

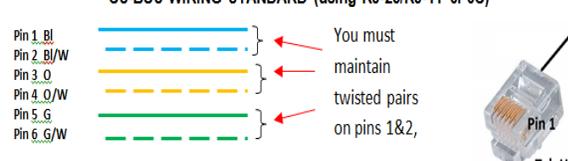
ILC-640d™ Installation Guide (with e-Node for commissioning/IP gateway connectivity)

The Converging Systems ILC-640d™ (“**Controller**”) is a member of the Converging Systems ILC-xxx™ lighting controller product line which provides support for targeted DALI-2™ Tunable White (TW) fixtures and enables compatibility with virtually any lighting and automation panels in the marketplace. The ILC-640d supports 1 to 64 TW (& mono) fixtures +compatible with the DALI-2 specification (color type Tc of Part 209 of the IEC 62386 standard). Up to four **Controllers** can be interconnected to a single Ethernet-based Converging Systems’ e-Node 4x00 gateway (“**Gateway**”) allowing for up to 256 DALI-2 fixtures to be supported from a single networked Gateway. Alternative dealer-configured e-Node 2000/4000 gateways can also be set up to support up to 254 ILC-100/200/300/400/450™ controllers using CAT5 or better cabling to support non-DALI-2 fixtures including linear tape, and third-party full color/full color temperature fixtures using Converging Systems **Pure Mode** lighting standard. In addition, an alternative e-Node 2100/4100 dmx gateway is available which is designed to support up to 32 connected DMX fixtures (per each Gateway) which expands the range of compatible lighting and fan devices. *Full Installation Manuals are available for ILC-xxx family controllers, the e-Node, and the e-Node/dmx at http://www.convergingsystems.com/lighting_install_library.php*

HARDWARE SETUP of ILC-640d Controller using e-Node for commissioning and IP gateway connectivity

Step 1 CS-BUS and IP Network Connections

CS-BUS WIRING STANDARD (using RJ-25/RJ-11 6P6C)



Pin 1_B/W
Pin 2_B/W
Pin 3_O
Pin 4_O/W
Pin 5_G
Pin 6_G/W

You must maintain twisted pairs on pins 1&2,

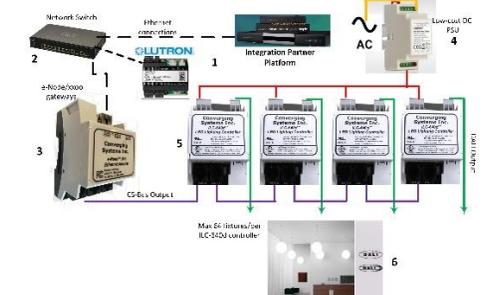
Pin 1
Tab Underneath

ILC-640d to ILC-640d bus connections. 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).**

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 this type 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)** by simply cutting the browns or oranges 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.

e-Node Ethernet connection. Connect a standard Ethernet wire from your network switch to the RJ-45 connector on the e-Node (silver connector marked Ethernet). The e-Node 4x00 is a Class 0 POE device for those with a POE switch (which may require POE switch setting).

Step 2 e-Node/ILC-640d Bus and Power Connections



e-Node/ILC-640d bus connections. Utilizing the **CS-Bus Wiring Standard** (specified in [Step 1](#)), connect the e-Node’s RJ-25 **Port 0** (not Port 1 or 2 which uses an RJ-45) to either unused CS-Bus Port on the first ILC-640d controller. Then connect the (other) unused Port on that same device to the alternative Port on the next ILC-640d (i.e., Port 1 on upstream controller to Port 0 on the downstream controller, or Port 0 to Port 1 until all are connected). **A maximum of 4 ILC-640d controllers** can be connected in a daisy-chained fashion from a single e-Node 4x00 (up to 4000 feet run using CAT5 or better cabling)

e-Node power connection. The e-Node 4x00 must either be powered using (i) its built-in POE feature (via the incoming Ethernet cable connected to the e-Node’s **silver** RJ-45 port) or (ii) any external 12v~24vDC (100ma or greater) source (**polarity sensitive**). An optional power supply is also available from Converging Systems

ILC-640d Power connection. Connect any 15-16vDC 240ma (min ma) to the DC input port on the ILC-640d. **Connect an earth ground to the ground pin on the Controller to enable proper data handling.**

Note: Typical DALI devices require expensive DALI power supplies (typically double the price of a non-DALI PSU) per supply). The ILC-640d eliminates requirements for expensive/specialized DALI power supplies. All that is required is a low-cost quality 15-16vDC 240ma (min) **constant voltage** power to support up to 4 ILC-640d devices.

