ILC LightLEEDer Cutler Hammer
Breaker Controller Installation/Configuration

RevB

Overview:

The ILC LightLEEDer Eaton Cutler Hammer (CH) Breaker Controller is designed to control the newer Quicklag 4 wire C.H. controllable breakers. With these controls, you can control the breakers the same way relays are controlled in a LightLEEDer (LL) system. The controls consist of left and right control rails that the controllable breakers plug directly into, and a control panel which contains a control processor, transformers, and CH Interface board. The control rails are provided in 3 configuration sizes, which include; 9, 15, or 21 outputs and are available in right or left side configurations.

Control Rail Installation:

If ILC provided the controllable breaker panel, the panel is ready to be wired, proceed to the installation procedure. If the panels were not provided by ILC, and they have the Quicklag CH 4-wire controllable breakers, follow the steps below to install the control rails.

1. Mount the right and left rails below the breakers control wires as shown in Figure 4. The rails should be positioned so the end with the controller is towards the lower end of the breakers. Align the rails to the nearest holes and fasten with a 10-32 screw on each end.
2. Plug each CH breakers control wiring, as shown in Figure 4, into the rail ports starting from the top to the bottom.
   Note: Breakers are numbered from the top to bottom with the odd on the left and even on the right.
3. Proceed to the installation procedure.

Installation Procedure:

1. Mount the ILC LightLEEDer Control panel adjacent or near the CH panelboard.
2. Install conduit between the panels for low voltage power and data control cable.
3. Install a second conduit for control panel power. This will be from an un-switched breaker in the breaker panelboard to the power transformer in the high voltage area.

Warning: Do not run Class 2 wires in the same conduit or raceways containing the high voltage wires.

4. Pull CAT5e data cable and 2-18AWG conductors from the LL control panel to the breaker panel. Be sure to leave the conductors long enough to terminate to the electronics plus some excess.

   Note: The CAT5 cable and 18AWG wires are required to be rated for 600VAC to meet UL and NEC requirements.

   Cable/Wire Suggestions:
   CAT5e Cable: Beldon Data Tuff 7958A
   18AWG Wire: UL1015 Beldon 8918 002100

