ROC800-Series IEC 62591 Interface

The IEC 62591 Interface allows a Series 2 ROC800 Remote Operations Controller (ROC800) to communicate with any mix of up to 60 WirelessHART® field devices. The module supports monitoring of both the process information contained in the remote terminal unit (RTU) and the intelligent diagnostic information residing in the WirelessHART field devices. The module can also be used for discrete control applications.

The IEC 62591 Interface consists of two parts: the Emerson Wireless 781 Field Link that provides the radio link to the WirelessHART field devices, and the IEC 62591 Interface Module that installs into the Series 2 ROC800.

The IEC 62591 Interface module is a key component in the Smart Remote Automation extension of PlantWeb. The IEC 62591 Interface module provides the ROC800 with Plantweb® Smart Remote Automation functionality. This includes the ability to pass HART data bi-directionally through the network to AMS™ Device Manager software.

WirelessHART Networks

WirelessHART networks provide 99.9% network reliability—reliability that is unmatched by other wireless sensor networks. WirelessHART networks achieve this performance by being self-organizing and self-healing mesh networks. This means that each device on the WirelessHART network has multiple communication paths, and support automatic path configuration. If one path is obstructed, the network automatically reorganizes and transmits data along another path to achieve a successful transmission. WirelessHART networks ensure that you always have access to the field information when you need it.

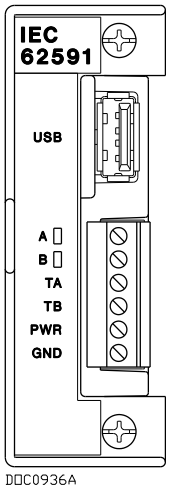
Information transmitted on the WirelessHART network is protected by 128-bit encryption, user-definable network key, and frequency-hopping spread spectrum radio signals.

Scalability

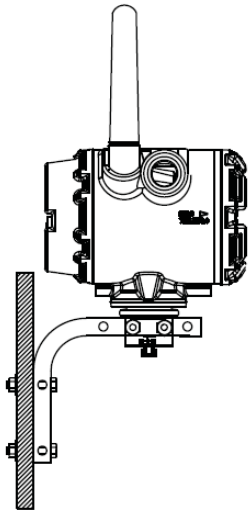
The IEC 62591 Interface can support up to 60 wireless field devices. Once your initial network has been installed, it is quick and easy to add additional devices, allowing you to plan a large installation and add devices over time. Once a WirelessHART device is configured with the Network ID and Join Key, simply install the device in the field and it is automatically detected and reconciled through ROCLINK™ 800 Configuration Software.

WirelessHART Communication Statistics

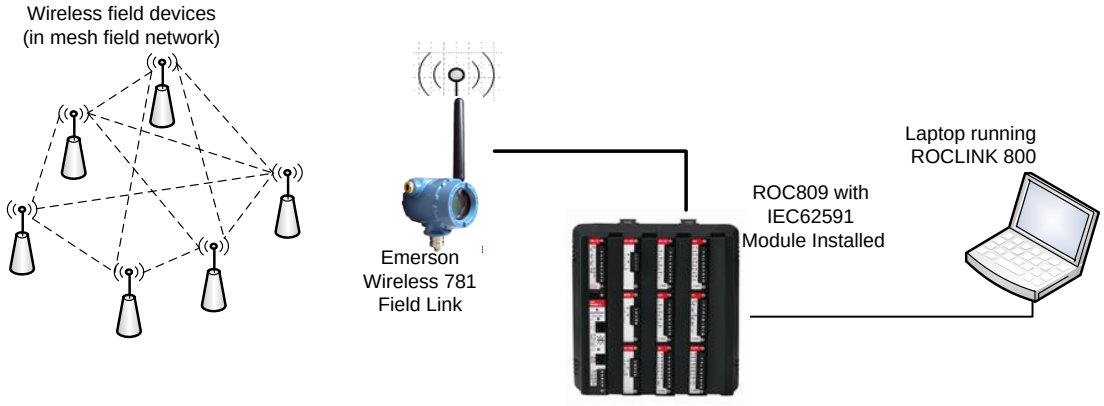
Detailed communication statistics are accumulated for the wireless network. Transmitted and received data is accumulated for byte, message, session, tunnel, radio and other HART messages.



