nLIGHT NETWORK LIGHTING CONTROL
AGENDA

1. The Basics
2. nLight Devices
3. Backbone Devices
4. Appendix Information
The Basics
nLight is a networked digital lighting control system that provides both energy savings & increased user configurability by cost effectively integrating time-based, daylight-based, sensor-based & manual lighting control schemes.
HOW DOES nLIGHT WORK?

By networking these components, nLight creates a system with an unmatched level of “distributed intelligence”

- Distributed Intelligence =
  - Digitally Addressable
  - Locally made switching & dimming control decisions
  - Self-Commissioning
  - Stand-alone Operation

nLight networks together intelligent digital devices including:
- occupancy sensors
- photocells
- power packs
- wall switches
- dimmers
- Panels
- luminaires
WHAT MAKES UP AN nLIGHT SYSTEM?

**nLight devices:**
- Occupancy sensors
- Photocells
- Dimmers
- Relays
- Manual Stations (WallPods)

**nLight backbone devices:**
- Bridge
- Gateway
- nWiFi devices

**nLight enabled devices:**
- Recessed LED luminaires
- LED Downlights
- Industrial fixtures
- Suspended luminaires

**SensorView Software:**
Model numbers start with the letter “n”

RJ-45 style communication ports

All devices consist of one or more of basic lighting control components
  - Sensor
  - Relay
  - Manual Control Station
  - Dimmer
DEFINITION:
A luminaire with a factory installed nLight device.

nLIGHT Enabled Luminaire

More added all the time!
nLIGHT CONTROL ZONE

DEFINITION:
A collection of nLight devices and nLight-enabled luminaires that function together in order to control a space’s lighting.

+ Zones are wired together using CAT-5e cable (in any order, daisy-chain recommended)
+ May have a single or several different devices types
+ May have multiple devices of the same type
+ Can be sub-divided into 16 local groups (channels) of occupancy, photocell, and switch control
+ Functions stand-alone if disconnected from Gateway/SensorView
BASIC nLIGHT ZONE

nLIGHT enabled Luminaire
  (e.g. with factory installed nIO EZ device)

nLIGHT Wall Switch Sensor
  (e.g. nWSX PDT LV DX)

Out of the Box Functionality
  Dual Tech Occupancy Detection
  Inhibit Photocell
  On/Off
  Raise/Lower
BASIC nLIGHT ZONE

nLIGHT Ceiling Sensor
(e.g. nCM PDT 9 ADCX RJB)

nLIGHT enabled Luminaire
(e.g. with factory installed nIO EZ device)

nLIGHT WallPod
(e.g. nPODM DX)

Out of the Box Functionality
Dual Tech Occupancy Detection
Daylight Harvesting Photocell
On/Off
Raise/Lower
**BASIC nLIGHT ZONE**

- Non-nLIGHT enabled Luminaire
- nLIGHT Dimming/Relay Pack (nPP16 D)
- nLIGHT Wall Switch Sensor (e.g. nWSX PDT LV DX)

**Out of the Box Functionality**
- Dual Tech Occupancy Detection
- Photocell
- On/Off
- Raise/Lower
LARGER nLIGHT ZONES (W/ MULTIPLES OF SAME DEVICE)

nLIGHT enabled Luminaires

nLIGHT Occupancy Sensor

nLIGHT Wall Switches

Provides Independently Controllable Fixtures
LARGER nLIGHT ZONES (W/ MULTIPLES OF SAME DEVICE)

- nLIGHT enabled Luminaires
- nLIGHT Wall Switches
- nLIGHT Occupancy Sensor
- nLIGHT Wall Switches

Order on CAT5 Bus Does not Matter
LARGER nLIGHT ZONES (W/ MULTIPLES OF SAME DEVICE)

Non-nLIGHT enabled Luminaires

Line Voltage Wires

Dimming Wires

nLIGHT Occupancy Sensor

nLIGHT Dimming/Relay Pack

nLIGHT Wall Switches

All Fixtures Controlled Together
Each nLight zone has 16 unique switch groups, 16 occupancy groups, and 16 photocell groups that can be assigned as needed to achieve the desired functionality for a zone:

