Quick Start Guide

00825-0700-4410, Rev AF July 2023

Emerson Wireless 781S Smart Antenna





ROSEMOUNT

Safety messages

NOTICE

This guide provides basic guidelines for the Emerson Wireless 781S Smart Antenna. It does not provide instructions for diagnostics, maintenance, service, or troubleshooting. Refer to the Emerson Wireless 1410S Gateway and 781S Smart Antenna Reference Manual for more information and instructions. The manuals and this guide are available electronically on Emerson.com.

A WARNING

Failure to follow these installation guidelines could result in death or serious injury.

Ensure only qualified personnel perform the installation.

A WARNING

Explosions could result in death or serious injury.

Installation of the transmitters in a hazardous environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Kindly review the Product Certifications section for any restrictions associated with a safe installation.

A WARNING

Electrical shock could cause death or serious injury.

Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

A WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental in protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

NOTICE

This device complies with Part 15 of the Federal Communication Commission (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 8 in. (20 cm) from all persons.

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1 Wireless planning

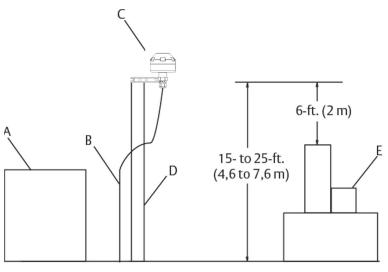
1.1 Power up sequence

For a simpler and faster network installation, first install the Emerson Wireless Smart Antenna and wireless inputs and outputs and make sure they are functioning properly. Next, power up wireless field devices in order of proximity from the antenna, beginning with the closest.

1.2 Antenna location

Mount the antenna in a location that allows convenient access to the host system network (wireless inputs/outputs) as well as the wireless field device network.





- A. Control room
- B. RS-485 cable
- C. Emerson Wireless 781S Smart Antenna
- D. Mast or pipe
- E. Infrastructure

1.3 Antenna position

Position the Emerson 781S Smart Antenna vertically and approximately 3 ft (1 m) from large structures, buildings, or conductive surfaces to allow for clear communication to other devices.

If installing multiple antennas, it is important that the antennas have 3 ft (1 m) of horizontal separation from one another.

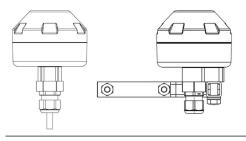


Figure 1-2: Antenna position

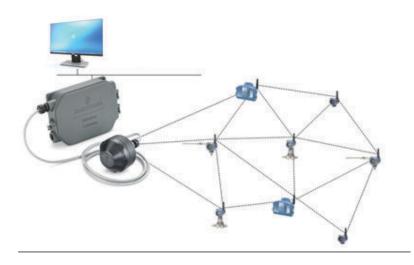
2 Intended use

2.1 System architecture

The smart antenna must be used in conjunction with a network manager or network gateway.

The smart antenna then functions as a translator between the wired network and a wireless field network.

Figure 2-1: Example system architecture



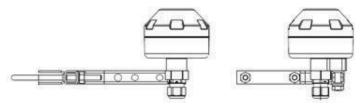
3 Physical installation

3.1 Mount the antenna to a pipe

Procedure

- 1. Insert U-bolt around 2-in. pipe or mast, through the saddle, through the L-shaped bracket, and through the washer plate.
- 2. Use a ½-in. socket-head wrench to fasten the nuts to the Ubolt.
- 3. Secure the antenna to the L-shaped bracket with a 5/16-in. threaded bolt.
- 4. Use a 5/16-in. wrench to tighten the screw into the housing.





3.2 Connect to power and data

The Emerson 781S is completely prewired and only needs to be connected and powered on the Gateway end. The housing is permanently sealed on the Emerson 781S.

Prerequisites

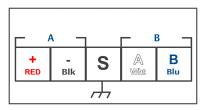
If operating with more than one antenna, it is important the antenna is always connected to the antenna terminal connection 1 port.

Procedure

- 1. Connect the positive power lead to the "+" power terminal and the negative power lead to the "-" terminal.
- 2. Connect the data + lead to the "**A** (+)" terminal and the data lead to the "**B** (-)" terminal.
- 3. Connect the grounding wire to the Gateway's shield connection.

