



SKY-Bridge  
SKY-Command  
SKY-Medley  
SKY-Sense  
SKY-Rise  
SKY-Trio  
SKY-Controls Software

Rev 051914

Please contact Customer Support at 1-800-24VOLTS for further information.



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Appendix A: Complete spec sheets for all *SKY-Controls* components

Appendix B: Your customized Controls Plan

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## ABOUT NEXTEK POWER SYSTEMS

Nextek Power Systems AC/DC integration technology represents a breakthrough in on-site electrical management, combining the availability of AC power with the quality and efficiency of a DC supply.

### NEXTEK PRODUCT BENEFITS

- Easy conversion of AC lighting fixtures to DC-powered units
- Easy conversion of AC grid power into DC power for commercial building applications
- Highly efficient management of peak loads
- Future-proof lighting and other systems to be developed
- Nextek Power Systems Direct Coupling® Technology, directly connects clean power generated at a building to its electronic loads inside cutting down on overall power consumption, boosts electricity generated and stored on-site, and delivers a robust renewable energy ready network.

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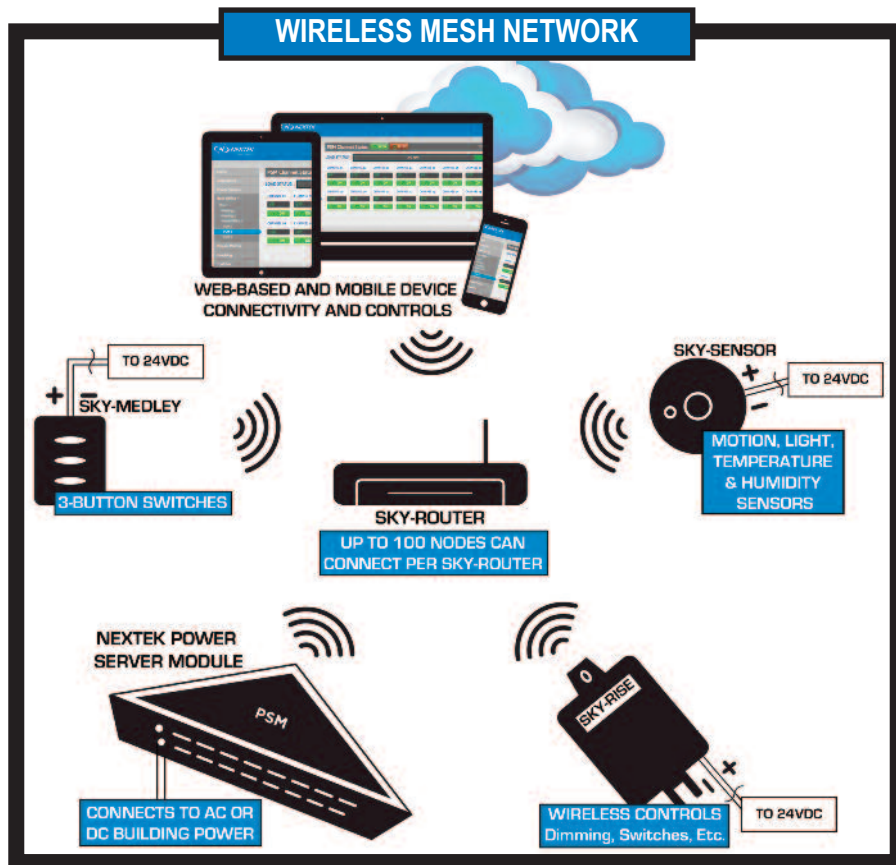
## INTRODUCTION

### SKY-Controls

Nextek Power Systems offers complete control of your building lighting through the SKY-Controls system of sensors and devices.

The SKY system consists of a family of control devices that communicate with each other in a wireless mesh network to provide a new standard of control and energy monitoring. That translates into the most cost-effective energy saving technology available. The highly programmable and interactive operation of our control architecture allows you to make the most efficient and responsive changes to your environment.

The SKY-Controls system equals significant savings for your facilities.



### SKY-Controls Benefits:

#### BETTER

- Smart power infrastructure
- Flexible and modular
- Touch Safe

#### FASTER

- Easy installation
- Real time monitoring and control

#### MORE ROBUST

- Cloud-based controls
- More reliable equipment

#### LESS EXPENSIVE

- Fully Programmable
- Reduced labor costs
- Fewer materials

## 1.0 SAFETY

- 1.1 **SAVE THESE INSTRUCTIONS**– This manual contains important safety and operating instructions for Nextek *SKY-Controls* system:

The following symbols are used throughout this manual to indicate potentially dangerous conditions or mark important safety instructions:



**DANGER:**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING:**

Indicates a potentially dangerous condition. Use extreme caution when performing this task.



**CAUTION:**

Indicates a critical procedure for safe and proper operation of the controller.



**NOTE:**

Indicates a procedure or function that is important for the safe and proper operation of the controller.

- 1.2 Before using *SKY-Controls*, read all instructions and cautionary markings.
- 1.3 Electrical hazards are probably the most common hazards throughout the industry. Virtually all workplaces have electrical installations and use electricity.
- 1.4 It is very important that all industry employees be familiar with electrical hazards and know how to protect themselves when working on, near, or with electricity. In most cases, industry electrical and electronic equipment is designed for both maximum safety and efficiency. However, potentially hazardous conditions such as inadvertent contact with hazardous voltages may exist while performing servicing and maintenance, handling materials, or cleaning.
- 1.5 The improper use of electrical extension cords and portable electrical equipment can result in hazardous exposure.

- 1.6 **WARNING - RISK OF ELECTRICAL SHOCK**



- 1.7 **DANGER – TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, CAREFULLY FOLLOW THESE INSTRUCTIONS**



- 1.7.1 Disconnect power to the receptacle before installing or removing the unit. When removing receptacle cover screw, cover may fall across plug pins or receptacle may become displaced.

## 1.0 SAFETY

### 1.8 INSTALLATION SAFETY PRECAUTIONS

- 1.8.1 Mount *SKY-Controls* indoors. Prevent exposure to the elements and do not allow water to enter the components.
- 1.8.2 Power connections must remain tight to avoid excessive heating from a loose connection.

## 2.0 STANDARDS AND REQUIREMENTS

- 2.1 All AC and DC cable types must meet all local and national codes
- 2.2 Shut off all AC breakers before installing any unit into the field

## 3.0 REGULATORY INFORMATION



**NOTE:** This section contains important information for safety and regulatory requirements.

- 3.1 *SKY-Controls* should be installed by a qualified technician according to the electrical rules of the country in which the product will be installed.

### 3.2 FCC Requirements:

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Nextek Power Systems, Inc. for compliance could void the user's authority to operate the equipment.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



## **4.0 INSTALLATION QUALIFICATIONS**

### **4.0 INSTALLATION QUALIFICATIONS**

- 4.1 Installation work and electrical wiring of permanently-connected power units must be performed only by qualified service personnel in accordance with all applicable codes and standards, including fire-rated construction.



## 5.0 SYSTEM DESCRIPTION AND FEATURES

### What is a Mesh Network?

A mesh network is a wireless system of sensors, controls and communication devices that operates on the 6LoWPAN standard. Up to 100 sensors and devices (called nodes) can be interconnected through each router, creating a mesh arrangement in which every device is in communication with every other device.

### What's the Advantage?

Constant, universal communication allows the SKY system to monitor energy and adjust lighting "scenes" to insure maximum efficiency and the lowest cost of operation. This just isn't possible with pre-programmed or manually operated systems.

### So it's Totally Automatic?

The SKY system allows users to design a variety of scenes, which describe system operation under certain circumstances. Once those are set up, the system uses the data from sensors to determine the best way to maintain the requested operational scene.

### Where is the Software Located?

The software that runs the system is cloud-based, which means it can be accessed from any location that has an internet connection, on any web-enabled device, and via mobile connectivity. But even if your internet is down, you can still control your lighting with what the SKY system has learned.



### What Equipment Is Available?

Equipment in the SKY system is remarkably simple in nature and easy to install (because there are no wires). A variety of sensors are installed on your equipment and in locations around the work environment. A conveniently-located SKY Bridge automatically connects to every node. That's it!

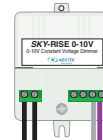
#### SKY-Bridge

The SKY-Bridge Router is the link between the cloud-based software and up to 100 nodes of sensors, controls and other devices at your location.



#### SKY Devices

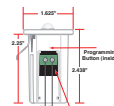
**SKY-Rise** is a low-voltage/constant voltage dimmer that can control a variety of lighting devices such as fluorescent fixtures or LED panels.



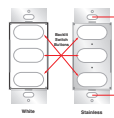
**SKY-Command** connects up to 8 switches or relays. This allows standard toggle or momentary contact switches, low voltage occupancy sensors, and other devices to act as "triggers" for programmed scenes in the SKY-Controls solution.



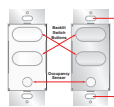
**SKY-Sensors** detect motion, light, temperature or humidity, and feed data to the system.



**SKY-Trio** is an easily mounted wall switch with three engravable, backlit buttons that can be programmed to trigger any action in the SKY-Controls system.



