




Light--Rama  


*CTB16PCg3*  
*Mechanical Assembly*



**16 Channel Lighting Controller**  
**Generation 3 Mechanical Assembly Manual**

August 20, 2015

V4.0

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**Version 2 model sold starting on  
 August 8, 2015**

**Introduction**

This manual describes the mechanical assembly procedure for the CTB16PCg3 Complete Kit. This kit requires no soldering since the controller circuit board is completely built with the heatsinks mounted at the factory. The controller has also passed an electrical test to verify that it is working properly.

This manual is for the Version 2 plastic case model which was first sold on August 8, 2015.

**What’s in the Box**

This depends upon which options you ordered. At a minimum, you will receive the controller, this assembly manual and the CTB16PCg3 User Manual. The latest versions of these manuals are also available at [www.lightorama.com](http://www.lightorama.com) ► Support ► CTB16PCg3 Mechanical Assembly Manual & CTB16PCg3 User Manual.

The following options are available for this controller:

- One 6’ AC power cord and power jumpers
- Two 6’ AC power cords
- Sixteen 12” AC output receptacles
- Outdoor plastic box with internal component mounting screws and cable strain relief/grounding bracket

**Caution: This product requires that you have an understanding of electrical wiring. It requires connections to 120/240 volt AC power. The board has many exposed line voltage connections that are dangerous. The board should be mounted in a safe enclosed box when it is powered.**

## Getting Started with the CTB16PC

Depending upon the options you selected when ordering your CTB16PC, you will have to do some of the following to prepare your CTB16PC for use.

1. Install CTB16PC circuit board in the plastic box
2. Prepare strain relief/grounding bracket and rubber grommets
3. Connect AC unit power cord(s)
4. Connect AC power pigtails (receptacles)
5. Check voltage selection and normal operation jumpers – these should be set at the factory for your voltage and should not be changed. See the *Voltage Jumpers* section.
6. Connect the network data cable
7. Assign a unit ID if Unit 01 is not acceptable.
8. Test the assembled CTB16PC (refer to the User Manual.)

## Installing Controller in the Plastic Box

If you purchased the plastic box for the CTB16PC, then you should have also purchased the CTB16PC with regular heat sinks already installed. The screw holes in the box are designed for the regular heatsinks.

The heat sinks are held slightly away from the box by the screws on the back of the heat sinks. Hold the controller firmly against the back of the box. Use four of the 3/8", self-tapping screws that came with the plastic box to attach the controller by its heat sinks to the plastic box. Tighten the screws just enough to be snug.



### **Preparing Strain Relief Bracket**

If you purchased the optional plastic box for your controller, prepare the strain relief/grounding bracket by installing the cable clamps as shown in the picture below.

Tighten the cable clamps to the bracket using the large nuts on the inside of the clamp. Make sure the screws face upward. You can tighten the nuts snug by hand and then tap them tight with a screw driver blade and small hammer, or you can tighten them snug by hand with the clamp about 30° counter-clockwise and then use a plier to turn the clamp clockwise until the screw holes face upward. The bracket should look like this:



### **Preparing the Rubber Grommets**

Use a knife to cut the pie shaped wedges in the four rubber grommets at the base of the plastic box. Cut from the inside of the grommet towards the center.

### **General Power Cable Information**

Usual wire coloring:

Hot wires are Black or Brown

Neutral wires are White or Blue

Ground wires are green

On a standard outlet:

Round hole is ground

Short slot is hot

Long slot is neutral

If you are making your own power connection cables, be sure the crimp-on quick-connects are firmly crimped. A loose connection will have resistance which will result in heat which may result in fire. Use insulated crimp-on connectors to prevent shorts.

When using zip cord (two wire cord) the wire with the smooth insulation is used as the hot.

Frayed wires can cause short circuits that can pose an electrocution hazard, may damage this controller and pose a fire hazard. Carefully inspect all connections before applying power. Be sure no stray strands of wire are sticking out of the crimp-on connector.

