

Instrument Area Network

**Central Concentrator and Resistance Temperature Detector (RTD),
Thermocouple, Gauge Pressure, Differential Pressure, and Absolute Pressure
End Nodes**

Contents

Tables	5
Figures	7
Important Information	9
Please Note	9
1. Introduction	11
Dangers, Warnings, and Cautions	11
Reference Documents	12
Radio Equipment Directive (RED)	12
Electrical Safety Specifications	13
Standard Specifications.....	14
RF Characteristics	14
Operating Temperature Range.....	14
Electronics Measurement and Transmissions.....	14
Enclosure Materials	14
Ingress Protection.....	14
Span and Range Limits.....	14
RTD End Node	14
Thermocouple End Node.....	15
Gauge and Absolute Pressure End Notes	15
Differential Pressure	15
Process Connections.....	15
Process Wetted Materials	15
2. Installation and Operation.....	17
Mounting the Transmitter	17
Mounting Brackets	18
Operating Instructions	18
Instrument Area Network Association	18
Push to Join and Unjoin End Nodes to Central Concentrators.....	18
Instrument Area Network Wakeup	18
Central Concentrator-End Node Joining/Unjoining	18
Central Concentrator-End Node Reconnection.....	19
End Node Substitution In an Instrument Area Network	19

Measurement.....	19
Acquisition Period	19
3. HART and the Web Interface.....	21
HCF_SPEC-155 Wireless Commands Supported (Instrument Area Network Central Concentrator only)	23
Unsupported HART Features (to be supported in a future product release).....	23
Field Device Comments	23
Central Concentrator Comments	24
WirelessHART Central Concentrator Join/Unjoin Time Delays	24
WirelessHART End Node Join/Unjoin Time Delays.....	24
Web Interface.....	25
Connecting to a WirelessHART Gateway.....	26
4. Maintenance.....	29
Inspecting Equipment Yearly.....	29
5. Dimensions	31
6. Model Codes	37

Tables

1	Electrical Certifications for WCC10, WRT10, WGP10, WAP10, and WDP10.....	13
2	Pressure Range	15
3	HCF_SPEC-127 Universal Commands Supported	21
4	HCF Test HART Commands Included in Testing and Passed (HCF_SPEC-127).....	22
5	HCF_SPEC-151 Common Practice Commands Supported.....	22
6	HCF Test HART Commands Included in Testing and Passed (HCF_SPEC-151).....	22
7	Model Code - Central Concentrator (WCC10)	37
8	Model Code RTD and Thermocouple Temperature End Nodes (WRT10)	37
9	Model Code - Absolute Pressure End Node (WAP10)	40
10	Model Code - Gauge Pressure End Node (WGP10).....	41
11	Model Code - Differential Pressure End Node (WDP10).....	42

Figures

1	Wi-Fi Page (Example)	26
2	Network ID, Join Key, and Join Status	27
3	Join Status	27
4	Dimensions for Central Concentrator and End Nodes with Wall Mounting Bracket.....	35
5	Dimensions for Central Concentrator and End Nodes with Bracket for Mounting on a 2- or 3-inch Pipe.....	36

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in death or serious injury**.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in death or serious injury**.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in minor or moderate injury**.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

1. Introduction

The hardware components are the Central Concentrator, the Resistance Temperature Detector (RTD) End Node, the Thermocouple End Node, the Gauge Pressure End Node, the Differential Pressure End Node, and the Absolute Pressure End Node.

Up to 8 End Nodes can be associated to the Central Concentrator, which then relay measurements to upstream networks such as WirelessHART and the Wi-Fi administrator interface. The joined group of Central Concentrator and End Node devices comprises an Instrument Area Network.

The Administrative Node can be any Wi-Fi (802.11) device with a modern web (HTTP) browser. All Instrument Area Network devices have a battery installed and SS316L wetted parts. The enclosure is SS304 and Polycarbonate.

These pressure transmitters measure pressure by applying the pressure to a piezoresistive silicon pressure sensor within the sensor assembly. The pressure sensor converts the pressure to a change in resistance, and the resistance change is converted to a signal that is proportional to the pressure.

- ◆ Gauge Pressure End Nodes measure pressure relative to ambient air pressure. They are used in a wide variety of oil, gas, water and industrial applications.
- ◆ Differential Pressure End Nodes measure the difference between two pressures applied to opposite sides of the sensor. The output signal is proportional to either the differential pressure or its square root. They are often used for measuring fluid flow rates across a primary device such as an orifice plate, but can also be used for other types of differential pressure measurements such as liquid level, interface level, or density measurements.
- ◆ Absolute Pressure End Nodes measure pressure relative to internal vacuum cell pressure. They are used in a wide variety of oil, gas, water and industrial applications.

Dangers, Warnings, and Cautions

▲ WARNING
RISK OF EXPOSURE
When installing or removing equipment, wear appropriate protective clothing including safety goggles.
Failure to follow these instructions can result in death or serious injury.

▲ WARNING**RISK OF EXPOSURE**

Follow your local site safety procedures regarding hazardous substances if you are using the field unit to measure a process with hazardous substances.

When processing hazardous substances, follow the recommended procedures.

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

Reference Documents

Document No.	Description
B0800AQ	Instrument Area Network Central Concentrator to End Node Joining and UN-Joining Getting Started

Radio Equipment Directive (RED)

Complies with Radio Equipment Directive (RED) requirements tested to: FCC 47CFR Pt.15.247, RSS-247, RSS-102, ETSI EN 300-328, ETSI EN 301-489-1, ETSI EN 301-489-17, EN 55032, EN 62311.

Electrical Safety Specifications

Table 1. Electrical Certifications for WCC10, WRT10, WGP10, WAP10, and WDP10

Device	Agency Certification, Type of Protection, Area Classification, and Application Conditions	Model Code Selection
Central Concentrator (WCC10)	No certification – ordinary locations only	ZZ
Temperature End Node (WRT10)	ATEX Intrinsically Safe Certified: II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54	EU
	North America Intrinsically Safe Certified: Canada: Ex ia IIC T4 Ga Ex ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54 United States: Class I Zone 0 AEx ia IIC T4 Ga Zone 20 AEx ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54	CU
Gauge Pressure (WGP10) and Absolute Pressure (WAP10) End Nodes	North America Intrinsically Safe Certified: Canada: Ex ia IIC T4 Ga Ex ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54 United States: Class I Zone 0 AEx ia IIC T4 Ga Zone 20 AEx ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54	CU
Differential Pressure (WDP10) End Node	North America Intrinsically Safe Certified: Canada: Ex ia IIC T4 Ga Ex ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54 United States: Class I Zone 0 AEx ia IIC T4 Ga Zone 20 AEx ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54	CU

— NOTE —

This equipment has been designed to meet the electrical safety descriptions listed in the table above. For detailed information or status of testing laboratory approvals/certifications, contact Global Customer Support.

— NOTE —

Optional certification options allow devices to meet numerous requirements for hazardous and non-hazardous locations

— NOTE —

CE marked; meets the requirements of applicable RED, WEEE, ATEX, RoHS, and PED European Union Directives

Standard Specifications

RF Characteristics

2.4 GHz Spread Spectrum, ISM license-free band

58mW maximum operational RF transmit power

BLE RF link margin:

TX Power: +5dBm

RX Sensitivity: -97dBm

WiFi:

TX Power: +15dBm

RX Sensitivity: -90dBm

WHART:

TX Power: +10dBm

RX Sensitivity: -96dBm

Operating Temperature Range

Electronics Measurement and Transmissions

-40°C to +80°C (-40°F to +176°F)

Enclosure Materials

Stainless Steel 304

Polycarbonate

PTFE antenna cover (Central Concentrator model only)

Ingress Protection

IP54

Span and Range Limits

RTD End Node

The tested RTD range is: -200C to 885C.