- Separate wall controls for each row of lights
- Multiple daylight dimming zones

These groups are also referred to as the “channels” of communication going between devices over the CAT5e cable (referred to as the “bus”)

CAT5e
• Some devices have information to “broadcast”:
  — Sensors communicate presence of occupancy or daylight status
  — A WallPod communicates manual switch presses
• Some devices track information so that they know how to control connected lighting:
  — A relay pack switches lights off when occupancy is not present
  — A dimming devices raises its 0-10V output when a manual raise button is pressed
Example:
Classroom with 4 circuits of lights (3 main rows of lights, 1 white board light)

- Two occupancy sensors are needed to cover space (turn off all lights)
- One dimming photocell to control two rows only
- Four switches enabling individual controls of all rows and whiteboard
Physical Connections
• Single CAT5e cable
• Any device order
• All ports are interchangeable

Logical Connections
• Devices talk on only one type of channel (per pole)
• Devices can track on several channels simultaneously
• Default channel assignment enables out-of-box operation
nLIGHT ZONE POWERING

- Power is supplied by power/relay packs (nPP16), power supplies (nPS 80), nPANELs, nLight enabled fixtures, and Bridges (via their external power supply).
- Power for all other devices within a zone is delivered via the CAT-5e bus.
- Zones need to have a net positive amount of power.

**Power consumers (typical)**
- Power Pack: 40mA per port
- Power Supply: 40mA per port
- Bridge: 90mA
- nPP16: 40mA
- nPS 80: 40mA
- nLIGHT Enabled Troffer: 6 mA total

**Power providers**
- nPANEL: 40 mA per port
- nLIGHT Enabled Troffer: 6 mA total
nLIGHT NETWORK BACKBONE

DEFINITION:
The communication network which interconnects nLight zones and the Gateway / SensorView software

Backbone devices include
+ Bridges
+ Gateways
+ nWiFi Devices
All zones connected to a Bridge via CAT-5e

Multiple Bridges and Gateway also connect with CAT-5e
WIRELESS nLIGHT BACKBONE

- Requires a nPP16 WIFI or nPS 80 WIFI pack in each zone
- All zones communicate via WiFi to existing WiFi router/access point(s)
- Eliminates need for nLight Bridges and longest CAT-5 cable runs
- Gateway is connected directly to same LAN as WiFi router/access point
MULTI-BACKBONE NETWORK ARCHITECTURE

Linking backbones via a LAN or WAN enables networks to span

- Floors of a building
- Building in a campus
- Locations across wide geography (e.g. bank branches)
ADDED SYSTEM FUNCTIONALITY

• Remote configuration and custom commissioning

• Run time-based and on demand control profiles (such as load shedding)

• Virtual switches and dimmers can control an occupant’s lighting from computer and smartphone-based applications

• Real-time lighting, photocell, and occupancy status collection and analysis

• Provides required connectivity for third party BMS via BACnet IP control

• Remote upgrading of all system devices

• Global Groups
What are Global Channels?

Groups of devices that communicate with each other using the nLight backbone.

- Typically, devices within a zone communicate common occupancy, photocell, and switch information over “local channels”
- “Global channel” functionality enables communication of this information between zones as well
- This provides enhanced design flexibility for applications requiring master control stations or centralized relays
- Global channels are provided by the backbone
- Devices can reside in any zone.
- Devices can use Global and Local channels simultaneously.
- 128 global channels (groups) are available within an nLight network
What is SensorView?


