aricom
partenaire français de
MONNIT™

*Votre Internet des objets*

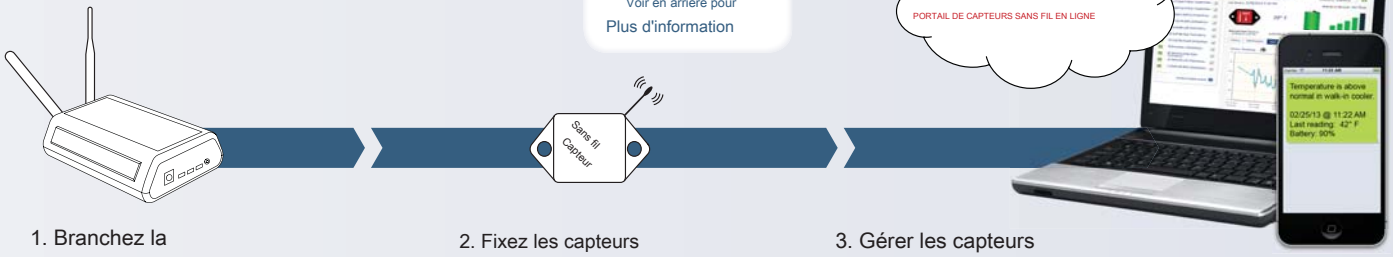
## Du capteur à la plate-forme, une solution de gestion à distance de vos équipements

Créez votre propre «Internet des objets» et surveillez à distance divers aspects de votre entreprise grâce à des solutions en ligne connectées en toute sécurité. Les produits Monnit ont été essayés et testés dans l'industrie, l'agriculture, les bâtiments tertiaires, les magasins, les hôtels, ..

## Où pouvez-vous utiliser les capteurs Monnit?

- Restaurants / Services alimentaires
- Dépanneurs
- Glacières / congélateurs de la cafétéria scolaire
- Gestion des propriétés vacantes / saisies
- Réfrigération pharmaceutique
- Fabricant d'aliments périssables
- Gestion des bâtiments commerciaux
- Surveillance des serres / agriculture
- Gestion de magasin de détail
- Salles de serveurs et centres de données
- Lutte antiparasitaire / assainissement thermique
- Surveillance des personnes âgées
- Gouvernement / Travaux publics
- Caves et brasseries
- Gestion de complexe d'appartements
- Manufacture et production
- Hôtels et hôtellerie
- Écoles et églises
- Dortoirs universitaires
- Installations de stockage
- Services financiers
- Médias et diffusion
- Galeries d'art et musées
- Chauffage et ventilation

## Comment ça marche?




Voir en arrière pour
Plus d'information

1. Branchez la passerelle sans fil.
2. Fixez les capteurs aux "équipements" à surveiller.
3. Gérer les capteurs en ligne et recevez des alertes pour les événements critiques.

## • Passerelles sans fil


- Utilisez jusqu'à 100 capteurs sans fil avec une passerelle Monnit
- Différentes versions disponibles
  - Passerelle cellulaire (CDMA ou GSM)
  - Passerelle Ethernet
  - Passerelle USB
  - Passerelle MODBUS série
- Les passerelles cellulaires sont disponibles avec une batterie de secours de 24 heures
- Portée des appareils de 250 à 300 pieds *

Voir plus à airicom.com/797-monnit-capteur-sans-fil

## • Capteurs sans fil


- Plus de 40 types de capteurs disponibles
- Portée des appareils de 250 à 300 pieds *
- Autonomie de la batterie de 1 à 5 ans et plus ***

Voir plus à airicom.com/797-monnit-capteur-sans-fil


## • Logiciel de surveillance

iMONNIT™ PORTAIL DE CAPTEURS SANS FIL EN LIGNE

La surveillance et les notifications de base des capteurs en ligne sont incluses avec tous les capteurs sans fil pour libre . La surveillance avancée des capteurs est disponible avec iMonnit Premiere pour un faible coût annuel.

**Fonctionnalités iMonnit Premiere;**

- Comptes d'utilisateurs illimités
- Enregistrement des capteurs jusqu'à 10 minutes
- Stockage illimité des données du capteur
- Outils de cartographie des capteurs
- Configurations de capteur avancées

* La portée réelle varie en fonction de l'utilisation.

* * L'autonomie de la batterie est affectée par la fréquence des rapports (battement de cœur), le type de capteur, la distance de la passerelle et d'autres variables.

* * * Les capteurs Wi-Fi se connectent directement aux réseaux Wi-Fi existants sans avoir besoin d'une passerelle Monnit.

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ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

# ALTA Wireless Control

## General Description

Monnit ALTA wireless control units contain two separate relay switches allowing for individual control through the iMonnit online sensors portal. The ALTA control unit relays can be switched on/off manually through the software or automatically by any wireless sensor notification assigned to a single sensor or group of sensors when a specified condition is detected.

## Principle of Operation

The ALTA control unit has two separate relays that can be toggled on/off at will by either: (a) the iMonnit.com web portal; (b) any device that triggers a notification on the same network.

Four LED indicators let the user know if the device is powered on, communicating with the online system and the status of each relay.

The user can manually turn a relay on or off through the iMonnit software. Manual changes are either: (a) temporary based on a set duration (ex. activate the relay for 10 minutes then return to the default state); (b) perpetuated indefinitely until overridden.

Each of the units two relays can also be controlled automatically by any wireless sensor or group of sensors. Automatic relay switching can be triggered by setting the control parameters in a sensor notification from the system. The user can set the default state of each relay to on or off and user defined messages from sensors will cause the relay unit to switch to the non-default state. The relay switches back to its default state when the condition is no longer met.

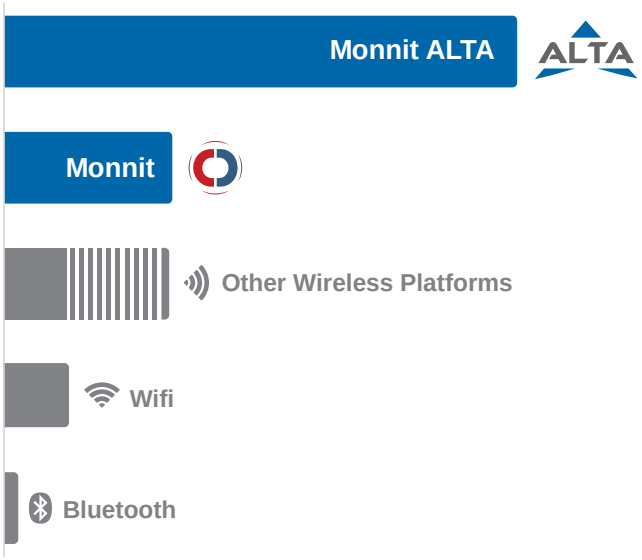
Example Use: If a water sensor detects water at a certain level in a sump pit, the relay will switch ON, activating the pump. When water is no longer detected, the relay will switch OFF, deactivating the pump motor.

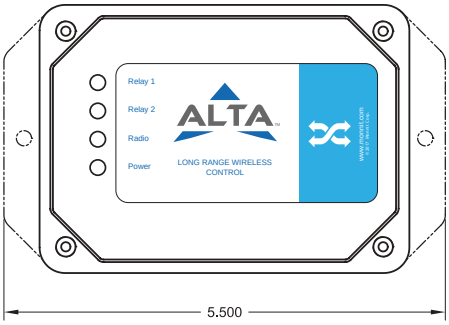
## ALTA Wireless Control Features

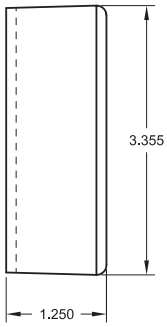
- Wireless range of 1,000+ feet through 12-14 walls *
- 900 MHz Frequency Hopping Spread Spectrum (FHSS) 868 and 433 MHz Frequency Agile
- Improved interference immunity
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- 16,000 sensor message memory
- Over the air updates (future proof)
- Allows for automated control.
- 10-amp or 30-amp units available.
- Two separate relays per unit.
- Can be triggered by any Monnit wireless sensor manually through the iMonnit software.
- AC powered, always on for immediate response from paired sensors.

* Actual range may vary depending on environment.

## Wireless Range Comparison






## Applications

- Facilities / Building Operations
- Automated Systems
- Smart Buildings
- Manufacturing Processes
- Machine Control
- Lighting Control
- Sump and Water Evacuation
- Agriculture and Greenhouses

| Monnit Wireless Control Unit Specifications | | |
|---|---|---|
| **Control Unit Relays** | **10-Amp Units** | **30-Amp Units** |
| Initial Contact Resistance | Max. 100 mΩ | Max. 50 mΩ |
| Max Switching Power (resistive load) | 2500VA 150W (NO)<br>1662VA 150W (NC) | 8310VA (30A 277VAC) |
| Max Switching Voltage | 250 VAC, 100 VDC (0.5A) | 277 VAC |
| Max Switching Current | 10A (AC), 5A (DC) | 30A |
| Nominal Operating Power | 360 mW | Approx 800 mW |
| Operate Time (at nominal voltage / 20°C) | Max 10 ms | Max 20 ms |
| Release Time (at nominal voltage / 20°C) | Max 10 ms | Max 10 ms |
| Max Operating Speed | 20 times/min<br>(at nominal switching capacity) | 20 times/min<br>(at nominal switching capacity) |
| Number of Relays | 2 (individually controlled) | |
| Control Activation | - Automatic based on sensor notification settings<br>- Manual through iMonnit online software | |
| Input Power | 5.5 VDC @ 900 mA | |
| Antenna | Connector: SMA<br>Gain (dBi): 3.0 | |
| Indicator Lights | Four LED indicators<br>- Power<br>- Radio (RF) communication<br>- Relay 1 status (On/Off)<br>- Relay 2 status (On/Off) | |
| Enclosure | ABS Plastic<br>UL94V-0 flame rating | |
| Dimensions | 5.5 x 3.355 x 1.25 in.<br>(139.7 x 85.217 x 31.75 mm) | |
| Weight | 8 ounces | |
| Wireless Range | 1,000+ ft. non-line-of-sight *** | |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) | |
| Operating Temperature | -40° to +85° C (-40° to +185° F) | |
| Certifications: | FC CE Industry Canada<br>900 MHz product; FCC ID: ZTL- RFSC1 and IC: 9794A-RFSC1.<br>868 and 433 MHz product tested and found to comply with: CISPR 22:2008-09 / EN 55022:2010 - Class B and ETSI EN 300 220-2 V2.4.1 (2012-05). | |

**Note: Monnit control units require a Monnit wireless gateway for operation.**

## Caution / Notice:

Monnit commercial grade products are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.)
- Volatile or flammable gas
- Dusty conditions
- Under low or high pressure
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality of this product.

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

The Leading Enterprise Internet of Things Solution

# ALTA Wireless Sensor Adapter

## General Description

The ALTA wireless sensor adapter allows ALTA long range wireless sensors to communicate with local or online wireless sensor monitoring systems by connecting to a PC or 3rd party IoT gateways via USB connection.

Easy plug & play support for PC use. If the PC has an active internet connection and you wish to use it with the iMonnit online software, install the free Monnit Gateway application to pass sensor data to the online system. If you wish to use your wireless sensors locally (collect and store sensor data on your PC), purchase and install the Monnit Express standalone software and all sensor data will be stored within the standalone software's database. The Monnit Express software allows you to export sensor data in a .csv format spreadsheet, and is also capable of sending SMS text and email alerts if the host computer has an active Internet connection.

With the online iMonnit software, you can easily configure your network, view collected sensor data and set alarms through SMS or e-mail, all from any web enabled browser. The system allows for complete configuration and customization at a sensor, local network, or client wide level.

The ALTA wireless sensor adapter is specifically designed to respond to the increasing market need for global technology that accommodates a variety of vertical M2M application segments and remote wireless sensor management solutions. With support for several leading 3rd party IoT gateways, it is easy to integrate ALTA long range wireless sensors with existing IoT platforms.

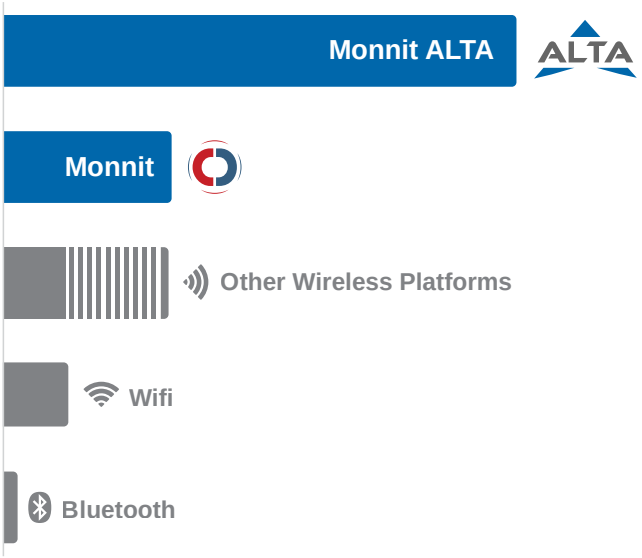
Enjoy reliable, low cost, wireless monitoring of your facilities or specific applications, with Monnit wireless sensor networks.

## ALTA Wireless Sensor Adapter Features

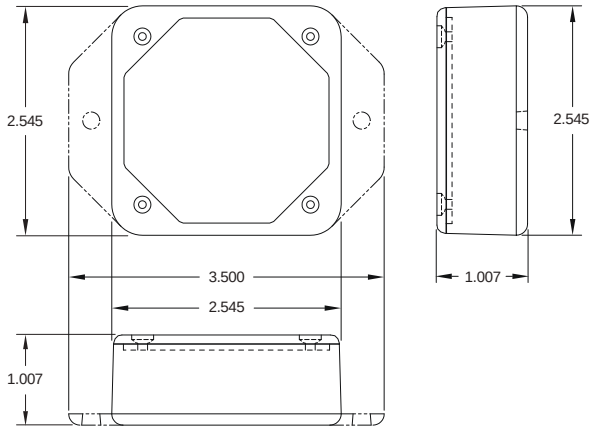
- Wireless range of 1,000+ feet through 12-14 walls *
- 900 MHz Frequency Hopping Spread Spectrum (FHSS) 868 and 433 MHz Frequency Agile
- Improved interference immunity
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- 16,000 sensor message memory
- Over the air updates (future proof)
- Optional RS232 DB9 communication port
- USB, RS232, or external power options
- Can be used with both iMonnit Online Software or Monnit Express Standalone PC Software
- Uses standard FTDI driver so no driver installation required
- External USB cable allows gateway to be positioned for improved communication range
- Programmable heart-beat control
- Supports up to 100 wireless sensors per USB
- Windows 10, 8, 7, and Vista compatible

* Actual range may vary depending on environment.

## Wireless Range Comparison



## ALTA Wireless Sensor Adapter Dimensions




## Example Applications

- Facilities / Building Operations
- Restaurants / Food Service
- Server Rooms / Data Closets
- Pharmaceutical / Labs
- Heating and Cooling
- Agriculture Monitoring
- And many more...

| ALTA Wireless Sensor Adapter Specifications | |
|---|---|
| **USB** | |
| Type: | USB 2.0 Full Speed Bus Standard |
| Display Name: | Monnit USB Radio Gateway |
| Display Type: | MonnitApnClass |
| Software Version: | 3.4.0.2 or later |
| Software Compatible Platforms: | Microsoft Windows 10, 8, 7 or Vista required.<br>(Windows XP and older are not supported.) |
| Bus Reported Device Description: | M+ LINK |
| Memory Capacity: | 14,336 up messages (to gateway/server)<br>2,048 down messages (to sensors) |
| RS232 (Optional) | 115200 baudrate, 8 data bits, no parity, 1 stop bit, DB9 connector |
| **Power** | |
| Power | Powered through USB output of PC<br>(Optional) External Power<br>(Optional) RS232 Power Pin 4<br>(Optional) RS232 Power Pin 8 |
| Maximum Power Required: | 100 mA |
| **Mechanical** | |
| Enclosure | ABS plastic |
| Dimensions | 3.5 in. x 2.545 in. x 1.007 in. |
| Weight | 4 ounces |
| **Environmental** | |
| Operating Temperature | -40°C to +85°C |
| **Wireless** | |
| Wireless Range | 1,000+ ft. non-line-of-sight *** |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Certifications<br>FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Actual range may vary depending on environment.

## Caution / Notice:

Monnit commercial grade products are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.)
- Volatile or flammable gas
- Dusty conditions
- Under low or high pressure
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality of this product.

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TEMPERATURE

# Wireless Temperature Sensors

## General Description

The ALTA Wireless Temperature Sensor uses a type NTC thermistor to measure temperature.

- Accurate to ± 1° C (± 1.8° F)
- Increased accuracy by user calibration to ± 0.25° C (± 0.45° F)

## Principle of Operation

The ALTA Wireless Temperature Sensor outputs the ambient temperature in degrees Fahrenheit. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, send power to the NTC Thermistor and wait for it to stabilize, and convert the analog data, mathematically compute the temperature and transmit the data to the gateway. To stay within the abilities of the processor, the temperature is computed off a data table provided by the manufacturer. To reduce error, a variable resistor configuration is implemented over specified temperature ranges.

## Example Applications

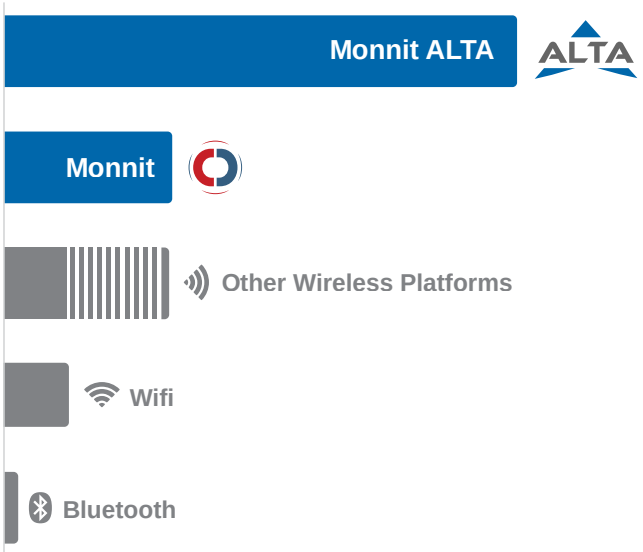
- Ambient Temperature Monitoring
- Environmental Monitoring
- Smart Machines & Smart Structures
- HVAC Operation & Testing
- Data Center Monitoring
- And many more...

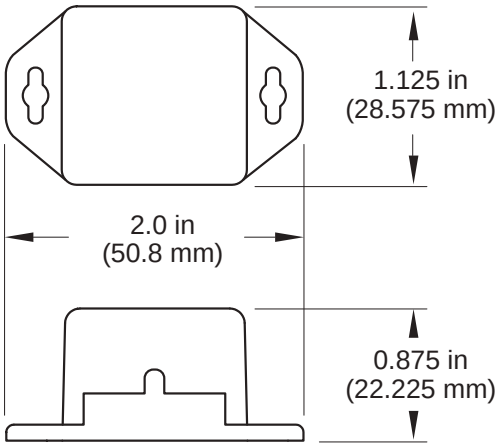
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

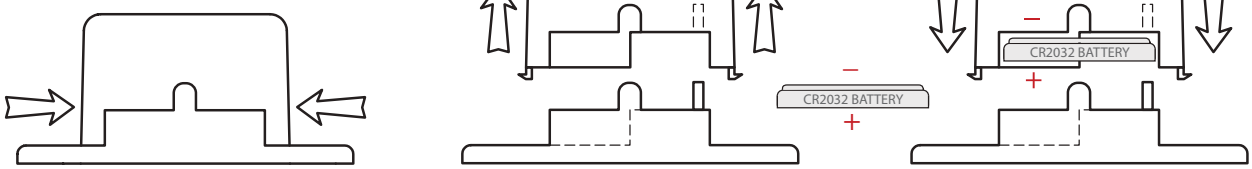





| ALTA Commercial Coin Cell Wireless Temperature Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Thermistor Temperature Range (Thermistor Only) | -40°C to +125°C ( -40°F to +257°F )<br>( Limited to Main Unit Circuitry, -7°C to +60°C unless wire leads are being used. ) |
| Accuracy @ 25°C | +/- 1% (1° C or 1.8° F) |
| User Calibrated Accuracy | +/- 0.25° C (± 0.45° F) |
| Time Constant @ 25°C | 30 sec |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware can not withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

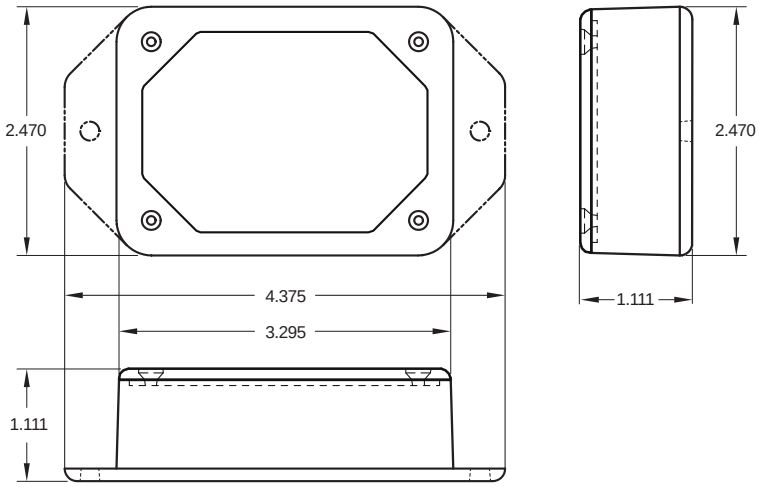
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Temperature Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Thermistor Temperature Range (Thermistor Only) | -40°C to +125°C ( -40°F to +257°F )<br>(Limited to Main Unit Circuitry, -7°C to +60°C unless thermistor leads are being used. |
| Accuracy @ 25°C | +/- 1% (1° C or 1.8° F) |
| User Calibrated Accuracy | +/- 0.25° C (± 0.45° F) |
| Time Constant @ 25°C | 15 sec max |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

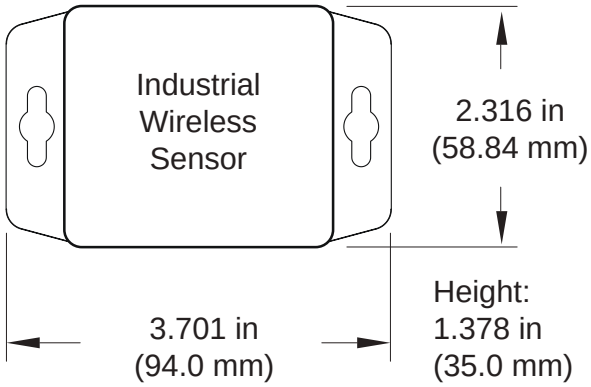
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Temperature Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Thermistor Temperature Range (Thermistor Only) | | -40°C to +125°C ( -40°F to +257°F )<br>( Limited to Main Unit Circuitry, -40°C to +85°C ) |
| Accuracy @ 25°C | | +/- 1% (1° C or 1.8° F) |
| User Calibrated Accuracy | | +/- 0.25° C (± 0.45° F) |
| Time Constant @ 25°C | | 30 sec |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC CE Industry Canada | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

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WATER DETECT

# Wireless Water Detection Sensors

## General Description

The ALTA Wireless Water Detection Sensor detects the presence or non-presence of water.

## Water Detection

- 3 ft. leaded wires
- Immediately detects water

## Principle of Operation

The ALTA Wireless Water Detection Sensor detects when water is present by completing the circuit between the two leaded wires. When water is present the sensor will immediately turn on the RF radio and transmit the data to the wireless gateway and iMonnit Online Sensor Monitoring and Notification System, allowing the user to immediately receive an SMS text or email alert. The sensor can be configured to detect both the presence and non-presence of water.

## Applications

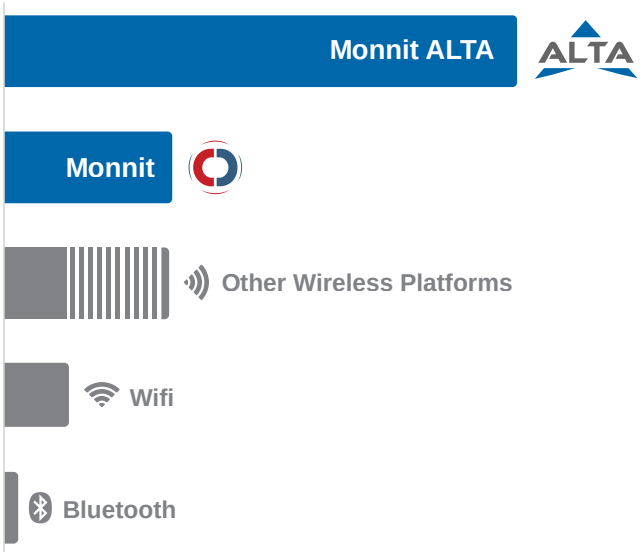
- Water heater monitoring
- Plumbing leak detection
- Sump monitoring
- Boat bilge monitoring
- Reservoir level monitoring

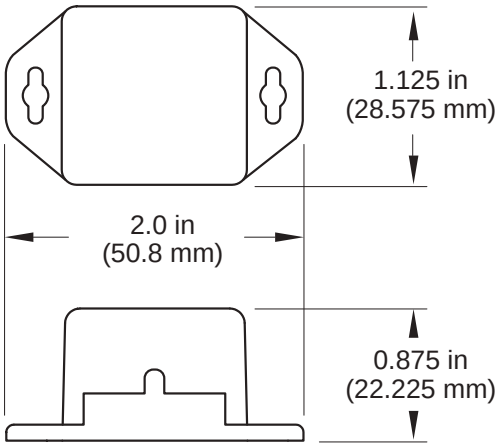
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls *
- Frequency Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory / storage (up to 512 readings per sensor)
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

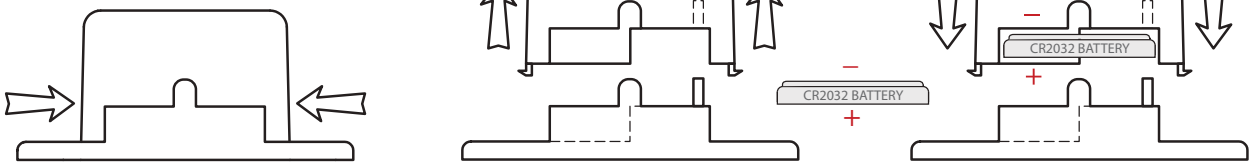





| ALTA Commercial Coin Cell Wireless Water Detection Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C (+50°F to +122°F) |
| Lead Wire Length | 3 ft. (36 in.) |
| Detection Wires | High Impedance |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware can not withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

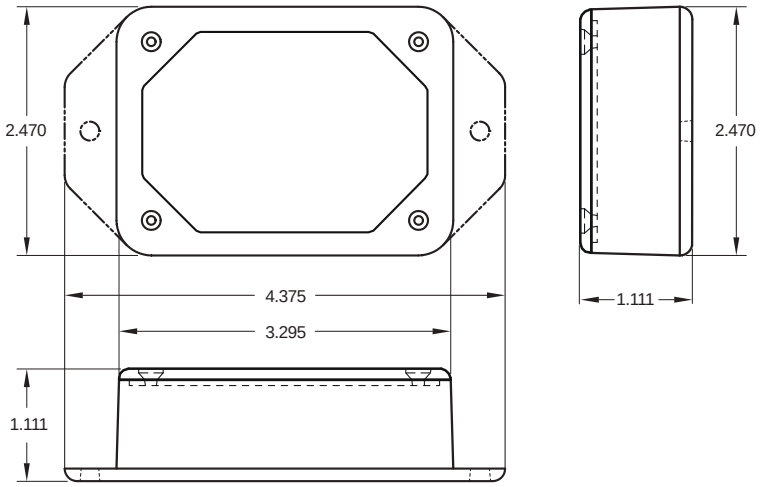
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Water Detection Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Lead Wire Length | 3 ft. (36 in.) |
| Detection Wires | High Impedance |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

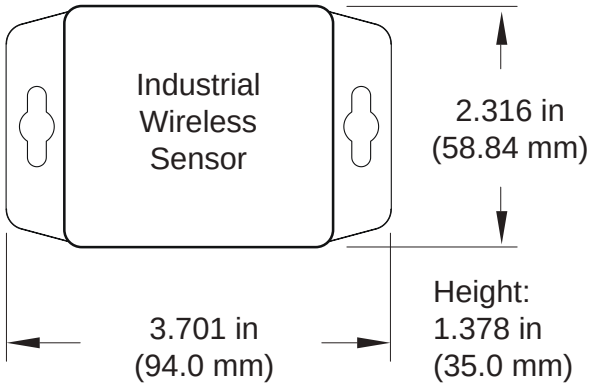
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

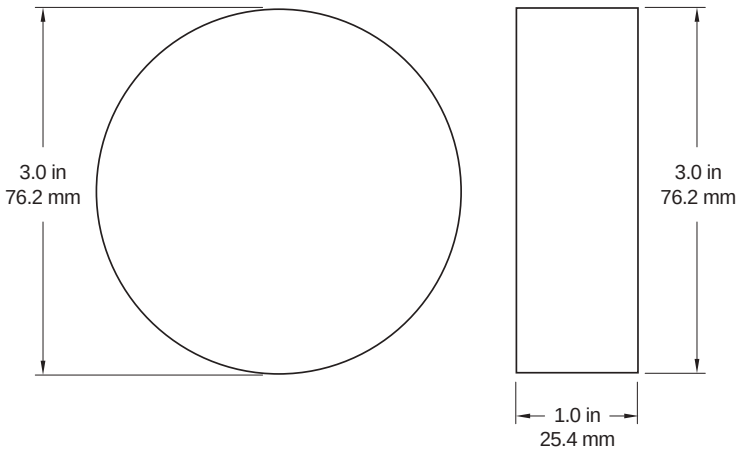
This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Water Detection Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included Battery | Max Temperature Range: | -40°C to +85°C (-40°F to +185°F) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0°C to 45°C (32°F to 113°F) |
| | Max Temperature Range: | -20°C to 60°C (-4°F to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Lead Wire Length | 3 ft. ( 36 in.) | +/- 0.25°C (± 0.45°F) |
| Detection Wires | High Impedance | 30 sec |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.




| ALTA Commercial Wireless Water Detection Puck Sensor - Technical Specifications | |
|---|---|
| Electronics Supply Voltage | 2.0 - 3.8 VDC |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Max Operating Temperature Range | -18°C to 55°C (0°F to 130°F) * |
| Optimal Temperature Range | +10°C to +50°C (+50°F to +122°F) |
| Battery | 3.6V 1200 mAh Lithium (non-replaceable) |
| Typical Battery Life | Up to 10 years ** |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 7.6 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
** Battery life is determined by sensor reporting frequency and other variables.

The ALTA Wireless Water Detection Puck Sensor detects when water is present by completing the circuit between the two probe points on the bottom of the puck sensor. When water is present the sensor will immediately turn on the RF radio and transmit the data to the wireless gateway and iMonnit Online Sensor Monitoring and Notification System, allowing the user to immediately receive an SMS text or email alert. The sensor can be configured to detect both the presence and non-presence of water.

## Features of the Water Detection Puck

- Water proof / fully submersible
- Weighted design helps sensor stay in place

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

The Leading Enterprise Internet of Things Solution

0-20mA CURRENT METER

# Wireless 0-20 mA Current Meters

## General Description

The ALTA Wireless 0-20 mA Current Meter is capable of measuring the current off another device or sensor up to 20mA VDC.

- Measures current up to 20 mA

## Principle of Operation

By connecting the leads on the ALTA Wireless 0-20 mA Current Meter to the positive and ground terminals of another device, the sensor can measure the current and send data to the iMonnit Online Sensor Monitoring and Notification System. The data is stored in the online system and can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user when certain thresholds have been met or exceeded.

## Example Interfacing

- Current transducers
- pH sensors
- Dissolved oxygen sensors
- Pressure sensors
- Magnetic flow sensors
- Many additional applications

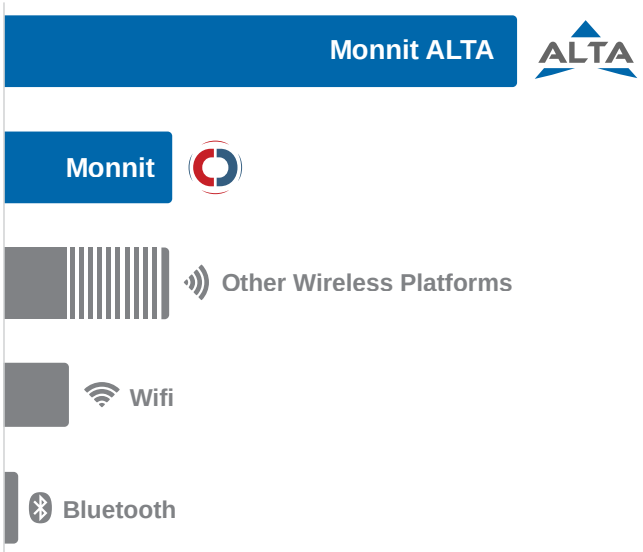
## Features of Monnit ALTA Sensors

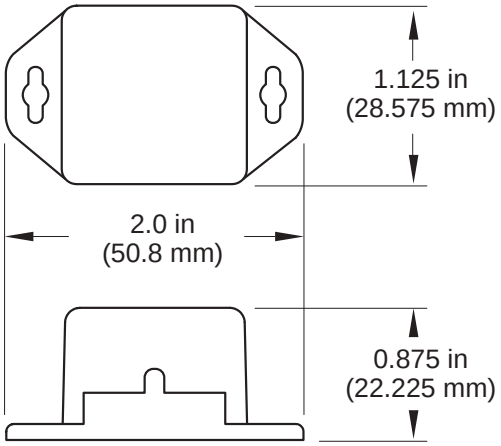
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- All ALTA sensors now have up to 3200 readings:
  - 10-minute heartbeats = 22 days
  - 2-hour heartbeats = 266 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison



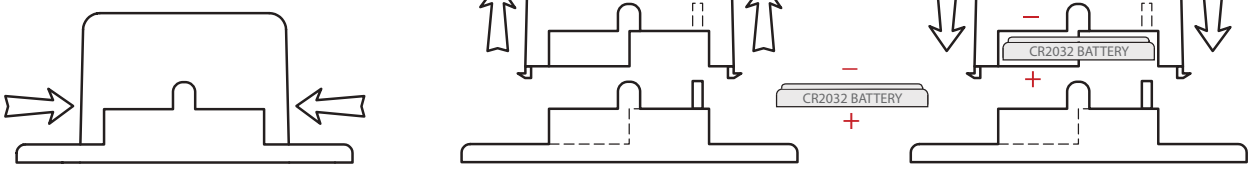



| ALTA Commercial Coin Cell Wireless 0-20 mA Current Meter \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Sensor resolution | ~ 0.01 mA (11-bit single ended) |
| Accuracy | Uncalibrated: 0.7mA, 0.35mA typical<br>Caibrated: 0.05mA |
| Conversion time | 228 µs |
| Full-scale current | 0–20 mA ** |
| Input resistance | 51 ohms |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** If application exceeds 20 mA the sensor will return a maximum reading of 20 mA. If current applied to measurement port exceeds 30 mA, circuit protection and conditioning is required.