4. If connecting multiple antennas, repeat this process for terminal connection 2.

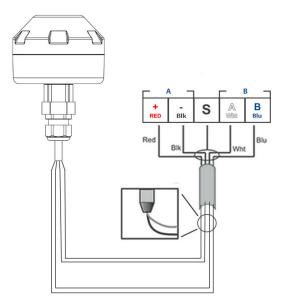
Figure 3-2: Wiring guide



- A. Power
- B. Data

sitive
gative
485 comm A
485 comm B

Figure 3-3: Emerson Wireless 781S



A. Power output

B. RS-485 comm

4 Best practices

Twisted shielded pair cable is generally used to wire the serial connection to the Gateway.

Install the Smart Antenna in a central location of the wireless field network so that it has the most direct connections to wireless devices as possible.

5 Verify operation

5.1 Verify antenna's operation through Gateway

The antenna has no exterior lights or LCD displays. Therefore, once it is powered up through the Gateway, you must verify its operation through the Gateway end of the connection.

5.2 Power up sequence

The second and third LEDs in the Emerson 1410S correlate to the first and second terminal connections. These lights should be green when the antenna is connected properly.

5.3 Normal operation

You can assess the operation of the *Wireless*HART[®] Smart Antenna within the Gateway user interface.

To see the connection, allow the link to be seen as a field device. To verify operation, attempt to connect to a device.

6 Product certifications

Rev 2.5

6.1 European Directive Information

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

6.2 Telecommunications compliance

All wireless devices require certification to ensure 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.

6.3 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.

This device complies with Industry Canada license-exempt RSS-247. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Changes or modification to the equipment not expressly approved by Emerson could void the user's authority to operate the equipment.

Cet appareil est conforme à la Partie 15 de la réglementation FCC. Son fonctionnement est soumis aux conditions suivantes: Cet appareil ne doit pas causer d'interférences nuisibles. Cet appareil doit accepter toute interférence reçue, incluant toute interférence pouvant causer un fonctionnement indésirable. Cet appareil doit être installé pour assurer une distance minimum de l'antenne de séparation de 20 cm de toute personne.

Cet appareil est conforme à la norme RSS-247 Industrie Canada exempt de licence. Son fonctionnement est soumis aux deux conditions suivantes: (1) cet appareil ne doit pas provoquer d'interférences et (2) cet appareil doit accepter toute interférence, y compris les interférences pouvant causer un mauvais fonctionnement du dispositif.

Les changements ou les modifications apportés à l'équipement qui n'est pas expressément approuvé par Emerson pourraient annuler l'autorité de l'utilisateur à utiliser cet équipement.

6.4 Ordinary location certification

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

6.5 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.

6.6 USA

I5 USA Intrinsic Safety

Certificate 80011679

- Markings Class I, II, III Division 1 Groups A, B, C, D, E, F, G T4; Class I, II, III Division 2, Groups A, B, C, D, F, G T4 T4 (-40 °C \leq T_a \leq +70 °C); Class I Zone 0, AEx ia IIC T4 Ga; Class I Zone 2, AEx ic IIC T4 Gc
- Standards FM 3600: 2011, FM 3610: 2018, FM 3611: 2018, ANSI/UL 60079-0: 2019, ANSI/UL 60079-11: 2014

Warnings/Conditions of Acceptability

- 1. Installed as per Control drawing 01410-1300 for Hazardous and Non-Hazardous areas.
- 2. Must be installed with a resistive barrier.
- 3. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
- 4. The measured capacitance between the equipment enclosure and metallic conduit adapter is 21pF. This must be considered only when the Model 781S is integrated into a system where the process connection is not grounded.

