Light-O-Rama

CTB08S & CTB08D
8 Channel Lighting Controllers

V4 User Manual
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V1.00
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[Cover picture is CTB08D . Deluxe version of controller]

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Introduction

The Light O Rama (LOR) CTB08S and CTB08D are 8 channel lighting controllers in the Component Product Line. They are microprocessor based, intelligent controllers that can perform a number of lighting effects including dimming, fading, shimmering and twinkling. They can be daisy-chained with any mix of LOR controllers up to the maximum of 240 controllers.

The CTB08x must be used with the LOR Windows Showtime Software Suite. This software allows you to configure and test this controller, design your sequences (*sequences* are lighting control command sets), arrange your sequences into shows and to schedule and play your shows.

To allow your PC to communicate with this controller, you will need one of Light O Ramas RS485 adapters. When you purchase the Generic Starter Package, you get the LOR Showtime Software, a 10 Cat5e network cable and you will be given a choice of two types of USB RS485 adapters or a serial port RS485 adapter. The RS485 adapter will allow you to connect your PC/laptop via the Cat5e cable to your lighting controller.

This controller is designed to control incandescent and line voltage series connected LED light strings

As with all LOR controllers, these controllers are field firmware upgradeable so you are guaranteed compatibility with future LOR hardware and software products.

What's in the Box

Included is a fully built and tested lighting controller and this user manual. The latest version of this manual is also available at www.lightorama.com Support   CTB08S & CTB08D v4 User Manual.

Caution: This product requires connection to 120/240 volt AC power. The board has many exposed line voltage connections that are dangerous. Be extremely careful if operating the controller without an enclosure or in an open enclosure.

Feature Chart CTB08S/CTB08D

Feature	CTB08S	CTB08D
Effects supported	All LOR	All LOR
Standalone commands	Approximately 20	Approximately 5,000
Inputs	1	1
Servo control	No	2 servos
Unit ID set by switches	No	Yes
Unit ID set by software	Yes	No
Standalone speed control	No	Yes

CTB08S with Heat Sinks (Figure 1)

This is the basic controller. The power handling capabilities and effects supported are the same as the deluxe controller.

This controller does not include Unit ID switches, a standalone speed control, extra standalone command storage and the ability to control servos.
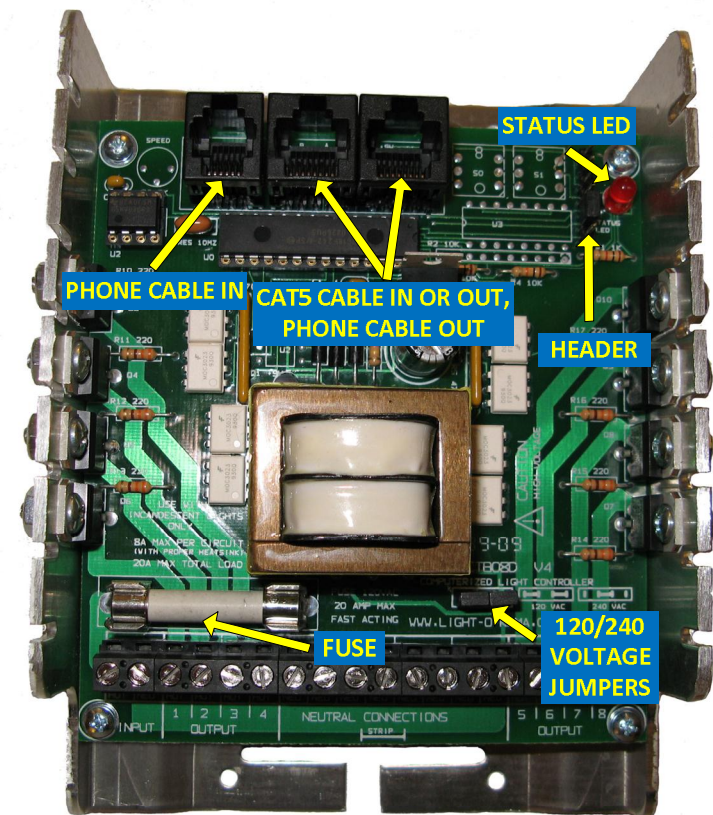

