CONVERGING SYSTEMS

Integration Note

Automation/Lighting Panel Manufacturer:	Savant Systems
Platforms:	**Savant Pro and Smart Platforms**
Versions:	RacePoint BluePrint v 5.22 or newer Note: tested with Version 6.X and 7.1 as well
Specific Profile/Driver Version:	V3.12 or later (see our site for latest)
Download location for Profile/Driver	Savant dealer portal Note: current name is **converging systems_enode.xml** or **converging systems_ibt.xml**
Document Revision Date:	April 14, 2015

OVERVIEW AND SUPPORTED FEATURES

The Savant TrueControl applications and associated hardware support the Converging Systems' family of motor and LED lighting control products using either Ethernet (e-Node) or RS-232 serial connection (IBT-100).

Integration of the Converging Systems' controllers is enabled from iOS devices both locally and remotely. Additionally, status available from a number of Converging Systems' controllers can trigger commands and other events within the above automation system. For example, a motor movement can trigger a lighting event. Or a lighting command issued can signal back to the touchscreen device as to its current setting (slider movement or level setting).

CURRENT PROFILES SUPPORT THE FOLLOWING FEATURES

The following commands are supported by the current profile (except those that are grayed out).

LED Lighting Commands

General CS-Bus Commands	Description	ILC-100	ILC-400	e-Node DMX
General LED Control Commands				
ON	On	✓	✓	✓
OFF	Off	✓	✓	✓

EFFECT,1		✓	✓	N/A
EFFECT,n (>1)		✓	✓	N/A
STORE,#	Store	✓	✓	✓
RECALL,#	Recall	✓	✓	✓
DISSOLVE.1=XX	Set LED Dissolve Rate.1	✓	✓	N/A
DISSOLVE.2=XX	Set LED Dissolve Rate.1	✓	✓	N/A
DISSOLVE.3=XX	Set LED Dissolve Rate.3	✓	✓	N/A
DISSOLVE.4=XX	Set LED Dissolve Rate.4	✓	✓	N/A
SEQRATE=XX	Set LED Sequence Rate	✓	✓	✓
SUN_UP	Circadian Setting UP	✓	✓	N/A
SUN_DOWN	Circadian Setting Down	✓	✓	N/A
SUN.S	Set Circadian Rhythm	✓	✓	N/A
HSB (HSL) Color Space Commands				
FADE_UP	Brightness Up	✓	✓	✓
FADE_DOWN	Brightness Down	✓	✓	✓
SET,L	Brightness	✓	✓	✓
HUE_UP	-Hue Up and Adjust LED -Adjust LED Levels moves by step.	✓	✓	✓
HUE_DOWN	Hue Down	✓	✓	✓
HUE,H	Hue	✓	✓	✓
SAT_UP	Sat Up	✓	✓	✓
SAT_DOWN	Sat Down	✓	✓	✓
SAT_S	Sat	✓	✓	✓
STOP	????	✓	✓	✓
COLOR=H.S.L	????	✓	✓	N/A
PRESETH.X=XXX.XXX.XXX	Set LED Presets/HLS Color spacer for preset x	✓	✓	✓
RGB Color Space Commands				
RED,R	Red	✓	✓	✓
GREEN,G	Green	✓	✓	✓
BLUE,B	Blue	✓	✓	✓
WHITE,W	White	NA	✓	N/A
VALUE=R.G.B	Set three color output	✓	NA	N/A
VALUE=R,G,B, W	Set four color output	NA	✓	N/A
PRESET.X=XXX.XXX.XXX (3-color)	Set LED Presets/RGB Color spacer for preset x	✓	✓	✓
PRESET.X=XXX.XXX.XXX (4-color)		NA	✓	NA
STOP	Stop adjustment	✓	✓	✓
Correlated Color Temperature (CCT) Commands				
CCT,XXXX		✓	✓	N/A
CCT_UP		✓	✓	N/A
CCT_DOWN		✓	✓	N/A
Bi-Directional Commands				
COLOR=?	Automatic polling within Driver	✓	✓	N/A

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VALUE=?	Automatic polling within Driver	✓	✓	N/A
PRESETH.X=?		*	*	*
PRESET.X=?		*	*	*
Accessory Enode Command/Setup Parameters				
Verbose Mode				
UDP Port 4000/5000		*	*	*
Telnet Login with Authentication (with e-Node		✓	✓	✓
Telnet Login without Authentication		✓	✓	✓

Notes:
***When needed, these can be implemented with modifications to Profile.

Motor Commands

General Commands	Description	IMC-100	BRIC ("Bric Mode")
UP	UP	✓	✓
DOWN	Down	✓	✓
STOP	Stop	✓	✓
RETRACT	Retract	✓	✓
STORE,#	Store preset x	✓	✓
RECALL,#	Recall preset x	✓	✓
PRESET.X=XX.XX	Store value into preset location		
STATUS=?			
POSITION=?			
Verbose Mode		*	*
UDP Port 4000/5000		*	*
Telnet Login with Authentication (with e-Node		✓	✓
Telnet Login without Authentication		✓	✓

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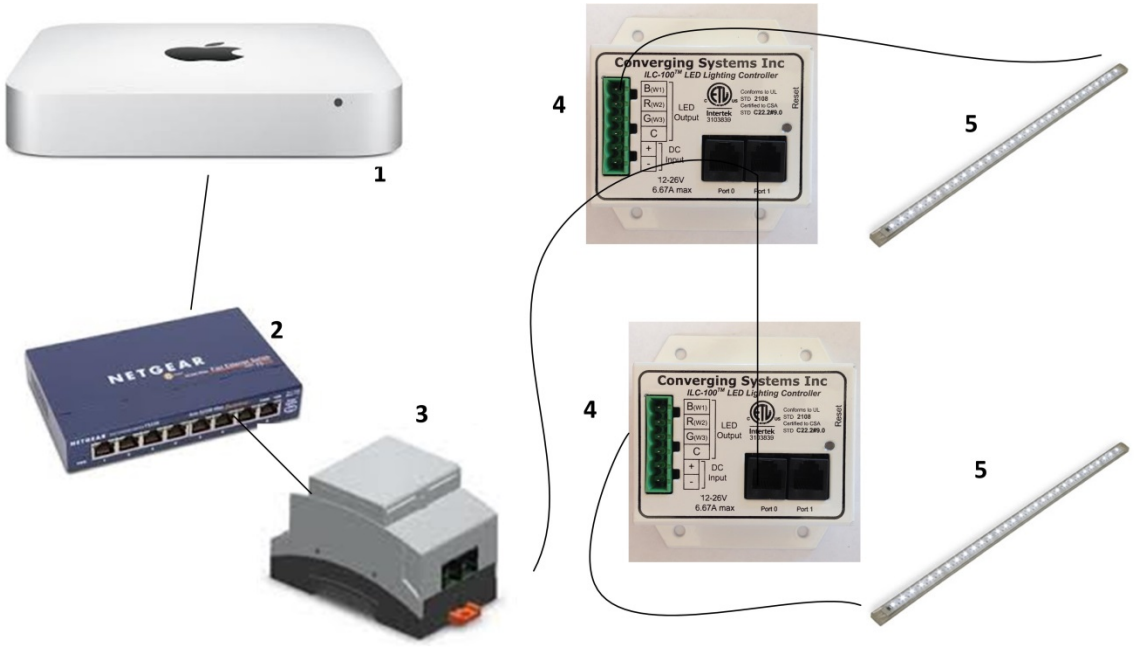
CURRENT PROFILES DO NOT SUPPORT THE FOLLOWING FEATURES

Other than any features that are grayed out below, the following features of Converging Systems' motor and lighting control devices are currently unsupported.

Any feature not specifically notes as supported should be assumed to be unsupported

WIRING DIAGRAM (for IP connection)



Wiring/Configuration Notes:

1. Maximum length of CS-Bus cabling from e-Node to the last ILC-x00 using CAT5e or better cabling (and obeying the 1-1 pin-out requirements for the RJ-25-RJ25 cable) = 4000 feet
2. Maximum number of ILC-x00 controllers and Converging Systems' keypads (if provided) that can exist on a single network connected to a single e-Node device = 254
3. Maximum number of e-Nodes that can exist on a Savant system = 254

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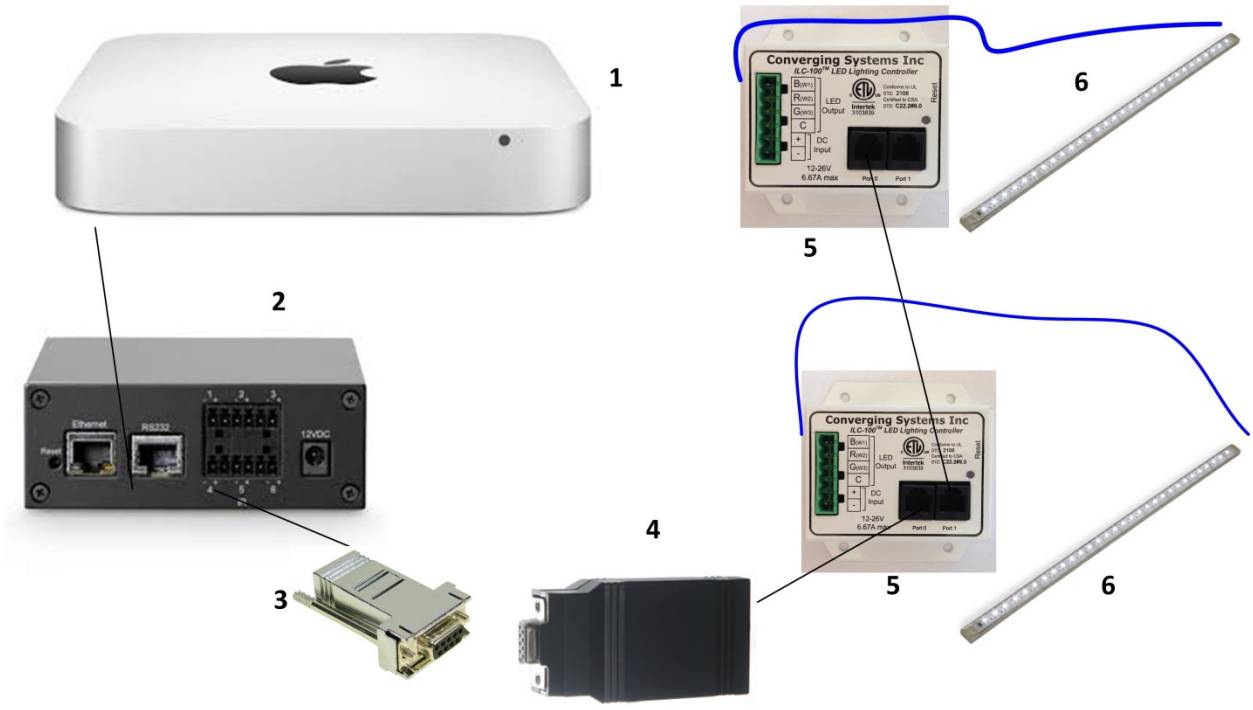
BILL OF MATERIALS (for IP control)

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	Savant Host (Pro or Smart)	Savant	Various	Ethernet/Serial/IR	various	
2	Network Switch	Various	Various	Ethernet	RJ-45	
3	e-Node	Converging Systems	e-Node	Ethernet	RJ-45 (for Ethernet) RJ-25 for local bus	
4	Lighting Controller (or Motor Controller)	Converging Systems	ILC-100 or ILC-400 or IMC-100 or (Stewart BRIC)	CS-Bus protocol	RJ-25 for CS-Bus communication	Must terminate beginning and end of bus with 120 ohm resister on pins 3/4
5	Flexible Linear Lighting (FLLA) RGB or RGBW luminaries	Converging Systems	FLLA-RGB-xxx FLLA-RGBW-xxx		3-color 4 pin 4-color 5 pin 1-color 4 pin	

WIRING DIAGRAM (for RS-232 serial connection)



Wiring/Configuration Notes:

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4. Maximum length of CS-Bus cabling from e-Node to the last ILC-100 using CAT5e or better cabling (and obeying the 1-1 pin-out requirements for the RJ-25-RJ25 cable) = 4000 feet
5. Maximum number of ILC-100 controllers and Converging Systems' keypads (if provided) that can exist on a single network connected to a single e-Node device = 254
6. Maximum number of e-Nodes that can exist on a Savant system = 254

BILL OF MATERIALS (for RS-232c connection)

<table>
<tr><th>#</th><th>Device</th><th>Manufacturer</th><th>Part Number</th><th>Protocol</th><th>Connector Type</th><th>Notes</th></tr>
<tr><td>1</td><td>Savant Host</td><td>Savant</td><td>Various</td><td>Ethernet/Serial/IR</td><td>various</td><td></td></tr>
<tr><td>2</td><td>SmartControl7 or similar</td><td>Savant</td><td>SSC-0007</td><td>RS-232c</td><td>RJ-45 (for serial)</td><td></td></tr>
<tr><td>3</td><td>RJ-45 to DB-9 connector</td><td>Savant</td><td>Straight Adapter</td><td>RS-232c</td><td>Pinouts
<table><tr><th>RJ45</th><th>DB9</th></tr><tr><td>4</td><td>5</td></tr><tr><td>5</td><td>2</td></tr><tr><td>6</td><td>3</td></tr><tr><td>7</td><td>8</td></tr><tr><td>8</td><td>7</td></tr></table></td><td></td></tr>
<tr><td>3</td><td>IBT-100</td><td>Converging Systems</td><td>IBT-100</td><td>RS-232c</td><td>DB-9 (for Serial)
RJ-25 for local bus</td><td></td></tr>
<tr><td>4</td><td>Lighting Controller (or Motor Controller)</td><td>Converging Systems</td><td>ILC-100 or IMC-100 or (Stewart BRIC)</td><td>CS-Bus protocol</td><td>RJ-25 for CS-Bus communication</td><td>Must terminate beginning and end of bus with 120 ohm terminating resister on pins 3/4</td></tr>
<tr><td>5</td><td>Flexible Linear Lighting (FLLA) RGB or RGBW luminaries</td><td>Converging Systems</td><td>FLLA-RGB-xxx
FLLA-RGBW-xxx</td><td></td><td>3-color 4 pin
4-color 5 pin
1-color 4 pin</td><td></td></tr>
</table>

System Configuration/Programming

Before proper operation between the Converging Systems' controllers and the SAVANT system can begin, it will be first necessary for most applications to configure the Converging Systems' products using the e-Node Pilot (PC-based) application (and the e-Node). In addition, communication parameters within the SAVANT BluePrint application are also required. Refer to the specified instructions below for the particular Savant subsystem for more information.

