WiFi-500 Sensor Series
Low-Cost WiFi Data Logging Sensors

Features

- Wireless temperature and temperature/humidity data logging sensors
- Set up sensor and transmit logged data over WiFi to host computer
- Software-selectable sample rate, data transmission rate, temperature units, and high and low alarms
- 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)
- 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 microUSB cable)
- Supported Operating Systems: Windows® 7/Vista®/XP SP2, 32-bit or 64-bit

Software

- EasyLog WiFi software available as free download
- Sensor setup via easy-to-use software interface
- View and analyze data from multiple WiFi-500 sensors, including immediate graphing of logged data
- Export logged data for immediate graphing in Microsoft® Excel®
- Audible temperature/humidity alarm feature

WiFi-500 Sensor Series wireless data loggers such as the WiFi-501-TP (shown above) transmit logged data to a host computer over a WiFi network.

Overview

The WiFi-500 Sensor Series of wireless data loggers includes the WiFi-501-TP which measures temperature using a detachable thermistor probe, and the WiFi-502 which measures temperature and humidity.

Both sensors use an existing WiFi network for setup and to transmit logged data to a host computer, minimizing the need to physically collect sensors and connect them to your computer.

WiFi Connectivity

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 the host computer by the included microUSB cable and searches for an existing WiFi network. Once the sensor connects to the network, it can then be placed anywhere within range of the network.[1]

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1 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.

WiFi-500 Sensor Series						
Model	Channels	Measurement Type	Sampling Rate	Data Transmission to Computer	Memory	Features
WiFi-501-TP	1	temperature	10 s to 12 hr	every sample to every 100 samples	500 K samples	detachable thermistor probe
WiFi-502	2	temperature, humidity	10 s to 12 hr	each sample to every 100 samples	1 M samples	—

WiFi-500 Sensor Series
General Information

The sensor logs data and transmits logged data wirelessly to the computer 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 continues logging data for up to 60 days with a 10 second sampling rate setting.

Rechargeable Over USB Connection
WiFi-500 Sensor Series data loggers include a low-powered, rechargeable battery. When set up to use typical sampling 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 EasyLog WiFi software is running again.
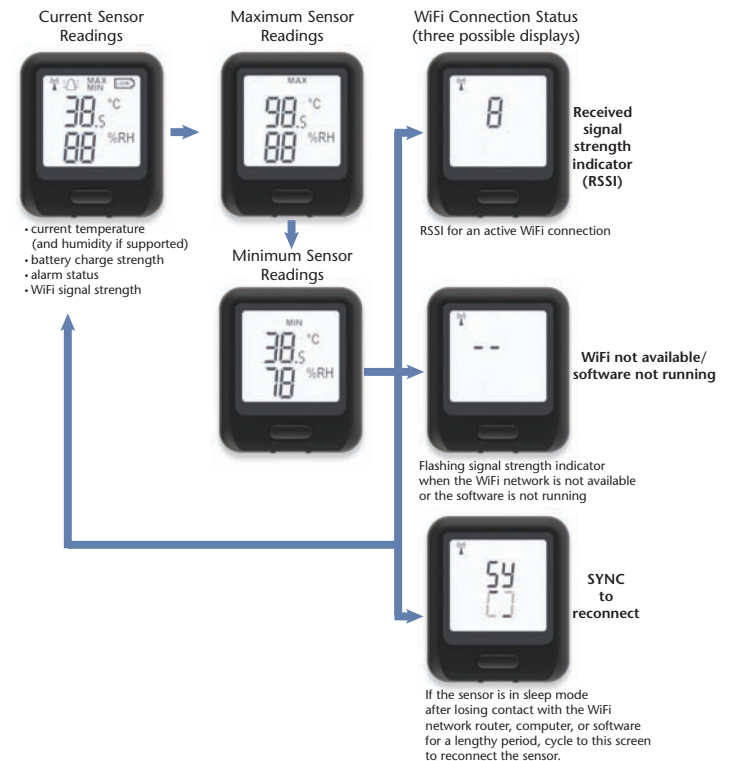
Each sensor continues to log data to its onboard memory while in sleep mode. When they detect that the software is running again, sensors reconnect and transmit all data stored in their memory to the computer.

The WiFi-502 can log over 500,000 temperature and humidity samples.

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.

Current Sensor Readings
- current temperature (and humidity if supported)
- battery charge strength
- alarm status
- WiFi signal strength

Maximum Sensor Readings

Minimum Sensor Readings

WiFi Connection Status (three possible displays)

Received signal strength indicator (RSSI)
RSSI for an active WiFi connection

WiFi not available/ software not running
Flashing signal strength indicator when the WiFi network is not available or the software is not running

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

Press the button on a WiFi-500 Sensor Series data logger to cycle through different information screens (WiFi-502 screens are shown above).

EasyLog WiFi Software
The EasyLog WiFi 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 sampling rate and WiFi data transmission rate, and set alarms and temperature scale.

