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Converging Systems Inc.

**PILOT**

**Commissioning Guide**

**-e-Node<sup>TM</sup> Pilot Application**

Version 3.0

### Revision History

| <b>Date</b> | <b>Version</b> | <b>Description</b>                  | <b>Author</b> |
|-------------|----------------|-------------------------------------|---------------|
| 01/23/2007  | 1.0            | Initial Draft                       | TS            |
| 03/03/2008  | 2.0            | First Revision                      | TS            |
| 03/09/2008  | 2.1            | Minor Revision with UID integration | TS            |
| 03/09/2008  | 2.2            | Updated Pilot                       | TS            |
| 07/21/2008  | 2.3            | e-Node PROG                         | TS            |
| 9/30/2008   | 2.4            | Serial connection to e-Node         | TS            |
| 10/8/2008   | 2.5            | Updates to serial parameters        | TS            |
| 08/29/2009  | 2.7            | Updates                             | TS            |
| 9/16/2009   | 2.7a           | Updates for CAT5 cable              | TS            |
| 8/26.2011   | 2.8            | Updates for LutronR Connectivity    | TS            |
| 10/11/2011  | 2.8c           | Updates for LutronR Connectivity    | TS            |
| 9/17/2012   | 3.0            | Abridged version                    | AD            |
|             |                |                                     |               |

### Referenced Hardware/Firmware

| <b>Applicable Firmware</b> | <b>Version</b>          |
|----------------------------|-------------------------|
| IMC-100T                   | Version 5.9             |
| BSKP-2                     | Version 2.0             |
| e-Node                     | Version 1.25            |
| Pilot Application          | Version 2.1, build 2.34 |
|                            |                         |

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# 1 Overview

The Converging Systems' developed and manufactured e-Node™ is a dual purpose CS-Bus™ Hardware Programmer and Internet Gateway. This unique piece of hardware combined with an associated application called Pilot can be used to setup, configure and troubleshoot CS-Bus Controller hardware. Either of two types of control languages (documented in a supplemental document entitled CS-Bus Messaging) can program all customizable functions within CS-Bus Controllers. Depending upon the particular function that is desired to be set or modified, either (i) command messages (referred to Zone/Group/Node ("ZGN") messaging) or (ii) configuration messages (referred to as Unique Identifier ("UID") messaging) can be used.

Specific programming tools (e-Node™ Pilot Application) are described in [Section 2](#) below

## 1.1 Specifications of the Hardware

The e-Node™ is a state-of-the Intelligent Internet Protocol controller is designed to enable wired or wireless (Ethernet) control of nearly a limitless range of facility automation clients/devices. Key features are as follows:

- 32-bit processor
- Ethernet interface port
- Din-Rail mounting
- Dual configurable RS-232C or RS-485 output channels
- On-board interbus connector to link device to additional e-Node™ devices or other compatible devices (opt)
- Compliance: Emissions: FCC Class B. Safety: PCB UL listed/UL listed removable power

## 1.2 Specifications of the Embedded Software

Embedded firmware enables the e-Node™ to control a myriad of facility automation clients through a rich set of protocols and device interfaces. These include:

- [DHCP](#)
- [HTTP](#)
- [HTML](#)
- [CGI](#)
- [XML](#)
- [UDP](#)

# 2 e-Node™ Pilot Application

Minimum Requirements. The following minimum requirements need to be met in order to run the e-Node™ Pilot application:

- PC platform that runs Windows 98 or later
- Computer with a 10Mbps or 10/100 Mbps Ethernet card or adapter installed
- Internet Explorer 4.0 and higher, or Netscape Navigator 4.0 or higher
- UTP CAT 5 network cables with RJ-45 connectors
- TCP/IP network protocol installed.

|  |
|--|
| Version 5.5 for Internet Explorer and Version 4.7 for Netscape Navigator are highly recommended for optimal results. |
|--|

The e-Node™ can connect to one or more CS-Bus Controllers.

## 2.1 Initial Setup

While your installation may consist of many devices it is recommended to initially set up the e-Node™ with just one device to become familiar with the use and to verify correct operation. This section will take you through all of the steps it takes to work with a CS-Bus Device connected to an e-Node™.

### 2.1.1 Launch e-Node™ Application

Copy the e-Node™ application into any user-selected directory.

Double-click on the e-Node™ executable which will automatically launch the e-Node™ Pilot application.

When you initially launch the Pilot application, you will see the user interface screen pictured in [Figure 1](#) below. Various sub-segments of the user interface are identified below. More information on features available from within this user interface is described in section 6.

