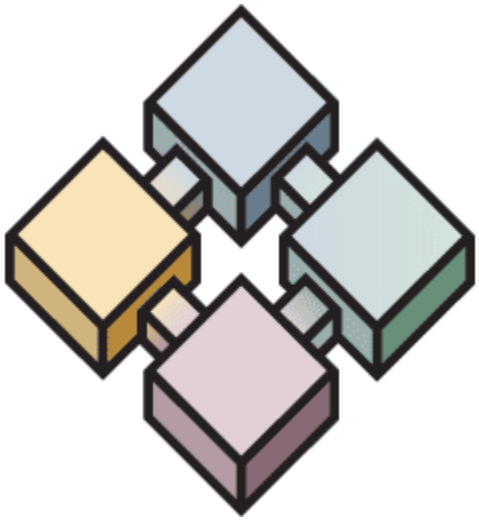
User Guide

Sector™



Document Release May 2014
Revision C

Warranty

Leviton Manufacturing Co Inc. warrants this product to be free of material and workmanship defects for a period of two years after system acceptance or 26 months after shipment, whichever comes first. This Warranty is limited to repair of replacement of defective equipment returned Freight Pre-Paid to Leviton Lighting & Energy Solutions Division at PO Box 2210, Tualatin, Oregon 97062, USA. User shall call 1-800-959-6004 and request a return authorization number to mark on the outside of the returning carton, to assure that the returned material will be properly received at Leviton. All equipment shipped back to Leviton must be carefully and properly packed to avoid shipping damage. Replacements or repaired equipment will be returned to sender freight prepaid, F.O.B. factory. Leviton is not responsible for removing or replacing equipment on the job site, and will not honor charges for such work. Leviton will not be responsible for any loss of use time or subsequent damages should any of the equipment fail during the warranty period, but agrees only to repair or replace defective equipment returned to its plant in Tualatin, Oregon. This Warranty is void on any product that has been improperly installed, overloaded, short circuited, abused, or altered in any manner. Neither the seller nor Leviton shall be liable for any injury, loss or damage, direct or consequential arising out of the use of or inability to use the equipment. This Warranty does not cover lamps, ballasts, and other equipment which is supplied or warranted directly to the user by their manufacturer. Leviton makes no warranty as to the Fitness for Purpose or other implied Warranties.

Notice

Although the information contained within this user guide is believed to be accurate at the time of printing, it is not guaranteed to be without fault and is subject to change without notice. Future software releases may change the features or operation of this product. For current information contact:

Leviton Lighting & Energy Solutions Division
20497 SW Teton Ave., Tualatin, OR 97062

Mailing Address:
PO Box 2210
Tualatin, OR 97062

Customer Service: (800) 736-6682
Technical Support: (800) 959-6004
Fax: (503) 404-5601
Internet: www.leviton.com/les

Table of Contents

1. Introduction

Welcome to Sector: According to United States Department of Energy (USDOE), lighting typically constitutes 30% to 35% of a building's total energy load. Leviton's Sector family of products offers immediate energy savings by managing your lighting needs and reducing energy consumption in the most efficient and cost-effective way possible.

Sector combines several energy saving technologies – occupancy sensing, daylight harvesting and dimming – into one conveniently integrated system. This topology free system uses the same wiring type for all Sector components and accessories making it one of the easiest fluorescent lighting control systems to install. To further simplify installation, all components are located on a bus, with accessories connected to the network, not the ballast.

The Sector family of products provides a scalable solution that offers maximum flexibility and maximum coverage in any application – from a single room to a campus of buildings. And Sector's automatic and manual lighting control of specific areas and zones provides increased workplace productivity through improved ergonomic lighting qualities.

Reduce Energy Costs: Using the Leviton Sector Lighting Management system can reduce your energy costs from an estimated 34% to 60%.

1.1. Sector Components

SectorNET Client Application Software

- **1.** Quick configuration and programming of a Sector network from any Windows XP based PC (X86, non 64 bit OS).
- **2.** Intuitive, easy-to-use interface.
- **3.** Network view for selection and setup of all Sector system devices.
- **4.** Graphical view of project, building and floor components offers smart programming capabilities.

Sector Intelligent Dimming Fluorescent Ballasts

- **5.** Continuous dimming offers higher energy savings and increased flexibility than traditional switching.
- **6.** Dimming fluorescent ballasts allow 100% to 1% dimming capabilities in 1% increments.
- **7.** Ballasts have a patent pending addressable labeling system for easy programming and personal lighting control.

Sector Network Bus Controller

- **8.** Contains the brain and the power supply for the Sector system in one component.
- **9.** Controls a maximum of 64 devices (including PC) on a loop with the ability to expand a system to include a maximum of 253 loops.

Sector Network Occupancy Sensors

- **10.** Turns lights ON/OFF based on vacancy or occupancy.
- **11.** Multi-technology and infrared models available.
- **12.** Self-adjusting settings continuously analyze and adjust sensitivity, timer operation and long-term performance - reducing user complaints.

Sector Network Photocell / IR

- **13.** Measures the amount of ambient light available in a space and lowers electric bills by reducing lighting usage when ambient light is sufficient.
- **14.** Offers constant lighting at desired level for greater visual comfort.
- **15.** Remote controlled.

Sector Network Switch

- **16.** Manually overrides programming at the push of a button to meet the user's needs.
- **17.** 5-button (On, Max, Bright, Dim, Off) and 2-button (On, Off) models.
- **18.** Remote controlled.

Sector Handheld Remote

- **19.** Manually overrides programming at the push of a button to meet the user's needs (On, Max, Bright, Dim, Off). Used with Photocell and wall switches.

SectorNET USB to CAN Adapter

- **20.** Offers a secure data connection (Kvaser device) between SectorNET Client Application software and Sector Network Bus Controllers.

Sector Relay

- **21.** Used for both switching only loads and dimming loads controllable with a 0-10V control signal.
- **22.** 0-10V control signal.

Sector Low Voltage Interface

- **23.** Allows integration of the Sector system with any switch or contact closure within an assigned area.
- **24.** 5 inputs can be switches or commands.

Sector Occupancy and Photocell Interface

- **25.** Allows integration of Sector system with non-Sector occupancy sensors and photocells.

2. Getting Help & Warnings

2.1. Online User Guide

A User Guide is provided via the Help Menu of the Client Application, *see section 3.2.1.3.*

2.2. Contacting Technical Support

If you cannot find answers in the User Guide, please contact Technical Support at www.leviton.com/les and we will be glad to answer your questions. You may also call us during regular business hours at 1-800-959-6004. Please have the model number available when you call.

Contact Information

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Internet: www.leviton.com/les

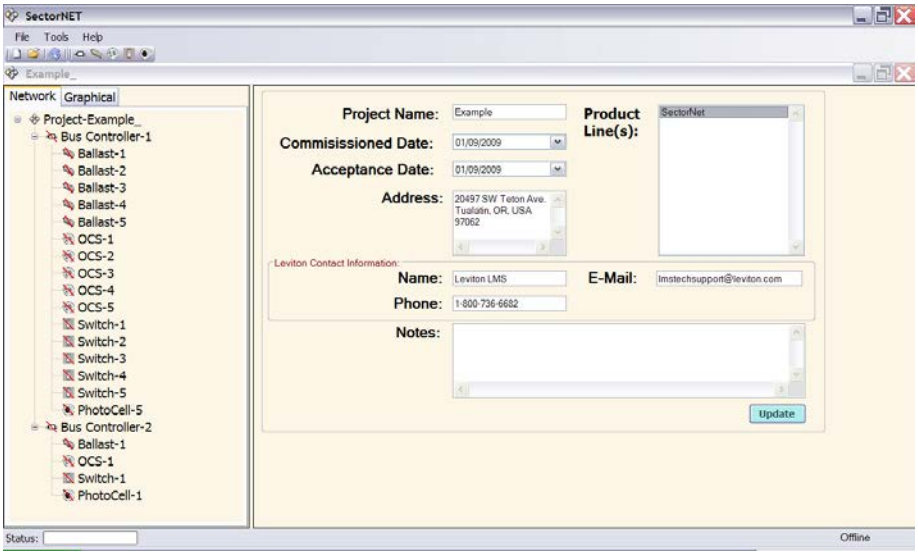
2.3. Warnings

- To avoid fire, shock, or death; turn off power at circuit breaker or fuse and test that power is off before wiring Sector devices.
- Disconnect power when servicing fixture or changing lamps.
- Sector devices must be installed in accordance with appropriate local and national electrical codes and regulations.
- Sector devices to be installed by a qualified Electrician.
- Do not connect line voltage wires to low voltage terminals.
- Fluorescent lighting fixture and ballast must be grounded.
- Bus controller and all other devices which operate on line voltage must be grounded.
- If unsure about any part of these instructions, consult a qualified electrician.

3. SectorNET Client Application Software

SectorNET Client Application software is used by system installers and building managers for configuration and programming of a Sector system.

The software provides a Network View for system configuration and a customizable Graphical View of project, building and floor components for complete system layout and programming.



3.1. Installation

3.1.1. Computer Requirements

The SectorNET Client Application is designed to run on Microsoft Windows XP based computers (X86).

3.1.2. Setup Utility

The SectorNET Setup Utility is available via web download at www.leviton.com/sector. Only certified installers may have access to the SectorNET software. Please have your user code and password ready.

TIP Remember to check regularly for software updates at the above website!

NOTE During the SectorNET application installation, the following components must be installed during the installation process (if not previously installed):

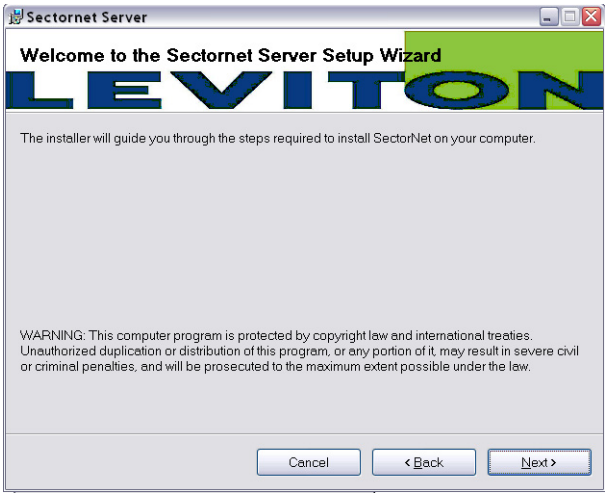
- **1.** Microsoft SQL Server Express
- **2.** Microsoft .NET Framework (version 3.5 or higher)
- **3.** Kvaser CAN device driver (for USB to CAN adapter)

1. Once the SectorNET Setup Utility is downloaded, locate and run **setup.exe** (located in the folder you downloaded the software to).

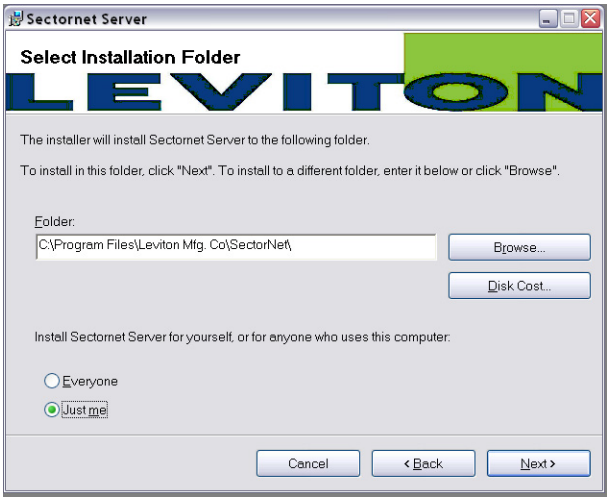
2. Select **I Agree** to accept license agreement.

3. Select **Next**.

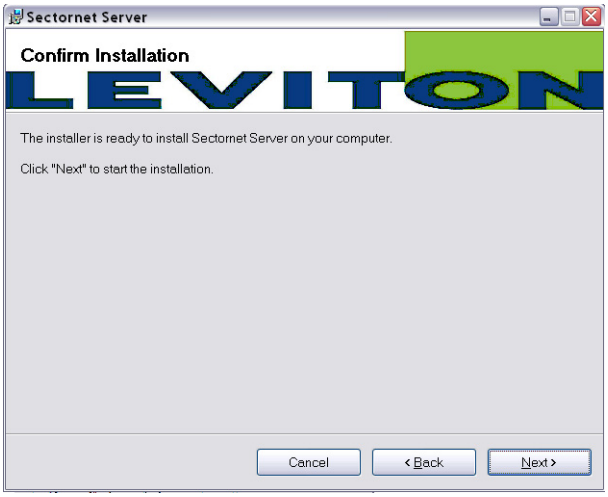
4. Select **Next** to begin Setup Wizard:



5. Select destination folder location where SectorNET will be installed.(default is C:\Program Files\Leviton Mfg. Co\SectorNET). Select if you would like other users on the computer to have access to the program. Select **Next**:



6. Select **Next** to begin installation:



7. Once complete, select **Close** to end installation.

3.1.3. Personal Dimming Option Software Installation

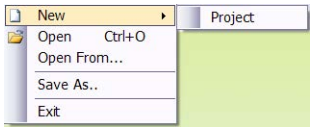
SectorNET Personal Dimming software will be installed on individual PC's by a SectorNET administrator. Once installed, the user may configure the software to their personal requirements. *See section 3.7*.

3.2. SectorNET Configuration and Programming

This section explains SectorNET configuration and programming. For advanced SectorNET configuration, *see section 3.6*.

3.2.1. Menus

3.2.1.1. File Menu Options



Start a New Project

Press **New** to create a new project. *See Initial Start Up, section 3.2.4 below*.

Open a Saved Project

Press **Open** to open a saved project from within the Client Application database. *See Initial Start Up, section 3.2.4 below*.

Open From

Press **Open From** to open a saved project from a specific location (**.scn** file). *See Initial Start Up, section 3.2.4 below*.

Save As

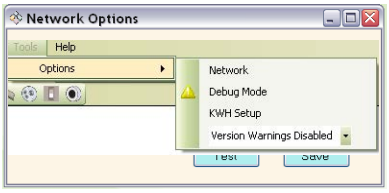
Press **Save As** to save project to a specific location as a **.scn** file.

Exit

Press **Exit** to close program.

3.2.1.2. Tool Menu Options

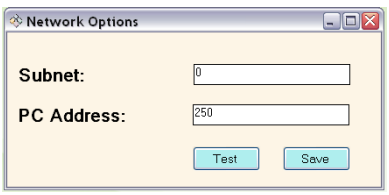
Tool Menu



Network

Selecting **Tool / Options / Network** will display the following dialog box for setting the Subnet and PC Address of the computer running SectorNET:

NOTE For device addressing, please *see section 3.2.5.9.*



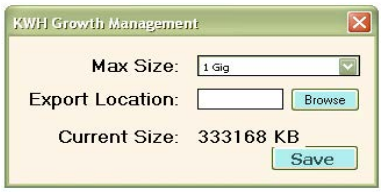
NOTE Valid Subnet values are from 0 - 253. Valid PC Address values are from 249 - 253 (maximum of five PCs for green friendliness).