- A suite of web-based software application used to provide a central point of access, control, and configuration of an nLight network and all its devices
- Typically installed on a networked host computer/server but can be installed on a laptop
- Typically communicates via Gateway, but can connect directly to a zone/device via a nCOMKIT.
- Connection to SensorView is not required for the nLight system to operate
# SENSORVIEW – UPDATES

## Admin Dashboard

### Software Updates
- SensorView software is up-to-date

### Firmware Cache Updates
- Current version: 2013.12.02
- New version: 2014.10.20
- **Update Firmware Cache**

### Gateway Updates

<table>
<thead>
<tr>
<th>Model</th>
<th>Label</th>
<th>Gateway ID</th>
<th>V#</th>
<th>New FW#</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>nGW9 CTRL</td>
<td></td>
<td>0076C793</td>
<td>2.1.4859-2.6.30.1</td>
<td>2.1.4859-2.6.30.1</td>
<td>None</td>
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<tr>
<td>nGW9</td>
<td>Training Room</td>
<td>9044888A</td>
<td>2.0.4706-2.6.30.1</td>
<td>2.1.4859-2.6.30.1</td>
<td>None</td>
</tr>
</tbody>
</table>

### WallPod Updates

<table>
<thead>
<tr>
<th>Model</th>
<th>Label</th>
<th>ID</th>
<th>Gateway ID</th>
<th>V#</th>
<th>New FW#</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>nPOD GFX</td>
<td>Front Entrance GFX</td>
<td>00092D0A4</td>
<td>9970C793</td>
<td>Z-015-O</td>
<td>Z-015-O</td>
<td>None</td>
</tr>
<tr>
<td>nPOD GFX</td>
<td>Conference Room</td>
<td>00092D0A3</td>
<td>9970C793</td>
<td>Z-015-O</td>
<td>Z-015-O</td>
<td>None</td>
</tr>
<tr>
<td>nPOD 4F DX</td>
<td>nPOD 4F DX</td>
<td>90401D92</td>
<td>9970C793</td>
<td>Z-000-F</td>
<td>Z-000-F</td>
<td>None</td>
</tr>
<tr>
<td>nPOD GFX</td>
<td>Front Door/Exit Train</td>
<td>00330E520</td>
<td>9970C793</td>
<td>Z-015-O</td>
<td>Z-015-O</td>
<td>None</td>
</tr>
<tr>
<td>nPOD GFX</td>
<td>GFX Outside Training</td>
<td>0033E95BC</td>
<td>9970C793</td>
<td>Z-015-O</td>
<td>Z-015-O</td>
<td>None</td>
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<tr>
<td>nPOD 4S WH</td>
<td>nPOD 4S WH</td>
<td>00484F35</td>
<td>9944888A</td>
<td>Z-015-O</td>
<td>Z-015-O</td>
<td>None</td>
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<tr>
<td>nPOD 4S WH</td>
<td>GFX, Men Display</td>
<td>0014A4508</td>
<td>9944888A</td>
<td>Z-015-O</td>
<td>Z-015-O</td>
<td>None</td>
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</tbody>
</table>

### Power Pack Updates

<table>
<thead>
<tr>
<th>Model</th>
<th>Label</th>
<th>ID</th>
<th>Gateway ID</th>
<th>V#</th>
<th>New FW#</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>nEP5 D KO IM</td>
<td>nEP5 D KO IM</td>
<td>00752F62</td>
<td>00752C705</td>
<td>Z-017-F</td>
<td>Z-017-F</td>
<td>None</td>
</tr>
</tbody>
</table>
Baseline Energy Usage: 4,421.4 kWh

Savings Scorecard

- Occupancy: 1,429.2 kWh
- Photocell: +141.7 kWh
- Dimming: +232.1 kWh
- Current monitoring: +47.5 kWh
- Switch: +246.6 kWh
- Misc.: +163.5 kWh

Total System Savings 2,289.6 kWh

* Relay loads were not recorded during this period for some devices in the following zones: Jared's Office, Ben's Office, Central Open Office, South Open Office, Quinnipiac Conf Room, Kitchen, Empty Office, Jen's Office, Education Conf Room, Chris & Ed's Office, Scott's Office, Training.
SENSORVIEW GREEN SCREENS – ZONE DETAILS