Step 3 DALI fixture Connections

DALI-2 bus connections. Connect the fixtures 2 wire DALI-2 bus wires to the 2-pin connector on the ILC-640d (marked DALI). Note: this bus is polarity independent. Use recommended cabling (typically 16 awg or 18 awg). See Voltage Drop table for more info. <http://www.convergingsystems.com/marketinginfotec.php>

DALI Fixture Power connections. DALI fixtures have separate AC power connections. Follow the fixture’s directions here.

SOFTWARE SETUP-Commissioning Requires the e-Node

Step 4 Web Page (uPnP) Discovery Mechanism

Use a Windows computer and open File Explorer and search for the **Network** tab to expand to see available uPnP* devices. Any connected e-Node(s) should appear



Then, double click on the e-Node icon to expose its webpage

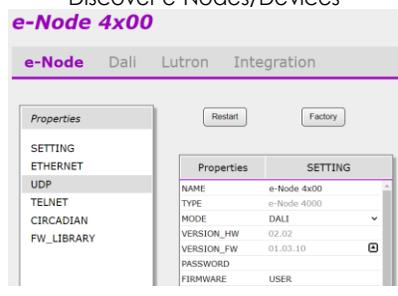


Next, click on the triple dash menu icon and you **may** be asked for a **Password**. Unless the Password has been changed or blanked out, enter **Admin** and select **Logon**



***Note on uPnP.** You may have to turn on Discovery or load the uPnP service within Windows to enable this type of Discovery

Step 5 Discover e-Nodes/Devices

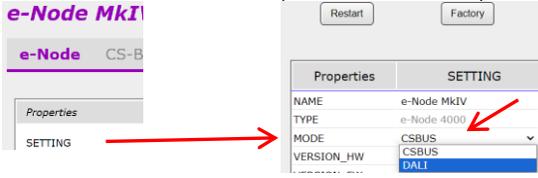


e-Node Network Parameters. By default, the e-Node is set to **DHCP ENABLED**. To change to a Static IP address, select the **e-Node** tab to reveal the above setup screen. Select the **ETHERNET** tab and enter a static IP address under **STATIC_IP**. Then, enter gateway IP address under **GATEWAY_ADD**. Next, select **DHCP DISABLED** and hit **Restart** to reboot the e-Node to establish the new parameters.

Step 6

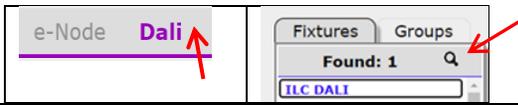
Set DALI Mode and Discover ILC-640d Controllers

Set DALI mode. By default, the e-Node's mode of operation is set to CSBUS mode (for Pure Mode operation). For DALI use, you must change this default mode to DALI in order to discover and use connected ILC-640d devices (connected to Port 0 on the e-Node). Select the **e-Node/SETTINGS** tab to reveal the Properties window. Here, select the **MODE** field and select **DALI** from the pull-down and hit **Restart** to reboot the e-Node to adopt the new modality.



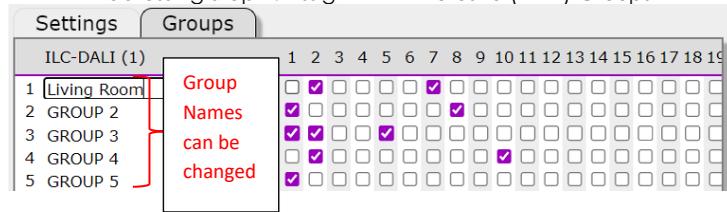
Discover ILC-640d devices. Select the **Dali** tab and within the **Fixtures** window, select  which will auto-discover (i) all (up to 4) connected ILC-640d controllers (and auto-assign Unique IDs to each), as well as (ii) any previously Commissioned DALI-2 devices/fixtures (see [Step 7](#) for more information). **UIDs are required only for the e-Node to properly communicate with ILC-640d controllers-duplicate UIDs will cause problems for this process.**

Note: Make sure all control systems (i.e., C4/NICE/Crestron, etc.) are powered off during this process for they may be issuing similar inquires on the bus which will interfere with this discovery.



Step 8

Addressing Step 1: Assign DALI fixtures to (DALI) Groups



Understanding Group. DALI fixtures need to be assigned into logical DALI Groups (up to 16 per Controller) by the installer to initiate the addressing process. Those DALI Groups can **then, and only then, be controlled by third-party automation/lighting systems with a public addressing scheme referred to as ZGN addressing** (described in [Step 9](#)) **but not with** proprietary DALI Group Addresses! **THIS IS IMPORTANT.**

Assign Group Names. Select the **Dali** tab/**Settings** window, and select the ILC-640d Controller to which your first set of DALI fixture(s) is/are connected. Next, select the **Groups** window, where you will see factory default group names for 16 available groups (for that Controller). It is recommended that you change each GROUP name for ease of identification that matches your setup. Simply mouse/highlight on any GROUP name, then edit its name and hit **Enter**.

