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Sensata IWTT-Node Series Industrial Wireless Temperature Transmitter User Manual

Contents

Sensata IWTT-Node Series Industrial Wireless Temperature Transmitter

Whilst every effort has been taken to ensure the accuracy of this document, we accept no responsibility for damage, injury, loss, or expense resulting from errors or omissions, and reserve the right of amendment without notice.

Information for users

This equipment has been tested and found to comply with the limits for a Class B device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Caution: To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance operation at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. No other antenna may be used with this equipment other than the PCB antenna supplied with this equipment.

INTRODUCTION

Safety Information

This manual contains information that must be observed in the interest of your safety and to avoid damage to assets. Please read this manual before installing and commissioning the device and keep the manual in an accessible location for all users.

Contains FCC ID: W70MRF24J40MDME
Caution: To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance operation at closer than this distance is not recommended. The antenna

used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. No other antenna may be used with this equipment other than the PCB antenna supplied with this equipment. Please see the Certifications section for more information on RF Exposure Compliance

Hardware Features

Our range of IWT wireless transmitters are available for a wide range of input types. The IWTT-Node temperature transmitter has been designed to accept an input from a K or J type thermocouple or PT100 RTD sensor and transmit the value to one of the IWR range of receivers.
Depending on the receiver used, the value can be outputted as either a 4-20 mA or
1-5 V dc signal, displayed and logged on a PC, output as a Modbus RTU or TCP/IP register, or transmitted to a remote server using MQTT messages. The range of receivers available is shown in the table below.

Receiver Type	Features
IWR-1	1 off 4-20 mA or 1-5V and 1 off Relay Output
IWR-5	5 off 4-20 mA or 1-5V and 1 off Relay Output
IWR-USB	Connects to any PC for data display and logging
IWR-PORT	Stores data from IWT transmitters as Modbus Registers
IoT-Gateway	Stores data from IWT Transmitters & sends it to remote servers using MQTT packets

- The IWTT-Node temperature transmitter works within the ISM license-free 2.4GHz bands.
- Ranges of up to 500m are possible using the standard transmitter and receiver unit with the optional 3dBi antenna giving a range of up to 750m.
- The transmitter is powered by a primary 3.6V lithium cell and care must be taken to insert the battery in the correct polarity.

UNPACKING

The instrument should be carefully inspected for signs of damage that may have occurred in transit. In the unlikely case that damage has been sustained, DO NOT use the instrument, but please retain all packaging for our inspection and contact your supplier immediately.

PRODUCT IDENTIFICATION LABEL

The unit delivered should be carefully inspected to ensure it is suitable for the application required. Detailed information on the product is included in the identification label and the user manual.
Please ensure, in particular, that the input range of the IWT is suitable for the intended application and that the IWT unit will not be subjected to temperatures greater than those specified in this manual.

INSTALLING/CHANGING THE BATTERY

- A Lithium 3.6V battery is included inside the IWT transmitter. The battery may be changed at any time, but care must be taken to install the battery with the correct polarity.
- After the battery has been changed, the unit should be switched on using the yellow slider switch SW3 and then the pushbutton SW1 should be pushed and held for 5s.

- This is to ensure the battery life count is reset correctly when a new battery is installed.
- The internal red LED will flash 5 times to indicate this procedure has been carried out successfully.
- The battery life is determined by the rate the transmitter sends the Temperature value to the receiver, this update rate can be selected using Dip Switch 1 and the default value is 10s.
- Please dispose of all batteries as specified by the legislator according to the Closed Substance Cycle and Waste Management Act or country regulations.

WARNING!
MAKE SURE THE CORRECT BATTERY POLARITY IS OBSERVED!
WARNING!
INCORRECT BATTERIES MAY DAMAGE THE UNIT USE ONLY 3.6V LITHIUM C CELL BATTERIES

SETTING UP THE IWT WIRELESS TRANSMITTER

The IWT instrument is shipped in a default configuration which allows the unit to connect with any default IWR receiver unit and transmit the measured signal every 10 s simply by switching the unit on using SW3 on the internal circuit board.
If a different update rate is required, or a different network frequency channel is required these parameters can be selected using DIP Switch 1 as detailed below:
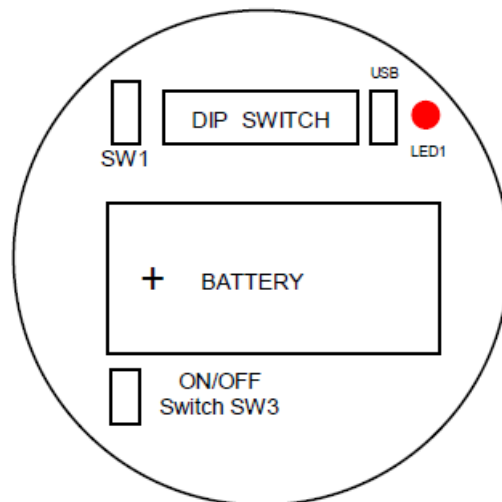
Switches 1, 2, 3 & 4 select the RF Network the IWT will transmit on. The default network for both the IWT transmitter and IWR receiver is network 1.

