The Leading Enterprise Internet of Things Solution

Wireless Resistance Sensor

General Description

The ALTA Wireless Resistance Sensor reports the resistance across a load. It can be connected to any kind of passive (no voltage) resistance load.

- Measures up to 250k Ohms.
- Accurate to ± 2% (FS) with user calibration.
- Interfaces with any purely resistive and passive load.

Principle of Operation

The ALTA Wireless Resistance Sensor reads the resistance across any resistive load and reports back the measured resistance. The resistance sensor leads are meant to connect to passive devices only, connecting the sensor leads to any voltage or power source may damage the sensor. It is programmed to sleep for a user-given time interval (heartbeat) and then wake up, convert the analog data, mathematically compute the resistance, and transmit the data to the gateway, where it is then logged into the cloud service. The user can configure defined thresholds and have the system alert on threshold breaches.

Example Applications

- Resistance Monitoring
- Battery Monitoring
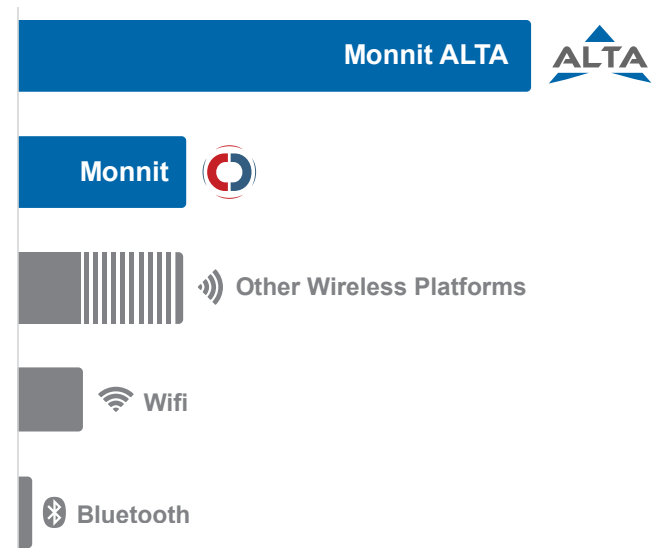- Transducer Interfacing
- And many more...
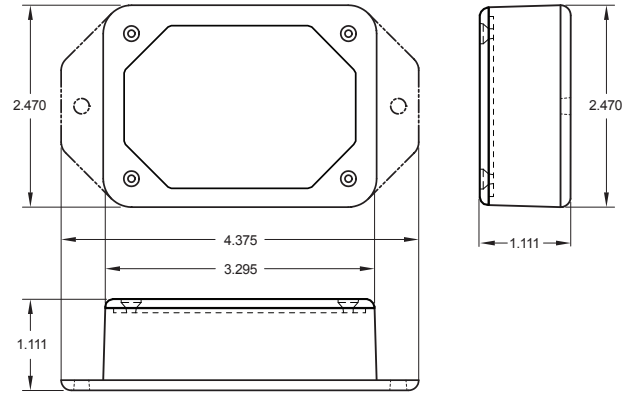
Features of Monnit ALTA Sensors

- 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)
- 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 AA Wireless Resistance Sensor | Technical Specifications

|	
Supply Voltage	2.0 - 3.6 VDC (3.0 - 3.6 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)	-18°C to 55°C (0°F to 130°F) using alkaline -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)
Resistive Range (in Ohms)	0 – 250000
Specific Resistive Ranges (in Ohms)	0 - 5600, 5600 - 250000
Resolution (in Ohms)	65535 Unique Values Per Specific Range (16 bit): ~3.4, ~125
Accuracy	+/- 3% FS of Specific Range
User Calibrated Accuracy	+/- 2% FS of Specific Range
Lead Wire Length	1ft. (12 in.)
Wireless Range	1,200+ 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

* 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

Two replaceable 1.5V AA sized batteries are included with the standard 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 utilize 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.