<table>
<thead>
<tr>
<th>Network Totals</th>
<th>Zone Details</th>
<th>Reports</th>
<th>Setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted Baseline - On (h)</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Actual - On (h)</td>
<td>5.3</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Occupancy - Off (h)</td>
<td>6.5</td>
<td>7</td>
<td>6.5</td>
</tr>
<tr>
<td>Photocell - Off (h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dimmed &lt; 100% (h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Switch - Off (h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Actual Current Draw &lt; Spike (h)</td>
<td>5.3</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Misc. - Off (h)</td>
<td>6.8</td>
<td>6.8</td>
<td>6.8</td>
</tr>
<tr>
<td>Maxed (h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NetRfelt (h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Click cells to view graphs

Click and drag to zoom in, click to reset zoom to full
SENSORVIEW - nFLOORPLAN
SENSORVIEW - nFLOORPLAN
Sold as a service; quote based on

- size of network (# devices)
- field labor reqs. (by Acuity or others)
- degree of layout detail requested (device vs zone)
nLIGHT DEVICES
## OCCUPANCY SENSORS

<table>
<thead>
<tr>
<th>Enclosure (model family #)</th>
<th>Lens Options (model option #)</th>
<th>Photocell Functionality</th>
<th>Auto-Dimming (model option #)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Mount (nCM xx RJB)</td>
<td>Small Motion 360° (-9) Large Motion 360° (-10) High Bay 360° (-6)</td>
<td>Standard</td>
<td>Optional (-ADCX)</td>
</tr>
<tr>
<td>Recessed Mount (nRM xx)</td>
<td>Small Motion 360° (-9) Large Motion 360° (-10) High Bay 360° (-6) High Aisleway (-50)</td>
<td>Standard</td>
<td>Optional (-ADCX)</td>
</tr>
<tr>
<td>Fixture Mount (nCMB xx)</td>
<td>Small Motion 360° (-9) Large Motion 360° (-10) High Bay 360° (-6) High Aisleway (-50)</td>
<td>Standard</td>
<td>Optional (-ADCX)</td>
</tr>
</tbody>
</table>

- Dual technology option (-PDT) available for all units with Small Motion (-9) and Large Motion(-10) motion lenses
### OCCUPANCY SENSORS

<table>
<thead>
<tr>
<th>Enclosure (model family #)</th>
<th>Lens Options (model option #)</th>
<th>Photocell Functionality</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Corner / Wall (nWV xx, nHW xx)</td>
<td>120° Wide View (-16) Hallway (-13)</td>
<td>On/Off</td>
<td>Standard</td>
</tr>
<tr>
<td>Wall Switch Sensor (nWSX xx)</td>
<td>180° Wall to Wall</td>
<td>Standard</td>
<td>NA</td>
</tr>
<tr>
<td>Embedded (nES xx)</td>
<td>Micro 360° (-7)</td>
<td>Standard</td>
<td>Optional (-ADCX)</td>
</tr>
</tbody>
</table>

- Dual technology option (-PDT) available for all units with Wide View (-16), Micro 360° (-7), and for Wall Switch Sensors.
# STANDALONE PHOTOCELL SENSORS

<table>
<thead>
<tr>
<th>Enclosure</th>
<th>Photocell Functionality/ Models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On/Off (model #)</td>
</tr>
<tr>
<td>Ceiling Mount</td>
<td>nCM PC RJB</td>
</tr>
<tr>
<td>Recessed Mount</td>
<td>nRM PC</td>
</tr>
<tr>
<td>Fixture Mount</td>
<td>nCMB PC</td>
</tr>
<tr>
<td>Embedded</td>
<td>(NA)</td>
</tr>
</tbody>
</table>
WALLPODS (LOW VOLTAGE)

Key Features:
- Traditional soft-click tactile feel
- Integrated LED per button
- 3-way configurations w/ other WallPods
- Buttons are field replaceable and can be custom engraved

<table>
<thead>
<tr>
<th>Model #</th>
<th>On/Off Control</th>
<th>Raise/Lower Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>nPODM</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>nPODM DX</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>nPODM 2P</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>nPODM 2P DX</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>nPODM 4P</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>nPODM 4P DX</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
WallPod Mode (default)
- Each button provides On/Off operation for different channel
- LED indicates current state

