Ethernet-based ROC devices.

The FFI CPU provides a high-speed Ethernet port for communications to a PlantWeb® host network using FF HSE protocol. AMS™ connectivity is included in the FFI and does not require any additional software or licensing from RAS to utilize retrieval and viewing of asset, diagnostics and configuration data located in the devices using Emerson AMS suite.



Typical Installation

A second Ethernet port on the FFI CPU module is used for port forwarding of TCP/IP messages to the ROC. This eliminates the need for multiple network connections. The FFI CPU also has its own integral three amp power supply which supplements the ROC800 power modules.

H1 Segment Modules

Each H1 Segment Module (H1 module) supports one H1 segment, which allows you to connect up to 16 devices per segment. Up to four H1 modules can be installed with any single FFI CPU.

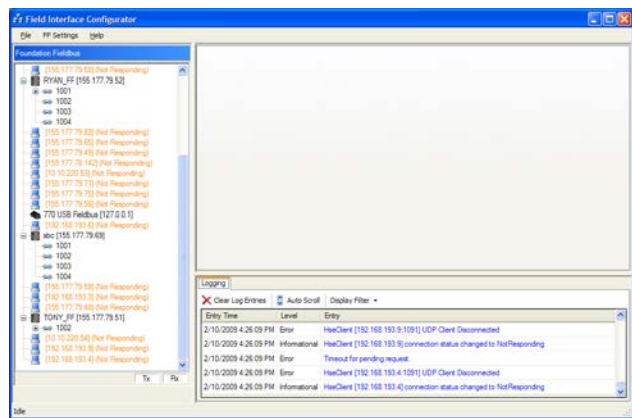
The H1 module is completely isolated from the FFI CPU electronics. The H1 module has removable terminal blocks for convenient wiring and servicing. The terminal blocks can accommodate wire size 16 to 22 American Wire Gauge (AWG).

H1 modules can be ordered with or without an optional FF-compliant 125 mA conditioned H1 segment power supply. Depending on your total device power consumption, these internal conditioned power supplies can greatly simplify the installation process and reduce additional external components. External segment power may also be supplied from FF compatible power supplies.

The H1 module functions as the H1 Link Master by maintaining the Link Active Scheduler for the segment, and each module has its own dedicated communications link to the FFI CPU module.

Field Interface Configurator

The Field Interface Configurator is a PC-based software tool used to configure the HSE server located on the FFI CPU module, monitor data, and manage applications involving fieldbus devices and ROCs. The Field Interface Configurator allows you to connect to the HSE server on the FFI CPU and establish bi-directional data relationships between parameters located in the fieldbus devices.



Field Interface Configurator

The Field Interface Configurator supports three methods for connecting to HSE servers.

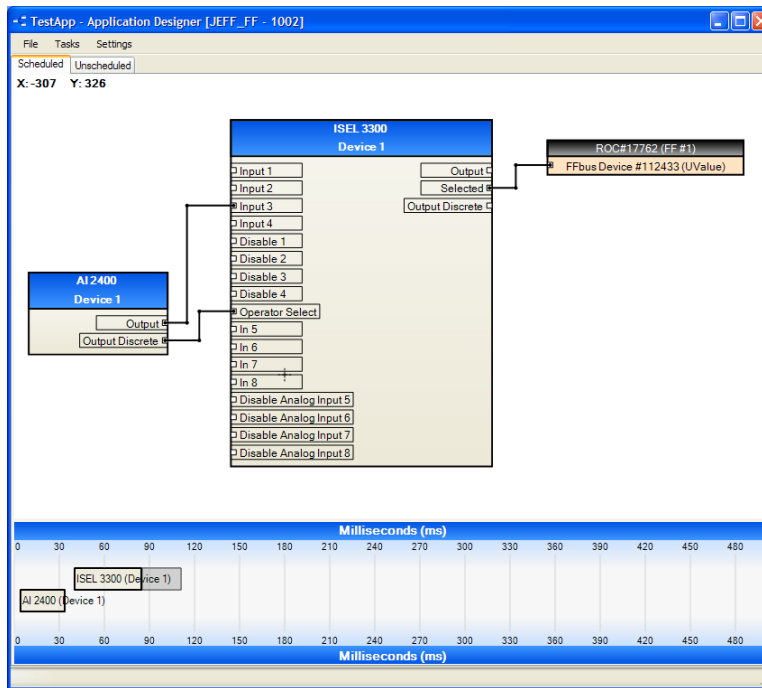
- Automatically detect all HSE servers on the network by using an auto-detection mode.
- Only listen for HSE servers currently in the server list.
- Manually add an HSE server.

