

Essential Insight.mesh* Wireless System Product Datasheet

Bently Nevada* Asset Condition Monitoring



The wSIM device with Zone 0 Battery Module and Zone 0 External Power Module

Description

The Essential Insight.mesh* Wireless System is a wireless data acquisition platform that is fully integrated with System 1* classic software version 6.90 or later. The wSIM system requires the following components:

- A manager gateway
- Wireless sensor interface modules
- Repeaters

These components create a robust, auto forming mesh network. Each wSIM device has four channels. Each channel can be configured individually to support vibration and temperature measurements.

The wSIM devices support the Bently Nevada 200150, 200155 and 200157 accelerometers, as well as our 200125 K-Type, and standard J, T & E-Type thermocouple temperature sensors.

The main features of Essential Insight.mesh* Wireless System are:

- 200-meter maximum unobstructed range between wSIM devices operating in a mesh at 3m AGL heights¹
- Static data rate configurable from once-per-minute to once-per-day²
- Dynamic data resolution configurable up to 3200 lines
- Dynamic data frequency span configurable from 0-100 Hz up to 0-10000 Hz
- Static and dynamic Data-on-Demand
- Battery can be replaced in the field and is intrinsically safe.
- Starter and expansion kits are available with all necessary wireless components.



Essential Insight.mesh* Wireless System, version 2.200, is ISA100 Wireless complaint.

¹Site obstructions and low placements relative to above ground level, AGL, may dramatically impair actual operational distances.

²Once-per-minute data collection is limited to only one active channel. Once-per-minute data collection dramatically shortens the battery life and may not be possible at high or low temperature extremes.



The Essential Insight.mesh* Wireless System is compatible with the ISA100.11a protocol and System 1 integration. The ISA100 protocol is an open, industrial standard that provides interoperability with other ISA100 wireless devices.

The wSIM I/O and repeater devices have flexible power options that include the following:

- A replaceable, integrated Lithium thionyl chloride battery module
- An external power module with battery backup

The external power module eliminates the cost of replacement batteries and allows more frequent data collection for a variety of applications. The power options are flexible so that you can choose the best suitable deployment for your application.

Channel Types

The wireless sensor network supports the four most essential measurements required for condition-based monitoring of motor driven assets:

- Acceleration
- Velocity
- Enveloped Acceleration
- Temperature

Consistent Power and Reporting

While other self-powered wireless systems change their data collection intervals based on available power generated from the asset, the Essential Insight.mesh* Wireless System sends data at fixed collection intervals for true condition monitoring capability.

Data collection consistency is achieved by saving power during sleep cycles and using a combination of power generated from the energy harvester and the battery when activated during scheduled data collection periods. Therefore, your

sensor reports are consistent and reliable as required by a true condition monitoring system.

Starter and Expansion Packages

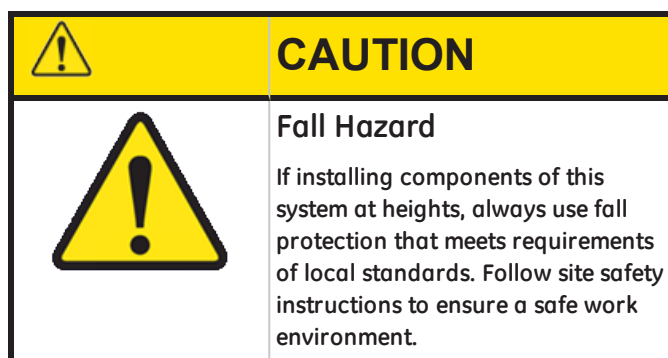
The starter and expansion packages simplify ordering and are cost effective. We have bundled Essential Insight.mesh* Wireless System into two value-priced packages. The starter package includes the following:

- A standalone gateway
- Four wSIMs
- System 1 classic software version 6.90 or later
- All accessories needed to get started with wireless monitoring

The expansion package includes additional wSIM devices and System 1 licenses so that you can grow your existing Essential Insight.mesh* Wireless System installation.

Applications

The Essential Insight.mesh* Wireless System is a comprehensive **Condition-Based Maintenance (CBM)** monitoring system designed for a variety of assets including motors, pumps, fans and compressors.



The Essential Insight.mesh* Wireless System is a scanning platform designed to provide condition monitoring where no monitoring or infrequent route-based monitoring is available. The measurements are not meant for machinery protection or use as a trip system. The measurements provide information on asset health and early warnings of mechanical fault conditions.

Most common bearing malfunctions initially cause small changes in machine vibration that may be insignificant compared to other sources of vibration such as gear-mesh, running speed, etc. To detect the early signs of a bearing fault, the sensor must be properly installed to receive bearing vibration as accurately as possible.

Improper installation can degrade the transducer's performance and generate signals that do not represent actual machine vibration. We can evaluate the housing measurements for the machine and assist you with the installation.

System Features

The Essential Insight.mesh* Wireless System offers the following features:

- Fully integrated with System 1 classic software version 6.90 or later
- Devices are ISA100.11a compatible and Zone 0 rated.
- Required range between devices are up to 200-meter clear line of site.
- Auto negotiating, self-forming, self-healing Mesh Network

ISA100 network supports gateways made by different vendors. We have tested NIVIS gateways extensively to ensure compatibility.

The system is fully compatible with the following NIVIS VR900 firmware:

- Version **2.7.22_vr900_isa** or later
- Version **2.7.42_vr900_isa** or later - This version is for large wSIM network implementation.

NOTE

Limited tests have been performed with Yokogawa and Honeywell gateways. We are still addressing known compatibility issues with each gateway.

Contact **GE Bently Nevada Technical Support** for the latest status of ISA100 gateway interoperability.

- The BN ISA100 gateway, Part Number 100M5186, supports up to 50 devices. Each gateway can support up to 200 sensors.

You may combine four additional gateways to increase overall asset visibility through the System 1 DAQ Enterprise.

- There are four input ports per wireless sensor device. You can configure each port for either vibration or temperature.
- Supports acceleration, velocity, acceleration enveloping, and temperature measurements
- Up to 5 manager gateways per System 1 DAQ
- Static and dynamic measurement and acquisition time schedules are configurable per channel.
- Dynamic data supports asynchronous waveforms and spectrums on vibration channels.
- Automatic self-checking and auto rerouting to optimize the following:
 - Network health
 - Battery life indicator
 - Transducer status
 - System status

- Zone 0 Battery Power Module provides up to 3 years of power with standard configurations.
- External Power Module supports line power and energy harvester extended power operations.
- IEEE 802.15.4 compliant radio used for wireless mesh communications
- Direct Sequence Spread Spectrum (DSSS) and frequency hopping operation for interference rejection
- Time Synchronized Mesh Protocol (TSMP) and AES 128 bit encryption used in conjunction with dynamically updated multiple encryption key scheme resulting in highly secure wireless communications

System Configuration Options

The following table lists the supported measurement types:



Measurement Type	Units (pk or RMS subunits)
Acceleration	g's or m/sec ²
Velocity	In/sec or mm/sec
Acceleration Enveloping	Env g's or Env m/sec ²
Temperature	°C or °F

The following table lists the supported transducer types:

Transducers	Measurement
200150 General Purpose (10 Hz – 1 kHz)	Acceleration & Velocity
200155 Low Frequency (1.5 Hz – 10 kHz)	Acceleration, Velocity & Enveloped Acceleration
200157 Enveloping (10 Hz – 10 kHz)	Acceleration, Velocity & Enveloped Acceleration
200125 K-type Thermocouple	Temperature
Standard K, J, T & E-Type thermocouples	Temperature

Environmental Limits


Operating Temperature	-30 to 65°C (-22 to 149°F) At extreme temperatures (<-20°C and >60°C), expect reduced battery life, longer scan intervals and reduced performance.
Maximum Storage Temperature	-40 to 85°C (-40 to 185°F)
Vibration	5 g's pk any axis
Operating and Storage Humidity	
Manager Gateway	95% RH Non-Condensing
wSIM I/O and repeater devices and sensors	100% RH, Condensing when installed in weatherproof housing with power applied 100% RH, Condensing when used with cable seals


	CAUTION
	Equipment Damage Unit could be damaged if the temperature is taken above the absolute maximum storage temperature specification.

Hazardous Area Approvals

For a detailed listing of country and product specific approvals, refer to the Approvals Quick Reference Guide (document **108M1756**) at www.GEmeasurement.com.

Zone certification applies only to wSIM I/O and repeater devices using the Zone 0 power modules, Part Number 185547-XX.

North America	
	
Rating	Class I, Zone 0, A/Ex ia IIC T4 @ -30 °C <Ta < 65 °C
Zone 0 for North America can be used in Class 1, Div1 & Div2 classified areas as specified in section 501.5 Zone Equipment of NFPA 70 (R), National Electric Code (R), 2008 Edition.	

ATEX/IECEX	
Rating	 II 1 G Ex ia IIC T4 Ga -30°C < Ta < 65°C

EMC Compliance

Europe	
Directive	2004/108/EC
Standards	EN 61000-6-2 Immunity for Industrial Environments EN 61000-6-4 Emissions for Industrial Environments
International	
Standards	IEC 61000-6-2 Immunity for Industrial Environments IEC 61000-6-4 Emissions for Industrial Environments

ISA100 Manager Gateway



FCC and IC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Specifications

All specifications are at +25 °C (+77 °F) unless specified otherwise.

Part Number	100M5186
Name	BN ISA100 Manager Gateway
Mesh Radios	Supports a maximum of 50 wireless devices in any combination of I/O or repeater devices

Input

Input Voltage	90 to 264 VAC
Input Power	10 watts maximum
Power Connector	Located on the back of the chassis

Output

ERP (output power without any antenna)	10.7 dBm
ERP (output power with included antenna)	12.7

Status LEDs

Power	Indicates manager gateway powered
Radio Network	Indicates RF radio operation

Antenna

Antenna Type	1/2 wave helictic base-wound monopole
Antenna Gain	2 dBi

Housing Material

Housing	Powder coated 5052-H32 Aluminum
19 inch rack-mount faceplate	14 gauge powder coated ROHS stainless steel

Optional Antennas

Part Number	1285519-01
Cable	75 ft (23 m)
Frequency	2400-2500 MHz
Gain	6 dBi Omni Directional
Cable Attenuation	6.8 dB at 2.5 GHz
Polarization	Vertical
Impedance	50 Ohm
Weight	0.24 lbs (0.1 kg)
Length	12 in (30 cm)
Base Diameter	1.27 in (3.22 cm)
Material	Fiberglass Radome
Radome Diameter	0.75 in (1.9 cm)
Wind Survival	>150 MPH
Operating Temperature	-40°C to 85°C (-40°F to 185°F)



Part Number	185519-02
Description	ATEX Zone 1 Antenna
Cable	25 m (82 ft) Cable
Frequency	2300 – 2500 MHz
Gain	5 dBi Omni Directional
Polarization	Vertical
Impedance	50 Ohm
Length	250 mm
Radome Diameter	0.75 in (1.9 cm)
IP Rating	IP66
Operating Temperature	-40°C to 60°C (-40°F to 140°F)
Certification	II 2 GD EEx e II T6
Certificate	Sira 06 ATEX 3198X

Part Number	185519-03
Description	FM-Approved Antenna
Cable	5 m (16 ft) Cable
Frequency	2300 – 2500 MHz
Gain	5 dBi Omni Directional
Polarization	Vertical
Impedance	50 Ohm
Length	205 mm
Radome Diameter	0.75 in (1.9 cm)
IP Rating	NEMA 4X
Operating Temperature	-40°C to 60°C (-40°F to 140°F)
Certification	Class I Div 1 Group ABCD Class II Div 1 Groups EFG T6
Certificate	3037549

Note: To reduce potential radio interference to other users, choose an antenna whose equivalent isotropically radiated power (e.i.r.p.) is not more than permitted for successful communication.

