Integration with Lutron QSX/RA3 Platform (with Converging Systems' e-Node™ 4000/e-Node™ 4100/dmx gateways)

The Converging Systems e-Node 4000™ and e-Node™ 4100/dmx gateways enable connectivity with a wide range of Lutron platforms (RA2 Select, RadioRA™ 2, Homeworks™ QS, Quantum™, myRoom™ Prime as well as the new Lutron Homeworks™ QSX platform and RadioRA™ 3 (soon). As a Lutron partner, direct control through the Converging Systems' e-Node family of gateways is now possible for the QSX platform for entire product family of Converging Systems lighting and motor controllers. For more information on other platforms, refer to our Lutron library at https://www.convergingsystems.com/inres_lutron.php.

HARDWARE SETUP of e-Node/dmx Controller and 3rd party DMX Fixtures

Step 1
e-Node/dmx wiring

Silver Connector Marked "LAN"

Network Cable (CAT5 type)

DC Input

e-Node/xxx to Network connections. Interconnect the **LAN (silver)** port on your e-Node/4x00 to an available LAN port on your network switch that is also connect to the Lutron processor using standard CAT5 or better cabling (same Subnet). The maximum distance from the switch to the e-Node is 100m (328ft).

Note: The black RJ-45 ports marked Port 1 or Port 2 are **not** the LAN port and should not be used here.

Optional WI-FI Adapter. See separate Quick Start Guide for information on this adapter.

e-Node/xxx power connection. The device supports POE and requires no external power. Should you not have a POE switch, simply connect the e-Node to an available DC power source (12v-24vdc 90 ma) using 2-conductor cabling (22 awg or larger). Pay attention to the polarity markings on the e-Node. If you have obtained the optional e-Node DC power supply, simply plug in the supplied 2-pin connector into the e-Node.

Step 2
e-Node/xxx– ILC-xxx/IMC-xxx Connectivity

CS-Bus wiring. Port 0 on the e-Node/4x00 is used for data connection to the first CS-Bus controller (IMC-xxx or ILC-xxx). Additional controllers can be daisy-chained to the first CS-Bus controller (port 1 of one controller to port 0 on the next controller or visa-versa).

DMX Fixture wiring. Port 2 on the e-Node/dmx is used for data connection to the first DMX fixtures. Additional fixtures should be daisy-chained from the first fixture (max 32 fixtures on chain). Consult the table below for creating your own RJ-45 to DMX Fixture cable (cable not supplied).

E-Node RJ-45	XLR connector	Std RJ-45 DMX*	Philips RJ-45
Pin 1 (485+)	Pin 3	RJ-45 Pin 1	RJ-45 Pin **2**
Pin 2 (485-)	Pin 2	RJ-45 Pin 2	RJ-45 Pin **1**
Pin 7 (Gnd)	Pin 1	RJ-45 Pin 7	RJ-45 Pin 7
(all other pins)	N/C	*Std wiring	N/C

*Use standard (straight) CAT 5 (or better) cable.

SOFTWARE SETUP-Commissioning Requires the e-Node/xxx embedded Web Pilot application (not standalone PC Pilot application).

Step 3
New uPnP Discovery Mechanism

Use a Windows computer and open File Explorer and search for the **Network** tab to expand in order to see available uPnP* devices. Any connected e-Nodes should appear.

Network — e-Node (E-NODE MkIII)

Double click on the e-Node icon to expose its webpage.

CONVERGING SYSTEMS

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**

Protected Access

Password

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 4
Discover e-Nodes/IP Addressing

e-Node (General) Settings. Within the **Properties/SETTINGS** tab, for **NAME** enter an alias name for your e-Node. For your **location***, select your Continent/Country/State/City for the closest location to you. Your Latitude/Longitude/Time Zone will auto appear.

e-Node Ethernet Settings. By default, the e-Node is set to **DHCP** ENABLED (you can use this with reservations). Without reservations, set a Static IP address within **STATIC_IP.** Then, within **GATEWAY_ADD** enter the Gateway address for your router's address. Lastly to disable DHCP in this case, select **DHCP** DISABLED

Restart. After making changes to the above settings, hit **Restart** to reboot the e-Node.