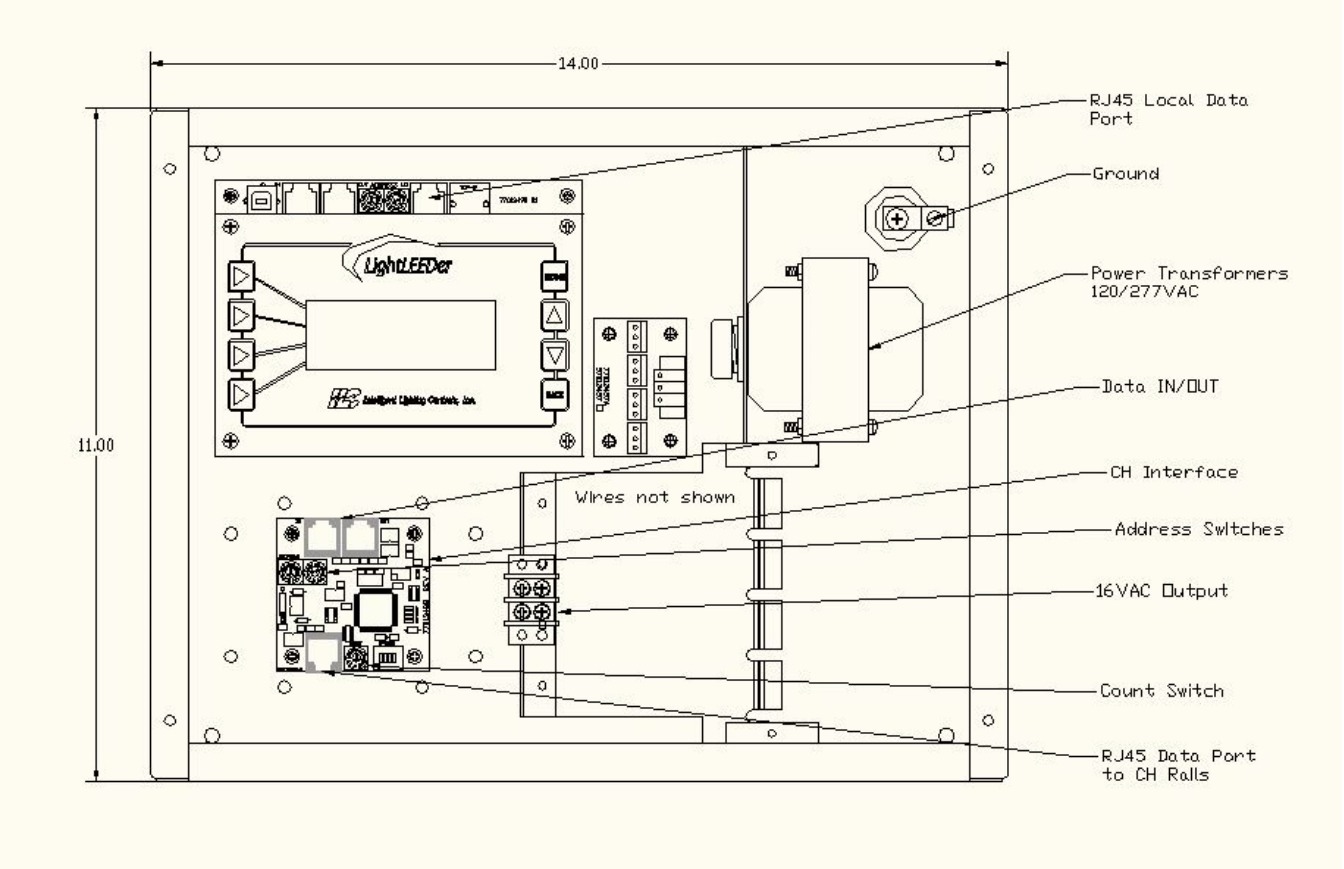

Figure 1 LL Control Panel with Interface/Power Supply

5. Install RJ45 connectors onto the end of each CAT5 cable. Be sure to use the correct connector designed for the cable being used. Terminate the CAT5 cable to the AEI/TIA 568B standards, and test all cables with the proper CAT5 tester.
6. Connect this CAT5 cable in the control panel to the CH Interface board to the lower RJ45 as shown in Figure 2.

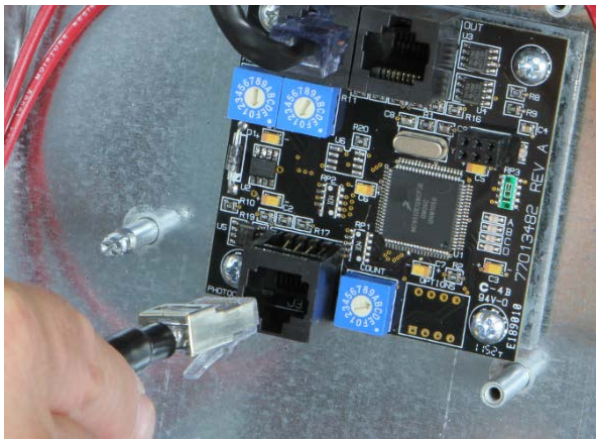

Figure 2 CH Interface

7. Terminate the 2 – 18AWG to the 16VAC terminal block in the control panel as shown in Figure 3. Note: These are not polarity sensitive.