**SKY-Medley** is a programmable, single gang, three-button wall switch for controlling various devices.



### What Are the Benefits?

The SKY system offers a wide variety of benefits over traditional environmental controls.

#### Flexibility

Our component-based and wireless systems provide the ultimate in flexibility. The mesh system adapts to your environment, not the other way around.

#### Reliability

Components in the SKY system are all digital and far more reliable than analog systems.

#### Ease of Installation

Installation is fast and easy because it's wireless. Simply install the devices where they're needed, and place the router in a convenient location. Components recognize each other instantly.

#### Touch Safe Electronics

Direct current 24-volt systems are safe to touch. You don't need to pay for professionals to move or replace devices.

#### Cloud-Based

Cloud-based systems can be accessed anywhere, through any internet capable device.

#### Significant Energy, Cost Savings

All this efficiency and flexibility comes down to one thing: you save on energy use and save money. We can't state it any more simply.

## 6.0 TECHNICAL SPECIFICATIONS

For complete spec sheets for each component, please see Appendix A.

### COMPLIANCE:

UL 2043; EmergeAlliance® Registered; FCC

### MECHANICAL

COMPONENT	DIMENSIONS	NOTES
SKY-Bridge	W=6.8" L=4.3" H=1.2"	
SKY-Command	Plastic enclosure W=2" L=2.25" H=.875" Fixing Center= 2.625"	Fits in 1 gang box
SKY-Medley	W=1.7" H=2.9" D=0.9"	Fits in 1 gang box
SKY-Sense	1 5/8" diameter cap; 1.25" circular ceiling output; 2.5" depth into ceiling void	
SKY-Rise	Plastic enclosure W=2" L=2.25" H=.875" Fixing Center= 2.625"	
SKY-Trio	W=1.7" H=2.9" D=0.9"	Fits in 1 gang box

All components use an internal ceramic and whip antennae for diversity.

### ELECTRICAL

COMPONENT	INPUT V	INPUT I	INRUSH	TEMP	HUMID	NOTES
SKY-Bridge	6 VDC	200-500ma				100 nodes per router
SKY-Command	24 VDC	100mA max	0A			8 normally open (NO) or closed (NC) switches or relays
SKY-Medley	12-24 VDC	100mA max	0A	-30° to +60° C	90% RH	
SKY-Sense	24 VDC			-20° to +100° F	0-100%	2 core connect, 9-30 VDC; 5 meter radius detection distance
SKY-Rise	24 VDC	5A max	0A			LV Controls Output: 0-10VDC; LED Dimming Output: PWM 0-24VDC
SKY-Trio	12-24 VDC	100mA max	0A	-30° to +60° C	90% RH	

All components utilize 6LoWPAN communications protocol, with a frequency band of 2.4Ghz. Data link protocol is IPU via Ethernet, IEEE 802.15.4. RF range is 100 ft to nearest node\*.

\* The range of each device is limited to 100 feet from the next device. Devices installed further away communicate through the mesh network to create an expansive communication territory.

## 7.0 GENERAL REQUIREMENTS

### 7.1 Recommended Tools

7.1.1 This installation may require the following:

#2 and #0 Phillips screwdriver

Wire strippers

## 8.0 INSTALLATION PROCEDURE

### 8.1 Planning and Installing Your SKY-Controls System

8.1.1 Since each SKY-Controls location is unique, Nextek Power Systems works with every customer to design the most efficient installation plan possible. Your unique system plan is included in Appendix B.



**NOTE:** A node is defined as any SKY-Controls monitoring or control device, such as a switch, sensor or relay.

#### 8.1.2 Basic System Requirements

- Hardwired Internet connection for programming, or data logging (if required)
- SKY-Bridge router
- Radio friendly environment
- Less than 100 feet between each device.
- Internet enabled computer for viewing data
- 24V DC power source for components
- 110-240V AC power source for SKY-Bridge router

### 8.2 Device Descriptions and Installation

8.2.1 SKY-Bridge: central communication device of the SKY-Controls system. Should be centrally located.

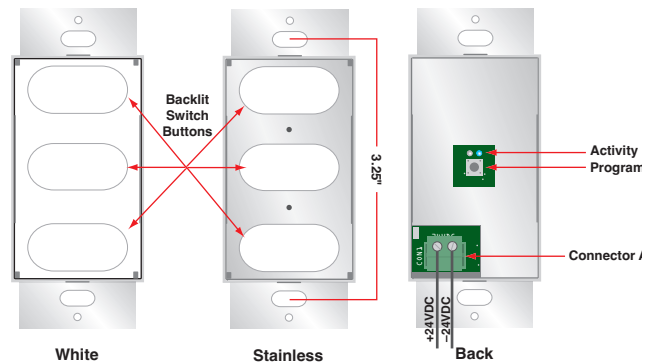
- IPv4-IPv6 VPN Bridge
- Dynamic DHCP or Static IP
- 6LoWPan Router
- Enables programming
- Enables data-Logging and analytics
- Enables virtual (QR or Lighting Pad based switching)
- Requires 110-240V AC power
- Requires Ethernet Internet access for programming and data logging. all devices
- Requires 24V DC power
- Polarity insensitive on power input
- Operates as a 6LoWPAN repeater and range extender



## 8.0 INSTALLATION PROCEDURE

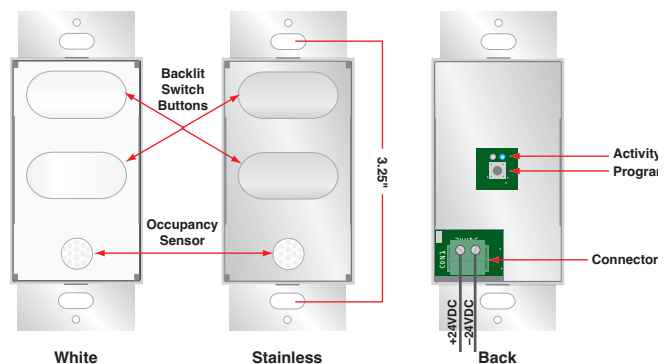
### 8.2.2 SKY-Trio

- Three button switch
- Backlit, independently programmed buttons
- Visually displays current system status
- Requires gangbox and 24V DC power



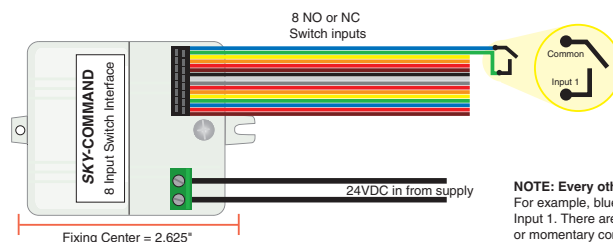
### 8.2.3 SKY-Medley

- Two button switch
- Backlit, independently programmed buttons
- Integrated motion sensor for occupancy/vacancy sensing
- Requires gangbox and 24V DC power



### 8.2.4 SKY-Command

- Enables the SKY-Controls system to utilize any Normally Open or Normally Closed switch/device
- Up to 8 inputs per device
- Requires 24V DC power

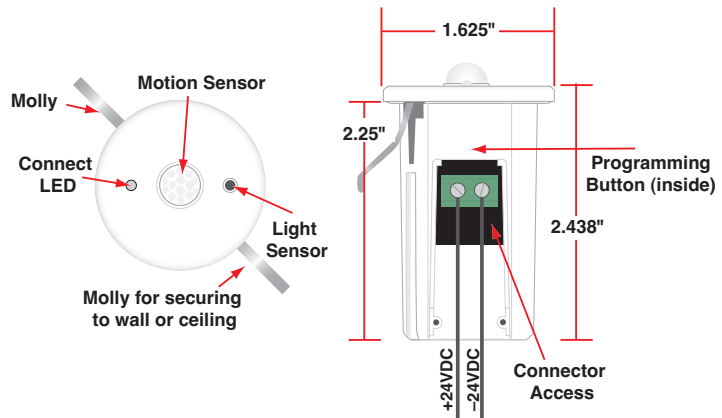


**NOTE: Every other wire is common.**  
For example, blue is common and green is Input 1. There are 8 possible open/closed or momentary contact switches.

