

About SwitchLinc's Certification

SwitchLinc has been thoroughly tested by ITS ETL SEMKO, a nationally recognized independent third-party testing laboratory. Products bearing North American ETL Listed mark signifies that the product has been tested to and has met the requirements of a widely recognized consensus of U.S and Canadian product safety standards, that the manufacturing site has been audited, and that the manufacturer has agreed to a program of quarterly factory follow-up inspections to verify continued conformance.



Smarthome Limited Warranty

Smarthome warrants to the original consumer purchaser of this product that, for a period of two years from the date of purchase, this product will be free from defects in material and workmanship and will perform in substantial conformity to the description of the product in this Owner's Manual. This warranty shall not apply to defects or errors caused by misuse or neglect.

If the product is found to be defective in material or workmanship or if the product does not perform as warranted above during the warranty period, Smarthome will either repair it, replace it or refund the purchase price, at its option, upon receipt of the product at the address below, postage prepaid, with proof of the date of purchase and an explanation of the defect or error. The repair, replacement, or refund that is provided for above shall be the full extent of Smarthome's liability with respect to this product.

For repair or replacement during the warranty period, call Smarthome customer service to receive an RA# (return authorization number), properly package the product (with the RA# clearly printed on the outside of the package) and send the product, along with all other required materials, to:

Smarthome
ATTN: Receiving Dept.
16542 Millikan Ave
Irvine, CA 92606-5027

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800.SMART.HOME - 949.221.9200 - www.smarthome.com

rev 110703



SwitchLinc Plus[™]

Remote Control Dimmer with Scenes

For models:

2386W SwitchLinc Plus 600-Watt in White

2386I SwitchLinc Plus 600-Watt in Ivory

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Congratulations!

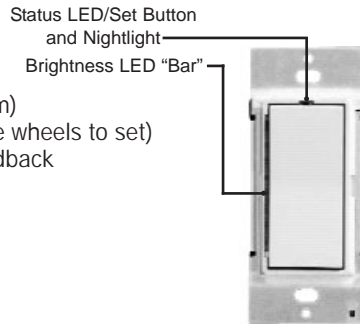
You've just purchased the highest quality wall dimmer for powerline carrier signals (PLC) X10 signals. SwitchLinc Plus is a specially designed version of the world's first two-way powerline carrier-control dimmer switch, the SwitchLinc 2-Way Dimmer. It gives you remote control of lighting and inductive loads. It only differs from the SwitchLinc 2-Way in that it does not have a transmitter to control other home automation products. Since it does not have a transmitter circuit, it will not have a significant impact on the signal levels. See page 9 to learn more about signal loading.

SwitchLinc Plus can also be controlled remotely from a powerline transmitter for powerful grouped lighting control. Each SwitchLinc Plus can be a member of up to 64 lighting scenes, allowing one powerline signal to set elegant "mood lighting."

The SwitchLinc's PLC/X10 address is electronically set; there are no code wheels on the unit to adjust. SwitchLinc Plus is easily installed and programmed. It installs (connects to home wiring) just like a regular light switch. This makes it ideal for retrofits in existing homes and it easily installs in new homes, with no special training required to install it.

Key Features

- Scene-ready
 - True rocker action (top = on/bright, bottom = off/dim)
 - All settings are held in non-volatile memory (no code wheels to set)
 - High quality micro switches give the user tactile feedback when pressed (no mushy feel)
 - 8-level LED "Bar" shows brightness of circuit
 - Status LED/ Set Button shows powerline activity
 - Wires in just like a standard wall switch*
- * Requires a neutral connection



Other SwitchLinc Models

- SwitchLinc 2-Way 600-Watt Dimmer #2380W/I - (White or Ivory)
- SwitchLinc 2-Way 1000-watt Dimmer #2381W/I - (White or Ivory)
- SwitchLinc Relay 2-Way #23883W/I - (White or Ivory)
- SwitchLinc PLC Dimmer #2384W/I - (White or Ivory)
- SwitchLinc Relay #23885W/I - (White or Ivory)
- SwitchLinc Deluxe Dimmer (No PowerLine Control) #2387W/I - (White or Ivory)
- SwitchLinc Multi-Way Companion Switch for 3-Way, 4-Way, & Up circuits #2382W/I

Other Smarthome Products

Your SwitchLinc Dimmer is compatible with many of our other home automation products. If you need a more traditional-looking wall switch, check out the **ToggleLinc** series of wall switches or the new

SwitchLinc RX, which is ideal for retrofit applications where there isn't a neutral wire at the switch's wall box. The **KeypadLinc Wall Mounted Transmitter** allows you to control multiple devices from one location at the press of a single button. And for plug-in devices, the **ApplianceLinc** and **LampLinc** modules will automate just about anything that plugs in. Please visit the Smarthome web site or contact your distributor for more information.



