

Instrument Area Network

Central Concentrator and End Nodes

PSS 2A-1B5 A

Product Specification

Revised November 8, 2024



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Features

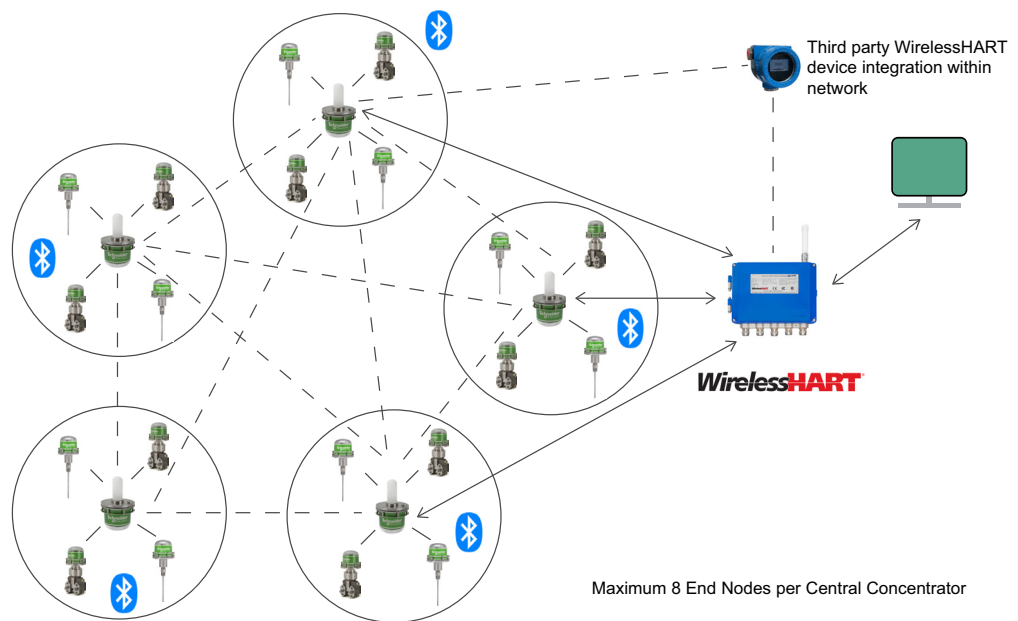
The Instrument Area Network consists of three types of equipment:

- Up to eight physically separated wireless end nodes for measurement and control.
- A wireless central concentrator for relaying the data between the end nodes and the plant area wireless network (either a sensor network or the upstream network).

The end nodes must be accompanied by a central concentrator.

- A customer-supplied device that has a standard web browser and Wi-Fi capability, such as a tablet, computer, or smartphone.

Figure 1 - Instrument Area Network Example



Key features include:

- Easy installation, configuration, and activation of a central concentrator and up to eight end nodes to create the wireless Instrument Area Network
- End nodes for absolute, gauge, and differential pressure measurements; temperature measurements from an RTD or thermocouple; on/off changes with discrete input
- Ability to remotely communicate with and configure the central concentrator and end nodes with a user-supplied device (such as a tablet, computer, or smartphone) with Wi-Fi capability and a web browser
- Simple, elegant design with few mechanical parts
- Wi-Fi and Bluetooth Low Energy technology
- Communication with the upstream WirelessHART network
- Agency certifications to meet numerous requirements for hazardous and non-hazardous locations
- CE marked; meets the requirements of applicable European Union directives: RED, ATEX, RoHS, and PED (WDP10 only)
- UKCA marked; meets the requirements of applicable United Kingdom (UK) regulations

Network Overview Page

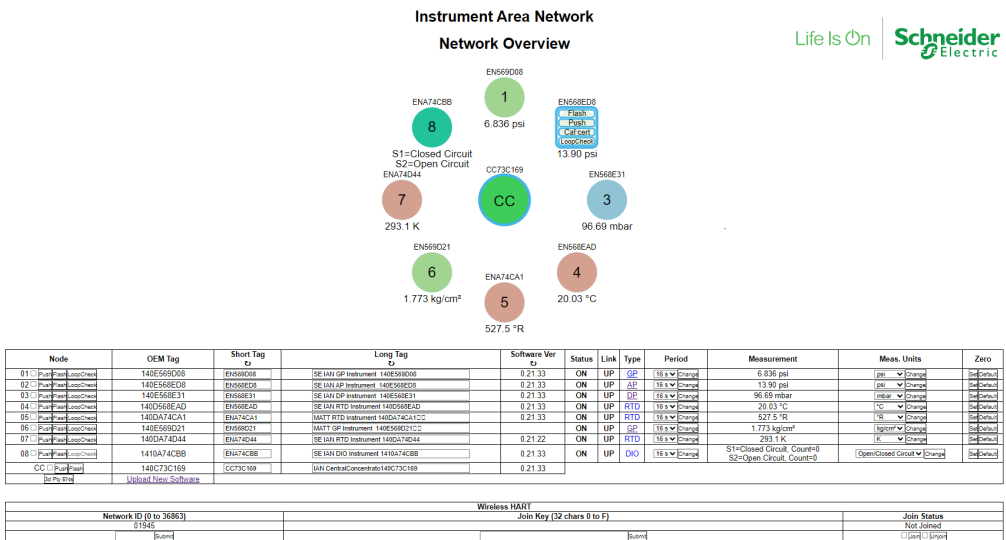
A web interface allows you to work with the network from a standard web browser with JavaScript enabled. Once you have connected to the network’s Wi-Fi signal, you can access the Network Overview web page at <http://10.10.10.10/ian/page>.

The Network Overview page shows a representation of the Instrument Area Network, with the concentrator in the center and all connected end nodes around it. You can read each end node’s hardware ID and most recent measurement; the measurements update approximately once per 16 seconds by default.

NOTE: The default update rate is 16 seconds. This rate provides optimal battery life, and therefore optimal life span for the unit. Although it is possible to update as often as once per second, doing so drastically reduces the life of the battery as well as the life of the unit.

From the Network Overview page, you can configure network parameters, connect the WirelessHART network, push or flash units, zero pressure end nodes, and configure each end node’s sampling period and measurement units. In addition, you can access release notes, user documentation, and end node calibration certificates (if applicable).

Figure 2 - Network Overview Page



Network ID (0 to 36853)

01946

Join Key (32 chars 0 to F)

Join Status

Not Joined

The **OEM Tag** listed on the screen matches the tag on the end node. You can also identify each end node by pushing it for two full seconds — either by pressing the pushbutton on the end node, or remotely by sending a push command from the Network Overview page. Pushing the end node causes it to flash. (You can also click the **Flash** button to light up the device without pushing it.)

Each Instrument Area Network device (central concentrator and end node) appears on the web interface as a colored circle. End nodes are displayed in a circle around the centrally displayed central concentrator. End nodes that are connected are color-coded by type; any end nodes that are connected but experiencing a link interruption are shown as white circles with lines through them, and the link status column in the end node table reads **Down**.

Establishing an Instrument Area Network

Creating a wireless Instrument Area Network is fast and easy. If the unit does not have a pushbutton, activate the central concentrator by pushing the antenna toward the outer edge of the housing and holding for two seconds. If the unit does have a

pushbutton, “push” refers to pressing the button and holding for two seconds. The central concentrator’s LEDs flash rapidly for a few seconds while it sets up the wireless Instrument Area Network. Then you can connect the end nodes to the central concentrator one at a time by pushing each end node to connect it to the central concentrator.

LEDs on the central concentrator, the newly added end node, and any other end nodes that are connected to the network flash rapidly and out of sync. When connecting is complete, the flashing LEDs in the central concentrator and all connected end nodes synchronize, indicating that the end node has been connected to the Instrument Area Network. The central concentrator can now relay the end nodes’ measurement data to the WirelessHART network.

Removing an end node from the network (disconnecting) is just as easy. Push any connected end node to activate the Instrument Area Network; the LEDs of the central concentrator and all connected end nodes flash in sync. Before the flashing stops, simply push the end node you wish to disconnect. The LEDs on the end node leaving the group flash out of sync with the other Instrument Area Network devices to indicate that it is disconnecting. Refer to MI 020-750 for details.

Calibration Certificates (Pressure End Nodes Only)

A calibration certificate verifies that the end node meets the reference accuracy specification. The calibration certificate is embedded in the end node; you can access it from the Network Overview page.

NOTE: Calibration certificates associated with WRT10 end nodes vary and are dependent on the sensor type and supplier. Contact Global Customer Support for details.