Thermocouple End Node

The tested Thermocouple range is: -100mV to +100mV

Gauge and Absolute Pressure End Notes

Error is 0.25% of full-scale, across -40 to +80 C

The Gauge Pressure End Node is available with a range of full scale pressure.

Differential Pressure

Error is 0.25% of full-scale plus static pressure offset error

The Differential Pressure End Node is available with a range of full scale pressure, and a 2000 PSI static pressure rating. The Differential Pressure process connection is a SS316 flange with 1/4"-18 NPT female process fittings and fixing threads 7/16"-20 UNF @ 1.625" center distance.

Table 2. Pressure Range

XXXX=	Pressure Range in PSI
7	-7.2 to +7.2
30	-30 to +30 PSI
300	-30 to +300 PSI

Process Connections

- ◆ Gauge Pressure connect direct to the process using its external 1/2" NPT male thread.
- ◆ RTD and Thermocouple units without thermowells connect direct to process using their external 1/2" NPT male thread.
- ◆ RTD and Thermocouple units may come with a thermowell that will connect direct to process.
- ◆ Differential Pressure units will connect to process via 1/4" NPT process connection and fixing thread 7/16"-20 UNF @ 1.625" center distance.
- ◆ Central Concentrator can be mounted with the included bracket and band strap to a vertical or horizontal pole.

Process Wetted Materials

The wetted parts of the Differential Pressure, Gauge Pressure, Absolute Pressure, RTD, and Thermocouple are 316L stainless.

2. Installation and Operation

Mounting the Transmitter

The hazardous area certification upper temperature limit for Instrument Area Network devices is 80°C for both enclosure as well as the electronics inside. Neither the enclosure nor the internal electronics may be permitted to go above this temperature.

▲ CAUTION

POTENTIAL EQUIPMENT DAMAGE

Observes all temperature limits for the device, enclosure, and mounting accessories.
--

Failure to follow these instructions can result in injury or equipment damage.

The Central Concentrator has an integral antenna that allows communication to the upstream wireless network and to all joined 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. The Central Concentrator can be mounted with the supplied band strap or optional mounting brackets.

Each End Node housing has either an integral process related sensor or a “plugged entry port” located on the center of the bottom face of the unit’s base. Select a mounting location for each housing type based on its use and the process measurement location. “Plugged entry port” devices without available threads need not be threaded into anything.

For End Nodes with protruding sensors, fully install the sensor’s threads into the process port fitting.

The distance between the Central Concentrator and each End Node should not exceed 15 meters (49.2 feet), although this specification does not imply that the Central Concentrator and the End Node need to be installed in a straight line or without obstruction. End Nodes can communicate with the Central Concentrator even in harsh metal works environments (TX Power: +5dBm, RX Sensitivity: -97dBm at 2.4 GHz).

NOTICE

POTENTIAL EQUIPMENT DAMAGE

Mounting locations should not be exposed to forceful impacts like heavy falling objects that could damage the integrity of the Central Concentrator and End Node enclosures.
--

Failure to follow these instructions can result in equipment damage.

Mounting Brackets

In addition to process port threads, Central Concentrator and End Node enclosures allow for mounting to a wall via the band strap groove or with the brackets shown in Figure 4. The Central Concentrator can also be mounted on a two- or three-inch pipe using the bracket shown in Figure 5.

Operating Instructions

Instrument Area Network Association

Push to Join and Unjoin End Nodes to Central Concentrators

Push refers to the act of physically pushing on an End Node or Central Concentrator device's process fitting /antenna and domed cover together and holding for one second or more in order to activate joining or unjoining activity in an Instrument Area Network.

Pushing is used for joining and unjoining End Nodes to Central Concentrators, so that the Central Concentrator can relay the End Nodes data back on the WirelessHART network.

Through the time coincident pushing, End Nodes and Central Concentrator devices form a persistent association as the user input causes them to become joined. This association continues across temporary interruptions of the RF link. Users can remove or unjoin an End Node from a Central Concentrator through the right sequence of pushes.

Instrument Area Network Wakeup

An Instrument Area Network group as a whole, is *woken up* by pushing the Instrument Area Network's Central Concentrator or any joined End Node.

Note that the device which is pushed to wake up the Instrument Area Network will flash almost immediately, but the Instrument Area Network is not considered woken up until all the associated devices begin to flash which may take several seconds.

When the Central Concentrator of a particular Instrument Area Network group has its upstream network activated, the End Nodes in that group, and any subsequently joined, automatically provision onto the upstream network with default spans and at the report interval configured for each End Node.

The End Nodes are designed to be placed anywhere within 15m of the Central Concentrator, in harsh metal works environments (TX Power: +5dBm, RX Sensitivity: -97dBm at 2.4 GHz).

Central Concentrator-End Node Joining/Unjoining

End Node devices may be *joined* one at a time with a particular Central Concentrator by activating (pushing) the End Node and the Central Concentrator. When joining is complete, you will see a synchronized, one second long, rapid flashing of both the Central Concentrator and the newly-joined End Node (along with any other End Nodes previously joined to the Central Concentrator). The new End Node and Central Concentrator are now *associated*.

An End Node can be *unjoined* by activating the Instrument Area Network group (i.e. making all devices in an Instrument Area Network flash by *pushing* a currently joined device of the Instrument Area Network group), then *pushing* on the particular End Node which is to be *unjoined*.

For example, an End Node (which is in a group) can be unjoined by pushing on that same End Node to awaken that group, waiting for the other devices in the Instrument Area Network to begin flashing (showing the group is awake), and then pushing on the End Node you wish to remove (in this case the same one again). The End Node leaving the group, flashes out-of-sync with the other Instrument Area Network devices to indicate it has been successfully unjoined.

If an End Node is taken out of RF range of the Central Concentrator it is joined to, then pushed, the End Node will *forget* its joined status. When next pushed it will begin searching for an activated Central Concentrator to join.

A device which has been accidentally pushed will flash, and if joined, will cause the group to flash. The device and the group, if not further pushed, will deactivate in 30 seconds. Any device is *deactivated* from a joining perspective when its flashing stops. It will be on-line if joined, and quiescent if unjoined.

Central Concentrator-End Node Reconnection

If the RF link between a Central Concentrator and joined End Node is interrupted, the devices will attempt to reconnect. If the devices cannot reconnect, the End Node and Central Concentrator will continue to reconnect at increasingly longer intervals. An End Node will only automatically reconnect to the Central Concentrator it was joined to. The End Node and Central Concentrator will not flash to indicate reconnection activity is in progress.

End Node Substitution In an Instrument Area Network

If an End Node is associated with an Instrument Area Network and is carried out of RF range of its Central Concentrator, the slot in the Central Concentrator allocated for the out-of-range End Node becomes available for joining a different End Node, even though the Central Concentrator was attempting to reconnect to the out-of-range End Node. Once a new End Node joins in the slot of an out-of-range End Node, the out-of-range End Node will no longer be able to reconnect. Therefore, it is not essential to unjoin an End Node when removing it from its Instrument Area Network, but doing so will avoid battery power being consumed by the automatic reconnection attempt activity.

Measurement

Acquisition Period

Sample acquisition period is configurable to a value between 125ms and 60s, inclusive. End Node devices ship with an acquisition period of 16 seconds, corresponding to a report rate of 1/30 Hz.

3. HART and the Web Interface

The HART 7 standard was referenced to develop all HART Commands.

The HCF Test Definitions used to test Universal Commands have the format UALUnnn, while the test definitions used for Common Practice Commands have the format CALUnnn.

