



SynchroLinc™

Power-Synching INSTEON® Controller

Model : 2423A5



SMARTHOME™

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SynchroLinc Owner's Manual



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ABOUT SYNCHROLINC

SynchroLinc allows you to create Load Sense scenes to control other INSTEON devices, based on the power state of the load plugged into SynchroLinc.



Key SynchroLinc Features

- Installs and Links to controlled devices in minutes
- Monitors loads with minimum of 7 Watts up to 1800 Watts (15 Amps at 120V)
- Triggers devices in programmed INSTEON scenes
- Indicates INSTEON setup mode activity and operational states with a dual-color Status LED and beeper
- Stores setup state in memory so settings aren't lost during power outages
- Two-year warranty

What is Included with SynchroLinc

- SynchroLinc – Power-Synching INSTEON Controller
- Quick-Start Guide

WHAT IS INSTEON?

Since its inception in 2005, INSTEON has become a best-selling home-control networking technology, offering more reliability and flexibility than any other home management system on the market. INSTEON systems are simple, reliable, and affordable. Simple, because each device takes mere minutes to install. Reliable, because every INSTEON device works as a network repeater, ensuring your commands will not be lost. Affordable, because INSTEON can be integrated into any number of devices easily and at a very low cost. An INSTEON home grows in value with each added INSTEON device, making life more convenient, safe, and fun.

How Does INSTEON Work?

What makes INSTEON the most reliable home automation network is its dual-mesh network. INSTEON devices use both radio frequency (RF) signals and the home's existing wiring to talk to each other. In an INSTEON network, every INSTEON device also acts as a repeater, receiving and sending every message to all other devices in the network. So by integrating more INSTEON devices you will strengthen the network and ensure no commands will be lost.

No central controller or networking setup is required with an INSTEON network. Simply install your devices and then use a series of button presses or taps to Link your devices together. Throughout this Owner's Manual, you may see the terms "Controller" or "Responder". These generic INSTEON terms refer to the components of an INSTEON scene, and are used on a scene-by-scene basis.

- **Controller** – sends INSTEON commands to other devices
- **Responder** – reacts to commands sent out by another INSTEON device

An INSTEON device may act as a Controller, Responder, or sometimes both.

INSTEON networks are also extremely secure. Each INSTEON device is assigned a unique INSTEON ID, so unless neighbors or would-be hackers have access to your particular device's INSTEON ID, they won't be able to control your home, even if they are using similar products.

INSTALLATION

Preparing to Install SynchroLinc

CAUTION

Read and understand these instructions before installing and retain them for future reference.

SynchroLinc 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. Use indoors only. SynchroLinc is not designed nor approved for use on power lines other than 120V 60Hz, single phase. Attempting to use SynchroLinc on non-approved power lines may have hazardous consequences.

Prior to installing SynchroLinc, please review the entire installation procedure and take the following precautions:

- Use indoors or in a properly insulated and weatherproof electrical box only
- Don't plug SynchroLinc into an outlet controlled by a switch because if the switch is inadvertently turned off, SynchroLinc won't have power
- Don't plug SynchroLinc into a filtered power strip or AC filter

If you have any questions, please call:

INSTEON Gold Support Line
800-762-7845

Product Use Restrictions

Use only as directed in the instructions and within the specifications and environmental conditions below. Using SynchroLinc in a different manner or outside the conditions below may defeat the safety features and protection against electrical shock and fire.

- 120 Volts AC +/- 10%, 60 Hertz, 15 Amps maximum continuous
- Indoor use only
- Temperature 41° to 104° F (5° to 40° C)
- Maximum relative humidity 80% for temperatures up to 87° F (31° C) decreasing linearly to 50% relative humidity at 104° F (40° C)
- Altitude up to 6,500 feet (2,000 meters)
- Installation Category II
- Pollution Degree 2

Installing SynchroLinc

- 1) Plug the desired device (also called the load) into the outlet on SynchroLinc
- 2) Plug SynchroLinc into an unswitched outlet

SynchroLinc will beep

The SynchroLinc Status LED will turn on solid green or solid red

After 20 seconds, SynchroLinc will double-beep and enter Calibration Mode

You will have 4 minutes to calibrate SynchroLinc before Calibration Mode automatically times out. Once Calibration Mode times out, SynchroLinc will ignore all button taps.