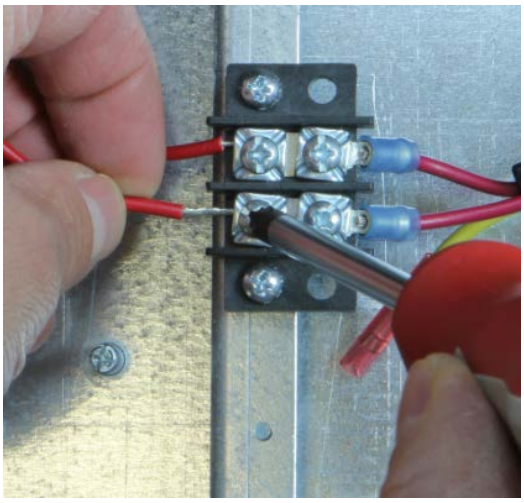

Figure 3 16VAC Terminal Block

8. Pull the proper wires from the breaker box to the transformers in the control panel. The control panel accepts either 120 or 277VAC power for the transformers (2). One transformer has a 24VAC secondary for the processor, and the other has a 16VAC secondary for the CH rails.
9. Terminate both transformers line and neutral wires, capping the unused leads to prevent electrical shock. Terminate a ground wire to the connector provided. Refer to the label in the panel for termination color code.
10. Terminate the power line in the breaker box to the breaker.

Warning: Do not energize until everything has been installed and tested.

11. Remove the 4 screws securing the cover on the left and right control rails as shown in Figure 4.

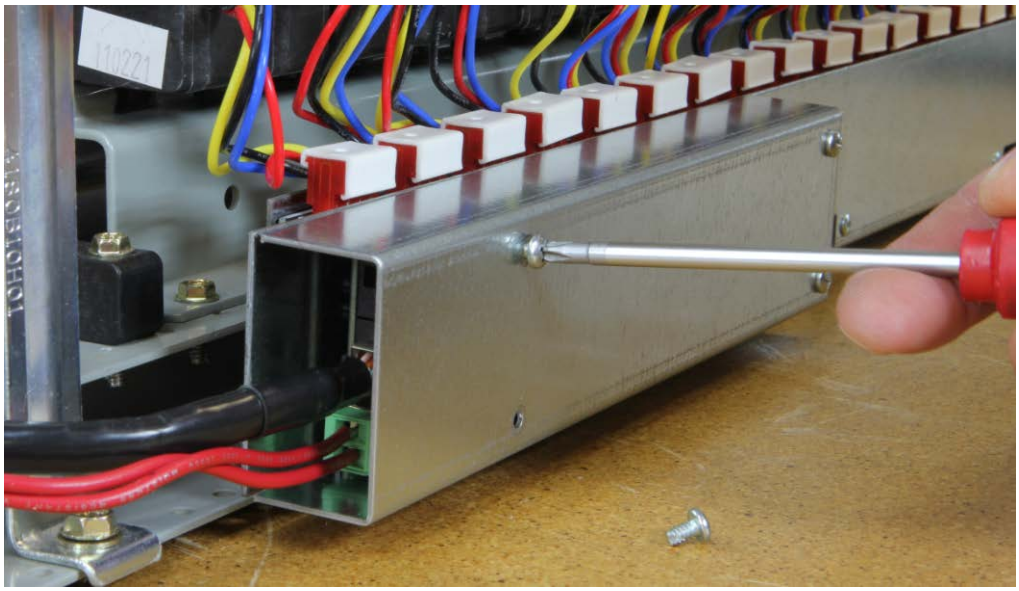

Figure 4 Remove Screws

12. Terminate the 2 - 18AWG wires to terminal block as shown in Figure 5.

Note: If ILC did not provide this panelboard, you will need to add a second 18AWG wire to run to the opposite side of the panel to the other rail as shown in Figure 9.

