ControlWave Micro IEC 62591 Interface

The IEC 62591 Interface allows a ControlWave Micro to communicate with any mix of up to 100 WirelessHART™ 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 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 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.

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 supports automatic path configuration. If one path is obstructed, the network automatically re-organizes 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 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 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 OpenBSI software.

WirelessHART 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.
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 24 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 ControlWave Micro with OpenBSI software to act as a gateway device. The ControlWave Micro can then receive signals from and transmit signals to WirelessHART 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 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.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Rosemount</td>
<td>248 Wireless Temperature Transmitter</td>
<td>CSI</td>
<td>9420 Wireless Vibration Transmitter</td>
</tr>
<tr>
<td>Rosemount</td>
<td>648 Wireless Temperature Transmitter</td>
<td>Rosemount</td>
<td>2160 Wireless Vibrating Fluid Liquid Level Switch</td>
</tr>
<tr>
<td>Emerson</td>
<td>Wireless 775 THUM Adapter (tested with 3051)</td>
<td>Rosemount</td>
<td>3308 Wireless Guided Wave Radar Transmitter</td>
</tr>
<tr>
<td>Rosemount</td>
<td>3051 Wireless Pressure Transmitter</td>
<td>Rosemount</td>
<td>702 Wireless Discrete Transmitter</td>
</tr>
<tr>
<td>Rosemount</td>
<td>2051 Wireless Pressure Transmitter</td>
<td>TopWorx</td>
<td>4310 Wireless Valve Position Monitor (firmware revision 5.0 or greater)</td>
</tr>
<tr>
<td>Rosemount</td>
<td>708 Wireless Acoustic Transmitter</td>
<td>Fisher</td>
<td>4320 Wireless Valve Position Monitor (firmware revision 5.0 or greater)</td>
</tr>
</tbody>
</table>

**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

IEC62591Termination Jumpers
Emerson Wireless 781 Field Link

Field Wiring Terminals

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Label</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A (+)</td>
<td>RS-485 (+)</td>
</tr>
<tr>
<td>2</td>
<td>CONNECT</td>
<td>Termination</td>
</tr>
<tr>
<td>3</td>
<td>CONNECT</td>
<td>Termination</td>
</tr>
<tr>
<td>4</td>
<td>B (–)</td>
<td>RS-485 (–)</td>
</tr>
<tr>
<td>5</td>
<td>HART +</td>
<td>HART Configurator</td>
</tr>
<tr>
<td>6</td>
<td>HART/POWER –</td>
<td>Input Power Negative</td>
</tr>
<tr>
<td>7</td>
<td>POWER +</td>
<td>Input Power Positive</td>
</tr>
</tbody>
</table>

### 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 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**

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 EN61326:2006

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
- 15 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 IIC
- 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

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 transmitter will not pass the 500Vrms 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.

Emerson Process Management complies with the R&TTE Directive

European Certification

I1 ATEX Intrinisc 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

<table>
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<tr>
<th>Input / Power</th>
<th>Input / RS485</th>
<th>Output / RS485</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ui = 30 V</td>
<td>Ul = 11 V</td>
<td>UO = 7.14 V</td>
</tr>
<tr>
<td>li = 200 mA</td>
<td>li = 300 mA</td>
<td>IO = 112 mA</td>
</tr>
<tr>
<td>Pi = 1.0 W</td>
<td>Pi = 1.0 W</td>
<td>PO = 1.0 W</td>
</tr>
<tr>
<td>Cz = 0</td>
<td>Cz = 5.1 nF</td>
<td>Ci = 0</td>
</tr>
<tr>
<td>Lz = 0</td>
<td>Lz = 0</td>
<td>Li = 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO = 13.9 μF</td>
</tr>
</tbody>
</table>

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 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.
IECEx Intrinsic Safety
Certificate Number: IECEx BAS 11.0028X
Ex ia IIC T4 Ga (Tamb = -40 °C to 70 °C)
Enclosure Type IP66/67
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Combination Certification
KL Combination of I5, I6, I1, and I7
ControlWave Micro IEC 62591 Interface Module

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<td>PWR</td>
<td>Output Power (+)</td>
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<tr>
<td>2</td>
<td>A</td>
<td>RS-485 (+)</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>RS-485 (–)</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
<td>Output Power (–)</td>
</tr>
<tr>
<td>USB</td>
<td>USB</td>
<td>USB 2.0</td>
</tr>
</tbody>
</table>

Communications

Quantity 1

Type 4-wire connection to the Emerson Wireless 781 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
<table>
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