

USB-500/600 Series

Low-Cost Data Loggers and Accessories



Features

- Stand-alone, remote data loggers and portable logger assistant
- Measure temperature, humidity, voltage, current, or event/state change
- 1 or 2 channels
- Low cost, small size
- Battery powered
- Start/stop logging directly from device on USB-600 Series loggers
- Bracket included for mounting USB-600 Series loggers

Software

- Includes easy-to-use software to set sampling interval, alarms, start time, and many other options
- Easily display, graph, and save data in formats such as .csv to import into Microsoft® Excel®
- Supported Operating Systems: Windows® 8/7/Vista®/XP, 32-/64-bit



USB-500/600 Series data loggers offer low-cost, stand-alone data collection for temperature, humidity, voltage, current, or event/state change.

Overview

The USB-500/600 Series of stand-alone data loggers record several types of environmental readings. Users can easily set up the logging interval and start-time, log data, and then download the data over USB to the computer.

Logged data can then be graphed, printed, and exported to Excel. Each data logger is powered by a long-life lithium battery which lasts for up to a full year.

Several models are available with different measurement input types, sampling intervals, and amount of built-in memory.

USB-500/600 Series Comparison Chart

Model	Channels	Measurement Type	Temperature Measurement Range	Sampling Interval	Memory	Features
USB-501-LT*	1	Temperature	-10 °C to 50 °C	15 min to 2 h	4 K readings	—
USB-501*	1	Temperature	-35 °C to 80 °C	10 s to 12 h	16 K readings	—
USB-501-LCD*	1	Temperature	-35 °C to 80 °C	1 s to 12 h	16 K readings	Built-in LCD Display
USB-501-PRO*	1	Temperature	-40 °C to 125 °C	1 s to 12 h	32 K readings	Extended Temp. Range
USB-501-RCG*	1	Temperature	-20 °C to 60 °C	1 s to 12 h	32 K readings	Rechargeable Battery
USB-501-TC*	1	Thermocouple	Thermocouple-dependent	1 s to 12 h	32 K readings	—
USB-501-TC-LCD*	1	Thermocouple	Thermocouple-dependent	1 s to 12 h	32 K readings	Built-in LCD Display
USB-502*	2	Temperature, Humidity	-35 °C to 80 °C	10 s to 12 h	16 K readings	—
USB-502-LCD*	2	Temperature, Humidity	-35 °C to 80 °C	10 s to 12 h	16 K readings	Built-in LCD Display
USB-502-PLUS*	2	Temperature, Humidity	-35 °C to 80 °C	10 s to 12 h	16 K readings	Increased Accuracy
USB-503	1	0 VDC to 30 VDC	—	1 s to 12 h	32 K readings	—
USB-504	1	4 mA to 20 mA	—	1 s to 12 h	32 K readings	—
USB-505	1	Event/State Change	—	10 s to 30 m	32 K readings	—
USB-601	1	Temperature	-30 °C to 80 °C	10 s to 2 h	250 K readings	Graphic Display, Stores Multiple Logging Sessions
USB-602	2	Temperature, Humidity	-30 °C to 80 °C	10 s to 2 h	250 K readings	
USB-603	2	Thermocouple	Thermocouple-dependent	2 s to 2 h	250 K readings	

* Compatible with USB-525 Logger Assistant

USB-500/600 Series

General Information



Analog Input

One or two channels are available on USB-500/600 Series data loggers. Devices are available with temperature, thermocouple, humidity, voltage, current, or event inputs.

Sampling Interval

Loggers can be programmed with sampling intervals from 1 second to as long as 12 hours, depending on your data collection needs and the logger you are using. The logger stores the data and then uploads it to a computer through USB when collection is complete.

Logger Start Modes

Depending on the USB-500/600 Series logger being used, user can configure a device to start logging in one of the following ways:

- start immediately
- start when logger button pressed (loggers with LCDs only)
- start at selected date and time
- start based on temperature or humidity condition (USB-600 loggers only)

Alarms

All USB-500/600 Series data loggers except for the USB-505 provide high alarm and low alarm options that can be set through software. Users can also enable a *hold* on each alarm so that an alarm status continues even if the logged value is no longer in an alarm condition. The hold option allows users to be notified of an alarm condition without having to download data from the logger.

Alarms are indicated by LED blink patterns. USB-600 Series data loggers also have LCD and audible alarm indicators.

Status LEDs

Each USB-500/600 Series data logger includes one or two LEDs which indicate logging status and alarm conditions.

Some loggers also have LED indicators for battery and memory status.

