

IWR-5 Series

FIVE CHANNEL INDUSTRIAL WIRELESS PRESSURE/TEMPERATURE RECEIVER



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 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 antenna supplied with this equipment.

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1. INTRODUCTION

1.1 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.

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

1.2 Hardware Features

The IWR range of Wireless Pressure & Temperature Receivers has been designed to receive the values from Wireless Pressure & Temperature transmitters and output the measured value as 4-20 mA or 1-5 V dc analog output signals.

The IWR-1 has a single output and the IWR-5 has five outputs, each of which can be linked to an individual transmitter.

The IWR range of receiver units operates on the license-free 2.4GHz frequency band.

Ranges of up to 500 m are possible using the standard transmitter and receiver units with the supplied antennas. The achieved ranges can be adversely affected by obstacles (particularly metals), walls, trees, vehicles, etc., in between the transmitter and receiver.

The receiver is powered by a DC voltage of 12-32 V dc.

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2. UNPACKING

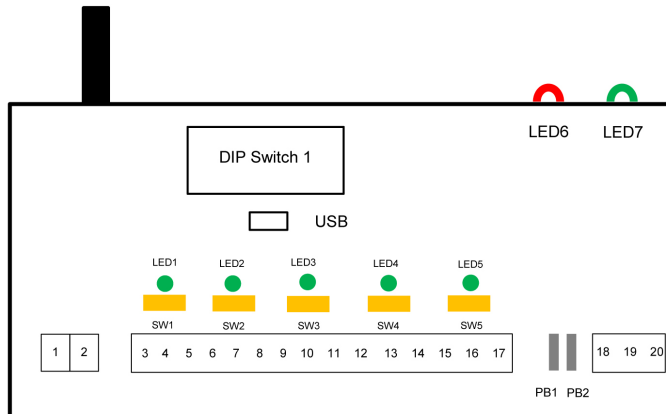
The instrument should be carefully inspected for signs of damage that may have occurred in transit. In the unlikely case that damage has been sustained, DO NOT use the instrument, but please retain all packaging for our inspection and contact your supplier immediately.

3. IWR-5 Receiver set up procedure

The IWR-5 receives data from up to 5 off wireless pressure or temperature transmitters and produces 4-20 mA or 1-5 V dc analog outputs representing 0 - 100% of each of the wireless transmitters connected.

It also has an alarm output that can be used as a high/low, loss of signal, or low battery alarm. As delivered the IWR-5 is configured to receive transmissions from IWPT and IWTT wireless pressure transmitters configured from channel 1 to channel 5.

Connections and Configuration Switches



Terminal Number	Connection
1	Power 0V
2	Power +ve
3	Output 1 0V
4	mA Output 1 +ve
5	1-5 V dc Output 1 +ve
6	Output 2 0V
7	mA Output 2 +ve
8	1-5 V dc Output 2 +ve
9	Output 3 0V
10	mA Output 3 +ve
11	1-5 V dc Output 3 +ve
12	Output 4 0V
13	mA Output 4 +ve
14	1-5V dc Output 4 +ve
15	Output 5 0 V
16	mA Output 5 +ve
17	1-5 V dc Output 5 +ve
18	Relay Common
19	Relay N.C
20	Relay N.O

Dipswitch Configuration

The 8-way Dipswitch 1 is used to configure the basic functionality of the IWR-5

The RF network code must be the same as the IWPT units to be used with the receiver unit.

Switches 1, 2, 3 & 4 select the network code as below

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

Switch 5 and 6 select the number of transmissions that are missed before the Alarm relay output switches to the alarm condition.

Missed Transmissions	5	6
4	0	0
2	0	1
6	1	0
No Alarm	1	1

Switch 7 and 8 Configure the action of the Alarm Relay output. This can also be configured to exact alarm values using the USB port and the IWR-Set software.

Relay Action	7	8
Relay 1 switches OFF any I/P above 50%	0	0
Relay 1 switches OFF any I/P above 75%	0	1
Relay 1 switches OFF any I/P above 25%	1	0
Relay 1 Configured via USB & IWR-Set software	1	1

LED Indication

LED 6 is used to indicate the status of the alarm relay. This is lit if any of the values transmitted are outside the alarm limit, the receiver has missed the number of transmissions configured above, or flashes if the transmitter has a low battery capacity.

LED 7 flashes when a valid transmission is received from any connected transmitter.

There is also an indicator LED for each output channel of the IWR-5. These are used to indicate the following alarm conditions for each channel:

LED Flashes 2 times:	This indicates that the number of transmissions missed has exceeded the number set up by Switches 5 & 6 above.
LED Flashes 3 times:	This indicates that the value for that channel is outside the limits selected by switches 7 & 8 above.
LED Flashes 4 times:	This indicates the transmitter linked to this channel has a low battery level.

