



## Remote Monitoring for Business



# 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.

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

### Principle of Operation

The ALTA Wireless Thermocouple Sensor measures high-temperature applications. It's programmed to:

1. Sleep for a user-given time interval (heartbeat) and then wake up
2. Send power to the thermocouple
3. Pause to stabilize
4. Convert the analog data
5. Mathematically compute the temperature
6. Transmit the data to the gateway

To stay within the abilities of the processor, the temperature is computed from a data table provided by the manufacturer.

### Example Applications

- Ovens and Cooking Device Monitoring
- Furnace and HVAC Monitoring
- Exhaust Hood Monitoring
- Boiler Monitoring
- Turbine Exhaust Monitoring
- Chimney/Flue Temperature Monitoring
- Kiln Temperature Monitoring
- High Temperature Food Monitoring
- [Additional applications](#)

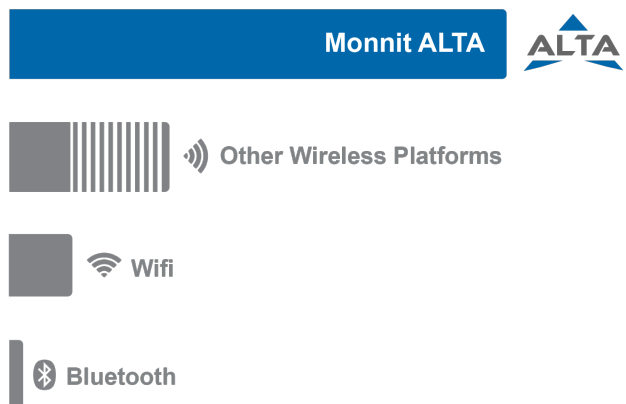
### Features of Monnit ALTA Sensors

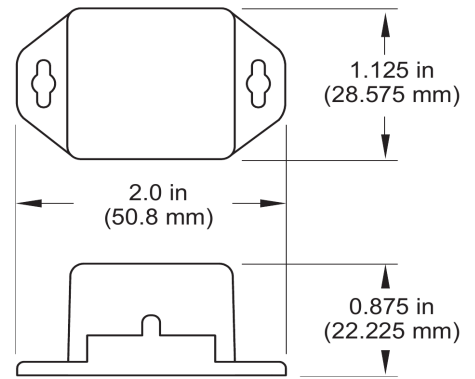
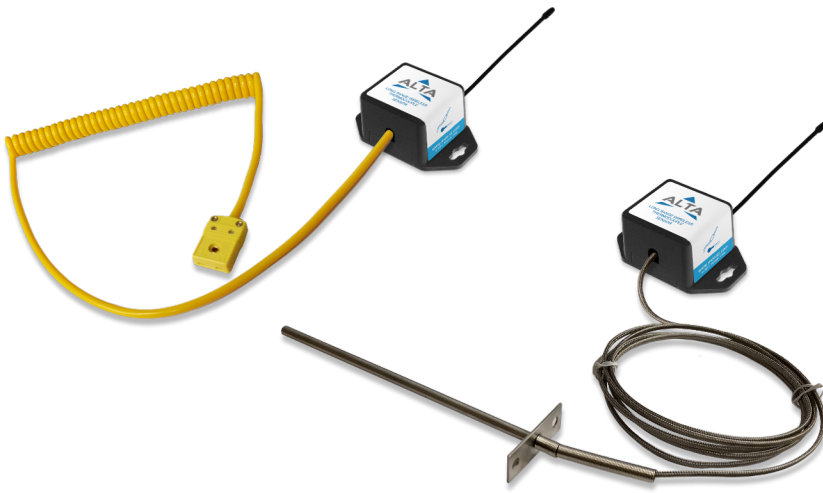
- Wireless range of 1,200+ feet through 12+ walls<sup>1</sup>
- Frequency-Hopping Spread Spectrum (FHSS)
- Best-in-class interference immunity
- Best-in-class power management for longer battery life<sup>2</sup>
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- 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