Local / Remote Scene Mode
- Runs scenes that are configurable via SensorView
- Scenes can control devices within local zone or other remote zones
- Scenes for local zones are stored locally, remote scenes are stored on the Gateway
- LED shows which scene is currently active

<table>
<thead>
<tr>
<th>Model #</th>
<th># Scenes / Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>nPODM 1S</td>
<td>1</td>
</tr>
<tr>
<td>nPODM 2S</td>
<td>2</td>
</tr>
<tr>
<td>nPODM 4S</td>
<td>4</td>
</tr>
<tr>
<td>nPODM 4S DX</td>
<td>4 + on/off &amp; raise lower</td>
</tr>
</tbody>
</table>
**2 & 4 LEVEL PRESET SCENE CONTROLLER**

**nPODM 4L DX**
- Enables 4 dimming levels to be selected and adjusted
- Unit has four preset level buttons, on/off & raise/lower
- Operates on a single switch channel
- The level assigned to each button can be adjusted and saved by holding button for 8 secs.
- Out of the box levels set to 25%, 50%, 75%, 100%

**nPODM 2L (AB)**
- Enables 2 dimming levels to be selected
- Unit has two preset level buttons and on/off
- Operates on a single switch channel
- Out of the box levels set to 50% and 100%

**nPODM 2L AB**
- Enables high/low control of two relays
- Unit has HIGH, LOW, and OFF buttons
- Operates on two single channel
nPOD-GFX

- 3.5” full-color touch screen
- Provides up to 16 On/Off & Raise/Lower WallPod
- Provides up to 16 Scene Controls of any type
  - Preset Scenes – change the on/off & dim level of any device
  - Profile Scenes – modify sequence of operation settings for devices in nLight zone
- Enables onscreen creation Preset Scenes
- Low voltage device mounts to a single gang switch box or ring
- Micro-USB connector (behind cover plated) for simple laptop connectivity with zone
- Requires separate PS-150 power supply (provided)
VIRTUAL WALLPODS

- Computer taskbar icon version of WallPod
- Requires network connection and SensorView
IPHONEY/IPAD VIRTUAL WALLPOD APP.
nPP16 Series

- Switches up to 16A loads (with inrush protection)
- 120/277 VAC (347 VAC optional)
- Supplies 40mA bus power per port

Options:

- UL 924 emergency operation (–ER)\(^1\)
- 0-10 VDC **Full Galvanically Isolated Dimming** (-D or –DS option), Class 1 Rated
- Plug Load w/Occupancy Tracking only (- PL)
- Current monitoring (-IM)
- 50% Partial On by Default (-PA)
- Manual On (-SA), Manual On Channel 2 (-SA2)
- Auto On Channel 2 (-SW2)

\(^1\) -ER version does not provide bus power
SECONDARY RELAY PACKS

nSP16 Series
- Switches up to 16A loads (with inrush protection)
- 120/277 VAC

nSP5 PCD (Phase Control Dimming) Series
- 2-wire Phase Dimming (-PCD-2W)
- 3-wire Phase Control Dimming (-PCD-3W)
- Magnetic Low Voltage Dimming (-PCD-MLV)
- Electronic Low Voltage (-PCD-ELV-120)\(^1\)
- Optional version for interfacing louver control motors (-2P-LVR)

nSHADE
- Pulse on / pulse off for interfacing with shade control systems

nAR40 Series
- Low voltage contact closure (1A rating)

\(^1\) ELV version only available for 120VAC
PLUG LOAD CONTROLLER - nPP20 PL

Features

- Existing blue nPP16 PL enclosure
- Two versions available – one that supplies bus power, one that self-powers only
- Full 20-amp general purpose load rating, 120V only
- 12-AWG relay wiring
nPANEL 4

Key Features
- nLight-enabled control board
- Utilizes 4 LC&D snap link relays
- One 0-10 VDC dimming output per relay
- Integrated power supply provides both bus & auxiliary device power
- Operates as two devices (each with two relay/dimming outputs), that can be utilized together in a single zone or in separate zone.