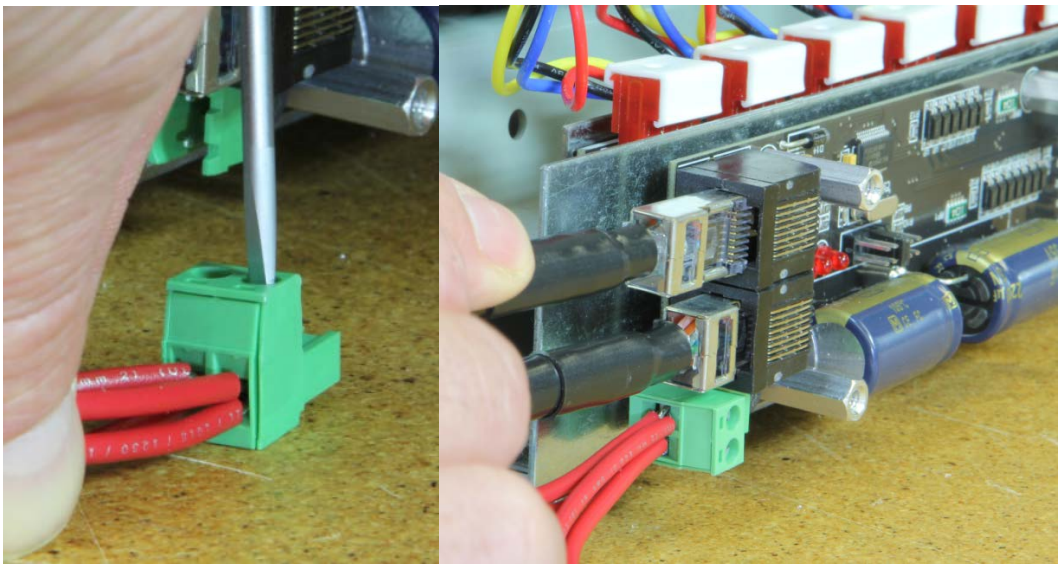

Figure 5 Terminating Cables/Wires

13. Connect the previously RJ45 terminated CAT5 cable from the control panel to one of the RJ45 connectors shown in Figure 5.
    Note: If ILC did not provide this panelboard, you will need to add a second CAT5 cable to run to the opposite side of the panel to the other rail.
14. Replace the rail covers with the 4 screws removed in step 11. See figure 6.

Note: Connections from the control panel to the rails can be terminated to either side.

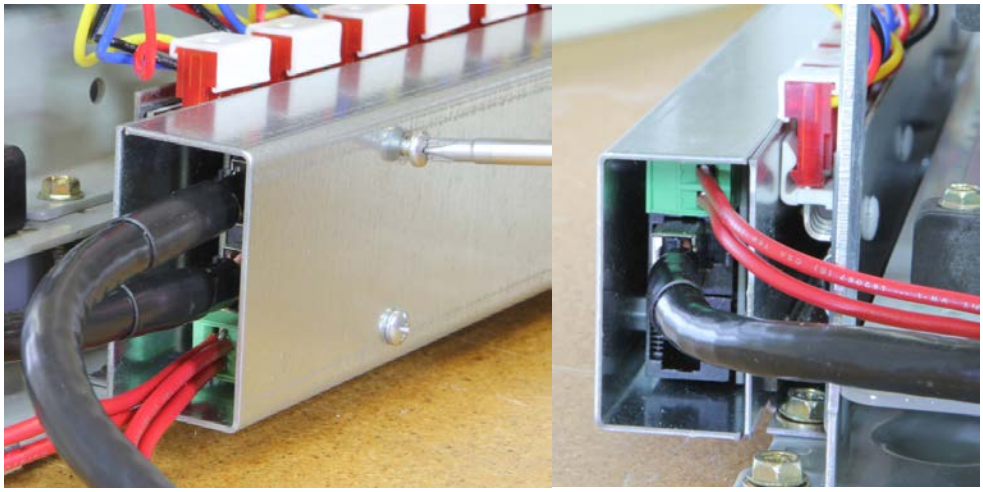

Figure 6 Rear View

Interface Configuration Settings:

The CH Interface needs to be configured for the breakers controlled. Refer to Table 1 for the configuration settings. Use the matrix in this table to identiy your settings for the address and count switches. The upper 2 switches are the address switches, and the lower switch is the count switch. See Figure 7.

