Remote Monitoring for Business

Wireless Temperature Sensors

General Description

The ALTA Wireless Temperature Sensor uses a type Negative Temperature Coefficient (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 or Celsius. The sensor's programmed to sleep for a user-given time interval (heartbeat) and then wake up. Then, it sends power to the NTC thermistor and waits for it to stabilize to convert the analog data, mathematically compute the temperature, and transmit the data to the gateway. The sensor's processor is programmed to calculate the temperature based on an internal data table. The ALTA Temperature Sensor also implements and configures a variable resistor over specified temperature ranges to reduce error.

An industry-leading 25-month NIST certification is available on leaded Monnit Temperature Sensors.

Example Applications

- Ambient temperature monitoring
- Environmental monitoring
- Smart machines and facilities
- HVAC operation and testing
- Data center monitoring
- Additional applications

Features of Monnit ALTA Sensors

- Wireless range of 1,200+ feet through 12+ walls[1]
- Frequency-Hopping Spread Spectrum (FHSS)
- Best-in-class interference immunity
- Best-in-class power management for longer battery life[2]
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Data logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through the power cycle):
    - 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 to be sent via SMS text and email

1 Actual range may vary depending on the environment.

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

Wireless Range Comparison

Monnit ALTA

Other Wireless Platforms

Wifi

Bluetooth
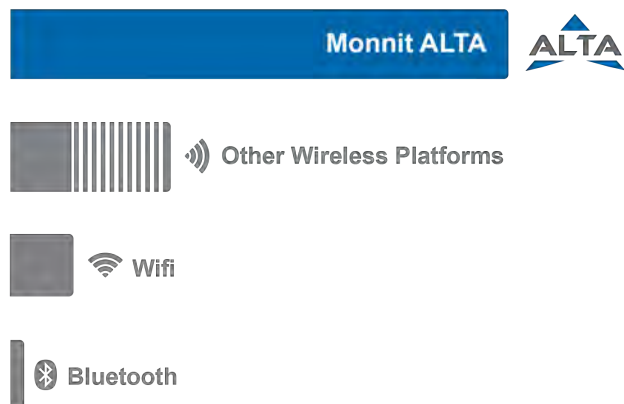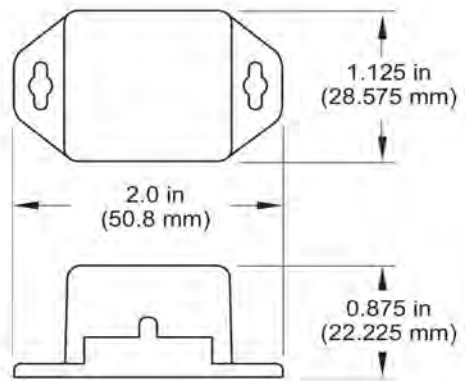
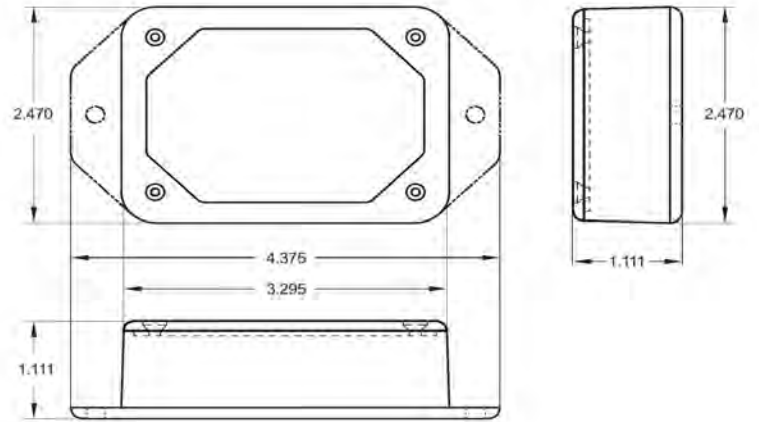| ALTA Commercial Coin Cell Wireless Temperature Sensor | Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC [1] |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating 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) |
| External Probe and Lead Operating Range | -40°C to +125°C (-40°F to +257°F) Waterproof |
| Accuracy @ 25°C | +/- 1% (1° C or 1.8° F) |
| User-calibrated accuracy | +/- 0.25° C (± 0.45° F) |
| Time constant @ 25°C | 30 secconds |
| Data logging | Data logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through the power cycle): - 10-minute heartbeats = ~ 22 days - 2-hour heartbeats = ~ 266 days |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.4 oz. (11.34 g) - No lead | 1.34 oz. (37.99 g) - with 3 ft. (0.91 m) lead |
| Lead | Probe: 316 stainless steel. Dimensions: 4.8 mm x 25 mm Waterproof Length Options: 3 ft. (0.91 m) 10 ft. (3.04 m) 25 ft. (7.62 m) 50 ft. (15.24 m) 100 ft. (30.48 m) |
| 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 |

