



IR Linc™

Control Audio-Video equipment with X10/PLC signals in you home!

Model #1623 IR Linc

SMARTHOME™
MAKING LIFE MORE CONVENIENT, SAFE AND FUN

Congratulations!

Congratulations on purchasing IR Linc, the smallest and easiest gateway for IR automation control. The IR Linc offers the easiest way to add IR automation to your home. For years, many home automation enthusiasts have struggled with controlling audio and video devices. Regular plug-in modules and even specialized universal modules can't turn on a TV or change the volume on a stereo. IR Linc will accept regular powerline PLC/X10 signals and generate IR signals that your AV equipment understands.

Just plug the supplied power module into a standard wall receptacle and place the IR Linc in position, it is that simple. No tools required, no in-wall devices or wires needed, and no hassle installation.

Key Features

- Two built-in IR blasters
- Built-in IR sensor for learning IR signals from existing remote controls
- Three jacks for attaching additional emitters (single/double or blast)
- External power sensing when used with Smarthome Probes
- Front panel status indicators
- No computer or other supporting equipment required for on-going operation
- Non-volatile memory. Contents will be retained after a power outage.
- Small sized

Other Complementary Smarthome Products

Your IR Linc is ready to be used by most any powerline-based product on the market. However, when teamed up and used with other Smarthome automation products, you can transform the whole home's automation system to the same level and sophistication normally found in multi-million dollar homes.

PC to IR Linc™

Control your whole-house audio or home theater system from the comfort of your PC. While it is very much like the IR Linc, it is essentially a powerful learning remote that transmits IR signals in response to an RS-232 signal. It learns IR codes from your existing remote controls or uses the built-in library of IR codes. All the programming is stored on a Windows-based computer, so there are fewer memory constraints than the IR Linc.



TouchLinc™ Touchscreen Controller

Smarthome's innovative TouchLinc Touchscreen controller lets you easily control all of your PLC-controllable home systems, including lighting, appliances, heating & air conditioning, automated drapes, and even home theater (with the help of an intelligent controller), through a single intuitive display. Subsections for controlling audio and video products are included, or make up your own series of menus and label them how you like!



Parts included with the IR Linc kit

- The IR Linc controller box
- PowerLinc™ II PowerLine Adapter
- Double headed Stick-on IR Emitter
- PowerLinc II connecting cable



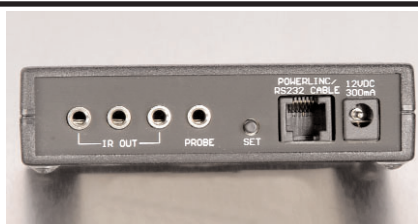
Please note that the PowerLinc II adapter is designed to only work with the IR Linc controller box. While it resembles our regular # 1132B

PowerLinc II adapter, the two are incompatible and not interchangeable. The included PowerLinc adapter contains special circuitry and programming to support the IR Linc control box.

Overview



- The **Active** indicator will show that the unit is ready to learn IR signals. During normal use, it will blink when IR signals are transmitted.
- The two **IR/Learn** blast emitters emit IR light to control the AV devices. During programming, they sense the IR light from the teaching remote.
- The **Probe** indicator is used to indicate when a Smarthome probe is detecting an ON condition. It is also used to during learning and will blink when PLC/X10 signals are detected on the power line.



- The three **IR Out** jacks for optional external IR emitters.
- The **Probe** jack will accept the Smarthome Probes to monitor the power status of equipment.
- The **Set** button is will put the IR Linc into the learning mode, clear learned commands, or clear the memory.
- The **Powerlinc/RS232 Cable** jack connects to PowerLinc II supplied with the IR Linc.
- The **12VDC, 300mA** is not used on the IR Linc, power for the unit is supplied by the PowerLinc II adapter.