## 8.0 INSTALLATION PROCEDURE

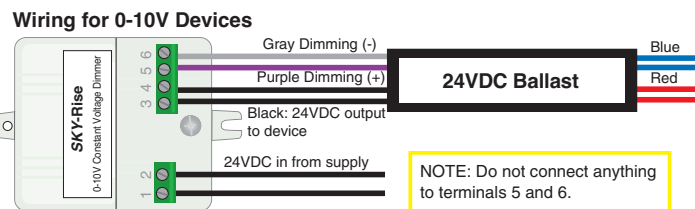
### 8.2.5 SKY-Sense

- Ceiling mounted PIR motion sensing for occupancy/vacancy testing
- Detection performance at 70°F is 16 feet, and 116° arc
- Variable timeout from 60 seconds to 24 hours
- Light sensor for daylight dimming
- Requires 24V DC power



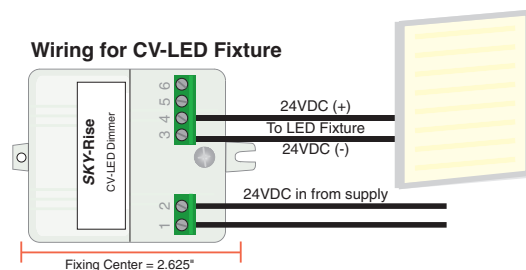
### 8.2.6 SKY-Rise 0-10

- Allows for dimming of multiple fixtures using 0-10V or 1-10V dimming.
- Up to 100 lamps
- Requires 24V DC power
- Designed to be installed in fixture.
- Low power device, can be powered off same circuit as fixtures
- Works with SKY-Sense for daylight harvesting



### 8.2.7 SKY-Rise LED

- Operates as a 24V DC PWM power source
- 95 Watts, 5 Amps
- Primary function is to power and dim LED lamps
- Secondary functionality of a power relay, fan, and motor controller
- Designed to be installed at fixture level
- Works with SKY-Sense for daylight dimming



## 8.0 INSTALLATION PROCEDURE

### 8.2.8 Lighting Control Pad

- Allows for controlling entire buildings from a digital interface
- Allows for Touchless Voice Control
- Local DNS Webserver for Local QR code switching
- Allows user defined scheduling
- Different mounting solutions based upon space/budget
- Requires large gang box with USB/Power outlet

### 8.2.9 QR Switches

- Require Internet to SKY-Bridge OR Lighting Control Pad
- Create unlimited Virtual Switches
- Uses QR Reader on most Smartphones to bring up an interface you can save and use without scanning later
- Can be restricted to in-building use, or global access
- Sticks to any surface wall using adhesive. No power connection is required



*Sample QR switch*

### 8.2.10 Power Server Module

Nextek's Power Server Module converts 120, 208, 240, 277 VAC, or 380 VDC power to 24 VDC through 16 individual Class 2 outputs. The Power Server Module has a wireless remote control and monitoring system. For installation and operation, please see the separate Power Server Module User Manual included with the unit.

## 8.3 Wireless Limitations

6LoWPan operates in a very similar environment to 2.4 Ghz Wifi. When placing devices, keep in mind that wireless interference may affect operation. For example, if a specific location has exhibited poor WiFi radio reception, it is advised that you install the devices elsewhere. Often times only a few feet of space can make a large difference in the effectiveness of the system's energy saving components. If you are unsure if your environment will interfere with communication, call our Technical Support line at 1-800-24VOLTS.



## 8.0 INSTALLATION PROCEDURE

### 8.4 System Setup

#### 8.4.1 Reading and Using the Design Schematic:

In Appendix B you will find your Controls Plan attached. It has been provided to assist you with placing the devices in the correct locations. Each device has comes pre-labeled to assist you with its placement. Each device has both a unique IPv6 MAC address, which assists in programming, as well as a location specific name.

MAC ADDRESS:

PLACE MAC ADDRESS AND LABEL PARTS HERE

LOCATION NAME:

PLACE LOCATION NAME AND LABEL PARTS HERE

For the location names, devices are abbreviated as follows:

P	=	Power Server Module
B	=	SKY-Bridge
D	=	SKY-Rise 0-10
L	=	SKY-LED
S3	=	SKY-Trio
SM	=	SKY-Medley
ML	=	SKY-Sense
C	=	SKY-Command
QR	=	QR Switch
LCP	=	Lighting Control Pad

Using this plan, follow the instructions for each device below, and install the devices in their correct locations. After you have done so, peel off the QR label sticker on the inside of each box, and place it on the corresponding As-Built plan sheets. You should have one for every zone. This will assist greatly with the programming, and tech support of your system.

8.4.2 After you have built the Physical As-Built, scan the QR labels, and group them together by location using Nextek's Configuration Tool, to create a digital layout of your system, allowing rooms to be programed with ease.

8.4.3 Finally, scan the physical As-Built, and send them back to your Nextek representative so that we may assist you more effectively in the future.

## 8.0 INSTALLATION PROCEDURE

### 8.5 Device Installations

#### 8.5.1 SKY-Bridge (to be installed first)

- Place on a level surface, as centrally located in the system as possible
- Attach internet-connected Cat 5/6 cable to the Ethernet Port.
- Plug the power cord into a 110-240V AC power source.
- Booting the device can take up to three minutes.
- Once the central blue light is blinking, the device is installed properly.

#### 8.5.2 SKY-Rise 0-10V

The SKY Rise 0-10V is designed to be installed at the fixture level. The fixtures themselves should be powered by any 24V DC power source.

- Unscrew and remove protective terminal enclosure
- Wire 24V DC Power to terminals 1 and 2
- Connect + 0-10V Wire to Terminal 5
- Connect – 0-10V Wire to Terminal 6



**CAUTIONS:** DO NOT CONNECT 24V POWER TO TERMINALS 5 AND 6

DO NOT CONNECT ANYTHING TO TERMINALS 3 AND 4

- Replace protective terminal enclosure
- Mount the switch using the tabs at the top and bottom of the unit. Use proper hardware based on the type of surface to which you will mount the unit (for example, wood screws for a wooden beam). You may also secure the unit with double sided mounting materials such as Scotch Foam Mounting Squares (permanent or removable), placed on the back side of the switch.
- Confirm the Blue LED on the device is lit. This shows power and a connection to SKY-Bridge.
- To test if wiring is correct, use the black button on the device. This will turn the light fully on, or fully off.



**NOTE:** Connecting the wires when the device is right side up will assist in connecting the wire to the terminal blocks.

#### 8.5.3 SKY-Rise LED

The SKY-Rise LED is designed to operate as a dimmable driver for 24V

## 8.0 INSTALLATION PROCEDURE

DC devices. It acts as a power pass-through device, and should be connected in between the PSM Channel and the load.

- Wire 24V DC Input power to terminals 1 and 2
- Wire - 24V Output to Terminal 3
- Wire + 24V Output to Terminal 4
- Connect 24V Output to Fixture with correct polarity



**CAUTION:** DO NOT CONNECT ANYTHING TO TERMINALS 5 AND 6

- Replace protective terminal enclosure
- Mount the switch using the tabs at the top and bottom of the unit. Use proper hardware based on the type of surface to which you will mount the unit (for example, wood screws for a wooden beam). You may also secure the unit with double sided mounting materials such as Scotch Foam Mounting Squares (permanent or removable), placed on the back side of the switch.
- Confirm the Blue LED on the device is lit. This shows power and a connection to SKY-Bridge.
- To test if wiring is correct, use the black button on the device. This will turn the light fully on, or fully off.



**NOTE:** Connecting the wires when the device is right side up will assist in connecting the wire to the terminal blocks.

### 8.5.4 SKY-Sense

The SKY-Sense is a PIR motion and light sensor designed to be installed in a drop ceiling.

- Cut a 1 ¼ inch hole in the ceiling
- Unscrew and remove protective terminal cover
- Connect 24V DC Power to terminals 1 and 2
- Replace protective terminal cover
- Depress clamps. Push into hole
- Confirm the green LED is lit. This shows power and a connection to SKY-Bridge
- For motion sensing and daylight harvesting applications, please refer to the Appendix A spec sheet for more details on placement.

## 8.0 INSTALLATION PROCEDURE

### 8.5.5 SKY-Command

The *SKY-Command* allows for up to 8 NO or NC Contact devices to be wired to it. Refer to the spec sheet in the Appendix for how to connect with each type of device. This can be located in the Gangbox with the switch or elsewhere, to allow for multiple switches to interface with the device.

- Remove the protective terminal cover
- Wire 24V DC power to terminals 1 and 2.
- Connect up to 8 switch inputs. Wiring will vary per connected device, see Appendix A spec sheet for more details.
- Replace protective terminal cover
- Mount the switch using the tabs at the top and bottom of the unit. Use proper hardware based on the type of surface to which you will mount the unit (for example, wood screws for a wooden beam). You may also secure the unit with double sided mounting materials such as Scotch Foam Mounting Squares (permanent or removable), placed on the back side of the switch.
- Confirm the Blue LED on the device is lit. This shows power and a connection to *SKY-Bridge*.
- You may test your switch by depressing the switch, if the orange LED flashes on, it has detected the input.

### 8.5.6 SKY-Trio

The *SKY-Trio* is a physical switch input with three multi-functional buttons. It has backlighting to designate the status of the system.

- Wire 24V DC power to the provided green terminal connector
- Plug connector into terminal block
- Confirm the blue LED on the device is lit. This shows power and a connection to *SKY-Bridge*.
- Take adhesive off front bezel
- Hold front bezel ON switch for 30 seconds
- Install in gangbox using proper hardware

### 8.5.7 SKY- Medley

The *SKY-Medley* is a physical switch input with two multi-function backlit buttons, as well as an integrated PIR Motion Sensor.

