HomeWorks®
Technical Reference Guide
Rev. H

LUTRON®

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LUTRON®

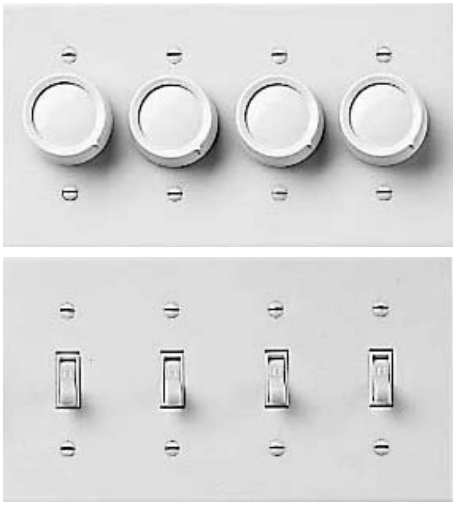
What is a Lighting Control System?

The most common form of lighting control today is a single switch or dimmer controlling a light or group of lights (a zone of lighting). While this historic standard certainly works, it is cumbersome relative to the ease of a lighting control system, especially in larger homes. Think of the time and effort expended turning the lights on in the morning, off when you go to work, back on in the evening, and finally off again at bedtime. When you think of the quantity of the dimmers and switches that you need to walk around turning on and off throughout the day, the convenience of a lighting control system quickly becomes apparent.

A lighting control system creates the ability for all of a home's lighting to be controlled together. For instance, one button press can turn on six dimmers, each to the ideal brightness for the task at hand, whether it is relaxing with a book, watching a movie, or cleaning. The picture at the right depicts how a single keypad can replace a bank of switches or dimmers, while still providing all the functionality—in a much smaller space. And a lighting control system is not just limited to controlling lights in a single room or area—the lights in an entire home can be controlled with the press of a single button. Imagine the time and effort that can be saved by hitting one button when you go to bed to turn the lights off rather than trudging around the house going from room to room manually turning off each dimmer or switch.

Convenience is the primary benefit of owning a lighting control system, but there are several other important benefits. Home security systems can be enhanced by controlling the lights during an alarm situation, turning on to full brightness inside the home and flashing outside to quickly identify the troubled home for authorities. Built-in timeclock capabilities allow all of the lighting in your home to be automatically controlled to simulate occupancy while you are away, deterring potential intruders.

But automation isn't just for security. Occupancy sensors, photosensors, and timeclock capabilities provide the greatest convenience, controlling your lights for you. Energy savings can also be realized when unnecessary lights are turned off or dimmed for you, such as when you leave the room or the sun begins to rise. And the elegance of dimming is only amplified when all of the lights you need are adjusted perfectly for you.



Replace large banks of switches with one elegant keypad

A lighting control system makes the repeated task of adjusting lights much simpler. Automated lighting changes on its own, and convenient keypads can be used to change the lighting anywhere in the home quickly and simply. The combination of these features in a lighting control system makes any home more convenient and its lighting more elegant.

Introduction to HomeWorks®

HomeWorks is a full-featured whole-home lighting control system that can be installed in any new or existing home. This is an introduction to the features and benefits that make *HomeWorks* the best residential lighting control system in the world.

CONVENIENCE

Convenience is the most obvious benefit of a lighting control system, but *HomeWorks* strives to offer you the ultimate in lighting control convenience. You only need to press one button when you want to change the lighting in the room you are in, or when it is time to retire for the evening. However, *HomeWorks* offers many ways to integrate with other systems and devices for full automation of your lighting, so that the lights change when you need them to without you ever having to lift a finger. The built-in timeclock allows your lights to automatically turn on or off at predetermined times, or even relative to the changing sunrise and sunset. For instance, you may want your landscape lights to turn on at sunset and turn off at midnight.

HomeWorks also offers convenient product features. Keypad backlighting enables you to read text on each keypad button in the dark. Portable tabletop keypads allow you to adjust the lights from anywhere in your home, whether you are in your favorite chair or on your outside patio. Car visor controls allow you to turn your lights on as you arrive and off as you leave—from your car.

SECURITY & SAFETY

The ability to integrate *HomeWorks* with a home's alarm systems is very important. When an alarm is tripped, whether it is the security system or a fire alarm, the lights should react with it. In the event of an intrusion, *HomeWorks* can force the home's interior lights to full brightness and cause the exterior lights to flash. This makes it easy for the police to identify which home is in trouble. In a fire, *HomeWorks* can again flash the exterior lights and dimly light a path that allows occupants to exit safely (bright light with smoke can cause a fog-like blinding effect). In the event of a medical emergency, the outside lights can be flashed, once again allowing help to find your home as fast as possible, saving precious time.

ELEGANCE

HomeWorks provides precise control over each light's brightness, allowing finely-tuned lighting scenes to be repeated as often as desired. Whether it is brightly lit landscape lighting, or a dimly glowing chandelier in the dining room, *HomeWorks* allows you to create the perfect lighting to maximize the beauty of your home and its furnishings. Your lighting can change as fast or as slow as you like, allowing you to create beautiful transitions that demand admiration.

HomeWorks has many unique control styles to fit your lifestyle and décor. There are many colors and finishes from which to choose as well (Appendix F). If you need a color *HomeWorks* does not offer, Lutron can quote custom painting or special materials to meet your goals.

Introduction to HomeWorks® (cont.)

TOTAL LIGHT CONTROL

With *HomeWorks*, you can control all of the light in a home—both electric and natural. While a traditional lighting control system only controls the electric lighting in a home, *HomeWorks* also uses shades and draperies to control the sunlight entering the home. During the hours of direct sunlight, closing window treatments protects a home's furnishings from damaging ultraviolet light. When daylight is available but not direct, opening window treatments brightens the home without the damaging effects of direct sunlight. Different shade fabrics are available for various needs—complete blackout, privacy, and semi-transparent.

Lutron® Sivoia QED® (Quiet Electronic Drive) shades and draperies are the quietest electronically controlled window treatments on the market. The precision with which multiple shades are controlled is unprecedented, ensuring that everything controlled by your *HomeWorks* system transitions elegantly.

Sivoia QED Roller Shade Example

ENERGY SAVINGS

The tendency for most homeowners is to turn lights on throughout the home when it gets dark outside, then turning them off when they go to bed. In a large residence, many lights may be left on unnecessarily for many hours. Keypads make it simple to turn off lights in unoccupied areas of the home, or, better yet, occupancy sensors can turn those lights off for you. The timeclock or photosensors can be used to turn off landscape lighting when it is no longer needed. This reduces utility bills and benefits the environment.

RELIABILITY

Lutron has been innovating with high quality products ever since its founder, Joel Spira, invented the world's first solid-state dimmer in 1961. Lutron continues to innovate with many high quality products, including *HomeWorks* and *Sivoia QED*. Lutron leads the industry in product design and quality. Our extensive experience is focused solely on the advancement of light control technologies. All Lutron products are engineered to the highest standards and are rigorously tested before being introduced to the field. All Lutron products are 100% end-of-line tested before they are shipped.