Specifications

- Load types: Permanently installed incandescent and inductive loads
- Operation: Dimming Triac (12-amp Rated)
- Maximum load: 600 watts
- Input power: 120 VAC, 60 Hz
- Connections (16 AWG): Black (to line), Red (to load), White (to neutral, required) Yellow (to optional Multi-way Companion Switches, 2382)
- Addresses: 1 PLC (X-10) Base (Primary) Address of 256 possible Up to 64 PLC (X-10) Scene Addresses of 255 possible
- On-Level: (Primary Address) 1 of 31 possible (3.2%-100%) or resume dim (Scene Address) 1 of 32 possible (0%-100%)
- Fade-on Rate: 0.12 to 9 seconds if programmed locally 0.12 sec. to 9 minutes if programmed remotely
- Maximum SwitchLincs per gang box: 4
- Maximum number of SwitchLincs per circuit: 10 (with more than 5, a PLC amplified coupler-repeater is highly recommended)
- Minimum load: No minimum load required
- Operating temperature range: 40° F to 104° F
- Minimum PLC receive level: 10mV
- Maximum PLC signal rejection: 200mV
- Mounting: Mounts in single or multiple-ganged J-box (200W of load control is lost on 600W SwitchLinc for each immediately adjacent dimmer installation; e.g., 600W load control becomes 400W with a SwitchLinc to the immediate right or left. Use a triple-gang box with a mechanical switch in the center to avoid downgrading.
- Status indicator: Green LED
- Brightness indicator: 8 Green LEDs
- Dimensions:

	Front Bracket	Main Body
(Width)	1.73"	1.74"
(Height)	4.14"	2.71"
(Depth)	1.73"	1.40"
- Safety tested for use in the U.S. and Canada

SMARTHOMEdesign Invest in better Home Automation Products

Unlike most electric items, many PLC-based products haven't changed much over the years.

Our Marketing and Customer Service teams surveyed our customers, like you, and our engineers have invented new and better wall switches and plug-in modules. We include more features, higher load handling, and better signal sensitivity for a superior user experience. While in some cases, they cost more; we hope you'll agree that not having to replace a dead module every couple years is worth the added expense and reduced aggravation. Please visit a retailer or distributor for the complete line of automation products from Smarthome Design. Check out our web site at:

<http://www.smarthome.com/smarthomedesignstore.html>



KeypadLinc 6 with 450W Integrated dimmer

Troubleshooting & Technical Support

Problem	Possible Cause	Solution
Light controlled by SwitchLinc turned itself ON.	SwitchLinc was triggered by a scene.	Check scene membership and remove unwanted scene from SwitchLinc, or perform a Factory Reset to reset SwitchLinc to factory defaults. Install an PLC Signal Blocker for the home.
Light does not appear to come ON or go OFF when SwitchLinc is tapped (manually).	Primary address fade-on rate-on may be set too slow.	Increase fade-on rate if desired. (see page 6)
SwitchLinc will not take programming of scene, fade-on rate, etc.	SwitchLinc may be in Program Disable mode.	Re-enable Program mode or perform a Factory Reset to reset SwitchLinc to factory defaults.
	SwitchLinc may not be "activated" (has not been manipulated within the last 4 minutes).	Manually turn SwitchLinc ON or OFF or send its primary PLC address during Step 2 of programming.
SwitchLinc is locked up.	Surge in power line.	Reset SwitchLinc by pulling out the Set Button for a minute and then pressing it in.
LED is not visible and or SwitchLinc is not controlling the light.	SwitchLinc is in system off position.	Press in the Set Button/Status LED.
	Incomplete (open) wire connection in wall box.	Check wall box wires to ensure all connections are tight and no bare wire is exposed.
	Incomplete (open) wire connection at fixture.	Check fixture to ensure all connections are tight and no bare wires are exposed.
Existing switch only has two wires.	SwitchLinc needs a neutral wire in order to operate. SwitchLinc RX #2386W2 could be substituted.	Look in the rear of the junction box for a group of white wires all tied together with a wire nut. Those are the neutral wires; connect the SwitchLinc's white wire there.
Difficulty setting scenes with a maxi-controller.	The CLEAR or SET commands were not sent in the correct order.	Don't hold down the buttons too long, it may send duplicate codes (i.e. two O16 codes).
SwitchLinc is not receiving signals.	Check the Status LED/Set Button.	It will blink when there is any PLC activity on the line.
	Move the transmitter to another outlet.	SwitchLinc needs at least 50mV of signal strength for reliable operation, a coupler-repeater or a signal bridge may be needed (see pg.10).
The load is buzzing when on or dimmed.	The triac inside the SwitchLinc needs to turn off the electricity to the load 120 times per second to 'listen' for PLC signals. This causes the electricity going to the load to be slightly choppy.	The bulbs filaments are vibrating. Using rough service, 130-volt, or appliance grade bulbs will reduce the noise.
		Run the SwitchLinc in the full-on mode, or consider using one of the SwitchLinc Relay models that have no-dimming abilities.
SwitchLinc turns on, but not off by remote control.	The load is producing electrical noise that is interfering with SwitchLinc's reception of PLC signals.	Install a noise filter like Smarhome #4835 between the load and the SwitchLinc or increase the signal strength with a coupler-repeater to overcome the line noise.
The switch is getting too warm to the touch.	It is normal for wall dimmers to get warm.	SwitchLinc will dissipate 1-watt per 100 watts controlled. Using metal junction boxes, removing insulation around the outside of the box, or using a smaller load can help lessen the heat.