Communication

Interfaces	IEEE 802.15.4
Ethernet	10 Base T or 100 Base TX Ethernet, auto-negotiating
Ethernet Cable	Category 5, twisted pair
Ethernet Cable Length	Maximum 100 meters (328 feet)

	CAUTION
	<p>UNAUTHORIZED MODIFICATION</p> <p>Any changes or modifications not expressly approved by Bently Nevada, Inc. could void the equipment's certifications, FCC compliance and manufacturer warranty.</p>

Wireless Sensor Interface Module (wSIM)

Part Number	185410
Name	Wireless Sensor Interface Module
ERP	10.96 dBm

Storage and Transport

Operating Temperature	-30°C to +65°C (-22°F to 149°F)
Humidity	95% non-condensing
Vibration	5 g's pk any axis
Rating	IP67

Battery Pack

Screw Torque	10in-lbs
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Antenna

Antenna Type	¼ Wavelength Monopole
Antenna Gain	1.414 dBi

Materials

Housing	10% glass fiber Polycarbonate with TPE antenna enclosure and LED windows
Mounting base	304/304L Stainless Steel

Communication

Interfaces	IEEE 802.15.4
Infrared	9600 baud

Sensors

Sensor Input	Four sensor inputs per device Sampled sequentially
Supported Sensors	200150, 200155, & 200157 Accelerometers 200125 K-Type Thermocouple J, K, T & E - Type Thermocouples

A/D Resolution

Acceleration	16 bits (14 effective bits)
Temperature	24 bits (21 effective bits)

Scan Rates Per Channel

Static Data Rate	1 min to once per day Note: Increased data acquisition rates may dramatically lower battery life and reliability of data as the device requires recharge time. You can use an energy harvester to improve performance.
Dynamic Data Rate	Once per day to once per every 30 days
Data on Demand	Static and dynamic data

Temperature Channel

Full Scale Range	
J - Type	-209 °C (-344 °F) to 1199 °C (2190 °F)
K - Type	-199 °C (-326 °F) to 1369 °C (2496 °F)
E - Type	-199 °C (-326 °F) to 999 °C (1830 °F)
T - Type	-199 °C (-326 °F) to 399°C (750°F)
Other	
Accuracy	±5°C from ideal input

Direct Filter

Non Integrated	
4-pole High-pass	1.5 Hz to 10 kHz
4-pole Low-pass	15 Hz to 10 kHz
Direct A and Direct B	
4-pole High-pass	1.5 Hz to 10 kHz
4-pole Low-pass	15 Hz to 10 kHz
Direct C	
4-pole High-pass	1.5 Hz to 10 kHz
2-pole Low-pass	15 Hz to 10 kHz
Direct D	
2-pole High-pass	1.5 Hz to 10 kHz
2-pole Low-pass	15 Hz to 10 kHz
Integrated	
4-pole High-pass	10Hz to 10 kHz
4-pole Low-pass	100 Hz to 10 kHz

Asynchronous Waveforms (Software Configurable)

Spectral Lines	100 200 (200 Hz span or greater) 400 (400 Hz span or greater) 800 (1000 Hz span or greater) 1600 (2000 Hz span or greater) 3200 (5000 Hz span or greater)
Frequency Spans	100 Hz 200 Hz 500 Hz 1000 Hz 2000 Hz 5000 Hz 10000 Hz
Sample Rates	256 Hz 512 Hz 1280 Hz 2560 Hz 5120 Hz 12800 Hz 25600 Hz 51200 Hz

Enveloping Filter

4-pole High-pass	1.5 Hz to 10 kHz
2-pole Low-pass	15 Hz to 10 kHz

Enveloped Waveforms (Software Configurable)

Spectral Lines	100 200 400 (200 Hz span or greater) 800 (500 Hz span or greater) 1600 (500 Hz span or greater) 3200 (1000 Hz span or greater)
Frequency Spans	100 Hz 200 Hz 500 Hz 1000 Hz 2000 Hz 5000 Hz 10000 Hz
Sample Rates	256 Hz 512 Hz 1280 Hz 2560 Hz 5120 Hz 12800 Hz 25600 Hz

Miscellaneous Specifications

Short Circuit Current Limit	20 mA maximum
Hardware Frequency Response (3 dB Corners)	1/3 Hz to 20 kHz Refer to transducer specifications for more information

Repeaters

Repeaters have the same specifications as the wSIM I/O devices. However, repeaters do not contain and support four transducer input channels.

Part Number	185450
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Zone 0 Power Modules

The Zone 0 Power Module is offered with two configuration options:

- The Zone 0 Battery Power Module, Part Number 185547-01, is a three-cell, integrated battery module for standalone operation of wSIM and Repeater devices.
- The Zone 0 External Power Module, Part Number 185547-02, offers an external connection for energy harvesting applications or other external power sources while providing integrated battery backup.

Part Number	185547-XX
Nominal Voltage	3.6 Volts
Nominal Capacity	
185547-01	25.5 Ah
185547-02	17.0 Ah
Input Voltage	
185547-02 Only	5Vdc ±0.5V

Thermal Energy Harvester

The thermal energy harvester is a renewable energy device that provides auxiliary power to our wireless sensors. The optional thermal energy harvester is powered from existing temperature differences on surfaces of equipment such as pipes, pumps, fans and motors.

The thermal energy harvester stores and regulates renewable energy. It delivers regulated voltage to power a wSIM I/O or repeater mote.

The Thermal energy harvester is an ultra long-life, self-charging system that minimizes battery replacement. You can collect more data at more frequent intervals using the thermal energy harvester.

To install the thermal energy harvester, place it on a surface at least 25°C above ambient and connect it to wSIM using a cable. The standard magnetic mounting requires no specialized tools.



Contact [Perpetua Customer Service](#) for technical support.

Thermal Energy Harvester	
Part Number	102M7936-01
Cables	
Part Number	185546-01
Description	10m (32 ft) Thermal Energy Harvester Cable Kit Unterminated cable and field installable external power module connector
Part Number	185549-01
Description	10m (32 ft) wSIM external power module cable Field trimmable

External Power Module for Safe Areas

The External Power Module for Safe Areas accepts power from external sources while maintaining battery backup. The module uses three user-replaceable, AA alkaline cells.

Part Number	185548-01
Input Voltage	5Vdc ±0.5V
Supply Current	0.5 mA typical, 10 mA peak

	WARNING
	<p>SAFE AREA USE ONLY</p> <p>The External Power Module for Safe Areas, Part Number 185548-01, is not certified for use in hazardous areas. The module is designed for use in safe areas only.</p> <p>All wSIM I/O or repeater devices used with the External Power Module for Safe Areas shall be deployed in safe areas and are not certified for use in hazardous areas.</p>

RF Operation and Certifications

RF Operation

RF Operation	
Band	Global 2.4 GHz license-free band suitable for use in North America, Europe and most of Asia with 15 channels nominally sized at 5MHz @ 250 kbps
Range	200 m

Note: 2.4000 – 2.4835 GHz range is supported. Range is adjusted to comply with local country certification requirements.

Actual ranges vary depending on site specific topology, environmental conditions and network device placement.

RF Certifications

FCC and IC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

United States



FCC	XFU-18531002 XFU-18541001 XFU-18551001 SQB-VN3104034R45
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Federal Communications Commission Documents

wSIM device and Repeater	FCC CFR47 Part 15B
BN ISA100 Gateway	FCC Part 15 section 247

Canada

ICC	8349A-18531002 8349A-18541001 8349A-18551001 6546A-VN3104034R5
Standard	RSS-210

Europe	CE
Directive	RTT&E 1999/5/EC
European Telecommunications Standards Institute (ETSI)	ETSI EN 300 328 ETSI EN 301 489-17

Ordering Information

For a detailed listing of country and product specific approvals, refer to the Approvals Quick Reference Guide (document **108M1756**) at www.GEmeasurement.com.

wSIM Packages

These packages are not configurable. Purchase separate cables if you need different lengths.

Indoor Starter Package

Part Number	100M3472-01
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This package includes Part Number 100M5186 with the following items:

- Four wSIM devices
Part Number 185410
 - One Repeater
Part Number 185450
 - Zone 0 battery bases
Part Number 185547-01 and 02
 - Four Unistrut mounting kits
 - One magnetic mounting kit
Part Number 185585-05
 - Sixteen high frequency accelerometers
Part Number 200157
 - Eight 4-meter accelerometer cables
Part Number 185555-04
 - Eight 6-meter accelerometer cables
Part Number 185555-06
 - Sixteen accelerometer epoxy mounting kits
Part Number 139153-01
 - System 1 software version 6.90 or later
 - System 1 licenses
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Outdoor Starter Package

Part Number	100M3472-03
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This package includes the same items as Part Number 100M3472-01 except:

- The gateway is replaced by the 100M2808 outdoor NEMA 4X gateway.
- The antenna extension is removed.
- The accelerometer cables are replaced by armored cables of the same length.

Note: Gateway is for use in safe areas only.

wSIM Expansion Packages

These packages are not configurable. Purchase separate cables if you need different lengths.

Basic Expansion Package

Part Number	100M3472-02
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Package includes:

- Four wSIM devices
Part Number 185410
 - Zone 0 battery bases
Part Number 185547-01 and 02
 - Four Unistrut mounting kits
 - Sixteen high frequency accelerometers
Part Number 200157
 - Eight four-meter accelerometer cables
Part Number 185555-04
 - Eight six-meter accelerometer cables
Part Number 185555-06
 - Sixteen accelerometer epoxy mounting kits
Part Number 139153-01
 - Sixteen System 1 dynamic point licenses
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Outdoor Expansion Package

Part Number	100M3472-04
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This package includes the same items as Part Number 100M3472-02 except all accelerometer cables are armored.