## **8.0   INSTALLATION PROCEDURE**

- Wire 24V DC power to the provided green terminal connector
- Plug connector into terminal block
- Confirm the blue LED on the device is lit. This shows power and a connection to *SKY-Bridge*.
- Take adhesive off front bezel
- Hold front bezel ON switch for 30 seconds
- Install in gangbox using proper hardware

## 9.0 SKY-CONTROLS OPERATION

### 9.1 SKY-Controls System Administrator Operations Manual

Congratulations on your installation of the Nextek Power and Controls Lighting System. This system provides increased energy efficiency through implementation of Nextek Power Systems' Power Server Modules (PSM), and advanced control functionality through the SKY-Controls system. The PSM operates by converting AC power to 24 VDC through 16 separate, controllable channels of 95 watts each. Your SKY-Controls system includes a wireless mesh IPv6 network, which allows your PSM, sensors, switches, and dimming modules to communicate with each other to log and make intelligent energy-saving decisions. This Controls system is operated by the combined use of a local Linux Server, and a SKY-Bridge router, your gateway to more customized control and dashboard application access.



**NOTE:** This tutorial uses an example of 6 zones and 4 PSMs. Your customized system may be different, and is included in Appendix B. A Nextek Power Systems specialist will be assigned to lead you through the operations procedure.

### 9.2 Wall Switch Operation

There are two wall switches. The right wall switch controls the right side of the floor and the left wall switch controls the left side. Each switch has three operations:

#### 9.2.1 ON (Click ON once):

9.2.1.1 All lights will turn on to full brightness.

9.2.1.2 Lights will stay on until you press OFF or AUTO.

#### 9.2.2 OFF (Click OFF once):

9.2.2.1 All lights will turn off.

9.2.2.2 Lights will remain off until you press ON or AUTO.

#### 9.2.3 AUTO (Press and hold ON):

9.2.3.1 System operates hands-free.

9.2.3.2 This allows lights to turn on when motion is sensed and off after 30 minutes of no movement.

9.2.3.3 Lights will dim when daylight is present.

## 9.0 SKY-CONTROLS OPERATION

### 9.3 Mobile Switch Operation

By connecting to the Nextek Controls Network, users may also have zone lighting control utilizing their Smartphones. In order to do so, the device must be on the Nextek Controls Wi-Fi Network.

Once you have done so, you may direct your web-browser of choice to the following URLs to control each zone (See Figure 1 for Zone Location). For example:

- Zone A: <http://vpn.amatiscontrols.com/mobile/ZoneA/>
- Zone B: <http://vpn.amatiscontrols.com/mobile/ZoneB/>
- Zone C: <http://vpn.amatiscontrols.com/mobile/ZoneC/>
- Zone D: <http://vpn.amatiscontrols.com/mobile/ZoneD/>
- Zone E: <http://vpn.amatiscontrols.com/mobile/ZoneE/>
- Zone F: <http://vpn.amatiscontrols.com/mobile/ZoneF/>

Once there, these buttons will simulate either a “Motion Detected” or “Motion Timeout” event. The current state of the system (Auto or Manual) will remain the same. Each button has the following functionality:

#### 9.3.1 ON :

- 9.3.1.1 All lights in the zone will turn on.
- 9.3.1.2 Lights near windows will utilize daylight dimming.
- 9.3.1.3 If the system is set to Auto: lights will turn off when encountering a Motion Time-out, or by manually turning OFF.
- 9.3.1.4 If the system is set to Manual: lights will turn off by manually turning off (until Timeout resets to Auto).

#### 9.3.2 OFF :

- 9.3.2.1 All lights will turn off
- 9.3.2.2 If the system is set to Auto: lights will stay off until motion is detected, or by manually turning on.
- 9.3.2.3 If the system is set to Manual: lights will turn on by manually turning on (until Timeout resets system to Auto).



## 9.0 SKY-CONTROLS OPERATION

### 9.4 Automatic Operation, Motion, and Occupancy Zone Control

The occupancy zones are labeled A through F (example shown in Figure 1). Below is what to expect when controls are left in the AUTO position:

9.4.1 When an occupancy sensor is triggered (motion is detected), the lights in that zone will turn on. If motion is detected in that zone for less than 30 seconds the lights will turn off after 3 minutes. However, if motion is still detected after 30 seconds have elapsed, the lights will turn off after no motion is detected for 30 minutes.

9.4.2 Figure 1 outlines all daylight dimming zones with a heavy black line. These lights dim according to light levels from daylight levels. If there is ample daylight (bright), then the lights will dim. If the sun is at a low level (overcast), then the lights will increase in brightness. These light levels are detected by one of four light sensors in the ceiling, labeled as “PS-(1-4)” in Figure 1.

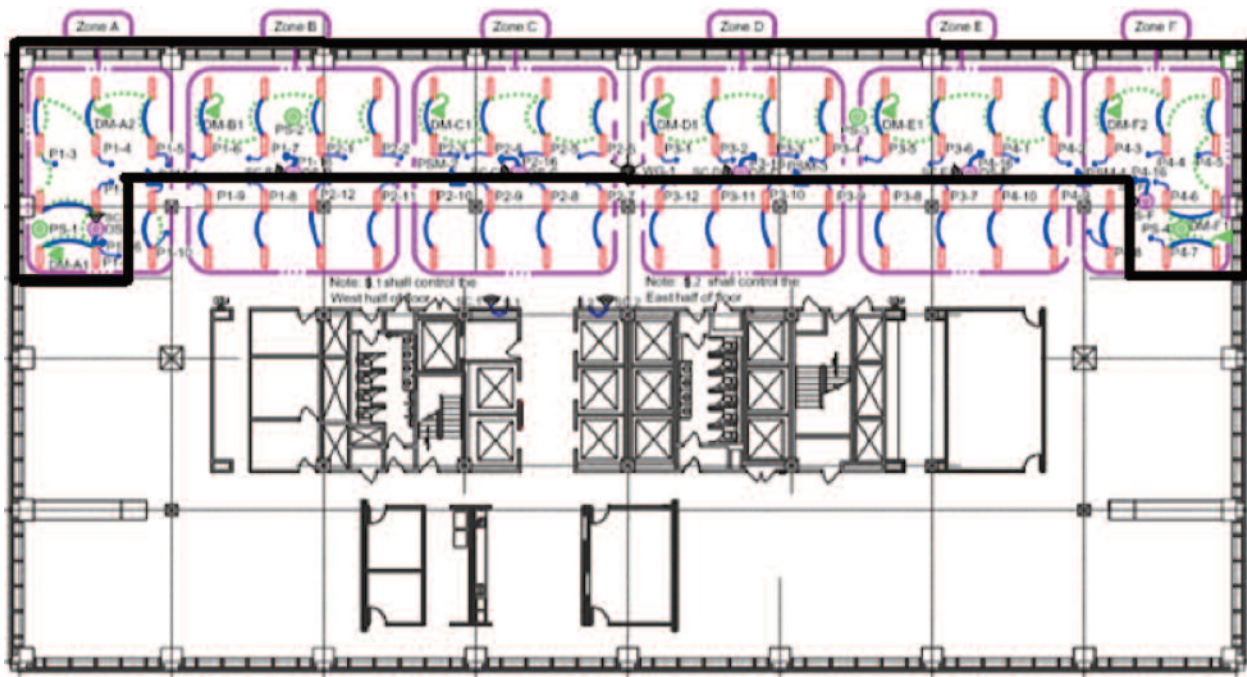


Figure 1

### 9.5 Control of Fixtures Using a Computer Dashboard

Below is a list of steps to get you started with the Nextek Dashboard. This dashboard will aid in the control of your lighting system using web enabled devices.

## 9.0 SKY-CONTROLS OPERATION

9.5.1 First, connect to the Nextek Controls Wi-Fi Network, using the password 8004828720

9.5.2 Go to [dash.amatiscontrols.com/nextek/nextek](http://dash.amatiscontrols.com/nextek/nextek)



Figure 2

9.5.3 Login using user@nextekpower.com, password 12345. (You can change your password once logged in.)

9.5.4 A page will appear that looks like Figure 3

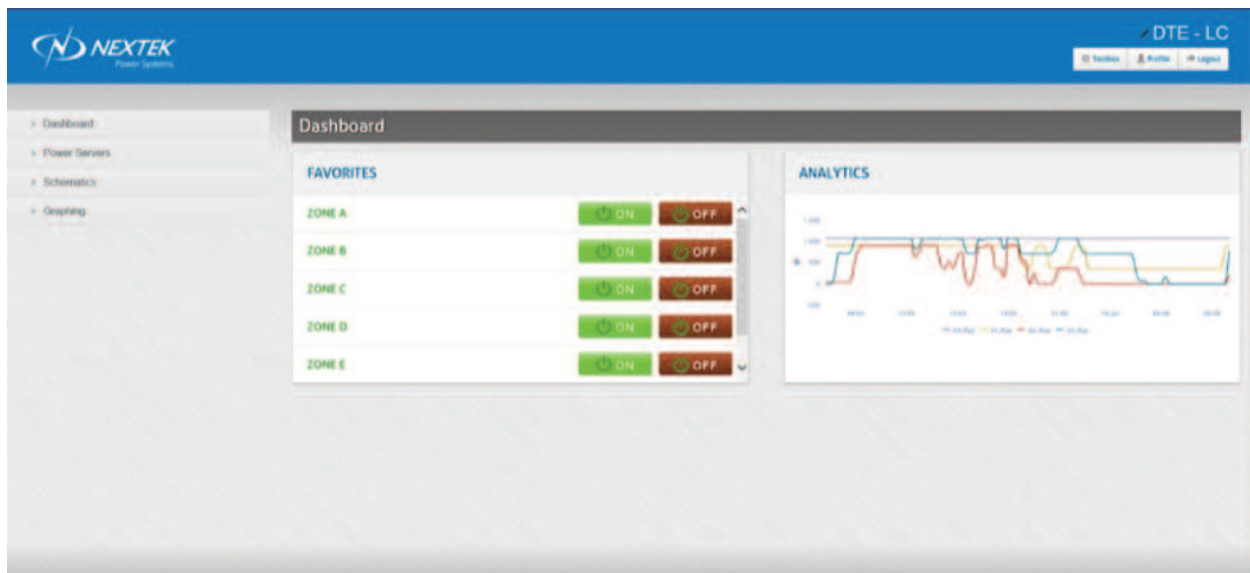


Figure 3

## 9.0 SKY-CONTROLS OPERATION

9.5.5 The PSMs are placed in the Power Servers dropdown on the left side of the page, and in the folder labeled WCB Third Floor (shown in Figure 4).

