



SwitchLinc™ Relay 2-Way

Remote Control Switch and Transmitter
with built-in BoosterLinc Signal Booster

**Now Includes
BoosterLinc Signal
Boosting**

For models:

#23883W SwitchLinc Relay 2-Way (White)
#23883I SwitchLinc Relay 2-Way (Ivory)

SMARTHOME™
MAKING LIFE MORE CONVENIENT. SAFE AND FUN

Congratulations !

You've just purchased the highest quality powerline-controllable wall switch available. SwitchLinc™ Relay 2-Way is built upon the SwitchLinc Dimmer platform and features a hard-contact relay that's ideal for controlling non-dimmable loads like fluorescent lights and high amperage inductive loads.

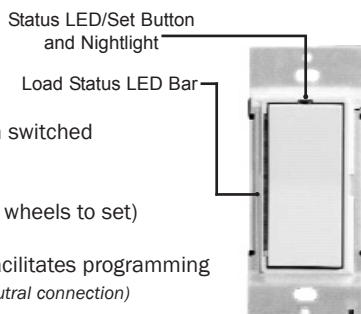
For the first time, Smarthome has included BoosterLinc™ technology in the SwitchLinc Relay 2-Way. When enabled, the BoosterLinc feature acts like a real-time repeater of PLC (powerline carrier) signals. It will boost powerline signals to allow an unlimited expansion of your automation system. Once installed and enabled, PLC signals will be boosted to improve reliability to other receivers.

SwitchLinc Relay 2-Way includes features normally found in expensive hardwired lighting systems. It can also be controlled remotely from a powerline transmitter (X10/PLC) and be a member of up to 64 lighting scenes, allowing one powerline signal to set elegant "mood lighting." It is a transmitter of powerline signals so it can be used to control other home automation devices. For advance users, it responds to status request signals over the powerline to provide feedback to a controller that the signal was received and executed.

SwitchLinc Relay 2-Way is easily installed and programmed. The address for the SwitchLinc is electronically set; there are no code wheels on the unit to adjust. It installs (connects to home wiring) just like a regular light switch. This makes it ideal for retrofits into existing homes and it easily installs in new homes, with no special training required.

Key Features

- Built-in BoosterLinc PLC signal booster
- 2-Way communications
- Super quiet relay – no disturbing "clunk" sound when switched
- Scene-ready
- True rocker action (top = on, bottom = off)
- All settings are held in non-volatile memory (no code wheels to set)
- Load Status LED "Bar" shows if the load is on or off
- Status LED/ Set Button shows powerline activity & facilitates programming
- Wires just like a standard wall switch (*Requires a neutral connection*)



Other SwitchLinc Models

SwitchLinc 2-Way Dimmer #2380W/I and 2381W/I - (White or Ivory)

SwitchLinc Plus Dimmer #2386W/I - (White or Ivory)

SwitchLinc PLC Dimmer #2384W/I - (White or Ivory)

SwitchLinc Switch #2385W/I - (White or Ivory)

SwitchLinc Deluxe Dimmer #2387W/I - (White or Ivory)

SwitchLinc 2-Way Relay Timer #23883TW/I - (White or Ivory)

SwitchLinc Relay PLC #23885W/I - (White or Ivory)

SwitchLinc RX Plus #2386(W/I)2 - (White or Ivory)

SwitchLinc RX PLC #2384(W/I)2 - (White or Ivory)

SwitchLinc RX Deluxe Dimmer #2387(W/I)2 - (White or Ivory)

SwitchLinc Multi-Way Companion Switch for 3-Way, 4-Way, & Up circuits #2382W/I - (White/Ivory)

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.
- 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.

SwitchLinc Relay is rated for loads up to 15 amps EXCEPT when incandescent and motor loads are connected. Due to the high "in-rush" current for these loads, the maximum load is 480-watts (4-Amps).