Debug Mode

Selecting **Tool / Options / Debug Mode** will create a log of all selections and results to assist in diagnosing software bugs.

KWH Setup

Selecting **Tool / Options / KWH Setup** will export the system KWH data to a specified location.



Version Warnings

Selecting **Tool / Options / Version Warnings** enables/disables the version warning message. Selecting Version warning enabled, enables the version warning messages when the program version is not up to date. Selecting disabled, disables the warning message.

3.2.1.3. Help Menu Options

User Guide

Select to view online PDF version of User Guide.

About

Select to view software version number and copyright information.

3.2.2. Transferring SectorNET Data to Remote Computers

To transfer a SectorNET file to a remote computer, save the data as a .**scn** file on the source computer. *See Save As.*

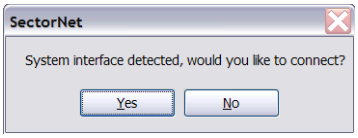
Next, send the file to a specific location on the target computer (via network, USB drive, etc.).

Use the **Open From** command to open the .**scn** file from saved location on remote computer (SectorNET software must be installed on remote computer). *See Open From*.

3.2.3. Connecting Bus Controller to Computer

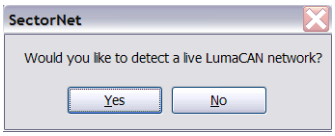
Before starting a new project connect the Bus Controller via the LumaCAN USB Adaptor to the computer. The software must detect the Bus Controller(s) in Live mode for successful system commissioning.

3.2.4. Initial Start Up



After starting a **New Project**, a dialog box will appear stating that a system interface has been detected.

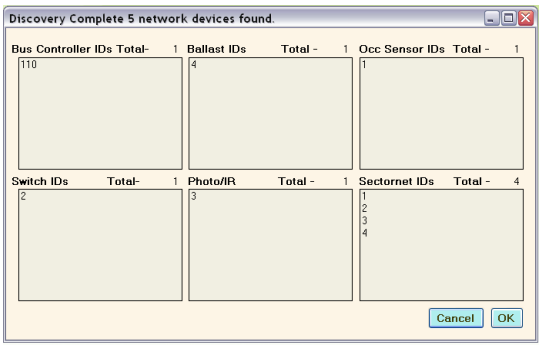
Press **Yes** to connect to online Sector devices or if **No** is pressed the program will remain offline.



After opening a **Saved Project**, a dialog box will appear asking if you would like to detect a LumaCAN network.

Press **Yes** to connect to online Sector devices, or if **No** is pressed the program will remain offline.

NOTE For more information about online (live) and offline modes, *see section 3.5*.



If **Yes** is pressed in the above instances, the software will display a list of connected live devices and their short address IDs (Device Discovery).

Press **Ok** to accept or **Cancel** to abort.

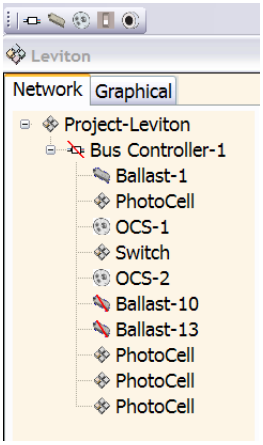
NOTE No IDs will appear if communication with devices fail, please *see section 6.1* for more information on communication errors.

After the Device Discovery is complete, a dialog box will appear asking if a "**Pull all Data from the Network**" procedure should be performed. (This procedure will automatically transfer all data parameters of all live devices to the SectorNET software. Procedure may require a few minutes to transfer parameters.)

NOTE A status bar, located at the bottom of the screen, indicates device communication progress and if the software is on or offline:

TIP In order for an online ballast to appear live, it must be assigned a short address in the Ballast Setup screen, *see section 3.6.2.2*.

3.2.5. Network View



The **Network View** is where you select and configure Sector devices for your project.

For example, you can add bus controllers and assign lamp ballasts, photocells, occupancy sensors and switches to each bus controller on the network.

Device parameters can be quickly transferred between same-type devices by dragging the source device to the target device within the network tree view.

NOTE Offline devices are shown with a red slash . *See section 3.5 for more information on Offline and Live modes*.

3.2.5.1. Adding a Bus Controller

To add bus controller to a project, select (left-click) the project name at top of network tree, then press the icon.

Enter device name, then press **Save**.

TIP Selecting **Refresh** (right-click) will update data of all live devices on the bus controller.

See section 3.6.2 for advanced bus controller configuration.

3.2.5.2. Adding a Ballast

To add a ballast to a bus controller, select (left-click) bus controller, then press the icon.

Enter device name, then press **Save**.

See section 3.6.3 for advanced ballast configuration.

3.2.5.3. Adding an Occupancy Sensor

To add an occupancy sensor to a bus controller, select (left-click) bus controller, then press the icon.

Enter device name, then press **Save**.

See section 3.6.4 for advanced occupancy sensor configuration.

3.2.5.4. Adding a Photocell / IR Sensor

To add a Photocell/IR Sensor to a bus controller, select (left-click) bus controller, then press the icon.

Enter device name, then press **Save**.

See section 3.6.5 for advanced Photocell /IR Sensor configuration.

3.2.5.5. Adding a Switch

To add a switch to a bus controller, select (left-click) bus controller, then press the  icon.

Enter device name, then press **Save**.

See section 3.6.6 for advanced switch configuration.

3.2.5.6. Adding a Sector Relay

To add a sector relay to a bus controller, select (left-click) bus controller, then press the  icon.

Enter device name, then press **Save**.

See section 3.6.3 for advanced ballast configuration.

3.2.5.7. Adding a Low Voltage Interface

To add a low voltage interface to a bus controller, select (left-click) bus controller, then press the  icon.

Enter device name, then press **Save**.

See section 3.6.6 for advanced switch configuration.

3.2.5.8. Adding an Occupancy Sensor/Photocell Interface

To add an low voltage interface to a bus controller, select (left-click) bus controller, then press the  icon.

Enter device name, then press **Save**.

See section 3.6.4 for advanced occupancy sensor configuration and section 3.6.5 for advanced Photocell / IR Sensor configuration

3.2.5.9. Setting Device Addresses

LumaCAN Address

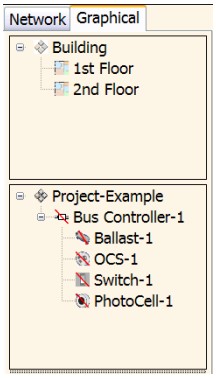
Each bus controller must be assigned a **LumaCAN Address** in order to be identified on the network. Please see *sections 3.6.2.1 and 4.2* for addressing methods.

SectorNET Short Address

Devices (occupancy sensors, switches, photocells, smart ballasts) must be assigned what is known as a **SectorNET** "**Short Address**" in order to be identified on the network. Please see *sections 3.6.2 - 3.6.9 and 4.3 - 4.10* for addressing methods.

NOTE Each smart ballast also has a unique factory-programmed **SectorNET** "**Long Address"** assigned to it (located on a label affixed to the ballast housing). In order for an online ballast to appear live, it must be assigned a short address in the Ballast Setup screen,*see section 3.6.2.2*.

3.2.6. Graphical View



The **Graphical View** is where area, zone and device light levels and states may be programmed within imported graphical (JPEG) representations of building floorplans.

Icons of areas, zones and devices can be placed on each floorplan for quick visual layout of, and access to, the SectorNET network.

The areas, zones and devices can then be individually programmed by double-clicking on their respective icons. For example, by left-clicking on a ballast icon, a dialog box will appear in which you can adjust the ballast level.

There are two tree views within the Graphical View: The lower tree shows the current network tree and its devices. To add a device icon to the floorplan, simply drag the device from the lower tree to the floorplan. The upper tree represents components that have been added to the floorplan.

3.2.6.1. Adding a Building

To add a building to a project, press the  icon.

Enter building name in space provided, then press **Save**.

3.2.6.2. Adding a Floor and Floor Images

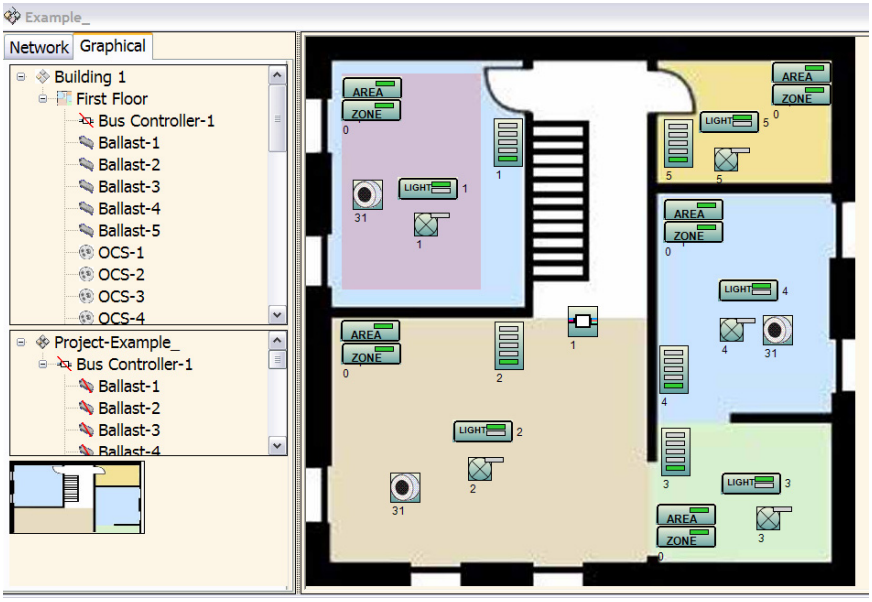
To add a floor to a building, select (left-click) the building in the upper tree view, then press the  icon. To delete a floor, right-click on its image.

Enter the floor name in space provided and browse for desired background image (JPEG) to be imported as a floorplan representation. Press **Save** to confirm.

To delete a floor, right-click on its image then press **Delete**.

In the example below, various Sector areas, zones and device icons have been added to the floorplan. *See Adding Icons to Floors, section 3.2.6.3 below*.

NOTE An area, zone or device can be individually programmed by double-clicking its icon, *see Programming Levels and States, section 3.3*.



3.2.6.3. Adding Icons to Floor Images

To add icons of devices to their desired locations on the floorplan, drag them from the lower graphical tree view.

NOTE Area and zone icons are not dragged from lower tree view. To add an area or zone icon to the floorplan, drag a bus controller which has previously assigned areas or zones to the floorplan. The area or zone icons will appear on top of the bus controller icon and can be repositioned accordingly.

Deleting Icons

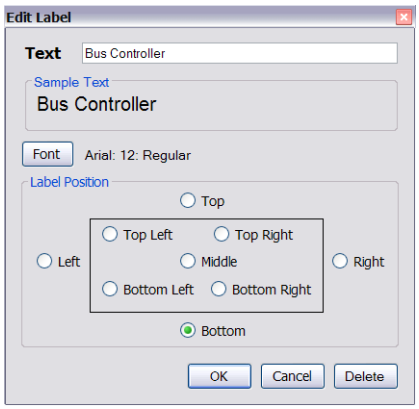
To delete an icon, right-click on it then press **Delete**.

Icon Locking

Once device icons are placed in position on the floorplan they may be locked in place by pressing the **Lock** icon.

To unlock devices icons for further placement, press **Lock** again.

Icon Label

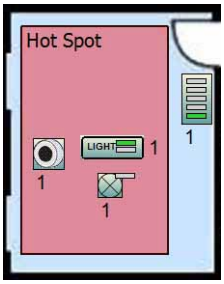


Right-clicking on an icon will open a dialog box in which its **Label** (**Text, Font, Position**) may be edited.

Press **Ok** after editing or **Cancel** to abort.

Press **Delete** to remove icon from floorplan.

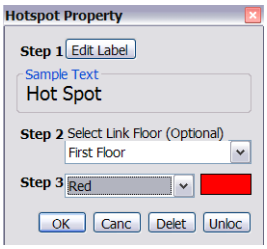
3.2.6.4. Adding a HotSpot to Floor Images



Hot Spots are highlighted areas that may be drawn within the imported floorplan image for further isolation of the floorplan.

To draw a hot spot within a floor image, select (left-click) the floor in the upper tree view, then press the icon. Next, drag the hot spot to desired size.

Hot Spot Properties



Right-clicking on a hot spot will bring up a dialog box in which the following hot spot properties can be edited: **Edit Label**, **Link to Floor** and **Hot Spot color**.

The hot spot can be locked in place within the floorplan image by pressing the dialog box **Lock** button.

3.3. Programming Levels and States

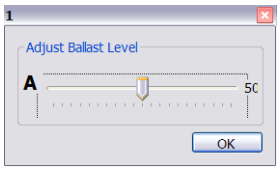
Programming of area, zone and device levels and states is performed in the graphical view.

To set levels and states, double-click on a device icon in the graphical view.

Assigning of area, zone and device levels and states to load shed selection is also performed in the graphical view.

3.3.0.1. Ballasts

Left-clicking on a **Ballast** icon on the graphical view floorplan will open a dialog box in which its individual light level can be adjusted:



3.3.0.2. Load Shed

Pre-configured Load Shed levels can be selected in the graphical view.

Select the area, zone or ballast desired, then press the **Load Shed 1**, **Load Shed 2** or **Load Shed 3** icon).

Press the **Off** icon to disable load shed of selected area, zone or ballast.

NOTE To configure load shed levels, *see Ballast Configuration, section 3.6.3*.

3.4. KWH Reporting

When KWH reporting is started the system will log KWH data which can be exported in csv format for importing into excel for analysis.

3.4.0.1. Data Reporting

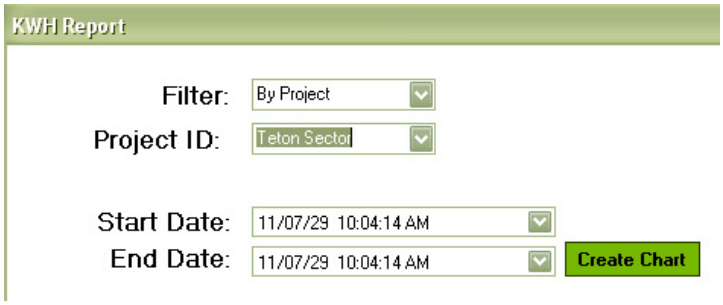
Press the Green icon to start KWH reporting. Press the Red icon to stop KWH Reporting. Press the X icon to remove all stored KWH data. Pres the ! icon to export KWH data.

