

WiFi-500 Sensor Series

Low-Cost WiFi Data Logging Sensors



WiFi-500 Sensor Series wireless data loggers such as the WiFi-502 (shown above) transmit logged data to either a host computer or a web-based Cloud account over a WiFi network.

Overview

The WiFi-500 Sensor Series of wireless data loggers collect temperature or temperature/humidity readings and transmit the logged data over a wireless network.

Wireless transmissions reduce the need to physically collect devices and connect them to a computer. Devices can be configured wirelessly using either the WiFi Sensor Software on a PC or using the Cloud interface.

Ideal for site monitoring, HVAC, agriculture/horticulture, food industry, temperature/humidity-sensitive environments, and many other applications.

All Cloud features are available on web-enabled PCs, smart phones, tablets, and Mac® computers. All devices comply with the IEEE 802.11b WiFi specification, and support bandwidths up to 11 Mbps.

Features

- Log and store over 250,000 samples
- Integrated LCD screen displays logger readings and status
- Devices log and store data even if temporarily disconnected from network
- Rechargeable internal lithium polymer battery

Software

- WiFi Sensor Software available as a free download
- PC-based or Cloud-based data storage available
- Software-selectable logging settings
- View, analyze, and print logged data immediately
- Export logged data to analyze/graph in Microsoft® Excel®
- Instant email alerts (Cloud only)
- Supports Windows® 10/8/7 (32/64-bit)

WiFi-500 Sensor Series						
Model	Channels	Measurement Type	Sample Rate	Data Transmission to PC/Cloud	Memory	Features
WiFi-501	1	Temperature	10 s to 12 hr	Every 1 minute to every 24 hours	More than 250,000 samples	—
WiFi-501-TP	1	Temperature	10 s to 12 hr	Every 1 minute to every 24 hours	More than 250,000 samples	Detachable thermistor probe
WiFi-502	2	Temperature, Humidity	10 s to 12 hr	Every 1 minute to every 24 hours	More than 250,000 samples (combined temperature and/or humidity)	—

WiFi-500 Sensor Series

General Information

WiFi Connectivity to PC or Cloud

All WiFi-500 Sensor Series loggers comply with the IEEE 802.11b WiFi specification, and support bandwidths up to 11 Mbps.

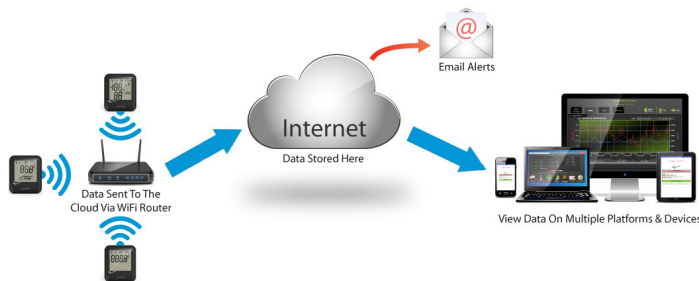
Once the device connects to a network, it can be set up to store data locally on the PC or on a local network, or remotely on the web-based Cloud. The device can then be placed anywhere within range of the network.*

The device logs data and transmits the data wirelessly to the PC or Cloud account. The device settings can also be changed over the wireless connection.

If the device temporarily loses WiFi connectivity, it continues logging samples until it regains communication with the network. For example, after losing its WiFi connection, a WiFi-500 Sensor Series logger continues logging data for up to 60 days with a 10 second sample rate setting.

Cloud Access Using Any Web-Enabled Device

Users can create and access a Cloud account from www.wifisensorcloud.com. All Cloud features are available on web-enabled devices – PC, smart phone, tablet, and Mac®.



For an overview of each account type, refer to the [Cloud Account Comparison](#) table on page 3.