Pinch and Pull
To Change Battery

1.125 in
(28.575 mm)

2.0 in
(50.8 mm)

0.875 in
(22.225 mm)
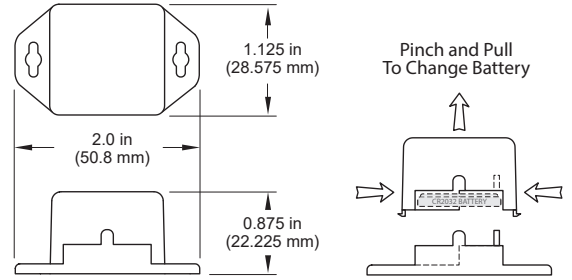
ALTA Coin Cell Wireless Resistance Sensor	Technical Specifications	
Supply Voltage	2.0 - 3.6 VDC *
Current Consumption	0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)
Operating Temperature Range (board circuitry and battery)	-7°C to +60°C (20°F to +140°F)**
Optimal Battery Temperature Range (AA)	+10°C to +50°C (+50°F to +122°F)
Resistive Range (in Ohms)	0 – 250000
Specific Resistive Ranges (in Ohms)	0 - 5600, 5600 - 250000
Resolution (in Ohms)	65535 Unique Values Per Specific Range (16 bit): ~3.4, ~125
Accuracy	+/- 3% FS of Specific Range
User Calibrated Accuracy	+/- 2% FS of Specific Range****
Lead Wire Length	1ft. (12 in.)
Wireless Range	1,200+ ft non-line-of-sight
Security	Encrypt-RF® (256-bit key exchange and AES-128 CTR)
Weight	1.0 oz.
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

FCC   CE   Industry Canada

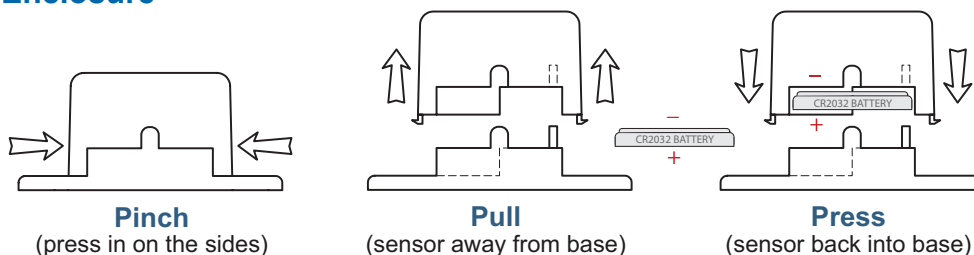* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

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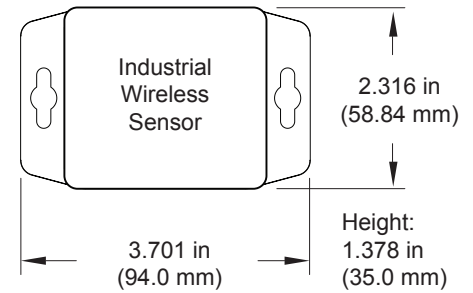
Power Options

Sensors are powered by a replaceable 3.0 V coin cell battery. Optional AA battery powered sensors are available. The AA version of these sensors are larger in size (3" [L] x 2.1" [W] x 1.2" [H]) and include two long-life AA batteries.

It is recommended that unless you are using the AA battery solution, you set heartbeat to no faster than one hour to preserve battery life.

PinchPower™ Enclosure

Pinch
(press in on the sides)

Pull
(sensor away from base)

Press
(sensor back into base)

Industrial Wireless Sensor

2.316 in (58.84 mm)

3.701 in (94.0 mm)

Height: 1.378 in (35.0 mm)

ALTA Industrial Wireless Resistance Sensor | Technical Specifications

Supply Voltage		2.0 - 3.6 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 Battery)		
Included Battery	Max Temperature Range:	-40°C to +85°C (-40°F 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)
	Charging Efficiency:	5% *****
	Luminous Sustainability:	Minimum of 10,000 LUX *****
Resistive Range (in Ohms)		0 – 145000***
Specific Resistive Ranges (in Ohms)		0 – 530, 530 – 3500, 3500 – 27200, 27200 - 145000
Resolution (in Ohms)		2047 Unique Values Per Specific Range (11 bit): ~.25, ~1.71, ~13.3, ~70.8.
Accuracy		+/- 3% FS of Specific Range
User Calibrated Accuracy		+/- 1.5% FS of Specific Range****
Lead Wire Length		1ft. (12 in.)
Wireless Range		1,200+ ft non-line-of-sight
Security		Encrypt-RF® (256-bit key exchange and AES-128 CTR)
Weight		1.0 oz.
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

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

Solar Power Option

Monnit Industrial Sensors are powered by a replaceable 3.6V Lithium battery (included). An optional solar powered version is also available. The solar powered sensor uses a Lithium Iron Phosphate rechargeable battery in conjunction with a solar power cell to extend battery life.

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

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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