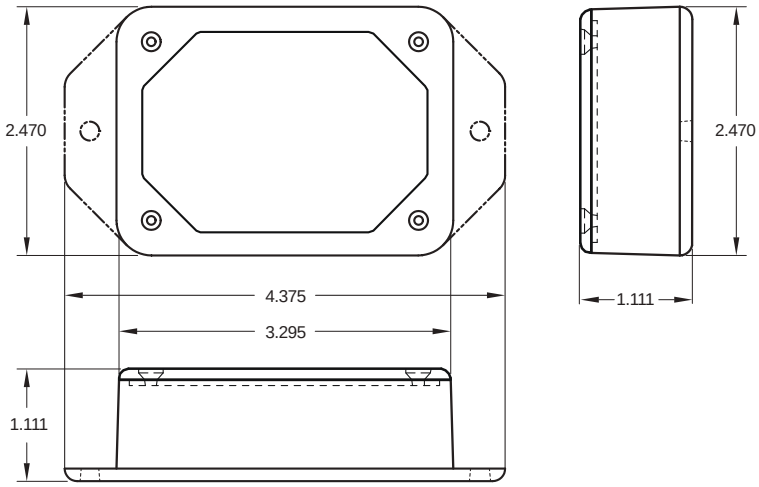
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless 0-20 mA Current Meter \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Sensor resolution | ~ 0.01 mA (11-bit single ended) |
| Accuracy | Uncalibrated: 0.7mA, 0.35mA typical<br>Caibrated: 0.05mA |
| Conversion time | 228 µs |
| Full-scale current | 0–20 mA ** |
| Input resistance | 51 ohms |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

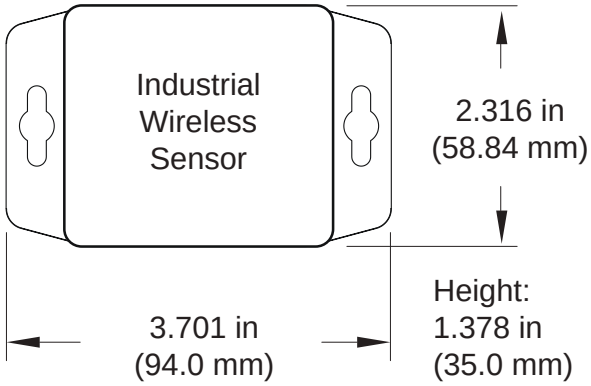
** If application exceeds 20 mA the sensor will return a maximum reading of 20 mA. If current applied to measurement port exceeds 30 mA, circuit protection and conditioning is required.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless 0-20 mA Current Meter \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation ** |
| | Charging efficiency | 40%**** |
| | Luminous sustainability | Minimum of 250 LUX **** |
| Sensor resolution | | ~ 0.01 mA (11-bit single ended) |
| Accuracy | | Uncalibrated: 0.7mA, 0.35mA typical<br>Caibrated: 0.05mA |
| Conversion time | | 228 µs |
| Full-scale current | | 0–20 mA *** |
| Input resistance | | 51 ohms |
| Integrated memory | | Up to 3200 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

*** If application exceeds 20 mA the sensor will return a maximum reading of 20 mA. If current applied to measurement port exceeds 30 mA, circuit protection and conditioning is required.

**** Solar feature's energy harvesting circuitry works indoors with low light.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas—chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA by MONNIT

The Leading Enterprise Internet of Things Solution

DRY CONTACT

# Wireless Dry Contact Sensors

## General Description

ALTA wireless dry contact sensors can be used to detect contact between two wired contact points, an external mechanical switch or a contact plate.

- 1 ft. (12 inch) lead wires.
- Can integrate with switches.

## Principle of Operation

The ALTA wireless dry contact sensor detects when there is contact between the two wired end points. It can easily be integrated into existing switches or contact plates. When the sensor detects contact between the two end points, it will immediately turn on the RF radio and transmit the data to the wireless gateway and iMonnit Online Sensor Monitoring and Notification System, allowing the user to immediately receive an SMS text or email alert. The sensor can be configured to detect both closed and open loops alerting if contact is made or broken.

## Example Applications

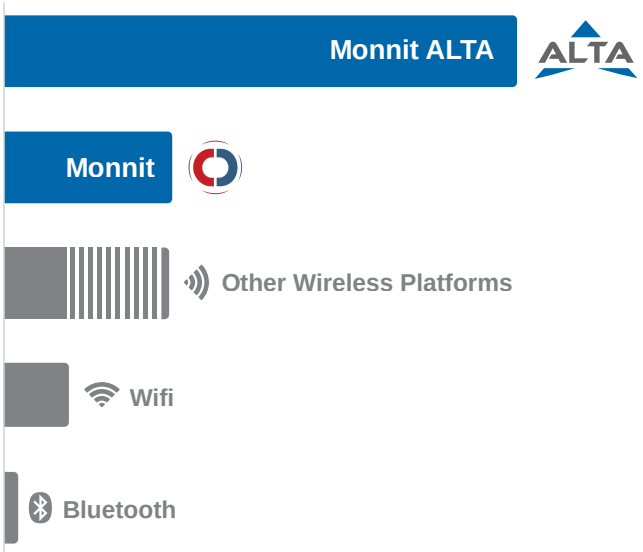
- Barn door monitoring.
- Freezer / cooler door monitoring.
- Forklift seat switches.
- Button or switch integration.
- Production line tracking.

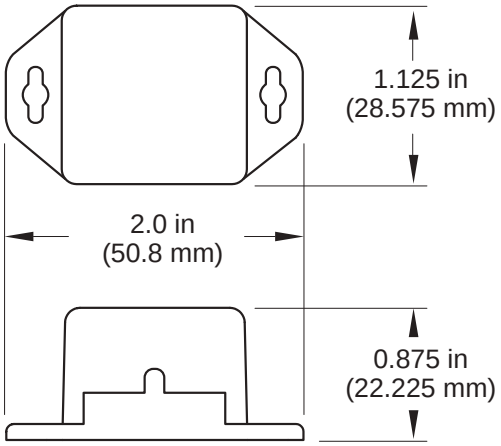
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

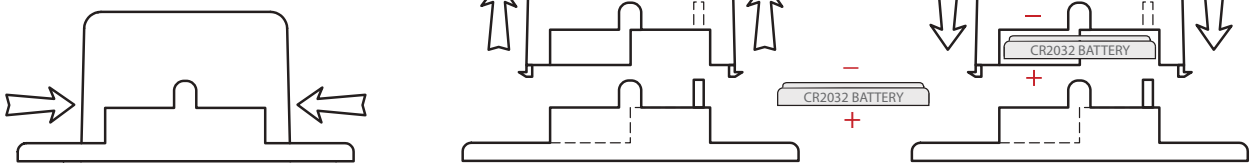





| ALTA Commercial Coin Cell Wireless Dry Contact Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Lead Wire Length | 1 ft. ( 12 in.) |
| Detection Wires | High Impedance |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

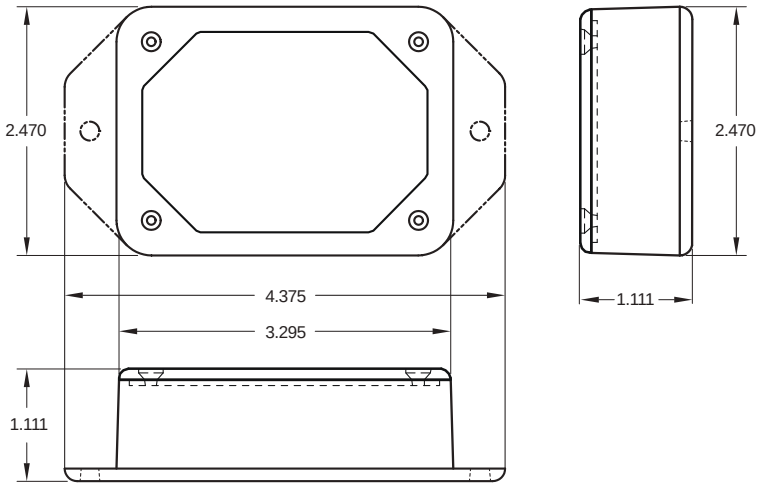
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Dry Contact Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Lead Wire Length | 1 ft. ( 12 in.) |
| Detection Wires | High Impedance |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

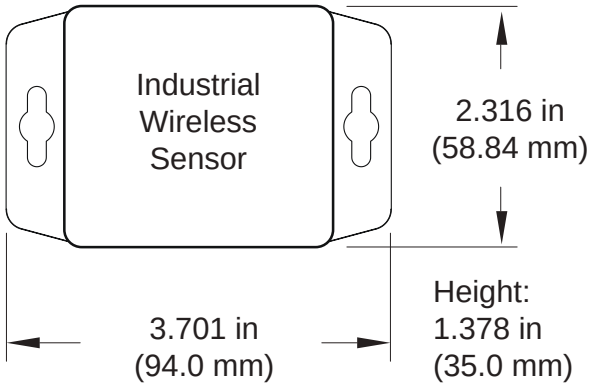
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Dry Contact Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Lead Wire Length | | 1 ft. ( 12 in.) |
| Detection Wires | | High Impedance |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC CE Industry Canada | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

The Leading Enterprise Internet of Things Solution

OPEN / CLOSED

# Wireless Open/Closed Sensors

## General Description

The ALTA Wireless Open/Closed Sensor can be used to detect when a door or window is opened and closed using a magnetic switch.

- Detects when a door or window is accessed.
- Uses magnetic detection switch.

## Principle of Operation

The ALTA Wireless Open/Closed Sensor uses an external magnetic switch to detect the presence or removal of a trigger magnet. When the sensor detects that the magnet is removed or returned it sends the information to the iMonnit Online Sensor Monitoring and Notification System. The data is stored in the online system and can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user when a magnetic source is present or not with the ability to only notify within time of day parameters.

## Example Applications

- Doors and windows.
- Cabinets and lockers.
- IT server closets.
- Freezer and cooler doors.
- And much more.

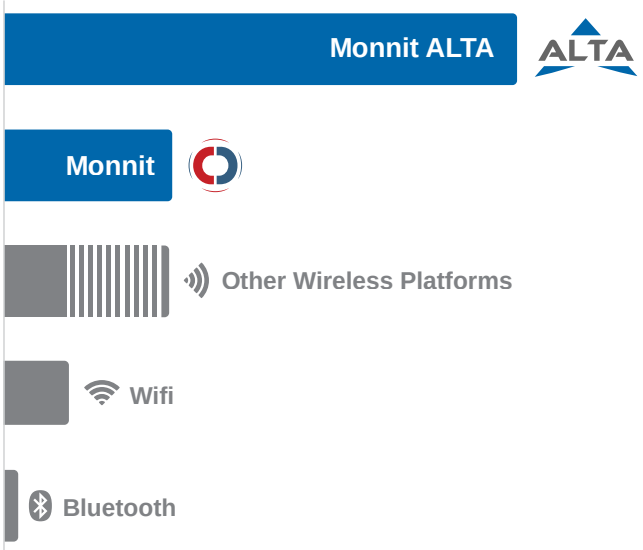
## Features of Monnit ALTA Sensors

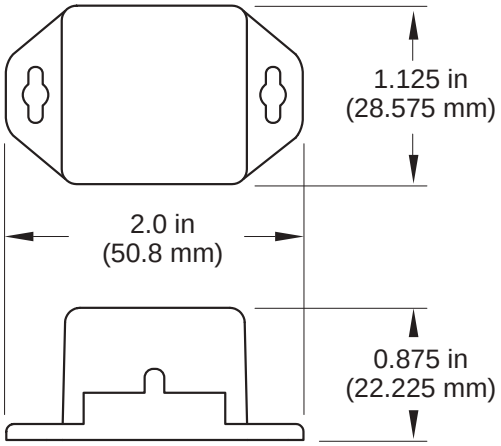
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

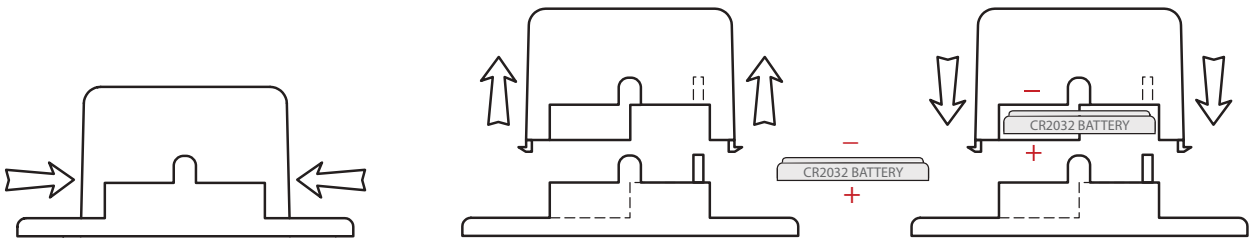





| ALTA Commercial Coin Cell Wireless Open/Closed Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Magnetic switch | SPST, gold under -plating with Deactivated Rhodium outer-plating (capable of 50 million activations) |
| Operation gap | Up to 3/4 inch |
| Wire leads | 22 gauge/15 inch length |
| Magnet | Alnico magnet/Weatherproof, high-impact ABS plastic covering with self-adhesive backing |
| Magnet temperature range | -15°F to 160°F (-25°C to 70°C) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

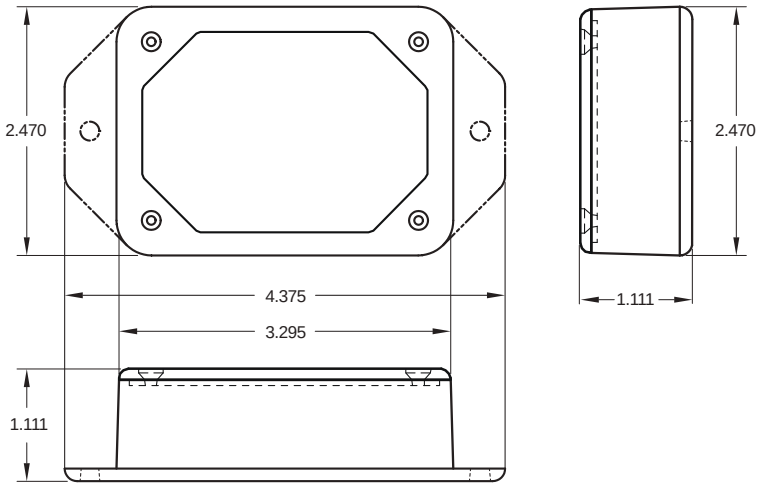
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Open/Closed Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Magnetic Switch | SPST, gold under -plating with Deactivated Rhodium outer-plating (capable of 50 million activations) |
| Operation Gap | Up to 3/4 inch |
| Wire Leads | 22 gauge/15 inch length |
| Magnet | Alnico magnet/Weatherproof, high-impact ABS plastic covering with self-adhesive backing |
| Magnet temperature range | -15°F to 160°F (-25°C to 70°C) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

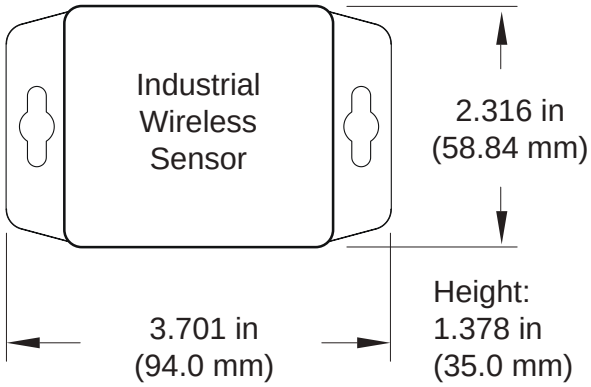
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Open/Closed Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Magnetic Switch | | SPST, gold under -plating with Deactivated Rhodium outer-plating (capable of 50 million activations) |
| Operation Gap | | Up to 3/4 inch |
| Wire Leads | | 22 gauge/15 inch length |
| Magnet | | Alnico magnet/Weatherproof, high-impact ABS plastic covering with self-adhesive backing |
| Magnet temperature range | | -15°F to 160°F (-25°C to 70°C) |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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Visit us on the web at www.monnit.com.

ALTA by MONNIT

The Leading Enterprise Internet of Things Solution

ACTIVITY DETECTION

# Wireless Activity Detection Sensors

## General Description

ALTA wireless activity sensors can be used in a host of applications where detecting vibration (sudden movement) or counting the number of vibrations is required.

- Detects vibration or sudden movement

## Principle of Operation

**Activity Detection**—sensor detects sudden movement or non-movement of a given device or surface, and alerts you of the change.

## Example Applications

- Machinery monitoring
- Pump monitoring
- Detect if a window is broken or shattered
- Many additional applications

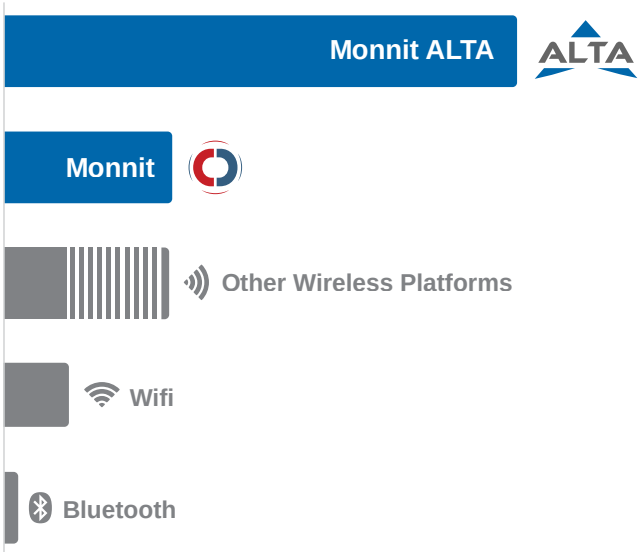
## Features of Monnit ALTA Sensors

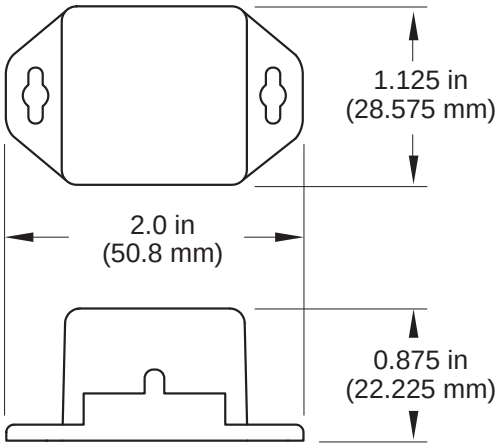
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- All ALTA sensors now have up to 3200 readings:
  - 10-minute heartbeats = 22 days
  - 2-hour heartbeats = 266 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

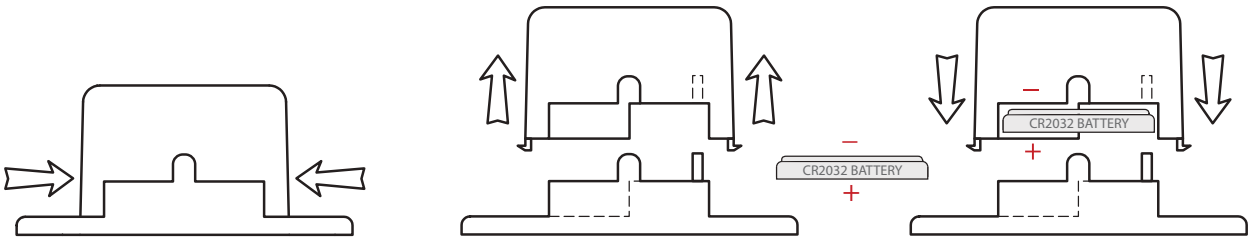





| ALTA Commercial Coin Cell Wireless Activity Detection Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Sensitivity | 0.05 g |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

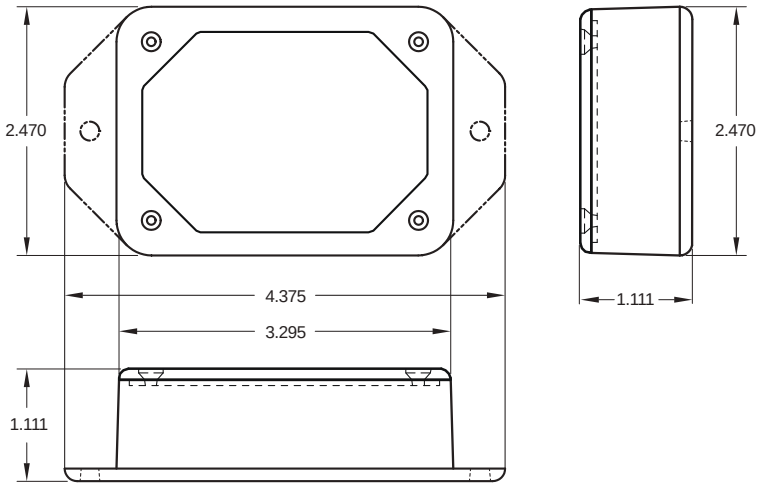
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Activity Detection Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Sensitivity | 0.05 g |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

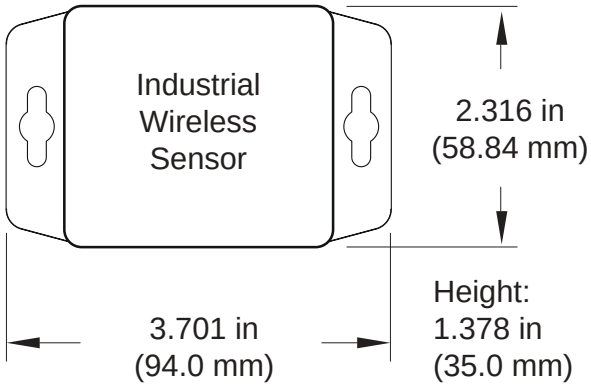
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Activity Detection Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation ** |
| | Charging efficiency | 40% *** |
| | Luminous sustainability | Minimum of 250 LUX *** |
| Sensitivity | | 0.05 g |
| Integrated memory | | Up to 3200 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.
*** Solar feature's energy harvesting circuitry works indoors with low light.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

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BUTTON

# Wireless Button Press Sensors

## General Description

The ALTA Wireless Button Sensor detects when the button has been pressed triggering a notification from the system.

- Detects when button is pressed.

## Principle of Operation

The ALTA Wireless Button Sensor sends a signal to the iMonnit Online Sensor Monitoring and Notification System when the button is pressed triggering a notification via SMS text or email and tracking the data in the online system and can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user immediately when movement is detected with the ability to only notify within time of day parameters.

## Example Applications

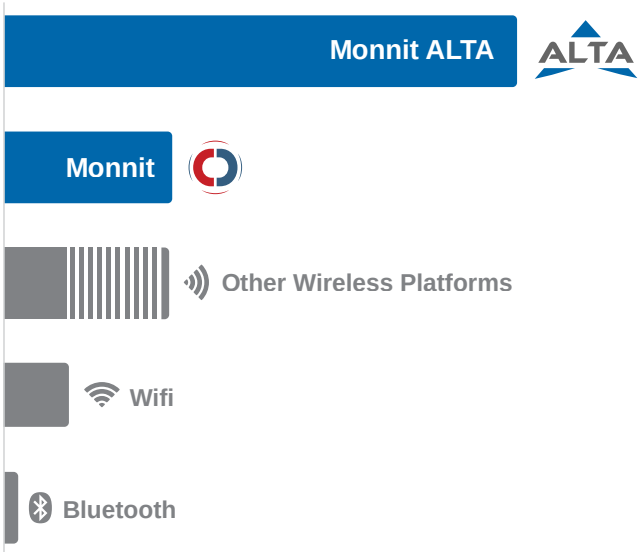
- Hotel / Motel front desk call button.
- Restroom service / clean-up request button.
- Service request button.
- And many more.

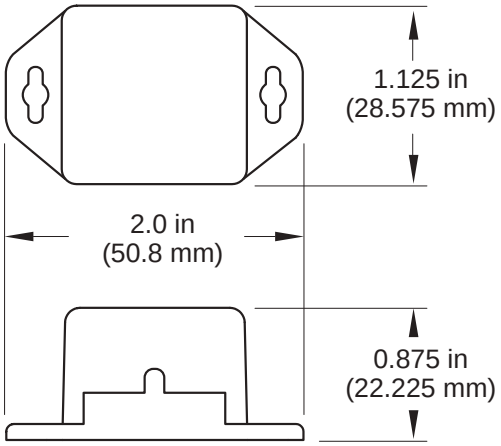
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

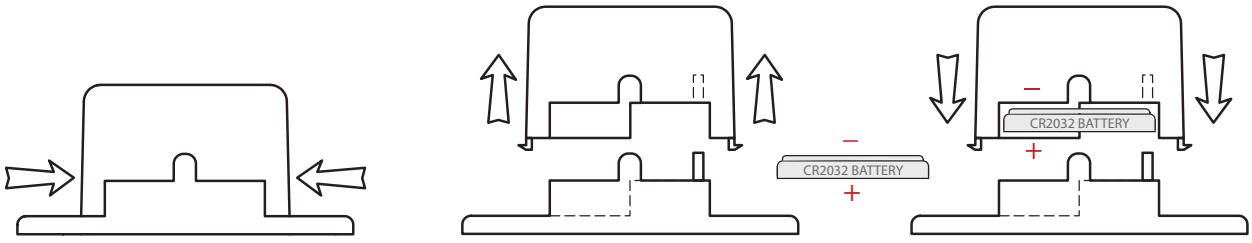



| ALTA Commercial Coin Cell Wireless Button Press Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Button Type | Momentary |
| Number of Operations | 10,000,000 |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

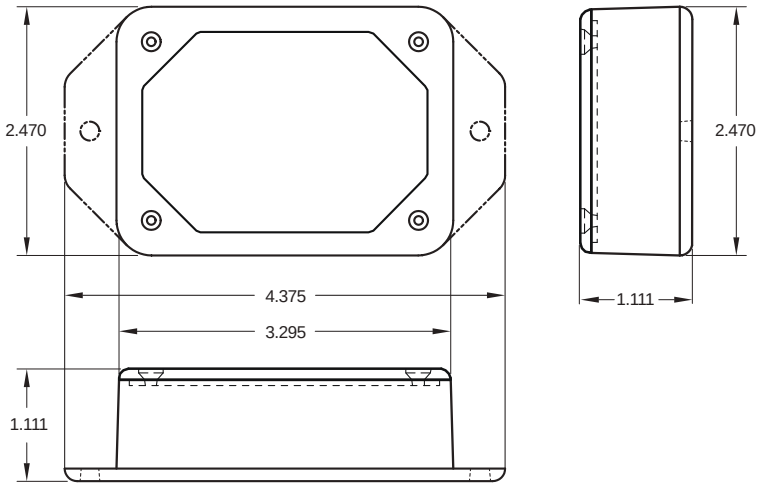
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Button Press Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Button Type | Momentary |
| Number of Operations | 10,000,000 |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

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LIGHT METER

# Wireless Light Meter

## General Description

The ALTA Wireless Light Meter measures the intensity of light from 0 – 82,000 lux (luminescence/unit area).

- Measures the amount of light present
- Can alert upon immediate detection of light or a change in light intensity
- Highly sensitive photodiode

## Principle of Operation

The ALTA Wireless Light Meter uses a highly sensitive photo-diode to detect and measure the intensity of light around the device. The sensor is also capable of alerting upon detection of a change in lighting conditions. The sensor returns a value in “lux” to the iMonnit Online Sensor Monitoring and Notification System. The data is stored in the online system and can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user when light is present or not with the ability to only notify within time of day parameters. Perfect for light sensitive applications like museum and art gallery light monitoring.

## Example Applications

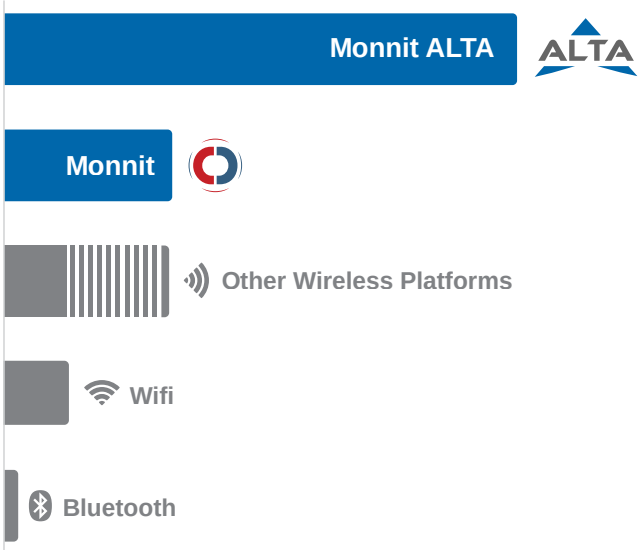
- Art gallery light metering
- Museum light metering
- Greenhouse and agricultural light monitoring
- Facilities lighting / energy management
- Business light monitoring
- Home light monitoring
- And many more...

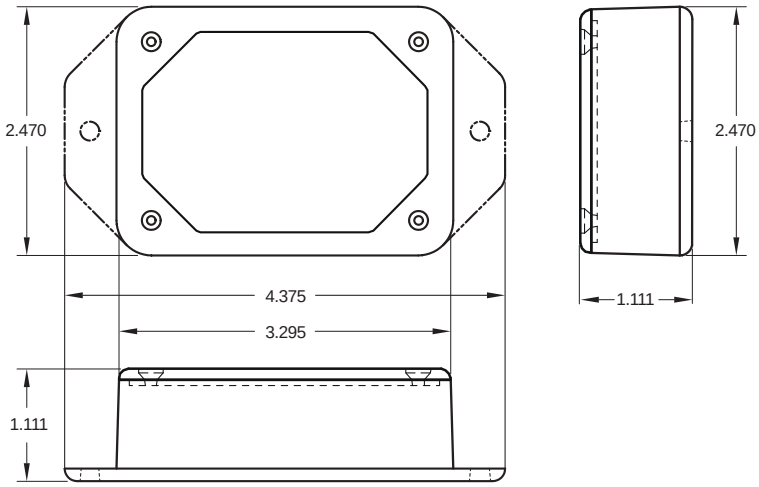
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial AA Wireless Light Meter - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Max Light Level | 0 - 82,000 Lux |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

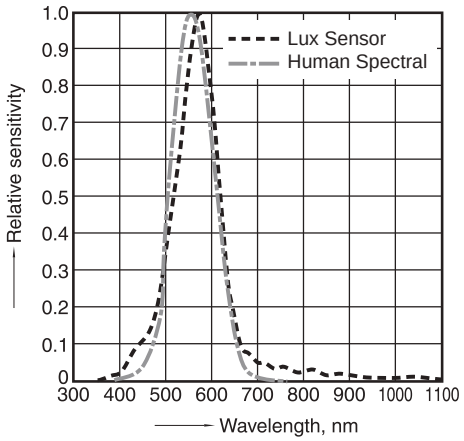
## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

Relative sensitivity vs. wavelength
Ambient Temperature: 25°C (77°F)



## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

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HUMIDITY

# Wireless Humidity Sensors

## General Description

The ALTA Wireless Humidity (RH) Sensor allows you to accurately monitor the relative humidity of the air within a room or enclosure.

- Measures relative humidity, temperature and dew point with high accuracy.

## Principle of Operation

The ALTA Wireless Humidity (RH) Sensor measures the relative humidity at the device. The sensor returns RH and temperature values to the iMonnit Online Sensor Monitoring and Notification System. The system calculates dew point from the data and stores all three data points in the online system where the data can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user when defined thresholds have been met or exceeded.

## Example Interfacing

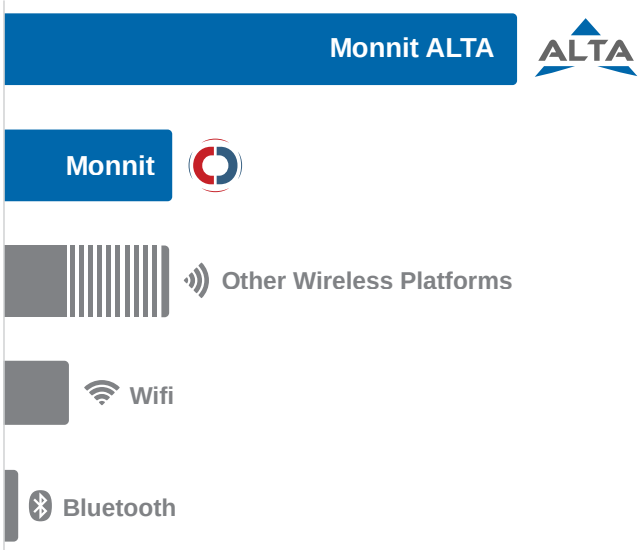
- Greenhouse humidity monitoring.
- Agriculture environmental monitoring.
- Art gallery and museum environmental monitoring.
- Humidor monitoring.
- General weather and environmental monitoring.
- And many more...

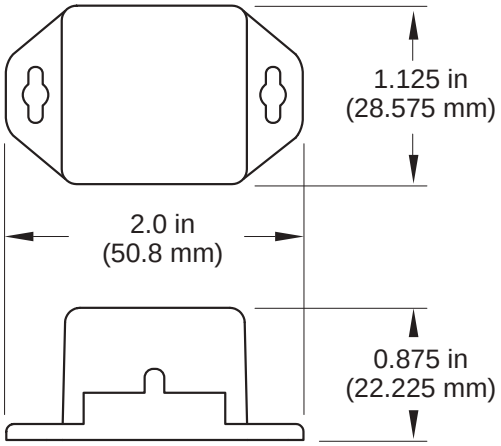
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

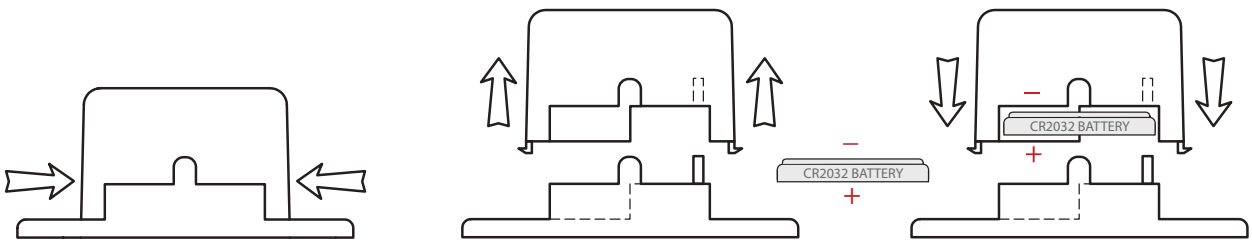





| ALTA Commercial Coin Cell Wireless Humidity Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +55°C ( 20°F to +131°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Accuracy | ± 3% under normal conditions ( 10% - 90% RH ) *** |
| RH Operating Range | 0 – 100% RH *** |
| RH Response Time | 8 sec ( tau 63% ) *** |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** View charts on last page for more information.