You may wish to go the topic that is most relevant for you (click on link).

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Background

The Converging Systems e-Node is an Ethernet communication device which can be used to connect the SAVANT Host to one or more Converging Systems motor and/or lighting controllers. Alternatively, the Converging Systems' IBT-100 serial interface device can be used alternatively to connect the same number of Converging Systems' controllers to a SAVANT processor in situations where Ethernet communication is not desired (but where bi-directional feedback is still required).

Regardless of which method (Ethernet or RS-232c) is desired to be used to communicate with Converging Systems' controllers, it is still suggested that initial set-up and commissioning of the controllers' addressing schemes and particular features are made using the e-Node Ethernet

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device and the e-Node Pilot application. Settings that can be implemented using this setup are as follows:

Overview

The Converging Systems e-Node is an Ethernet communication device which can be used to connect the SAVANT Host to one or more Converging Systems motor and/or lighting controllers. Alternatively, the Converging Systems' IBT-100 serial interface device can be used to connect the same number of Converging Systems' controllers to a SAVANT processor in situations where Ethernet communication is not desired (but where bi-directional feedback is still required).

Regardless of which method (Ethernet or RS-232c) is desired to be used to communicate with Converging Systems' controllers, ***it is still suggested that initial set-up and commissioning of the controllers' addressing schemes and particular features are made using the e-Node Ethernet device and the e-Node Pilot application***. Settings that can be implemented using this setup are as follows:

e-Node Programming/Device Programming

Min requirements for this operation

- Computer running Windows XP or later OS, preferably with a wired Ethernet connection to a local router using CAT5 type cabling
- Converging Systems E-Node Ethernet adapter connected using CAT5 cabling to the above router.
- Download of the latest version of e-Node Pilot application, unzipped and operating on your computer platform
- Powered up and connected ILC-x00 controller using straight thru (1-1) wiring using a 6-pin RJ-connector (Do not use 568A or 568B wiring and simply chop off the browns because this does not preserve twisted pairs on pins 1 / 2, 3 /4 , and 5/ 6 which is required).

Recommended RJ-25 6P6C connections 6 wires		
e-Node Side	**ILC-x00 side**	**Color of wire**
Pin 1	Pin 1	blue
Pin 2	Pin 2	Blue/white
Pin 3	Pin 3	Orange
Pin 4	Pin 4	Orange/white
Pin 5	Pin 5	Green
Pin 6	Pin 6	Green/white

Suboptimal RJ-11 4P4C connection 4 wires		
e-Node Side	**ILC-x00 side**	**Color of wire**
Pin 1	Pin 1	Orange
Pin 2	Pin 2	Blue
Pin 3	Pin 3	Blue/white
Pin 4	Pin 4	Orange/white

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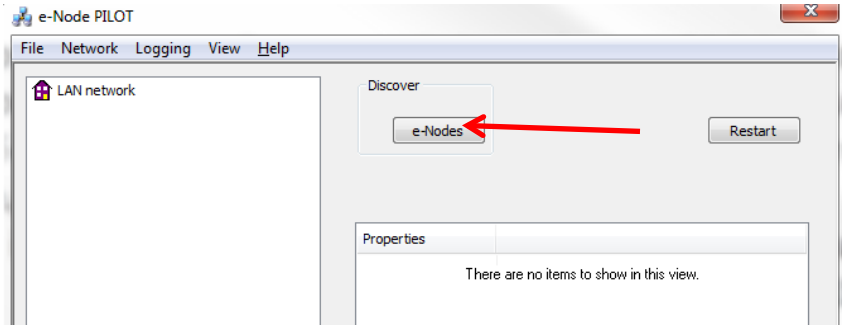
Note: For the purposes of commissioning if *you do not have* 6P6C RJ-25 connectors, you can use standard 4-pin RJ11 connectors, but follow the wiring directions above preserving twisted pairs on Pin 2/3 and Pins 1 /4. **This cable will not work for keypad communication or IBT-100 communication**.

Please follow the below steps under "**e-Node Programming**" when using the e-Node for Ethernet communication

No special steps need to be followed to commission an IBT-100 for RS-232c communication.

However, in all cases it recommended that you follow the steps under "**ILC-100/ILC-400 Programming**" regardless if you are using the **e-Node** for Ethernet communication or the **IBT-100** for serial communication.

e-Node Programming

Step	Setting	Choices
EN-1	**e-Node IP Address** setting Set up the e-node with an appropriate Static or Dynamic IP address. Refer to the separate "e-Node Quick Start Guide" on how to make such settings.	Static or Dynamic Addressing -Launch the e-Node Pilot application.  -Select the **View e-Node** tab and select the Discover **e-Node** button**.** Any e-Node(s) connected on the same network will appear as shown.

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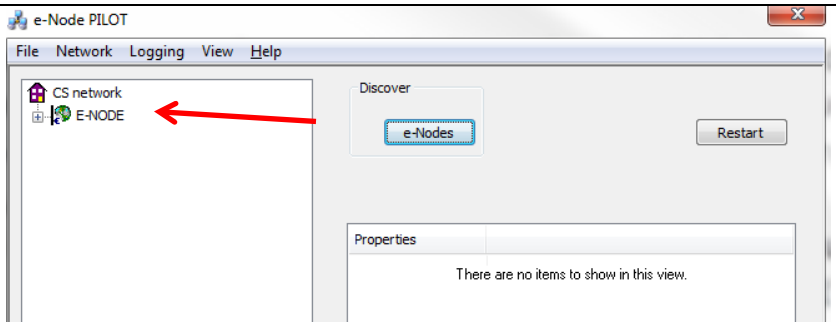
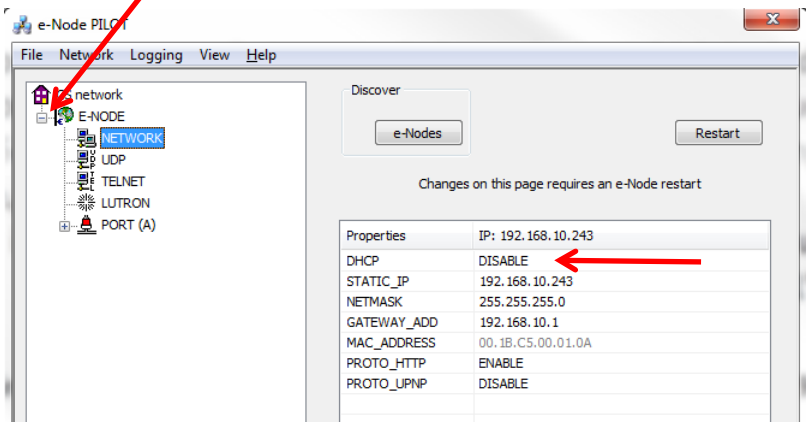


-Select the **+** mark in front of the e-Node found to expand the menu.

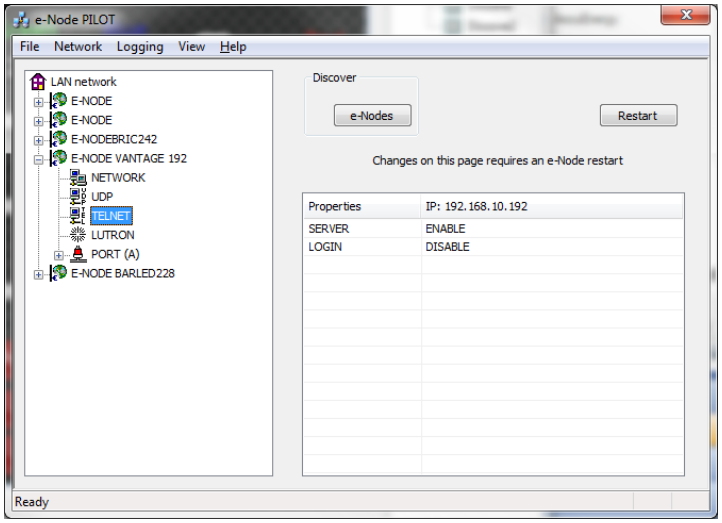


-Review the **DHCP** entry, the factory default is ENABLE which means **DHCP** is activated. DISABLE for **DHCP** refers to static IP addressing. If you wish to set a **STATIC** IP address, enter the following variables ***in the order specified below:***

STATIC_IP	xxx.xxx.xxx.xxx	Your new static IP address
GATEWAY_ADD	xxx.xxx.xxx.xxx	Typically the address of your network's gateway
FINALLY ***and only after you have set the above variables***, select **DHCP**	And Set to **DISABLE**	Now reboot the e-Node for this to take effect.

-Note: It is recommended that only STATIC addressing be used with the SAVANT processors.

EN-2	**TELNET Port**	Depending upon the functionality of the SAVANT driver and the

	(transmit and receive) **Note**: Communication to the e-Node is also possible using UDP (Port 5000 for Sending from Savant and Port 4000 for Receiving from Savant). You may wish to select UD (by editing the eNode Profile) if the single TELNET SERVER port within the e-Node is being used for alternative purposes (another control system).	installer's specific settings, the suggested communication protocol between Savant the e-node is Telnet Port 23 communication (with or without Login). You will need at minimum (i) to turn on **Telnet** within the e-Node, and (ii) to adjust secondarily the setting for **Login** as required by the SAVANT driver. 1) Select the **View e-Node tab** and select the **Telnet tab**. Set **SERVER** to **ENABLE**. 2) Login Settings. a) If Telnet communication with Login ***is supported***, set **LOGIN** to **ENABLE** and select the **Restart** button for the particular e-Node that you are utilizing to communicate with the SAVANT system. b) If Telnet communication with Login is ***unsupported***, set **LOGIN** to **DISABLE** and select the **Restart** button for the particular e-Node that you are utilizing to communicate with the SAVANT system. 

Step	Setting	Choices
DV-1	**ILC-x00 Discovery** and **Address Setup**	More thorough documentation of this step can be found in the *e-Node Commissioning Guide* referenced in Step EN-1 above. However for document completeness, an abridge version of this guide is summarized below. Background. From the factory the **ILC-x00** controllers do not have an assigned UID (unique ID) address. Units come equipped with a factory default address of **Zone**=2, **Group**=1, and **Node**=undefined or a 0. If you set up your SAVANT system to communicate with an ILC-x00 with an address of **2.1.0** the ILC-x00 will react but it will not provide feedback data which is required for automatic slider updates within the SAVANT systems. ***Therefore, it is advisable to set up a non-zero address for each ILC-x00 controller that is connected to either an IBT-100 or an e-Node.*** The directions below indicated how to perform this operation. (See **Step 2b** below as well as **Appendix 2** for more information on **Z**one/**G**roup/**N**ode addressing.) Process. (1) Power on the e-Node and any connected ILC-x00 controllers. (2) Launch the Pilot application and select the Discover **e-Node** within the **View Map** tab. (3) Now, under the **UID** window, select and enter a unique UID number/address (good to start with 1 and work upwards but never use a duplicate number) and select **Set**.

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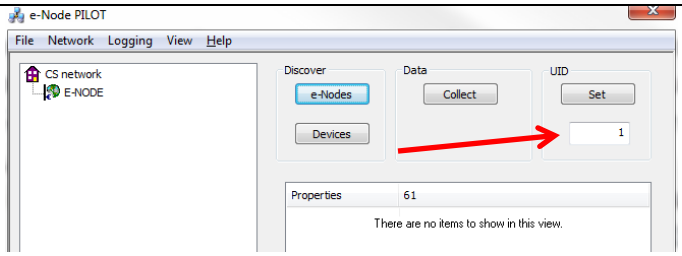

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4) You will now need to hit the discovery button on your respective controller. Now close down the pop-up menu.

5) Now you will need to depress for approximately ½ second the "Discovery/Reset" button on an ILC-x00 controller for the unit to become programmed with the selected UID address. See the appropriate section for your particular device.

- **ILC-100.** Take a larger type paper clip or similar device and **gently** insert it into the reset/discovery hole on the side of the chassis and press the momentary button that you will feel for ½ second and then release. The existence of the ILC-100 will appear under the e-Node entry within Pilot.
- **ILC-400**. Remove the white plastic protective shroud to the left of the dual RJ-25 connectors with your finger nail or a small flat-headed to expose a push button mounted to the PCB. Depress the pushbutton for ½ second and then release. The existence of the ILC-400 will appear under the e-Node entry within Pilot

-If you have more than one connected controller (ILC-100 or ILC-400) continue this process until you have **Discovered** all devices. In the example below, three ILC-100 devices have been Discovered or found.

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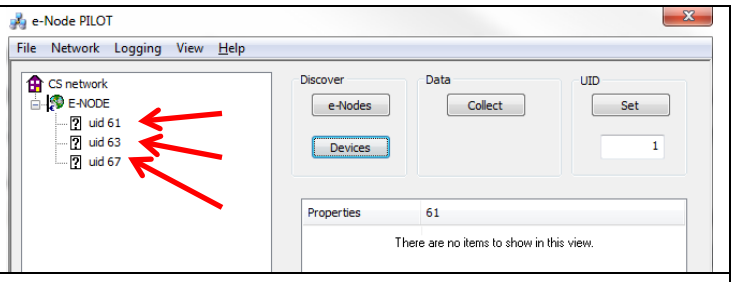
<table>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>DV-2</td><td>Notify Mode</td><td><u>Background</u>. Should you be implementing Color and Dimmer sliders within your project, the Savant system needs to receive color data back from the Converging Systems' controllers in order to update Savant's resources to automatically move the sliders and/or provide data within an Infobox. The SAVANT software is able to receive such color state information broadcast by Converging Systems' controllers whenever there is a color/lighting state change.