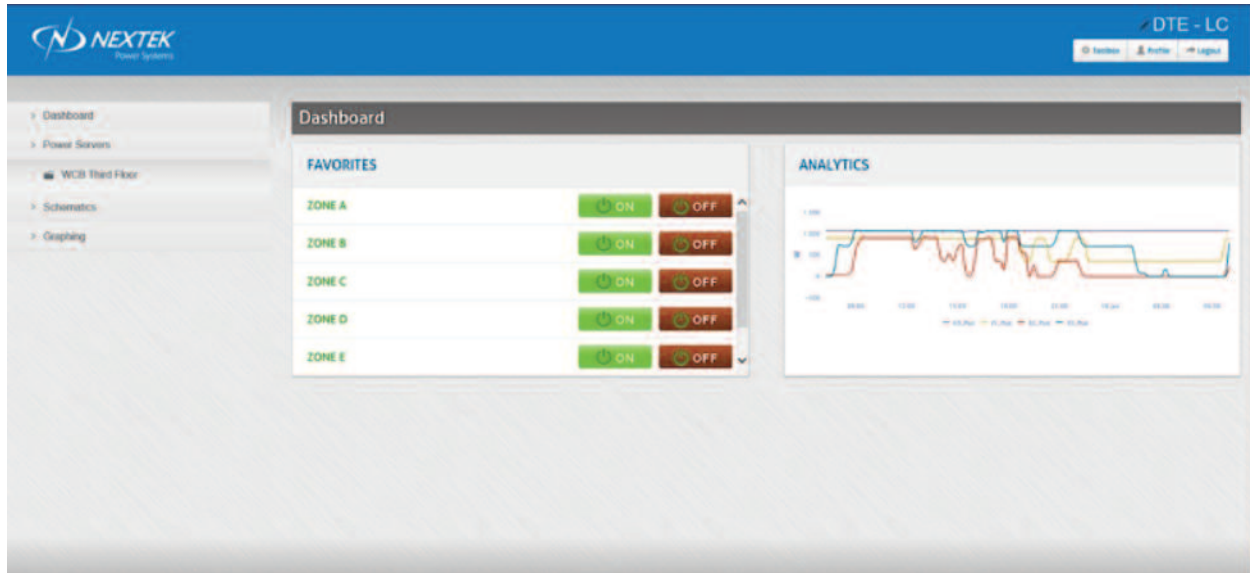


Figure 4

9.5.6 Within this folder you have four PSMs. PSM 1 is located to the far left from the elevators and is shown in Figure 5.

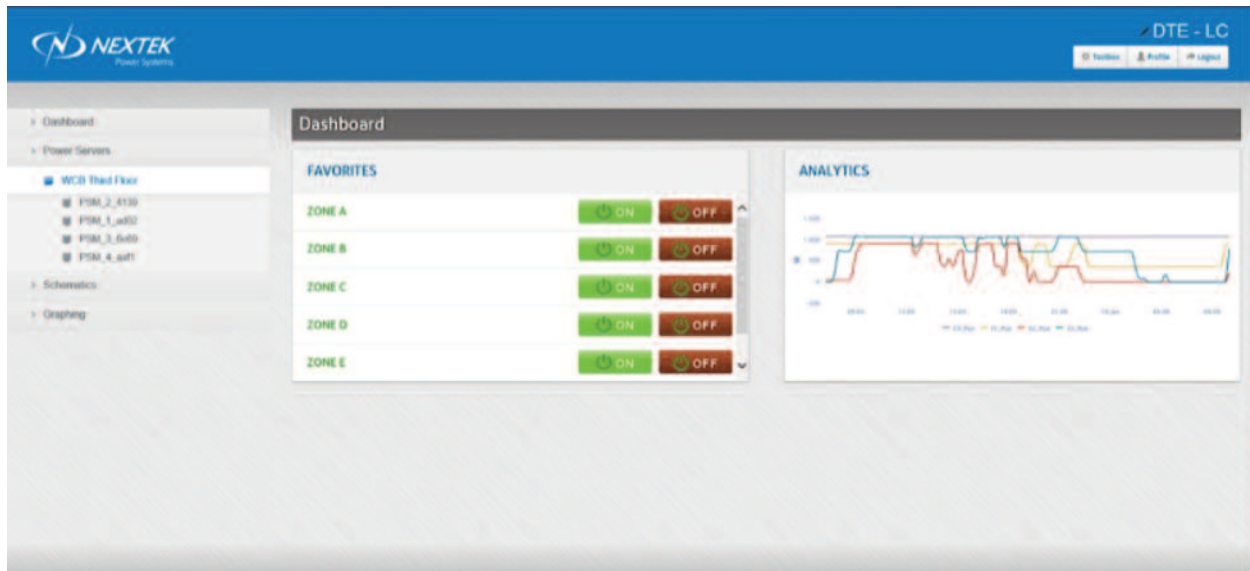


Figure 5

## 9.0 SKY-CONTROLS OPERATION

9.5.7 Click on PSM\_4\_aaf1 and the page should look like Figure 6.

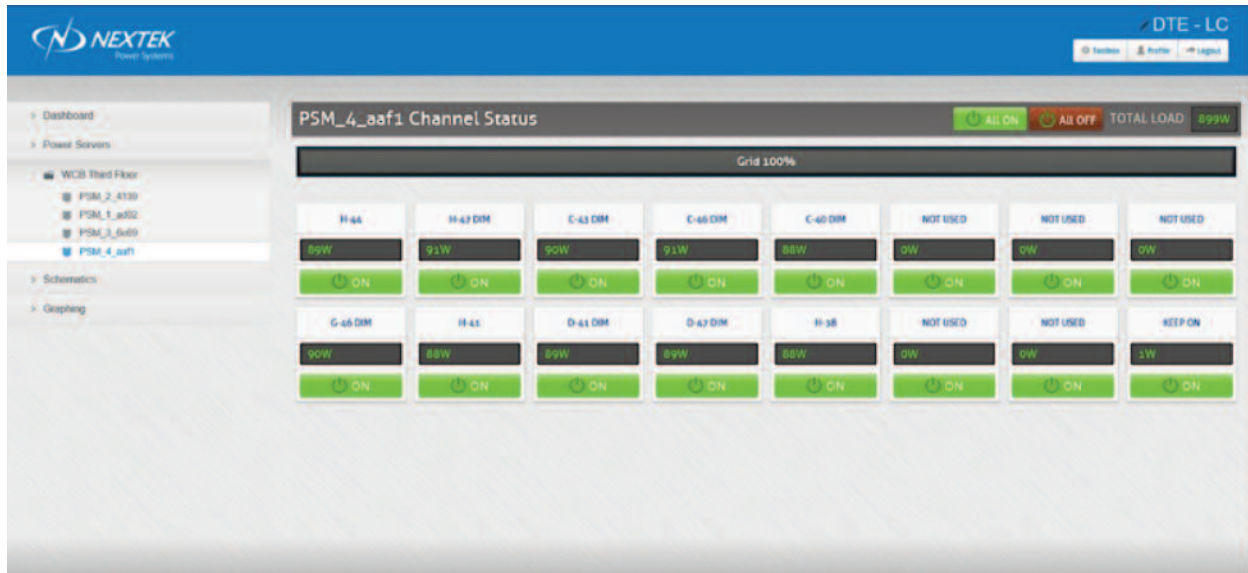


Figure 6

9.5.8 Your dashboard has been set up to control fixtures corresponding to a physical location. For instance, PSM 4 has a button labeled H-47. This fixture is above the desk that has that identifier on it and is located all the way to the right (from the elevators).



**NOTE:** Buttons Labeled DIM, correspond to Dimming Controls on fixtures. These should remain on. Not only can specific fixtures be turned On or Off, but the dashboard monitors the wattage of each channel, allowing for graphing and analysis of all fixtures.