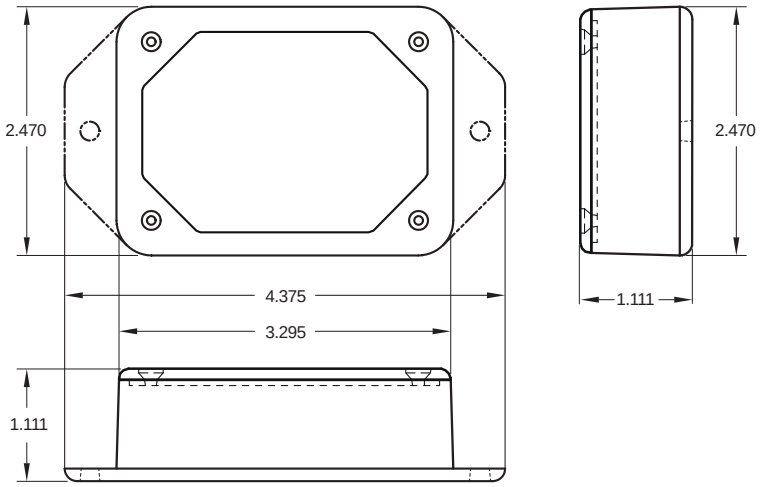
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Humidity Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 50°C (0°F to 122°F) using alkaline<br>-40°C to 80°C (-40°F to 176°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +45°C ( +50°F to +113°F ) |
| Accuracy | ± 3% under normal conditions ( 10% - 90% RH ) *** |
| RH Operating Range | 0 – 100% RH *** |
| RH Response Time | 8 sec ( tau 63% ) *** |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

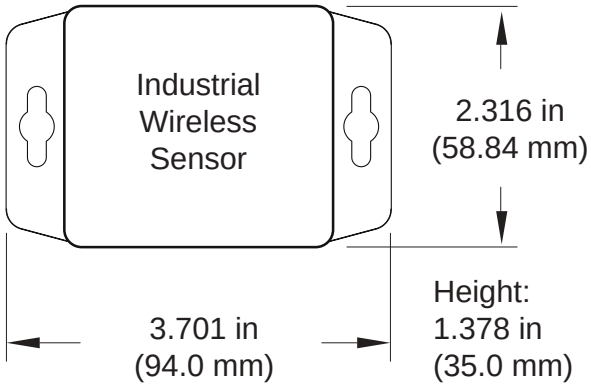
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** View charts on last page for more information.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Humidity Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +80°C ( -40°F to +176°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +80°C ( -40° to +176°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Accuracy | | ± 3% under normal conditions ( 10% - 90% RH ) *** |
| RH Operating Range | | 0 – 100% RH *** |
| RH Response Time | | 8 sec ( tau 63% ) *** |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** View charts on last page for more information.

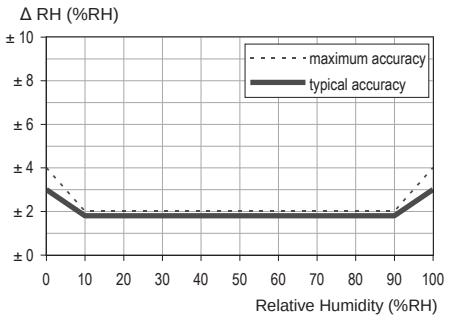



Figure 1. Typical and maximal tolerance at 25°C.

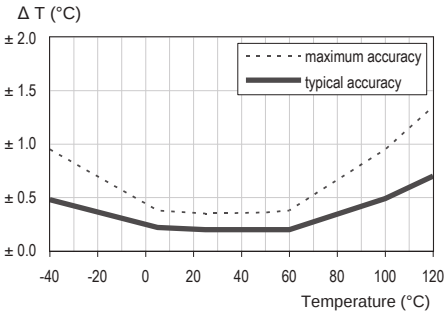



Figure 2. Maximal tolerance for temperature sensor in °C.

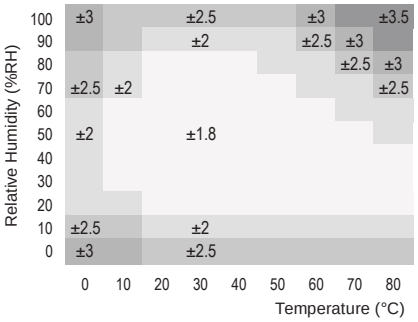



Figure 3. Typical accuracy of relative humidity measurements given in %RH for temperatures between 0 – 80°C.

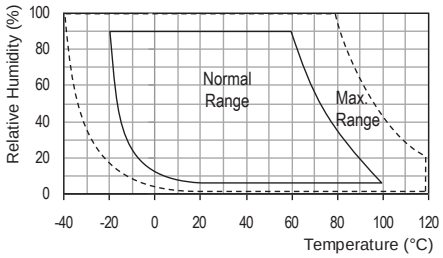



Figure 4. Operating Conditions

### Operating Range

The sensor works stable within recommended Normal Range – see Figure 4. Long term exposure to conditions outside Normal Range, especially at humidity >80%RH, may temporarily offset the RH signal (+3%RH after 60h). After return into the Normal Range it will slowly return towards calibration state by itself. Prolonged exposure to extreme conditions may accelerate aging.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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Visit us on the web at www.monnit.com.

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MOTION DETECTION

# Wireless Motion Detection Sensor

## General Description

The ALTA wireless motion detection sensor uses an infrared sensor to accurately detect movements made by people/animals within 15 ft (4.5 m) range.

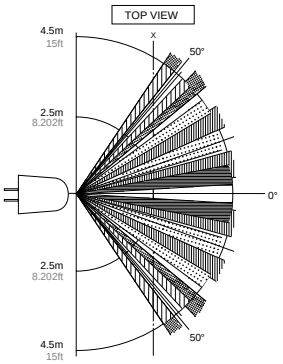
## Features

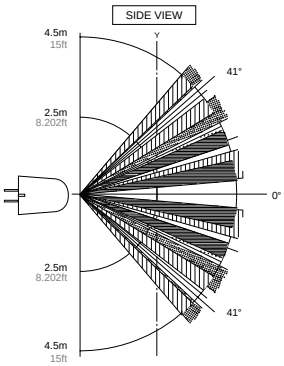
- Software adjustable range (15 ft / 12 ft / 9 ft)

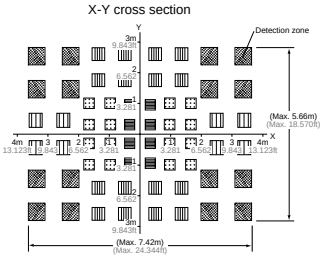
Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

## Principle of Operation

The Wireless Motion Detection Sensor detects motion and movement using infrared technology. When the sensor detects movement it communicates with the iMonnit Online Sensor Monitoring and Notification System. iMonnit stores all data in the online system where the data can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user when motion has been detected.




1. The X-Y cross-sectional diagram shows the detection area.
2. The differences in the detection zone patterns are indicative of the projections of the 16 lenses with single focal point and with five optical axes. An object whose temperature differs from the background temperature and which crosses inside the detection zone will be detected.

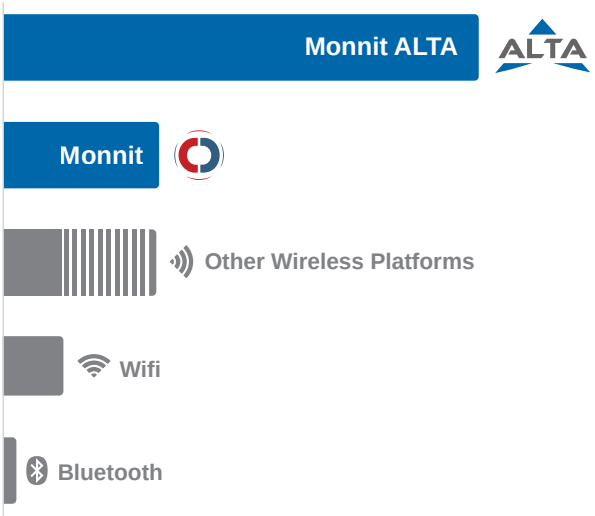
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.

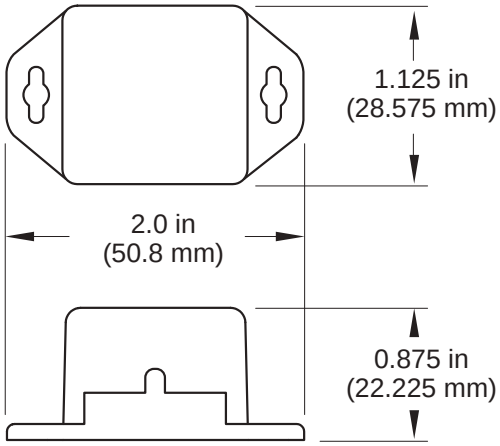
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison




## Example Applications

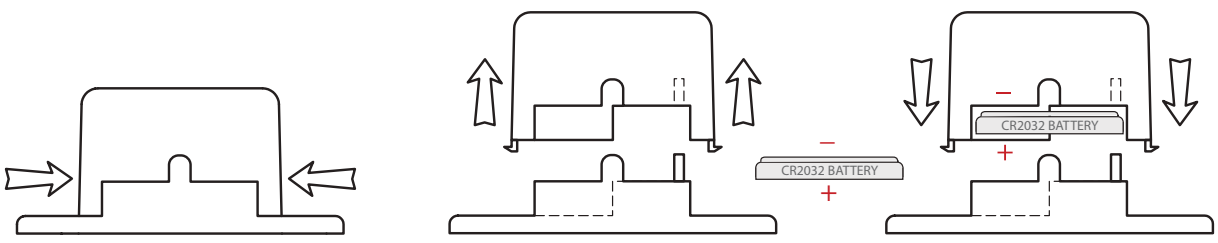
- Monitor area access.
- Detect when people enter a room.
- And many more...




| ALTA Commercial Coin Cell Wireless Motion Detection Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 1.0 µA (Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Software Adjustable Sensor Detection Range | 15 ft (4.5 m) / 12 ft (3.7 m) / 9 ft (2.7 m) |
| PIR Element Current Consumption | 3 µA |
| Sensor Warmup Time | 7 Seconds |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

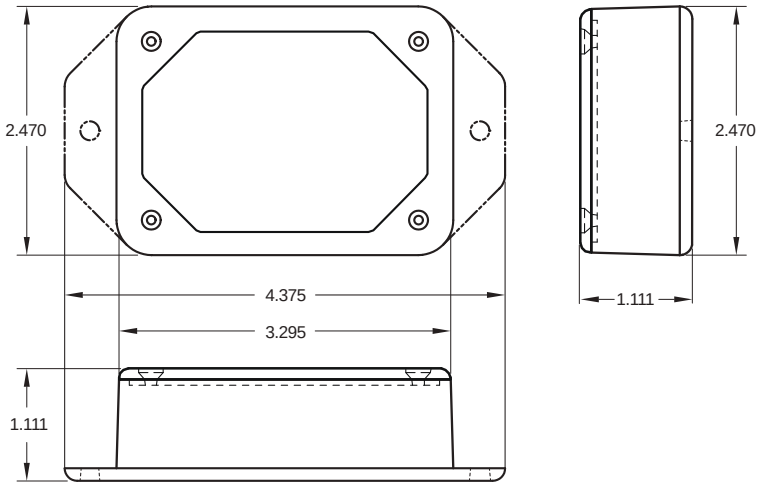
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Motion Detection Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 1.0 µA (Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Software Adjustable Sensor Detection Range | 15 ft (4.5 m) / 12 ft (3.7 m) / 9 ft (2.7 m) |
| PIR Element Current Consumption | 3 µA |
| Sensor Warmup Time | 7 Seconds |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA by MONNIT

The Leading Enterprise Internet of Things Solution

0-500 VOLT

VOLTAGE METER

# Wireless 500 VAC/VDC Voltage Meters

## General Description

The Wireless 500 VAC/VDC Voltage Meter is an analog measuring device that reports the measured voltage on user specified intervals. The sensor has three operating modes, in which you can obtain the voltage measurement in VACrms (root mean squared), the peak voltage, or the DC voltage. The modes can be set by the user; the default mode measures VACrms.

- Wireless interface for measuring voltage.
- Measures voltage up to 500 VAC/VDC

Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

## Principle of Operation

By connecting the leads on the Monnit Wireless 500 VAC/VDC Voltage Meter to the positive and ground terminals of another device, battery or sensor, it can measure the voltage and send data to the iMonnit Online Sensor Monitoring and Notification System. The data is stored in the online system and can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user when certain thresholds have been met or exceeded.

## Example Applications

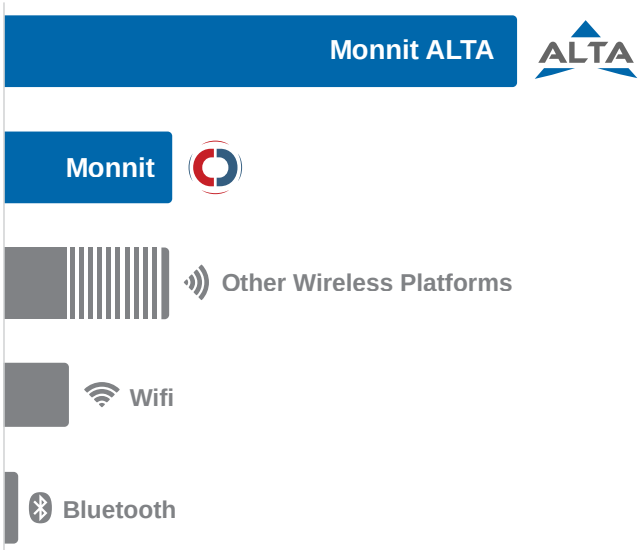
- Power Lines
- Machinery
- Electrical Motors
- Generators
- And many more...

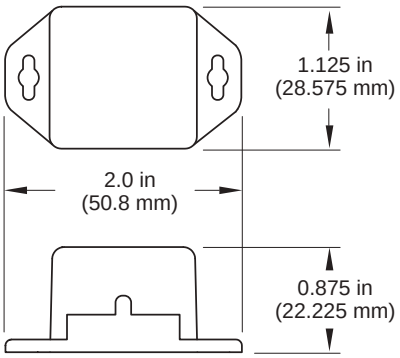
## Features of Monnit ALTA Sensors

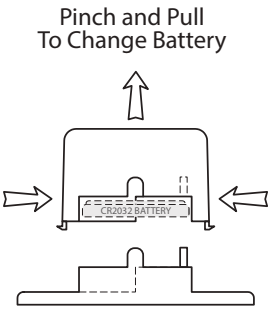
- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison



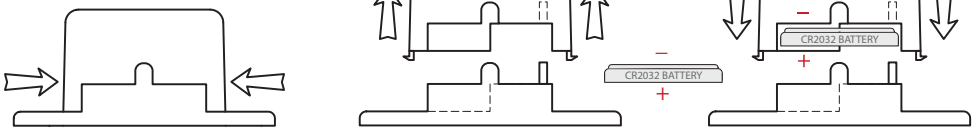



| Wireless 500 VAC/VDC Voltage Meter (Coin Cell) - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.6 VDC * |
| Current Consumption | 0.7 µA (sleep mode)<br>2 mA (radio idle/off mode)<br>2 mA (measurement mode)<br>25 mA (radio RX mode)<br>35 mA (radio TX mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F )** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Sensor Resolution | 11 bit (single ended) |
| Conversion Time | 228 µs |
| Supported Operation Modes *** | VACrms (root mean squared)<br>Peak Voltage<br>DC Voltage |
| Full Scale Voltage | 0 - 500 VAC/VDC **** |
| Maximum Input Voltage | 600 VAC/VDC **** |
| Accuracy | +/- 3% FS (User calibrated: +/- 1% FS) |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 1.0 oz. |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Operation mode must be specified at time of purchase.
**** If application exceeds 500 VAC/VDC the sensor will return a maximum reading of 500 V.

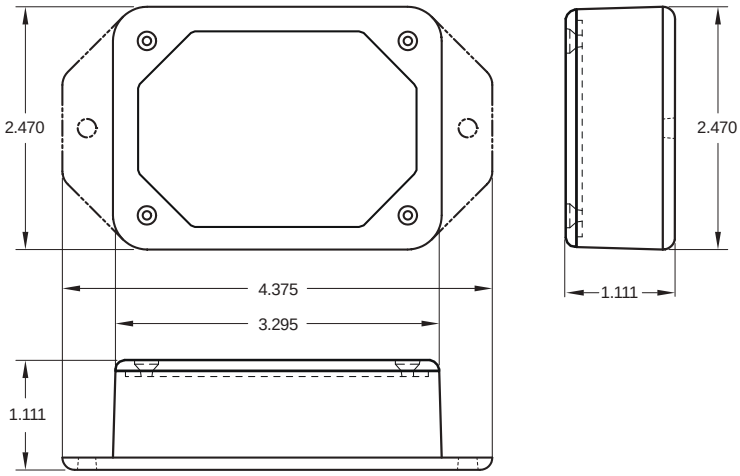
## PinchPower™ Enclosure




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)



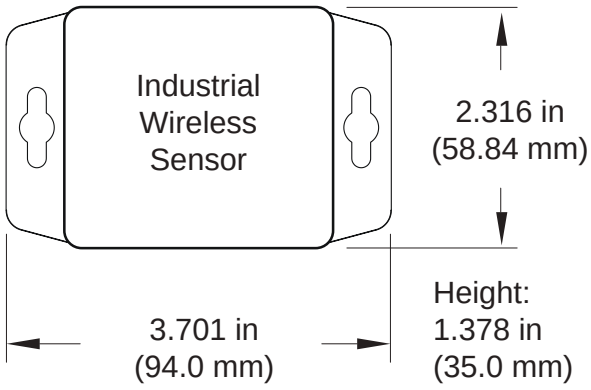

| ALTA Wireless 500 VAC/VDC Voltage Meter (AA) - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.6 VDC (3.0 - 3.6 VDC Using Power Supply) * |
| Current Consumption | 0.7 µA (sleep mode)<br>2 mA (radio idle/off mode)<br>2 mA (measurement mode)<br>25 mA (radio RX mode)<br>35 mA (radio TX mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Sensor Resolution | 11 bit (single ended) |
| Conversion Time | 228 µs |
| Supported Operation Modes *** | VACrms (root mean squared)<br>Peak Voltage<br>DC Voltage |
| Full Scale Voltage | 0 - 500 VAC/VDC **** |
| Maximum Input Voltage | 600 VAC/VDC **** |
| Accuracy | +/- 3% FS (User calibrated: +/- 1% FS) |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 4.0 oz. |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Operation mode must be specified at time of purchase.
**** If application exceeds 500 VAC/VDC the sensor will return a maximum reading of 500 V.

## Power Options

Two replaceable 1.5V AA sized batteries are included with the stanadard model. A line-power version with battery backup is also available - allowing it to be powered by a standard 3.0 - 3.6V power supply and use the internal batteries if there is a power interruption.

Power options must be selected at time of purchase as the internal hardware of the sensor must be changed to support the selected power requirements.

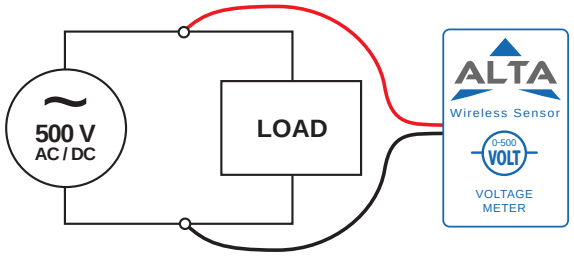



| ALTA Industrial Wireless 500 VAC/VDC Voltage Meter - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Sensor Resolution | | 11 bit (single ended) |
| Conversion Time | | 228 µs |
| Supported Operation Modes *** | | VACrms (root mean squared)<br>Peak Voltage<br>DC Voltage |
| Full Scale Voltage | | 0 - 500 VAC/VDC **** |
| Maximum Input Voltage | | 600 VAC/VDC **** |
| Accuracy | | +/- 3% FS (User calibrated: +/- 1% FS) |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Operation mode must be specified at time of purchase.
**** If application exceeds 500 VAC/VDC the sensor will return a maximum reading of 500 V.

## Proper Installation

IIf the sensor is not connected to the power source properly, it will appear that the sensor is broken.  Please follow this wiring diagram to ensure proper performance and detection.




## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures.  Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

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The Leading Enterprise Internet of Things Solution

RTD HIGH TEMPERATURE

# Wireless High Temperature Sensors

## General Description

The ALTA Wireless High Temperature Sensor uses a glass coated platinum RTD sensor to accurately measure temperatures from -50°C to +370°C (-58°F to 700°F).

- Standard accuracy at 0°C: +/- 3.3°C
- Calibrated accuracy at 0°C: +/- 0.5°C
- RTD temperature range: -50°C to +370°C (-58°F to 700°F)

## Principle of Operation

The ALTA Wireless High Temperature Sensor outputs the ambient temperature in degrees Celsius or Fahrenheit. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, power up the RTD sensor and wait for it to stabilize then mathematically compute the temperature and transmit the data to the gateway.

Industry leading 25 month NIST certified product included on leaded temperature sensors.

⚠ The ALTA High Temperature Sensor is not meant for wet, damp, high humidity environments. This sensor should only be operated in dry, low humidity environments. Should you need a temperature sensor that operates at extreme temperatures and can withstand getting wet or condensed on, please consider our Thermocouple Sensors.

## Example Applications

- Heaters & boilers
- Ovens & cooking devices
- Environmental monitoring
- Smart machines & smart structures
- HVAC operation & testing
- Many additional applications

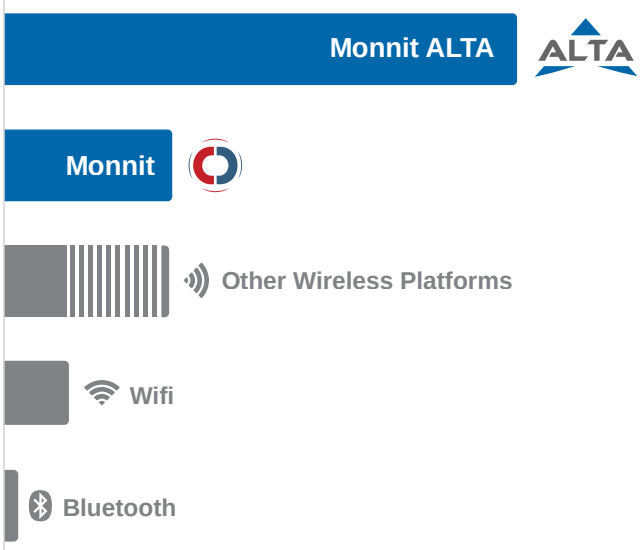
## Features of Monnit ALTA Sensors

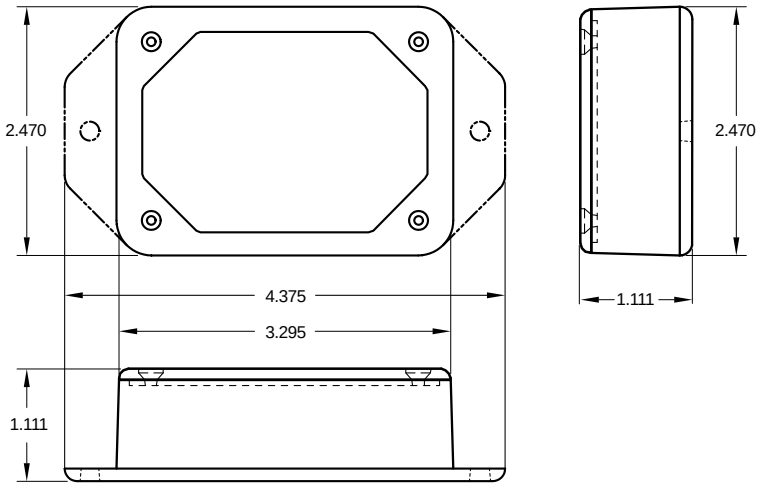
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial AA Wireless High Temperature Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| RTD temperature range (RTD and cable only) | -50°C to +370°C (-58°F to +700°F) |
| Accuracy @ 0°C | +/- 3.3°C Standard (+/- 0.5°C Calibrated) ** |
| Dissipation constant | 2mW/°C |
| Thermal time constant | 15 sec max |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

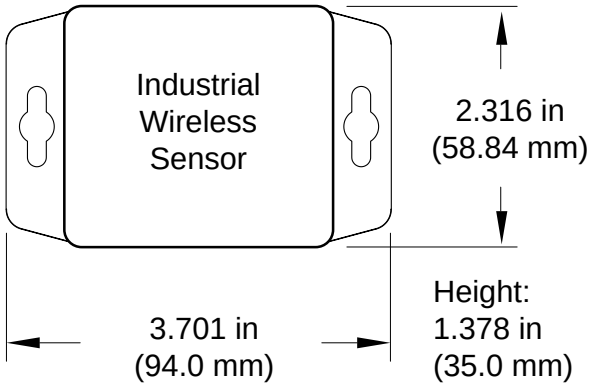
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** See RTD accuracy chart on last page.
*** The ALTA High Temperature sensor is not meant for wet, damp, high humidity environments.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless High Temperature Sensor \| Technical Specifications+ | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation ** |
| RTD temperature range (RTD and cable only) | | -50°C to +370°C (-58°F to +700°F) |
| Accuracy @ 0°C | | +/- 3.3°C Standard (+/- 0.5°C Calibrated) *** |
| Dissipation constant | | 2mW/°C |
| Thermal time constant | | 15 sec max |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.
*** See RTD accuracy chart on last page.
**** The ALTA Temperature sensor is not meant for wet, damp, high humidity environments.

| RTD Accuracy | | |
|---|---|---|
| Temperature (°C) | Accuracy (±°C) | |
| | Uncalibrated | Calibrated |
| - 50°C | 3.55 | 0.75 |
| - 30°C | 3.45 | 0.65 |
| - 10°C | 3.35 | 0.55 |
| 0°C | 3.30 | 0.50 |
| 10°C | 3.35 | 0.55 |
| 30°C | 3.45 | 0.65 |
| 50°C | 3.55 | 0.75 |
| 70°C | 3.65 | 0.85 |
| 90°C | 3.75 | 0.95 |
| 110°C | 3.85 | 1.05 |
| 130°C | 3.95 | 1.15 |
| 150°C | 4.05 | 1.25 |
| 170°C | 4.15 | 1.35 |
| 190°C | 4.25 | 1.45 |
| 210°C | 4.35 | 1.55 |
| 230°C | 4.45 | 1.65 |
| 250°C | 4.55 | 1.75 |
| 270°C | 4.65 | 1.85 |
| 290°C | 4.75 | 1.95 |
| 310°C | 4.85 | 2.05 |
| 330°C | 4.95 | 2.15 |
| 350°C | 5.05 | 2.25 |
| 370°C | 5.15 | 2.35 |

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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RTD LOW TEMPERATURE

# Wireless Low Temperature Sensors

## General Description

The ALTA Wireless Low Temperature Sensor uses a glass coated platinum RTD sensor to accurately measure temperatures from -200°C to +162°C (-328°F to +325°F).

- Standard accuracy at 0°C: +/- 3.3°C
- Calibrated accuracy at 0°C: +/- 0.5°C
- Temperature range: -200°C to +162°C (-328°F to +325°F)

## Principle of Operation

The ALTA Wireless Low Temperature Sensor outputs the ambient temperature in degrees Celsius or Fahrenheit. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, power up the RTD sensor and wait for it to stabilize then mathematically compute the temperature and transmit the data to the gateway.

## Example Applications

- Freezers & coolers
- Environmental monitoring
- Smart machines & smart structures
- HVAC operation & testing
- Many additional applications

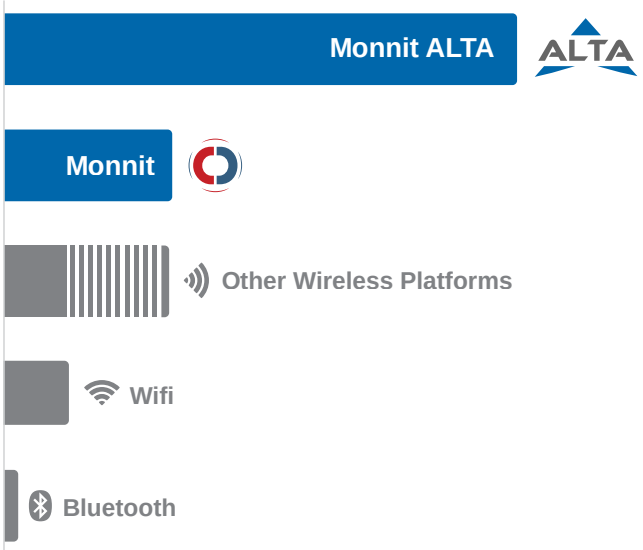
## Features of Monnit ALTA Sensors

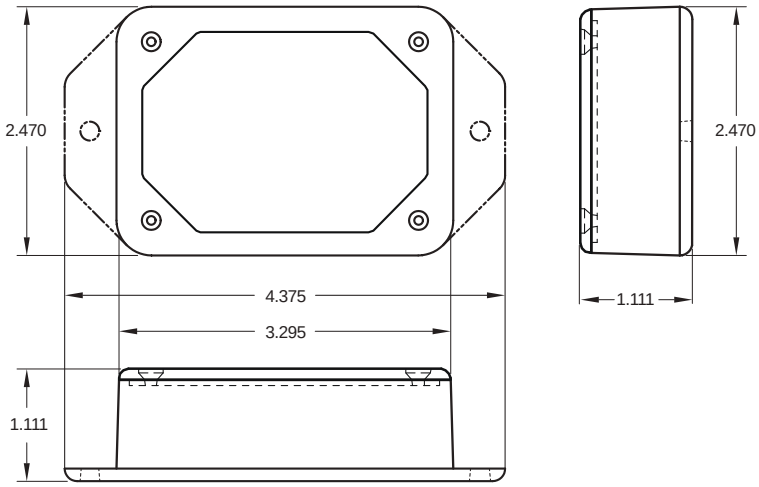
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial AA Wireless Low Temperature Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| RTD temperature range (RTD and cable only) | -200°C to +162°C (-328°F to +325°F) |
| Accuracy @ 0°C | +/- 3.3°C Standard (+/- 0.5°C Calibrated) *** |
| Dissipation constant | 2mW/°C |
| Thermal time constant | 15 sec max |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

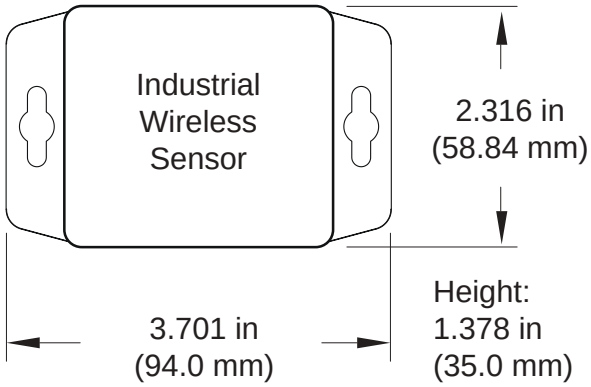
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** See RTD accuracy chart on last page.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Low Temperature Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| RTD temperature range (RTD and cable only) | | -200°C to +162°C (-328°F to +325°F) |
| Accuracy @ 0°C | | +/- 3.3°C Standard (+/- 0.5°C Calibrated) **** |
| Dissipation constant | | 2mW/°C |
| Thermal time constant | | 15-sec max |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.
**** See RTD accuracy chart on last page.

| RTD Accuracy | | |
|---|---|---|
| Temperature (°C) | Accuracy (±°C) | |
| | Uncalibrated | Calibrated |
| -200°C | 4.30 | 1.50 |
| -180°C | 4.20 | 1.40 |
| -160°C | 4.10 | 1.30 |
| -140°C | 4.00 | 1.20 |
| -120°C | 3.90 | 1.10 |
| -100°C | 3.80 | 1.00 |
| -80°C | 3.70 | 0.90 |
| -60°C | 3.60 | 0.80 |
| -40°C | 3.50 | 0.70 |
| -20°C | 3.40 | 0.60 |
| 0°C | 3.30 | 0.50 |
| 20°C | 3.40 | 0.60 |
| 40°C | 3.50 | 0.70 |
| 60°C | 3.60 | 0.80 |
| 80°C | 3.70 | 0.90 |
| 100°C | 3.80 | 1.00 |
| 120°C | 3.90 | 1.10 |
| 140°C | 4.00 | 1.20 |
| 160°C | 4.10 | 1.30 |

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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SINGLE-INPUT PULSE COUNTER

# Wireless Pulse Counter - Single Input

## General Description

The ALTA wireless pulse counter can be connected to the pulse output of a system (water meter, power meter, etc.) to count the number of actuations within a given time frame.

- Counts the number of pulses in given time frame, or aggregates pulses in an ongoing accumulation.
- 3 filter settings: No filter, 4 Hz filter, and 40 Hz filter.
- Capable of counting passive (open/closed switch) and active (Up to +15 VDC) pulses.
- Capable of counting the positive edge, negative edge, or both edges of a pulse.

## Principle of Operation

The ALTA wireless pulse counter is an electronic counter capable of counting passive(open/closed switch) or active (Up to +15 VDC) pulses. The counter includes 3 software configurable low pass filter settings (No filter, 40 Hz filter, or 4 Hz filter). The pulse counter filters pulses with pulse widths greater than those designated in the technical specifcations. For example, if the 4Hz filter is set, the pulse counter will count a pulse if the pulse width is longer than 250 ms, if the pulse width is shorter than 250 ms it will be completely or partially filtered (See the Technical Specification table for detailed filtering information). The sensor can be set to send an alert through the iMonnit Online Sensor Monitoring and Notification System when a given number of pulses have been reached within a set time frame. Alerts from the iMonnit system are sent as they happen (in real time) via SMS text or email.