*Requires internet connection for Circadian functionality.

Step 5
Discover/Setup CS-Bus Devices

Select the **CS-Bus** tab to discover/activate devices in order to properly control them. **Note**: Without activation, any Lutron Table programming instructions will **not** be functional.

Task	
Connect all CS-Bus controllers as per their [instructions](#) to e-Node	
Select the **spyglass** icon to initially discover all connected devices	🔍
Under **Devices**, any non-activated device will initially appear with its factory default name appearing in **RED** or its SN displayed	**Devices** **Found: 2** ILC-400C ILC-450
Under the **Settings** tab, select a non-activated entry (in RED) and enter a unique ID number (not used before). Typically start from 1 and work upwards. Once you hit **Enter**, the product name becomes BLUE (and it is activated).	Settings Presets Properties SN UID NOT SET TYPE ILC-400C
Within the **Settings** Tab, assign a new **ALIAS**, set an **Address** to a non-zero entry (i.e., 2.1.1—see [Appendix A](#) for detail), and turn **NOTIFY** to **Both**.	

Identify Units. Within the **CS-Bus** tab and after setting any CS-Bus device with a **Z/G/N** address, you can **IDENTIFY**/flash the unit within your installation by right-clicking on the Device name and selecting **IDENTIFY** which will flash its on-board LED indicator (as well as its connected load) for 15 seconds

Devices
 Fou... IDENTIFY
 ONYZ HO... RESET
 KNIFE EDG... FACTORY
 SINK

Additional Operations. The above popup menu will also allow you to (i) reboot (**RESET** or power off/power on a unit without data loss) or (ii) perform a **Factory** Reset (used if same UID is given to two different devices which will cause inconsistence/failures in communication—unplug the duplicate device when selecting this option so the "correct device" will know to clear/update).

Step 6a
Link Homeworks QSX/RA3 with e-Node/4x00

Connect Status--**Connected**

e-Node 4000 <br> e-Node CSBus **Lutron**
 Devices Trace
 Restart
 Settings Table
 Properties Disconnected

Settings	Table
Properties	**Connected**
SYSTEM	HOMEWORKS QSX
ADAPTOR_IP	192.168.10.20
CONNECTION	ENABLE

Lutron Settings Tab
-**SYSTEM**. Enter **HOMEWORKS QSX (or other platforms)**.
-**ADAPTOR_IP**. Enter the IP address for your QSX 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.

Step 6b
Import Devices/Loads (from Lutron platform) into e-Node

Devices Trace

1412	10 desktop	
1555	Pico White	
1924	HQWD-w5BRL	
2014	HQRD-6D	
2096	PID	
2756	6B WiredA	
280B	6B Wiredb	
3889	RF Occupancy Ser	

Spyglass

Subset of Supported devices

(Grayed out)

Lutron Devices Tab. After Connection is made within [Step 6a,](#) all pre-programmed Lutron Devices programmed within Designer/**Design-Controls** will auto appear. If they don't appear, select the **spyglass** above.

Note: items that grayed out (see above) cannot be used to trigger actions events through the e-Node/4x00 but their connected load(s) can be tracked. For more information, see expanded instructions [here](#).

Step 7
Assign Actions (and other data) to Individual Button Presses using the Lutron/**S**implfied **L**utron **I**ntegration **M**odule-SLIM Tool

Lutron
 Restart
 Settings Table
 Track Command
 Lutron ID Address Device Command Value

Pop-UP

ID	Button ?	Action	✕
10 desktop	Button 1	Level	⬇

Upload icon

Assign actions to Lutron buttons. Select the **Lutron/Table** Tab and hover/rt. click over (any) empty row under **LUTRON ID**. The upper right popup above will appear. Fill in the column entries as shown below:
  -**Lutron ID**. Scroll down and pick the desired Lutron device/load.
  -**Button?** Select box and scroll down to select applicable button or load (use the [?](#) hyperlink to identify Lutron button numbers).
  -**Action.** Select any of the available button actions (provided that action was already programmed within Designer) for this trigger. **Only an action programmed in Designer can be monitored** even though you may have selected it here (i.e., if you select **Release** and Designer was programmed for a **Press**-a match will not be found and this table entry will not work). Select the upload icon to store (see above).
  -**Address** (three octets separated by commas (see [Appendix A](#)).
  -**Device.** Select the target CS-Bus device (**LED**, **Motor**, or **Key**) from the scroll list.
  -**Command.** Select the target CS-Bus command from the scroll list.

