

# WiFi-500 Sensor Series

## Low-Cost WiFi Data Logging Sensors



### Features

- Wireless temperature and temperature/humidity data logging sensors
- Integrated LCD screen displays current readings, min/max readings, high and low alarm occurrences, WiFi signal strength, and battery charge status
- Supports bandwidths up to 11 Mbps (complies with IEEE 802.11b WiFi specification)
- Supports WEP 64-bit, WEP 128-bit, WPA-PSK, and WPA2-PSK WiFi security protocols
- Logs more than 1 million temperature samples and more than 500,000 temperature/humidity samples
- Sensor memory logs and stores data even if temporarily disconnected from WiFi
- Internal lithium polymer battery (rechargeable using included Micro-USB cable)

### Software

- WiFi Sensor Software available as a free download
- Set up multiple devices for PC-based or Cloud-based data storage with easy-to-use software interface
- Software-selectable sample rate, data transmission rate, temperature units, high/low alarms, and device audit check
- View, analyze, and print\* logged data immediately in graph or tabular format
- Export logged data for immediate graphing in Microsoft® Excel®
- Audible software temperature/humidity alarm feature (PC only)
- Supports Windows® 8/7/Vista®/XP (32/64-bit)



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.

### Cloud-Only Features

- Free and paid Cloud accounts available
- Supports all operating systems and web-enabled devices – smart phones, tablets, and desktops/laptops
- Instant email alerts of alarms, power, battery, and network connection events
- Audit trail export to document device changes\*
- Multiple user access\*
- Individual time zones per user\*
- Unlimited data storage\*
- Unlimited devices\*

\* Feature availability depends on type of Cloud account being used. Refer to [Cloud Account Types and Supported Features](#) and to <https://www.wifisensorcloud.com/accountdifferences.aspx> for a comparison of Cloud accounts.

### Overview

The WiFi-500 Sensor Series consists of the following wireless data loggers:

- WiFi-501 temperature data logger
- WiFi-501-TP temperature data logger with detachable thermistor probe
- WiFi-502 temperature/humidity data logger

Sensors can be set up to transmit logged data over a WiFi network either locally to a host PC, or remotely to a web-based Cloud account. WiFi transmissions minimize the need to physically collect sensors and connect them to your computer.

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 1,000,000 samples	—
WiFi-501-TP	1	Temperature	10 s to 12 hr	Every 1 minute to every 24 hours	More than 1,000,000 samples	Detachable thermistor probe
WiFi-502	2	Temperature, Humidity	10 s to 12 hr	Every 1 minute to every 24 hours	More than 500,000 samples	—

# WiFi-500 Sensor Series

## General Information



### WiFi Connectivity to PC or Cloud

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

During initial setup, the sensor is connected to a WiFi-enabled host PC by the included Micro-USB cable and searches for an existing WiFi network. Once the sensor connects to the network, it can be set up to store data on the PC or on the Cloud. The sensor can then be placed anywhere within range of the network.<sup>1</sup>

The sensor logs data and transmits logged data wirelessly to the PC or Cloud account used to set up the sensor. You can also change the sensor configuration over the wireless connection.

If the sensor temporarily loses WiFi connectivity, it continues to log samples until it regains communication with the WiFi 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.

Refer to [Cloud Account Types and Supported Features](#) and to <https://www.wifisensorcloud.com/accountdifferences.aspx> for a comparison of Cloud accounts.

### Cloud Access Using Any Web-Enabled Device

To access a Cloud account from a web-enabled PC, smart phone, tablet, or Mac®, open <https://www.wifisensorcloud.com/> in a browser window and log in to the Cloud account. All Cloud features are available on web-enabled devices.



<sup>1</sup> Typically, expect a 30 m range in an office-like environment, where obstructions can degrade radio frequency transmissions. With line-of-sight or outdoor environments, a 100 m transmission is possible. To increase the range of the sensor, install a WiFi extender between a base router or access point and a sensor that is not close enough to receive acceptable service or one that is on the other side of a barrier.

### Real-Time LCD Screen

WiFi-500 Sensor Series data loggers feature a built-in high-contrast LCD screen for real-time display of data. To cycle through the different screens that display, press the button on the sensor.

#### Home Screen

The **Home Screen** displays the following information:

- current readings
- WiFi signal indicator (flashes when WiFi connection is lost)
- alarm indicator
- battery charge indicator



#### Max Screen

The **Max Screen** displays the maximum recorded value(s) since last reset. To reset the maximum values, press and hold the button for three seconds while Max is displayed.



# WiFi-500 Sensor Series

## Software Information



### Min Screen


The **Min Screen** displays the minimum recorded value(s) since last reset. To reset the minimum values, press and hold the button for three seconds while Min is displayed.



### Received Signal Strength (RSSI) Screen

The RSSI screen displays the current WiFi signal strength. Displays a number from 1 (weakest signal) to 10 (strongest signal) or -- (no signal received).