3.4.0.2. KWH Chart Utility

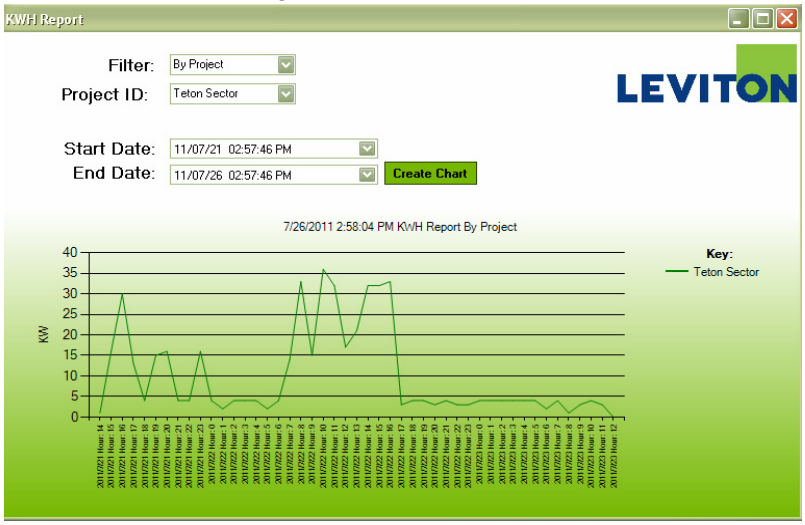
Open the Chartkwh.exe application.

The report can be filtered by Project, by Bus Controller or by Area.

After selecting the filter type, select the project to report KWH data for and the dates to start and end reporting.



Press create chart to generate the chart.



3.5. Live and Offline Modes

Configuration and programming tasks can be performed in **Live** (online) mode only. Programming or updates performed in **Offline** mode will not be executed.

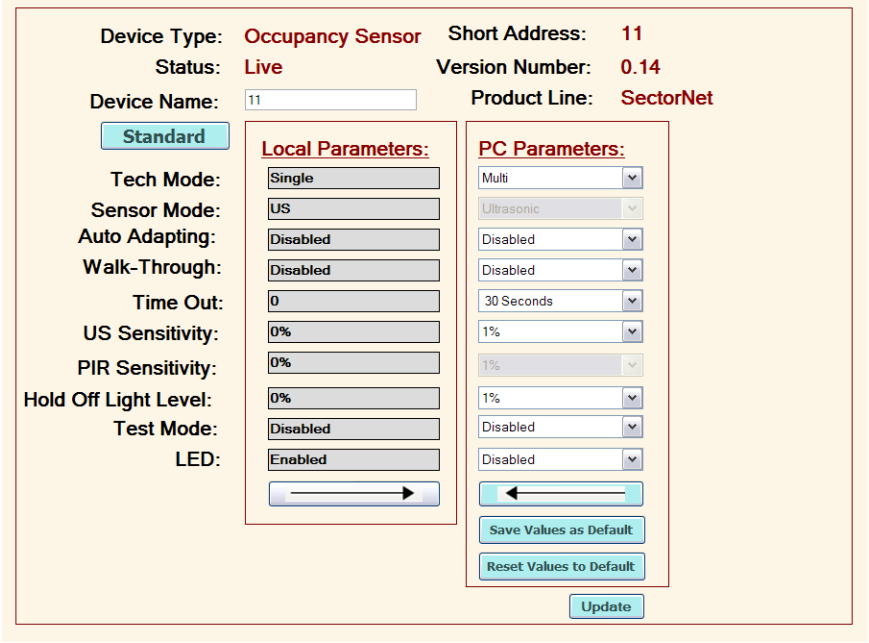
NOTE Offline devices are shown with a red slash in the network and graphical tree views. A status bar is located at the bottom of the application which indicates device communication progress and if the software is on or offline:

3.5.1. Live Configuration

Area, zone and device parameters may be configured in live (online) mode only.

In the example below, an occupancy sensor's **PC Parameters** are being configured in Live mode in order to be transferred to an actual live online sensor (**Local Parameters**).

NOTE For individual device configuration, *see section 3.6.*



- Press ← to transfer **PC Parameters** to **Local Parameters**.
- Press → to transfer **Local Parameters** to **PC Parameters**.
- Press Save Values as Default to save **PC Parameters** as default values.
- Press Reset Values to Default to set **PC Parameters** to saved default values.
- Press Update after device name change.

TIP Select **Push all Configuration Data to Network** (right-click on project name in network tree) to send **all** PC-based device parameters to live devices.

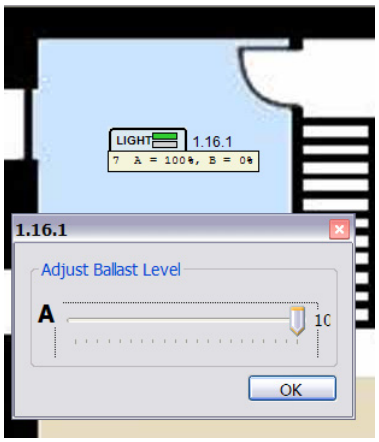
3.5.2. Live Programming

Area, zone and device levels and states can be programmed live (online) only.

When live, all level and state adjustments occur instantaneously.

To set levels and states, double-click on an icon in graphical view.

In the example below, a ballast's lighting level is being adjusted.



NOTE For more information on programming levels and states, *see section 3.3*.

3.6. Advanced SectorNET Configuration

3.6.1. New Project Setup

Select **File/New** or press the **New** icon to begin a new project.

The following screen will appear where relevant project data can be entered:

Project Name

Commissioned Date

Acceptance Date

Address

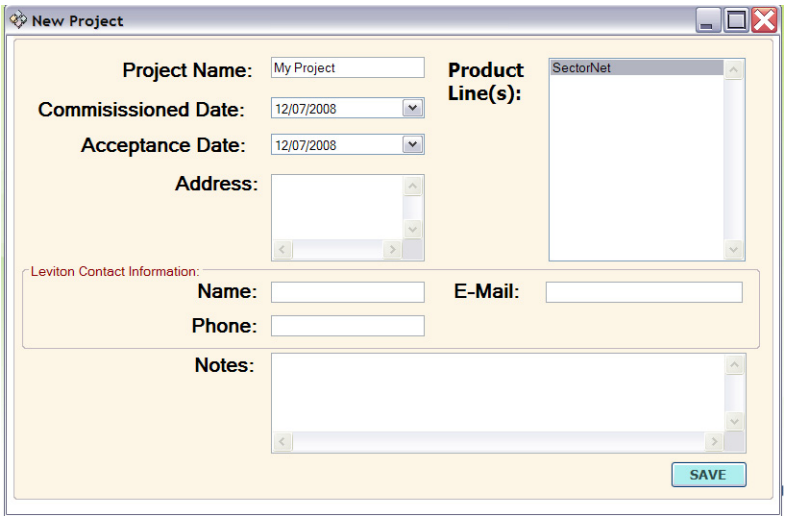
Name

Phone Number

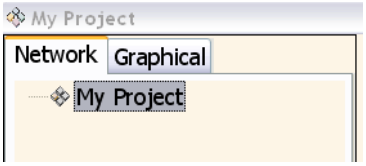
Product Line(s)

EMail

Notes



Press the **Save** button after data completion:



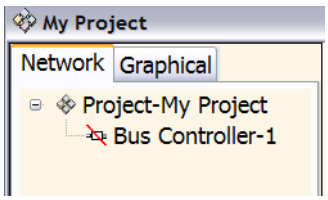
TIP Once devices are assigned to your project, select **Push all Configuration Data to Network** (right-click on project name in network tree) to send **all** PC-based device parameters to live devices (individual device parameters can also be transferred via each device's configuration screen as explained in *section 3.5.1*).

3.6.2. Bus Controller Configuration

To add a bus controller, select the project name in the network tree view, then press the icon. You may also right-click the project name, then select **Add / Bus Controller**.

Enter device name, then press **Save**.

The new bus controller will appear in the network tree as shown below.



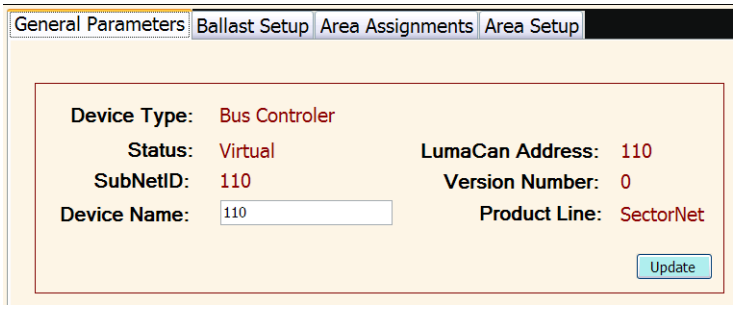
TIP Parameters can be transferred between bus controllers by dragging the source bus controller to the target bus controller within the network tree.

NOTE Selecting **Update Device Software** (right-click on bus controller) will update the controller's software code, please make sure you have the latest code before initializing the update.

Double-clicking a bus controller in the network tree will open up four tabs as shown below; **General Parameters**, **Ballast Setup**, **Area Assignments** and **Area Setup:**

3.6.2.1. General Parameters Screen

1. Displays general parameters of selected bus controller.



NOTE Press **Update** after making any changes.

Device Type

Displays the device type that is currently selected.

Status

If the Client Application is connected to a live SectorNET network, **Live** will be displayed in this area, otherwise the Client Application will be in **Offline** mode. *See section 3.5 for information about Live and Offline modes*.

SubNetID

Displays SectorNET SubNet number: Each bus controller belongs to a SubNet which is related to its LumaCAN address (see LumaCAN address below).

Device Name

Used to give the bus controller a specific name, for example, Reception Area. Enter the name in the space provided.

LumaCAN Address

Displays current LumaCAN address of the bus controller. The LumaCAN address is set via three rotary switches located on the bus controller.

Version Number

Displays current version number of the device.

Product Line

Displays name of product line.

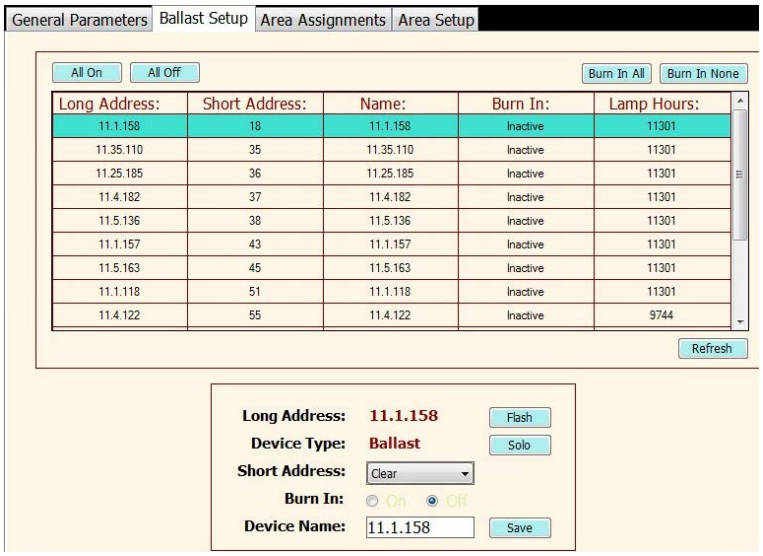
3.6.2.2. Ballast Setup Screen

- **2.** Displays list of ballasts which are assigned to selected bus controller. **Lamp Hour** life (elapsed) of each lamp is also displayed.

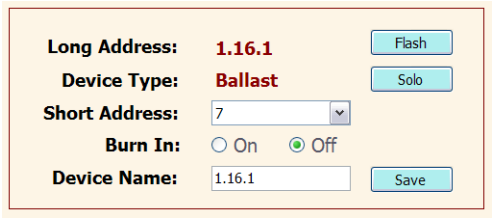
Press the **All On** or **All Off** buttons to turn on or off all lamps which have ballasts assigned to the bus controller.

Press **Burn In All** to burn-in (season) all lamps which have ballasts assigned to the bus controller.

Press **Burn In None** to deactivate burn-in.



Double clicking on a ballast (highlighted in cyan as shown above) will open up the following screen in which additional ballast parameters and features may be accessed:



The ballast's lamp **Burn-In** functions may be selected.

The ballast's **Short Address** and **Device Name** may be modified.

TIP Make sure to give the ballast a short address in order for an online ballast to appear live in the network and graphical tree views!

Lamp Locate Functions

- **3.** Used for individual lamp location purposes.

Press the **Flash** button to blink lamp on and off.

Press the **Solo** button to only light selected lamp while turning off all other lamps assigned to the bus controller.

NOTE *See Test Mode, section 4.2.3 for other lamp and device location methods*.

3.6.2.3. Area Assignments Screen

- **4.** Displays list of available area devices assigned to selected bus controller and to which areas devices are assigned.

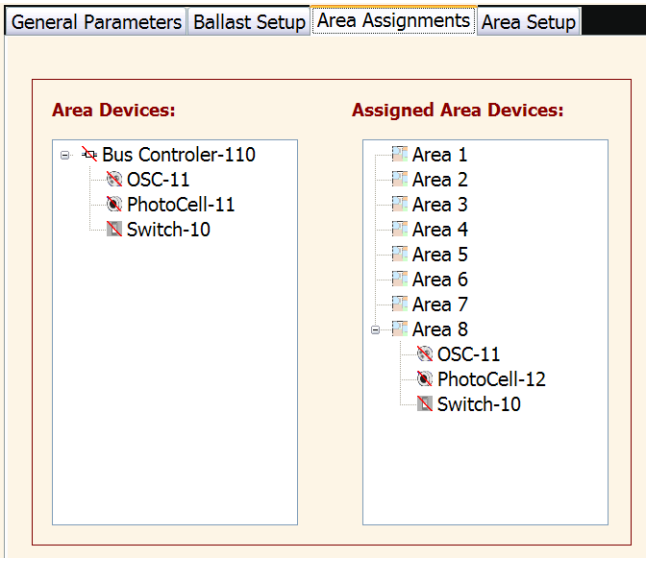
NOTE Ballasts are not assigned in the Area Assignments screen. They must first be assigned to a group, *see Ballast Configuration, section 3.6.3*. The ballast group is then assigned to a zone in the **Area Setup** screen, *see section 3.6.2.4*.

To assign a device (except ballast, see note above) to an area, select the device from the **Area Devices** section then drag it to desired **Area** (1-8).

To remove a device from an area, select the device then drag it back to the **Area Devices** section.

NOTE For more information on areas, *see section 3.6.2.4* and *section 5.1*.

In the example below, OSC-11, Photocell-12 and Switch-10 have been assigned to Area 8:



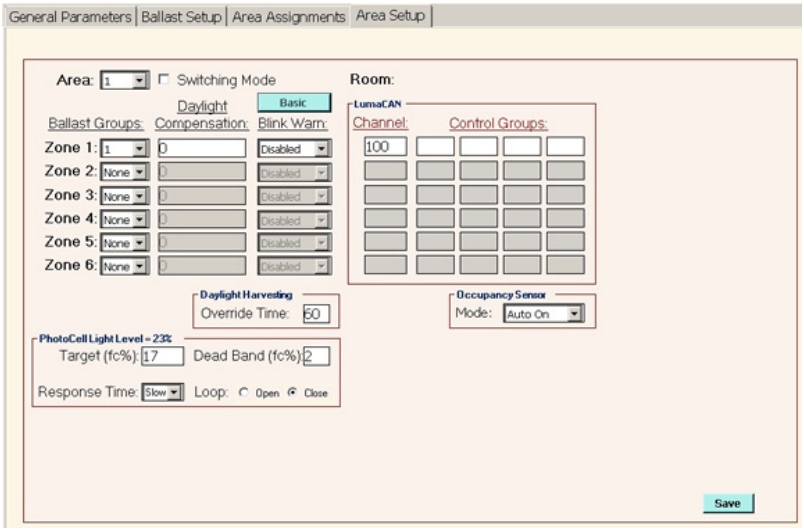
NOTE Offline devices are shown with a red slash .

