This pocket guide will help you quickly and easily get your nLight® devices connected and operating.

The guide includes:

• Basic terminology
• Expected, out-of-the-box functionality
• Bus power budget considerations
• Connecting devices to create an nLight Control Zone
• How to interconnect multiple Control Zones using nLight Backbone devices
• Troubleshooting tips
• Installation Do’s and Don’ts

The guide assumes:

1. A basic familiarity with nLight products and concepts
2. Familiarity with CAT-5e cabling and terminations
3. nLight devices are installed and wired to line voltage per device datasheets

Out of the Box - It Just Works

nLight devices ship with default settings so they simply work, right out of the box. With as little as a switch as a sensor and a Power Pack wired to lights, you can create a perfectly functional nLight Control Zone.

Consider a simple office with an iPOD® wall switch and a Power Pack wired to the room’s light fixture. The iPOD® broadcasts switch status (ON/OFF) on Channel 1, and the Power Pack tracks (light switch status changes on Channel 1). Right out of the box, the iPOD® can control the room’s lighting.

This table shows default broadcast (status) channels for a sampling of nLight WallPod® switches, and default broadcast (listening) channels for common nLight Power Pack devices with 2P or 4P indicate multiple poles.

<table>
<thead>
<tr>
<th>Switch Channels</th>
<th>Device</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>nPODM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nPODM 2P</td>
<td></td>
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</tr>
<tr>
<td>nPODM 4P</td>
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<tr>
<td>iPPS</td>
<td></td>
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<tr>
<td>iPPS 5W</td>
<td></td>
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<td></td>
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<tr>
<td>iPPS 10W</td>
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<td></td>
</tr>
</tbody>
</table>

Occupancy Channel (default): All sensors broadcast on Channel 1. All devices tracking, track Occupancy Channel 1.

Occupancy Channel: 

• All devices tracking, track Occupancy Channel 1.

Switch Channels

Backbone - The communication network formed by nBridge Bridges and nLight ECLYPSE® devices that is required to deploy remote or time-based controls, such as a scheduled override, out to a device, groups of devices, or zones. Additionally, advanced features, such as performance monitoring and interfacing with higher level BMS systems, require the end-to-end network connectivity that the backbone provides.

nBridge (nBGE) - nLight backbone device with 8 RA5.5 ports to connect control zones, either Bridges, or as an nLight ECLYPSE. Bridges act as hubs by aggregating communication traffic from connected zones onto the backbone. Bridges also act as routers, for forwarding information from the backbone out to the applicable zones. Additionally, Bridges combine system power from zones that are not contributors of power and distribute it to zones that are net consumers of power.

nLight ECLYPSE® - An nLight backbone device that maintains a database of all downstream devices, provides time clock functionality, stores custom operating profiles, and displays system status. This device links an nLight backbone to the host computer of the Sensormatic® Management software via an Ethernet LAN/WAN network. This device also hosts on board edge applications that provide system information (e.g. nLight Explorer) and is a BACnet native device (BTL listed BACnet control device). It supports connection to a touch screen display (nG2W2 GUI), and is optionally sold within an enclosed and powered by a 24V power supply (PS 150).

WallPod® (or nPODM) - general term for a nLight wall station. WallPods are available in many configurations that enable occupants to issue On, Off, Raise, Lower, and/or Scene selection commands. WallPods have model numbers that start with (n)POD(M).

nLight Power Considerations

Each nLight zone supports up to 128 devices. Some devices provide power, others consume it. Most nLight devices use only 3-4 mA, some up to ~8 mA, nLight power generating devices typically provide 30-40 mA per RA5.5 port. For nLight zones with more than 16 devices, you should carefully budget power consumption to ensure that all devices have adequate power. Device data sheets give accurate power consumption information.

Tips to avoid low voltage in a Control Zone:

• Remember that nLight device placement is flexible. Locate Power Packs mid-Zone. Ex. in an 11-device Control Zone, place Power Pack as device #6. Each side of the Power Pack offers ~40mA, or 8mA per device. If the Power Pack were device #1 or #11, less power is available per device.