Table 3. HCF_SPEC-127 Universal Commands Supported

Command	Description
Command 0	Read Unique Identifier
Command 1	Read Primary Variable
Command 2	Read Loop Current (a)
Command 3	Read Dynamic Variables (a)
Command 6	Wire Polling Address (a)
Command 7	Read Loop Configuration (a)
Command 8	Read Dynamic Variables Classifications
Command 9	Read Device Variables
Command 11	Read Unique Identifier Associated with Tag
Command 12	Read Message
Command 13	Read Tag, Descriptor, Date
Command 14	Read Primary Variable Transducer Information
Command 15	Read Device Information
Command 16	Read Final Assembly Number
Command 17	Write Message
Command 18	Write Tag, Descriptor, Date
Command 19	Write Final Assembly Number
Command 20	Read Long Tag
Command 21	Read Unique Identifier Associated with Long Tag
Command 22	Write Long Tag
Command 38	Reset Configuration Changed Flag
Command 48	Read Additional Device Status (b)

- a. While command request yields a valid HART response, there is no Current Loop support within the Instrument Area Network. The Loop Current Mode is fixed as Disabled.
- b. The Central Concentrator acts as a WirelessHART adapter to provide End Node and Central Concentrator Command 48 responses to the WirelessHART gateway. The CC bursts Command 48 responses to the gateway once per hour, or upon change in Central Concentrator or End Node information. The WirelessHART gateway caches all Command 48 Additional Information bursts and therefore has a copy of the latest information of each device. Command 48 Additional Information should be read by periodically issuing a HART-IP Command 48 Pass-Through Request to the gateway. The gateway immediately responds with the current cached information per the most recent burst information. A device signals Low Battery Alarm via two Command 48 Additional Information bytes: Extended Device Status - Maintenance Required (0x01), and Standardized Status 1 - Battery or Power Supply needs Maintenance (0x08).

Table 4. HCF Test HART Commands Included in Testing and Passed (HCF_SPEC-127)

HCF Test	Command
UALU000	0, 1, 2, 3, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 38, 48
UALU005	0, 12, 15, 17, 20
UALU006	0, 11, 13, 18, 20
UALU008	0,15, 16, 19, 20
UALU011a	0, 9, 20
UALU012	0, 3, 8, 20
UALU013	0, 1, 15, 20, 21, 22
UALU048a	0, 20, 48

Table 5. HCF_SPEC-151 Common Practice Commands Supported

Command	Description
Command 43	Set Primary Variable Zero - warning: Lower Trim limits are not enforced
Command 44	Write Primary Variable Units
Command 50	Read Dynamic Variable Assignments
Command 54	Read Device Variable Information
Command 72	Squawk
Command 74	Read I/O System Capabilities
Command 77	Send Command to Sub-Device (a)
Command 84	Read Sub-Device Identity Summary
Command 90	Read Real-Time Clock (b)
Command 101	Read Sub-Device to Burst Message Map (a)
Command 103	Write Burst Period (a)
Command 105	Read Burst Mode Configuration (a)
Command 143	Reset Zero of Primary Variable

- a. HART Adapter Command is supported by Central Concentrator only.
- b. Real-Time Clock is not yet supported.

Table 6. HCF Test HART Commands Included in Testing and Passed (HCF_SPEC-151)

HCF Test	Command
CALU000	44, 50, 54, 72, 74, 77, 84, 90, 101, 103, 105
CALU072	72

HCF_SPEC-155 Wireless Commands Supported (Instrument Area Network Central Concentrator only)

- ◆ WirelessHART commands are supported per the Linear Technology LTP5902-WHM WirelessHART Mote Module. See *Linear SmartMesh WirelessHART User's Guide*. Section HCF_SPEC-155 Commands for details.
- ◆ Commands supported include: 768, 769, 770, 771, 772, 773, 774, 777, 778, 779, 780, 781, 782, 783, 784, 785, 787, 794, 795, 796, 797, 798, 800, 801, 802, 804, 805, 806, 808, 810, 811, 812, 813, 819, 820, 823, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 973, 974, 975, 64512.

Unsupported HART Features (to be supported in a future product release)

- ◆ Device Status bits (Primary Variable Out of Limits, Non-Primary Variable Out of Limits, Loop Current Saturated, Loop Current Fixed, Cold Start, and Device Malfunction).
- ◆ Real-Time Clock management.
- ◆ Additional HART Common Practice Commands.

Field Device Comments

- ◆ HART Device Variable Code 0 represents the measured process value.
- ◆ Unit of measure is configurable.
- ◆ Sensor acquisition period is configurable - default is 16 seconds.
- ◆ User Trim/Span operations are not supported.
- ◆ Operates as a multi-drop device with loop current signaling disabled.

Central Concentrator Comments

1. HART Device Variable Code 0 tentatively represents the Battery Life (days battery in operation), but value is fixed and does not reflect actual value.
2. Burst Message configuration for Central Concentrator is fixed as:
 - a. Burst Message ID = 0
 - b. Burst Mode Control Code = Off
3. Burst Message configuration for each Field Device is fixed as:
 - a. Burst Message ID's 1 - 8 map one-to-one for each RTD device.
 - b. Burst Mode Control Code = TDMA Data-Link Layer only
 - c. Extended Command Number assignment = HART Command 3
 - d. Burst Trigger Mode = Continuous.
4. The publish period to the WirelessHART gateway is configurable - default is 16 seconds.

WirelessHART Central Concentrator Join/Unjoin Time Delays

- ◆ The Time delta for a Join request that transitions from Join Requested to Join Succeeded is approximately five minutes. An automatic retry will occur if the join is not successful.
- ◆ The Time delta for an Unjoin request that transitions from Join Succeeded to Not Joined is approximately one minute. However, the registration within the WirelessHART Gateway servlet may take as long as ten minutes before the Central Concentrator HART status changes to offline.

WirelessHART End Node Join/Unjoin Time Delays

- ◆ The Time delta for an End Node Field Device Join operation to register within the Emerson WirelessHART Gateway servlet ranges from 3 - 10 minutes.
- ◆ The Time delta for an End Node Field Device Unjoin operation to register within the Emerson WirelessHART Gateway servlet ranges from 3 - 10 minutes.

— NOTE —

The delay is approximately three minutes if there are no prior devices joined. With seven devices joined, adding an eighth device requires approximately 10 minutes. During this time, existing measurement values in the Gateway servlet may temporarily disappear (blank out) then re-appear during the device join process.

Web Interface

The web interface's Wi-Fi name is set to use a SSID of IAN_[X] where X is the 802.11 MAC address.

This SSID is advertised and therefore easily seen for a device wishing to associate to the Central Concentrator's Wi-Fi.

The webpage to administer the Instrument Area Network is set as `http://10.10.10.10/ian/page`

To conserve battery life, the Wi-Fi interface is disabled by default. Instrument Area Network Wakeup ("push" any currently joined member of the group) enables the Wi-Fi interface for five minutes. Once a web browser is open, receiving updates from the web interface, the time enabled is extended to one hour. After five minutes of inactivity with no web browser interaction, or one hour since Wi-Fi power on, the Wi-Fi interface is powered off. There is no Wi-Fi encryption and you need to activate the Wi-Fi by "pushing" a joined unit.

The web browser interface allows you to see the Instrument Area Network group from the Central Concentrator's perspective. All joined End Nodes are shown, as well as their most recent measurement and hardware unique name. You can individually identify each End Node by causing it to flash or simulate "pushing" any joined End Nodes or the Central Concentrator.

Embedded Calibration Certificates (in End Nodes) may be read out live from each connected End Node.

In the Central Concentrator's web page, there is an interface to configure the network parameters and join WirelessHART (via textual entry of data and buttons on screen). Also, there is a quick start guide and the release notes available as web pages.