## Example Applications

- Water, gas and air flow meters
- Door access counter
- Turn style counting
- Forklift seat switches
- Button or switch integration
- Production line tracking
- Many additional applications

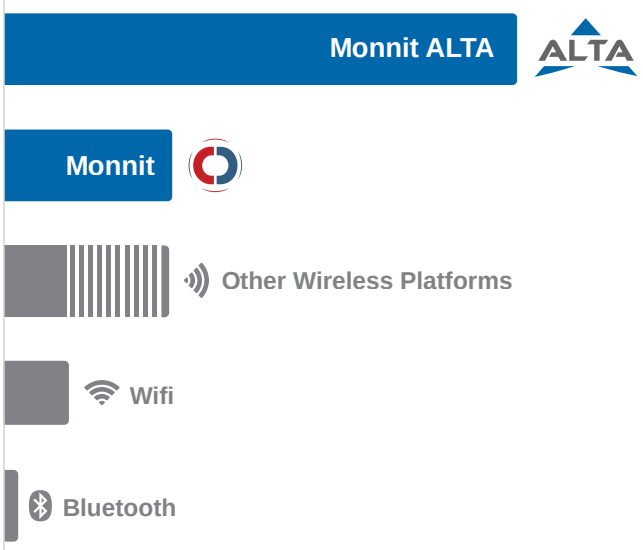
## Features of Monnit ALTA Sensors

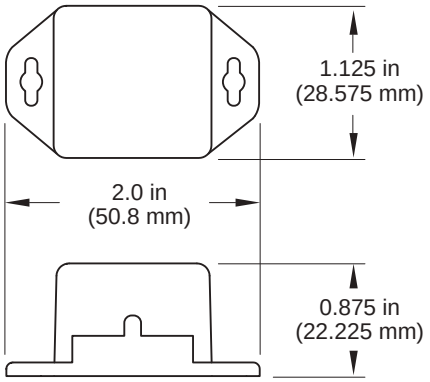
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

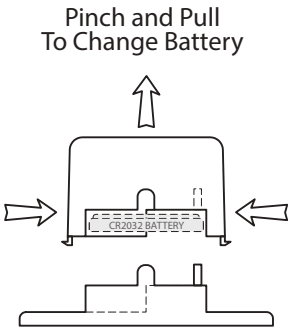
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison



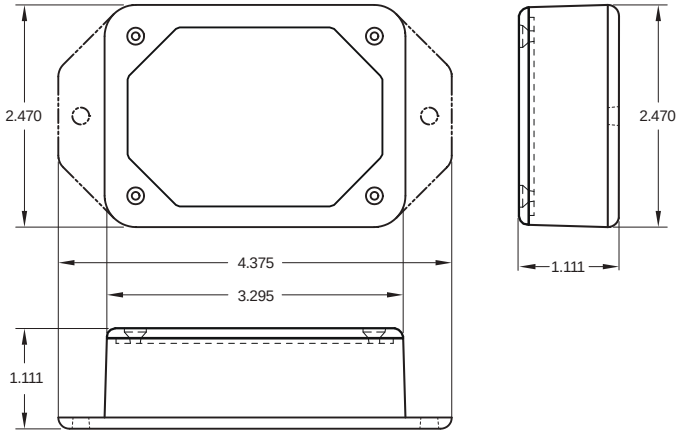



**PinchPower™ Enclosures**




| ALTA Commercial Coin Cell Wireless Pulse Counter \| Technical Specifications | | | |
|---|---|---|---|
| Supply voltage | 2.0–3.8 VDC * | | |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) | | |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** | | |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) | | |
| Maximum count | 4294967296 (32 bit number) | | |
| Input voltage | 0 to 15 Volts DC | | |
| Detection wires | High impedance (2-wire), 3 ft length | | |
| Counter operation | Positive and/or negative edge pulses | | |
| Compatibility | Open collector NPN switches (passive)<br>Mechanical switches (passive)<br>0–15V driven source (active)*** | | |
| Max input pulse rate/min pulse width with passive input **** | | Max Pulse Rate | Min Pulse Width***** |
| | No Filter | ~ 2 KHz | ~ 0.5 ms |
| | 4 Hz Filter | ~ 4 Hz | ~ 250 ms |
| | 40 Hz Filter | ~ 40 Hz | ~ 25 ms |
| Integrated memory | Up to 512 sensor messages | | |
| Wireless range | 1,200+ ft non-line-of-sight | | |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) | | |
| Weight | 0.7 ounces | | |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 | | |

* Hardware cannot withstand negative voltage. Take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Low Pulse: 0 Volts to 0.2 * VBatt, High Pulse: 0.8 * VBatt to 15 Volts.
**** High pulse count rates can impact battery life. AA battery powered sensors are recommended if counting pulses faster than 1x per second.
***** Input pulse rate must be less than specified Max Pulse Rate and input pulse width must be greater than specified Min Pulse Width to ensure the input pulse is counted.

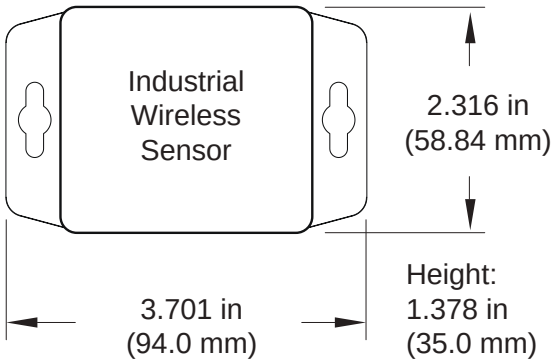



| ALTA Commercial AA Wireless Pulse Counter \| Technical Specifications | | | |
|---|---|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * | | |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) | | |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** | | |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) | | |
| Maximum count | 4294967296 (32 bit number) | | |
| Input voltage | 0 to 15 Volts DC | | |
| Detection wires | High impedance (2-wire), 3 ft length | | |
| Counter operation | Positive and/or negative edge pulses | | |
| Compatibility | Open collector NPN switches (passive)<br>Mechanical switches (passive)<br>0–15V driven source (active)*** | | |
| Max input pulse rate/min pulse width with passive input **** | | Max Pulse Rate | Min Pulse Width***** |
| | No Filter | ~ 2 KHz | ~ 0.5 ms |
| | 4 Hz Filter | ~ 4 Hz | ~ 250 ms |
| | 40 Hz Filter | ~ 40 Hz | ~ 25 ms |
| Integrated memory | Up to 512 sensor messages | | |
| Wireless range | 1,200+ ft non-line-of-sight | | |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) | | |
| Weight | 0.7 ounces | | |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 | | |

* Hardware cannot withstand negative voltage. Take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Low Pulse: 0 Volts to 0.2 * VBatt, High Pulse: 0.8 * VBatt to 15 Volts.
**** High pulse count rates can impact battery life. AA battery powered sensors are recommended if counting pulses faster than 1x per second.
***** Input pulse rate must be less than specified Max Pulse Rate and input pulse width must be greater than specified Min Pulse Width to ensure the input pulse is counted.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase). This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage. Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




## ALTA Industrial Wireless Pulse Counter | Technical Specifications

| | | | | |
|---|---|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * | | |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) | | |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) | | |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) | | |
| | Capacity | 1500 mAh | | |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) | | |
| | Charging temperature range | 0° to 45°C (32° to 113°F) | | |
| | Max temperature range | -20° to 60°C (-4° to 140°F) | | |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) | | |
| | Solar efficiency | Optimized for high and low-light operation *** | | |
| | Charging efficiency | 5% ** | | |
| | Luminous sustainability | Minimum of 10,000 LUX ** | | |
| Maximum count | | 4294967296 (32 bit number) | | |
| Input voltage | | 0 to 15 Volts DC | | |
| Detection wires | | High impedance (2-wire), 3 ft length | | |
| Counter operation | | Positive and/or negative edge pulses | | |
| Compatibility | | Open collector NPN switches (passive), mechanical switches (passive), 0–15V driven source (active) **** | | |
| Max input pulse rate/min pulse width with passive input ***** | | | Max Pulse Rate | Min Pulse Width****** |
| | | No Filter | ~ 2 KHz | ~ 0.5 ms |
| | | 4 Hz Filter | ~ 4 Hz | ~ 250 ms |
| | | 40 Hz Filter | ~ 40 Hz | ~ 25 ms |
| Integrated memory | | Up to 512 sensor messages | | |
| Wireless range | | 1,200+ ft non-line-of-sight | | |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) | | |
| Weight | | 4.7 ounces | | |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof | | |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) | | |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 | | |

* Hardware cannot withstand negative voltage. Take care when connecting a power device.
** Solar feature's energy harvesting circuitry works indoors with low light.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.
**** Low Pulse: 0 Volts to 0.2 * VBatt, High Pulse: 0.8 * VBatt to 15 Volts.
***** High pulse count rates can impact battery life. AA battery powered sensors are recommended if counting pulses faster than 1x per second.
****** Input pulse rate must be less than specified Max Pulse Rate and input pulse width must be greater than specified Min Pulse Width to ensure the input pulse is counted.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA by MONNIT

The Leading Enterprise Internet of Things Solution

24-500 VAC

VOLTAGE DETECT

# Wireless AC Voltage Detection Sensors (24-500 VAC)

## General Description

The ALTA wireless AC voltage detection sensor can interface with other devices to detect voltage from 24 VAC to 500 VAC. The sensor notifies of the presence or absence of voltage. It is intended for use on power sources or power supplies up to 500 VAC. Not intended for voltages higher than 600 VAC and also not intended for use with DC sources without permission. Perfect for monitoring electrical appliances.

- Wireless interface for detecting voltage.
- Detects voltage from 24 to 500 VAC.

## Principle of Operation

The ALTA wireless AC voltage detection sensor can be connected to the positive and ground terminals of an electrical device or power supply line, triggering on the state change from voltage presence to absence and vice versa. The information is sent to the iMonnit Online Sensor Monitoring and Notification System where the data is displayed as either “No Voltage” or “Voltage Detected”. The data is stored in the online system and can be reviewed and exported as a spread sheet or graph. Notifications can also be set up through the online system to alert the user when certain criteria have been met.

## Example Applications

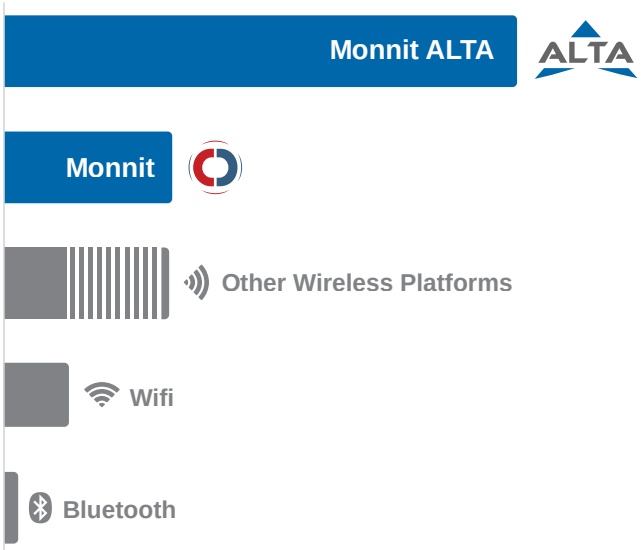
- Sprinkler Systems
- HVAC Systems
- Appliances
- Electrical Sources
- Power Couplings
- Line Power
- Power Supplies
- Sump Pumps
- And many more...

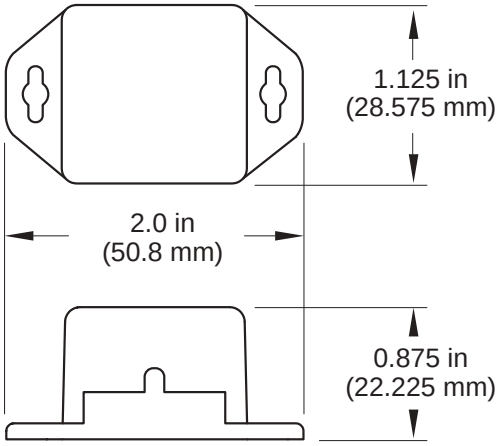
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

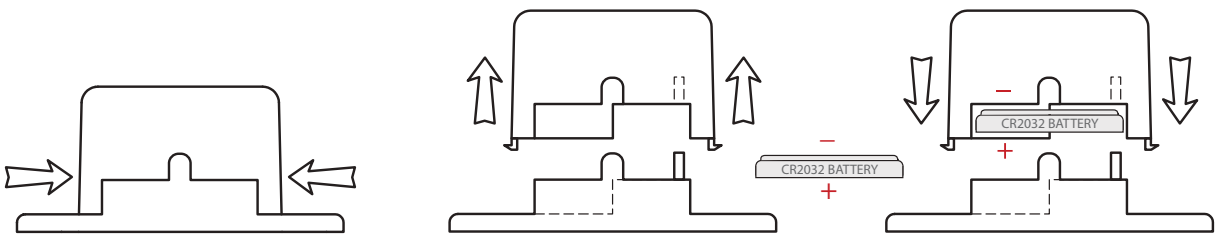





| ALTA Commercial Coin Cell Wireless AC Voltage Detection Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Sensor Resolution | 11 bit (single ended) |
| Conversion Time | 228 µs |
| Full Scale Voltage | 24 - 500 VAC |
| Maximum Input Voltage | 600 VAC *** |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Connecting to power sources over 600 volts can damage the hardware.

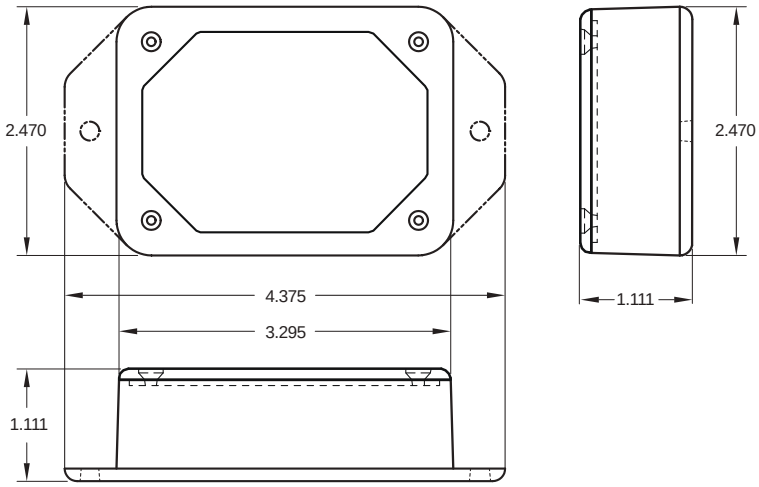
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless AC Voltage Detection Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Sensor Resolution | 11 bit (single ended) |
| Conversion Time | 228 µs |
| Full Scale Voltage | 24 - 500 VAC |
| Maximum Input Voltage | 600 VAC *** |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

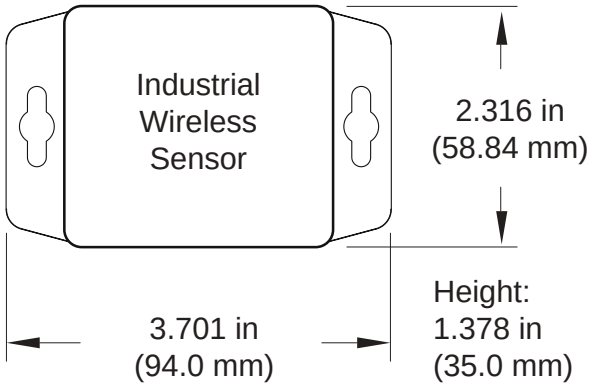
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Connecting to power sources over 600 volts can damage the hardware.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

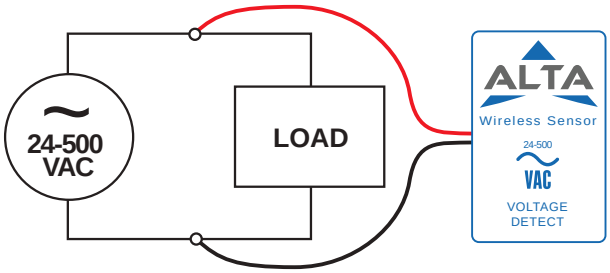



| ALTA Industrial Wireless AC Voltage Detection Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Sensor Resolution | | 11 bit (single ended) |
| Conversion Time | | 228 µs |
| Full Scale Voltage | | 24 - 500 VAC |
| Maximum Input Voltage | | 600 VAC *** |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Connecting to power sources over 600 volts can damage the hardware.

## Proper Installation:

If the sensor is not connected to the power source properly, it will appear that the sensor is broken. Please follow this wiring diagram to ensure proper performance and detection.




## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

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0-10 VDC

0-10 VOLT METER

# Wireless 0-10 VDC Voltage Meters

## General Description

The ALTA Wireless Voltage Meter measures the voltage between two electrical points. It can be connected to the power and ground of any voltage source and measure within stated accuracy up to 10 VDC. It can be connected to any kind of variable voltage device, such as a transducer or sensor that outputs voltage. If the device to be measured is passive, the user must supply their own excitation voltage to the device.

- Accurate to ± 3.0% full scale (FS) of voltage range
- Accurate to ± 0.5% FS with user calibration
- Interfaces with any variable-voltage device
- 5 mV resolution

## Principle of Operation

ALTA Wireless Voltage Meters read the voltage difference between two electrical points and reports back the measured voltage. It is programmed to sleep for a user-given time interval (heartbeat) and then wake up, convert the analog data, mathematically compute the voltage, and transmit the data to the gateway, where it is then logged into a cloud service. The user can configure defined thresholds and have the system alert on threshold breaches.

## Example Applications

- Battery Health
- Voltage Measurement
- Transducer Measurement
- Machinery
- Electrical Motors
- Many additional applications

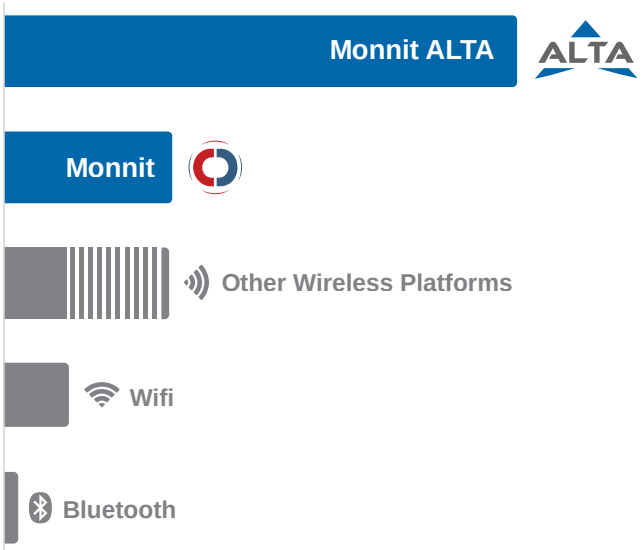
## Features of Monnit ALTA Sensors

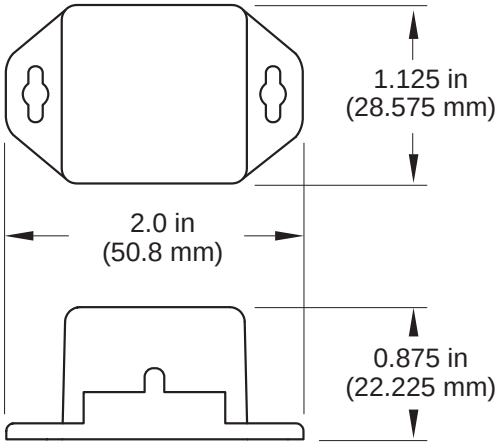
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- All ALTA sensors now have up to 3200 readings:
  - 10-minute heartbeats = 22 days
  - 2-hour heartbeats = 266 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

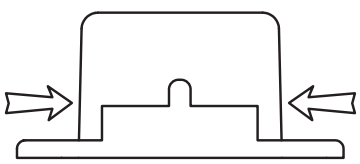




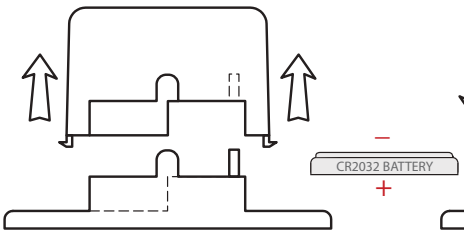

| ALTA Commercial Coin Cell Wireless 0-10 VDC Voltage Meter \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Voltage Range | 0–10 Volts DC *** |
| Resolution | ~5 mV |
| Accuracy | +/- 3.0% FS |
| User-calibrated accuracy | +/- 0.5% FS **** |
| Open Circuit Voltage | ~0.00 Volts |
| Max Rated Input | 250K Volts |
| Lead wire length | 2 Wires, 1 ft (12 in), Red (+), Black (-), 18 AWG (Custom lengths available upon request) |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 ounces |
| Certifications | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** The sensor is capable of measuring above 10 volts but may not meet the specified accuracy above this value.
**** For best results calibrate at a voltage between 50% and 90% of the voltage range.

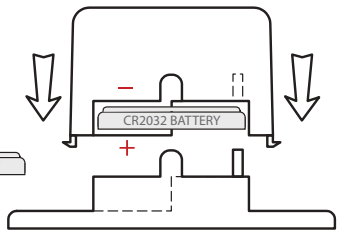
## PinchPower™ Enclosures



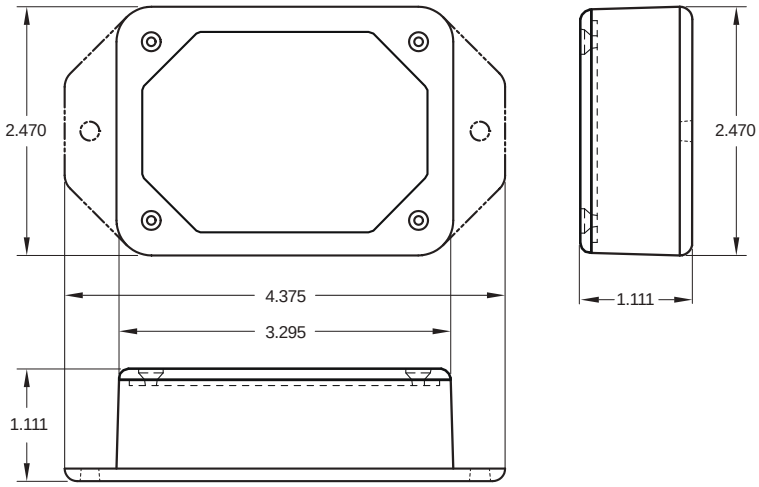
**Pinch**
(press in on the sides)




**Pull**
(sensor away from base)




**Press**
(sensor back into base)

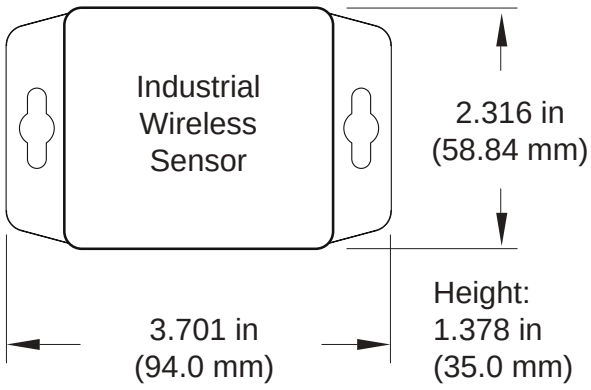



| ALTA Commercial AA Wireless 0-10 VDC Voltage Meter \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Voltage Range | 0–10 Volts DC *** |
| Resolution | ~5 mV |
| Accuracy | +/- 3.0% FS |
| User-calibrated accuracy | +/- 0.5% FS **** |
| Open Circuit Voltage | ~0.00 Volts |
| Max Rated Input | 250K Volts |
| Lead wire length | 2 Wires, 1 ft (12 in), Red (+), Black (-), 18 AWG<br>(Custom lengths available upon request) |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** The sensor is capable of measuring above 10 volts but may not meet the specified accuracy above this value.
**** For best results calibrate at a voltage between 50% and 90% of the voltage range.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase). This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage. Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

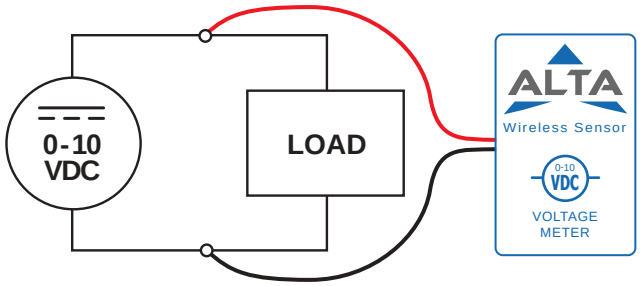



| ALTA Industrial Wireless 0-10 VDC Voltage Meter \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Voltage Range | | 0–10 Volts DC**** |
| Resolution | | ~5 mV |
| Accuracy | | +/- 3.0% FS |
| User-calibrated accuracy | | +/- 0.5% FS ***** |
| Open Circuit Voltage | | ~0.00 Volts |
| Max Rated Input | | 250K Volts |
| Lead wire length | | 2 Wires, 1 ft (12 in), Red (+), Black (-), 18 AWG (Custom lengths available upon request) |
| Integrated memory | | Up to 3200 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.
**** The sensor is capable of measuring above 10 volts but may not meet the specified accuracy above this value.
***** For best results calibrate at a voltage between 50% and 90% of the voltage range.

## Proper Installation

If the sensor is not connected to the power source properly, it will appear that the sensor is broken. Please follow this wiring diagram to ensure proper performance and detection.




## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

WATER ROPE

# Wireless Water Rope Sensors

## General Description

The ALTA Wireless Water Rope Sensor detects the presence of water anywhere along the surface of the rope. Sensor comes with 10 feet of water rope. Additional 10 ft sections are available and can be connected up to 100 feet.

- 10 ft lead and 10 ft water detection rope
- Immediately detects water anywhere along rope
- Expandable up to 100 ft of detection rope

## Principle of Operation

The ALTA Wireless Water Rope Sensor detects conductive liquids anywhere along the length of the detection rope by using two wires covered with conducting polymer. When water or conductive liquid contacts the rope, the sensor will immediately turn on the RF radio and transmit the data to the wireless gateway and iMonnit Online Sensor Monitoring and Notification System, allowing the user to immediately receive an alert by SMS text, email or voice call. The sensor rope dries quickly allowing the sensor to reset for next use. Detection rope can be expanded up to 100 feet by simply clicking additional 10 foot sections of detection rope together. Additional sections of water detection rope are available on the Monnit website.

## Example Applications

- Data center and server room water monitoring
- Document retention center monitoring
- Basement water monitoring
- Plumbing leak detection
- Boat bilge monitoring
- Storage monitoring
- Many additional applications

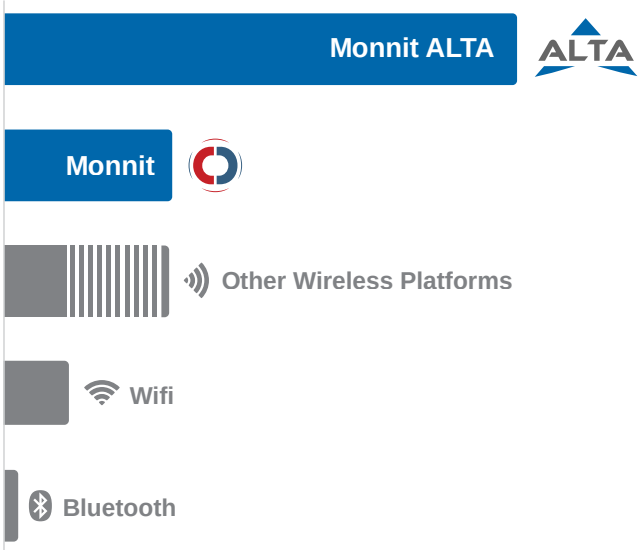
## Features of Monnit ALTA Sensors

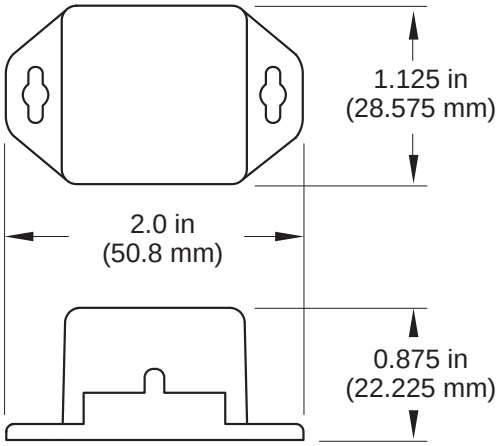
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

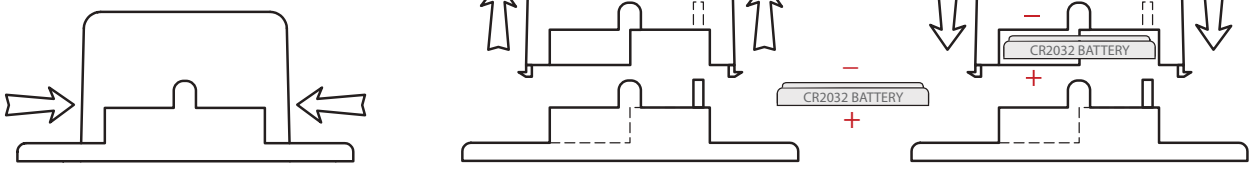





| ALTA Commercial Coin Cell Wireless Water Rope Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Water rope material | PE + alloy lead |
| Water rope maximum exposed temperature | 75°C (167°F) |
| Water rope weight | 30g/meter |
| Water rope pull force limit | 60kg |
| Water rope core resistance | 3ohm/100 meters |
| Water rope cable diameter | 5.5mm |
| Water rope cable length | 10 ft (120 in) included (expandable to 100 ft) |
| Water rope fire resistance | Second pressure plenum cable |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Sensor Weight | 0.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

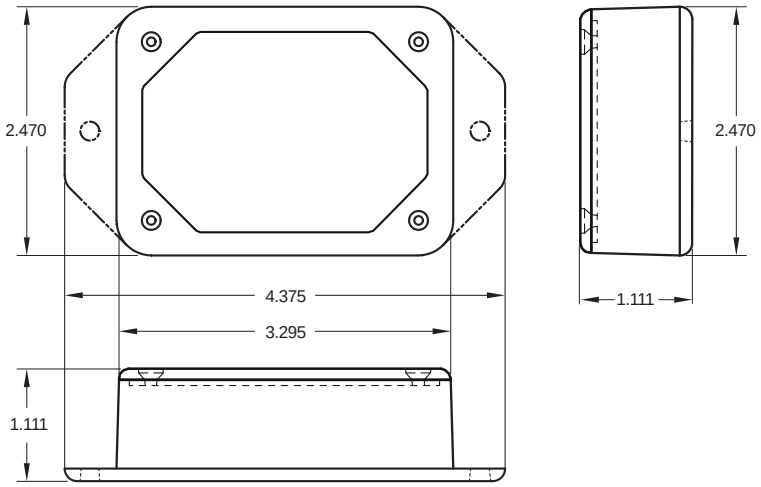
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Water Rope Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Water rope material | PE + alloy lead |
| Water rope maximum exposed temperature | 75°C (167°F) |
| Water rope weight | 30g/meter |
| Water rope pull force limit | 60kg |
| Water rope core resistance | 3ohm/100 meters |
| Water rope cable diameter | 5.5mm |
| Water rope cable length | 10 ft (120 in) included (expandable to 100 ft) |
| Water rope fire resistance | Second pressure plenum cable |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

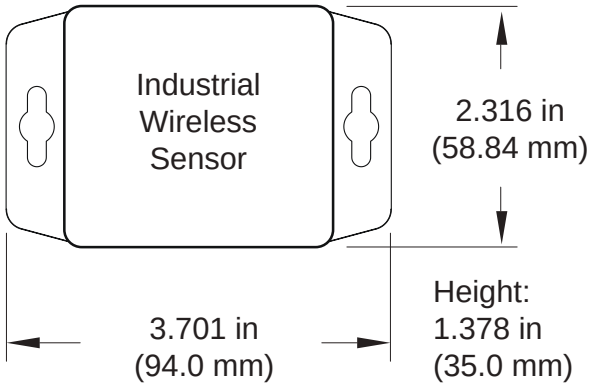
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Water Rope Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Water rope material | | PE + alloy lead |
| Water rope maximum exposed temperature | | 75°C (167°F) |
| Water rope weight | | 30g/meter |
| Water rope pull force limit | | 60kg |
| Water rope core resistance | | 3ohm/100 meters |
| Water rope cable diameter | | 5.5mm |
| Water rope cable length | | 10 ft (120 in) included (expandable to 100 ft) |
| Water rope fire resistance | | Second pressure plenum cable |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

300 PSIG PRESSURE METER

# Wireless 5V Pressure Meters

## General Description

The ALTA wireless pressure sensor measures pressure from a 5 volt pressure transducer and transmits the pressure measurement to iMonnit. This solution combines a standard pressure transducer interfaced to a Monnit ALTA wireless radio.

- Measure pressure with 50 or 300 PSIG transducers (others available upon request).
- Measure non-caustic liquid or vapor pressures.
- Pressure transducer is NEMA 4X (IP66), CE rated.

## Principle of Operation

By connecting the ALTA wireless pressure sensor to a pressurized gas, liquid or vapor supply line, it can measure the pressure within the line and send data to the iMonnit Online Sensor Monitoring and Notification System. The data is stored in the online system and can be reviewed and exported as a data sheet or graph. User customization allows you to set notifications and alerts from the system so you can know immediately if pressure is above or below an optimal range.

## Example Interfacing

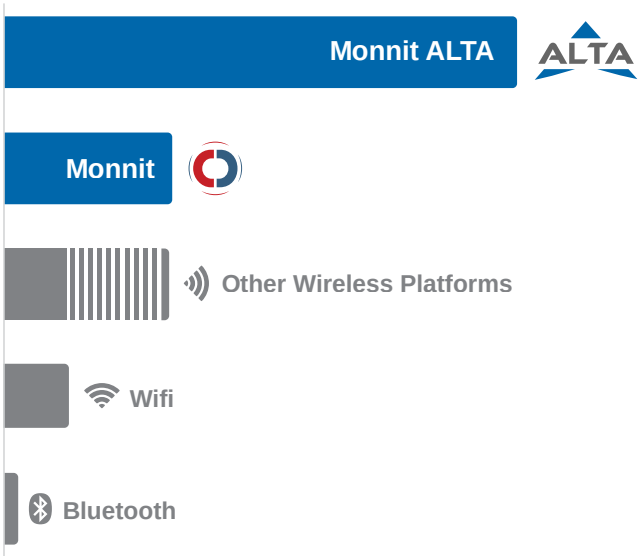
- Compressors/Compressed Air Lines
- Water Supply Lines
- Pumping Systems
- Irrigations System Pressure
- Industrial Process Monitoring
- Trash Compaction Equipment

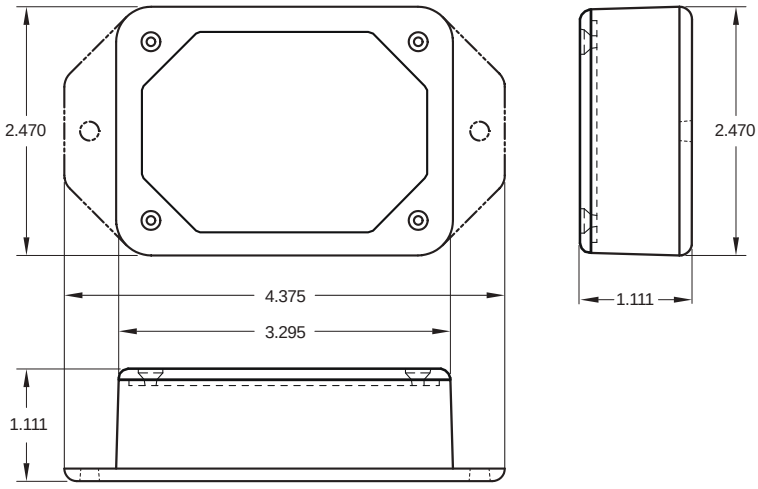
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial AA Wireless Pressure Meter - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 10.3 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

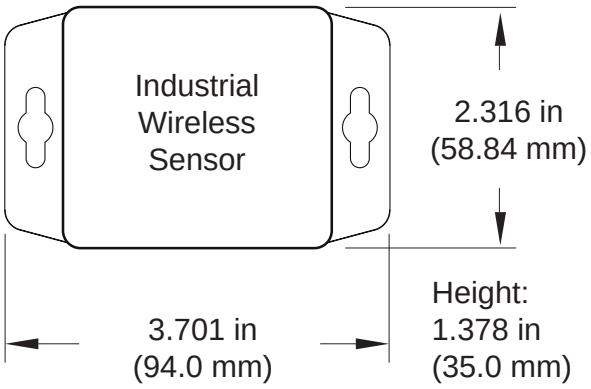
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Pressure Meter - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 13.3 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

| Pressure Transducer Specifications | |
|---|---|
| Operating Temperature | 0 to 175°F (-18 to 79°C). |
| Thermal Effect on Reading | ±0.02% FS/°F. (includes zero and span). |
| Media | Gas, Liquid or Vapor |
| Response Time | 300 msec. |
| Stability | 1.0% FS/year (Typ.). |
| Wire Length | 1 Meter |
| Accuracy | 1.0% FS; 0.5% RSS;<br>(Includes linearity, hysteresis, and repeatability) |
| Process Connection | ¼" NPT-Male Standard |
| Pressure Transducer(s) | 50 or 300 PSIG (Others available upon request) |
| **5V Transducer Interface Board Specifications** | |
| Max Voltage Output | 5.5 V |
| Typical Voltage Output | 5.0 V |
| Max Voltage Input | 0 - 15 V |
| Voltage Measurement Range | 0 - 5.2 V *** |
| Voltage Measurement Resolution | ~0.5 mV |
| Voltage Measurement Accuracy | ± (2% of reading + 1.5 mV) |
| Input Impedance | 13 kOhm |
| **Combined Specifications** | |
| Pressure Measurement Accuracy | ± (2% of reading + 1.05% FS) |
| User Calibrated Pressure Accuracy | ± (0.5% of reading + 0.5% FS) **** |

*** The sensor is capable of measuring above 5 volts but may not meet the specified accuracy above this value.
**** For best results first zero the sensor then calibrate at greater than 20% maximum pressure of the transducer.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out. (Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.). Volatile or flammable gas. Dusty conditions. Under low or high pressure. Wet or excessively humid locations. Places with salt water, oils chemical liquids or organic solvents. Where there are excessively strong vibrations. Other places where similar hazardous conditions exist.)

