

About ApplianceLinc's Certification

ApplianceLinc 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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Limitations:

THE ABOVE WARRANTY IS IN LIEU OF AND SMARTHOME DISCLAIMS ALL OTHER WARRANTIES, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH MAY NOT BE DISCLAIMED OR SUPPLANTED AS PROVIDED ABOVE SHALL BE LIMITED TO THE ONE YEAR PERIOD OF THE EXPRESS WARRANTY ABOVE. NO OTHER REPRESENTATION OR CLAIM OF ANY NATURE BY ANY PERSON SHALL BE BINDING UPON SMARTHOME OR MODIFY THE TERMS OF THE ABOVE WARRANTY AND DISCLAIMER.

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



ApplianceLincTM

Plug-in PLC Appliance Module

For models:

#2001SHL

ApplianceLinc PLC

#2002SHL

ApplianceLinc PLC with ground pin

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Troubleshooting & Technical Support

Problem	Possible Cause	Solution
The load turned on by itself.	ApplianceLinc was triggered by a legitimate PLC signal.	Check primary address is what was learned or perform a Factory Reset to clear the module. Install an PLC Signal Blocker in the home to keep stray signals from neighboring homes from interfering.
The load does not come on when the switch is manually activated.	The Local Control feature may be set to off (set during primary address setting).	Re-set the primary address by sending the house and unit code followed by an "ON" command.
ApplianceLinc is not taking programming.	Program Disable mode is on.	Re-enable Program Mode or perform a Reset.
ApplianceLinc is not receiving signals from transmitters.	Other modules are loading down the signal.	Install a coupler-repeater, a BoosterLinc, or a phase coupler like SignalLinc.
	The module is plugged into a power strip.	PLC signals can't travel through power filters. Plugging the ApplianceLinc directly into the wall works best.
	Move the transmitter to another outlet.	ApplianceLinc needs 50mV of signal strength for consistently reliable operation. Also, the Green Status LED will blink when there is any activity on the powerline
The module is locked up.	A surge or excessive noise on the power line may have glitched it.	Unplug the module for a 10 seconds and re-install.
		If the above doesn't work, perform a Reset.
The ApplianceLinc does not fit in my North American wall outlet.	The polarized prongs are not compatible with older AC outlets.	The ApplianceLinc 's AC prongs are polarized so that it may only be inserted one way into a receptacle. If the home's outlets are over 40 years old, replacing the outlet with a modern one will allow the ApplianceLinc and many other modern devices to be used safely. DO NOT defeat this safety feature.
The light does not come on when manually switched on or when an "ON" signal is sent.	Some type of bulbs, especially compact fluorescent lamps can confuse the ApplianceLinc.	Set the Local Control feature to OFF. Go into the Set Primary Address mode (press and hold the Set Button), send the address, (e.g., M8) and an "OFF" command.
When setting the Primary Address, the indicator LED continues to flash after sending the address.	The user is not pressing "ON" or "OFF" to set the Local Control Mode	After sending the PLC signal for the Primary Address, an "ON" command needs to be sent to enable local control. An "OFF" may be sent if local control is not preferred.
When the light is off, occasionally the bulb flashes.	A fluorescent bulb is installed in the lamp controlled by the ApplianceLinc.	The local control sense voltage is charging up components inside the compact fluorescent bulb. When enough electricity is stored, it produces a flash. Setting the Local Control option to OFF will fix this. Also, some brands of CFL's don't do this.

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

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

Quick Start Instructions

Setting the Primary Address

1. Press and hold the Set Button for five seconds (the load will come on)
2. Send the X10/PLC signal from any transmitter within 30 seconds
3. Send an "ON" to enable local control

OR

4. Send an "OFF" to disable local control
(see page 4 for more detailed instructions)

Factory Reset

1. Unplug the ApplianceLinc for 10 seconds
2. Holding down the Set Button, plug in the ApplianceLinc
3. Continue holding the Set Button for three seconds then release
4. After 30 seconds, when the load comes on, the ApplianceLinc is reset
(see page 7 for more detailed instructions)

Installation

1. Turn off the appliance or light to be controlled by the ApplianceLinc and unplug it from the wall
2. Plug the ApplianceLinc module into the receptacle; the Green Status LED indicator will come on
3. Insert the appliance or light's AC plug into the bottom outlet of the ApplianceLinc
4. Turn on the power switch for the appliance or lamp; the device will come on

Installation Tips

Due to the size of ApplianceLinc, it will block the bottom outlet of a duplex wall receptacle if plugged into the top outlet. If possible, use the bottom outlet for the module so that the top outlet is accessible for other use. For convenience, a pass through receptacle has been supplied on the module so you don't lose a receptacle.

If the ApplianceLinc is plugged into a receptacle controlled by a wall switch, consider leaving the switch on at all times. This will ensure that the module never loses power and is always functioning. If the outlet is switched off, the ApplianceLinc will turn the light back on if it was on when the power was switched off.

Setting the Primary Address

Each ApplianceLinc 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 addresses can be programmed.