Real-Time LCD Display

The following USB-500/600 Series data loggers feature a built-in LCD for real-time text display of data:

- | | |
|------------------|-----------|
| • USB-501-LCD | • USB-601 |
| • USB-501-TC-LCD | • USB-602 |
| • USB-502-LCD | • USB-603 |

The LCD on all of these loggers can display current and maximum/minimum stored temperature and humidity values.

The LCD on the USB-601, USB-602, and USB-603 also display the following information:

- graphical display of temperature/humidity
- logging start mode (if logging does not start immediately)
- alarm indicators
- animated icon indicating device is logging
- *locked* mode indicator when start/stop logging button is disabled



The USB-601, USB-602, and USB-603 are the newest additions to the USB-500/600 Series of data loggers. USB-600 Series loggers offer device controls to start and stop logging, LCD and audible alarm indicators, the ability to store multiple logging sessions between downloads, and graphical data displays.

Multiple Logging Sessions (USB-600 Series Only)

Users can start and stop logging on the USB-600 Series data loggers either through software or using the buttons on the logger. This feature allows for storing of multiple logging sessions in between downloads.

USB-500/600 Series

General Information & Specifications



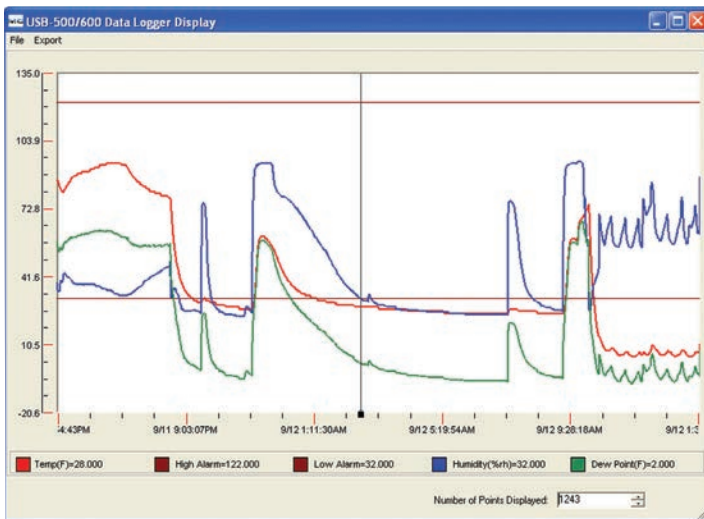
USB-500/600 Series Data Logger Software

Each USB-500/600 Series data logger includes an easy-to-use software application which allows users to configure the following settings:

- sampling interval
- high/low alarm options
- temperature scale
- logger start mode
- buffer management
- LED and LCD power saving options

Settings vary depending on the data logger you are using.

Use the included software to download, display, and save data to a file. The loggers also record maximum and minimum values. Logged temperature, humidity, dew point, voltage, and current data can also be exported to *comma-separated values* (.csv) and text formats for display and analysis in popular spreadsheet programs such as Microsoft Excel.



The included USB-500/600 Data Logger software displays recorded measurements in an easy-to-read chart. Movable markers isolate data values along with a time stamp. Temperature, humidity, dew point, voltage, or current measurements are displayed. In addition, high and low alarms are also shown.

USB-525 Logger Assistant

The ultra-portable USB-525 Logger Assistant allows the user to conveniently program compatible USB-500 model loggers and view the data on a high-resolution screen.



The USB-525 is compatible with the following temperature/humidity data loggers:

- USB-501-LT
- USB-501
- USB-501-LCD
- USB-501-PRO
- USB-501-RCG
- USB-501-TC
- USB-501-TC-LCD
- USB-502
- USB-502-LCD
- USB-502-PLUS

Connect a data logger directly to the USB port on the USB-525, and follow the instructions on the touch-screen display to set up a compatible logger, download data, view data, and export data for use in a spreadsheet application. Logger setup and data display can be done on site without the need of a computer, reducing interruptions in data collection and decreasing travel by users between sites.

Logged data can also be transferred to a computer over the included micro-USB cable for display using the USB-500/600 Data Logger software.

Specifications

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

USB-501-LT

Lowest Cost Temperature Logger

Temperature

Measurement range: -10 °C to 50 °C
(14 °F to 122 °F)

Resolution: 1 °C (2 °F) typ

Accuracy (overall error): ±2.5 °C (±4.5 °F) max

Data Sampling

Sampling intervals (software-selectable): 15 min, 30 min, 1 h, 2 h

Max temperature samples: 4,080

Units: °C or °F

Alarms

High temp alarm range: -10 °C to 79.5 °C (14 °F to 175 °F)

Low temp alarm range: -10 °C to 79.5 °C (14 °F to 175 °F)

Temp resolution: 0.5 °C (1 °F)

USB Specifications

USB device type: USB 2.0 (full speed)

Device Compatibility: USB 1.1, USB 2.0

Power

Power source: CR1620 lithium button cell

Battery lifespan: @ 30 min logging rate, 1 month min



USB-500/600 Series

Specifications



Environmental

Operating temperature range: -10 °C to 50 °C (14 °F to 122 °F)

Mechanical

Dimensions (L × W × H): 68 × 18 × 9.4 mm (2.7 × 0.7 × 0.4 in.)