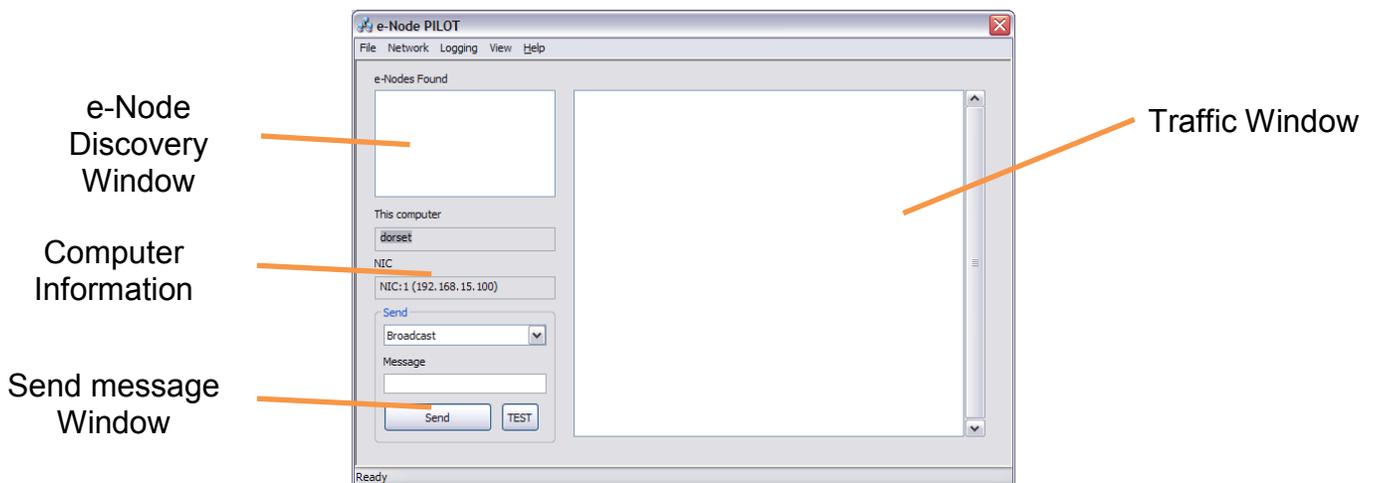


Figure 1

### 2.1.2 Discover e-Nodes™ on your Network

As soon as you see this user interface screen, it is first necessary to “search” for your e-Node™ on your network. Place your cursor within the top left box entitled “e-Nodes Found.” This is what we refer to as the e-Node™ Discovery Window. Right click on this “e-Node Found” box until you see a “Refresh” pop-up box. Then, left click on the “Refresh” pop-up box and you should immediately see any e-Nodes™ that are seen (i.e. “discovered”) on your network. See [Figure 2](#) below for a sample e-Nodes™ “discovered” using this process.

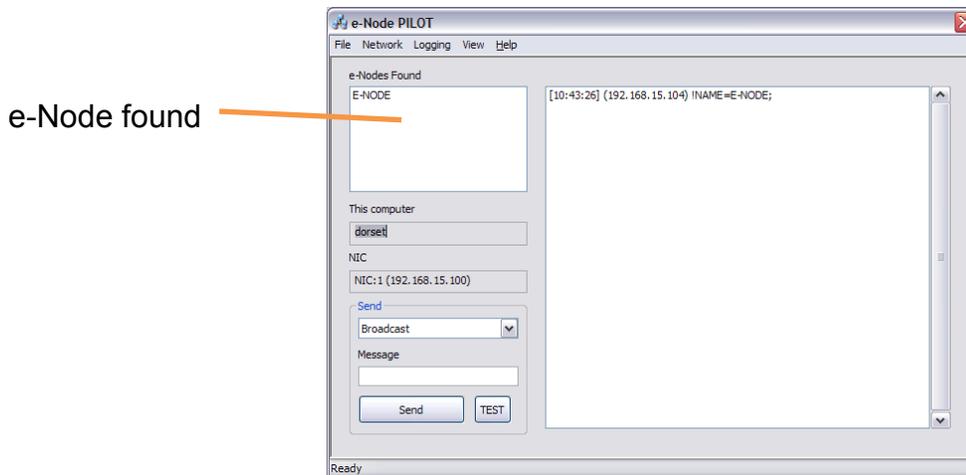


Figure 2

### 2.1.3 Verify IP Address of Connected e-Node™

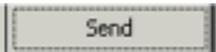
You will know that your e-Node™ is seen (i.e. “discovered”) by your network by observing messaging that appears in the “Traffic Window.” You should see the date/time stamp corresponding to the time the message passed onto the CS-Bus as well as the IP address for the e-Node™ found in the header of the data stream. At the end of the data stream will appear the default name of the e-Node™ found.