77013482 Controllable Breaker Address/Count Switch Settings																
	ADDRESS															
COUNT	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10
0	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
1	R01-04	R05-08	R09-12	R13-16	R17-20	R21-24	R25-28	R29-32	R33-36	R37-40	R41-44	R45-48	R49-52	R53-56	R57-60	R61-64
2	R01-08	R05-12	R09-16	R13-20	R17-24	R21-28	R25-32	R29-36	R33-40	R37-44	R41-48	R45-52	R49-56	R53-60	R57-64	Invalid
3	R01-12	R05-16	R09-20	R13-24	R17-28	R21-32	R25-36	R29-40	R33-44	R37-48	R41-52	R45-56	R49-60	R53-64	Invalid	Invalid
4	R01-16	R05-20	R09-24	R13-28	R17-32	R21-36	R25-40	R29-44	R33-48	R37-52	R41-56	R45-60	R49-64	Invalid	Invalid	Invalid
5	R01-20	R05-24	R09-28	R13-32	R17-36	R21-40	R25-44	R29-48	R33-52	R37-56	R41-60	R45-64	Invalid	Invalid	Invalid	Invalid
6	R01-24	R05-28	R09-32	R13-36	R17-40	R21-44	R25-48	R29-52	R33-56	R37-60	R41-64	Invalid	Invalid	Invalid	Invalid	Invalid
7	R01-28	R05-32	R09-36	R13-40	R17-44	R21-48	R25-52	R29-56	R33-60	R37-64	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
8	R01-32	R05-36	R09-40	R13-44	R17-48	R21-52	R25-56	R29-60	R33-64	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
9	R01-36	R05-40	R09-44	R13-48	R17-52	R21-56	R25-60	R29-64	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
A	R01-40	R05-44	R09-48	R13-52	R17-56	R21-60	R25-64	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
B	R01-44	R05-48	R09-52	R13-56	R17-60	R21-64	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
C	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
D	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
E	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
F	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

Table 1 Configuration Settings Table

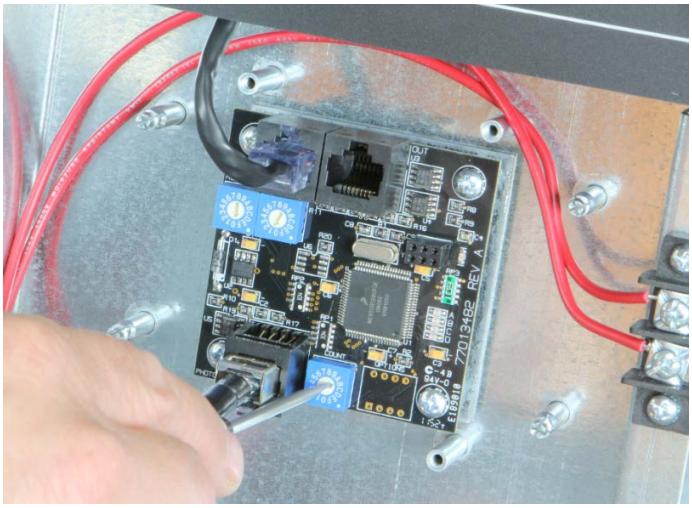

Figure 7 Configuration Switches

Control Rail Jumper Settings:

Each control rail, as shown in Figure 8, has a set of jumpers just to the right of the LED's. These jumpers are used to configure the size (number of breakers; 9, 15, or 21) of the rail, and what side is being controlled. Refer to Table 2 and Figure 8 for the configuration required. If jumpers are required, they are placed vertically in the positions shown. Figure 8 is an example of a left rail with 21 breakers.