Once connected to an HSE server, the Field Interface Configurator automatically displays fieldbus devices connected to the H1 segments, and shows the available fieldbus device parameters based on the fieldbus device descriptor file. The Field Interface Configurator allows you to commission the device by setting its tag and address, and then configure the device through changing parameter settings in the various resource, transducer, and function blocks.

Function Block Application Designer

One of the primary features of the Field Interface Configurator is its ability to direct input from fieldbus devices on an H1 segment into one or more ROC800s. Use the Field Interface Configurator's Function Block Application Designer utility to create applications, which you then download to the FFI that controls the H1 segments.

Use the Function Block Application Designer's graphical interface to create, maintain, save, and load applications (data relationships) built with function blocks. These applications are bi-directional and can read information from or write information to fieldbus devices. Applications created with the Function Block Application Designer can be scheduled (occurring automatically on a specified timeframe) or unscheduled (occurring as permitted by the free time on the segment).



Function Block Application Designer

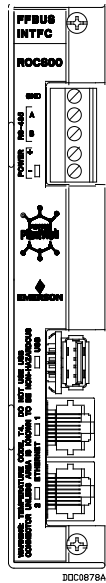
Supported Devices

AutoMAX FlowServe	Positioner	BUSWITCH
E+H	Prowirl	E+H Prowirl Rev 1
Fisher	Positioner	DVC5000_R1
Fisher	Positioner	DVC6000_R1
MicroMotion	Gas Chromatograph	XA700GC_R1
Rosemount		3095_R1
Rosemount	PLC	848L_R1
Rosemount	Pressure	2051_R1
Rosemount	Pressure	3051_R7
Rosemount	Remote Indicator	752_R3
Rosemount	Temperature	3144_R2
Rosemount	Temperature	3244_R5
Rosemount	Temperature	644_R1
Rosemount	Temperature	644_R2
Rosemount	Temperature	848T_R6
Rosemount	Vortex Flowmeter	8800_R7
Rosemount	Vortex Flowmeter	8800_R9
Rosemount Analytical	Analyzer	5081A_R2
Rosemount Analytical	Analyzer	5081C/T_R2
Rotork	Actuator	FF01:080800456
Siemens	Differential Pressure	SieTrans_R1_A
SMAR	FF to 4-20mA converter	FI-302

Note: For other devices, contact your LBP.

ROC800 Foundation Fieldbus Interface: CPU Module

Wiring Terminals



Terminal	Label	Definition
TB1 – 1	GND	Ground
TB1 – 2	A	Not Currently Used
TB1 – 3	B	Not Currently Used
TB1 – 4	+	Power Input Positive
TB1 – 5	-	Power Input Negative
6	USB	Not Currently Used
7	1	Ethernet Port
8	2	Ethernet Port

Processor

Type	32-bit ARM Based Atmel AT91SAM9260 processor with processor bus clock frequency at 180 MHz.
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Memory

Flash	256MB NAND
Synchronous DRAM (SDRAM)	64MB

Communications

Ethernet Port	Quantity	2
	Type	100BASE-TX twisted pair. IEEE multi-segment 100 MB/second baseband Ethernet.
	Maximum Segment	100 m (330 ft)
	Connector	RJ45

Power

Input Supply	FFI CPU Module	10 to 30 V dc
Requirements	FFI CPU Module	3.56 W at 24 V dc
Battery Backup (RTC)	Type	3 V dc, 48 mAh, lithium
	Normal Use Life	10 years
	Backup Life	48,000 hours
	Shelf Life	10 years

Weight	1.65 kg (3.65 lb) for housing, backplane and CPU	
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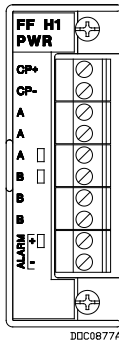
Dimensions	CPU Module	26 mm W by 150 mm H by 133 mm D (1.03 in. W by 5.91 in. H by 5.24 in. D)
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Housing	147.4 mm W by 241 mm H by 174 mm D (5.80 in. W by 9.49 in. H by 6.85 in. D)
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ROC800 Foundation Fieldbus Interface: H1 Segment Module