Standalone Manager Gateways

Nivis VR900, NEMA 4X Enclosure

Part Number	100M2808
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Note: For use in safe areas only!

Optional Antenna for BN Manager Gateways

Part Number	Description
185519-01	<ul style="list-style-type: none"> ■ Optional 6 dBi Antenna ■ 75 ft (22.9 m) 50 ohm Cable ■ Surge Protector ■ Cable Adapter ■ Mounting Hardware
185519-02	<ul style="list-style-type: none"> ■ Optional ATEX Zone 1 antenna ■ 25 m (82 ft) cable ■ Surge Protector ■ Cable Adapter ■ Mounting Hardware
185519-03	<ul style="list-style-type: none"> ■ Optional FM antenna ■ 5 m (16 ft) cable ■ Surge Protector ■ Cable Adapter ■ Mounting Hardware

wSIM I/O and Repeater devices

Part Number	Description
185410	Essential Insight.mesh ISA100 wSIM
185450	Essential Insight.mesh ISA100 Repeater

Zone 0 Power Modules

Part Number	185547-AA
Description	Zone 0 Power Module

AA Configuration Option

01	Zone 0 Battery Power Module
02	Zone 0 External Power Module

Note: The Zone 0 Power Module is certified for use in hazardous areas. See "Hazardous Area Approvals" on page 5.

Part Number	185548-01
Description	External Power Module for Safe Areas
Battery	Alkaline battery power module with external power connector
Required Cable	185546-01 or 185549-01

Note: The External Power Module for Safe Areas, Part Number 185548-01, is not for use in hazardous areas.

wSIM Mounting Kit and Hardware

Mounting kits include a hex base and all hardware required to mount the device.

Part Number	185585-AA
AA Configuration Option	
01	½-20 direct bolt mount
02	M12 direct bolt mount
03	Direct mount for strut channel
04	Angle mount for strut channel
05	Magnetic mount
06	Magnetic mount with angle bracket

Thermal Energy Harvesters

Bently Part

Part Number	102M7936-01
Description	Misc Perpetua Thermal Energy Harvester

Perpetua Power Part

Part Number	00324-01
Description	Boxed Level Product Model 5V-OL Power Puck 60 Energy Harvester (Ordinary Location)

Cables

Part Number	Description
185549-01	10 m (32-ft) wSIM External power module cable (field trimmable)
200152-15	15M (49-Ft) Accelerometer Field Trimmable Cable. This item must be used with Part Number 162438-01 field connector kit.
200152-25	25M (82-Ft) Accelerometer Field Trimmable Cable. This item must be used with Part Number 162438-01 field connector kit.
289304	USB to Serial Infrared Converter
284988	Cat5 3M (10-Ft) Cross-over cable
287362	Spare part for External Power Module cable connector

Part Number	185555-AA-BB
Description	wSIM Accelerometer Cable
AA Length Option	
02	2M (6-ft) Length
04	4M (13-ft) Length
06	6M (20-ft) Length
10	10M (33-ft) Length
15	15M (49-ft) Length
25	25M (82-ft) Length
BB Armor Option	
00	No Armor
01	Stainless Steel Braided Armor

Accelerometer Mounting Hardware

Part Number	Description
139153-01	Accelerometer Epoxy Mounting Kit. Mag Force Kit can be ordered with 20015x transducers.
02200371	Accelerometer Magnetic Mount This part is for temporary accelerometer mounting and requires mounting stud, Part Number 89139-01.
89139-01	3/8-24 to 1/4-28 mounting stud

Note: See 20015x Accelerometer data sheet for additional accelerometer mounting options.

Transducers

Part Number	Description
200150	General Purpose Accelerometer
200155	Low Frequency Accelerometer
200157	High Frequency Accelerometer
200125	K-Type Thermocouple This item must be field terminated with Part Number 162438-01 connector kit.
162438-01	Temperature Connector Kit

Power Supply

Part Number	Description
287202	+5Vdc wSIM / Repeater Power Supply
02200794	+24Vdc Manager Gateway Power Supply
162003	Power Supply Wiring Harness
00580441	Rack Mount Manager Gateway Power Connector

SW Package & Licenses

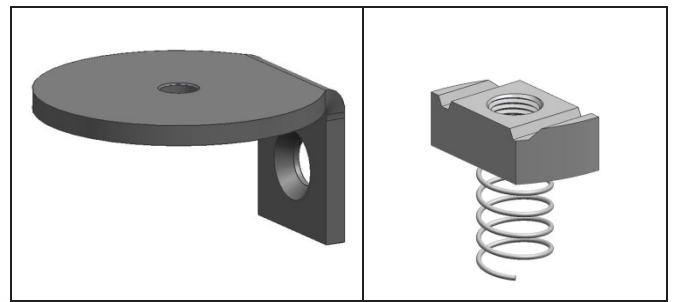
Part Number	Description
3060/15 -Mxxxx-Nxxxx	System 1 Essential Insight point licenses via 3060/00 System 1 catalog number
3060/10	System 1 Essential Insight/Trendmaster Application Package via 3060/00 System 1 catalog number
3060/18 - 01	Essential Insight.mesh Manager Gateway License

Accessories and Tools

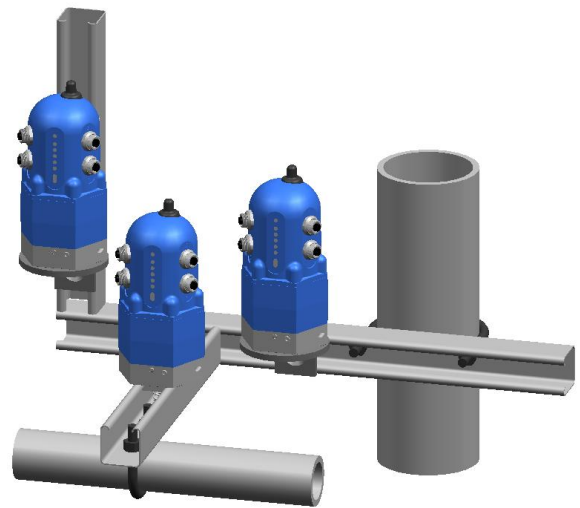
Part Number	Description
185305	Mag Wand (magnetic switch activator)
285243	7/64" T-Handle Hex Key for Battery Screws
289961	5/16" L-Handle Hex Key
04500022	DOW Conring #4 This part is used to insulate the connector at wSIM I/O or repeater end of accelerometer cable.
03839240	Line Cable Seal. 5.1 mm to 6.7 mm This part is used to seal the connector at transducer end.

Drawings and Documents

Part Number	Description
185302-01	Installation and Operation Manual
185303-01	BN Network Protocol Quick Start Card
164985-01	20015x Accelerometer Installation Guide
163857	Wireless Ethernet Application Note



Mounting Bracket and Retaining Nut for Unistrut Channel



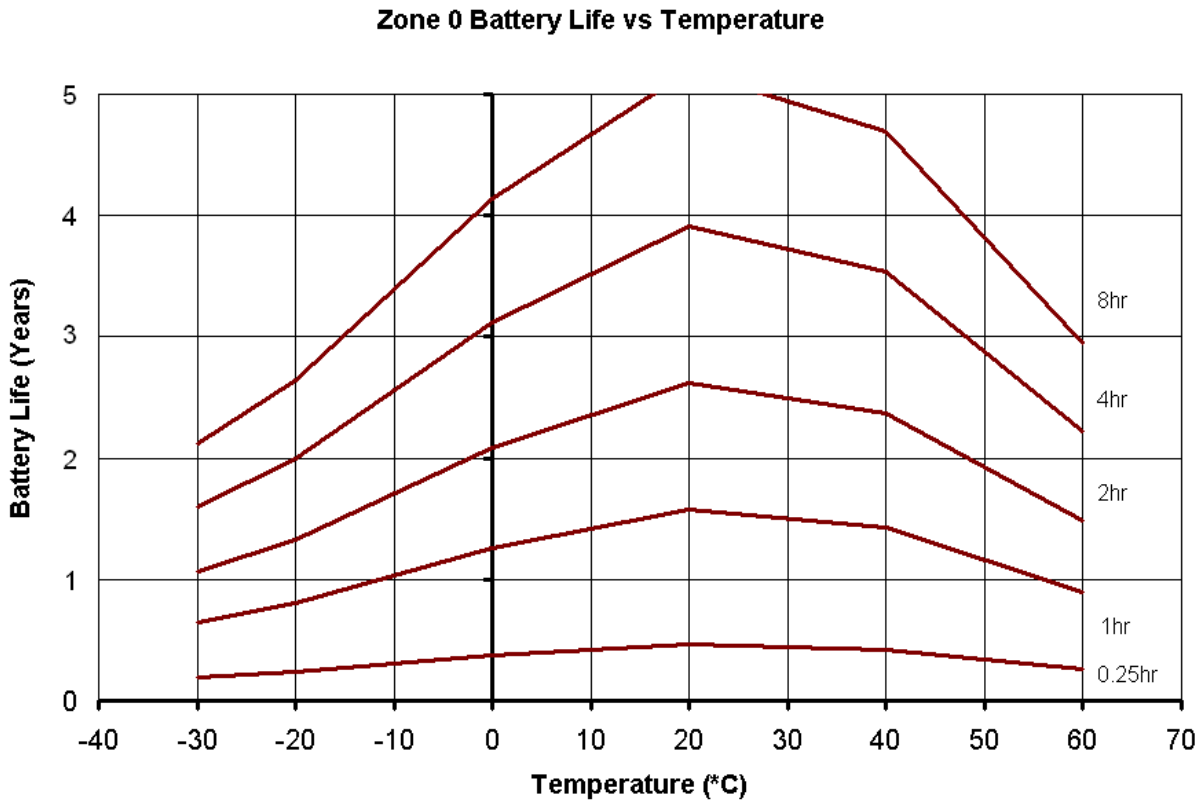
Mounting Example Using Unistrut Channel

Graphs and Figures

These graphs represent a standard installation configuration for an I/O device whose repeater functionality is disabled. The following factors dramatically impact battery life:

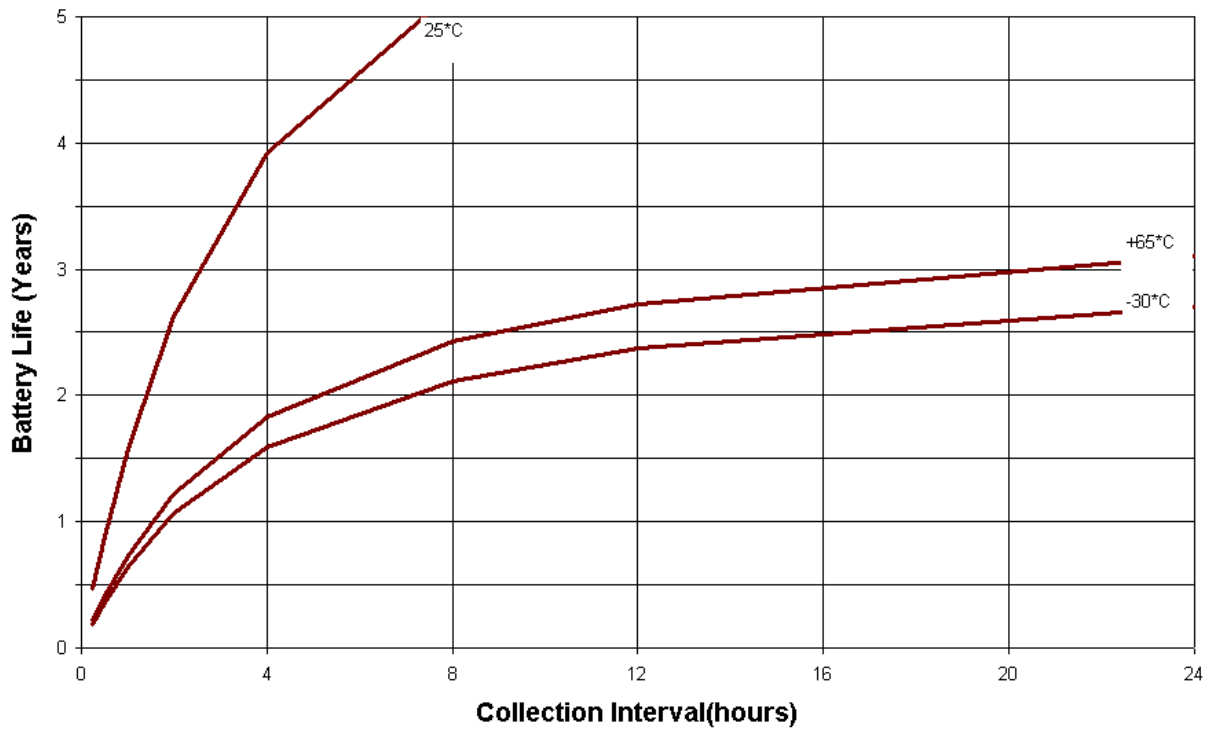
- Mesh and relay topology load
- Physical placement of devices within obstructed industrial sites

All dimensions are in inches followed by millimetres in brackets: **inches [millimetres]**



Graph 1 - Interval Curves (Battery Life vs. Temperature)

Zone 0 Battery Life vs Collection Interval(Typical Config)



Graph 2 - Temperature Curves for a Typical Configuration (Battery Life vs. Collection Interval)

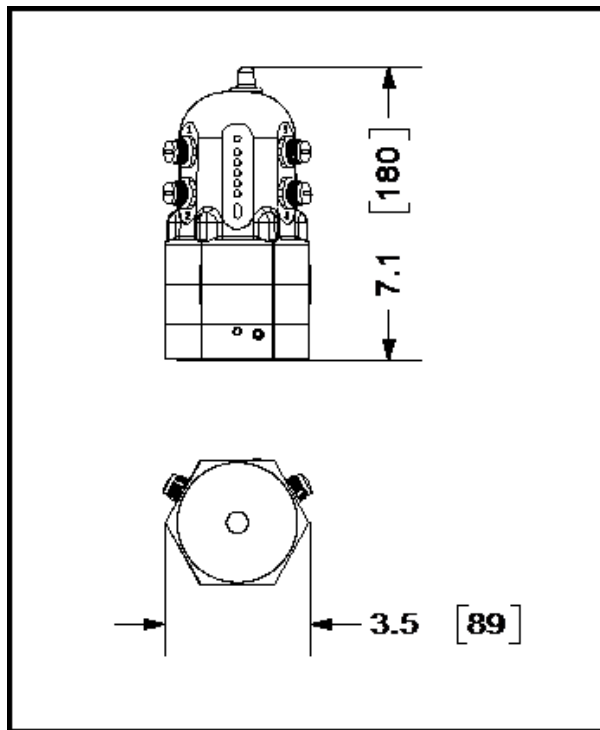


Figure 1 – wSIM Device with Battery Power Module and Hex Base

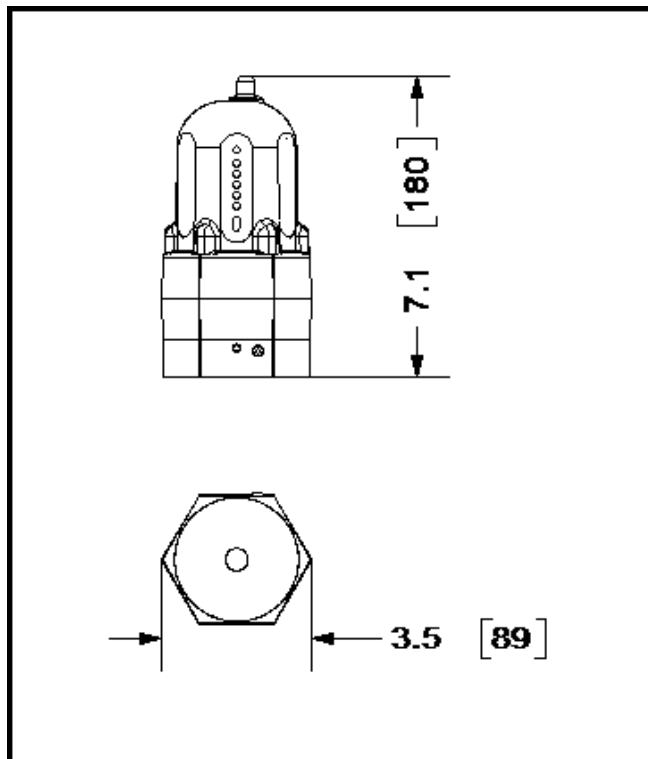


Figure 2 – Repeater with Battery Power Module and Hex Base

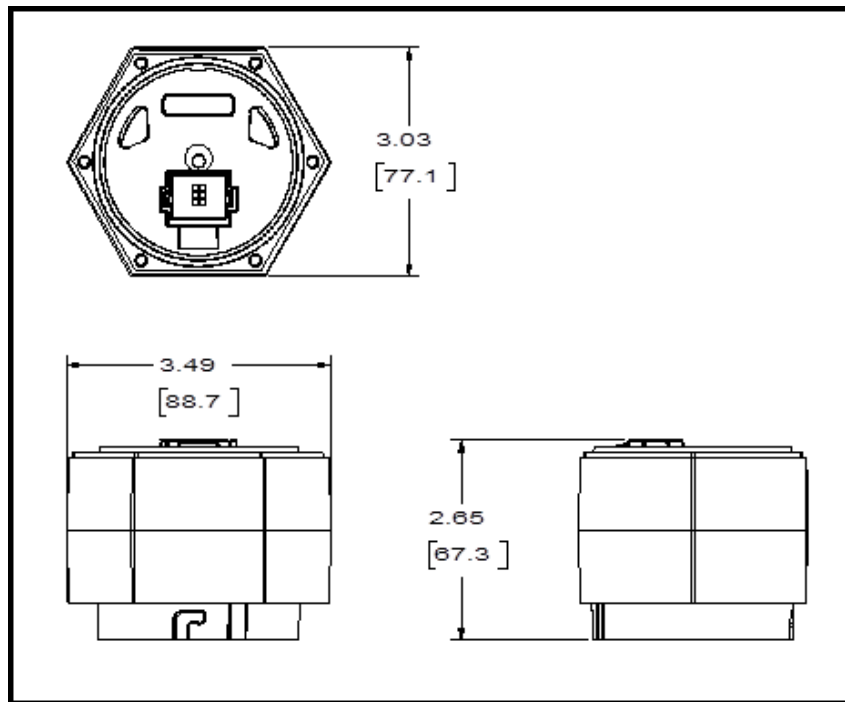


Figure 3 – Zone 0 Battery Power Module 185547-01

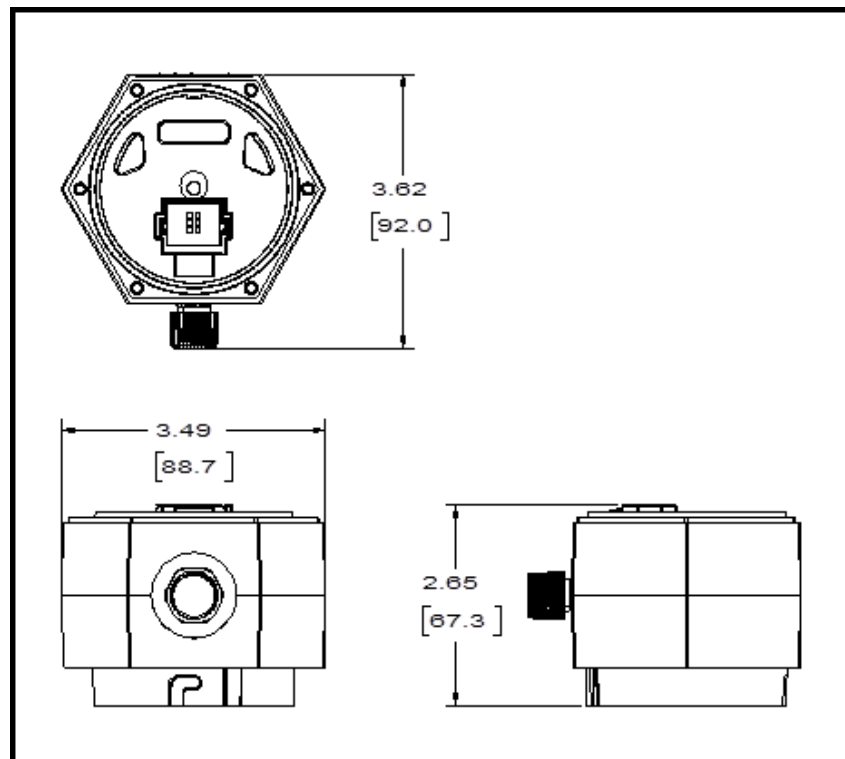


Figure 4 – Zone 0 External Power Module 185547-02
 External Power Module for Safe Areas, 185548-01, shares identical exterior dimensions