Assign DALI fixtures to DALI Groups. Assign each DALI fixture to its desired (DALI) Group(s) by selecting a checkbox for that fixture within the targeted Group. Proceed until all DALI fixtures for that Controller have been assigned.

Complete Tasks for all other Controllers. Repeat the directions here for each additional Controller (if present) connected to the common e-Node, until all DALI fixtures connected to all Controllers have been programmed.

Step 7

Identifying and Naming Fixtures

Commissioning DALI fixtures. Within the **Dali** tab/**Fixtures** window, select the first ILC-640d discovered and right click to expose a pop up and select **COMMISSION** which will (i) automatically delete any previous commissioning information within each connected DALI-2 fixture, and (ii) auto-generate/write new parameters to those same fixtures including an auto-assigned/unique DALI address (from 1 to 64) for each as well. Continue for each ILC-640d controller devices available until all DALI-2 fixtures are commissioned. **This will override any previous DALI address assigned to each DALI-2 fixture.**

Note: If later you want to add additional DALI fixtures (up to maximum of 64 permitted), select RECOMMISSION instead of COMMISSION to expedite the add-on process (by not changing previously assigned values).

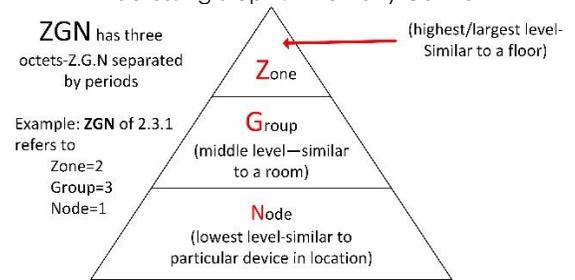


Other Actions Possible (with above popup per ILC-640d device)

- IDENTIFY.** Flashes all commissioned DALI fixtures in unison
- OFF.** Turns off all commissioned DALI fixtures in unison
- RESET.** Activates a Power-Off/Power on to the ILC-640d device
- FACTORY.** Activates a Factory Reset to the ILC-640d device (all dealer programmed data is deleted)

Step 9

Addressing Step 2: Third Party Control



Background on ZGN Addressing: The ZGN addressing scheme is a hierarchical schema that permits automation systems -to address individual DALI Groups for the smallest granularity of control (traditional approach), **OR** -to address multiple DALI Groups as a virtual unit (often through "phantom devices" with phantom addresses) in order to streamline the programming requirements for the installer (it is easier to send one command to turn off all lights in a building than 100 separate commands to achieve the same goal).

ZGN Factory Defaults. The table below can be used to understand the default ZGN addresses for DALI Groups supported by each Controller. These ZGN addresses (and not DALI addresses) are the only addresses that can be used by automation systems for control. **Note:** Many systems will auto-imposed these ZGN addresses as part of their commissioning process.

	Contrl 1	Contrl 2	Contrl 3	Contrl 4
Group 1	1.1.0	2.1.0	3.1.0	4.1.0
Group 2	1.2.0	2.2.0	3.2.0	4.2.0
Group 3	1.3.0	2.3.0	3.3.0	4.3.0
Group 4	1.4.0	2.4.0	3.4.0	4.4.0
~	~	~	~	~
Group 16	1.16.0	2.16.0	3.16.0	4.16.0

ZGN Phantom Example Within any HA or Lighting System (i.e., Lutron et al.), you could create a phantom or wildcard address of **1.0.0** to control all DALI Groups 1-16 within Controller 1 (with the second "0" being the wildcard for Groups 1-16). Similarly, a **0.0.0** would control all DALI Groups connected to a single e-Node (the first "0" covering all Zones, the second "0" covering all Groups, and the final "0" covering all Nodes already set to "0" here).

For more information on addressing, review the *Instruction Manual* or applicable *Integration Note*.

Appendix 1
Other Features

Appendix 2
Reserved

Fixture Identification (individual or group)

Individual													Group										
Settings													Groups										
ILC-DALI (1)													ILC-DALI (1)										
1 Living Room	<input type="checkbox"/>	1 Living Room	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			
2 GROUP 2	<input type="checkbox"/>	2 GROUP 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			
3 GROUP 3	<input type="checkbox"/>	3 GROUP 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			
4 GROUP 4	<input type="checkbox"/>																						
5 GROUP 5	<input type="checkbox"/>																						

- Within the **Dali/Fixtures** tab, select the target ILC-640d controller.
- For **Individual Identification**,
Within the **DALI/Groups** (for that pre-selected ILC-640d), select the **Fixture #** (1~64) until it shows ON/gold (see left figure above). Note: the specific light will flash until you deselect the Fixture (hit "Gold" highlight)
- For **Group Identification**,
Within the **DALI/Groups** (for that pre-selected ILC-640d), select the **Group #** (1~16) until it shows ON/gold (see above). Note: the selected Group lights will flash until you deselect the Group (hit "Gold" highlight again)