Figure 3 - Example of Calibration Certificate of Compliance - Screen 1

Calibration Certificate of Compliance	
SE Pressure Calibration Stand : PRESSCAL01	
Calibration Reference Standard ID : MENS0100,570117,1,82,0	
Calibration Reference Standard Date Of Calibration : 09/26/2017	
SE Pressure Sensor Serial # : 66137	
Calibrated Pressure Range : 0 to 300 (PSI)	
Date of Calibration : 2019, 06, 27	
Published Accuracy as percentage of factory calibrated span, 0.25%	
* This unit's worst case accuracy during factory verification : error = 0.370 (PSI) error % = 0.123 % of calibrated span	
* The unit may perform worse at other pressure and temperature regions, but in no case is worse than the published accuracy	
Schneider Electric certifies that the instrument referenced above has been fully tested and calibrated prior to shipment in accordance with Schneider Electric standard manufacturing procedures and Quality System Guidelines.	
Schneider Electric certifies that the instrument meets or exceeds the published electrical, mechanical, and operational performance characteristics. Performance rating is the maximum error as percentage of calibrated span based on reference conditions of -40,-33.8,-27.5,-21.5,-15,-8.8,-2.5,3.8,10.16,3.22,5.28,8.35,41.3,47.5,53.8,60.66,3,72.5,78.8,85 °C and 10% to 55% RH.	
All tests and calibrations were performed with instruments, equipment and standards which are directly traceable to the National Institute of Standards & Technology (NIST).	

Figure 4 - Example of Calibration Certificate of Compliance - Screen 2

Table of single worst error during factory verification from multiple measurements at each point																					
PSI	40°C	33.8°C	27.5°C	21.5°C	15°C	8.8°C	2.5°C	3.8°C	10°C	16.3°C	22.5°C	28.8°C	35°C	41.3°C	47.5°C	53.8°C	60°C	66.3°C	72.5°C	78.8°C	85°C
0	0.029	0.039	0.030	0.048	0.029	0.043	0.030	0.042	0.032	0.061	0.066	0.033	0.035	0.037	0.034	0.029	0.021	0.019	0.026	0.019	0.026
7.5	0.026	0.051	0.028	0.044	0.029	0.040	0.031	0.041	0.033	0.059	0.066	0.034	0.036	0.037	0.036	0.031	0.020	0.020	0.028	0.020	0.026
15	0.021	0.039	0.023	0.031	0.023	0.033	0.026	0.033	0.028	0.055	0.063	0.032	0.035	0.034	0.034	0.026	0.016	0.017	0.026	0.018	0.023
22.5	0.019	0.030	0.021	0.030	0.022	0.028	0.025	0.029	0.029	0.052	0.062	0.031	0.034	0.033	0.032	0.024	0.015	0.015	0.026	0.018	0.026
30	0.015	0.020	0.018	0.020	0.020	0.021	0.022	0.024	0.026	0.047	0.062	0.049	0.033	0.032	0.032	0.021	0.012	0.012	0.023	0.013	0.024
37.5	0.010	0.009	0.014	0.012	0.014	0.014	0.015	0.017	0.018	0.040	0.055	0.044	0.030	0.030	0.030	0.021	0.011	0.011	0.023	0.014	0.024
45	0.011	0.004	0.012	0.011	0.014	0.015	0.017	0.019	0.022	0.045	0.059	0.048	0.032	0.030	0.031	0.021	0.012	0.012	0.023	0.017	0.024
52.5	0.013	-0.009	0.015	0.004	0.017	0.012	0.020	0.017	0.022	0.045	0.062	0.051	0.035	0.033	0.037	0.022	0.011	0.013	0.028	0.019	0.029
60	0.022	-0.009	0.023	0.009	0.026	0.018	0.029	0.024	0.024	0.052	0.072	0.060	0.044	0.040	0.046	0.030	0.019	0.020	0.038	0.029	0.038
67.5	-0.030	-0.055	-0.025	-0.041	-0.020	-0.031	-0.014	-0.023	-0.012	-0.012	0.033	0.024	0.008	0.003	0.011	-0.017	-0.028	-0.025	-0.006	-0.015	0.004
75	-0.013	-0.049	-0.008	-0.029	0.007	-0.015	0.012	-0.006	0.017	0.029	0.055	0.043	0.026	0.022	0.033	0.009	-0.010	-0.007	0.024	0.015	0.026
82.5	-0.017	-0.057	-0.011	-0.037	-0.006	-0.022	0.010	-0.009	0.017	0.030	0.051	0.042	0.029	0.022	0.032	0.012	-0.011	-0.008	0.025	0.014	0.024
90	-0.021	-0.067	-0.014	-0.043	0.007	-0.023	0.008	-0.011	0.017	0.028	0.053	0.043	0.030	0.023	0.030	0.011	-0.011	-0.007	0.027	0.016	0.028
97.5	0.014	-0.057	0.016	-0.026	0.027	-0.009	0.029	0.012	0.034	0.047	0.075	0.062	0.050	0.041	0.050	0.029	0.016	0.023	0.047	0.033	0.049
105	-0.039	-0.098	-0.024	-0.063	-0.013	-0.042	-0.010	-0.032	0.017	0.015	0.062	0.048	0.030	0.019	0.033	0.014	-0.027	-0.019	0.032	0.018	0.032
112.5	-0.040	-0.108	-0.029	-0.064	-0.017	-0.044	-0.011	-0.033	0.015	0.013	0.063	0.044	0.030	0.020	0.036	-0.014	-0.026	-0.017	0.035	0.018	0.031
120	-0.039	-0.118	-0.036	-0.075	-0.019	-0.052	-0.013	-0.036	0.011	0.016	0.064	0.041	0.033	0.022	0.036	-0.014	-0.027	-0.022	0.037	0.016	0.029
127.5	-0.042	-0.121	-0.036	-0.079	-0.022	-0.056	-0.013	-0.034	0.010	0.017	0.064	0.041	0.036	0.019	0.035	-0.019	-0.031	-0.024	0.030	0.020	0.029
135	-0.046	-0.133	-0.038	-0.083	-0.025	-0.060	-0.017	-0.041	0.014	0.023	0.068	0.040	0.038	0.018	0.037	-0.021	-0.033	-0.028	0.027	0.016	0.033
142.5	-0.049	-0.139	-0.042	-0.091	-0.027	-0.067	-0.017	-0.043	0.011	0.028	0.065	0.044	0.039	0.021	0.039	-0.022	-0.036	-0.026	0.029	0.015	0.030
150	-0.053	-0.151	-0.049	-0.098	-0.030	-0.071	-0.022	-0.050	0.015	0.028	0.067	0.040	0.042	0.017	0.033	-0.022	-0.037	-0.029	0.026	0.015	0.032
157.5	-0.061	-0.158	-0.049	-0.105	-0.030	-0.078	-0.026	-0.052	0.015	0.034	0.065	0.039	0.046	0.015	0.042	-0.028	-0.041	-0.033	0.028	0.016	0.029
165	-0.065	-0.166	-0.059	-0.113	-0.038	-0.083	-0.026	-0.059	0.016	0.033	0.066	0.037	0.043	0.012	0.030	-0.034	-0.039	-0.033	0.027	0.021	0.029
172.5	-0.061	-0.173	-0.057	-0.125	-0.033	-0.087	-0.023	-0.057	0.019	0.033	0.063	0.035	0.043	0.012	0.031	-0.028	-0.040	-0.030	0.029	0.019	0.029
180	-0.067	-0.186	-0.059	-0.138	-0.035	-0.091	-0.025	-0.067	0.016	0.034	0.067	0.033	0.040	0.012	0.032	-0.032	-0.044	-0.033	0.027	0.019	0.035
187.5	-0.070	-0.202	-0.069	-0.153	-0.042	-0.096	-0.034	-0.074	0.022	0.047	0.067	0.033	0.040	0.018	0.038	-0.033	-0.049	-0.035	0.025	0.019	0.028
195	-0.072	-0.218	-0.066	-0.166	-0.041	-0.105	-0.033	-0.076	0.024	0.051	0.064	0.030	0.040	0.018	0.030	-0.038	-0.056	-0.036	0.026	0.014	0.035
202.5	-0.081	-0.235	-0.071	-0.156	-0.047	-0.104	-0.033	-0.079	0.023	0.057	0.047	0.030	0.020	0.014	0.034	-0.039	-0.055	-0.041	0.025	0.021	0.032
210	-0.089	-0.245	-0.079	-0.161	-0.046	-0.115	-0.035	-0.083	0.028	0.062	0.046	0.031	0.025	0.018	0.036	-0.041	-0.054	-0.042	0.020	0.017	0.026
217.5	-0.085	-0.254	-0.081	-0.171	-0.050	-0.116	-0.042	-0.087	0.023	0.064	0.045	0.034	0.016	0.021	0.038	-0.046	-0.061	-0.046	0.023	0.014	0.031
225	-0.102	-0.266	-0.089	-0.177	-0.059	-0.119	-0.044	-0.092	0.013	0.070	0.051	0.031	0.015	0.023	0.023	-0.045	-0.066	-0.046	0.025	0.015	0.029
232.5	-0.107	-0.279	-0.092	-0.186	-0.057	-0.124	-0.041	-0.101	0.013	0.077	0.045	0.035	0.016	0.028	0.028	-0.047	-0.066	-0.047	0.024	0.014	0.034
240	-0.117	-0.296	-0.099	-0.189	-0.062	-0.126	-0.045	-0.108	0.016	0.076	0.043	0.036	0.019	0.026	0.024	-0.052	-0.067	-0.048	0.023	0.014	0.031
247.5	-0.110	-0.299	-0.089	-0.204	-0.061	-0.142	-0.051	-0.109	0.013	0.079	0.039	0.034	0.015	0.028	0.020	-0.051	-0.067	-0.049	0.024	0.017	0.033
255	-0.113	-0.296	-0.089	-0.218	-0.062	-0.144	-0.052	-0.111	0.012	0.082	0.038	0.037	0.016	0.027	0.020	-0.053	-0.074	-0.055	0.026	0.018	0.034
262.5	-0.116	-0.315	-0.104	-0.230	-0.062	-0.155	-0.050	-0.113	0.048	0.081	0.035	0.032	0.012	0.027	0.026	-0.060	-0.079	-0.055	0.024	0.019	0.036
270	-0.106	-0.327	-0.106	-0.219	-0.073	-0.166	-0.062	-0.127	0.041	0.095	0.028	0.025	0.017	0.028	0.021	-0.056	-0.080	-0.058	0.027	0.017	0.033
277.5	-0.109	-0.344	-0.115	-0.214	-0.080	-0.169	-0.066	-0.137	0.048	0.094	0.031	0.020	0.021	0.017	0.023	-0.057	-0.084	-0.059	0.025	0.024	0.033
285	-0.116	-0.355	-0.117	-0.224	-0.084	-0.173	-0.062	-0.130	0.048	0.091	0.038	0.027	0.021	0.019	0.019	-0.063	-0.085	-0.059	0.020	0.022	0.033
292.5	-0.118	-0.359	-0.110	-0.230	-0.078	-0.172	-0.068	-0.135	0.049	0.091	0.027	0.016	0.020	0.042	0.025	-0.067	-0.088	-0.069	0.025	0.017	0.029
300	-0.125	-0.370	-0.111	-0.235	-0.076	-0.204	-0.062	-0.142	0.051	0.112	0.023	0.015	0.024	0.061	0.020	-0.087	-0.118	-0.086	0.023	0.017	0.038

