Light-O-Rama

Hobbyist Kits

Troubleshooting Guide

www.lightorama.com

[v1.02] This guide applies to the CTB16K, CTB16KV6 and the CTB16Kpcv1 16 channel lighting controller kits.

Note Well: *More than 98% of kits built work or customers get them to work and we (LOR) don't hear about them. Of those returned to be repaired, the overwhelming majority (over 90%) are fixed by soldering missed joints, re-soldering poorly soldered joints or removing solder bridges. We cannot overstress the importance of following the soldering guidelines in the kit manuals. Poor solder joints result in high resistance. This results in various hard failures and/or erratic behavior. If this resistance is in a line voltage section of the board, it may result in heat. If this resistance is high enough, the board can burn. Please make sure you have followed the soldering guidelines and examined the foil side of the board with a lighted magnifying glass.*

Notes:

1. When testing a board, you must have at least 4 watts of load on a triac for it to fire properly. If you are just using a meter on an open output, the results will not be meaningful.

2. Make sure the voltage selection jumper(s) are correctly installed on the four pin header that is to the lower right of the transformer.

3. If you have a standard CTB16K, a standard CTB16KV6 or CTBKpcv1 make sure the reset jumper is installed on the large header near the LED. See the kit assembly manual for the correct position. If this jumper is not installed on these board models, the board will continuously reset.

4. If you have a Deluxe CTB16K or deluxe CTB16KV6, set the unit ID switches to 01.

5. Use the Hardware Utility rather than the Sequence Editor to test your board. Using the Sequence Editor requires that several software items be configured properly and will just add confusion.

6. If you are using a USB RS485 adapter, make sure you have a Hardware Utility that shows a version number in the title bar of 1.5.6 or greater.

7. When using the Hardware Utility, if Autoconfigure does not find the COM port, manually select the COM port from the drop-down menu. You will have to know the COM port number if you have an SC485 serial adapter (Usually COM1, COM2 or COM3.) If you have a USB485 or a USB485B adapter, click *My Computer ► View system information ► Hardware* tab ► *Device Manager* button ► expand *Ports (COM & LPT)*, the USB adapter will be "USB Serial Port (COMn)."

Resetting a board (removes a stand alone sequence, removes high/low burn setting, corrects various other problems):

- CTB16K/CTB16KV6 boards with Unit ID switches: power it off, set the switches to 00, power it on for a few seconds, the LED will flash twice, pause, flash twice, pause…, power it off and put the Unit ID switches back to 01.

- CTB16K/CTB16KV6 boards without Unit ID switches: power it off, remove the jumper from J0, power it on for a few seconds, the LED will flash twice, pause, flash twice, pause…,, power it off and replace the jumper.

- CTB16Kpcv1 boards: Power off, remove the jumper from second row of J0 pins, power on for a few seconds, power off, replace jumper.

Running a channel test on boards with Unit ID switches:

Power the board off, set the Unit ID switches to FF, power it back on. It will turn on each channel in sequence for about ½ second and repeat forever.

When Board is powered, transformer and/or Voltage Regulator(s) Q16/Q17 get very warm or hot

There is a short somewhere. Check for solder bridges on **both** sides of the board. Make sure that voltage regulators Q16 and Q17 are not swapped.

If Q16 , the 5 vdc regulator gets hot, power the board off and try removing all the ICs that are in sockets. See if the voltage regulator still gets hot. If no, try replacing the ICs one at a time and powering the board. Check the transformer and voltage regulator for excessive heat each time.

If Q17, the 10 vdc regulator gets hot, look at the solder joints on header J0 and all data jacks for solder bridges.

Board is powered but not connected to PC and LED is on solid

1. Check U2 the microprocessor, it must be installed with the notch to the right, all other horizontally mounted ICs have their notches to the left.

2. Check Unit ID switches (if you have them) be sure they're set to 01

3. Check all solder joints, be sure there are no bridges

Board is powered and not connected to PC but LED does not light at all [1]

1. Blue board CTB16DV6 – Check 18 pin header for +5 VDC ±0.1 VDC between top left pin and 4th pin down on left, no need for other checks in this section is voltage present.

2. Green Board CTB16PCV1– Check 18 pin header for +5 VDC ±0.1 VDC between bottom left pin(gnd) and 4th pin down on left, no need for other checks in this section is voltage present.

3. Green board CTB16D – Check 16 pin header for +5 VDC ±0.1 VDC between bottom left pin and 4th pin down on left, no need for other checks in this section is voltage present.

4. Check for 120 VAC between AC power input between "HOT" and "NEU" input on right side of board, if not present, no power to board.

5. Check for 120 VAC between AC power input "NEU" on right side of board and right side of right fuse, if not present, fuse is blown.