 If the sensor is uploading data or is in sleep mode after losing contact with the WiFi network router, computer, or software for a long period, cycle to this screen to reconnect the sensor.

### Rechargeable Over USB Connection

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 sensor operates for over one year. The battery can be recharged using the included USB cable connecting it to a computer or to a USB 5 V wall adapter.

The battery is safely charged when the unit 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.

### Sleep Mode for Battery Optimization

WiFi-500 Sensor Series devices include a sleep mode feature to optimize battery performance. Connected sensors automatically go into sleep mode when the WiFi software is not running. Each sensor turns off its transmitter, then *wakes up* every 15 minutes to check if the WiFi Sensor Software is running again.

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

### 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 for storing data on either a PC or on the Cloud.

The maximum number of devices supported for 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.

Refer to [Cloud Account Types and Supported Features](#) and to <https://www.wifisensorcloud.com/accountdifferences.aspx> for a comparison of Cloud accounts.

# WiFi-500 Sensor Series

## Software Information



Cloud Account Types and Supported Features (Personal and Professional Accounts Require Monthly Fee)		
Free	Personal	Professional
<ul style="list-style-type: none"> <li>45 days of data storage</li> <li>Two devices and one user max per account</li> <li>100 email alerts per month</li> <li>Five email recipients per device</li> </ul>	<ul style="list-style-type: none"> <li>Unlimited data storage</li> <li>Unlimited devices and one user max per account</li> <li>Unlimited email alerts</li> <li>Five email recipients per device</li> <li>Multi-format data export</li> <li>Graph printing</li> </ul>	<p>All Personal account features and these additional features:</p> <ul style="list-style-type: none"> <li>Unlimited users per account</li> <li>Device audit tracking</li> <li>100 email recipients (depends on user privileges)</li> <li>Configure locations and time zones</li> <li>Manage Cloud account users</li> </ul>

### 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 sensor.

Users can also set how often the sensor 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 sensor transmits six samples to the computer every minute ( $60 \text{ seconds} \div 10 \text{ seconds} = 6 \text{ samples}$ ).

### Viewing Sensor Settings and Readings

Users can select from among all WiFi-500 Sensor Series devices that were configured on the same computer 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<sup>2</sup>
- export graph to .jpg or .pdf<sup>3</sup>
- export data and graph to Excel® (PC interface only)
- change sensor settings
- display sensor properties
- delete sensor readings or a sensor from the WiFi software/network
- print a graph
- reset sensor alarm state
- mute audible software alarm (PC interface only)

<sup>2</sup> Export logged data to .pdf only available for PC interface. Export to .csv only available with Personal and Professional Cloud accounts.

<sup>3</sup> Export graph to .jpg only available for PC interface. Export to .pdf only available with Personal and Professional Cloud accounts.

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)

Graphs on both the PC and Cloud interface display the following data:

- temperature samples
- relative humidity samples<sup>4</sup>
- high and low temperature alarm settings
- high and low relative humidity alarm settings

The PC interface graph also displays dew point<sup>3</sup>

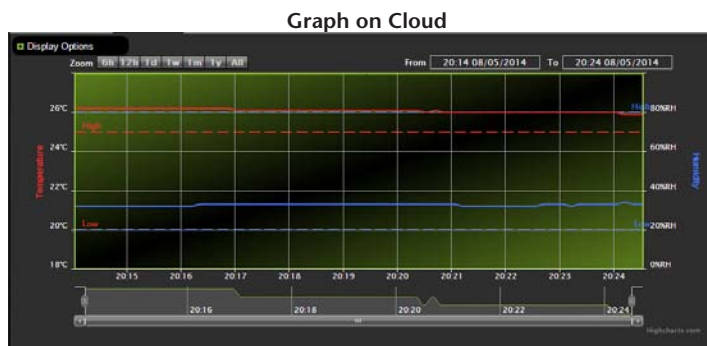
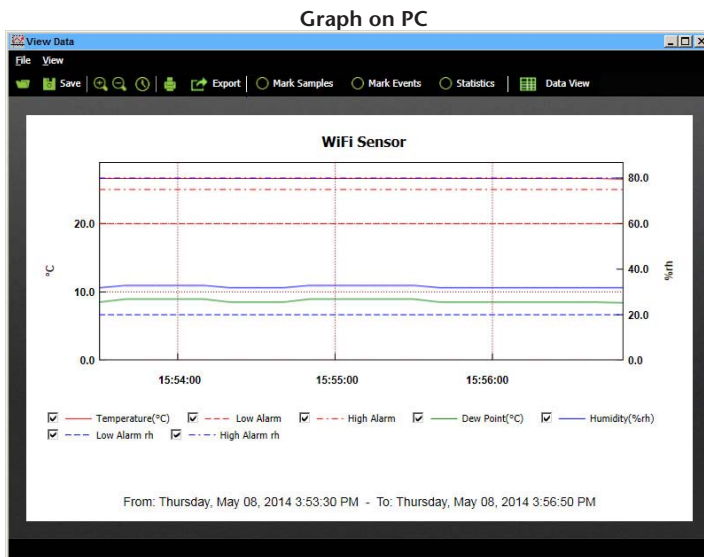
Once a graph is displayed, users can zoom in and out to view select data segments. Whole data log sessions or segments of a session can be saved to comma-delimited text file (.txt). Data and graph can also be exported for immediate display in Microsoft Excel.