Electrical Specs

**Relay Load** (all relays normally closed latching)
- 20 Amps @ 120 VAC Tungsten
- 30 Amps @ 277 VAC Ballast
- 20 Amps @ 347 VAC Ballast

**Dimming Load**
- Each 0-10 VDC Dimming outputs can sink < 20 mA (~40 ballasts)

**Power Supply** (120/277 VAC)
- Bus Power: 40 mA from each RJ-45 port
- Auxiliary Device Power: 200mA

**Note:** Version for switching 2 dual phase power circuits also available (nPANEL 2 480)
# Devices for nLight-Enabled Digital Luminaires

<table>
<thead>
<tr>
<th>Model #</th>
<th>Compatible Driver</th>
<th>Power Source</th>
<th>Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>nIO LEDG LC N80</td>
<td>Samsung Accudrive</td>
<td>Driver</td>
<td>Enables full range dimming and sleep mode</td>
</tr>
<tr>
<td>nIO LEDG LC N100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nIO EZ</td>
<td>eldoLED ECOdrive</td>
<td>Driver</td>
<td>Enabled lumen management (-n80) option</td>
</tr>
<tr>
<td>nIO EZ N80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nPS 80 EZ</td>
<td>eldoLED ECOdrive</td>
<td>Line Voltage</td>
<td>Emergency (-ER) operation option</td>
</tr>
<tr>
<td>nPS 80 EZ N100</td>
<td>or SOLOdrive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nEPS 60 IO EZ LC N80</td>
<td>eldoLED ECOdrive</td>
<td>Line Voltage</td>
<td></td>
</tr>
<tr>
<td>nEPS 60 IO EZ LC N100</td>
<td>or SOLOdrive</td>
<td></td>
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</tr>
</tbody>
</table>

Look for nLight enabled symbol on luminaire cut-sheets
All nLight enabled fixtures have the ability to utilize lumen management.
## SPECIALTY nIO DEVICES

<table>
<thead>
<tr>
<th>Model #</th>
<th>Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>nIO D</td>
<td>- 0-10 VDC Dimming Output&lt;br&gt;- Also available in KO mountable pack enclosure</td>
</tr>
<tr>
<td>nIO 1S</td>
<td>- Interfaces a toggle or momentary contact closure&lt;br&gt;- Sends a on/off toggle signal (like a WallPod) or runs a Scene&lt;br&gt;- Interfaces 0-10 VDC dimming control signal from any non-nLight device</td>
</tr>
<tr>
<td>nIO MLO</td>
<td>- Senses contact closures and advances dim/relay level of listening devices through a fixed sequence&lt;br&gt;- <strong>nIO MLO</strong>: 20%, 40%, 60%, then OFF&lt;br&gt;- <strong>nIO MLO 5STEPA</strong>: 20%, 50%, 80%, 100%, OFF&lt;br&gt;- <strong>nIO MLO AB</strong>: A On/B Off, A Off/B On, A On/B On, A Off/B Off</td>
</tr>
<tr>
<td>nIO MLO 5 STEPA</td>
<td></td>
</tr>
<tr>
<td>nIO MLO AB</td>
<td></td>
</tr>
<tr>
<td>nIO RLX</td>
<td>- Senses contact closure and issues either a toggle switch command, or if pressed and held down, a dim up/dim down command&lt;br&gt;- Used as patient bed remote interface</td>
</tr>
<tr>
<td>nIO PC KIT</td>
<td>- Kit containing a non-nLight low voltage outdoor photocell and a nIO NLI interface device enabling communication with nLight network.&lt;br&gt;- Change of daylight state can trigger a relay(s) or causes a scene to run.</td>
</tr>
</tbody>
</table>
nIO X: 3RD PARTY TOUCH SCREEN INTERFACE

Features

- Enables a non-nLight touch screen (e.g. Crestron, AMX) to interface with an nLight network
- Device has both an nLight port and a RS-232 or RS-485 port for direct digital interface
- Simple protocol commands (programmed into 3rd party device)
- On/Off and Raise/Lower Control of any lights in local zone
- Triggering of up to 4 local or remote nLight scenes
- Scenes created in SensorView
nLIGHT
BACKBONE DEVICES
**nLIGHT BRIDGE**