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555. Visit us on the web at www.monnit.com.

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DUCT TEMPERATURE

# Wireless Duct Temperature Sensors

## General Description

The ALTA Wireless Duct Temperature Sensor uses an NTC thermistor with 8 ft lead wires to accurately measure temperatures in duct work, while maintaining a sealed environment. Can be easily installed and mounted for long-term use.

- Accurate to ± 1° C (± 1.8°F)
- Increased accuracy by user calibration to ± 0.25° C (± 0.45° F)
- Probe temperature range of -40°C to +150°C (-40°F to +302°F)
- 8 ft UL listed plenum cable

## Principle of Operation

The ALTA Wireless Duct Temperature Sensor outputs the ambient temperature in degrees Fahrenheit. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, send power to the temperature probe, wait for temperature to stabilize, then transmit the temperature data to the gateway. To stay within the abilities of the processor, the temperature is computed off a data table provided by the manufacturer.

## Example Applications

- Air duct temperature monitoring
- HVAC operation & testing
- Data center monitoring
- Coolers & freezers
- Environmental monitoring
- Smart machines & smart structures
- Many additional applications

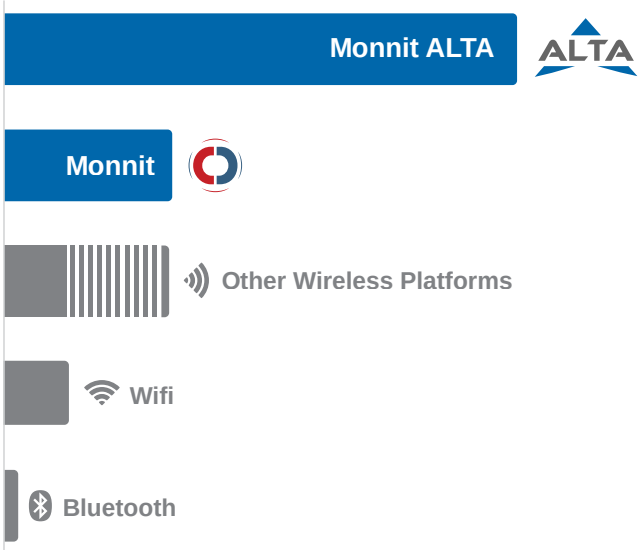
## Features of Monnit ALTA Sensors

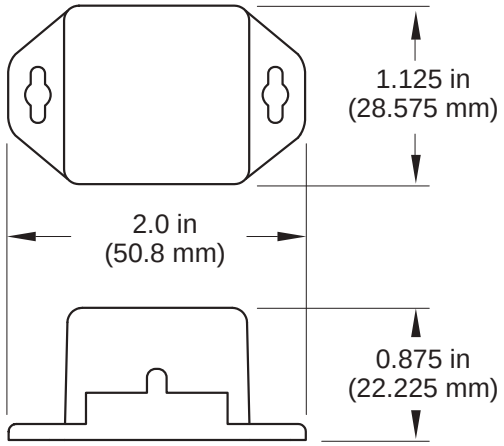
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

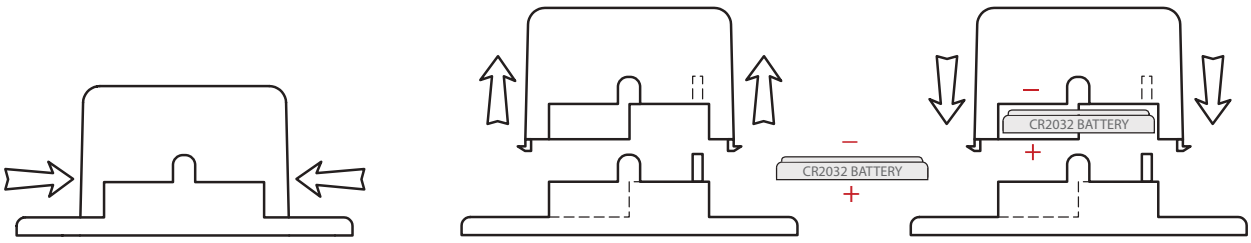





| ALTA Commercial Coin Cell Wireless Duct Temperature Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Thermistor temperature range (leaded thermistor) | -40°C to +150°C (-40°F to +302°F) |
| Accuracy @ 25°C | +/- 1° C (±1.8°F @ 77°F) |
| User-calibrated accuracy | +/- 0.25° C (±0.45°F @ 77°F) |
| Time constant @ 25°C | 30 sec. |
| Lead wire length | 8 ft (96 in) |
| Cable rating | UL listed plenum cable |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

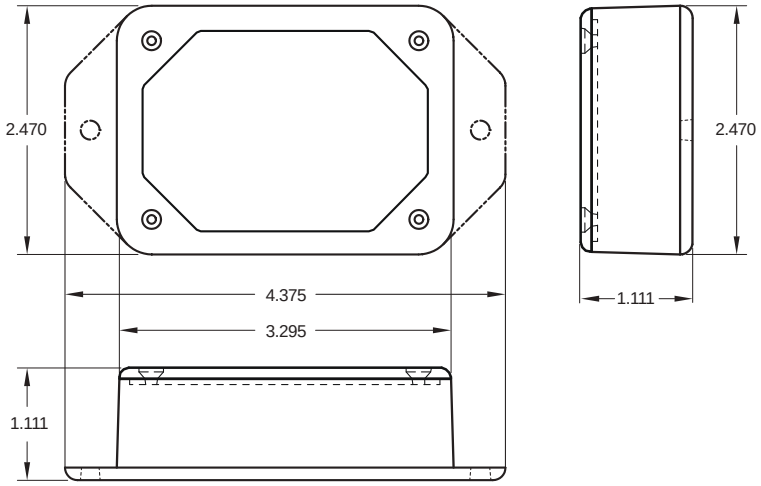
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Duct Temperature Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Thermistor temperature range (leaded thermistor) | -40°C to +150°C (-40°F to +302°F) |
| Accuracy @ 25°C | +/- 1° C (±1.8°F @ 77°F) |
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| Time constant @ 25°C | 30 sec. |
| Lead wire length | 8 ft (96 in) |
| Cable rating | UL listed plenum cable |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

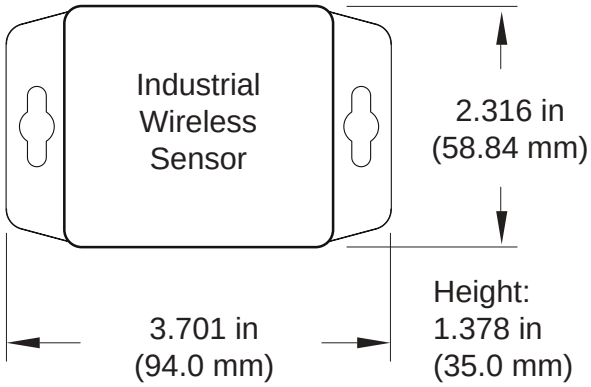
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Duct Temperature Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation ** |
| | Charging Efficiency | 40% ** |
| | Luminous Sustainability | 250 LUX ** |
| Thermistor temperature range (leaded thermistor) | | -40°C to +150°C (-40°F to +302°F) |
| Accuracy @ 25°C | | +/- 1° C (±1.8°F @ 77°F) |
| User-calibrated accuracy | | +/- 0.25° C (±0.45°F @ 77°F) |
| Time constant @ 25°C | | 30 sec. |
| Lead wire length | | 8 ft (96 in) |
| Cable rating | | UL listed plenum cable |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** Solar feature's energy harvesting circuitry works indoors with low light.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

AC CURRENT METER

# Wireless 500 Amp AC Current Meters

## General Description

The ALTA wireless AC Current Meter measures the RMS current of an alternating current (AC) system using a current transformer (CT) that wraps around the “hot” wire of a two wire (hot, common, ground(optional)) power system. The sensor reports Minimum RMS current, maximum RMS current, average RMS current, and amp hours to the iMonnit system. The iMonnit system is capable of generating watt hour or kilowatt hour readings as well.

- Measures amp hours, max RMS current, min RMS current, and average RMS current
- Three different current transducers available:
  - Low Current: 0-20 amp
  - Medium Current: 0-150 amp
  - High Current: 0-500 amp
- Capable of generating watt hour or kilowatt hour readings using iMonnit
- Data logging for accumulated amp hour readings
- Can notify based on current levels or changes in current levels
- Simple and safe installation of current/power measurement hardware, no rewiring required

## Principle of Operation

To measure current, clip the CT around only a single wire of the AC system (clipping around a hot and neutral wire at the same time will result in 0 current readings). After the sensor powers on and connects to the gateway it will begin taking measurements based on the averaging interval (5 seconds default). It will report data to iMonnit every heartbeat or if the current goes outside of the aware thresholds set in iMonnit. The sensor reports amp hours, max RMS current, min RMS current, and average RMS current. iMonnit can also generate watt hour or kilowatt hour readings if a default RMS voltage is set in iMonnit.

## Example Interfacing

- Current monitoring
- Current usage
- Amperage monitoring
- Amp hour meter

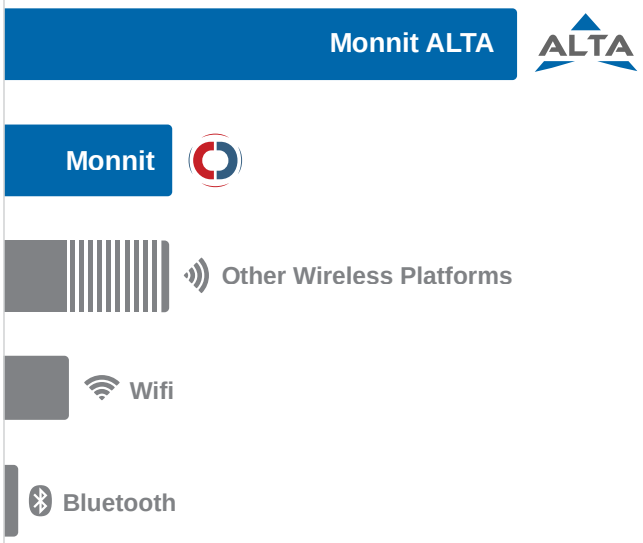
## Features of Monnit ALTA Sensors

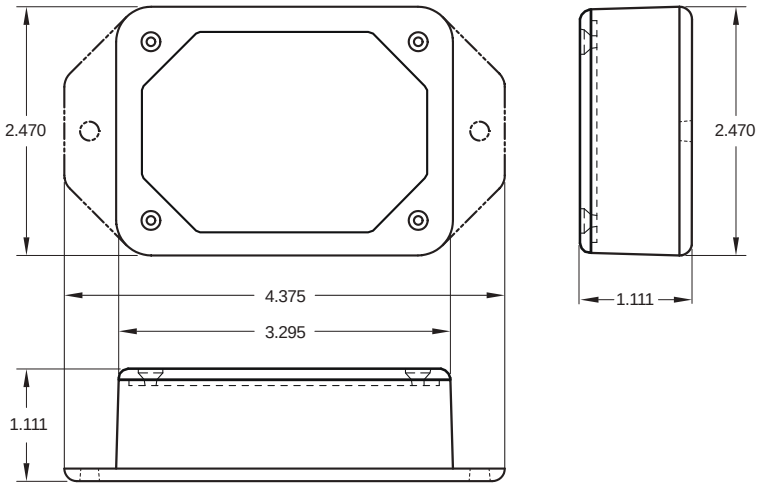
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial AA Wireless AC Current Meter \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

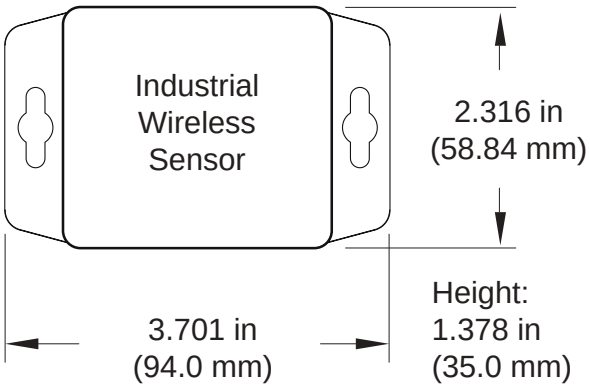
* Circuits cannot withstand negative voltage. Please take care when installing batteries.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless AC Current Meter \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Circuits cannot withstand negative voltage. Please take care when installing batteries.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

| 0-20 Amp CT Specifications | |
|---|---|
| Absolute max CT current | 50 Amps RMS (A rms) |
| Maximum accurate CT current | 20 A rms |
| Frequency range | 50–100 Hz |
| Accuracy | +/- 2% @ 2 to 20 A rms, +/- .07 A rms @ < 2 A rms ** |
| Calibrated accuracy with appropriate offset | +/- 1% @ 2 to 20 A rms, +/- .035 A rms @ < 2 A rms ** |
| Offset limits | -1.27 to + 1.27 A rms (default set to +0.1 A rms) *** |
| Measurement resolution | ~.01 A rms |
| Current transducer dimensions | 40 mm x 25 mm x 26 mm (10 mm inner diameter) |

| 0-150 Amp CT Specifications | |
|---|---|
| Absolute max CT current | 200 Amps RMS (A rms) |
| Maximum accurate CT current | 150 A rms |
| Frequency range | 50–100 Hz |
| Accuracy | +/- 2% @ 2 to 150 A rms, +/- 0.4 A rms @ < 15 A rms ** |
| Calibrated accuracy with appropriate offset | +/- 1% @ 2 to 150 A rms, +/- 0.2 A rms @ < 2 A rms ** |
| Offset limits | -1.27 to + 1.27 A rms (default set to + 0.3 A rms) *** |
| Measurement resolution | ~0.1 A rms |
| Current transducer dimensions | 67 mm x 49 mm x 42 mm (24 mm inner diameter) |

| 0-500 Amp CT Specifications | |
|---|---|
| Absolute max CT current | 600 Amps RMS (A rms) |
| Maximum accurate CT current | 500 A rms |
| Frequency range | 50–100 Hz |
| Accuracy | +/- (2% + 1.4 A rms) ** |
| Calibrated accuracy with appropriate offset | +/- (1% + .7 A rms) ** |
| Measurement resolution | ~0.3A rms |
| Typical Deadband | ~1.45 A rms *** |

* Circuits cannot withstand negative voltage. Please take care when installing batteries.

** CTs are inherently less accurate at or below 10% of max range. For best calibration results calibrate at a current between 30% and 90% of max accurate range.

*** Because of a diode inherent to the hardware, the sensor is incapable of reading between 0 and 1.45 A rms (deadband). This diode also creates an offset To account for this offset and deadband, the sensor adds 1.45 A rms to all readings above 0 A rms. so the sensor will go from 0 to ~1.45 on the lowest end of the sensor measurement range.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout. Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc. Volatile or flammable gas. Dusty conditions. Low-pressure or high-pressure environments. Wet or excessively humid locations. Places with salt water, oils chemical liquids or organic solvents. Where there are excessively strong vibrations. Other places where similar hazardous conditions exist.

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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AC CURRENT METER

# Wireless 500 Amp AC Current Meters

## General Description

The ALTA wireless AC Current Meter measures the RMS current of an alternating current (AC) system using a current transformer (CT) that wraps around the “hot” wire of a two wire (hot, common, ground(optional)) power system. The sensor reports Minimum RMS current, maximum RMS current, average RMS current, and amp hours to the iMonnit system. The iMonnit system is capable of generating watt hour or kilowatt hour readings as well.

- Measures amp hours, max RMS current, min RMS current, and average RMS current
- Three different current transducers available:
  - Low Current: 0-20 amp
  - Medium Current: 0-150 amp
  - High Current: 0-500 amp
- Capable of generating watt hour or kilowatt hour readings using iMonnit
- Data logging for accumulated amp hour readings
- Can notify based on current levels or changes in current levels
- Simple and safe installation of current/power measurement hardware, no rewiring required

## Principle of Operation

To measure current, clip the CT around only a single wire of the AC system (clipping around a hot and neutral wire at the same time will result in 0 current readings). After the sensor powers on and connects to the gateway it will begin taking measurements based on the averaging interval (5 seconds default). It will report data to iMonnit every heartbeat or if the current goes outside of the aware thresholds set in iMonnit. The sensor reports amp hours, max RMS current, min RMS current, and average RMS current. iMonnit can also generate watt hour or kilowatt hour readings if a default RMS voltage is set in iMonnit.

## Example Interfacing

- Current monitoring
- Current usage
- Amperage monitoring
- Amp hour meter

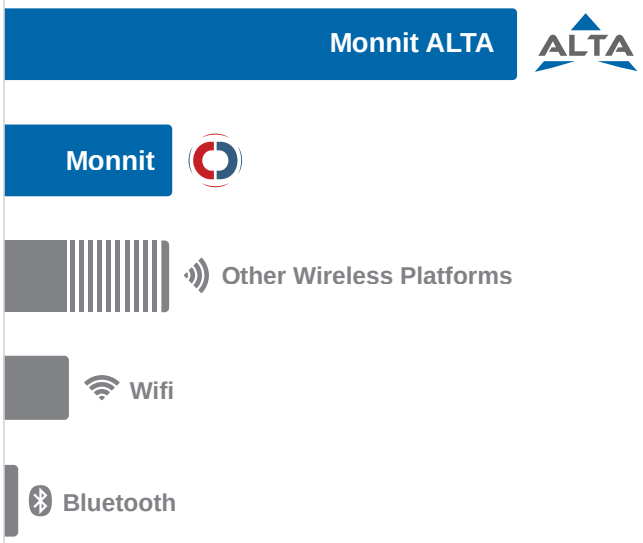
## Features of Monnit ALTA Sensors

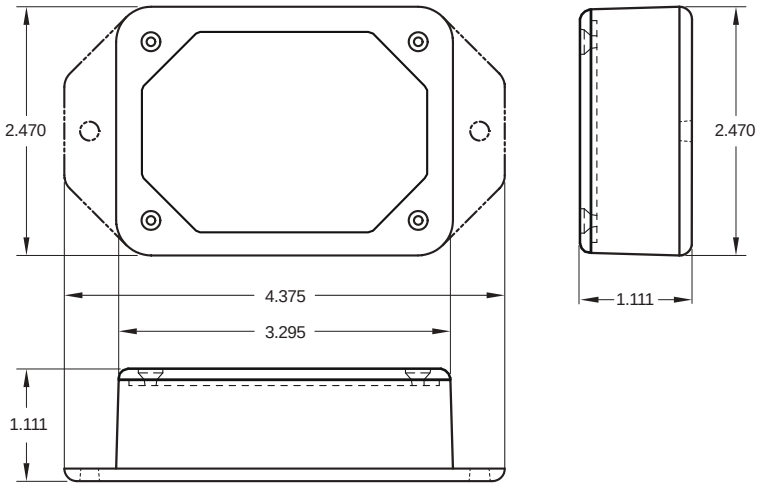
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial AA Wireless AC Current Meter \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

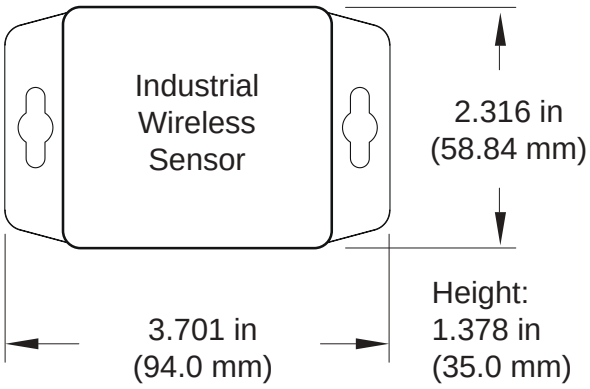
* Circuits cannot withstand negative voltage. Please take care when installing batteries.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless AC Current Meter \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Circuits cannot withstand negative voltage. Please take care when installing batteries.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

| 0-20 Amp CT Specifications | |
|---|---|
| Absolute max CT current | 50 Amps RMS (A rms) |
| Maximum accurate CT current | 20 A rms |
| Frequency range | 50–100 Hz |
| Accuracy | +/- 2% @ 2 to 20 A rms, +/- .07 A rms @ < 2 A rms ** |
| Calibrated accuracy with appropriate offset | +/- 1% @ 2 to 20 A rms, +/- .035 A rms @ < 2 A rms ** |
| Offset limits | -1.27 to + 1.27 A rms (default set to +0.1 A rms) *** |
| Measurement resolution | ~.01 A rms |
| Current transducer dimensions | 40 mm x 25 mm x 26 mm (10 mm inner diameter) |

| 0-150 Amp CT Specifications | |
|---|---|
| Absolute max CT current | 200 Amps RMS (A rms) |
| Maximum accurate CT current | 150 A rms |
| Frequency range | 50–100 Hz |
| Accuracy | +/- 2% @ 2 to 150 A rms, +/- 0.4 A rms @ < 15 A rms ** |
| Calibrated accuracy with appropriate offset | +/- 1% @ 2 to 150 A rms, +/- 0.2 A rms @ < 2 A rms ** |
| Offset limits | -1.27 to + 1.27 A rms (default set to + 0.3 A rms) *** |
| Measurement resolution | ~0.1 A rms |
| Current transducer dimensions | 67 mm x 49 mm x 42 mm (24 mm inner diameter) |

| 0-500 Amp CT Specifications | |
|---|---|
| Absolute max CT current | 600 Amps RMS (A rms) |
| Maximum accurate CT current | 500 A rms |
| Frequency range | 50–100 Hz |
| Accuracy | +/- (2% + 1.4 A rms) ** |
| Calibrated accuracy with appropriate offset | +/- (1% + .7 A rms) ** |
| Measurement resolution | ~0.3A rms |
| Typical Deadband | ~1.45 A rms *** |

* Circuits cannot withstand negative voltage. Please take care when installing batteries.

** CTs are inherently less accurate at or below 10% of max range. For best calibration results calibrate at a current between 30% and 90% of max accurate range.

*** Because of a diode inherent to the hardware, the sensor is incapable of reading between 0 and 1.45 A rms (deadband). This diode also creates an offset To account for this offset and deadband, the sensor adds 1.45 A rms to all readings above 0 A rms. so the sensor will go from 0 to ~1.45 on the lowest end of the sensor measurement range.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout. Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc. Volatile or flammable gas. Dusty conditions. Low-pressure or high-pressure environments. Wet or excessively humid locations. Places with salt water, oils chemical liquids or organic solvents. Where there are excessively strong vibrations. Other places where similar hazardous conditions exist.

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

# Industrial Wireless Quad Temperature Sensors

## General Description

Monnit's ALTA Industrial Wireless Quad Temperature Sensor uses four individual sensor probes to measure and track temperatures with reliable accuracy. Perfect for monitoring a variety of temperature critical applications such as food coolers, HVAC systems and data centers.

- Accurate to ± 1° C (± 1.8° F).
- Increased accuracy by user calibration to ± 0.25° C (± 0.45° F).
- 4 individual 3 ft. temperature probes.
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

## Principle of Operation

The ALTA industrial wireless temperature sensor outputs the ambient temperature in degrees Fahrenheit. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, send power to the NTC thermistor probes, wait for them to stabilize, convert the analog data and mathematically compute the temperatures then transmit the data through the gateway to the online monitoring software. To stay within the abilities of the processor, the temperature is computed off a data table provided by the manufacturer. To reduce error, a variable resistor configuration is implemented over specified temperature ranges.

## Example Applications

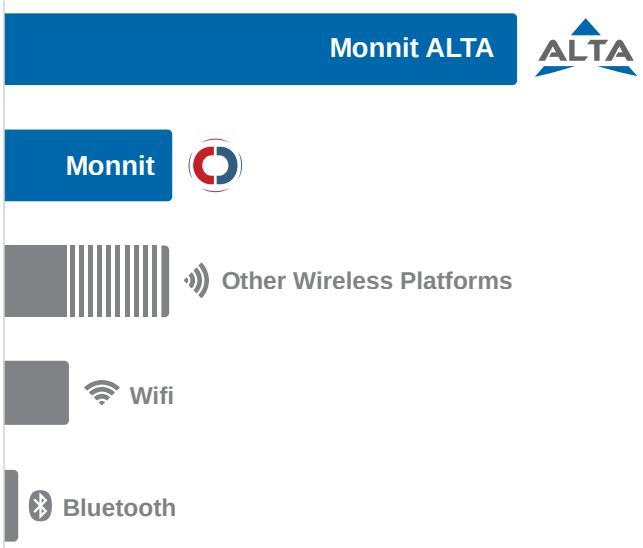
- HVAC Operation & Testing
- Boilers and Pumps
- Coolers & Freezers
- Data Center Monitoring
- Environmental Monitoring
- Smart Machines & Smart Structures
- And many more...

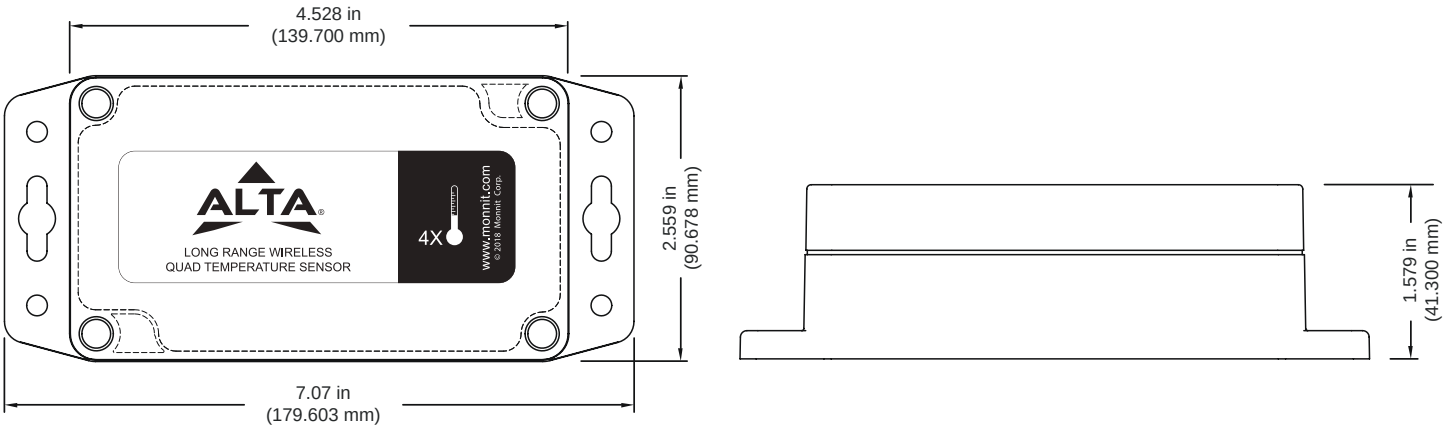
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Industrial Wireless Quad Temperature Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included Battery | Max Temperature Range: | -40°C to +85°C (-40°F to +185°F) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0°C to 45°C (32°F to 113°F) |
| | Max Temperature Range: | -20°C to 60°C (-4°F to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Thermistor Temperature Range (Thermistor Only) | | -40°C to +125°C (-40°F to +257°F)<br>(Limited to Main Unit Circuitry, -40°C to +85°C) |
| Number of Temperature Probes | | 4 individual temperature probes |
| Temperature Probe Length | | 3 ft. (36 in.) / standard |
| Accuracy @ 25°C | | +/- 1% (1°C or 1.8°F) |
| User Calibrated Accuracy | | +/- 0.25°C (± 0.45°F) |
| Time Constant @ 25°C | | 30 sec |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

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The Leading Enterprise Internet of Things Solution

VIBRATION METER

# Wireless Accelerometer - Vibration Meters

## General Description

The ALTA Wireless Vibration Meter Sensor uses an accelerometer to measure vibration speed and frequency and report on 3 axes.

- Reports data as speed (mm/s) and frequency (Hz) on all three axes, and how long the sensor was measuring during the interval.
- Adjustable measurement methods: RMS, peak data only, and absolute mean.

## Principle of Operation

The ALTA Vibration Meter uses an accelerometer to measure g-force on all axes and then determine speed and frequency. It can be set to only capture when a vibration occurs and sleep when no vibrations are present, or it can be set to measure at a given assessment interval regardless of whether a vibration has occurred. If it is set to always measure, the sensitivity can be further adjusted to filter out noise. The Vibration Meter will also report the duty cycle, or how long the sensor was measuring vibrations throughout the heartbeat.

## Example Applications

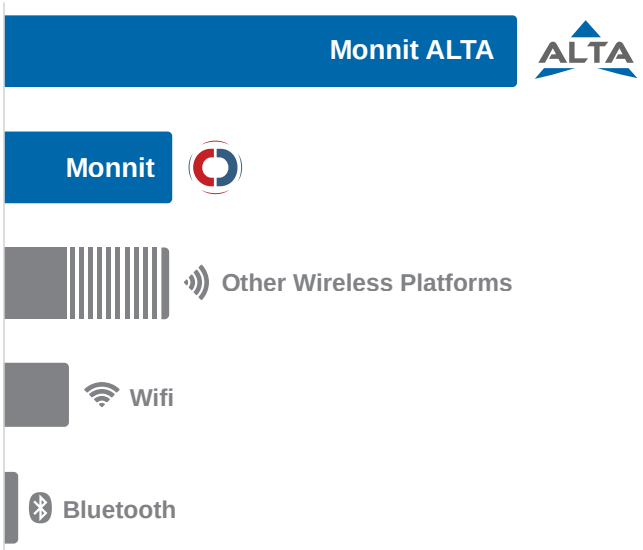
- Vibration Monitoring
- Smart Machines, Smart Structures & Smart Materials
- Bridge and Building Seismic Activity Monitoring
- Assembly Line Monitoring
- And many more...

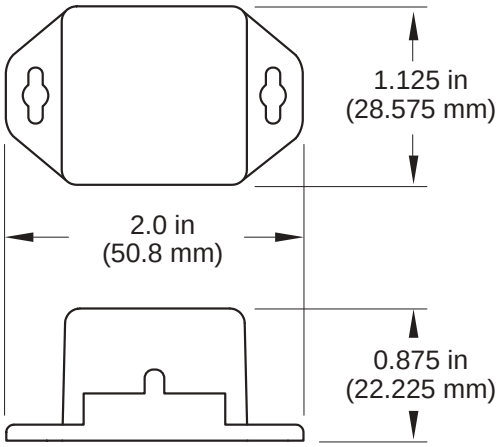
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

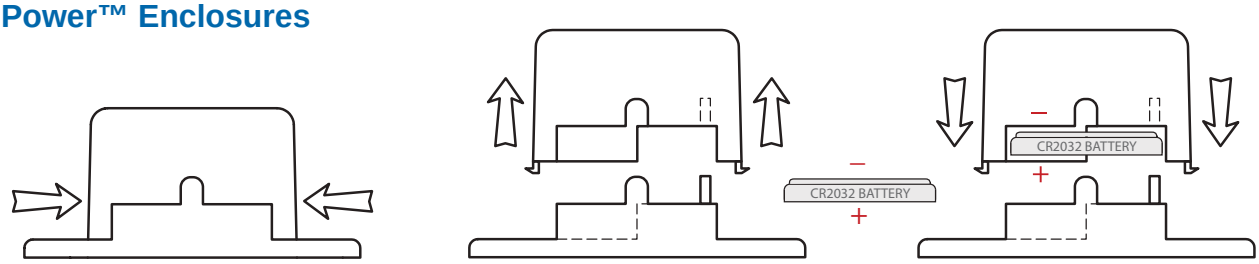





| ALTA Commercial Coin Cell Wireless Accelerometer - Vibration Meter - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Speed Measurement Range | 0 to 25.5 mm/s |
| Speed Measurement Resolution | 0.1 mm/s |
| Frequency Measurement Range | 0 to 256 Hz |
| Frequency Measurement Resolution | 1.5625 Hz rounded down to nearest 1 Hz |
| Vibration Intensity Threshold Range | 0 to 1.701 g |
| Vibration Intensity Threshold Resolution | 0.063 g |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware can not withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

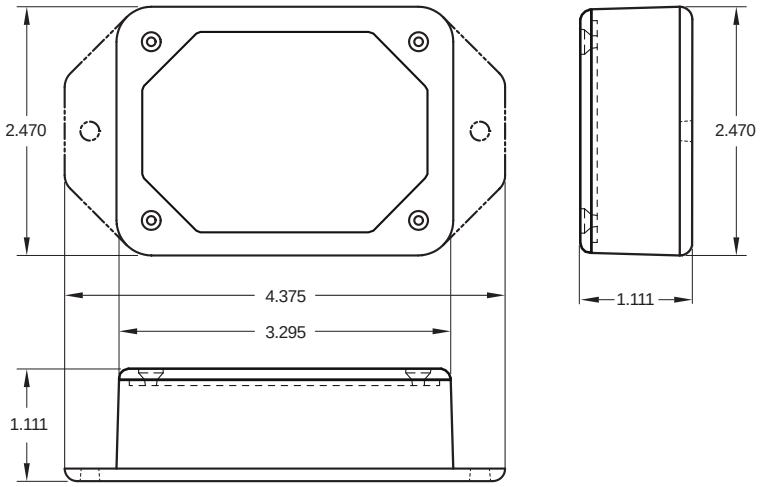
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Accelerometer - Vibration Meter - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Speed Measurement Range | 0 to 25.5 mm/s |
| Speed Measurement Resolution | 0.1 mm/s |
| Frequency Measurement Range | 0 to 256 Hz |
| Frequency Measurement Resolution | 1.5625 Hz rounded down to nearest 1 Hz |
| Vibration Intensity Threshold Range | 0 to 1.701 g |
| Vibration Intensity Threshold Resolution | 0.063 g |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

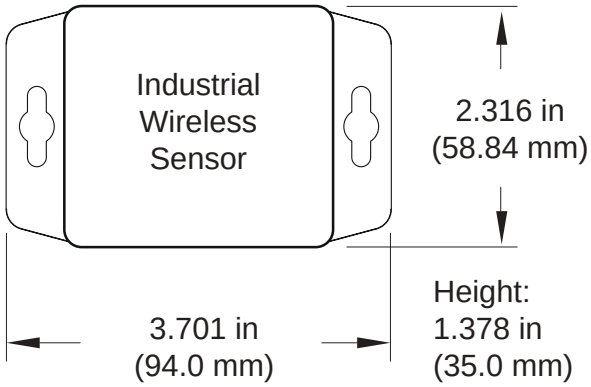
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Accelerometer - Vibration Meter - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Speed Measurement Range | | 0 to 25.5 mm/s |
| Speed Measurement Resolution | | 0.1 mm/s |
| Frequency Measurement Range | | 0 to 256 Hz |
| Frequency Measurement Resolution | | 1.5625 Hz rounded down to nearest 1 Hz |
| Vibration Intensity Threshold Range | | 0 to 1.701 g |
| Vibration Intensity Threshold Resolution | | 0.063 g |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC CE Industry Canada | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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TILT

# Wireless Accelerometer - Tilt Sensor

## General Description

The ALTA Wireless Accelerometer - Tilt Sensor is a digital, low-power, low-profile, capacitive sensor that is able to measure acceleration on three axes to provide a measure of pitch and roll.

