

ALTA® Wireless Resistance Sensors

General Description

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

Key Features

- ▶ Measures up to 250k Ohms
- ▶ Accuracy: ± 2% FS with user calibration
- ▶ Interfaces with any purely resistive and passive load
- ▶ Configurable thresholds for critical condition monitoring

Principles of Operation

The ALTA Wireless Resistance Sensor reads the resistance across any resistive load on a user-configurable time interval or Heartbeat. 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. On every Heartbeat, the sensor measures the resistance across its leads. This measurement is then sent to the gateway, making the data available in iMonnit or another approved data service.

Example Applications

- ▶ Resistance Monitoring
- ▶ Battery Monitoring
- ▶ Transducer Interfacing
- ▶ [Additional applications](#)

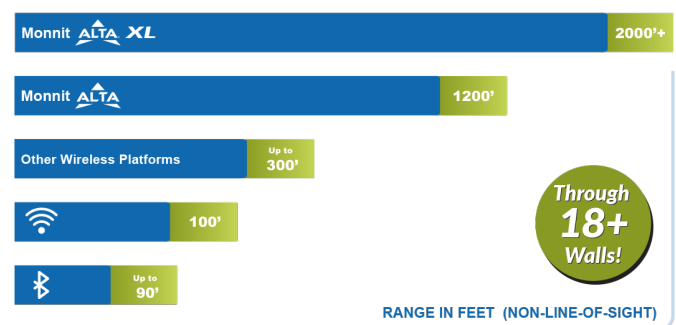
Features of Monnit ALTA Sensors

- Wireless range of 2,000+ feet through 18+ walls¹
- Frequency-Hopping Spread Spectrum (FHSS)
- Best-in-class interference immunity
- Best-in-class power management for longer battery life²
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + Advanced Encryption Standard (AES)-128 Cipher Block Chaining (CBC) for sensor data messages)
- Sensor logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through power cycling):
 - 10-minute Heartbeats = ~ 22 days
 - 2-hour Heartbeats = ~ 266 days
- Automatic over-the-air updates to sensor firmware (future-proof)
- Free iMonnit Basic Online Wireless Sensor Monitoring and Notification System to configure sensors, view data, and send alerts via SMS text, email, and voice call