Radio Equipment Directive (RED)

Complies with Radio Equipment Directive (RED) requirements tested to the following standards:

- ETSI EN 300 328 V2.1.1 (2016-11)

Under RED Article 3, 1(a) covering essential safety requirements of 2014/35/EU:

- EN 62311:2008
- EN 61010-1:2010

Under RED Article 3, 1(b) covering essential EMC requirements of 2014/30/EU:

- ETSI EN 301 489-1 V2.2.0 (2017-03)
- ETSI EN 301 489-3 V2.1.1 (2017-03)
- ETSI EN 301 489-17 V3.2.0 (2017-03)
- IEC 61000-6-2 Edition 3.0 (2016-08)
- IEC 61000-6-4 Edition 3.0 (2018-02)

Radio Equipment Regulations SI 2017 No. 1206

Complies with The Radio Equipment Regulations SI 2017 No. 1206 requirements tested to the following standards:

UKSI 2017:1206

- ETSI EN 300 328 V2.1.1 (2016-11)

Under 2014/53/EU RED Article 3, 1(a) covering essential safety requirements of 2014/35/EU:

- EN 62311:2008
- EN 61010-1:2010

Under 2014/53/EU RED Article 3, 1(b) covering essential EMC requirements of 2014/30/EU:

- ETSI EN 301 489-1 V2.2.0 (2017-03)
- ETSI EN 301 489-3 V2.1.1 (2017-03)
- ETSI EN 301 489-17 V3.2.0 (2017-03)
- IEC 61000-6-2 Edition 3.0 (2016-08)
- IEC 61000-6-4 Edition 3.0 (2018-02)

Mounting Brackets

The device enclosures allow for mounting to a wall or to a two- or three-inch pipe, using the brackets shown in the diagrams. End nodes can also connect directly to the process port threads.

Figure 5 - Wall Mounting Bracket (Shown with WCC15)

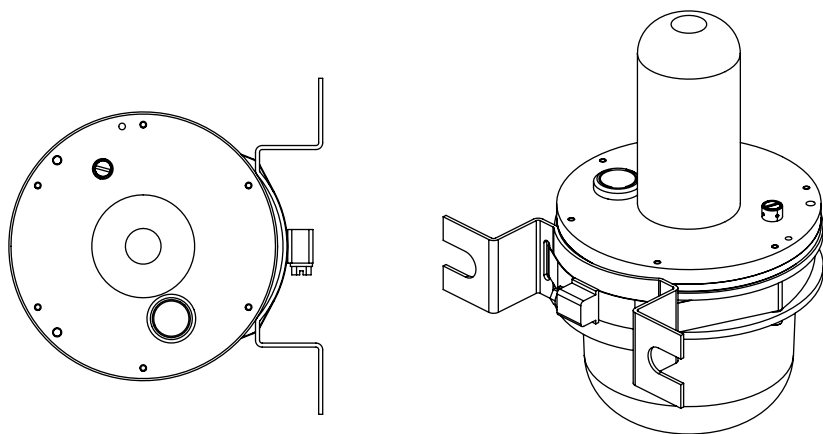
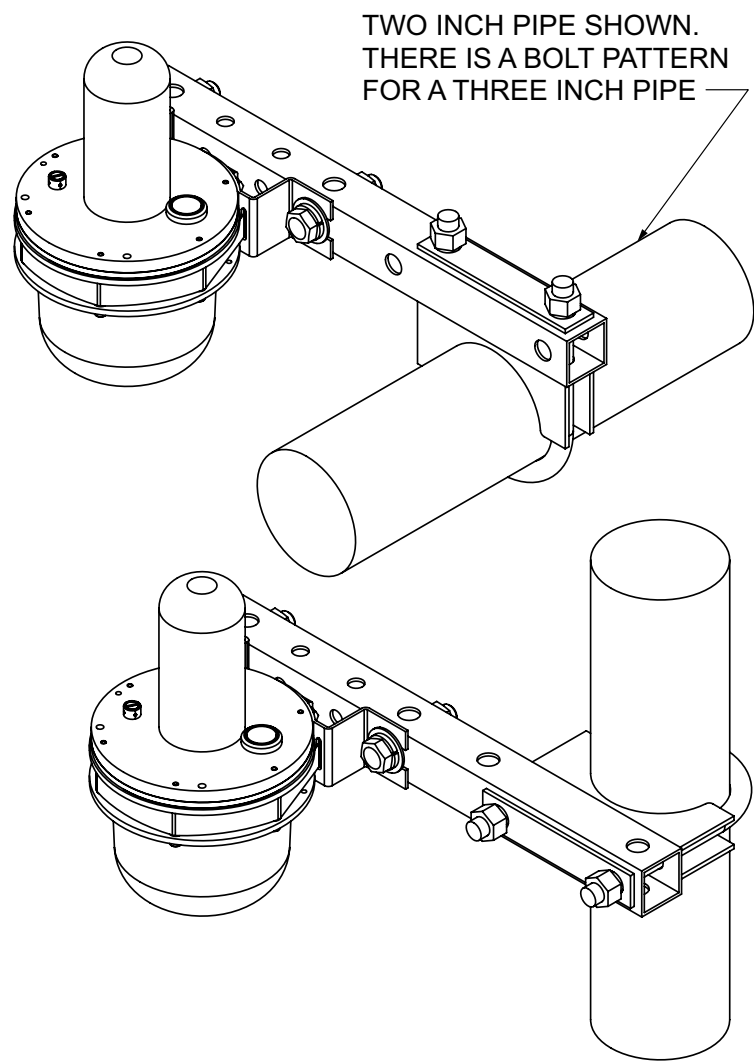


Figure 6 - Pipe Mounting Bracket (Shown with WCC15)



Specifications

Mounting Locations

The central concentrator has an integral antenna that allows communication to the upstream wireless network and to all connected end nodes. Choose a mounting location where the central concentrator is positioned above any metal structures, and where the integral antenna has optimal connectivity to the upstream wireless network. You can mount the central concentrator directly or with an optional mounting bracket. See [Mounting Brackets](#), page 7.

Each end node housing has an integral process related sensor located on the bottom center of the unit's base. Select a mounting location for each end node based on the application and the process measurement location.

The distance between the central concentrator and each end node should not exceed 10 m (33 ft) in any direction (horizontally or vertically). This specification does not require the central concentrator and end node to be installed in a straight line or without obstruction. End nodes can communicate with the central concentrator even in harsh metal-obstructed environments (refer to [RF Characteristics](#), page 10).