### 2.1.4 Communicate with a CS-Bus Device

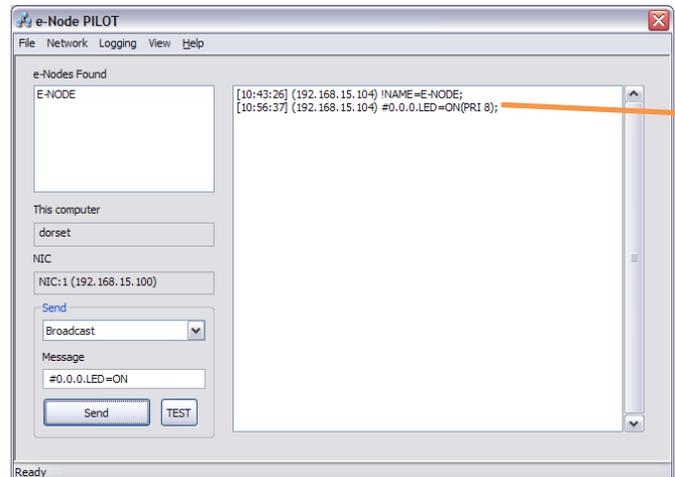
Now that you have “discovered” available e-Node™ (s) on your network, it is necessary to “discover” connected CS-Bus Devices. For this *Simple Setup* procedure, you can simply assume that **one** CS-Bus Device is connected and is working properly. In order to quickly prove that this is the case, follow the instruction below. Make sure the **one** CS-Bus Controller is powered up and connected to the e-Node™. If you find that the results described below do not occur, please see our trouble shooting guide on the Converging Systems web site.

Within the “Message” Window of the Pilot Application (see figure 1 above), type in an applicable command under the column heading below referring to the type of device that is powered-on and connected to the CS-Bus.

| Lighting controllers (ILC) | Motor Controllers (IMC) |
|----------------------------|-------------------------|
| #0.0.0.LED=ON              | #0.0.0.MOTOR=DOWN       |

And hit the  button

These commands use a universal address (0.0.0), so any device will respond. If you have an ILC-100, its connected LED devices will turn on, or if you have an IMC-100, its connected motor should move down. All messages to and from a CS-Bus device will appear in the traffic view. Any CS-Bus message can be entered in the “send box,” and will be sent via UDP to the e-Node™ selected.

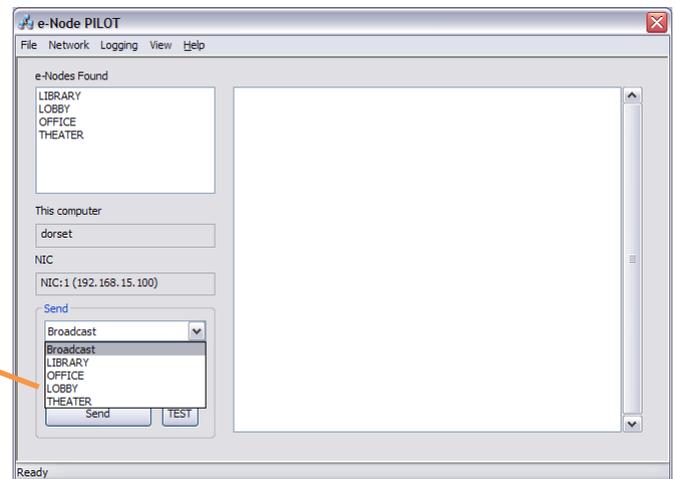


Command sent onto the CS-Bus

Figure 3

### 2.1.5 Multiple e-Nodes™

If you have more than one e-Node™ on a LAN, you can send a message to a specific e-Node™, by selecting an e-Node™ from the selection box. Or you can choose to broadcast to all e-Nodes™.



Select specific e-Node to which communication will be routed

### 2.1.6 Understanding Commissioning

All CS-Bus devices have configuration data associated with them; this is stored in non-volatile memory within each device. This data, or properties, determine the address that the device recognizes on the bus, and features about the operation of the device. In normal operation all devices are addresses by its Z.G.N number. This permits control of a device either uniquely or as part of a group of devices. To facilitate setting these properties each device must have a unique identifier (UID) **other** than its Z.G.N number. This will allow you to change a devices properties by uniquely specifying it using its UID.