-**Value.** Where required, enter a # (i.e., brightness {**SET**} level from 0 to 240, **CCT** level from 1700 to 7000(k), **EFFECT**s from 1,2 or 4, **RECALL/STORES** from 1-24, Pre sunrise/post sunset/ Circadian (**SUN**) levels from 0 to 240, or Hue/ Sat/ Red/ Green/ Blue/ White levels from 0~240. (Hue of 0 is red, 80 is green and 160 is blue.)

Continue through each row until completed.

Shorthand keys

🔄	**Sort** key to sort rows	🗑 📋	Trash icon to delete row, Copy icon to copy row

Button Types (defined within Lutron software)

	Level	Press	Release	Hold	Multi-Tap
[Trace Alias](#)	0	3	4	5	6

Load Tracking. For more information on Lutron Load tracking for alternative control of CSI loads, see this [document](#).

Appendix A
Zone/Group/Node Addressing
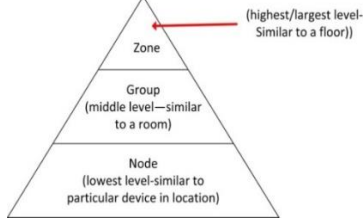
Assign Z/G/N Address. Enter a discrete **Z**one/**G**roup/**N**ode address for each Table/Address entry (in Step 7). For more information on addressing, review the *Instruction Manual* referenced above or applicable *Integration Note*.

A typical address might be **2.1.1** for the first controller. The first field (# from 0~254 is the **Z**one address), the second field (# from 0~254) is the **G**roup Address and the final field (# from 0~254) is the **N**ode address. A Z/G/N of 2.1.1 would be entered as following (**with periods not commas as shown**)


Address

2.1.1

You may change these as appropriate. Much more information on Addressing can be found within the Full integration Note for Lutron.

Appendix B-1
Circadian Backgrounder (**feature available only with e-Node 4000**)

Circadian Functionality. The e-Node 4000 gateways have a built-in Circadian server that allows connected/calibrated CS-Bus devices to track the sun's spectral output from pre-sunrise to post-sunset. See Appendix B-2/B-3/B-4 below for details. In short, make sure you have set your location. Then, (i) activate the Circadian server, and (ii) select the type of Spectral range desired***** and finally (iii) Trigger that server task for each CS-Bus device under **CS-Bus/SOLAR**.
The figure below shows the various types of spectral ranges possible
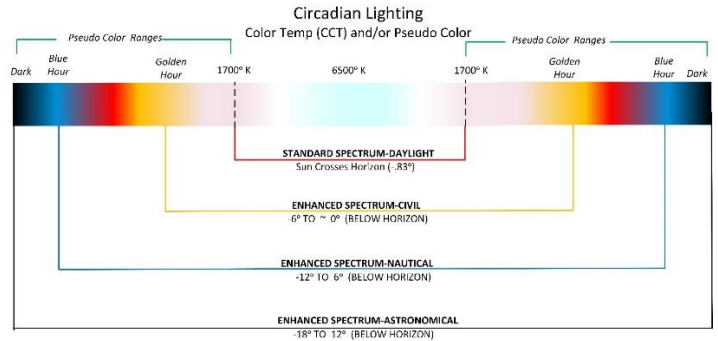
*In order to match the standard/ unmodified Lutron Natural show, select the Standard Spectrum Daylight ("**Horizon**")

Appendix B-2
Circadian Setup
Step 1: Activate the Circadian Server. Provided you have entered your location in Step 4, enable the Circadian Server under **Properties/CIRCADIAN**

Properties	CIRCADIAN
SERVER	DISABLE ⌄
PEAK ELEVATION	DISABLE
	ENABLE

Step 2: Select the desired Spectral Range. If matching the unmodified/standard Lutron Natural Show, set TWILIGHT to **HORIZON**. For expanded spectral ranges, select an alternative setting (for spectral ranges see Appendix B-1).

