Next™ Wi-Fi Low Temperature Sensor

The Next™ Wireless Low Temperature Sensor uses a glass-coated platinum resistance temperature detector (RTD) encapsulated in a waterproof probe to accurately measure temperature. It comes standard with a one-meter (3-foot) lead that operates at extremely low temperatures and withstands external condensation.

Principles of Operation

The Next Low Temperature Sensor measures temperature based on a user-configurable time interval or Heartbeat. When performing a measurement the sensor momentarily energizes a platinum RTD in series with a precision resistor. This produces a voltage directly proportional to the temperature of the RTD. The sensor converts the analog voltage signal to a digital value and calculates the temperature. This measurement is then sent to iMonnit Software through Wi-Fi.

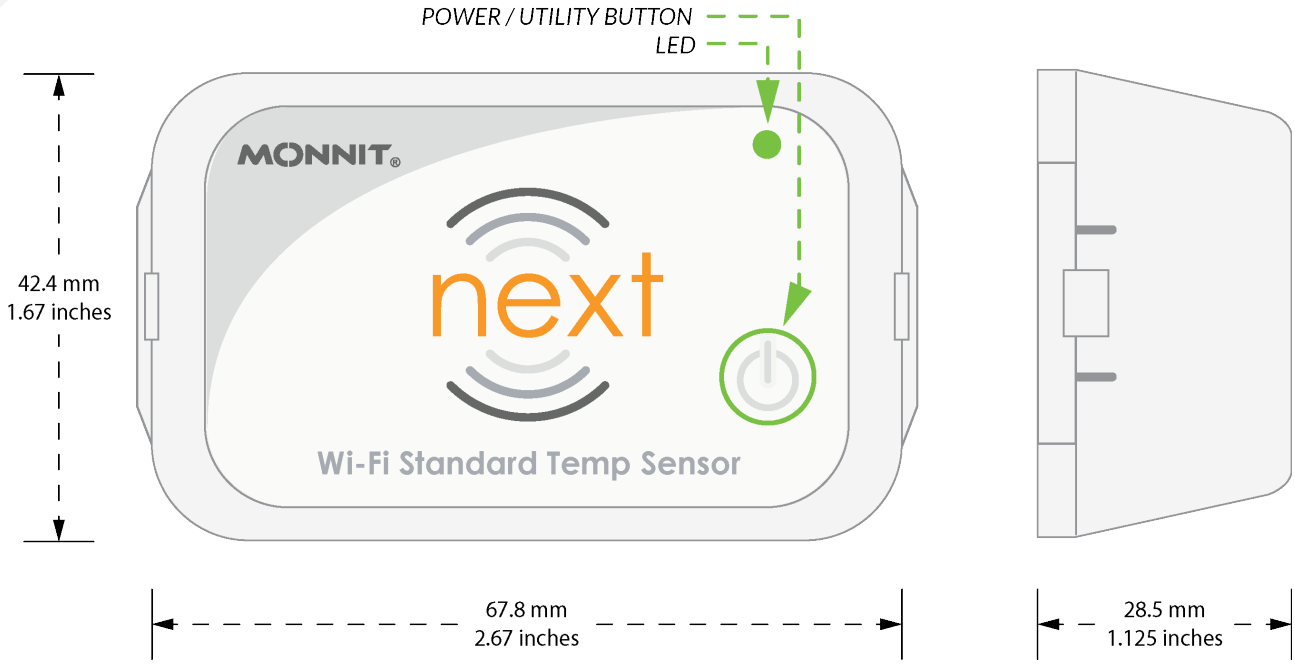
The Next Low Temperature Sensor can be calibrated for improved accuracy. Additionally, an industry-leading 13-month ISO-17025 (NIST) certification is available.

Example Applications

- Freezers and coolers
- Environmental monitoring
- Smart machines and facilities
- HVAC operation and testing
- Additional applications

Key Sensor Features

- Measurement Range: -200°C to 0°C (-325°F to 32°F)
- Resolution: 0.1°C (0.18°F)
- Standard Accuracy (at 0°C): ±1°C (±1.8°F)
- Calibrated Accuracy (at 0°C): ±0.5°C (±0.9°F)
- Accuracy Over Temperature Range: See table below
- Configurable thresholds for critical condition monitoring
- Logs data if Wi-Fi network is disrupted



The sensor reports the temperature (in °C or °F).

Features of Monnit Next Wi-Fi Sensors

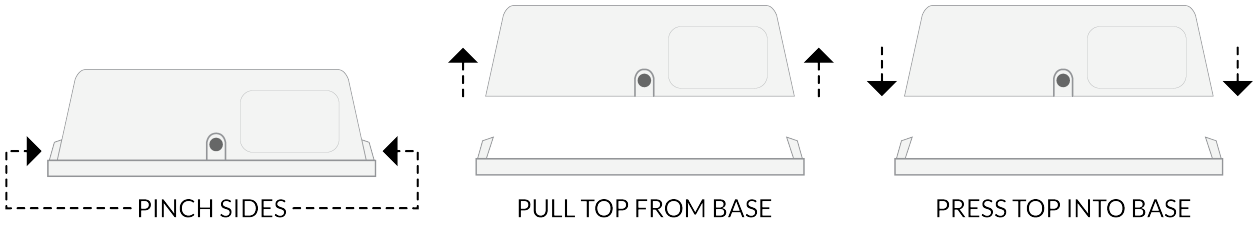
- Wireless range: 125 feet through five walls or 500-ft line of sight[1]
- Power: Two replaceable 1.5V AA batteries (included)
- Communications: 802.11b/g/n (2.412-2.484 GHz)
- Wi-Fi Security: OPEN, WPA, WPA2, WPA3
- Wi-Fi Provisioning: Bluetooth® via app
- iMonnit after Wi-Fi is successfully provisioned
- Best-in-class power management for longer battery life[2]
- Data logs up to 4096 readings if the Wi-Fi 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)
- Power/Utility Button: Powers the sensor on/off, triggers data transmission, change operating mode, etc.[3]
- LED Indicator: Shows status and activity.[3]
- Free iMonnit Basic Online Wireless Sensor Monitoring and Notification System to configure sensors, view data, and set alerts to be sent via 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.*
3. *For a full description of Button/LED behaviors see the Next Sensor General Information Guide.*

