In-LineLinc™ Dimmer

INSTEON® Remote Control In-Line Dimmer

Owner's Manual (rev 5.1+)

(#**2475D**)

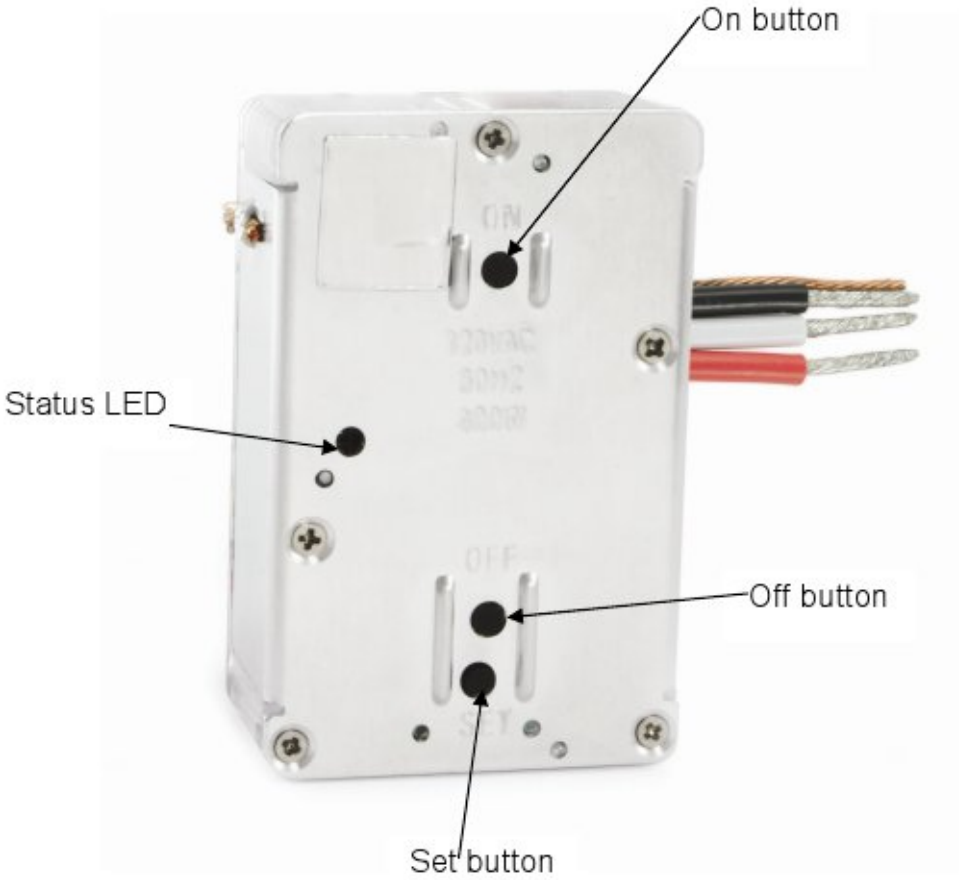
INSTEON®

In-LineLinc Dimmer – Features and Benefits

Congratulations on purchasing the high-quality INSTEON In-LineLinc Dimmer Switch. With this easy-install module, you can add conveniently hidden, fully-dimmable remote control to not only the lights wired to In-LineLinc, but also other INSTEON devices.

Features

- Quick setup links to other INSTEON devices in minutes
- Controls all incandescent lights up to 300 watts
- Customize with 32 brightness levels and 4 ramp rates
- Also compatible with low-voltage lighting with magnetic or dimmable electronic transformers
- Status LED and beeper indicate setup activity
- Setup state stored in non-volatile memory and preserved through power outages
- Wires in to a standard junction box (Neutral connection required)
- Responds to X10 commands
- Two-year warranty



What's in the Box?

- In-LineLinc Dimmer
- Quick Start Guide
- Two (2) mounting screws
- Three (3) wire nuts

Preparing to Install In-LineLinc

CAUTIONS AND WARNINGS

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

This product 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. This product is not designed or approved for use on power lines other than 120V 60Hz, single phase. Attempting to use this product on non-approved power lines may have hazardous consequences.