IEC 62591 Interface Module



Emerson Wireless 781 Field Link



IEC 62591 Interface Self-Organizing Network

WirelessHART Data Access

The IEC62591 Function Block is pre-configured to return the Universal and Common HART parameters including;

- Long Tag
- User Defined Message
- User Defined Descriptor
- Extended Device Type
- Device ID
- Manufacturer ID
- Device Serial Number
- Adapter Type – THUM's Expanded Device Type
- Adapter ID – THUM's Device ID
- PV, SV, TV and QV Variable Units
- Slot 0, 1, 2 and 3 Variable Units
- PV, SV, TV and QV Variable Value
- Slot 0, 1, 2 and 3 Variable Value
- Primary Variable Loop Current
- Device Status
- Battery Life

  Note: Battery life is calculated by the transmitter. Refer to the transmitter's manufacturer for details.
- PV Loop current
- Burst Rate
- Variable Status

Installation and Configuration

The IEC 62591 Interface module connects to the Emerson Wireless 781 Field Link through a four-wire connection. This allows the Wireless 781 Field Link to be strategically placed away from the controller in the optimal location for best network performance. The module provides 12 Vdc loop-output to power the Wireless 781 Field Link.

After installing the IEC 62591 Interface module and the Wireless 781 Field Link, you configure the Series 2 ROC800 with ROCLINK™ 800 Configuration Software to act as a gateway device. The ROC800 can then receive signals from and transmit signals to WirelessHART field devices.

ROCLINK 800 provides you with a list of wireless field devices with the correct Network ID and Join Key. You can choose which of those devices are enabled (commissioned) on the network. You can also configure the update rate for individual devices.

You can install one IEC 62591 Interface module in a Series 2 ROC800. IEC 62591 Interface modules can be installed in any slot. Modules can be easily installed or removed from the module slots at any time by removing the two captive screws accessible from the front of the unit.

IEC 62591 Interface modules are hot-swappable, meaning the module can be removed and another module of the same kind can be installed under power. IEC 62591 Interface modules are hot-pluggable, meaning they may be installed directly into unused module slots under power.

The module has a removable terminal block for convenient wiring and servicing. The terminal block can accommodate size 16 to 24 American Wire Gauge (AWG). A USB port is provided on the module to perform firmware updates and to provide debug information to support personnel.

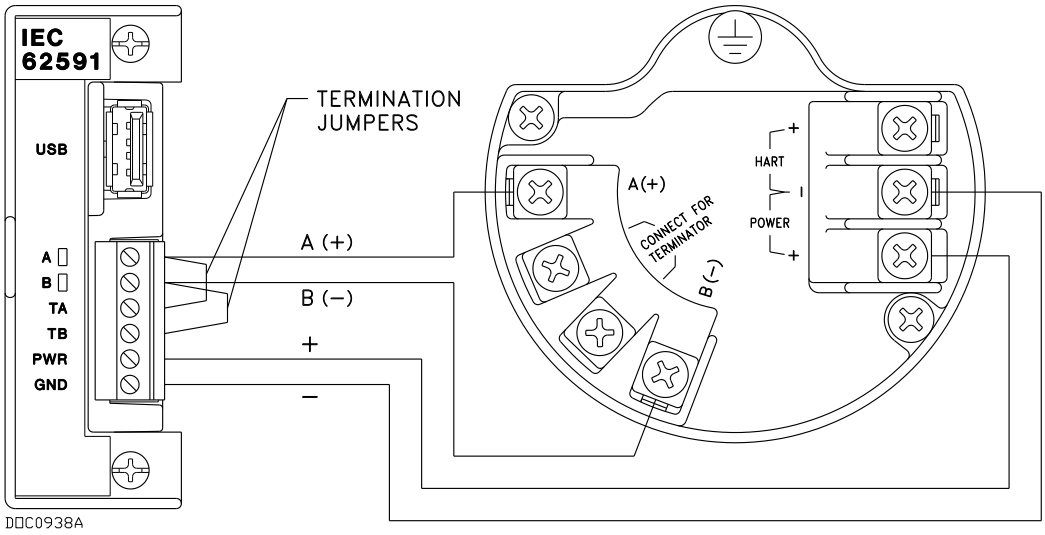
Note: This discrete I/O support of the IEC 62591 module requires a Series 2 ROC800 unit with firmware version 3.60 (or higher) and ROCLINK 800 version 2.40 (or higher).