<sup>4</sup> For WiFi-500 sensors that support humidity measurements



# WiFi-500 Sensor Series

## Software Information & Specifications



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

### Email Notifications (Cloud Interface Only)

Depending on the type of Cloud account, users can enter from five to 100 email recipients for notifications about any the following sensor 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. When transmissions are interrupted, this alert notifies users to check the WiFi network, device position, and battery charge.
- **Device Problems** - Notify recipients that there is a problem with the device (probe disconnected, readings out of range, and so on).

## 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 vaccine, historical artifact, and wine storage

## Specifications

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

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

### Microcontroller

Advanced RISC Machines

### 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 sensor 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 sensor transmits 6 samples to the computer every minute (60 seconds ÷ 10 seconds = 6 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:** More than 1 year typ

**Note:** Battery lifespan depends on how often the sensor transmits data to the computer using WiFi. The more frequent the transmission, the shorter the battery life.

**Battery Recharge Cycles:** 400 min

**Battery Charging Temperature Range:** Battery safely recharges when the sensor 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.

### Environmental

**Moisture and Dust Protection**

**Main Sensor Enclosure:** IP55 (dust and water spray)

### Mechanical

**Main Enclosure Dimensions (L × W × H):** 97.3 × 71.3 × 26.4 mm  
(3.8 × 2.8 × 1.0 in.)

# WiFi-500 Sensor Series

## Specifications & Ordering



### WiFi-501

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

#### Temperature

**Measurement Range:** -20 °C to 60 °C (-4 °F to 140 °F)

**Temperature Accuracy**

**Overall Error Between -10 °C and 60 °C (14 °F to 140 °F):** ±1.0 °C (±1.8 °F) typ

**Internal Resolution:** ±0.1 °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, 30 s, 1 min, 5 min, 30 min, 1 hr, 6 hr, 12 hr

**Temperature Samples:** More than 1,000,000 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

### WiFi-501-TP

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

#### Temperature

**Thermistor Probe Measurement Range:** -40 °C to 125 °C (-40 °F to 257 °F)

**Internal Resolution:** ±0.1 °C typ

**Thermistor Probe Temperature Accuracy (Overall Error):** ±0.5 °C typ, ±2.0 °C max

**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, 30 s, 1 min, 5 min, 30 min, 1 hr, 6 hr, 12 hr

**Temperature Samples:** More than 1,000,000 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)

**Thermistor Probe Bracket Operating Temperature Range:** -40 °C to 100 °C (-40 °F to 212 °F)

**Moisture and Dust Protection**

**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:** 304-grade stainless steel

**Resistance Value:** 10 kΩ at 25° C

**Bend Radius:** 10 mm (0.4 in.)

### WiFi-502

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

#### Temperature

**Measurement Range:** -20 °C to 60 °C (-4 °F to 140 °F)

**Temperature Accuracy**

**Overall Error Between -20 °C and 60 °C (-4 °F to 140 °F):** ±0.4 °C (±0.7 °F) typ, ±1.2 °C (±2.1 °F) max

**Overall Error Between 5 °C and 6 °C (41.0 °F to 42.8 °F):** ±0.3 °C (±0.5 °F) typ, ±0.4 °C (±0.7 °F) max

**Internal 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, 30 s, 1 min, 5 min, 30 min, 1 hr, 6 hr, 12 hr

**Combined Temperature and Humidity Samples:** More than 500,000 max

**Temperature Units:** °C or °F

#### Relative Humidity

**Measurement Range:** 0% RH to 100% RH

**Accuracy (Overall Error Between 20% RH and 80 %RH):** ±2.0% RH typ, ±3.0% RH max

**Internal Resolution:** 1.0% RH typ

**Alarm Threshold Range:** 0% RH to 100% RH (high and low alarms)

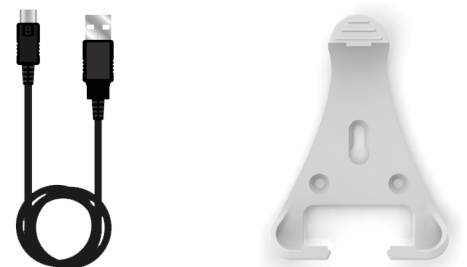
#### Environmental

**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

## Ordering 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.*