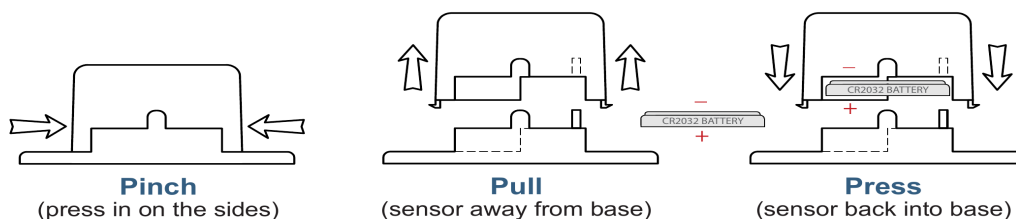


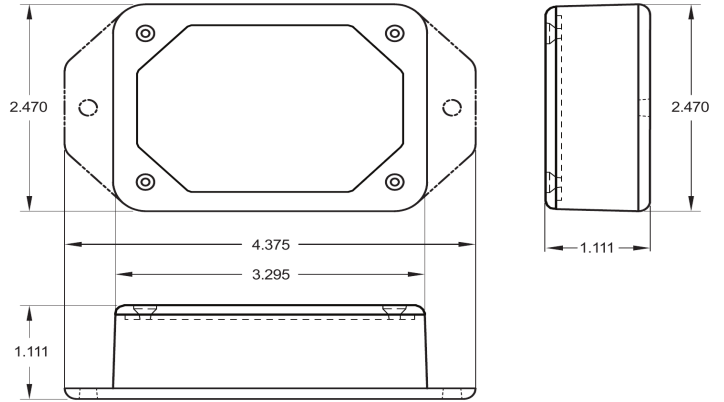
ALTA Commercial Coin Cell Wireless Thermocouple Sensors   Technical Specifications	
Supply voltage	2.0–3.8 VDC <sup>1</sup>
Current consumption	0.2 $\mu$ A (sleep mode), 0.7 $\mu$ A (RTC sleep), 570 $\mu$ A (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)
Operating temperature range (board circuitry and coin cell)	-7°C to +60°C (20°F to +140°F) <sup>2</sup>
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	<div style="display: flex; align-items: center; gap: 10px;">   <span>Industry Canada</span> </div> 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



<sup>1</sup> Hardware cannot withstand negative voltage. Please take care when connecting a power device.

<sup>2</sup> At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## PinchPower™ Enclosures





ALTA Commercial AA Wireless Thermocouple Sensors   Technical Specifications	
Supply voltage	2.0–3.8 VDC (3.0–3.8 VDC using power supply) <sup>1</sup>
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 <sup>2</sup>
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	<div style="display: flex; align-items: center; gap: 10px;">   <span>Industry Canada</span> </div> 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

<sup>1</sup> Hardware cannot withstand negative voltage. Please take care when connecting a power device.

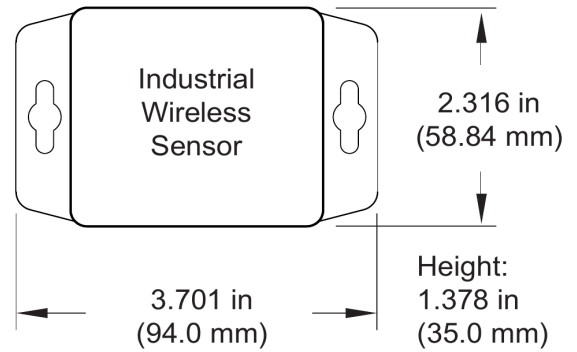
<sup>2</sup> At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.



## Power Options

Two replaceable 1.5V AA-sized batteries (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 3.0–3.6V power supply. The line-powered version also uses two standard 1.5V AA batteries as backup for uninterrupted operation in the event of 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 Thermocouple Sensors   Technical Specifications		
Supply voltage	2.0–3.8 VDC (3.0–3.8 VDC using power supply) <sup>1</sup>	
Current consumption	0.2 $\mu$ A (sleep mode), 0.7 $\mu$ A (RTC sleep), 570 $\mu$ A (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) <sup>2</sup>	
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 <sup>3</sup>
	Charging efficiency	40% <sup>4</sup>
Luminous sustainability	250 LUX <sup>4</sup>	
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 weatherproof	
UL rating	UL Listed to UL508-4x specifications (File E194432)	
Certifications	  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	