If these solutions have been tried, the manual has been reviewed and you still cannot resolve an issue you're having with the SwitchLinc;

- Search our on-line knowledge base at:
<http://smarhome.custhelp.com>
- E-mail tech@smarhome.com
- Call our Technical Support Dept. at 949-221-9200

CAUTION!!

Read and understand these instructions before installing. This device is intended for installation in accordance with the National Electric Code and local regulations in the United States, or the Canadian Electrical Code and local regulations in Canada. To reduce the risk of overheating and possible damage to other equipment, do not install a SwitchLinc to control a receptacle or fluorescent lighting fixture. For indoor use only. Connect only copper or copper-clad wire to this device. Before installing, disconnect power at circuit breaker or remove fuse to avoid shock or damage to the control. It is recommended that a qualified electrician perform this installation. Retain these instructions for future reference.

Dimming an inductive load (such as a ceiling fan) below the minimum voltage set by the manufacturer of the load device could cause damage to the load device from overheating. If the manufacturer of the load device does not recommend dimming, DO NOT use SwitchLinc Plus dimmer with that device (use SwitchLinc Relay 2-Way #23883W/1 or SwitchLinc Relay #23885W/1). **USER ASSUMES ALL RISKS ASSOCIATED WITH DIMMING AN INDUCTIVE LOAD.**

Gradateurs commandant une lampe à filament de tungstène - afin de réduire le risque de surchauffe et la possibilité d'endommagement à d'autres matériels, ne pas installer pour commander une prise, un appareil à moteur, une lampe fluorescente ou un appareil alimenté par un transformateur.

Quick Start Instructions

DEFAULT

Setting the Dimmer's Primary Address	<ol style="list-style-type: none"> 1. Press and hold the Set Button for 3 seconds (the LED will begin blinking and the load will come on) 2. Send the desired address from any transmitter within 30 seconds (see page 6 for more detailed instructions) 	A-1
Setting the Preset On-Level	<ol style="list-style-type: none"> 1. Adjust the dim level to the desired level 2. Tap the Set Button ONCE (see page 6 for more detailed instructions) 	100%
Setting the Fade-On Rate	<ol style="list-style-type: none"> 1. Adjust the dim level (Brighter = faster dimming) 2. Double tap the Set Button (press it TWICE quickly) (see page 6 for more detailed instructions) 	2 Seconds
Factory Reset	<ol style="list-style-type: none"> 1. Gently pull the Set Button out to remove power for 5 seconds 2. Push and hold in the Set Button for 5 seconds, then release 3. When the LED Indicator comes on, the SwitchLinc is reset (see page 9 for more detailed instructions) 	Resets to default settings

Programming a Scene

1. Transmit the "clear" sequence:

O16	N16	M16	P16	M16
-----	-----	-----	-----	-----

2. Adjust on the Dimmer to the desired brightness
3. Send the following command sequence:

M16	N16	O16	P16
-----	-----	-----	-----

4. Transmit the desired scene address (house and unit code) to lock-in the new scene.

(see pages 8 for more detailed instructions)

Preparation

Before installing SwitchLinc, please familiarize yourself with the following and take the necessary precautions listed here:

- Be sure that the fuse has been removed or the circuit breaker is turned off to the circuit being controlled. Installing SwitchLinc with the power on will expose you to dangerous voltages.
- SwitchLinc Wiring Diagram on page 5 will help you to determine the wire colors of the connections to the SwitchLinc and Multi-Way Companion Switch. Note: While the neutral connection is optional on the Multi-Way Companion Switch, the SwitchLinc Plus requires a neutral connection.
- Wiring for 3-way, 4-way, & up switch circuits follow conventional (standard, non-remote) wiring practice (plus the requirement for a neutral). Wiring the SwitchLinc Multi-Way Companion Switch requires the Line (Black) wire be accessible and be the same 110V leg of the house wiring. The White wire on the Multi-Way Companion Switch is connected to NEUTRAL ONLY. If neutral is not available, cap the White wire, which will simply causes the nightlight LED not to function.
- The SwitchLinc may feel warm during operation. The amount of heat generated is within approved limits and poses no hazards. To minimize heat build-up, ensure that the area surrounding the rear of the SwitchLinc has adequate ventilation (i.e., clear away excess insulation).
- Installation should be performed only by a qualified electrician, or by a homeowner who is familiar and comfortable with electrical circuitry. If there are any questions, consult an electrician or contact Smarthome's Tech Support department for guidance.