**nBRG 8**

- Routes Information between upstream Gateways & downstream sensor zones
- Aggregates lighting zones onto backbone so that “home run” cables are not required
- Acts as both a hub and router of information between zones and Gateway
- Redistributes power between zones
- 8 ports can be used to connect to Gateway, zones, or other Bridges
- Comes with power supply in **nBRG 8 KIT**

Bridge and power supply mount directly to a 4” x 4” square box
nGWY2

- Local Control Point
  - Discovers and maintains database of all network devices
  - Capable of managing 1500 nLight devices

- Network Access Point
  - Links Ethernet to nLight network
  - Contains one Ethernet port and 3 ports for downstream connection

- Maintains Time Clock

- Profile (Schedule) Management
  - Stores all profiles created by SensorView that include a device connected to Gateway
  - Sends out new settings to all devices in the Group bound to a particular Profile at the times specified by that Profile
  - Enables profiles to be run on-demand from scene controllers

nGWY2 KIT: Contains control unit and GFX interface device
RACK MOUNT BACKBONE

**Application**
- Provides a convenient way to install backbone devices in a network IT rack/closet.
- Targeted at “structured cable” environments (i.e. data centers)

**Features**
- 1RU (1.75”) x 19” rack mountable enclosure with optional drawer and/or wall mounting
- Contains two nBRG 8 units, one nGWY2 CTRL, and one nGWY2 GFX unit.
- All units mounted and cabled together and to front patch cord panel
- Single integrated power supply with computer style power cord

Rack Mount SensorView Servers also available

![Image of Rack Mount Backbone](image.png)
nBACNET APPLIANCE

- Provides an improved BACNET solution for distributed networks (multi-building campus applications)
- Utilizes an industry standard embedded appliance (Jace 6), replacing the existing SensorView software plugin
- Each nBACNET appliance can interface to up to ~1500 total BACNET points (across up to 5 nGWY2s)
- Appliance configuration done in SensorView, although it is not required for ongoing operation.
nADR (Automated Demand Response)

- Raspberry Pi device, available as nADR (up to 5 Gateways) or nADR L400 (Single Gateway)
- Automated demand response and load shed capabilities for nLight systems
- Enables 2013 CA Title 24 compliance
- Enables LEED Version 4 compliance
- Qualifies building for a 2-point credit
- Acuity Controls Virtual End Point (VEN)3 to Open Automated Demand Response 2.0a (OpenADR) Demand Response Automation Server (DRAS)
- Supports four demand response levels (None, Moderate, High, Special)
- Supports integration through proxy servers, if required

**Device hardware in process of changing**
http://www.nlightcontrols.com/resources

- nLight Hardware Manual
- SensorView User’s Guide
- Training Presentation
- SensorView Installation Instructions
- Gateway Menu Map
- Device Instruction Cards
- Application Examples
- Settings Glossary
Acuity Controls is a world leader in excellent lighting controls
THANK YOU
APPENDIX INFORMATION

EMERGENCY LIGHTING
OPERATIONAL MODES
MLO MODES
EMERGENCY LIGHTING

nPP16 ER
- Automatically overrides relay closed (i.e. lights on) upon loss of normal power
- Requires both normal & EM power feed
- UL 924 Listed
- Test Button

nPP16 D ER
- Automatically Overrides Relay Closed (i.e. lights on) and/or Dim Level to 100% upon loss of normal power
- Requires both normal & EM power feed
- UL 924 Listed
- Test Button
nIO LEDG xx ER / nIO EZ xx ER

- Available with nLight enabled fixtures with –EMG option
- Device doesn’t power from driver, thus requiring bus power.
- nLight bus must be powered from normal power
- If luminaire is powered from EM power and normal power is lost, lights will go on an full bright (because nIO Device will no longer have power from bus)
PP16 Shunt Relay Pack

- Functions as automatic bypass shunt that overrides relay closed upon loss of normal power.
- Enables bypass of nLight phase dimming packs or other controls (such as toggle switches or standard PP20 power packs).
- *Device is not an nLight device thus does not communicate w/ nLight network*
- UL924 Listed
- Test Button

1. Normal power can sense 120-277VAC
2. Red wire can be connected to 120 or 277 VAC
OPERATIONAL MODES

- How relays and/or dimming outputs react when events such as occupancy, daylight, or manual switching occurs.