Real-Time LCD Screen

WiFi-500 Sensor Series data loggers feature a built-in high-contrast LCD screen for real-time display of logged data and the following information:

- WiFi signal strength
- Maximum and minimum logged values since the device was last reset
- Alarm indicator
- Battery charge



Home screen



Maximum readings



Minimum readings



WiFi signal strength

Rechargeable Batteries

WiFi-500 Sensor Series data loggers include a low-powered, rechargeable battery. When set up to use typical sample rates – such as once every 60 seconds – the device can operate for over one year. The battery can be recharged by connecting the included USB cable to a computer or to a USB 5 V wall adapter.

Sleep Mode for Battery Optimization

WiFi-500 Sensor Series devices include a sleep mode feature to optimize battery performance. Connected devices automatically go into sleep mode when the software is not running.

Each device continues to log data to its onboard memory while in sleep mode. When they detect that the software is running again, devices reconnect and transmit all data stored in their memory to the computer.

* Typically, expect a 30 m range in an office-like environment, where obstructions can degrade RF transmissions. In line-of-sight or outdoor environments, a 100 m transmission is possible. To increase the range of the device, install a WiFi extender between the base router or access point and a device that is not close enough to receive acceptable service or one that is on the other side of a barrier.

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Software Information



WiFi Sensor Software

The WiFi Sensor Software for use with WiFi-500 Sensor Series devices is available as a free download. This easy-to-use software application allows users to set up a WiFi connection, set the sample rate and WiFi data transmission rate, and set alarms and temperature scale.

Support for Multiple Devices

Multiple devices can be set up to store data on either a PC or on the Cloud.

- The maximum number of devices supported for local PC data storage depends on the capabilities of the PC.
- The maximum number of devices supported for Cloud data storage depends on the type of Cloud account being used.

Cloud features for each account type are compared in the following table.

Cloud Account Comparison			
Feature	Account Type		
	Free	Personal*	Professional*
Maximum Devices	2	Unlimited	Unlimited
Maximum Length of Data Storage	45 days	Unlimited	Unlimited
Maximum Email Alerts	100 per month	Unlimited	Unlimited
Email Alert Recipients	5 per device	5 per device	100 per device
Export Data (CSV)	–	✓	✓
Print Data	–	✓	✓
Audit Trail	–	–	✓
Multi-User Administration	–	–	✓
Locations and Time Zones	–	–	✓

* Personal and Professional accounts require a monthly fee

Sample and Transmission Rates

Use the WiFi Sensor Software to configure a device with sample rates ranging from 10 seconds to 12 hours, depending on the application and length of data collection needed. The sample rate controls the rate at which data is acquired and stored on the device.

Users can also set how often the device transmits data to the host computer. Transmission rates range from every one minute to every 24 hours.

The sample rate and transmission rate settings work together to

determine how often data is transmitted to the host PC or Cloud account. For example, if the sample transmission frequency is set to 1 minute and the sample rate is set to 10 seconds, the device transmits six samples to the computer every minute:

$$60 \text{ seconds} \div \frac{1 \text{ sample}}{10 \text{ seconds}} = 6 \text{ samples}$$

Viewing Device Settings and Readings

Users can select from among all WiFi-500 Sensor Series devices that were configured on the same PC or Cloud account and perform the following operations over WiFi:

- view logged data in graph or tabular format
- export logged data to .csv or .pdf
- export graph to .jpg or .pdf†
- export data and graph to Excel® (PC interface only)
- change device settings
- display device properties
- delete device readings or a device from the WiFi software/network
- print a graph
- reset device alarm state
- mute audible software alarm (PC interface only)
- download device data over USB if WiFi transmission is not available
- copy data files for processing by third-party software

On the Cloud, users can also perform the following operations:

- set up email alerts for alarms, AC power outage, low battery charge, loss of network connection, and other device-specific problems
- display and export an audit trail to provide a documentary record of changes (depends on type of Cloud account)
- add comments to annotate data in tabular format and event logs

The following data is graphed on both the PC and Cloud interfaces:

- temperature samples
- relative humidity samples‡
- dew point
- high and low temperature alarm settings
- high and low relative humidity alarm settings

* Export logged data to .pdf only available for PC interface. Export to .csv only available with Personal and Professional Cloud accounts.