NOTE: If you plan to use SynchroLinc with INSTEON home automation software (e.g., HouseLinc 2), wait until SynchroLinc enters Calibration Mode (after the double-beep) to add it to the software.

Calibrating SynchroLinc

- 1) Make sure the load is off or in its standby state
- 2) Wait at least 10 seconds and then tap the Set button on SynchroLinc to record the off/low energy state

SynchroLinc will beep

- 3) Turn the load on or set it to its high energy state
- 4) Wait at least 10 seconds and then tap the Set button to record the on/high energy state

SynchroLinc will double-beep and its Status LED will turn on solid green when the load is in its high energy state and red when it is in its low energy state

If you would like to reset the energy states or if SynchroLinc times out of Calibration Mode, unplug the SynchroLinc and reinstall. See *Installing SynchroLinc*.

USING SYNCHROLINC IN A LOAD SENSE SCENE

Creating a Load Sense Scene with SynchroLinc

A Load Sense scene allows you to control other INSTEON devices based on the energy level of the load. For example, you could create a scene that turns on your surround sound system when your DVD player (the load) is turned on.

The scene will be activated when the load reaches its high energy state. When the load reaches the low energy state, all Linked Responders will also turn off.

NOTE: To create Load Sense Scenes, you must first lock in the high and low energy states of the load. See *Calibrating SynchroLinc*.

As an advanced feature, SynchroLinc is capable of storing two scenes. See *Using a Second Load Sense Scene with SynchroLinc*.

Linking SynchroLinc to an INSTEON Responder

Once you have locked-in the load's energy states, you can Link SynchroLinc to the desired Responders and complete the Load Sense scene. See your Responder's Owner's Manual for more detailed instructions on how to Link it to SynchroLinc.

The following will work for the most common INSTEON devices:

- 1) At the Responder, set it to the state you wish to be activated from SynchroLinc when the load reaches its high energy state (turn it on if you wish it to be on or off if you wish it to be off when SynchroLinc activates the scene, set brightness levels, etc.)
- 2) Set SynchroLinc to Linking Mode by pressing & holding the Set button until it beeps (3 seconds)
The SynchroLinc Status LED will begin blinking green
You will have 4 minutes to complete the next step before Linking Mode automatically times out.
- 3) Press & hold the Responder's Set button for 3 seconds
SynchroLinc will double-beep and its Status LED will turn on solid green when the load is in its high energy state and red when it is in its low energy state
- 4) Confirm that Linking was successful by turning the load on and off
The Responder will respond appropriately
- 5) If you wish to Link additional devices to the scene, repeat steps 1-4 with each additional Responder

Unlinking an INSTEON Responder from SynchroLinc

If you are no longer going to use an INSTEON Responder that has previously been Linked to SynchroLinc, it is very important that you Unlink it. Otherwise, SynchroLinc will retry any commands repetitively, thus slowing down the system.

The following will work on the most common INSTEON devices:

- 1) If the Responder is a multi-scene device, tap the Scene button you wish to remove control from until its LED illuminates
- 2) Set SynchroLinc to Linking Mode by pressing & holding the Set button until it beeps (3 seconds)
The SynchroLinc Status LED will begin blinking green
- 3) Set SynchroLinc to Unlinking Mode by pressing & holding the Set button until it beeps again (3 seconds)
The SynchroLinc Status LED will begin blinking red
You will have 4 minutes to complete the next step before Unlinking Mode automatically times out.
- 4) Press & hold the Responder's Set button for 3 seconds
SynchroLinc will double-beep and its Status LED will turn on solid green when the load is in its high energy state and red when it is in its low energy state
- 5) Confirm that Unlinking was successful by turning the load on and off
The Responder will no longer respond

ADVANCED FEATURES

Advanced Calibration

SynchroLinc uses a trigger point to determine if the load is in the high or low energy state and send the appropriate commands. If power consumption of the load is below the trigger point, SynchroLinc considers the load to be at its low energy state. If power consumption is above the trigger point, the load is in its high energy state. The trigger point may differ depending on how SynchroLinc is calibrated.

