

USB-500 Series

Quick Start & Reference Guide



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System requirements and recommendations

- PC with Pentium® II-class processor, 450 MHz (Pentium III class processor, 650 MHz or higher recommended)
- Windows 2000 (SP4) , Windows XP (SP2), or Windows Vista (32-bit)
- Microsoft .NET framework 2.0 or greater (included on CD)
- CD-ROM drive
- VGA or higher resolution monitor (Super VGA recommended)
- Microsoft® mouse or compatible pointing device (recommended)
- At least 5 Mb of free storage
- Microsoft Excel 2000 or greater (optional)

Important! Install the USB-500 Data Logger Application software before plugging your USB-500 Series data logger into a USB port on your computer.

Notice

Logicbus does not authorize any product for use in life support systems and/or devices without prior written consent from Logicbus. Life support devices/systems are devices or systems which, a) are intended for surgical implantation into the body, or b) support or sustain life and whose failure to perform can be reasonably expected to result in injury. Logicbus products are not designed with the components required, and are not subject to the testing required to ensure a level of reliability suitable for the treatment and diagnosis of people.

USB-501-PRO Safety Agreement

PLEASE READ THROUGH THIS USB-500 QUICK START GUIDE, WHICH SHOULD BE KEPT FOR FUTURE REFERENCE. PASS THE USB-500 QUICK START GUIDE ON TO THOSE WHO USE THIS DEVICE. DO NOT ATTEMPT TO USE THE USB-501-PRO WITHOUT READING AND UNDERSTANDING THE DOCUMENTATION. THIS PRODUCT IS CAPABLE OF MEASURING HIGH TEMPERATURES. THE CORRECT PROCEDURES ARE REQUIRED TO AVOID INJURY. IF THERE IS ANY DOUBT AS TO THE SAFETY OR APPLICATION - STOP! AND CONSULT A QUALIFIED EXPERT.

The USB-501-PRO is a professional measuring instrument, designed to record TEMPERATURE. Care must be taken when:

1. Removing the USB-501-PRO from extreme environments - The logger is metal and will retain heat or will remain cold when it has been removed from the environment under measurement. Personal protection, such as suitable heat resistant gloves or tools must be used to remove the logger from any environment. Refer to the product specifications for the maximum and minimum temperatures in which the logger can be used.
2. Replacing batteries - Always operate the USB-501-PRO and replace its batteries according to the instructions. The USB-501-PRO will work in extreme temperatures. However, many batteries will not work at these extremes. Serious injury can result if the replacement battery is not designed for use within the full operating temperature range of the USB-501-PRO. Never replace the battery with any battery not specified for use with this device by Logicbus. Contact Logicbus if you are unable to find the correct battery.

Installing the software

Follow these steps to install the USB-500 Data Logger Application on your computer.

1. Insert the *USB-500 Data Logger Application* CD into your computer's CD drive. If the CD does not start automatically, run *setup.exe* from the root of the CD.

A **Preparing to Install...** dialog opens momentarily. If the Microsoft .NET framework is not installed on the system, its setup program starts, followed by a **Welcome...** dialog that starts the USB-500 Data Logging Application installation program.

2. Click on the **Next>** button. A **Destination Folder** dialog opens.

To install the software in the default folder, click on the **Next>** button.

To install the software in a different folder, click on the **Change...** button, enter the new location on the **Change Current Destination Folder** dialog, click on the **OK** button, and then click on the **Next>** button.

A **Ready to Install the Program** dialog opens.

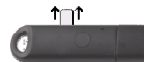
3. Click on the **Install** button. An **Installing USB 500 Data Logger Application** dialog opens and remains open while the software installs. An **Installation Completed** dialog opens when the software finishes installing. Click on the **Finish** button. The installation is complete.

Installing USB-500 Series Data Loggers

Follow these steps to install USB-500 Series Data Loggers on your computer. **Make sure you have already installed the software.**

Important! To avoid damaging your USB-500 Series data logger, do not disconnect it from the USB port while it is communicating with the PC, such as when you are setting up the data logger or downloading data from it.

Note: Before connecting a USB-501-LT to the computer, remove the plastic tab from the side of the device to activate the battery.