TIP Always assign devices to areas before assigning zones and groups to areas (zones and groups are assigned in the Area Setup Screen, see next page).

3.6.2.4. Area Setup Screen

- **5.** Displays area, zone and group setup options. Press the **Advanced** button to view and configure additional features. Press the **Basic** to return to the regular view.

  Note that certain features will only be visible in this screen depending if they have already been assigned to areas in the Area Assignments screen (for example, photocells and occupancy sensors), or if they are enabled (for example, Blink Warn).



NOTE Press **Save** after making any changes!

Areas, Zones and Groups Assigning

- **6.** A Bus Controller is divided into separate partitions known as **Areas**, with each Bus Controller supporting eight Areas.
- **7.** Each Area is further divided into six **Zones**.
- **8.** Each Zone may be associated with a **Group**. 32 ballast groups are available for selection.

Assigning Areas to a Bus Controller

Before assigning zones and groups, an area must be assigned to the bus controller: Please select the Area number from area drop-down menu.

Assigning Zones to an Area

To assign a zone to an area, select the desired zone number (to remove, select None). You can then assign a group to a zone as described below.

Assigning Groups to a Zone

To assign a group to a zone, select the ballast group from the zone's drop-down menu.

NOTE Ballasts must be assigned to a ballast group, *see Ballast Configuration, section 3.6.3.*

NOTE See example layout in *section 5.1* for more information on areas, groups and zones.

Daylight Compensation

Set level of zone as a percentage (0-100%) of the maximum lighting level as defined for the photocell (see Photocell section below).

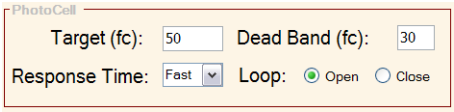
TIP Zones farther away from an ambient light source (for example, a window) would have a higher compensation level than closer zones.

Daylight Harvesting

Set amount of time (0-240 min.) that Daylight Harvesting will be overridden when Max, Bright or Dim is selected on a switch or via switch IR. See *section 4.6* for more information on switches.

Photocell

NOTE The below photocell parameters can be viewed and adjusted only after the photocell has been assigned to an area in the Area Assignments Screen, *see section 3.6.2.3*.



Target (fc%)

Enter the target level (in fc%) to be maintained by daylight harvesting.

NOTE The level of each zone within an area can be individually adjusted as percentage of this value, see Daylight Compensation section above.

Dead Band (fc)

Set range in which the Target (fc) will operate. For example, if the Target (fc) value is 50, a Dead Band (fc) value of 5 will allow the Target (fc) to operate between 45-55 footcandles.

Response Time

Select photocell's response time.

Response Time Options

- **9.** Test: 5 seconds.
- **10.** Fast: 30 seconds.
- **11.** Slow: 30 minutes.

NOTE Response time may also be set via the photocell's onboard DIP switches, *see section 4.5.3.1*.

Loop

The photocell will operate in a **Open Loop** or **Closed Loop** daylight harvesting mode:

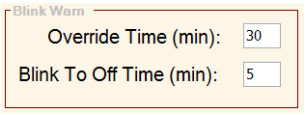
- **12.** In open loop mode, the photocell will sense the amount of light coming in through the skylight or windows.
- In closed loop mode, the photocell will sense the amount of artificial light in the room.

Blink Warn Enable / Disable

Select whether the zone will send a Blink Warn message to indicate upcoming area lighting shutdown. See Blink Warn Parameters section below to change parameters.

NOTE Blink Warn parameters can be viewed and adjusted only when Blink Warn is enabled.

Blink Warn Parameters



Override Time

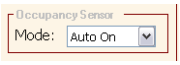
Set amount of time specified to override Blink to Off Time (below).

Blink to Off Time

Set amount of time the area lighting will Blink To Warn of upcoming area lighting shutdown.

NOTE Individual ballasts are enabled/disabled to Blink Warn and their Blink Warn times set in the Ballast Configuration Screen, see *section 3.6.3.8*.

Occupancy Sensor Mode



Select type of On mode (Auto or Manual) for the occupancy sensor.

NOTE The occupancy sensor's mode parameters can be viewed and adjusted only after it has been assigned to an area in the Area Assignments Screen, *see section 3.6.2.3*.

LumaCAN Channel

A LumaCAN channel is a single dimmer control channel on a LumaCAN network. Enter channel number in space provided (0-255).

LumaCAN Control Groups

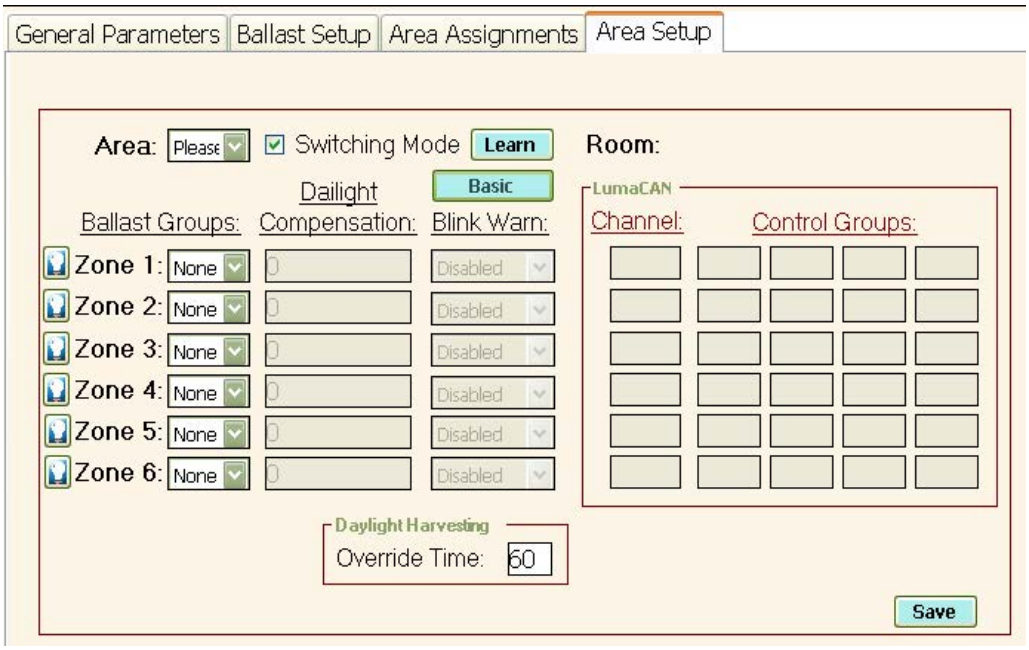
A LumaCAN Control Group is a collection of dimmer channels that can be controlled as a whole with a single LumaCAN message. Enter data in space provided.

LumaCAN Room

If needed, enter the associated LumaCAN Room number on the LumaCAN network.

Switching Mode

In switching mode 6 threshold levels may be set to balance lighting levels with available daylight. When switching mode is selected the Learn button will appear. The learn function will automatically set the threshold levels based on existing system configuration data.



3.6.3. Ballast Configuration

To add a ballast to a bus controller, select the bus controller in the network tree view, then press the icon. You may also right-click the bus controller then select Add/Ballast.

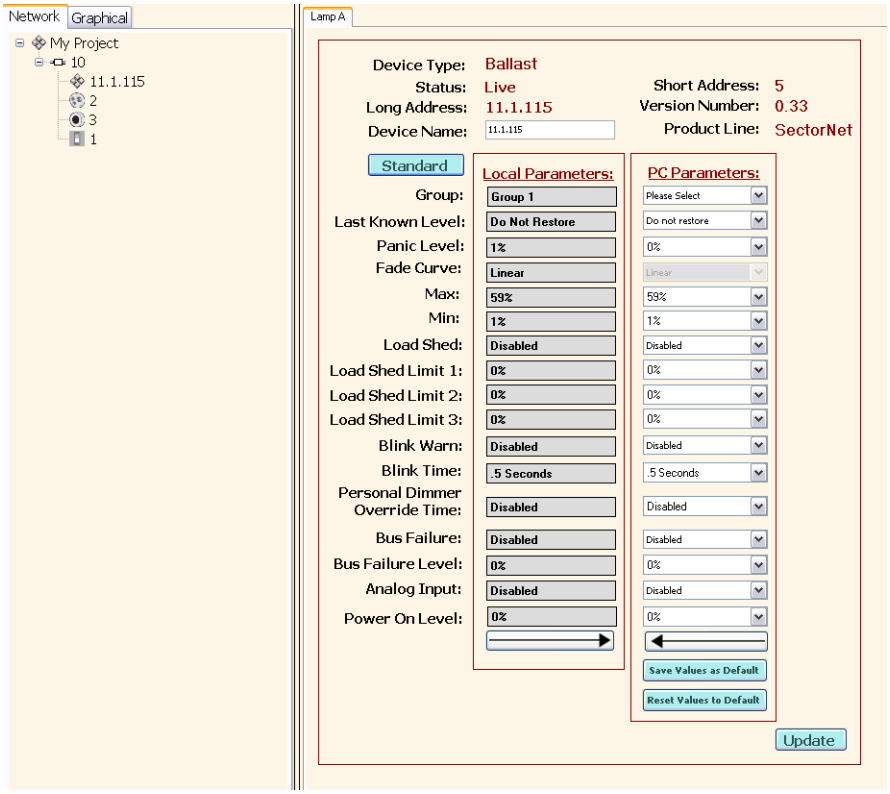
Enter device name, then press **Save**.

The new ballast will appear in the network tree as shown below.

NOTE Parameters can be transferred between ballasts by dragging the source ballast to the target ballast within the network tree.

Double-clicking the ballast in the network tree will open the ballast configuration screen. Press **Save** after making any changes.

NOTE In Standard mode, only the group number will be transferred from PC to Local Parameters.



3.6.3.1. Device Type

Displays the device type that is currently selected.

3.6.3.2. Status

If the Client Application is connected to a live SectorNET network, **Live** will be displayed in this area, otherwise the Client Application will be in **Offline** mode. *See section 3.5 for information about Live and Offline modes*.

3.6.3.3. Long Address

Displays the unique long address of the ballast, which is factory programmed in the ballast and cannot be altered.

NOTE The long address is also marked on a three part label located on the ballast.

3.6.3.4. Device Name

Used to give the ballast a specific name, for example, Corner Office. Enter the name in the space provided.

3.6.3.5. Short Address

Displays the current short address of the ballast. The ballast's short address can be set in the Ballast Setup screen, *see section 3.6.2.2*.

3.6.3.6. Version Number

Displays current version number of the device.

3.6.3.7. Product Line

Displays name of product line.

3.6.3.8. Parameters

Group

Used to assign the ballast to a particular ballast group (1-32).

Last Known Level

Select this option if ballast is to be returned to programmed values immediately when system is turned on.

Panic Level

Set lighting level at which light will operate under urgent conditions.

Fade Curve

Select fade curve type (voltage output in relation to light level).

Max

Set maximum level at which light will operate (59-100%).

Min

Set minimum level at which light will operate (1-39%).

Load Shed

Used to enable or disable load shedding of ballast. Three load shed levels may be pre-configured (Load Shed Limit 1, Load Shed Limit 2, or Load Shed Limit 3).

NOTE *See section 3.3.0.2 for more information on load shedding*.

Load Shed Limit 1

Used to set level of Load Shed Limit 1 (0-100%).

Load Shed Limit 2

Used to set level of Load Shed Limit 2 (0-100%).

Load Shed Limit 3

Used to set level of Load Shed Limit 3 (0-100%).

Blink Warn

Used to enable or disable ballast to respond to **Blink Warn** option as defined in the **Area Setup Screen**, *see section 3.6.2.4*.

Blink Time

Used to set amount of time light will blink before shutdown if **Blink Warn** above is enabled.

Personal Dimmer Override Time

Used to set amount of time that a Personal Dimmer will be allowed to override pre-programmed levels and times defined for the ballast.

NOTE *For more information on personal dimming, see section 3.7*.

Bus Failure

If enabled, ballast will operate if bus failure communication occurs.

Bus Failure Level

Used to set level at which ballast will operate if bus failure occurs (**Bus Failure** option must be enabled, see above).

Analog Input

Used to enable ballast's 0-10V input control signal.

Power On Level

Used to set level at which ballast will operate when powered up after a loss of power.

NOTE *See section 4.3 for more information on ballasts*.

3.6.4. Occupancy Sensor Configuration

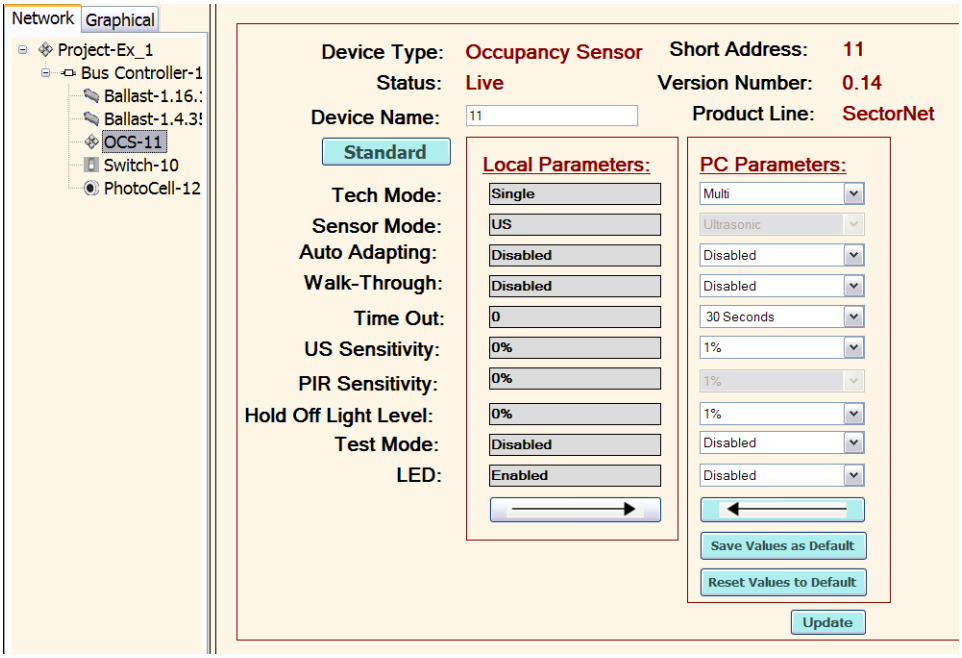
To add an occupancy sensor to a bus controller, select the bus controller in the network tree view, then press the icon.

Enter device name, then press **Save**.

The new occupancy sensor will appear in the network tree as shown below.

NOTE Parameters can be transferred between occupancy sensors by dragging the source occupancy sensor to the target occupancy sensor within the network tree.