6. Check for 25 VAC by touching probes to the left side of D1 & D2, if not present or low, check voltage jumpers next to transformer, check all solder connections for transformer, fuse holders and voltage jumpers. Check that both C2 [& C3 for CTB16KV6] (big electrolytic capacitors) are properly oriented.

If 25 VAC present, but no +5 VDC, check Q16, D1, D2 solder joints.

Board is powered but LED does not light at all [2] (voltage checks above pass)

With power removed, pop out U2 (microprocessor), power up board

1. Blue board CTB16DV6 – on the 18 pin header, use a short jumper to connect the top pin on the left to the 2nd pin down on the right – LED should light

2. Green Board CTB16PCV1 – on the 18 pin header, use a short jumper to connect the bottom pin on the left to the 2nd pin down on the right – LED should light

3. Green board CTB16D – on the 16 pin header, use a short jumper to connect the bottom pin on the left to the top pin on the right – LED should light.

If LED does not light, check solder joints for LED, R3, R5 and microprocessor.

LED flashes, but does not go solid when connected to Hardware Utility

When you bring up the Hardware Utility, it sends a heartbeat out through the RS485 Adapter. The Autoconfigure button to find the LOR COM port will not work unless there is a working controller out there for it to sense. If you have no known-to-be-good controller to use Autoconfigure with, manually select the COM port using the drop down menu.

If you have an SC485 adapter, the +9 VDC power supply must be working. USB RS485 adapters do not require the +9 VDC.

- Blue board CTB16DV6– Check 18 pin header for +9 VDC (can be a volt or so higher) between top left pin and 3rd pin down on left

- Green Board CTB16PCV1 – Check 18 pin header for +9 VDC (can be a volt or so higher) between bottom left pin(gnd) and 3rd pin down on left

- Green board CTB16D – Check 16 pin header for +9 VDC between bottom left pin and 3rd pin down on right.

- If no 9 VDC, check Q17 solder joints.

To find the COM port for your USB adapter, click My Computer -> View system information -> Hardware tab -> Device Manager button -> click "+" Ports (COM & LPT) – if the adapter is properly configured, you will see "USB Serial Port (COMn) – this is your LOR COM port.

If you are using a phone cable to go from the RS485 adapter to the controller, make sure you use the smaller jack on the controller. With Cat5 it does not matter which RJ45 jack on the controller you use. Try both to see if one is bad. If no luck:

Check the orientation of U1, check solder joints for C0, U1, R1 and all the jacks.

LED flashes when Hardware Utility is not running, goes solid when Hardware Utility is running, but *Refresh* in Hardware Utility does not find the board

The Unit ID switches are set to 01. Try rotating the Unit ID switches a couple rotations to clean the contacts, the back to 01 and repeat the Hardware Utility test. If still no good, proceed below:

Put the Jumper on the header as if you did not have a deluxe kit (see kit manual)

Connect only the one board to the PC

Bring up the Hardware Utility, LED must go from flashing to solid

Go to the *Set Unit ID* section of window

Under *Old Unit ID* select *Any Unit*

Under *New Unit ID* select *01*

Click *Change Unit ID* button

Try Refresh now, if it works, the Unit ID and/or supporting hardware is not working. Check solder joints on S0, S1, U3, R2. Check orientation of R2 and U3.

Board is recognized in Hardware Utility by *Refresh*, but labeled as "…Bootloader…"

Two Possibilities:

1. You have a very tight loop stand alone sequence loaded – use the reset procedure above,

2. You have a microprocessor without the firmware loaded.

   - Get the appropriate firmware for your board from **http://www.lightorama.com** -> Support.
   - Connect only your board to the PC.
   - Start the latest Hardware Utility, click the firmware button, under step 1, click "Only one unit is connected," under Step 2, select the firmware file you downloaded, under Step 3, click download.

Refresh in the Hardware Utility finds the board and shows the board type and firmware version, but channels 1-8 or 9-16 don't work

None of channels 1 through 8 work when testing with Hardware Utility
1. Is the left half of the board powered, either by a jumper from the right half or its own power cord
2. Is the left fuse good
3. Is the shift register U4 properly installed, notch to left, no folded under pins
4. Are R15 and R16 properly installed, orientation is not important
5. Check solder joints for all components above
6. Check U2, microprocessor, solder joints and IC for folded pins/complete insertion into socket
7. Check that the optos are correctly oriented (U20, U21, U6, U7, U8, U9, U10, U11) they should be pin one DOWN (this is the opposite of the orientation for channels 9-16)

None of channels 9 through 16 work when testing with Hardware Utility
1. Is the shift register U5 properly installed, notch to left, no folded under pins

2. Are R18 and R19 properly installed, orientation is not important
3. Check solder joints for all components above
4. Check U2, microprocessor, solder joints and IC for folded pins/complete insertion into socket
5. Check that the optos are correctly oriented (U12, U13, U14, U15, U16, U17, U18, U19) they should be pin one UP (this is the opposite of the orientation for channels 1-8)