1. Insert your USB-500 Series device into a USB port on your computer.
A **Found New Hardware Wizard** opens.
2. Click on the **Install the software automatically** option, and then click on the **Next>** button.
Another **Found New Hardware Wizard** dialog opens while it searches for the software. Once the software is found, the last **Found New Hardware Wizard** dialog opens, telling you the installation is complete.
3. Click on the **Finish** button.

Running the USB-500 Data Logger Application and Help

To run the USB-500 Data Logger Application, select **Programs ► Measurement Computing ► USB-500 ► USB-500** from the **Start** menu.

You can open the online help from either the computer's Start menu or from within the application:






- To open the online help from the **Start** menu, select the **USB-500 Help** option from the **Programs ► Measurement Computing ► USB-500** folder.
- To open the online help from within the application, pull down the **Help** menu and select **Help Topics**.

Refer to the USB-500 help file for detailed information on the functions of the USB-500 Data Logger Application.

USB-501 LED functions

The USB-501 has two LEDs. The red/green LED flashes green when there is no alarm, and flashes red to indicate an alarm reading. The amber LED flashes when the USB-501's data memory is full, and when the battery charge is low.



	<p>Green LED</p> <ul style="list-style-type: none"> When the green LED flashes <i>once</i> every 10 seconds, the USB-501 is logging with no alarms. No action is needed. When the green LED flashes <i>twice</i> every 10 seconds, the USB-501 starts logging at the date and time you set.
	<p>Red LED</p> <ul style="list-style-type: none"> When the red LED flashes <i>once</i> every 10 seconds, the USB-501 is logging with a low alarm. The action you take depends on your application. When the red LED flashes <i>twice</i> every 10 seconds, the USB-501 is logging with a high alarm. The action you take depends on your application. <p>If both alarms have <i>Hold</i> selected, the LED only applies to the first alarm condition detected.</p>
	<p>Amber and red/green LED</p> <p>When the amber LED flashes concurrently with the red or green LED, the USB-501's memory is full and it can store no more readings. An alarm condition is indicated by the green or red LED.</p> <p>You need to download data from the device.</p>
	<p>Amber LED</p> <p>When the amber LED flashes <i>once</i> every 60 seconds, the USB-501's battery charge is low. The device continues logging, but alarm conditions are ignored.</p> <p>You need to replace the battery and then download data from the device.</p>
	<p>No LEDs</p> <p>When no LEDs are flashing, plug the USB-501 into the PC and run the USB-500 software to find out which condition applies and then take the corresponding action.</p> <p>If logging is not set up, then set up logging. If the battery is depleted, then install a new battery.</p>

USB-501-TC LED functions

The USB-501-TC has two LEDs—one that flashes green and the other that flashes red. The red LED flashes to indicate an alarm reading.



	<p>Green LED</p> <ul style="list-style-type: none"> When the green LED flashes <i>once</i> every 10 seconds, the USB-501-TC is logging with no alarms. No action is needed. When the green LED flashes <i>once</i> every 20 seconds, the USB-501-TC's battery charge is low. The device continues logging, but alarm conditions are ignored. You need to replace the battery. When the green LED flashes <i>twice</i> every 20 seconds, the USB-501-TC's memory is full, and no alarm condition. You need to download data from the device. When the green LED flashes <i>once</i> every 30 seconds, the USB-501-TC starts logging at the date and time you set.
	<p>Red LED</p> <ul style="list-style-type: none"> When the red LED flashes <i>once</i> every 10 seconds, the USB-501-TC is logging with a low alarm. The action you take depends on your application. When the red LED flashes <i>twice</i> every 10 seconds, the USB-501-TC is logging with a high alarm. The action you take depends on your application. When the red LED flashes <i>once</i> every 20 seconds, the USB-501-TC's battery charge is low and it has a low alarm, but it continues logging. Replace the battery and download data. When the red LED flashes <i>twice</i> every 20 seconds, the USB-501-TC's battery charge is low and it has a high alarm, but it continues logging. Replace the battery and download data.
	<p>Red and green LED</p> <p>When the red and green LEDs both flash <i>once</i> every 20 seconds, the USB-501-TC's memory is full, and a high or low alarm condition exists. You need to download data from the device. If both the high and low alarms have <i>Hold</i> selected, the LED only applies to the first alarm condition detected.</p>
	<p>No LEDs</p> <p>When no LEDs are flashing, plug the USB-501-TC into the PC and run the USB-500 software to find out which condition applies and then take the corresponding action. If logging is not set up, then set up logging. If the battery is depleted, then install a new battery.</p>