USB-501

Temperature Logger

Temperature

Measurement range: -35 °C to 80 °C (-31 °F to 176 °F)

Resolution: 0.5 °C (1 °F) typ

Accuracy (overall error): ±1 °C (±2 °F) typ

Data Sampling

Sampling intervals (software-selectable): 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Max temperature samples: 16,382

Units: °C or °F

Alarms

High temperature alarm range: -35 °C to 79.5 °C (-31 °F to 175 °F)

Low temperature alarm range: -35 °C to 79.5 °C (-31 °F to 175 °F)

Temperature resolution range: 0.5 °C (1 °F)

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery lifespan: @ 1 min logging rate, 1 year typ

Environmental

Moisture and dust protection: Protective cap installed, IP67

Operating temperature range: -35 °C to 80 °C (-31 °F to 176 °F)

Mechanical

Dimensions (L × W × H): 98 × 26 × 26 mm (3.86 × 1.02 × 1.02 in.)

USB-501-LCD

Temperature Logger with LCD

Temperature

Measurement range: -35 °C to 80 °C (-31 °F to 176 °F)

Resolution: 0.5 °C (1.0 °F) typ

Accuracy (overall error): ±0.5 °C (±1.0 °F) typ,

±1.5 °C (±3.0 °F) max, when operating between 0 °C and 40 °C

Data Sampling

Sampling intervals (software-selectable): 1 s, 2 s, 5 s, 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Temperature samples: 16,379

Units: °C or °F

Data rollover (software-selectable): Allows unlimited logging periods by overwriting the oldest data when the memory is full

Alarms

High temperature alarm range: -35 °C to 79.5 °C (-31 °F to 175 °F)

Low temperature alarm range: -35 °C to 79.5 °C (-31 °F to 175 °F)

Alarm temperature resolution: 0.5 °C (1.0 °F) typ

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery lifespan: 1 year max @ 1 min logging rate,



Environmental

Operating temperature range: -35 °C to 80 °C (-31 °F to 176 °F)

Moisture and dust protection: Protective cap installed, IP67

Mechanical

Dimensions (L × W × H): 119.5 × 25.3 × 22.1 mm (4.7 × 1.04 × 0.87 in.)

USB-501-PRO

Temperature Logger with Rugged Enclosure

Temperature

Measurement range: -40 °C to 125 °C (-40 °F to 257 °F)

Resolution: 0.1 °C (0.2 °F) typ

Accuracy (overall error): ±0.2 °C (±0.4 °F) typ,

±0.5 °C (±1.0 °F) max, when operating between 0 °C and 40 °C

Data Sampling

Sampling intervals (software-selectable): 1 s, 2 s, 5 s, 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Temperature samples: 32,510

Units: °C or °F

Data rollover (software-selectable): Allows unlimited logging periods by overwriting the oldest data when the memory is full

Alarms

High temperature alarm range: -40 °C to 124.5 °C (-40 °F to 256 °F)

Low temperature alarm range: -40 °C to 124.5 °C (-40 °F to 256 °F)

Alarm temperature resolution: 0.1 °C (0.2 °F) typ

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 2/3AA 3.6 V lithium battery

Battery lifespan

1 year min @ -20 °C and a 10 s logging rate

2 years typ @ 80 °C and a 10 s logging rate,

3 years max @ -40 °C to 125 °C (-40 °F to 257 °F)

Environmental

Operating temperature range: -40 °C to 125 °C (-40 °F to 257 °F)

Moisture and dust protection: Protective cap installed, IP67

Corrosion protection: Stainless steel housing, 316 grade

Mechanical

Dimensions (L × W × H): 111 × 20 × 20 mm (4.37 × 0.787 × 0.787 in.)

USB-501-RCG

Temperature Logger with Rechargeable Battery

Temperature

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

Resolution: 0.1 °C (0.2 °F) typ

Accuracy (overall error): ±1 °C (±2 °F) typ,

Data Sampling

Sampling intervals (software-selectable): 1 s, 2 s, 5 s, 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Temperature samples: 32,510

Units: °C or °F

Data rollover (software-selectable): Allows unlimited logging periods by overwriting the oldest data when the memory is full

Alarms

High temperature alarm range: -20.5 °C to 60 °C (-5 °F to 140 °F)

Low temperature alarm range: -20.5 °C to 60 °C (-5 °F to 140 °F)

Alarm temperature resolution: 0.5 °C (1.0 °F)



USB-500/600 Series Specifications



USB Specifications

USB device type: USB 2.0 (full speed)
Device Compatibility: USB 1.1, USB 2.0

Power

Power source: Rechargeable lithium battery

Battery lifespan

@ -20 °C (-4 °F) and a 1 s sampling interval, 1 week min,
@ 20 °C (68 °F) and a 1 min sampling interval, 4 weeks min
Battery operates best at temperatures between 10 °C and 30 °C (50 °F and 86 °F). Only recharge battery in an environment within this temperature.