Output Calibration

The IWR-5 is factory calibrated for 4-20 mA and 1-5 V source outputs so that if a sensor transmits a zero or full-scale output the IWR-5's output for that channel will be within its accuracy specifications.

The output selector switches are used to select either 4-20 mA & 1-5 V dc for each channel. Push the switch SW1 to the left to select 4-20mA and to the right to select 1-5 V dc. It is possible to adjust the outputs to match the equipment used to monitor the output or to compensate for any zero or span drift of the transmitters. This is achieved by using the pushbuttons PB1 (DOWN) and PB2 (UP) and the internal LEDs as outlined here:

- Push both buttons at the same time then release to put the unit into zero tare mode starting with Channel 1.
- LED1 will go amber, and output one will change to the zero value.
- Ensure there is no pressure or temperature applied to the connected transmitter and then use the DOWN and UP buttons to adjust the output to be 4 mA or 1 V
- If the LED flashes amber this indicates that the connected transmitter zero value is not valid.
- Push both buttons at the same time again and then release.
- LED1 will go red to indicate that the full-scale output will be adjusted. Inject the full-scale pressure or temperature range into the sensor using a Calibrator. If no Calibrator is available press both buttons again to exit the calibration mode saving only the zero tare value. The LED will go amber for 0.5 seconds as the zero tare value is learned and saved to memory.
- If the full-scale pressure can be applied using the DOWN (PB1) and UP (PB2) buttons to adjust the output to be 20 mA or 5 V. When the output is correct push both buttons at the same time and then release.
- If LED1 flashes RED this indicates that the measured value is not close enough to the full-scale value expected to allow calibration to be achieved.

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- If full-scale calibration has been achieved LED1 will go amber for 0.5 seconds as calibration values are learned and saved to memory.
- To cycle which channel is being calibrated push the UP or DOWN buttons until the LED linked to the channel to be calibrated is lit. Repeat the above using the appropriate LED for the channel selected.

The analog output can be scaled to any part of the full-scale range of the transmitter connected. For example, an IWTT with a P100 input sends a temperature back between -200°C & 800°C. By default, the 4-20 mA output will be at 4 mA at -200°C and 20 mA at +800°C. The IWR-Set V2.1 software can be used to scale the 4-20 mA so that 4 mA is output at a temperature of 0°C and 20 mA is output at a temperature of +500°C.

The setup procedure is intuitive once the IWR-SET software is opened on a PC and connected to the IWR receiver using a standard micro USB cable.

If switches 5 & 6 are configured to switch the Alarm Relay if wireless transmissions are missed the analog output can also be set to go to a failsafe burnout output if no transmissions are received.

If a 4-20 mA output is selected the output will go to 2.2 mA if Low Burnout is selected or 22.8 mA if High Burnout is selected.

If No Action (the default setting) is selected the analog output will stay at the last valid value received from the connected transmitter.

4. TROUBLE-SHOOTING GUIDE

Problem encountered	Possible Causes
LED 7 doesn't flash	The IWR receiver is not connected to a transmitter or the transmitters are out of range.
Any mA or Voltage Output channel reads zero	The IWR receiver output is not wired correctly, check the wiring and try again. If wiring is OK check the 4-20mA or 1-5 V dc selector switch is in the right position.
Output from any IWR receiver channel isn't equivalent to the pressure or temperature being monitored by the appropriate transmitter.	Check that the IWR receiver is linked to the transmitter in question by pressing the push button inside the transmitter and checking that LED 7 on the receiver flashes when the transmitter button is pressed.
As above	Check that the transmitter is set to the correct channel number using the internal DIP switch.
LED 6 Remains Permanently Lit	One of the transmitters is sending a value that is outside the alarm conditions or the receiver is out of range of one of the transmitters or one of the transmitters is switched OFF. The internal channel LEDs can be used to ascertain the channel initiating the alarm and the type of alarm.
LED 6 is flashing	This indicates that the battery inside the transmitter is running low. Change the battery inside the transmitter taking care to reset the battery level using the procedure outlined in the transmitter manual. The internal LEDs can be used to ascertain the channel initiating the low battery alarm.