- Reports data as pitch and roll

## Principle of Operation

The ALTA Wireless Accelerometer - Tilt Sensor activates at a set time interval (defined by user) and converts accelerometer measurements to pitch and roll (0 to 180° -> -180° to 0°). The data is displayed in degrees with 0.1° of resolution.

Example:  Pitch: 1.6  Roll: -0.1

## Example Applications

- Inclination monitoring
- Pitch & roll
- Many additional applications

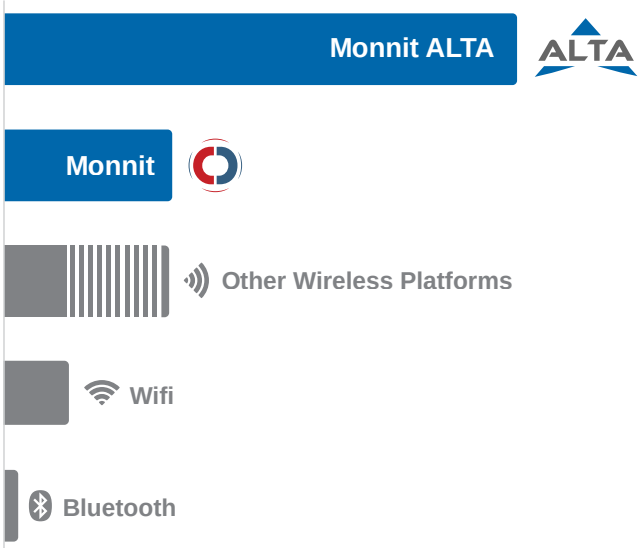
## Features of Monnit ALTA Sensors

- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

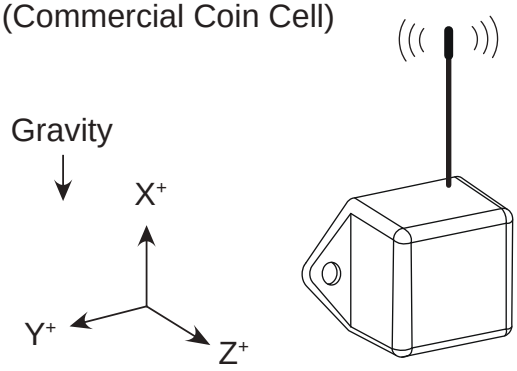
* Actual range may vary depending on environment.

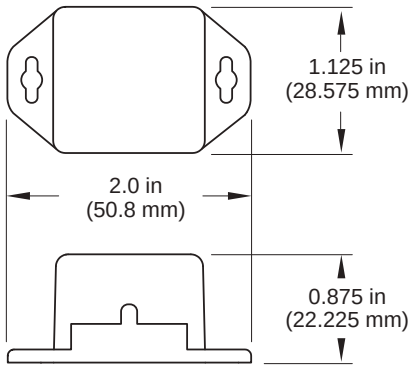
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison



Monnit Wireless Accelerometer Orientation
(Commercial Coin Cell)

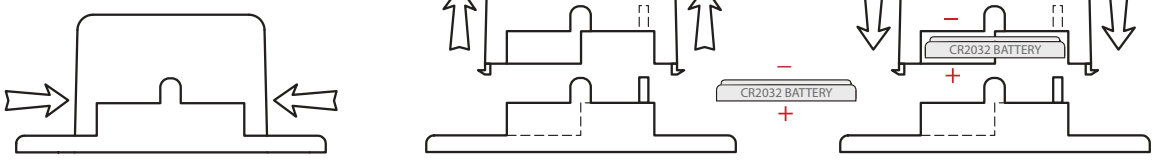



| ALTA Commercial Coin Cell Wireless Accelerometer - Tilt Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Sensitivity | 4096 count/g |
| Sensitivity range selections | +/-2 G, +/-4 G, +/-8 G |
| Measurement accuracy | ±2.5 % (force: X, Y, Z) |
| Minimum g-force to turn on/wake up | 0.050–0.100 g |
| Fastest update interval/heart rate in any configuration | Heartbeat: 1 minute |
| Bandwidth for data measurement | 800 Hz |
| Measurement range (profile 4 tilt only) | 0° to 180° ► -180° to -0° (Rotating in positive direction) |
| Measurement resolution (profile 4 tilt only) | 0.1° |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

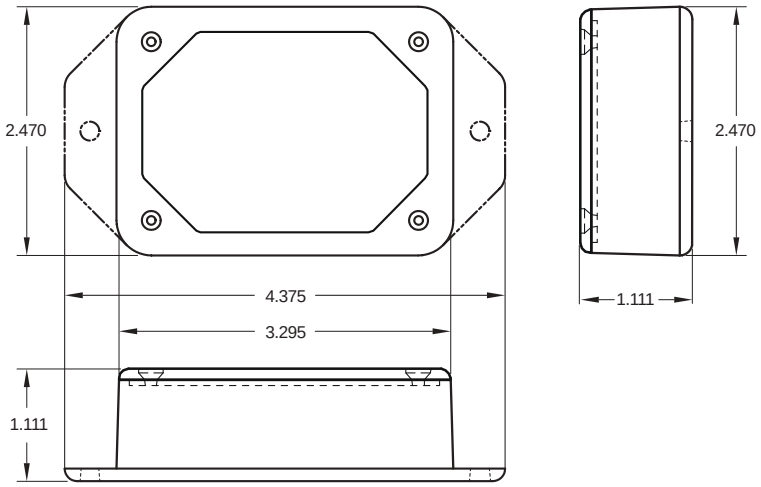
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)



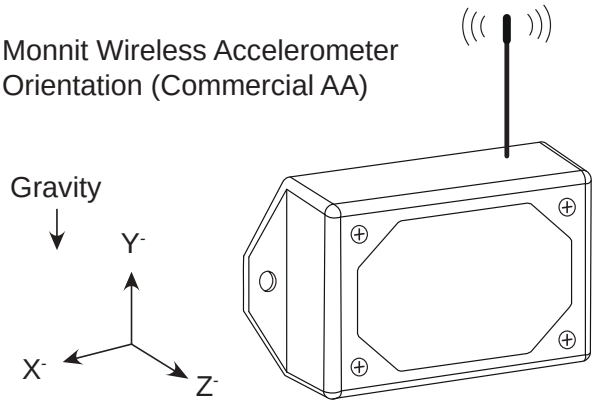

| ALTA Commercial AA Wireless Accelerometer - Tilt Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Sensitivity | 4096 count/g |
| Sensitivity range selections | +/-2 G, +/-4 G, +/-8 G |
| Measurement accuracy | ±2.5 % (force: X, Y, Z) |
| Minimum g-force to turn on/wake up | 0.050–0.100 g |
| Fastest update interval/heart rate in any configuration | Heartbeat: 1 minute |
| Bandwidth for data measurement | 800 Hz |
| Measurement range (profile 4 tilt only) | 0° to 180° ► -180° to -0° (Rotating in positive direction) |
| Measurement resolution (profile 4 tilt only) | 0.1° |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

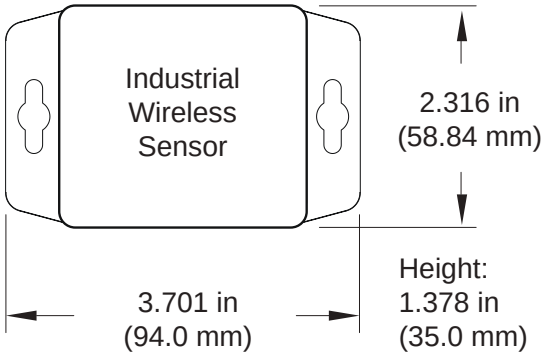
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

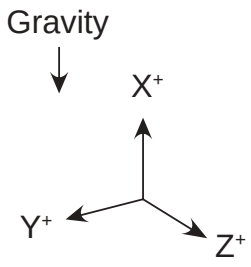
The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase). This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage. Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

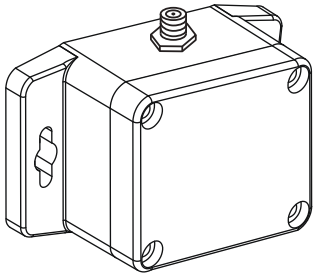
Monnit Wireless Accelerometer Orientation (Commercial AA)






Monnit Wireless Accelerometer Orientation (Industrial)



| ALTA Industrial Wireless Accelerometer - Tilt Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Sensitivity | | 4096 count/g |
| Sensitivity range selections | | +/-2 G, +/-4 G, +/-8 G |
| Measurement accuracy | | ±2.5 % (force: X, Y, Z) |
| Minimum g-force to turn on/wake up | | 0.050–0.100 g |
| Fastest update interval/Heart Rate in Any Configuration | | Heartbeat: 1 minute |
| Bandwidth for data measurement | | 800 Hz |
| Measurement range (profile 4 tilt only) | | 0° to 180° ► -180° to -0° (Rotating in positive direction) |
| Measurement resolution (profile 4 tilt only) | | 0.1° |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC CE Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA by MONNIT

The Leading Enterprise Internet of Things Solution

G-FORCE SNAPSHOT

# Wireless Accelerometer - G-Force Snapshot Sensor

## General Description

The ALTA Wireless Accelerometer - G-Force Snapshot Sensor is a digital, low power, low profile, capacitive sensor that is able to measure acceleration on three axes to determine inclination.

- Takes 3-Axis G-Force Measurements
- 4096 count/g Sensitivity

## Principle of Operation

The ALTA Wireless Accelerometer - G-Force Snapshot Sensor Accelerometer activates at a set time interval (defined by user) and measures g-force along X, Y and Z axes. Primary use is as an inclinometer or tilt sensor. There are three operating modes, ±2 G, ±4 G, or ±8G. The data is displayed as g-force on each axis.

Example: X: 0.001 Y: 0.031 Z: 1.01

## Example Applications

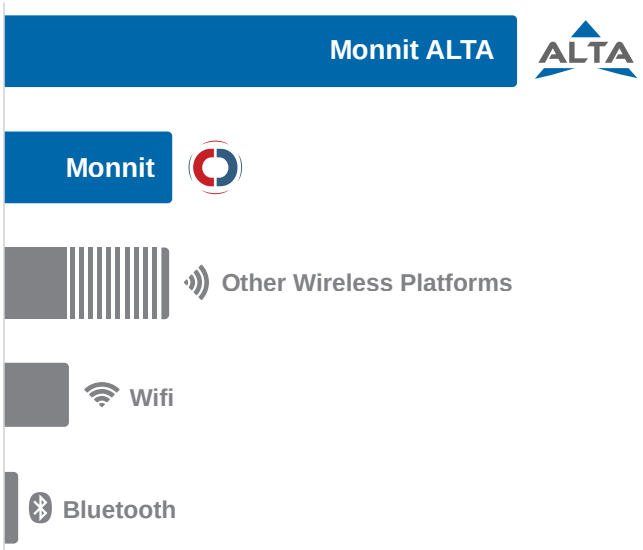
- Inclination and vibration testing
- Orientation sensing
- Smart machines, smart structures and smart materials
- And many more...

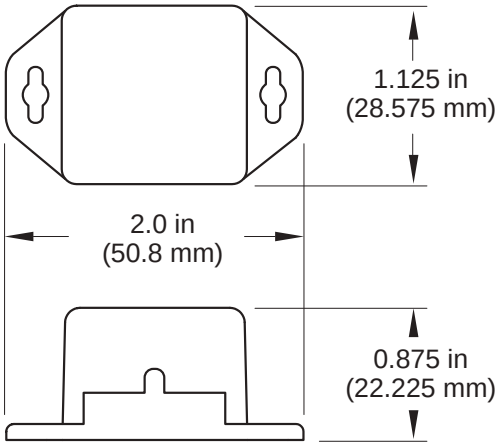
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

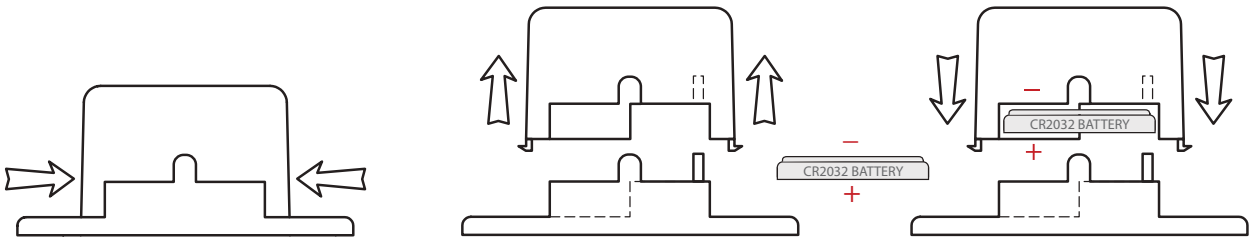





| ALTA Commercial Coin Cell Wireless Accelerometer - G-Force Snapshot - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Coin Cell) | -7°C to +60°C ( 20°F to +140°F ) ** |
| Optimal Battery Temperature Range (Coin Cell) | +10°C to +50°C ( +50°F to +122°F ) |
| Sensitivity | 4096 count/g |
| Sensitivity Range Selections | +/-2 G, +/-4 G, +/-8 G |
| Measurement Accuracy | ±2.5 % (Force: X, Y, Z) |
| Minimum G Force to Turn On/Wake Up | 0.050 g - 0.100 g |
| Fastest Update Interval/Heart Rate in Any Configuration | Heartbeat: 1 Minute |
| Bandwidth for Data Measurement | 800 Hz |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware can not withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

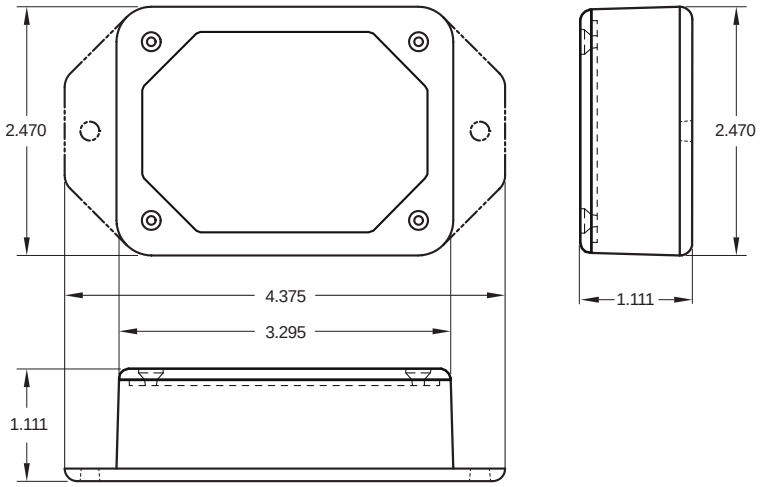
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Accelerometer - G-Force Snapshot - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Sensitivity | 4096 count/g |
| Sensitivity Range Selections | +/-2 G, +/-4 G, +/-8 G |
| Measurement Accuracy | ±2.5 % (Force: X, Y, Z) |
| Minimum G Force to Turn On/Wake Up | 0.050 g - 0.100 g |
| Fastest Update Interval/Heart Rate in Any Configuration | Heartbeat: 1 Minute |
| Bandwidth for Data Measurement | 800 Hz |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

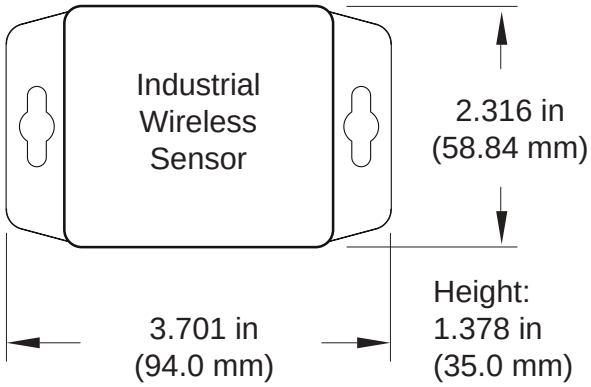
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Accelerometer - G-Force Snapshot - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Sensitivity | | 4096 count/g |
| Sensitivity Range Selections | | +/-2 G, +/-4 G, +/-8 G |
| Measurement Accuracy | | ±2.5 % (Force: X, Y, Z) |
| Minimum G Force to Turn On/Wake Up | | 0.050 g - 0.100 g |
| Fastest Update Interval/Heart Rate in Any Configuration | | Heartbeat: 1 Minute |
| Bandwidth for Data Measurement | | 800 Hz |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC CE Industry Canada | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures.  Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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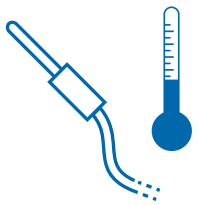
The Leading Enterprise Internet of Things Solution



THERMOCOUPLE

# Wireless Thermocouple Sensors

## General Description

The ALTA Wireless Thermocouple Sensor is available with a hardwired thermocouple or K-type connector to support various thermocouple types and ranges. The hardwired thermocouple option measures temperatures up to 400°C (752°F).

- Hardwired version measures temperatures up to 400°C (752°F)
- Pigtail version supports standard K-type thermocouples

## Principle of Operation

The ALTA Wireless Thermocouple is available with either a hardwired thermocouple or a K-Type connector (for supporting various thermocouple types and ranges) to measure high temperature applications. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, send power to the thermocouple and wait for it to stabilize, and convert the analog data, mathematically compute the temperature and transmit the data to the gateway. To stay within the abilities of the processor, the temperature is computed off a data table provided by the manufacturer.

## Example Applications

- Chimney/Flue Temperature Monitoring
- Kiln Temperature Monitoring
- High Temperature Food Monitoring
- Many additional applications

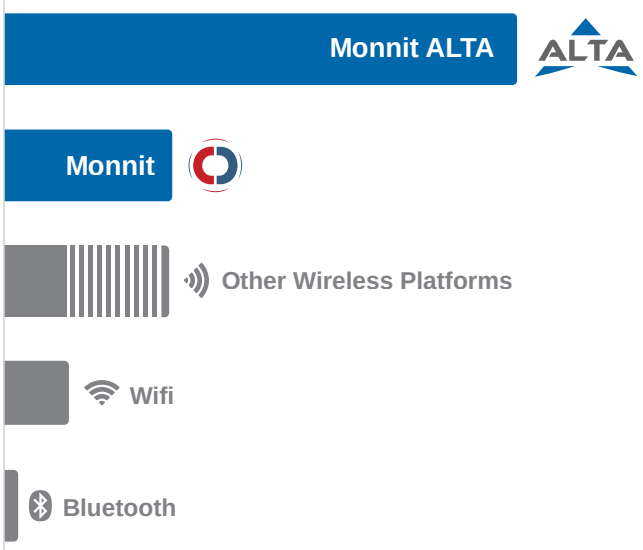
## Features of Monnit ALTA Sensors

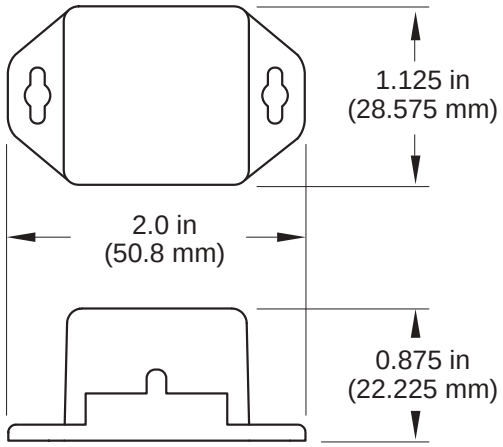
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

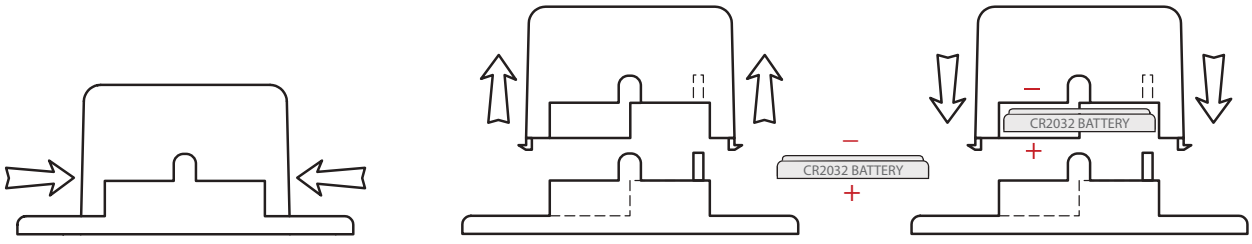





| ALTA Commercial Coin Cell Wireless Thermocouple Sensors \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Thermocouple connection options | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe: temperature range | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe: accuracy above 0°C | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe: accuracy below 0°C | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 1.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

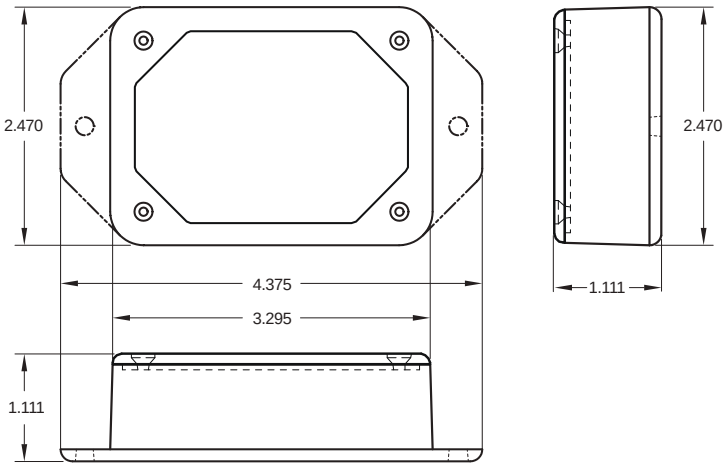
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Thermocouple Sensors \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Thermocouple connection options | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe—temperature range | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe—accuracy above 0°C | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe—accuracy below 0°C | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 4.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

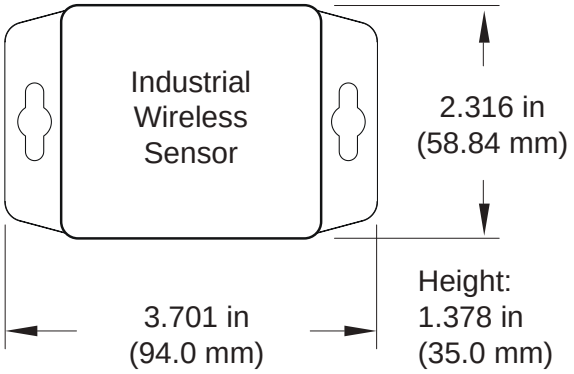
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Thermocouple Sensors \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Thermocouple connection options | | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe—temperature range | | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe—accuracy above 0°C | | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe—accuracy below 0°C | | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 5.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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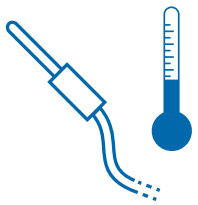
ALTA by MONNIT

The Leading Enterprise Internet of Things Solution



THERMOCOUPLE

# Wireless Thermocouple Sensors

## General Description

The ALTA Wireless Thermocouple Sensor is available with a hardwired thermocouple or K-type connector to support various thermocouple types and ranges. The hardwired thermocouple option measures temperatures up to 400°C (752°F).

- Hardwired version measures temperatures up to 400°C (752°F)
- Pigtail version supports standard K-type thermocouples

## Principle of Operation

The ALTA Wireless Thermocouple is available with either a hardwired thermocouple or a K-Type connector (for supporting various thermocouple types and ranges) to measure high temperature applications. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, send power to the thermocouple and wait for it to stabilize, and convert the analog data, mathematically compute the temperature and transmit the data to the gateway. To stay within the abilities of the processor, the temperature is computed off a data table provided by the manufacturer.

## Example Applications

- Chimney/Flue Temperature Monitoring
- Kiln Temperature Monitoring
- High Temperature Food Monitoring
- Many additional applications

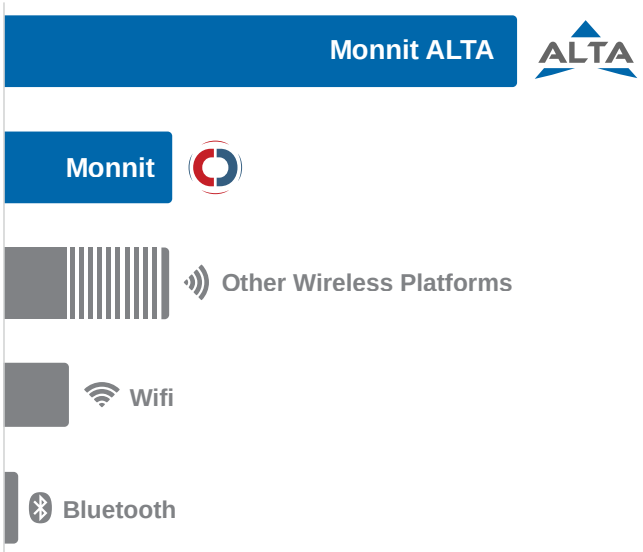
## Features of Monnit ALTA Sensors

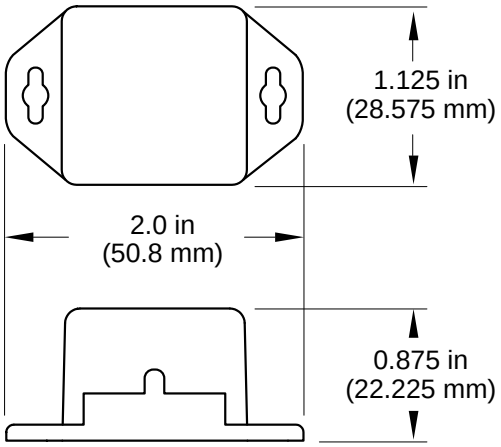
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- All ALTA sensors now have up to 3200 readings:
  - 10-minute heartbeats = 22 days
  - 2-hour heartbeats = 266 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

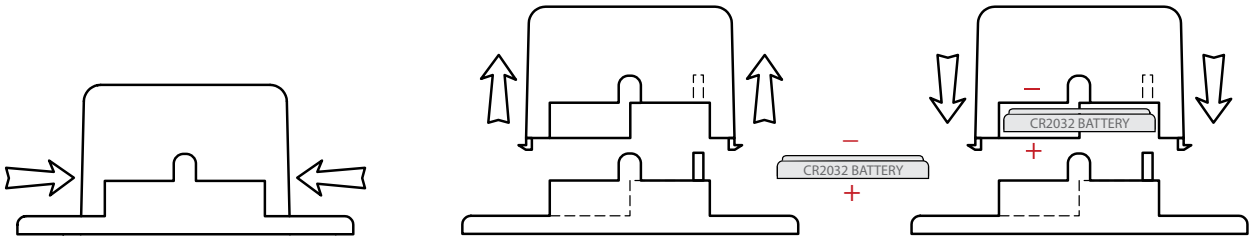





| ALTA Commercial Coin Cell Wireless Thermocouple Sensors \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Thermocouple connection options | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe: temperature range | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe: accuracy above 0°C | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe: accuracy below 0°C | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 1.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

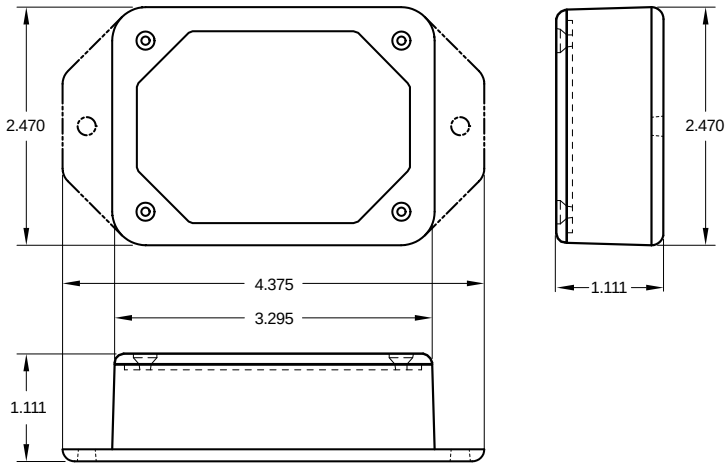
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Thermocouple Sensors \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Thermocouple connection options | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe—temperature range | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe—accuracy above 0°C | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe—accuracy below 0°C | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | Up to 3200 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 4.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

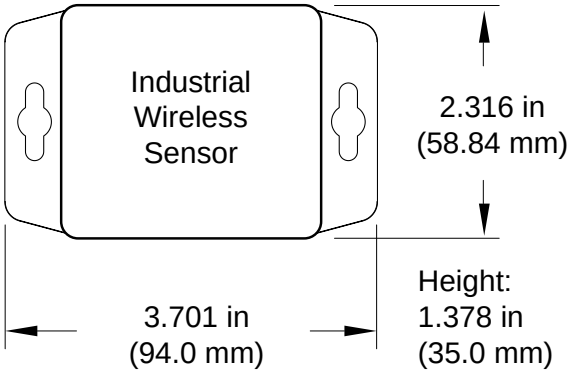
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Thermocouple Sensors \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| | Charging efficiency | 40% **** |
| | Luminous sustainability | 250 LUX **** |
| Thermocouple connection options | | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe—temperature range | | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe—accuracy above 0°C | | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe—accuracy below 0°C | | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | | Up to 3200 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 5.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.
**** Solar feature's energy harvesting circuitry works indoors with low light.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

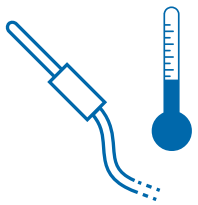
- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA by MONNIT

The Leading Enterprise Internet of Things Solution



THERMOCOUPLE

# Wireless Thermocouple Sensors

## General Description

The ALTA Wireless Thermocouple Sensor is available with a hardwired thermocouple or K-type connector to support various thermocouple types and ranges. The hardwired thermocouple option measures temperatures up to 400°C (752°F).

- Hardwired version measures temperatures up to 400°C (752°F)
- Pigtail version supports standard K-type thermocouples

## Principle of Operation

The ALTA Wireless Thermocouple is available with either a hardwired thermocouple or a K-Type connector (for supporting various thermocouple types and ranges) to measure high temperature applications. It is programmed to sleep for a user-given time interval (heartbeat) and then wakeup, send power to the thermocouple and wait for it to stabilize, and convert the analog data, mathematically compute the temperature and transmit the data to the gateway. To stay within the abilities of the processor, the temperature is computed off a data table provided by the manufacturer.