NOTICE

POTENTIAL EQUIPMENT DAMAGE

Do not expose mounting locations to forceful impacts like heavy falling objects that could damage the device enclosures.

Failure to follow these instructions can result in equipment damage.

Operating Limits

Operative Limits for measurement and transmission are defined in accordance with ANSI/ISA 51.1-1979 (R1993).

Description	Operative Limits
Ambient Temperature	-40 and +60°C (-40 and +140°F) ¹
Silicone Fill Fluid	-46 and +121°C (-50 and +250°F)
Relative Humidity	0 and 100%
Vibration	1 g constant acceleration input over a frequency range of 5 to 200 Hz
Mounting Position	No limit

Battery Life

- Central concentrator: 5+ years
- End node: 10+ years

These estimates assume 25°C (77°F) ambient temperature and 16-second update rates for each end node, with eight end nodes connected to each concentrator. Actual

1. The new temperature limit for Ex-certified End Nodes is +60°C and the central concentrator will remain at +80°C.

battery life depends on ambient temperature and precipitation, configured update rates, and device positioning. To achieve stated battery life, HART Command 3 and Command 48 have been optimized to burst and must be used to read PV and Additional Device Status. For greater battery efficiency and ease of use, position devices for best connectivity, and monitor the low battery alarm feature. You can further optimize battery life by configuring for longer interval measurement update rates if they are suitable for your application.

All Instrument Area Network devices are shipped with a battery installed. The Wi-Fi interface is disabled by default, and normally remains active for only five minutes when connecting and disconnecting end nodes.

RF Characteristics

- 2.4 GHz spread spectrum, ISM license-free band
- 58 mW maximum operational RF transmit power
- Link margin (LKM):

Wireless Communication Type	Transmitter Power (TxP)	Receiver Sensitivity (RS)
Bluetooth Low Energy	+5 dBm	-97 dBm
Wi-Fi	+15 dBm	-90 dBm
WirelessHART	+10 dBm	-96 dBm

Process Connections

End Node	Process Connection
Temperature (WRT10)	Without thermowell: Connects directly to the process using a 1/2 NPT external thread.
	With thermowell: Thermowell connects directly to the process. Available connections are 3/4 NPT, socket weld 1.05 in, or weld-in 1.5 in. Refer to <i>Model Codes</i> , page 16.
Absolute Pressure (WAP10) Gauge Pressure (WGP10)	Connects to the process with an externally threaded 1/2 NPT connection.
Differential Pressure (WDP10)	Connects to the process with a 1/4-18 NPT internal thread process connection and fixing thread 7/16"-20 UNF at 41.3 mm (1.625 in) center distance.
Discrete Input (WIO10)	Two dry-contact closure inputs.

End Node Connections

Up to eight end nodes can be wirelessly connected with the central concentrator. Together, the end nodes and the central concentrator comprise an Instrument Area Network. The end nodes of the Instrument Area Network relay their measurements to upstream networks, such as WirelessHART and the Wi-Fi administrator interface.

The end nodes are designed to be placed anywhere within 10m (33ft) of the central concentrator in harsh metal-obstructed environments (TX Power +5dBm, RX Sensitivity -97dBm link margin at 2.4GHz).

Range Limits

End Node	Limits												
Temperature with RTD	-200°C and +885°C (-328°F and +1625°F)												
Temperature with Thermocouple	<table> <tr> <th>TC Type</th><th>Range Limits</th></tr> <tr> <td>J</td><td>0°C and 760°C (32°F and 1400°F)</td></tr> <tr> <td>K</td><td>0°C and +1260°C (32°F and 2300°F)</td></tr> <tr> <td>E</td><td>0°C and +870°C (32°F and 1600°F)</td></tr> </table>	TC Type	Range Limits	J	0°C and 760°C (32°F and 1400°F)	K	0°C and +1260°C (32°F and 2300°F)	E	0°C and +870°C (32°F and 1600°F)				
TC Type	Range Limits												
J	0°C and 760°C (32°F and 1400°F)												
K	0°C and +1260°C (32°F and 2300°F)												
E	0°C and +870°C (32°F and 1600°F)												
Absolute Pressure	Detected error is 0.25% of full scale, across -40 to +60°C (-40 to +140°F) <table> <tr> <th>Code</th><th>Range Limits</th></tr> <tr> <td>C</td><td>0 and 0.21 MPaa (0 and 30 psia)</td></tr> </table>	Code	Range Limits	C	0 and 0.21 MPaa (0 and 30 psia)								
Code	Range Limits												
C	0 and 0.21 MPaa (0 and 30 psia)												
Gauge Pressure	Detected error is 0.25% of full scale, across -40 to +60°C (-40 to +140°F) <table> <tr> <th>Code</th><th>Range Limits</th></tr> <tr> <td>C</td><td>0 and 0.21 MPag (0 and 30 psig)</td></tr> <tr> <td>D</td><td>0 and 2.1 MPag (0 and 300 psig)</td></tr> <tr> <td>E</td><td>0 and 13.79 MPag (0 and 2000 psig)</td></tr> <tr> <td>F</td><td>0 and 41.37 MPag (0 and 6000 psig)</td></tr> <tr> <td>J</td><td>0 and 68.95 MPag (0 and 10000 psig)</td></tr> </table>	Code	Range Limits	C	0 and 0.21 MPag (0 and 30 psig)	D	0 and 2.1 MPag (0 and 300 psig)	E	0 and 13.79 MPag (0 and 2000 psig)	F	0 and 41.37 MPag (0 and 6000 psig)	J	0 and 68.95 MPag (0 and 10000 psig)
Code	Range Limits												
C	0 and 0.21 MPag (0 and 30 psig)												
D	0 and 2.1 MPag (0 and 300 psig)												
E	0 and 13.79 MPag (0 and 2000 psig)												
F	0 and 41.37 MPag (0 and 6000 psig)												
J	0 and 68.95 MPag (0 and 10000 psig)												
Differential Pressure	Detected error is 0.25% of full scale plus static pressure offset error <table> <tr> <th>Code</th><th>Range Limits</th></tr> <tr> <td>B</td><td>-50 and +50 kPa (-7.25 and +7.25 psi)</td></tr> <tr> <td>C</td><td>-210 and +210 kPa (-30 and +30 psi)</td></tr> <tr> <td>D</td><td>-0.21 and +2.10 MPa (-30 and +300 psi)</td></tr> </table>	Code	Range Limits	B	-50 and +50 kPa (-7.25 and +7.25 psi)	C	-210 and +210 kPa (-30 and +30 psi)	D	-0.21 and +2.10 MPa (-30 and +300 psi)				
Code	Range Limits												
B	-50 and +50 kPa (-7.25 and +7.25 psi)												
C	-210 and +210 kPa (-30 and +30 psi)												
D	-0.21 and +2.10 MPa (-30 and +300 psi)												
Discrete Input	Dry-contact closure input characteristics: - Maximum switch impedance: 1.0 kΩ - Input isolation between Input 1 and Input 2: 20 kΩ - The inputs support a maximum input frequency of 5 Hz with a 50% duty cycle. The input must be in a state for 100 ms for the state to be recognized.												

Maximum Static, Overrange, and Proof Pressure Ratings

⚠ DANGER

HAZARD OF EXPLOSION

Exceeding the proof pressure can cause the sensor to rupture forcefully. Avoid exposing end nodes to the proof pressure limit.

Failure to follow these instructions will result in death or serious injury.

NOTICE

POTENTIAL EQUIPMENT DAMAGE

Exceeding the overrange pressure limit for the end nodes can cause damage to the end nodes, degrading their performance. The end node could become nonfunctional after exceeding the overrange pressure. Avoid exposure to the overrange pressure limit.

Failure to follow these instructions can result in equipment damage.

Table 1 - Absolute Pressure Transmitters

Code	Maximum Overrange Pressure	Maximum Proof Pressure
C	2.1 MPaa (300 psia)	5.51 MPaa (800 psia)

Table 2 - Gauge Pressure Transmitters

Code	Maximum Overrange Pressure	Maximum Proof Pressure
C	2.1 MPag (300 psig)	5.51 MPag (800 psig)
D	20.7 MPag (3,000 psig)	55.1 MPag (8,000 psig)
E	34.5 MPag (5,000 psig)	52.4 MPag (7,600 psig)
F	59.1 MPag (8,580 psig)	152 MPag (22,000 psig)
J	99 MPag (14,300 psig)	180 MPag (26,000 psig)

Table 3 - Differential Pressure Transmitters

Code	Maximum Static Pressure	Maximum Proof Pressure
B	25 MPa (3,626 psi)	100 MPa (14,500 psi)
C		
D		

Measurement Update Rate

1 to 60 seconds, configurable. End nodes ship with a default update rate of 16 seconds.

