



Acuity Relay Panel User Guide

Table of Contents

Installation and Troubleshooting

1.1 - Powering Up the Panel.....	3
1.2 - LED Blink Codes On Relay Control Card	5
1.3 - Testing Relay and Dimming Outputs	5
1.4 - Manual Factory Reset	6
1.5 - nLight Digital Devices and Bus Termination	6
1.6 - Initial "Out-of-Box" Panel Operation	7
1.7 - Creating 2-Pole & 3-Pole Relays	9
1.8 - Installing a Voltage Barrier.....	11
1.9 - Wiring Recommended Photosensors to Relay Panel	12
1.10 - Wiring to "Override" Input.....	14

General Programming

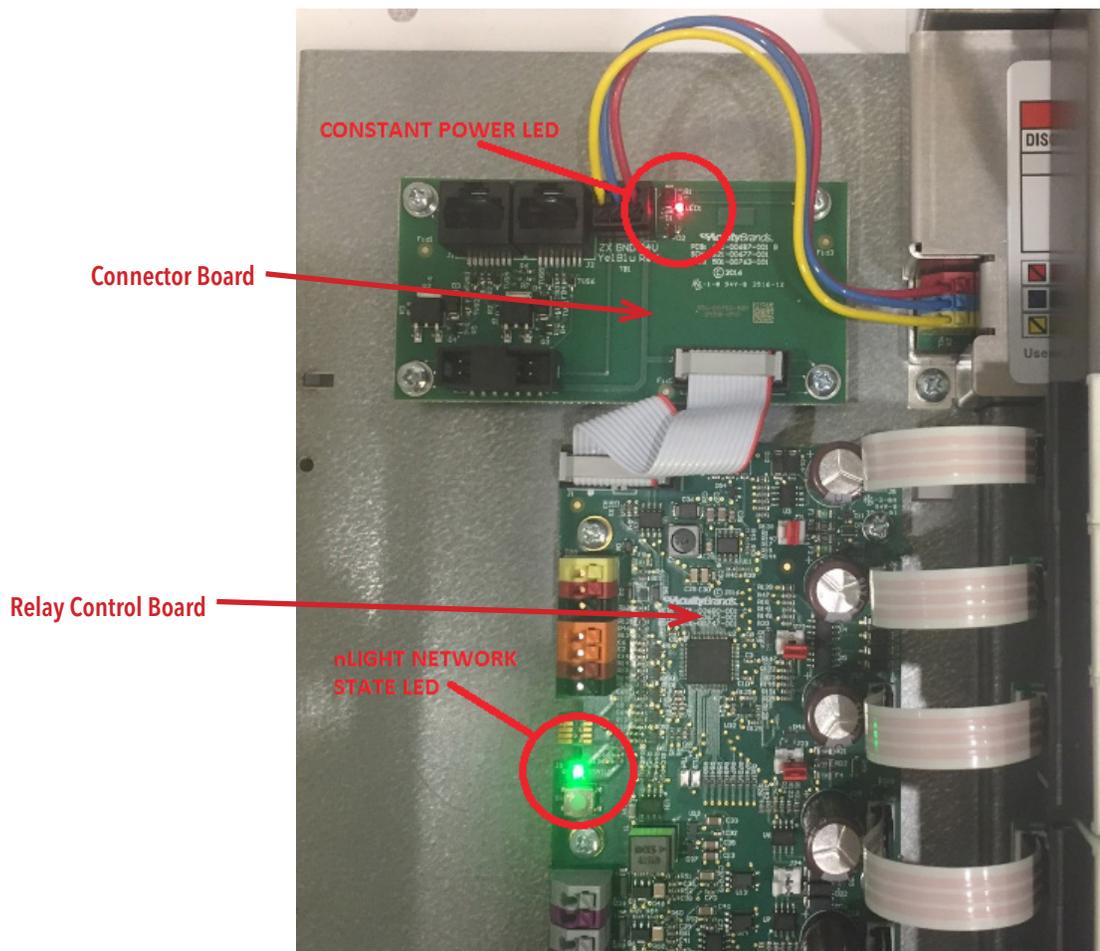
2.1 - Viewing the Default nLight Panel in SensorView	15
2.2 - Viewing 2-Pole & 3-Pole Relays in SensorView	17
2.3 - Programming Sensor Input for On/Off Only Photosensor	19
2.4 - Programming Sensor Input for Dimming Photosensor	20
2.5 - Programming "Override" Input.....	24
2.6 - Additional Programming Settings	24
2.7 - Default nLight Relay Panel Settings	25

Installation & Troubleshooting Tips

1.1 - Powering Up the Panel

Upon powering up panel for the first time, all relays will either remain closed or toggle to the closed position (if initially open upon power up). The following are some of the initial power-up characteristics that should be expected:

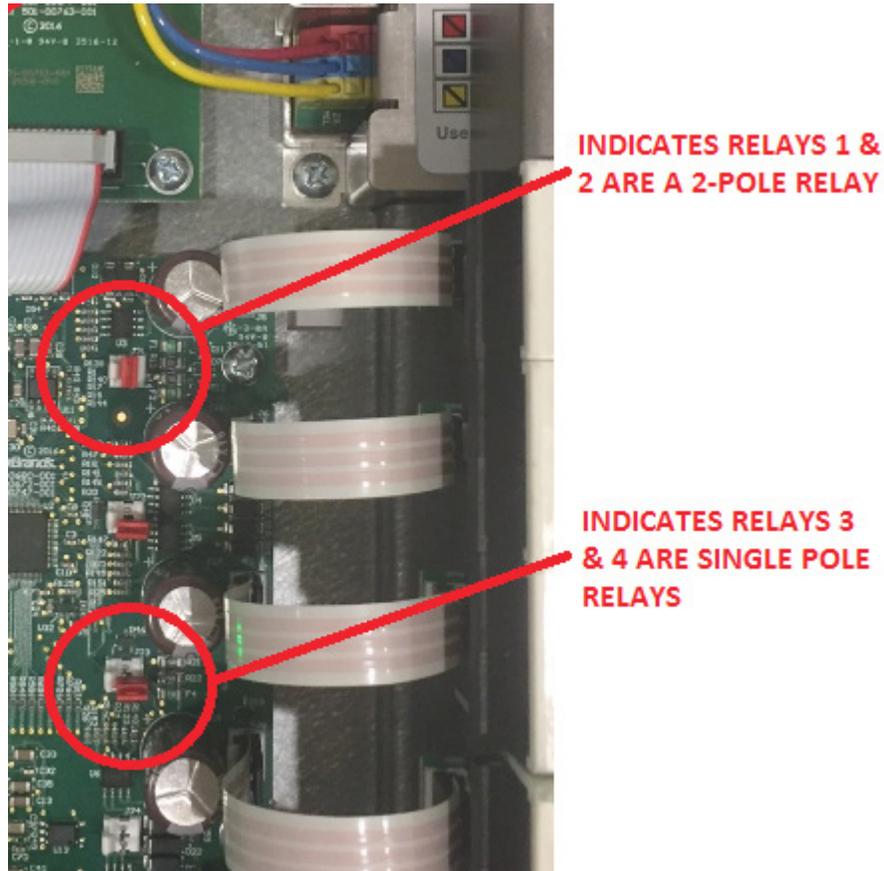
- Red LED on connector board indicates that 24VDC is present and will remain solid lit
- Green LED on relay control board indicates the card status and will flash initially, then follow nLight LED codes (described in section 1.2 below)



- Full power up of the panel (charging of all capacitors and reaching steady-state operation) should take ~10 seconds
- During power up, the panel will actively discover any 2 and 3-pole relays based on state of the red jumpers on the relay control circuit. There are the following 3 possibilities:
 - ◇ A lack of jumper, or one in the horizontal position leaving two pins disconnected, indicates single pole relays
 - ◇ Jumpers in the vertical position connecting two pins indicates a 2-pole relay, connecting the relay above and below the jumper (e.g. in the image below, relays 1 & 2 are connected to form a 2-pole relay)
 - ◇ Two consecutive vertical jumpers will indicate a 3-pole relay

NOTE: Due to the physical board layout for a 16-relay panel, relays 8 and 9 cannot be joined together in a 2-pole or 3-pole configuration

Installation & Troubleshooting Tips



Troubleshooting: *Panel does not appear to power up*

- Confirm AC voltage is present and wired correctly on the primary side of the power supply.
- Verify that the red LED on connector board with 2x RJ45 is lit - if the LED is not lit or is dim, confirm that 21-26VDC is present between red and blue wires from the power supply, and that wires are secure within the push-in connectors.
- Verify that the green LED on the relay control board is lit upon initial power up - if the LED does not blink or light up, confirm that the ribbon cable between connector board and relay control board is present and properly seated

Installation & Troubleshooting Tips

1.2 - LED Blink Codes On Relay Control Card

There is an LED located on the relay control board – it is located midway between the input connectors and dimming output connectors (pictured below).

