Quick Start Guide 00825-0100-4848, Rev EB June 2017

Rosemount[™] 848T Wireless Temperature Transmitter







NOTICE

This guide provides basic guidelines for the Rosemount 848T. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, or installations. Refer to the Rosemount 848T <u>Reference Manual</u> for more instruction. The manual and this guide are also available electronically on <u>EmersonProcess.com/Rosemount</u>.

AWARNING

Explosions could result in death or serious injury.

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Review the Product Certifications section for any restrictions associated with a safe installation.

- Before connecting a Field Communicator in an explosive atmosphere, ensure the instruments are
 installed in accordance with intrinsically safe or non-incendive field wiring practices. Electrical shock can
 result in death or serious injury.
- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock. 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.
- The power module may be replaced in a hazardous area. The power module has surface resistivity greater than one gigaohm and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

NOTICE

Shipping considerations for wireless products:

The unit was shipped to you without the power module installed. Remove the power module prior to shipping the unit.

Each power module contains two "C" size primary lithium batteries. Primary lithium batteries are regulated in transportation by the U.S. Department of Transportation, and are also covered by IATA (International Air Transport Association), ICAO (International Civil Aviation Organization), and ARD (European Ground Transportation of Dangerous Goods). It is the responsibility of the shipper to ensure compliance with these or any other local requirements. Please consult current regulations and requirements before shipping.

1.0 Wireless considerations

1.1 Power up sequence

The power module should not be installed on any wireless device until the Emerson[™] Smart Wireless Gateway (Gateway) is installed and functioning properly. Wireless devices should also be powered up in order of proximity from the Gateway, beginning with the closest. This will result in a simpler and faster network installation. Enable Active Advertising on the Gateway to ensure that new devices join the network faster. For more information see the <u>Smart Wireless</u> <u>Gateway Reference Manual</u>.

1.2 Antenna position

The antenna should be positioned vertically and it should be approximately 3 ft. (1 m) from any large structure, building, or conductive surface to allow for clear communication to other devices.



1.3 Conduit plug

The temporary orange plugs should be replaced with the included conduit plugs using approved thread sealant.

Figure 2. Conduit Plug



1.4 Field Communicator connections

The power module needs to be connected for the Field Communicator to interface with the Rosemount 848T Wireless.



2.0 Physical installation

2.1 Initial configuration

If the device was ordered with a factory configured Network ID and Join Key, it should join the network with no user input. If unsure, the Network ID and the Join Key may be manually entered to match the Gateway's.

The Network ID and Join Key may be obtained from the Gateway on the *Setup>Network>Settings* page on the web server.

Network Settings		Q 🕼 💼 admin	
168.1.10 Network name	myNet		
ploter Network ID	36063		
Security mode	Common join key CAccess control list		
Join key			
Show join key	O'Yes @No		
Generate random join key	Generate		
Ethernet protocol Rotate network key?	O'Yes ® No		
Security Key rotation period (days)	191 Contract of the second		
Time Change network key now?	O Yes No		
Paga Optona Kestat App Fermuse Upgaba Fermuse Optons Matt Onges Modus PEococ			

The Network ID and Join Key may be changed in the wireless device by using the following Fast Key sequence.

Function	Fast Key sequence	Menu items	
Wireless	2,1,1	Join Device to Network	

2.2 Sensor configuration

Sensor inputs can be configured for different sensor types. To verify or change the sensor configuration with a Field Communicator, use the following Fast Key sequence.

Function	Fast Key sequence	Menu items		
Sensor Configuration	2,1,3	Configure Sensors		

2.3 Remote mount

The Rosemount 848T Wireless is designed to be installed only in the Remote Mount configuration where the sensor is mounted separate from the Rosemount 848T housing, then connected to the Rosemount 848T via conduit.

1. Install the sensor according to standard installation practices. Be sure to use thread sealant on all connections.

 To reduce sensor wiring length, mount the Rosemount 848T Wireless transmitter central to all of the measurements. When installing the Rosemount 848T Wireless, the conduit entries need to be facing downward. If using the mounting bracket (Option Code B6), mount to a 2-in. pipe.



3. Run wiring (and conduit, if necessary) from the sensor to the Rosemount 848T. For an easier installation, use the outside conduit entries as shown below. Any unused conduit entries should be sealed with approved sealant using the included threaded conduit plugs.



- A. Conduit Entry B. Conduit Plug
- 4. Pull the wiring through the threaded conduit entry of the 848T.
- Attach the sensor wiring to the terminals as indicated on the wiring diagram. Note that Terminal screw 5 is for attaching the shield wire of the sensor to the device. See Rosemount 848T Wireless <u>Reference Manual</u> for more information.