Physical Specifications

Description	Specification
Enclosure Materials	304 ss; polycarbonate; PTFE antenna cover (WCC15)
Process Wetted Materials (End Nodes only)	316L ss
Sensor Fill Fluid (Pressure End Nodes only)	Silicone oil
Ingress Protection	The enclosure has the following rating, as defined by IEC 60529: IP66/67

Description	Specification
Dimensions (including Mass)	See Nominal Dimensions, page 22
Mounting Position	See Mounting Brackets, page 7

Electrical Certifications

This equipment has been designed to meet the electrical safety descriptions listed in this table. Contact Global Customer Support for information or status of testing laboratory approvals or certifications.

Refer to *Model Codes*, page 16 for availability of electrical safety design codes with each device, and refer to MI 020-750 for connectivity requirements.

Table 4 - Electrical Certifications for End Nodes

Agency Certification, Types of Protection, and Area Classification	Application Conditions ²	Model Code Option
North America Intrinsically Safe Certified (cETLus Listed by Intertek) Canada: Ex ia IIC T4 Ga Ex ia IIIC T135°C Da United States: Class I Zone 0 AEx ia IIC T4 Ga Zone 20 AEx ia IIIC T135°C Da	End Nodes = $-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}$	CU
ATEX Intrinsically Safe Certified (ITS16ATEX201373X) II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T135°C Da	End Nodes = $-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}$	EU
UKEX Intrinsically Safe Certified (ITS21UKEX0326X) II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T135°C Da	End Nodes = $-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}$	EU
IECEX Intrinsically Safe Certified (IECEX ETL 21.0052X) Ex ia IIC T4 Ga Ex ia IIIC T135°C Da	End Nodes = $-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}$	CU or EU ³
No certification (ordinary locations only)	$-40^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$ (all models)	ZZ

Table 5 - Electrical Certifications for Central Concentrator (WCC15)

Agency Certification, Types of Protection, and Area Classification	Application Conditions ²	Model Code Option
North America Certified for Increased Safety (Ex ec) and Protection by Enclosure (Ex tc) (cETLus Listed by Intertek) Canada: Ex ec IIC T5 Gc Ex tc IIIC T100°C Dc United States: Class I Zone 2, AEx ec IIC T5 Gc Zone 22, AEx tc IIIC T100°C Dc	$-40^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$	CU
ATEX Certified for Increased Safety (Ex ec) and Protection by Enclosure (Ex tc) (ITS-I21ATEX29216X) II 3 G Ex ec IIC T5 Gc II 3 D Ex tc IIIC T100°C Dc	$-40^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$	EU
UKEX Intrinsically Safe Certified (ITS21UKEX0292X) II 3 G Ex ec IIC T5 Gc II 3 D Ex tc IIIC T100°C Dc	$-40^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$	EU

2. Application Conditions: End Nodes = $-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}$; IP54, Central Concentrator = $-40^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$; IP64

3. IECEX is included with both the CU and EU certifications.

Table 5 - Electrical Certifications for Central Concentrator (WCC15) (Continued)

Agency Certification, Types of Protection, and Area Classification	Application Conditions ⁴	Model Code Option
IECEX Certified for Increased Safety (Ex ec) and Protection by Enclosure (Ex tc) (IECEX ETL 21.0005X) Ex ec IIC T5 Gc Ex tc IIIC T100°C Dc	$-40^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$	CU or EU ⁵
No certification (ordinary locations only)	$-40^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$ (all models)	ZZ

4. Application Conditions: End Nodes = $-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$; IP54, Central Concentrator = $-40^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$; IP64

5. IECEx is included with both the CU and EU certifications.

Model Codes

Table 6 - Central Concentrator with Push button (WCC15)

Code	Description
Model	
WCC15 ⁶	Central Concentrator with Push Button ⁷
Wireless Communication	
-WH	WirelessHART
Electrical Certifications⁸	
CU	North America Certified for Increased Safety (Ex ec) and Protection by Enclosure (Ex tc) ⁹
EU	ATEX Certified for Increased Safety (Ex ec) and Protection by Enclosure (Ex tc) ⁹
ZZ	No certification (ordinary locations only)
Optional Selections	
-M2	304ss Bracket, Clamps, and Bolts ¹⁰
Example: WCC15-WHCU-M2	

Table 7 - Temperature End Node (WRT10)

Code	Description
Model	
WRT10 ⁶	Temperature End Node
Wireless Communication	
-W1	Wireless Sensor
Sensor Type	
1	RTD (Pt100, ASTMA, 4-Wire)
2	Thermocouple (Type J)
3	Thermocouple (Type K)
4	Thermocouple (Type E)
Sensor Construction	
W	Fixed 1/2 NPT
S	Spring-Loaded for Thermowell Insertion
Sensor Insertion Length¹¹	
020	2.0inches (50.8mm)
025	2.5inches (63.5mm)
030	3.0inches (76.2mm)
035	3.5inches (88.9mm)
040	4.0inches (101.6mm)
045	4.5inches (114.3mm)

6. Wireless end nodes deployed in the field must be accompanied by a wireless central concentrator.

7. WirelessHART gateways are ordered separately. Contact Global Customer Support.

8. Refer to *Electrical Certifications*, page 14 for details. Contact Global Customer Support for availability.

9. IECEx is included with both the CU and EU certifications. UKEX/UKCA approvals are included with EU certifications.

10. A wall mounting bracket is standard and included with the unit. The -M2 bracket option allows for pipe mounting.

11. The Sensor Insertion Length must equal the Thermowell Insertion Length + Thermowell Lagging Length + 1.5inches.

Table 7 - Temperature End Node (WRT10) (Continued)

Code	Description
050	5.0inches (127.0mm)
055	5.5inches (139.7mm)
060	6.0inches (152.4mm)
065	6.5inches (165.1mm)
070	7.0inches (177.8mm)
075	7.5inches (190.5mm)
080	8.0inches (203.2mm)
085	8.5inches (215.9mm)
090	9.0inches (228.6mm)
095	9.5inches (241.3mm)
100	10.0inches (254.0mm)
105	10.5inches (266.7mm)
110	11.0inches (279.4mm)
115	11.5inches (292.1mm)
120	12.0inches (304.8mm)
125	12.5inches (317.5mm)
130	13.0inches (330.2mm)
135	13.5inches (342.9mm)
140	14.0inches (355.6mm)
145	14.5inches (368.3mm)
150	15.0inches (381.0mm)
155	15.5inches (393.7mm)
160	16.0inches (406.4mm)
165	16.5inches (419.1mm)
170	17.0inches (431.8mm)
175	17.5inches (444.5mm)
Thermowell Attached to Sensor	
N	No Thermowell
T	Threaded 3/4 NPT
S	Socket Weld 1.05inches
W	Weld-In 1.5inches
Thermowell Insertion Length¹²	
000	0.0inches (0mm)
020	2.0inches (50.8mm)
025	2.5inches (63.5mm)
030	3.0inches (76.2mm)
035	3.5inches (88.9mm)

12. The Sensor Insertion Length must equal the Thermowell Insertion Length + Thermowell Lagging Length + 1.5inches.

Table 7 - Temperature End Node (WRT10) (Continued)

Code	Description
040	4.0inches (101.6mm)
045	4.5inches (114.3mm)
050	5.0inches (127.0mm)
055	5.5inches (139.7mm)
060	6.0inches (152.4mm)
065	6.5inches (165.1mm)
070	7.0inches (177.8mm)
075	7.5inches (190.5mm)
080	8.0inches (203.2mm)
085	8.5inches (215.9mm)
090	9.0inches (228.6mm)
095	9.5inches (241.3mm)
100	10.0inches (254.0mm)
105	10.5inches (266.7mm)
110	11.0inches (279.4mm)
115	11.5inches (292.1mm)
120	12.0inches (304.8mm)
Thermowell Lagging Length¹³	
000	0.0inches (0mm)
020	2.0inches (50.8mm)
025	2.5inches (63.5mm)
030	3.0inches (76.2mm)
035	3.5inches (88.9mm)
040	4.0inches (101.6mm)
Electrical Certifications¹⁴	
CU	North America Intrinsically Safe Certified ¹⁵
EU	ATEX Intrinsically Safe Certified ¹⁵
ZZ	No certification (ordinary locations only)
Optional Selections	
-WF	Wake Frequency Calculation ¹⁶
Example: WRT10-W1S055T020020CU-WF	

13. The Sensor Insertion Length must equal the Thermowell Insertion Length + Thermowell Lagging Length + 1.5inches.

14. Refer to Electrical Certifications, page 14 for details. Contact Global Customer Support for availability.

15. IECEx is included with both the CU and EU certifications. UKEX/UKCA approvals are included with EU certifications.

16. Requires a completed wake frequency data form. Contact Global Customer Support for this form..

Table 8 - Absolute Pressure End Node (WAP10)