Recommended installation practices:

- Use only indoors or in an outdoor rated box.
- Be sure that you have turned off the circuit breaker or removed the fuse for the circuit you are installing this product into. Installing this product with the power on will expose you to dangerous voltages.
- Connect using only copper or copper-clad wire.
- This product may feel warm during operation. The amount of heat generated is within approved limits and poses no hazards. To minimize heat buildup, ensure the area surrounding the rear of this product is as clear of clutter as possible.
- Each INSTEON product is assigned a unique INSTEON I.D., which is printed on the product's label.
- To reduce the risk of overheating and possible damage to other equipment, do not use this product to control Loads in excess of the specified maximum(s) or, install in locations with electricity specifications which are outside of the product's specifications. If this device supports dimming, please note that dimming an inductive Load, such as a fan or transformer, could cause damage to the dimmer, the load-bearing device or both. If the manufacturer of the load device does not recommend dimming, use a non-dimming INSTEON on/off switch. USER ASSUMES ALL RISKS ASSOCIATED WITH DIMMING AN INDUCTIVE LOAD.

Identifying the Electrical Wires in Your Home

- Line – carries 120VAC electricity into the wall box, may also be called hot, live or power, commonly black
- Neutral – returns 120VAC to power company, commonly white and in a multi-wire bundle
- Load – connects to light/load device, commonly black and in a separate cable jacket
- Ground – connection to electrical ground, commonly a bare wire, a green wire or a screw on a metal box

IMPORTANT!
If you have any difficulties or questions, consult an electrician. If you are not knowledgeable about and comfortable with electrical circuitry, have a qualified electrician install the product for you.

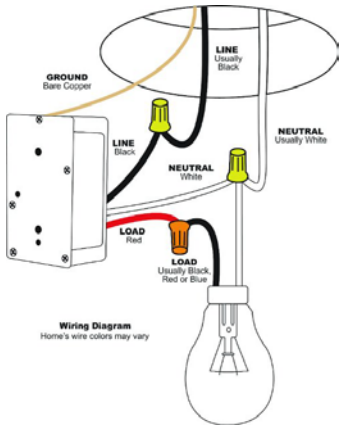
Tools Needed

- Flathead screwdriver
- Wire cutter/stripper
- Phillips screwdriver
- Voltage meter

Installing In-LineLinc

1) If you plan to configure In-LineLinc using home-management software (such as HouseLinc) or SmartLinc (2412N), write down the INSTEON I.D. and the fixture in which it's being installed for future reference.
2) Turn off the circuit breaker/fuse panel supplying power to the fixture. Check that the power is off by toggling the load on and off from its local switch.
3) Remove wallpaper from the fixture, unscrew it and remove from the junction box.
4) Disconnect wires from fixture. If the wires cannot be detached by unscrewing, cut the wires where they enter the switch and strip ½" of insulation off the ends. Make sure the wires are not touching anything.
5) Turn on circuit breaker, then use a voltage meter to identify the Line, Load, Neutral and Ground wires. Once all wires are identified, turn off circuit breaker again.

6) Referring to the diagram at right and the table below, use the included wire nuts to connect the fixture's Line, Load, Neutral and Ground wires to In-LineLinc's corresponding wires.



In-LineLinc Wire	Wall Box Wires
Bare copper	Ground (commonly bare copper, green wire or green screw)
White	Neutral (commonly white wire bundle)
Red	Load (light, fan, etc.)
Black	Line (100 - 277V to Ground)

7) Enable power to the switch from the circuit breaker or fuse panel.
8) Use In-LineLinc's On and Off buttons to test that In-LineLinc is installed properly.
The load will turn on and off.
9) Adjust and set the local on-level and ramp rate for the connected load.
10) Link In-LineLinc to an INSTEON controller.
11) Gently place In-LineLinc into the junction box, making sure nothing could accidentally press the buttons on its face.
12) Reinstall the fixture.