HomeWorks® Technology

When you press a button on a *HomeWorks* keypad, the lights change. But how? There are actually several components working together in order to accomplish this feat and others. There are typically three types of components communicating for any given task: an input device, a processor, and an output device.

The role of the input device (e.g., keypad) is to trigger a system event. A system event could be lights turning on and/or control of third-party devices, such as turning on a spa or a fountain. Inputs are either user-controlled, such as a button press from a keypad or car visor control, or they are automatic, such as a timeclock event, an RS-232 or ethernet command from another system, or a contact closure input from a sensor. The input device is the keypad or interface that communicates with the processor to signal that an event has been triggered.

The role of the processor is to listen to the input devices, process the input signal, and then tell the output devices what to do. The processor can be programmed to respond to the same input differently, depending on the time of day or the state of other sensors. For example, when the homeowner enters his driveway, sensors tell the processor that the homeowner has arrived. The processor can check the timeclock or an outdoor photosensor to determine whether the lights should be turned on. All of this happens in a fraction of a second, allowing the homeowner to enjoy the convenience of automated lighting control without noticing all of the intelligence behind the scenes.

The role of the output devices (e.g., a dimmer) is to produce the desired effect (the system event), such as turning on a light or opening a shade. Outputs can also cause other systems to perform certain tasks through interfaces, using contact closure outputs, RS-232, or ethernet. HomeWorks can be used to control home theater equipment, a spa, or shades—just to name a few.

Figure 1 shows the basic signal flow of what happens when a keypad button is pressed. (1) The keypad sends a message to the processor indicating which button has been pressed. (2) After receiving the keypad button press, the processor tells the appropriate dimmers what to do. (3) The dimmers each send a command back to the processor informing it the lights are on. (4) The processor then tells the keypad when all of the lights have turned on, so that it can provide feedback on the keypad in the form of a lit LED (next to the button of the scene that was activated). In the unlikely event that communication is interrupted, this sequence will be repeated multiple times to always ensure reliable communication.