Tested WirelessHART Devices

Note: The IEC 62591 Wireless Interface Module is designed to return the process and dynamic variables (PV, SV, TV, QV, SLOT 0, 1, 2, 3) from any device which meets the IEC 62591 specification (HCF_SPEC-285, Revision 2.0). The following table lists the devices which Emerson has tested and supports with the interface. If you have a WirelessHART device which does not appear in the table consult with the manufacturer of the device to determine whether the process variable values you want to collect are available through the PV, SV, TV, QV, and SLOT 0, 1, 2, and 3. If the device meets the discrete control specification, it should work with the IEC 62591 Wireless Interface; alternatively, it may be treated like an analog wireless device. Always test any WirelessHART devices not listed in table to see whether they work with the IEC 62591 Wireless Interface before you install them in the field. Also, always check with Remote Automation Solutions Lifecycle Services to verify that the firmware version of your device is supported in the IEC 62591 Wireless Interface.

Manufacturer	Model	Manufacturer	Model
Rosemount	248 Wireless Temperature Transmitter	CSI	9420 Wireless Vibration Transmitter
Rosemount	648 Wireless Temperature Transmitter	Rosemount	2160 Wireless Vibrating Fluid Liquid Level Switch
Emerson	Wireless 775 THUM Adapter (tested with 3051)	Rosemount	3308 Wireless Guided Wave Radar Transmitter
Rosemount	3051 Wireless Pressure Transmitter	Rosemount	702 Wireless Discrete Transmitter
Rosemount	2051 Wireless Pressure Transmitter	TopWorx	4310 Wireless Valve Position Monitor (firmware revision 5.0 or greater)
Rosemount	708 Wireless Acoustic Transmitter	Fisher	4320 Wireless Valve Position Monitor (firmware revision 5.0 or greater)
Rosemount	705 Wireless Totalizing Transmitter	Rosemount	WPG45 Wireless Pressure Gauge
Rosemount	928 Wireless Gas Monitor		

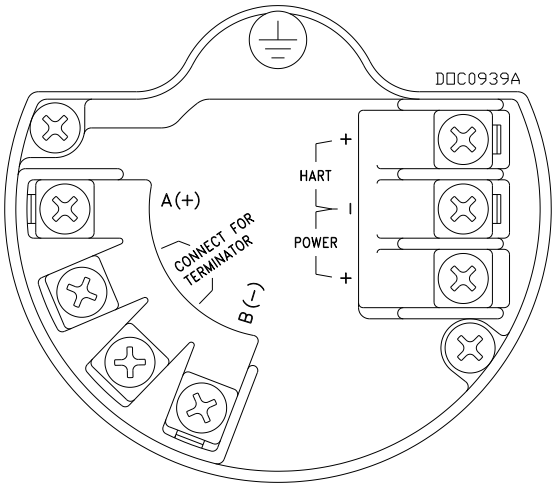
Note: Each THUM adapter supports **only one** wired HART device. The maximum number of THUM devices cannot exceed the maximum number of supported wireless devices. Refer to Emerson's *Wireless THUM™ Adapter Quick Start Guide*, 00825-0100-4075, for further information.