Setting up the properties of multiple devices can be achieved one at a time by connecting each to the e-Node™ individually, or can be done with all devices connected to the network. The former is recommended to avoid issues programming with possible network problems.

### 3 Device configuration – Commissioning

#### 3.1 Setting Unique Identifier Address (UID)

Each device needs to have a UID allocated to it. This is a number from 1 to 65535. To set the UID, select the “View Map” option under “View” menu.

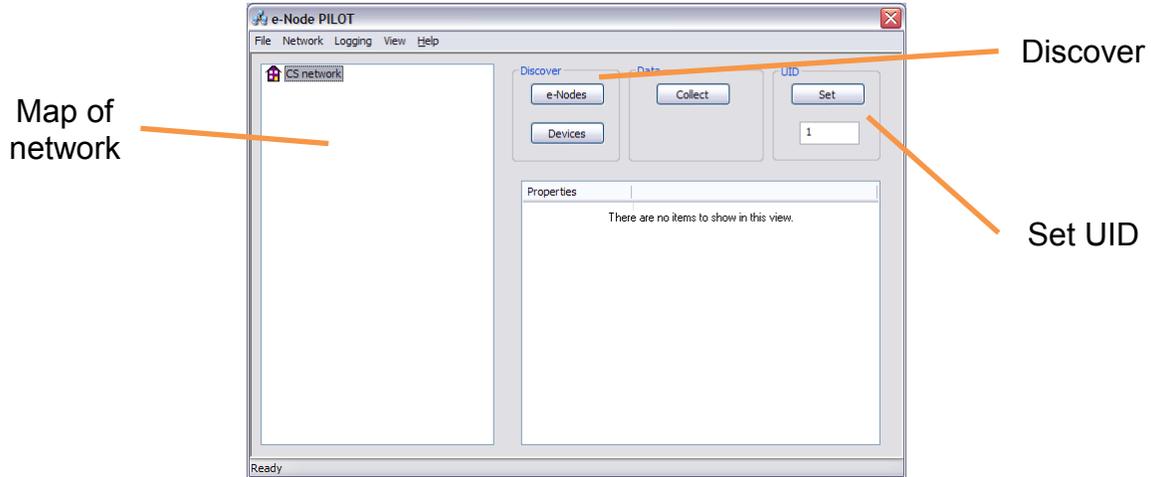


Figure 4

The Window on the left will detail the devices on the CS-Bus network. There may initially be no e-Node™ displayed, in which case click on “e-Nodes” in the Discover section, to find all available e-Nodes™.

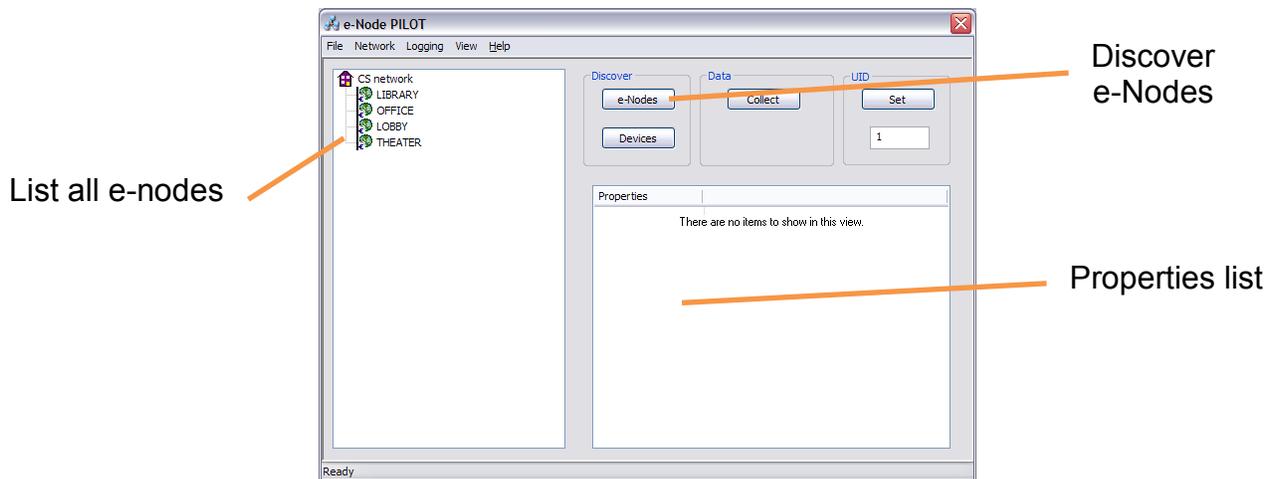


Figure 5

A new device (Factory default) **does not** have a UID set. Enter a number into the “UID Set window” (Hint: use low numbers, high numbers can slow down the discovery process). If you have multiple e-Nodes™ select the one that the device is connected to. Click the “Set” button, a message will ask you the press the discovery button on the device. Each CS-Bus device has a discovery button, its location is shown in its installation manual. Once the discovery button is pressed the UID of that device is shown in the map.