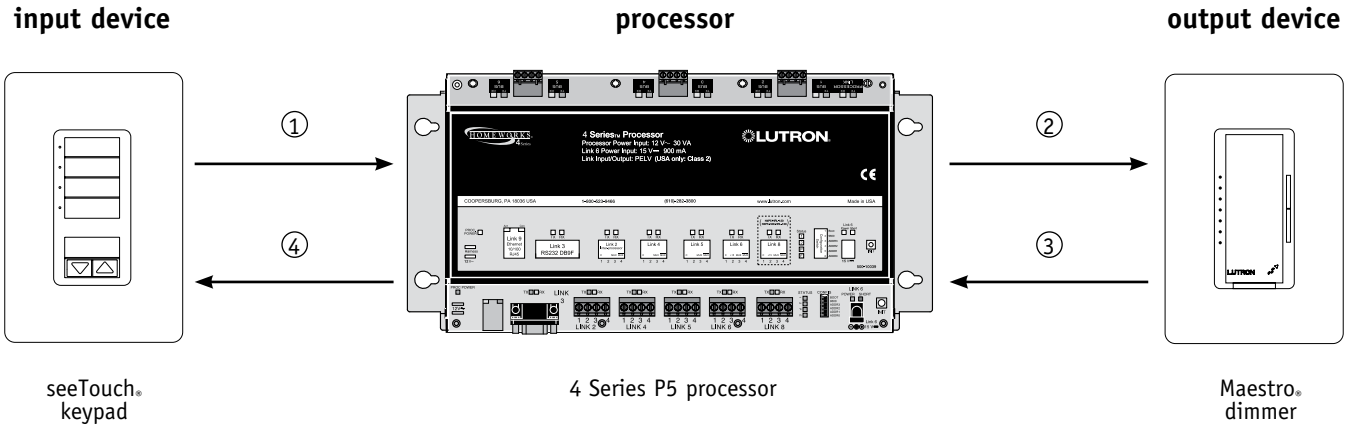


***Figure 1* – HomeWorks Device Communication**

System Overview

For system wiring details, see Appendix A

RF COMPONENTS

Switches

Dimmers

Lamp Dimmers

Hybrid Repeaters

RF Processors

Fan-speed Controls

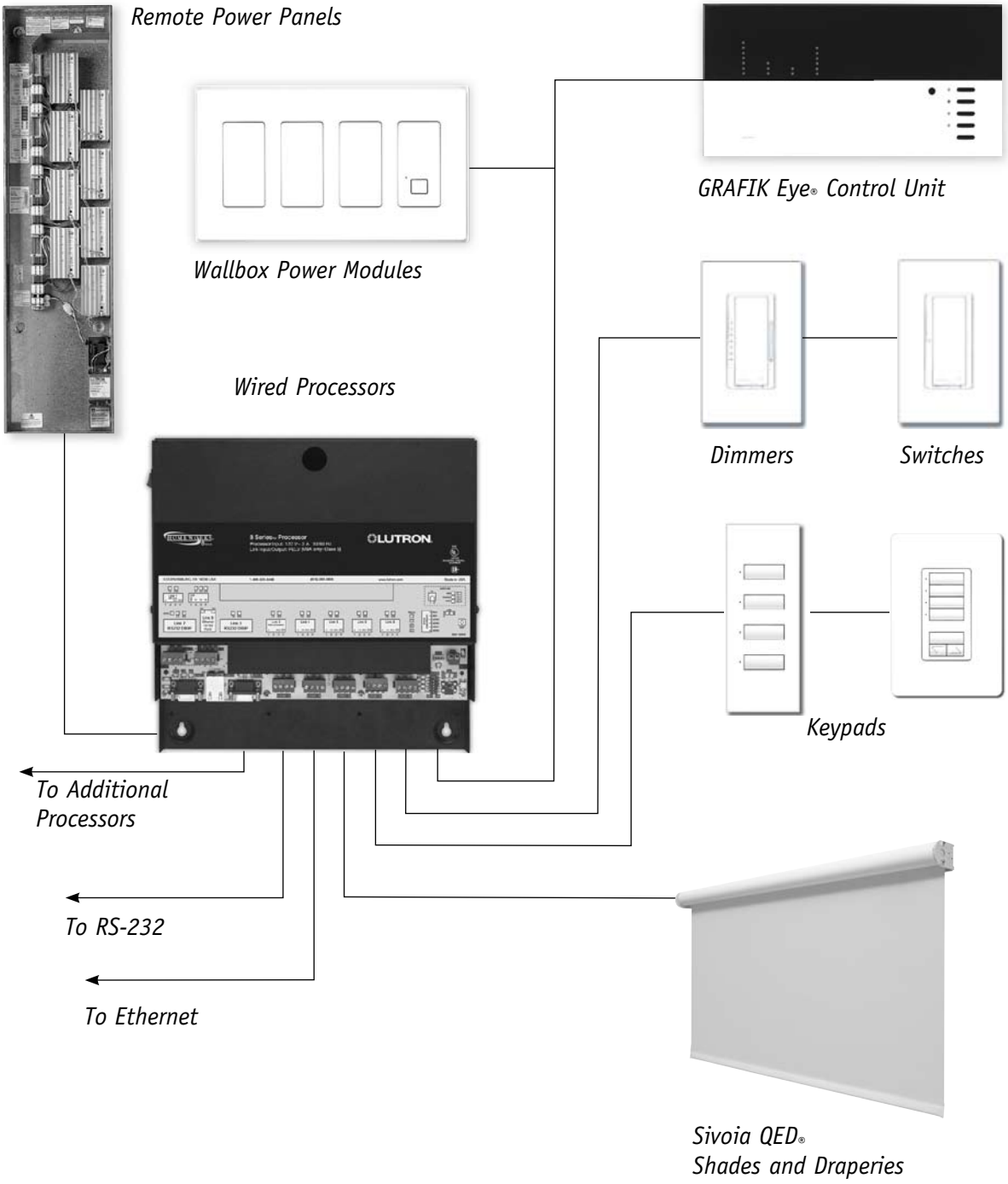
Sivoia QED® Shades

Visor Controls

Keypads

Tabletop Keypads

WIRED COMPONENTS



Using This Guide

This guide is divided into two main product sections: front room equipment and back room equipment. Front room equipment includes devices that homeowners will interact with on a daily basis, such as dimmers and keypads. Back room equipment is comprised of all the other components typically hidden from view in a HomeWorks® system, such as processors and remote power panels.

At the beginning of each product's section, there will be a small table to allow designers to quickly identify whether a particular product can be used in the system layout chosen. The table includes four categories:

SERIES

Indicates with which series a product is compatible. Wireless series products can be added to 4 or 8 Series projects using hybrid RF/wired repeaters. (8 Series, 4 Series, wireless series)

EQUIPMENT TYPE

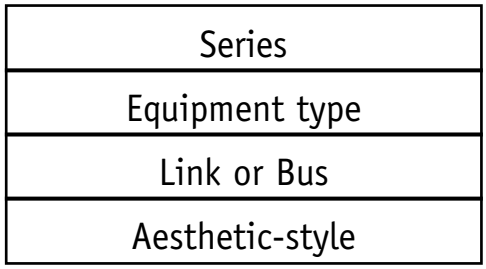
This indicates a general category for what type of equipment a particular device is. Use this to help identify the main function of a product with which you are unfamiliar. (keypad, processor, enclosure, etc.)

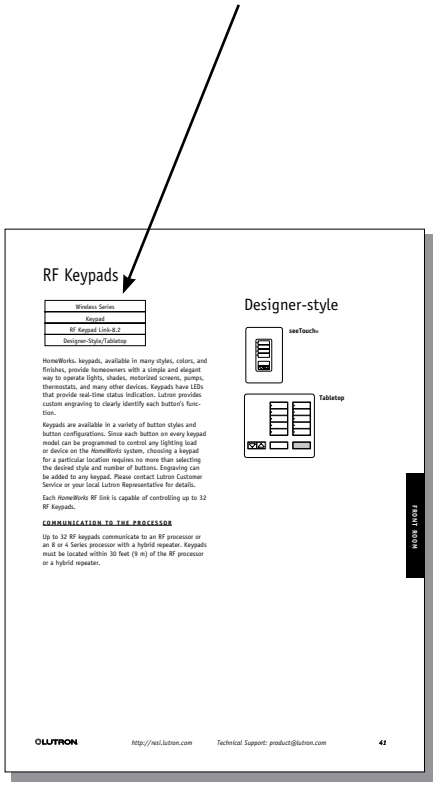
PROCESSOR LINK

This indicates to which type of processor link or interface bus the device will be connected. If it is not a direct connection, the interface in between will be noted. (keypad, inter-processor, H48 dimmer, etc.)

AESTHETIC STYLE

This is only used for visible front room equipment. Wall-mounted controls are either designer style or architectural style. As a rule, these two styles should not be mixed on a single job. Tabletop devices can be mixed with either style of wall-mounted controls (architectural-style, designer-style, tabletop).




RF Keypads

Wireless Series
Keypad
RF Keypad Link-8.2
Designer-Style/Tabletop

Designer-style

seeTouch®

Tabletop

HomeWorks® keypads, available in many styles, colors, and finishes, provide homeowners with a simple and elegant way to operate lights, shades, motorized screens, pumps, thermostats, and many other devices. Keypads have LEDs that provide real-time status indication. Lutron provides custom engraving to clearly identify each button's function.

Keypads are available in a variety of button styles and button configurations. Since each button on every keypad model can be programmed to control any lighting load or device on the HomeWorks system, choosing a keypad for a particular location requires no more than selecting the desired style and number of buttons. Engraving can be added to any keypad. Please contact Lutron Customer Service or your local Lutron Representative for details.

Each HomeWorks RF link is capable of controlling up to 32 RF Keypads.

COMMUNICATION TO THE PROCESSOR

Up to 32 RF keypads communicate to an RF processor or an 8 or 4 Series processor with a hybrid repeater. Keypads must be located within 30 feet (9 m) of the RF processor or a hybrid repeater.

FRONT ROOM

LUTRON http://resi.lutron.com Technical Support: product@lutron.com 42

System Specification & Design

Specifying a HomeWorks® System

The key elements to consider while specifying a *HomeWorks* system are: the construction type, system design, *HomeWorks* series, and aesthetic style. A system designer must understand all these elements—and their customers' requirements—to select the proper system components.

Here is the suggested series and aesthetic style for each combination of construction type and system design. Note that existing construction only uses a localized system design, because localized is the only design that uses a standard electrical wiring layout.

NEW CONSTRUCTION, LOCALIZED SYSTEM DESIGN

4 Series provides the most cost-effective solution for a localized system design. 4 Series uses Maestro® dimmers, which are designer-style.

NEW CONSTRUCTION, CENTRALIZED SYSTEM DESIGN

8 Series is the only system with the remote dimming panels that are used in a centralized system design. Keypads of either style may be used, but architectural-style has the most options. No local dimmers are used.

NEW CONSTRUCTION, OPTIMIZED SYSTEM DESIGN

8 Series is the only system with the remote dimming panels that are used in an optimized system design. Dimmers and keypads of either style may be used, but architectural-style has the most options.

EXISTING CONSTRUCTION (Open Walls), LOCALIZED SYSTEM DESIGN

4 Series provides the most cost-effective solution in a retrofit situation where low-voltage wiring can be pulled through most of the home. Use a 4 Series processor with hybrid RF/wired repeaters to add wireless devices for lamp control and tabletop keypads or to reach areas of the home where pulling wire may be difficult. 8 Series may also be used if Vareo® dimmers and other architectural-style controls are desired.

EXISTING CONSTRUCTION (No Open Walls), LOCALIZED SYSTEM DESIGN

Wireless Series is the simplest retrofit solution that *HomeWorks* offers, because it does not require any special wiring. Wireless Series uses *Maestro* dimmers and designer-style keypads.