Figure 1

CTB08D with Heat Sinks (Figure 2)

This is the deluxe version of the controller. It includes Unit ID switches. It can control two servos. It is capable of storing approximately 5,000 commands for standalone operation. It also includes a speed control to allow the speed of a standalone sequence to be adjusted.
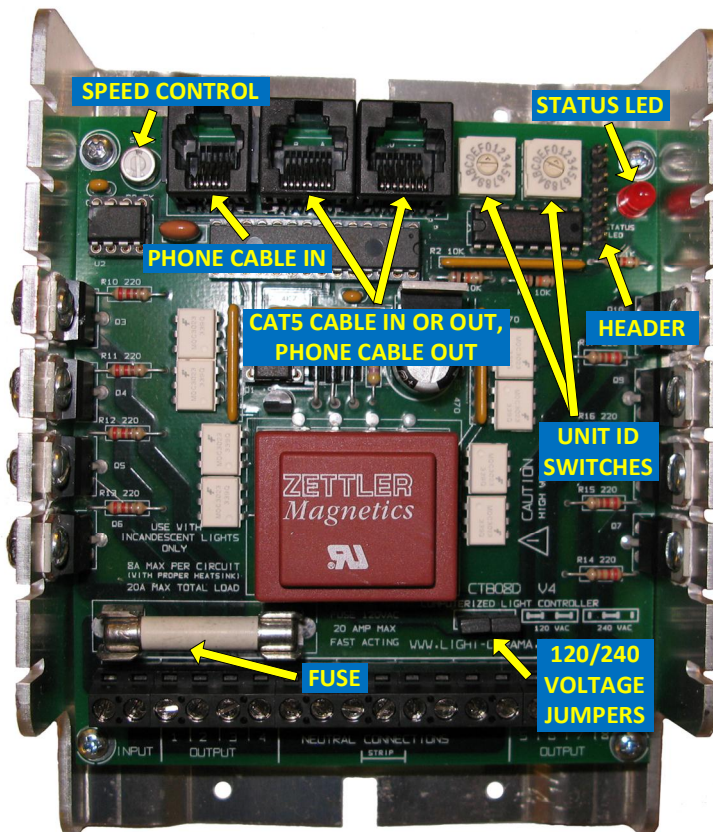

Figure 2

Getting Started with the CTB08x

There are three steps required to make the CTB08x useful.

1. It must be wired to accept an AC power source and to distribute AC through one or more of its 8 output circuits

2. Connected to a PC so you can control it

3. Given a unit ID if the factory default of unit 01 is not acceptable. If you need to change this: See the *Assigning a Unit ID* section

Wiring the CTB08x

AC power wiring is the same for either the CTB08S or the CTB08D.

Hot wires are usually Black or Brown. Neutral wires are usually White or Blue. If you are using lamp cord, usually one of the wires has smooth insulation (hot) and the other has ribbed insulation (neutral.)

On a standard outlet, the round hole is ground, the shorter slot is hot and the longer slot is neutral.

Wires should be stripped (about ⅜") where the bare conductor can be fully inserted in the screw terminal connector and no bare conductor is exposed. There is a strip length guide at the bottom center of the controller circuit board.

The screw holding the wire must be tightened firmly. Pull on the wires to make sure that there is a good mechanical connection. A loose wire can caused overheating and pose a fire hazard. Make sure all

the strands of a stranded wire are in the screw terminal hole. A stray strand of wire could cause a short or pose a fire hazard.

Frayed wires can cause short circuits that may damage the unit and pose a fire hazard. Carefully inspect all connections before applying power to insure that there are no short circuits.

