ControlWave Micro IEC 62591 Interface

The IEC 62591 Interface allows a ControlWave Micro to communicate with any mix of up to 100 *Wireless*HART™ field devices (based on load). The module supports monitoring of both the process information contained in the remote terminal unit (RTU) and the intelligent diagnostic information residing in the *Wireless*HART field devices. The module can also be used for discrete control applications.

The IEC 62591 Interface consists of two parts: the Smart Wireless Field Link that provides the radio link to the *Wireless*HART field devices, and the IEC 62591 Interface Module that installs into the ControlWave Micro.

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

*Wireless*HART Networks

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

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

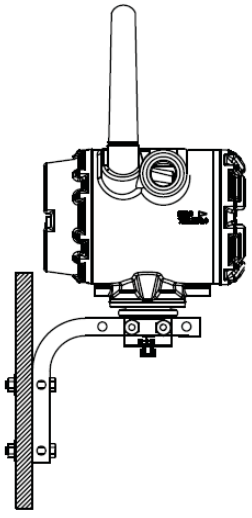
Scalability

The IEC 62591 Interface is capable of supporting up to 100 wireless field devices (based on load). 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 *Wireless*HART 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 OpenBSI software.

*Wireless*HART Communication Statistics

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

IEC 62591 Interface Module



Smart Wireless Field Link

IEC 62591 Interface Self-Organizing Network

*Wireless*HART 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 Smart Wireless Field Link through a four-wire connection. This allows the Smart Wireless Field Link to be strategically placed away from the controller in the optimal location for best network performance. The module provides 24 Vdc loop-output to power the Smart Wireless Field Link.

After installing the IEC 62591 Interface Module and Smart Wireless Field Link, you configure the ControlWave Micro with OpenBSI software to act as a gateway device. The ControlWave Micro can then receive signals from and transmit signals to *Wireless*HART field devices.

OpenBSI software 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 ControlWave Micro. IEC 62591 Interface Modules can be installed in any slot. With power removed, modules can be easily installed or removed from the module slots accessible from the front of the unit.

Notes:

1. The IEC62591 module **cannot** be installed in a ControlWave I/O expansion chassis.
2. The IEC62591 module **cannot** fit into the last slot of the base ControlWave Micro chassis (slot 3 of 3-slot base, slot 4 of 4-slot base, or slot 8 of 8-slot base).

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.

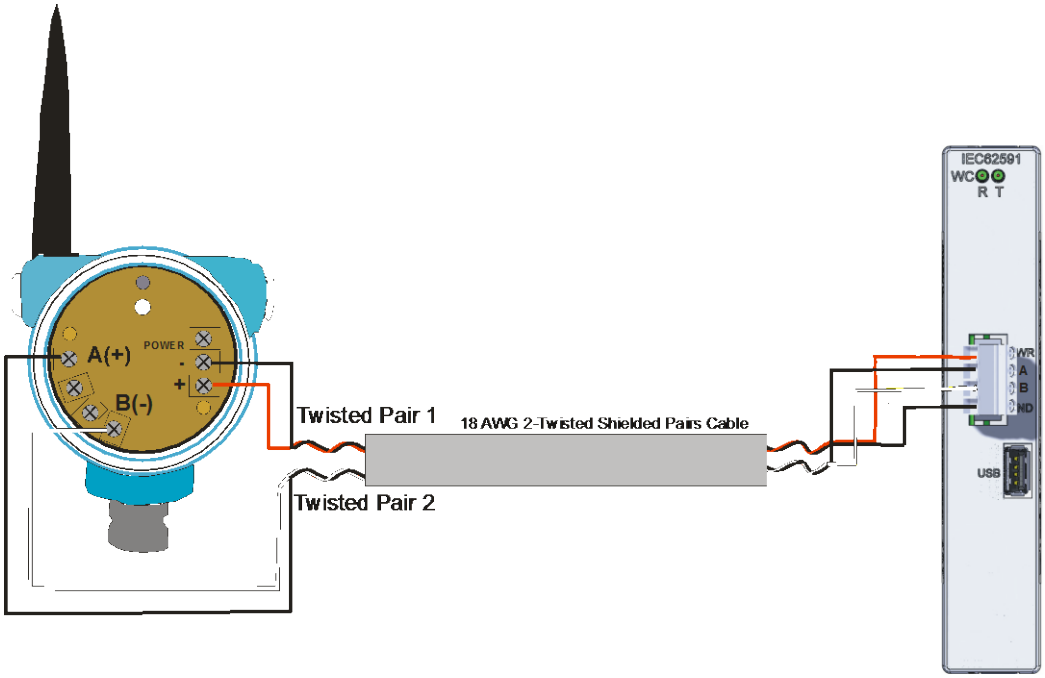
The IEC 62951 module is compatible with ControlWave Micro with firmware version 5.70 (or higher) and OpenBSI version 5.90 (or higher).