***Note:** the Neutral wire will not normally be connected to the switch you are replacing. If there is no Neutral wire in the box, consult an electrician or call the INSTEON Support Line at 1-800-762-7845.*

Using In-LineLinc Dimmer

Button Functions

Button	Tap	Double-Tap	Press and Hold
ON	Ramp to on-level	Fast on	Brighten
OFF	Ramp to off	Fast off	Dim
Set	Set the default on-level	Sets the default ramp rate	Starts linking mode

An 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 Access Points (#2443) or other dual-band INSTEON products. INSTEON has only been officially tested in a split single-phase residential environment, but has been known to work in many 3-phase systems with three dual-band products installed (one on each phase). However, due to the potential complexity of its troubleshooting, the INSTEON Support Line is unable to support INSTEON in 3-phase environments.

Linking In-LineLinc Dimmer as an INSTEON Responder

Be sure to link In-LineLinc Dimmer to an INSTEON controller before you finish installing the fixture. Refer to your controller device's Quick Start Guide or Owner's Manual to properly link it to In-LineLinc.

Most controllers use the procedure below:

1) Put your controller into linking mode. For most INSTEON controllers, press and hold the Set button for 3 seconds or the On/scene button for 10 seconds.
   You will have 4 minutes to complete the next step before linking mode times out.
2) Press and hold In-LineLinc's Set button until it double-beeps.
   In-LineLinc's status LED will flash once, then turn on if the load is off or off if the load is on.
3) Confirm that linking was successful by tapping the controller button you just linked.
   The load wired to In-LineLinc will respond appropriately.

Unlinking In-LineLinc Dimmer as an INSTEON Responder

If you are no longer going to use an In-LineLinc Dimmer that was linked to an INSTEON controller, it is important that you unlink it. Otherwise, the controller will retry commands and cause network delays.

Most controllers use the unlinking procedure below:

1) Put your controller into unlinking mode. For most INSTEON controllers, press and hold the Set button for 3 seconds *twice* or the On/scene button for 10 seconds *twice*.
   You will have 4 minutes to complete the next step before unlinking mode times out.
2) Press and hold In-LineLinc's Set button until it double-beeps.
   In-LineLinc's status LED will flash once, then turn on if the load is off or off if the load is on.
3) Confirm that unlinking was successful by tapping the controller button you just unlinked.
   The load wired to In-LineLinc will not respond.

Advanced Features

Setting the Local On-Level

The local on-level is the brightness setting at which the connected load will turn on. While In-LineLinc Dimmer's default on-level is 100% brightness, it is adjustable anywhere from off to 100%. You can set the local on-level from 32 levels manually at In-LineLinc Dimmer (we recommend doing so prior to final installation) or configure it within 1% increments using home management software such as HouseLinc.

1) Using either the local ON and OFF buttons or a controller (if In-LineLinc Dimmer is already linked to one), adjust the load wired to In-LineLinc Dimmer to the desired brightness level.
2) Once you have reached the level you want, tap In-LineLinc Dimmer's Set button.
   .
3) Test the local on-level by tapping In-LineLinc's On and Off buttons.
   The load connected to In-LineLinc will turn on at the local on-level.

Setting the Ramp Rate

The ramp rate is the speed at which the connected load goes from full-off to the local on-level and vice versa. The default ramp rate is 0.5 seconds, but is adjustable from 0.1 seconds to 2 seconds (manual programming from the Set button) all the way to 9 minutes (programming through home automation software such as HouseLinc).

When setting the ramp rate, the speed is determined using the load's brightness level. Refer to the table below while programming to set the desired ramp rate:

1) Using either the local ON and OFF buttons or a controller (if In-LineLinc Dimmer is already linked to one), adjust the load wired to In-LineLinc Dimmer to the brightness level that corresponds with your desired ramp rate:

Brightness Level	Ramp Rate (seconds)
90-100%	0.1
77-87%	0.2
65-74%	0.3
52-61%	2
39-48%	2
26-35%	4.5
13-23%	6.5
2-10%	8.5
1%	9

2) Once you have reached the level you want, double-tap In-LineLinc Dimmer's Set button.
   In-LineLinc's status LED will blink red.
3) Test the ramp rate by tapping In-LineLinc's On and Off buttons.
   The load connected to In-LineLinc will ramp to full-on at the programmed speed.
4) Note: if the light is ramping to a brightness level under 100%, the ramp rate will be less. For example, a light ramping to 50% brightness at a ramp rate of 2 seconds will only take 1 second.