Attaching AC Power to the Controller
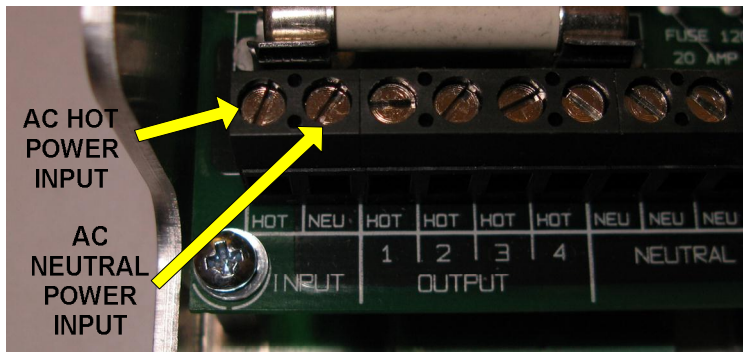
Attaching Output circuits to the Controller

The next diagram shows four output lamp circuits connected to the controller. The Hot Outputs are switched by the controller. The Neutral Outputs are all the same and you can use any one of them with any output circuit. You can even connect all of you neutral wires together off this board as long as you tie them to the AC Neutral Power input wire.
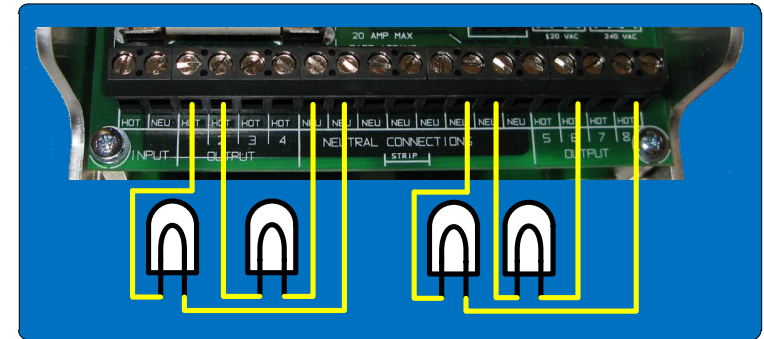
Connecting Controller to your PC

If you have not installed your RS485 adapter, do it now. If you have an SC485 (PC serial port adapter, shown on the left below), you need only plug it into an available PC 9-pin serial port. The cable from a serial adapter to the first controller is limited to 100q or less.

If you have one of the USB adapters (shown center and right above), follow the installation instructions that came with the adapter.

If you are using telephone cable to connect your controller to the RS485 adapter, plug one end of the phone cable into the adapter and the other end of

the cable into the PHONE CABLE IN jack as shown in Figures 1 & 2.

If you are using Cat5 or CAT6 LAN cable to connect your controller to the RS485 adapter, plug one end of the data cable into the adapter and the other end into either of the *CAT5 CABLE IN or OUT* jacks shown in Figures 1 & 2.

If you have not installed the Light O Rama Windows Showtime Software, do it now.

The board will need to be powered at this point – BE VERY CAREFUL – there are dangerous voltages present on the exposed circuit board. Take appropriate precautions with children and pets.

Plug the CTB08x power cord into AC power. The Status LED on the upper right will blink about twice/second. This means that the board has booted and is waiting for the PC to talk to it.