† Export graph to .jpg only available for PC interface. Export to .pdf only available with Personal and Professional Cloud accounts.

‡ For WiFi-500 devices that support humidity measurements, such as the WiFi-502.

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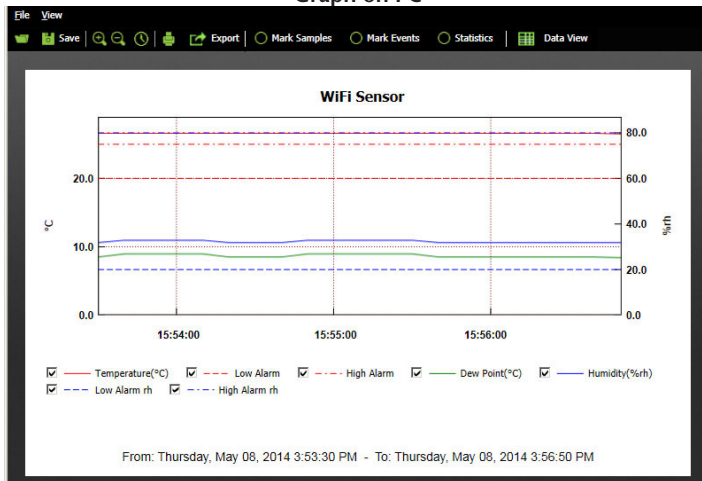


Software Information

Data peaks (normally averaged out by the software) and audit checks can also be displayed on Cloud graphs.

Once a graph is displayed, users can zoom in and out to view select data segments. Whole data log sessions or segments of a session can be saved to comma-delimited text file (.txt). Data and graph can also be exported for immediate display in Microsoft Excel.

Graph on PC



Graph on Cloud



Users can graph and display WiFi-500 Sensor Series readings using either a PC or the Cloud interface.

Email/Text Notifications (Cloud Only)

Depending on the type of Cloud account, users can enter from five to 100 email recipients to send notifications about any the following device events:

- **Alarm conditions** - Notify recipients when high/low alarm conditions occur.
- **AC power** - Notify recipients about a change in the state of AC power connected to your device. The Cloud sends emails when power fails and when power is restored.
- **Battery charge** - Notify recipients when the battery charge in a device is low and needs recharging.
- **Loss of connection** - Notify recipients when regular transmissions from the device are interrupted and instruct them how to troubleshoot the problem.
- **Device problems** - Notify recipients of device problems (probe disconnected, readings out of range, and so on).

Notifications can also be set up as text-only messages to send to mobile devices.

Applications

WiFi-500 Sensor Series devices are suitable for a variety of applications, such as:

- site monitoring (buildings, server rooms)
- HVAC
- agriculture and horticulture
- food industry (manufacturing and storage to distribution and retail)
- sensitive environments, such as medical vaccines, historical artifacts, and wine storage

WiFi-500 Sensor Series

Specifications



Specifications

All specifications are subject to change without notice.
Typical for 25 °C unless otherwise specified.

All WiFi-500 Sensor Series Devices

The following specifications apply to all WiFi-500 Sensor Series data loggers.

USB Specifications

USB device type: USB 2.0 (full speed)
Device compatibility: USB 1.1, USB 2.0, USB 3.0
Micro-USB type B connector (bottom of enclosure): Connects device to computer using included 25 in. Micro-USB cable

Wireless Connectivity

Connects to IEEE 802.11b WiFi networks running WEP 64 bit, WEP 128 bit, WPA-PSK, and WPA2-PSK security protocols

Wireless Data Transmission

Sample transmission frequency range (software-selectable): Every 1 minute to every 24 hours

For example, if the sample transmission frequency is set to 1 minute and the sample rate is set to 10 seconds, the device transmits 6 samples to the computer every minute.

$$60 \text{ seconds} \div \frac{1 \text{ sample}}{10 \text{ seconds}} = 6 \text{ samples}$$

LCD Status Indicators

The high-contrast LCD screen cycles through different information displays when the user presses the button on the front of the device (refer to [Real-Time LCD Screen](#) for screen examples).