6.7 Canada

I6 Canada Intrinsic Safety

Certificate 80011679

- Markings Class I, II, III Division 1 Groups A, B, C, D, E, F, G T4; Class I, II, III Division 2, Groups A, B, C, D, F, G T4 T4 (-40 °C $\leq T_a \leq +70$ °C); Ex ia IIC T4 Ga; Ex ic IIC T4 Gc
- Standards CAN/CSA C22.2 No 60079-0: 2019, CAN/CSA C22.2 No. 60079-11: 2014, CSA C22.2 No.213 – 2017, CSA C22.2 No. 94.2-15

Warnings

- 1. Installed as per Control drawing 01410-1300 for Hazardous and Non-Hazardous areas.
- 2. Must be installed with a resistive barrier.
- The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
- 4. The measured capacitance between the equipment enclosure and metallic conduit adapter is 21pF. This must be considered only when the Model 781S is integrated into a system where the process connection is not grounded.

6.8 Europe

I1 ATEX/UKEX Intrinsic Safety

Certificate	CSAE 21UKEX2710X, CSANe 21ATEX2301X
Markings	Ex ia IIC T4 Ga (-40 °C \leq T _a \leq +70 °C)
Standards	EN IEC 60079-0: 2018, EN 60079-11: 2012

Special Conditions for Safe Use (X):

- 1. Must be installed with a resistive barrier.
- The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
- 3. The measured capacitance between the equipment enclosure and metallic conduit adapter is 21pF. This must be considered only when the Model 781S is integrated into a system where the process connection is not grounded.

ATEX/UKEX Intrinsic Safety

Certificate	CSAE 21UKEX4711X, CSANe 21ATEX4302X
Markings	Ex ic IIC T4 Gc (-40 °C \leq T _a \leq +70 °C)
Standards	EN IEC 60079-0: 2018, EN 60079-11: 2012

Special Conditions for Safe Use (X):

- 1. Must be installed with a resistive barrier.
- 2. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
- 3. The measured capacitance between the equipment enclosure and metallic conduit adapter is 21pF. This must be considered only when the Model 781S is integrated into a system where the process connection is not grounded.

6.9 International

I7 IECEx Intrinsic Safety

Certificate IECEx CSA 21.0052X

- Markings Ex ia IIC T4 Ga (-40 °C \leq T_a \leq +70 °C), Ex ic IIC T4 Gc (-40 °C \leq T_a \leq +70 °C)
- Standards IEC 60079-0: 2017, IEC 60079-11: 2011

Special Conditions for Safe Use (X):

- 1. Must be installed with a Resistive barrier.
- The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
- 3. The measured capacitance between the equipment enclosure and metallic conduit adapter is 21pF. This must be considered only when the Model 781S is integrated into a system where the process connection is not grounded.

6.10 Brazil

I2 INMETRO Intrinsic Safety

Certificate UL-BR 20.1568X

Markings Ex ia IIC T4 Ga (-40 °C \leq T_a \leq +70 °C), Ex ic IIC T4 Gc (-40 °C \leq T_a \leq +70 °C)

Standards ABNT NBR IEC 60079-0: 2013, ABNT NBR IEC 60079-11: 2013

Special Conditions for Safe Use (X)

See certificate.

6.11 Japan

I4 CML Intrinsic Safety

Certificate CML20JPN2401X

Markings Ex ia IIC T4 Ga (-40 °C \leq T_a \leq +70 °C), Ex ic IIC T4 Gc (-40 °C \leq T_a \leq +70 °C)

Special Conditions for Safe Use (X)

See certificate.

6.12 Eurasian conformity

IM Intrinsic Safety

Certificate TOO T-Стандарт ЕАЭС КZ 7500525.01.01.00739

Markings 0Ex ia IIC T4 Ga X, 2Ex ic IIC T4 Gc X; (-40 °C \leq Ta \leq +70 °C)

Special Conditions for Safe Use (X)

See certificate.

6.13 China

I3 Nepsi Intrinsic Safety

Certificate GYJ21.1109X

Markings Ex ia IIC T4 Ga, Ex ic IIC T4 Gc (-40 °C \leq T_a \leq +70 °C)

Special Conditions for Safe Use (X)

See certificate.

6.14 Korea

IP KTL Intrinsic Safety

Certificate	21-KA4BO-0489X
Markings	Ex ia IIC T4 Ga (-40 °C ≤ T _a ≤ +70 °C)

Certificate	21-KA4BO-0490X
Markings	Ex ic IIC T4 Gc (-40 °C \leq T _a \leq +70 °C)

Special Conditions for Safe Use (X)

See certificate.