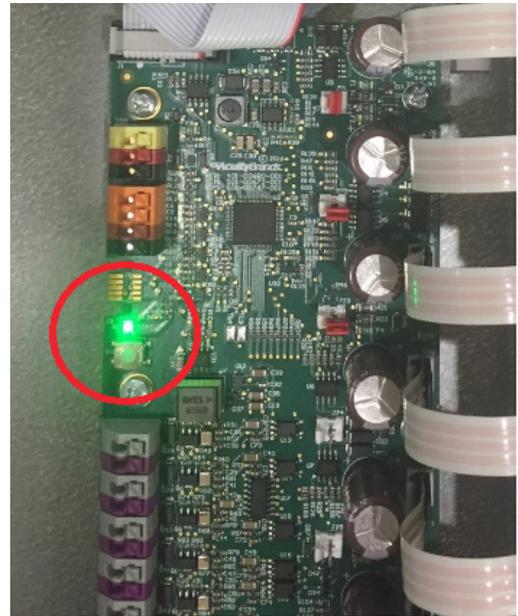
This LED provides panel state and error indication, similar to what is provided on all existing nLight devices. This LED will follow one of the following blink patterns – troubleshooting instructions are also provided below:

Normal LED Conditions:

- Steady Slow Blink (1 second on, 1 second off): This is the normal mode for the panel and indicates it is operating properly.
- Constant Rapid Flash: Panel firmware is currently being updated. LED will stop flashing once the firmware update is complete.

Error LED Conditions:

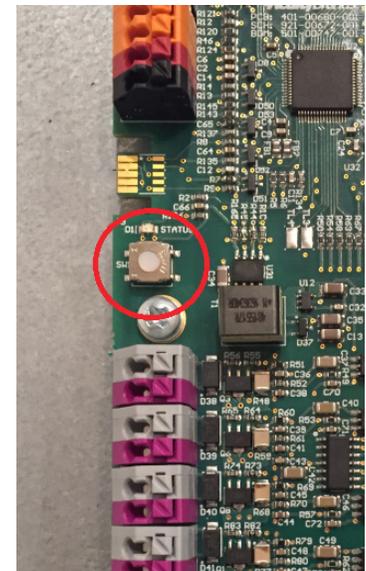
- Constant Rapid Flash When Firmware Update Is Not In Process: Device in Boot Loader Mode, which indicates an interrupted/failed firmware update. Re-flash the firmware update to clear this error.
- One Second Of Rapid Flashing Followed By Two Blinks: No communication with additional nLight devices. Confirm CAT5 connections to nLight devices in the daisy-chain.



1.3 - Testing Relay and Dimming Outputs

There is a button located just below the LED on the relay control board (pictured right) that can be used to test the relays and dimming outputs. The button will control the relays in the following manner:

- Pressing the button will ONLY control the relays/dimming outputs on the respective control card.
- Pressing the button will force the relays to toggle based on the following logic:
 - ◇ If 1 or more relays is in the "off" (relay open) position, an "on" command will be sent to those relays. Dimming outputs will go to the programmed "occupied bright level". Any relays configured for "momentary on" will close for 1 second, then return to open.
 - ◇ If all of the relays are in the "on" (relay closed) position, a "turn off" command will be sent to all relays. The dimming will go to minimum (~0VDC). Any relays configured for "momentary off" will close for 1 second, then return to open.
 - ◇ Once all relays/dimming outputs are in sync, each press of the button will alternate between the above described states (i.e. On at 100%, Off at 0%).



Installation & Troubleshooting Tips

- This button command acts similar to an nLight Wallpod switch press
 - ◇ Relays/dimming outputs driven "on" with this button – if lights are tracking occupancy sensors that are unoccupied, lights will turn off after a 1 minute "temporary manual override". Otherwise, the lights will remain on.
 - ◇ Relays/dimming outputs driven "off" with this button – lights will remain in this state until turned back on from the same button, or an nLight Wallpod switch.
- If an nLight digital Wallpod (nPODM DX) or occupancy sensor (nCM 9) is available, these can also be utilized to test the outputs. Plugging either (or both) devices into the panel will result in default operation, as described in section 1.6.

1.4 - Manual Factory Reset

Completing a factory reset will erase ALL custom programming and bring the unit back to factory default settings (as described in section 1.6). This should ONLY be utilized when factory settings are desired and SensorView is not available to complete this operation.

The same push button described in section 1.3 can be utilized to complete a factory reset of the entire PCB control card, using the following process:

NOTE: If attempting to factory reset a 16-relay panel, both relay control cards will need to be reset to factory defaults using the instructions described below.

1. Press and hold the button for ~10 seconds, at which point the LED just above the button will begin to flash rapidly. Release the button.
2. Press and hold the button again for ~10 seconds, until the LED again reaches a rapid flash. Release the button.
3. After successfully completing steps 1 & 2, the LED will flash rapidly until the factory default is complete. At this point the LED will return to normal operation, and the panel will now operate as shipped from the factory.

1.5 - nLight Digital Devices and Bus Termination

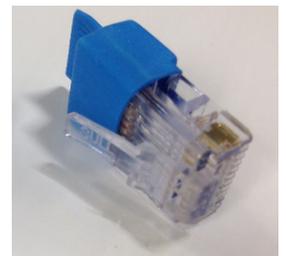
The rules for connecting nLight devices remains the same for a panel and digital devices:

- All devices must be connected using CAT5 (recommended CAT5e or CAT6) in daisy-chain fashion, without T-taps, with a maximum of 1500' of CAT5.
- Maximum 128 digital devices per single zone

NOTE: When using panels, every 8-relays accounts for 9 digital devices

As panels are often placed in the harshest electrical environments, controlling large loads that can create electrical "noise", each panel is shipped with a "bus terminating" device. This device is placed in one of the RJ45 ports on the connection board for shipment, and is pictured to the right.

This RJ45 termination device should be placed on the last nLight device within the daisy-chain, since there will be an open RJ45 port on this device. So if the panel is not the last device in the daisy-chain, move this termination to the last digital device. If multiple panels are in the same nLight zone, remove all but 1 of the termination devices.



Installation & Troubleshooting Tips

The following outline the two typical nLight installations:

- If the nLight zone is "stand-alone", not connected to a system backbone (i.e. there is no connection to a bridge or Gateway/ECLYPSE device), there will be open RJ45 ports at either end of the daisy-chain. The RJ45 termination device can be placed at either end.

Note: This rule applies to nLight zones where there are multiple panels. If the panel is not the last device in the daisy-chain, the RJ45 termination can be placed in any nLight digital device (e.g. switch/sensor/power pack).

- If the nLight zone is connected to a backbone through bridge or Gateway/ECLYPSE, connect the RJ45 termination device at the opposite end of the bus (since this will be the only open RJ45 port).

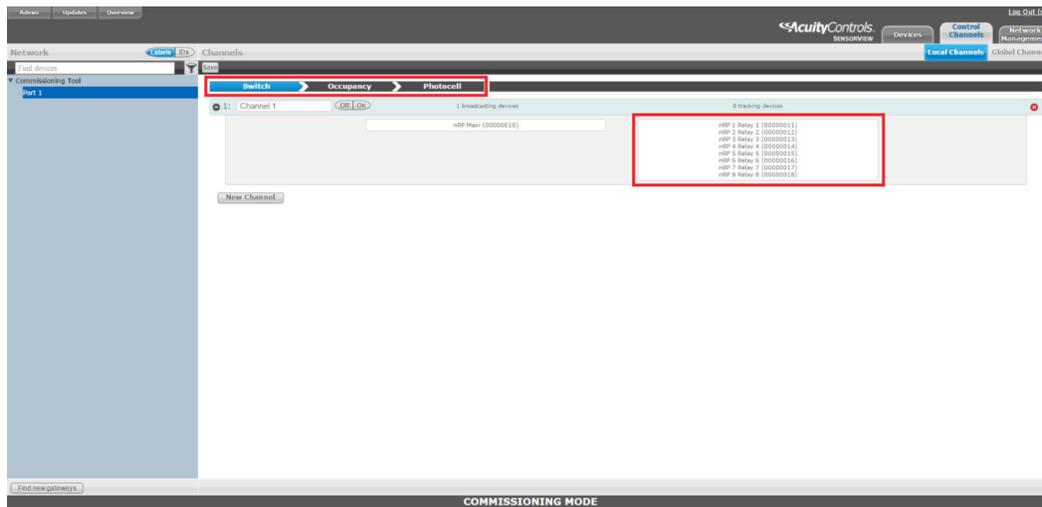


1.6 - Initial "Out-of-Box" Panel Operation

After full power up (<10 seconds), all devices will begin operating under default settings – for a panel direct from the factory, all relay/dimming output will track the following:

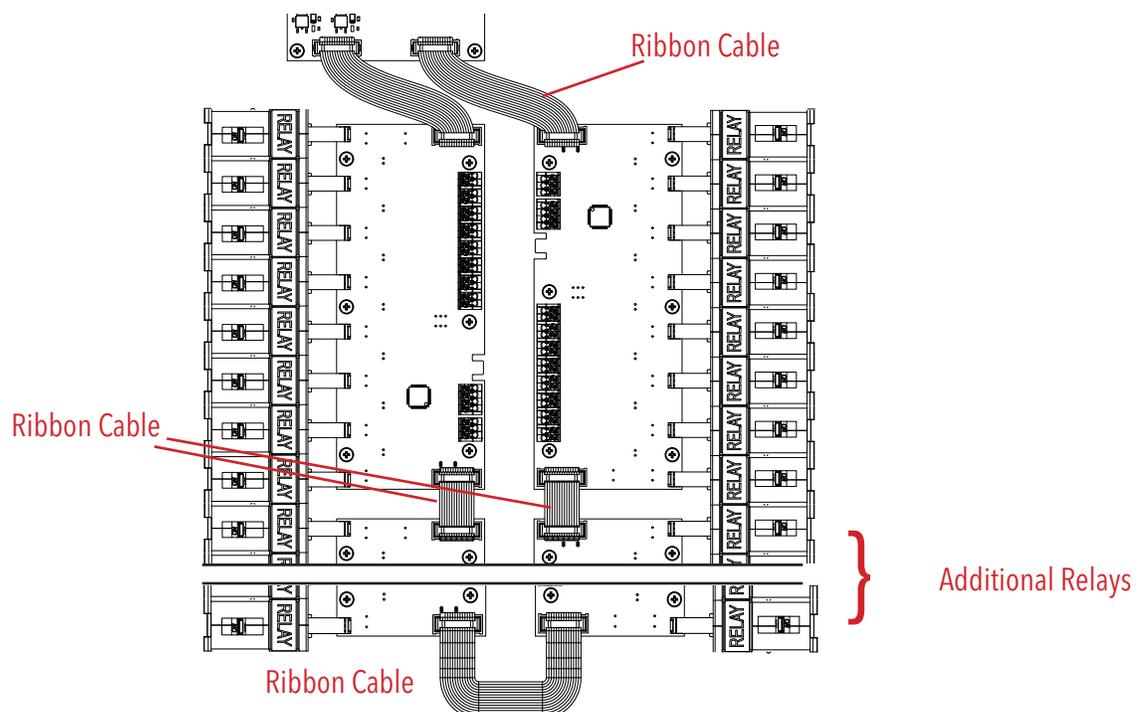
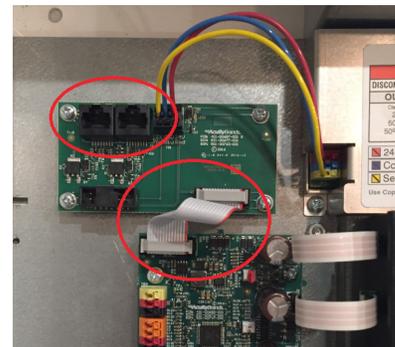
- Switch Channel 1
 - ◇ Connecting the panel to a single pole switching/dimming Wallpod will allow control of all relay and dimming outputs without any additional programming. For a multi-pole Wallpod, all relays will respond only to the first pole. To modify switch control, reprogram utilizing SensorView software.
- Occupancy Channel 1
 - ◇ Connecting the panel to one or more digital occupancy sensors will provide occupancy control of all relays. By default, all lights will dim to 1% after 7.5 minutes of no activity on ALL sensors, and turn off after 10 minutes of no activity. To modify occupancy control, reprogram utilizing SensorView software.
- Photocell Channel 1
 - ◇ Relays will respond to on/off digital photosensor (e.g. nCM PC) only by default. "Follow photocell mode" is disabled for each dimming output, and must be enabled through SensorView to support digital dimming photosensors (e.g. nCM ADCX).

Installation & Troubleshooting Tips



Troubleshooting:

- If relays are not responding to switch/occupancy/photosensor commands, confirm CAT5 connection from digital devices to the nLight panel RJ45 inputs. Also confirm ribbon cable connection from input to relay control card (pictured right).
- If relays 1-8 are functional in a 16-relay panel, but relays 9-16 are not responding to commands, confirm ribbon cable connections between two relay control cards.
- If any portion of relays in a 24, 32 or 48 relay panel are not responding to commands, confirm ribbon cable connections between all of the relay control cards. These should be plugged in as shown below.



Installation & Troubleshooting Tips

1.7 - Creating 2-Pole & 3-Pole Relays

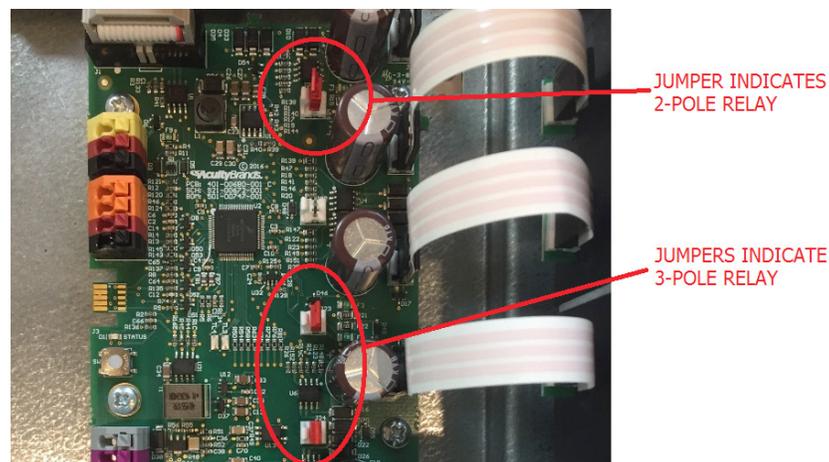
The nLight relay panel has the unique capability of being field configured for 2 and 3-Pole applications without requiring a swap out of existing single pole relays shipped with the unit. The process for this is outlined below, as well as in the installation instructions shipped with the unit.

THE PANEL MUST BE DE-ENERGIZED WHEN CONFIGURING 2-POLE AND 3-POLE RELAYS. THE MULTI-POLE RELAYS WILL NOT FUNCTION PROPERLY UNLESS THIS IS FOLLOWED.

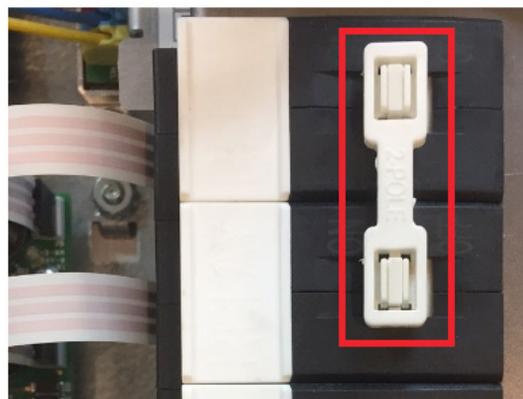
The required steps are the following, and also outlined in the below image:

- After de-energizing the panel, place supplied jumper on the 2 exposed pins between the relays that should work together.
 - A single jumper will indicate a 2-pole relay
 - Two consecutive jumpers will indicate a 3-pole relay

Note: Relays can only be jumped together when controlled by the same controller card. So for 16-relay control cards, relays 8 and 9 cannot be jumped together.

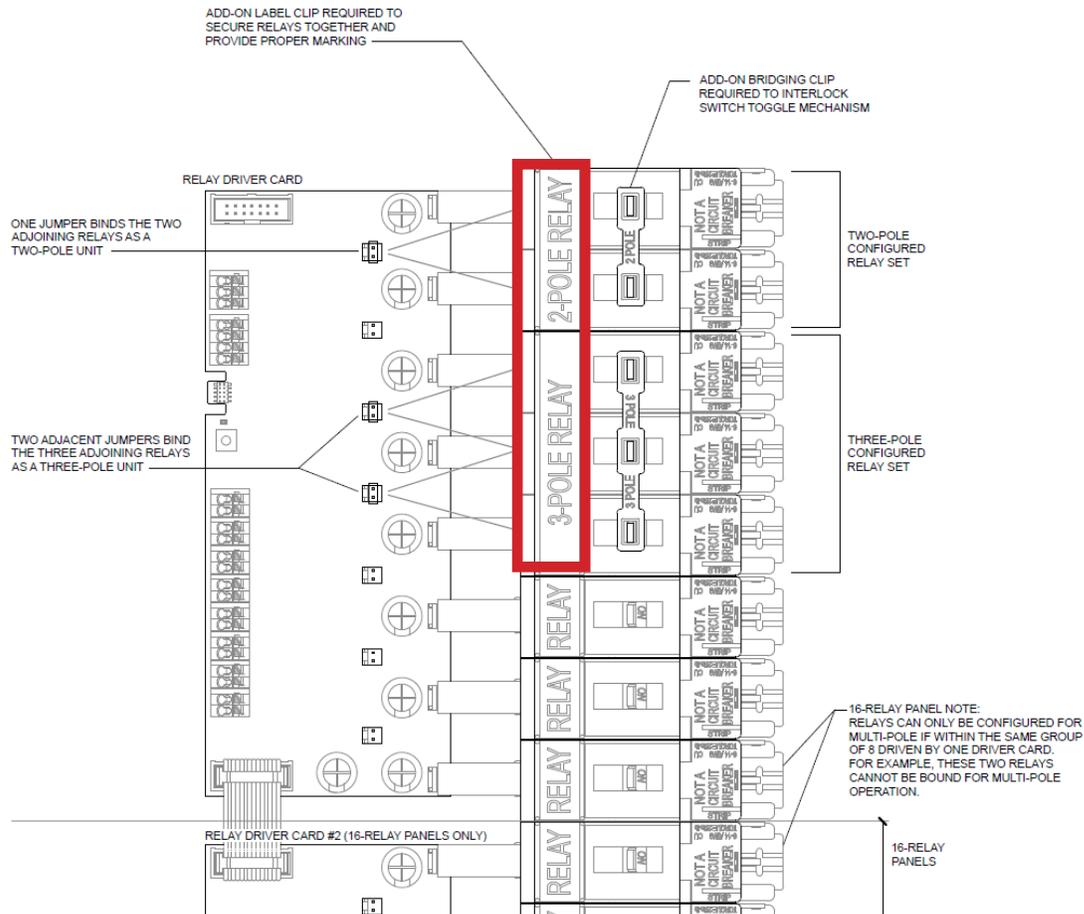


- Add manual switch handle bridging clips to the relays, matching those that have the red jumper from step 1. These will be marked with "2-POLE" and "3-POLE".



