

# Wireless Duct Temperature Sensor

## General Description

The 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  $\pm 1^\circ \text{C}$  ( $\pm 1.8^\circ \text{F}$ ).
- Increased accuracy by user calibration to  $\pm 0.25^\circ \text{C}$  ( $\pm 0.45^\circ \text{F}$ ).
- Probe temperature range of  $-40^\circ \text{C}$  to  $+150^\circ \text{C}$  ( $-40^\circ \text{F}$  to  $+302^\circ \text{F}$ ).
- 8 ft. UL listed plenum cable.



Free iSenseit 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 Senseit 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. To reduce error, a variable resistor configuration is implemented over specified temperature ranges.

## Example Applications

- Air Duct Temperature Monitoring
- HVAC Operation & Testing
- Data Center Monitoring
- Coolers & Freezers
- Environmental Monitoring
- Smart Machines & Smart Structures
- And many more...

## Senseit Sensor Core Specifications

- Wireless Range: 250 - 300 ft. (non line-of-sight / indoors / through walls, ceilings & floors) \*
- Communication: RF 900, 920, 868 and 433 MHz
- Power: Replaceable batteries (optimized for long battery life). Line-power (AA version) and solar (Industrial version) options are available.
- Battery Life (at 1 hour heartbeat setting): \*\*
  - AA battery > 4-8 years
  - Coin Cell > 2-3 years.
  - Industrial > 4-8 years

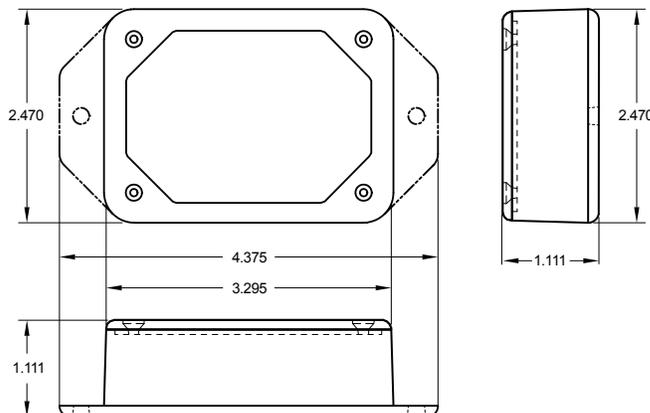
\* Actual range may vary depending on environment.

\*\* Battery life is determined by sensor reporting frequency and other variables.

## Sensor Types & Options

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## Wireless Duct Temperature Sensor (AA)



### Technical Specifications

Supply Voltage	2.0 - 3.6 VDC (3.0 - 3.6 VDC Using Power Supply) *
Current Consumption	0.7 $\mu$ A (sleep mode) 2 mA (radio idle/off mode) 2 mA (measurement mode) 25 mA (radio RX mode) 35 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 )
Thermistor Temperature Range (Leaded Thermistor)	-40°C to +150°C ( -40°F to +302°F )
Accuracy @ 25°C	+/- 1° C ( $\pm$ 1.8°F @ 77°F)
User Calibrated Accuracy	+/- 0.25° C ( $\pm$ 0.45°F @ 77°F)
Time Constant @ 25°C	30 sec
Lead Wire Length	8 ft. ( 96 in.)
Cable Rating	UL listed plenum cable
Weight	3.7 oz
Wireless Range	250 - 300 ft. (Indoors / through walls, ceilings and floors) Range may vary according to environmental variables.
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).