Power

USB supply voltage: 4.5 V to 5.5 V
Power source: Internal lithium polymer battery recharges over USB connection
Battery lifespan: Greater than 6 months typ
Note: Battery lifespan depends on how often the device transmits data to the computer using WiFi. The more frequent the transmission, the shorter the battery life.

Battery charge/discharge cycles: More than 300

Battery charging temperature range: Battery safely recharges when the device is operating between 0 °C to 40 °C (32 °F to 104 °F). It is protected against charging outside this temperature range. Sensor samples may be inaccurate during battery charging.

Mechanical

Main enclosure dimensions (L × W × H): 82 × 70 × 36 mm (3.22 × 2.75 × 1.41 in.)

WiFi-501

The following specifications apply to the WiFi-501 temperature logger.

Temperature

Measurement range: -20 °C to 60 °C (-4 °F to 140 °F)
Temperature accuracy: ±0.5 °C (±0.1 °F)
Temperature measurement resolution: 0.1 °C (0.2 °F) typ
Temperature display resolution: 0.5 °C typ
Alarm threshold range (software-selectable): -20 °C to 60 °C (-4 °F to 140 °F) range for both high alarms and low alarms

Data Sampling

Sample rate (software-selectable): 10 s, 15 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 15 min, 20 min, 30 min, 1 hr, 2 hr, 4 hr, 6 hr, 12 hr
Temperature samples: More than 250,000 max
Temperature units: °C or °F

Environmental

Main unit operating temperature range: -20 °C to 60 °C (-4 °F to 140 °F)
Note: At temperatures below -20 °C (-4 °F), the LCD may exhibit a slower response time of approximately 10 seconds
Moisture and dust protection: IP55 (dust and water jets)

WiFi-501-TP

The following specifications apply to the WiFi-501-TP temperature logger and its detachable thermistor probe.

Temperature

Thermistor probe measurement range: -40 °C to 125 °C (-40 °F to 257 °F)
Temperature accuracy
Typical: ±0.6 °C (-10 to +70 °C)
Maximum: ±1.0 °C (-40 to +125 °C)
Temperature measurement resolution: 0.1 °C (0.2 °F) typ
Temperature display resolution: 0.1 °C typ
Thermistor probe temperature accuracy: ±0.5 °C (-10 °C to 70 °C), ±1.0 °C (-40 °C to 125 °C)
Alarm threshold range (software-selectable): -40 °C to 125 °C (-40 °F to 257 °F) range for both high alarms and low alarms

Data Sampling

Sample rate (software-selectable): 10 s, 15 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 15 min, 20 min, 30 min, 1 hr, 2 hr, 4 hr, 6 hr, 12 hr
Temperature samples: More than 250,000 max
Temperature units: °C or °F

Environmental

Main unit operating temperature range: -20 °C to 60 °C (-4 °F to 140 °F)
Note: At temperatures below -20 °C (-4 °F), the LCD may exhibit a slower response time of approximately 10 seconds
Thermistor probe operating temperature range: -40 °C to 125 °C (-40 °F to 257 °F)
Moisture and dust protection
Main device enclosure: IP43 (dust and water spray)
Thermistor probe: IP67 (dust and water immersion)

Mechanical (Thermistor Probe)

Length: 1 m (39.4 in.)
Audio plug: 3.5 mm (0.14 in.), gold-plated
End cap: Stainless steel

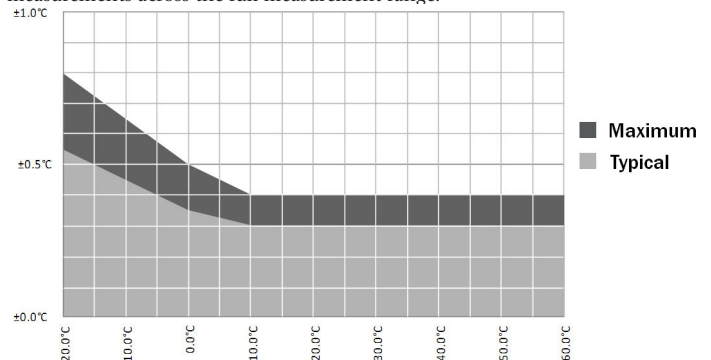
WiFi-502

The following specifications apply to the WiFi-502 temperature and humidity logger.