Gradateurs commandant une lampe a filament de tungstene - afin de reduire le risque de surchauffee et la possibilite d'endommagement a d'autres materiels, ne pas installer pour commander une prise, un appareil a monte, une lampe fluorescente ou un appareil alimente par un transformateur.

Quick Start Instructions

DEFAULT

Setting the Primary
Address & Booster Mode

1. Press and hold in the Set Button for 4 seconds (the LED will begin blinking and the load will come on) A-1
 2. Send the desired address from any transmitter within 30 seconds
 3. Send an "ON" to enable BoosterLinc Mode
- OR**
4. Send an "OFF" to disable BoosterLinc Mode
(see page 6 for more detailed instructions)

Factory Reset

1. Press and hold the off button for 4 to 5 seconds Resets to
2. Push and hold in the Set Button for 10 seconds, until the load turns on default settings
3. Release the Set Button
(see page 10 for more detailed instructions)

Programming a Scene

1. Transmit the "clear" sequence:

016	N16	M16	P16	M16
------------	------------	------------	------------	------------
2. Activate the switch by turning it on
3. Send the following command sequence:

M16	N16	016	P16
------------	------------	------------	------------
4. Transmit the desired scene address (house and unit code) to lock-in the new scene.
(see pages 6 & 7 for more detailed instructions)

Preparing to Install SwitchLinc Relay

Before installing SwitchLinc Relay, 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 Relay with the power on will expose you to dangerous voltages.
- SwitchLinc Relay Wiring Diagram on page 5 will help you to determine the wire colors of the connections to the SwitchLinc Relay and Multi-Way Companion Switch. Note: While the neutral connection is optional on the Multi-Way Companion Switch, the SwitchLinc Relay 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 to be 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 Relay 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 Relay 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.

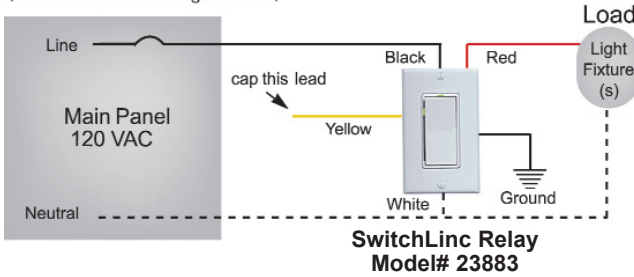
Step-by-Step Installation Instructions

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 Relay 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 instructions included with the Multi-way Companion Switch to identify the "Hot," "Neutral," "Ground," and "Traveler" wires.
6. Orient SwitchLinc Relay so the LED is at the top and make connections according to the "SwitchLinc Relay Wiring Diagram". Wire Multi-way Companion Switches (if used) according to the "SwitchLinc Relay Multi-Way Wiring Diagram".
7. 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.
8. Gently place the wires and switch into the wall box (with LED at top) and screw into place.
9. Turn the circuit breaker back on. The SwitchLinc Relay will be operational when the green Status LED will comes on.
10. After testing 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.

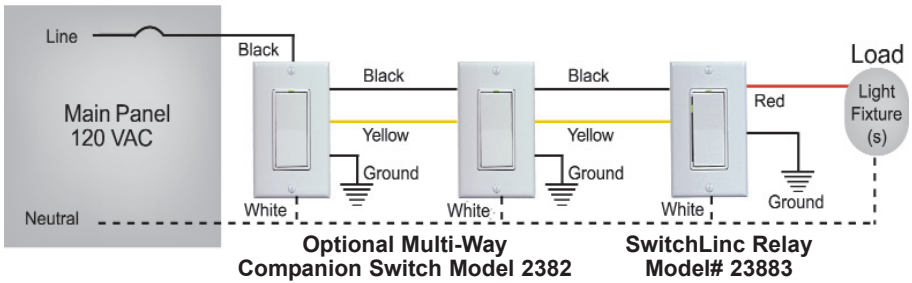
SwitchLinc Relay Wiring Diagram

(One switch controlling the load)