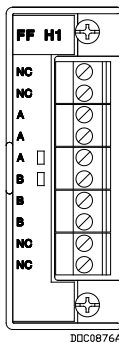
Wiring Terminals

With Conditioned Power



Terminal	Label	Definition
1	CP+	Conditioned Power Positive
2	CP-	Conditioned Power Negative
3	A	Fieldbus A
4	A	Fieldbus A
5	A	Fieldbus A
6	B	Fieldbus B
7	B	Fieldbus B
8	B	Fieldbus B
9	Alarm+	Over-current open-collector
10	Alarm -	Ground

Without Conditioned Power



Terminal	Label	Definition
1	NC	No Connection
2	NC	No Connection
3	A	Fieldbus A
4	A	Fieldbus A
5	A	Fieldbus A
6	B	Fieldbus B
7	B	Fieldbus B
8	B	Fieldbus B
9	NC	No Connection
10	NC	No Connection

Device Communication

Up to four H1 modules are supported, and up to 16 fieldbus devices can be connected to each H1 segment.




Note: The actual number of devices supported depends upon the power consumption of each device and the type of connecting cable in use.

Power

Requirement	1.18 W (from internal power conditioner or external power supply)
Over-Voltage Protection	36 Vdc, fieldbus connections 28 Vdc, alarm connections
Conditioned Power Output (H1 module with conditioned power option)	18 to 24 Vdc 125 mA maximum 150 mA over-current fault indication
Terminator (H1 module with conditioned power option)	100 Ω, 1%, 1 uF, 50 V
Segment Module Impedance	Compliant with FF standard

Physical	
Weight	100 g (3.5 oz)
Dimensions	26 mm W by 75 mm H by 133 mm D (1.03 in. W by 2.96 in. H by 5.24 in. D)
Wiring	12 to 22 AWG at the removable terminal block

ROC800 Foundation Fieldbus Interface: Common Specs

Environmental		
Operating Temperature	-40 to 75°C (-40 to 167°F)	
Storage Temperature	-40 to 85°C (-40 to 185°F)	
Relative Humidity	IEC68-2-3; 5-95% non-condensing	
Vibration	IEC68-2-6; 0.15 mm or 20 m/sec ²	
Mechanical Shock	IEC68-2-27; 11 milliseconds, sinusoidal 50 Gs non-operating, 15 Gs operating	
Thermal Shock	IEC68-2-14; Air to air from -20 to 85°C (-4 to 185°F)	
Approvals		
If installed in a ROC800-Series	Same as the ROC800-Series where it is installed.	
Stand-alone version	Product Markings for Hazardous Locations	CSA C/US Certified by CSA as model W40198 Cert. No. 1258773 (LR 83777) Class I, Division 2, Groups A, B, C, and D, T4 Class I, Zone 2, Group IIC, T4 AEx nA IIC, T4 
		CE Certified by Sira as model W40203 Cert. No. Sira 05ATEX4046X EEx nA IIC, T4 (T _{Ambient} = -40°C to +75°C),  II 3 G. 
	Approval Standard	CAN/CSA/UL C22.2 No. 0 M1991 and No. 0.4 M2004 C22.2 No. 142 M1987, and No. 213 M1987 CAN/CSA E60079-0-02 and E60079-15-02 UL 1604 – 3 rd Edition UL 508 – 17 th Edition UL 60079-0-02 and 60079-15-02
		ATEX EN50014:1997 plus amendments A1 and A2 EN60079-15:2003
	EMC EN 55011:2002 EN 61000-4-2:2001 EN 61000-4-3:2006 EN 61000-4-4:1995 EN 61000-4-6:2006 EN 61326:2003 EN 301-489-1 V1.4.1:2002 EN 301-489-17 V1.2.1:2002	

Miscellaneous
Approvals

RoHS (China)



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**Global Headquarters,
North America, and Latin America:**

Emerson Process Management
Remote Automation Solutions
6005 Rogerdale Road
Houston, TX 77072 U.S.A.
T +1 281 879 2699 | F +1 281 988 4445
www.EmersonProcess.com/Remote

Europe:

Emerson Process Management
Remote Automation Solutions
Unit 8, Waterfront Business Park
Dudley Road, Brierley Hill
Dudley UK DY5 1LX
T +44 1384 487200 | F +44 1384 487258

Middle East/Africa:

Emerson Process Management
Remote Automation Solutions
Emerson FZE
P.O. Box 17033
Jebel Ali Free Zone – South 2
Dubai U.A.E.
T +971 4 8118100 | F +971 4 8865465

Asia-Pacific:

Emerson Process Management
Remote Automation Solutions
1 Pandan Crescent
Singapore 128461
T +65 6777 8211 | F +65 6777 0947

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