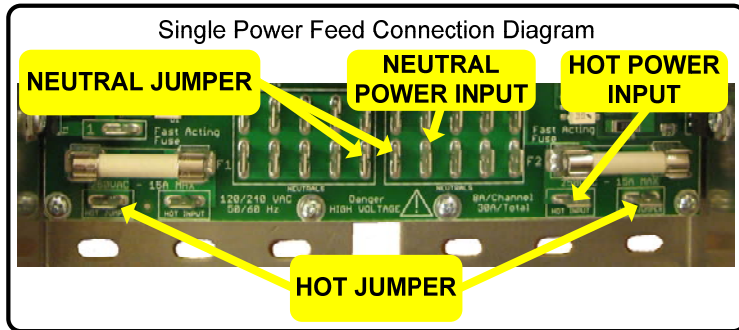
Make sure you push the quick-connect completely on to the board's spade lug. Again, a loose connection will result in resistance which causes heat and may cause a fire.

### How to Connect Unit AC Power Cable(s)

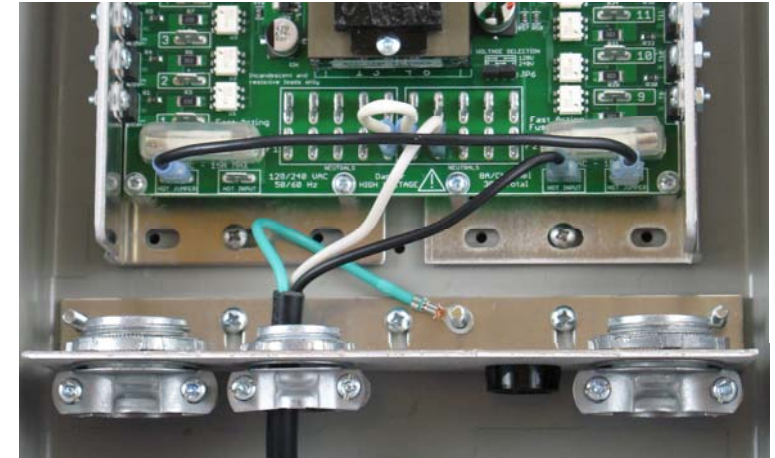
#### Single Power Feed (15 amp board max)

The next diagram shows how to connect the single AC power cord to your CTB16PC. If you did not purchase the power cord from Light-O-Rama, you will need to construct one 4" white and one 8" black 14 gauge wire quick-connect jumper. Both jumpers have 1/4" female quick-connects on each end.

Remember to attach the ground lug to the strain relief bracket's grounding stud.



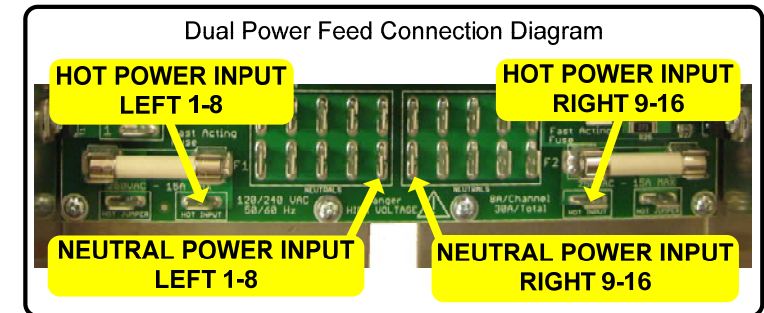
Note that in this arrangement only the right fuse is used and carries the current for both the left and right banks of channels. The picture on the next page is just to illustrate the connections for a single power feed, do not connect the wires or mount the bracket yet.