In order to activate this feature within Converging System's controllers, it is necessary to first turn on the appropriate NOTIFY function within the targeted controller (under the LED entry). By default from the factory, NOTIFY is set to OFF to reduce the amount of bus traffic. It is recommended that one of these NOTIFY functions is utilized in any integration with SAVANT's products. These choices are as follows:

<table>
<tr><td>HSB color data</td><td>NOTIFY=COLOR</td></tr>
<tr><td>RGB color data</td><td>NOTIFY=VALUE</td></tr>
<tr><td>HSB and RGB color data</td><td>NOTIFY=BOTH*</td></tr>
</table>

*note: this feature is newly added in V3.14 of ILC-100 firmware. However, if is recommended to reduce bus traffic, that either HSB sliders (with NOTIFY=COLOR chosen), or RGB sliders (with NOTIFY=VALUE chosen) should be used on a user interface. If it is absolutely required that both RGB and HSD sliders are implemented within the Customer User Interface (and NOTIFY=BOTH is chosen), there may be cases where the preponderance of bus traffic received from the LED controller might interfere with valid commands transmitted onto the bus. Although this rare, it may occur.</td></tr>
</table>

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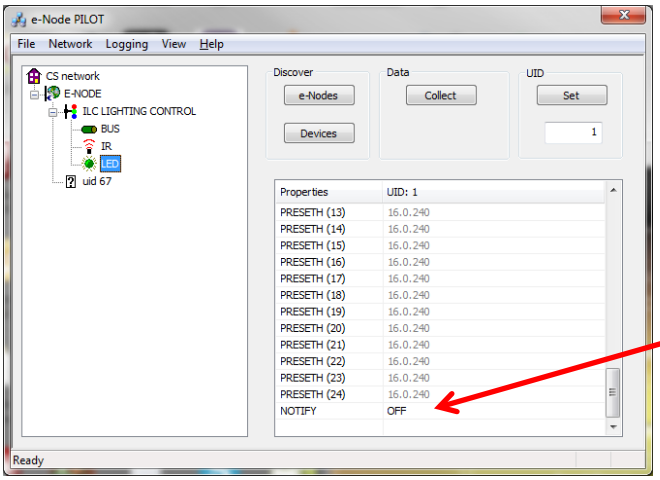
Process. Within the e-Node Pilot application, select each controller (i.e. ILC Lighting Controller) that you wish to adjust from the **View Map** tab. Then open the **LED** tab. Find the **NOTIFY variable,** and set it to **OFF.** This will prevent the selected controller from broadcasting its status after every state change therefore reducing CS-Bus traffic.



Note: Prior to V 3.15 of the ILC-100 firmware, it is necessary to reboot the ILC-100 for this new setting to become active after it is changed. For versions 3.15 or later, simply changing this value within Pilot is sufficient.

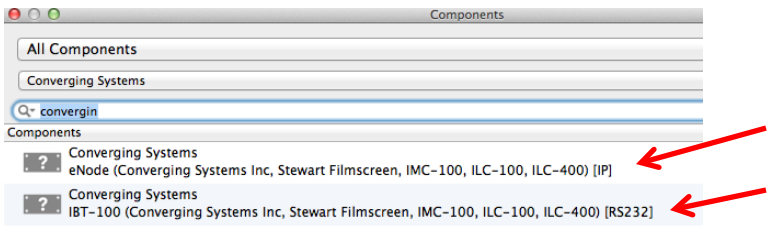
Legacy Firmware Note: Earlier version of Converging Systems' color controllers did not support the **NOTIFY** function. In those cases, there is an entry within the Savant e-Node profile that can turn on alternatively the ability for the Savant software to automatically poll Converging Systems' controllers every x milliseconds to receive the necessary information to update Savant's resources. In order to make these changes, you must be able to edit a Savant Profile. Here are the original values in the Profile and the suggested changes if needed.

		<table><tr><th>Setting</th><th>Default Setting</th><th>Proposed Setting</th></tr><tr><td>GetLightLevcel</td><td>86400000ms</td><td>1000 ms</td></tr><tr><td>GetRGBLevels</td><td>86400000</td><td>1000ms</td></tr></table> *With current Converging System' controllers, there really is no need to ever change this function for the Converging Systems controllers automatically broadcast current color state information ONLY upon a sate change to minimize traffic on the bus. You should only make these changes if you have a legacy version of ILC-100 firmware.*

SAVANT Programming

Below is a summary of those steps required to integrate the Converging Systems' e-Node Ethernet adapter/firewall and one or more loads (motors or lighting). Screen shots are provided for additional information. Typically, the following features are set-up within the SAVANT commissioning software.

1. Import Converging Systems Intelligent Lighting Controller into your project

Step #	Step Overview	Detail
1a	Select Show Library	Select Converging Systems Proflie for either the e-Node (Ethernet) or IBT -100 (RS-232c) and drag within the applicable room or zone. 
1b	Place appropriate communication device into the appropriate Room or Zone.	Drag selected communication device into appropriate room or zone.

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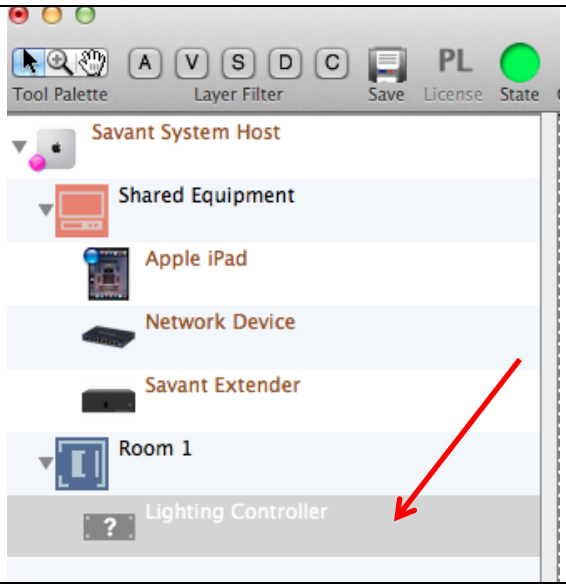
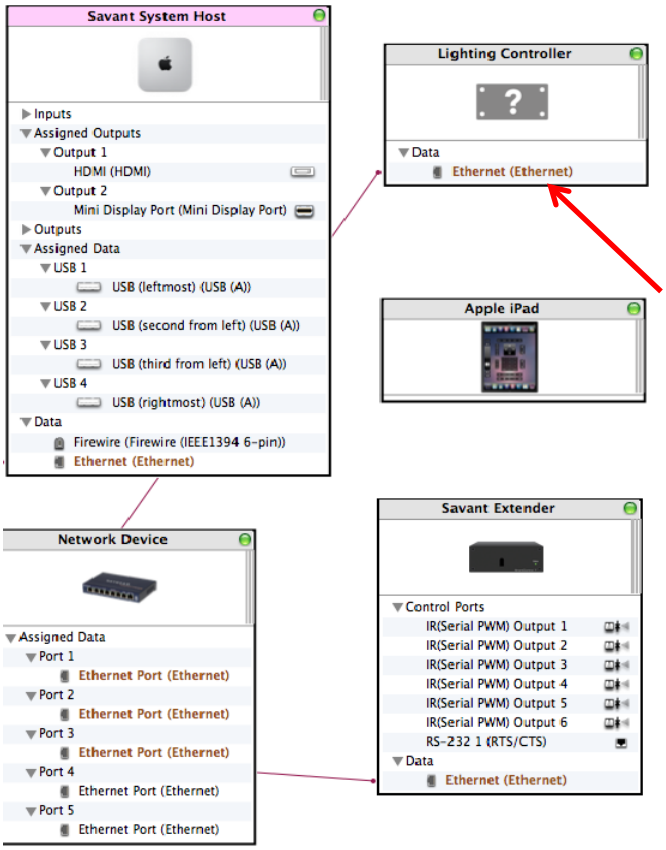
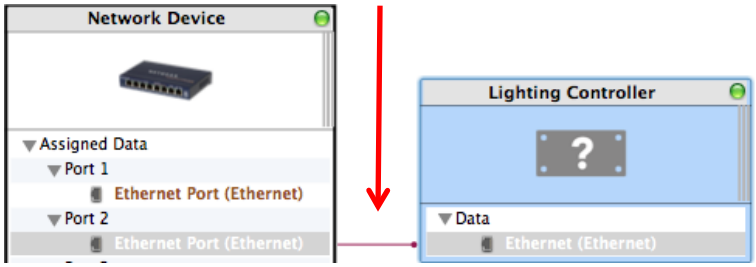
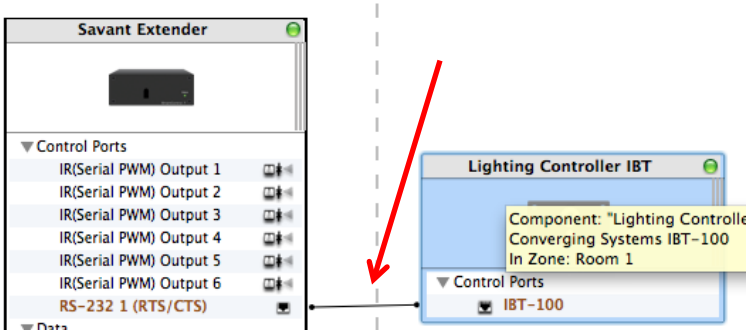
		
1c	Populate your workspace with the Converging Systems device.	Drag Converging Systems communication device to an appropriate location on your workspace 

1d	Make connection from Communication Device to Savant system.	Drag connection from Converging Systems' communication device to appropriate IP device or Serial device depending upon the type of Converging Systems' communication device selected IP Connect wire from Converging Systems' e-Node to available Port on a Network Device.  RS-232 Communication Connect wire from Converging Systems' IBT-100 to available Serial Port on a Savant Extender (and make sure you have actually plugged in the IBT-100 into that serial port). 

2. Set-up communication parameters for the Converging Systems Intelligent Lighting Controller

Step #	Step Overview	Detail
2a	Set-up communication parameters for the Converging Systems interface(**e-Node IP device or IBT-100 serial device**) that will be used with one or more Intelligent Lighting Controllers	Determine what will be the communication linkage that you will use to connect to the Converging Systems' device. -If using IP/ Ethernet control (**TCP/IP** Client communication from Savant) to the e-Node, proceed to **Step 2b** below.

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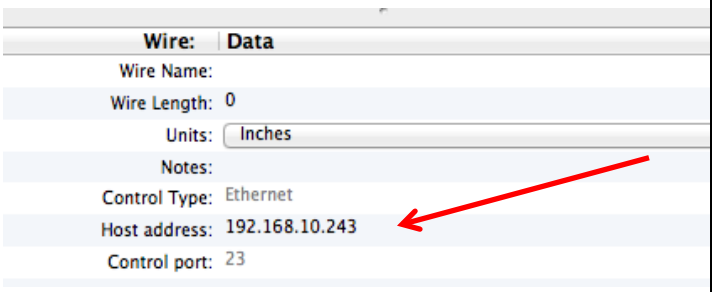
<table>
<tr><td></td><td></td><td>-If using Serial (IBT-100) control (RS-232 Client communication from Crestron) to the IBT-100, proceed to Step 2d below.</td></tr>
<tr><td colspan="3">Directions Relating Specifically to IP Control for the e-Node</td></tr>
<tr><td>2b</td><td>Set up the appropriate IP address for the e-Node.</td><td>Single click on Lighting Controller Heading to illuminate the device, and then click on Ethernet to expose the Host Address entry. Enter the IP address for the e-Node that was set-up earlier within Step EN-1.
 
</td></tr>
<tr><td>2c</td><td>Set up Telnet User Name and Telnet Password</td><td>The Savant Profile permits making changes to the Telnet Username and Password. Consult Savant for more information here.

The default names from Converging Systems are
<table><tr><td>Username</td><td>E-NODE</td></tr><tr><td>Password</td><td>ADMIN</td></tr></table>(these are case sensitive)

Now, proceed to Step 3 below</td></tr>
<tr><td colspan="3">Directions Relating Specifically to RS-232c Control using the IBT-100</td></tr>
<tr><td>2d</td><td>Verify the appropriate RS-232 communication information is set up for the IBT-100.</td><td>Double click on Lighting Controller Heading to illuminate the device. Within the Control Connector section, verify the Supported baud rate of rate of 57600 is entered. (Other baud rate settings of Data Length=8, Stop Bits=1, Parity=None, Flow Control=none should all be set.)</td></tr>
</table>

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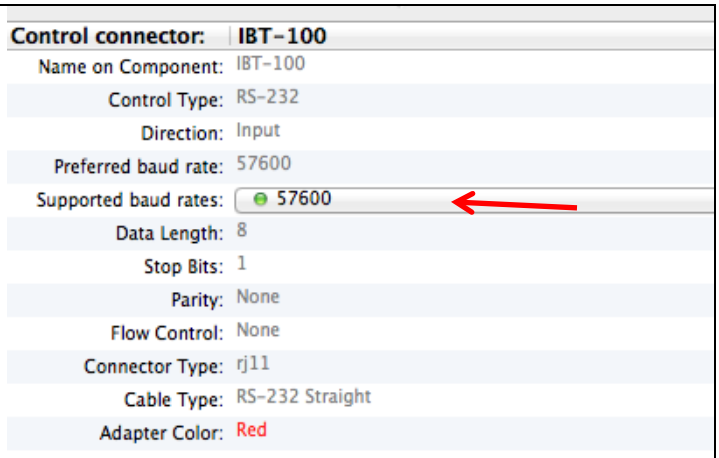
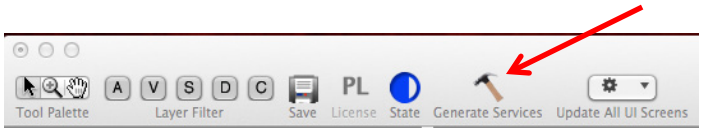
		 Here are the standard defaults which should be provided above. RS-232C Serial Parameters Baud Rate: **57600** Data Bits: **8** Stop Bits: **1** Parity: **N** Comm. Std.: **RS232** Handshaking: **(None)** SW: **(None)**
2e	Proceed to next Section	Now proceed to **Step 3a**.

3. Generate Services for desired actions of buttons and associated workflows.

Step #	Step Overview	Detail
3a	For every button or slider action, it is advised to generate (i) Service Requests and associated (ii) Workflows in advance of actually programming your buttons/sliders. Let us create a few standard Service Requests for standard functions in this section. After these Service Requests are	-Select the **Generate Services** tab within BluePrint. **Services** for the Lighting Controller will be generated.  -Under **Service Requests**, select the "**+**" icon and start adding names for each action that you wish to add. After you create the first Request, once again select the "**+**" icon and continuing adding all **Requests** for your project.