Installation & Troubleshooting Tips

3. Replace existing "RELAY" label clip with those sized for 2-pole and 3-pole relays. These will be marked with "2-POLE RELAY" and "3-POLE RELAY"



After successfully completing the three above steps for the desired number of 2-pole and 3-pole relays, re-energize the panel. The panel controller will actively discover the number of 2-pole and 3-pole relays, and report this information to SensorView. Screenshots of this are shown in Section 2, SensorView programming.

Relays that are combined will operate exactly as a 2-pole or 3-pole relay. Additionally, the dimming outputs for the associated relays will operate together. For example, if relays 1 and 2 are combined as a 2-pole relay, these relays will switch together and the dimming outputs will always match one another.

Installation & Troubleshooting Tips

1.8 - Installing a Voltage Barrier

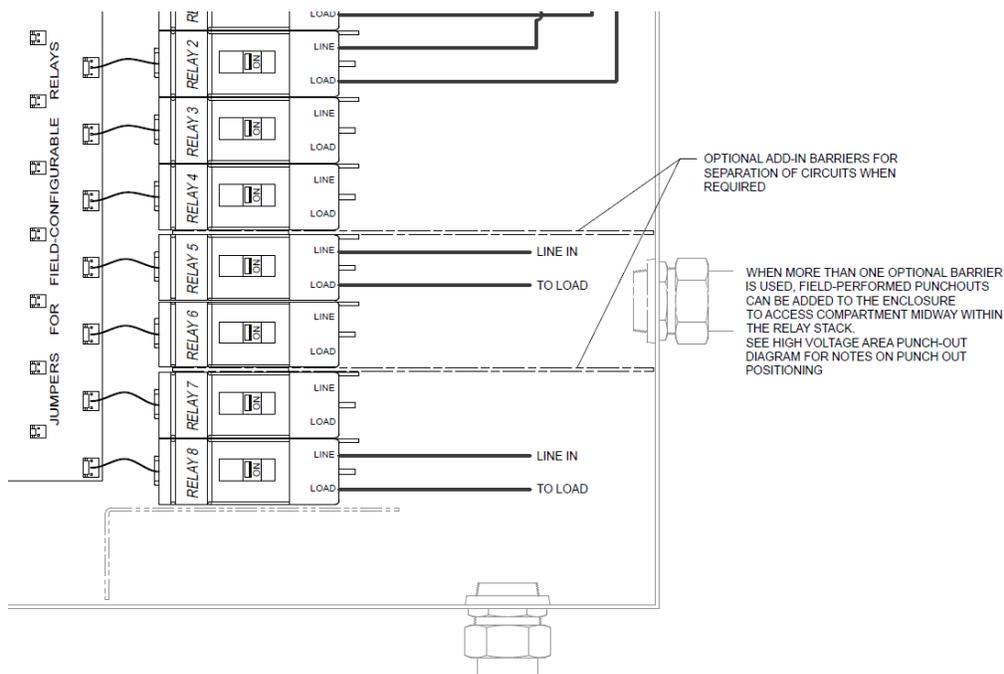
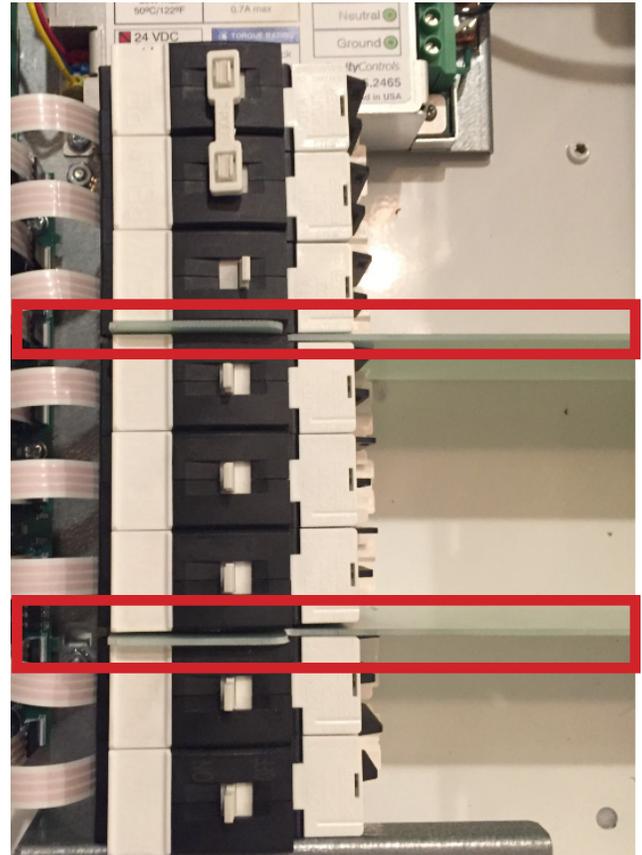
Voltage barriers are often necessary when panels are servicing multiple voltages (i.e. 120VAC and 277VAC) and sources (i.e. normal and emergency circuits) within the same panel. These are optional fiberglass barriers that are field installed after the panel voltage and source layout has been determined.

A couple notes regarding the voltage barriers:

- If more than one barrier is used, field knockouts will need to be added to the side of the enclosure to access the line voltage compartment (see image from installation instructions below).
- When utilizing two voltage barriers, it is not recommended to surround a single relay, as this does not leave sufficient space to create field knockouts.

Barrier installation:

1. Fiberglass barrier will include cutout to snap securely to DIN rail. Place barrier with DIN rail cutout facing down between two relays that require separation, and snap into place.
2. Should Emergency circuits be located in the panel, place "Emergency" stickers supplied with the barriers to mark this section of the high voltage compartment.



Installation & Troubleshooting Tips

1.9 - Wiring Recommended Photosensors to Relay Panel

The following four photosensor types are recommended when controlling loads from the nLight relay panel:

NCM ADCX RJB, NCM PC RJB

Applications: Recommended for indoor closed loop On/Off or On/Off/Dimming

Description: Digital sensor (0-200FC) for local nLight control zones, connected via CAT5/CAT6 cables. Setpoint digitally adjustable (via SensorView)



ARPA PC

Applications: Recommended for outdoor dusk to dawn lighting, on/off only

Description: Simple switching (at ~1-3fc) with mechanically adjustable slide



LSA APS OL

Applications: Recommended for outdoor dusk to dawn lighting, on/off or on/off/dimming (where necessary)

Description: Analog sensor (0-100FC) with switching/dimming thresholds remotely adjustable (via SensorView)



PCELL 3WI ZT

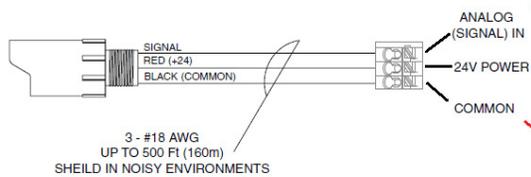
Applications: Recommended for Indoor open loop On/Off or On/Off/Dimming

Description: Analog sensor (0-100FC) with switching/dimming thresholds remotely adjustable (via SensorView)



Installation & Troubleshooting Tips

Wiring for the various analog photosensor types is shown below:



SIGNAL WIRE COLOR:
ARPA PC - ORANGE
LSA APS OL - YELLOW
PCELL 3WI ZT - BLUE



A single photosensor can be used to control a single panel (of any number of relays), or multiple panels on the same local nLight zone. Global photosensor control for panels in separate control zones is also available when using the 3-wire sensor input directly in the panel. This provides the ability for the following:

- A single **ARPA PC** photocell to control panels from any bridge port under a single Gateway/controller. If multiple controllers are connected over a LAN, this photocell can also be programmed to control loads across controllers due to the programming as a "switch channel" command (or a "global profile" can also be used).
- A single **LSA APS OL** or **PCELL 3WI ZT** photocell can be used to control panels from any bridge port under a single Gateway/controller, including dimming. The panel supports global dimming/on/off photocell control, which broadcasts over a "photocell channel". If using multiple Gateways/controllers, one photocell will be required per Gateway/controller (i.e. photocell channel commands are not forwarded between controllers over a LAN).

The various programming options will be covered in section 2, SensorView programming.