Sampling and Transmission Rates
Use the EasyLog WiFi software to configure a WiFi-500 Sensor Series device with sampling 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 sample to every 100 samples.
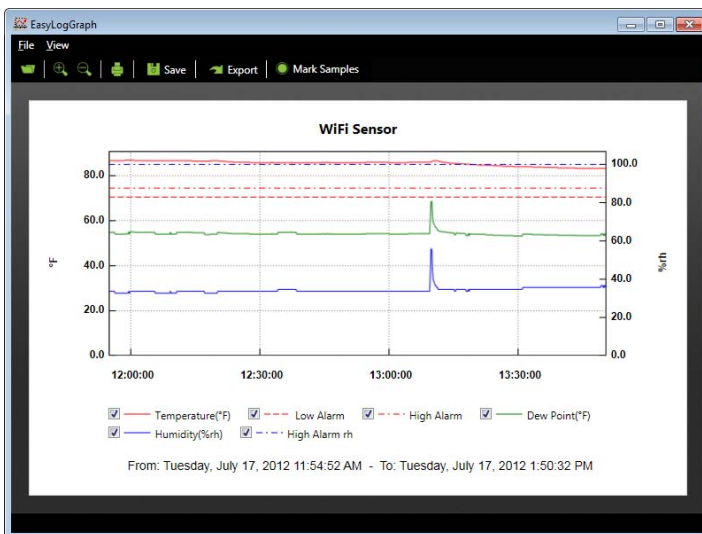
WiFi-500 Sensor Series
General Information & Specifications

The sample rate and transmission rate settings work together to determine how often data is transmitted to the host computer. For example, if the sample rate is set to 10 seconds and the sample transmission frequency is set to 6 samples, the sensor transmits 6 samples to the computer every minute (10 seconds × 6 samples = 60 seconds).

Viewing Sensor Data

Users can select from among all WiFi-500 Sensor Series devices that were configured on the same computer in order to view settings and graph logged data from a specific sensor. Once a sensor is selected, users can select a logging session to display on the graph.

Users can select the WiFi-500 Sensor Series data to display using the EasyLog WiFi software (WiFi-502 data graph shown above).

The graph includes options to display:

- temperature samples
- relative humidity samples[2]
- high and low temperature alarm samples
- high and low relative humidity alarm samples[2]
- dew point[2]

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 can also be exported for immediate display in Microsoft Excel.

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

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

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
microUSB Type B Connector (Bottom of Enclosure): Connects sensor to computer using included 25 in. microUSB cable
USB Device Type: USB 2.0 (full speed)
Device Compatibility: USB 1.1, USB 2.0
microUSB Type B Connector (Bottom of Unit): Connects sensor to computer using included 25 in. microUSB cable

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 rechargeable 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 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.

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2 For WiFi-500 sensors that support humidity measurements

WiFi-500 Sensor Series
Specifications & Ordering

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

Sampling 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

Wireless Data Transmission

Sample Transmission Frequency Range (Software-Selectable): Every one sample to every 100 samples
For example, if the sample rate is set to 10 seconds and the sample transmission frequency is set to 6 samples, the sensor transmits 6 samples to the computer every minute (10 seconds x 6 samples = 60 seconds).

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
Main Sensor Enclosure: IP55 (dust and water spray)
Thermistor Probe: IP67 (dust and water immersion)

Mechanical

Main Enclosure Dimensions (L × W × H): 97.3 × 71.3 × 26.4 mm (3.8 × 2.8 × 1.0 in.)
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 –10 °C and 60 °C): ±1.0 ˚C typ
Internal Resolution: ±0.5 ˚C typ
Alarm Threshold Range (Software-Selectable): –20 ˚C to 70 ˚C (–4 ˚F to 158˚F) range for both high alarms and low alarms

Relative Humidity

Measurement Range: 0% RH to 100% RH
Accuracy (Overall Error Between 20% RH and 80 %RH): ±3.0% RH typ
Alarm Threshold Range: 0% RH to 100% RH (high and low alarms)

Data Sampling

Sampling 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

Wireless Data Transmission

Sample Transmission Frequency Range (Software-Selectable): Every one sample to every 100 samples
For example, if the sample rate is set to 10 seconds and the sample transmission frequency is set to 6 samples, the sensor transmits 6 samples to the computer every minute (10 seconds x 6 samples = 60 seconds).

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
Moisture and Dust Protection: IP55 (dust and water spray)

Mechanical

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

Ordering Information

Description	Part No.
Rechargeable battery-powered WiFi Temperature Sensor with LCD and detachable thermistor probe. Includes 25 in. microUSB cable and wall mounting brackets for main enclosure and probe.	WiFi-501-TP
Rechargeable battery-powered WiFi Temperature/Humidity Sensor with LCD. Includes 25 in. microUSB cable and wall mounting bracket.	WiFi-502

Each WiFi-500 Sensor Series data logger ships with a microUSB cable and a wall mounting bracket.

The WiFi-501-TP sensor (shown above) also includes an adhesive mounting bracket for its detachable thermistor probe.