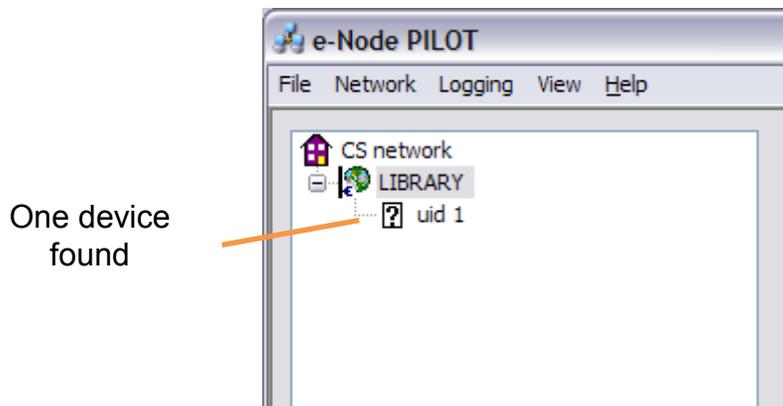


Figure 6

Repeat this process for every device you have, assigning a different UID to each one. If you are unable to set a UID, it may be because a UID has previously been set, you can either reset the device back to a Factory Default, and repeat the set again, or you can choose to use the devices' current UID.

### 3.2 Finding devices on the network

Click on the "Devices" button will cause each device on the network to indicate itself. If you have devices with high UID numbers, this process could take up to 2 minutes, please be patient.

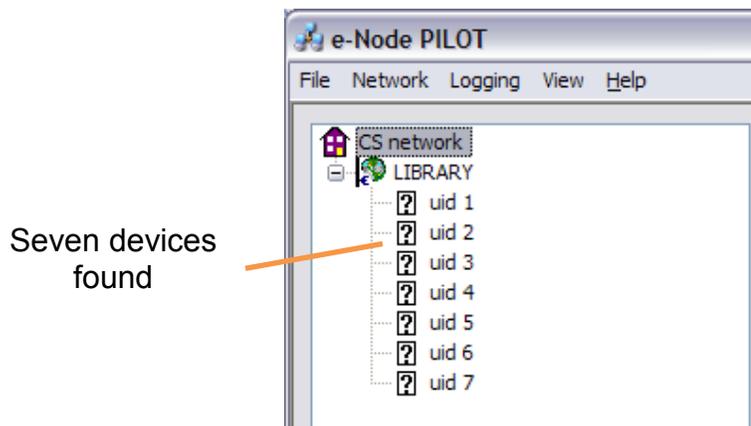


Figure 7

### 3.3 Viewing a device's attributes

Click on the ID of the device,



the specific device will respond with its name and all its properties. These are categorized and shown in a tree list which can be expanded by clicking on the Plus sign or collapsed by clicking on the Minus sign.

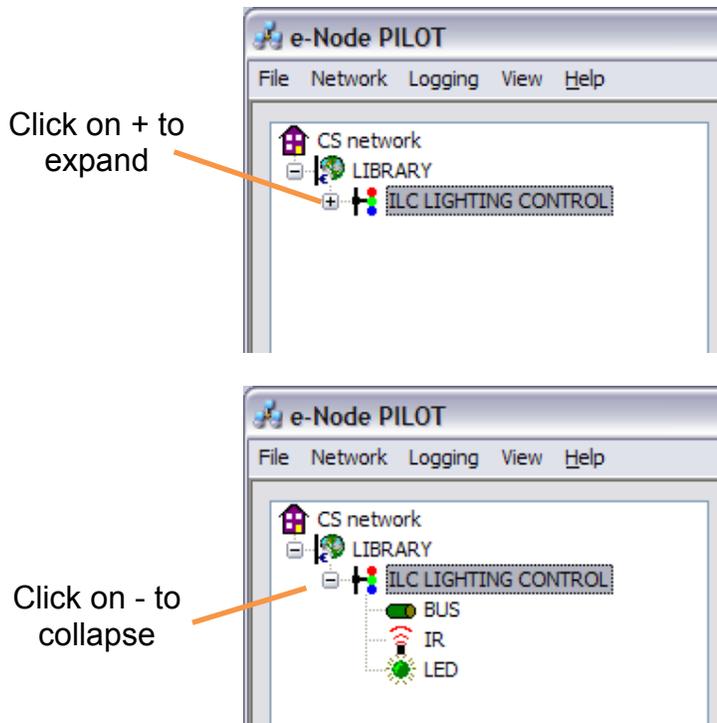


Figure 8

The “Properties” window will show the detail of all the properties for each selected category. Selecting the “Bus” category, for example, will display all the properties about the bus of the device in the properties window.