Installation & Troubleshooting Tips

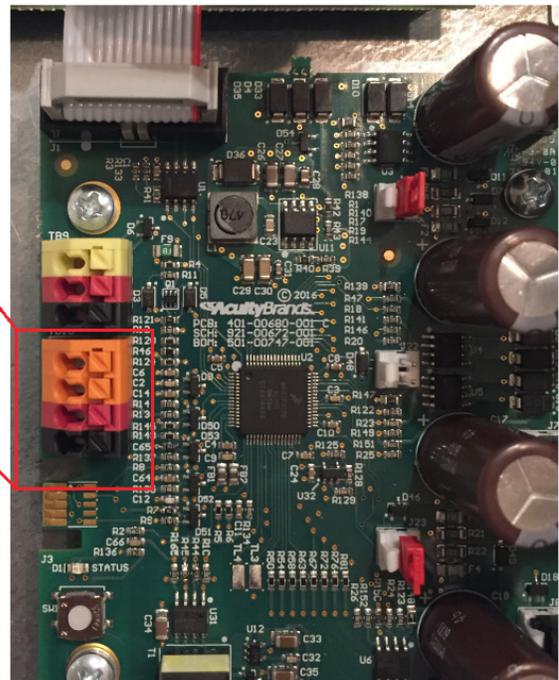
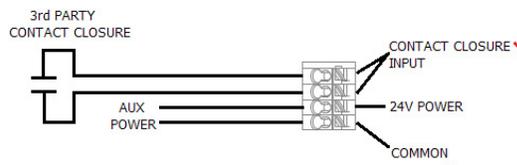
1.10 - Wiring to "Override" Input

The nLight relay panel also supports a dry contact "override" input. When the two orange connectors received a contact closure input, all relays/dimming outputs on that specific relay control card will go into their "override" state (relay closed and dimming at 100% by default). This override state can be modified through SensorView software, and is described in more detail in the section 2, SensorView programming.

This input can be used for various operations, but the most common will be an "alarm/emergency" override triggered by a dry contact from another system. A few comments regarding this input:

- This signal must be a maintain dry contact.
- For 12, 16, 24, 32 or 48 relay panels, or multiple relay panels exist on the nLight network, each group of 8 relays (i.e. individual relay control card) requires a signal. This is the best way to confirm an "alarm/emergency" command reaches all controllers, especially if some panels are powered down during the emergency event. This can also be achieved from wiring the same signal in parallel to each "override" input.
- 24VDC auxiliary power is present and can be used if necessary for the 3rd party device. There is a total of 150mA available per relay controller card.

Wiring for the "override" input is shown below:



General Programming Tips

2.1 - Viewing the Default nLight Panel in SensorView

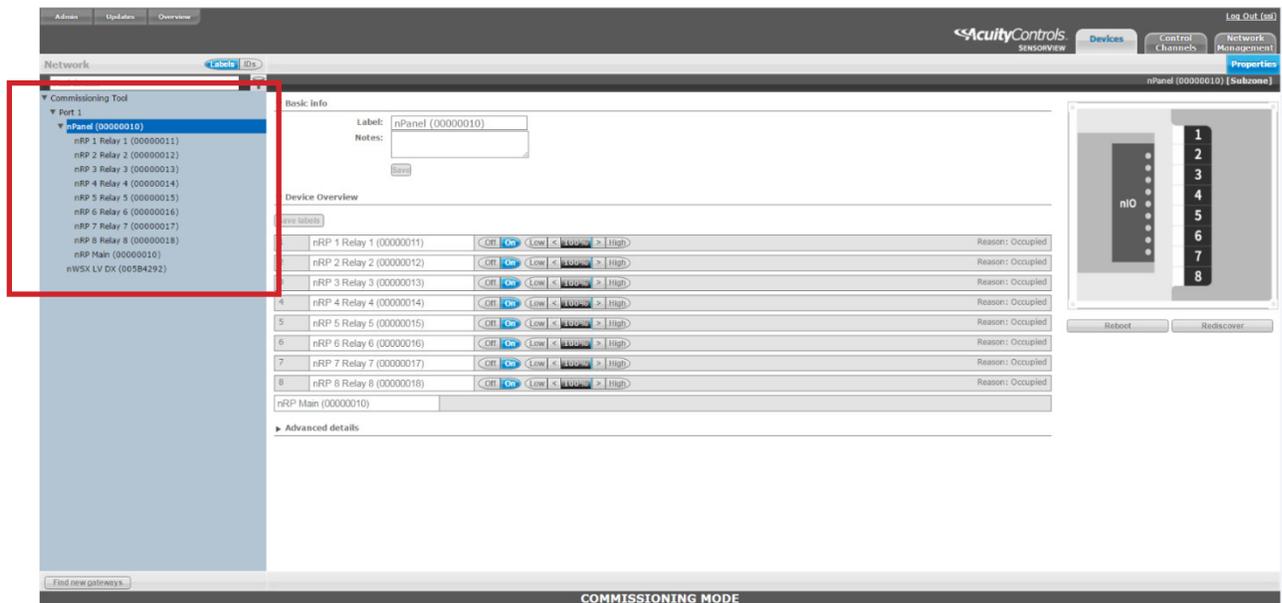
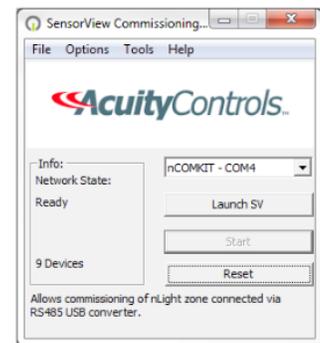
The nLight relay panel can be viewed in SensorView using either of the following:

- Utilizing a nCOMKIT to connect to a local daisy-chain of nLight devices which include 1 or more nLight panels
- Connecting to an nLight Gateway V2 or nLight ECLYPSE that has one or more nLight panels (either connected to a system bridge port, or directly to the nGWY2/nECY through one of the nLight ports)

NOTE: Connecting to a relay panel will always results in discovery of 9 nLight devices per 8 relays, 8 devices for the relay/dimming outputs, and 1 device for the programmable sensor input.

The panels will display for the same number of devices even when 2 and 3-pole relays are created within the panel.

The following are screenshots taken to display connection to an nLight relay panel.



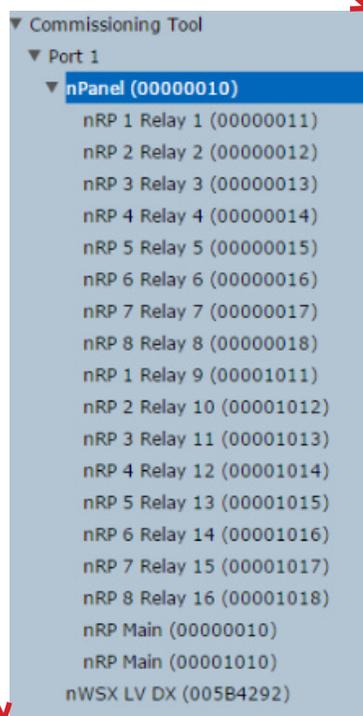
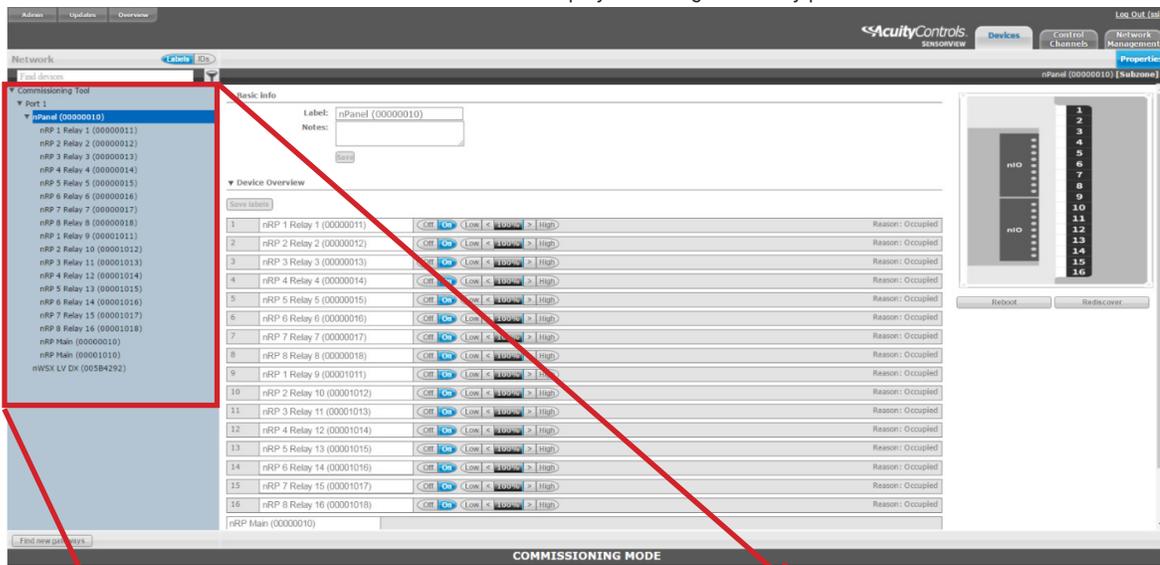
Above is the SensorView display of an nLight 8-relay panel. The display will be an overall panel (model "nPanel(12345678)") and sub devices ("nRP x Relay (12345679)"), each with a unique serial ID.