USB-501-TC-LCD LED functions

The USB-501-TC-LCD has two LEDs—one that flashes green and the other that flashes red. The red LED flashes to indicate an alarm reading.



	<p>Green LED</p> <ul style="list-style-type: none"> When the green LED flashes <i>once</i> every 10 seconds, the USB-501-TC-LCD is logging with no alarms. No action is needed. When the green LED flashes <i>once</i> every 20 seconds, the USB-501-TC-LCD's battery charge is low. The device continues logging, but alarm conditions are ignored. You need to replace the battery. When the green LED flashes <i>twice</i> every 20 seconds, the USB-501-TC-LCD's memory is full, and no alarm condition. You need to download data from the device. When the green LED flashes <i>once</i> every 30 seconds, the USB-501-TC-LCD starts logging at the date and time you set.
	<p>Red LED</p> <ul style="list-style-type: none"> When the red LED flashes <i>once</i> every 10 seconds, the USB-501-TC-LCD is logging with a low alarm. The action you take depends on your application. When the red LED flashes <i>twice</i> every 10 seconds, the USB-501-TC-LCD is logging with a high alarm. The action you take depends on your application. When the red LED flashes <i>once</i> every 20 seconds, the USB-501-TC-LCD's battery charge is low and it has a low alarm, but it continues logging. Replace the battery and download data. When the red LED flashes <i>twice</i> every 20 seconds, the USB-501-TC-LCD's battery charge is low and it has a high alarm, but it continues logging. Replace the battery and download data. <p>If <i>Hold</i> is selected, the alarm condition may have been triggered at any point during the current logging session.</p>
	<p>Red and green LED</p> <p>When the red and green LEDs alternately flash <i>once</i> every 20 seconds, the USB-501-TC-LCD's memory is full, and a high or low alarm condition exists (<i>Hold</i> is selected). Download data from the device.</p>
	<p>No LEDs</p> <p>When no LEDs are flashing, plug the USB-501-TC-LCD into the PC and run the USB-500 software to find out which condition applies and then take the corresponding action. If logging is not set up, then set up logging. If the battery is depleted, then install a new battery.</p>

USB-501-TC-LCD display

The USB-501-TC-LCD's high contrast LCD displays temperature information as well as the logging status. You can configure the LCD to be always on, always off, or on when the LCD button is pressed.

By pressing the LCD button you can cycle between the current measured temperature data and the values stored during the current logging session. The data display in the following sequence:

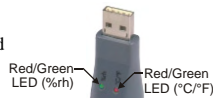
- Current temperature (°F or °C)
- Maximum stored temperature (Δ °F or °C)
- Minimum stored temperature (∇ °F or °C)

The LCD also displays the status of the logging indicators. Refer to the table below for an explanation of the logging status indicators:

LCD status icon	Logger status	Explanation
	Delayed start	Displays when the logger is configured to start logging at a specific date and time. If the LCD is configured to display for 30 seconds after the button is pressed, then this will only be shown after the LCD button is pressed.
	Push to start	Displays when the logger is configured for "push to start" logging. This icon flashes on the display until the LCD button is pressed.
	Logging	Displays for three seconds when the LCD mode is set to "Always off" and the LCD button is pressed.
	Stopped	Displays for three seconds when the LCD button is pressed even though the device is not configured to log data.

USB-502 and USB-502-PLUS LED functions

The USB-502 and USB 502-PLUS each have two LEDs—each of which flash either red or green. One LED represents temperature (°C/°F), and the other represents relative humidity (%rh). An LED flashes red to indicate an alarm reading.