Using SwitchLinc

Basic Operations	
Input at Switch	Output at Bulb
Tap top of rocker (when light is off)	Light ramps up to preset ON-level
Tap top of rocker (when light is on)	Light ramps up to full brightness
Press & hold top of rocker	Light brightens until rocker is released
Tap bottom of rocker	Light ramps down to OFF
Press & Hold bottom of rocker	Light dims until rocker is released

Advanced Operations	
Input at Switch	Output at Bulb
Double-tap top of rocker	Light ramps fast to full brightness
Double-tap bottom of rocker	Light dims fast to OFF

4. Install a whole-house surge suppressor. Adding one whole-house surge protector at the electric panel will help protect against costly damage to the PLC components and other delicate electrical equipment.

5. Install an PLC phase coupler (signal bridge) or coupler-repeater (amplifier) at the incoming electrical service. A common problem with PLC signals is getting the signals between the two legs of electricity that service the home. A coupler-repeater is recommend for homes of 3,000 square feet or greater. Smaller homes will work well with a passive phase coupler.

6. Work with the electrician to isolate non-automation loads. Ask the electrician to place the non-PLC carrying lines on one of the two incoming lines. Having the kitchen, laundry appliances, and the heating systems on one phase will help keep potential noise off the PLC-carrying lines. He probably won't be able to accommodate 100% of the loads on one phase or another, but an attempt should be made.

Glossary of Terms

PLC- Power Line Control- A control signal that is embedded onto the electricity lines. X10 signals are a form of PLC signals.

X10 Address- The Address part of an X10 signal contains the House and Unit code. An Address can be Unit codes 1 to 16 and House codes A - P. There are 256 total X10 (PLC) addresses. Examples of X10 Addresses are A-1, B-5, P-15, O-9.

X10 Command- The Command is action part of an X10 signal. It tells the module what to do when it sees its address. Examples of a command are ON, OFF, Bright, DIM, PREdim, All Light ON, and All Units OFF. There are other rarely used commands, but these are the most common ones.

Status & Status Request- Some receivers, like SwitchLinc 2-Way Dimmer and Switch, have the ability to report their status when asked. These modules contain transmitters that can send PLC signals. When a transmitter sends a Status Request command, the module will reply with its status (On, Off, Predim at some %).

Resume Dim Level- If set, the SwitchLinc can come on to the level it was at before being turned off.

PreDim Level- One of 32 brightness levels the SwitchLinc supplies to lights. When a scene address is received, the SwitchLinc can instantly (or slowly) change the light's brightness to a predefined brightness level.

Scenes in SwitchLincs- SwitchLincs Wall Switches can be set up to respond to multiple PLC signals and when received come onto a predefined brightness level all with one signal. One scene signal from transmitter like KeypadLinc, can instantly (within seconds) change the lighting mood in your home.

Maxi Controller- A transmitter that has separate buttons for the unit codes and the commands. In some of the advanced set up functions for the SwitchLinc, it is necessary for only a unit code to be sent. The X10 SC-503, Leviton 6320, Stanley 370-2549 are examples of Maxi-Controllers. We recommend having a Maxi Controller to set up the SwitchLinc.

X10 Keypress- This is an PLC signal that only contains the house and unit code WITHOUT a command. The Maxi-Controller, some TouchLinc LCD controllers, and home automation interfaces can produce a keypress command.

Appliance Module- An PLC receiver device that can be used with any type of load including lighting. It will never contain dimming control as it always has a hard contact relay. An Appliance Module will ignore the All Lights ON command.

Lamp Module- An PLC receiver that is used to control only lighting devices. It often contains dimming control or sometime may have a hard contact relay. A Lamp Module will respond to the All Lights ON command.

Hot or Line- The wire in the junction box that contains the incoming electricity from the electrical panel. It is usually black and may be tied with a wire nut to other black wires in the the box.

Load- The wire in the junction box that goes to the light(s). Usually, there is just one load wire in a junction box and it is commonly black. It has no voltage when the switch is off.

Neutral- While not used on a mechanical switch to control a load, SwitchLinc will need a neutral wire to operate. Generally, the neutral wires are white and located in the rear of the junction box. There may be two or more wires tied together by a wire nut.

Helpful Tools

If you're investing in home automation, there are a few tools that will make your projects run smoother:

Maxi-Controller

This plug-in transmitter has the ability to send individual PLC commands. The buttons are separated into Addresses and Command functions. To use this controller, you have to press the address (for example, "5"), then the command (ON, OFF, BRIGHT, etc.). Some of the KeypadLinc and SwitchLinc advanced programming features need to be programmed with individual button presses in order to set certain features. For more info visit:

<http://www.smarthome.com/4020.html>



Signal Meter

This is an invaluable tool when it comes to installing and diagnosing problems. By knowing the signal strength at a specific location, you can make sure that the signal will always trigger that module. Generally, it is ideal to have at least 100mV at each location. Conservative installers will want even more; perhaps 250mV just in case the homeowner installs a new big-screen TV after final installation. The extra margin will still give the receivers enough signal strength to be reliably triggered. These units can also be used to measure the effects of signal absorption mentioned earlier. Plug in the transmitter and measure the signal, then unplug the device that's plugged into that outlet. If you see a 10% or greater change, it's time for a filter on that device. Smarthome has three units to choose from:

www.smarthome.com/4814.html www.smarthome.com/4811.html
www.smarthome.com/4813.html



Voltmeter or Voltage Tester

During the installation of SwitchLincs, it may be necessary to identify the wires inside the wall box. Knowing for sure which wire is the HOT or LINE wires can reduce the guesswork when installing a single switch and it is absolutely necessary when working with 3-way lighting circuits. A voltmeter is ideal for this application. Many of the digital models can also read current so you'll know how much power is being drawn by the SwitchLinc's load.

