Next Humidity Sensor

The Next Wi-Fi Humidity Sensor uses a high-end, factory-calibrated industrial humidity transducer to accurately measure relative humidity (RH) and temperature. The sensor comes in various leaded and non-leaded options.

Principles of Operation

The Next Humidity Sensor measures relative humidity (RH) and temperature on a user-configurable time interval or Heartbeat. It uses a high-accuracy silicon-based digital humidity/temperature element to produce % RH and temperature data. On every Heartbeat, the measurement is taken and the data is then sent to iMonnit through Wi-Fi.

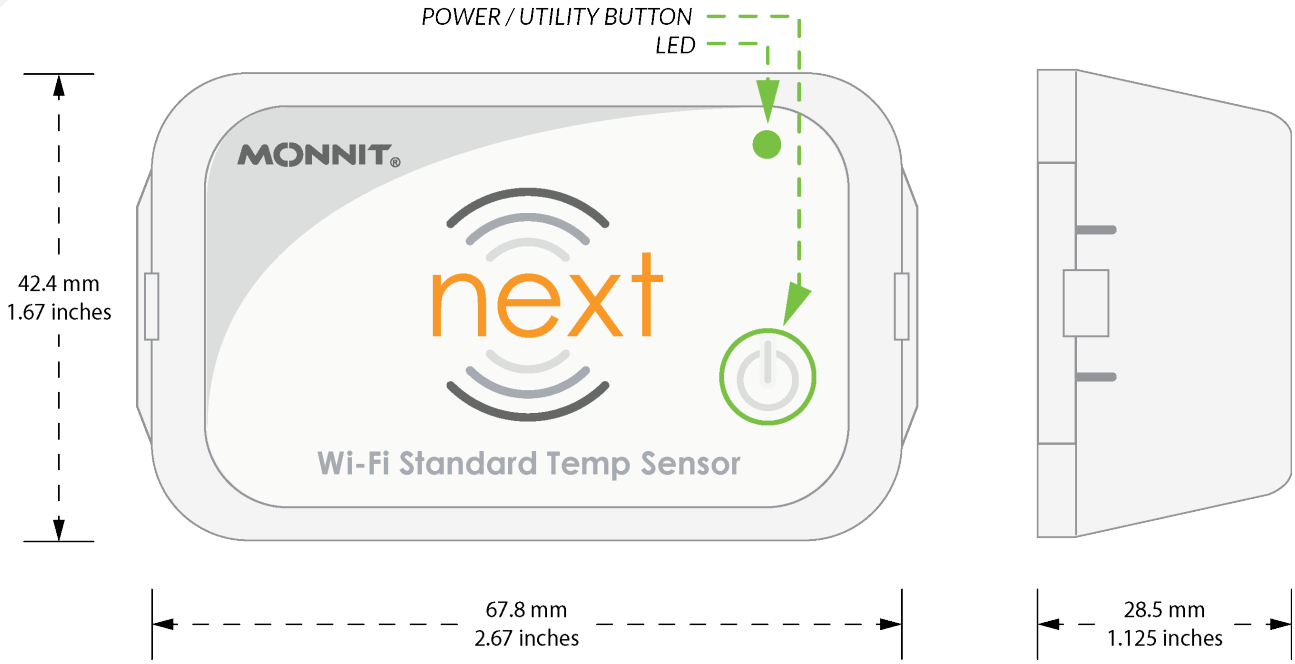
A 7-month ISO-17025 (NIST) calibration certificate is available.

Example Applications

- Ambient Humidity/Temperature Monitoring
- Lab Monitoring
- Indoor/Outdoor Environmental Monitoring
- Greenhouse and Grow House Monitoring
- Smart Machines and Facilities
- HVAC Operation and Testing
- Data Center Monitoring
- Additional applications

Key Sensor Features

- Humidity Measurement Range: 0 to 100% RH
- Temperature Measurement Range:
  - Leaded: -25°C to 70°C (-13°F to 158°F)
  - Non-leaded: Limited to the operational range of the sensor body (enclosure and body)
- Resolution: 0.01% RH, 0.01°C(0.018°F)
- Typical Accuracy: ± 2% RH, 0.3°C (± 0.54°F)
- Configurable thresholds for critical condition monitoring



The sensor reports the relative humidity (RH) in %, and temperature (in °C or °F).