## Example Applications

- Chimney/Flue Temperature Monitoring
- Kiln Temperature Monitoring
- High Temperature Food Monitoring
- Many additional applications

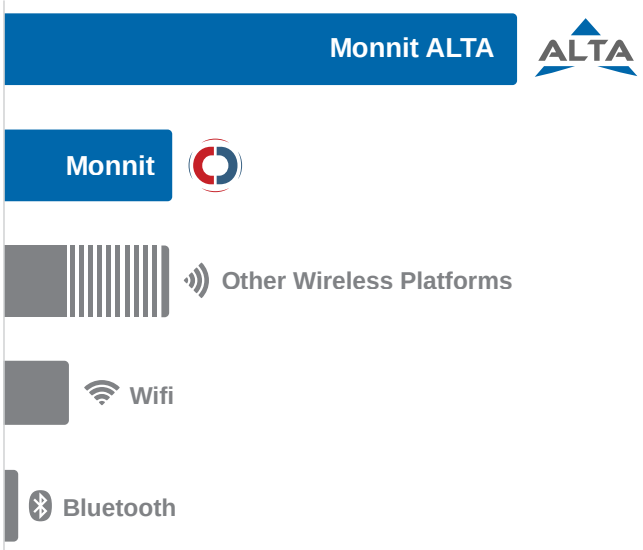
## Features of Monnit ALTA Sensors

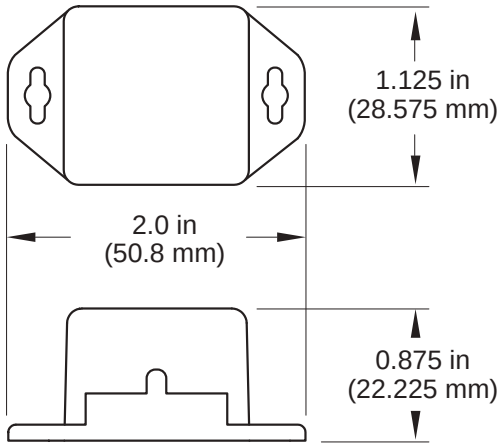
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

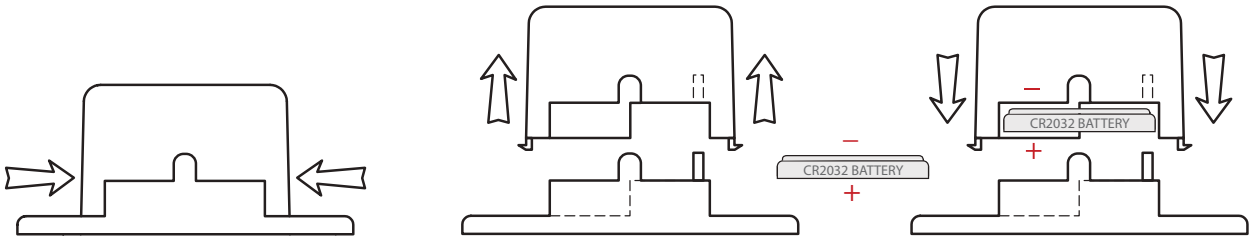





| ALTA Commercial Coin Cell Wireless Thermocouple Sensors \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) ** |
| Optimal battery temperature range (coin cell) | +10°C to +50°C (+50°F to +122°F) |
| Thermocouple connection options | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe: temperature range | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe: accuracy above 0°C | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe: accuracy below 0°C | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 1.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

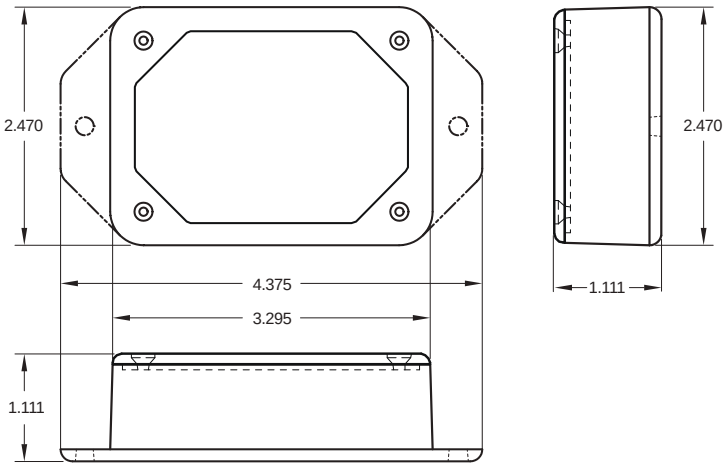
## PinchPower™ Enclosures




**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)




| ALTA Commercial AA Wireless Thermocouple Sensors \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Thermocouple connection options | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe—temperature range | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe—accuracy above 0°C | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe—accuracy below 0°C | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 4.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

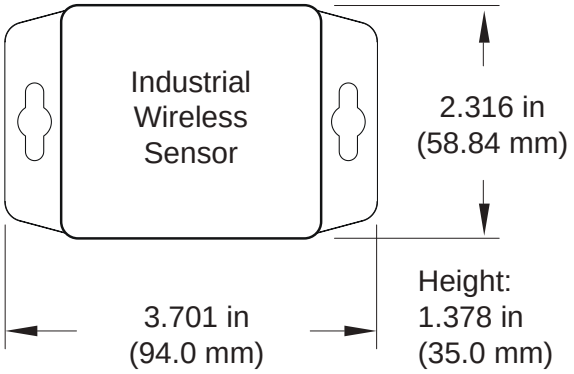
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Thermocouple Sensors \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Thermocouple connection options | | 6 ft hardwired probe/5 ft K-type connector |
| Hardwired thermocouple probe—temperature range | | -100°C to +400°C (-148°F to +752°F) |
| Hardwired thermocouple probe—accuracy above 0°C | | +/- 2.2°C or 0.75% (whichever is greater) |
| Hardwired thermocouple probe—accuracy below 0°C | | +/- 2.2°C or 2.0% (whichever is greater) |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 5.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

DIFFERENTIAL AIR PRESSURE

# Wireless Differential Pressure Sensors

## General Description

The ALTA wireless differential pressure sensor measures the pressure difference between two input ports and transmits the measurement to iMonnit.

- Measurement range: -500 Pa to 500 Pa
- Calibrated and temperature compensated

## Principle of Operation

The differential pressure sensor measures the pressure difference between two ports. When viewing the sensor from the top, the right inlet port is the positive or high side pressure input. When the pressure on this port is greater than the left port the sensor produces a negative pressure reading. When the pressure is greater on the left port the sensor produces a positive pressure reading.

## Example Applications

- Building/Room Pressure
- Air Flow
- Variable Air Volume Filter Status
- Duct Pressure
- Clean Rooms
- Hospitals
- Fume Hoods
- Computer Rooms
- Many additional applications

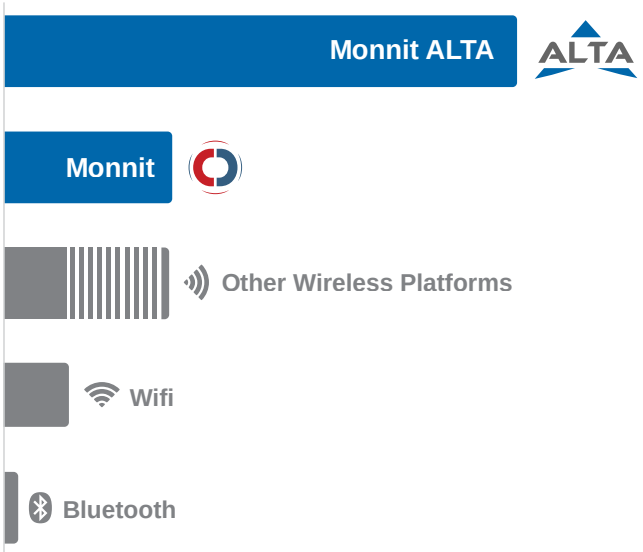
## Features of Monnit ALTA Sensors

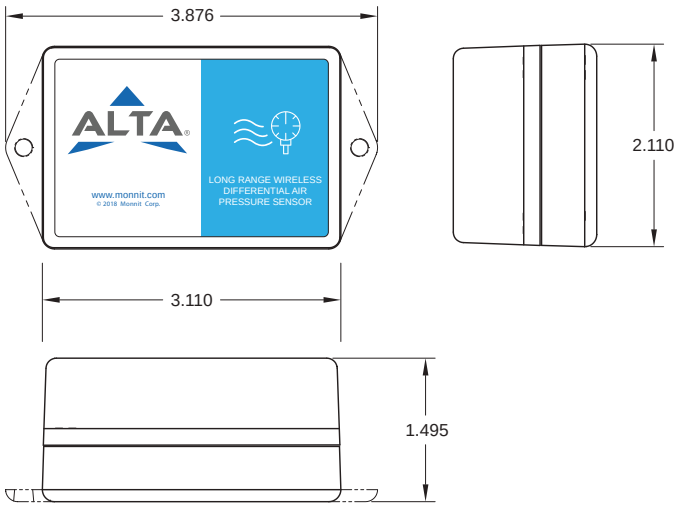
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Differential Pressure Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.7–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (commercial version) ** | -18°C to 55°C (0°F to 130°F) with Alkaline Batteries<br>-40°C to 85°C (-40°F to 185°F) with Lithium Battery |
| Pressure range | -500 Pa to 500 Pa |
| Allowable overpressure | 100 kPa |
| Rated burst pressure | 500 kPa |
| Max humidity for long-term exposure | 40°C dew point |
| Accuracy | 3% of reading +/- 0.1 Pa |
| Span repeatability | 0.5% of reading |
| Span shift due to temperature variation | < 0.5% of reading per 10°C |
| Offset stability | < 0.05 Pa/year |
| Calibrated for | Air, N2 |
| Media compatibility | Air, N2, O2, non-condensing |
| Temperature measurement range | -40°C to 85°C (-40°F to +185°F) |
| Calibrated temperature measurement range | -20°C to 85°C (-4°F to +185°F) |
| Temperature resolution | 0.1°C |
| Temperature accuracy | +/- 2°C (-10°C to +60°C)<br>+/- 3°C (-40°C to +85°C) |
| Temperature repeatability | +/- 0.1°C |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Wireless operation | 900 MHz—Frequency-Hopping Spread Spectrum<br>868 MHz and 433 MHz—Frequency-Agile Wireless |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

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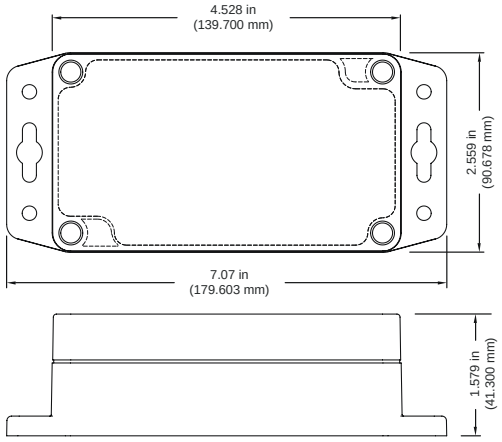


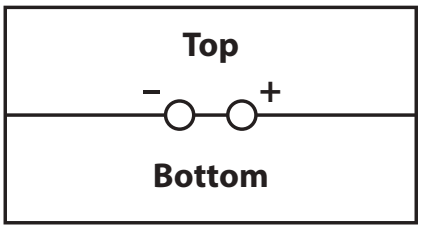

| ALTA Industrial Wireless Differential Pressure Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.7–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Pressure range | | -500 Pa to 500 Pa |
| Allowable overpressure | | 100 kPa |
| Rated burst pressure | | 500 kPa |
| Max humidity for long-term exposure | | 40°C dew point |
| Accuracy | | 3% of reading +/- 0.1 Pa |
| Span repeatability | | 0.5% of reading |
| Span shift due to temperature variation | | < 0.5% of reading per 10°C |
| Offset stability | | < 0.05 Pa/year |
| Calibrated for | | Air, N2 |
| Media compatibility | | Air, N2, O2, non-condensing |
| Temperature measurement range | | -40°C to 85°C (-40°F to +185°F) |
| Calibrated temperature measurement range | | 0.1°C |
| Temperature resolution | | 0.1°C |
| Temperature accuracy | | +/- 2°C (-10°C to +60°C)<br>+/- 3°C (-40°C to +85°C) |
| Temperature repeatability | | +/- 0.1°C |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC CE Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Note

Do not connect any tubing to the pressure ports without the sensor lid securely installed. The lid helps the keep sensor in place and stabilizes and supports the pressure ports.

Pressurizing the positive side will produce a positive reading. Pressurizing the negative side will produce a negative reading.




## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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PM 2.5 AIR QUALITY

# Wireless PM 2.5 Air Quality Sensors

## General Description

The ALTA wireless PM2.5 sensor measures PM1, PM2.5 and PM10 concentrations in the air and transmits the measurement to iMonnit.

- Measurement range:
  - PM1: 0.3 to 1.0 um
  - PM2.5: 1.0 to 2.5 um
  - PM10: 2.5 to 10 um

## Principle of Operation

The PM2.5 sensor works by turning on a small fan at the beginning of a measurement cycle to bring in a volume of ambient air and measuring the particulate matter (PM) content of that sample volume. The sensor measures PM content using a laser that scatters based on the number and size of particles suspended in the air. It is important to keep the inlet ports of the sensor clear to ensure proper readings.

## Example Applications

- Building/Room Air Quality
- Pollution Sensing
- Mines and Quarries
- Cement Factories
- Construction/Demolition Sites
- Petrochemicals
- Agricultural/Waste
- Many additional applications

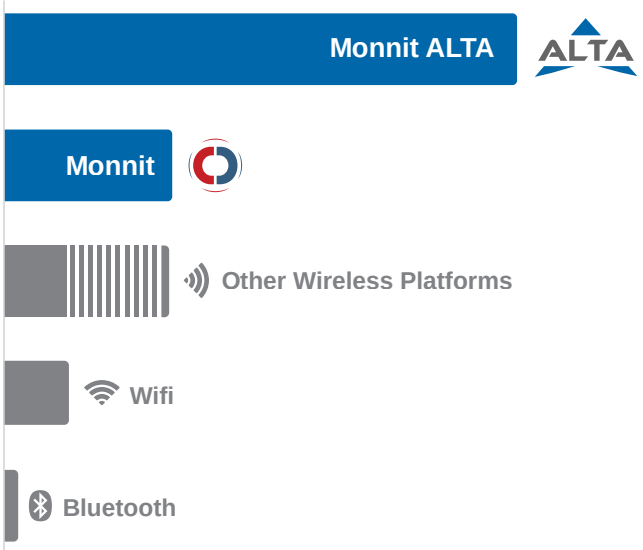
## Features of Monnit ALTA Sensors

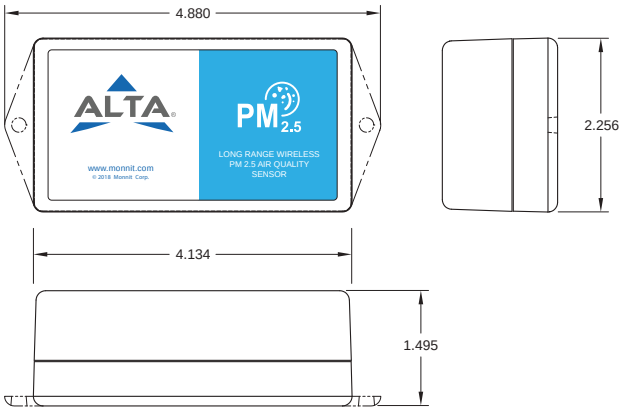
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA PM 2.5 Air Quality Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (commercial version) ** | -18°C to 55°C (0°F to 130°F) with Alkaline Batteries<br>-40°C to 85°C (-40°F to 185°F) with Lithium Battery |
| Operating temperature range (industrial version) ** | -40°C to 85°C (-40°F to +185°F) with Industrial Battery |
| Measurement sensitivity | PM1: 0.3 to 1.0 um<br>PM2.5: 1.0 to 2.5 um<br>PM10: 2.5 to 10 um |
| Counting efficiency | 50% @ 0.3 um, 98% @ >= 0.5 um |
| Effective range | 0 to 500 ug/m^3 |
| Maximum range | 0 to 1000 ug/m^3 |
| Maximum consistency error | +/- 10% @ 100 to 500 g/m^3<br>+/- 10 ug/m^3 @ 0 to 100 ug/m^3 |
| Response time | ~10 Seconds*** |
| Active current | ~180 mA @ 3.3 battery voltage, ~0.6 W overall |
| Operating temperature | -10 to 60 C |
| Operating humidity | 0 to 99% |
| Storage temperature | -40 to 80 C |
| Mean time to failure | >= 3 Years |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Wireless operation | 900 MHz—Frequency-Hopping Spread Spectrum<br>868 MHz and 433 MHz—Frequency-Agile Wireless |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** Response time may vary with stability threshold setting and PM concentration. Increasing the stability threshold will improve response time but reduce stability and accuracy of readings. With higher PM concentrations the sensor will acquire stable readings more quickly.

## Installation Note

Install the sensor with the intake slits pointing down to prevent accumulation of dust and or moisture in the sensing element housing. Ensure that the intake slit is open to the ambient air without any obstructions within 1 inch from the slits.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

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ULTRASONIC

# Wireless Ultrasonic Sensors

## General Description

ALTA Ultrasonic Sensors can be used in a variety of applications for measuring distances between the sensor and objects in its path. ALTA ultrasonic sensors are imperviousness to target surface and color, and feature autocalibration algorithms which allow them to adapt to variable environmental conditions and compensate for temperature and humidity effects. The ultrasonic sensors can also be calibrated through the iMonnit software for greater accuracy in distance measurements.

- Measures distance between the sensor and objects in its path.
- Measurement resolution of 1 centimeter.
- Auto-calibration algorithms allow sensor to adapt to variable environmental conditions.

## Principle of Operation

The Ultrasonic Sensor sends out a high-frequency sound pulse and then times how long it takes for the echo of the sound to reflect back. The sensor has 2 openings on its front. One opening transmits ultrasonic waves, (like a tiny speaker), the other receives them, (like a tiny microphone). The ultrasonic sensor uses the speed of sound to and time difference between sending and receiving the sound pulse to determine the distance to an object. It will take readings at set intervals and report the data back to the iMonnit software portal where the information is processed to display distance and alert users if a defined condition is met. All sensor data is then stored for historical analysis.

## Example Interfacing

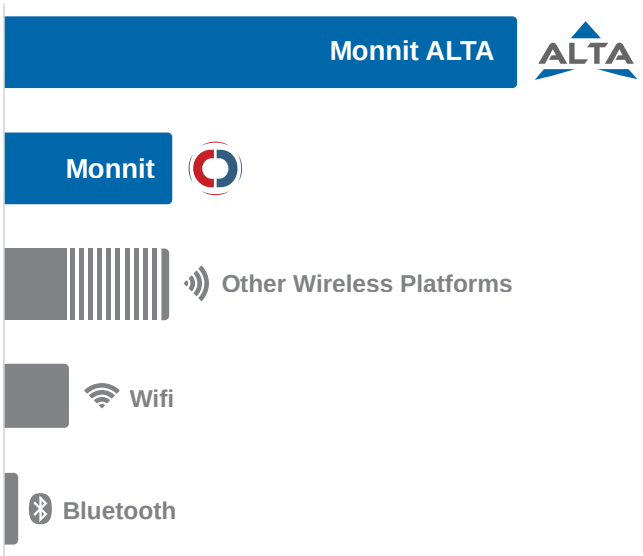
- Liquid Level Detection
- Object/Vehicle Detection
- Inventory Status (based on distance measurement)
- And much more

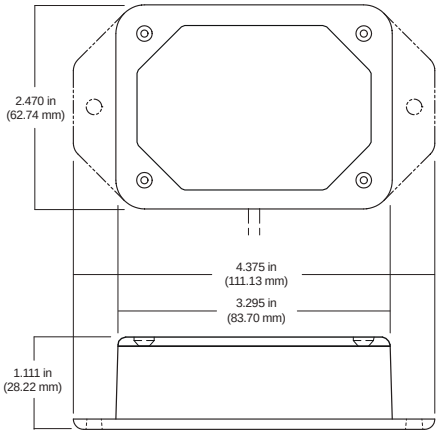
## Features of Monnit ALTA Sensors

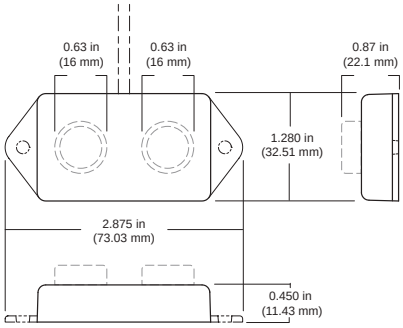
- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial Ultrasonic Sensor - Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Sensor Resolution | 1 centimeter |
| Minimum Measurement Distance | 10 centimeters |
| Maximum Measurement Distance | 400 centimeters |
| Sensor Accuracy | 5% FS (can be calibrated for further accuracy) |
| Integrated Memory | Up to 512 sensor messages |
| Wireless Range | 1,000+ ft. non-line-of-sight |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 Ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

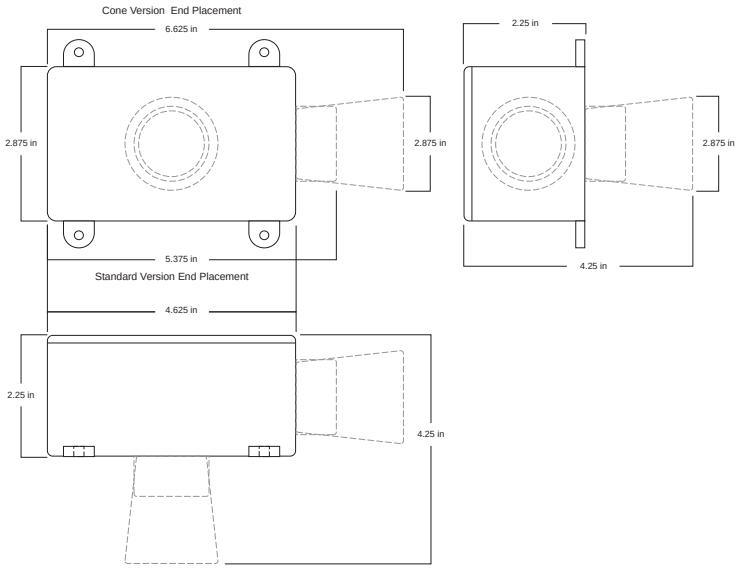
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.




| ALTA Industrial Wireless Ultrasonic Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C ( -40°F to +185°F ) ** |
| Included Battery | Max Temperature Range: | -40° to +85°C ( -40° to +185°F ) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0° to 45°C (32° to 113°F) |
| | Max Temperature Range: | -20° to 60°C (-4° to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Sensor Resolution | | 1 centimeter |
| Minimum Measurement Distance | | 20 centimeters |
| Maximum Measurement Distance | | 750 centimeters |
| Sensor Accuracy | | +/- 1% Full Scale |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

*** While the wire leads and thermistor have a water tight seal, the electronics housing (RF portion) is not sealed for wet environments or outdoor use. If needed, we recommend using Monnit industrial water temperature sensors.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out. (Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.). Volatile or flammable gas. Dusty conditions. Under low or high pressure. Wet or excessively humid locations. Places with salt water, oils chemical liquids or organic solvents. Where there are excessively strong vibrations. Other places where similar hazardous conditions exist.)

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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CO2 CARBON DIOXIDE

# Wireless CO2 - Carbon Dioxide Sensors

## General Description

The ALTA Wireless Carbon Dioxide Sensor uses an ultra low power, high performance CO2 sensor to measure the amount of carbon dioxide in ambient air.

- Measures 0 to 10000 ppm CO2
- Accurate to +/- 50 ppm (+/-3% of reading)
- Sensor produces instantaneous CO2 readings and 8 hour time weighted average(TWA) readings

## Principle of Operation

The ALTA Wireless Carbon Dioxide Sensor measures the amount of CO2 in the ambient air surrounding the element. It is programmed to take readings at a set interval to accurately calculate CO2 levels, then send the time-stamped data to the iMonnit Online Sensor Monitoring and Notification System at user-specified time intervals (sensor heartbeat). The CO2 data can be reviewed and exported as a data sheet or graph and notifications can be set up through the online system to alert the user when defined thresholds have been met or exceeded.

## Example Applications

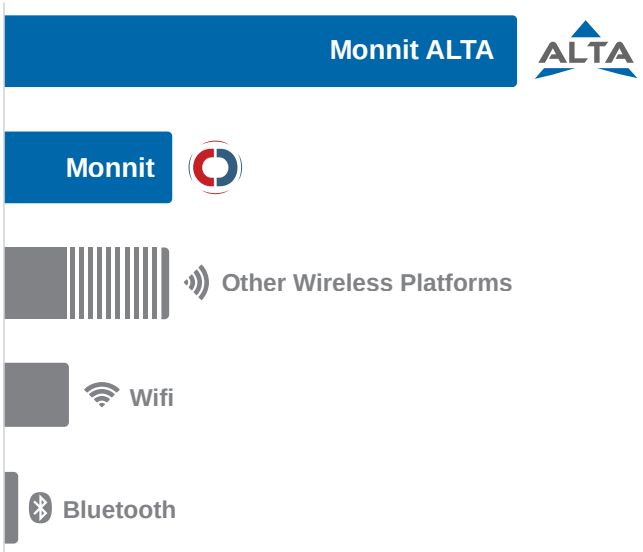
- Indoor air quality
- Greenhouses
- Cellar and gas stores
- Marine vessels
- Modified atmospheres
- Landfill gas
- Confined spaces
- Cryogenics
- Ventilation management
- And many more...

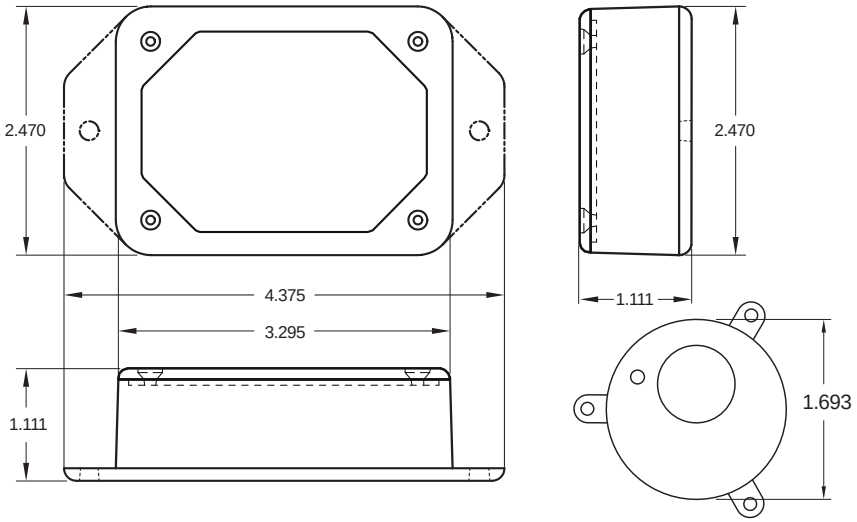
## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls.*
- Frequency Hopping Spread Spectrum (FHSS).
- Improved interference immunity.
- Improved power management for longer battery life.** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages).
- Onboard data memory / storage (up to 512 readings per sensor).
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof).
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






| ALTA Commercial AA Wireless Carbon Dioxide Sensor - Technical Specifications | | |
|---|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * | |
| Current Consumption | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle) | 2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Sensor and CO2 Element) | 0°C to 50°C (32°F to 122°F) standard range<br>-25°C to 55°C (-13°F to 130°F) extended range ** | |
| Recommended Storage Temperature (No Batteries) | -30°C to +70°C (-22°F to +158°F) | |
| Sensing Method | Non-dispersive infrared (NDIR) absorption<br>Gold-plated optics<br>Solid-state source and detector | |
| Sample Method | Diffusion | |
| Measurement Range | 0 to 10000 ppm CO2 | |
| Accuracy | +/- 50 ppm (+/-3% of reading) | |
| Calibration | Autocalibration *** | |
| Non Linearity | < 1% of FS | |
| Pressure Dependence | 0.13% of reading per mm Hg in normal atmospheric conditions | |
| Response Time | 3 minutes | |
| Integrated Memory | Up to 512 sensor messages | |
| Wireless Range | 1,000+ ft. non-line-of-sight | |
| Security | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) | |
| Weight | 4.5 Ounces | |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. | |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.
*** For correct autocalibration, the sensor must experience fresh air CO2 levels (~400 ppm) for at least 4 hours per day. If the environment does not meet this criteria then disable the autocalibration feature.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase). This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0 - 3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for un-interupted operation in the event of line power outage. Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

## Commercial Grade Sensors:

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

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# Industrial Wireless Three Phase Current Meters

## General Description

The ALTA Industrial Wireless Three Phase Current Meter measures the RMS current of an alternating current (AC) system using 3 current transformers (CTs) that wrap around the wires of a three phase power system. The sensor reports Minimum RMS current, maximum RMS current, average RMS current, and duty cycle for each phase and the combined amp hours of all three phases to the iMonnit system. The iMonnit system is capable of generating watt hour or kilowatt hour readings as well based on a user specified RMS voltage.

- Measures amp hours, max RMS current, min RMS current, average RMS current, and duty cycle for each phase and combined amp hours from all three phases
- 3 x 0-150 Amp Current Transducers
- Capable of generating Watt Hour or Kilowatt Hour readings using iMonnit
- Data logging for accumulated amp hour readings
- Can notify based on current levels
- Simple and safe installation of current/power measurement hardware, no rewiring required

## Principle of Operation

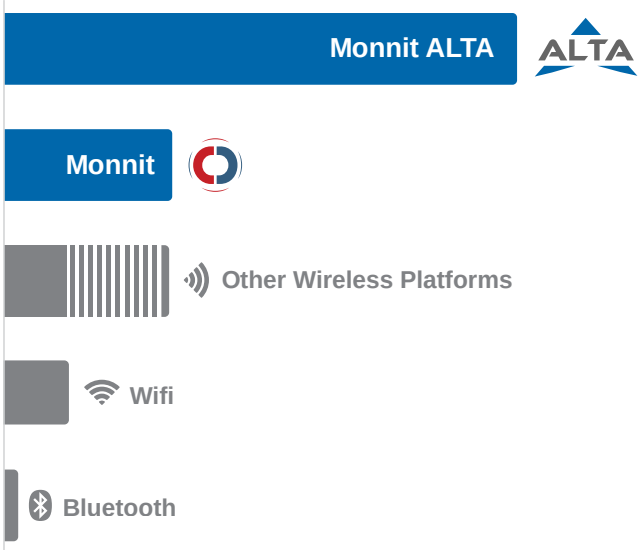
To measure current, clip the CT around only a single wire of a powered system (clipping around a hot and neutral wire at the same time will result in 0 current readings). After the sensor powers on and connects to the gateway it will begin taking measurements based on the averaging interval (5 seconds default). It will report data to iMonnit every heartbeat or if the current goes outside of the aware thresholds set in iMonnit. The sensor reports average current, max RMS current, min RMS current, and duty cycle for each phase and amp hours for all three phases combined. iMonnit can also generate watt hour or kilowatt hour readings if a default RMS voltage is set in iMonnit.

## Features of Monnit ALTA Sensors

- Wireless range of 1,000+ feet through 12-14 walls *
- Frequency Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (10+ years on AA batteries)
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory / storage (up to 512 readings per sensor)
  - 10 min heartbeats = 3.5 days
  - 2 hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

* Actual range may vary depending on environment.
** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison



| ALTA Industrial Wireless Three Phase Current Meter - Technical Specifications | | |
|---|---|---|
| Supply Voltage | | 2.0 - 3.8 VDC (3.0 - 3.8 VDC Using Power Supply) * |
| Current Consumption | | 0.2 µA (Sleep Mode)<br>0.7 µA (RTC Sleep)<br>570 µA (MCU Idle)<br>2.5 mA (MCU Active)<br>5.5 mA (Radio RX Mode)<br>22.6 mA (Radio TX Mode) |
| Operating Temperature Range (Board Circuitry and Battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included Battery | Max Temperature Range: | -40°C to +85°C (-40°F to +185°F) |
| | Capacity: | 1800 mAh |
| Optional Solar Feature | Solar Panel: | 5VDC / 30mA (53mm x 30mm) |
| | Charging Temperature Range: | 0°C to 45°C (32°F to 113°F) |
| | Max Temperature Range: | -20°C to 60°C (-4°F to 140°F) |
| | Included Rechargeable Battery: | 600 mAh / >2000 Charge Cycles (80% of initial capacity) |
| Integrated Memory | | Up to 512 sensor messages |
| Wireless Range | | 1,000+ ft. non-line-of-sight |
| Security | | Encrypt-RF™ (256-bit key exchange and AES-128 CTR) |
| Weight | | 28.7 Ounces |
| Enclosure Rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL Rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL- G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950. |
| **Current Transformer Specifications** | | |
| Number of Current Transducers | | 3 per sensor (3 ft. wires) |
| Absolute Max CT Current | | 200 Amps RMS (Arms) |
| Maximum Accurate CT Current | | 150 Arms |
| Frequency Range | | 50 – 100 Hz |
| Accuracy | | +/- 2% @ 2 to 150 Arms, +/- 0.4 Arms @ < 15 Arms * |
| Calibrated Accuracy with Appropriate Offset | | +/- 1% @ 2 to 150 Arms, +/- 0.2 Arms @ < 2 Arms * |
| Offset Limits | | -1.27 to + 1.27 Arms (default set to +0.3 Arms) ** |
| Measurement Resolution | | Average: 0.01 Arms<br>Max: 1 Arms<br>Min: 1 Arms<br>Duty: 1%<br>Amp Hours: 0.1 Amp Hours |
| Current Transducer Dimensions | | 67 mm x 49 mm x 42 mm (24 mm inner diameter) |

Industry Canada

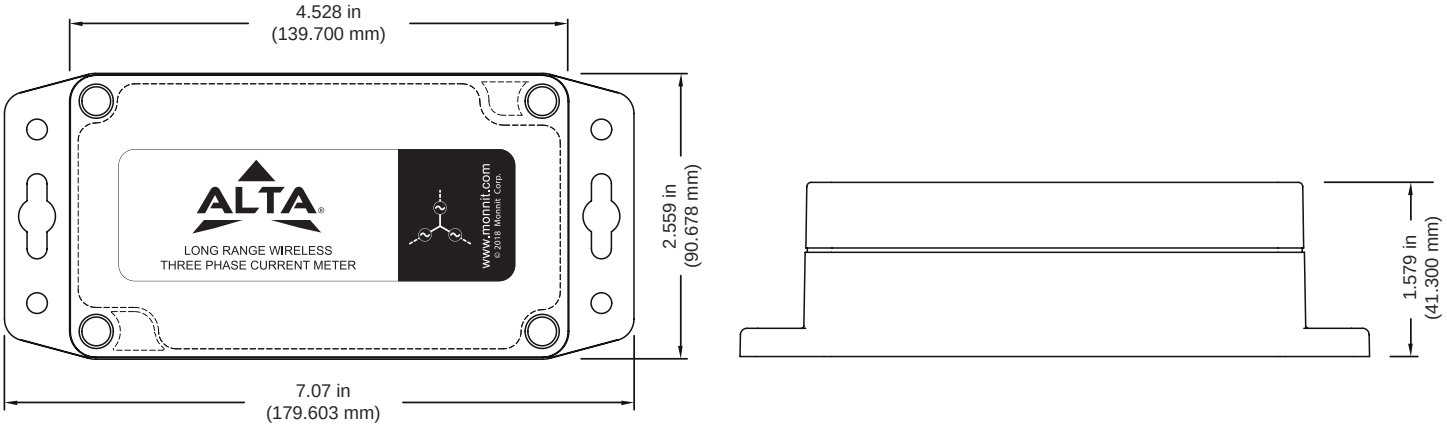
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

*** CTs are inherently less accurate at or below 10% of max range. For best calibration results calibrate at a current between 30% and 90% of max accurate range.

**** Offset is used to overcome a diode voltage drop inherent to the hardware. To accurately account for this drop a default offset is used. To best identify the optimal value of this offset make a series of measurements at .2 to 2 Arms and find the current (Arms) difference between your measurement standard and the Monnit sensor.

## Three Phase Current Meter Enclosure Dimensions:




## Example Interfacing

- Current Monitoring
- Current Usage
- Amperage Monitoring
- Amp Hour Meter

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt
- Protects against wind blown dust
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

AIR VELOCITY

# Wireless Air Velocity Sensors

## General Description

The ALTA wireless air velocity sensor measures the pressure difference between two input ports, the temperature, and altitude determines the speed at which the air is moving in a system and transmits the measurement to iMonnit.

- Measurement range: -50 m/s to 50 m/s
- Calibrated and temperature compensated

## Principle of Operation

The sensor measures the pressure difference between two ports. When viewing the sensor from the top, the right inlet port is the positive or high side pressure input. When the pressure on this port is greater than the left port the sensor produces a negative pressure reading. When the pressure is greater on the left port the sensor produces a positive pressure reading. Combined with the temperature and the altitude, the sensor determines at what rate the air is flowing in a system.