Temperature

Measurement range: -20 °C to 60 °C (-4 °F to 140 °F)
Temperature accuracy
Typical: ±0.3 °C (±0.6 °F); +5 °C to +60 °C (+41 °F to +140 °F)
Maximum: ±0.8 °C (±1.6 °F); -20 °C to +60 °C (-4 °F to +140 °F)
Temperature measurement resolution: 0.1 °C (0.2 °F) typ
Temperature display resolution: 0.5 °C typ
Alarm threshold range (software-selectable): -20 °C to 60 °C (-4 °F to 140 °F) range for both high alarms and low alarms

The following chart gives an indication of expected tolerance in temperature measurements across the full measurement range.



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Ordering

Relative Humidity

Measurement range: 0% RH to 100% RH

Humidity accuracy (@ 25 °C)

Typical: $\pm 2\%RH$ (10%RH to 90%RH)

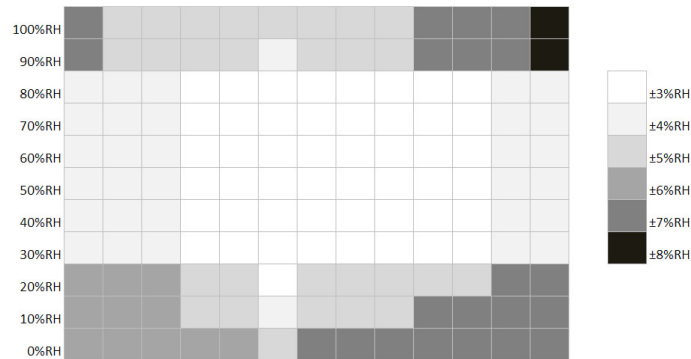
Maximum: $\pm 0.8\text{ }^{\circ}C$ ($\pm 1.6^{\circ}F$); $-20\text{ }^{\circ}C$ to $+60\text{ }^{\circ}C$ ($-4\text{ }^{\circ}F$ to $+140\text{ }^{\circ}F$)

Humidity measurement resolution: 1.0% RH

Humidity display resolution: .0% RH

Alarm threshold range: 0% RH to 100% RH (high and low alarms)

The following chart gives an indication of expected tolerance in humidity measurements across the full measurement range.



Data Sampling

Sample rate (software-selectable): 10 s, 15 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 15 min, 20 min, 30 min, 1 hr, 2 hr, 4 hr, 6 hr, 12 hr

Temperature and humidity samples: More than 250,000

Temperature units: °C or °F

Environmental

Operating temperature range: $-20\text{ }^{\circ}C$ to $60\text{ }^{\circ}C$ ($-4\text{ }^{\circ}F$ to $140\text{ }^{\circ}F$)

Note: At temperatures below $-20\text{ }^{\circ}C$ ($-4\text{ }^{\circ}F$), the LCD may exhibit a slower response time of approximately 10 seconds

Moisture and dust protection: IP55 (dust and water jets)

Order Information

Part No.	Description
WiFi-501	Rechargeable battery-powered WiFi temperature sensor with LCD. Includes 25 in. Micro-USB cable and wall mounting bracket.
WiFi-501-TP	Rechargeable battery-powered WiFi temperature sensor with LCD and detachable thermistor probe. Includes 25 in. Micro-USB cable and wall mounting brackets for main enclosure and probe.
WiFi-502	Rechargeable battery-powered WiFi temperature/humidity sensor with LCD. Includes 25 in. Micro-USB cable and wall mounting bracket.



Each WiFi-500 Sensor Series device ships with a Micro-USB cable and a wall mounting bracket.