Features of Monnit Next Wi-Fi Sensors

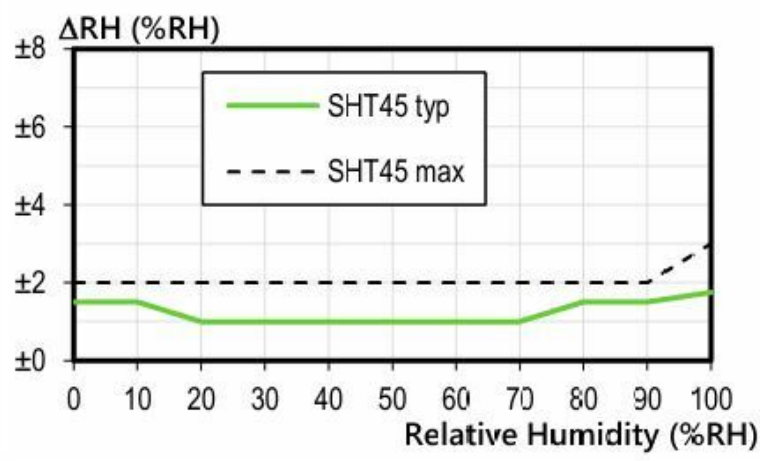
- Wireless range: 125 feet through five walls or 500-ft line of sight[1]
- Power: Two replaceable 1.5V AA batteries (included)
- Communications: 802.11 b (2.412-2.484 GHz)
- Wi-Fi Security: OPEN, WPA, WPA2
- Wi-Fi Provisioning: Bluetooth via app
- Sensor data available in iMonnit after Wi-Fi is successfully 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.*

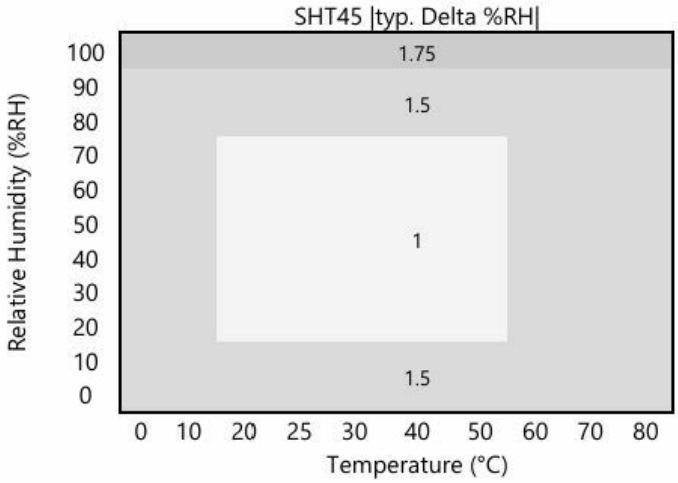
NEXT HUMIDITY SENSOR | TECHNICAL SPECIFICATIONS		
Humidity Measurement	Range	0 to 100% RH (non-condensing)
	Accuracy	± 2% RH (0 to 80%), ± 3% RH (80% to 100%)[1]
	Resolution	0.01% RH
	Response Time—Leaded Sensor	40 seconds (8-second time constant)[2]
	Response Time—Non-Leaded Sensor	6+ hours (75-minute time constant)[2]
Temperature Measurement	Range—Leaded Sensor	-25°C to +70°C (-13°F to +158°F)[3]
	Range—Non-Leaded Sensor	Limited to operational range of sensor body -7°C to +60°C (+20°F to +140°F)
	Accuracy	± 0.3°C (0.54°F) Typical[1]
	Resolution	0.01° C (0.018° F)
	Response Time - Leaded Sensor	15 Seconds (3 second time constant)[2]
	Response Time - Non-Leaded Sensor	100 minutes (20 minute time constant)[2]
Leaded Probe	Tip Dimensions	11 mm Wide x 4.5 mm Tall (0.44" Wide x 0.16" Tall)
	Tip Construction	PCA with high accuracy digital temp/humidity sensing element, soldered interface wires, all wrapped in waterproof heat shrink with small hole for air exchange.
	Wire Details	4-conductor, 26 AWG, stranded copper
	Insulation	PVC, 0.010"
	Shield	No
	Jacket	PVC (white)
	Overall Diameter	4.25 ± 0.2 mm (0.17" ± 0.007)
	Ratings/Approvals	UL AWM STYLE 2464, cUL AWM I/II A 80°C 300V FT1 LF
	Temperature Rating	-25°C to 80°C (-13°F to 176°F)
	Voltage Rating	300 V Max
	Dielectric Strength	1500 V RMS
	Cable Length	0.9 m (3 ft)
Wi-Fi	Wireless Protocol	802.11 b
	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
	Provisioning	Over Bluetooth via Monnit provided application
	Network Settings	Auto DHCP/DNS or Static
	Data Rate	Auto configures to the best rate for maximum range
Next	Data Logging	Data logs 4000 to 4096 readings if the Wi-Fi connection is lost
	Additional Data Security	Advanced Encryption Standard (AES)-128 Cipher Block Chaining
	LED	RGB (Indicates status and activity)[4]
	Button	Tactile (Powers the sensor on/off, triggers data transmission, changes operating mode, etc.)[4]
General	Battery Voltage Range	2.0 to 3.3 VDC
	Operating Altitude (non-pressurized environments)	-15.2 to 1,982 m (-50 to 6,500 ft)[5]
	Storage Altitude (non-pressurized environments)	-15.2 to 3,048 m (-50 to 10,000 ft)[5]
	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	63 g (2.24 oz)
	Certifications	FCC ID: 2AC7Z-ESPC3MINII IC: 21098-ESPC3MINI1