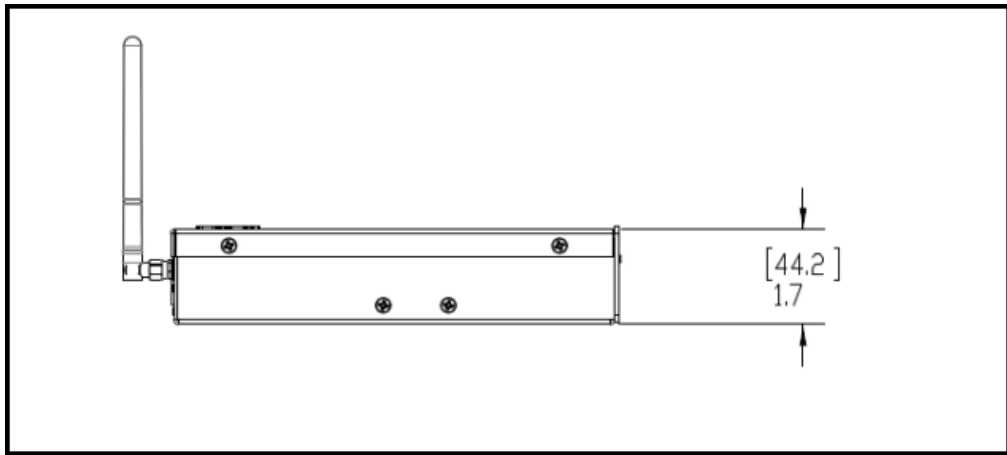
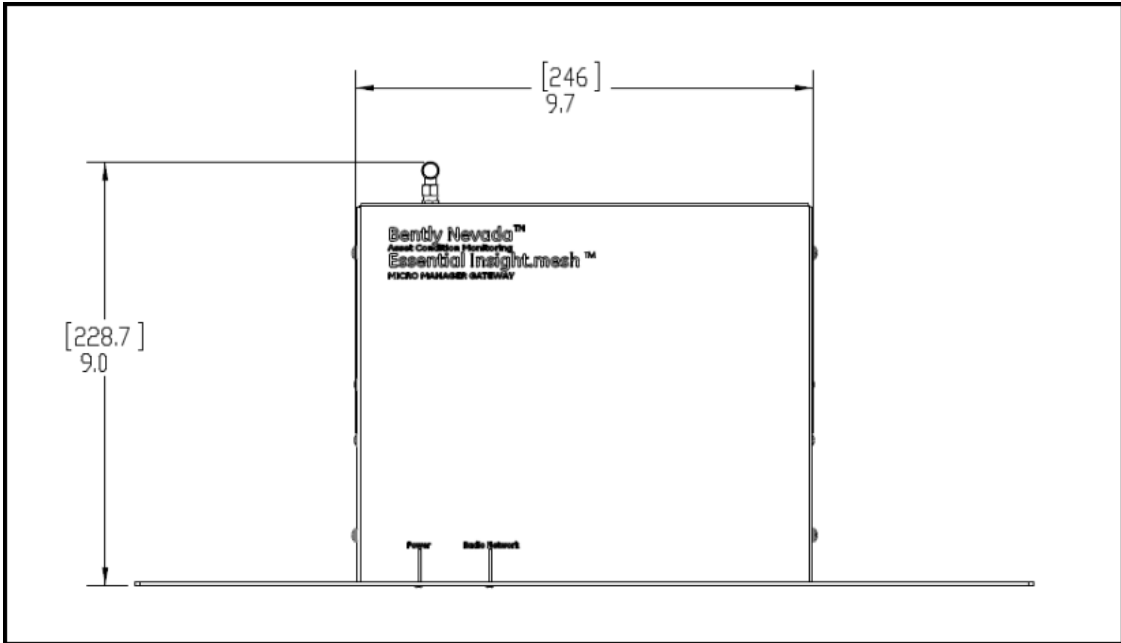
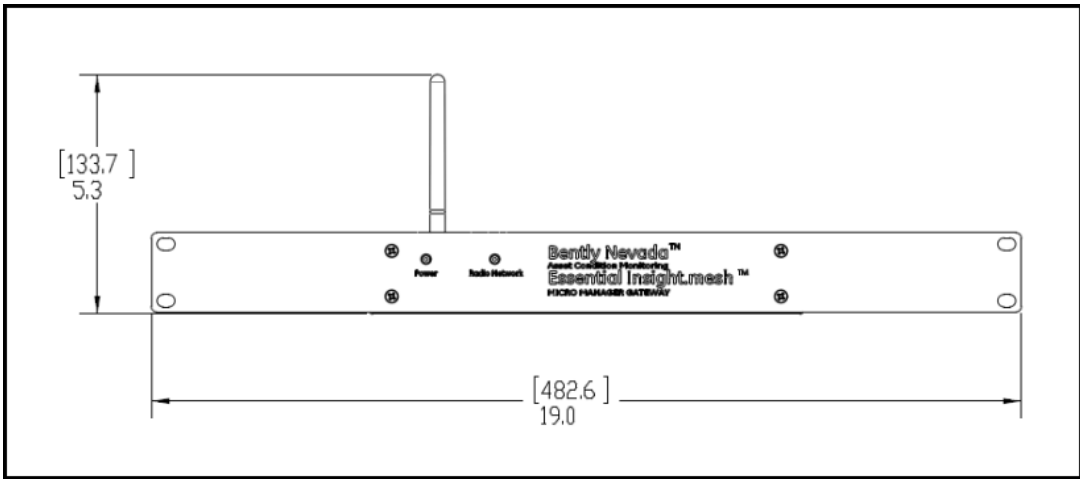


Figure 5– Three Views of the 19" Rack Mount Manager Gateway

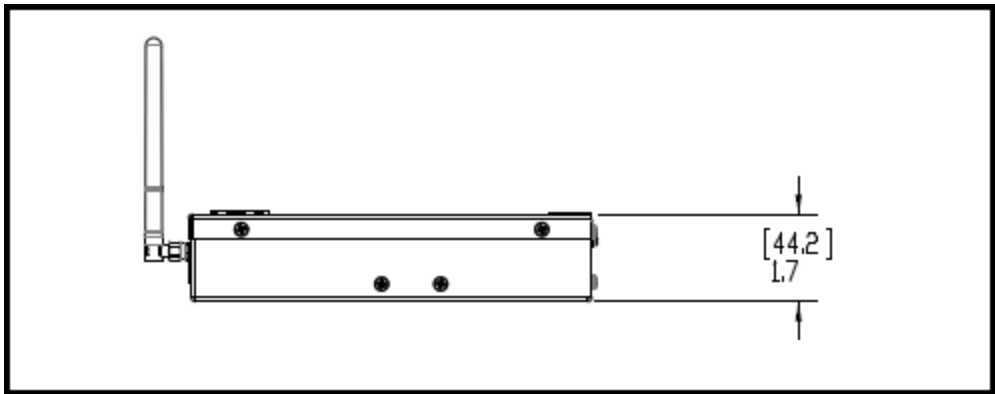
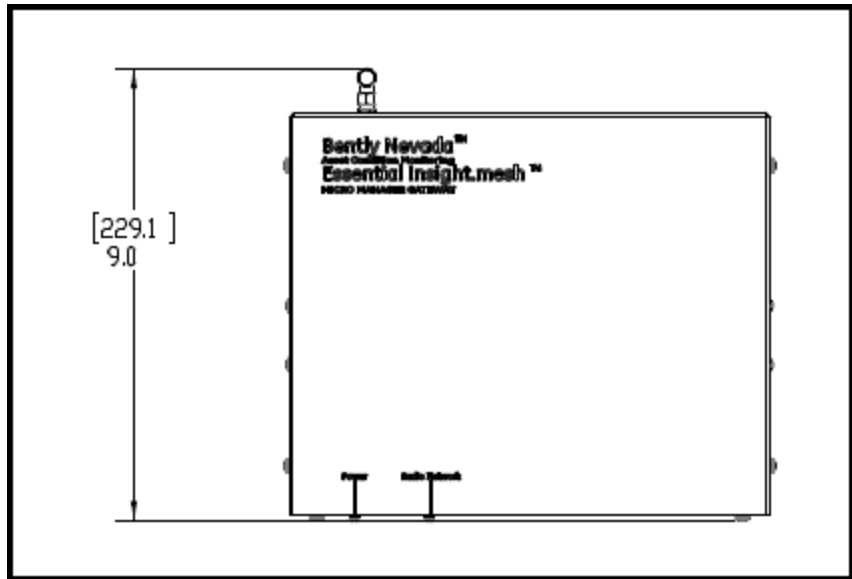
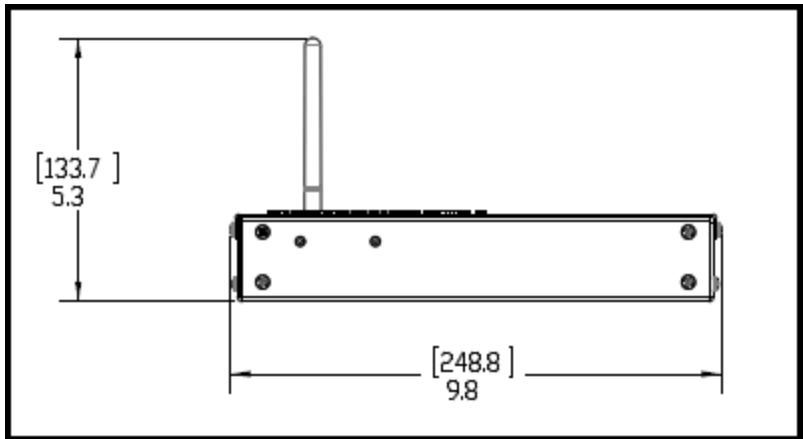