The following pages provide more detail on each of the key elements:

Construction Type, pg. 11

System Design, pg. 12

HomeWorks Series, pg. 16

Aesthetic Styles, pg. 17

Construction Type

HomeWorks® can be used in both new and existing homes. Many system components are available in either wired or RF versions for maximum flexibility during installation. If low-voltage wiring can be run, wired components are more economical than RF components. However, RF components are the easiest to install in existing homes, because they do not need any communication wires.

NEW CONSTRUCTION

New construction is the most desirable time to install a *HomeWorks* system, since it allows all *HomeWorks* options to be considered. Before the electrical wiring has been done, any of the three system designs may be chosen. Low-voltage wiring may be run throughout the home, making wired components the best choice for in-wall devices. Both architectural and designer aesthetic styles are available.

EXISTING CONSTRUCTION (Open Walls)

Open wall access allows low-voltage wiring to be easily run throughout the home, making wired components the best choice for in-wall devices. Localized system design is typically the best option, since it is the only design that uses a standard layout for the electrical wiring. However, if dimmers are not wanted on the wall, minor electrical changes can allow wallbox power modules to dim remotely throughout the home, so that only keypads are used for the lighting. Wired components are available in either architectural-style or designer-style, but if wireless components are being used in some areas of the home, designer-style is the only option.

EXISTING CONSTRUCTION (No Open Walls)

Without open walls, wireless series is the best option. Wireless series still offers wall-mounted dimmers and keypads, but does not require low-voltage wiring. Localized system design is the only wireless option, since it is the only design that uses a standard layout for the electrical wiring. Wireless series components are designer-style.

System Design

The flexible HomeWorks® architecture accommodates three basic system designs for laying out a *HomeWorks* system. The system design and controls used are based on the construction type and customer requirements. The main difference among these three designs is the dimming equipment used.

LOCALIZED SYSTEM DESIGN (pg. 13)

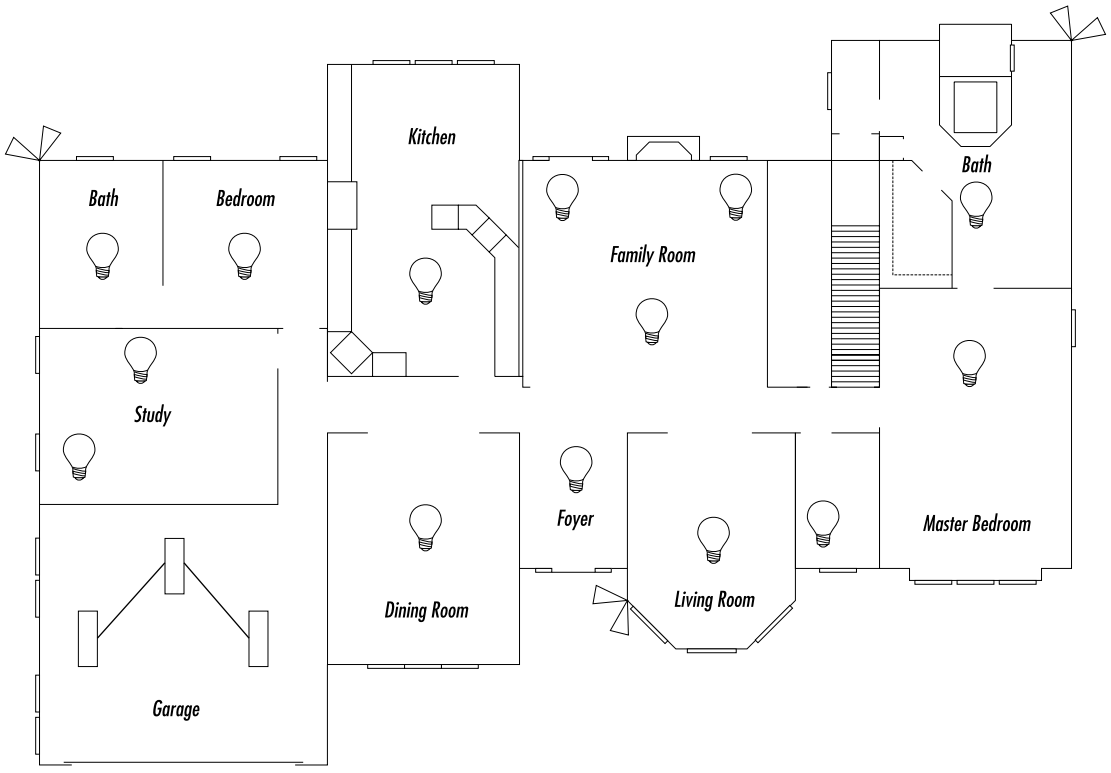
In a localized design, each zone of light has its own local switch or dimmer. Using a traditional approach to lighting control by placing familiar, easy-to-use switches and dimmers throughout the home. The localized system design is usually the simplest to understand—especially for guests. Keypads are added in key areas of the home for simplified control of multiple lights. The localized design is the only fully compatible configuration for retrofit or pre-wired whole-home lighting control.

CENTRALIZED SYSTEM DESIGN (pg. 14)

Centralized designs use wall-mounted keypads in each room, instead of traditional dimmers or switches. In a centralized design, there are no wall-mounted dimmers, because all dimming is done through remotely mounted panels. A single keypad can take the place of several dimmers or switches, creating less clutter on the wall. Keypads also offer maximum controllability everywhere, allowing control of both local lights and lights throughout the rest of the home. A centralized design requires the electrical wiring for all lighting in the home to be routed through remote dimming panels, before being run to the lights. These panels are installed out of sight (e.g., equipment room or utility closet).

OPTIMIZED SYSTEM DESIGN (pg. 15)

An optimized design combines both localized and centralized system designs, using each design where it is best suited. Local dimmers are installed in areas where familiar, easy-to-use operation is desired (e.g., guest bedrooms, bathrooms, and kids' rooms). Keypads are installed instead of dimmers in rooms or areas where several lights are controlled (e.g., front door, kitchen, and master bedroom). As in a centralized design, lights in those areas must be wired through remote dimming panels.



Localized System Design

In a localized design, each zone of light has its own switch or dimmer. This traditional approach to lighting control places familiar, easy-to-use switches and dimmers throughout the home. The localized system design is usually the simplest to understand—especially for guests. Keypads are added in key areas of the home for simplified control of multiple lights.