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

1. Press and hold the Set Button above the green indicator on the right side of the module for 5 seconds until the LED begins blinking and the load being controlled by the ApplianceLinc comes on (you'll also hear a click from within the ApplianceLinc Module).
2. Within 30 seconds, transmit the desired primary address (housecode and unit code) from any transmitter.
3. Next, set the Local Control Feature by sending an ON or OFF Command (see page 9 for more details).
 - a) Sending an "ON" command immediately after the house and unit code will activate the load control feature. (Recommended)
 - b) Sending an "OFF" command immediately after the house and unit code will disable the load detect feature. (Recommended if the ApplianceLinc is controlling a fluorescent lamp.)
4. Once the ApplianceLinc has received a valid address and either an "ON" or "OFF", the Green Status LED will stop blinking and the load controlled by the ApplianceLinc will remain turned on.

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

Controlling the ApplianceLinc Remotely

The ApplianceLinc responds to any of the 256 X10/PLC addresses. It will respond to ON, OFF, and ALL UNITS OFF commands. It ignores ALL LIGHTS ON, DIM, BRIGHT, AND PREDIM commands. The ApplianceLinc can be controlled remotely from any compatible transmitter by sending its base address (e.g., M6) and the command.

Specifications

Load Types:	All plug-in loads up to the rated maximums below
Maximum Load:	15 Amp Resistive, 480 Watts for Inductive and incandescent loads
Addresses:	1 PLC (X10) Base (Primary) Address of 256 possible.
Scene Addresses:	Up to 64 PLC (X10) Scene Addresses of 255 possible
Maximum number of ApplianceLincs per circuit:	10
Minimum load:	None
Minimum PLC receive level:	10 mV
Surge Protection:	MOV rated for 150 Volts
Feed through outlet:	Max 15 amps less the load controlled by the ApplianceLinc module
Input Power:	120 Volts AC +/- 10%, 60 Hertz, 100mA (Idle)
Operating Temperature:	32 to 122 degrees Fahrenheit
Dimensions:	4"(h) x 2.5"(w) x 1.5"(d)
Weight:	4.37 oz

SMARTHOME
design

Invest in better Home Automation Products

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



**KeypadLinc 6
with 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>

How Powerline Signals Travel Around A Home and How To Improve Reliability *(continued)*

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-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 ApplianceLinc is set up, it can be programmed to lockout any changes. Any changes made at the module (by pressing the Set Button) or remotely will be ignored. Please note that all Smarthome-brand modules, switches, or transmitters that are plugged in or electrically active will be locked out.

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

M16	O16	P16	N16	M16
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Re-Enable Programming *(default is enabled)*

1. Send the following command sequence to enable programming:

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

Other Features

Power Restore

In the event of a power loss, ApplianceLinc will automatically return the load being controlled to its last power state when the power was interrupted. If the ApplianceLinc is plugged into an outlet that is controlled by a wall switch, turning on the wall switch will restore power to the module and it will come back on to its last state.

Factory Reset (to default settings)

The factory reset procedure can be used to clear the ApplianceLinc's memory and restore its factory default settings. This procedure will clear the unit of all addresses.

1. Unplug the ApplianceLinc from the receptacle for about 10 seconds.
2. While holding down the set button on the lower right-hand side, plug it back in.
3. After plugging the module back in, continue to hold down the set button for about 2 or 3 more seconds.
4. Release the set button; the Green Status LED will remain on.
5. After 30 seconds, the load will turn on and the module will be reset to primary address A-1 and ready for programming or use.

Understanding the Local Control

The local control feature allows a user to turn on a lamp or appliance without having to send a signal to the ApplianceLinc module. The controlled load can be turned on and off manually by the switch on the device (i.e. a switch on a lamp). The local control feature can be successfully used with most loads including heaters and incandescent lamps.

However, some loads may cause the circuit to malfunction. In particular, we have found that fluorescent lights, devices with motors, and other electric/electronic controls may result in false triggering. This may happen when an OFF command is sent to the module and it turns back on a few seconds later. For these loads, it is recommended that the load detect feature be turned off, (by sending an OFF during the setting of the primary address).



ApplianceLinc 2-Way Modules will transmit an ON command for the primary address when the controlled load is switched from OFF to ON. It will not send an OFF command when the load is manually switched off.

Controlling Devices that have a "Soft-Switch"

Some AC powered devices found in homes today may not turn on when controlled by an ApplianceLinc module. These devices may have a "soft-switch", which is an electronic switch that controls the ON/OFF status of the device. Simply applying power to the device may not cause it to turn on.

A soft-switch controlled device will require either a manual pressing of a power button on the device or a remote control signal. The most common example of a soft-switch operated device is a television. Simply plugging in a television does not cause it turn on and displaying a picture. Instead, when it is plugged in, power is applied to some circuits, like the remote control receiver in the set. To turn it on, one must press the physical POWER button on the set or on the remote control. Most home entertainment gear and computers operate by way of a soft switch.

You can test your device for compatibility with ApplianceLinc by turning on the device while still plugged into the outlet. Then, remove the AC cord from the wall and wait a few seconds. After a few moments, plug the AC cord back into the wall and observe if the device turns on. If it does, then ApplianceLinc will be able to turn it on. Otherwise, ApplianceLinc can only turn off a device like this (with a soft switch).

If the device fails the test above and has an infrared remote control, you can still use PLC commands to control it. Smarthome's IRLinc #1623 is an intelligent controller that can accept regular PLC commands and send out infrared remote control signals to the device. Up to 31 IR commands can be taught to the unit and associated to PLC signals. Please visit the Smarthome web site or your distributor for more information.



#1623 IRLinc Controller

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.

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.



#4826B
Signalinc™ Repeater