A simpler measurement tool, available at most home improvement centers, is a voltage sensor. This device, often costing less than \$20, can sense voltage when its tip is placed near a wire. The tip of the voltage sensor can tell if voltage is inside the wire without touching the bare copper conductor or breaking the insulation.

When using these tools, be certain to read and understand the safety instructions. Often when these tools are used, the power to the circuit will need to be turned on. When working around live electrical wires, take your time and concentrate on the task.

Helpful Hints for New Construction

By design, home automation equipment does not need much in the way of special wiring. The following are six items we recommend for all homes with PLC installations:

1. Ask the builder or electrician to run the neutral wire to each wall switch location. This wiring may be a code requirement or a regular practice in your area, but unless explicitly specified, it may get omitted. Most SwitchLincs and all KeypadLinc controllers require the neutral connection.
2. Specify the installation of deep J-boxes in all locations where PLC switches, receptacles, or transmitters will be used. While all PLC products fit in the spacing offered by all North American electrical boxes, the deep models have extra working space and make the installation go a little easier. Deep boxes only costs a few cents more than normal depth models. Look for single gang boxes that are 22cu or higher (cubic inches) and double gang boxes that are 36cu or higher.
3. If the PLC product is going to be controlling 400 watts or more, do not place insulation around the wall box and consider using metal junction boxes. Dimmers that control high loads will dissipate heat that may be felt through the switch faceplate. Metal boxes will more efficiently draw out the heat and spread it over all the surfaces of the box. By keeping wall insulation a few inches from the box, free air will help move the heat away from the switch and box.

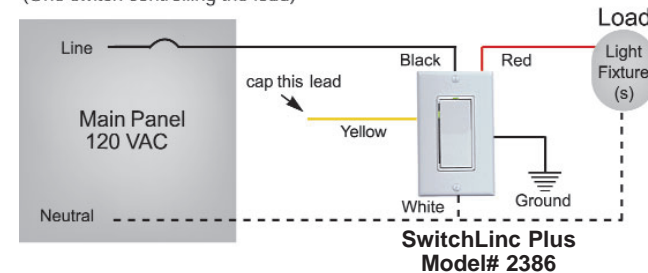
Step-by-Step Instructions

1. Disconnect the power for the existing switches at the circuit breaker or fuse panel. Verify that the power has been removed by trying to turn on the lights controlled by the switches.
2. Remove the trim plate from the existing switches.
3. Unscrew and pull the existing switches from the wall box.
4. Disconnect the wires from the existing switches.
5. If the SwitchLinc is being installed into a 3/4/5-way circuit, the SwitchLinc Multi-way Companion Switch must be installed in the wall box where power comes into the circuit. Follow the instruction included with the Multi-way Companion Switch to identify the "Hot," "Neutral," "Ground," and "Traveler" wires.
6. Before making any connections to SwitchLinc, gently pull the Set Button until a click is heard. This will open the "air gap" and isolate the SwitchLinc from the electricity when the circuit breaker is turned back on.
7. Orient SwitchLinc so the LED is at the top and make connections according to the "SwitchLinc Wiring Diagram" below. Wire Multi-way Companion Switches (if used) according to the "SwitchLinc Multi-Way Wiring Diagram" below.
8. After all connections have been made, ensure that all wire connectors are firmly attached and that there is no exposed copper except for the Ground wire.
9. Gently place the wires and switch into the wall box (with LED at top) and screw into place.
10. Turn the circuit breaker back on.
11. Restore power to the circuit by pressing in the SwitchLinc's Status LED/ Set Button top until it is even with the front plastic trim ring. SwitchLinc will be operational when the green Status LED will come on.
12. After testing SwitchLinc for proper operation, install the faceplate (sold separately).

Tip: For additional help installing 3-way circuits, see page 5 in the Multi-way Companion Switch manual.