6.15 Combinations

- **KD** Combination of I1, I5, and I6
- KL Combination of I1, I5, I6, and I7

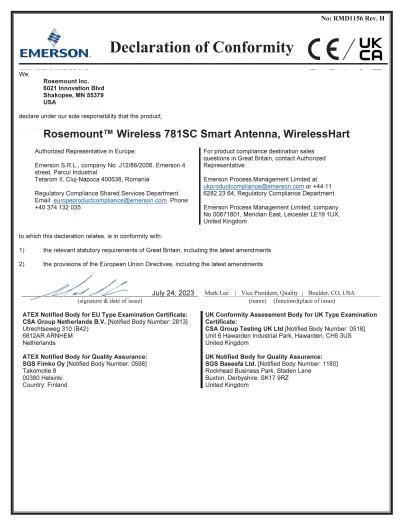
6.16 Declaration of Conformity

Emerson Wireless 781SA Smart Antenna

	No: RMD1155 Rev. I
EMERSON Declaration	of Conformity C € / UK
We, Rosemount Inc. 6021 Innovation Blvd Shakopee, MN 55379 USA	
declare under our sole responsibility that the product,	
Emerson Wireless 781SA Smart Antenna, Wirele	essHart
Authorized Representative in Europe: Emerson S.R.L., company No. J12/68/2006, Emerson 4 street, Parcul Industrial Tetarom II, Cluj-Napoca 400638, Romania Regulatory Compliance Shared Services Department Email: <u>europeproductoompliance@emerson.com</u> Phone: +40 374 132 035	For product compliance destination sales questions in Great Britain, contact Authorized Representative: Emerson Process Management Limited at <u>ukproductoompliance@emerson.com</u> or +44 11 6282 23 64, Regulatory Compliance Department. Emerson Process Management Limited, company No 00671801, Meridian East, Leicester LE19 1UX,
to which this declaration relates, is in conformity with:	United Kingdom
1) the relevant statutory requirements of Great Britain, includ	
 the provisions of the European Union Directives, including 	g the latest amendments.
1/1/2	
July 24, 2023 (signature & date of issue)	Mark Lee Vice President, Quality Boulder, CO, USA (name) (function) (place of issue)
ATEX Notified Body for EU Type Examination Certificate: CSA Group Netherlands B.V. [Notified Body Number: 2813] Utrechtseveg 310 6812 AR ARNHEM Netherlands ATEX Notified Body for Quality Assurance: SGS Finiko Qy (Notified Body Number: 0598] Taksoloke 6 00300 Helsinki Finland	UK Conformity Assessment Body for UK Type Examination Certificate: CSA Group Testing UK Ltd [Approved Body Number: 0518] Unite Kingdom UK Approved Body for Quality Assurance: SGS Baseafa Ltd. [Approved Body Number: 1180] Rochidead Dumess Park, Station Lane Buoton, Derbyahire, SK17 9R2 United Kingdom

EMERSON Declaratio	on of Conformity $\mathbf{C} \in \mathbf{C}$
EMC Directive (2014/30/EU) Iarmonized Standards: EN 613261-12013 RoHS Directive (2011/65/EU) Amended 2015/863 Iarmonized Standards: EN IEC 63000-2018	Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091) Designated Standards: EN 61326-1:2013 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (S.I. 2012/3032) Designated Standards: EN IEC 63000:2018
tadio Equipment Directive (RED) (2014/35/EU) Iarmonized Standards: IN 300 328 V2.2.2.2019 IN 301 489-17 V2.2.3 IN 301 489-17 V3.2.4 IN 61010-1.2010/41.2019	Badio Equipment Regulations 2017 (S.I. 2017/1206) Designated Standards; EN 300 328 V2 2.2 2019 EN 301 489-1 V2 2.3 EN 301 489-1 7 V3 2.4 EN 301 400-1700/04/12019
ATEX Directive (2014/34/EU) CSANE 21ATEX2301X - Wireless Field Link Equipment Group II, [Category 10 Ex la IIC 14 Ga (40° C 3 Ta 3° 0° C)] Harmonized Standards: EN 60079-11:2012 CSANE 21ATEX4302X - Wireless Field Link Equipment Group II, [Category 3G Ex le IIC 14 Ge (40° C 3 Ta 3° 0° C)] Harmonized Standards: EN IIC 60079-0218 EN 60079-11:2012	Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016 (S.I. 2016/1107) CSAE 21UKEX27101. [Category 16 Ex Ia IIC T4 Ga ("40"C S Ta 3 70"C)] Designated Standards: EN EC 90079-0 2018 EN 60079-11:2012 CSAE 21UKEX4711X – Wireless Field Link Equipment Group II. [Category 36 EX Ic IIC T4 Ge ("40"C S Ta 3 70"C)] Designated Standards: EN IEC 60079-0 2018 EN 80079-11:2012