Creating INSTEON Scenes

INSTEON scenes let you activate dramatic room ambiences with multiple lights and appliances. For example, you can set all the lights in a scene to dim to 50% or turn certain lights on while turning others off, all with the tap of a button on a controller.

INSTEON scenes are very easy to set up: just link more than one responder to the same On/Off or scene button on a controller. Then, when you press any of the linked buttons on the controller, all of the INSTEON devices linked in the scene will respond as a group.

To set up an INSTEON scene, you can individually link each device to a controller. Or save time and create multiple links at once.

Power Restore

In-LineLinc Dimmer stores all of its scenes, properties, etc. in its internal non-volatile memory so all settings are retained after a power outage. Upon power being restored, In-LineLinc will return its connected load(s) and all LEDs to their states prior to power outage.

Factory Reset

Factory Reset clears all user settings from In-LineLinc Dimmer, including INSTEON scenes, on-levels, ramp rates, X10 addresses, etc.

1) Make sure In-LineLinc Dimmer is unlinked from all controllers.
2) Turn off the breaker supplying power to In-LineLinc Dimmer's fixture.
3) Wait 10 seconds.
4) Push in Set button and hold it. While continuing to hold in the Set button, have a partner turn on the circuit breaker.
5) Release the Set button.
   A few seconds will pass, then In-LineLinc will double-beep.
   The connected load will turn on.

X10 Settings

Setting the X10 Address

Most INSTEON devices are X10 ready, meaning that they can respond to X10 commands from any X10 controller. And it can send X10 commands to X10 devices. However, to operate an INSTEON device in X10 mode, you must first set up an X10 address. As it ships from the factory, or after a factory reset procedure, INSTEON devices will have no X10 address set up.

Follow these instructions to allow In-LineLinc Dimmer to respond to X10 commands:
1) Press and hold In-LineLinc's Set button until it double-beeps.
   You will have 4 minutes to complete the next step before linking mode times out.
2) From an X10 controller, send the X10 address you want to assign followed by the ON command three times.
   For example, to use the address A1, send A1-ON-A1-ON-A1-ON.
3) Once In-LineLinc has received the preceding sequence, it will double-beep and automatically exit linking mode.

Removing the X10 Address

If you are no longer going to control In-LineLinc Dimmer with an X10 address, it is very important that you unlink it. Otherwise In-LineLinc Dimmer will respond to the X10 command, and may cause turn on by itself.

Follow these instructions to allow In-LineLinc Dimmer to respond to X10 commands:
1) Press and hold In-LineLinc's Set button until it double-beeps.
2) Press and hold In-LineLinc's Set button until it double-beeps again.
   You will have 4 minutes to complete the next step before unlinking mode times out.
3) From an X10 controller, send the X10 address you want to remove followed by the ON command three times.
   For example, to remove the address A1, send A1-ON-A1-ON-A1-ON.
4) Once In-LineLinc has received the preceding sequence, it will double-beep and automatically exit unlinking mode.