#### Dual Power Feed (30 amps board max)

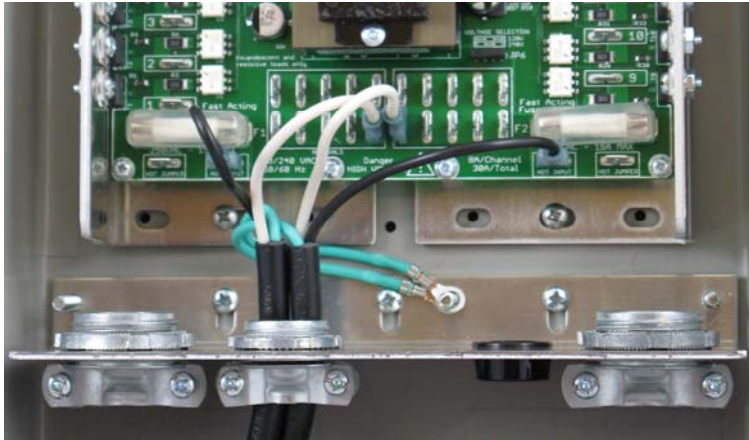
The next diagram shows how to connect the dual AC power cords to your CTB16PC.

Remember to attach the ground lugs to the strain relief bracket's grounding studs.



## CTB16PCg3 Mechanical Assembly

The following picture is just to illustrate the connections for the dual power feed, do not connect the wires or mount the bracket yet.



## CTB16PCg3 Mechanical Assembly

### ***Installing Power Cables***

Refer to this picture for instructions that follow:



Sort 4 short & 4 long black wire cords per side  
See step 2

## Finished Controller

The following picture shows the finished controller with a data cable attached.



## Connecting the Power Cord(s)

1. The strain relief/grounding bracket should **NOT** be installed in the plastic box at this

**point. Do all of the following wiring with the bracket outside the plastic box.**

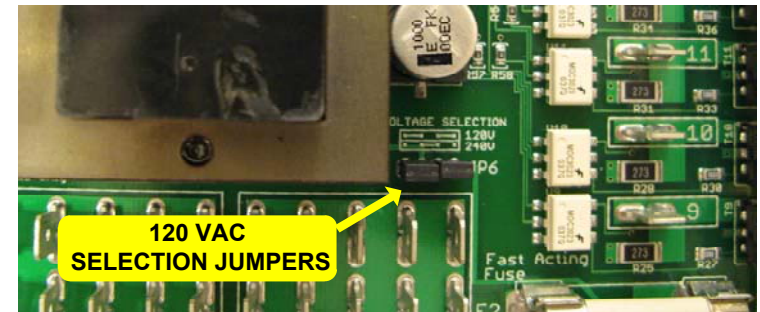
2. There are two types of dangle cords. 8 cords have shorter black wires and 8 cords have 2" longer black wires. Make two groups of 8 cords using 4 cords with shorter black wires and 4 cords with longer black wires in each group.
3. Use a Metallic Sharpie or cable labels to mark the sockets or cords in one group "1" through "4" for the shorter black wire cords and "5" through "8" for the longer black wire cords. Mark the second group "9" through "12" for the shorter black wire cords and "13" through "16" for the longer black wire cords. Use a Sharpie to mark the quick-connects for the black wires so they correspond with the marking on the sockets.
4. The large rubber grommets only fit one way in the plastic case, make sure you have the grommet correctly oriented. Arrange cords 1-8 in one of these grommets as three layers, layering the longer black wire cords on top of the shorter black wire cords. Three cords in the top layer, three cords in the middle layer and two cords in the bottom layer (the layer near the curved end of the grommet.) Then push the quick-connect ends through the large left cable clamp. About 7½" of cable should extend through the cable clamp. Loosely tighten the cable clamp's screws.
5. Repeat the above process for the right pigtails (channels 9-16.)