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 joined are in full color (depending on type) and any End Nodes which are joined but currently experiencing an RF link interruption will appear lined out, and the link status column in the End Node table will show *Down*.

Depending on the RF environment, occasional brief intervals of link interruption are normal. Also, joining an additional End Node to a Central Concentrator may sometimes cause a brief link interruption for all previously connected End Nodes.

The web page refreshes the measurement information for each End Node approximately once per second.

When the acquisition period for an End Node is longer than one second, values from End Nodes will refresh at the longer period; third-party End Nodes may refresh more frequently than the specified period.

To reset the web interface, close the browser window, allow the 5 minute time-out to occur, and then perform Instrument Area Network Wakeup and reconnect to the Wi-Fi interface.

— NOTE

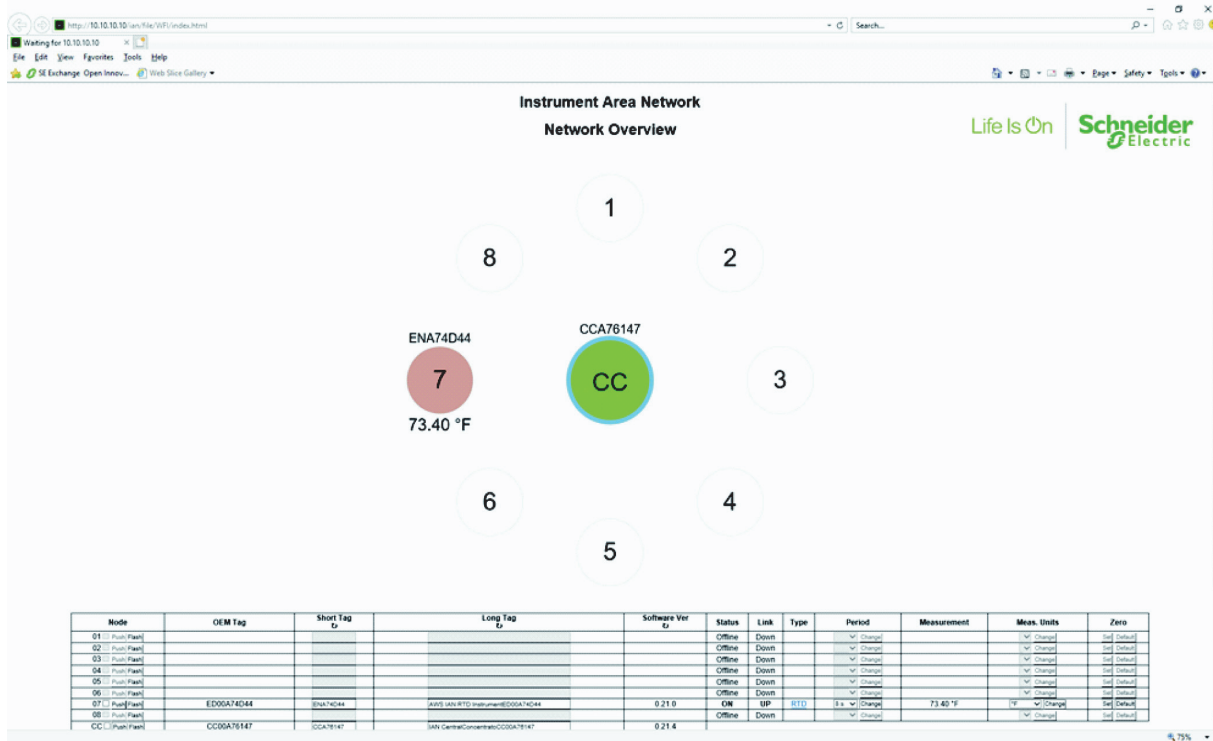
Do not include spaces in any uploaded file names.

Connecting to a WirelessHART Gateway

To connect to a WirelessHART gateway:

1. First, *wake up* the Instrument Area Network Central Concentrator and connect to the Instrument Area Network Central Concentrator Wi-Fi page (<http://10.10.10.10/ian/file/WFI/index.html>). An example of the Wi-Fi page appears in Figure 1.

Figure 1. Wi-Fi Page (Example)



2. Scroll down to the bottom of the Wi-Fi page that shows the Network ID, Join Key, and Join Status. An example of the Wi-Fi page appears in Figure 2.

Figure 2. Network ID, Join Key, and Join Status

Node	OEM Tag	Short Tag	Long Tag	Software Ver	Status	Link	Type	Period	Measurement	Meas. Units	Zero
01	Push Panel				Offline	Down					Set Default
02	Push Panel				Offline	Down					Set Default
03	Push Panel				Offline	Down					Set Default
04	Push Panel				Offline	Down					Set Default
05	Push Panel				Offline	Down					Set Default
06	Push Panel				Offline	Down					Set Default
07	Push Panel	E000A74D44	ANA74D44	ANA74D44	ON	UP	RTD	0.1	76.40 °F	°F	Set Default
08	Push Panel	CC00A76147	CCA76147	CCA76147	Offline	Down					Set Default
CC	Push Panel	CC00A76147	CCA76147	CCA76147	Offline	Down					Set Default

- Type the Network ID of your WirelessHART gateway and click Submit.
- Enter the Join Key of your WirelessHART gateway and click Submit.
- Under Join Status, click on the box next to the Join button.
- Click the Join button.
- The Join Status will display that the Instrument Area Network Central Concentrator is attempting to connect to the WirelessHART gateway. The Join Status will display Join Succeeded if the Instrument Area Network Central Concentrator connects successfully to the WirelessHART gateway. See Figure 3.

Figure 3. Join Status

			▼ Change	Set Default
			▼ Change	Set Default
			▼ Change	Set Default
	77.36 °F	°F	▼ Change	Set Default
			▼ Change	Set Default

Join Status	
Join Succeeded	
<input type="checkbox"/> Join	<input type="checkbox"/> Unjoin

4. Maintenance

Inspecting Equipment Yearly

NOTICE
POTENTIAL EQUIPMENT DAMAGE Follow all recommended inspection schedules. Failure to follow these instructions can result in equipment damage.

Perform a yearly visual inspection for the following:

- ◆ Is the Field Unit still securely fastened to the mount point?
- ◆ Corrosion, cracks, or residue build-up on the unit?
- ◆ Has the application changed from the original intended use?
- ◆ Consider chemical compatibility with the integral probe material of stainless steel and the overall enclosure materials of stainless steel and poly-carbonate plastic.