Environmental

Operating temperature range: -20 °C to 60 °C (-4 °F to 140 °F)
Moisture and dust protection: Protective cap installed, IP67
Corrosion protection: Protective cap installed, stainless steel housing, 316 grade

Mechanical

Dimensions (L × W × H): 92.7 × 19.8 × 19.8 mm (3.65 × 0.78 × 0.78 in.)

USB-501-TC

Thermocouple Logger

Temperature

The USB-501-TC can log temperatures as detailed below using thermocouple sensors. However, the data logger should not be subjected to temperatures outside the operating temperature range of -10 °C to 40 °C (14 °F to 104 °F).

Measurement range

K-type thermocouple: -200 °C to 1350 °C
(-328 °F to 2462 °F)
J-type thermocouple: -200 °C to 1190 °C
(-328 °F to 2174 °F)
T-type thermocouple: -200 °C to 390 °C
(-328 °F to 734 °F)

Resolution: 0.5 °C (1 °F) typ

Accuracy (logger error): ±1 °C (±2 °F) typ

Included Thermocouple Probe

Type: K

Measurement range: 0 °C to 400 °C (32 °F to 752 °F)

Accuracy: ±2.5 °C (±4.5 °F)

Connector type: Mini-thermocouple

Cable length: 1.5 m

Stainless steel probe length: 100 mm

Data Sampling

Sampling intervals (software-selectable): 1 s, 2 s, 5 s, 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Max temperature samples: 32,510

Units: °C or °F

Alarms

High temperature alarm range: -200 °C to 1349.5 °C (-328 °F to 2461 °F)

Low Temperature alarm range: -200 °C to 1349.5 °C (-328 °F to 2461 °F)

Alarm temperature resolution: 0.5 °C (1 °F)

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery lifespan @ 1 min sampling interval: 6 months typ

Environmental

Operating temperature range: -10 °C to 40 °C (14 °F to 104 °F)

Mechanical

Dimensions (L × W × H): 118 × 27 × 27 mm (3.86 × 1.02 × 1.02 in.)

USB-501-TC-LCD

Thermocouple Logger with LCD

Temperature

Measurement range

K-type thermocouple: -200 °C to 1350 °C
(-328 °F to 2462 °F)

J-type thermocouple: -200 °C to 1190 °C
(-328 °F to 2174 °F)

T-type Thermocouple: -200 °C to 390 °C
(-328 °F to 734 °F)

Resolution: 0.5 °C (1 °F) typ

Accuracy (logger error): ±1 °C (±2 °F) typ

Note: The USB-501-TC-LCD can log temperatures as detailed above using thermocouple sensors. However, the data logger should not be subjected to temperatures outside the operating temperature range of -10 °C to 40 °C (14 °F to 104 °F).



Included Thermocouple Probe

Type: K

Measurement range: 0 °C to 400 °C (32 °F to 752 °F)

Accuracy: ±2.5 °C (±4.5 °F)

Connector type: Mini-thermocouple

Cable length: 1.5 m

Stainless steel probe length: 100 mm

Data Sampling

Sampling intervals (software-selectable): 1 s, 2 s, 5 s, 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Temperature samples: 32,510 max

Units: °C or °F

Data rollover (software-selectable): Allows unlimited logging periods by overwriting the oldest data when the memory is full.

Alarms

High temperature alarm range: -200 °C to 1349.5 °C
(-328 °F to 2461 °F)

Low temperature alarm range: -200 °C to 1349.5 °C
(-328 °F to 2461 °F)

Alarm temperature resolution: 0.5 °C (1 °F) typ

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery life: @ 25 °C and 1 min Sampling Interval, 6 months typ

Environmental

Operating temperature range: -10 °C to 40 °C (14 °F to 104 °F)

LCD Status Indicators

The high-contrast LCD shows temperature data and information regarding the logger status.

Temperature (°C/°F): Current temperature, stored max, and stored min values
LCD mode (software-selectable): Always on; on for 30 seconds after the LCD button is pressed; always off

Mechanical

Dimensions (L × W × H): 134.5 × 23.9 × 21.2 mm (5.29 × 0.94 × 0.83 in.)