TWILIGHT	ASTRONOMICAL ⌄
SUNRISE	HORIZON
SUNSET	CIVIL
DURATION	NAUTICAL
	ASTRONOMICAL

Other Settings. For basic operation, leave **Peak Elevation** set to 10.00°, **Warm Elevation** set to -3.00°, **Transition** set to 0.8. Unless you desire an alternative **Peak Temp** (k) for mid-day sun, leave the factory default set to 6500(K).

Appendix B-3
Solar Tracking (Circadian) Theory of Operation/Adjustments

Solar Tracking (Circadian) Theory of Operation. Solar tracking (Circadian functionality) can be selected to operate:
-never, or
-only during selected days of the week, or
-throughout the week (all 7-days)
Set this up within **CS-BUS/Settings/Circadian** for each target device

SOLAR SETTING	Programmed Day		
	Never	M to F	ALL Days
SOLAR	Leave blank	MOTUWETHFR	ALL

Once triggered (see Trigger below-Step 3 of 3). Solar Tracking will auto-run (follow the spectral path pictured in Appendix B-1 depending upon the Spectral Range selected) during the course of the current day and will continue to auto-start subsequently on each subsequent day (for any days programmed for Circadian) until the Circadian Server is "suspended" by any incoming user command (i.e., Off, On, Recall or Store, or any other color or intensity adjustment). That user intervention will take precedence until either (i) a "Circadian ON/Resume" command is transmitted to the system or (ii) the next day (or next programmed day) is encountered.

The e-Node **Properties/CIRCADIAN** page summarizes accurately the entire period during the day when initially some transition or CCT color is generated by a programmed ILC-xxx controller (i.e., faint light will first be displayed at **START TIMES** (first entry) which kicks off the Solar Tracking cycle which finally culminates with **a** similar faint output transitioning to OFF).

TWILIGHT	ASTRONOMICAL ⌄
SUNRISE	7:15
SUNSET	16:35
DURATION	2:48
START TIMES	5:37 (15:24)

Example. Here, OFF starts transitioning to some form of light output at 5:37 (a.m.) and continues through the applicable spectral range shown in Appendix B1 until finally some form of faint light output transition to OFF at 6:12 p.m. (15:24 + 2:48 or 18:12)

Appendix B-4
Triggering Solar Tracking (Circadian)

Step3: Circadian Triggering. The **Circadian ON/Resume** command must be initially sent by an automation system to complete the required 3rd step (of 3 steps) to run Solar Tracking. This command is supported by various automation systems as the **SOLAR** command followed by PEAK brightness variable. For a Z/G/N of 2.1.1 the command is   **#2.1.1.LED=SOLAR,240;<cr>**

Note: The value (0 to 240) after the comma specifies the brightest level the sequence reaches at mid-day sun. (240 is recommended.)

This string **also** needs to be sent if the Circadian server (for any CS-Bus device) has been suspended and the Circadian sequence is desired to be rejoined at the current time (as if it had never been suspended). ***Nevertheless, the solar tracking sequence will auto-start on the next programmed day without any new action.***

Lutron	Create a button to manually activate Step 3 here
	C Lutron ID Address Device Command Value 🗑📋 2304,1,3 2.1.1 LED SOLAR 240
Elan	Use latest drivers and search for SOLAR
RTI	Create a Raw command for SOLAR
Control4	Use latest drivers and search for SOLAR
Crestron SIMPL	Add the new command in the field to the driver

