

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 consists of wireless data logging sensors that collect temperature or temperature/humidity readings and transmit the logged data over a wireless network either locally to a host PC, or remotely to a web-based Cloud account.

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

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.

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 sensors comply with the IEEE 802.11b WiFi specification, and support bandwidths up to 11 Mbps.

Features

- Log temperature or temperature/humidity data
- Store over 1 million temperature samples and over 500,000 temperature/humidity samples
- Supports bandwidths up to 11 Mbps (complies with IEEE 802.11b WiFi specification)
- Integrated LCD screen displays logger readings and status
- Supports WEP 64-bit, WEP 128-bit, WPA-PSK, and WPA2-PSK WiFi security protocols
- Sensors 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 sensor settings (sample rate, data transmission rate, high/low alarms, and other settings)
- View, analyze, and print logged data immediately (printing only available with Personal/Professional accounts)
- Export logged data to analyze/graph in Microsoft® Excel®
- Instant email alerts of sensor data and status (Cloud only)
- Supports Windows® 8/7/Vista®/XP (32- and 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 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 loggers 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.*

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 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.

Refer to the [Cloud Account Types and Supported Features](#) table for an overview of each account type, and to www.wifisensorcloud.com/accountdifferences.aspx for more information.

Cloud Access Using Any Web-Enabled Device

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



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.

- The **Home Screen** displays current readings, WiFi signal strength, alarms, and battery charge.
- The **Max Screen** displays the maximum logged values since the sensor was last reset.
- The **Min Screen** displays the minimum logged values since the sensor was last reset.
- The **RSSI** screen displays the current WiFi signal strength ranging from 1 (weakest signal) to 10 (strongest signal) or -- (no signal received).

* 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 sensor, install a WiFi extender between the 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.



Home screen



Max screen



Min screen



RSSI screen

Rechargeable Battery Features

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.

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 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-500 Sensor Series

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 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 account features are compared in the following table and also at www.wifisensorcloud.com/accountdifferences.aspx.

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

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 seconds ÷ 10 seconds = 6 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*
- export graph to .jpg or .pdf†
- 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)

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

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

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

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.

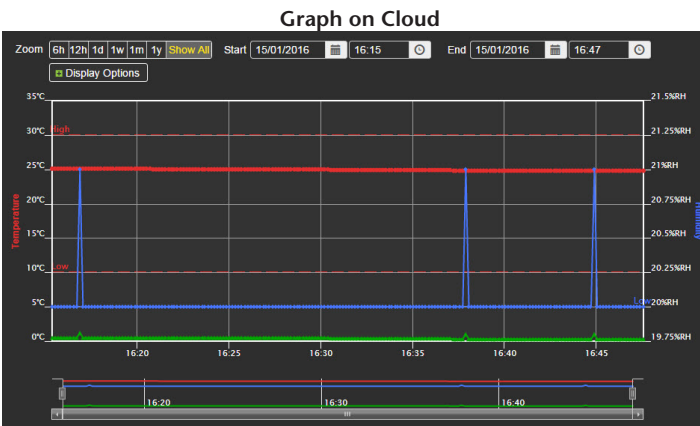
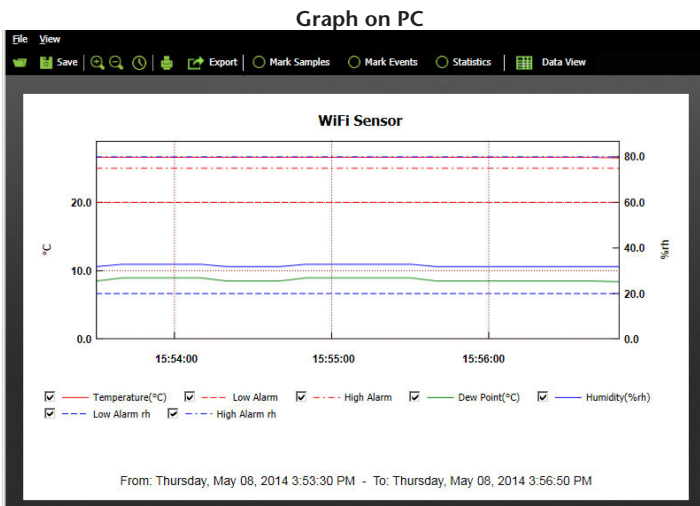
* Export logged data to .pdf only available for PC interface. Export to .csv only available with Personal and Professional Cloud accounts.

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

‡ For WiFi-500 sensors that support humidity measurements

WiFi-500 Sensor Series

Software Information



Users can graph WiFi-500 Sensor Series readings for display 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 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 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

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.

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

Software Information & Specifications



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): ±2.5% RH typ, ±5.0% 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.