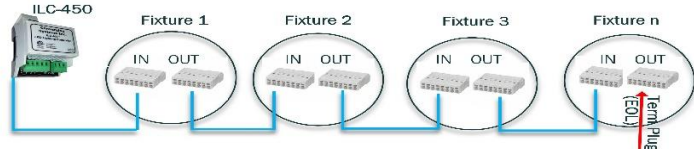
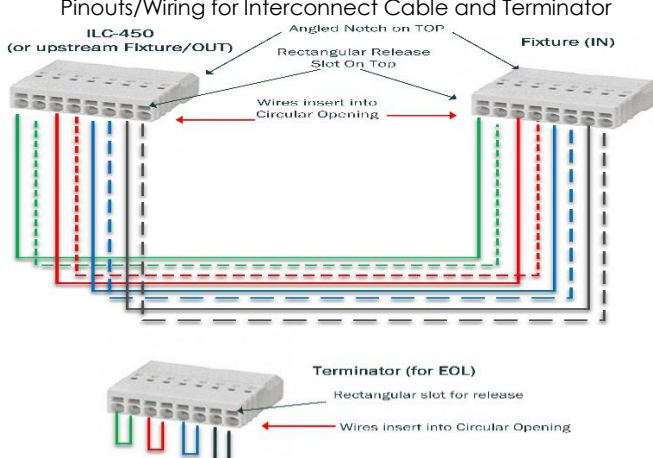
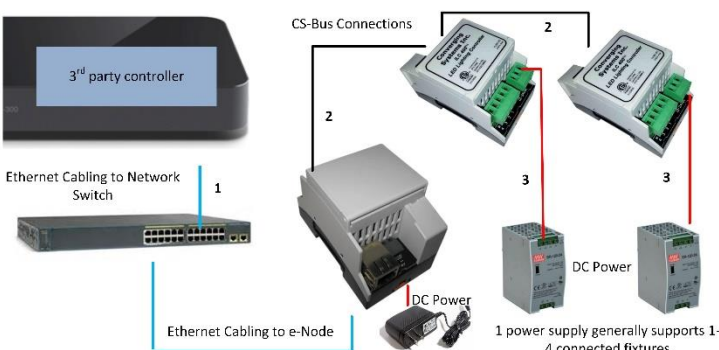




ILC –450 Family Quick Reference Installation Guide (with e-Node for IP control)

The Converging Systems ILC-450™ constant current LED lighting controller is a remote single zone/light processing engine for 1 or more daisy-chained compatible lighting fixtures*. The ILC-450 can be installed within an approved low-voltage wiring box along with a recommended power supply. Low-voltage (Class 2) wiring is utilized to connect the ILC-450 to the first fixture and subsequently to each additional permitted downstream fixture*. The only Class 1 (AC connection) within this system is to the above power supply. Connectivity with 3rd party lighting/automation systems (Lutron, Elan, Contro4, RTI, etc.) is through a single e-Node (IP) gateway (recommended). Standalone operation is also available through various low-voltage Converging Systems Decora® -style keypad devices.

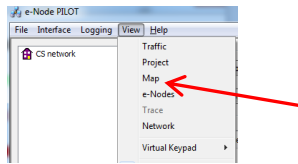
***Note:** For maximum number of downstream supported fixtures per ILC-450 (as well as full documentation for all products), consult documentation at http://www.convergingsystems.com/lighting_install_library.php.

HARDWARE SETUP OF ILC-x000 Controller using e-Node for commissioning and either e-Node or IBT-100 for control thereafter