	<p>Green LEDs</p> <ul style="list-style-type: none"> When each LED alternately flashes green <i>once</i> every 10 seconds, the USB-502/502-PLUS is logging with no alarms. No action is needed. When each LED alternately flashes green <i>twice</i> every 10 seconds, the USB-502/502-PLUS will start logging at the date and time you set. When each LED alternately flashes green <i>three times</i> every 10 seconds, the logger's memory is full, and can store no more readings. You need to download data from the device.
	<p>Red LEDs</p> <ul style="list-style-type: none"> When an LED flashes red <i>once</i> every 10 seconds, the USB-502/502-PLUS is logging with a low alarm. The action you take depends on your application. When an LED flashes red <i>twice</i> every 10 seconds, the USB-502/502-PLUS is logging with a high alarm. The action you take depends on your application. When each LED alternately flashes red <i>three times</i> every 10 seconds, both readings have an alarm condition, and the logger's memory is full and can store no more readings. You need to download data from the device. When both LEDs flash red simultaneously <i>once</i> every 60 seconds, the logger's battery charge is low. The device continues logging, but alarm conditions are ignored. Replace the battery and then download data from the device. <p>If both alarms have <i>Hold</i> selected, the LED only applies to the first alarm condition detected.</p>
	<p>Both red and green LEDs</p> <p>When one LED flashes green <i>three times</i> and the other LED alternately flashes red <i>three times</i> every 10 seconds, the red LED indicates a reading with an alarm condition. The logger's memory is full and can store no more readings. Download data from the device.</p>
	<p>No LEDs</p> <p>When no LEDs are flashing, plug the USB-502/502-PLUS into the PC and run the USB-500 software to find out which condition applies, and then take the corresponding action.</p> <p>If logging is not set up, set up logging. If the battery is depleted, then install a new battery.</p>

USB-502-LCD LED functions

The USB-502-LCD has two LEDs—each of which flash either red or green. One LED represents temperature (°C/°F), and the other relative humidity (%rh). An LED flashes red to indicate an alarm reading. The LCD can display temperature and humidity data all of the time or when the LCD button is pressed, depending on its configuration.



	<p>Green LEDs</p> <ul style="list-style-type: none"> When a green LED flashes <i>once</i> every 10 seconds, the USB-502-LCD is logging with no alarms. The last stored readings are within the set alarm limits. No action is needed. When a green LED flashes <i>twice</i> every 10 seconds, the USB-502-LCD starts logging at the date and time you have set. When a green LED flashes <i>three times</i> every 10 seconds, the USB-502-LCD's memory is full and it can store no more readings. You need to download data from the device. <p>If <i>Hold</i> is selected, a flashing green LED indicates that no alarm condition has been logged during the current logging session.</p>
	<p>Red LEDs</p> <ul style="list-style-type: none"> When a red LED flashes <i>once</i> every 10 seconds, the USB-502-LCD is logging with a low alarm. The action you take depends on your application. When a red LED flashes <i>twice</i> every 10 seconds, the USB-502-LCD is logging with a high alarm. The action you take depends on your application. When a red LED flashes <i>three times</i> every 10 seconds, the USB-502-LCD has an alarm condition and its memory is full. You need to download data from the device. When the red LEDs simultaneously flash <i>once</i> every 60 seconds, the USB-502-LCD's battery charge is low. The device continues logging, but alarm conditions are ignored. You need to replace the battery and then download data from the device. <p>If both alarms have <i>Hold</i> selected, the alarm condition may have been triggered at any point during the current logging session.</p>
	<p>No LEDs</p> <p>When no LEDs are flashing, plug the USB-502-LCD into the PC and run the USB-500 software to find out which condition applies. If logging is not set up, then set up logging. If the battery is depleted, then install a new battery.</p>

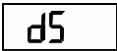
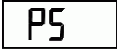
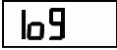
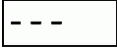
USB-502-LCD display

The USB-502-LCD's high contrast LCD displays temperature and humidity information as well as the logging status. You can configure the LCD to be always on, always off, or on when the LCD button is pressed.