1 Actual range may vary depending on the environment and gateway.

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

Wireless Range Comparison

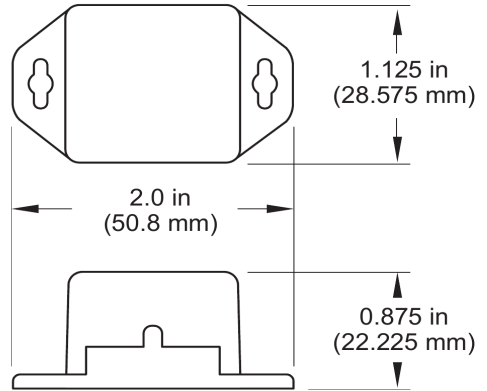


Technical Specification | ALTA® Wireless Resistance Sensors

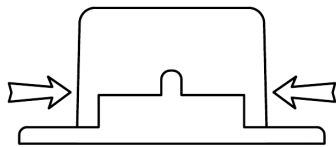
Resistance Measurement	Resistive Range (in Ohms)	0 – 250000
	Specific Resistive Ranges (in Ohms)	0 - 5600, 5600 - 250000
	Resolution (in Ohms)	65535 Unique Values Per Specific Range (16 bit): ~3.4, ~125
	Accuracy	+/- 3% FS of Specific Range
	User Calibrated Accuracy	+/- 2% FS of Specific Range
Commercial/ Enterprise Lead	Cable length	Standard: 0.9 m (3 ft)
	Wire count	2-conductor
	Wire gauge	24 AWG
	Conductor material	Stranded Copper 7/32
	Insulation	PVC, 0.41mm (0.016")
	Shield	No
	Jacket	PVC (black)
	Cable dimensions	1.47mm x 2.79mm (0.058" x 0.117")
	Ratings / Approvals	RoHS/Reach Compliant
	Temperature Rating	-30°C to 80°C (-22°F to 176°F)
Industrial Lead	Cable length	Standard: 0.9 m (3 ft)
	Wire count	2-conductor (red/black)
	Wire gauge	22 AWG
	Conductor material	Stranded Copper 7/30
	Insulation	PVC, 0.254mm (0.010")
	Shield	No
	Jacket	PVC (black)
	Overall Diameter	4.2 mm (0.164")
	Ratings / Approvals	NEC (UL) Type CM, UL AWM Style 2464, CSA AWM FT4, RoHS/Reach Compliant
	Temperature Rating	-20°C to 85°C (-4°F to 185°F) ¹
	Voltage Rating	300 V Max
Dielectric Strength	1500 V RMS (Root Mean Square)	
ALTA Wireless	Data logging	Sensor logs 2000 to 4000 readings if gateway connection is lost (non-volatile flash, persists through power cycling): 10-minute Heartbeats = ~22 days - 2-hour Heartbeats = ~266 days
	Wireless protocol	ALTA Proprietary Frequency-Hopping Spread Spectrum (FHSS)
	Wireless transmission power (EIRP)	50 mW (900MHz), 25 mW (868 MHz), 10 mW (433 MHz)
	Wireless range	2,000+ ft. through 18+ walls with the ALTA XL® Gateway
Security	Encrypt-RF® (256-bit key exchange and AES-128 CTR)	
General	Battery voltage range	2.0 to 3.8 VDC
	Operating altitude (non-pressurized environments)	-15.2 to 1,982 m (-50 to 6,500 ft) ²
	Storage altitude (non-pressurized environments)	-15.2 to 3,048 m (-50 to 10,000 ft) ²
	Operating humidity	5 to 85% RH (non-condensing)
	Certifications	900 MHz sensors: FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1 . 868 and 433 MHz sensors tested and comply with: EN 55032: 2015/A11:2020; EN 55035:2017/A11:2020; ETSI EN 300 220 V3.2.1 (2018-06); ETSI EN 301 489-3 V2.2.0. (2021-11); and ETSI EN 303 645 . All sensors tested and comply with: EN 61010-1 and EN 60950 and meet RoHS 2015/863 and REACH 224 (June 2022), according to IEC 63000:2016/AMD1:2022 .
		

1. Temperatures colder than the rating are acceptable if the cable is not moving or vibrating.
2. Operating and storage altitude without DC power supply is -30.48 to 9144 m (-100 to 30000 ft).

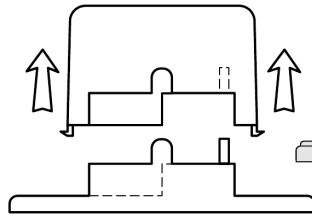
The sensor reports the following value:
Resistance in Ohms.



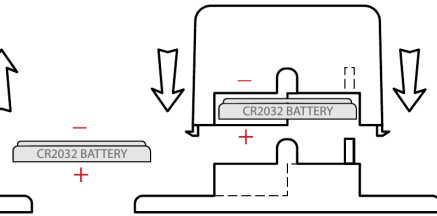
PinchPower™ Enclosure



Pinch
(press in on the sides)



Pull
(sensor away from base)

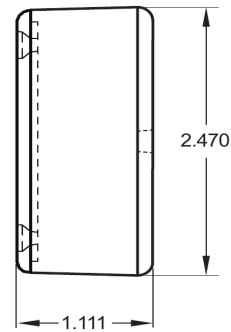
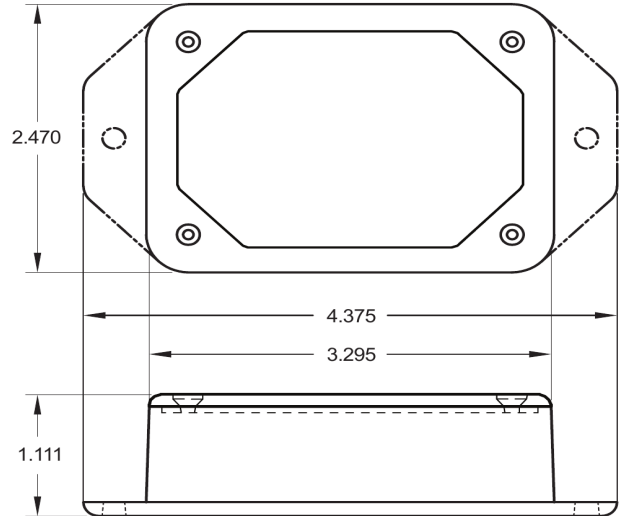


Press
(sensor back into base)