<p>Step 1 LV Wiring of Compatible Fixtures to ILC-450</p> <p>ILC-450 to first fixture connection. Interconnect ILC-450 controller to first fixture using 8-conductor solid wiring (20 awg-NOT CAT 5 or 6). Maintain 1/1 pinouts between ends (see Figure 2). Consult documentation (above) for more information on wiring.</p> <p>Head-end Fixture to Downstream Fixtures. Interconnect downstream fixtures as shown below. Again use 1/1 pinouts on all connectors. For number of downstream fixtures see documentation link above.</p> <p>End-of-Line (Termination). Insert supplied Terminator into the OUT bus on the last fixture (mandatory). Pin out for Terminator is in Figure 2.</p> 	<p>Step 2 Pinouts/Wiring for Interconnect Cable and Terminator</p> 													
<p>Step 3 Additional System Wiring</p>  <p>Required Additional Wiring. Using this above diagram, follow steps referenced below:</p> <p>(Step 4a) Add CS-Bus wiring between ILC-450s (Step 4b) Add DC remote power to each ILC-450 controller (Step 5) Connect gateway (e-Node or IBT-100) to system and power e-Node (if used).</p>	<p>Step 4 System Wiring/Setup</p> <p>(Step 4a) Local Bus (CS-Bus) Connections between ILC-450s. Connect CS-Bus cabling between Port 0 on one ILC-450 to Port 1 on the next ILC-450. See Step 3/Reference #2 for more detail on CS-Bus connections. See Step 4-5 Detail below on proper pinouts.</p> <p>(Step 4b) DC Constant Voltage Power Supply Connection. Connect specified power supply to the input power connector on each ILC-450 (typically 12vdc). Obey the polarity printed on the ILC-x00 case. Each controller has a 3-pin power connection (+, -, and GND), you should connect a separate GND lead from a solid earth ground to the ILC-450 Ground connection. (See Step 3/Reference #3 above)</p>													
<p>Step 5 e-Node/IBT-100 Connectivity</p>  <p>e-Node connections. Interconnect Port 0-CS-Bus (RJ-25 not RJ-45) port on the e-Node to an available/unused CS-Bus on the first or last ILC-450 controller using a fabricated CAT 5(or better) cable wired as per Step 4-5 Detail. Connect the supplied 12vdc power adapter to the mating 2-pin connector on the e-Node. Connect a standard Ethernet wire from your network switch to the RJ-45 connector on the e-Node. (In case you wish to share power supplies, the e-Node can operate from remote power 12-24vdc 90 ma as well.)</p> <p>IBT-100 connections. If you are using serial connectivity, connect a CS-BUS Standard cable from Port 0 on the first ILC-x00 controller to the single RJ-25 port on the IBT-100. Plug the IBT-100's DB-9 connector directly onto your computer or controller's serial port or to a USB/Serial adapter connected to your system (57,600,n.8,1,n). Note: The IBT-100 requires power to operate which is only available from Port 0 of the ILC-450 controllers. Should Port 0 be unavailable on a convenient ILC-x00 device, unplug the existing wire plugged into Port 0 and swap it into Port 1 of the target ILC-450 controller and in a sequential fashion reverse the connections of all other connections from Port 1/Port 0 to Port 0/ Port 1 across the lighting CS-Bus network.</p>	<p>Step 4-5 Detail CS-BUS Wiring Standard</p> <p>CS-BUS WIRING STANDARD (using RJ-25/RJ-11 6P6C)</p> <table border="0"> <tr> <td>Pin 1. BL</td> <td>—————</td> <td rowspan="6">} ← You must maintain twisted pairs on pins 1&2, 3&4, 5&6.</td> </tr> <tr> <td>Pin 2. BL/W</td> <td>—————</td> </tr> <tr> <td>Pin 3. O</td> <td>—————</td> </tr> <tr> <td>Pin 4. O/W</td> <td>—————</td> </tr> <tr> <td>Pin 5. G</td> <td>—————</td> </tr> <tr> <td>Pin 6. G/W</td> <td>—————</td> </tr> </table>  <p>ILC-450 to ILC-450 interconnections. Interconnect LED lighting controllers sequentially in a daisy-chain fashion (without "Y"s or "T"s) by connecting Port 1 of one device to Port 0 of the next sequential device. Utilize standard CAT5 (or better) wiring and maintain 1/1 pinouts between ends (see CS-Bus Wiring Standard above). Also maintain twisted pairs as shown above (1&2, 3&4, 5&6).</p> <p>Note: The CS-Bus uses standard RJ-25 (RJ-11) 6P6C connectors available at Home Depot, and all electrical distributors. You cannot use standard flat telephony cable for telephony cable (i) does not have twisted pairs and (ii) utilizes typically a swapped wiring pinout (1-6, 2-5, 3-4, etc. which is not compatible with the CS-Bus). Failure to follow the CS-BUS wiring standard will void your warranty. If you return a unit to Converging Systems with its communication chip destroyed this is a telltale sign that you used Telephone cabling. REPEAT--DO NOT USE TELEPHONY CABLE. Also, do not attempt to use standard Ethernet cabling (568B or 568A) and simply chop off the browns for this will leave the twisted pairs inconsistent with our CS-BUS Wiring Standard (the middle two lines will not be a twisted pair and data integrity will be lost). If you do not have 6P6C RJ11/RJ-25 modular connectors and still wish to proceed, refer to the ILC-x00 family controller Instruction manual for more information.</p>	Pin 1. BL	—————	} ← You must maintain twisted pairs on pins 1&2, 3&4, 5&6.	Pin 2. BL/W	—————	Pin 3. O	—————	Pin 4. O/W	—————	Pin 5. G	—————	Pin 6. G/W	—————
Pin 1. BL	—————	} ← You must maintain twisted pairs on pins 1&2, 3&4, 5&6.												
Pin 2. BL/W	—————													
Pin 3. O	—————													
Pin 4. O/W	—————													
Pin 5. G	—————													
Pin 6. G/W	—————													