By pressing the LCD button you can cycle between the current measured temperature and humidity data and the values stored during the current logging session. The data display in the following sequence:

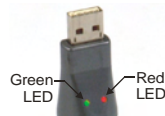
- Current temperature (°F or °C)
- Current relative humidity (% rh)
- Maximum stored temperature (Δ °F or °C)
- Minimum stored temperature (∇ °F or °C)
- Maximum stored relative humidity (Δ % rh)
- Minimum stored relative humidity (∇ % rh)

The LCD also displays the status of the logging indicators. Refer to the table below for an explanation of the logging status indicators:

LCD status icon	Logger status	Explanation
	Delayed start	Displays when the logger is configured to start logging at a specific date and time. If the LCD is configured to display for 30 seconds after the button is pressed, then this will only be shown after the LCD button is pressed.
	Push to start	Displays when the logger is configured for "push to start" logging. This icon flashes on the display until the LCD button is pressed.
	Logging	Displays for three seconds when the LCD mode is set to "Always off" and the LCD button is pressed.
	Stopped	Displays for three seconds when the LCD button is pressed even though the device is not configured to log data.

USB-503 and USB-504 LED functions

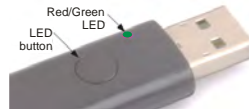
The USB-503 and USB-504 have two LEDs—one that flashes green and the other that flashes red. The red LED flashes to indicate an alarm reading.



	<p>Green LED</p> <ul style="list-style-type: none"> When the green LED flashes <i>once</i> every 10 seconds, the USB-503/USB-504 is logging with no alarms. No action is needed. When the green LED flashes <i>once</i> every 20 seconds, the USB-503/USB-504's battery charge is low. The device continues logging, but alarm conditions are ignored. You need to replace the battery. When the green LED flashes <i>twice</i> every 20 seconds, the USB-503/USB-504's memory is full, and no alarm condition. You need to download data from the device. When the green LED flashes once every 30 seconds the USB-503/USB-504 starts logging at the date and time you set
	<p>Red LED</p> <ul style="list-style-type: none"> When the red LED flashes <i>once</i> every 10 seconds, the USB-503/USB-504 is logging with a low alarm. The action you take depends on your application. When the red LED flashes <i>twice</i> every 10 seconds, is logging with a high alarm. The action you take depends on your application. When the red LED flashes <i>once</i> every 20 seconds, the USB-503/USB-504's battery charge is low and it has a low alarm, but it continues logging. Replace the battery and download data. When the red LED flashes <i>twice</i> every 20 seconds, the USB-503/USB-504's battery charge is low and it has a high alarm, but it continues logging. Replace the battery and download data.
	<p>Red and green LED</p> <p>When the red and green LEDs both flash <i>once</i> every 20 seconds, the USB-503/USB-504's memory is full, and a high or low alarm condition exists. You need to download data from the device.</p> <p>If both alarms have <i>Hold</i> selected, the LED only applies to the first alarm condition detected.</p>
	<p>No LEDs</p> <p>When no LEDs are flashing, plug the USB-503/USB-504 into the PC and run the USB-500 software to find out which condition applies and then take the corresponding action.</p> <p>If logging is not set up, then set up logging. If the battery is depleted, then install a new battery.</p>

USB-501-LT LED functions

The USB-501-LT has one LED which can flash either red or green. You must press the LED button to make the LED flash. The LED flashes red to indicate an alarm reading.



	<p>Green LED</p> <p>When you press the LED button and the green LED flashes <i>once</i>, the USB-501-LT is logging with no alarms. No action is needed.</p>
	<p>Red LED</p> <ul style="list-style-type: none"> ▪ When you press the LED button and the red LED flashes <i>once</i>, the USB-501-LT is logging with a low alarm. The action you take depends on your application. ▪ When you press the LED button and the red LED flashes <i>twice</i>, the USB-501-LT is logging with a high alarm. The action you take depends on your application. <p>If both alarms have <i>Hold</i> selected, the LED only applies to the first alarm condition detected.</p>
	<p>No LEDs</p> <p>When you press the LED button and the LED <i>does not flash</i>, plug the USB-501-LT into the PC and run the USB-500 software to find out which condition applies and then take the corresponding action.</p> <p>If logging is not set up, then set up logging. If the battery is depleted, then install a new battery.</p>