Double-clicking the occupancy sensor in the network tree will open the sensor configuration screen. Press **Save** after making any changes.



3.6.4.1. Device Type

Displays the device type that is currently selected.

3.6.4.2. Status

If the Client Application is connected to a live SectorNET network, **Live** will be displayed in this area, otherwise the Client Application will be in **Offline** mode. *See section 3.5 for information about Live and Offline modes*.

3.6.4.3. Device Name

Used to give the occupancy sensor a specific name, for example, Hallway. Enter the name in the area provided. The default name is the short address of the device.

3.6.4.4. Short Address

Displays the current short address of the occupancy sensor. The short address is physically set on the device itself via two rotary address switches.

3.6.4.5. Version Number

Displays current version number of the device.

3.6.4.6. Product Line

Displays name of product line.

3.6.4.7. Parameters

Tech Mode

Used to select type of occupancy sensor being utilized:

Multi for dual-purpose sensors which combine passive infrared (**PIR**) motion detection and ultrasonic (**US**) capabilities.

Single for individual passive infrared or ultrasonic sensors.

Sensor Mode

Used to select type of sensor if Single is selected in Tech Mode (see above).

Auto Adapting

If **Enabled**, the occupancy sensor will automatically return to programmed operation when false-on or false-off conditions occur or if sensor is left in test mode.

Walk-Through

If **Enabled**, occupancy sensor will automatically turn on lamp when a person enters a space and turn off when a person exits.

Time Out

Used to set time lamp will remain on after a person exits a space when **Walk-Through** is **Enabled**.

Ultrasonic (US) Sensitivity

Used to set level of sensor's ultrasonic sensitivity. Valid range is from 1-100%.

Passive Infrared (PIR) Sensitivity

Used to set level of sensor's PIR sensitivity. Valid range is from 1-100%.

Hold Off Light Level

Light will only operate above threshold. Valid range is from 1-100%.

Test Mode

Selecting **Enable** will allow sensor to respond to Bus Controller Test Mode commands.

NOTE *See section 4.2.3 for information about Test Mode*.

LED

If **Disabled**, ultrasound and PIR LED's on device will not illuminate.

NOTE *See section 4.4.4 for more information on occupancy sensor LED's*.

NOTE *See section 4.4 for more information on occupancy sensors*.

NOTE Advanced features are for future use and are not active at this time.

3.6.5. Photocell / IR Configuration

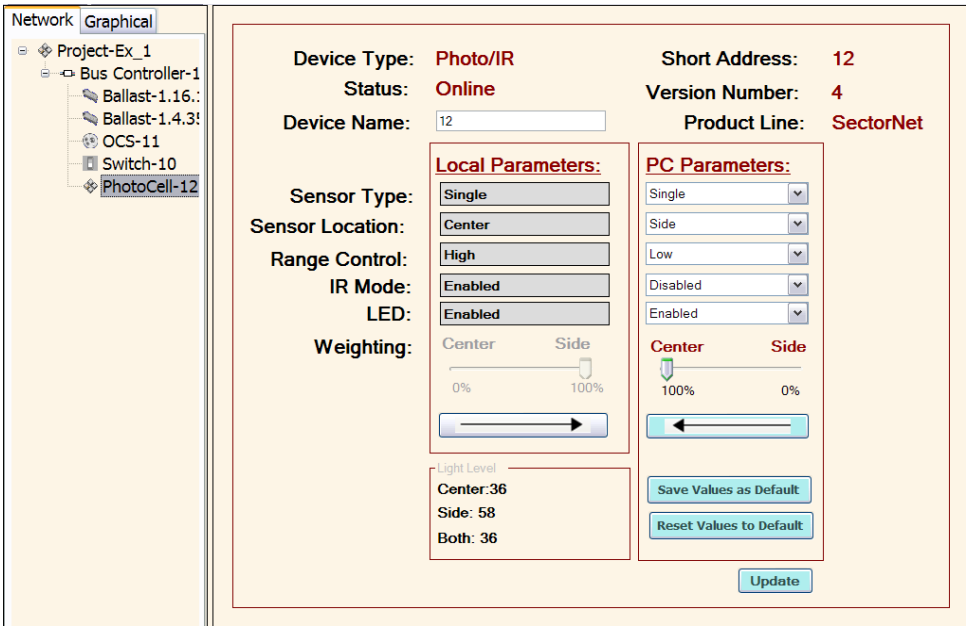
To add a Photocell / IR to a bus controller, select the bus controller in the network tree view, then press the  icon.

Enter device name, then press **Save**.

The new Photocell / IR will appear in the network tree as shown below.

NOTE Parameters can be transferred between Photocell / IR devices by dragging the source Photocell / IR device to the target Photocell / IR device within the network tree.

Double-clicking the Photocell / IR in the network tree will open the Photocell / IR configuration screen. Press **Save** after making any changes.



3.6.5.1. Device Type

Displays the device type that is currently selected.

3.6.5.2. Status

If the Client Application is connected to a live SectorNET network, **Live** will be displayed in this area, otherwise the Client Application will be in **Offline** mode. *See section 3.5 for information about Live and Offline modes*.

3.6.5.3. Device Name

Used to give the Photocell / IR a specific name, for example, East Window. Enter the name in the area provided. The default name is the short address of the device.

3.6.5.4. Short Address

Displays the current short address of the Photocell / IR. The short address is physically set on the device itself via two rotary address switches.

3.6.5.5. Version Number

Displays current version number of the device.

3.6.5.6. Product Line

Displays name of product line.

3.6.5.7. Parameters

Sensor Type

Used to select single (photocell only) or dual sensor (photocell and IR receiver) operation.

Sensor Location

Used to select side or center photocell sensor location on device.

Range Control

Used to select range sensitivity of IR receiver.

IR Mode

Used to **Enable** IR receiver on device, if equipped.

LED

If **Disabled**, photocell LED on device will not illuminate.

NOTE *See section 4.5.2 for more information about Photocell / IR LED's*.

Weighting

Used to select degree (in percent) between side or center photocell sensor sensitivity.

NOTE *See section 4.5 for more information on Photocell / IR's*.

3.6.6. Switch Configuration

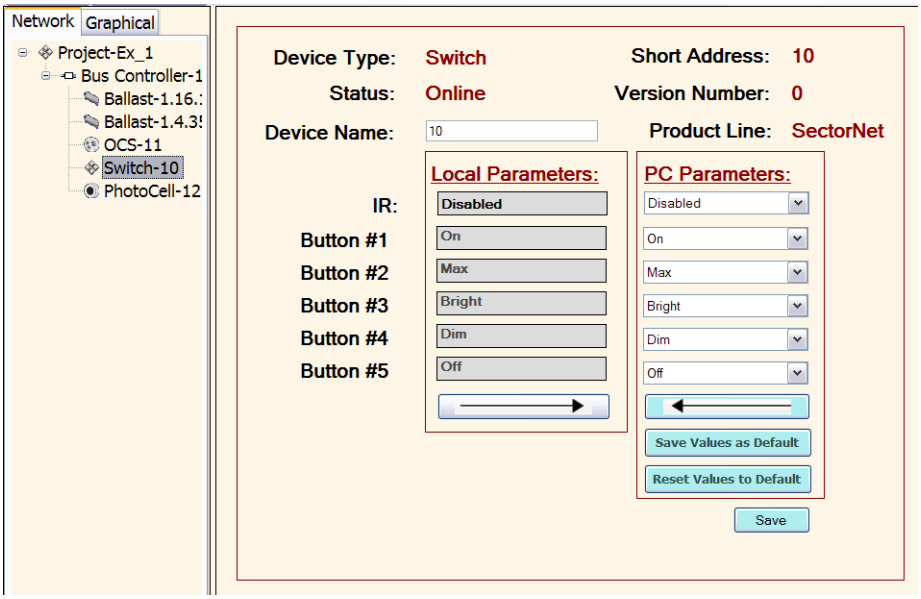
To add a switch to a bus controller, select the bus controller, then press the icon.

Enter device name, then press **Save**.

The new switch will appear in the network tree view as shown below.

NOTE Parameters can be transferred between switches by dragging the source switch to the target occupancy switch.

Double-clicking the switch in the network tree will open the switch configuration screen. Press **Save** after making any changes.



3.6.6.1. Device Type

Displays the device type that is currently selected.

3.6.6.2. Status

If the Client Application is connected to a live SectorNET network, **Live** will be displayed in this area, otherwise the Client Application will be in **Offline** mode. *See section 3.5. for information about Live and Offline modes*.

3.6.6.3. Device Name

A switch can have a specific name, for example, North Wall. Enter the name in the area provided. The default name is the short address of the device.

3.6.6.4. Short Address

Displays the current short address of switch. The short address is physically set on the device itself via two rotary address switches.

3.6.6.5. Version Number

Displays current version number of the device.

3.6.6.6. Product Line

Displays name of product line.

3.6.6.7. Parameters

IR Mode

Used to **Enable** IR receiver on device, if equipped.

Buttons

Used to configure actions of individual buttons on switch:

On and **Off** for **2-Button** switches,

On, **Off**, **Max**, **Bright** and **Dim** for **5-Button** switches.

NOTE *See section 4.6 for more information on switches*.

3.6.7. Relay Configuration

see section 3.6.3 Ballast Configuration for information on Relay configuration.

3.6.8. Low Voltage Interface Configuration

see section 3.6.6 Switch Configuration for information on Low Voltage Interface configuration.

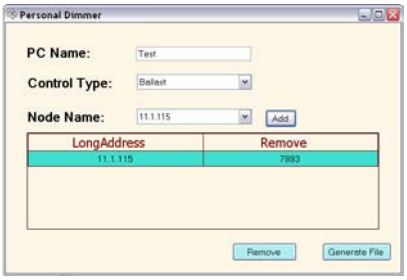
3.6.9. Occupancy Sensor and Photocell Interface Configuration

see section 3.6.4 Occupancy Sensor Configuration and section 3.6.5 Photocell/IR Configuration for information on Occupancy Sensor and Photocell Interface configuration.

3.7. Personal Dimmer

The **Personal Dimmer** software application offers lighting control for each individual within a workspace. For example, the user can set custom lighting levels and recall pre-programmed lighting scenes. The software application can be installed on any PC connected to the Sector system, *see section 3.1.3 for more information*.

To create a Personal Dimmer, right-click on a ballast in the network tree view and select **Create Personal Dimmer**:



Select PC Name, Control Type (ballast or zone) and Node Name then press **Add**. Next, press **Generate File** to save a **.scn file** which can then be transferred to desired user's personal computer.

4. Sector System Devices

4.1. Network Specifications

Network	SectorNET	LumaCAN
Max # Devices	64	253
Network Topology	Any	Daisy-chained
Wire Type	18AWG or larger	CAT5
Max # of SectorNET Areas / LumaCAN Rooms	8	250
Bus Controller input power	120-277VAC, 50/60Hz 0.5A	-
Run Length CAT5	-	2500’
Run Length 14 -18 AWG Solid or Stranded	1,000’	-

4.2. Bus Controller

A **Bus Controller** is capable of controlling 64 individual devices (ballasts, occupancy sensors, photocells, etc.).

NOTE The bus controller is included as a device on the network.

The bus controller communicates with each device using SectorNET protocol with a maximum of 64 bus controllers allowed in a SectorNET network.

Each bus controller connects to the SectorNET bus via class 1 wiring. Power to the bus controller is supplied by line voltage.

NOTE For SectorNET bus controller configuration, *see section 3.6.2*. For installation instructions, see Sector Device Installation Sheet (Leviton part # PK-93649-10-02-0A).

4.2.1. Addressing

Bus Controllers are compatible with the LumaCAN protocol specification and can be assigned an address on a LumaCAN network via three rotary switches located on front of device (valid range between 1 and 254).

4.2.2. Reset

Pressing the **Reset Button** (located on front of device) will re-initiate boot-up process (process will take 30 sec. to 5 minutes depending on how many devices are on the system).

4.2.3. Test Mode (Locating Devices)

Test Mode is a method for testing and locating devices in order to aid in isolating fault conditions.

- **1.** Momentarily press the **Black Test Button** located on the right hand side of the bus controller. This will initiate a locate command to all devices on the network.

- **2.** Each device associated with the bus controller will visually identify itself in the manner outlined in the following chart.

Device	Method of Identification	Additional Instructions
Switch	A concealed LED, in the lower right corner of the faceplate, will continuously flash.	None
Occupancy Sensor	The yellow LED will continuously flash.	None
Ballast/Fixture	The ballast will slowly dim the light output of the fixture and then fade up at same rate of speed.	Pressing the test button a second time will start feature.
Photocell	The yellow LED will continuously flash.	None

- **3.** Test mode will broadcast an on and minimum level to all ballasts connected, and send location requests to all other devices for 15 minutes.
- **4.** A second press of test button within 15 minutes will set all ballast levels to on and full and terminate the 15 minute timer.
- **5.** After 15 minutes, all dimmed ballasts will return to previous state
- **6.** To exit test mode, press and hold the test button for 5 seconds. Release the button and the system will restore to normal operation.

4.2.4. Network Termination

The **Blue Termination Button** (located on right side of device) must be pressed in on the last bus controllers on both ends of a LumaCAN network.

4.2.5. LED Status

Three status LED's are located on the front of the device:

4.2.5.1. Red

The Red LED indicates the following:

- **7.** Steady when power is supplied to the bus controller.
- **8.** Flash slowly when bus is in standby.
- **9.** Flash quickly when the Sector system is in Locate (Test) mode.
- **10.** Off when supply voltage is absent.

4.2.5.2. Yellow

The yellow LED indicates the following:

- **11.** Off indicates the Sector system is in Locate (Test) mode.
- **12.** Flash quickly indicates bus activity without errors.
- **13.** A quick flash every 5 seconds indicates no bus activity.
- **14.** Slow, steady flash indicates bus communications error.
- **15.** Rapid bright flashing every 2 seconds indicates a duplicate address.

4.2.5.3. Green

Indicates device is connected to an active LumaCAN network. Flashes as per LumaCAN protocol specifications.

4.3. Ballasts

4.3.1. Smart Ballasts

A **Smart Ballast** is a dimmable electronic ballast that provides two-way communication using Leviton SectorNET protocol.

Each Smart Ballast connects to the SectorNET bus via class 1 wiring. Power to the Smart Ballast is supplied by line voltage.

The ballast also offers communication via DALI open protocol and can operate as a 0-10V ballast where needed.

NOTE For SectorNET ballast configuration, *see section 3.6.3*. For installation instructions, see Sector Device Installation Sheet (Leviton part # PK-93649-10-02-0A).

4.3.2. Addressing

Each smart ballast has a unique factory-programmed SectorNET **Long Address** located on a label affixed to the ballast housing.

The ballast's **Short Address** can be set in the **Ballast Setup Screen,** *see section 3.6.2.2*.

4.3.3. 0-10V Ballasts

Standard 0-10V Ballasts may be used in a Sector installation. Each 0-10V ballast is controlled via a **Sector Relay**, *see section 4.10*

4.4. Occupancy Sensors

Leviton's wall and ceiling-mounted occupancy sensors use passive infrared and/or ultrasonic sensing technology to signal SectorNET when a space is in use.