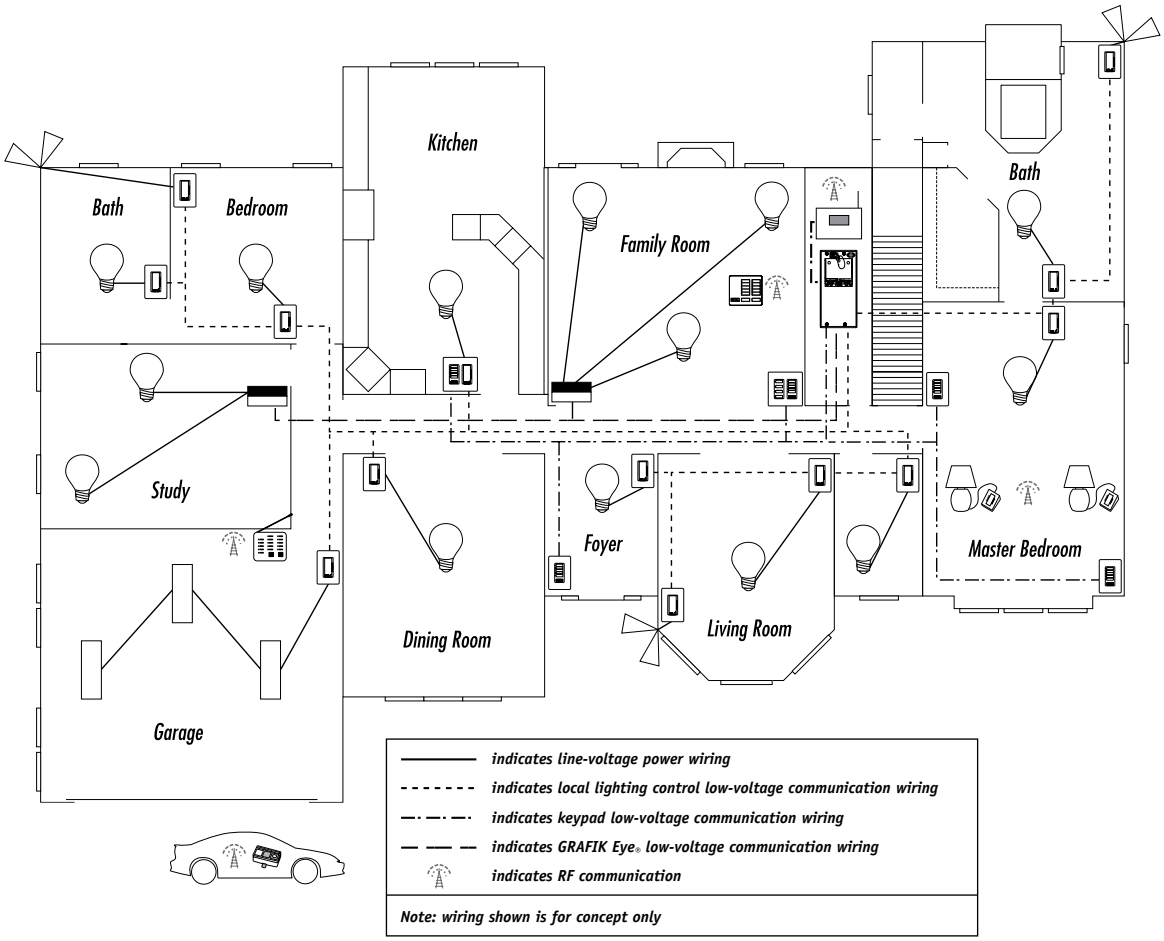
HomeWorks® local lighting controls directly control all lighting loads in a localized design. Local lighting controls allow the homeowner to dim and switch loads without requiring communication to the processor, providing "fail-safe" operation of all lights—in the unlikely event that communication is interrupted.

Keypads provide control of multiple lights within one area or all of the lights throughout the home. In this design, keypads (wall-mounted and tabletop) are typically installed in locations such as entryways, master bedrooms, and key entertaining areas. Visor controls are used to control house lighting from the homeowner's vehicles.

The localized design is the only fully compatible configuration for retrofit or pre-wire whole-home lighting control. It is the only system design that uses the same standard line-voltage wiring plan used in homes without control systems. This design is ideal for the homeowner who wants to add a control system at any time, with or without pre-wiring.

LOCALIZED DESIGN SUMMARY:

- Dimmers and switches provide familiar control and operation in every room
- Local lighting controls provide individual "fail-safe" operation of every light in the home
- Standard line-voltage wiring allows a whole-home lighting control system to be added at any time



Centralized System Design

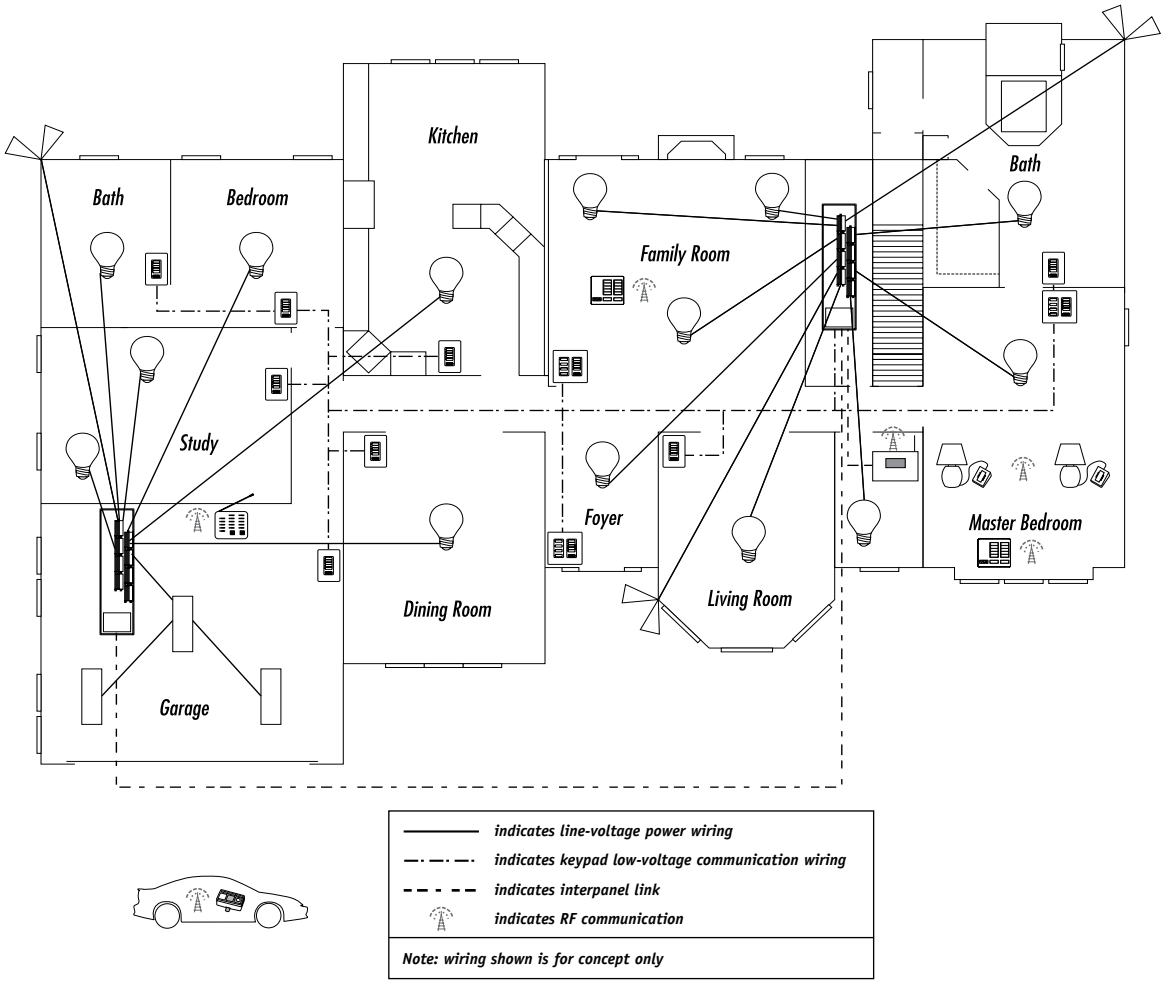
Centralized designs use wall-mounted keypads in each room, instead of traditional dimmers or switches. In a centralized design, there are no traditional dimmers, because all dimming is done through remote power modules installed in panels. A centralized design requires the electrical wiring for all lighting in the home to be routed through the remote power panels before being run to the lights (home run wiring). These panels are installed out of sight (e.g., equipment room or utility closet).