6. To connect the power module, remove the plastic plug from the receptacle.



A. Plastic Plug

- 7. After initial installation, close the housing cover securely. Always ensure a proper seal by installing the electronics housing cover so that metal touches metal, but do not over tighten.
- 8. Position the antenna vertically. The antenna should be approximately three feet (1 m) from any large structures or buildings to allow clear communication to other devices.

2.4 Installing the optional voltage adapter

The Rosemount 848T Wireless voltage adapter allows voltage measurement from 0-10 volts. Each adapter accommodates 2 voltage inputs, and can be installed interchangeably on inputs 1 and 2 or 3 and 4.



To install voltage adapter:

1. Open terminal screws 2 and 3 on BOTH inputs. Note that the screws are captive and should NOT be completely removed by using excess force.



2. Angle adapter and slide spade lugs into terminals 2 and 3 on the left side, as shown in the figure below. Ensure that the positive and negative polarity indicators match on the adapter and the terminal block.



- 3. Lower right side of adapter into terminals 2 and 3 on the right side and center the adapter.
- 4. Tighten all terminal screws to lock divider in place.

3.0 Verify operation

Operation can be verified using one of three methods: Field Communicator, the Smart Wireless Gateway's integrated web interface, or via AMS Wireless Configurator.

3.1 Field Communicator

For HART[®] communication, an Rosemount 848T Wireless Device Dashboard (DD) is required. For connecting with a Field Communicator, refer to Figure 3 on page 4.

Function	Fast Key sequence	Menu items		
Communications	3,3	Join Status, Communications Status, Join Mode, Number of Advertisements Heard, Number of Available Neighbors, Number of Join Attempts		

3.2 Smart Wireless Gateway

In the Gateway's integrated web interface, navigate to the *Explorer* page. This page shows whether the device has joined the network and if it is communicating properly.

Note

It may take several minutes for the device to join the network.

Note

If the device joins the network and immediately has an alarm present, it is likely due to sensor configuration. Check the sensor wiring (see "Rosemount 848T Terminal Diagram" on page 10) and the sensor configuration (see "Rosemount 848T Fast Key Sequence for Field Communicator" on page 10).

Signed 4. Smart Wireless Gateway Explorer Page Signe Fage Signed 4. Smart Wireless <

3.3 AMS Wireless Configurator

When the device has joined the network, it will appear in the AMS Device Manager as illustrated below:

Figure 5. AMS Wireless Configurator Explorer Page							
# AMS Wireless Configurator - [Device Explorer]							
File View Tools Window Help							- 8 ×
<u> </u>							
Current Device							
🖃 💰 AMS Device Manager	Tag	Manufacturer	Device Type	Device Rev	Protocol	Protocol Rev	
E gge Physical Networks	02/19/2009 11:30:39.347	Rosemount	848T	2	HART		
Ready					User	admin	//

4.0 Reference information

Figure 6. Rosemount 848T Terminal Diagram

Table 1. Rosemount 848T Fast Key Sequence for Field Communicator

Function Fast Key sequence		Menu items		
Device Information 1, 1, 13		Manufacturer, Model, Final Assembly Number, Universal, Field Device, Software, Hardware, Descriptor, Message, Date, Model Number SI Unit Control, Country, Device ID		
Guided Setup 2, 1		Join Device to Network, Configure Update Rate, Configure Sensor, Calibrate Sensors, Configure Alerts		
Manual Setup	2,2	Wireless, Sensor 1, Sensor 2, Sensor 3, Sensor 4, Device Temperature, Device Information, Other		
Wireless 2, 2, 1		Network ID, Join Device to Network, Configure Update Rate, Configure Broadcast Power Level, Power Mode, Power Source		
Sensor Calibration 3, 4, 1-4		Sensor 1-4, Current Upper Trim, Current Lower Trim, Lower Sensor Trim, Upper Sensor Trim, Recall Factory Trim, RTD 2 Wire Offset		

Figure 7. Sensor Wiring Diagrams



4.1 Wiring 0-10 volts inputs on the voltage adapter

Wiring voltage 0-10 volt inputs using the adapter follows the same procedure as mV inputs and thermocouples.

Figure below shows how to connect the voltage leads.