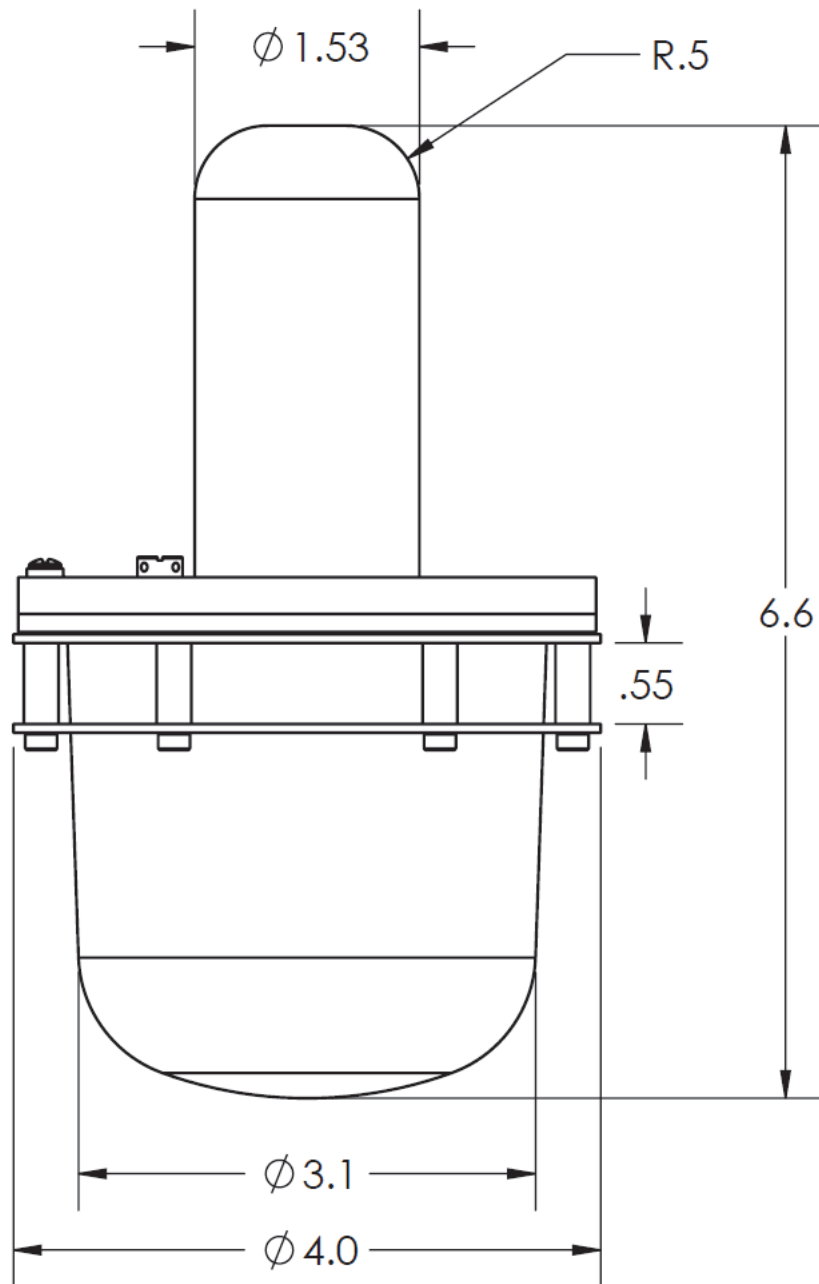
⚠ CAUTION
POTENTIAL EQUIPMENT DAMAGE Do not clean the equipment with abrasive cleaners or coarse wipes. Clean with a damp cloth. Failure to follow these instructions can result in injury or equipment damage.

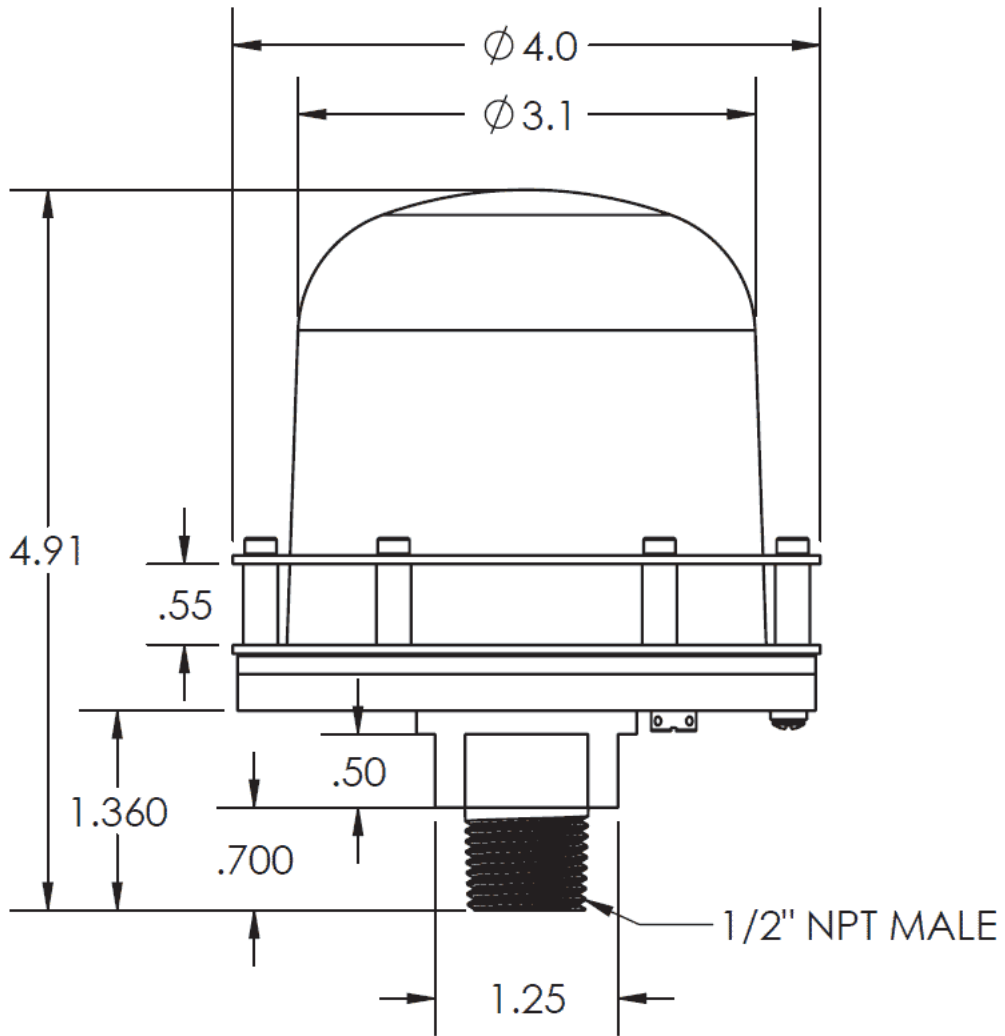
⚠ WARNING
RISK OF EXPOSURE Follow your local site safety procedures regarding hazardous substances if you are using the field unit to measure a process with hazardous substances. When processing hazardous substances, follow the recommended procedures. Failure to follow these instructions can result in death or serious injury.