Each occupancy sensor connects to the SectorNET bus via class 1 wiring. Power to the occupancy sensor is supplied by the SectorNET bus.

NOTE For SectorNET occupancy sensor configuration, *see section 3.6.4.* See Sector Device Installation sheet (Leviton part # PK-93649-10-02-0A for installation instructions.

4.4.1. Passive Infrared (PIR)

Upon room entry, the infrared sensor detects motion and turns lights on. The sensor is sensitive to the heat emitted by the human body. To trigger the sensor, the source of heat must move from one zone of sensing to another. Non-moving heat emitting objects will not cause the lights to turn on.

4.4.2. Multi Technology (Ultrasonic / PIR)

Dual technology occupancy sensors combine passive infrared (PIR) motion detection and ultrasonic motion detection for maximum sensitivity. Upon room entry, the infrared sensor detects motion and turns lights on. The ultrasonic sensor keeps lights on even with very minor motion.

4.4.3. Addressing

The occupancy sensor's SectorNET **Short Address** is physically set on the device via two rotary address switches located under cover (valid range between 1 and 64).

4.4.4. LED Status

4.4.4.1. Red

Flashes to indicate PIR activity.

4.4.4.2. Yellow

The yellow LED indicates the following:

- **16.** Rapid flashing indicates the device is in Locate mode.
- **17.** A quick flash every 5 seconds indicates no bus activity.
- **18.** LED Off indicates bus activity without errors.
- **19.** Slow, steady flash indicates bus communications error.
- **20.** Rapid bright flashing every 2 seconds indicates a duplicate address.

4.4.4.3. Green

Flashes to indicate ultrasonic activity.

4.4.5. Controls

The functional parameters and behavior of the occupancy sensor and photocell can be adjusted locally at the sensor or in the Client Application and uploaded to the device.

4.4.5.1. Knob Settings

NOTE The knob controls (located under cover) on the device will relinquish control and become inactive upon on network commands from the Client Application and on power-up/reset.

Knob Color: Control	Function	Automatic Operation	Conditions Analyzed in Automatic Operation	Knob Setting Under Manual Operation	Default Settings
Green: **Ultrasonic Sensitivity**	Sets ultrasonic range	Sensor analyzes room and sets sensitivity to optimal setting	Air currents False-on occurrence False-off	Linear range setting Full CCW = min (off) Full CW = max	100% 
Red: **PIR Sensitivity**	Sets passive infrared range	Same as above	Room (surface) temp Lens dirt Signal to noise ratio	Same as above	50% 
Black: **Timer**	Sets the length of time lights will remain on after last motion is sensed	Timer setting generally increased during learning period, then decreases to minimize "on" time	False-off occurrences Error free operation decreases the timer setting	Linear range setting Full CCW = min. Full CW = max (30 min)	100% for Auto-Adaptive mode 
Blue: **Photocell**	Sets level of daylight needed to prevent lights from turning on	No automatic operation	N/A	Linear range setting Full CCW = min daylight Full CW = max (off)	100% 

4.4.5.2. Dip Switch Settings

NOTE The dip switches (located under cover) on the occupancy sensor will relinquish control and become inactive upon on network commands from the Client Application and on power-up/reset.

DIP Switch Number	Function Name	ON Position	OFF Position
B1	Override	Force the B2 State	Auto Mode
B2	Forced State	Lights Forced OFF	Lights Forced ON
B3	Test Mode	Test Mode ON	Test Mode OFF
B4	LED	LED's Disabled	LED's Enabled

4.5. Photocell / IR

Leviton's photocell daylight sensor is used for daylight harvesting, thus allowing SectorNET to automatically lower the lighting when the available daylight level is high, and raise the lighting when the available daylight level is low (light levels are adjusted to take into account the amount of ambient daylight).

NOTE When daylight harvesting is active, the lights may appear dim when directly looked at. However, you will find that the working light level in your area will remain at a user-defined level throughout the day.

A Photocell / IR (Infrared) sensor provides reception of IR transmitting devices (such as an IR Handheld Remote Control) in addition to daylight sensing capabilities.

Each Photocell / IR sensor connects to the SectorNET bus via class 1 wiring. Power to the Photocell / IR sensor is supplied by the SectorNET bus.

NOTE For SectorNET Photocell / IR configuration, *see section 3.6.5*. For installation instructions, see Sector Device Installation Sheet (Leviton part # PK-93649-10-02-0A).

4.5.1. Addressing

The Photocell / IR sensor's SectorNET **Short Address** is physically set on the device via two rotary address switches located under cover (valid range between 1 and 64).

4.5.2. LED Status

4.5.2.1. Red

Flashes to indicate active IR communication.

4.5.2.2. Yellow

The yellow LED indicates the following:

- **21.** Rapid flashing indicates the device is in Locate mode.
- **22.** A quick flash every 5 seconds indicates no bus activity.
- **23.** LED Off indicates bus activity without errors.
- **24.** Slow, steady flash indicates bus communications error.
- **25.** Rapid bright flashing every 2 seconds indicates a duplicate address.

4.5.3. Controls

The functional parameters and behavior of the Photocell / IR sensor can be adjusted locally at the sensor or in the Client Application and uploaded to the sensor.

4.5.3.1. Dip Switch Settings

NOTE The dip switches (located under cover) on the Photocell / IR sensor will relinquish control and become inactive upon on network commands from Client Application and on power-up/reset.

DIP Switch Number	Function Name	ON Position	OFF Position
B1	Override	Force the B2 State	Normal Mode
B2	Forced State	Lights Forced OFF	Lights Forced ON
B3	Test Mode	Test Mode ON	Test Mode OFF
B4	Range	Low (0-25 fc)	High (0-100 fc)

4.6. Switches

Sector **Digital Switches** are available in **2-Button** and **5-Button** models.

An IR (Infrared) Sensor, located on the switch, provides reception of IR transmitting devices in addition to switching capabilities

Each switch connects to the SectorNET bus via class 1 wiring. Power to the switch is supplied by the SectorNET bus.

NOTE For SectorNET switch configuration, *see section 3.6.6*. For installation instructions, see Sector Device Installation Sheet (Leviton part # PK-93649-10-02-0A).

2-Button Switches provide two states of operation, **On** and **Off**.

5-button Switches provide five states of programmable operation, **On**, **Max**, **Bright**, **Dim**, and **Off**.

NOTE Tapping the On, Max and Off buttons once will fade level to desired state. Pressing and holding the Bright and Dim buttons will rapidly bring level to desired state.

Button Name	Action
On	Turn on daylight harvesting mode.
Max	Full level (100%).
Bright	User defined level (typically less than Max).
Dim	User defined level (typically a low to mid level).
Off	Zero level (0%).

The functional parameters and behavior of the switch can be adjusted in the Client Application and uploaded to the switch.

4.6.1. Addressing

The switch's SectorNET **Short Address** is physically set on the device via two rotary address switches located under switch (valid range between 1 and 64).

4.6.2. LED Status

4.6.2.1. Yellow

The yellow LED (concealed) indicates the following:

- **26.** Rapid flashing indicates the device is in Locate mode.
- **27.** A quick flash every 5 seconds indicates no bus activity.
- **28.** LED Off indicates bus activity without errors.
- **29.** Slow, steady flash indicates bus communications error.
- **30.** Rapid bright flashing every 2 seconds indicates a duplicate address

4.7. Handheld Remote

The **Handheld Remote Control** allows lighting control within 25 feet (100º angle) of compatible Leviton IR-receiving devices.

Manually overrides programming at the push of a button to meet the user's needs (On, Max, Bright, Dim, Off).

4.8. Low Voltage Interface

The **Low Voltage Interface** allows integration of the Sector system with any non-Sector switch or contact closure within an assigned area. The LV Interface has the ability to assign commands and has 5 switch inputs that can be switches or commands.

NOTE For SectorNET switch configuration, *see section 3.6.6*. For installation instructions, see Sector Device Installation Sheet (Leviton part # PK-93649-10-02-0A).

4.9. Occupancy Sensor and Photocell Interface

The **Occupany Sensor and Photocell Interface** allows integration of the Sector system with any non-Sector occupancy sensor and photocells.

NOTE For SectorNET occupancy sensor configuration, *see section 3.6.4*. For SectorNET photocell configuration, *see section 3.6.5*. For installation instructions, see Sector Device Installation Sheet (Leviton part # PK-93649-10-02-0A).

4.10. Sector Relay

The **Sector Relay** enables switching control of any device or 0-10VDC control of any 0-10VDC controllable device as part of the SectorNet system. Used for individual fixture or entire zone control, the Sector Relay provides additional system design options, allowing control of Ballast, Incandescent LED< code cathode, or other sources that may accept a 0-10VDC control input. The Sector Relay provides switching control of lighting and motor loads.

NOTE For SectorNET ballast configuration, *see section 3.6.3*. For installation instructions, see Sector Device Installation Sheet (Leviton part # PK-93649-10-02-0A).

5. Sector System Examples

5.1. Areas, Zones and Groups

NOTE See example layout on next page.

5.1.1. Areas

A bus controller is divided into separate partitions known as **Areas**, with each bus controller supporting eight Areas.

Devices are assigned to Areas via the **Bus Controller Area Assignments** screen, *see section 3.6.2.3*.

NOTE Ballast devices are not assigned to an area in the Bus Controller Area Assignments screen. They must first be assigned to a group in the **Ballast Configuration** screen, *see section 3.6.3*.

The group is then assigned to a zone which is then assigned to an area in the **Bus Controller Area Setup** screen, *see section 3.6.2.4*.

5.1.2. Zones

Each Area is divided into six **Zones**. Zones are assigned to Areas in the **Bus Controller Area Setup** screen, *see section 3.6.2.4.*

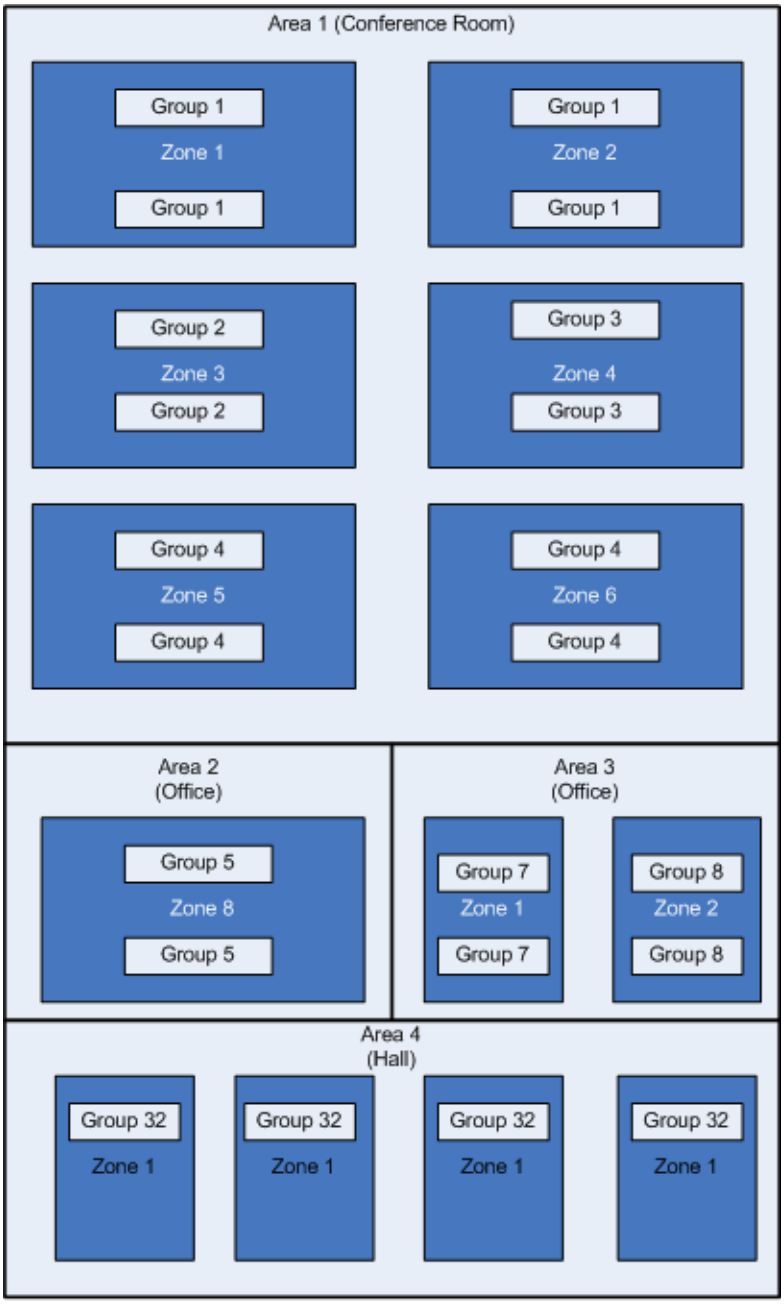
5.1.3. Groups

Each Zone may be associated with a **Ballast Group**. 32 Groups are available for selection.

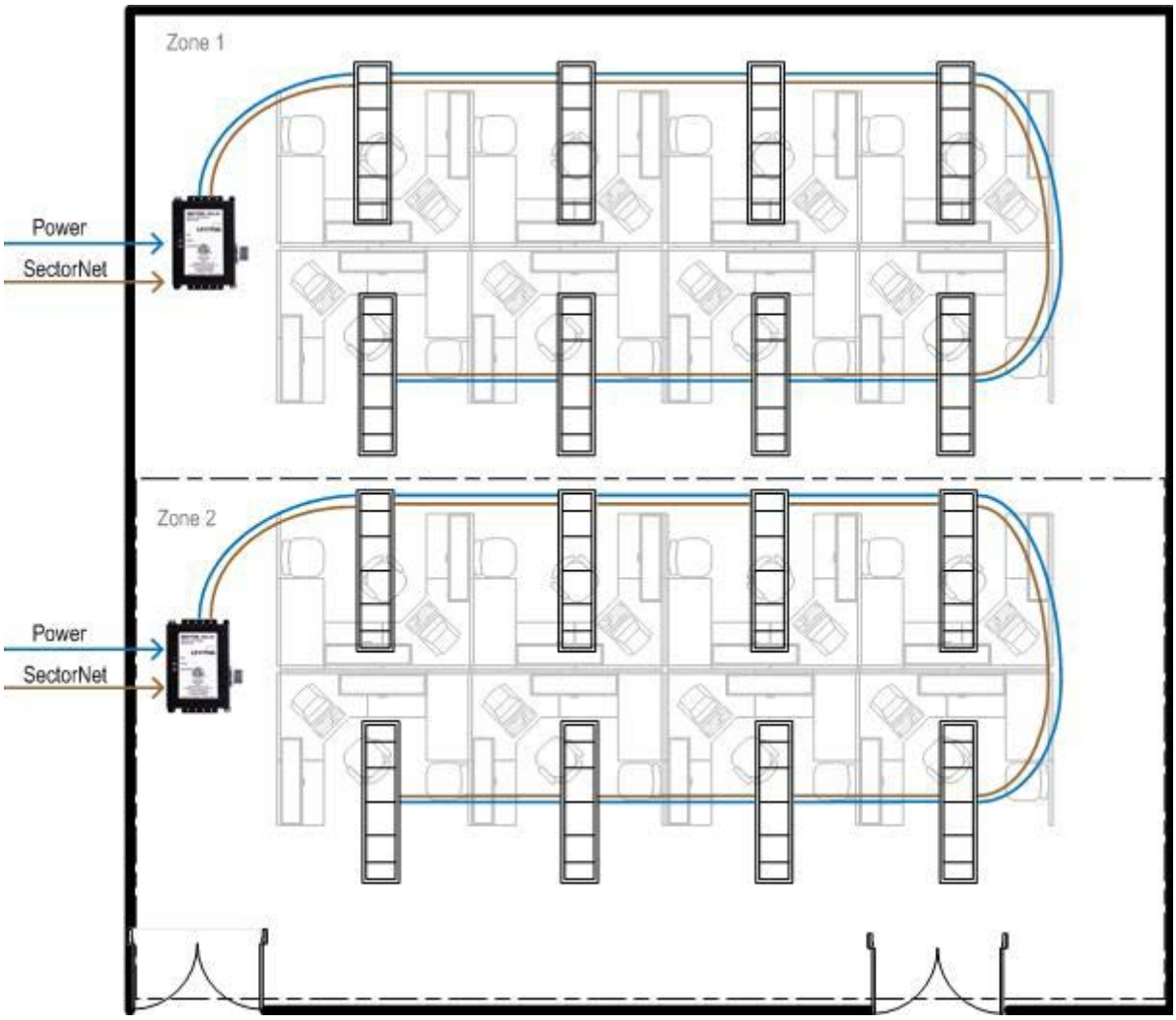
Groups are assigned to Zones via the **Bus Controller Area Setup** screen, *see section 3.6.2.4.*

NOTE A Zone in an Area may only have one Group.