Additional Resources

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

Specifications

General	
Product Name	In-LineLinc Dimmer
Brand	INSTEON
Manufacturer Product Number	2475D, INSTEON In-LineLinc Dimmer
UPC	689076402743
Patent Number	Protected under U.S. and foreign patents (see www.insteon.com)
Warranty	Two years, limited
Operation	
On-Levels	32 locally, increments of 1% with software
Ramp Rates	0.1 to 9 seconds, up to 9 minutes with software
LED Indicator	Off when load is on and vice versa
Operation Modes	INSTEON only, X10 only, INSTEON and X10 combo
Combo Mode Message Order	INSTEON, INSTEON cleanup, X10
Multi-Way Circuit Support	As a receiver that controls a load
Setup Memory	Non-volatile EEPROM
INSTEON Features	
INSTEON Address	1 hard-coded out of 16,777,216 possible
INSTEON Links	417
INSTEON Powerline Frequency	131.65 KHz
INSTEON Minimum Transmit Level	3.2 Vpp into 5 Ohms
INSTEON Minimum Receive Level	10 mV
INSTEON Messages Repeated	Yes
Mechanical	
Mounting	Mounts in single-ganged junction box or light fixture such as a recessed can light
Wire Nuts	4 included
Wires	Line (black)
	Load (red)
	Neutral (white)
	Ground (bare copper)
Dimensions	2.75" H x 1.75" W x 0.88" D
Weight	3.6 oz.
Operating Environment	Indoors
Operating Temperature Range	32°F to 104°F
Operating Humidity Range	Up to 85% relative humidity
Electrical	

Voltage	120 volts AC +/- 10%, 60 Hertz, single phase
Power Wire Leads	6", 16 AWG, stranded,600V, 105°C insulation, ends stripped and tinned, LINE (black), LOAD (red), NEUTRAL (white)
Ground Lead	6”, 18 AWG, stranded, bare copper
Maximum Dimmer Load	600 watts (uses 12-Amp triac dimmer)
Maximum Amps	2.5 amps
Standby power consumption	0.78 watts
Certifications	Safety tested for use in USA and Canada (ETL #3017581)
X10 Features	
X10 Primary Address	1 optional (comes unassigned)
X10 Status Response	Supported
X10 Resume Dim	Supported by setting local on-level to zero
X10 Powerline Frequency	120 KHz
X10 Minimum Transmit Level	3.2 Vpp into 5 Ohms
X10 Minimum Receive Level	20mV into 5 Ohms
X10 Messages Repeated	No

Troubleshooting

Problem	Possible Cause	Solution
In-LineLinc’s status LED is not turning on at all and In-LineLinc won't control my light.	In-LineLinc is not getting power.	Make sure the circuit breaker is turned on.
		Check junction box wires to ensure all connections are tight and no bare wires are exposed.
		Check the light fixture to ensure all connections are tight and no bare wires are exposed.
The switch I'm replacing only has two wires.	In-LineLinc 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 Neutral In-LineLinc wire there.
In-LineLinc is not receiving signals from INSTEON or X10 controllers.	In-LineLinc and the controller are on opposite powerline phases.	Make sure two Access Points (#2443) or other dual-band INSTEON products are properly installed to detect the two powerline phases.
	The controller is plugged into a power strip.	Powerline signals can't travel through power filters. Plugging the Controller directly into a wall outlet works best.
	Other modules are loading down the signal.	Move the other modules or the controller to another outlet.
In-LineLinc is not linking to or working with an INSTEON controller or device.	The INSTEON signal may be too weak.	Add new INSTEON devices or move around existing INSTEON devices. All INSTEON devices act as INSTEON network repeaters.
		Make sure you are not experiencing