General Programming Tips

A few notes when looking at the display:

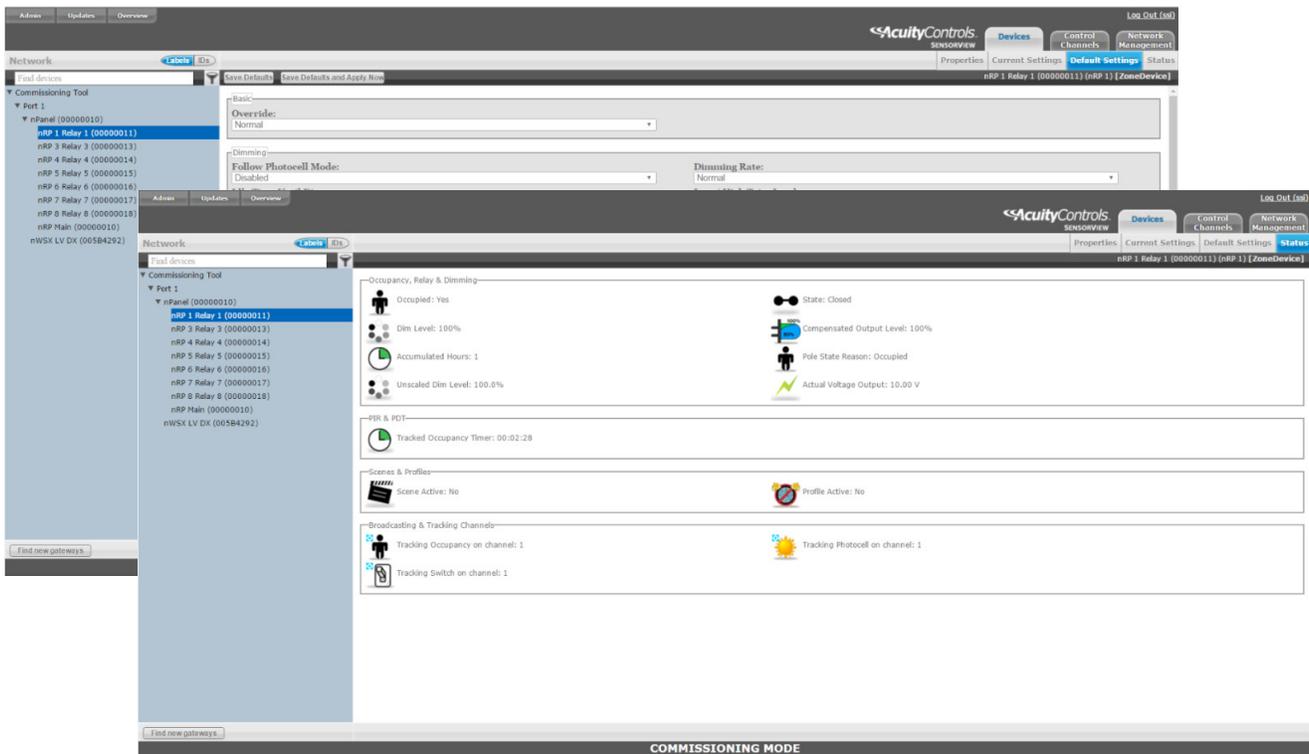
- The serial ID of the main panel ("nPANEL") and the input ("nRP Main") will be the same for an 8-relay panel, and the same 4 for the first input ("nRP Main 1") on a 16-relay panel.
- Although the devices display as a "sub-zone" underneath the main nPANEL, this is purely for a simplified tree structure to group the relays. All devices under the bridge port will still be available for control channels programming.
- Selecting the main panel will provide override control (on/off/dimming) on the properties page, similar to a standard output device

Below is the SensorView display of an nLight 16-relay panel



General Programming Tips

Below is the SensorView display of an nLight 16-relay panel



2.2 - Viewing 2-Pole & 3-Pole Relays in SensorView

Note: Creating 2-pole and 3-pole relays requires additional hardware components (supplied with the unit) to the circuit board and relays. This process is described in section 1.7 above, and must be completed while the panel is de-energized. If the panel is not de-energized it will not display the correct relay configuration in SensorView.

The following images are how a panel will display in SensorView after configuring 2-pole or 3-pole relays. There are several immediate visual indicators of a 2-pole or 3-pole relay:

- For a 2-pole or 3-pole relay, only the top most relay will display in the device tree. The other relay(s) will not be visible.
 - For example: In the screenshot below, relays 1 and 2 are combined as a 2-pole relay - relay #2 no longer displays in the tree.
 - Additionally, relays 3, 4 and 5 are combined as a 3-pole relay - relays #4 and #5 no longer display in the tree.
- Under "device overview", the combined relay numbers will display on the left hand side.
- The product image will show the proper number of relays

General Programming Tips

AcuityControls SENSOVIEW

Devices Control Channels Network Management

Log Out (98)

Network Labels IDs

Commissioning Tool

Port 1

nPanel (00000010)

- nRP 1 Relay 1 (00000011)
- nRP 3 Relay 3 (00000013)
- nRP 6 Relay 6 (00000016)
- nRP 7 Relay 7 (00000017)
- nRP 8 Relay 8 (00000018)
- nRP Main (00000010)

Basic info

Label: nPanel (00000010)

Notes:

Save

Device Overview

Save labels

1	nRP 1 Relay 1 (00000011)	Off On Low < 100% >	Reason: Occupied
2			
3	nRP 3 Relay 3 (00000013)	Off On Low < 100% >	Reason: Occupied
4			
6	nRP 6 Relay 6 (00000016)	Off On Low < 100% >	Reason: Occupied
7	nRP 7 Relay 7 (00000017)	Off On Low < 100% >	Reason: Occupied
8	nRP 8 Relay 8 (00000018)	Off On Low < 100% >	Reason: Occupied
	nRP Main (00000010)		

Advanced details

COMMISSIONING MODE

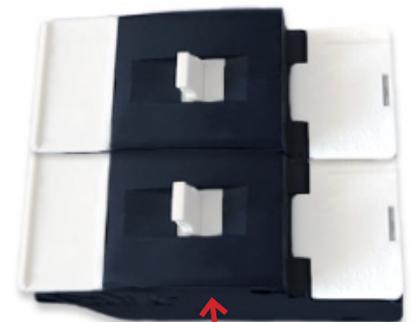
Commissioning Tool

Port 1

nPanel (00000010)

- nRP 1 Relay 1 (00000011)
- nRP 3 Relay 3 (00000013)
- nRP 6 Relay 6 (00000016)
- nRP 7 Relay 7 (00000017)
- nRP 8 Relay 8 (00000018)
- nRP Main (00000010)

1	nRP 1 Relay 1 (00000011)	Off On Low < 100% >
2		
3	nRP 3 Relay 3 (00000013)	Off On Low < 100% >
4		
5		



AcuityControls SENSOVIEW

Devices Control Channels Network Management

Log Out (98)

Network Labels IDs

Find devices

Commissioning Tool

Port 1

nPanel (00000010)

nRP 1 Relay 1 (00000011)

- nRP 3 Relay 3 (00000013)
- nRP 4 Relay 4 (00000014)
- nRP 5 Relay 5 (00000015)
- nRP 6 Relay 6 (00000016)
- nRP 7 Relay 7 (00000017)
- nRP 8 Relay 8 (00000018)
- nRP Main (00000010)
- nWSX LV DX (00584292)

Basic info

ID: 00000011

Firmware Version: F580A01Z-001 / B580A01A

Label:

Notes:

Load: 0 Watts

Save

Device Overview

1, 2	nRP 1 Relay 1 (00000011)	Off On Low < 100% >	Reason: Occupied
------	--------------------------	---------------------	------------------

Copy programming

Copy programming from nRP Main (00000010) Copy

Advanced details

Health

COMMISSIONING MODE



General Programming Tips

2.3 - Programming Sensor Input for On/Off Only Photosensor

Recommended photosensor model: **ARPA PC**

Programming a photosensor to switch the lights at the appropriate daylight levels can be achieved using the following steps: *NOTE: The settings below are the default settings of the nLight panel, and therefore an on/off switching photosensor should work out-of-the-box on the local nLight zone without any additional programming*

1. From the device tree in SensorView, select the relay panel input ("nRP Main"). If a 12, 16, 24, 32 or 48 relay panel, select the appropriate input which the photosensor is wired to (i.e. For a 16-relay panel, "nRP Main 1" if wired to the top control card for relays 1-8, "nRP Main 2" if wired to the bottom control card for relays 9-16).
2. Navigate to "default settings", and change the mode setting to "Wallpod" and "Maintain".
 - While in this mode, when the photosensor relay closes (at <1FC for model ARPA PC) it will trigger any devices on the respective nLight local switch channel to turn on. When the photosensor relay opens (at >1FC for model ARPA PC) any lights tracking will turn off.
 - By default, all relays will track switch channel 1.
3. For photosensor model ARPA PC, adjust the mechanical slide on the photosensor if lights are turning on with too much or too little daylight.

Programming notes for global photosensor programming:

- A single **ARPA PC** photosensor can be used to control panels from any bridge port under a single Gateway/controller. If multiple controllers are connected over a LAN, this photocell can also be programmed to control loads across controllers due to the programming as a "switch channel" command (or a "global profile" can also be used).
- Programming this photosensor for global control is completed using the "Global Channels" interface. Create a "Global Switch Channel", select the "nRP Main" input that the photosensor is wired to as the broadcasting device, and select all relays requiring global photosensor control as the tracking devices. Select "save", and test the photosensor functionality.