Figure 6 – Three Views of the Desktop Manager Gateway

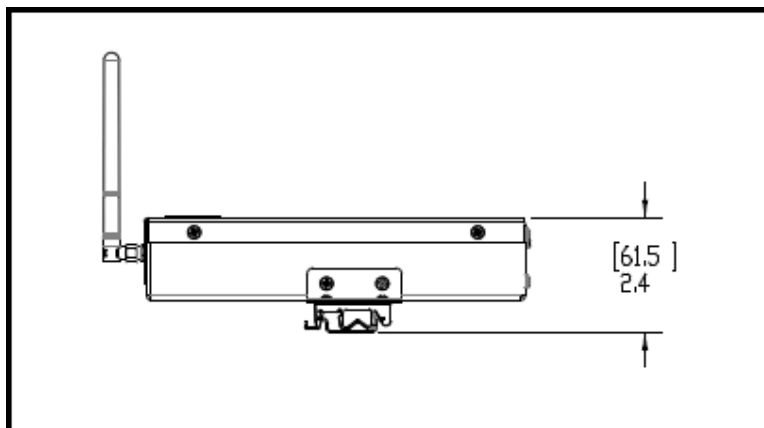
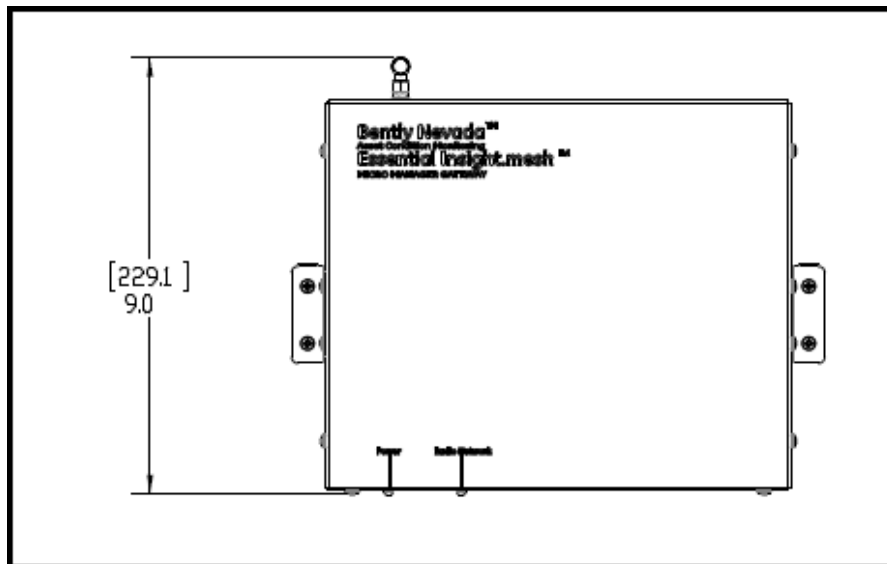
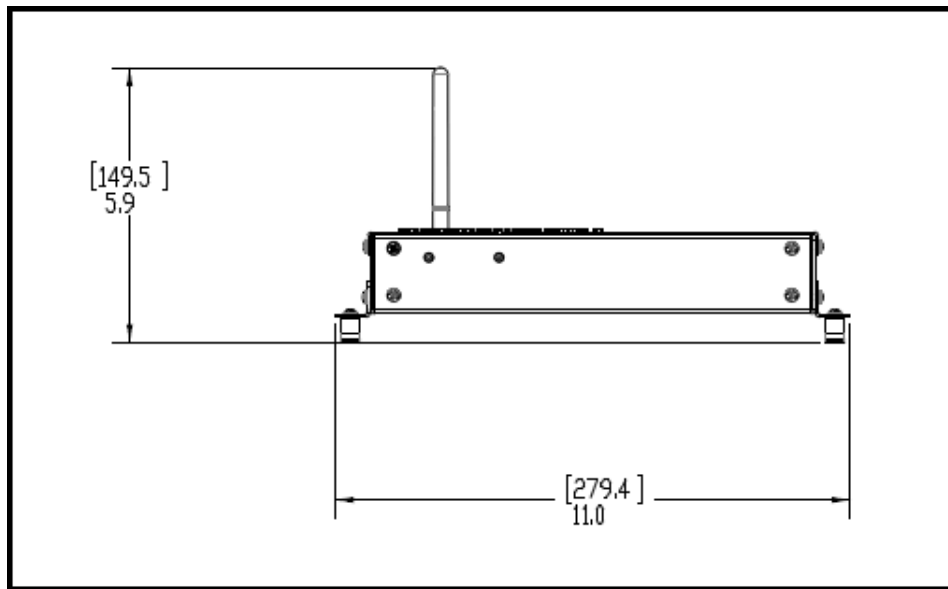