USB-500/600 Series Specifications



USB-502

Temperature & Humidity Logger

Temperature

Measurement range: -35°C (-31°F) min, 80°C (176°F) max

Repeatability: $\pm 0.1^{\circ}\text{C}$ ($\pm 0.2^{\circ}\text{F}$) typ

Accuracy (overall error): $\pm 0.5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$) typ, $\pm 2^{\circ}\text{C}$ ($\pm 4^{\circ}\text{F}$) max

Dew point accuracy (overall error): $\pm 1.1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$) typ

Note: Specifies the overall error in the calculated dew point, for relative humidity measurements between 40% and 100% RH at 25°C

Alarm threshold range (software-selectable): -35°C to 79.5°C (-30°F to 175°F) (high and low alarms)

Relative Humidity (%RH)

Measurement range: 0% to 100%

Repeatability (short term): ± 0.1 typ

Accuracy (overall error): ± 3.0 typ

Note: Specifies the overall error in the logged readings for relative humidity measurements from 20% to 80%

Internal resolution: 0.5 typ

Long term stability: 0.5 typ (%RH per year)

Alarm threshold range: 0% to 99.5% (high and low alarms)

Data Sampling

Sampling intervals (software-selectable): 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Temperature samples: 16,382 max

Relative humidity samples: 16,382 max

Temperature units: $^{\circ}\text{C}$ or $^{\circ}\text{F}$

Logging modes: Immediate and delayed start

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery lifespan: 1 year typ (battery lifespan depends on the sample rate and ambient temperature)

Environmental

Operating temperature range: -35°C to 80°C (-31°F to 176°F)

Ingress protection: Meets IP67 Standard with protective cap installed

Mechanical

Dimensions (L \times W \times H): 103 \times 26.4 \times 26.4 mm (4.06 \times 1.04 \times 1.04 in.)



USB-502-LCD

Temperature and Humidity Logger with LCD

Temperature

Measurement Range: -35°C to 80°C (-31°F to 176°F)

Note: At temperatures below -20°C (-4°F), the LCD may exhibit slower response time of approximately 10 seconds.

Repeatability (short term): $\pm 0.1^{\circ}\text{C}$, $\pm 0.2^{\circ}\text{F}$ typ

Accuracy (overall error): $\pm 0.5^{\circ}\text{C}$ typ, $\pm 2^{\circ}\text{C}$ max; $\pm 1^{\circ}\text{F}$ typ, $\pm 4^{\circ}\text{F}$ max

Internal resolution: 0.5 $^{\circ}\text{C}$, 1 $^{\circ}\text{F}$ typ

Dew point accuracy (overall error): $\pm 1.1^{\circ}\text{C}$, $\pm 2^{\circ}\text{F}$ typ

Specifies the overall error in the calculated dew point, for relative humidity measurements between 40% and 100% RH at 25°C .

Alarm threshold range (software-selectable): -35°C to 79.5°C (-31°F to 175°F) (high and low alarms)

Relative Humidity (%RH)

Measurement range: 0% to 100%

Repeatability (short term): ± 0.1 typ

Accuracy (overall error): ± 3.0 typ, ± 6.0 max

Specifies the overall error in the logged readings for relative humidity measurements between 20% and 80% RH

Internal resolution: 0.5 typ

Long term stability: 0.5 typ (%RH per year)

Alarm threshold range: 0% to 99.5% (high and low alarms)

Data Sampling

Sampling interval (software-selectable): 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1 h, 2 h, 6 h, 12 h

Temperature samples: 16,379 max

Relative humidity samples: 16,379 max

Temperature units: $^{\circ}\text{C}$ or $^{\circ}\text{F}$

Logging modes: Immediate, delayed start, and push to start (through the LCD button on the device)

Data rollover (software-selectable): Allows unlimited logging periods by overwriting the oldest data when memory is filled

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

LCD Status Indicators

The high-contrast LCD shows temperature data and information regarding the logger status.

Temperature ($^{\circ}\text{C}/^{\circ}\text{F}$): Current temperature, stored max, and stored min values

Relative humidity (%RH): Current relative humidity, stored max, and stored min values

LCD mode (software-selectable): Always on; on for 30 seconds after the LCD button is pressed; always off

Power

Power source: 1/2AA 3.6 V lithium battery

Battery life: 1 year typ (depends on the sample rate, ambient temperature, and use of the LCD screen)

Environmental

Operating temperature range: -35°C to 80°C (-31°F to 176°F)

Note: At temperatures below -20°C (-4°F), the LCD may exhibit slower response time of approximately 10 seconds

Mechanical

Dimensions (L \times W \times H): 126.0 \times 24.1 \times 25.3 mm (4.96 \times 0.95 \times 1.00 in.)