SOFTWARE SETUP-Commissioning Requires the e-Node, Operation with control systems (except Lutron) is OK with IBT-100 or e-Node

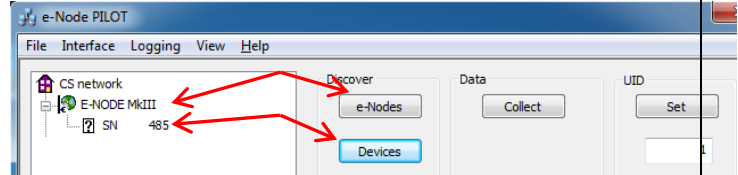
Figure 7
e-Node Pilot Commissioning Process



Download and Launch Pilot. Download and launch the (PC compatible) e-Node Pilot application available from the Converging Systems website. Before running, please make sure you **unzip** the file. http://www.convergingsystems.com/downloads_library.php

Note: It is highly advised to make a **hardwired** Ethernet connection from the e-Node to your network switch and another **hardwired** Ethernet connection from your switch to your computer running the Pilot application. Data may be lost or corrupted otherwise.

Figure 8
Discover e-Nodes/Devices

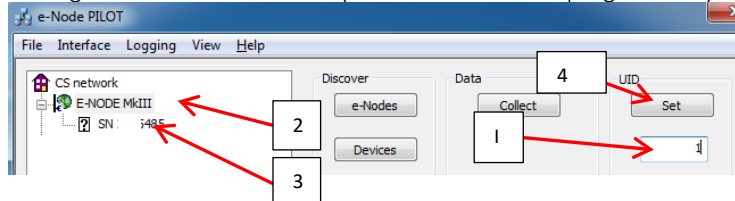


Discover e-Node. From the **View/Map** window, select the **Discover e-Node** button and any e-Nodes that have been powered-up and which exist on the same subnet as your computer will be populated within the left window.

Discover e-Node. Select the Discover Devices and any (SN Addressing Scheme) Devices that have been powered-up and are connected to the e-Node will be populated in the left window. If you have a device **without** SN Addressing Scheme firmware, proceed to Figure 7 (Note) for more information.

Figure 1

Assign UID to **EACH** Controller (so that each can be programmed)



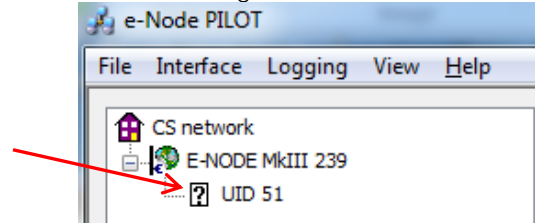
Assign UID to Controller. Next, (1) assign an unused **UID** (unique ID) to the ILC device to be addressed (generally start with the UID value of "1" and work up sequentially) and enter this number into the UID window, then (2) **highlight the e-Node** to which the device is connected, then (3) **select the device with SN** displayed and then (4) select **"SET."** The initial ILC device with a SN "name" will be updated to a programmed **UID n** entry.

Note: If your device **does not** have SN Addressing, (i) **highlight the e-Node** to which the device is connected. (ii) **enter a unique UID** in the window, and (iii) **press for 1/2 second the discovery/reset** button on the ILC-450 device using a paper clip (the on-board PCB LED will blink off for a moment then re-light which indicates success) and Select OK to the pop-up window. Once ID'd, the discovered device will appear on the left window.

Note: Make sure all control systems are powered off during this process for they may be issuing similar beacons on the bus which will interfere with this process.

Figure 2

Program Controllers



Expand Data Fields of ID'd controller. Click on the "?" mark and/or the "+" mark in front of the targeted controller to expand its data fields. Select the **BUS** tab, to expose the BUS properties window.