Battery safety and power-saving guidelines

- Remove worn-out batteries immediately. Replace with the battery type recommended for your USB-500 Series data logger:
 - The USB-501, USB-501-TC, USB-502, USB-502-PLUS, USB-502-LCD, USB-503, and USB-504 use a 3.6 V, ½AA lithium battery.
 - The USB-501-PRO uses a 3.6 V, ⅔AA lithium battery.
 - The USB-501-LT uses a CR1620 lithium button cell battery.
- Be careful when handling batteries to avoid damaging the battery casing in any way. Keep batteries away from heat, and do not try to recharge them.
- Follow local regulations when recycling or disposing of batteries.
- Keep batteries out of reach of children.
- A USB-500 Series data logger that is connected to the USB port uses more battery power than normal. Do not leave the data logger connected to the USB port for longer than necessary. Remove batteries if you don't plan on using a USB-500 Series data logger for over a month.

Replacing the battery

Perform the procedure below to replace the 3.6 V ½AA lithium battery in these data loggers:

- USB-501
- USB-502
- USB-503
- USB-501-TC
- USB-502-PLUS
- USB-504
- USB-501-TC-LCD
- USB-502-LCD

1. Disconnect the data logger from the computer.
2. Using a small, flathead screwdriver, move the screwdriver in the direction of the arrow and push down the tab. Do not push the tab down too far to avoid damaging the tab.
3. While the tab is pushed down, carefully pull apart the two sections of the data logger.
4. Remove the old battery and dispose of it in accordance with local regulations. Heed any warnings on the battery casing.
5. Insert a new ½AA battery in the battery compartment.
Make sure the battery is aligned to the correct polarity symbols in the compartment.
6. Slide the two data logger sections back together until you hear a "click." The "click" sound indicates that the sections are snapped together correctly.



After you replace the battery, connect the data logger to your PC and download any data stored in the logger device.

USB-501-PRO

Perform the procedure below to replace the 3.6 V ½AA lithium battery in the **USB-501-PRO**.



1. Disconnect the data logger from the computer.
2. Remove the end cap from the bottom of the logger using a coin or flathead screwdriver.
3. Remove the old battery and dispose of it in accordance with local regulations. Heed any warnings on the battery casing.
4. Insert a new ½AA battery in the battery compartment.
5. Screw the end cap onto the logger.

After you replace the battery, connect the data logger to your PC and download any data stored in the logger device.

We recommend that you replace the battery every year, or prior to logging critical data. Stored readings are not lost when the battery is discharged or replaced; the data logging process will however be stopped and cannot be re-started until the battery has been replaced and the logged data has been downloaded to PC.

Caution! The 3.6 V ½AA lithium battery supplied with the USB-501-PRO is rated for use in high temperatures and has the correct battery terminals. Using a different battery type may result in fire or explosion at high temperatures. Always operate the USB-501-PRO and replace its batteries according to the instructions. The USB-501-PRO will work in extreme temperatures. However, many batteries will not work at these extremes. Serious injury can result if the replacement battery is not designed for use within the full operating temperature range of the USB-501-PRO. Never replace the battery with any battery not specified for use with this device by Logicbus. Contact Logicbus if you are unable to find the correct battery.

USB-501-LT

Perform the procedure below to replace the CR1620 lithium button cell battery in the **USB-501-LT**.

1. Disconnect the data logger from the computer.
2. Remove the screw using a small Phillips screwdriver.
3. Open slightly, and pull the top housing away from the bottom housing.

The battery is located on the underside of the circuit board.

4. Remove the circuit board from the housing.
5. Remove the old battery by pushing in the direction of the arrow on the battery guard. Dispose of the old battery in accordance with local regulations. Heed any warnings on the battery casing.
6. With the positive terminal facing away from the circuit board, slide a new CR1620 lithium battery beneath the battery guard.
7. Place the circuit board on the housing bottom.
8. Replace the top housing, and replace the screw.



After you replace the battery, connect the USB-501-LT to your PC and download any data stored in the logger device.