SwitchLinc Relay Multi-Way Wiring Diagram

(Two or more switches controlling the load)



SwitchLinc Relay 2-Way Operations

Input at Switch	Output at Load	PLC Transmission
Top rocker is tapped once (when light is off)	Load turns ON	Housecode & Unit Code Housecode & ON
Top rocker is tapped twice (when light is off)	Load turns ON	Housecode & Unit Code (once) Housecode & ON (twice)
Top rocker is tapped three times (when light is off)	Load turns ON	Housecode & Unit Code (twice) Housecode & ON (3 times)
Bottom rocker is tapped once (when light is on)	Load turns OFF	Housecode & Unit Code Housecode & OFF
Bottom rocker is double-tapped (when light is on)	Load turns OFF	Housecode & Unit Code (once) Housecode & OFF (twice)
Bottom rocker is triple-tapped (when light is on)	Load turns OFF	Housecode & Unit Code (twice) Housecode & OFF (3 times)

Setting the Primary Address

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

The SwitchLinc Relay 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.

Important: If you plan on sending status requests to the SwitchLinc Relay 2-Way, make sure that each one is programmed with a different primary address. Otherwise, their simultaneous responses to a status request will collide with one another.

Tip:

If you have trouble communicating to the SwitchLinc Relay, there may be a lot of signal activity on the powerline. Unplug transmitters that send signals that 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 in the Status LED/ Set Button for approximately 4 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.
3. Set the BoosterLinc Mode by **sending an ON or OFF Command** (see page 10 for more details).
 - a) Sending an **"ON"** command immediately after the house and unit code will activate the BoosterLinc mode.
 - b) Sending an **"OFF"** command immediately after the house and unit code will disable the BoosterLinc mode.
4. Once a valid address and command (ON or OFF) has been received, the Green Status LED will stop flashing and the load will be turned off.
5. Confirm that the address was accepted by turning it on from a remote transmitter.

Scene Address Programming

The SwitchLinc Relay 2-Way 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 scene-enabled modules, all members programmed to that address 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. (The 23883 SwitchLinc Relay 2-Way does not have dimming abilities, but some other Smarthome scene-enabled products do.)

Additionally, the SwitchLinc Relay 2-Way is compatible with other scene-enabled Smarthome products:

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

The scenes for all these modules can be setup simultaneously using the same programming sequence. Signals sent by transmit-enabled Smarthome products, like those on the preceding page, will be received and understood by the SwitchLinc Relay!

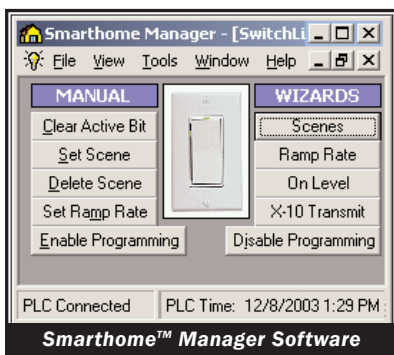
Transmitters that can set up scenes

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. Programming will be ignored if some commands are not sent in the proper 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).

Smarthome **TouchLinc Touchscreens** have a built-in wizard to help automate the scene setting process.

Many **computer programs** like Smarthome Manager, Indigo for Macintosh, HCA, and HomeSeer have tools to aid in setting up scenes and many other features. Please check with your automation software supplier for availability.



Programming Scene Membership:

1. Transmit the "clear" sequence:

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

2. Activate the SwitchLinc Relay (manually or remotely) by turning it on. (Hint: a scene can trigger a module to go off by turning the switch off during this sequence.)

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

Removing the SwitchLinc Relay from a Scene:

1. Transmit the "clear" sequence:

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

2. Using a PLC/X10 Controller, send the primary address of the SwitchLinc Relay and an ON or OFF **or** press either the ON or OFF button on the SwitchLinc Relay.