5. SYSTEM PART NUMBERS

Pressure Transmitters		Temperature Transmitters	
Part Number	Pressure Range	Part Number	Transmitter Type
WPT-G1000-00	0-1 Bar g	WTTP100A	PT100 6x100mm 1/4"BSP
WPT-G6000-00	0-6 Bar g	WTTP150A	PT100 6x150mm 1/4"BSP
WPT-GM1P9-00	-1-+9 Bar g	WTTP200A	PT100 6x200mm 1/4"BSP
WPT-G1002-00	0-10 Bar g	WTTP250A	PT100 6x250mm 1/4"BSP
WPT-G1602-00	0-16 Bar g	WTTP300A	PT100 6x300mm 1/4"BSP
WPT-CO184-00	-1-+24 Bar g	WTTP400A	PT100 6x400mm 1/4"BSP
WPT-G2502-00	0-25 Bar g	WTTJ200A	J type 6x200mm 1/4"BSP
WPT-G4002-00	0-40 Bar g	WTTJ300A	J type 6x300mm 1/4"BSP
WPT-G1003-00	0-100 Bar g	WTTJ400A	J type 6x400mm 1/4"BSP
WPT-G2503-00	0-250 Bar g	WTTK150A	K type 6x150mm 1/4"BSP
WPT-G4003-00	0-400 Bar g	WTTK200A	K type 6x200mm 1/4"BSP
WPTU-GP015-00	0-15 psi g	WTTK300A	K type 6x300mm 1/4"BSP
WPTU-GP030-00	0-30 psi g	WTTK400A	K type 6x400mm 1/4"BSP
WPTU-CO446-00	-14.5 to +150 psi g	WTTUP100A	PT100 6x100mm 1/4"NPT
WPTU-GP075-00	0-75 psi g	WTTUP150A	PT100 6x150mm 1/4"NPT
WPTU-GP100-00	0-100 psi g	WTTUP200A	PT100 6x200mm 1/4"NPT
WPTU-CO447-00	-14.5 to +350 psi g	WTTUP250A	PT100 6x250mm 1/4"NPT
WPTU-GP150-00	0-150 psi g	WTTUP300A	PT100 6x300mm 1/4"NPT
WPTU-GP300-00	0-300 psi g	WTTUP400A	PT100 6x400mm 1/4"NPT
WPTU-GP750-00	0-750 psi g	WTTUJ200A	J type 6x200mm 1/4"NPT
WPTU-GP1K5-00	0-1500 psi g	WTTUJ300A	J type 6x300mm 1/4"NPT
WPTU-GP3K6-00	0-3600 psi g	WTTUJ400A	J type 6x400mm 1/4"NPT
WPTU-GP5K8-00	0-5800 psi g	WTTUK150A	K type 6x150mm 1/4"NPT
WPTL-G0050-00	0-50mbar G	WTTUK200A	K type 6x200mm 1/4"NPT
WPTL-G0100-00	0-100mbar G	WTTUK300A	K type 6x300mm 1/4"NPT
WPTL-G0250-00	0-250mbar G	WTTUK400A	K type 6x400mm 1/4"NPT
WPTL-G0500-00	0-500mbar G		
WPTL-G0750-00	0-750mbar G		
WPTL-G1000-00	0-1000mbar G		
WPTL-G0500-00	0-500mbar Abs		
WPTL-G0750-00	0-750mbar Abs		
WPTL-G1000-00	0-1000mbar Abs		
WPTLU-GP001-00	0-1 psi g		
WPTLU-GP002-00	0-2 psi g		
WPTLU-GP005-00	0-5 psi g		
WPTLU-GP008-00	0-8 psi g		
WPTLU-GP010-00	0-10 psi g		
WPTLU-GP015-00	0-15 psi g		
WPTLU-GP005-00	0-5 psi Abs		
WPTLU-GP010-00	0-10 psi Abs		
WPTLU-GP015-00	0-15 psi Abs		

Part Number	Number of Output Channels
IWR-5	One
IWR-5	Five
IANT-3	3dBi Antenna
IWPT-SW	Swivel Adaptor (1/4" BSP) for pressure transmitters only

6. SPECIFICATIONS

System Performance	
Accuracy (non-linearity & hysteresis)	$\leq \pm 0.25\%$ / FS (BFSL)
Setting Errors	Zero & Full Scale, $\leq \pm 0.5\%$ / FS
Operating Temperature	-20 to +50 °C
Storage Temperature	-20 to +80 °C
Outputs x 5	4-20 mA current source 1-5 V dc voltage source
Relay	5A rated changeover contact
Enclosure Material	Light Grey ABS (RAL 7035)
Weight	285 g
RF Transmitter	Contains FCC W&MRF24J40MDME
Power Requirements	12 to 32 V dc
Fuse	Internal resettable fuse
Dimensions	160mm x 80mm x 57mm (L x W x D)
Mounting	Any Orientation

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