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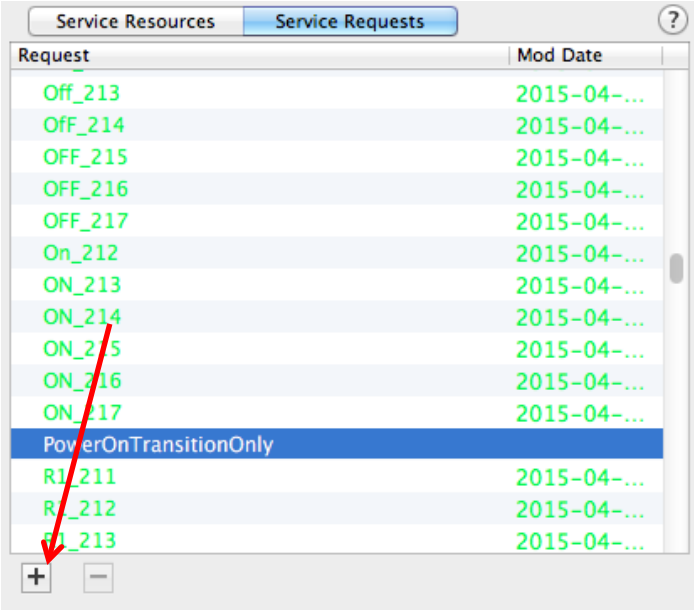
	established , we will generate associated Workflows (see **Step 3b** below) **Note**: Alternatively, you may choose in import the sample Converging Systems Config file which includes virtually every Service Request available as well as associated Workflows for up to 7 loads (working with one e-Node for instance) are provided. This will expedite your programming efforts. The sample project can be found at: http://www.convergingsystems.com/inres_savantav.htm	**Note**: Please remember that you will be supporting multiple lighting (or motor) loads; you will need to generate a ***unique*** request for each load.  Here is an example of **Services Requests** that should be generated if you will have 3 loads with typical buttons associated with each load. For each of troubleshooting and programming, it is advised to add the **Z**one/**G**roup/**N**umber address for each Service Request within the name itself. For more information on Z/G/N address see Appendix 2. **Service Requests suggestions for first load with address of 2.1.1 (Zone = 2, Group= 1 and Node= 1)** LED ON_211 LED OFF_211 SET HUE_211 SET SAT_211 SET FADE_211 RECALL1_211 RECALL2_211 STORE1_211

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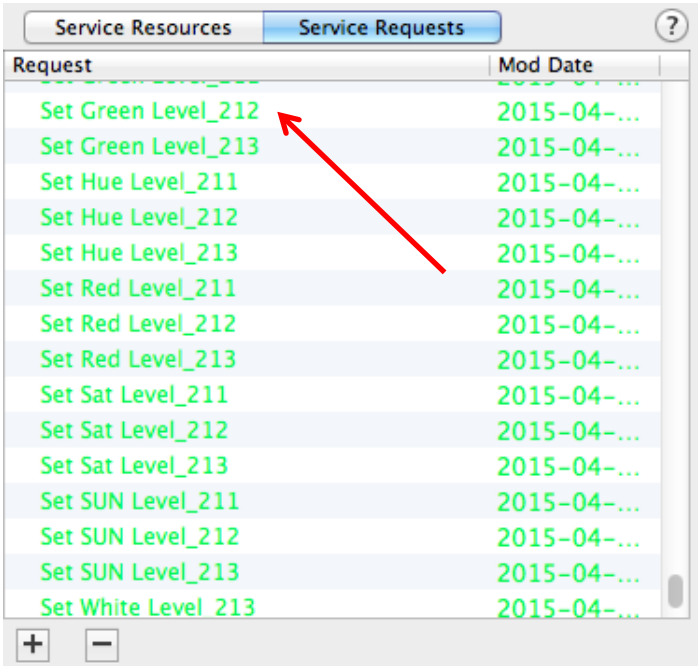
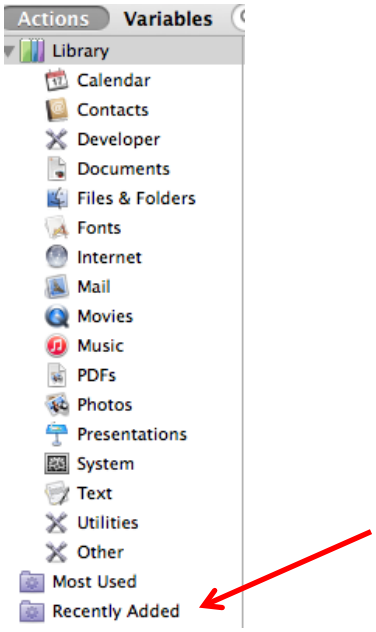
		STORE2_211 EFFECT1_211 **Service Requests suggestions for second load with address of 2,1,2 (Zone= 2, Group= 1 and Node= 2)** LED ON_212 LED OFF_212 SET HUE_212 SET SAT_212 SET FADE_212 RECALL1_212 RECALL2_212 STORE1_212 STORE2_212 EFFECT1_212 **Service Requests suggestions for third load with address of 2,1,3 (Zone=2, Group= 1 and Node= 3)** LED ON_213 LED OFF_213 SET HUE_213 SET SAT_213 SET FADE_213 RECALL1_213 RECALL2_213 STORE1_213 STORE2_213 EFFECT1_213

3b	Let us create **Workflows** using **Automator** for each **Service Request** established above in **Step3a.** We first associate a Service request for a particular Workflow which we will complete in the next step.	-Double click on the first **Service Request** to expose the **Workflow** menu.  -After you select a previously entered **Service Request** you will see this next screen.  -Select **Recently Added** to expose the targeted

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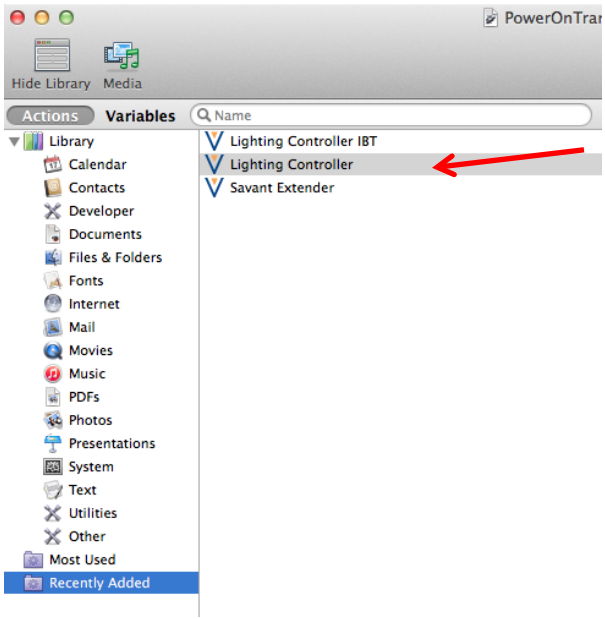
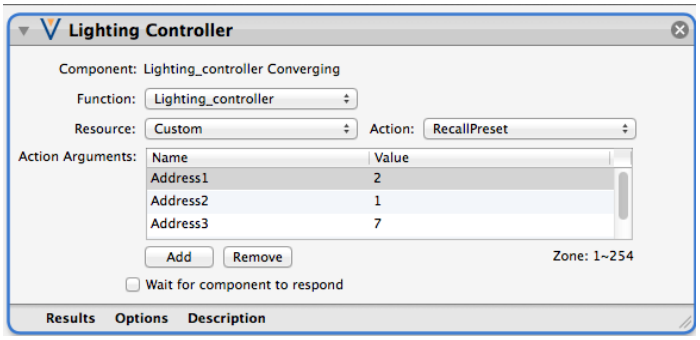
		controller (typically if the controller was recently added, it will appear here). In this case, it is the **Lighting Controller**.  -Finally, you will see the **Automator** screen for the **Lighting Controller** selected.  -Now proceed to the next step to program the specifics for the **Lighting Controller** selected.
3c	Now, we will customize the particular load within **Automator** for the particular **Savant Profile** supported command and targeted **Z**one/**G**roup/**N**ode address and any additional command parameter required.	<u>-Function</u> One or more Functions may be supported in the Converging Systems Profile. For lighting loads, select **Lighting_controller** from the pull-down box.

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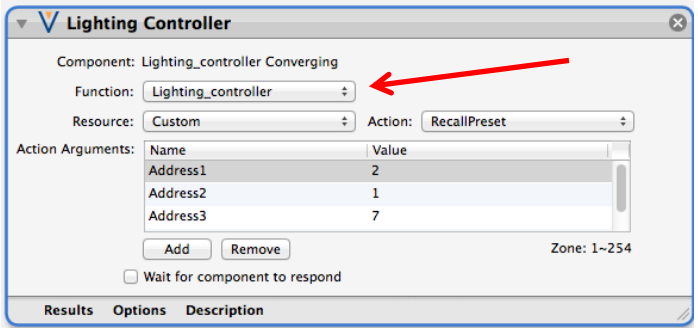
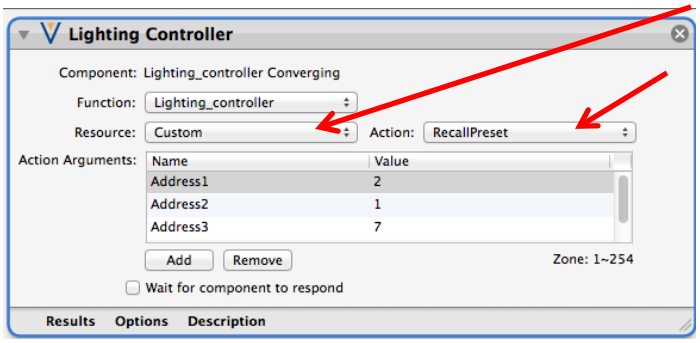


-Resource

One or more **Resources** are supported in the Converging Systems Profile. Currently three Resources are available. Depending upon the **Resource, *specific Actions can only be found and selected***. Therefore, make sure you select the correct Resource of else you will not find the targeted Action. Pick **Custom** to program a Recall Preset Action.



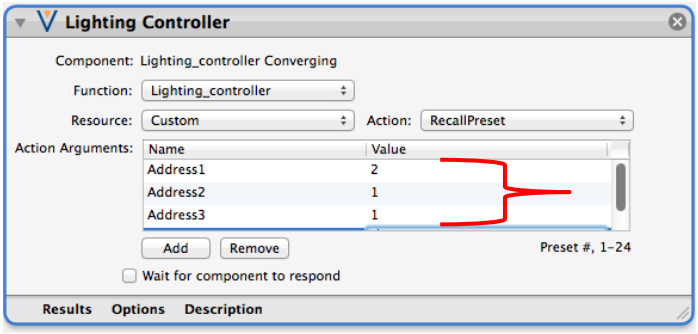
-Action Arguments

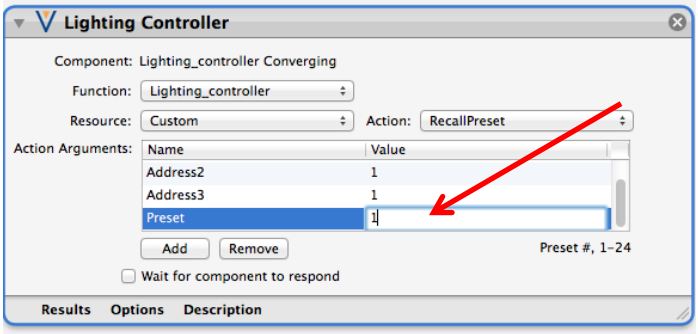
The final section of this step involves filling in parameters for the **Z**one/**G**roup/**N**ode address of the targeted load and other remained/required parameters. The format for this section is as follows.

Resource	Type of Values	When present
Address1	Zone address (1-254)	Always
Address2	Group address (1-254)	Always
Address3	Node address (1-254)	Always
Special Argument	Numerical depending upon the function	Only when action

		"X"	which might require it. Examples include Recall Preset X, Store Preset X, Set Saturation Level X, etc.	requires data entry	

In our Example for a device with a **Z**one/**G**roup/**N**ode address of 2.1.1 and for a Recall of Preset #1 the data entry would be as follows:

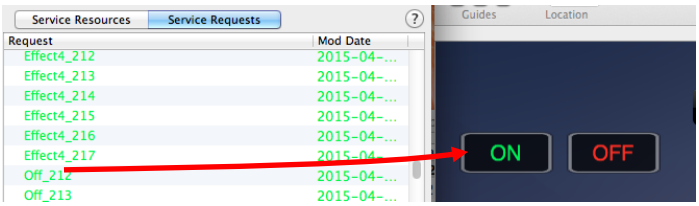




Proceed now to the next step

3d	Continue Workflow creation for EVERY **Service Request** that will be programmed for the Lighting Controller within your project	-Continuing creating **Workflows** for every Service Request by following the steps in the above example. When completed we are now ready to attach a **Service Request/Workflow** to all buttons desired to be added to your GUI. Note: ***If any Service Request is not programmed using the Workflow menu, that operation will fail to operate.***

4. Attach Service Requests/Actions to one or more buttons that you have created (for Sliders see Section 5)

Step #	Step Overview	Detail
4a	You can create a user interface (UI) for your system that is suited to your customer's requirements. This **Integration Note** will not focus on the creation of unique pages for your particular project, but will focus on attaching Service Requests/Actions to buttons that you have already created. Let us create a fully programmed button that will turn LEDS On. ***It is suggested that you open the Converging Systems sample Project to see an entire functioning project. This will save time for the first time programmer of our controller products. .***	-Within Inspector, select **Screens** and your user interface. Select a standard (non-toggle) button for LED On. -On an adjacent screen open **Services** such that you can drag a particular previously generated **Service Resource** with **Workflow** on top of your targeted button. 
4b	Continue dragging all other **Service Requests/Actions** to all other buttons that you desire to have operate CS-Bus devices.	Follow above directions until you are finished here. If you desire any bi-directional Sliders and Infoboxes proceed to **Section 5.**

5. Attach Service Requests/Actions to one or more Sliders that you have created (and Infoboxes)

Step #	Step Overview	Detail
5a	Let us create a set of three sliders for the control of RGB full color LEDS. The three sliders will be **Hue/Saturation and Fade**. Although you can easily program sliders for **Red/Green/Blue** this is not	-Within Inspector, select **Screens** and your user interface screen. Select a Lighting Slider for **HUE** adjust (Hue is a more technical name for color, so HUE will enable a user to pick from a palette of millions of colors quickly and without knowledge of color science).