Quick Start Instructions








Learning
an IR
Command

1. Press and hold the "Set" button for about one second. The red "Active" indicator will begin to blink rapidly.
2. Press the button on the teaching remote. Once the "Active" indicator turns off, release the button on the remote control.
3. The green "Probe" indicator will begin to flash indicating that the IR Linc is ready to receive PLC commands to associate with the learned IR signal.
4. Send the PLC signal. The green indicator will turn on solid, then off.

(See page 6 for more detailed instructions)

Optional Accessories for the IR Linc

A level of intelligence can also be added to the IR Linc by using it with one of the Smarthome Probes. Probes may be used for many purposes including detecting the power status of an AV device.

<p style="text-align: center;">TV Detector Probe #8012</p> 	<p style="text-align: center;">Light Detector Probe 8013</p> 	
<p>Senses the presence of the high frequency RF emissions of a TV when it is on. Place the white "Whip" near the rear of the set.</p>	<p>This sensor can be placed over the location of an LED or any other light source to sense if the AV device is on.</p>	
<p style="text-align: center;">Digital Input Low Voltage Detector Probe #8015</p>	<p style="text-align: center;">Video Detector Probe #8016</p>	
		
<p>This probe can be attached to any device that generates a 3-28 volt (AC or DC) signal. Some AV equipment have low-voltage outputs that may be used to detect the device's power status.</p>	<p>Detects the presence of a baseband video signal when connected to the VIDEO OUT jack. Can't be used with video gear that outputs a blank or blue screen when switched off (or in stand-by).</p>	
<p style="text-align: center;">Contact Closure Probe #8018</p>	<p style="text-align: center;">Extra Emitters</p>	
		
<p>This probe is ideal for detecting the condition of a dry-contact switch. Some AV receivers have dry-contact relays open or close when powered on or off.</p>	<p style="text-align: center;">Blast IR Emitter#8174</p>	<p style="text-align: center;">Stick-on Emitter 8171S</p>
	<p>Using Mini Stick-On IR Emitters or Blast Emitters can increase the controller's flexibility. The #8174 Blast Emitter will have a range of four to seven feet when used with the IR Linc.</p>	

Installation

The IR Linc should be installed in a location that has a standard 120-volt household receptacle readily accessible. If external Mini Stick-On IR Emitters are not being used, place the IR Linc in a location that allows the built-in IR blasters to be within line-of-site of the equipment. When Mini Stick-On IR Emitters are used, the IR Linc can be placed in any location since the built-in IR blasters will not be used. Once the location has been finalized, place the IR Linc in that location and plug in the PowerLinc II Interface. Plug in any Mini Stick-On IR Emitters and/or probes into the appropriate jacks. The IR Linc is now ready for use.

Installation Tips:

- 1 The built-in IR blaster's light can sometimes be reflected. Therefore, direct line-of-site may not be necessary depending on the reflecting surface or objects the IR Linc is facing and the distance to the equipment. Experimentation with bouncing the IR signal off of surfaces and objects may allow the IR Linc to be placed in a location, other than direct line-of-site.
- 2 Any combination of Mini Stick-On IR Emitters may be used with the built-in IR blasters. Plugging in Mini Stick-On IR Emitters does not disconnect the built-in IR blasters. Using this combination method allows IR Linc to control equipment that is in direct line-of-site and A/V gear using Mini Stick-On IR Emitters.
- 3 While the IR Linc can be placed in an inconspicuous location when Mini Stick-On IR Emitters are used, the unit should be readily available for programming. The "Active" and "Probe" indicators can be used as a visual indication of IR transmissions and equipment status. The IR Linc can be programmed in one location, and then transported to its final location without losing the stored data.
- 4 Be careful plugging in external emitters on the rear of the unit. **If an emitter is plugged into the Probe jack, it will be instantly destroyed!**

Tip:
Stick-on emitters are the most reliable method of communicating to AV gear.