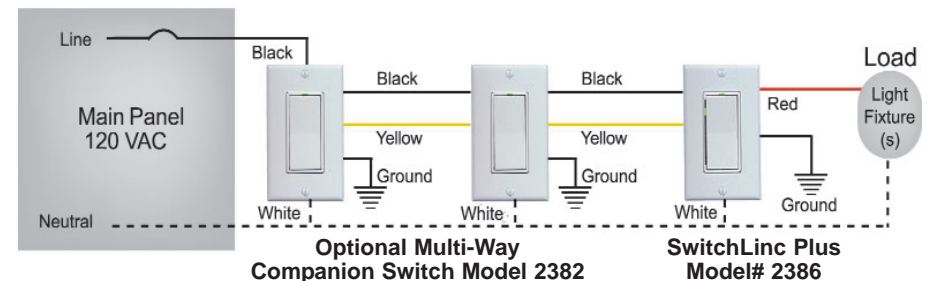
SwitchLinc Plus Wiring Diagram

(One switch controlling the load)



SwitchLinc Plus Multi-Way Wiring Diagram

(Two or more switches controlling the load)



Note: When installing multiple SwitchLincs in a J-box, or many on the same circuit breaker, please see specifications at the end of this manual for limitations and recommendations.

Setting the Primary Address

Each SwitchLinc requires a primary address to operate. It ships from the factory with "A1" as the default address; it will also have this address after performing a factory reset. Any of the 256 PLC/X10 addresses can be programmed.

The SwitchLinc does not use code wheels or dials to set its primary address. Instead, it will accept the first PLC address it finds on the powerline once the programming mode is started. Any PLC/X10 transmitter can be used to set the primary address.

Tip:
If you have trouble communicating to the SwitchLinc, there may be a lot of signal activity on the powerline. Unplug transmitters might be intercepted by SwitchLinc during the programming sequences. RF transceivers, computer controllers, and X10 thermostats should be unplugged to avoid interference.

1. Using the tip of a very small screwdriver, press and hold the Status LED/ Set Button for approximately 3 seconds then release. The green Status LED/ Set Button will begin blinking and the load will come on.
2. Within 30 seconds, transmit the desired primary address (housecode and unit code) from any transmitter.

The light(s) controlled by the SwitchLinc will blink and the Status LED/ Set Button will stop flashing.

3. Confirm that the address was accepted by turning it on or off from a remote transmitter.

Setting the Preset On-Level (Optional)

The Preset On-Level is the brightness level that SwitchLinc will adjust to when activated or it receives a powerline carrier (PLC) ON-command to its primary address. It can be set to resume to the same brightness level each time or to the previous brightness level before it was turned off.

Setting a fixed brightness level:

1. Adjust the brightness of the load (at the SwitchLinc or remotely with dim commands) to the desired level.
2. Tap the Status LED/Set Button **ONCE**.

The light(s) will blink indicating that it has set the new on-level.

Setting the Resume Dim mode:

1. Turn the light off.
2. Tap the Status LED/Set Button **ONCE**.

Setting the Fade-On Rate (Optional)

The "Fade-On Rate" is the speed that SwitchLinc brings the brightness of the connected light(s) up or down when manually activated or it receives a powerline carrier (PLC) ON-command to its primary address. From the SwitchLinc, the rate is adjustable between .1 and 9 seconds, (the factory default rate is 2 seconds).

1. Adjust the brightness of the load (at the SwitchLinc or remotely with dim commands) so that the brighter the load, the faster the fade-on rate will be.
2. Tap the Status LED/Set Button **TWICE**.

The light(s) will blink indicating that it has set the new fade-on rate.

Brightness Level	Fade-on Rate in Seconds
90-100%	0.1
77-87%	0.2
65-74%	0.3
52-61%	0.5
39-48%	2.0
26-35%	4.5
13-23%	6.5
1-10%	8.5
0%	9.0

(See the Advanced Primary Address Programming section for instructions to set a fade-on rate for longer than 9 seconds and remotely setting the ON-level.)

Once the signal has been amplified, it's time to preserve it. Since PLC signals go everywhere in the home, some electrical devices will have more of an effect on the signal strength than other devices. PLC signals are like water pressure in pipes, it actually goes everywhere it can, not just to the receiving module. In the last 20 years, an explosion of electrical devices has invaded our homes. Computers, video gear, and fancy high-end electronics are more present than in years past. The more complicated the electrical power supply is in a device, the more likely it is to absorb PLC signals. Engineers who design power supplies build in traps to filter out and kill electrical noise. Unfortunately, the PLC signals look like electrical noise to these devices. The result is that a large percent of the transmitted signal is lost to these devices leaving less for the receivers. The most common sources of signal loss are:

- Televisions
- Computer systems
- Audio/Video gear
- Computer UPS's and power strips
- Power supplies for laptops and cell phones

Testing for the problem is simple. If a device is suspected of causing signal absorption, unplug the device and then re-transmit the signal. It is very important that the device is unplugged and not just turned off! If the controlled product begins working after the appliance is unplugged, then a filter will be needed on that device to keep PLC signals from being absorbed and raise the signal strength of the entire home. Smarthome has many filters that will fix the problem. An average home will need between three and five filters. If you are in the business of installing automation systems and not in the 'call-back' business, include some of these in your bid as part of the standard package.