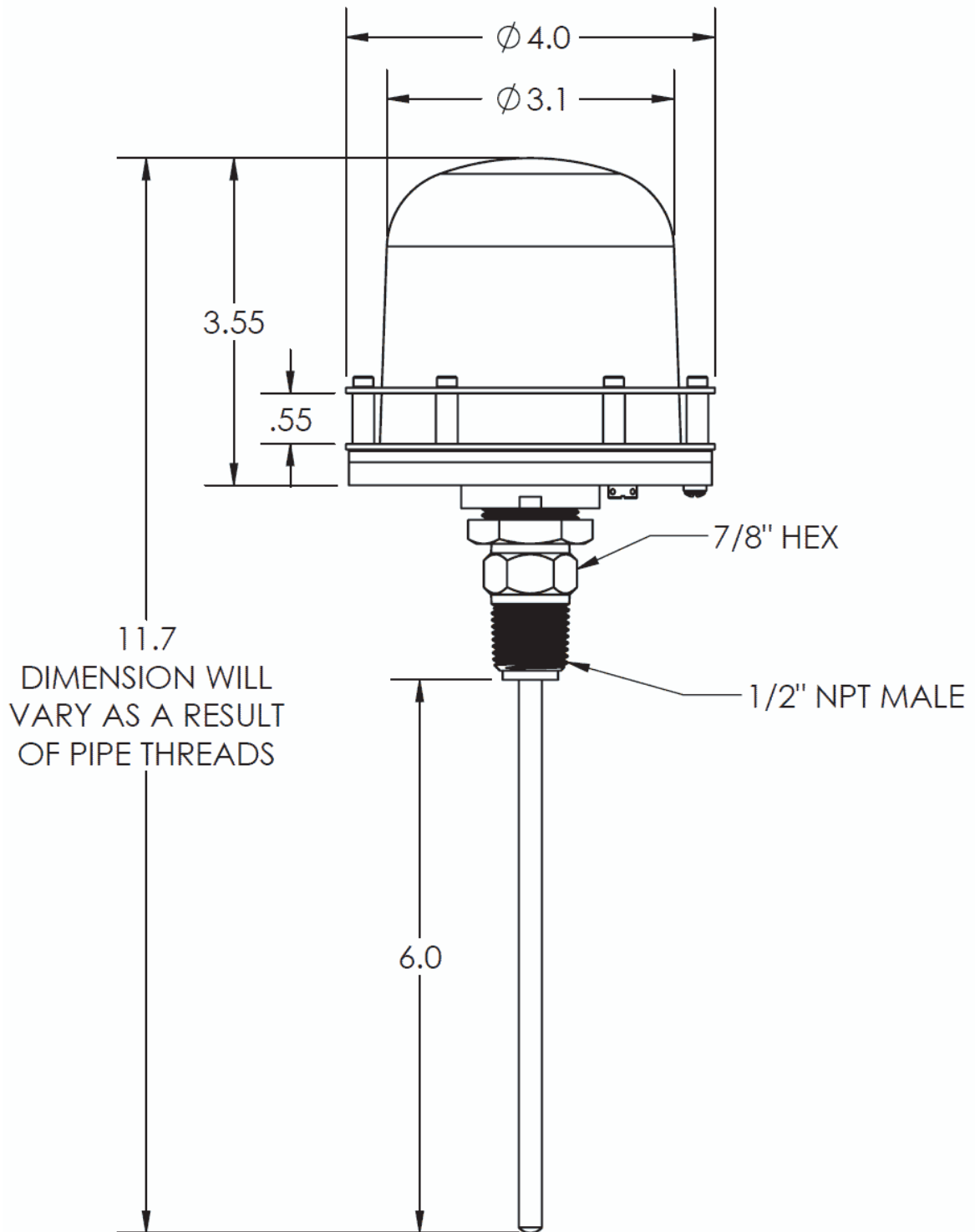
⚠ WARNING
RISK OF EXPOSURE Properly dispose of lithium batteries in accordance with local regulations. Failure to follow these instructions can result in death or serious injury.

5. Dimensions

Mount the equipment using the process connection. Mount the Central Concentrator using the .5 inch band strap groove.







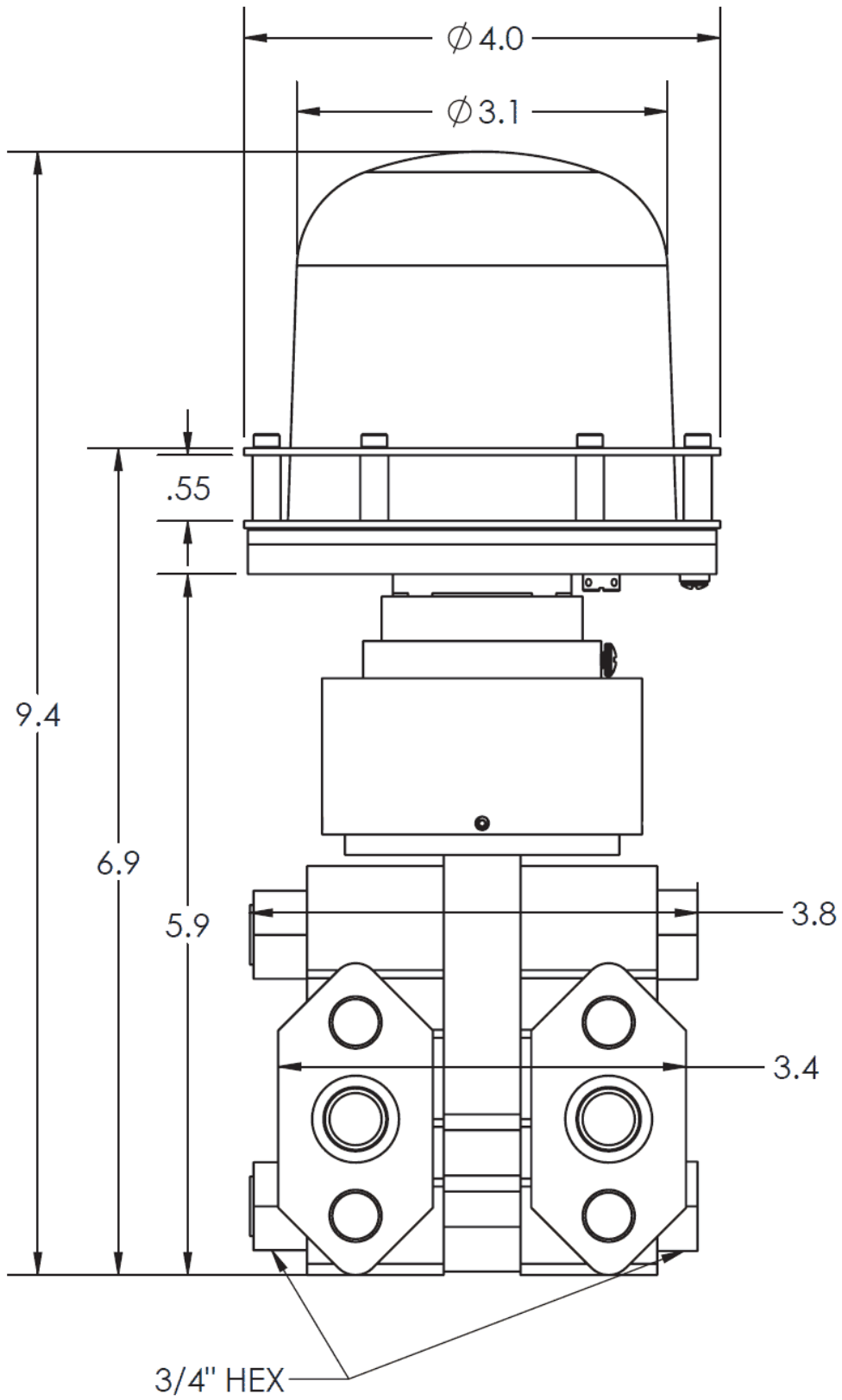


Figure 4. Dimensions for Central Concentrator and End Nodes with Wall Mounting Bracket