- 5 When using stick on emitters, it is important that to find the IR sensor on the equipment and place the emitter directly over the sensor. Use a flashlight to look into the display or bezel of the equipment to find the sensor. Sometimes, using the original remote control and covering the front of the equipment with an object or thick cloth can help locate the sensor. Try placing a computer mouse pad over the equipment and working from right to left, move the mouse pad (to the left and exposing the right) while shooting the remote at the equipment until a response from the equipment to the IR signals is observed. For example, holding down the volume button on the remote control as the mouse pad is moved to the left. When the unit begins increasing the volume, the approximate location of the IR sensor on the equipment has been found. Next, use the same technique starting at the top of the equipment to find the exact center of the sensor. Now that the approximate vertical and horizontal of the sensor is known, use a flashlight to find exactly where it is.



Place the stick on emitter over this location!

Once the IR Linc is installed, the unit can be programmed with IR commands. However, it is recommended that a factory reset be performed before programming. This will ensure that all the memory has been cleared of codes learned during quality testing and it will also indicate that the IR Linc is setup and operating correctly. See page 9 for details.

Learning an IR Command

The IR Linc uses powerline (PLC/X10) commands for communications. A compatible transmitter will be needed before learning IR commands. A ControLinc Duo (Smarthome #4071) or X10 Maxi-Controller (#4020) is ideal for programming the IR Linc. Up to seven different PLC functions can be used for each house/unit code. The different codes are selected by the appropriate PLC function code. The function code will determine how the IR command is transmitted. Refer to the following table for a list of the available function codes:



PLC Function Code	Operation
ALL LIGHTS ON*	IR command turns ON a device. The probe will be checked first and if the device is already on, the command will be ignored.
ALL UNITS OFF**	IR command turns OFF a device. The probe status will be checked first and if the device is already off the IR command will not be sent.
ON	Normal IR. Only one IR command will be sent upon receipt of the a powerline signal.
OFF	Normal IR. Only one IR command will be sent upon receipt of the powerline signal.
BRIGHT	IR command is for continuous control functions like volume up or channel up. The IR command will be sent as long as the BRIGHT command is being received.
DIM	IR command is for continuous control function such as volume down or channel down. The IR command will be sent as long as the DIM command is being received.
House - Unit Code (repeated)***	Normal IR. Only one IR command will be sent upon receipt of the powerline signal.

*To transmit the learned IR command send house/unit code and house code + "ON" from any powerline compatible transmitter (i.e. A1, AON).

**To transmit the learned IR command send house/unit code and house code + "OFF" from any powerline compatible transmitter (i.e. A1, AOFF)

***To transmit the learned IR command, send house/unit code once (i.e. A1).

To learn an IR command, follow these steps:

1. Disconnect any probe connected to the IR Linc.
2. Press and hold the "Set" button for about one second and release.
3. The red "Active" indicator will begin to blink rapidly; the IR Linc is now ready to learn an IR signal.
4. Point the remote control at the two built-in IR blasters on the front of IR Linc.
5. Press the button on the remote control that is to be learned. Once the red indicator turns off, release the button on the remote control. The IR signal has been successfully learned into the IR Linc.

6. The green "Probe" indicator will begin to flash indicating that the IR Linc is ready to receive PLC commands to associate with the learned IR signal.
7. From a compatible transmitter, send the house/unit code that is to be identified with this IR signal followed by the function code (ON, OFF, Dim, etc.).
8. The green indicator will turn on solid for a few seconds to indicate that it successfully received the PLC commands then turn off.