## 9.0 SKY-CONTROLS OPERATION

### 9.6 Graphing

9.6.1 Click on Graphing, located on the left hand side of the page, Figure 7.

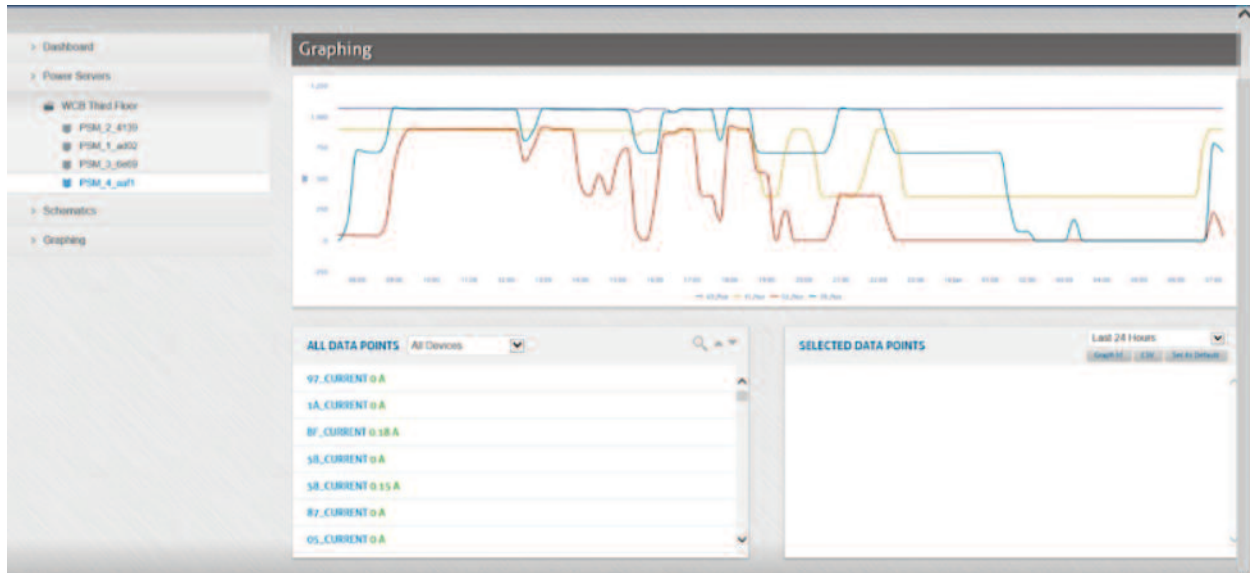


Figure 7

9.6.2 Click on the search icon shown in Figure 8.

➤ **NOTE:** All devices are searchable by the last two digits of their MAC address. The last four digits of each PSM are present in the name of the PSM. For instance, PSM 4 is named PSM\_4\_aaf1. This would be searchable by using f1, as shown in Figure 9.



Figure 8

## 9.0 SKY-CONTROLS OPERATION

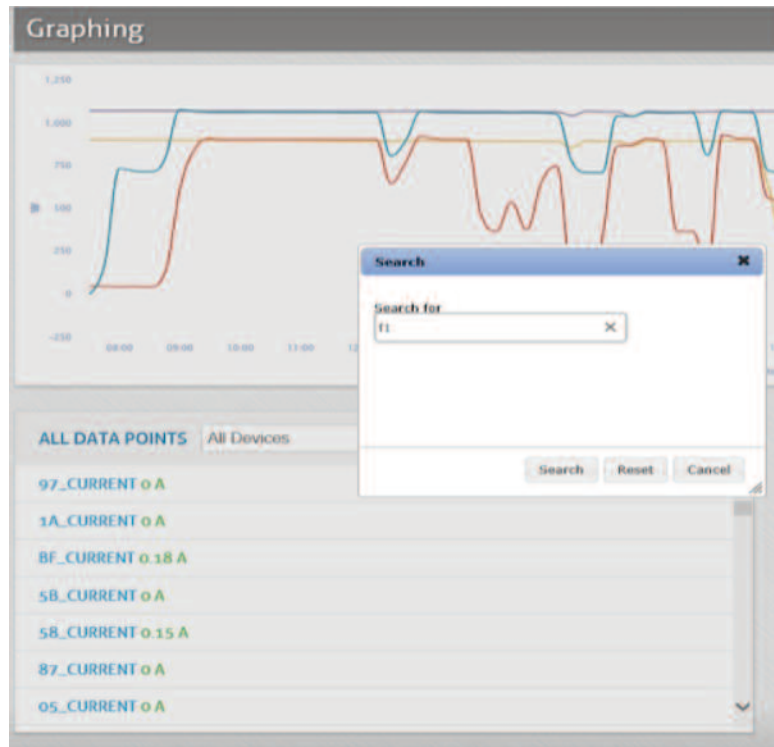


Figure 9

9.6.3 Click search and you will see all applicable data points that are associated with that PSM.

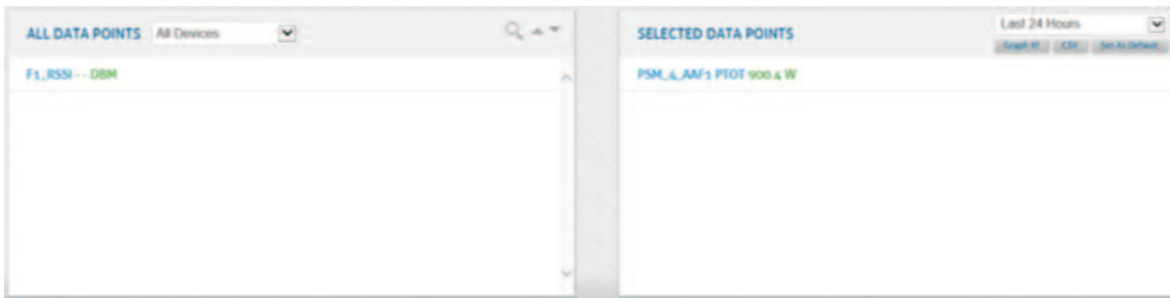


Figure 10

9.6.4 Click on PSM\_4\_AAF1 PTOT. When clicked, it will move to the right side of the screen, under selected data points. Click on the data point to graph it.

9.6.5 This will graph the total power usage of that PSM, as in Figure 11.

## 9.0 SKY-CONTROLS OPERATION

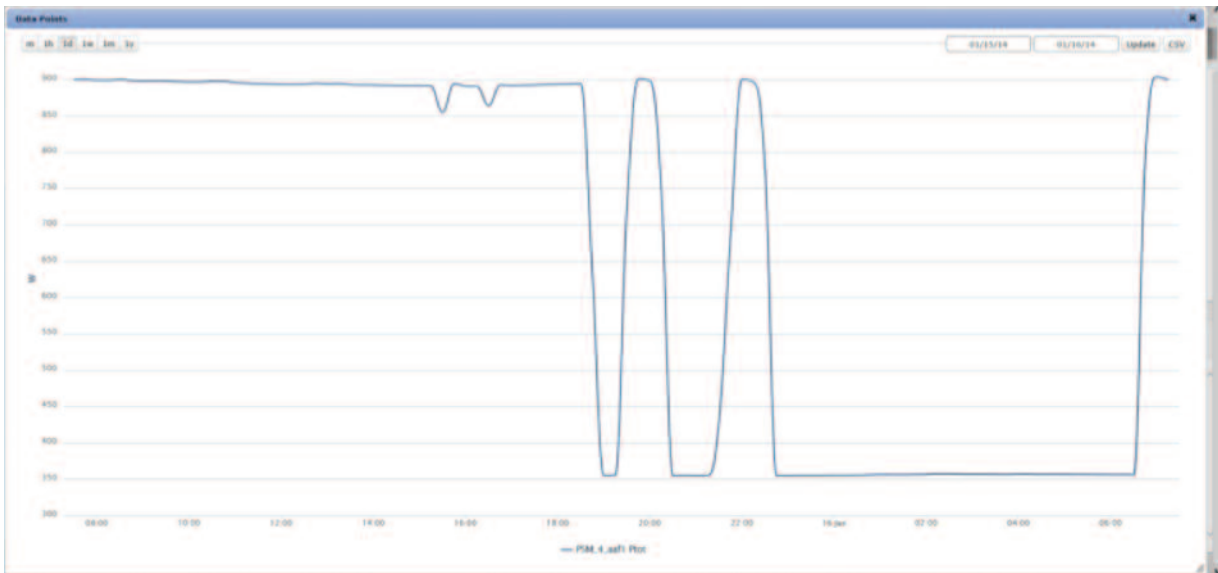


Figure 11





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## **SKY-Controls**

### ***Appendix A: Spec Sheets***

*SKY-Bridge*  
*SKY-Command*  
*SKY-Medley*  
*SKY-Sense*  
*SKY-Rise*  
*SKY-Trio*  
*SKY-Controls Software*

Rev 051914

Please contact Customer Support at 1-800-24VOLTS for further information.