Start the Hardware Utility . click **start ► All Programs ► Light-O-Rama ► Light-O-Rama Control Panel.** There will be a light bulb with a red halo on the right side of the task bar at the bottom of the screen. Right-click this light bulb and select *Hardware Utility* from the menu. Make sure the *LOR Control* tab is selected. You may get a warning because the software does not know which comm port to use yet . just click it away. You will see the following window:
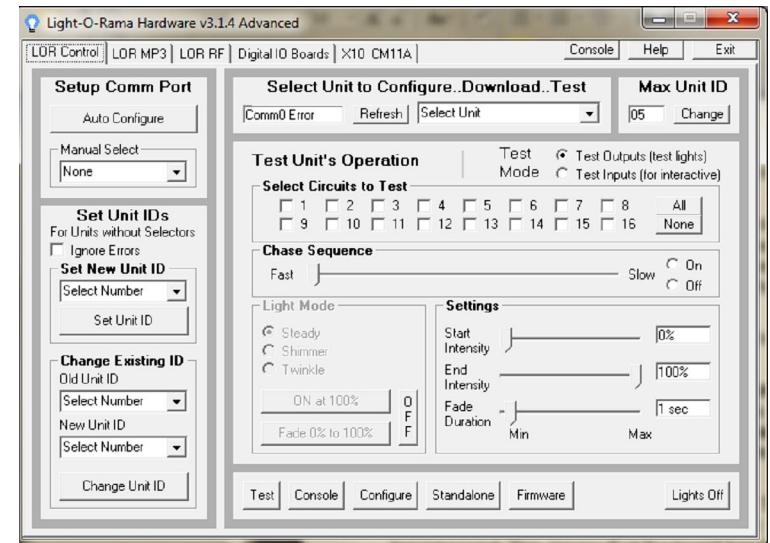

At this point, the controller should be powered up and connected to the RS485 adapter which should in turn be connected to your PC.

Click the *Auto Configure* button in the *Setup Comm Port* section. The Hardware Utility will search for the comm port that your RS485 adapter is plugged into and select it. If the Hardware Utility does not find the comm port, see *the Autoconfigure fails to find comm Port* section.

In the *Max Unit ID* section (upper right) of the Hardware Utility window, click the *Change* button. Move the slider in the *Change Maximum Units* box so that the Max Units is set to 10 (or the maximum number of controllers you have configured.) This will limit the search for controllers to the first 10 unit IDs, otherwise 240 controllers would be searched for . taking a long time. Click the *Save* button.

In the *Select Unit to Configure..Download..Test* section of the Hardware Utility screen, click the *Refresh* button to locate your attached controller. Your controller will appear in the box to the right of the Refresh button. See picture below:
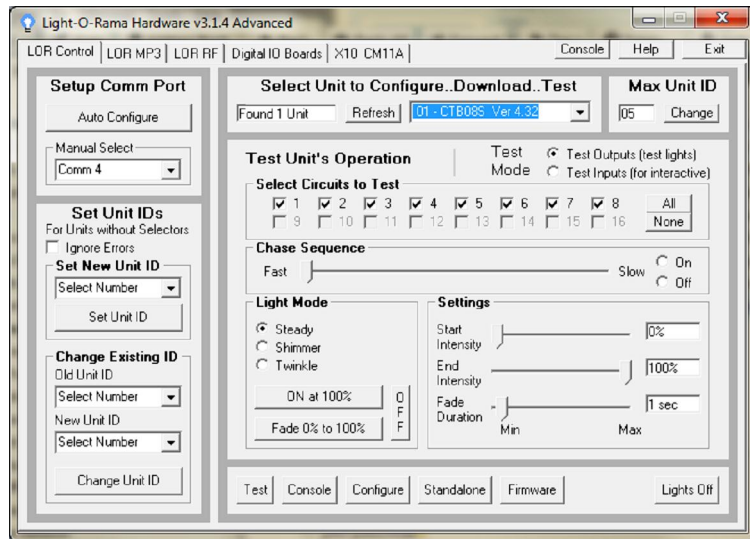
If the Hardware Utility does not find your controller, it may not have its unit ID properly assigned. See the *Assigning a Unit ID* section to set the unit ID.

The *Test Unit's Operation* section of the screen should be active. Plug some lights into your controller and use the sliders and buttons in this section to test your controller.

Assigning a Unit ID (and DMX address)

The Unit ID you pick below selects the DMX address according to the following formula: DMX starting

address = ((Unit ID . 1) * 16) + 1. So unit IDs 01, 02, 03 would select DMX addresses 1, 17, 33.