USB-500/600 Series

Specifications



USB-502-PLUS

Temperature and Humidity Logger
with Increased Accuracy

Temperature

Measurement range: -35°C to 80°C
(-31°F to 176°F)

Repeatability: $\pm 0.1^{\circ}\text{C}$ ($\pm 0.2^{\circ}\text{F}$) typ

Accuracy (overall error): $\pm 0.3^{\circ}\text{C}$ ($\pm 0.6^{\circ}\text{F}$) typ,
 $\pm 1.5^{\circ}\text{C}$ ($\pm 3^{\circ}\text{F}$) max

Internal resolution: 0.5°C (1°F) typ

Dew point accuracy (overall error): $\pm 1.1^{\circ}\text{C}$
($\pm 2.0^{\circ}\text{F}$) typ

Specifies the overall error in the calculated dew point for relative humidity measurements from 40% to 100% RH at 25°C

Alarm threshold range (software-selectable): -35°C to 79.5°C
(-30°F to 175°F) (high and low alarms)

Relative Humidity (%RH)

Measurement range: 0% to 100%

Repeatability (short term): ± 0.1 typ

Accuracy (overall error): ± 2.0 typ, ± 4.0 max

Specifies the overall error in the logged readings for relative humidity measurements between 10% and 90% RH

Internal resolution: 0.5 typ

Long term stability: 0.5 typ (%RH per year)

Alarm threshold range: 0% to 99.5% (high and low alarms)

Data Sampling

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

Temperature samples: 16,382 max

Relative humidity samples: 16,382 max

Temperature units: $^{\circ}\text{C}$ or $^{\circ}\text{F}$

Logging modes: Immediate and delayed start

Data rollover (software-selectable): Allows unlimited logging periods
by overwriting the oldest data when the memory is full.

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery life: 1 year typ (depends on the sample rate and ambient temperature)

Environmental

Operating temperature range: -35°C to 80°C (-31°F to 176°F)

Ingress protection: Meets IP67 Standard with protective cap installed

Mechanical

Dimensions (L \times W \times H): 103.0 \times 26.4 \times 26.4 mm (4.06 \times 1.04 \times 1.04 in.)



USB-503

Voltage Logger

Voltage

Measurement range: 0 VDC to 30 VDC

Resolution: 50 mVDC

Accuracy (overall error): $\pm 1\%$ typ

Data Sampling

Sampling intervals (software-selectable): 1 s,
2 s, 5 s, 10 s, 30 s, 1 min, 5 min, 15 min,
30 min, 1 h, 2 h, 6 h, 12 h

Max voltage samples: 32,510

Units: VDC

Alarms

High voltage alarm range: 0 VDC to 30 VDC

High voltage alarm resolution: 0.3 V

Low voltage alarm range: 0 VDC to 30 VDC

Low voltage alarm resolution: 0.3 V

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery lifespan: 1 year typ (depends on ambient temperature, sampling interval, and use of alarm LEDs)

Environmental

Operating temperature range: -35°C to 80°C (-31°F to 176°F)

Mechanical

Dimensions (L \times W \times H): 98.0 \times 26.8 \times 26.8 mm (3.86 \times 1.05 \times 1.05 in.)

USB-504

4-20 mA Current Logger

Current

Measurement range: 4 mA DC to 20 mA DC typ

Resolution: ± 0.05 mA DC

Accuracy (overall error): $\pm 1\%$, ± 1 count

Data Sampling

Sampling intervals (software-selectable): 1 s, 2 s,
5 s, 10 s, 30 s, 1 min, 5 min, 15 min, 30 min, 1
2 h, 6 h, 12 h

Max current samples: 32,000

Units: mA DC

Alarms

High current alarm range: 4 mA DC to 20 mA DC

High current alarm resolution: 0.16 mA

Low current alarm range: 4 mA DC to 20 mA DC

Low current alarm resolution: 0.16 mA

USB Specifications

USB device type: USB 2.0 (Full-speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery lifespan: 1 year typ (depends on ambient temperature, sampling interval, and use of alarm LEDs)

Environmental

Operating temperature range: -35°C to 80°C (-31°F to 176°F)

Mechanical

Dimensions (L \times W \times H): 98.0 \times 26.8 \times 26.8 mm (3.86 \times 1.05 \times 1.05 in.)