The screenshot shows a 'Properties' window with a table of properties. The table has two columns: 'Properties' and 'UID: 1'. The 'UID: 1' column contains the value '2. 1.0' for the 'ADDRESS' property and '255.255' for all other properties. An orange arrow points to the 'UID: 1' header with the label 'UID'. Another orange arrow points to the 'ADDRESS' row with the label 'CS Bus Address'.

| Properties | UID: 1  |
|------------|---------|
| ADDRESS    | 2. 1.0  |
| SHADOW (1) | 255.255 |
| SHADOW (2) | 255.255 |
| SHADOW (3) | 255.255 |
| SHADOW (4) | 255.255 |
| SHADOW (5) | 255.255 |
| SHADOW (6) | 255.255 |
| SHADOW (7) | 255.255 |
| SHADOW (8) | 255.255 |
| TRACK (1)  | 255.255 |
| TRACK (2)  | 255.255 |
| TRACK (3)  | 255.255 |
| TRACK (4)  | 255.255 |
| TRACK (5)  | 255.255 |
| TRACK (6)  | 255.255 |
| TRACK (7)  | 255.255 |
| TRACK (8)  | 255.255 |

Figure 9

Some of the details will be shown in red, which indicated that the data is read only and cannot be changed. To change any property details, highlight the data with the mouse and type in the new property. Type a “return” or “enter” on the keyboard to complete the change (**IMPORTANT**). Some properties have options, click on the value, and then on the arrow on the right side, a drop down box will appear to select the option.

### 3.4 Deleting or refreshing the information.

It may be necessary to delete a device or refresh the information. Move the cursor to indicate which device, and right click the mouse to bring up a popup menu with the option to delete or refresh the data.

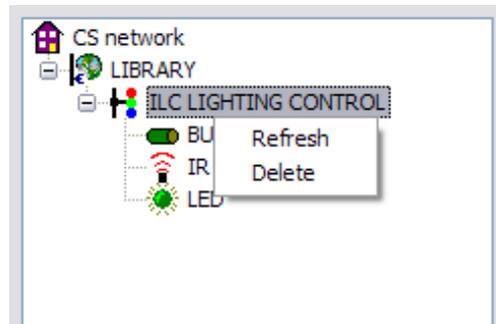


Figure 10

### 3.5 What does it all mean?

To understand what each of the properties of the device do, you need to consult the manual of the device. However, there is one common property that all controllers have--the "Address" property under the "Bus" category. This specifies what Z.G.N address the device will identify. Every device should have a unique Z.G.N value; however, several devices may share the same Zone number or Group Number.

Good addresses:

|       |       |        |       |       |       |       |       |       |
|-------|-------|--------|-------|-------|-------|-------|-------|-------|
| 2.1.1 | 2.1.2 | 2.1.3. | 2.1.4 | 2.2.1 | 2.2.2 | 3.1.1 | 3.2.4 | 3.2.3 |
|-------|-------|--------|-------|-------|-------|-------|-------|-------|

Bad addresses:

|       |       |        |       |       |       |       |       |
|-------|-------|--------|-------|-------|-------|-------|-------|
| 2.1.0 | 2.0.2 | 0.1.3. | 2.1.3 | 2.1.3 | 3.1.1 | 3.1.1 | 3.1.1 |
|-------|-------|--------|-------|-------|-------|-------|-------|



The node number is set initially as a factory default of zero. While this device will work and respond to commands, a unique node number is needed to get any feedback from the device. **It is highly recommended to set the node number to a non-zero value.**

## 4 e-Node™ configuration

The properties of the e-Node™ are initially set to operate without changes, however if you have multiple e-Nodes™ or wish to configure the network, it is possible to change the properties with Pilot. Most of these properties can also be changed using the built in web interface, see the e-Node™ Quick Start Guide for more information. View the e-Node™ details by clicking on the "View e-Node" option under "View". A display similar to the Map View will show all the properties of the e-Node™. Some are read only and are displayed in red.