In this design, all lights are controlled from keypads, providing maximum programming flexibility, while minimizing wall clutter. Keypads have the ability to perform any function from control of a single light to whole-home control. A single keypad on the wall can take the place of several dimmers or switches, creating less clutter on the wall. Tabletop keypads can be added in rooms where lighting control is desired from a sitting area or bedside. Visor controls are added for control of house lighting from the homeowner's vehicles.

Remote power modules support larger wattage loads and a wide range of load types than local lighting controls, reducing the need for power boosters or specialized interfaces. Modules can also control fans, motors, and relays in addition to lighting. Dimmable receptacles or RF lamp dimmers can be installed wherever lamps will be on the HomeWorks® system. Each panel has manual override control, providing "fail-safe" operation—in the unlikely event communication to the processor is interrupted.

CENTRALIZED DESIGN SUMMARY:

- Remote power panels power all home lighting rather than local dimmers and switches
- Keypad-only design minimizes wall clutter and provides maximum programming flexibility
- Remote power panels minimize the need for power boosters or interfaces, and can also control fans, motors, and relays



Optimized System Design

An optimized design combines both localized and centralized system designs, using each design where it is best suited. Local lighting controls are installed in guest rooms, bathrooms, and in any other areas where simple, familiar controls are desired. Lighting loads in foyers, dining rooms, living rooms, and other high-profile areas are wired to remote power panels—instead of dimmers or switches—reducing wall clutter. Keypads are then distributed throughout the home, for control in rooms with no dimmers, and for additional control in other areas.

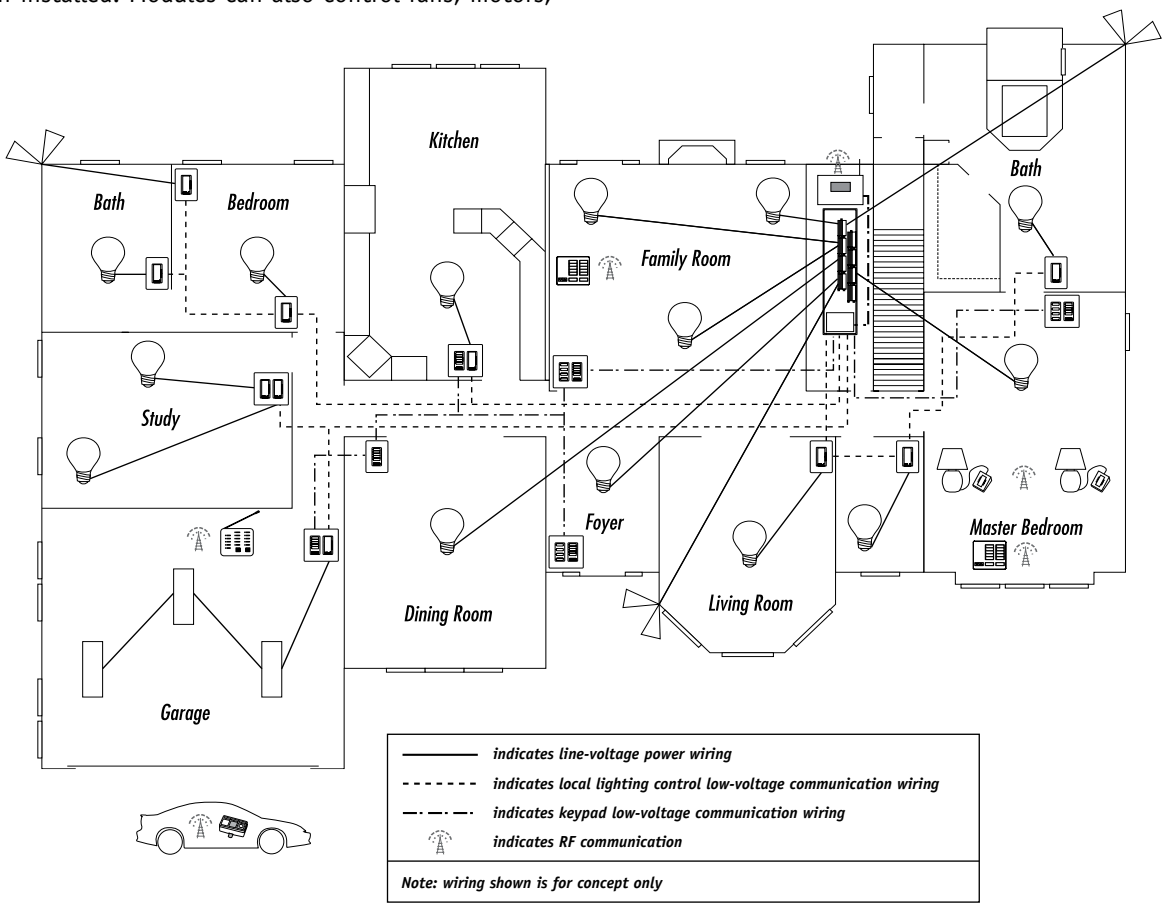
In this design, lights are controlled from keypads in high-profile areas to minimize wall clutter, and in other areas for additional control (e.g., master bedroom). Tabletop keypads can be added in rooms where lighting control is desired from a sitting area or the bedside. Visor controls are added for control of house lighting from the homeowner's vehicles.

Remote power modules support larger wattage loads and a wider range of load types than local lighting controls. This reduces the need for power boosters or specialized interfaces in the high-profile areas that these lighting loads are often installed. Modules can also control fans, motors, and relays, in addition to lighting. Dimmers provide manual control, and each panel has manual override control, providing "fail-safe" operation—in the unlikely event communication to the processor is interrupted.

The optimized design allows retrofit or pre-wiring for later expansion, using local lighting controls. This design is ideal for the homeowner who would like to start with a basic system and expand it later.