Figure 7 – Three Views of the DIN Rail Mount Manager Gateway

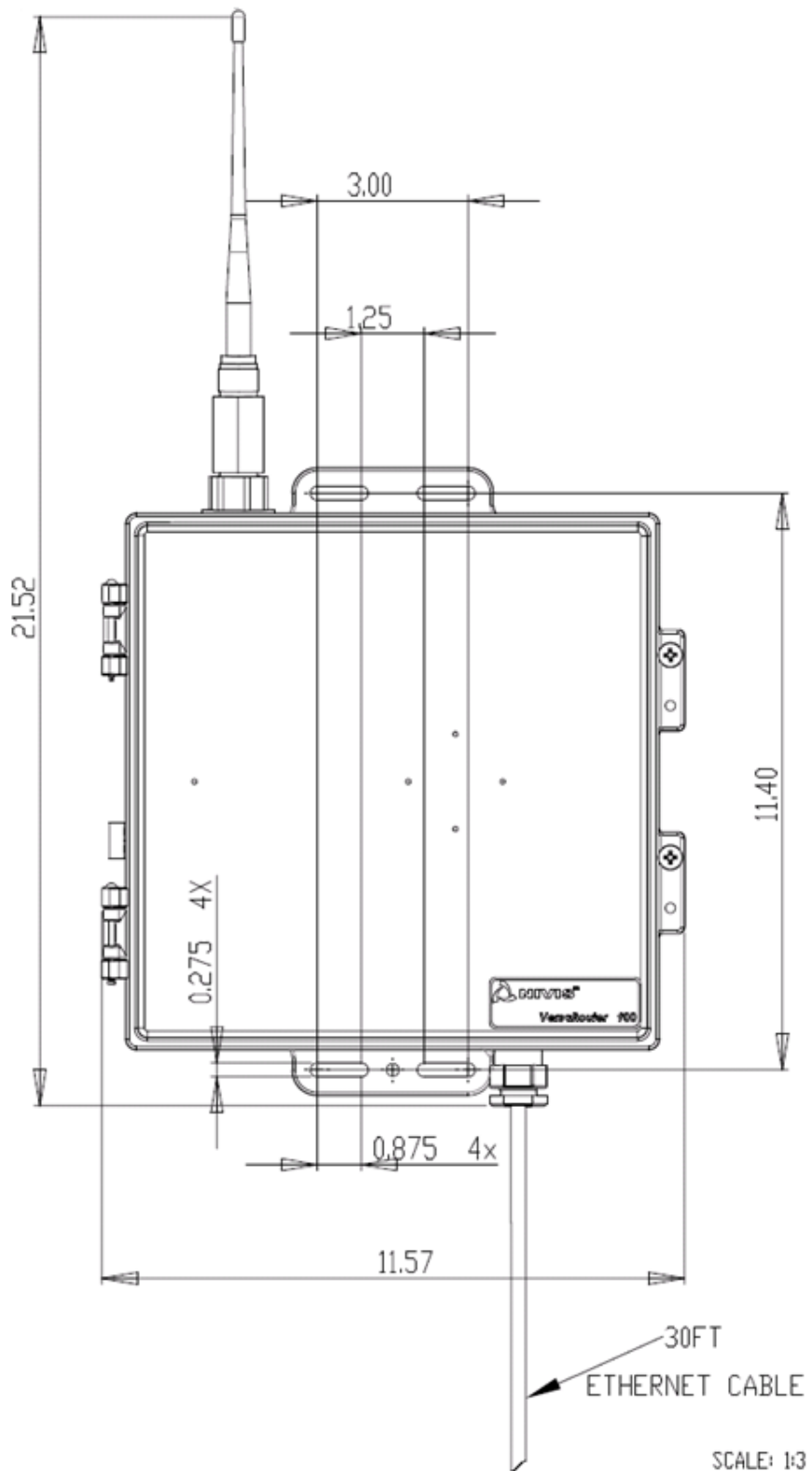


Figure 8a - Nivis VR900 NEMA 4X Gateway

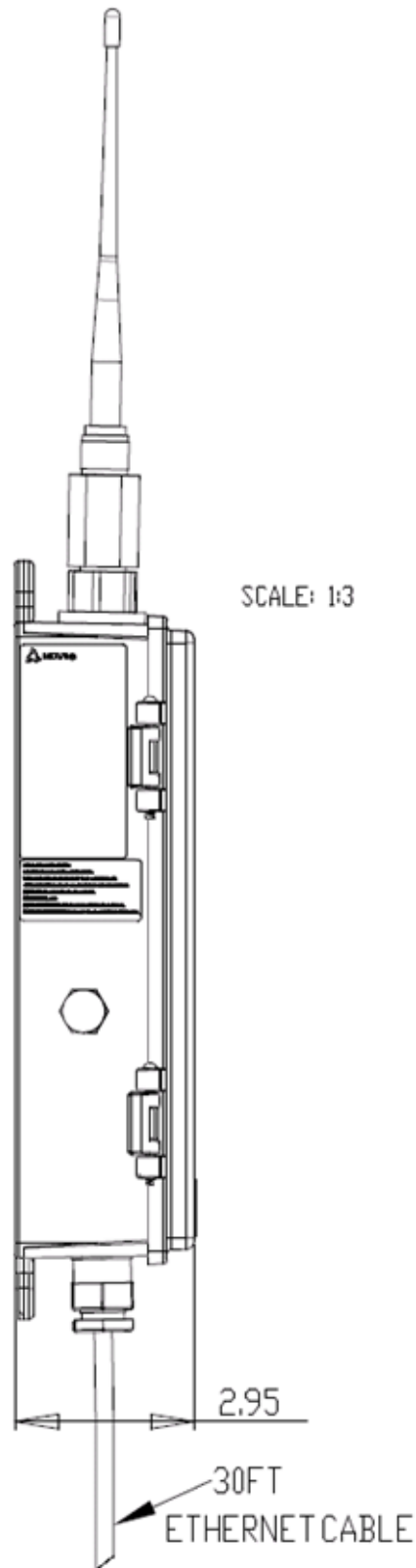


Figure 8b - Nivis VR900 NEMA 4X Gateway

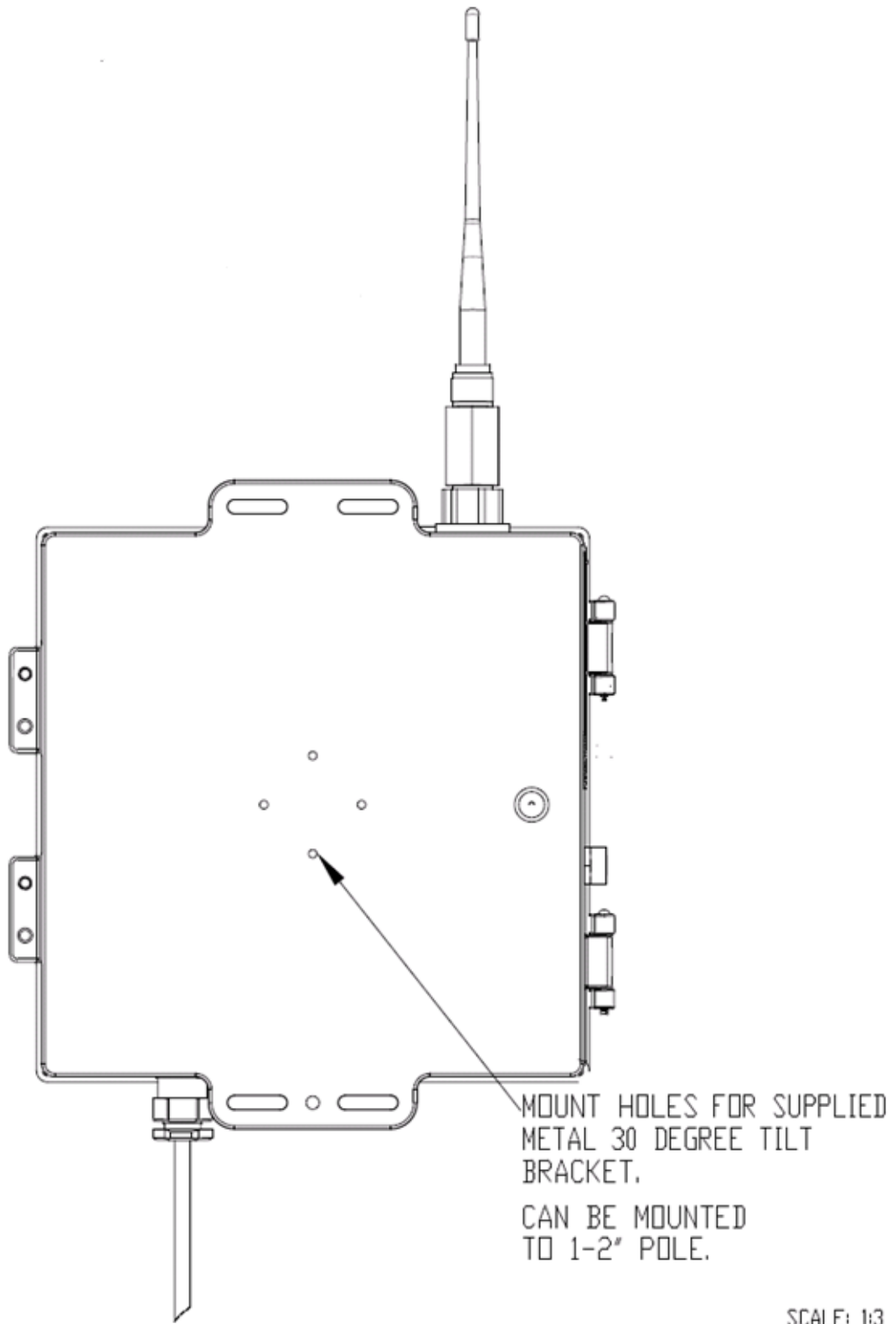


Figure 8c - Nivis VR900 NEMA 4X Gateway

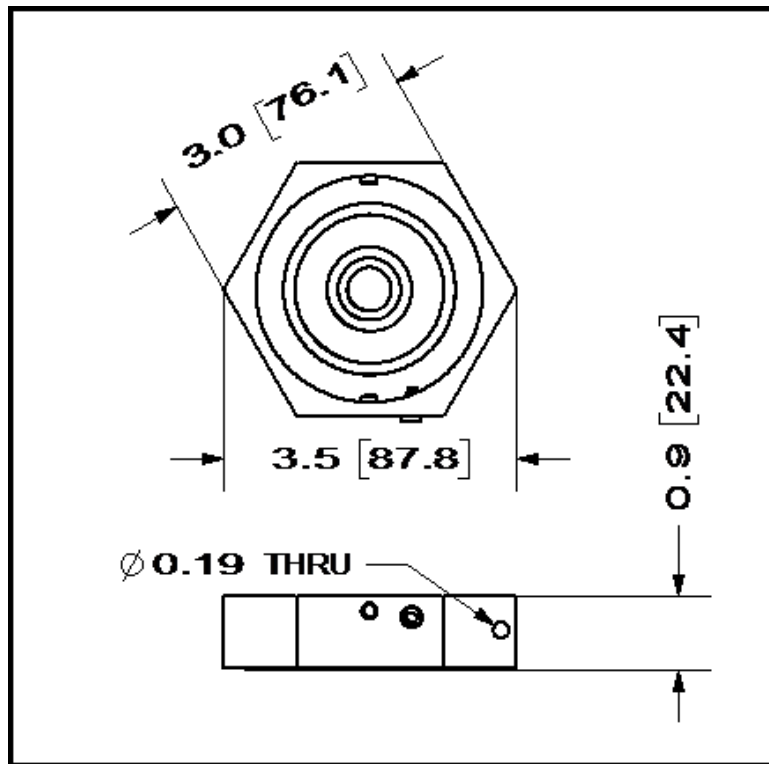


Figure 9 - Hex Base (Stainless Steel)