- Operational Modes are defined by device settings that can be programmed via SensorView or device push-button.

- The default operational mode of a device is stored within the each device, however temporary modes can be enabled on demand from SensorView or via a time-based profile

- Override Lights On
- Override Lights Off
- Special Modes
- Track/Ignored Occupancy
- Track/Ignore Daylight (Photocell)
- Track/Ignore Switch(es)
- Occupancy Tracking Channel (1-16)
- Photocell Tracking Channel (1-16)
- Switch Tracking Channel (1-16)
- Follow Only Internal Occupancy
- Follow Only Internal Photocell
- Follow Only Internal Switches
MANUAL ON OPERATIONAL MODES

Manual Off – Permanent
- Pressing the off switch will turn lights off. The lights will remain off regardless of occupancy until switch is pressed again, restoring the sensor to Automatic On functionality.

Manual Off – Occupancy Expiration
- When enabled, operation of device will revert from a push-button triggered override off state to Normal mode once the Occupancy Time Delay expires. Not used with Manual On operating modes.

Manual Off – Time Expiration
- When enabled, operation of device will revert from a push-button triggered override off state to Normal mode once the Timed Override Delay (adjustable via SensorView) expires. Not used with Manual On operating modes.
SPECIAL OPERATING MODES

Defined behaviors for relays and/or dimming outputs

- Normal
- Manual On (Semi-Automatic)
- Auto-to-Override On
- Manual-to-Override On
- Manual On to Fully Automatic
- Manual On/Automatic Off (Semi Automatic)
- Predictive Off

Selectable via SensorView or device push-button
Normal Mode:
- Automatic On: Zones with occupancy sensors automatically turn lights on when occupant is detected
- Automatic Off: Zones with occupancy sensors turn lights off when vacancy is detected

Auto to Override On:
- Lights are turned on initially by occupant detection but remain in the Override On state
- Override On can be set to expire after a timer expires

Manual to Override On:
- Lights are initially turned on manually but remain in the Override On state for a pre-determined period (Timed Override Delay)
- Override On can be set to expire after a timer expires
Manual On to Fully Automatic:
- Initially requires the occupant to manually turn on the lights, after which the sensor assumes full on/off control

Manual On (Semi-Automatic):
- Requires the occupant to manually turn the lights on, while having them turn off automatically by a sensor

Predictive Off
- When lights are switched off, sensor determines whether occupants remain or left the room, so as to leave the lights in either the Override Off or Auto On state
What is it?

- New nLight operating mode designed specifically for bi-level applications
- Enables the user to cycle through the up to four potential on/off lighting states using only a single button.
- Eliminates user confusion as to which of two buttons controls which load
- Three different transition sequences are available in order to comply with energy codes or user preference (see next slide)
- Available as a setting on all nLight devices that have single manual switches.

nWSX    nPOD    nPOD DX
nWSX PDT nPODM  nPODM DX
MULTI-LEVEL OPERATING MODE (MLO)

How does it work?

- Depending on the sequence, every button push steps through relays states according to below table

<table>
<thead>
<tr>
<th>Sequence State #</th>
<th>Alternating Sequence</th>
<th>Full On Sequence</th>
<th>3 Step On Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relay 1</td>
<td>Relay 2</td>
<td>Relay 1</td>
</tr>
<tr>
<td>1</td>
<td>On</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>2</td>
<td>Off</td>
<td>On</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
<td>On</td>
</tr>
<tr>
<td>4*</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
</tbody>
</table>

(*step only present for devices without separate off button)

- Zone must have at least two relays, tracking switching on different channels