Fixture Fade Rate Settings (individual or group)

Individual				Group			
e-Node Dali Lut				Settings Groups			
Fixtures				ILC-DALI (1)			
ILC-DALI (1)	IDENTIFY	OFF	FRASE	1 Liv	IDENTIFY	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(1) DALI-TW	OFF	FRASE	FADE 0.7s	2 GR	CLEAR	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(2) DALI-TW	FADE 0.7s	FADE 1.0s	FADE 1.4s	3 GR	FADE 0.7s	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				4 GR	FADE 1.0s	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				5 GR	FADE 1.4s	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				6 GR		<input type="checkbox"/>	<input type="checkbox"/>

- Within the **Dali/Fixtures** tab, select the target ILC-640d
- For **Individual Fixture Setting** (see left figure above)
Within the same Fixture tab, right click on a **Fixture #** "(1~64) to expose a popup. Select a provided Fade Rate (only those on list are supported).
- For **Group Fixture Setting** (see right figure above)
Within the **DALI/Groups** (for that pre-selected ILC-640d),right click on a **Group Name** to expose a popup. Select a provided Fade Rate (only those on list are supported).

Other Actions Available

- OFF**. Turns off a Group or Fixture as available
- Clear**. Resets Fade Rate
- Erase**. De-commissions the DALI fixture (TBD)

Appendix 3

Interfacing with Lutron-Lutron Tab
(see the [Lutron Quick Start Guide](#) –under Gateways)

The Lutron Tab allows supported Lutron platforms to control supported DALI fixture.

Overview of Settings and Operations

- SYSTEM**. Enter **HOMEWORKS LEAP platform-QSX (or other platform)**.
- ADAPTOR_IP**. Enter the IP address for your Lutron processor. Find IP address within Lutron's Designer/**Activate-Processors**.
- LOGIN/PASSWORD**. Enter a Username and Passphrase (password) that were previously created within Designer within **Tools/Configure Integration**. (If not available, please create within Designer.)
- CONNECTION**. Select **ENABLED** to start the IP connection. Once the status indicator turns to **CONNECTED**, you can proceed.

You must see "Connected" before proceeding.

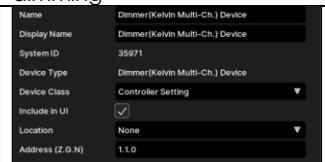
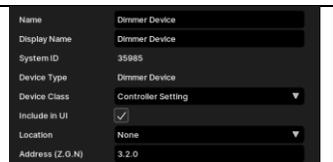
- Lutron Device**. Within this tab, you will see all discovered real and phantom keypads and loads. **Phantoms are imported see Quick Start Guide for more information.**
- Lutron Table**. Within this tab you will (i) assign any real (or phantom) Lutron button press/operation to trigger a targeted response with a supported DALI device or (ii) enable an existing Lutron load (real or phantom) to drive a matching output state from a supported DALI device.

Appendix 4

Interfacing with Other Automation Systems

For other third-party automation systems, existing certified drivers available for the e-Node will automatically support our supported DALI-2 fixtures. These systems may in some cases automatically import all DALI (customized) **Group Names** as well as their **device type** (monochrome or bi-white or other) as well as their **ZGN** addressing assignments as well as their DALI assigned Name. See our [Integration Partner Guides](#) for more information.

Here is an example of an automatic import using NICE (ELAN) automaton platform.

ZGN: 1.1.0 Type: Monochrome Dimming ILC-640d controller: 1 of 4 DALI Group #: 1 Description: Monochrome dimming	ZGN: 3.2.0 Type: Tunable White ILC-640d controller: 3 of 4 DALI Group #: 3 Description: TW dimming
	

DALI Fixture Documentation Template (if is recommended that you fill out this form to facilitate assigning fixtures to Groups)

Device #	ILC-640d (1 st unit)	ILC-640d (2nd unit)	ILC-640d (3rd unit)	ILC-640d (4th unit)
sample	Bedroom 1 rt1	Living Room NE 1	Basement NW1	Theater
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
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IMPORTANT SAFETY INFORMATION

The ILC-xx0 LED Controller and FLA/Listed Luminaires driven by a specified Class 2 power supply and mounting hardware carry a UL Listing under Low Voltage Lighting System (UL File-2108). The ILC-xx0 Controller as a standalone unit in addition has been approved as a Recognized Component/Low Voltage Under Cabinet fitting (UL File-2108).



Caution: ILC-xx0 Controllers and Listed Luminaires should only be installed with Class 2 Power Units
 Attention: Les contrôleurs ILC-xx0 et les luminaires répertoriés ne doivent être installés qu'avec des unités d'alimentation de classe 2