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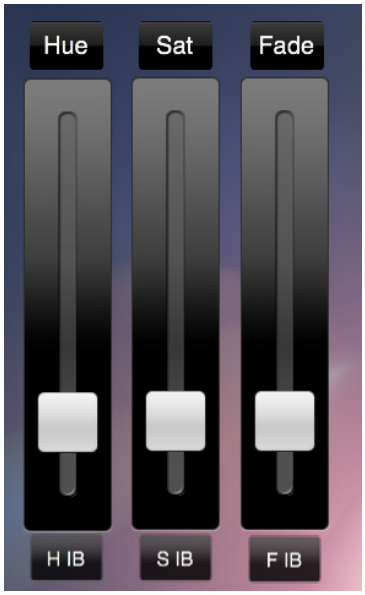
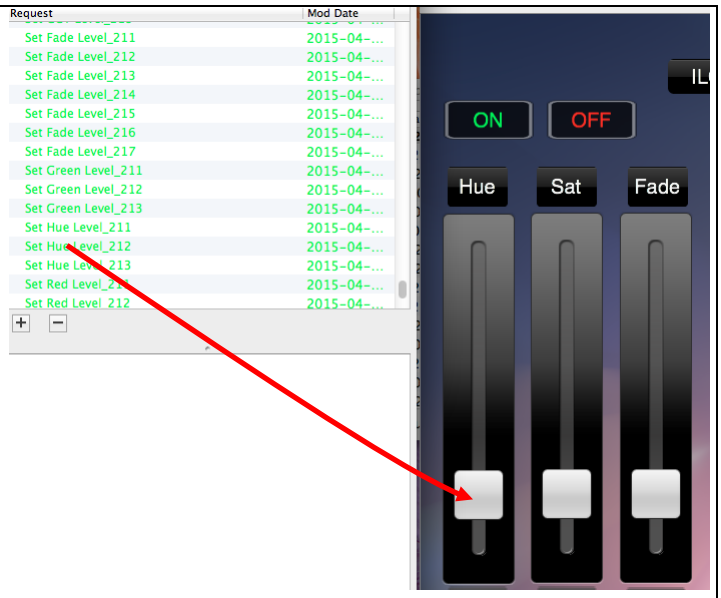
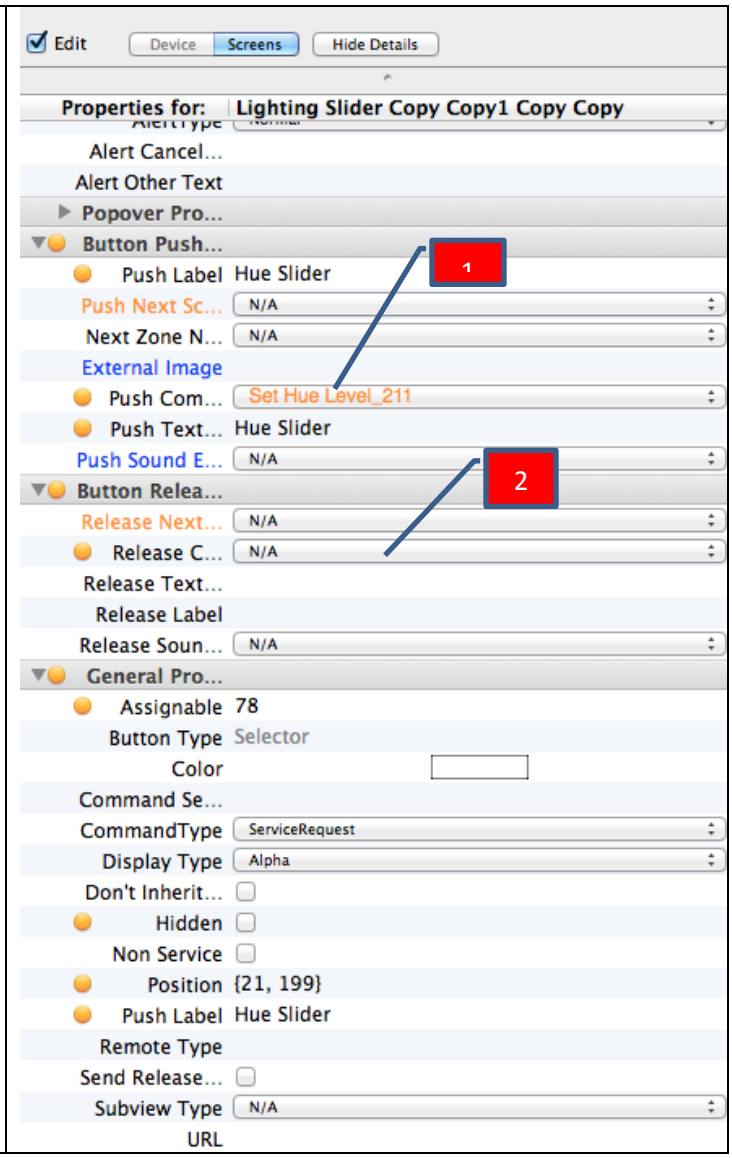
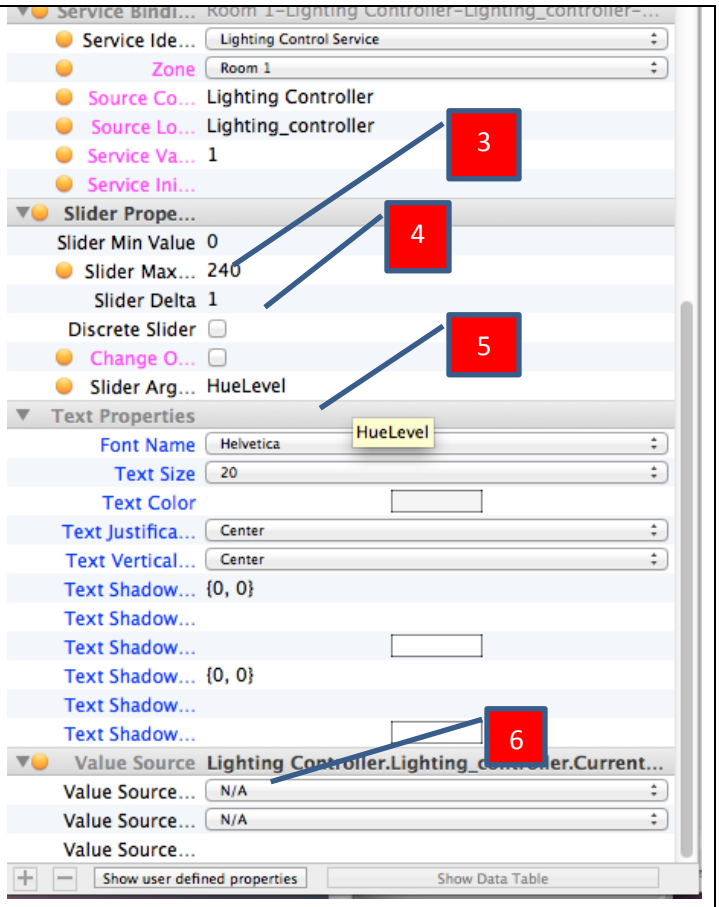
	recommended for the RGB color space has no concept of FADING which is most important for more of our customers. **Note**: If you wish to program Red, Green, Blue sliders simply add additional sliders and follow these same directions but use alternative Argument types as summarized in Step 5 c below.	-Similarly, add in another slider for **SATURATION** adjust (which removes or adds white to a particular hue). -Finally, add in another slider for **FADE** adjust (which is the standard type dimmer with which we are familiar). 
5b	In this step, let us begin the steps to program the sliders to invoke an Action. **Note**--In the next step we will program them to move as a result of color and light output changes within the Converging Systems CS-Bus controllers (bi-directional communication).	-On an adjacent screen open **Services** such that you can drag a particular previously generated **Service Resource** with **Workflow** on top of your targeted slider.

		 -Drag **Set Hue Level_212** on top of the **Hue slider** to program the Hue slider to send variable **HUE** data to the Converging System's controller. -Repeat the above step for each additional slider that you wish to commission.
5c	Now we are ready for the hand tweaking process to finish up the programming of sliders.	-Click on your first slider (i.e. Hue) to open the Inspector. Here is an example of what you will see. Items referenced with Red boxes will be hand tweaked below.



-<u>Item 1 & 2 Push Command/Release Argument</u>
Dragging **Service Resources** onto a slider (currently) places that **Service Resource** as a **Release Command**. **You must manually transfer that specified Release Command to a Push Command.** Data that is programmed onto a Release Command will not transfer variable data to the Converging Systems controllers. **The final product should appear as #1 and #2 above.**

-<u>Item 3 & 4 Min/Max Slider Arguments</u>
Depending upon the range of the specific slider to be brought into the Savant system, you must enter the specified Minimum and Maximum value below. Failure to enter the correct Min/Max values will render the slider faulty in its operation. Those entries which will need to be altered as heighted in

yellow below. **The final product should appear as those numbers detailed below.**

Variable	Min	Max
HUE	0	**240**
SATURATION	0	**240**
FADE	0	**240**
RED	0	***240***
GREEN	0	***240***
BLUE	0	***240***
WHITE	0	***240***
CCT (Color temperature)	**1700**	**7000**
SUN (Circadian Rhythm)	0	**240**

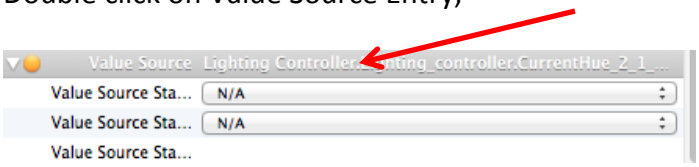
-Item 5 Arg Value-**MOST IMPORTANT**

This is the most common error in programming. This entry must be added, REPEAT ADDED. You must enter the exact command that is contained in the Savant Profile for all slider commands. The syntax for those commands is below. **The final product should appear as those "Savant Profile Actions" in bold below.**

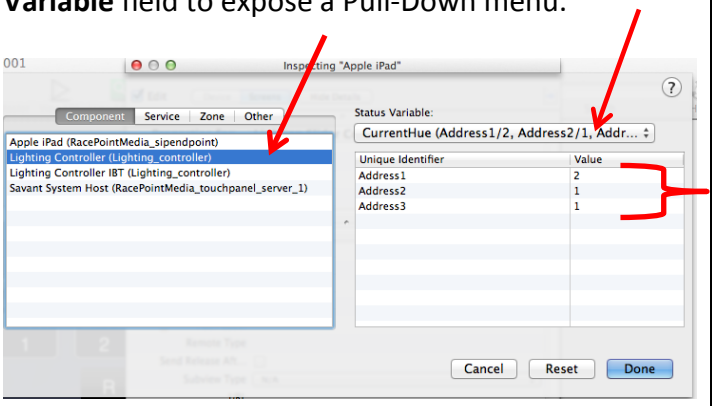
SAVANT PROFILE ACTION	Generic Reference (do not use as the Arg Value)
HueLevel	Hue Slider adjustment
SaturationLevel	Saturation Slider adjustment
DimmerLevel	Fade Level adjustment
Red	Red adjustment
Green	Green adjustment
Blue	Blue adjustment
White	White adjustment (for the ILC-400 controller only)
CCTLevel	Correlated Color temp adjustment
SUNLevel	SUN or circadian adjustment (for the ILC-400 only)

Item 6 Value Source(Bi-directional source data)

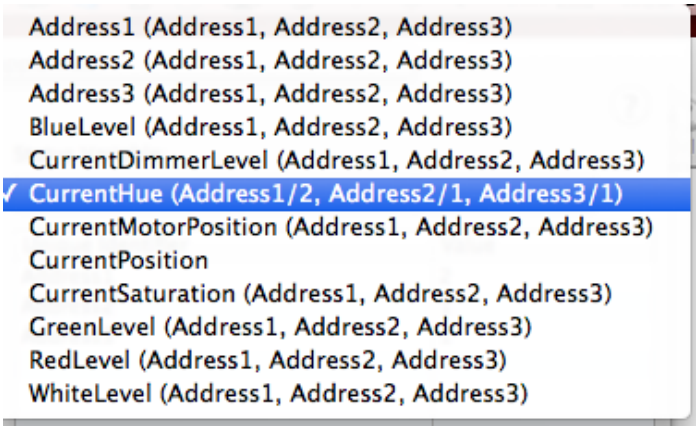
Double click on Value Source Entry,



And this screen will appear. Make sure the correct **Component** is selected and then select the **Status Variable** field to expose a Pull-Down menu.



The Pull-Down menu will expose the following choices. Select the appropriate argument for the specific bi-directional feedback that you want this slider (or Infobox) to monitor. Be sure to enter the appropriate **Z**one, *G*roup, **N**ode address in the prompt boxes. Hit Done with finished.



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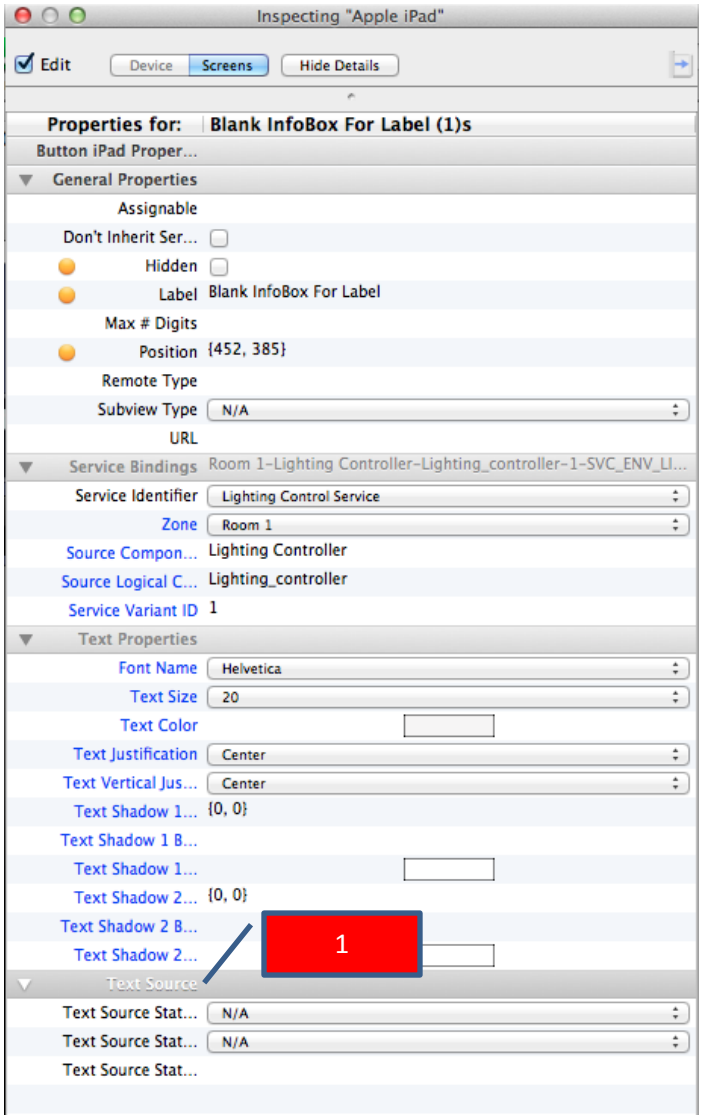
	Let us finally create one or more Infoboxes to monitor the exact numerical value of a color or fade parameter in textual format	-Click on your first Infobox (i.e. Hue) to open the Inspector. Here is an example of what you will see. Items reference with Red boxes will be adjusted below.  <u>Item 1 Text Source</u> Double click on this field and a Pull-Down menu will expose the following choices. Select the appropriate argument for the specific bi-directional feedback that you want this Infobox to monitor. Be sure to enter the appropriate **Z**one, **G**roup, **N**ode address in the prompt boxes. Hit **Done** with finished.