## Example Applications

- Building/Room Pressure
- Air Flow
- Variable Air Volume Filter Status
- Duct Pressure
- Clean Rooms
- Hospitals
- Fume Hoods
- Computer Rooms
- Many additional applications

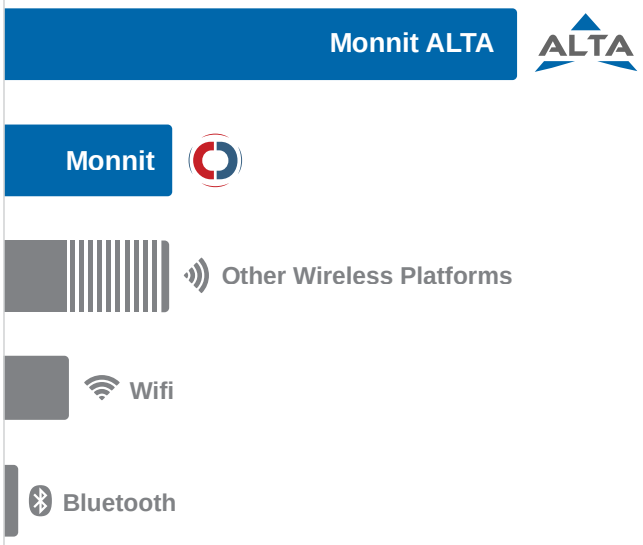
## Features of Monnit ALTA Sensors

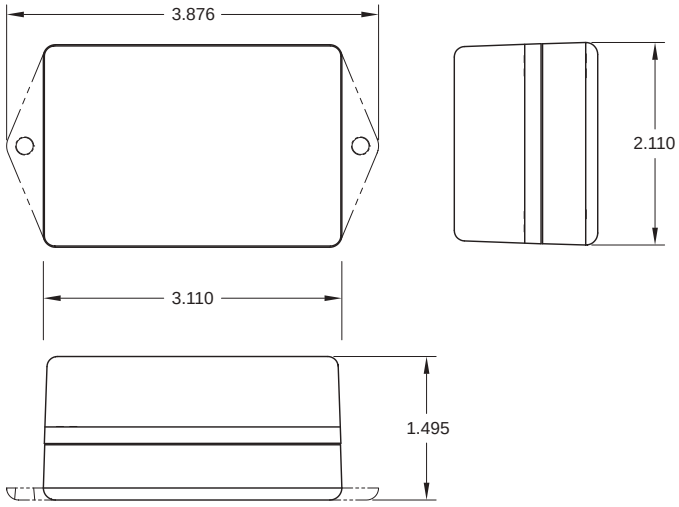
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison

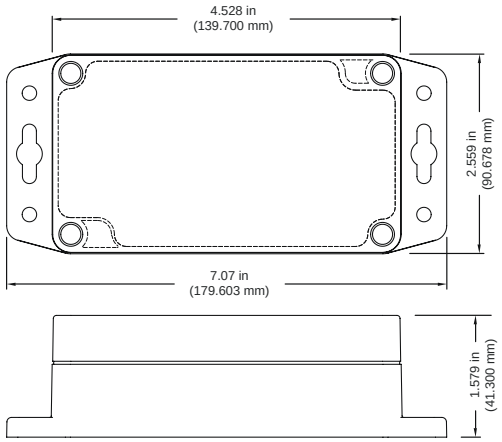





| ALTA Commercial Wireless Air Velocity Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.7–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (commercial version) ** | -18°C to 55°C (0°F to 130°F) with Alkaline Batteries<br>-40°C to 85°C (-40°F to 185°F) with Lithium Battery |
| Pressure range | -500 Pa to 500 Pa |
| Allowable overpressure | 100 kPa |
| Rated burst pressure | 500 kPa |
| Max humidity for long-term exposure | 40°C dew point |
| Range at 0 m Altitude<br>Range at 5000 m Altitude<br>Range at 8000 m Altitude | 0-30m/s<br>0-40m/s<br>0-50m/s |
| Span repeatability | 0.5% of reading |
| Span shift due to temperature variation | < 0.5% of reading per 10°C |
| Offset stability | < 0.05 Pa/year |
| Calibrated for | Air, N2 |
| Media compatibility | Air, N2, O2, non-condensing |
| Temperature measurement range | -40°C to 85°C (-40°F to +185°F) |
| Calibrated temperature measurement range | -20°C to 85°C (-4°F to +185°F) |
| Temperature resolution | 0.1°C |
| Temperature accuracy | +/- 2°C (-10°C to +60°C)<br>+/- 3°C (-40°C to +85°C) |
| Temperature repeatability | +/- 0.1°C |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Wireless operation | 900 MHz—Frequency-Hopping Spread Spectrum<br>868 MHz and 433 MHz—Frequency-Agile Wireless |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.



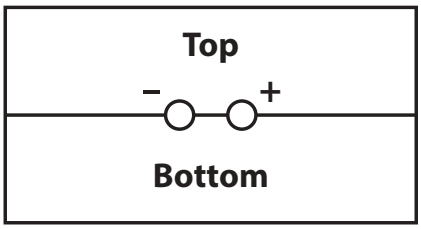

| ALTA Industrial Wireless Air Velocity Sensor \| Technical Specifications | | |
|---|---|---|
| Supply voltage | | 2.7–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) ** |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1800 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation *** |
| Pressure range | | -500 Pa to 500 Pa |
| Allowable overpressure | | 100 kPa |
| Rated burst pressure | | 500 kPa |
| Max humidity for long-term exposure | | 40°C dew point |
| Range at 0 m Altitude<br>Range at 5000 m Altitude<br>Range at 8000 m Altitude | | 0-30m/s<br>0-40m/s<br>0-50m/s |
| Span repeatability | | 0.5% of reading |
| Span shift due to temperature variation | | < 0.5% of reading per 10°C |
| Offset stability | | < 0.05 Pa/year |
| Calibrated for | | Air, N2 |
| Media compatibility | | Air, N2, O2, non-condensing |
| Temperature measurement range | | -40°C to 85°C (-40°F to +185°F) |
| Calibrated temperature measurement range | | 0.1°C |
| Temperature resolution | | 0.1°C |
| Temperature accuracy | | +/- 2°C (-10°C to +60°C)<br>+/- 3°C (-40°C to +85°C) |
| Temperature repeatability | | +/- 0.1°C |
| Integrated memory | | Up to 512 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications FC CE Industry Canada | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Note

Do not connect any tubing to the pressure ports without the sensor lid securely installed. The lid helps the keep sensor in place and stabilizes and supports the pressure ports.

Pressurizing the positive side will produce a positive reading. Pressurizing the negative side will produce a negative reading.




## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA by MONNIT

The Leading Enterprise Internet of Things Solution

# Wireless Hydrogen Sulfide ($H_2S$) Sensor

## General Description

Hydrogen Sulfide ($H_2S$) is a highly toxic gas similar to carbon monoxide. This sensor from Monnit allows you to monitor the air and presence of $H_2S$ in the surrounding environment.

The small footprint and affordability makes Monnit sensors the industry standard for $H_2S$ detection. Monnit sensors are the longest lasting and most efficient devices on the market.

- Measures $H_2S$ levels in surrounding air.

Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

## Principle of Operation

ALTA Wireless Hydrogen Sulfide ($H_2S$) Sensors monitor the presence of toxic gas in the atmosphere. Combined with the iMonnit Online System, the sensor will deliver up to date readings to notify you the second gas levels breach a set threshold. Readings can be viewed online through graphs and downloadable spreadsheets. Event notifications can be set in iMonnit through the easy to use online interface available on mobile devices.

## Example Applications

- Crude oil production
- Natural gas production
- Wastewater treatment
- Utility facilities
- Sewers

And many more...

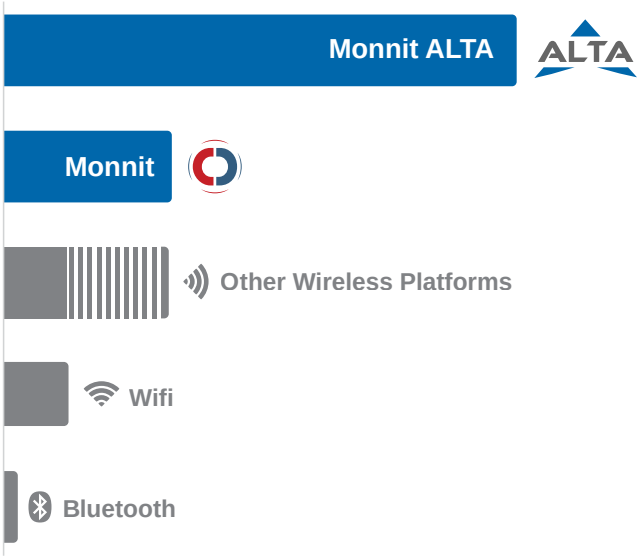
## Features of Monnit ALTA Sensors

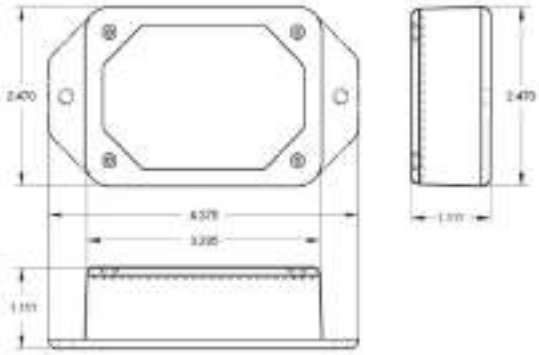
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison





| ALTA Commercial AA Wireless Hydrogen Sulfide ($H_2S$) Sensor \| Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.8 VDC (2 x AA 1.5V Batteries or Optional Power Supply) * |
| Current Consumption | 0.7 µA (sleep mode)<br>2 mA (radio idle/off mode)<br>2 mA (measurement mode)<br>25 mA (radio RX mode)<br>35 mA (radio TX mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 60°C (-40°F to 140°F) using lithium ** |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( 50°F to +122°F ) |
| Operating Pressure Range | ± 0.2 atm (recommended) |
| Operating Humidity Range | 15 to 85% RH |
| Measuring Range | 0-50 PPM |
| Maximum Overload | 50 PPM |
| Measuring Principle | Electrochemical reaction of $H_2S$. |
| Resolution | ± 0.1 PPM |
| Response Time (t-90) | < 40 seconds typical at 20°C |
| Stabilization Time | < 120 seconds |
| Long Term Drift – Zero | Zero Signal ≤ ± 2 PPM / month |
| Long Term Drift – Span | Output Signal ≤ ± 2% of reading per month |
| Maximum Zero Shift | < 1 ppm equivalent (-20°C to +40°C) |
| Weight | 4.0 oz. |
| Wireless Range | 1,200+ ft. non-line-of-sight |
| Certifications<br>FC CE Industry Canada | 900 MHz product; FCC ID: ZTL- RFSC1 and IC: 9794A-RFSC1. 920 MHz product; ARIB STD-T108 R210-103733. 868 and 433 MHz product tested and found to comply with: CISPR 22:2008-09 / EN 55022:2010 - Class B and ETSI EN 300 220-2 V2.4.1 (2012-05). |

* Circuits cannot withstand negative voltage. Please take care when installing batteries.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

**Notes**

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas - chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.).
- Volatile or flammable gas.
- Dusty conditions.
- Under low or high pressure.
- Wet or excessively humid locations.
- Places with salt water, oils chemical liquids or organic solvents.
- Where there are excessively strong vibrations.
- Other places where similar hazardous conditions exist.

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors - Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA rated enclosures. Our NEMA rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose directed water).

- Safe from falling dirt.
- Protects against wind-blown dust.
- Protects against rain, sleet, snow, splashing water, and hose directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

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CO CARBON MONOXIDE

# Wireless Carbon Monoxide (CO) Sensor

## General Description

The Wireless Carbon Monoxide (CO) sensor allows you to monitor the level of carbon monoxide (CO) gas in the surrounding air.

Monnit wireless CO sensors have a small footprint and low cost but boast industry standard setting, premium performance specifications and are the longest lifetime sensors in the industry (powered by a coin cell battery and last over a year at 1 hour heartbeat)

- Measures CO levels in surrounding air.

Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

## Principle of Operation

The Wireless Carbon Monoxide (CO) Sensor measures the the amount of CO gas in the surrounding air. The sensor returns carbon monoxide level and temperature values to the iMonnit Online Sensor Monitoring and Notification System. The system stores both data points in the online system where the data can be reviewed and exported as a data sheet or graph. Notifications can be set up through the online system to alert the user when defined CO levels have been met or exceeded.

## Example Applications

- Gas ranges and ovens
- Gas clothes dryers
- Furnaces
- Fireplaces
- Grills
- Space heaters
- Vehicles
- Water heaters

And many more...

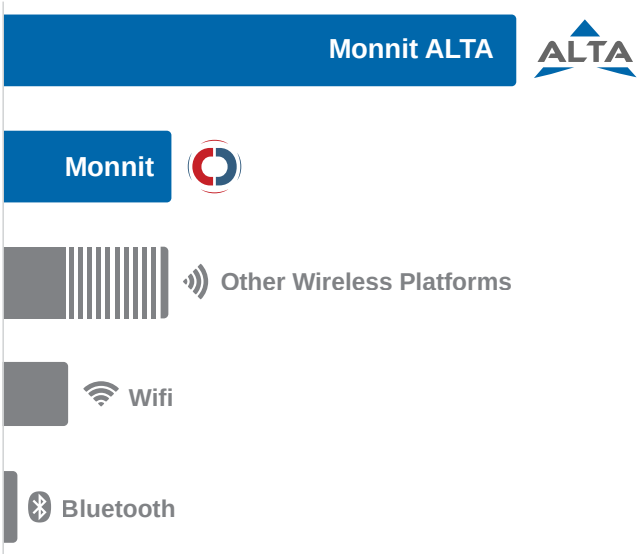
## Features of Monnit ALTA Sensors

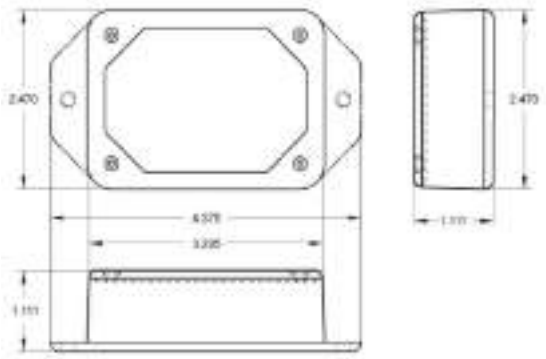
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison





| ALTA Commercial AA Wireless Carbon Monoxide Sensor \| Technical Specifications | |
|---|---|
| Supply Voltage | 2.0 - 3.6 VDC (3.0 - 3.6 VDC Using Power Supply) * |
| Current Consumption | 0.7 µA (sleep mode)<br>2 mA (radio idle/off mode)<br>2 mA (measurement mode)<br>25 mA (radio RX mode)<br>35 mA (radio TX mode) |
| Operating Temperature Range (Board Circuitry and Batteries) | -30°C to 55°C (-20°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium |
| Optimal Battery Temperature Range (AA) | +10°C to +50°C ( +50°F to +122°F ) |
| Operating Pressure Range | ± 0.2 atm (recommended) |
| Operating Humidity Range | 15 to 95% RH |
| Measuring Range | 0-1000 PPM |
| Maximum Overload | 1000 PPM |
| Measuring Principle | Electrochemical Oxidation of CO |
| Resolution | ± 1 PPM |
| Response Time (t-90) | < 40 seconds typical at 20°C |
| Stabilization Time | < 120 seconds |
| Long Term Drift – Zero | Zero Signal ≤ ± 2 PPM / month |
| Long Term Drift – Span | Output Signal ≤ ± 2% of reading per month |
| Maximum Zero Shift | < 8 ppm equivalent (-20°C to +40°C) |
| Weight | 4.0 oz. |
| Wireless Range | 1,200+ ft. non-line-of-sight |
| Certifications | 900 MHz product; FCC ID: ZTL- RFSC1 and IC: 9794A-RFSC1. 920 MHz product; ARIB STD-T108 R210-103733. 868 and 433 MHz product tested and found to comply with: CISPR 22:2008-09 / EN 55022:2010 - Class B and ETSI EN 300 220-2 V2.4.1 (2012-05). |

* Circuits cannot withstand negative voltage. Please take care when installing batteries.

** Accuracy is based at typical operating temperature and pressure (25 degrees C and 1 Atmosphere (sea level))

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

ALTA® by MONNIT

The Leading Enterprise Internet of Things Solution

VIBRATION METER

# Wireless Accelerometer - Advanced Vibration Meters

## General Description

The ALTA Wireless Advanced Vibration Meter uses an accelerometer to measure vibration and frequency on 3 axes. The sensor reports vibration (acceleration, velocity, displacement, or acceleration peak), frequency (Hz/RPM), and crest factor on all three axes, and duty cycle (how much of the report interval was vibration present), and temperature. This sensor can be used to manage vibration in assembly lines and monitor seismic activity in bridges.

## Features

- Three Axis Measurement
- Capable of Measuring Acceleration, RMS, Velocity RMS, Displacement, or Acceleration Peak
- Configurable Frequency Range
- Configurable Rectangular, Hanning, or Flat Top Window Filters
- Measure Up to 4800 Hz / 288,000 RPM
- Configurable Measurement Interval as Low as 1 second
- Configurable Critical Vibration Aware Threshold
- Runtime Indication via Duty Cycle
- Leaded and Non-Leaded Options Available

## Principle of Operation

The ALTA Advanced Vibration Meter measures vibration (acceleration, velocity, displacement, or acceleration peak), frequency (Hz/RPM), and crest factor on all three axes, duty cycle (how much of the report interval vibration was present), and temperature of the system to which it is attached. The sensor uses an accelerometer to capture g-force on all axes and then calculates vibration, frequency, and crest factor from that acceleration data. The Vibration Meter reports the duty cycle as a percentage of how long the vibration was present during the heartbeat. A single measurement consists of gathering 256 acceleration data points, analyzing those data points to produce vibration data, then taking a temperature measurement. The sensor will take a measurement based on a configurable Measurement Interval. Only the most recent set of data points is reported on each heartbeat.

## Example Applications

- Vibration monitoring
- Smart machines, smart structures & smart materials
- Bridge and building seismic activity monitoring
- Assembly line monitoring
- Many additional applications

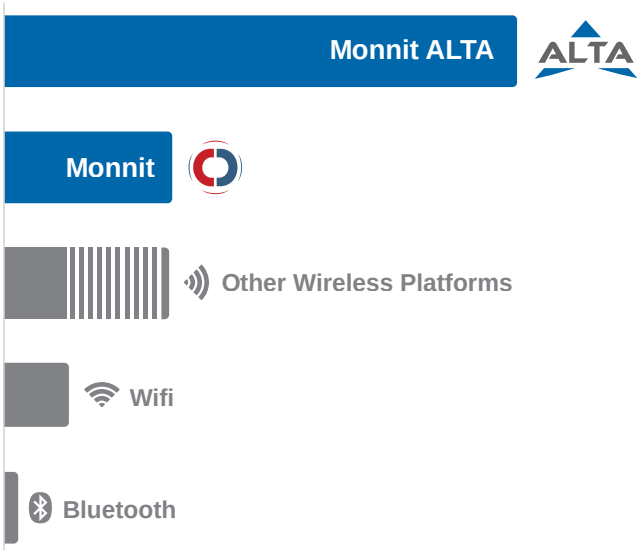
## Features of Monnit ALTA Sensors

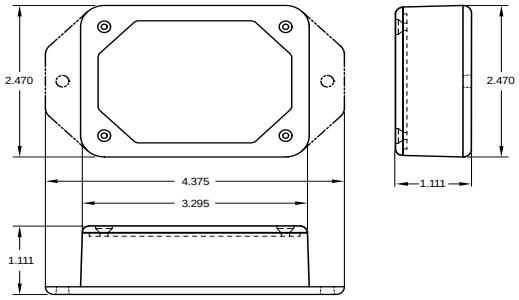
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 512 readings per sensor:
  - 10-minute heartbeats = 3.5 days
  - 2-hour heartbeats = 42 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison





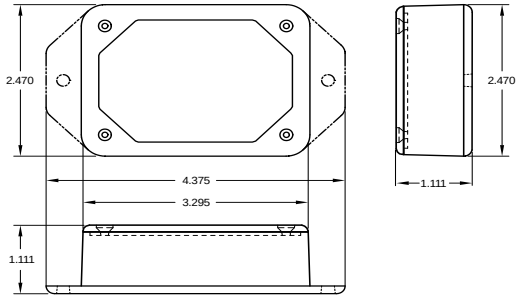

| ALTA Commercial AA Wireless Accelerometer - Advanced Vibration Meter (Non-Leaded) \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Vibration Measurement Range and Units | Acc RMS / Acc Peak: 0 to 65.535 mm/s^2, Velocity RMS: 0 to 655 35 mm/s, Displacement: 0 to 655.35 mm ** |
| Vibration Resolution | 0.001 mm/s^2, 0.01 mm/s, .01 mm |
| Frequency Measurement Range | See Frequency Measurement Range table below |
| Frequency Measurement Resolution | 0.1 Hz |
| Minimum Sensitivity Range / Resolution | Software Configurable (0 to 2.56 g / .01 g) |
| Accelerometer g-Force Range | Software Configurable (+/- 8 g, +/- 16 g, +/- 32 g) |
| Crest Factor Measurement Range / Resolution | 1.41 to 3.97 / .01 |
| Duty Cycle Measurement Range / Resolution | 0 to 100% / 1% |
| Temperature Measurement Range / Resolution | -40°C to +125°C ( -40°F to +257°F ) / 0.1 C (0.1 F) |
| Sample Rates | Software Configurable (See Frequency Measurement Range table below for available Sample Rates) |
| Window Filters | Software Configurable (Rectangular, Hanning, Flat Top)*** |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces, cube dimensions: 0.75 in. x 0.75 in. x 0.75 in. |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** Vibration measurement mode is software configurable. Only one measurement mode can be used at a time.

*** When making Displacement measurements the Hanning filter is recommended for best accuracy and performance.

| Frequency Measurement Range (Based on Configured Sample Rate) | | | | | | |
|---|---|---|---|---|---|---|
| | ACC RMS/AccPeak | | Velocity | | Displacement | |
| **Sample Rate** | Min Freq (Hz) | Max Freq (Hz) | Min Freq (Hz) | Max Freq (Hz) | Min Freq (Hz) | Max Freq (Hz) |
| **12800** | 200 | 4800 | 300 | 4800 | 400 | 4800 |
| **6400** | 100 | 2400 | 150 | 2400 | 200 | 2400 |
| **3200** | 50 | 1200 | 75 | 1200 | 100 | 1200 |
| **1600** | 25 | 600 | 37.5 | 600 | 50 | 600 |
| **800** | 12.5 | 300 | 18.75 | 300 | 25 | 300 |
| **400** | 6.25 | 150 | 9.375 | 150 | 12.5 | 150 |
| **200** | 3.125 | 75 | 4.6875 | 75 | 6.25 | 75 |
| **100** | 1.5625 | 37.5 | 2.34375 | 37.5 | 3.125 | 37.5 |
| **50** | 0.78125 | 18.75 | 1.171875 | 18.75 | 1.5625 | 18.75 |
| **25** | 0.390625 | 9.375 | 0.5859375 | 9.375 | 0.78125 | 9.375 |




| ALTA Commercial AA Wireless Accelerometer - Advanced Vibration Meter (Leaded) \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -18°C to 55°C (0°F to 130°F) using alkaline<br>-40°C to 85°C (-40°F to 185°F) using lithium |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Vibration Measurement Range and Units | Acc RMS / Acc Peak: 0 to 65.535 mm/s^2, Velocity RMS: 0 to 655 35 mm/s, Displacement: 0 to 655.35 mm ** |
| Vibration Resolution | 0.001 mm/s^2, 0.01 mm/s, .01 mm |
| Frequency Measurement Range | See Frequency Measurement Range table below |
| Frequency Measurement Resolution | 0.1 Hz |
| Minimum Sensitivity Range / Resolution | Software Configurable (0 to 2.56 g / .01 g) |
| Accelerometer g-Force Range | Software Configurable (+/- 8 g, +/- 16 g, +/- 32 g) |
| Crest Factor Measurement Range / Resolution | 1.41 to 3.97 / .01 |
| Duty Cycle Measurement Range / Resolution | 0 to 100% / 1% |
| Temperature Measurement Range / Resolution | -40°C to +125°C ( -40°F to +257°F ) / 0.1 C (0.1 F) |
| Sample Rates | Software Configurable (See Frequency Measurement Range table below for available Sample Rates) |
| Window Filters | Software Configurable (Rectangular, Hanning, Flat Top)*** |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces, cube dimensions: 0.75 in. x 0.75 in. x 0.75 in. |
| Certifications | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** Vibration measurement mode is software configurable. Only one measurement mode can be used at a time.

*** When making Displacement measurements the Hanning filter is recommended for best accuracy and performance.

| Frequency Measurement Range (Based on Configured Sample Rate) | | | | | | |
|---|---|---|---|---|---|---|
| | ACC RMS/AccPeak | | Velocity | | Displacement | |
| **Sample Rate** | Min Freq (Hz) | Max Freq (Hz) | Min Freq (Hz) | Max Freq (Hz) | Min Freq (Hz) | Max Freq (Hz) |
| **12800** | 200 | 4800 | 300 | 4800 | 400 | 4800 |
| **6400** | 100 | 2400 | 150 | 2400 | 200 | 2400 |
| **3200** | 50 | 1200 | 75 | 1200 | 100 | 1200 |
| **1600** | 25 | 600 | 37.5 | 600 | 50 | 600 |
| **800** | 12.5 | 300 | 18.75 | 300 | 25 | 300 |
| **400** | 6.25 | 150 | 9.375 | 150 | 12.5 | 150 |
| **200** | 3.125 | 75 | 4.6875 | 75 | 6.25 | 75 |
| **100** | 1.5625 | 37.5 | 2.34375 | 37.5 | 3.125 | 37.5 |
| **50** | 0.78125 | 18.75 | 1.171875 | 18.75 | 1.5625 | 18.75 |
| **25** | 0.390625 | 9.375 | 0.5859375 | 9.375 | 0.78125 | 9.375 |

| ALTA Industrial Wireless Accelerometer - Advanced Vibration Meter (Leaded) \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and batteries) | -40°C to +85°C (-40°F to +185°F) ** |
| Optimal battery temperature range (AA) | +10°C to +50°C (+50°F to +122°F) |
| Vibration Measurement Range and Units | Acc RMS / Acc Peak: 0 to 65.535 mm/s^2, Velocity RMS: 0 to 655 35 mm/s, Displacement: 0 to 655.35 mm ** |
| Vibration Resolution | 0.001 mm/s^2, 0.01 mm/s, 0.01 mm |
| Frequency Measurement Range | See Frequency Measurement Range table below |
| Frequency Measurement Resolution | 0.1 Hz |
| Minimum Sensitivity Range / Resolution | Software Configurable (0 to 2.56 g / .01 g) |
| Accelerometer g-Force Range | Software Configurable (+/- 8 g, +/- 16 g, +/- 32 g) |
| Crest Factor Measurement Range / Resolution | 1.41 to 3.97 / .01 |
| Duty Cycle Measurement Range / Resolution | 0 to 100% / 1% |
| Temperature Measurement Range / Resolution | -40°C to +125°C ( -40°F to +257°F ) / 0.1 C (0.1 F) |
| Sample Rates | Software Configurable (See Frequency Measurement Range table below for available Sample Rates) |
| Window Filters | Software Configurable (Rectangular, Hanning, Flat Top)*** |
| Integrated memory | Up to 512 sensor messages |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces, cube dimensions: 0.75 in. x 0.75 in. x 0.75 in. |
| Certifications FC CE Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** Vibration measurement mode is software configurable. Only one measurement mode can be used at a time.

*** When making Displacement measurements the Hanning filter is recommended for best accuracy and performance.

| Frequency Measurement Range (Based on Configured Sample Rate) | | | | | | |
|---|---|---|---|---|---|---|
| | ACC RMS/AccPeak | | Velocity | | Displacement | |
| **Sample Rate** | Min Freq (Hz) | Max Freq (Hz) | Min Freq (Hz) | Max Freq (Hz) | Min Freq (Hz) | Max Freq (Hz) |
| **12800** | 200 | 4800 | 300 | 4800 | 400 | 4800 |
| **6400** | 100 | 2400 | 150 | 2400 | 200 | 2400 |
| **3200** | 50 | 1200 | 75 | 1200 | 100 | 1200 |
| **1600** | 25 | 600 | 37.5 | 600 | 50 | 600 |
| **800** | 12.5 | 300 | 18.75 | 300 | 25 | 300 |
| **400** | 6.25 | 150 | 9.375 | 150 | 12.5 | 150 |
| **200** | 3.125 | 75 | 4.6875 | 75 | 6.25 | 75 |
| **100** | 1.5625 | 37.5 | 2.34375 | 37.5 | 3.125 | 37.5 |
| **50** | 0.78125 | 18.75 | 1.171875 | 18.75 | 1.5625 | 18.75 |
| **25** | 0.390625 | 9.375 | 0.5859375 | 9.375 | 0.78125 | 9.375 |

## Commercial Grade Sensors

Monnit commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

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# ALTA Propane Tank Level Monitor

## General Description

The Wireless ALTA Propane Tank Level Monitor allows a user to remotely monitor the level of a propane tank by simply plugging in the R3D® (Remote ready) sensor into a pre-installed R3D tank gauge. As the propane level is decreased, the reading produced decreases as well. The monitor converts the reading into a percentage of propane remaining in the tank and transmits that percentage wirelessly to its connected ALTA Gateway. The percentage depends on the configuration of the tank and the R3D gauge pulling an accurate level of propane inside.

**Important:** Tank gauges that are not R3D ready can be upgraded with an R3D gauge from one of these vendors: See the chart on page 3.

- Rochester Gauge
- Squibb Taylor

**Warning:** If you do not have a dial that is R3D compatible, do NOT attempt to change the dial yourself. Please contact your propane supplier and ask them for a replacement dial that supports the R3D standard. The float gauge inside the tank does not need to be replaced, just the plastic dial that reports the propane level inside the tank. (Compare your dial to those in the following link and verify which one is installed on your tank. If R3D ready, please proceed.)

## Principle of Operation

The ALTA Propane Tank Level Monitor uses the Level Monitor to measure volumetric percentage of propane in a contained environment. A magnet attached to a buoyant device will be placed atop propane in a container with the Level Monitor placed at a reasonably close distance. The Level Monitor produces a voltage proportional to the sensed magnetic field, so as the propane level is decreased, the voltage produced is as well. This monitor converts the sensed voltage into a percentage based on the volume of the container. This monitor is based on the assumption that the container holding the propane is uniform in width such that each unit of height the propane gas is depleted is of equal volume

If the propane level has fallen below 8% then iMonnit displays "**Empty**".

If the propane level is above 80% then iMonnit reports "**Full**".

## Example Interfacing

- Propane level monitoring

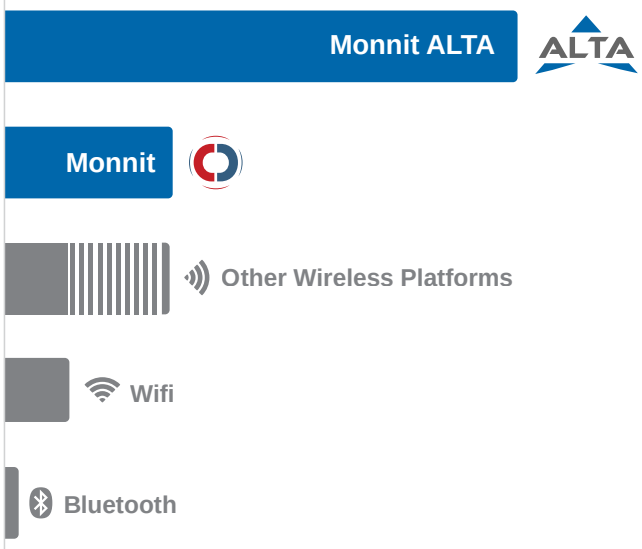
## Features of Monnit ALTA Sensors

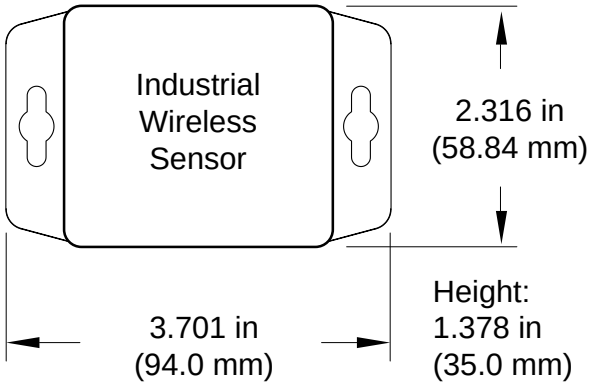
- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Improved interference immunity
- Improved power management for longer battery life ** (12+ years on AA batteries)
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- All ALTA sensors now have up to 3200 readings:
  - 10-minute heartbeats = 22 days
  - 2-hour heartbeats = 266 days
- Over-the-air updates (future proof)
- Free iMonnit basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

* Actual range may vary depending on environment.

** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

## Wireless Range Comparison






## ALTA Industrial Wireless Propane Tank Monitor | Technical Specifications

| | | |
|---|---|---|
| Supply voltage | | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) |
| Current consumption | | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | | -40°C to +85°C (-40°F to +185°F) |
| Included battery | Max temperature range | -40° to +85°C (-40° to +185°F) |
| | Capacity | 1500 mAh |
| Optional solar feature | Solar panel | 5VDC/30mA (53mm x 30mm) |
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation * |
| Integrated memory | | Up to 3200 sensor messages |
| Wireless range | | 1,200+ ft non-line-of-sight |
| Lead Length | | 6 feet |
| Security | | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | | 4.7 ounces |
| Enclosure rating | | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| Voltage Conversion Table | | |
| UL rating | | UL Listed to UL508-4x specifications (File E194432) |
| Certifications | | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

| Volume Content (%) | Voltage Produced (V) |
|---|---|
| Empty | <0.3 |
| 8 | 0.3 |
| 10 | 0.6 |
| 20 | 1.1 |
| 30 | 1.5 |
| 40 | 2 |
| 50 | 2.5 |
| 60 | 3.1 |
| 70 | 3.6 |
| 80 | 4 |
| Full | >4 |

* Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Monnit's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

## R3D Gauge Information

The ALTA Propane Level Monitor supports both Jr. and Sr. R3D Gauges. Monnit's level monitor does not support anything outside of this specification.

R3D LP Dial Sr. Tab

R3D LP Dial Jr. Tab

| Style | Tank |
|---|---|
| Jr. | Horizontal |
| Sr. | |
| Snap-On | |
| Jr. | Vertical DOT |
| Jr. | Below Ground |

**Warning:** If you do not have a dial that is R3D compatible, do NOT attempt to change the dial yourself. Please contact your propane supplier and ask them for a replacement dial that supports the R3D standard. The float gauge inside the tank does not need to be replaced, just the plastic dial that reports the propane level inside the tank. (Compare your dial to those in the following link and verify which one is installed on your tank. If R3D ready, please proceed.)

For more information about our products or to place an order, please contact our sales department at 801-561-5555.

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