If the low energy state is locked in first during Calibration Mode (as described in *Calibrating SynchroLinc*), SynchroLinc will set the trigger point at 25% *above* the low energy level. However, if the high energy state is locked in first, the trigger point will be set at 25% *below* the high energy level.

For example, if the low energy state is locked in first at 0 Watts and the high energy state is locked in second at 100W, the trigger point will be set at 25W.

If the high energy state is locked in first at 100W and the low energy state is locked in second at 25W, the trigger point will be set at 75W.

NOTE: Trigger point can be manually adjusted when used with INSTEON home automation software, such as HouseLinc 2.

Using a Second Load Sense Scene with SynchroLinc

As an advanced feature, SynchroLinc is capable of storing two scenes, referred to as Scenes 1 (described in *Creating a Load Sense Scene with SynchroLinc*) and 2.

- **Scene 1** is activated when the load reaches its high energy state

NOTE: Without Scene 2 set up, all Linked Responders will turn off when the load reaches its low energy state.

- **Scene 2** is activated when the load reaches its low energy state

Depending on how you plan to use SynchroLinc, you might need to set up both scenes. For example, you might want your lights to dim from full-bright to 50% brightness when your DVD player turns on (Scene 1), and return to full-bright when your DVD player turns off (Scene 2).

See *Linking SynchroLinc to an INSTEON Responder* to Link Scene 1.

To Link to Scene 2:

- 1) At the Responder, set it to the state you wish to be activated from SynchroLinc when the load reaches its low energy state (turn it on if you wish it to be on or off if you wish it to be off when SynchroLinc activates the scene, set brightness levels, etc.)

- 2) Set SynchroLinc to Linking Mode by pressing & holding the Set button until it beeps (3 seconds)

The SynchroLinc Status LED will begin blinking green

- 3) Set SynchroLinc to Unlinking Mode by pressing & holding the Set button until it beeps again (3 seconds)

The SynchroLinc Status LED will begin blinking red

- 4) Press & hold the Set button until it beeps a third time (3 seconds)

The SynchroLinc Status LED will begin blinking green

You will have 4 minutes to complete the next step before Linking Mode automatically times out.

- 5) Press & hold the Responder's Set button for 3 seconds

SynchroLinc will double-beep and its Status LED will turn on solid green when the load is in its high energy state and red when it is in its low energy state

- 6) Confirm that Linking was successful by turning the load on and off

The Responder will respond appropriately

- 7) If you wish to Link additional devices to Scene 2, repeat steps 1-6 with each additional Responder

To Unlink from Scene 2:

- 1) If the Responder is a multi-scene device, tap the Scene button you wish to remove control from until its LED illuminates
- 2) Set SynchroLinc to Linking Mode by pressing & holding the Set button until it beeps (3 seconds)
The SynchroLinc Status LED will begin blinking green
- 3) Set SynchroLinc to Unlinking Mode by pressing & holding the Set button until it beeps again (3 seconds)
The SynchroLinc Status LED will begin blinking red
- 4) Press & hold the Set button until it beeps a third time (3 seconds)
The SynchroLinc Status LED will begin blinking green
- 5) Press & hold the Set button until it beeps a fourth time (3 seconds)
The SynchroLinc Status LED will begin blinking red
You will have 4 minutes to complete the next step before Unlinking Mode automatically times out.
- 6) Press & hold the Responder's Set button for 3 seconds
SynchroLinc will double-beep and its Status LED will turn on solid green when the load is in its high energy state and red when it is in its low energy state
- 7) Confirm that Unlinking was successful by turning the load on and off
The Responder will no longer respond

Restoring Power to SynchroLinc

SynchroLinc stores all of its settings, such as Links to other INSTEON devices, with non-volatile memory. Because settings are saved in this non-volatile memory, they will not be lost in the event of a power failure.

Additionally, in the event of a power loss, SynchroLinc will not resend ON/OFF commands to the INSTEON devices it is Linked to.

Resetting SynchroLinc to its Factory Default Settings

The factory reset procedure will clear SynchroLinc of all INSTEON Links.