Code	Description
Model	
WAP10 ¹⁷	Absolute Pressure End Node
Wireless Communication	
-W1	Wireless Sensor
Structure Code, Materials, and Type	
22	316Lss Process Connection, 316Lss Diaphragm, Silicone Fill Fluid, FKM O-ring, 1/2 NPT External Thread Connection Type
Upper Range Limits	
C	0.21MPaa, 30psi, 2.1bar or kg/cm ²
Electrical Certifications¹⁸	
CU	North America Intrinsically Safe Certified ¹⁹
EU	ATEX Intrinsically Safe Certified ¹⁹
ZZ	No certification (ordinary locations only)
Optional Selections	
-00	None
Example: WAP10-W122CCU-00	

Table 9 - Gauge Pressure End Node (WGP10)

Code	Description
Model	
WGP10 ¹⁷	Gauge Pressure End Node
Wireless Communication	
-W1	Wireless Sensor
Structure Code, Materials, and Type	
22	316Lss Process Connection, 316Lss Diaphragm, Silicone Fill Fluid, FKM O-ring, 1/2 NPT External Thread Connection Type
Upper Range Limits	
C	0.21MPag, 30psig, 2.1bar or kg/cm ²
D	2.1MPag, 300psig, 21bar or kg/cm ²
E	13.79MPag, 2000psig, 138bar or kg/cm ²
F	41.37MPag, 6000psig, 414bar or kg/cm ²
J	68.95MPag, 10000psig, 690bar or kg/cm ²
Electrical Certifications¹⁸	
CU	North America Intrinsically Safe Certified ¹⁹
EU	ATEX Intrinsically Safe Certified ¹⁹
ZZ	No certification (ordinary locations only)
Optional Selections	
-00	None
Example: WGP10-W122CCU-00	

17. Wireless end nodes deployed in the field must be accompanied by a wireless central concentrator.

18. Refer to *Electrical Certifications*, page 14 for details. Contact Global Customer Support for availability.

19. IECEx is included with both the CU and EU certifications. UKEX/UKCA approvals are included with EU certifications.

Table 10 - Differential Pressure End Node (WDP10)

Code	Description
Model	
WDP10	Differential Pressure End Node
Wireless Communication	
-W1	Wireless Sensor
Structure Code, Materials, and Type	
22	316Lss Process Connection, 316Lss Sensor, Silicone Fill Fluid
Upper Range Limits	
B	50kPa, 200inH ₂ O, 500mbar
C	210kPa, 30psi, 2100mbar
D	2.1MPa, 300psi, 21bar
Process Connector²⁰	
0	No Connectors; Both Covers Tapped for 1/4NPT
1	1/4NPT
2	1/2NPT
Electrical Certifications²¹	
CU	North America Intrinsically Safe Certified ²²
EU	ATEX Intrinsically Safe Certified ²²
ZZ	No certification (ordinary locations only)
Optional Selections	
-M1	Painted Steel Mounting Bracket with Plated Steel Bolts ²³
-M2	316ss Bracket with 316ss Bolts
Example: WDP10-W122C0CU-M1	

Table 11 - Discrete Input End Node (WIO10) with WACS-001 Cable

Code	Description
Model	
WIO10 ²⁴	Discrete Input End Node
Wireless Communication	
-W1	Wireless Sensor
I/O Type	
01	2-Channel Digital Input
Electrical Certifications²¹	
ZZ	No certification (ordinary locations only)
Optional Selections	
-M2	304ss Bracket, Clamps, and Bolts ²⁵
Example: WIO10-W101ZZ-M2	

20. The material used for the process connector is the same material used for the process cover.

21. Refer to [Electrical Certifications](#), page 14 for details. Contact Global Customer Support for availability.

22. IECEx is included with both the CU and EU certifications.

23. Contact Global Customer Support for availability.

24. Wireless end nodes deployed in the field must be accompanied by a wireless central concentrator.

25. A wall mounting bracket is standard and included with the unit. The -M2 bracket option allows for pipe mounting.

Table 12 - Replacement Cable for WIO10

Code	Description
Model	
WACS-001	4 m (13 ft) Cable for WIO10 Discrete Input End Node

Nominal Dimensions

For dimensional information specific to your sales order, contact your sales representative to order a Certified Dimensional Print (CDP).

All dimensions in diagrams are shown in millimeters over inches (^{mm}/_{in}).

Table 13 - Approximate Mass

Model	Mass
WCC15, with standard wall mount bracket and clamp only	1.1 kg (2.35 lbs)
WRT10, welded (6" probe)	0.9 kg (2.0 lbs)
WRT10, spring-loaded (6" probe)	1.1 kg (2.4 lbs)
WAP10	0.8 kg (1.7 lbs)
WGP10	
WDP10	3.7 kg (8.2 lbs)
WIO10	1 kg (2.2 lbs)

Figure 7 - Central Concentrator (WCC15)

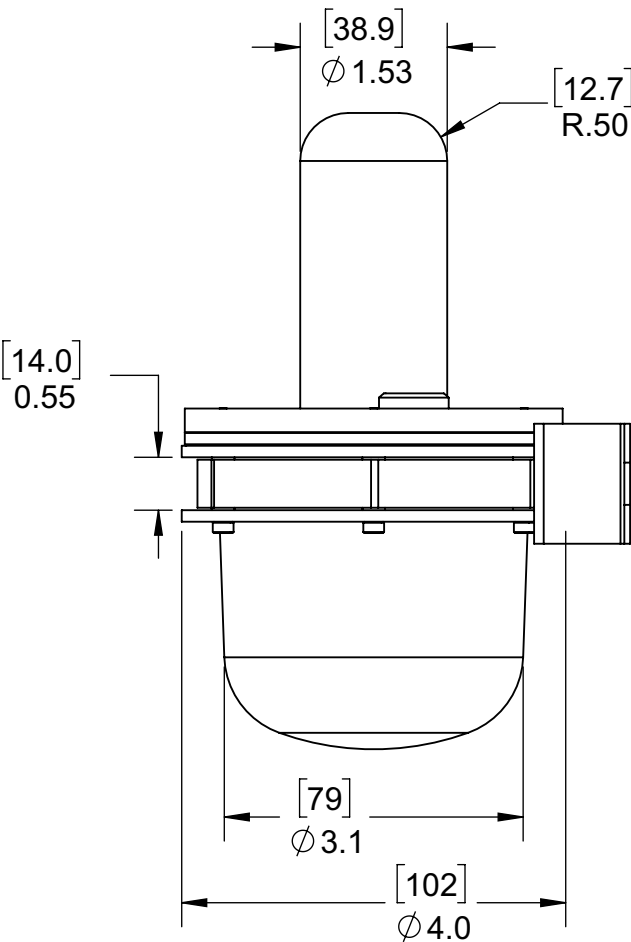


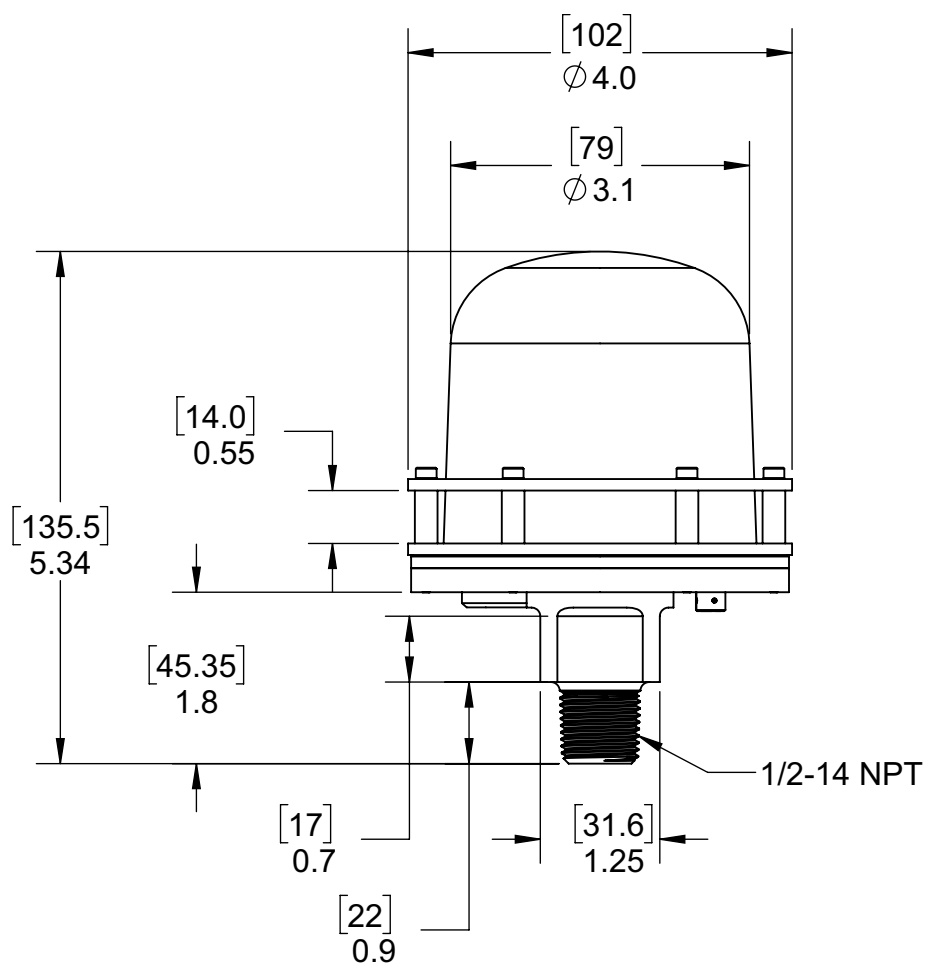
Figure 8 - End Node: Absolute Pressure (WAP10) or Gauge Pressure (WGP10)