OPTIMIZED DESIGN SUMMARY:

- Keypad-only design is used in main areas of the home to reduce wall clutter
- Dimmers and switches are used in areas with less lighting to provide simple operation of individual lights
- Remote power panels minimize the need for power boosters or interfaces, and can also control fans, motors, and relays
- Compatibility with standard line-voltage wiring allows for system expansion at a later time



HomeWorks® Series

HomeWorks is broken into three series to simplify specification—8 Series, 4 Series, and Wireless Series. Each series is focused on a particular line of matching products, but it is important to note that all *HomeWorks* series can be interconnected.

8 SERIES—Our Premier System

The 8 Series features the widest selection of control styles and finishes. In addition to the dimmers and switches offered in the other series, 8 Series offers remote power modules to control lighting, without using a dimmer or switch on the wall. Remote power modules can also control fans, motors, and relays.

8 Series is best suited for new construction or major renovation projects with open walls because low-voltage communication wiring must be pulled throughout the home. A special electrical wiring layout is also required for any lighting or other device controlled by remote power modules.

4 SERIES—Our Most Economical System

The 4 Series focuses on the high-value products in the *HomeWorks* line to offer the most cost-effective lighting control solution. The high-value products are designer-style wired devices. Maestro® dimmers and other designer-style products use standard designer opening wallplates. This eliminates the cost associated with custom or specialized wallplates, such as the varied openings associated with architectural-style products. A standard electrical wiring layout can be used, since 4 Series only uses local lighting controls to control its lighting loads.

WIRELESS SERIES—Our Most Versatile System

The Wireless Series features our RF products, which do not require communication wiring. RF wall-mounted products include *Maestro* dimmers and designer-style keypads. Tabletop keypads, car visor controls and lamp dimmers are exclusive to the wireless series. Wireless Series components may be used with 4 or 8 Series by adding hybrid repeaters or a Wireless Series processor. An exclusively wireless series system is intended for projects where pulling low-voltage wiring is not a reasonable option. A standard electrical wiring layout can be used, including an existing one, since Wireless Series only uses local lighting controls to control its lighting loads.

Aesthetic Styles

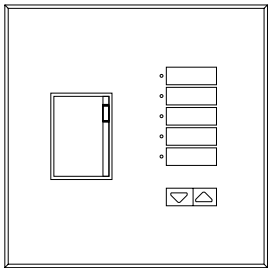
HomeWorks® wall-mounted products are available in two aesthetic styles—architectural-style and designer-style. Both styles offer keypads, local controls, and accessories. The differences between the two styles are the colors available and the faceplate design.

ARCHITECTURAL-STYLE

Architectural-style has the widest range of keypad choices available. It also includes Vareo® lighting controls and GRAFIK Eye® multi-zone lighting controls. Architectural-style products are only available as wired devices, and *Vareo* lighting controls are only compatible with an 8 Series system.

Aesthetic Features

- Square corners and beveled edges
- Minimalist aesthetics intended to blend with environment
- Architectural matte plastic and metal finishes
- Color matching available

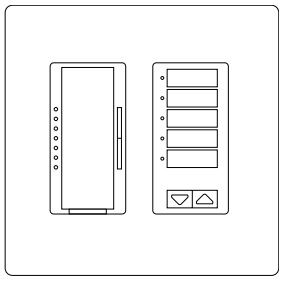


DESIGNER-STYLE

Designer-style products are available for any *HomeWorks* series. There are Maestro® local controls and two choices of designer-style keypads.

Aesthetic Features

- Rounded corners and square edges
- Fashionable aesthetics intended to complement environment
- Designer gloss and satin finishes
- All products use standard decorator opening, eliminating the need for custom faceplates



General HomeWorks® Specifications

Wired Processor Communication Link Specifications

Link Type	Max. links per Processor 4 Series	8 Series	Baud Rates	Wiring Configuration	Termination Required
Module Interface	0	1	125 K	Daisy-Chain	Yes, at last MI on link[1]
Inter-Processor	1	1	125 K	Daisy-Chain	Yes, at both ends of link[1]
GRAFIK Eye®	3	4	31.25 K	Daisy-Chain	No
RS-232	1	2	9600-115.2 K	Point-to-Point	No
Keypad	3	4	10.42 K-41.67 K	Any	No
Dimmer Interface (D48)	0	4	62.5 K	Daisy-Chain	Yes, at both ends of link[1]
Dimmer Interface (H48)	1	1	125 K	Daisy-Chain	Yes, at both ends of link[1]
Hybrid Repeater	1[2]	1	125 K	Daisy-Chain	Yes, at both ends of link[1]
Q96	3	4	9600	Daisy-Chain	Yes, at both ends of link[1]
Ethernet	1	1	10/100 Base-T	Point-to-Point	No

[1] Terminators required if total cable length exceeds 50 feet (15 m).
[2] For 4 series processors with "HRL" in the model number.

RF Processor Communication Link Specifications

Link Type	Max. links per Processor	Baud Rates	Wiring Configuration	Termination Required
Inter-Processor	1	125 K	Daisy-Chain	Yes, at both ends of link[1]
RS-232	2	9600-115.2 K	Point-to-Point	No
RF Keypads	1[2]	N/A	RF	N/A
RF Dimmers	1[2]	N/A	RF	N/A
Hybrid RF/Wired Repeaters	1[2]	N/A	RF	N/A
Ethernet	1	10/100 Base-T	Point-to-Point	No

[1] Terminators required if total cable length exceeds 50 feet (15 m).
[2] Virtual link (no physical/wired link present).

Remote Power Module (RPM) Capacities

Number of zones per RPM	4
Max. number of RPMs per Module Interface (MI)	8
Max. number of MIs per MI link	16
Max. number of MI links per processor	1
Max. number of RPMs per processor	128
Max. number of RPM zones per processor	256
Max. number of processors per system	16
Max. number of RPMs per system	2048
Max. number of RPM zones per system	4096

GRAFIK Eye® Capacities	4 series	8 series
Max. number of *GRAFIK Eye* Control Units per *GRAFIK Eye* link	8	8
Max. number of *GRAFIK Eye* Accessory Controls per *GRAFIK Eye* link	15	15
Max. number of *GRAFIK Eye* links per processor	3	4
Max. number of *GRAFIK Eye* Control Units per processor	24	32
Max. number of *GRAFIK Eye* Accessory Controls per processor	45	45
Max. number of processors per system	16	16
Max. number of *GRAFIK Eye* Control Units per system	384	384
Max. number of *GRAFIK Eye* Accessory Controls per system	720	720

General HomeWorks® Specifications (cont.)