4.2 Adapter requirements

 The adapter is only designed to be used with the 1000 mV sensor type, found on device revisions 3 and above. If it is ordered pre-installed from the factory, this will be the default sensor type. If the adapter is ordered as a spare part, the user must configure the inputs to this sensor type. The user is responsible for converting the 0–1000 mV transmitter output into a 0–10 volt scale. The formula to do this is as follows:

 $\frac{\text{Transmitter output (in mV)}}{100} = \text{Actual reading (in V)}$

- 2. If input type S004 ((1) dual channel voltage adapter) is ordered, it will be factory installed on channels 1 and 2. However, if the adapter is required to be installed on channels 3 and 4, the procedure to do so is a simple process. Confirm that channels 3 and 4 are configured for 1000 mV sensor input. After confirmation, remove the adapter from channels 1 and 2 and follow the steps provided in the 'Installing the Optional Voltage Adapter' section of this guide to install it on channels 3 and 4.
- In order to ensure the device remains within the accuracy specifications, the effect of source impedance must be checked.
 Loaded to unloaded, the impedance ratio cannot exceed 0.1%. For detailed instructions on how to verify this, refer to Section 5 of the Reference Manual.

5.0 Product Certifications

Rev 1.2

5.1 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.

5.2 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.

5.3 European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at <u>EmersonProcess.com/Rosemount</u>.

5.4 Ordinary Location Certification

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by a nationally recognized testing laboratory (NRTL), as accredited by the Federal Occupational Safety and Health Administration (OSHA).

5.5 Installing Equipment in North America

The US National Electrical Code[®] (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

- 15 FM Intrinsically Safe
 - Certificate: 3034378
 - Standards: FM Class 3600:1998, FM Class 3610:2010, FM Class 3810:2005,
 - NEMA®-250:1997, ANSI/ISA-60079-0:2009, ANSI/ISA-60079-11:2009, IEC 60529:2004

Markings: IS CL I, DIV 1, GP A, B, C, D; NI CL I, DIV 2, GP A, B, C, D; IS CL I, Zone 0, AEx ia llC T4 (–50 °C \leq T_a \leq +70 °C), when installed per Rosemount drawing 00849-1000; Type 4X; IP66

See Table 2 at the end of the Product Certifications section for entity parameters.

N5 FM Class 1, Division 2, and Dust Ignition-proof Certificate: 3034378 Standards: FM Class 3600:1998, FM Class 3610:2010, FM Class 3810:2005, NEMA-250:1997, IEC 60529:2004

Markings: NI CL I, DIV 2, GP A, B, C, D; T4(-50 °C $\leq T_a \leq +70$ °C); DIP CL II/III DIV 1, GP E, F, G; -50 °C $\leq T_a \leq +85$ °C; when installed per Rosemount drawing 00849-1000; Type 4X; IP66

Canada

I6 CSA Intrinsic Safety

Certificate: 1261865

Standards: CSA Std. C22.2 No. 25-1966, CSA Std. C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA C22.2 No. 142-M1987, CAN/CSA C22.2 No. 157-92, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No 60529:05

Markings: Intrinsically Safe for CL I, DIV 1 GP A, B, C, D; Suitable for CL I DIV 2 GP A, B, C, D; when installed per Rosemount drawing 00849-1016; T3C; Type 4X, IP66 See Table 2 at the end of the Product Certifications section for entity parameters.

N6 CSA Class I, Division 2

Certificate: 1261865

Standards: CSA Std. C22.2 No. 25-1966, CSA Std. C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA C22.2 No. 142-M1987, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No 60529:05

Markings: Suitable for CL I DIV 2 GP A, B, C, D; T3C; when installed per Rosemount drawing 00849-1016; Type 4X, IP66

Europe

11 ATEX Intrinsic Safety Certificate No.: Baseefa09ATEX0022X Standards: EN 60079-0:2012, EN 60079-11:2012 Markings: \bigcirc II 1 G Ex ia IIC T4/T5 Ga T4(-60 °C \leq T_a \leq +70 °C), T5(-60 °C \leq T_a \leq +40 °C) See Table 2 at the end of the Product Certifications section for entity parameters.

Special Conditions for Safe Use (X):

- 1. The surface resistivity of the antenna is greater than $1 G\Omega$. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
- The power module may be replaced in a hazardous area. The power module has surface resistivity greater than 1GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
- 3. The enclosure may be made from aluminum alloy with a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in Zone 0.

International

17 IECEx Intrinsic Safety

Certificate: IECEx BAS 09.0004X Standards: IEC 60079-0:2011, IEC 60079-11:2011 Markings: Ex ia IIC T5/T4 Ga, T4(-60 °C \leq T_a \leq +70 °C), T5(-60 °C \leq T_a \leq +40 °C) See Table 2 at the end of the Product Certifications section for entity parameters.

Special Conditions for Safe Use (X):

- 1. The surface resistivity of the antenna is greater than $1G\Omega$. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
- 2. The power module may be replaced in a hazardous area. The power module has surface resistivity greater than $1G\Omega$ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
- 3. The enclosure may be made from aluminum alloy with a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in Zone 0.