## SKY-Bridge Router

# Bring Cloud Connectivity to All SKY-Controls IPv6 Devices

## FEATURES

- The SKY-Bridge provides data connectivity between internal IPv6 mesh network of connected nodes and the internet through a standard wired ethernet connection.
- Provides web-based configuration and control from all web enabled devices, e.g. tablets, smart phones, laptops, etc.
- Automatically establishes VPN connection to cloud via wired IP4 Ethernet connection to Local Area Network (LAN)
- Seamlessly handles a Personal Area Network (PAN) of up to 100 Individual IPv6 devices
- Color-coded LED lights indicate node connection, internet access, and power
- CoAP server for efficient open source communication from cloud to nodes.
- Contains 2GB of internal storage, which records operation and energy use data in the event of internet downtime
- Internal Linux operating system and Contiki OS for connection to 6LoWPAN networks



## TECHNICAL SPECIFICATIONS

**Dimensions:** W=6.8" L=4.3" H=1.2"  
**Input Voltage:** 6VDC (AC power supply included)  
**Input Current:** 200-500mA  
**Data Link Protocol:** IPU via Ethernet, IEEE 802.15.4  
**Nodes per SKY-Bridge:** 100  
**DHCP enabled**

**Frequency Band:** 2.4Ghz

**Antennae:** Internal ceramic and whip antennae for diversity

**Communications Protocol:** 6LoWPAN

**RF Range:** 100ft to nearest node\*

\* The range of each device is limited to 100 feet from the next device. Devices installed further away communicate through the mesh network to create an expansive communication territory.



For more information:

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Rev. 121613



## SKY-Command: 8 Input Switch Interface



### Low Voltage 8-Input Switch Interface for Scene and Device Control

#### FEATURES

- Connects to up to 8 switches or relays. This allows standard toggle or momentary contact switches, low voltage or latched occupancy sensors, and other devices to act as “triggers” for programmed scenes in the Amatis controls solution.
- “Button Hold Time” feature can be used for dimming control
- 24VDC input integrates easily into DC systems
- High efficiency polarity correction
- Fits in standard 1-gang box behind most switch options
- IPv6 wireless communication
- Acts as a repeater in the IPv6 mesh network
- Compatible with entire SKY family of products
- Ultra-low power consumption
- UL 2043 listed plastic enclosure. Suitable for use in air handling space
- Automatically populates to web-based configuration software

#### TECHNICAL SPECIFICATIONS

##### Electrical:

Input Voltage: 24VDC (polarity correcting)  
Input Current: 100mA max  
Inrush Current: 0A

##### Mechanical:

Plastic enclosure W=2" L=2.25" H=.875" Fixing Center= 2.625"  
Fits behind most standard switches in 1 gang box

##### Communication:

Communications Protocol: IEEE 802.15.4  
RF Range: 100ft to nearest node\*  
Frequency Band: 2.4Ghz  
Antennae: Internal ceramic and whip antennae for diversity  
Routing Protocol: 6LoWPAN

##### Standards and listings:

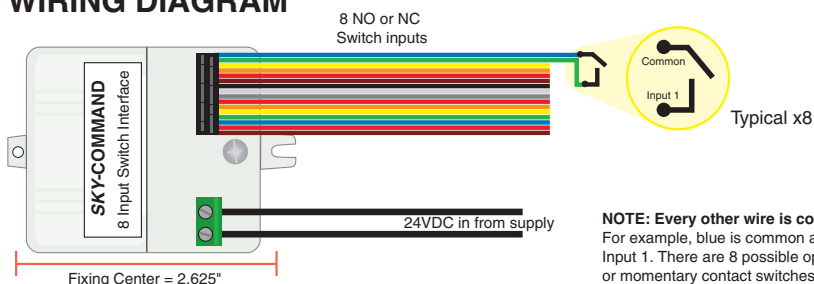
UL2043, FCC

##### Inputs:

8 normally open (NO) or normally closed (NC) switches or relays

\* The range of each device is limited to 100 feet from the next device. Devices installed further away communicate through the mesh network to create an expansive communication territory.

#### WIRING DIAGRAM



For more information:

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## SKY-Medley: 2 Button Switch with Occupancy Sensor

### Low Voltage Integrated Occupancy Sensor and 2-Button Switch

#### FEATURES

- Integrated PIR occupancy sensor
- 2 engravable, backlit buttons
- Available in brushed stainless or white finish  
(Engravings to be specified at purchase.)
- Ideal for dimming, on/off, and lighting scene control
- Can be programmed to trigger any action in the SKY Controls system.
- 24VDC input integrates easily into DC systems
- Fits in standard 1-gang box
- IPv6 wireless communication
- Acts as a repeater in the IPv6 mesh network
- Compatible with entire "SKY" family of products
- Ultra-low power consumption
- Automatically populates to web-based configuration software

#### TECHNICAL SPECIFICATIONS

##### Electrical:

Input Voltage: 12 to 24VDC (polarity correcting)  
 Input Current: 100mA max      Inrush Current: 0A  
 Operating Temperature: -30° C to +60° C  
 Humidity To 90% RH, non-condensing

##### Mechanical:

Enclosure W=1.7" H=2.9" D=0.9"  
 Sensor should be placed 9-30 feet from ground; covers a 28° arc at 70° F  
 Fits in 1 gang box with Decora® cover plates

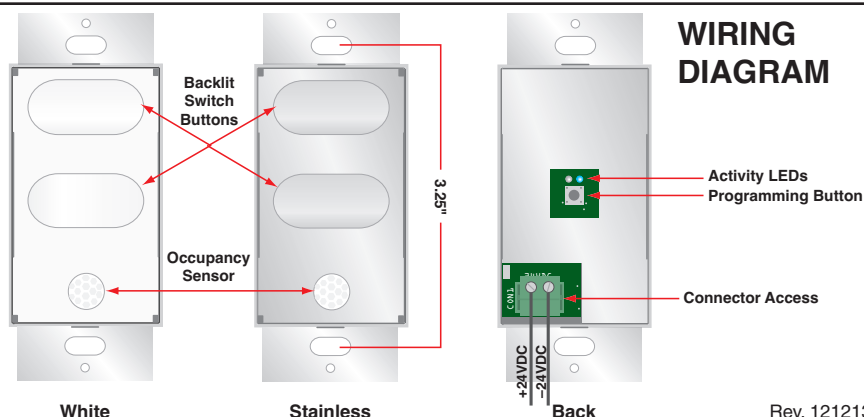
##### Communication:

Communications Protocol: IEEE 802.15.4  
 RF Range: 100ft to nearest node\*  
 Frequency Band: 2.4Ghz      Routing Protocol: 6LoWPAN  
 Antennae: Internal ceramic and whip antennae for diversity

##### Standards and listings:

UL2043, FCC

\* The range of each device is limited to 100 feet from the next device. Devices installed further away communicate through the mesh network to create an expansive communication territory.



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## SKY-Sense ML: Motion and Light

### Low Voltage Occupancy and Daylight Sensor for Ceiling Installations

#### FEATURES

- Daylight Dependent Switching
    - Programmable % to turn off from 125-250%
    - Programmable level to turn lighting back on to avoid nuisance switching
  - Daylight Harvest
    - Set multiple determined light levels for daylight harvest scene controlled lighting.
    - Grouping of dimming devices available
  - Bi-colored status LED to indicate activation and PAN performance
  - Configurable motion timeout periods with corridor hold facility. Daytime motion sensors timeout
- can be programmed differently for nighttime to ensure security personnel rounds do not affect energy useable.
- Graphical representation of occupancy with occupancy logging
  - Motion disable for conference facilities
  - Sensors may be grouped to activate as a single channel.
  - Infrared occupancy sensor
  - 16 single focal point lenses; 5 optical axes
  - Light sensing element corrects for human eye response, offering daylight dependent switching or continuous daylight harvest.

#### TECHNICAL SPECIFICATIONS

##### Electrical:

Input Voltage: 24VDC (polarity correcting)  
2 core connect, 9-30 VDC

##### Mechanical:

1 5/8" diameter cap  
1.25" circular ceiling output  
2.5" depth into ceiling void

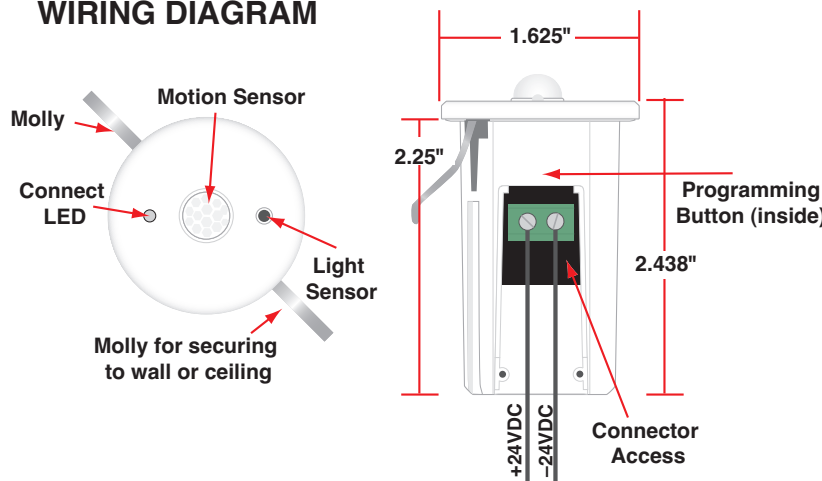
##### Communication:

Communications Protocol: IEEE 802.15.4  
RF Range: 100ft to nearest node  
Frequency Band: 2.4Ghz  
Routing Protocol: 6LoWPAN

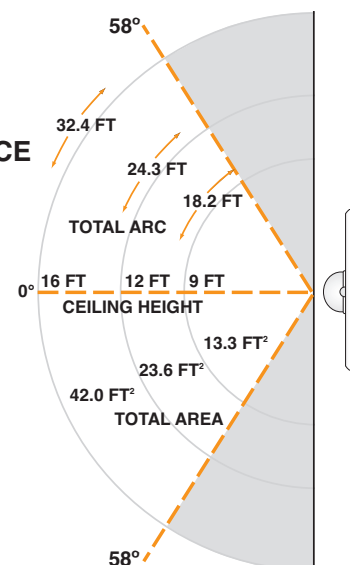
##### Measurements Range:

-20° to 100° F temperature range  
0-100% humidity range  
5 meter radius detection distance

#### WIRING DIAGRAM



#### DETECTION PERFORMANCE at 70°F



For more information:

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Rev. 031714





## SKY-Rise 0-10V Dimmer

### Low Voltage 0-10V Dimmer

#### FEATURES

- 0-10VDC (or 1-10V) sink control for 0-10 dimming devices
- 5A FET output
- 24VDC input integrates easily into DC systems
- High efficiency polarity correction
- Programmable output to meet device-specific requirements
- Built in power meter reports current, voltage, power, and energy use data to the cloud.
- PWM output can be used as wireless speed controller for 24VDC fans
- Small size fits inside luminaires
- IPv6 wireless communication
- Compatible with entire SKY family of products
- Automatically populates to web-based configuration software
- Ultra low power consumption

- Acts as a repeater in the IPv6 mesh network
- UL 2043 listed plastic enclosure. Suitable for use in air handling space

#### TECHNICAL SPECIFICATIONS

##### Electrical:

Input Voltage: 24VDC (polarity correcting)  
Input Current: 5A max (depending on load or SKY-Rise power plus load)  
Inrush Current: 0A  
LV Controls Output: 0-10VDC

##### Mechanical:

Plastic enclosure W=2" L=2.25" H=.875" Fixing Center= 2.625"

##### Communication:

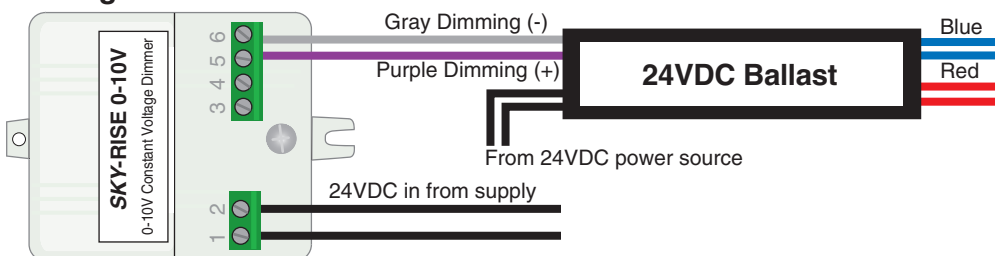
Communications Protocol: IEEE 802.15.4  
Routing Protocol: 6LoWPAN  
RF Range: 100ft to nearest node\*  
Frequency Band: 2.4Ghz  
Antennae: Internal ceramic and whip antennae for diversity

##### Standards and listings: UL2043, FCC

\* The range of each device is limited to 100 feet from the next device. Devices installed farther away communicate through the mesh network to create an expansive communication territory.

#### WIRING DIAGRAM

##### Wiring for 0-10V Devices



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Rev. 010814





## SKY-Rise LED Driver



## Low Voltage LED Constant Voltage Driver

### FEATURES

- Constant voltage 0-24V PWM output for dimming LEDs
- 5A FET output
- 24VDC input integrates easily into DC systems
- High efficiency polarity correction
- Programmable output to meet device-specific requirements
- Built in power meter reports current, voltage, power, and energy use data to the cloud.
- PWM output can be used as wireless speed controller for 24VDC fans
- Small size may fit inside luminaires
- IPv6 wireless communication
- Compatible with entire SKY family of products
- Automatically populates to web-based configuration software
- Ultra low power consumption
- Acts as a repeater in the IPv6 mesh network
- UL 2043 listed plastic enclosure. Suitable for use in air handling space

### TECHNICAL SPECIFICATIONS

#### Electrical:

Input Voltage: 24VDC (polarity correcting)  
Input Current: 5A max (depending on load or SKY-Rise power plus load)  
Inrush Current: 0A  
LED Dimming Output: PWM 0-24VDC

#### Mechanical:

Plastic enclosure W=2" L=2.25" H=.875"  
Fixing Center= 2.625"

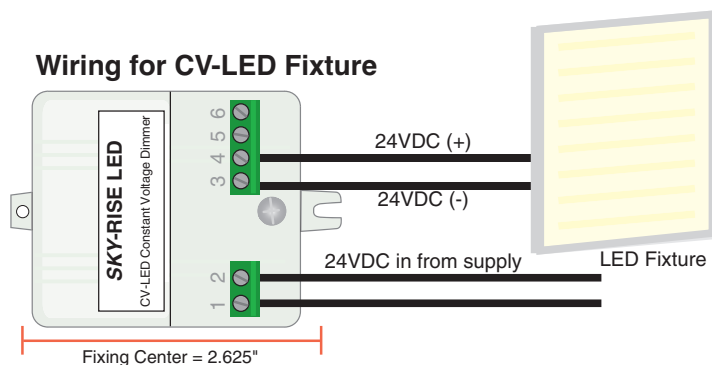
#### Communication:

Communications Protocol: IEEE 802.15.4  
Routing Protocol: 6LoWPAN  
RF Range: 100ft to nearest node\*  
Frequency Band: 2.4Ghz  
Antennae: Internal ceramic and whip antennae for diversity

#### Standards and listings: UL2043, FCC

\* The range of each device is limited to 100 feet from the next device. Devices installed farther away communicate through the mesh network to create an expansive communication territory.

### WIRING DIAGRAM



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Rev. 011314



## SKY-Trio: 3 Button Wall Switch

### Low Voltage Integrated 3-Button Switch

#### FEATURES

- 3 engravable, backlit buttons
- Available in brushed stainless or white finish (Engravings to be specified at purchase.)
- Ideal for dimming, on/off, and lighting scene control
- Can be programmed to trigger any action in the SKY Controls system
- 24VDC input integrates easily into DC systems
- Fits in standard 1-gang box
- IPv6 wireless communication
- Acts as a repeater in the IPv6 mesh network
- Compatible with entire "SKY" family of products
- Ultra-low power consumption
- Automatically populates to web-based configuration software

#### TECHNICAL SPECIFICATIONS

##### Electrical:

Input Voltage: 12 to 24VDC (polarity correcting)  
Input Current: 100mA max Inrush Current: 0A  
Operating Temperature -30° C to +60° C  
Humidity To 90% RH, non-condensing

##### Mechanical:

Enclosure W=1.7" H=2.9" D=0.9"  
Fits in 1 gang box with Decora® cover plates

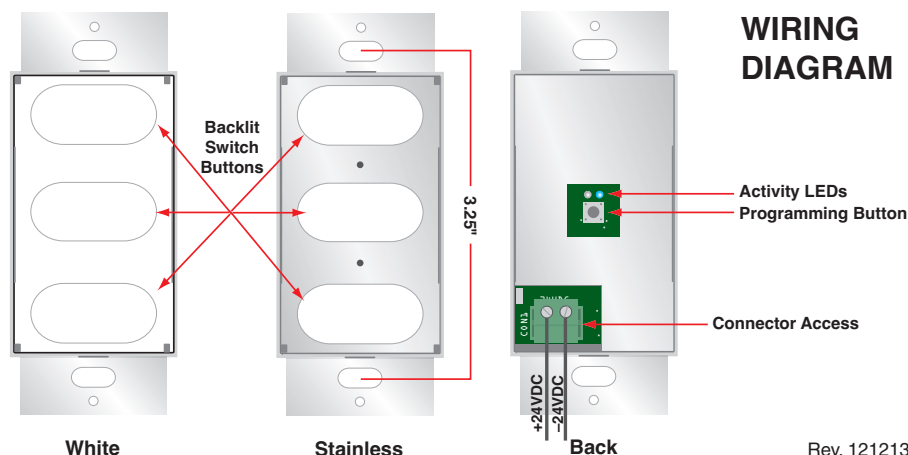
##### Communication:

Communications Protocol: IEEE 802.15.4  
RF Range: 100ft to nearest node\*  
Frequency Band: 2.4Ghz  
Antennae: Internal ceramic and whip antennae for diversity  
Routing Protocol: 6LoWPAN

##### Standards and listings:

UL2043, FCC

\* The range of each device is limited to 100 feet from the next device. Devices installed further away communicate through the mesh network to create an expansive communication territory.



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