#1626 FilterLinc Plug-In Filter

Smarthome's BoosterLinc™ can solve localized problems



#4827 BoosterLinc Plug-In Amplifier

SignalLinc Repeater is ideal for improving the home automation signal strength throughout all the outlets in a home. But, as the PLC signals travel down a circuit and away from the repeater, it will weaken by the same factors listed above. Additionally, the signal will get weaker as it passes installed PLC transmitters. Each PLC transmitter contains a tuned circuit that when it's not sending signals it's absorbing them! In addition to plug-in transmitters, LampLinc™ 2-Way, SwitchLincs™ 2-Ways, ToggleLinc™ 2-Ways,

ApplianceLinc™ 2-Ways, KeypadLincs™, or any module with 2-way abilities will load down the available signal. With so many transmitters installed, the signal is loaded down to a point where some modules will be unable to receive a signal. Installing a multiple 2-way devices on one branch circuit may necessitate the use of local amplifier like Smarthome's BoosterLinc.

Disable Programming

Once the SwitchLinc is set up, it can be programmed to lockout any changes. Any changes made at the unit or remotely will be ignored. Please note that all SwitchLincs, LampLincs, and KeypadLincs that are plugged in or electrically active will receive these commands and also be locked out.

1. Send the following command sequence to disable the programming:

M16	O16	P16	N16	P16
-----	-----	-----	-----	-----

The light(s) will blink (if they are on) indicating the command was received.

Re-Enable Programming (default is enabled)

1. Send the following command sequence to enable programming:

N16	M16	O16	P16	P16
-----	-----	-----	-----	-----

The light(s) will blink (if they are on) indicating the command was received.

Other Features

Power Restore

In the event of a power loss, the SwitchLinc will automatically return the lighting circuit being controlled to its last brightness level when the power was interrupted.

How Powerline Signals Travel Around A Home and How To Improve Reliability

Most homes in North America have two lines of 120 volts coming into the home from the utility company. This split-single phase electricity is divided out at the home's breaker box into the circuits that feed light switches, plug-in outlets, and appliances. Half of the electricity outlets and wall switches are fed by one of the 120-volt lines and the second 120-volt line feeds the other half. The intermittent operation of PLC/X10 modules usually happens when the transmitter is sending signals on one line and the receiver module is plugged into an outlet on the other line. For the signals to get to the receiver, it must leave the home, travel to the utility company transformer then come back in on the other AC line. By the time the signal gets back to the home, travels through the electrical meter and circuit breaker box, there may not be enough signal left to trigger the module.

The first order of business will be to install a coupler-repeater, also known as amplifier. A coupler-repeater will 'see' the incoming signal, re-generate it, and blast it out over both lines of the 120 volts. We recommend that any home larger than 3000 square feet install a coupler-repeater. In smaller homes, a passive phase coupler also known as a signal bridge may give satisfactory results.



Advanced Primary Address Programming

The SwitchLinc's Fade-on Rate and Preset On-Level can be remotely set using an Maxi-Controller (Smarthome #4020) or an equivalent transmitter capable of sending Housecode and Unit Code without ON or OFF. These procedures will not work with a transmitter that sends both the address and command on one button press (e.g. Mini-Controller).

Tip:
Whenever the CLEAR sequence is sent, you will have 4 minutes to make your adjustments.

Remotely Setting the Preset On-Level (Optional)

This is the alternative method for setting dimmer's default on-level.

1. Transmit the "clear" sequence:

O16	N16	M16	P16	M16
-----	-----	-----	-----	-----

2. Send the house/unit code for the SwitchLinc and adjust the dim level or send preset dim level.
3. Send the following command sequence to lock-in the new on-level.

P16	N16	M16	O16	M16
-----	-----	-----	-----	-----

The light(s) will blink indicating that it has set the new on-level.

Remotely Setting the Fade-On Rate (Optional)

1. Transmit the "clear" sequence:

O16	N16	M16	P16	M16
-----	-----	-----	-----	-----

2. Send the house/unit code for the SwitchLinc followed by the PRESET DIM from the table below. (Alternatively, send BRIGHT or DIM signals to change the light's brightness to a comparable level.)

Preset Dim Level	Fade-on Rate in Seconds
100%	0.1
97%	0.2
94%	0.3
90%	0.5
87%	2.0
84%	4.5
81%	6.5
77%	8.5
74%	19.0
71%	21.5
68%	23.5

Preset Dim Level	Fade-on Rate in Seconds
65%	26.0
61%	28.0
58%	30.0
55%	32.0
52%	34.0
48%	38.5
45%	43.0
42%	47.0
39%	60.0
35%	90.0
32%	120.0

Preset Dim Level	Fade-on Rate in Seconds
29%	150.0
26%	180.0
23%	210.0
19%	240.0
16%	270.0
13%	300.0
10%	360.0
6%	420.0
3%	480.0
0%	540.0

3. Send the following command sequence to lock-in the new fade-on rate

O16	P16	N16	M16	O16
-----	-----	-----	-----	-----

The light(s) will blink indicating that it has set the new fade-on rate.