Assigning a Unit ID to the CTB08S

When assigning a unit ID, only one controller should be plugged into the RS485 adapter on the PC. Be sure you do not have more than one controller connected.

Steps to set/change unit ID:

1. Start the Hardware Utility.

2. In the *Change Existing ID* section, use the *Old Unit ID* drop-down menu to select *Any Unit*, then click *OK* in the warning box for changing all unit IDs, there should only be one unit attached.

3. Use the *New Unit ID* drop down menu to select %01+or whatever Unit ID you want to assign to the attached controller.

4. Click the *Change Unit ID* button to set your CTB08S unit ID. You will see a *Unit ID Changed* box . click OK.

Assigning a Unit ID to the CTB08D

Change the Unit Id switches, see Figure 1, to the unit ID you want. Power the controller off and on.

Hardware Description

Status LED

LED blinking approximately twice/second: Controller has booted correctly and is waiting for commands.

The controller is not connected to a Light O Rama network or the network is not active.

LED is on solid: Controller is connected to an active network (is receiving the heartbeat and commands from LOR software running on a PC or a Show Director)

LED is blinking fast: The normal operation jumper is not on the header for the CTB08S or the Unit ID switches are set to 00 for the CTB08D, so the controller is resetting. See the section on *Resetting the Controller* to put controller in normal operation mode.

LED is not on at all: There is no power to the controller . verify power source with a working lamp. The fuse is blown . power the controller off and replace the fuse.

Fuse

There is a white fuse located on the lower left of the controller circuit board. The fuse is a 20 amp, fast acting ceramic. See Figures 1 & 2.

Voltage Selection Jumper(s)

For 120 VAC operation, both jumpers should be installed on the header that is to the lower right of the transformer.

For 240 VAC operation, only one jumper is installed on the header that is to the lower right of the transformer. See following pictures:

120 VAC Jumpers:
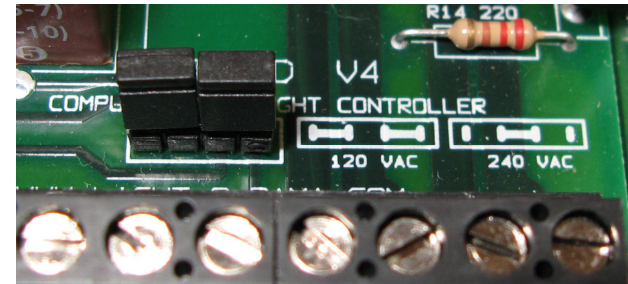
240 VAC Jumper:
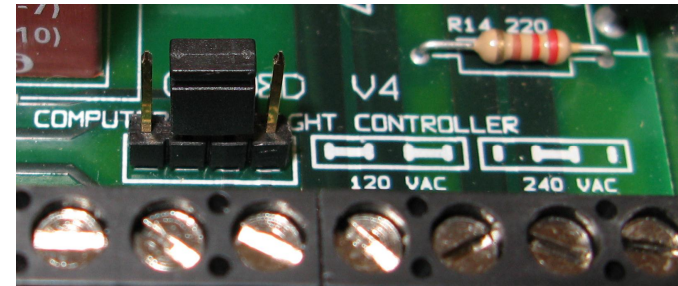
Speed Control

The speed control allows the speed of a standalone sequence to be adjusted.

Resetting the Controller

Reset sets all controller parameters except the Unit ID back to the factory defaults. It also removed any standalone sequence loaded into the controller.