1. Refer to the humidity/temperature graphics below for more detailed information on the sensors accuracy and range.
2. Response time (τ of 99.3%) is significantly affected by airflow and the conditions present in the immediate vicinity of the sensing element.
3. High temperature limited by heat shrink at 70°C. The sensor electronics in the lead are rated to 125°C and will not fail at 70°C but the heat shrink and heat shrink adhesive may become malleable at this temperature compromising the waterproof seal.
4. For a full description of Button/LED behaviors, see the Next Sensor General Information Guide.
5. Operating and storage altitude without DC power supply is -30.48 to 9144 m (-100 to 30,000 ft).

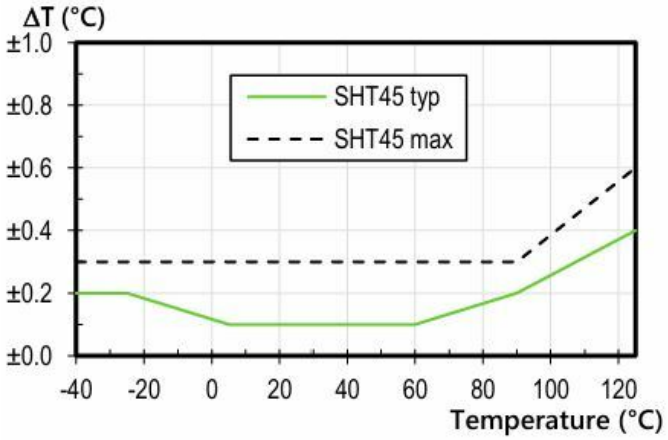
Accuracy: Relative Humidity Measured (%) vs Relative Humidity Actual (%)



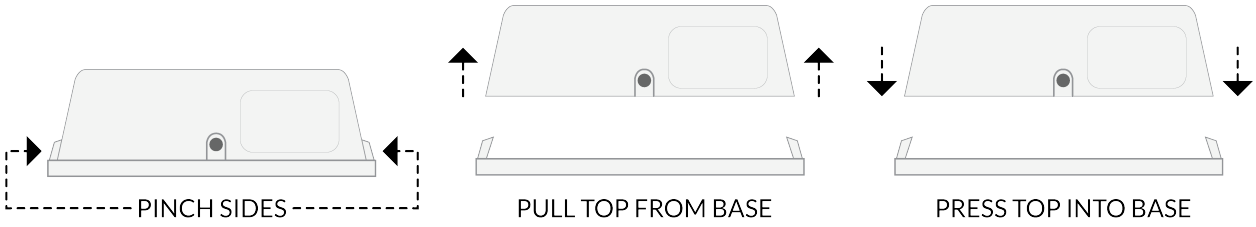
Accuracy: Relative Humidity Measured (%) vs Temperature Actual (°C)



Accuracy: Temperature Measured (°C) vs Temperature Actual (°C)



Next Enclosures



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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