Figure 9 - End Node: Differential Pressure (WDP10)

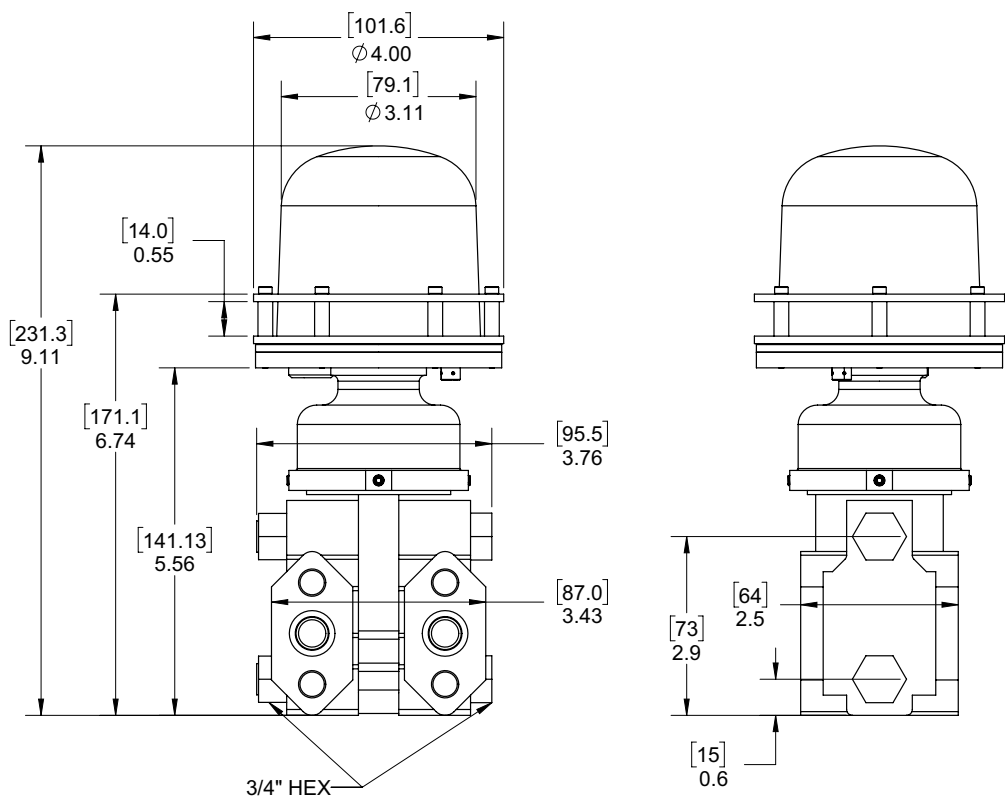


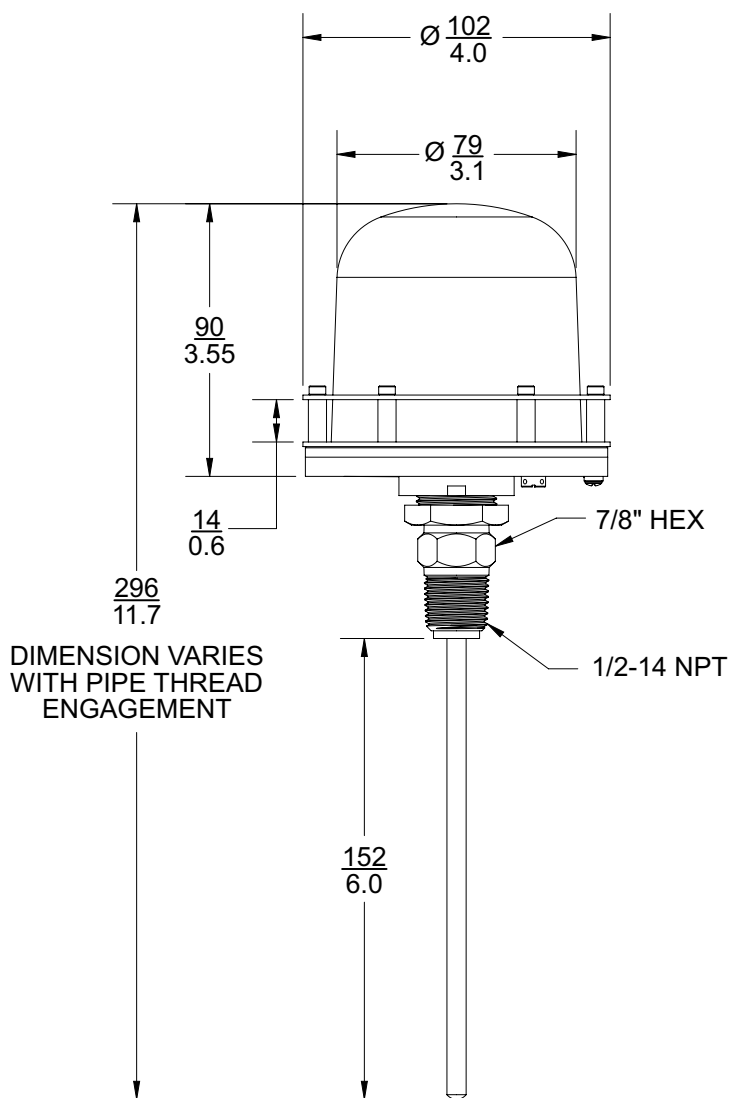
Figure 10 - End Node: Temperature (WRT10)

Figure 11 - End Node: Discrete Input (WIO10)

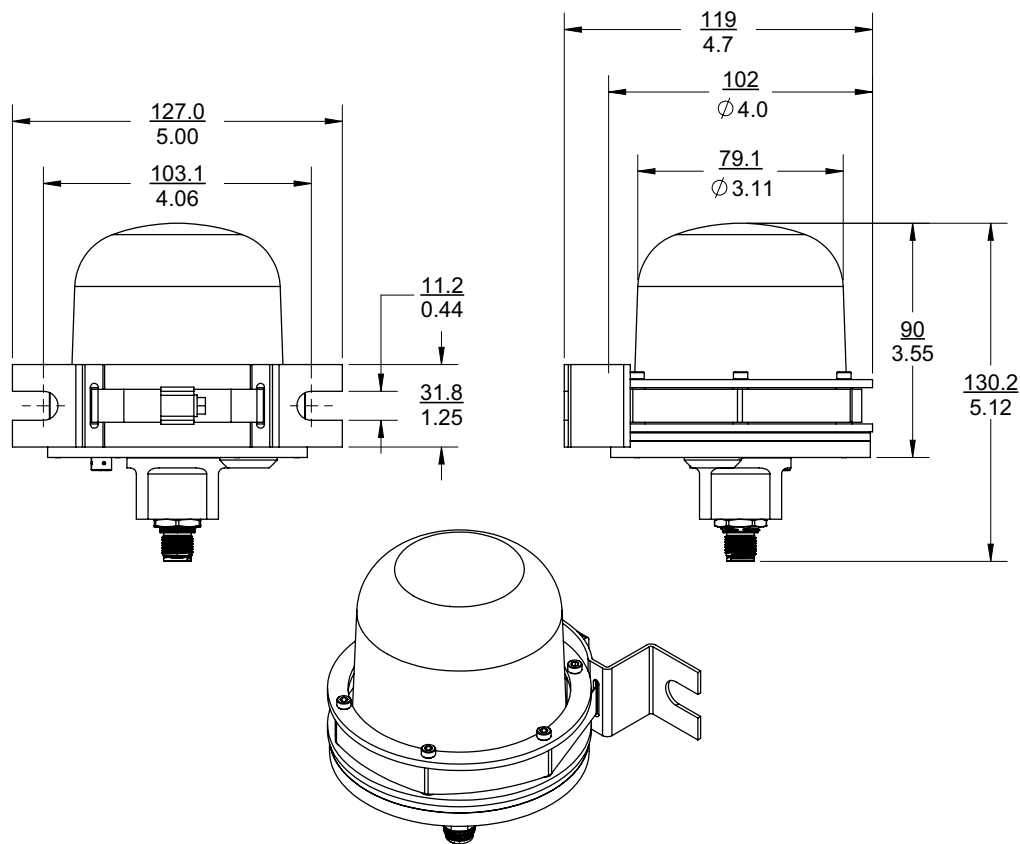


Figure 12 - Wall Mounting Bracket (Shown with WCC15)