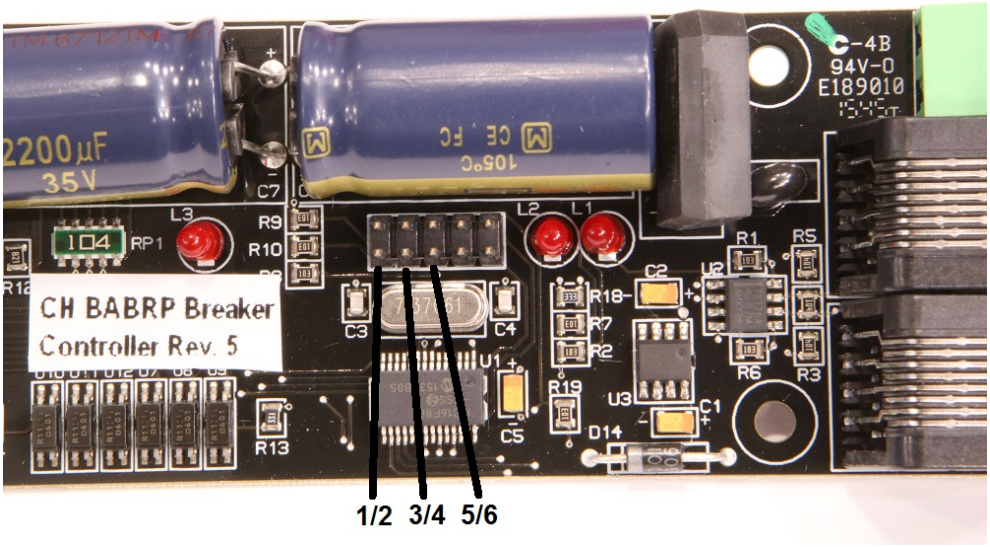

Figure 8 Control Rail Electronics

JUMP	1,2	3,4	5,6
LEFT			NONE
RIGHT			X
9/18	NONE	X	
15/30	X	NONE	
21/42	NONE	NONE	

Table 2 Control Rail Jumper Settings

Final Inspection and Testing:

All data and low voltage power wire should be neatly bundled and installed in a manner to maintain separation from line voltage circuit wiring as much as possible. Figure 9 shows the connections before the load wires are terminated to the breakers. After installing line voltage circuit wiring and verifying all wiring connections, test all circuits for shorts and opens.

Figure 9 Wiring Complete

Power-up the controller panel transformers. From the Control panel, turn the power switch to the ON position as shown in Figure 10.
Test the setup using the ALL ON / ALL OFF buttons to sweep the breakers.

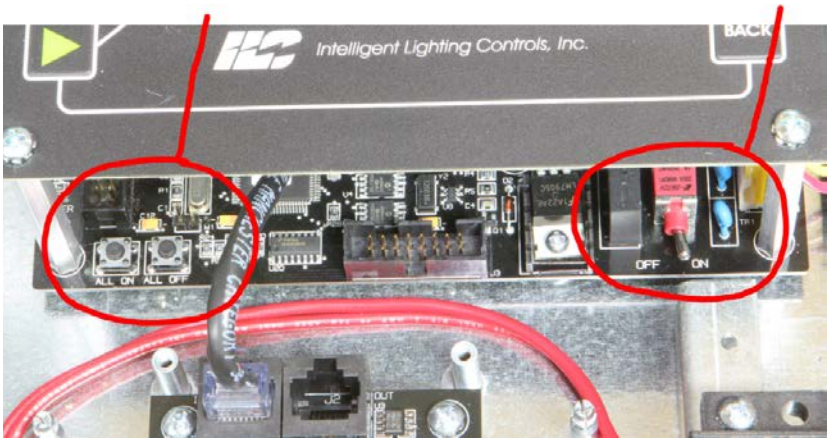

Figure 10 Power and ON/OFF Switches

Re-install trim pieces and dead front cover provided for the panelboard and the control panel.