USB-500/600 Series

Specifications



USB-505

Counter, Event and State Logger

Voltage

Input range: 3 VDC to 24 VDC

Volt free contacts voltage resolution: 50 mVDC

Current

Volt free contacts current: 35 μ A typ

Data Sampling

Time between events: 200 ms minimum

Time between state changes: 500 ms minimum

Time between event counts: 10 ms minimum

with red LED disabled;

50 ms minimum with red LED enabled

Max event or state change samples: 32,510

Timing accuracy: ± 3 s per day at 20 °C

Sampling intervals (software-selectable): 10 s, 30 s, 1 min, 5 min, 15 min, 30 min

Max event samples: 32,510

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: 1/2AA 3.6 V lithium battery

Battery lifespan: 1 year typ (depends on ambient temperature, sampling interval, and use of alarm LEDs)

Environmental

Operating temperature range: -35 °C to 80 °C (-31 °F to 176 °F)

Mechanical

Dimensions (L \times W \times H): 98.0 \times 26.8 \times 26.8 mm (3.86 \times 1.05 \times 1.05 in.)

USB-525 Logger Assistant

Portable Device for USB-500 Model Logger Setup and Data Viewing

Compatible Data Loggers

- | | |
|---------------|------------------|
| • USB-501-LT | • USB-501-TC |
| • USB-501 | • USB-501-TC-LCD |
| • USB-501-LCD | • USB-502 |
| • USB-501-PRO | • USB-502-LCD |
| • USB-501-RCG | • USB-502-PLUS |

Memory

Internal Flash Memory: Stores over 8,500,000 temperature/humidity samples

LCD

240 \times 320 pixels, 2.8" thin film transistor with touch-screen

Time out (software-selectable): Backlight turns off after 10 s, 20 s, 30 s, or 1 min of inactivity

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

USB type a socket (top of device): Connects to compatible USB-500/600 Series data loggers

micro-USB socket (bottom of device): Connects device to computer using 1 m (3.28 ft) USB cable (included)



Power

Power source: Lithium polymer battery, rechargeable using micro-USB connection

Battery lifespan: 8 hours max (intermittent use), 5 hours min (constant use)

Power down: Device powers down after 5 minutes of inactivity

Environmental

Operating temperature range: 0 °C to 50 °C (32 °F to 122 °F)

Mechanical

Dimensions (L \times W \times H): 107 \times 68 \times 19 mm (4.2 \times 2.7 \times 0.7 in.)

USB-601

Temperature Logger with Graphic LCD Screen

Temperature

Measurement range: -30 °C to 80 °C (-22 °F to 176 °F)

Resolution: 0.1 °C (0.1 °F) typ

Accuracy (overall error): ± 0.1 °C (± 0.2 °F) typ, ± 0.75 °C (± 1.5 °F) max

Data Sampling

Sampling intervals (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 h, 2 h

Max temperature samples: 252,928

Units: °C or °F

Alarms

High temperature alarm range: -30 °C to 79.5 °C (-22 °F to 175 °F)

Low temperature alarm range: -30 °C to 79.5 °C (-22 °F to 175 °F)

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: Two 1/2AA 3.6 V lithium batteries

Battery lifespan: 6 months typ at 25 °C and 10 minute logging rate with no audible alarm or alarm LEDs and minimal LCD use

Environmental

Moisture and dust protection: IP67

Operating temperature range: -30 °C to 80 °C (-22 °F to 176 °F)

Mechanical

Dimensions (L \times W \times H): 88.0 \times 48.5 \times 30.5 mm (3.86 \times 1.02 \times 1.02 in.)



USB-500/600 Series

Specifications



USB-602

Temperature/Humidity Logger with Graphic LCD Screen

Temperature

Measurement range: -30 °C to 80 °C (-22 °F to 176 °F)

Internal resolution: 0.1 °C (0.1 °F) typ

Dew point accuracy (overall error): ±1.1 °C (±2.0 °F) typ

Accuracy (overall error): ±0.5 °C (±1.0 °F) typ, ±2.0 °C (±4.0 °F) max

Repeatability: ±0.1 °C (±0.2 °F) typ

Relative Humidity (%RH)

Measurement range: 0% to 100%

Repeatability (short term): ±0.1 typ

Accuracy (overall error): ±2.0 typ, ±4.0 max

Note: Specifies the overall error in the logged readings for relative humidity measurements between 20% and 80% RH

Internal resolution: ±0.1 %RH typ

Long term stability: 0.5 typ (%RH per year)

Alarm threshold range: 0% to 99.5% (high and low alarms)

Data Sampling

Sampling intervals (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 h, 2 h

Max temperature samples: 252,928

Units: °C or °F

Alarms

High temperature alarm range: -30 °C to 79.5 °C (-22 °F to 175 °F)

Low temperature alarm range: -30 °C to 79.5 °C (-22 °F to 175 °F)

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: Two 1/2AA 3.6 V lithium batteries

Battery lifespan: 4 months typ at 25 °C and 10 minute logging rate with no audible alarm or alarm LEDs and minimal LCD use

Environmental

Moisture and dust protection: IP67

Operating temperature range: -30 °C to 80 °C (-22 °F to 176 °F)

At temperatures below -5 °C the LCD exhibits slower response times. The LCD is disabled at temperatures below -20 °C and above 70 °C.