Learning Tips:

- The remote should be level with the IR Linc and directly in front on it. The emitter on the front of the remote should be located directly between the two built-in IR blasters on the front of the IR Linc and located about 1 to 2 inches from them.
- The remote should have fresh strong batteries. If commands are not being learned correctly or it takes multiple tries, try changing the batteries.
- Since the green "Probe" indicator is used to indicate status during learning cycles, the probe be disconnected during learning.
- The IR learning time is fixed at no more than five seconds. IR Linc will allow 15 seconds for the capturing the associated powerline signal.
- Sunlight, florescent light sources and plasma screen monitors can interfere with IR reception. The best learning will occur in darkened rooms.
- The length of time the teaching remote's button is held down can have an effect on learning success. In some cases, the button may need to be held down longer than normal for the IR Linc to successfully sample the signal. Other times, it may only need to be held down less than a second.



Errors that can occur during learning

If powerline commands are sent while the green "Probe" indicator is blinking and the green indicator turns off instead of going solid, the IR command was not learned properly. The command was not saved to memory and no deleting is necessary. Re-teach the IR command by following the instructions above. Sending a powerline command during the IR learning cycle will take the IR Linc out of the learning mode.

Tip:
Unplug or disable other PLC/ X10 transmitters in the house during programming. This will reduce the likelihood of an unintentional signal being learned by the IR Linc.

The IR Linc has a finite amount of memory for learning IR commands. The total number of commands it can learn is based upon the length of each IR command. A maximum of 31 IR commands can be learned, assuming that the sum of each command does not exceed the IR Linc Controller's memory. If the green "Probe" indicator goes solid and then turns off instead of blinking after the command is learned, the memory is full.

Deleting Individual IR Commands

A learned IR commands can be deleted at any time. To delete an IR command, follow these steps:

1. Press and hold the "Set" on the back of the IR Linc for one second
2. The red "Active" indicator will begin to blink rapidly
3. Send the PLC house/unit code and function code for that IR command
4. The green "Probe" indicator will turn on for a few seconds then turn off
5. Once the "Active" indicator stops blinking, the IR command has been deleted

Macros

IR Linc comes with a powerful macro feature that allows more than one IR command to be learned under a single powerline command. This allows the user to transmit multiple IR commands with only a single command. When a single command is received, the IR Linc will transmit IR signals in the order that they are learned.

For example, when A1 AON is received, all the IR commands used to turn on the TV and VCR then play a movie can be learned. To do this, learn the commands in the following order:

TV Power	(Turns on the power to the TV)
VCR Power	(Turns on the power to the VCR)
TV Channel 3	(Changes the TV to channel 3)
VCR Play	(Starts the VCR playing back the tape)

Each time an A1 AON signal is received, IR Linc will transmit all of these commands, in the order they were learned.

To teach the IR Linc a series of IR commands to be used in a macro, each command will be learned individually. That is, each IR command will go through steps 1 through 8 on page 6. The only difference is that in step 7, the PLC command sent is the same for all the IR commands.

Multiple IR signals can also be learned to the PLC commands that check probe status. The IR Linc will send out the multiple IR commands as it would under a normal command except that it checks the probe status before it sends out each IR command. If the probe status changes while it is going through the macro list it will stop at that point in the macro list and not transmit the remaining IR commands.

Other Features

Powerline Activity

If a probe is not being used or it is attached, but not detecting that the AV device is powered on, the green "Probe" indicator is used to indicate activity on the powerline. When IR Linc sees a valid command on the powerline, whether it is for the IR Linc or not, the green "Probe" indicator will flash. This can be used for troubleshooting or to ensure the IR Linc is plugged into a receptacle with good signal strength.

Probe Status

IR Linc will transmit powerline commands based on the probe's status. When a probe goes from an "OFF" condition to an "ON" state, IR Linc will transmit the house/unit code associated with the learned IR command that checks the probe status plus the house code + "ON". For example, if an IR command were learned under A1, A ALL LIGHTS ON, (the function code indicates that it will check the status of the probe), IR Linc will transmit A1, AON when the probe went to the "ON" state. If the probe goes from "ON" to "OFF", IR Linc will send A1, AOFF. If there is more than one house/unit code associated with checking the probe's status, IR Linc will send out the house/unit code that was last learned.