NOTE: Resetting SynchroLinc does not remove the high/low energy states stored during calibration. To reset the high/low energy states, see *Calibrating SynchroLinc*.

- 1) If you are using SynchroLinc to control any INSTEON devices, Unlink those devices from SynchroLinc. See *Unlinking an INSTEON Responder from SynchroLinc*.
- 2) Unplug SynchroLinc for about 10 seconds
- 3) While holding down the Set button on SynchroLinc, plug it back in, making sure not to let up on the Set button
SynchroLinc will beep and its Status LED will turn on solid green or red
- 4) Continue to hold down the Set button for 3 seconds and then release
After a few seconds, SynchroLinc will double-beep and its Status LED will switch colors



ABOUT INSTEON

Using Dual-Band INSTEON Devices to Upgrade Your Network

What are phases?

The majority of single-family homes in North America have two phases (or “legs”) of 110 Volts coming into their electricity panels. From the panel, they are distributed throughout the home, providing power to outlets and wall switches. These phases come together in some parts of the home to provide 220 Volts of power to large appliances, such as an electric oven or pool pump.

Why do I need to bridge these phases?

Single-band power line devices send commands via the home’s electricity, but only on a single phase. If the command is intended for a device on the opposite phase, there is a good chance the command will go unnoticed. Installing dual-band INSTEON devices, such as Access Points (#2443), on each phase will allow for devices to communicate between the two phases via RF.

Dual-band INSTEON devices embody the full potential of a true INSTEON mesh network. Taking the power line band signal and working in conjunction with the RF band signal, its dual-band function plays out in two ways:

- Phase bridger – a receiver of commands, reacting to and translating signals sent from one power phase to the opposite via RF
- Signal repeater – a participant in an INSTEON network, repeating commands intended for other devices whether those commands are generated from RF or power line-only devices. To ensure reliability, every INSTEON device confirms that it has received a command. If a Controller does not receive this confirmation, it will automatically retransmit the command up to five times.

While using at least one dual-band device is required when using an RF-only device, at least two dual-band devices are recommended to ensure reliable communication across two-phase home wiring systems. For larger applications, it is recommended to install at least one dual-band device for every 750 – 1,000 square feet.

Search for dual-band INSTEON devices at: www.smarthome.com/dualband

Important Note about INSTEON Networks; Split Single-Phase vs. 3-Phase Installation

For the best INSTEON network performance, be sure you have properly installed at least two dual-band INSTEON devices. INSTEON has only been officially tested in a split single-phase residential environment but has been known to work in many 3-phase systems, where three dual-band devices are used (one on each phase). However, due to the potential complexity of its troubleshooting, the INSTEON Gold Support Line is unable to support INSTEON in 3-phase environments.

Further Enhancing Reliability

As signals travel via the power line or RF throughout the home, they naturally become weaker the farther they travel. The best way to overcome weakened signals is to increase the coverage of the mesh network by introducing more INSTEON devices.

It is possible that some audio-video devices, computers, power strips, or other electrical equipment may attenuate INSTEON signals on the power line. You can temporarily unplug suspected devices to test whether the INSTEON signal improves. If it does, then you can plug in filters that will permanently fix the problem.

ADDITIONAL RESOURCES

Find home automation solutions, helpful tips, interactive demos, videos, user forums, and more at the Smarthome Learning Center: www.smarthome.com/learningcenter.html