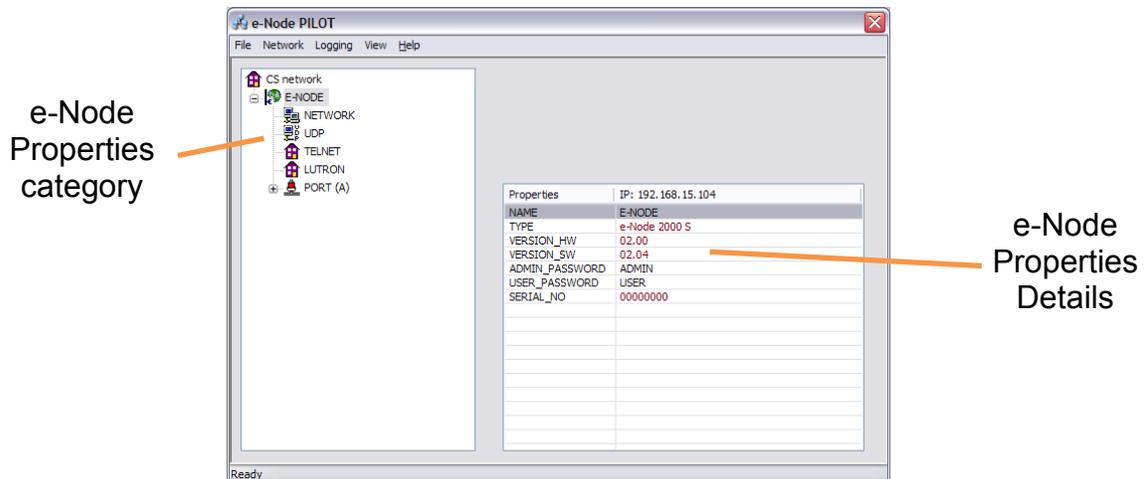


Figure 11

### 4.1 Base category

Click on the e-Node™ name in the left view will show the basic properties. Here the name, and passwords can be changed. The versions of hardware, firmware, and serial number are displayed. If no categories are displayed, you may need to retrieve the data from the e-Node™. Right click on the “CS network” icon, and click refresh

| Properties     | Description   | Default |
|----------------|---|---------|
| NAME           | The network name used by WINS (20 characters max)                       | E-NODE  |
| TYPE           | Type of e-Node™   |         |
| VERSION_HW     | The hardware version  |         |
| VERSION_SW_    | The firmware version  |         |
| ADMIN_PASSWORD | The password required to access the web setup pages (20 characters max) | ADMIN   |
| USER_PASSWORD  | The password required to access specific web pages (20 characters max)  | USER    |
| SERIAL_NO      | The device serial number  |         |

### 4.2 Network category

| Properties   | Description   | Default       |
|--------------|---|---------------|
| DHCP         | Select either DHCP (Dynamic IP address) Enable or Disable (Static IP Address) | Enable        |
| STATIC_IP    | The Static Address if DHCP is Disabled  | 192.168.1.200 |
| NETMASK      | The Netmask if DHCP is Disabled   | 255.255.255.0 |
| GATEWAY_ADD  | The Gateway Address if DHCP is Disabled                                       | 192.168.1.1   |
| MAC_ADDRESS  | The Devices unique MAC address (read only)                                    |               |
| PROTO_HTTP   | The internal HTTP Protocol Enable or Disable                                  | Enable        |
| PROTO_UDP    | The internal UDP Protocol Enable or Disable (read only)                       | Enable        |
| PROTO_TCP    | The internal TCP Protocol Enable or Disable (read only)                       | Enable        |
| PROTO_XML    | The internal XML Protocol Enable or Disable (read only)                       | Enable        |
| PROTO_FTP    | The internal FTP Protocol Enable or Disable (not Implemented) (read only)     | Disable       |
| PROTO_WINS   | The internal NETBEUI Protocol Enable or Disable                               | Enable        |
| PROTO_UPNP   | The internal UPNP Protocol Enable or Disable (not Implemented) (read only)    | Disable       |
| PROTO_TELNET | The internal TELNET Client Enable or Disable (used for Lutron Application)    | Disable       |

### 4.3 UDP category

| Properties  | Description   | Default         |
|-------------|---|-----------------|
| LISTEN_PORT | The port number the e-Node listens                                    | 5000            |
| SEND_PORT   | The port number the e-Node sends                                      | 4000            |
| REMOTE_IP   | The IP address the e-node sends information on (default is broadcast) | 255.255.255.255 |

### 4.4 Telnet category

This is used by the Lutron Application and properties are set using the e-Node™ Web Interface.