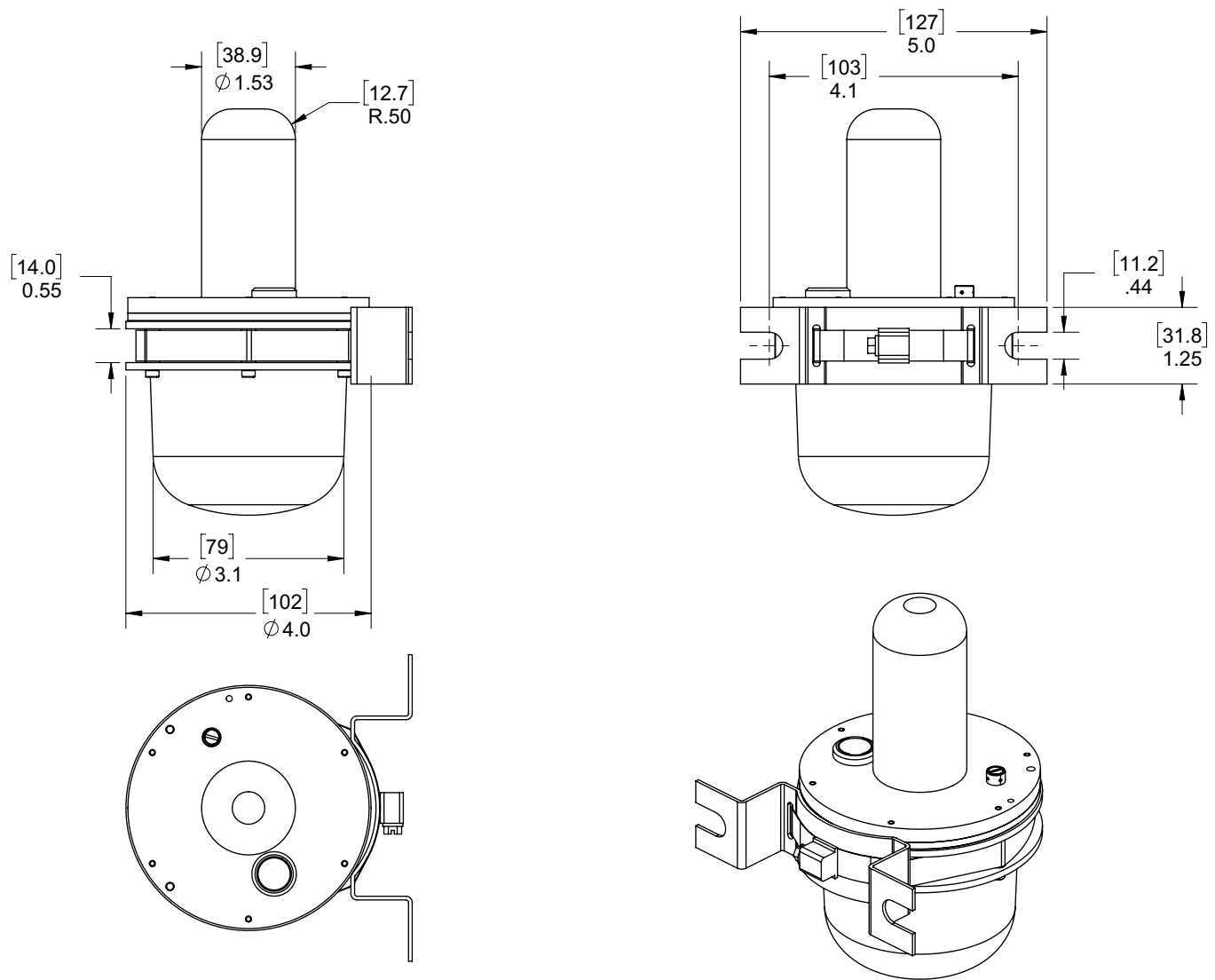
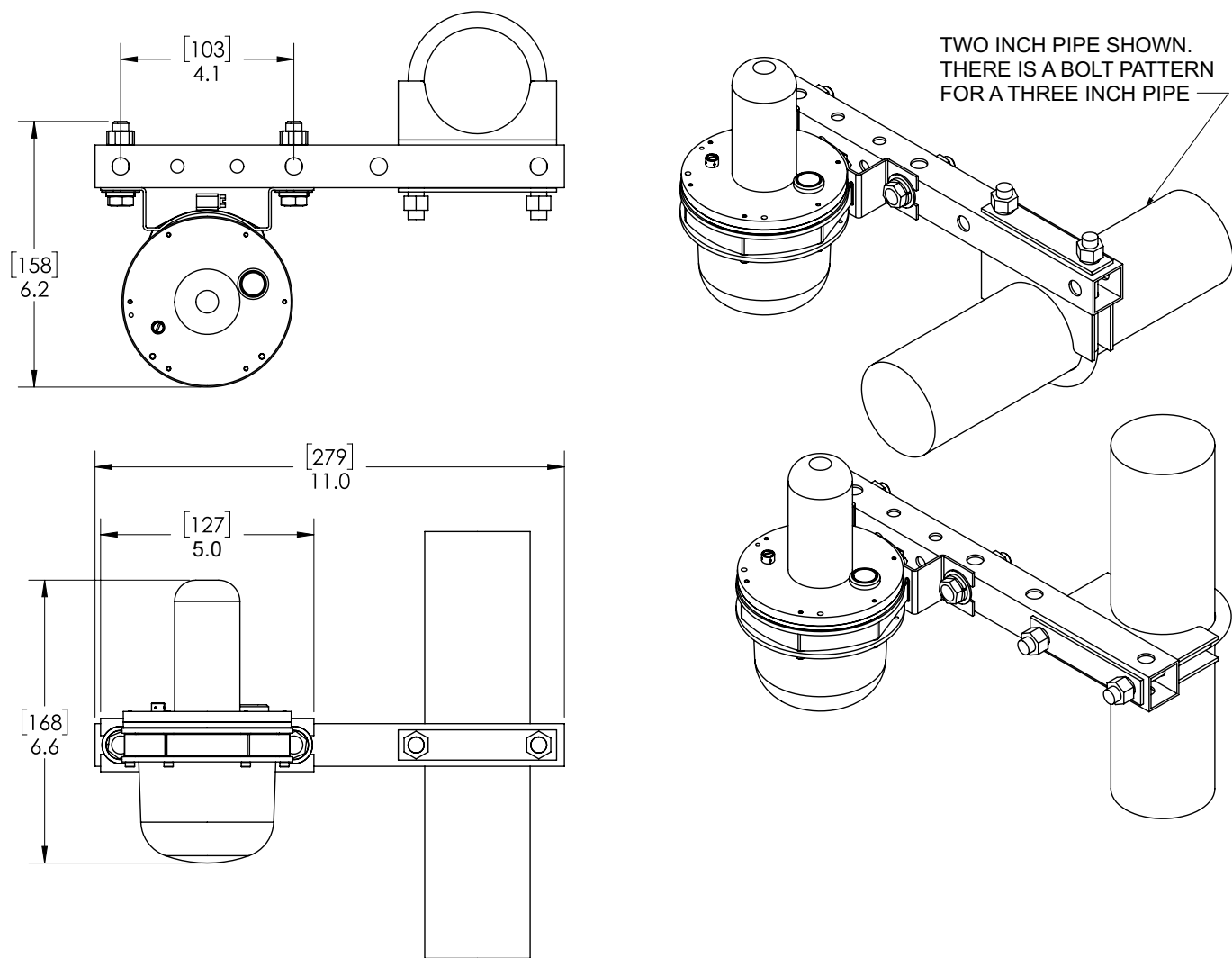


Figure 13 - Pipe Mounting Bracket (Shown with WCC15)



Reference Documents

Document	Description
MI 020-750	Instruction - Central Concentrator and End Nodes
B0800AQ	Getting Started
B0800AS	Installing the WIO10 End Node

Additional Products

Our product lines offer a broad range of measurement and instrument products, including solutions for pressure, flow, analytical, temperature, positioning, and controlling. For a list of these offerings, visit our web site at:

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