TROUBLESHOOTING

Problem	Possible Cause	Solution
The Status LED on SynchroLinc is not turning on at all.	SynchroLinc may not be getting power.	Make sure SynchroLinc is not plugged into a switched outlet that is turned off.
Responders are not being controlled after I've created a Load Sense scene with SynchroLinc.	The Responder might have been reset without Unlinking SynchroLinc from it.	Re-Link SynchroLinc to the Responder.
	SynchroLinc and the Responders may be on opposite power line phases.	Make sure two dual-band INSTEON devices are properly installed to bridge the two power line phases.
	The INSTEON signal may be too weak.	Add additional INSTEON devices or move around existing INSTEON devices. All INSTEON devices act as INSTEON network repeaters.
	Large appliances, such as refrigerators or air conditioners, may be producing electrical noise on the power line. Other electrical devices, such as computers, televisions, or power strips, may be absorbing the INSTEON signal.	Install a power line noise filter (#1626-10) to filter electrical noise and minimize signal attenuation.
Responders are taking a long time to respond to SynchroLinc.	SynchroLinc may be sending commands to a Responder that is no longer in use. Commands for the unused Responder are being resent and loading down the signal.	Unlink any unused Responders from SynchroLinc. HINT: If you are using home automation software, you can easily check scene membership and eliminate unnecessary Links. If the above doesn't work, perform a factory reset.
	SynchroLinc turns off a Responder but nothing happens when an ON command is sent from SynchroLinc.	The Responder may be Linked at its off state.
SynchroLinc is locked up.	A surge or excessive noise on the power line may have glitched it.	Unplug SynchroLinc for 10 seconds and reinstall.
		If the above doesn't work, perform a factory reset. See <i>Resetting SynchroLinc to its Factory Default Settings</i> .
SynchroLinc does not beep or double-beep when I tap the Set button to calibrate SynchroLinc.	SynchroLinc may have timed out of Calibration Mode. Once timed out, SynchroLinc will not respond to button presses.	Unplug SynchroLinc for at least 10 seconds. Then, reinstall and recalibrate SynchroLinc. See <i>Installing SynchroLinc</i> .



Additional Troubleshooting with HouseLinc 2:

Problem	Possible Cause	Solution
HouseLinc 2 is not recognizing SynchroLinc or it lists it as a "PowerLinc Modem".	SynchroLinc might have been added to HouseLinc 2 too soon. It needs to be powered for at least 20 seconds before HouseLinc 2 will recognize it.	Delete the PowerLinc Modem from HouseLinc 2 and unplug SynchroLinc. Wait at least 10 seconds and then reinstall SynchroLinc. Once SynchroLinc beeps to enter Calibration Mode (20 seconds), add SynchroLinc to HouseLinc 2.
SynchroLinc is sending ON/OFF commands repeatedly and its Status LED is flashing green and red.	Triggers, delay, and/or tolerance may be set too close to the load's power level.	Turn the load attached to SynchroLinc off. Then, in HouseLinc 2, choose SynchroLinc from the Devices list and select the Properties tab. Increase the delay and tolerance or decrease the trigger point.

If you have tried these solutions, reviewed this Owner's Manual, and still cannot resolve an issue you are having with SynchroLinc, please call:

INSTEON Gold Support Line
800-762-7845

SPECIFICATIONS, CERTIFICATION, AND WARRANTY

Specifications

View specifications for SynchroLinc at: www.smarthome.com/2423A5.html

Certification

SynchroLinc has been thoroughly tested by Internek Testing Services NA, a nationally recognized independent third-party testing laboratory. The North American ETL Listed mark signifies that the device has been tested to and has met the requirements of a widely recognized consensus of U.S. and Canadian device 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.

Limited Warranty

Seller warrants to the original consumer 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, Seller 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 the Seller's liability with respect to this product. For repair or replacement during the warranty period, call the INSETON Gold Support Line at 800-762-7845 with the Model # and Revision # of the device to receive an RMA# and send the product, along with all other required materials to:

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



Limitations

The above warranty is in lieu of and Seller 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 two-year of the express warranty above. No other representation or claim of any nature by any person shall be binding upon Seller or modify the terms of the above warranty and disclaimer.

Home automation devices have the risk of failure to operate, incorrect operation, or electrical or mechanical tampering. For optimal use, manually verify the device state. Any home automation device should be viewed as a convenience, but not as a sole method for controlling your home.

In no event shall Seller be liable for special, incidental, consequential, or other damages resulting from possession or use of this device, including without limitation damage to property and, to the extent permitted by law, personal injury, even if Seller knew or should have known of the possibility of such damages. Some states do not allow limitations on how long an implied warranty lasts and/or the exclusion or limitation of damages, in which case the above limitations and/or exclusions may not apply to you. You may also have other legal rights that may vary from state to state.

INSTEON Technology Patent

U.S Patent No. 7,345,998, International patents pending

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