[1] 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)
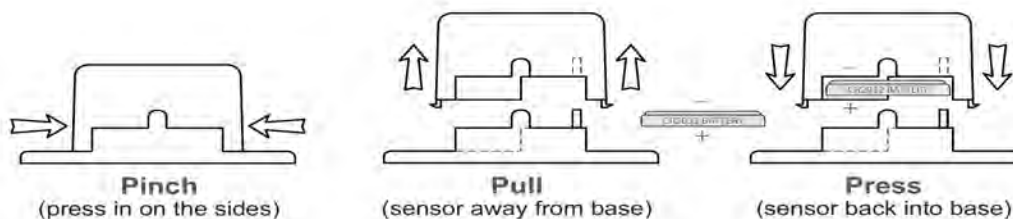
ALTA Commercial AA Wireless Temperature Sensor | Technical Specifications

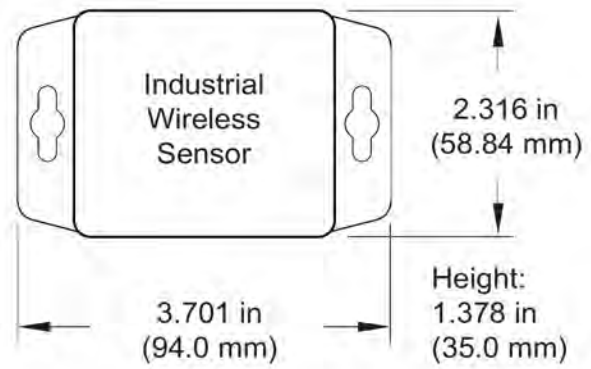|	
Supply voltage	2.0–3.8 VDC (5.0–12 VDC using power supply)[1]
Current consumption	0.2 μA (sleep mode), 0.7 μA (RTC sleep), 570 μA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)
Operating temperature range (board circuitry and batteries)	-18°C to 55°C (0°F to 130°F) using alkaline -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)
External Probe and Lead Operating Range	-40°C to +125°C (-40°F to +257°F) Waterproof
Accuracy @ 25°C	+/- 1% (1° C or 1.8° F)
User-calibrated accuracy	+/- 0.25° C (± 0.45° F)
Time constant @ 25°C	15-second max
Data logging	Data logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through the power cycle): - 10-minute heartbeats = ~ 22 days - 2-hour heartbeats = ~ 266 days
Wireless range	1,200+ ft non-line-of-sight
Security	Encrypt-RF® (256-bit key exchange and AES-128 CTR)
Weight	3 oz. (85.05 g) - No lead	3.7 oz. (105 g) - with 3 ft. (0.91 m) lead
Lead	Probe: 316 stainless steel. Dimensions: 4.8 mm x 25 mm Waterproof Length Options: 3 ft. (0.91 m) 10 ft. (3.04 m) 25 ft. (7.62 m) 50 ft. (15.24 m) 100 ft. (30.48 m)
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

[1] Hardware cannot withstand negative voltage. Please take care when connecting a power device.