Resetting the CTB08S

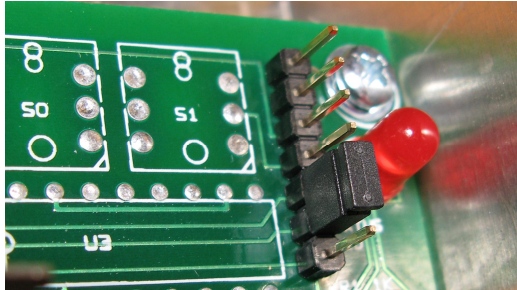The 7-pin header on the upper right of the circuit board is used to reset the CTB08S. The following picture shows the reset jumper in the normal operation position:


1. To reset, power the controller off
2. Remove the jumper between pins 5 & 6
3. Power the controller on
4. The Status LED will flash rapidly
5. Power the controller off
6. Replace the jumper on pins 5 & 6

Resetting the CTB08D

1. Power the controller off
2. Set the Unit ID switches to 00
3. Power the controller on
4. The Status LED will flash rapidly
5. Power the controller off
6. Set the Unit ID switches as appropriate

Header for Input/Servo/Power

This 7-pin header is located on the upper right of the controller circuit board. The %INPUT+pin is nearest the top edge of the circuit board:
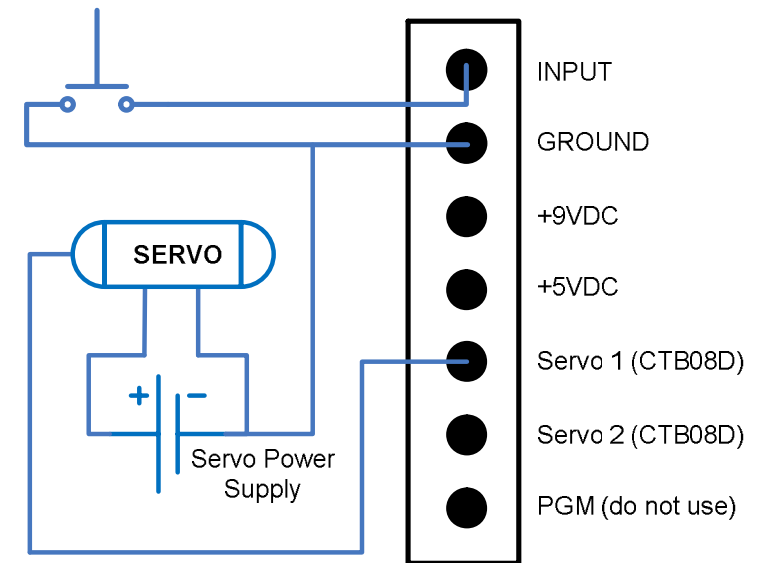
The diagram above shows sample connections for the input trigger and one of the servo outputs. Do not apply voltages to any pins. The trigger input must be a simple switch closure. The +9vdc pin may be used to power accessories like motion detection switches. The combined maximum current draw from the +5 and +9v pins is 100ma. If you are using the SC485 serial RS485 adapter, this is reduced to 50ma.

Designing and Playing a Sequence

Lighting commands for your shows are called *Sequences* and are designed and implemented using the Sequence Editor Windows software.

Stop the Hardware Utility. You will not be able to command your controller from the Sequence Editor if the Hardware Utility is running. Only one program may use the RS485 adapter at a time to talk to lighting controllers.

There are Quick Start Guides for creating animation (non-musical) and musical sequences, Flash Tutorials and much more at:

www.lightorama.com   ***Support***

The following Wiki is also an excellent source of information on all things Light-O-Rama:

www.lorwiki.com

There is also a very active and helpful Light-O-Rama user community on Planet Christmas:

www.planetchristmas.com

Stand Alone Operation

A standalone animation sequence (sequence with no accompanying audio) can be downloaded into the flash memory of the lighting controller.

These commands can also be for controllers other than this controller, so this controller can direct a network of controllers. There are no restrictions on the types of LOR controllers in this network.

The sequence is designed and tested using the Showtime Software Sequence Editor. When you are happy with the sequence, save it and stop the Sequence Editor.

Loading a Standalone Sequence

Start the Hardware Utility and click the *Refresh* button to find the CTB08x. Use the drop down menu next to the *Refresh* button to select the controller.

Click the *Standalone* button at the bottom of the window. Select one of "Run when power is on," "Input (norm open switch)" or "Input (norm closed switch.)" Click the *Send Trigger info to Unit* button.