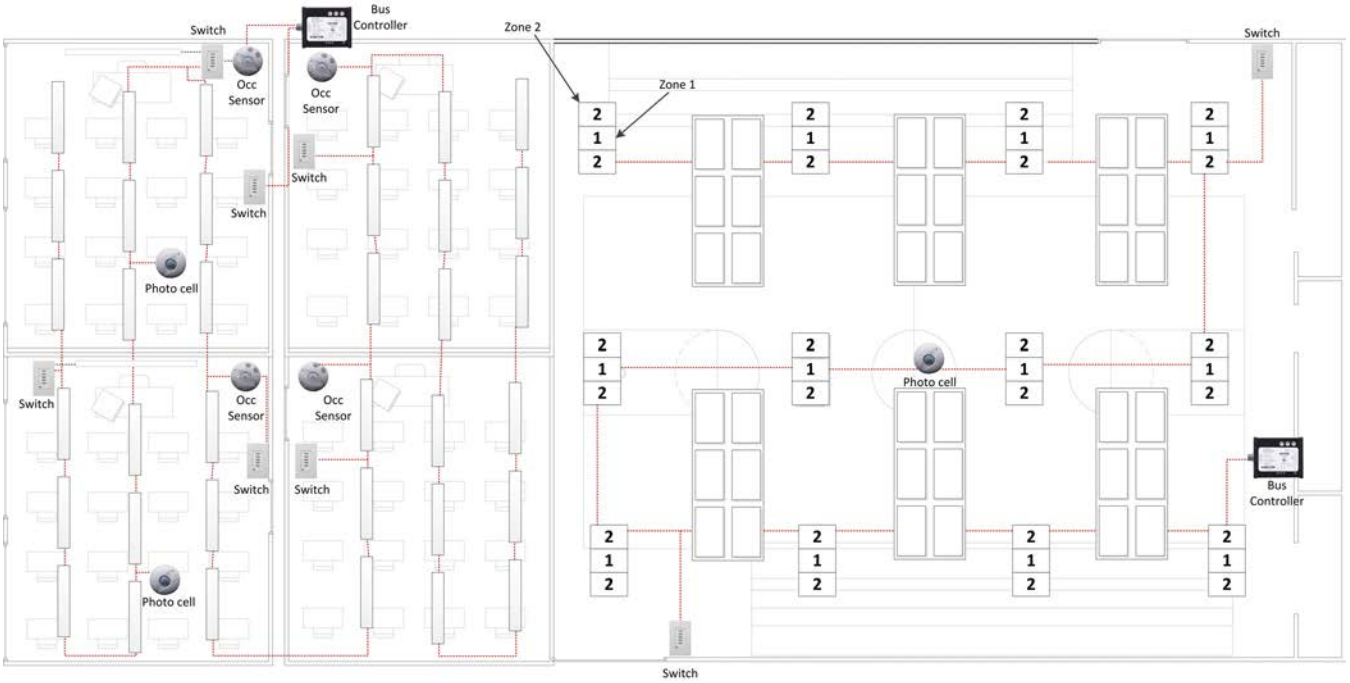
5.1.4. Typical Areas, Zones and Groups Layout



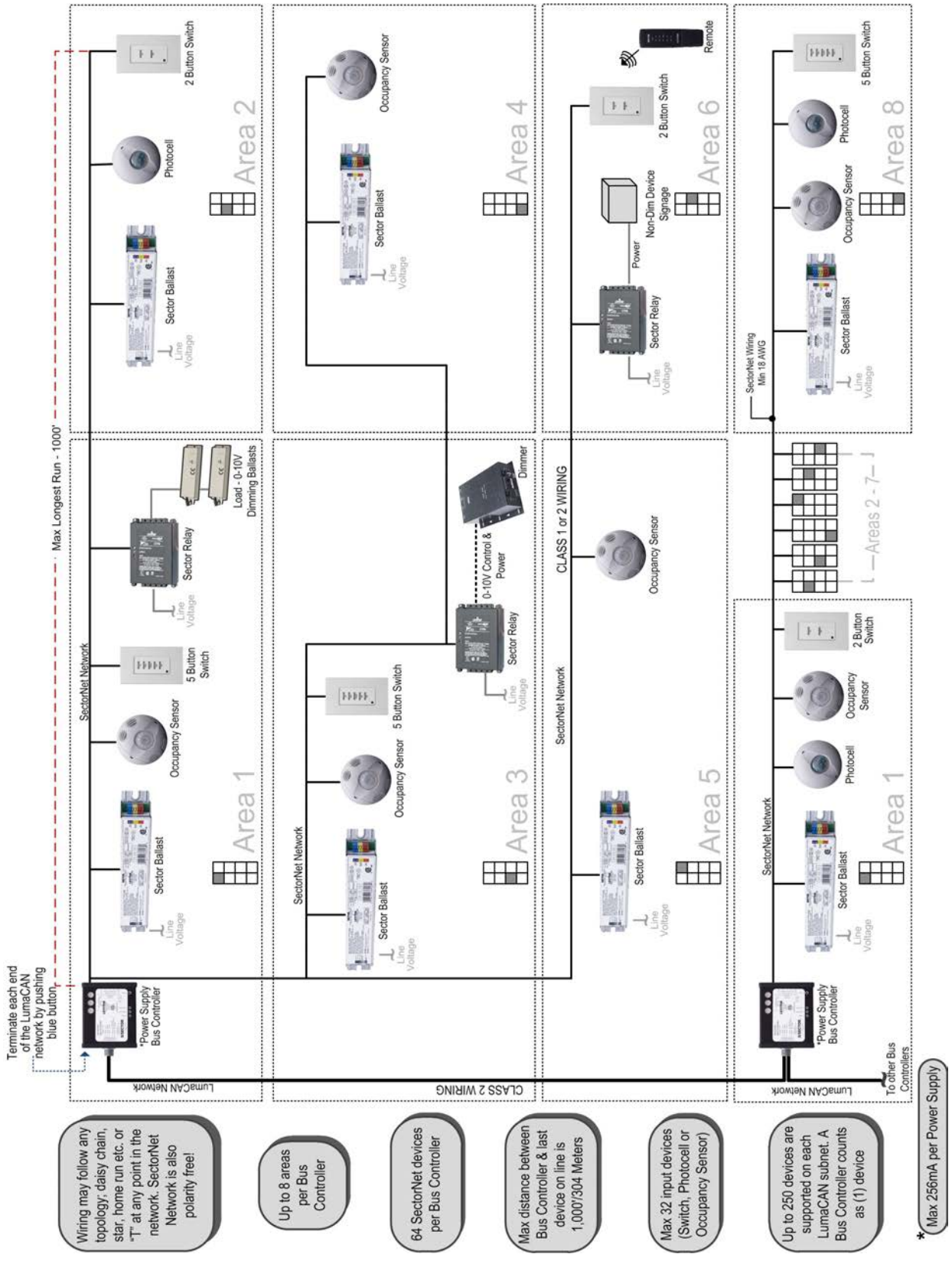
5.2. Typical Office Layout



5.3. Typical School Layout



5.4. Typical Network Components



6. Troubleshooting

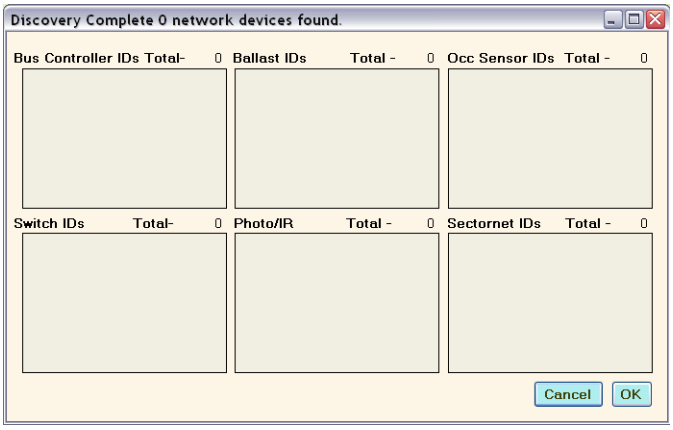
6.1. Possible Device Discovery Error States

The following error states may occur during initial device discovery *(section 3.2.4)*.

6.1.1. Kvaser Not Found

- Please check that the latest Kvaser device driver is installed and connections between PC and bus controller are secure.

6.1.2. Unable to Locate Devices



- If live devices in network do not appear in device discovery screen, verify that devices are addressed correctly, *see section 3.2.5.9*.

6.1.3. Duplicate Device Addresses Detected

- Assign conflicting devices to different short addresses.

NOTE If moving ballasts between bus controllers, do not take a ballast from one bus controller and move it to a different bus controller which is using the same short address as a duplicate short address will occur. Instead, delete the ballast and add a new ballast, then assign it a new short address.

6.1.4. LumaCAN Failure

- Verify that bus controllers are receiving correct AC power.

- Check LumaCAN addresses on all bus controllers.

- Check all physical connections on LumaCAN network.

6.2. Trouble Shooting Guide

In the event of an unexpected error there are 5 areas to investigate to find the root cause; the PC, Bus Controllers, LumaCAN, SectorNet Network, and SectorNET Devices, the chart below will assist in finding solutions for encountered errors.

Troubleshooting PC Issues

PDO doesn't control lights	PDO file creation failure	Check server is functioning properly
		Validate the file was created with the correct PC name and correct ballasts
	PDO server failure	Reset service by restarting PC or restarting service
Project not found	Unable to open a project	An SQL interaction failure may have occurred, wait a few seconds and try again
		Restart the application
		Restart computer
Program nonresponsive	Sluggish or frozen interface	Restart the application
		Restart computer
Erratic "Warning Icon", erratic offline icons of single device	Cannot locate device	Noise on line, or errant device. Cycle power of device
Erratic "Warning Icon", erratic offline icons of multiple devices	Cannot locate devices	Noise on line, or errant device. Cycle power of devices.
		Validate Bus Controller(s) are operational, if failure has occurred replace Bus Controller
		Validate that no more than the maximum 64 devices are connected to the Bus controller
		Validate Bus Controller(s) have the latest version of released software
		Validate LumaCAN connection and terminations
"Warning Icon" over Bus Controller	Cannot locate Bus Controller	Noise on line, or errant device. Cycle power of device
		Validate Bus Controller(s) are operational, if failure has occurred replace Bus Controller
		Validate that no more than the maximum 64 devices are connected to the Bus controller
		Validate Bus Controller(s) have the latest version of released software
		Validate LumaCAN connection and terminations

Unable to operate system	Wire length greater than 900ft	Validate wire length is not greater than 900 ft.
	Wire gauge is not 18	Validate wire is 18 gauge
	PC generating continuous traffic	Validate by looking at Kvaser Can LED. If solid yellow restart the system
	SectorNET line has been severed	Validate SectorNet line has not been severed
	Multiple errors detected	Validate LumaCAN connection and terminations
		Validate Bus Controller(s) are operational, if failure has occurred replace Bus Controller
Kvaser not found error	Kvaser device driver failure	Reinstall device driver
	Kvaser USB connection Issue	Reseat Kvaser USB connection, use a different port for connection
	Debugging application interference	Close all debugging applications
	Kvaser device failure	Replace Kvaser
	Scheduling Service error	Restart scheduling service
	Port failure	Restart PC
Unable to Save/ Edit/Delete information	Unable to Save/ Edit/Delete information	An SQL interaction failure may have occurred, wait a few seconds and try again
		Restart the application
		Restart Computer
User interface freeze	User interface freeze	An SQL interaction failure may have occurred, wait a few seconds and try again
		Restart the application
		Restart computer
Unable to communicate on LumaCAN	Port failure	Connect to a different port
		Restart PC
		Diagnose driver issues
		Contact your PC manufacturer
	IO failure	Contact your PC manufacturer
Exception received indicating memory failure	PC has a virus	Validate your PC is virus free
	PC resource issue	Validate PC has enough resources to run the SectorNET application

SQL failure	SQL failure	An SQL interaction failure may have occurred, wait a few seconds and try again
		Restart the application
		Restart computer
Unhandled exception failure	Unhandled exception failure	An SQL interaction failure may have occurred, wait a few seconds and try again
		Restart the application
		Restart computer

Troubleshooting LumaCAN Issues

Erratic "Warning Icon", erratic offline icons	Network fault	Validate LumaCAN connection and terminations
	Communication failure	Validate length is not greater than 2500 ft.
	Ringing	Reduce Bus Controllers
	Duplicate address	Confirm addresses are unique
	PC generating continuous traffic	Validate by looking at Kvaser Can LED. If solid yellow restart the system

Troubleshooting Bus Controller Issues

Bus Controller not found	Power failure	Bus Controller is not connected, connect it
	Bus Controller dials are set to a number greater than 254	Set the dials = 0 - 254