NEXT TEMPERATURE SENSOR | TECHNICAL SPECIFICATIONS		
Temperature Measurement	Range—Leaded Sensor	-200°C to 0°C (-328°F to +32°F)
	Accuracy @ 0°C	+/- 1° C (1.8° F)
	Calibrated Accuracy	+/- 0.5° C (0.9° F)
	Resolution	0.1° C (0.18° F)
	Response Time	50 Seconds (10 second time constant) [1]
Leaded Probe	Transducer Type	Glass-coated platinum RTD, IEC 751-95 Class A
	Tip Dimension	4.00 mm (0.157") diameter by 30 mm (1.18")
	Tip Material	Type 304 stainless steel
	Cable Material	Waterproof Teflon cable with lucency jacket
	Cable Diameter	2.6 mm (0.102")
	Cable Length	Standard: 0.9 m (3 ft) (Contact Monnit for other length options)
Wi-Fi	Wireless Protocol	802.11b/g/n
	Wireless Range	125 feet through five walls or 500-ft line of sight
	Frequency Band	2.412 - 2.484 GHz
	Security	Wi-Fi: Open, WPA, WPA2, WPA3
	Provisioning	Over Bluetooth® via Monnit provided application
	Network Settings	Auto DHCP/DNS or Static
	Data Rate	Auto configures to best rate for maximum range
Next	Data Logging	Data logs 4000 to 4096 readings if the Wi-Fi connection is lost (non-volatile flash, persists through the power cycle): - 10-minute Heartbeats = ~ 22 days - 2-hour Heartbeats = ~ 266 days
	Additional Data Security	Advanced Encryption Standard (AES)-128 Cipher Block Chaining (CBC) for sensor data messages)
	LED	RGB (Indicates status and activity)[2]
	Power/Utility Button	Tactile (Powers the sensor on/off, triggers data transmission, changes operating mode, etc.)[2]
General	Battery Voltage Range	2.0 to 3.3 VDC
	Operating Altitude (non-pressurized	-15.2 to 1,982 m (-50 to 6,500 ft)[3]
	Storage Altitude (non-pressurized environments)	-15.2 to 3,048 m (-50 to 10,000 ft)[3]
	Operating Humidity	5 to 85% RH (non-condensing)
	Operating Temperature Range (board circuitry)	-18°C to +55°C (-0.4°F to +131°F)
	Optimal Battery Temperature Range (AA)	+10°C to +50°C (+50°F to +122°F)
	Weight	76 g (2.67 oz)
	Certifications	FCC ID: 2AC7Z-ESPC3MINII IC: 21098-ESPC3MINI1

1. *Response time defined as five time constants for 99.3% of actual temperature.*
2. *For a full description of Button/LED behaviors see the Next Sensor General Information Guide.*
3. *Operating and storage altitude without DC power supply is -30.48 to 9144 m (-100 to 30000 ft).*

Next Enclosures



RTD ACCURACY OVER TEMPERATURE			
Temperature (°C)	**Accuracy (±°C)**		
	Uncalibrated Sensor	Calibrated Sensor	IEC 751-95 Class "A" RTD Only
-200°C	4.30	1.50	0.55
-180°C	4.20	1.40	0.51
-160°C	4.10	1.30	0.47
-140°C	4.00	1.20	0.43
-120°C	3.90	1.10	0.39
-100°C	3.80	1.00	0.35
-80°C	3.70	0.90	0.31
-60°C	3.60	0.80	0.27
-40°C	3.50	0.70	0.23
-20°C	3.40	0.60	0.19
0°C	3.30	0.50	0.15

MECHANICAL TECHNICAL SPECIFICATIONS		
Enclosure Material	Housing	Acrylonitrile Butadience Styrene (ABS)
	Grommet/Plug	Thermoplastic Elastomer (TPE)
	Enclosure Screws x 2	Flat head, #4 screw size, 0.5" length, Phillips, blunt tip, high-low dual-spaced threads, zinc-plated steel
Mounting	Screws x 2	#7 x 7/16, Phillips, pan head, black phosphate-plated steel
	Magnets (optional) x 4	1/2" diameter x 1/16" thick, poles on the flat surface, super strong neodymium (NDFeB) rare earth magnets, approximate pull force: 3 lbs (grade N42), nickel-copper-nickel triple layer coating for corrosion protection **Note: Combined pull force is 12 lbs**
	Recommendations for Custom Mounting Screws	Max head diameter: 8mm (5/16")
		Min head diameter: 6.5mm (1/4")
		Max head height: 2.54mm (0.1")
		Max shaft diameter: 4.75mm (3/16")

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.

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