		interference with older X10 BoosterLinc technology. Upgrade to INSTEON-compatible BoosterLinc modules (#4827).
In-LineLinc doesn't always respond to an INSTEON controller.	The INSTEON controller may have been reset without first unlinking In-LineLinc from it.	Relink In-LineLinc to the INSTEON controller. See *Adding In-LineLinc Relay as an INSTEON Responder*.
The light turned on by itself.	Another controller, a timer or stray X10 signals triggered In-LineLinc.	Install a powerline signal blocker in your home to keep X10 signals from neighboring homes from interfering. Consider not using In-LineLinc in X10 mode.
		If the above doesn't work, perform a factory reset. See *Factory Reset*.
In-LineLinc turns on, but not off, using another controller.	The load is producing electrical noise that is interfering with the reception of powerline signal.	Install a powerline noise filter (such as FilterLinc) between the load and In-LineLinc.
		Install additional INSTEON devices to boost the INSTEON signal.
		Increase the X10 signal strength with an INSTEON-compatible X10 booster to overcome the power line noise.
		Remove the X10 address from the button on your INSTEON controller so it doesn't send both INSTEON and X10 commands.
In-LineLinc doesn't respond to X10 address A1 when I first set it up.	Unlike previous X10-only products, In-LineLinc does not have an X10 address set up at the factory.	Set up an X10 address. See *Adding an X10 Address*.
The load is buzzing when on or dim.	The dimming component inside In-LineLinc "chops" the powerline sine wave to reduce the power.	The buld filaments are vibrating. Use rough-service, 130V or appliance-grade bulbs to reduce the noise.
		Run In-LineLinc in "full-on" mode or switch to a non-dimming In-LineLinc On/Off Relay.
In-LineLinc is locked up.	A surge or excessive noise on the powerline may have glitched it.	Pull the Set button on In-LineLinc all the way out to create an air gap, wait 10 seconds, then push it back in until it's flush with the trim frame (don't push it all the way in).
		If the above doesn't work, perform a factory reset. See *Factory Reset*.
In-LineLinc is getting warm to the touch.	It is normal for wall dimmers to feel warm, but not hot.	In-LineLinc Dimmer will dissipate about 1W per 100W controlled. Using metal junction boxes, removing insulation around the box or controlling a smaller load can lessen the heat.
In-LineLinc can turn off my responder, but nothing happens when I send an ON command from In-LineLinc.	Your responder may be linked at its off state.	Relink your responder to In-LineLinc, while the responding device is on.
My controller can turn off In-LineLinc, but In-LineLinc does not turn on when I send an ON command from my	In-LineLinc may be linked at its off state.	Relink In-LineLinc to your controller, while the load is on.

controller.		
After wiring in In-LineLinc, the unit lets out a continuous beep.	In-LineLinc is issuing an error beep because the unit is wired incorrectly.	Turn off the circuit breaker and try reinstalling In-LineLinc. If you are still experiencing an error beep, consult an electrician to help you install In-LineLinc.
In-LineLinc trips the Arc Fault Circuit Interrupter (AFCI).	The AFCI might be too sensitive.	Replace your AFCI with a less sensitive brand or model from a hardware store with a customer-friendly return policy. In-LineLinc modules do not trip when used with the following AFCI models: • GE 15 Amp Combination Arc Fault Breaker #THQL1115AFP2 • Murray 2-Pole Combination Type Arc Fault Circuit Interrupter #MP215AFCP
	There might be loose connections within your home's wiring.	Install a powerline noise filter (such as a FilterLinc) between the output and the lead.

If you have tried these solutions, reviewed this Owner's Manual, and still cannot resolve an issue you are having with In-LineLinc Dimmer, please call the INSTEON Support Line at 1-800-762-7845.

Certification and Warranty

Certification
This product has been thoroughly tested by ITS ETL SEMKO, 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.

FCC and Industry Canada Compliance Statement
This device complies with FCC Rules Part 15 and Industry Canada RSS-210 (Rev. 7 or 8). Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorise aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radiolectrique subi, mme si le brouillage est susceptible d'en compromettre le fonctionnement.

The digital circuitry of this device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause such interference, which can be verified by turning the device off and on, the user is encouraged to eliminate the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna of the device experiencing the interference
- Increase the distance between this device and the receiver
- Connect the device to an AC outlet on a circuit different from the one that supplies power to the receiver
- Consult the dealer or an experienced radio/TV technician

WARNING: Changes or modifications to this device not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ETL/UL Warning (Safety Warning)
CAUTION: To reduce the risk of overheating and possible damage to other equipment, do not install this device to control a receptacle, a motor-operated appliance, a fluorescent lighting fixture, or a transformer-supplied appliance.
Gradateurs commandant une lampe a filament de tungstene – afin de reduire le risqué de surchauffe et la possibilite d'endommagement a d'autres materiels, ne pas installer pour commander une prise, un appareil a moteur, une lampe fluorescente ou un appareil alimente par un transformateur.

Limited Warranty
Seller 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, 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 Seller's liability with respect to this product. For repair or replacement during the warranty period, call the INSTEON 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:

INSTEON
ATTN: Receiving
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 or 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.