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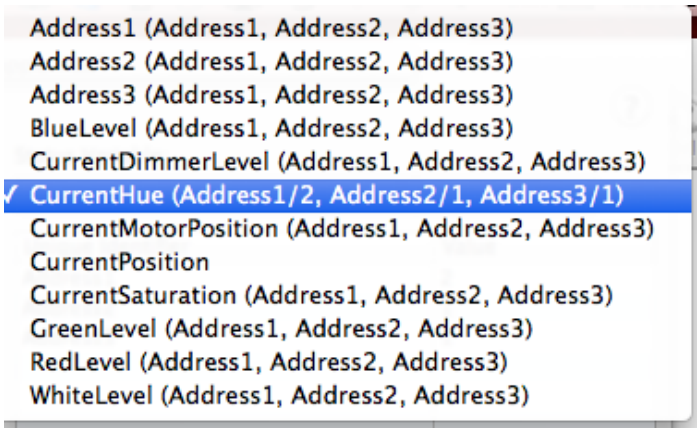
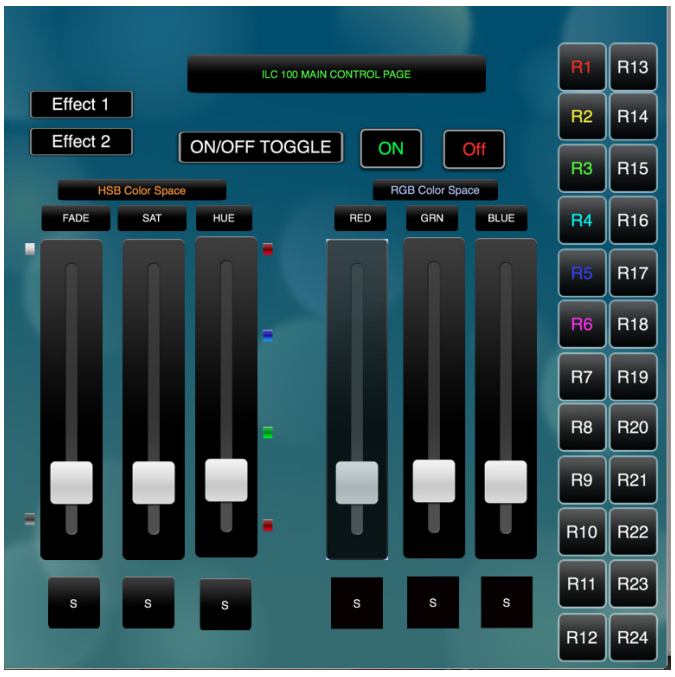
		

6. Upload Project to Processor and Test

Step #	Step Overview	Detail
6a	Upload the project to you Savant processor.	-Make sure you are connected to your SAVANT processor and select **Upload to Master**. -
6b	Open the Savant **TrueControl** application to view all created UI pages. Select each button or slider to test.	Here is a sample page that could be created and tested. 

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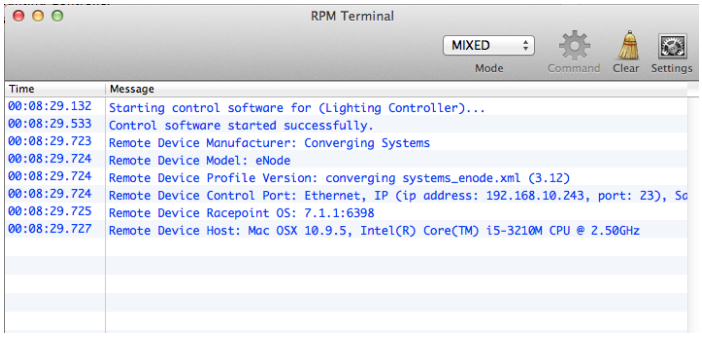
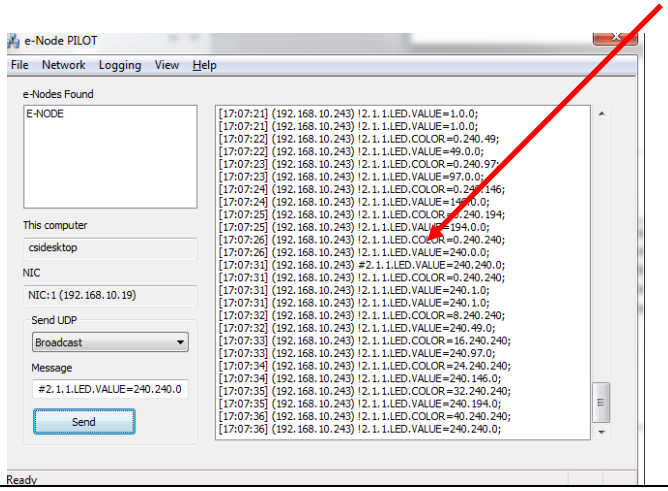
		Proceed through each button and slider to verify proper operation. If certain functions are not operational proceed to the next step.
6c	There are two tools available to proceed with troubleshooting. Utilize one or both of these tools to determine your error.	<u>BluePrint Terminal</u> You may wish to open the **System Monitor**, and click on the **Savant System Host**, hit **Connect**, the select **Component Status** and Launch **Terminal** to monitor the output from Savant for each button push**.** This is an ideal tool to verify your proper programming.  <u>e-Node Pilot Application</u> Launch the e-node Pilot application and select **View Map** and **Discover e-Node** and then **Discover Devices**. Once the environment appears, go to **View Traffic**, and observe CS-Bus traffic. You can see the actual valid commands that are being received on the CS-Bus from the Savant system. If you do not see a command that implies that the Savant System is not properly sending out a command to the Converging Systems bus. 

SAVANT Programming-User Interfaces

The individual installer typically designs the User Interface (UI) for the particular needs of the end-user. Converging Systems may add from time-to-time new UIs with advanced functionality. Sample UI screens are pictured below.

LED CONTROL ENVIRONMENTS

The following illustrations provide some sample UI for LED control interfaces.

Hue /Saturation/Brightness Adjustments (see left hand slide of UI)

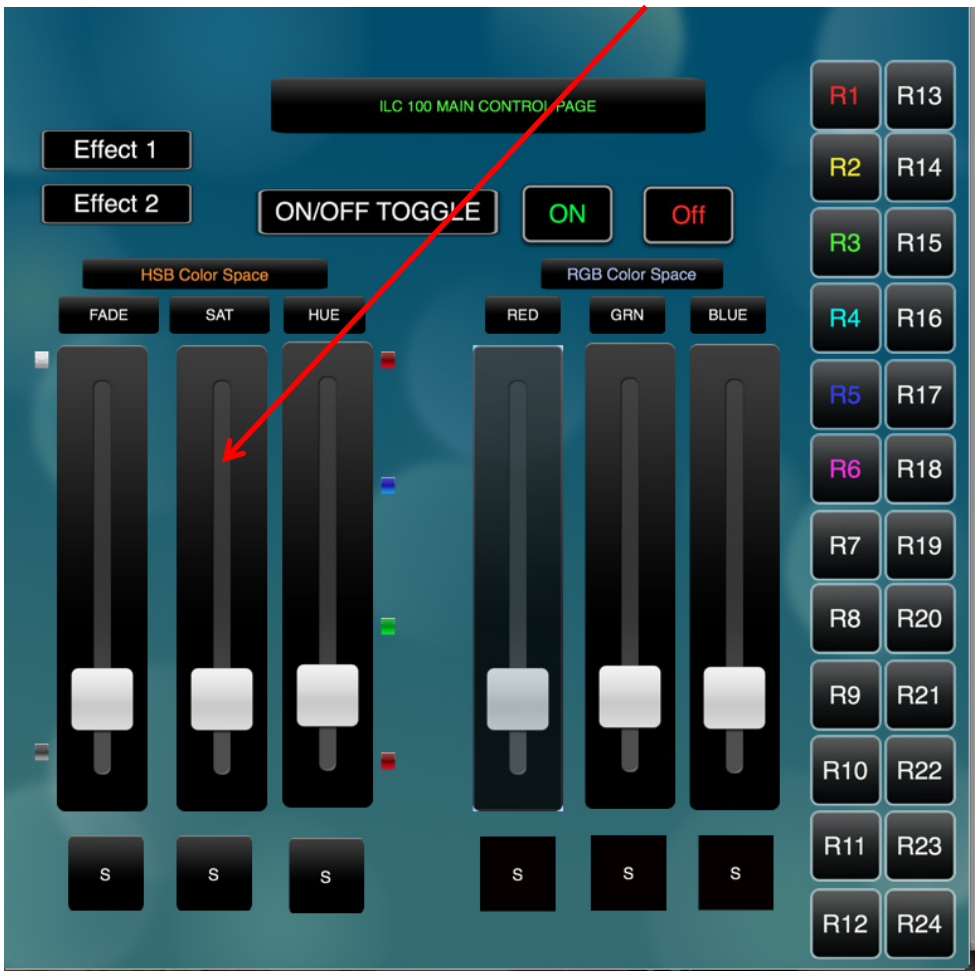


Figure 1

Hue/Saturation/Brightness controls with Infoboxes on left. Controls for two (stored) Effects. On/Off Toggle and standard ON and OFF buttons

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Red/Green/Blue Adjustments (see right hand slide of UI)

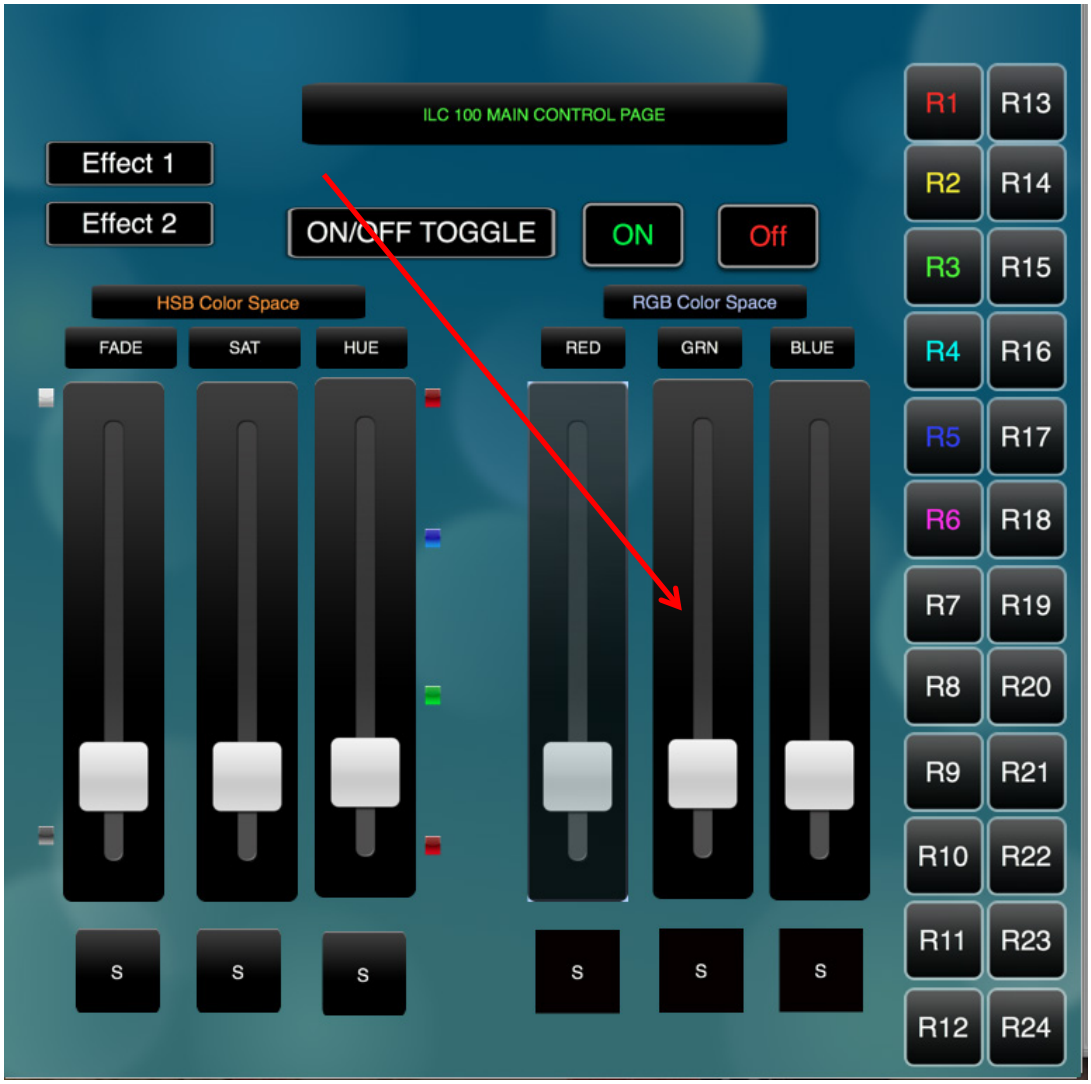

Figure 2

Red/Green/Blue controls with Infoboxes. Controls for two (stored) Effects. On/Off Toggle and standard ON and OFF buttons

MOTOR CONTROL ENVIRONMENTS

The following illustrations provide some sample UI for motor control interfaces.

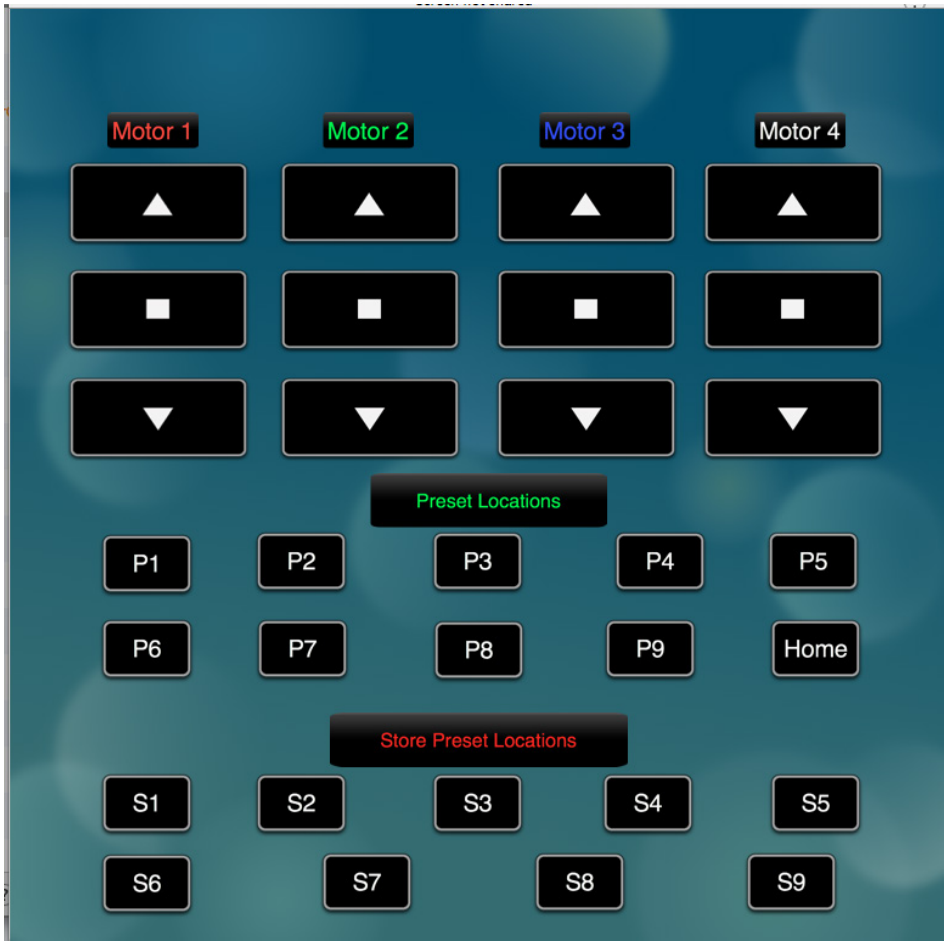

Figure 3

Motor Control UP/Stop/Down for up to 4 motors. Preset Recall positions for up to 10 presets. Store Preset positions for up to 9 presets.