IEC 62591 Interface Wiring Diagram

Emerson Wireless 781 Field Link

Field Wiring Terminals



Terminal	Label	Definition
1	A (+)	RS-485 (+)
2	CONNECT	Termination
3	CONNECT	Termination
4	B (–)	RS-485 (–)
5	HART +	HART Configurator
6	HART/ POWER –	Input Power Negative
7	POWER +	Input Power Positive

Wireless Communications		
Protocol	IEC 62591 (WirelessHART®) 2.4–2.5 GHz DSSS	
Supported Device Update Rates	1 second to 60 minutes Active Advertising support enable for 30 minutes	
Network Size/Latency	100 WirelessHART devices at a burst rate of 8 seconds or higher 50 WirelessHART devices at a burst rate of 4 seconds 25 WirelessHART devices at a burst rate of 2 seconds 12 WirelessHART devices at a burst rate of 1 second	
Range (Line of Sight)	Standard Antenna	225 m (750 ft)
	Extended Antenna	800 m (2600 ft)
Security	AES-128 encrypted WirelessHART, including individual session keys Unique join keys and device white listing	
Output Power	10 dBm (10mW)	
Wired Communications		
Type	4-wire connection to the IEC 62591 Interface module Less than 15 pF/ft capacitance	
Distance	200 m (656 ft) maximum	
Power		
Input	Supplied by the 4- wire connection to the IEC 62591 Interface module (10.5 – 30 Vdc)	
Consumption	20 mA at 12 Vdc	
Physical		
Dimensions	781 Wireless Field Link	140 mm H by 106.7 mm W by 133.4 mm D (5.51 in H by 4.20 in W by 5.21 in D)
	Standard Antenna	90.2 mm (3.55 in)

	Extended Range Antenna	175.8 mm (6.92 in)
Weight	Aluminum Housing	1.7 kg (3.7 lb)
	Stainless Steel Housing	2.9 kg (6.4 lb)
Wiring	14 – 24 AWG twisted shielded pair	
Mounting	All SST, 2-inch pipe mounting and panel mount bracket	
Environmental		
Operating Temperature	-40 to 85°C (-40 to 185°F)	
Operating Humidity	0 to 90% relative humidity	
EMC	Complies with EN613261:2006	
Approvals		
Telecommunication Compliance	All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.	
FCC and IC	This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.	
ETSI	With firmware of version 1.11 and higher, this device complies with ETSI EN 300 328 V1.8.1.	
Ordinary Location Certification for FM	As standard, the Gateway has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).	
	North American Certifications	I5 FM Intrinsically Safe, Non-Incendive, and Dust Ignition-proof Certificate Number: 3040398 Intrinsically Safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, and G. Zone Marking: Class I, Zone 0, AEx ia llC Temperature Codes T4 (Tamb = -40 to 70 °C) Non-Incendive for Class I, Division 2, Groups A, B, C, and D. Dust Ignition-proof for Class II, III, Division 1, Groups E, F, and G. Ambient temperature limits: -40 to 70 °C Enclosure Type 4X, IP66/67
	Certification Standards	When installed per Rosemount Drawing 00781-1010: 3600:1998, 3610:2010, 3611:2004, 3810:2005, ANSI/NEMA 250:2003, ANSI/IEC 60529:2004