Programming notes for combined time-based and on/off photosensor control:

- If the desire is for astronomical (sunrise/sunset) time based control of lights, coupled with a photosensor for periods when the light level is low during the day, this should be programmed using "global profiles". Profiles are shared between Gateways/controllers, so only a single photosensor is required for this control.
- The following is an example of the programming that can be applied:
 - ◇ Profile 1: Manual Triggered profile (no schedule), Highest Priority Profile
 - "Override: Override On"
 - Set this profile to be triggered by the "nRP Main" which the photosensor is wired to.
 - ◇ Profile 2: Dusk - Dawn schedule, Middle Priority Profile
 - "Override: Override On"
 - ◇ Profile 3: Dawn - Dusk schedule, Lower Priority Profile
 - "Override: Override Off"

General Programming Tips

2.4 - Programming Sensor Input for Dimming Photosensor

Recommended photosensor model: **PCELL 3WI ZT** (interior) or **LSA APS OL** (exterior)

NOTE: There are graphs demonstrating the below descriptions at the end of the section.

1. From the device tree in SensorView, select the relay panel input ("nRP Main") which the photosensor is wired to.
2. Navigate to the "status" page, and locate the reading that says "input dim level" (shown in the screenshot below). Record this status value at the following 2 light levels (note that this might require viewing this status value at different times during the day, or if possible, leveraging the use of blinds or other means to cover the photosensor and block out sunlight):
 - a. Note the "input dim level" when the lights in the space should begin dimming down from 100%. This will typically occur when the sunlight in the space brings the total light level in the space above the designed foot-candle level.
 - b. Note the "input dim level" when the lights in the space should be at minimum dim. This will typically occur when there is sufficient sunlight in the space to meet the light level requirements without any electric light.
3. Navigate to the "default settings" page, and change the mode to "Broadcast Analog Input". Under this input, you will see multiple settings (cont'd on next page):

The screenshot displays the AcuityControls SensorView interface. On the left, a device tree shows 'nRP Main 1 (0121E6CC)' selected. The main panel shows various settings and status information. A red box highlights the 'Input Dim level: 90%' value. A red arrow points from this value to a larger graphic below the screenshot.

 Input Dim level: 90%

General Programming Tips

The screenshot displays the AcuityControls nLight programming interface. The main window shows the configuration for 'nRP Main 1 (0121E6CC) [HRP Main] [ZoneDevice]'. The 'Photocell' section is expanded, showing three input trim sliders: 'High End Input Trim (100%)' set to 10 V, 'Middle Input Trim (50%)' set to 5 V, and 'Low End Input Trim (1%)' set to 1.5 V. Other settings include 'Photocell Transition On: 45 sec', 'Photocell Transition Off: 10 min', 'DeadbandExternalPeel: 0.5V', 'LED: Normal', 'RelayThresh Delay: 50 mSec', 'Sweep Exit Time: 1 sec', 'Sweep Grace Period: 5 sec', 'Push-Button Operation: Normal', and 'Scene Expiration Time: Never'. Three callout boxes are overlaid on the image, each with a red arrow pointing to a specific slider in the interface. The callouts are: 'High End Input Trim (100%): 10 V', 'Middle Input Trim (50%): 5 V', and 'Low End Input Trim (1%): 1.5 V'. Two other callouts point to 'DeadbandExternalPeel: 0.5V' and 'Photocell Transition On: 45 sec'.

Broadcast Analog Input Options

High End Input Trim (100%) – This will be the same value you found in step 2a. When the photosensor goes below this value, lights will begin dimming. *Note: To convert the “input dim level” from a % value to a voltage, simply move the decimal place 1 position to the left (e.g. 75% = 7.5V, 50% = 5.0V)*

Low End Input Trim (1%) – This will be the same value you found in step 2b. When the photosensor reaches this value, lights will dim to minimum (1%).

Middle Input Trim (50%) – When the photosensor reaches this value, lights will be at 50%. This will typically be halfway between 2a and 2b. Lights will dim linearly with the photosensor input, so adjusting the “middle input trim” closer to the high or low end input trim levels will make the dimming more or less aggressive. Graphs demonstrating this feature are available later in this section.

General Programming Tips

Deadband External Photocell – After the photosensor reaches the “low end input trim”, if the photosensor reading continues dropping more than the deadband setting, the lights will transition off. For example – with a “low end input trim (1%)” value of 2V, and a “deadband” value of 0.5V, once the photosensor reaches 1.5V ($2V - 0.5V = 1.5V$) the lights will begin transitioning off. If the desire is for the lights to only reach minimum dim and never go off, set the deadband to the maximum of 2.5V, and the low end trim to 2.5V or less.

- The deadband should also be used to keep lights for “cycling” when the photosensor can see the electric light it is controlling (i.e. closed-loop). The amount of deadband necessary can be determined by turning the photosensor controlled lights on and off while monitoring the photosensor status (use a switch in the space or the manual relay levers to change the state of the lights and determine this value) – the difference between the “input dim level” when on and off should be the minimum deadband setting (it is recommended to add 10% to this value as a safety factor).

Photocell Transition Off – This setting is the time delay after the photosensor has reached the “lower end input trim” level and deadband before the lights will actually transition off. This is to make sure periodic changes in brightness to the photosensor do not transition the lights often. This countdown can be monitored on the status page in SensorView.

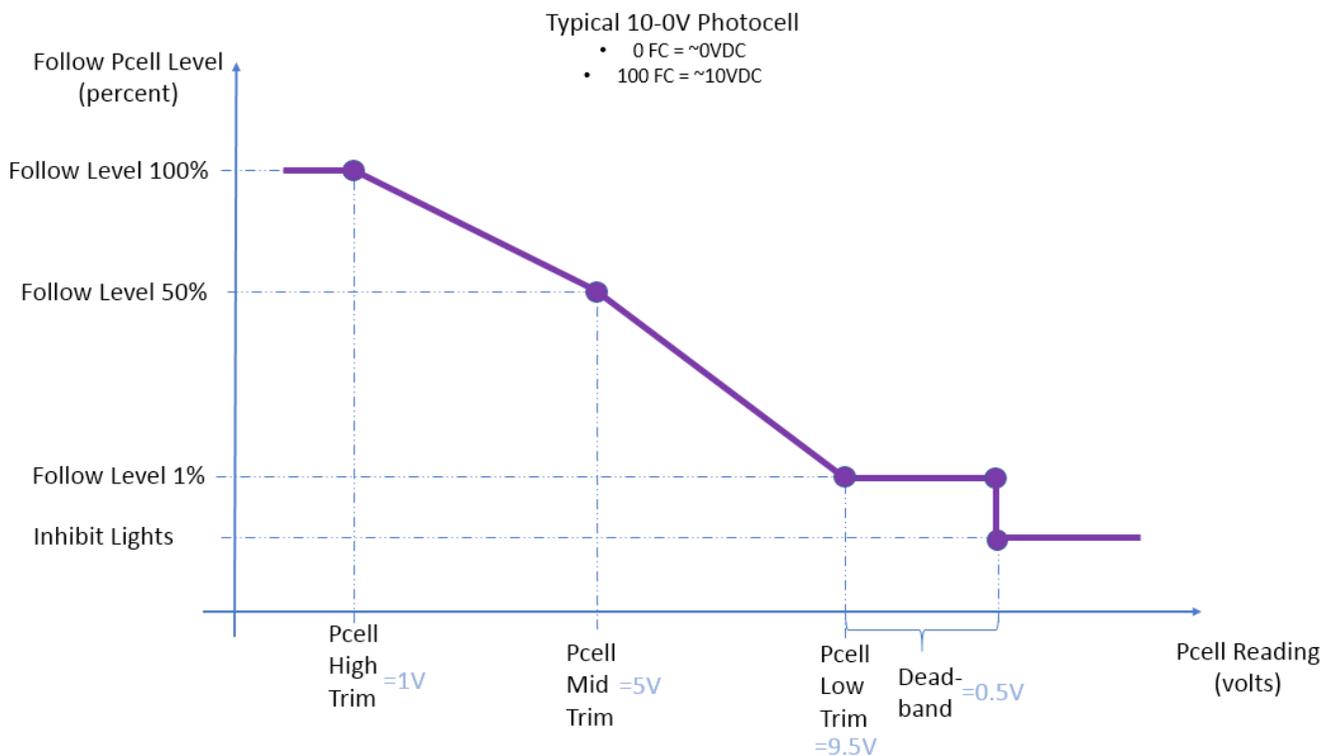
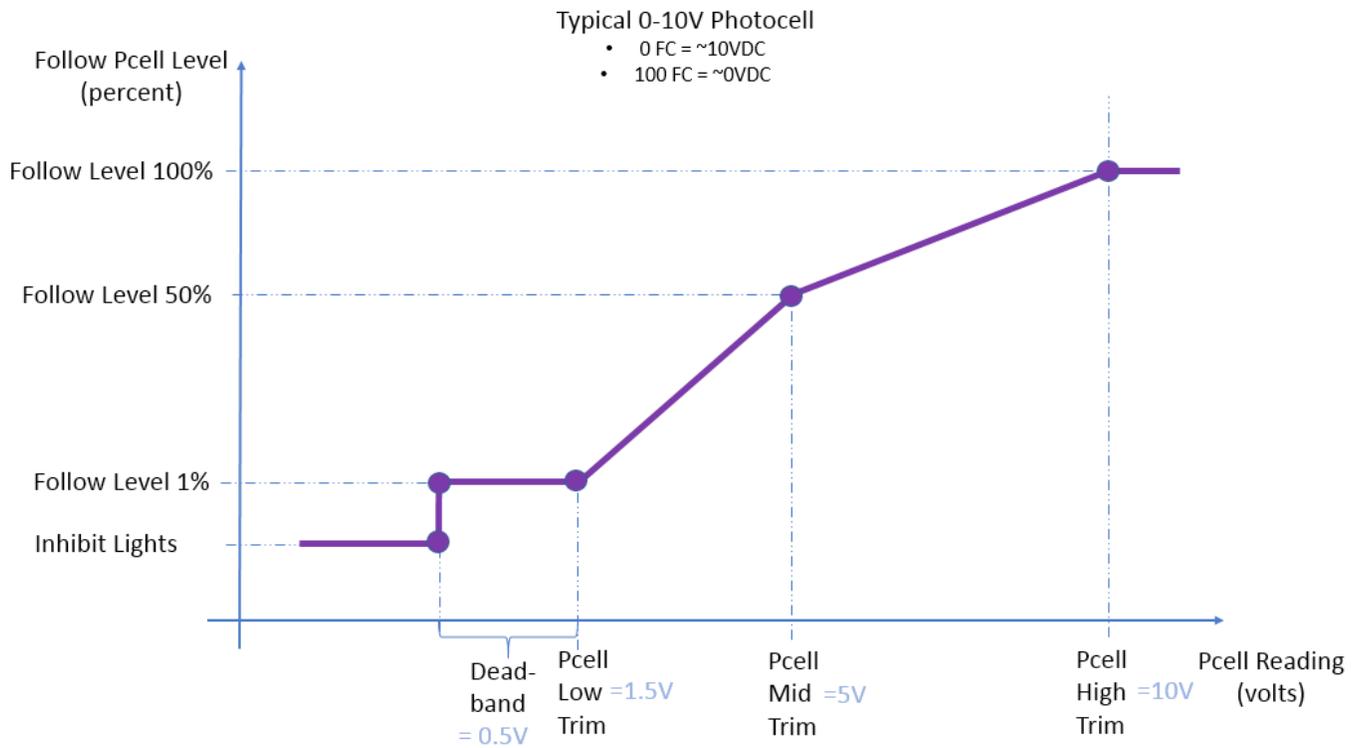
Photocell Transition On – After the lights have been transitioned off due to photosensor, this setting is the time delay for the lights to turn back on when the photosensor light level begins dropping. This is to make sure periodic changes in brightness (e.g. passing clouds) do not transition the lights often.