Emerson Wireless 781SC Smart Antenna



A	No: RMD1156 Rev. H
EMERSON Declaration	of Conformity C E / UK
EMC Directive (2014/30/EU) Harmonized Standards: EN 61326-1:2013	Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091) Designated Standards: EN 61326-12013
RoHS Directive (2011/85/EU) Amended 2015/863 Harmonized Standards: IEC 63000-2018	The Restriction of the Use of Cartain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (S.I. 2012/2032) Designated Standards: IEC 63000:2018
Radio Equipment Directive (RED) (2014/35/EU) Harmonized Standards: EN 300 328 V2 22.2219 EN 301 489-17 V3.1.12017 IEC 6101-1.2101, AMD1.2016 IEC 60529.2001	Radio Equipment Regulations 2017 (S.I. 2017/1206) Designated Standards: EN 300 282 V2.2.2.2019 EN 301 489-17 V3.1.1.2017 IEC 61010-1.2010, AMD1.2016 IEC 60529.2001
ATEX Directive (2014/34/EU) CSANE 21ATEX2301X - Wireless Field Link Equipment Group II, [Category 1G Ex ia IIC 74 Ga (40° C 51 a 5 70°C)] Harmonized Standards: EN 105 (50079-0.2018 EN 00078-11.2012 CSANE 21ATEX4302X - Wireless Field Link Equipment Group III, [Category 3G Ex in IIC 74 Gc (-40° C 51 a 5 70°C)] Harmonized Standards: EN 1EC 60079-0:2018 EN 1EC 60079-0:2018	Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016 (S.I. 2016/102) CSAE 21UKEX2710X – Wireless Field Link Equipment Group II, (Category 1G Ex Ia IIC 74 Ga (~40°C 5 Ta 5 70°C)) Designated Standards: EN 80079-11.2012 CSAE 21UKEX4711X – Wireless Field Link Equipment Group II, (Category 3G Ex Ia IIC 74 Ge (~40°C 5 Ta 5 70°C)) Designated Standards: EN IEC 60079-0.2018 EN 80079-11.2012

6.17 China RoHS table

含有China RoHS 管控物质超过最大浓度限值的部件型号列表 781S List of 781S Parts with China RoHS Concentration above MCVs

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

SJ/T11364.的规定而制作. This table is proposed in accordance with the provision of SJ/T11364.

O: 激力该部件的所有均质材料中该有套物质的含量均低于GB/T 26572.所规定的闭量要求. O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X. 意力在该部件所使用的所有站质材料里, 至少有一类构质材料中该有害物质的含量有了GB/T 26572 所规定约缩量要求 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.

7 Reference data

For information on product specs, dimensional drawings, ordering information or the complete reference manual, see Emerson.com.

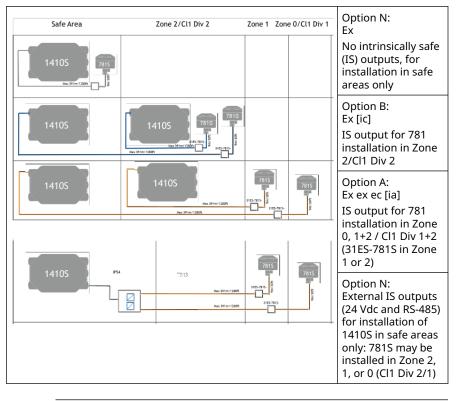


Figure 7-1: Hazardous Location Installation

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For more information: Emerson.com

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