Ordinary Location Certification for FM (continued)	Special Conditions of Certification	1. The Wireless 781 Field Link housing contains aluminum and is considered a potential risk of ignition by impact or friction. Take care during installation and use to prevent impact and friction. 2. The surface resistivity of the unit is greater than one gigaohm (GΩ). To avoid electrostatic charge build-up, do not rub or clean the unit with solvents or a dry cloth. 3. The 781 Field Link will not pass the 500 Vrms dielectric strength test and this must be taken into account during installation.
	CSA Intrinsically Safe	Certificate Number: 2330424 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. Temp Code T3C Enclosure Type 4X, IP66/67 When installed per Rosemount Drawing 00781-1010
European Union Directive Information	The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at *www.rosemount.com*. A hard copy may be obtained by contacting your local sales representative. ATEX Directive (94/9/EC) *Emerson Process Management complies with the ATEX Directive.* Electro Magnetic Compatibility (EMC) (2004/108/EC) *Emerson Process Management complies with the EMC Directive.* Radio and Telecommunications Terminal Equipment Directive (R&TTE) (1999/5/EC) *Emerson Process Management complies with the R&TTE Directive*	
	European Certification	I1 ATEX Intrinsic Safety Certificate Number: Baseefa11ATEX0059X II 1G Ex ia IIC T4 Ga (T_{amb} = -40 °C to 70 °C) Enclosure Type IP66/67 When installed per Rosemount Drawing 00781-1024 CE 1180

Input/Output Parameters	Input / Power	Input / RS485	Output / RS485
	Ui = 30 V Ii = 200 mA Pi = 1.0 W Ci = 0 Li = 0	Ui = 11 V Ii = 300 mA Pi = 1.0 W Ci = 5.1 nF Li = 0	UO = 7.14 V IO = 112 mA PO = 1.0 W Ci = 0 Li = 0 CO = 13.9 µF LO = 0

<table>
<tr><td rowspan="6">European Union Directive Information (continued)</td><td rowspan="2">European Certification (continued)</td><td>Special Conditions for Safe Use (X)</td><td colspan="3">1. The plastic antenna may present a potential electrostatic ignition hazard and must not be rubbed or cleaned with a dry cloth.
2. The Wireless 781 Field Link enclosure is made of aluminum alloy and is given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 environment.
3. The device is not capable of withstanding the 500V isolation test required by EN60079-11:2007 Clause 6.3.12. This must be taken into account when installing the device.</td></tr>
<tr><td>IECEx Intrinsic Safety</td><td colspan="4">Certificate Number: IECEx BAS 11.0028X
Ex ia IIC T4 Ga (T_{amb} = -40 °C to 70 °C)
Enclosure Type IP66/67
When installed per Rosemount Drawing 00781-1024</td></tr>
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Ii = 200 mA
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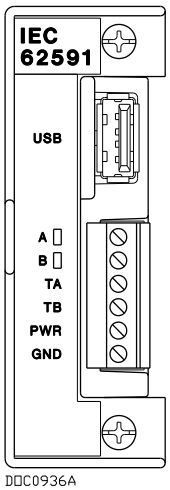
<tr><td>Combination Certification</td><td colspan="4">KL Combination of I1, I5, I6, and I7</td></tr>
</table>

ROC800-Series IEC 62591 Interface Module

Field Wiring Terminals



Terminal	Label	Definition
USB	USB	USB 2.0
1	A	RS-485 (+)
2	B	RS-485 (–)
3	TA	Termination A
4	TB	Termination B
5	PWR+	Output Power (+)
6	PWR–	Output Power (–)

Communications			
Quantity	1		
Type	4-wire connection to the Emerson Wireless 781 Field Link		
Max. Number of Wireless Field Devices per Module	60		
Max. Number of Modules per ROC800	1		
USB Port			
Quantity	1		
Type	USB 2.0 specification		
Use	Firmware upgrades and troubleshooting report **Warning** **Do not use USB connector unless the area is known to be non-hazardous.**		
Power			
Loop Output Power	12 Vdc		
Consumption	Main power supply loading at the Battery Terminals (at 24.0 Vdc)	Typical	31 mA at 24 Vdc
	Additional loading that may apply	USB Connection	13 mA at 24 Vdc
Physical			
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)		
Weight	62.4 g (2.2 oz)		
Wiring	16 – 24 AWG twisted shielded pair		
LEDs	RS-485 transmit and recieve		

Environmental
Same as the Series 2 ROC800 in which it is installed.
Approvals
Same as the Series 2 ROC800 in which it is installed (with the exception of ATEX certification).

For customer service and technical support,
visit www.Emerson.com/SupportNet.

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