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Appendix 1

Common Mistakes

1. **No Communication to the e-Node**.

(.1) Forgetting to IP address of the e-Node within BluePrint. Make sure you have selected a static IP address for the e-Node using the e-Node pilot application and then use that same address within BluePrint.

(.2) Forgetting to make sure that the alias name for the e-Node is E-NODE and the password for e-NODE is ADMIN. These are set within the Savant profile. If you want to change those alias names and passwords for the e-NODE make sure you change them within the Savant profile.

2. **Individual Lighting or Motor Controllers do not respond, although data is passing to e-Node or IBT-100.**

(.1) Forgetting to set the addresses for controllers (motor or lighting) from within BluePrint.

3. **Sliders send out data which can be observed within e-Node Pilot application but LEDs so not change.**

(.1) Make sure the sliders have been set to an ACTION for **Button Push** rather than the default of **Button Release, which happens when you drag a workflow over a button.**

(.2) Make sure the (i) **Button Push** command is connected to a valid Resource and Workflow, and (ii) the **Arg Name** has been set to the applicable/related command. If the **Arg Name** is set to another non-related command such as **DimmerLevel** when you are trying to control **Hue**, for instance, the command coming back through the e-Node Pilot application (Traffic window) will look as follows:

#2.1.1.LED=HUE,(with nothing after the word Hue or the comma) BAD.

By entering the correct and related Arg. Name, the command coming back through Pilot will appear as follows:

#2.1.1.LED=HUE,230 (for instance for a Z/G/N address of 2.1.1) GOOD

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Appendix 2

COLOR SPACE ISSES

Note on Color Space. Converging Systems recommends that only the HSB (Hue, Saturation and Brightness color space is used for it is infinitely more accurately and user friendly to control color. Although **Figure 4** below shows both HSB and RGB on the same UI, this is probably more confusing for the typical user than the simple subset of HSB (hue, saturation, brightness) controls**. Since there is no concept of dimming within the RGB color space, having RGB sliders only frustrates the user who may just want to dim an existing colored output. However, if the User is intent on having RGB sliders, we would recommend leaving the Brightness slider to get accurate dimming.**

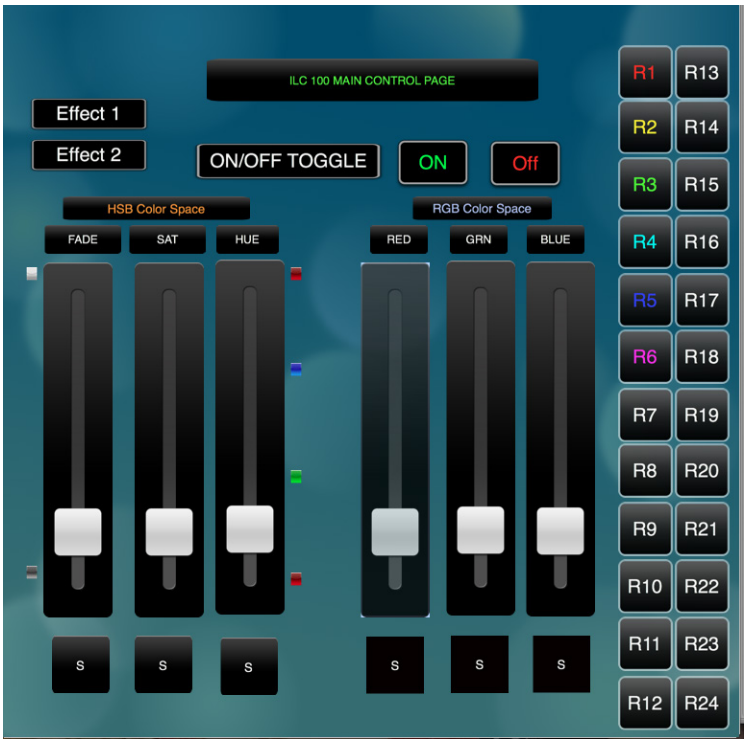

Figure 4

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Appendix 3

ADVANCED SAVANT PROGRAMMING

AP Topic 1

1.0 How to set up group control of loads using sliders with feedback available to sliders.

Addressing Background CS-Bus controllers can be address with a unique **Z**one/**G**roup/Node (ZGN) address. Up to 254 entries can be used for each field. The first field is the **Zone** (or largest range), the middle field is the **Group**, and the last field is the **Node**. No two loads can share the same **Z/G/N** address. As an example, if you will be populating a pair of two controllers within each of two rooms on two floors of a building here would be the suggested addressing that could be used.

	Floor One	Floor Two
Room 1	2.1.1 for first controller in room. 2.1.2 for second controller in this room	
Room 2	2.2.1 for first controller in room. 2.2.2 for second controller in this room	
Room 3		3.1.1 for first controller in room. 3.1.2 for second controller in this room
Room 4		3.2.1 for first controller in room. 3.2.2 for second controller in this room

Group Addressing. In certain cases it is desirable is simply send a wildcard address for a group of controllers to all respond in unison rather than programming each individually to respond through macros. There are two problems with macros in general. One is that often they are executed serially which means that if you had two hundred loads referenced within a macro, the timing of the execution of the last command sent out might be delayed from the first command sent out. In this case, not all LEDs would turn on or OFF at the same time, potentially. The second issue involves the actual programming time required to program scores or even hundreds of commands for a simple ALL OFF button.

Within the CS-Bus software protocol is the concept of utilizing a “0” within any address field as a surrogate for defined numbers ranging from 1 to 254 within that same field. Thus, if you issued a command of #2.1.0.LED=ON:<cr> , all units with addresses of 2.1.1 to 2.1.254 would immediately respond. Please see the table below for an example of how various wildcards could be used.

Specific controller address	Specific command that will trigger targeted controller
2.1.1	2.1.0 or 2.0.0 or 0.0.0
2.1.2	2.1.0 or 2.0.0 or 0.0.0
2.1.3	2.1.0 or 2.0.0 or 0.0.0
2.2.1	2.2.0 or 2.0.0 or 0.0.0
2.2.2	2.2.0 or 2.0.0 or 0.0.0
2.2.254	2.2.0 or 2.0.0 or 0.0.0
5.254.4	5.254.0 or 5.0.0 or 0.0.0

NOTIFY Command Background Converging Systems has a **NOTIFY** function which automatically provides color state feedback (from the targeted controller) provided a unique **Z**one/**G**roup/**N**ode (**Z/G/N**) address is provided with an action/argument payload to that specific controller. Specifically, if a command to invoke a color change is directed to a controller that has a **Z/G/N** address of 2.1.1, that specific controller with that address will respond back to the automation system as to its specific color state if and only if there is a color state change impacted on that specific controller.

In some cases as has been discussed above, there might be a requirement to send a group command or all hail command to more than one controller. In this case, the group command would be directed not to a single controller or load but to a series of controllers. To reduce bus traffic when a series of controllers is given the same command, ***only the first controller whose node number is 1 greater than the wildcard command of "0" will respond*** (which reduces bus traffic by up to 243 messages). The logic here is that if 254 controllers are all told to turn **Red**, only the surrogate for that group of controllers will respond and within the CS-Bus messaging logic that surrogate is the controller with a node of "1." So for example, if a **#2.1.0.LED.VALUE=240.0.0:<cr>** command is transmitted to 254 controllers, they will all turn to **Red** , but only the controller with an address of **2.1.1** will respond with its new color status. In this case, a command on the bus from that surrogate controller would come back as follows: **!2.1.1.LED.VALUE=240.0.0** (the exclamation mark indicates that it is a message from CS-Bus device rather from an automation controller). Please see the diagram on the next page for the theory of operation here.

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Initial State of Light Output
(on Off condition)

Argument/Action Issued to a specific Z/G/N address of 2.1.1 to go to Red
#2.1.1.LED.VALUE=240.0.0;<cr>

RGB Command received by a unique Z/G/N address (2.1.1). Controller recognizes a color state change and transmits back its color state as
!2.1.1.LED.VALUE=240.0.0

3rd Party control system receives response beginning with "!" and updates its applicable color slider or other registers to received value

RGB Command received by a unique Z/G/N address (2.1.1). Controller recognizes that this was not a color state change and no response is provided (to reduce bus traffic since no new status needs to be provided)

Argument/Action Issued to a specific Z/G/N address of 2.1.1 to go to Red (again)
#2.1.1.LED.VALUE=240.0.0;<cr>

Nothing transmitted back to 3rd party control system

RGB Command received by a group Z/G/N address (2.1.0). All loads turns green but since command was transmitted to Group address, only Controller with first Node address greater than 0 (i.e. "1") within wildcard range will respond (i.e. 2.1.1 responds, but 2.1.2 to 2.1.254 do not respond)

Argument/Action Issued to a **Group** Z/G/N address of 2.1.0 to go to Green
#2.1.1.LED.VALUE=0.240.0;<cr>

!2.1.1.LED.VALUE=0.240.0 is received, but no other Z/G/N messages are received
Note: !2.1.0 LED.VALUE =0.240.0. is never received.

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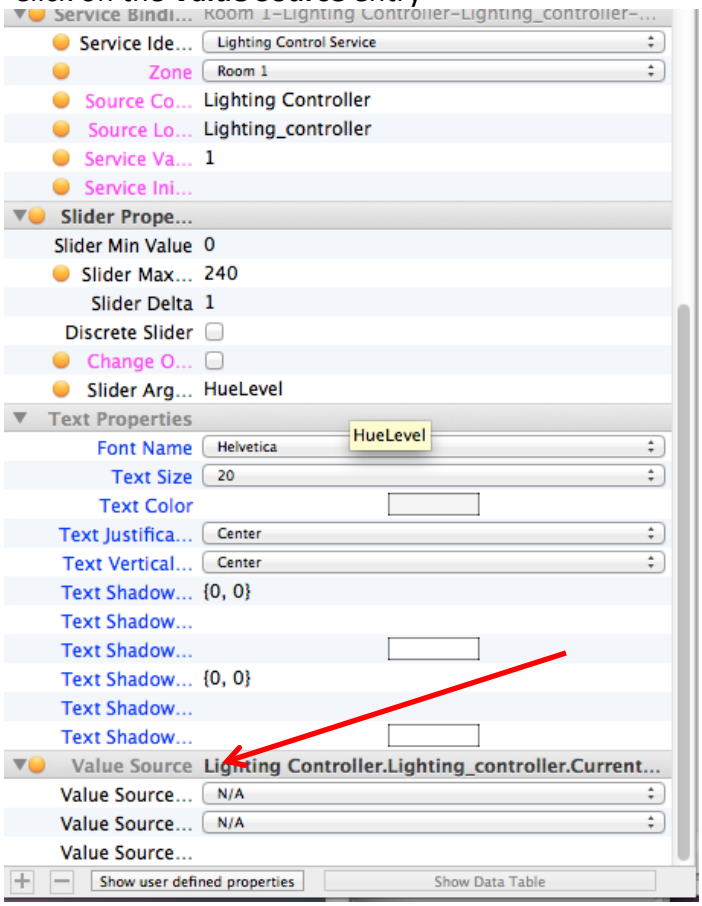
Special Programming Considerations to Enable a Slider to send a group (or all hail) command but still be able to provide feedback as to color state changes

<table>
<tr><th>Step #</th><th>Step Overview</th><th>Detail</th></tr>
<tr><td>AP1</td><td>Program Slider to send a group command</td><td>-Make the slider send out an appropriate group or all hail command. For our above example the Zone/Group/Node address would be 2.1.0

<table>
<tr><th>Unique Identifier</th><th>Value</th></tr>
<tr><td>Address1</td><td>2</td></tr>
<tr><td>Address2</td><td>1</td></tr>
<tr><td>Address3</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>AP2</td><td>Program the Value Source field for the Slider to the Z/G/N address for the CS-Bus Surrogate Address for the group.</td><td>-Click on the Value Source entry
 

The Inspector window will appear as below:</td></tr>
</table>

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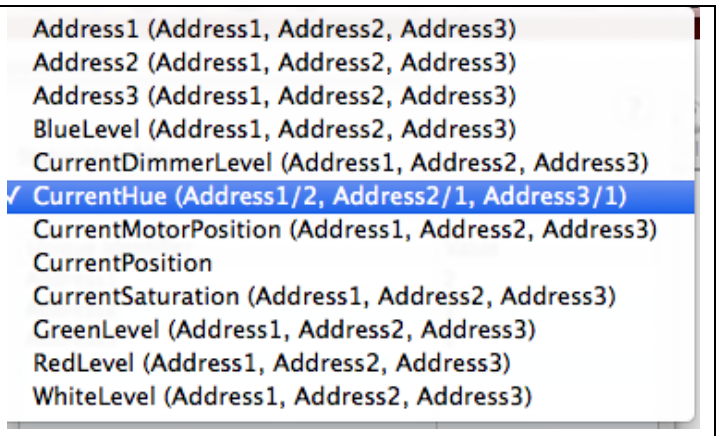

After you select the correct **Component** adjust the **Address 1/Address2/Address3** field for the **Z/G/N Surrogate Address** which in this case is as follows:

Unique Identifier	Value
Address1	**2**
Address2	**1**
Address3	**1 (note not "0")**

Hit **Done**

Appendix 4

DMX Options

Note on DMX Lighting Devices. There are many third-party lighting devices available in the marketplace that support the DMX512 lighting standard ("standard for digital communication). DMX devices were originally utilized for theatrical interior and architectural lighting application only, but recently their adoption rate has grown in other areas where colored lighting is desired. DMX 3-color lighting fixtures utilize the Red, Green, Blue (RGB) color space which although practical for theatrical uses and the trained lighting designer is quite limited for traditional dimming application ***for the technology inherently lacks the most basic dimming slider*** which would preserve a specific hue while lowering the brightness to full off. But that has all changed now...