Technical Specifications | ALTA® Commercial Resistance Sensor

Battery ¹	1x 3.0V CR2032 Button Cell, 100 mAh
Battery Life	2+ years expected
Operating temperature range (non-leaded measurement range)	10°C to 50°C (50°F to 122°F)
Wireless antenna type	1/4-wave, 20 gauge wire whip, 3.5" (900/868MHz), 7" (433MHz)
Weight	0.7 oz. (19.8 g)

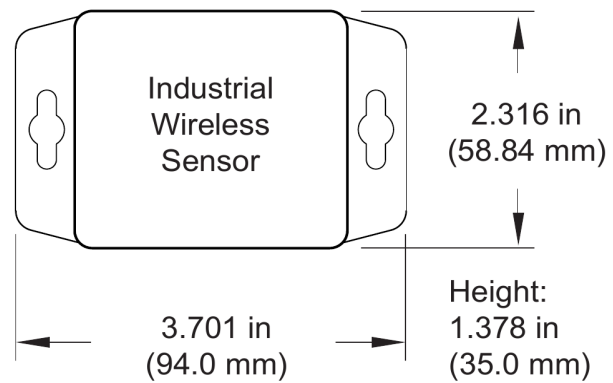
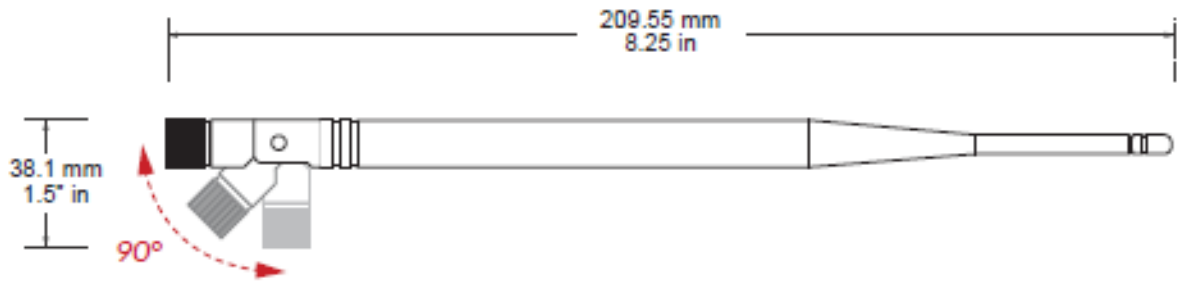
1. Hardware cannot withstand negative voltage. Please take care when inserting and removing battery.



Technical Specifications | ALTA® Enterprise Wireless Resistance Sensor

Battery ¹	2x 1.5V AA Alkaline, 1500 mAh, (standard) 2x 1.5V AA Lithium, 3000 mAh, (optional)
Battery Life	10+ years expected
External line-power option ²	Input voltage: 5.0-12.0 V, greater than 0.1A, less than 100mVp-p noise Power jack: 2.1 x 5.5 mm barrel, center positive
Operating temperature range with given power sources ³	-18°C to 55°C (0°F to 130°F) - AA Alkaline Batteries -25°C to 60°C (-13°F to 140°F) - AA Lithium L91 Batteries 0°C to 40°C (32°F to 104°F) - US 5V Power Supply 10°C to 40°C (50°F to 104°F) - International 5V Power Supply
Wireless antenna type	1/4-wave, 20 gauge wire whip, 3.5" (900/868MHz), 7" (433MHz)
Weight	3.1 ounces (87.9 g)

1. Hardware can't withstand negative voltage. Please take care when inserting and removing batteries.
2. Batteries will provide backup power when the external power is removed.
3. Operating below 0°C (32°F) degrees will reduce battery life.



Technical Specifications ALTA® Industrial Wireless Resistance Sensor	
Battery	1x 3.6V AA Lithium Thionyl Chloride, 1500mAh, pre-installed
Battery Life	10+ years expected
Operating temperature range ¹	-25°C to 80°C (-13°F to 176°F)
Wireless antenna type	1/2-wave waterproof dipole with RP-SMA connector and swivel neck; dBi of 3.0 (900/868MHz) or 2.5 (433 MHz); length of 8.27" (210mm) (900/868MHz) or 7.68" (195mm) (433 MHz); diameter at thickest point of 0.55" (14mm)
Weight	5.1 ounces (144.5 g)
Enclosure rating	NEMA 1, 2, 4, 4x, 12, and 13 rated, sealed, and weatherproof
UL rating	UL Listed to UL508-4x specifications (File E194432)

1. Operating below 0°C (32°F) degrees will reduce 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 burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxide 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 temperatures 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 indoor and outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust and the damaging effects of 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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