Finally, Use the *Open* button to browse to your sequence and click the *Download* button.

You also use this screen to remove downloaded standalone sequences. You can also remove a standalone sequence by resetting the controller, see the *Resetting the Controller* section.

Triggering a Stand-Alone Sequence

In the *Hardware Utility*, when you download a standalone sequence, you can specify what trigger condition will be used to start that sequence. A standalone sequence can be triggered one of two ways: *Power on* and *Input Control*.

Power On Mode

This means that the sequence will run anytime that power is supplied to the controller. You plug it in and it plays until you unplug it.

Input Control Mode

This uses the input on the controller to determine when the sequence should run. When the input switch is on, the sequence will run one time and then check to see if the switch is still on. For more information on trigger conditions see the help for the *Hardware Utility*.

For information on how to connect the switch to the controller, see the *Header for Input/Servo/Power* section.

Troubleshooting

AutoConfigure fails to find comm port

If the comm port is not detected, you can manually select it from the drop down list.

If you are not sure which comm port is the RS485 adapter and you have a USB adapter, stop the Hardware Utility and unplug the USB adapter from your PC. Start the Hardware Utility and use the Manual Select drop down to note which comm ports you have. Stop the Hardware Utility and plug in the USB adapter. After it installs, start the Hardware Utility and use the Manual Select drop down to see which new port appeared. Select that comm port.

If you are not sure which comm port is the RS485 adapter and you have a serial port RS485 adapter, you will have to consult your PC's documentation; it is normally COM1, COM2 or COM3. You can try the Refresh button with each serial port in succession.

Hardware Utility Refresh Fails

Use the procedure in the section *Assigning a Unit ID* to assign a unit ID to the controller. If this has been done and *Refresh* still does not work, try manually typing the controller number into the box to the right of the *Refresh* button. Use the options in the *Test Unit's Operation* section of the Hardware Utility window to see if the controller can be controlled.

Updating Controller Firmware

Light-O-Rama may distribute new firmware for your CTB08x. If you believe you need updated firmware, use the Hardware Utility to determine your current firmware version. Use the *Refresh* button to find your controller and check its firmware version. The drop-down menu to the right of the *Refresh* button will be filled in with the attached controllers. The right part of the controller name in this drop-down is the current firmware version.

The latest firmware can be found by going to www.lightorama.com *Firmware* and scrolling down to the ***Using the Hardware – Documentation and Firmware*** section. Find your controller and roll the mouse over the *Firmware* button . look at the bar in the lower left of the browser window. It will show the name of the firmware file. The file name contains the version at the end. If the version number is greater than what you saw in the Hardware Utility, new firmware is available. Click the *Firmware* button to download the firmware to your PC . remember where you put it.

To load new firmware, use a data cable (not wireless) to connect the controller to the PC. Start the Hardware Utility and click the *Refresh* button to find your controller. Select the controller you want to update from the drop-down menu to the right of the *Refresh* button. Click the *Firmware* button at the bottom of the window.

In the **Firmware** section of the window, under **Step 1 – Select Unit,** select the *unit* listed above. Under **Step 2 – Select Firmware File,** use the *Open* button to browse to the firmware file you downloaded. Under **Step 3 – Press Download Button** click the *Download* button. Do not interrupt this process. Your controller will reboot after the download completes.

Specifications CTB08S & CTB08D

Configuration	8 channels
Individual Channel Capacity	1 amp . No Heat Sinks
	8 amps . Regular Heat Sinks
Controller Capacity	8 amps . No Heat Sinks
	20 amps . Regular Heat Sinks
Supply Voltage	120 VAC, 50/60 Hz
	240 VAC, 50/60 Hz
Fuse	20 amp fast acting
Isolation	Optos isolate line voltage from control logic
Power Connections	Screw terminals
No Heat Sinks	4″w x 4″h x 1½″d
Regular Heat Sinks	4¾″w x 5½″h x 2″d

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