Scene Address Programming

The SwitchLinc Plus Dimmer can be a member of up to 64 scenes. A scene address is a single address (just like a primary address), and is set at the time scene membership is programmed. Using a single command to trigger a scene is much less complicated than using an intelligent computer controller to initiate a macro that in turn sends dozens of commands over the next few minutes to turn on multiple receivers and set brightness levels (for dimming-enabled modules). When an ON signal is transmitted to activate a scene, all scene-enabled modules programmed to be members of that scene will turn on to their independent ON-levels **and** at their independent fade-on rates for that scene. Transmitting an OFF for a scene address will turn off all modules that are members of that scene. Modules will react to dim and bright commands after the scene address is sent, however, they will ignore All Light On and All Units Off commands for the scene address' house code.

SwitchLinc Plus Dimmer is compatible with other scene-enabled Smarthome products:

- SwitchLinc RX Plus Dimmers
- SwitchLinc Relay 2-Way Switch
- ToggleLinc 2-Way and Plus Dimmers and Switches
- KeypadLinc Wall Mounted Controllers with Integrated Dimmer
- LampLinc 2-Way and Plus Modules
- ApplianceLinc 2-Way and Plus Modules

The scenes for all these modules can be setup simultaneously using the same programming sequence. Signals sent by other Smarthome transmit-enabled products will be received and understood by the SwitchLinc Plus dimmer!

Scenes can be programmed with a Maxi-Controller or any transmitter capable of sending Housecode and Unit Code address without an ON or OFF command. Transmitters in which one button is pressed to turn a load on or off WILL NOT WORK. When using a Maxi-Controller or an equivalent transmitter, be careful when pressing the buttons. Commands will be ignored if some commands are not sent in the right sequence. "Fat-Fingering" or accidentally pressing the same button twice may prevent the programming from being accepted.



If KeypadLinc controllers are installed in the house and one of their buttons is programmed to transmit to SwitchLinc scene-enabled receivers, it can be used to quickly set up scenes (see the KeypadLinc manual for more information).

If a TouchLinc 4.0 Touchscreen is available, use the SmartLinc Lighting Control drop-in app to help automate the scene setting process. It can be downloaded from the Smarthome website at this address:

http://www.smarthome.com/files/1270_control.zip

Additionally, Timer TouchLinc has the Lighting Control application built into it.

Programming Scene Membership and On-Levels:

1. Transmit the "clear" sequence:

O16	N16	M16	P16	M16
-----	-----	-----	-----	-----

2. Activate the SwitchLinc (manually or remotely) by turning it on and adjusting the brightness to the desired brightness level for the scene. (Hint: a scene can trigger a module to go off by setting the dim level to 0%.)
3. Send the following command sequence:

M16	N16	O16	P16
-----	-----	-----	-----

4. Transmit the desired scene address (house and unit code) to lock-in new scene.
The light(s) will blink and come to 100% brightness to indicate that it has set the new scene.

Programming Scene Fade-on Rates (optional):

The fade-on rate of each in each scene is individually adjustable from .1 to 540 seconds (9 minutes). If this setting is not adjusted, the SwitchLinc will use the fade rate of the primary address for the scene.

1. Transmit the "clear" sequence:

O16	N16	M16	P16	M16
-----	-----	-----	-----	-----

2. Using an PLC Controller, send the primary address of the SwitchLinc and adjust the dim level corresponding to the fade-on rate time using the table on page 7 (brighter=faster).

3. Send the following command sequence:

N16	O16	P16	M16
-----	-----	-----	-----

4. Transmit the scene address (house and unit code).

The light(s) will blink indicating that the new fade-on rate has been set.

Removing the SwitchLinc from a Scene:

1. Transmit the "clear" sequence:

O16	N16	M16	P16	M16
-----	-----	-----	-----	-----

2. Using an PLC Controller, send the primary address of the SwitchLinc plus an ON or OFF **or** press either the ON or OFF button on the SwitchLinc.

3. Send the following command sequence:

O16	P16	M16	N16
-----	-----	-----	-----

4. Transmit the scene address (house and unit code) that is to be removed.

The light(s) will blink (if they are still on) indicating that the scene has been removed.

Tip:
Be careful not to "fat-finger" the buttons as you send these sequences.

Other Options

Factory Reset

If the SwitchLinc begins to operate strangely, the factory reset procedure can be used to clear the EEPROM's memory and restore it factory default settings. Doing this procedure will clear the unit of all scene addresses and fade-on rates.

1. Gently pull out the Status LED/ Set Button on the SwitchLinc until a click is heard. This completely removes the power from the SwitchLinc.
2. Wait five seconds, push in **and** hold in the Status LED/ Set Button.
3. Release the Status LED/ Set Button after five seconds.
4. WAIT approximately 25 seconds until the Status LED/ Set Button illuminates before using the switch. During this time, the Status LED/ Set Button will remain off and the load controlled by the SwitchLinc will be off. When the reset procedure is complete, the load will come on to 100% and the SwitchLinc is ready for initial programming or use.