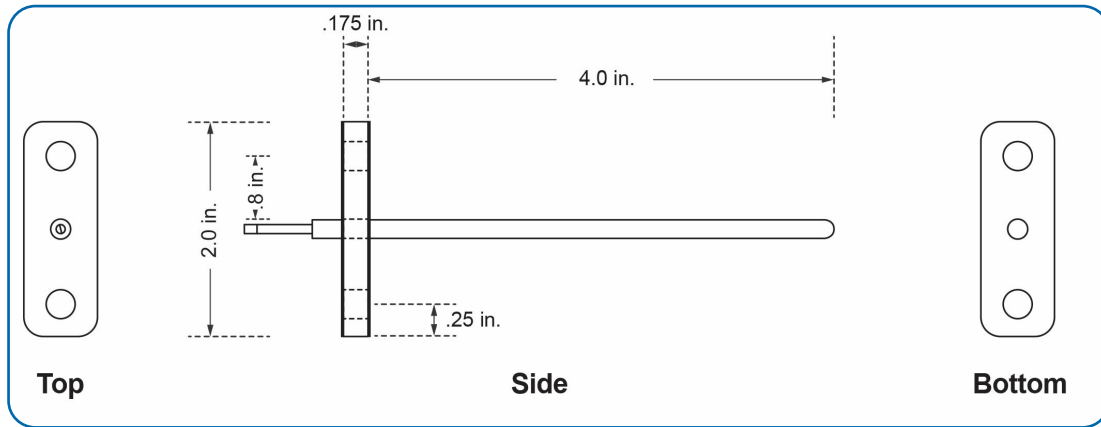
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<sup>2</sup> At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

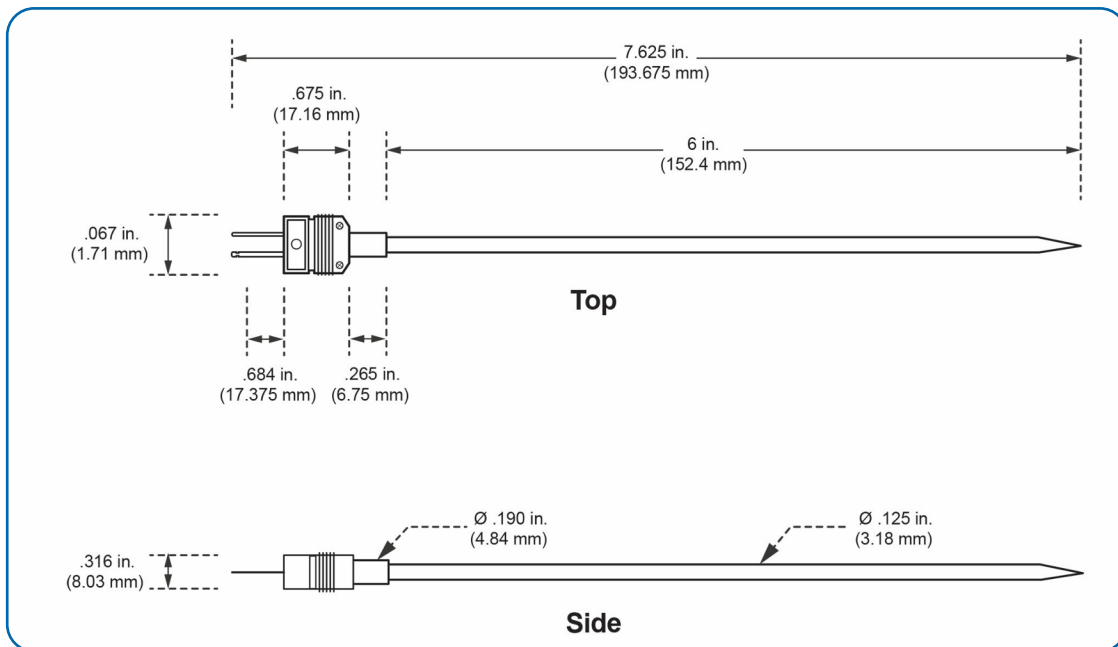
<sup>3</sup> Light present 25% of the day yields 125% of operating power to support 10-minute heartbeats.

<sup>4</sup> Solar feature's energy harvesting circuitry works indoors with low light.

## Fixed Probe Dimensions



## K-Type Dimensions



## 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 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.

- 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