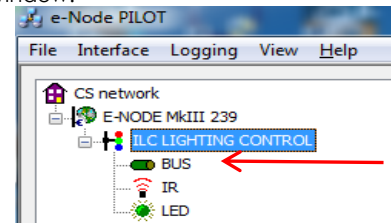
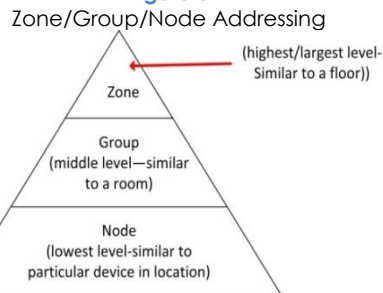


Figure 3



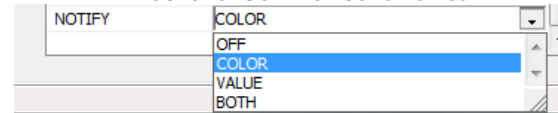
Assign Z/G/N Address. Enter a discrete **Zone/Group/Node** address for each Lighting Controller identified within the previous pane. For more information on addressing, review the *Instruction Manual* or applicable *Integration Note*.

The factory default for Lighting Controllers is **2.1.0** with the "0" acting as a wildcard **and** as an undefined address (with no bi-directional capability). Typically, if you identify your first controller as a **2.1.1** and work upwards (**2.1.2; 2.1.3; ... 2.1.254**) sequentially among controllers, you will be fine for most installations.

Enter the Zone/Group/Node address separated by **PERIODS** and hit **ENTER**. When the field turns **BLUE** you know the data has been successfully entered.

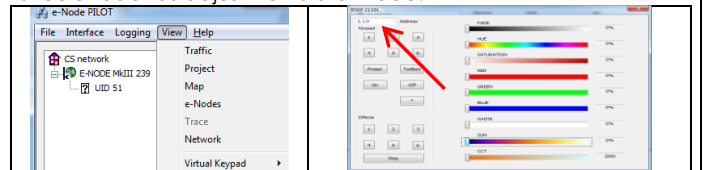
Figure 4

Bi-Directional Communication & Test



Enable Bi-directional Communication. In order to invoke bi-directional communication so that a control system with compatible sliders can show feedback when there are changes in ILC-x00 controller's color state (i.e. colors change or states), set the **NOTIFY** Flag to either **COLOR** (for the HSV or Hue, Saturation, Value color space) or to **VALUE** (for the old school Red, Green, Blue Value color space—**old school because there is no dimmer in this color space**). If you want to have both sets of sliders (not really recommended in larger systems where bus traffic may become excessive), set the flag to **BOTH**.

Test. Launch the **Virtual Keypad/Lighting** and test by entering an appropriate (**Z.G.N**) address and adjust sliders. Connected LEDs should react as adjustments are made.



Important Safety Information

The ILC-x00 LED Controller and specified associated components are listed under UL File-325 and has been tested by the following safety agency:
TO REDUCE THE RISK OF ELECTRIC SHOCK, THIS EQUIPMENT HAS A GROUNDING TYPE PLUG THAT HAS A THIRD (GROUNDING) PIN. THIS PLUG WILL ONLY FIT INTO A GROUNDING TYPE OUTLET. IF THE PLUG DOES NOT FIT INTO THE OUTLET, CONTACT A QUALIFIED ELECTRICIAN TO INSTALL THE PROPER OUTLET. DO NOT CHANGE THE PLUG IN ANY WAY.



POUR REDUIRE LES RISQUES DE CHOC ELECTRIQUE, CET APPAREIL EST QUIPE D'UNE FICHE AVEC MISE A LA TERRE COMPORTANT UNE TROISIEME BROCHE (BROCHE DE TERRE). CETTE FICHE NE PEUT ETRE BRANCHE QUE DANS UNE PRISE AVEC MISE A LA TERRE. S'IL N'EST PAS POSSIBLE DE LA BRANCHER DANS LA PRISE, FAIRE POSE UNE PRISE APPROPRIEE PAR UN ELECTRICIEN QUALIFIE. NE PAS MODIFIER LA FICHE
*UTILISER A L'INTERIEUR SEULEMENT

Additional Terms and Conditions and exclusions and Warranty Information are available on the Converging Systems website