Power Options

Two replaceable 1.5 V AA-sized batteries (included with purchase) power the standard version of this sensor.

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 5.0–12V power supply. The line-powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of a line-power outage.

Power options must be selected at the time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.
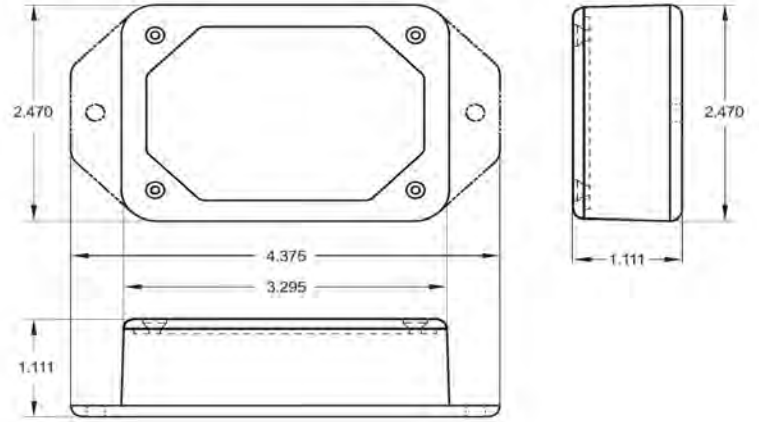
ALTA Industrial Wireless Temperature Sensor | Technical Specifications		
Supply voltage		2.0–3.8 VDC
Current consumption		0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)
Operating temperature range (board circuitry and battery)		-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 [1]
	Charging efficiency	40% [2]
	Luminous sustainability	Minimum of 250 LUX [2]
External Probe and Lead Operating Range		-40°C to +125°C (-40°F to +257°F) (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 seconds
Data logging		Data logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through the power cycle): - 10-minute heartbeats = ~ 22 days - 2-hour heartbeats = ~ 266 days
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 weatherproof
UL rating		UL Listed to UL508-4x specifications (File E194432)
Lead		Probe: 316 stainless steel. Dimensions: 4.8 mm x 25 mm Waterproof Length Options: 3 ft. (0.91 m) 10 ft. (3.04 m) 25 ft. (7.62 m) 50 ft. (15.24 m) 100 ft. (30.48 m)
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

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

[2] Solar feature's energy harvesting circuitry works indoors with low light.

ALTA-ISX IECEx-Certified Wireless 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 batteries)	-40°C to 40°C (-40°F to 104°F)
External Probe and Lead Operating Range	-40°C to +125°C (-40°F to +257°F) Waterproof
Accuracy @ 25°C	+/- 1% (1° C or 1.8° F)
User-calibrated accuracy	+/- 0.25° C (± 0.45° F)
Time constant @ 25°C	15-second max
Data logging	Data logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through the power cycle): - 10-minute heartbeats = ~ 22 days - 2-hour heartbeats = ~ 266 days
Wireless range	1,200+ ft non-line-of-sight
Security	Encrypt-RF® (256-bit key exchange and AES-128 CTR)
Weight	5.6 oz. (158.7 g) - with 3 ft. (0.91 m) lead
Lead	Probe: 316 stainless steel. Dimensions: 4.8 mm x 25 mm Waterproof Length Options: 3 ft. (0.91 m)
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 IECEx - Ex ib IIA T3 Gb - Cert # 21.0028X

Power Options

WARNING: The sensor is supplied with a single **AA RAMWAY ER14505M battery** with a capacity of approximately 2,200 mAh. A single AA RAMWAY ER14505M lithium / thionyl chloride battery MUST be used and ONLY the RAMWAY ER14505 battery.

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 both indoor or 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