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

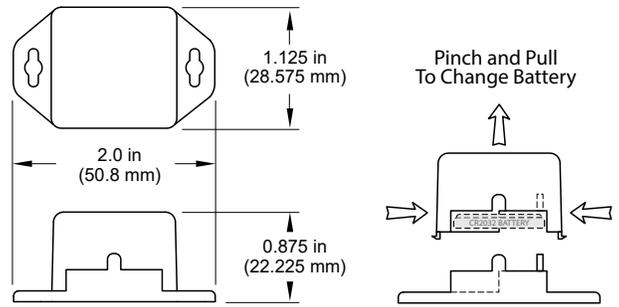
\*\* At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

### 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 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.

# Wireless Duct Temperature Sensor (Coin Cell)



Technical Specifications	
Supply Voltage	2.0 - 3.6 VDC *
Current Consumption	0.7 $\mu$ A (sleep mode) 2 mA (radio idle/off mode) 2 mA (measurement mode) 25 mA (radio RX mode) 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
Thermistor Temperature Range (Leaded Thermistor)	-40°C to +150°C ( -40°F to +302°F )
Accuracy @ 25°C	+/- 1° C ( $\pm$ 1.8°F @ 77°F)
User Calibrated Accuracy	+/- 0.25° C ( $\pm$ 0.45°F @ 77°F)
Time Constant @ 25°C	30 sec
Lead Wire Length	8 ft. ( 96 in.)
Cable Rating	UL listed plenum cable
Weight	1.5 oz
Wireless Range	250 - 300 ft. (Indoors / through walls, ceilings and floors) Range may vary according to environmental variables.
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).



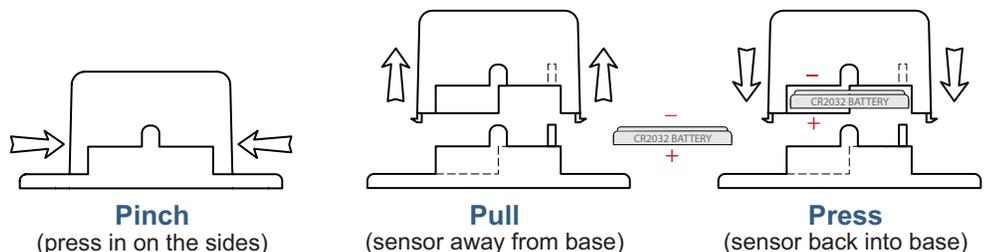
\* Hardware cannot withstand negative voltage. Please take care when connecting a power device.  
 \*\* At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

## Power Options

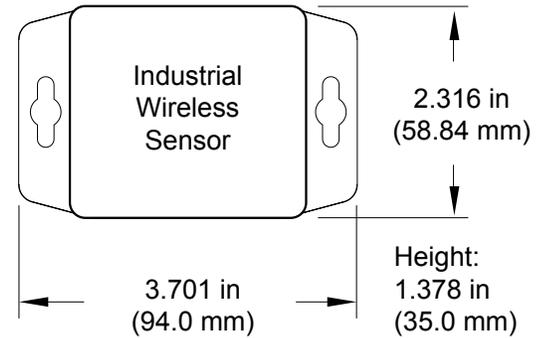
Sensors are powered by a replaceable 3.0 V coin cell battery. Optional AA battery powered sensors are available. The AA version of these sensors are larger in size (3" [L] x 2.1" [W] x 1.2" [H] ) and include two long-life AA batteries.

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



## Wireless Duct Temperature Sensor (Industrial)



### Technical Specifications

Supply Voltage	2.0 - 3.6 VDC *	
Current Consumption	0.7 $\mu$ A (sleep mode) 2 mA (radio idle/off mode) 2 mA (measurement mode) 25 mA (radio RX mode) 35 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:	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 +150°C (-40°F to +302°F)
Accuracy @ 25°C		+/- 1° C ( $\pm$ 1.8°F @ 77°F)
User Calibrated Accuracy		+/- 0.25° C ( $\pm$ 0.45°F @ 77°F)
Time Constant @ 25°C		30 sec
Lead Wire Length		8 ft. ( 96 in.)
Cable Rating		UL listed plenum cable
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)
Weight		4.7 oz (solar option 5.1 oz.)
Wireless Range		250 - 300 ft. (Indoors / through walls, ceilings and floors) Range may vary according to environmental variables.
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).

\* 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.



### Solar Power Option

Senseit 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.

## Notes

### Commercial Grade Sensors

Senseit 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

Senseit'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