3. Send the following command sequence:

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

4. Transmit the scene address (house and unit code) that is to be removed.
5. Confirm that the address was accepted by trying to turn it on (with the scene address) from a remote transmitter.

Other Features

Disable PLC transmissions

The SwitchLinc Relay's ability to transmit may be disabled if the feature is not needed, interferes with other home automation tasks, or just to cut down on the amount of PLC signals on the lines. It can be re-enabled later if necessary. Please note that the electronics that connect the SwitchLinc Relay's transmitter circuitry to the AC line are still in place and, like all transmitters, will absorb some of the X10 signal from other transmitters. For more information, please see page 10, **"How Powerline Signals Travel Around a Home and How to Improve Reliability"**.

1. Transmit the "clear" sequence:

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

2. Activate all the switches for which you want to disable by sending the primary Housecode, Unit Code, and ON.
3. Send the following command sequence to disable the transmitter:

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

The SwitchLinc Relay's transmitter is now disabled.

Enable PLC transmissions (default is enabled)

1. Transmit the "clear" sequence:

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

2. Activate all the switches for which you want to disable by sending the primary Housecode, Unit Code, and ON.
3. Send the following command sequence to enable the transmitter:

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

The SwitchLinc Relay's transmitter is now enabled.

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

Disable PLC Reception

SwitchLinc Relay can be manually set at the switch to temporarily disable reception to all powerline signals. This may be helpful in troubleshooting signals or if maintenance is being performed on the load.

1. Press and hold the OFF portion of the paddle for 4 to 5 seconds.
2. When disabled, the Status LED blinks slowly.

During this time, the SwitchLinc will operate only manually. PLC signals will still be sent when manually controlled.

Enable PLC Reception (default is enabled)

1. Press and hold the ON portion of the paddle for 4 to 5 seconds.
2. The load will come on and a few seconds later, the load status LED will illuminate and the Status LED will come on solid.

Power Restore

In the event of a power loss, the SwitchLinc Relay will automatically return the load being controlled to its last power state before the interruption. If the load was on when the power was lost, the SwitchLinc Relay will turn back on when the power is restored.

Disable Programming

Once the SwitchLinc Relay 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, ToggleLincs, ApplianceLincs, 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 SwitchLinc Relay will now ignore changes to its programming.

Re-Enable Programming (default is enabled)

1. Send the following command sequence to enable programming:

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

The SwitchLinc Relay will now accept changes to its programming.

Switching Between Appliance and Lamp Mode

SwitchLinc Relay can be configured to behave like either a lamp or appliance module. When in the Lamp Mode, the switch will respond to All Lights On, All Lights Off (a rarely used command), and All Units Off. If the switch is in the Appliance Mode, it will only respond to All Units Off. The SwitchLinc Relay comes default to the appliance mode.

To set the switch for the Lamp Mode:

1. Transmit the “clear” sequence:

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

2. Activate the SwitchLinc Relay (manually or remotely) by turning it on.
3. Send the following command sequence:

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

To set the switch for the Appliance Mode:

1. Transmit the “clear” sequence:

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

2. Activate the SwitchLinc Relay (manually or remotely) by turning it on.
3. Send the following command sequence:

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

Querying SwitchLinc

It is possible with some home automation interfaces and products to query the status of a SwitchLinc Relay 2-Way. It will respond to Status Request signals that are received for its base address. The sample session on the right is from a PowerLinc Controller.

Example: SwitchLinc is ON	Example: SwitchLinc is OFF
Sent by Interface A Unit(1) House A, Unit(1), Status Request	Sent by Interface HC: A Unit(1) House A, Unit(1), Status Request
Received from SwitchLinc House A, Unit(1), Status is ON HC: A Unit(1) House A, Unit(1), On	Received from SwitchLinc House A, Unit(1), Status is OFF HC: A Unit(1) House A, Unit(1), Off

Factory Reset

If the SwitchLinc Relay 2-Way begins to operate strangely, the reset procedure can be used to clear the EEPROM's memory and restore its factory default settings. Doing this procedure will clear the unit of all scene addresses.