Tested *Wireless*HART Devices

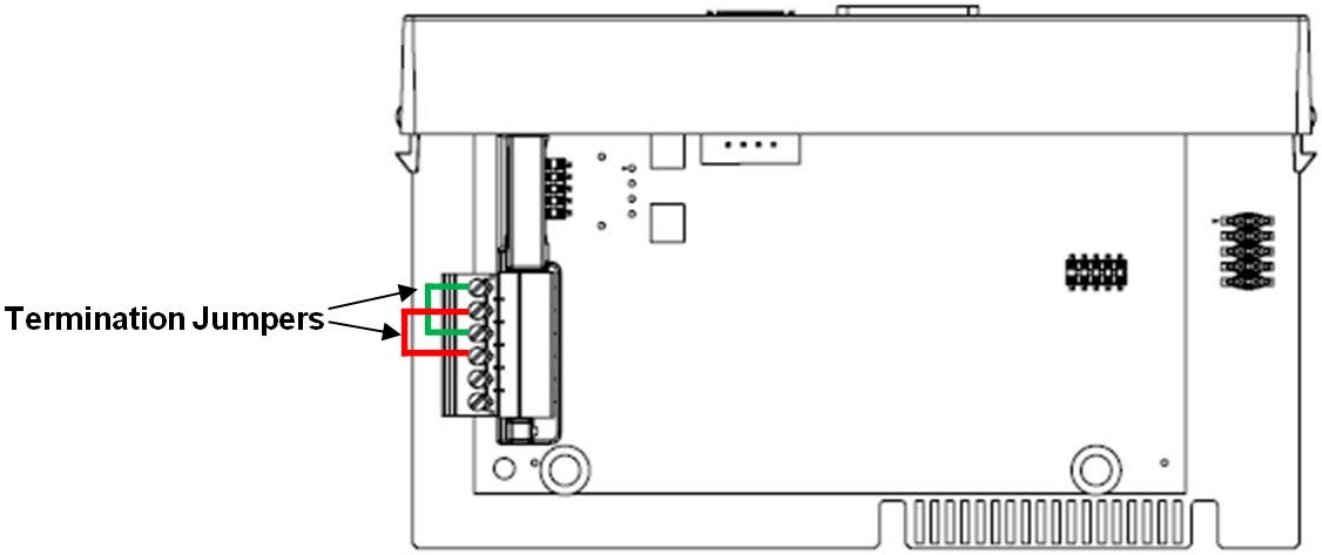
Note: The IEC 62591 Wireless Interface Module is designed to return the process and dynamic variables (PV, SV, TV, QV, SLOT 0, 1, 2, 3) from any device which meets the IEC 62591 specification (HCF_SPEC-285, Revision 2.0). The following table lists the devices which Emerson has tested and supports with the interface. If you have a *Wireless*HART 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 *Wireless*HART 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 Level Switch
Rosemount	775 Smart Wireless 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)

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 Rosemount's *SmartWireless THUM Adapter Quick Start Guide*, 00825-0100-4075, for further information.