Converging Systems' e-Node/dmx. Converging Systems has developed an adaptation of its lighting/dimming technology currently available within its ILC-x00 line of LED controllers and has re-purposed that technology into a separate product known as the e-Node/dmx. The existing SAVANT drivers compatible with the ILC-x00 LED controllers can also drive directly the e-Node/dmx (color engine/dmx translator), and the e-Node/dmx makes the necessary color adjustments within its own processor to translate incoming commands to outgoing DMX commands **and transmits those directly onto *a DMX bus***. What is unique about this implementation is that the Converging Systems' hue-accurate dimming technology (with a built-in dimmer slider) can now drive DMX fixtures by using Savant device drivers already in existence for other Converging Systems' products. (See the listing of commands that are supported with the e-Node/dmx device see LED Commands in this document.)

Please follow the directions which follow to drive DMX fixtures from a SAVANT System

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WIRING DIAGRAM (for DMX control using e-Node/dmx and IP)

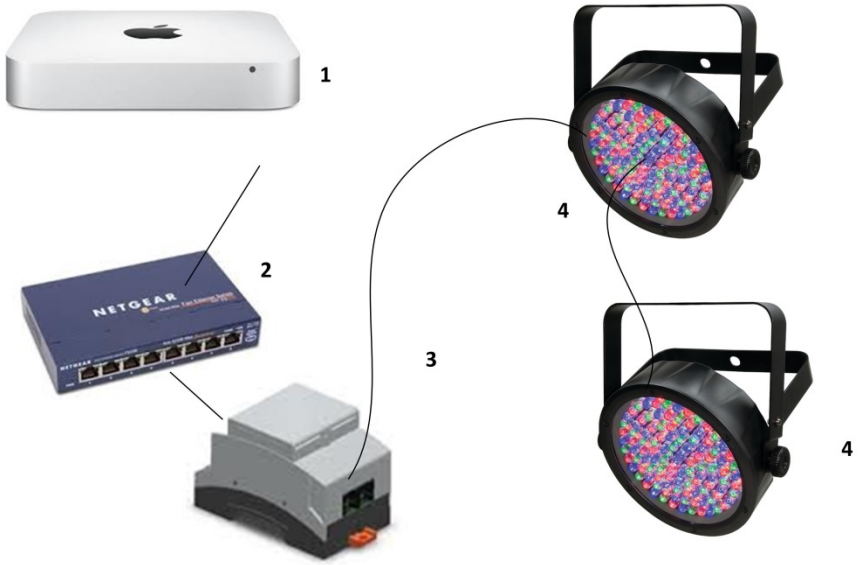

Figure 5

Wiring/Configuration Notes:

1. Maximum length of CS-Bus cabling from e-Node to the last DMX fixture using DMX cabling = 1200 meters (3,900 feet)
2. Maximum number of DMX fixtures connected to a single e-Node/dmx device = 32. If more than 32 fixtures are required, implement additional e-Node/dmx devices.
3. Maximum number of e-Nodes that can exist on a Savant system = 254

BILL OF MATERIALS (for IP control)

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	SAVANT 2-Series and 3-Series processors	SAVANT	Various	Ethernet/USB	various	
2	Network Switch	Various	Various	Ethernet	RJ-45	
3	e-Node/dmx	Converging Systems	e-Node/dmx	Ethernet	RJ-45 (for Ethernet) RJ-25 for local DMX bus	
4	Third party DMX fixtures	Various	Various	DMX512	RJ-25 for DMX communication	Must terminate final OUT or THRU connector on last DMX fixture using a 120 ohm

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						resistor
5	Flexible Linear Lighting (FLLA) RGB or RGBW luminaries	Converging Systems	FLLA-RGB-xxx FLLA-RGBW-xxx		3-color 4 pin 4-color 5 pin 1-color 4 pin	

e-Node Programming/Device Programming

Minimum requirements for this operation.

-e-Node/dmx with power supply
-Necessary cabling to connect e-Node/dmx to first DMX fixture (see "e-Node Interfacing with DMX Guide"). For reference the pin-outs on the e-Node/dmx are as follows:

Pin	Signal
1	Not Used
2	DMX Ground
3	RS485 -
4	RS485 +
5	Not Used
6	Not Used

Note: Even though Converging Systems recommends that RJ-25 6P6C plugs should be used for most CS-Bus wiring, the DMX wiring can utilize a 4P4C RJ11 plug.

e-Node/dmx Programming

Step	Setting	Choices
DMX-1	e-Node/dmx setup	Follow the directions under e-node Programming at the beginning of this Integration Note **Step EN-1** and **EN-2**.

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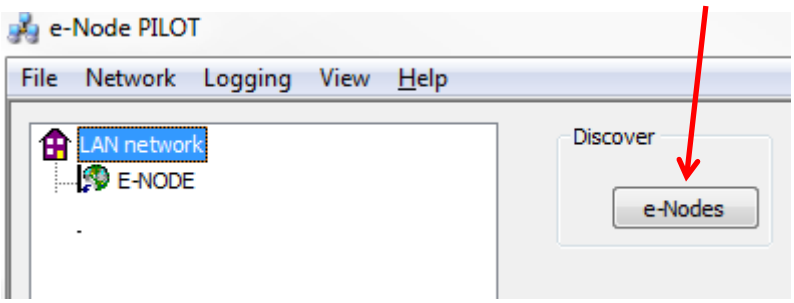
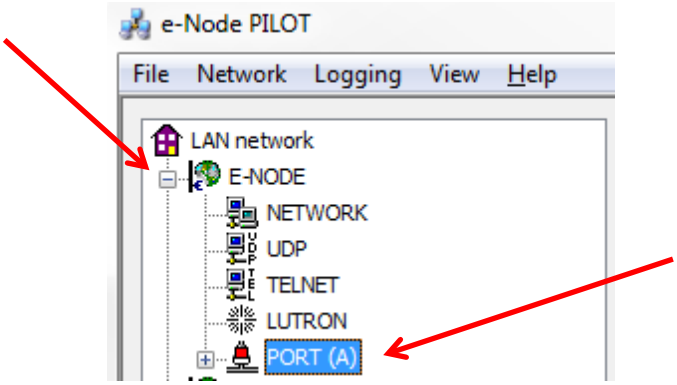
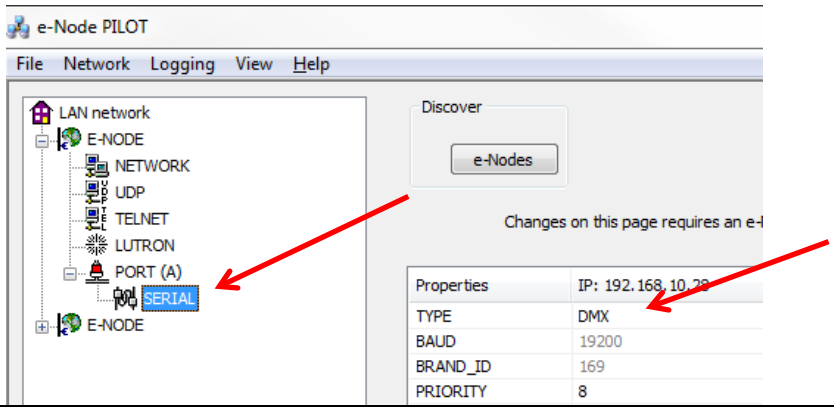
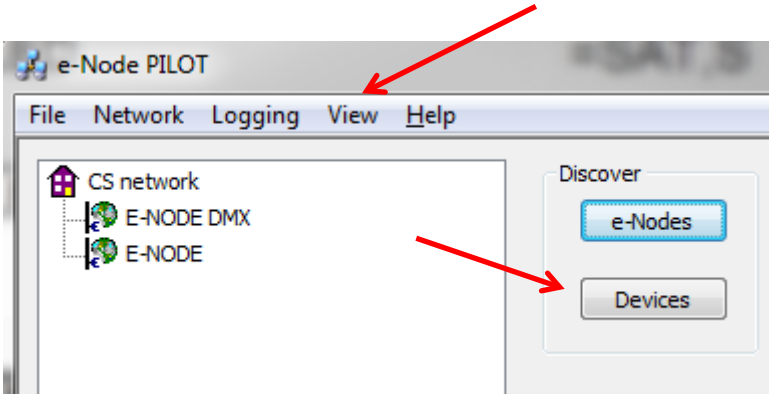
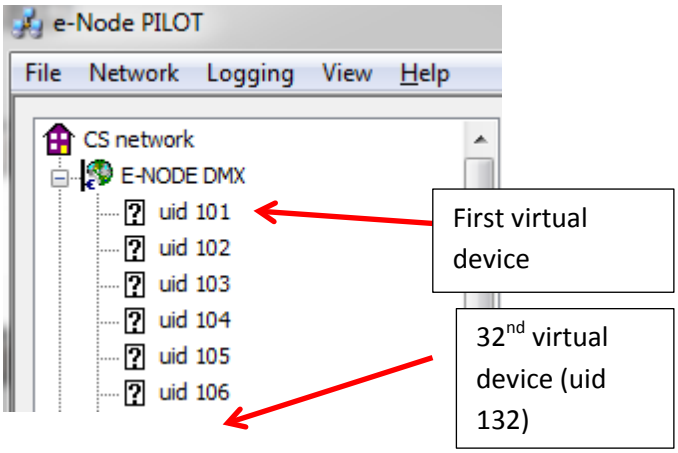
DMX-2	Verify the e-Node DMX is set to communicate to DMX fixtures	-Select the **View e-Node** tab and select the Discover **e-Node** button**.** Any e-Node(s) connected on the same network will appear as shown.  -Select the + mark in front of the **e-Node/dmx** that you wish to program to expose the sub-tabs.  -Expand the **PORT(A)** tab and then expand the **Serial** tab. 

		-Verify that after the **TYPE** entry, the data field indicates **DMX**. If it does not indicate **DMX**, select **DMX** from the pull down menu and reboot the e-Node/dmx in order to make this setting active. **Note**: the e-Node/dmx can also be configured to communicate with standard CS-Bus devices (ILC-100, ILC-400) and therefore only when this entry is set to DMX, will the e-Node/dmx properly communicate to DMX fixtures.
DMX-3	Device Discovery	-Select the **View Map** tab and select the Discover **e-Node** button**.** Any e-Node(s) connected on the same network will appear as shown. -Select the Discover **Devices** button.  -Immediately 32 virtual "DMX Devices" will appear as follows:  **Note**: this picture shows the first 6 devices discovered. In a real example, all 32 virtual devices will appear.

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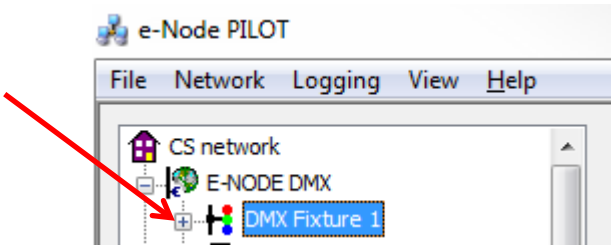
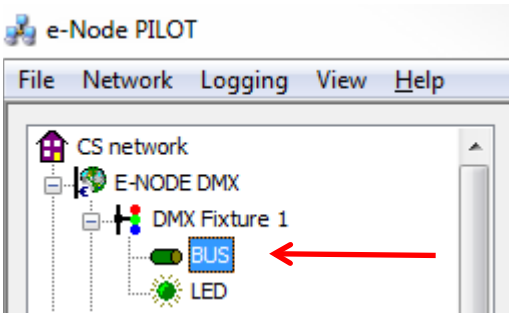
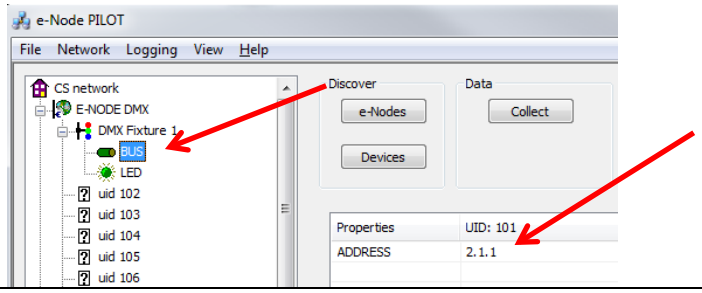
DMX-4	Set up Device Addressing	The DMX data packet is mapped to CS messages by assigning a unique Zone. Group. Node number to three successive DMX channels. These are mapped as shown in the following table:

Fixture	DMX Channel Allocation	CS-Zone.Group. Node
1	1-3	2.1.1
2	4-6	2.2.1
3	7-9	2.3.1
4	10-12	2.4.1
5	13-15	2.5.1
6	16-18	2.6.1
7	19-21	2.7.1
8	22-24	2.8.1
9	25-37	3.1.1
10	28-30	3.2.1
11	31-33	3.3.1
12	34-36	3.4.1
13	37-39	3.5.1
14	40-42	3.6.1
15	43-45	3.7.1
16	46-48	3.8.1
17	49-51	4.1.1
18	52-54	4.2.1
19	55-57	4.3.1
20	58-60	4.4.1
21	61-63	4.5.1
22	64-66	4.6.1
23	67-69	4.7.1
24	70-72	4.8.1
25	73-75	5.1.1
26	76-78	5.2.1
27	79-81	5.3.1
28	82-84	5.4.1
29	85-87	5.5.1
30	88-90	5.6.1
31	91-93	5.7.1
32	94-96	5.8.1

		-To see these entries, click on the **?** in front of any particular **uid** listing which will expand its directory.  -After the directory is expanded, you will see these entries:  -If you desire to change any **Z**one/**G**roup/**N**ode address, click on the **BUS** entry, and change the address as appropriate. 
DMX-4	Proceed through standard SAVANT Programming.	In this case, you will not be programming ILC-100 or ILC-400 devices, so you can skip the ILC-100/400 section (**Steps DV-1 and DV-2**). -Proceed to standard Savant Programming (**Steps 1** onwards above in the main body of this Integration Note). Note: the e-Node/dmx takes care of everything else!!!

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Appendix 5

Troubleshooting/System Monitoring

(reserved)

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