RF NETWORK	1	2	3	4
1	0	0	0	0
2	0	0	0	1
3	0	0	1	0
4	0	0	1	1
5	0	1	0	0
6	0	1	0	1
7	0	1	1	0
8	0	1	1	1
9	1	0	0	0
10	1	0	0	1
11	1	0	1	0
12	1	0	1	1
13	1	1	0	0
14	1	1	0	1
15	1	1	1	0
16	1	1	1	1

Switches 5, 6 & 7 select the Transmission rate of the unit. This effectively sets how often the measured value is sent to the receiver.
At 1 and 5 second rate, a power save option is available (on by default) that changes the transmit time to every 30 seconds if the IWR is switched off or out of range for more than 3 minutes. This option can be changed using the IWT-SET program.

Transmit time	5	6	7
10 seconds	0	0	0
20 seconds	0	0	1
30 seconds	0	1	0
60 seconds	0	1	1
120 seconds	1	0	0
600 seconds	1	0	1
1 second	1	1	0
5 seconds	1	1	1

Switches 8, 9, and 10 set the Channel Number of the transmitter. This is used with the 5 channel receiver unit (IWR-5) to select which IWT wireless transmitter is linked to which 4-20 mA or 1-5 V dc output channel.
Channels 1 to 128 can be used with an IWR-USB, IWR-PORT, or IoT Gateway receiver. The channel number can be changed using the IWT-SET PC configuration software if switches 8, 9, and10 are switched to the on position

1	0	0	0
2	0	0	1
3	0	1	0
4	0	1	1
5	1	0	0
6	1	0	1
7	1	1	0
8 (or 1 to 128)	1	1	1

The IWT transmitter is now set up and ready to be used. Install the unit where required, wire the appropriate input into the IWT as specified below (if there isn't an integral sensor), and switch the unit ON using SW3. Pushbutton switch SW1 can be pushed to force the unit to transmit its current measured value. A red LED 1 will flash once when the transmit button is pressed and flash a second time if the transmission has been received and acknowledged by an IWR receiver unit.

If the unit has transmitted successfully, the output of the connected receiver unit will output a value reflecting the signal level being measured.

TROUBLE-SHOOTING GUIDE

Problem encountered	Possible Causes
LED1 doesn't flash when pushbutton SW1 is pressed	Unit not switched on, switch on using SW3. The battery is not installed correctly. The battery needs replacing.
LED1 only flashes once when SW1 is pressed	IWR receiver not switched on. IWR receiver is not set up for the same RF network. IWR receiver not within range of the transmitter. If an IWR-1 receiver is used, ensure that the transmitter is set to Tx Channel 1
Output from the IWR receiver isn't equivalent to the signal being monitored	IWR receiver set up incorrectly, see IWR user manual for further details. Check that the green external LED on the receiver is flashing when the transmitter push button is pressed as the receiver may be out of range.

SYSTEM PART NUMBERS

Part Number	Input Range	Terminal Connection
IWTT-Node-K	K Type thermocouple 0-1200 °C	1. +ve 2. -ve
IWTT-Node-J	J Type Thermocouple 0-1200 °C	1. +ve 2. -ve
IWTT-Node-PT	PT100 RTD Sensor -200 – 800 °C	1. +ve 2. -ve 3. 3rd wire

Receiver Part Number	Number of Output Channels
IWR-1	One
IWR-5	Five
IWR-USB	Data from up to 128 IWT Transmitters
IWR-PORT	Data from up to 128 IWT Transmitters
IoT-Gateway	Data from up to 128 IWT Transmitters
IANT-3	3 dBi Antenna

SPECIFICATIONS

System Performance	
Accuracy (non-linearity & hysteresis)	<± 0.5°C
Setting Errors	Zero & Full Scale, <± 0.5°C
Input range	J, K type thermocouples, PT100 Sensors
Ambient Temperature	-20 to +80 °C
Storage Temperature	-20 to +80 °C
Temperature Sensor Connection	Wired input using an M12 Cable Gland
Weight	310 g
RF Transmitter	Contains FCC W70MRF24J40MDME
Power Requirements	Lithium Thionyl Chloride C 3.6V Cell
Battery Life	5 Years (10s transmission rate)
Dimensions	79 mm x 79 mm x 52 mm (L x W x D)
Mounting	Any Orientation

United States FCC

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- Reorient or relocate the receiving antenna

- Increase the separation between the equipment and receiver

- Connect the equipment into an outlet on a circuit different from that which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help

Warning: Changes or modifications not expressly approved by Cynergy3 could void the user's authority to operate the equipment.
RF Exposure
Contains FCC ID: W70MRF24J40MDME
In this equipment, the antenna supplied is a PCB antenna and an alternative antenna must not be used.
Caution: To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance operation at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. No other antenna may be used with this equipment other than the PCB antenna supplied with this equipment.
This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and this device must accept any interference, including interference that may cause undesired operation of the device.
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of the type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

The MRF24J40MD/ME wireless module used in this equipment has been tested and is in conformity with the essential requirements and other relevant requirements of the RED Directive 2014/53/EU. That module is in conformity with the following standards and/or other normative documents:

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Documents / Resources

Sensata IWTT-Node Series Industrial Wireless Temperature Transmitter [pdf] User Manual IWTT-Node Series Industrial Wireless Temperature Transmitter, IWTT-Node Series, Industrial Wireless Temperature Transmitter, Wireless Temperature Transmitter, Temperature Transmitter, Transmitter

References

- **Home | Cynergy3**
- **Sensata Technologies: Sensing is What We Do**

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