Mechanical

Dimensions (L × W × H): 88.0 × 48.5 × 30.5 mm (3.86 × 1.02 × 1.02 in.)



USB-603

Two-Channel Thermocouple Logger with Graphic LCD Screen

Temperature

Measurement ranges

K-type thermocouple: -200 °C to 1350 °C (-328 °F to 2462 °F)

J-type thermocouple: -200 °C to 1190 °C (-328 °F to 2174 °F)

T-type thermocouple: -200 °C to 390 °C (-328 °F to 734 °F)

Resolution: 0.1 °C (0.1 °F) typ

Above 999.9 °C/°F display becomes 1 °C.

Internal resolution remains at 0.1 °C/°F.

Accuracy (overall error): ±0.5 °C (±0.9 °F) typ

Quoted accuracy is for the data logger only when measuring within the specified operating temperature. Thermocouple error is not included and should also be taken into consideration.

Included Thermocouple Probes

Type: K

Measurement range: 0 °C to 400 °C (32 °F to 752 °F)

Accuracy: ±2.5 °C (±4.5 °F)

Connector type: Mini-thermocouple

Cable length: 1.5 m

Stainless steel probe length: 100 mm

To improve response time, the thermocouple probes supplied with the USB-603 are not electrically isolated from the thermocouple junction.

Depending upon the application, it may be necessary to use electrically-isolated thermocouple probes to avoid ground loops, and/or situations where the probes may come into contact with conductors that are at different electrical potentials. If unsure of the application needs, Measurement Computing recommends using electrically-isolated probes.

Data Sampling

Sampling intervals (software-selectable): 2 s, 5 s, 10 s, 15 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 15 min, 20 min, 30 min, 1 h, 2 h

Max temperature samples: 252,928

Units: °C or °F

Alarms

High temperature alarm range: -30 °C to 79.5 °C (-22 °F to 175 °F)

Low temperature alarm range: -30 °C to 79.5 °C (-22 °F to 175 °F)

USB Specifications

USB device type: USB 2.0 (full speed)

Device compatibility: USB 1.1, USB 2.0

Power

Power source: Two 1/2AA 3.6 V lithium batteries

Battery lifespan: 4 months typ at 25 °C and 10 minute logging rate with no audible alarm or alarm LEDs and minimal LCD use

Environmental

Operating temperature range: -10 °C to 40 °C (-14 °F to 104 °F)

Applies to the data logger module only. Refer the probe manufacturer for operating temperature of thermocouple.

Mechanical

Dimensions (L × W × H): 102.0 × 48.5 × 30.5 mm (4.06 × 1.02 × 1.02 in.)



USB-500/600 Series

Ordering



Ordering Information

Part No.	Description	Part No.	Description
USB-501	Battery-powered remote temperature logger measures and stores up to 16,382 temperature readings	USB-502-PLUS	Temperature and humidity logger with increased accuracy (± 0.3 °C typical, ± 2.0 %RH typical) measures and stores over 16,000 readings
USB-501-LCD	Battery-powered remote temperature logger with LCD measures and stores up to 16,379 temperature readings	USB-503	Voltage data logger measures and stores over 32,000 readings
USB-501-LT	Lowest-cost temperature logger temperature logger measures and stores over 4,000 temperature readings	USB-504	Current loop data logger measures and stores over 32,000 readings
USB-501-PRO	Temperature logger with rugged enclosure and extended temperature range (-40 °C to 125 °C) measures and stores over 32,000 temperature readings	USB-505	Event, state change, and event count logger measures and stores up to 32,510 readings
USB-501-RCG	Temperature logger with rechargeable battery measures and stores over 32,000 temperature readings	USB-525	Portable Logger Assistant for logger setup and data viewing from compatible USB-500 model data loggers.
USB-501-TC	Thermocouple data logger measures and stores over 32,000 temperature readings. One K-type thermocouple included.	USB-601	Temperature logger with graphic LCD screen, device controls, and multi-session logging measures and stores over 250,000 readings.
USB-501-TC-LCD	Thermocouple data logger with LCD measures and stores over 32,000 temperature readings. One K-type thermocouple included.	USB-602	Temperature/humidity logger with graphic LCD screen, device controls, and multi-session logging measures and stores over 250,000 readings.
USB-502	Temperature and humidity logger measures and stores over 16,000 readings	USB-603	Two-channel thermocouple logger with graphic LCD screen, device controls, and multi-session logging measures and stores over 250,000 readings. Two K-type thermocouples included.
USB-502-LCD	Temperature and humidity logger with LCD measures and stores over 16,000 readings		