1. Press and hold the OFF portion of the paddle for 4 to 5 seconds until the Status LED blinks slowly.
2. Push and hold in the Set Button for 10 seconds, until the load turns on.
3. Release the Set Button
4. The reset procedure is complete. The SwitchLinc Relay 2-Way is ready for initial programming or use.

Hints for using the BoosterLinc Mode

- Unlike the Plug-In BoosterLinc (#4827), SwitchLinc Relay 2-Way does not repeat signals from single-phase onto three-phase electricity.
- SwitchLinc Relay 2-Way is able to boost signals that are weak, but not totally gone. If the receiver circuit can't detect the signal, it won't be boosted.
- While the BoosterLinc feature in SwitchLinc Relay 2-Way works well in homes that don't have a phase coupler (sometimes called a signal bridge), it works better when a coupler is installed. We recommend a SignalLinc™ Plug-In Phase Coupler (#4816A2 or 4816B2) or Hardwired SignalLinc™ Phase Coupler (4816H). The BoosterLinc feature is compatible with traditional coupler-repeaters.
- Multi-gang wall boxes that contain multiple BoosterLinc-enable products, only one unit should have the BoosterLinc feature enabled. The other units should have their BoosterLinc feature disabled.
- It is unlikely that more than one BoosterLinc-equipped product will be required on a single line serviced by the same circuit breaker.
- Having too many BoosterLinc-enabled products installed (and the BoosterLinc feature turned on) may cause false-positive signals. If you notice strange happenings or unusual events with your automation system, disable the BoosterLinc mode.
- The BoosterLinc feature has been tested and found to be compatible with all current X10 powerline products. However, it may interfere with other current or future powerline carrier technologies. Disabling the BoosterLinc mode and observing the results from the other powerline carrier system may confirm interference.

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.



10 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.

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 looks 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.



Smarthome's BoosterLinc™ can solve localized problems

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-Ways, SwitchLinc™ 2-Ways, ToggleLinc™ 2-Ways, ApplianceLinc™ 2-Ways, KeypadLinc™ Controllers, 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 multiple 2-way devices on one branch circuit may necessitate the use of local amplifier like Smarthome's BoosterLinc.

Helpful Tools

Maxi-Controller

This plug-in transmitter has the ability to send individual commands. Some of the KeypadLinc and SwitchLinc advanced programming features need to be programmed with individual button presses in order to set certain features.



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 X10 module. Generally, it's ideal to have at least 100mV at each location. Conservative installers will want even more. Visit Smarthome's web site to learn more about these tool at www.smarthome.com

Helpful Hints for New Construction

By design, X10 (also known as PLC) 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 automation switch is dimming-enabled and 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, which 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.
4. Install a whole-house surge suppressor. Adding a good whole-house surge protector at the breaker will help protect against costly damage to the PLC components and other delicate electrical equipment.
5. Install a 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 recommended for homes of 3,000 square feet or greater. Smaller homes will generally 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 and laundry appliances plus the heating systems on one phase will help keep potential noise off the signal-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 a PLC 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 addresses. Examples of PLC Addresses are A-1, B-5, P-15, O-9.
- X10 Command-** The Command is action part of a PLC 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 Timer, have the ability to report their status when asked. These modules contain transmitters that can send 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 it was turned off. *(Not used in the non-dimmable SwitchLinc Switch or SwitchLinc Relay series)*
- PreDim Level-** One of 32 brightness levels the SwitchLinc can instantly (or slowly) change the light's brightness to a predefined brightness level. *(Not used in the non-dimmable SwitchLinc Switch or SwitchLinc Relay series)*
- Scenes in SwitchLinc-** SwitchLinc Wall Switches can be set up to respond to multiple signals and when received come onto a predefined brightness level all with one signal. One scene signal from a KeypadLinc or any transmitter 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 Timer.
- X10 Keypress-** This is a 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-** A 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-** A receiver that is used to control only lighting devices. It may contain dimming control or it may have a hard contact relay. A Lamp Module will respond to the All Lights ON command. SwitchLinc Timer is defined as a lamp module so it will respond to the All Lights On for the primary address housecode.
- 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 rear of 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 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.