Problem	Possible Cause & Solution
The IR Linc appears to be locked up.	Remove and reset the power. Disconnect all the emitters and the probe, and unplug the unit for three minutes, then reconnect. If it is still locked up, perform a factory reset.
How can I get the power ON command to only be issued if the AV device is off?	Some AV devices have discrete IR signals for power on and off. If the remote control has these buttons, use them. Otherwise, use a Smarthome Probe. The IR command will be taught to the IR Linc with any address and the All Light ON command. See Probe Status on page 8
I am having problems learning one of my remote controls into the IR Linc.	There could be several factors causing this problem. Check the tips on page 7. The remote's IR frequency may be beyond the normal 40kHz. Excessive IR light or brightly lit room could cause problems. Teaching IR Linc in a dark room produces the best results.
When an powerline command is sent, the Probe LED does not blink.	The PowerLinc II adapter is not "seeing" the powerline signal. Make sure the adapter is not plugged into a power strip that filters the electricity. The equipment electrically near the adapter may be sucking up PLC signals or you may need a phase coupler for the powerline signals. Visit http://www.smarthome.com/project_x10.html to learn more.
How can I speed up the to IR system?	The IR Linc will send IR signals when the first address is received. If a home automation interface is being used, try sending only the address, which is sometimes known as a "Keypress" command. The only exception to this is when an IR command is learned as "Continuous" in which case the Bright and Dim commands are used to trigger an IR output.
Can the IR Linc be used on 230-volt systems like those found outside of North America?	It can't be used on 230-volt electrical systems, even with a step-down transformer. A voltage-converting transformer will block powerline signals. The PowerLinc II adapter (which contains special circuitry the IR Linc box needs) is not substitutable with other powerline interfaces.
Sometimes the signals from the built-in blaster don't trigger the AV device.	Using the blast emitters on the front of the IR Linc is the least reliable method of controlling AV devices. We don't recommend bouncing IR signals off walls, doors, or other surroundings. Additionally, external IR light interference from sunlight, fluorescent lights, and plasma screen monitors may hamper reliable operation. By using Mini Stick-on emitters, most IR light reliability problems can be overcome.
How can I get around the 31 IR command limit.	The memory of the IR Linc can't be increased and the commands can't be compressed. By investing in a second IR Linc, the work can be divided and in most cases, two IR Linc Controllers controlling a complex home theater system will cut down on total set up time after a command has been issued.
How do I get an IR command to repeat, like for volume up/down?	When teaching the IR commands to the IR Linc, after sending the address for the command (F4, P12, etc.), press the BRIGHT or DIM button on the controller. You will need to use a 4020 Maxi-Controller for this or a controller that can send addresses and commands separately. See page 6 for more information.
I can't see my Mini Stick-on Emitters blink when a command is sent.	Most brands of Mini Stick-on Emitters don't produce visible light we humans can see.
I plugged the emitter into the "Probe" jack accidentally, now it does not work.	The emitter was most likely destroyed. The "Probe" jack's voltage is a little too much for the emitter to handle. Sorry about this, but we warned you about this back on the installation section (step 4) on page 5.

Still having trouble....

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

- 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

Specifications

- Number of IR Commands: 31
- Memory Volatility: EEPROM non-volatile memory
- Input Power: 12 Volts DC (supplied by PowerLinc Interface)
- Dimensions: 4.0in. wide, 2.5in. deep, 1.1in. high
- Weight: .2 pounds
- Emitters: 2 built-in "blast" and up to three external emitters

SMARTHOME
design

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.



**KeypadLinc 6 with
450W integrated
dimmer**

Other Smarthome Products

Your controller is compatible with many of our other home automation products. If you need a traditional-looking wall switch, check out the new **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.



About PowerLinc II's Certification

The PowerLinc Interface 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

SMARTHOME™
MAKING LIFE MORE CONVENIENT, SAFE AND FUN

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