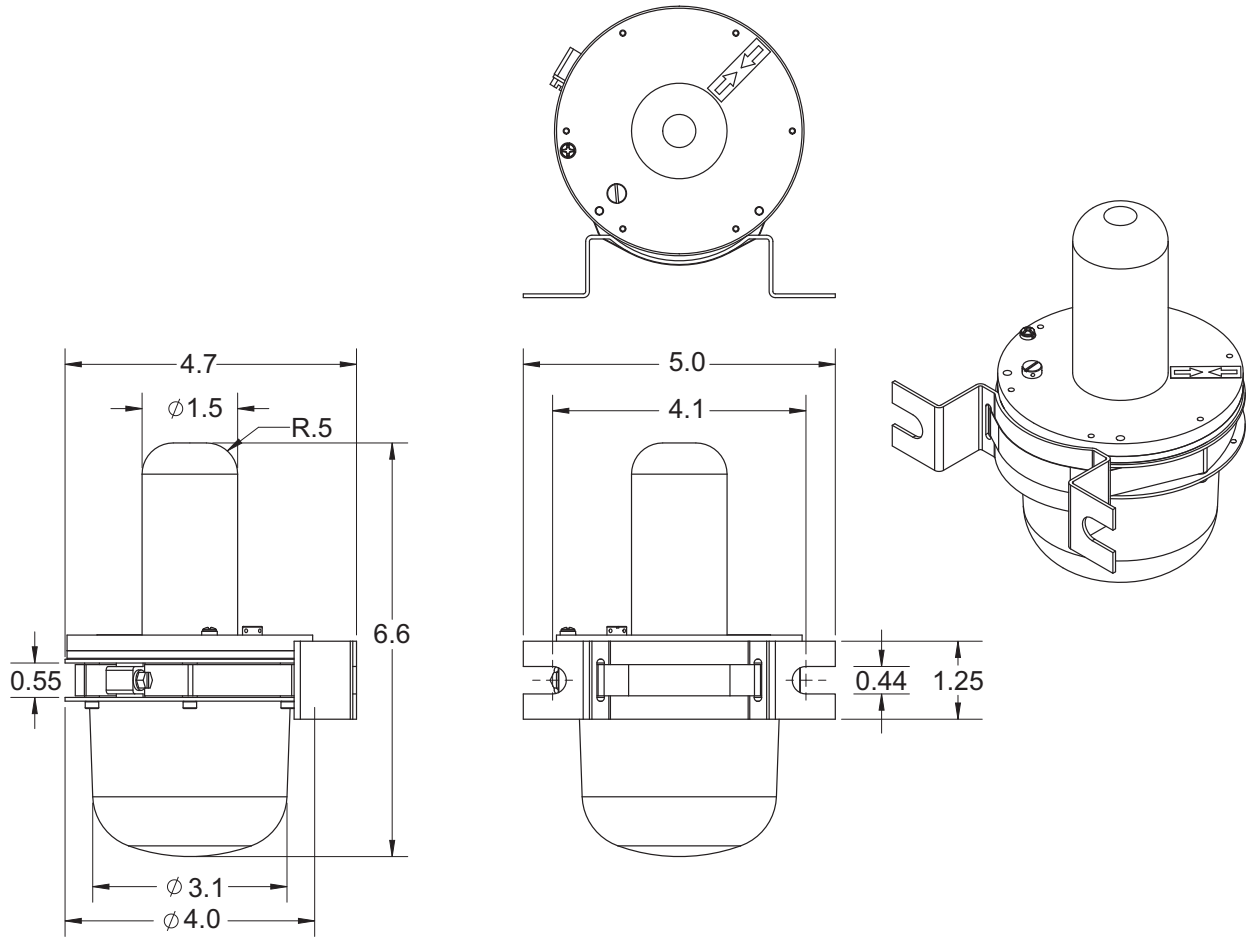
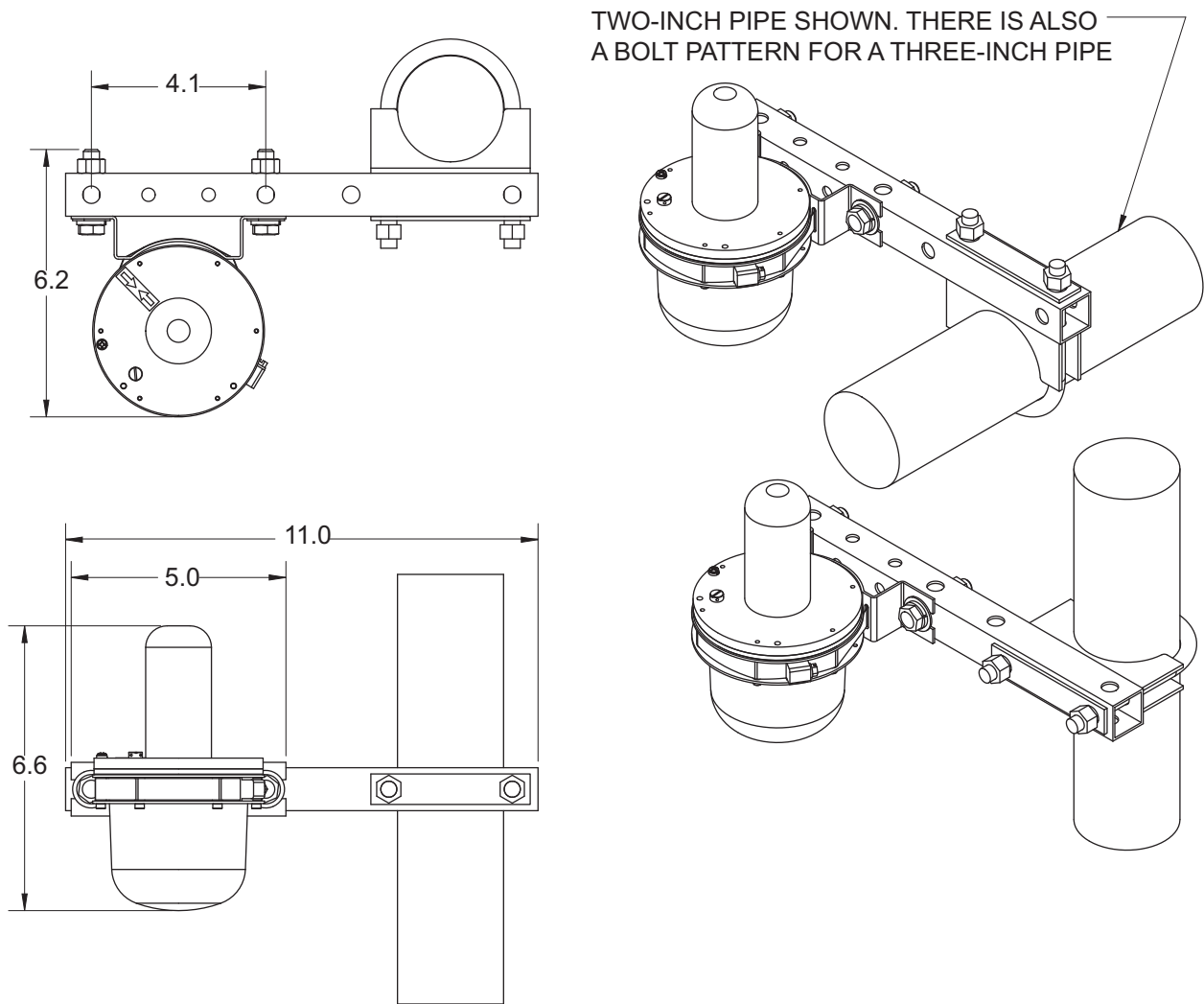


Figure 5. Dimensions for Central Concentrator and End Nodes with Bracket for Mounting on a 2- or 3-inch Pipe



6. Model Codes

Table 7. Model Code - Central Concentrator (WCC10)

<u>Description</u>	<u>Model</u>
Central Concentrator (a)	WCC10
<u>Wireless Communication</u>	
Wireless HART	-WH
<u>Electrical Certifications</u>	
No certification – ordinary locations only	ZZ
<u>Optional Selections</u>	
304 ss Bracket, Clamps and Bolts (b)	-M2
Example: WCC10-WHZZ-M2	

- a. Wireless HART gateways can be ordered separately via part numbers 217229 and 252863.
- b. The M2 bracket is required and included with the WCC10.