Brazil

I2 INMETRO Intrinsic Safety

Certificate: UL-BR 15.0034X Standards: ABNT NBR IEC 60079-0:2008 + Corrigendum 1:2011, ABNT NBR IEC 60079-11:2009

Markings: Ex ia IIC T4/T5, T4($-60 \degree C \le T_a \le +70 \degree C$), T5($-60 \degree C \le T_a \le +40 \degree C$) See Table 2 at the end of the Product Certifications section for entity parameters.

Special Condition for Safe Use (X):

- 1. The surface resistance of the antenna is greater than $1 G\Omega$. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
- 2. The Model 701PBKKF Power Module may be replaced in a hazardous area. The power module has surface resistance greater than 1 G Ω and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
- 3. The 848T enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in areas that requires EPL Ga (Zone 0).

China

13 NEPSI Intrinsic Safety

Certificate: GYJ16.1205X

Markings: Ex ia IIC T4/T5 Ga, T4(-60 °C \leq T_a \leq +70 °C), T5(-60 °C \leq T_a \leq +40 °C) See Table 2 at the end of the Product Certifications section for entity parameters.

Special Condition for Safe Use (X):

- 1. The surface resistance of the antenna is greater than $1 G\Omega$. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
- 2. The power module may be replaced in a hazardous area. The power module has surface resistance greater than 1 G Ω and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
- 3. Manufacture-provided battery pack made up of two Tadiran TL-5920 Lithium Thionyl-Chloride primary cells should be used.
- 4. The product should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.
- The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shield has to be grounded reliably in non-hazardous area.

- 6. End user is not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
- 7. When installation, use and maintenance of this product, observe following standards: GB3836.13-2013 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres" GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)" GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)" GB3836.18-2010 "Explosive Atmospheres Part 18: Intrinsically Safe System GB50257-2014 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering"

EAC – Belarus, Kazakhstan, Russia

 IM Technical Regulations Customs Union (EAC) Intrinsic Safety Certificate: RU C-US.GB05.B.00289 Markings: 0Ex ia IIC T4, T5 Ga X See Table 2 at the end of the Product Certifications section for entity parameters.

Japan

I4TIIS Intrinsic Safety
Certificate: TC19154
Markings: Ex ia IIC T4, T4(-20 °C \leq Ta \leq +60 °C)
See Table 2 at the end of the Product Certifications section for entity parameters.

5.6 Additional Certifications

SBVBureau Veritas (BV) Type Approval Certificate: 26325/A2 BV Requirements: Bureau Veritas Rules for the Classification of Steel Ships

Table 2. Entity Parameters (Sensor Terminals)

Parameter	FM	CSA	ATEX, IECEx, NEPSI, EAC, TIIS, INMETRO
Voltage U _o (V)	6.51	6.6	6.6
Current I _o (mA)	3.12	3.2	3.2
Power P _o (mW)	5.1	20.4	5.3
Capacitance C _o (µF)	22	22	22
Inductance L _o (H)	1	1	1

Figure 8. Rosemount 848T Wireless Declaration of Conformity

EMERSON EU Declaration of Conformity No: RMD 1073 Rev. G We, Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA declare under our sole responsibility that the product, **Rosemount 848T Wireless Temperature Transmitter** manufactured by, Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule. Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule. dita Vice President of Global Quality (signature) (function) May 24, 2017 Chris LaPoint (date of issue) (name) Page 1 of 2



Table 1B: List of Rosemount 848T Wireless Parts with China RoHS Concentration above MCVs 表格 1B: 含有China RoHS管控物质超过最大浓度限值的部件型号列表 Rosemount 848T Wireless

	Hazardous Substances / 有害物质						
Part Name 部件名称	Lead 铅 (Pb)	Mercury 汞 (Hg)	Cadmium 镉 (Cd)	Hexavalent Chromium 六价铬 (Cr +6)	Polybrominated biphenyls 多溴联苯 (PBB)	Polybrominated diphenyl ethers 多溴联苯醚 (PBDE)	
Electronics Assembly 电子组件	х	0	0	0	0	0	
Housing Assembly 壳体组件	0	0	0	х	0	0	
Sensor Assembly 传感器组件	х	0	0	0	0	0	

This table is proposed in accordance with the provision of SJ/T11364

本表格系依据SJ/T11364的规定而制作.

O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

O: 意为该部件的所有均质材料中该有害物质的含量均低于GB/T 26572 所规定的限量要求.

X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

X: 意为在该部件所使用的所有均质材料里,至少有一类均质材料中该有害物质的含量高于GB/T 26572 所规定的限量要求.

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