4. After the above settings are set as expected, make sure the relays have the following settings for daylight harvesting:
 - Tracking on the same LOCAL or GLOBAL channel with the dimming photocell is broadcasting. Only a single dimming photocell can be used per local or global channel. If multiple photocells are broadcasting on the same channel, the input with the lowest serial number will control the lights.
 - “Follow photocell mode” on the relays must be “enabled: both positive and negative” for photosensor dimming to operate

Inverse Daylight Harvesting Note: This panel is also capable of completing “inverse dimming daylight harvesting” by swapping the values of the “high end input trim (100%)” and “low end input trim (1%)”. These settings are able to be reversed, with the same logic as described above applied.

General Programming Tips

Below are graphical displays of the above settings and descriptions:



General Programming Tips

2.5 - Programming "Override" Input

As described in section 1.10, the panel includes an "override" input that overrides all relays closed by default. This can be used for 3rd party system alarms, emergency sense devices, etc. When this input signal is present, the relays will ignore all other commands on the lighting control system (e.g. commands such as occupancy, switch, schedule, etc.). This input is not specifically programmable, but each relay has a setting that describes how it will react when this input is made.

This setting can be found on the "default settings" page of each relay – it is listed as "Direct Alarm Input State", and it uses the following logic:

- "Closed" – Relay will always close when a signal is received
- "Open" – Relay will always open when a signal is received
- "Unchanged" – Relay will maintain the current state when a signal is received

DirectAlarmInputState:

A screenshot of a web-based configuration interface showing a dropdown menu for 'DirectAlarmInputState'. The menu is open, displaying three options: 'Closed', 'Open', and 'Unchanged'. The 'Closed' option is currently selected and highlighted in blue.

2.6 - Additional Programming Settings

The nLight relay panel includes a number of additional settings that are not typically found on additional control devices. Each is described below:

Overall Panel Settings (located on the "nRP Main" default settings page):

- Relay Throw Delay – when more than 1 relay triggers at one, this setting describes the time offset between the relays switching. The default setting of 50 milli-seconds is typically used to avoid building energy spikes by offsetting relay throws by a small delay. Use of the other available settings (1-5 seconds) can be used to provide small delays when controlling lights on/off.

RelayThrowDelay:

A screenshot of a web-based configuration interface showing a dropdown menu for 'RelayThrowDelay'. The menu is open, displaying six options: '50 mSec', '1 sec', '2 sec', '3 sec', '4 sec', and '5 sec'. The '50 mSec' option is currently selected and highlighted in blue.

Individual Relay Settings:

- Momentary Relay Mode – this setting can be used to create a momentary contact relay (e.g. when used to connect to an existing contactor panel). The various options are the following:

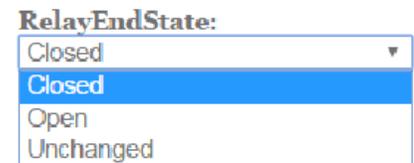
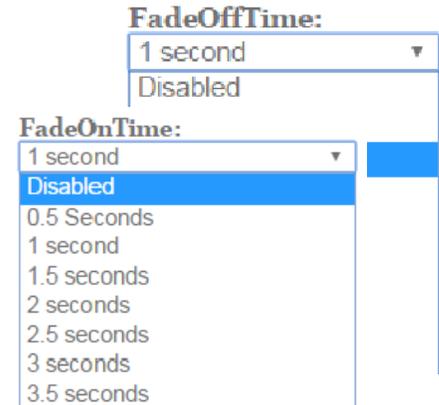
- ◇ Normal: Default setting – relay will operate normally.
- ◇ Momentary ON: In this mode, when a relay receives an "on" command from a switch, occupancy sensor, photosensor, or preset/profile scene, the relay will close for 1.0 seconds and open back up.
- ◇ Momentary OFF: In this mode, when a relay receives an "off" command from a switch, occupancy sensor, photosensor, or preset/profile scene, the relay will close for 1.0 seconds and open back up.

Momentary Relay Mode:

A screenshot of a web-based configuration interface showing a dropdown menu for 'Momentary Relay Mode'. The menu is open, displaying three options: 'Normal', 'Momentary ON', and 'Momentary OFF'. The 'Normal' option is currently selected and highlighted in blue.

General Programming Tips

- Fade On Time / Fade Off Time - The “fade on time” and “fade off time” control the amount of time for lights to reach full bright and full off when given an “on” or “off” command, respectively. That is, when an “on” command is received, lights will dim up for the amount of time in the “Fade On Time” setting. When an “off” command is received, the lights will dim down and turn off after the “Fade Off Time” has elapsed. Setting this to disabled is the equivalent of 0 seconds, or instant on/off. Both are set to “1 second” by default.
- Relay End State – This setting defines the behavior of the relay when the panel loses power. The available options are the following:
 - ◇ Closed: Default setting - Relay will close
 - ◇ Open: Relay will open
 - ◇ Unchanged: Relay will remain in the current state



2.7 - Default nLight Relay Panel Settings

The following are the notable default settings for the nLight relay panel:

Switching Settings:

Switch Channel Tracking: Enabled on channel 1 for all relays/dimming outputs

Occupancy Channel Tracking: Enabled on channel 1 for all relays/dimming outputs

Photocell Channel Tracking: Enabled on channel 1 for all relays/dimming outputs

Special Operating Mode: Normal for all relays/dimming outputs

Occupancy Expiration of Manual Off: Disabled for all relays/dimming outputs

Timed Expiration of Manual Off: Disabled for all relays/dimming outputs

Direct Alarm Input State: Closed for all relays

Relay End State: Closed for all relays

Dimming Settings:

Occupied Bright Level: 100%

- Adjustable from 1-100%

Unoccupied Dim Level: 1%

- Adjustable from 1-100%

Trim Level High: 10VDC

- Adjustable from 0.7 – 10VDC

General Programming Tips

Trim Level Low: 1VDC

- Adjustable from 0.7 – 10VDC

Off Level: ~0VDC

- Not available for programming adjustment

Follow Photocell Mode: Disabled

Wallpod Dimming Adjustments: Permanent

Idle Time Until Dim: 7.5 Minutes

Fade On Time: 1 Second

Fade Off Time: 1 Second

Sensor Input Settings:

Mode: Wallpod Mode

Type: Maintain

Broadcast Channel: Switch Channel 1

For additional resources or troubleshooting assistance:

www.acuitycontrols.com

800.535.2465