### 4.5 Lutron category

This is used by the Lutron Application and properties are set using the e-Node™ Web Interface.

### 4.6 Port category

| Properties | Description   | Default |
|------------|---|---------|
| TYPE       | The type of interface 0 - CSBus (read only)                       | 0       |
| BAUD       | The interface baud rate(read only)                                | 19200   |
| BRAND_ID   | Certain CS-Bus devices require a specific customer ID (read only) | 169     |
| PRIORITY   | Certain CS Bus messages can be assigned various priority levels   | 8       |

## 5 Templates

The Pilot application supports the use of templates. Templates are a way to pre-configuration an installation prior to actually programming the devices. It allows you to re-use an existing installation. A template is an XML file that defines all devices in an installation. Each device is identified by its UID number, and once identified all the properties specified in the template are automatically downloaded into the device. To use an existing template use the following procedure:

- Load a template into Pilot using the “**File->Load Template**” menu.
- The preferred method is to set the UID and identify all the devices on the network. However It is possible to set the UID and upload the template in one step.
- Ensure that the UID of the devices match the UID’s of the template.
- Press the start button.
- A warning message will appear to ensure the current map is valid. This may be passed over if you wish to set the UID at this time.



- If the UID’s of the devices specified in the template are found then the properties will be updated to those in the template. A dialog window will show the progress.

- If the UID of a device is not found a dialog box will appear asking you to activate the discovery button of the device.



The best way to create a template is to use an existing configuration, save the map file ("**File->Save map**") and use this as a template. Any editing is best accomplished using an XML editor on the file. Standard templates are available from Converging Systems.

## 6 Pilot configuration

This section will take you through all of the drop-down menu tabs available from within the Pilot application. Once a setting is made, that new setting remains permanent until subsequently changed by the user.

### 6.1 File

Select the "File" tab. You will see several selections pop up.

| Option        | Description  |
|---------------|--|
| Save Map File | Allows you to save all the data in the current database. File save in an XML format. |
| Load Template | Allows you to load a template  |
| Save Template | Allows you to save a template. File save in an XML format                            |
| Exit          | Exits the program  |

### 6.2 Network

Select the "Network" tab, and the "Interface" option. This will display a window where the UDP ports can be set and the selection of which Network Interface Card (NIC) to use if you computer has multiple NICs.

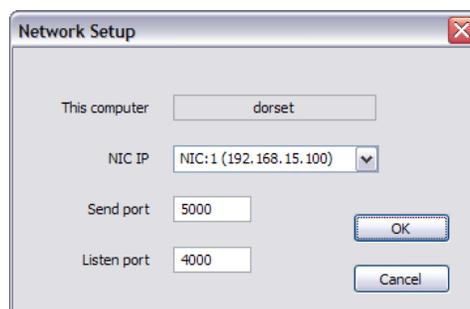


Figure 12

The send and listen ports refer to the computer NOT the e-Node™. If the e-Node™ has its send port at 4000 then Pilot should have its listen port set to 4000.

### 6.3 Logging

It is possible to keep a log of all the traffic on the CS-Bus. Enable the logging by selecting the “**Logging->Start**” option. Set up a log file name prior to starting. The log file is a simple txt file that can be viewed in a text editor.

### 6.4 View

The various view displayed by Pilot can be selected.

| Option                | Description   |
|-----------------------|---|
| <b>View Traffic</b>   | Displays all the traffic on the CS bus with a time stamp and IP address (optional)                        |
| <b>View Template</b>  | Displays the template view  |
| <b>View Map</b>       | Displays the Map view   |
| <b>View e-Node</b>    | Displays the e-Node view  |
| <b>Virtual keypad</b> | Displays a virtual keypad (ILC keypad) which emulates a physical keypad, and can be used to send commands |
| <b>Time Stamp</b>     | Use to turn on / off the time stamp in the traffic messages.  |
| <b>Show IP</b>        | Use to turn on / off the IP address in the traffic messages.  |

## 7 Further reading

| For more details   | Document  |
|--|---|
| About the properties of a device, and what function they perform see the respective user manual. | ILC-100 Manual<br>ILC-100 Overview<br>IMC-100 Manual<br>IMC-100 Overview<br>BSKP Manual |
| <b>Lutron Application and operation</b>  | Lutron Application Manual   |
| <b>ILC or IMC commands</b>   | CS-Bus Messaging Manual   |
| <b>UDP command format</b>  | CS-Bus Messaging Manual   |
| <b>Web page settings</b>   | e-Node™ Quick Start Guide   |
| <b>CS Bus Cabling</b>  | CS-Bus Planning Tech bulletin   |