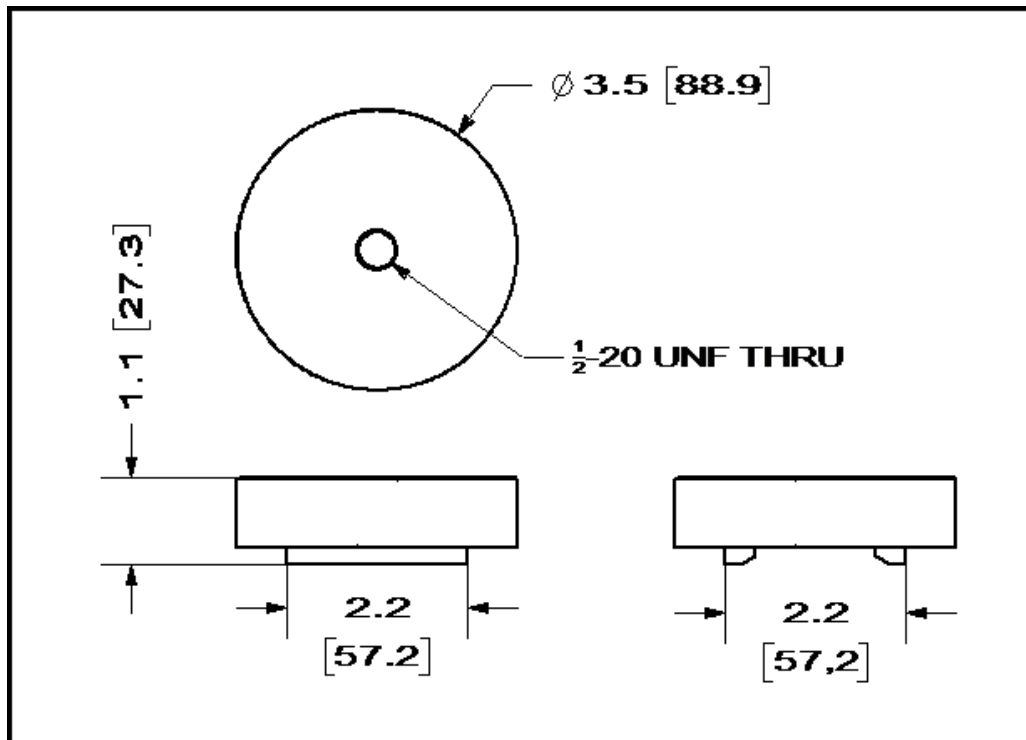


Figure 10 - Magnet Mount

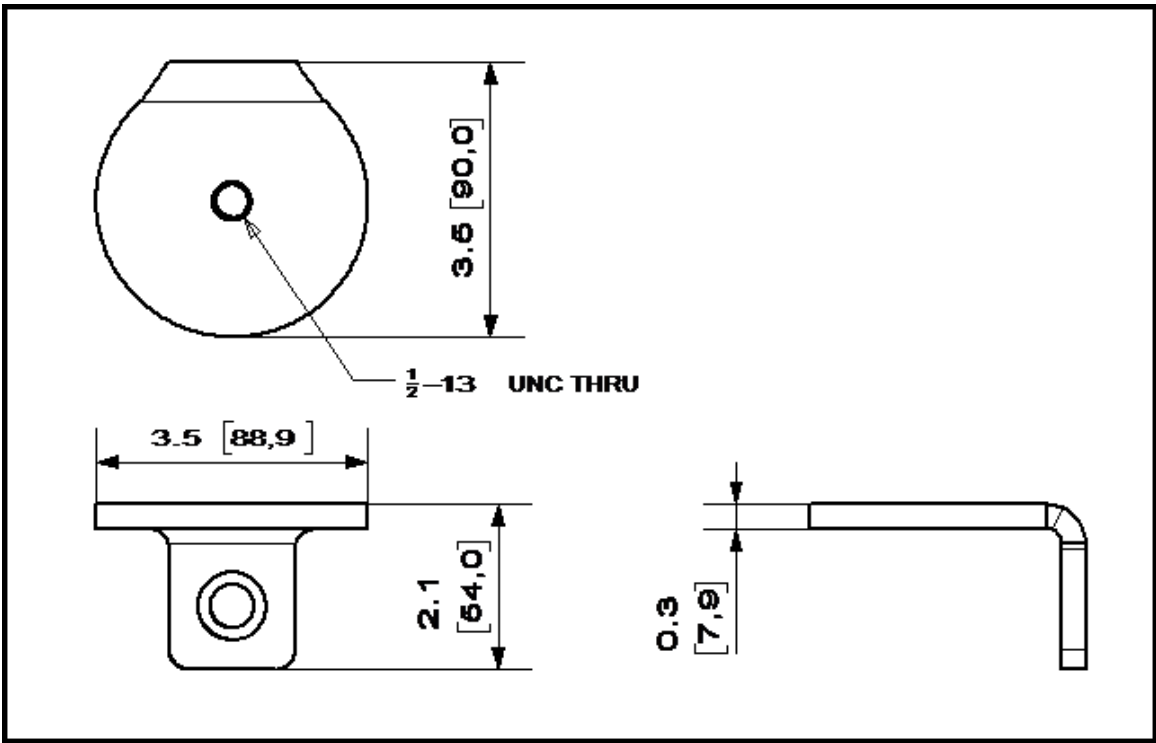


Figure 11 – Right Angle Mounting Bracket for Unistrut Channel

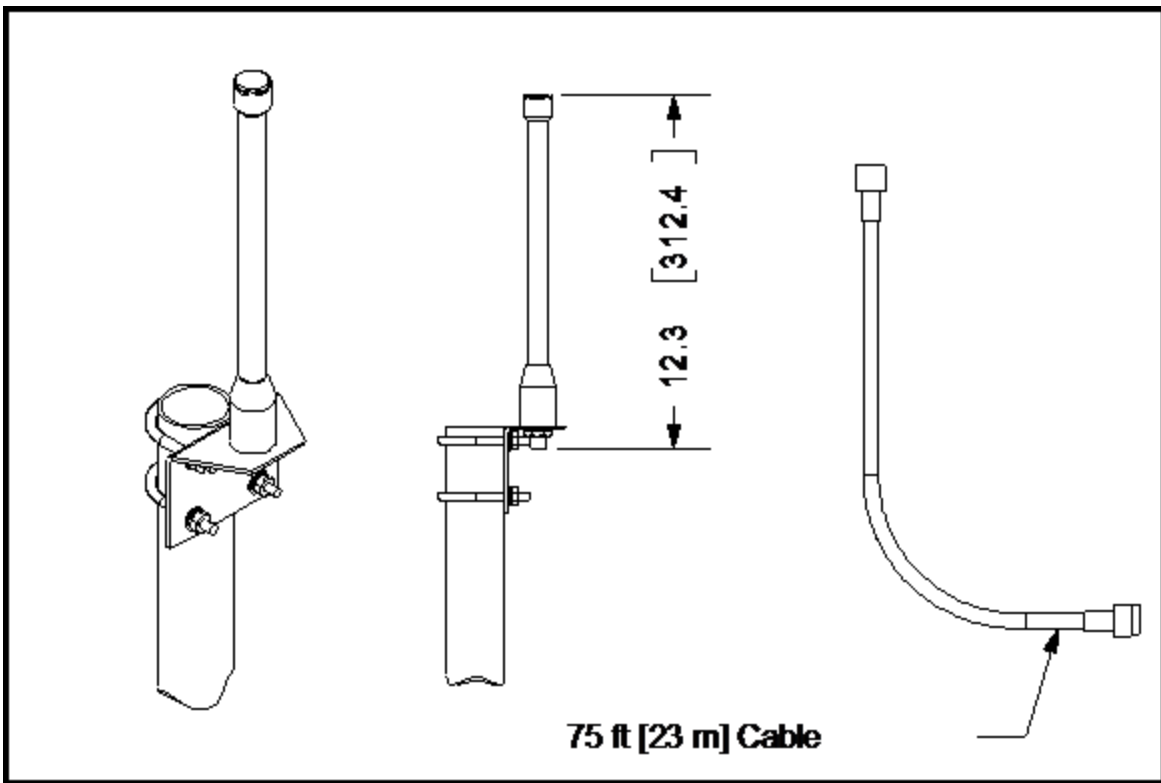


Figure 12 - Optional Antenna and Cable 185519-01

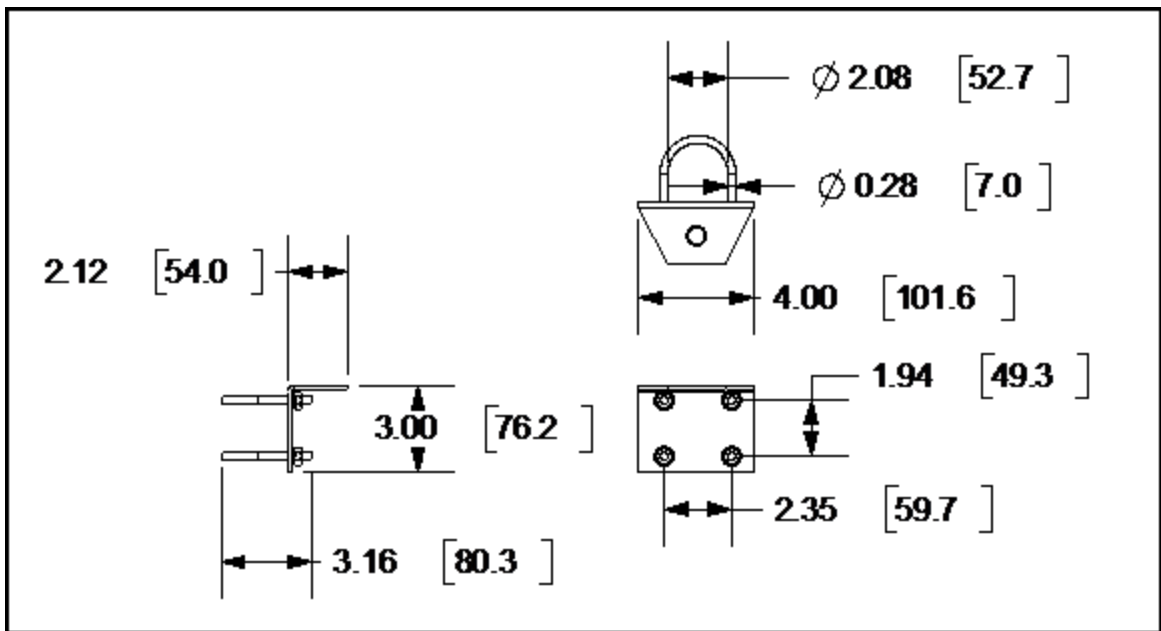


Figure 13 - Optional Antenna and Cable Mounting Hardware 185519-01

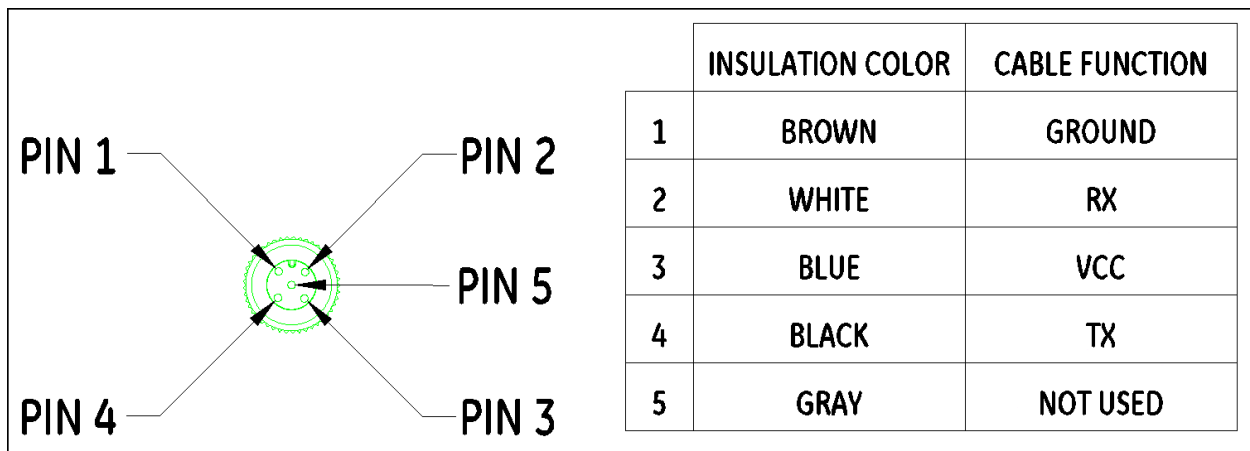


Figure 14 - Cable 185549-01 Pin Out

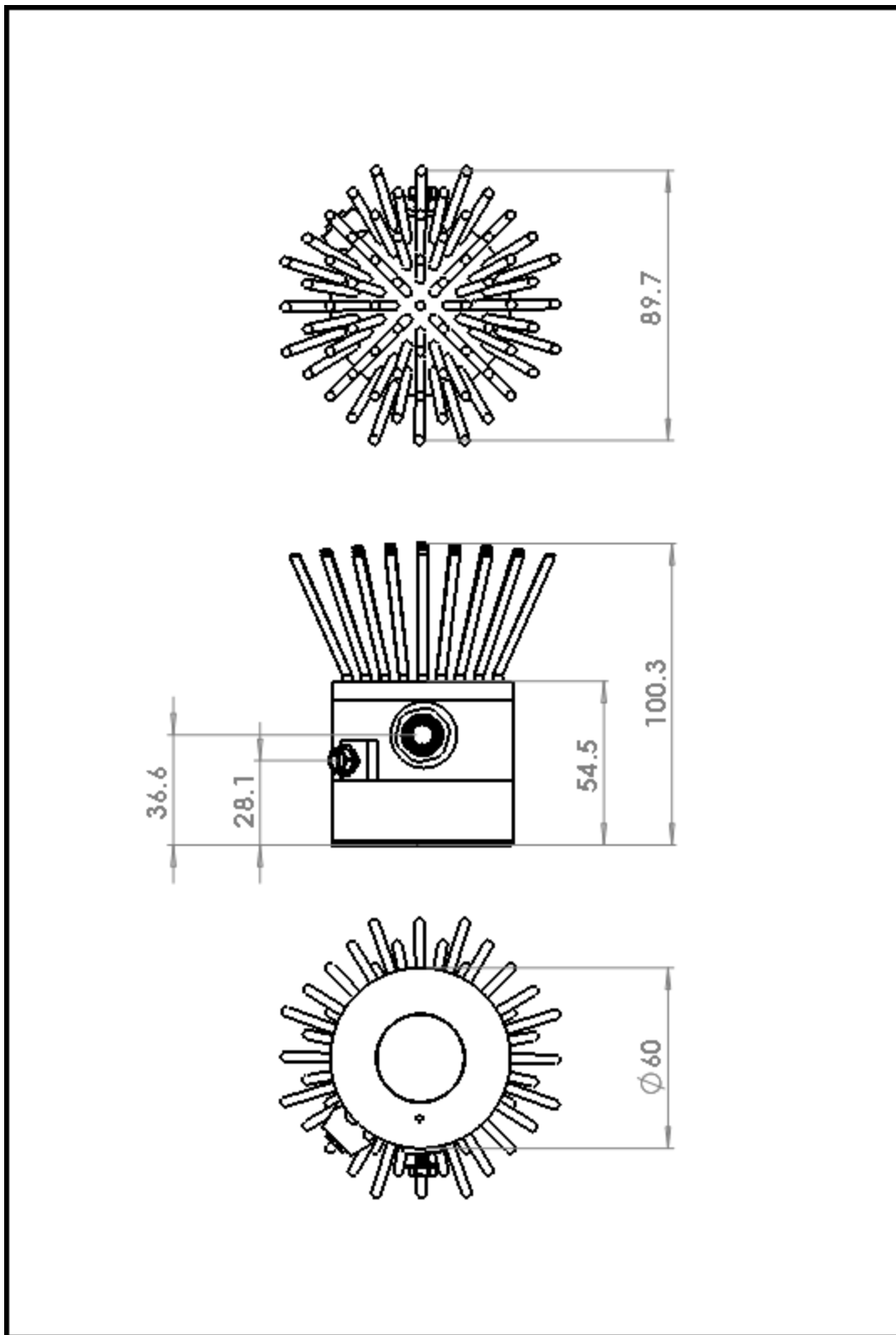


Figure 15 - Perpetua Thermal Energy Harvester

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