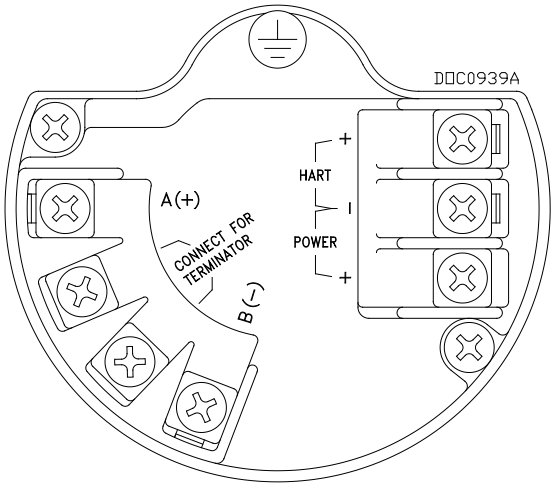
IEC 62591 Interface Wiring Diagram



IEC62591Termination Jumpers

Smart Wireless 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 (*Wireless*HART®) 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 *Wireless*HART devices at a burst rate of 8 seconds or higher 50 *Wireless*HART devices at a burst rate of 4 seconds 25 *Wireless*HART devices at a burst rate of 2 seconds 12 *Wireless*HART 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 *Wireless*HART, 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	Smart Wireless Fieldlink	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	5 to 95% non-condensing	
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 00781-101: 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 Model 781 transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction. 2. The surface resistivity of the unit is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth. 3. The Model 781 transmitter will not pass the 500Vrms dielectric strength test and thismust 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 00781-1011
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 (Tamb = -40 °C to 70 °C) Enclosure Type IP66/67 When installed per Rosemount Drawing 00781-1024 CE 1180

Input/Output Parameters	Input / Power Ui = 30 V Ii = 200 mA Pi = 1.0 W Ci = 0 Li = 0	Input / RS485 Ui = 11 V Ii = 300 mA Pi = 1.0 W Ci = 5.1 nF Li = 0	Output / RS485 UO = 7.14 V IO = 112 mA PO = 1.0 W Ci = 0 Li = 0 CO = 13.9 µF LO = 0
Special Conditions for Safe Use (X)	1. The plastic antenna may present a potential electrostatic ignition hazard and must not be rubbed or cleaned with a dry cloth. 2. The Model 781 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.		

	IECEx Intrinsic Safety	Certificate Number: IECEx BAS 11.0028X Ex ia IIC T4 Ga (Tamb = -40 °C to 70 °C) Enclosure Type IP66/67 When installed per Rosemount Drawing 00781-1024			
		Input/Output Parameters	Input / Power Ui = 30 V Ii = 200 mA Pi = 1.0 W Ci = 0 Li = 0	Input / RS485 Ui = 11 V Ii = 300 mA Pi = 1.0 W Ci = 5.1 nF Li = 0	Output / RS485 UO = 7.14 V IO = 112 mA PO = 1.0 W Ci = 0 Li = 0 CO = 13.9 µF LO = 0
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Combination Certification	KL Combination of I5, I6, I1, and I7				

ControlWave Micro IEC 62591 Interface Module

Field Wiring Terminals

Terminal	Label	Definition
1	PWR	Output Power (+)
2	A	RS-485 (+)
5	B	RS-485 (–)
6	GND	Output Power (–)
USB	USB	USB 2.0

Communications			
Quantity	1		
Type	4-wire connection to the Smart Wireless Field Link		
Max. Number of Wireless Field Devices per Module	100		
Max. Number of Modules per ControlWave Micro	1		
USB Port			
Quantity	1		
Type	USB 2.0 specification		
Use	Firmware upgrades and troubleshooting report		
Power			
Loop Output Power	12 to 30 Vdc		
Consumption	Main power supply loading at the Battery Terminals (at 12.0 Vdc)	Typical	73 mA at 12 Vdc
	Additional loading that may apply	USB Connection	25 mA at 12 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	127.6 g (4.5 oz)		
Terminations	Local and remote		
Wiring	16–24 AWG twisted shielded pair		
LEDs	RS-485 transmit and receive		

Environmental
Same as the ControlWave Micro in which it is installed
Approvals
Same as the ControlWave Micro in which it is installed

For customer service and technical support,
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