6. Place the strain relief/grounding bracket into the plastic box sliding the rubber grommets into place. Use three 3/8" screws to secure the bracket to the box. Make sure you have at least 7½" of cable from the clamp to the end of the long black wire quick-connects, then tighten the cable clamps.
7. Now route the AC power cord or cords through the smaller rubber grommet on the left side of the box and then through the cable clamp. See the section *How to Connect Unit AC Cord(s)* for correct wiring. Put a lock washer and nut on the center grounding stud.
8. Separate the black, white and green wires.
9. Slide all green ground wires over the grounding stud nearest the 8 channel group of wires. Make sure you have all grounds on the stud, a missed wire could cause a short later. Put a lock washer and a nut on the grounding studs.
10. When pushing on quick-connects, make sure the blade on the circuit board goes into the quick-connect female end. Sometimes the blade will go between the plastic and the female metal end – this will not provide a good connection and may be dangerous. You should not be able to easily pull off a properly seated quick-connect.
11. Push all white wires on the neutral terminals grouped together at the center bottom of the board. Keep channels 1-8 on the left-most set of neutral terminals and channels 9-16 on the right-most set. This last step is important for a dual AC

- power feed, especially if you are using ground fault interrupters.
12. Using the previously labeled black wire quick-connects, push them on to the appropriate terminals along the left and right sides of the board.
  13. This completes the assembly of your controller. (Note that this picture shows the fuse covers – these were a late addition designed to protect the wires passing over the fuses.) You are ready to configure it for testing.

### 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. See following picture:



### \*\*\* 240 VAC operation \*\*\*

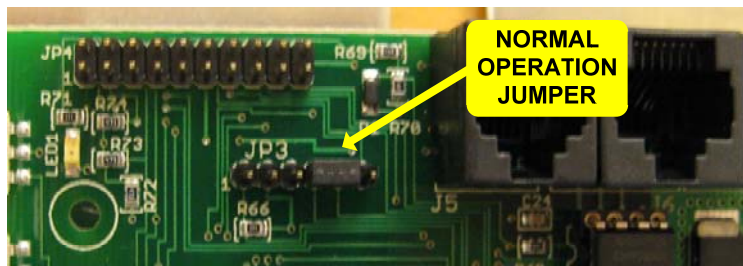
For 240 VAC operation, only one jumper on the center two pins of this header must be installed – AND – the ghost loads must either not be present or of the correct value. Boards configured for 240VAC



operation will be marked with a sticker specifying 240VAC operation allowed.

### Reset / Normal Operation Jumper

There is a jumper on header JP3. JP3 is the smaller, 6-pin header to the lower left of the network connection jacks. Pin 1 of this jumper is furthest from the network jacks. For normal operation, the jumper is installed between pins 4 & 5 as shown in the following picture:



To reset the controller, power it off, move this jumper to pins 5 & 6 (one pin right) and power the controller on. The status LED will fast blink during reset. Once you see this, power the board off and move the jumper back to pins 4 & 5.

Reset resets everything. The Unit ID reverts to 01, all channels are set to the Standard dimming curve and downloaded dimming curves are deleted.

### Testing and Operation

Please refer to the *CTB16PCg3 Generation 3 User Manual*.

### Specifications

Configuration	Two banks of 8 channels
Individual Channel Capacity	1 amp – No Heat Sinks 8 amps – Regular Heat Sinks
Individual Bank Capacity	8 amps – No Heat Sinks 15 amps – Regular Heat Sinks
Board Capacity Single Power Feed	15 amps – No Heat Sinks 15 amps – Regular Heat Sinks
Board Capacity Dual Power Feed	16 amps – No Heat Sinks 30 amps – Regular Heat Sinks
Supply Voltage (two separate models)	120 VAC, 50/60 Hz 240 VAC, 50/60 Hz
Fuses	15 amp fast acting
Isolation	Optos isolate line voltage from control logic
Power Connections	Quick connects (spade lugs)
No Heat Sinks	6 ¾" w x 5 ¼" h x 1 ½" d
Regular Heat Sinks	7 ¼" w x 6 ¾" h x 2 ¼" d
Plastic enclosure	9 ½" w x 11 ½" h x 3 ½" d

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