• Calculate the power load and make sure there are enough power supplying devices placed appropriately in the Control Zone.

• A Bridge can redistribute power from Zones with a surplus to Zones with a deficit. When coupled with a PS150 supply, a Bridge has ~200mA available to share with connected Zones that need power.

The illustration below drives how a Bridge can share power with Control Zones that need it, as well as re-distribute power from Zones with excess power.
Installing a Control Zone

**Troubleshooting the Zone - Device Blink Codes**

All nLight devices are equipped with status LEDs. These LEDs are used in conjunction with the device’s push button for programming and configuration, but the rest of the time they indicate status and display any error code that may be present at the device. The table at the right tells how to interpret common error codes from the LEDs.

<table>
<thead>
<tr>
<th>Blink Pattern</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device has two LEDs, and the left LED is on solid (not blinking)</td>
<td>Device is blink-patterned on the nLight network, this is expected operation.</td>
</tr>
<tr>
<td>Constant rapid flash of all LEDs</td>
<td>A device firmware update is in process. Wait for the update to complete. (Note: If on a photovoltaic device, transition mode)</td>
</tr>
<tr>
<td>Rapid flash for 1 second, followed by two blinks</td>
<td>No TIA-485 communications between devices. Check CAT-5e cable connections, pins, etc.</td>
</tr>
<tr>
<td>Rapid flash for 1 second, followed by three blinks</td>
<td>Low voltage on the port; this indicates a lack of line power. Add a bus powering device to supply additional voltage. See nLight Power Considerations for more info.</td>
</tr>
<tr>
<td>Rapid flash for 1 second, followed by four blinks</td>
<td>This indicates a device’s firmware is incompatible with the other devices in this zone. Newer firmware devices will display this blink pattern. Remove the device and replace it with an up-to-date unit, or use SensorView Software to update the device’s firmware to a compatible version.</td>
</tr>
</tbody>
</table>

**LED Writing Steps**

1. Locate one of the devices that provides power to the bus, and run CAT-5e cable to the next right device in the daisy chain. Install connectors as necessary, terminating cables according to TIA 568B. Review the tips in the Do’s and Don’ts section to ensure install goes smoothly.
2. If the device location has not previously been recorded, do so ex post facto. It is very helpful information to have later on. There are two Serial ID stickers on every nLight device, use the second sticker to record the device location. Adjacent to the sticker, record the device type (i.e., LED fixture or ceiling sensor) and location (i.e., Room 216 Row 2 ceiling).
3. Plug the CAT-5e cable into the power supplying device. It does not matter which of the K42's ports you plug into a device with two ports.
4. Plug the other end of the CAT-5e cable into an available K42 port at the next device.
5. As soon as the device is plugged in and has bus power, the LED should display a rapid flash followed by two blinks as the device boot up. If you don’t see LEDs come on, check the cables using the tips from the Do’s and Don’ts table.
6. As each device is added, you’ll see LED activity during network discovery, after which the LEDs will settle into default states. Power Pack and switch (WallPod) are powered, and the display is cabled to the port marked “GFX” on the controller. Some devices may also indicate a rapid flash for 1 second in status mode (GFX) on the controller. A beating green heart symbol on the display indicates communication is present between the two devices.

**Installing a Backbone**

An nLight backbone consists of devices called “ Bridges ” and “ nLight ECLYPSE™ ” connected with CAT-5e cable. Individual control zones are each cabled to a port on a Bridge, which may also be cabled to other Bridges or directly to a single nLight ECLYPSE. One or more nLight ECLYPSE devices are then typically linked together over an Ethernet LAN/WAN (not provided) to a host computer or server (supplied by customer) running the SensorView™ management software.

**Troubleshooting the Zone - Device Blink Codes**

You can see the status of an individual Zone as it is connected to the Bridge by observing the LED for that Bridge Port, and interpreting its Blink Pattern when in port status mode.