The Converging Systems ILC-XO™ family of LED lighting controllers are networkable devices which can provide support for Converging Systems’ Flexible Linear Lighting Arrays™ (FLEX) RGB, RGBW, and monochrome LED devices. The devices are supported using either RS-232 serial connection (IBT-100) or Ethernet (e-Node). Typically for systems with more than one ILC-x00 controller or in cases where you wish to have bi-directional communication, initially you must set up with e-Node™ even though you will be using the IBT-100™ within the system. Full installation Manuals are available for ILC-x00 family controllers, the e-Node, and IBT-100 at http://www.convergingsystems.com/lighting_install_library.php

HARDWARE SETUP of ILC-x00 Controller using e-Node for commissioning and either e-Node or IBT-100 for control thereafter

**Figure 1** CS-Bus Wiring Standard

**ILC-x00 to ILC-x00 Interconnections.** Interconnect LED lighting controllers sequentially in a daisy-chain fashion (without “T’s” or “Y’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).

**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 telephone cable for telephony cable (I) does not have twisted pairs and (II) utilizes typically a swapped wiring pinout (1-2, 3-4, 5-6) 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 wires 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.

**Figure 2** e-Node/IBT-100 Connectivity

**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-x00 controller using a fabricated CAT5 (or better) cable wired as per the CS-Bus Wiring Standard. 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 24vdc as well.)

**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). **Note:** The IBT-100 requires power to operate which is only available from Port 0 of the ILC-x00 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-x00 controller and in a sequential fashion reverse the connections of all other connections from Port 1/Port 0 to Port 0/1 across the lighting CS-Bus network.

**Figure 3** FLA LED Lighting Connections

**FLA connections.** Connect the flying leads from the header end of the FLA device to the ILC-x00 controller using recommended cable (typically 16 awg or 18 awg). See Voltage Drop table for more info. [http://www.convergingsystems.com/marketinginfoFLA.php](http://www.convergingsystems.com/marketinginfoFLA.php)

**Figure 4** Remote Power Supply Connection

**DC Constant Voltage Power Supply Connection.** Connect power supply which provides the same voltage as the FLA LED rating (typically 24vdc). Obey the polarity printed on the ILC-x00 case. If your controller has a 3-pin power connection (+-- and GND), you should connect a separate GND lead from a solid earth ground to the ILC-x00 Ground connection.

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

**Figure 5** e-Node Pilot Commissioning Process


**Note:** It is highly advised to make a hardwired Ethernet connection from 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 6** 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 (Notes) for more information.

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Limited Warranty

Each CSI product, except as otherwise provided herein, will be free from defects in materials and workmanship for a period of three (3) years from the date of delivery to the end-user including coverage of the following performance criteria:

- LED Light Output will be maintained above 90% of initial output
- Tri-colored (RGB) output will consist of all three color components (red, green, and blue)
- Quad-channel (RGBW) output will consist of three color components (red, green, and blue) and white.
- Monochrome output will consist of a single color output (white).

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