Solar Tracking (Circadian) Adjustments. If attempting to match a customized Lutron Natural Show or some other third-party circadian cycle, it may be necessary to adjust the **Properties/CIRCADIAN PEAK ELEVATION** entry. **PEAK ELEVATION** describes the degrees above the horizon when transitioning spectral colors cease and constant CCT (PEAK TEMP) light output is reached and maintained until the sun once again crosses the PEAK ELEVATION on the way to dusk. Increasing the **PEAK ELEVATION** entry extends the duration of the **Peak Temp** (CCT) plateau, while reducing the **PEAK ELEVATION** entry reduces the duration of the **Peak Temp** (CCT) output. The factory default is 10.00°. The recommended setting to match the un-modified Lutron Natural Show to Set Twilight to "Horizon"

Appendix C
Setup Example – Keypad to control discrete operation
(for more information and examples see expanded documentation)

Background on Control. For all supported Lutron UI controls, any button, slider, or event can be programmed within the e-Node/SLIM Table to operate in three distinct modes (see below).

Mode A (Just Lutron)	Mode B (Just CSI)	Mode C (Shared Lutron/CSI)
No impact on CSI devices	To control only CSI devices	To control Lutron + CSI together

Basic Example (for Mode B operation)

Enable button #1 on a 10-button desktop keypad (**HWR-T10RL**) to turn on supported linear strip/fixture to 2700K (with a **Z**one/**G**roup/**N**ode address of 2.1.1).

Note: this assumes the 10-button device has been programmed within Designer and the action of button #1 is for a Press. This button can always be used to control Lutron concurrently (if programmed through Designer to control some Lutron load) which makes this also a Mode C operation.

Button 1 will set CSI equipment to 2700K

Steps	Detail
Within the e-Node/**Lutron/Table** tab, select an unused row and enter information as applicable	ID: 10 desktop Button?: Button 1 Action: Press C Lutron ID Address Device Command Value 🗑📋 1430,3 2.1.1 LED CCT 2700 -under **Lutron ID**, right click and select your "desktop 10 button," then select button #1 and hit Upload ⬆ -under **Address**, enter Z.G.N of 2.1.1 (with periods) -under **Device**, right click and select "LED" -under **Command**, right click and pick "CCT" -under **Value**, enter 2700

Appendix D
Testing/Troubleshooting

e-Node   CSBus

Devices   Trace

"1430" is the keypad/button identifier

"0" is a Level trigger

"3" is a press

"4" is a release

Lutron Trace window. Select the **TRACE** tab within the Lutron area and monitor Lutron keypad button presses. The first number before the comma (i.e., 1430 above) relates to the specific Lutron keypad and button number, and the entry after the comma indicates the type (i.e., "3"--Press, "4"--Release, "5"—Hold, "6"--Multi-Tap). The **exact** entry in green must appear identically within the Lutron ID entry on a specific row on the Luton SLIM table for proper operation. Any inconsistency will cause a failure—either adjust the Table entry (or fix in Designer by adjusting the action that results from the operation of a button or event).

CSI Pilot Application Virtual Terminal tab. You can also download the Pilot application and use the Traffic Window to monitor Lutron button presses. See the troubleshooting section within the Lutron Integration Notes.

Appendix E
Common Mistakes

1	Forgetting to generate a UserName and Passphrae within Designer prior to commissioning the e-Node.
2	Enter commas instead of periods in Z/G/N address .
3	Forgetting to enter a **Value** within the Lutron Table for specfic oeprations. For instance, if you wanted to pick full brightness you would enter **SET** for Command and **240** for Value.
4	Entering the incorrect IP address for your primary QSX processor.
5	Entering a button Action within the Lutron Table that is inconsistent with what was programmed in Designer. Run Trace to see what is actually coming out of Lutron
6	Forgetting to activate an ILC-x00 or IMC-xxx controller under the CS-Bus tab with an appropriate Z/G/N address.
7	Forgetting to set a dissolve rate for particular Actions (such as from On to Off), if it is desired. Make sure you enter the dissolve rate in seconds within the Value column in Step 7. For Circadian enter in minutes.
8	Typing in a command in the Lutron Table (rather than selecting it with the pulldown) that is spelled incorreclty. Typically, commos might be used instead of periods for the Z/G/N or one of the data fields is wrong or not entered.
9	Installing the e-Node/xxx on a different subnet as the QSX processor.
10	Can't find a particular Lutron Table entry, Run the Sort shortcut to organize.