Table 8. Model Code RTD and Thermocouple Temperature End Nodes (WRT10)

<u>Description</u>	<u>Model</u>
Temperature Transmitter	WRT10
<u>Wireless Communication</u>	
Wireless SensorB	-W1
<u>Sensor Type</u>	
RTD (Pt100, ASTM A, 4-Wire)	1
Thermocouple (Type J)	2
<u>Sensor Construction</u>	
Fixed 1/2 NPT	W
Spring-Loaded for Thermowell Insertion	S
<u>Sensor Insertion Length (a)</u>	
2.0 inches (50.8 mm)	020
2.5 inches (63.5 mm)	025
3.0 inches (76.2 mm)	030
3.5 inches (88.9 mm)	035
4.0 inches (101.6 mm)	040
4.5 inches (114.3 mm)	045
5.0 inches (127.0 mm)	050
5.5 inches (139.7 mm)	055
6.0 inches (152.4 mm)	060
6.5 inches (165.1 mm)	065
7.0 inches (177.8 mm)	070
7.5 inches (190.5 mm)	075
8.0 inches (203.2 mm)	080
8.5 inches (215.9 mm)	085
9.0 inches (228.6 mm)	090
9.5 inches (241.3 mm)	095
10.0 inches (254.0 mm)	100
10.5 inches (266.7 mm)	105

Table 8. Model Code RTD and Thermocouple Temperature End Nodes (WRT10) (Continued)

Description	Model
11.0 inches (279.4 mm)	110
11.5 inches (292.1 mm)	115
12.0 inches (304.8 mm)	120
12.5 inches (317.5 mm)	125
13.0 inches (330.2 mm)	130
13.5 inches (342.9 mm)	135
14.0 inches (355.6 mm)	140
14.5 inches (368.3 mm)	145
15.0 inches (381.0 mm)	150
15.5 inches (393.7 mm)	155
16.0 inches (406.4 mm)	160
16.5 inches (419.1 mm)	165
17.0 inches (431.8 mm)	170
17.5 inches (444.5 mm)	175
<u>Thermowell Attached to Sensor</u>	
No Thermowell	N
Threaded ¾ NPT	T
Socket Weld 1.05 inches	S
Weld In 1.5 inches	W
<u>Thermowell Insertion Length (a)</u>	
0.0 inches (0 mm)	000
2.0 inches (50.8 mm)	020
2.5 inches (63.5 mm)	025
3.0 inches (76.2 mm)	030
3.5 inches (88.9 mm)	035
4.0 inches (101.6 mm)	040
4.5 inches (114.3 mm)	045
5.0 inches (127.0 mm)	050
5.5 inches (139.7 mm)	055
6.0 inches (152.4 mm)	060
6.5 inches (165.1 mm)	065
7.0 inches (177.8 mm)	070
7.5 inches (190.5 mm)	075
8.0 inches (203.2 mm)	080
8.5 inches (215.9 mm)	085
9.0 inches (228.6 mm)	090
9.5 inches (241.3 mm)	095
10.0 inches (254.0 mm)	100
10.5 inches (266.7 mm)	105
11.0 inches (279.4 mm)	110
11.5 inches (292.1 mm)	115
12.0 inches (304.8 mm)	120
<u>Thermowell Lagging Length (a)</u>	
0.0 inches (0 mm)	000
2.0 inches (50.8 mm)	020
2.5 inches (63.5 mm)	025
3.0 inches (76.2 mm)	030
3.5 inches (88.9 mm)	035
4.0 inches (101.6 mm)	040

Table 8. Model Code RTD and Thermocouple Temperature End Nodes (WRT10) (Continued)

Description	Model
<p>Electrical Certifications (b) ATEX Intrinsically Safe Certified II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54 North America Intrinsically Safe Certified: Canada: Ex ia IIC T4 Ga Ex ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54 United States: Class I Zone 0 AEx ia IIC T4 Ga Zone 20 AEx ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54</p> <p>Optional Selections Wake Frequency Calculation (c)</p>	<p>EU</p> <p>CU</p> <p>-WF</p>
<p>Example: WRT10-W1S055T020020CU-WF</p>	

- a. The Sensor Insertion Length must equal Thermowell Insertion Length + Thermowell Lagging Length + 1.5 inches
- b. 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.
- c. Requires that you fill out a wake frequency data form; obtain this form by typing "wake frequency" in the search box at <http://www.schneider-electric.com/en/download/>

Table 9. Model Code - Absolute Pressure End Node (WAP10)

Description	Model
Absolute Pressure End Node	WAP10
Wireless Communication Wireless Sensor	-W1
Structure Code, Materials, and Type 316L ss Process Connection, 316L ss Diaphragm, Silicone Fill Fluid, Viton™ O-ring, 1/2 NPT External Thread Connection Type	22
Upper Range Limits 0.21 MPa, 30 psia, 2.1 bar or kg/cm ²	C
Electrical Certifications (a) North America Intrinsically Safe Certified: Canada: Ex ia IIC T4 Ga Ex ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54 United States: Class I Zone 0 AEx ia IIC T4 Ga Zone 20 AEx ia IIIC T135°C Da -40°C ≤ Ta ≤ +80°C, IP54	CU
Optional Selections None	-00
Example: WAP10-W122CCU	

- a. 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.

Table 10. Model Code - Gauge Pressure End Node (WGP10)

Description	Model
Gauge Pressure End Node	WGP10
<u>Wireless Communication</u>	
Wireless Sensor	-W1
<u>Structure Code, Materials, and Type</u>	
316L ss Process Connection, 316L ss Diaphragm, Silicone Fill Fluid, Viton™ O-ring, 1/2 NPT External Thread Connection Type	22
<u>Upper Range Limits</u>	
0.21 MPa, 30 psi, 2.1 bar or kg/cm ²	C
2.1 MPa, 300 psi, 21 bar or kg/cm ²	D
7 MPa, 1000 psi, 70 bar or kg/cm ²	E
<u>Electrical Certifications (a)</u>	
North America Intrinsically Safe Certified:	CU
Canada:	
Ex ia IIC T4 Ga	
Ex ia IIIC T135°C Da	
-40°C ≤ Ta ≤ +80°C, IP54	
United States:	
Class I Zone 0 AEx ia IIC T4 Ga	
Zone 20 AEx ia IIIC T135°C Da	
-40°C ≤ Ta ≤ +80°C, IP54	
<u>Optional Selections</u>	
None	-00
Example: WGP10-W122CCU	

- a. 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.

Table 11. Model Code - Differential Pressure End Node (WDP10)

<u>Description</u>	<u>Model</u>
Differential Pressure End Node	WDP10
<u>Wireless Communication</u>	
Wireless Sensor	-W1
<u>Structure Code, Materials, and Type</u>	
316L ss Process Connection, 316L ss Sensor, Silicone Fill Fluid	22
<u>Upper Range Limits</u>	
50 kPa, 200 inH ₂ O, 500 mbar	B
210 kPa, 30 psi, 2100 mbar	C
2.1 MPa, 300 psi, 21 bar	D
<u>Process Connector (a)</u>	
No Connectors, Both Covers Tapped For ¼ NPT	0
¼ NPT	1
½ NPT	2
<u>Electrical Certifications (b)</u>	
North America Intrinsically Safe Certified:	CU
Canada:	
Ex ia IIC T4 Ga	
Ex ia IIIC T135°C Da	
-40°C ≤ Ta ≤ +80°C, IP54	
United States:	
Class I Zone 0 AEx ia IIC T4 Ga	
Zone 20 AEx ia IIIC T135°C Da	
-40°C ≤ Ta ≤ +80°C, IP54	
<u>Optional Selections</u>	
Painted Steel Mounting Bracket With Plated Steel Bolts	-M1
316 ss Bracket with 316 ss Bolts	-M2
Example: WDP10-W122C0CU-M1	

- a. The material used for the process connector is the same material used for the process cover)
- b. 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.

ISSUE DATES

JUN 2019

Vertical lines to the right of text or illustrations indicate areas changed at last issue date.

Schneider Electric Systems USA, Inc. Global Customer Support
 38 Neponset Avenue Inside U.S.: 1-866-746-6477
 Foxboro, MA 02035 Outside U.S.: 1-508-549-2424
 United States of America <https://pasupport.schneider-electric.com>
<http://www.schneider-electric.com>

Copyright 2019 Schneider Electric Systems USA, Inc. All rights reserved.

The Schneider Electric brand and any trademarks of Schneider Electric SE or its subsidiaries are the property of Schneider Electric SE or its subsidiaries. All other trademarks are the property of their respective owners.