"Warning Icon in UI over BC	Hardware failure #1 EEPROM Error	Replace Bus Controller
	Hardware failure #2 RTC Error	
	Hardware failure #3 SRAM Error	
	Hardware failure #4 SFLASH Error	
	PoolID: "Could not allocate memory in pool"	Too much switch activity, stop pushing the switch
		Restart SectorNET program
	Task ID: "Could not create or start a task"	Catastrophic failure- contact factory for warranty replacement if device is covered under warranty
	Timer ID: "Could not create or start a timer"	
	Device ID: "Device-Table corruption"	Contact Factory for technical support
	Duplicate Bus Controller address detected	Two Bus Controllers are programmed with the same address, change one of the addresses
Watchdog ID (from Bitmap): "Watchdog triggered"	Task stopped in Bus Controller	Restart Bus Controller
Mailbox ID: "Mailbox full"	Task stopped in Bus Controller	Restart Bus Controller
"Error executing LoadShed"		Not supported
"Error executing Fire"		Not supported
No action after switch button is released	Area#: "Undefined switch event"	Contact factory for technical support
	Area#: "Area received an unknown context switch command"	

UI shows device with red slash	SectorNET device and the device reported a failure	Replace failed SectorNET device
	Device is disconnected	Plug device in
Erratic "Warning Icon", erratic offline Icons	"Read Error" "Write Error" "Verify Error" "DTR does not match" "DTR1 does not match" "Could not reset to factory defaults"	Noise on line, or errant device. Cycle power of devices. Validate Bus Controller(s) are operational, if failure has occurred replace Bus Controller Validate that no more than the maximum 64 devices are connected to the Bus controller Validate wire length is not greater than 900 ft. Validate wire is 18 gauge Validate SectorNet line has not been severed
Unable to Operate System	"LC HW Error count changed"	Validate LumaCAN connection and terminations Validate length is not greater than 2500 ft. Validate Bus Controller(s) are operational, if failure has occurred replace Bus Controller
	Count%256: "LC Over Error count changed"	Reduce Bus Controllers
	PC generating continuous traffic	Validate by looking at Kvaser Can LED. If solid yellow restart the system
"Illegal outgoing msg type"	Unsupported LumaCAN commands are being sent to the Bus Controller	Validate Bus Controller(s) have the latest version of released software
"Duplicate short address detected"	Switch dials are set to a number greater than 254	Set the dials = 1 - 64
	More than one device has the same address	Set unique address for each device
	Ballast has duplicate address	Change ballast to unassigned then reassign it to an unique address

Several devices off line	"Laddr found, but Saddr already assigned"	Bad Ballast, replace ballast
	"No Laddr found after positive missing-Saddr-Query"	
	"Laddr 255:255:255 found"	

Troubleshooting SectorNET Network Issues

Erratic "Warning Icon", erratic offline icons	Power draw failure	Noise on line, or errant device. Cycle power of devices.
		Validate Bus Controller(s) are operational, if failure has occurred replace Bus Controller
		Validate that no more than the maximum 64 devices are connected to the Bus controller
		Validate SectorNet line has not been severed
		Validate wire is 18 gauge
	Communication failure due to wire length	Validate wire length is not greater than 900 ft.

Troubleshooting SectorNET Device Issues

Erratic "Warning Icon", erratic offline Icons	Power failure	Noise on line, or errant device. Cycle power of devices.
		Validate that no more than the maximum 64 devices are connected to the Bus controller
	Hardware failure	Validate Bus Controller(s) are operational, if failure has occurred replace Bus Controller
LED is out	Lamp failure	Replace lamp
Lights are too bright		
Network failure	Network wiring rules not followed	Validate wire length is not greater than 900 ft.
		Validate wire is 18 gauge
	Network not configured	Use SectorNET program to configure system

6.3. Bus Controller Error Codes (LumaCAN message)

006	Error Polling Switch	Device is not communicating with bus controller, Validate device address
007	Error Setting DTR1 for node ID query	
008	Error reading device type for node ID query.	
009	Error reading device sub-type for node ID query.	
013	Error polling Photo cell	Device is not communicating with bus controller, Validate device address
019	Error polling occupancy sensor	Device is not communicating with bus controller, Validate device address
019	Occupancy failed to set state change bit	
020	Error reading occupancy output state	Error communicating with Occupancy Sensor, Validate device address
022	Error reading ballast property 0 (number of cached properties)	
025	Error reading ballast property.	
026	Error sending SET_DTR command (writing ballast property)	
028	Error reading switch property	
029	Error writing switch property	
030	Error reading ballast property 1 (feature byte)	
031	Error reading ballast property 2 (minimum level A)	
032	Error reading ballast property 3 (minimum level B)	
033	Error reading ballast property 4 (maximum level A)	
034	Error reading ballast property 5 (maximum level B)	
035	Error reading ballast property 6 (emergency level AB)	
036	Error reading ballast property 7 (power on level AB)	
037	Error reading ballast property 8 (load shed level-1 AB)	
038	Error reading ballast property 9 (load shed level-2 AB)	
039	Error reading ballast property 10 (load shed level-3 AB)	
040	Error reading ballast property 11 (fire level AB)	
041	Error reading ballast property 12 (PDO duration time)	
042	Error reading switch property 0 (number of cached properties)	
043	Error reading switch property 1 (feature byte)	
044	Error reading occupancy sensor property 0 (number of cached properties)	
045	Error reading occupancy sensor property 1 (feature byte)	

046	Error reading occupancy sensor property 2 (time delay)	
047	Error reading occupancy sensor property 3 (PIR sensitivity)	
048	Error reading occupancy sensor property 4 (US sensitivity)	
049	Error reading occupancy sensor property 5 (light level threshold)	
054	Inconsistent results detected while searching for long addresses	
066	Error setting DTR1 for long address read	
067	Error reading long address (high byte) while searching ballasts with short address	
068	Error reading long address (middle byte) searching ballasts with short address	
069	Error reading long address (low byte) while searching ballasts with short address	
077	Error reading photo cell property	
078	Error writing photo cell property	
079	Error reading occupancy sensor property	
080	Error writing occupancy sensor property	
083	Error reading photo cell property 0 (number of cached properties)	
084	Error reading photo cell property 1 (feature byte)	
088	Error reading device firmware version for node ID query	
082	Error sending load shed command	
085	Error sending fire command	
093	Error sending SET_DTR1 command (writing ballast property)	
094	Error sending STORE_DTR_TO_DTR1 command (writing ballast property)	
095	Error reading occupancy sensor property (undefined property number)	
097	Invalid property number during property write to photocell	
098	Invalid property number during property read to photocell	
099	Target foot candle assignment out of range (MIN_LIGHT - MAX_LIGHT)	
100	Compensation out of range (0-100)	
102	Error polling switch state	Device is not communicating with bus controller, Validate device address
103	Error reading 'trash can' from switch	
114	Error polling occupancy sensor	Device is not communicating with bus controller, Validate device address

116	Duplicate Short Address Detected	Duplicate Ballast short address, validate Ballast short addresses
117	Cannot allocate memory for sending message to download power buffers	
118	Cannot allocate memory for memory block ack message	
119	Timed out waiting for metadata ack (power buffer xfer) message from PC	
120	Timed out waiting for data ack (power buffer xfer) message from PC	
121	Timed out waiting for final data ack (power buffer xfer) message from PC	
122	Error adding device information to table	
123	Error writing group number (out of range)	
126	Error writing response time (out of range)	
127	Attempt to add ballast to a device slot which is already being occupied	
128	Attempt to remove non-ballast device from table	
129	PC attempts to assign short address to an existing device	
130	Error writing bus controller property (device address out of range)	
131	Error reading ballast subtype (during short address assignment)	
132	Error reading ballast subtype (during device scan)	
133	Error more than 1 ballast detected on SectorNET while assigning a Long Address	
134	Error reading ballast network status byte (during ballast property updates)	
135	Error reading ballast device status byte (during ballast property updates)	

6.4. Codes posted by Bus Controller using Status Byte.

(PC must query Bus Controller)

001	Unable to allocate memory for LumaCAN fire event	
002	Unable to allocate memory for LumaCAN node ID query	
003	Unable to allocate memory for LumaCAN property write	
004	Unable to allocate memory for LumaCAN property query	
005	Error allocating memory for switch event	
010	Unable to transmit LumaCAN property reply message. Too many errors	
011	Unable to transmit LumaCAN node ID replay message. Too many errors	
012	Unable to allocate memory for input device	
014	Attempt to add unknown input device	Validate device is Sectornet compatible
015	Attempt to add unknown device type	Validate device type is supported by Sectornet
016	Error allocating memory for photo cell event	
017	Area controller detects unknown input device type	
021	Error allocating memory for occupancy sensor event	
023	Attempt to read using invalid property number from ballast	
024	Attempt to write using invalid property number to ballast	
050	Attempt to assign out-of-range short address to a ballast	
051	Invalid sub-property number for short address	
052	Error updating sorting table with new short address	
053	Unable to store long address into sorting table	
055	Error creating area task	
056	Error starting area task	
057	Error creating bright timer	
058	Error creating day-light timer	
059	Error starting day-light timer	
060	Error creating dim timer	

061	Attempt to read using invalid property number from bus controller	
062	Attempt to read using invalid property number from bus controller	
063	Attempt to write using invalid sub-property 1	
064	Attempt to write using invalid property number to area controller	
065	Attempt to write using invalid property number to bus controller	
070	Attempt to update property for unknown device type	
071	Device manager attempts to read property from unknown device	
072	Device manager attempts to write property to unknown device	
073	Device manager detects invalid command code	
074	Device manager failed clearing address sorting table	
075	Unable to start device manager or device timers	
076	Unknown switch event	
081	Attempt to read using invalid sub-property number from zones	
086	Unable to allocate memory for LumaCAN load shed event	
087	Illegal outgoing LumaCAN message type	
091	Hardware errors detected while trying to erase flash memory (for config data)	
092	Hardware errors detected while trying to program flash memory	
096	More than 64 ballasts were detected	Validate that no more than the maximum 64 devices are connected to the Bus controller
101	Cannot allocate memory polling switch state	
104	Cannot allocate memory for node ID query	
105	Cannot allocate memory for switch property write	
106	Cannot allocate memory for photocell property write	
107	Cannot allocate memory for occupancy sensor property write	
108	Cannot allocate memory for ballast property write	

109	Cannot allocate memory for bus controller property write	
110	Cannot allocate memory for switch property query	
111	Cannot allocate memory for photocell property query	
112	Cannot allocate memory for occupancy sensor property query	
113	Cannot allocate memory for ballast property query	
115	Cannot allocate memory for area control message	
124	Unknown message context in after hour mode	
125	Error starting power manager task	
126	Attempt to write Response Time to the Bus Controller which is greater than 2	
127	Error while attempting to add a device of type "ballast"	
128	Error cannot remove a device of other type than ballast	
129	Error in attempting to write a short address that is already assigned	Validate that there are no duplicate ballast short addresses
130	Device exceeds the maximum number of devices on SectorNET	Validate that no more than the maximum 64 devices are connected to the Bus controller
131	Error in attempting to read a ballast's subtype	
132	Error while reading subtypes during a long/short address search	
133	Error attempting to write long address to a ballast	
134	Error attempting to read property 100 from the ballast, "Network Status Byte"	
135	Detected a bit set in ballast property 100 (Network Status Byte)	
135	Detected a bit set in ballast property 101 (Device Status Byte)	

7. Glossary

0-10V Signal: A low-voltage signal used for communication between 0-10V controls, ballasts and other 0-10V devices.

Area: A separate partition on a bus controller in which devices are assigned to. Each bus controller supports eight areas.

Auto Adapting: An occupancy sensor's ability to automatically return to programmed operation when false-on or false-off conditions occur or if sensor is left in test mode.

Ballast: An electrical device for starting and regulating fluorescent lamps. Required for all fluorescent lights.

Bus Controller: SectorNET control unit and power supply. Capable of controlling up to 64 individual devices (ballasts, occupancy sensors, photocells, etc.). Communicates with each device using SectorNET protocol with a maximum of 64 bus controllers allowed in a SectorNET network.

Class 1 Wiring: Used for network connection of Sector devices on network bus. May be run in same electrical box, conduit or cable as line-voltage wiring.

Class 2 Wiring: Used for low voltage 0-10V signals. Can also be used for network connection of Sector devices on network bus. May not be run in same electrical box, conduit or cable as line-voltage wiring.

Commissioning: Initial set-up and programming of Sector components and SectorNET network.

DALI (Digital Addressable Lighting Interface): A European digital lighting protocol developed for communication with digital ballasts.

Daylight Harvesting: Used to maintain a desired lighting level within a space, regardless of light source (daylight or dimmable artificial). If the lighting level can be maintained with daylight, no artificial light is necessary. However, if the day lighting is not sufficient, the desired level can be increased automatically by artificial light.

Device: Sector components such as bus controllers, ballasts, occupancy sensors, photocells and switches.

Fade Curve: Voltage output in relation to light level.

Footcandle (fc): A unit of illumination for measurement of light intensity falling on a surface. Defined with reference to a standardized candle burning at a one foot distance from a given surface.

Graphical View: Part of SectorNET Client Application where devices, areas and zones are selected and programmed.

Group: A ballast group (1-32) which is associated to a zone. See zone below.

Hold Off Light Level: Level at which an occupancy sensor will begin operation. Valid range is from 0-100%.

Load Shedding: Load shedding is when a reduction in energy consumption levels is required (mainly used in commercial, industrial and utility operations). Electric usage is reduced when certain electrical loads and times are programmed.

Long Address: The factory-assigned digital address of a Sector device.

Loop: A photocell can operate in a **Open Loop** or **Closed Loop** daylight harvesting mode: In closed loop mode, the photocell will sense the amount of ambient or task light in the room. In open loop mode, the photocell will sense the amount of light coming in through the skylight or windows.

Low Voltage Interface: A Sector device which allows for connection of Leviton low voltage devices and low voltage devices manufactured by companies other than Leviton.

LumaCAN: A control protocol used by Leviton control devices. Each device requires it's own unique address on the LumaCAN network to which it is connected. Valid addresses for LumaCAN devices are between 1 & 254.

Multi Technology Sensor: Occupancy sensor which combines passive infrared (PIR) motion detection and ultrasonic motion detection for maximum sensitivity.

Network View: Part of SectorNET Client Application where devices are selected and configured.

Occupancy Sensor: Sensors which automatically turn lights on when a room is occupied and off when a room is vacant.

Passive Infrared (PIR) Sensor: A sensor which detects infrared heat emitted by living objects.

Personal Dimming: A SectorNET software application that offers lighting control for each individual within a workspace. For example, the user can set custom lighting levels and recall pre-programmed lighting scenes.

Photocell Sensor: A sensor which detects lighting level in a space. A photocell daylight sensor is used for daylight harvesting, which allows for automatic lowering of indoor lighting levels when available daylight level is high, and raising of indoor lighting levels when available daylight level is low.

Polarity-Free: Electrical connections which are not permanently positive or negative. Sector bus wiring is polarity-free and can be reversed without electrical problems.

Short Address: The user-assigned digital address of a Sector device.

Test Mode: Test Mode is a method for testing devices in order to aid in locating devices and isolating fault conditions. Pressing the test button on the Bus Controller activates the test mode.

Topology-Free: Topology is the configuration of a communications network. SectorNET is a topology-free network, meaning that any network topology may be used (daisy-chain, star and ring methods).

Walk-Through: Occupancy sensor feature which will automatically turn on lighting when a person enters a space and turn off lighting when person exits.

Zone: Part of an area. Up to six zones may belong to an area. See area above.

8. Index

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