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 scenes from SwitchLinc, or perform a Factory Reset to reset SwitchLinc to factory defaults. Install an Signal Blocker for the home.
The switch makes a click when turned on or off.	It is normal for a relay-based wall switch to make an audible click.	SwitchLinc Relay uses a hard contact relay that will produce a audible click when the switch is turning on or off.
SwitchLinc will not take programming of a scene or the primary address.	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 X10 address during Step 2 of programming.
SwitchLinc is not transmitting (will not control a scene).	SwitchLinc may be in Disable PLC Transmit mode.	Re-enable PLC Transmit Mode or perform a Factory Reset to reset SwitchLinc to defaults.
	Other transmitters are loading down the circuit.	Install a coupler-repeater or BoosterLinc(see page 10 for more info).
	Make sure the SwitchLinc can transmit	The similar-looking SwitchLinc Relay PLC switch can't transmit.
SwitchLinc is locked up.	Surge in power line.	Reset SwitchLinc by cycling the power at the circuit breaker that controls it.
LED is not visible and or SwitchLinc is not controlling the light.	SwitchLinc does not have power.	Check that the circuit breaker is on.
	Incomplete (open) wire connection in wall box.	Check wall box wires to ensure all connections are tight and no bare wires are exposed.
	Incomplete (open) wire connection at fixture.	Check fixture to ensure all connections are tight and no bare wire is exposed.
SwitchLinc is unable to brighten or dim other modules.	The 23883 SwitchLinc Relay does not have the ability to dim or send dim signals.	If your load can be dimmed without damaging it, consider using the 2380 SwitchLinc 2-Way Dimmer .
Existing switch only has two wires.	SwitchLinc needs a neutral wire in order to operate.	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 10mV of signal strength for reliable operation, (50mV is better); an amplifier or a signal bridge may be needed (see pg.10).
The relay inside the SwitchLinc chatters when turned on.	The in-rush of current across the relay contacts is causing them to mechanically vibrate.	The electrical characteristics of the load are contributing to this problem. Installing a noise filter like Smarhome #4835 will help lessen the affect the load is having on the SwitchLinc Relay.
SwitchLinc turns on, but not off by remote control.	The load is producing electrical noise and it 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.

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

- 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

Specifications

- Load types: Permanently installed incandescent, inductive, and fluorescent loads
- Operation: Relay (15-amp rated)
- Maximum load: 15 Amps for resistive loads, 480-watts for incandescent and inductive loads
- 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
- Maximum SwitchLincs per gang box: 4
- Maximum number of SwitchLincs per circuit: 10 (with more than 5, a BoosterLinc Amplifier (#4827) is highly recommended)
- Minimum load: No minimum load required
- Operating temperature range: 40° F to 104° F
- Minimum PLC transmit level: 2V
- Minimum PLC receive level: 10mV
- Maximum PLC signal rejection: 200mV
- Mounting: Mounts in single or multiple-ganged J-box
- Status indicator: Green LED
- On indicator: One Green LED on the side bar
- Dimensions:

	Front Bracket	Main Body
(Width)	1.73"	1.74"
(Height)	4.14"	2.71"
(Depth)	1.73"	1.40"
- Weight: 4.0 oz
- Safety tested for use in the U.S. and Canada

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450W integrated
dimmer**

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>

About SwitchLinc Relay's Certification

SwitchLinc Relay 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

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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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