Wired Vareo® Local Lighting Controls Capacities	
Max. number of *Vareo* Local Lighting Controls per Dimmer Interface (D48) bus	4
Number of buses per D48	12
Max. number of *Vareo* Local Lighting Controls per D48	48
Max. number of D48 Dimmer Interface Boards per processor D48 link	4
Max. number of *Vareo* Local Lighting Controls per processor D48 link	192
Max. number of D48 links per processor	3
Max. number of *Vareo* Local Lighting Controls per processor	256
Max. number of processors per system	16
Max. number of *Vareo* Local Lighting Controls per system	4096

Wired Maestro® Local Controls Capacities	
Max. number of *Maestro* Local Controls per Dimmer Interface (H48) bus	8
Number of buses per H48	6
Max. number of *Maestro* Local per H48	48
Max. number of H48 Dimmer Interface per processor H48 link	4
Max. number of *Maestro* Local Controls per processor H48 link	192
Max. number of H48 links per processor	1
Max. number of *Maestro* Local Controls per processor	192
Max. number of processors per system	16
Max. number of *Maestro* Local Controls per system	3072

RF *Maestro* Local Controls / RF Shades Capacities	RF
Max. number of RF *Maestro* Local Controls / RF Shades per Processor	64
Max. number of Processors per system	16
Max. number of RF *Maestro* Local Controls / RF Shades per system	1024

Q96 Capacities	
Max. number of Sivoia QED® EDUs per Q96	96
Max. number of Q96 per processor H48 link	4
Max. number of Sivoia QED® EDUs per processor H48 link	256
Max. number of H48 links per processor	1
Max. number of processors per system	16
Max. number of Sivoia QED® EDUs per system	4096

Keypad Capacities	RF	4 series Wired	8 series Wired
Max. number of devices per keypad link	32	32*	32*
Max. number of keypad links per processor	1	3	4
Max. number of keypads per processor	32	96*	128*
Max. number of tabletop keypads per system	32	N/A	N/A
Max. number of processors per system	16	16	16
Max. number of keypads per system	512	1536*	1536*

* Wired keypad capacities based on maximum number of available addresses. For maximum capacities based on number of keypad LEDs, see Table 1 on pgs. 40 and 91.

Notes:

Front Room Equipment

Wired Keypads

4/8 Series
Keypad
Keypad Link
Architectural & Designer-Style

HomeWorks® keypads, available in many styles, colors, and finishes, provide homeowners with a simple and elegant way to operate lights, shades, motorized screens, pumps, thermostats, and many other devices. Keypads have LEDs that provide real-time status indication. Lutron provides custom engraving to clearly identify each button's function.

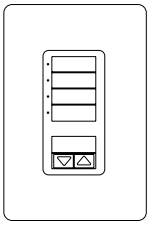
Keypads are available in a variety of button styles and button configurations. Since each button on every keypad model can be programmed to control any lighting load or device on the *HomeWorks* system, choosing a keypad for a particular location requires no more than choosing the desired style and number of buttons. Engraving can be added to any keypad. Please contact Lutron Customer Service or your local Lutron Representative for details.

Each *HomeWorks* wired processor has configurable links, each capable of controlling up to 32 wired keypads. See pg. 90 for processor details.

CONNECTION TO PROCESSOR

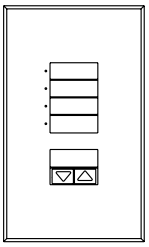
Up to 32 wired keypads can be connected to a configurable link on a *HomeWorks* wired processor using two pair — one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded — NEC® Class 2 (IEC PELV) cable. Keypads may be wired in a daisy-chain, home run, star, or T-tap configuration. The maximum total cable length of any wire run is 1000 feet (305 m) with up to 10 keypads or interfaces. The maximum total cable length is 4000 feet (1220 m).

Designer-style

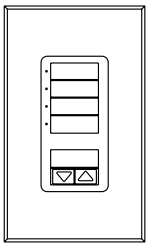


seeTouch®
pg. 34
(RF models also available)

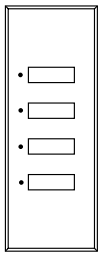
Architectural-style



seeTouch® - No Insert
pg. 24

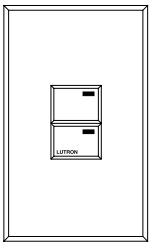


***seeTouch* - Insert**
pg. 25

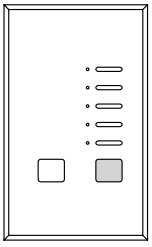


Signature Series™
pg. 26

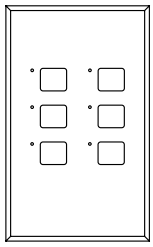
Architrave™
pg. 27



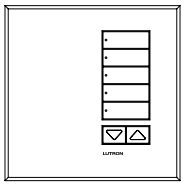
2-Button
pg. 28



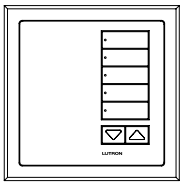
Slim Button
pg. 29



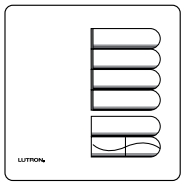
Large Button
pg. 29



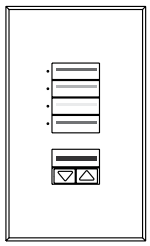
International *seeTouch* - Frameless
pg. 30



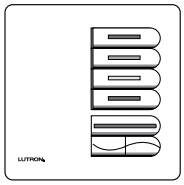
International *seeTouch* - Insert
pg. 31



European-style
pg. 32



***seeTouch* Bang & Olufsen®**
pg. 33



European-style Bang & Olufsen®
pg. 33

Wired Keypads - Architectural

Architectural seeTouch® KEYPADS

The Architectural-style *seeTouch* keypads feature large, easy-to-use buttons, plus a unique backlit engraving option that makes the keypads readable any time of the day or night. *seeTouch* buttons are rounded, allowing engraving to be displayed at an upward angle for increased readability. *seeTouch* keypads are available with one to seven buttons, allowing you to customize the number of functions to fit your needs.

The flexible design allows the number of buttons and the configuration of the buttons to be changed after the keypad is installed.

Wired *seeTouch* models have two contact closure inputs on the back of the unit which provide independent functions from the front buttons. Other options include configurations with infrared receiver and raise/lower buttons.

COLORS AND FINISHES

Architectural-style *seeTouch* keypads are available in Architectural Matte finish plastic colors and Architectural Metal finishes. Button and insert color may differ. Refer to *seeTouch* Ordering Guide (367-571) for details. Custom finishes and paint matching are also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. Also see Appendix F: Colors & Finishes.

ORDERING METHODS

Temporary button labels for *seeTouch* keypads are available in Gray letters (GR) for light colored buttons, or in White letters (WH) for dark colored buttons. Order model number ST-LBL-GR (or WH) for 1 sheet, or model number ST-LBL25-GR (or WH) for a pack of 25 sheets.

a) **Engraving will be decided after installation**

1) Order keypad with buttons. A prepaid engraving certificate is included.
   ST-Model-Color

2) After engraving is determined, redeem engraving certificate.
   SK-Model-Color-E

b) **Engraving will be decided before installation**

1) Order keypad without buttons.
   Non-IR: ST-NB-NONE
   IR: ST-NBIR-NONE

2) Order engraved button kit.
   SK-Model-Color-E

***seeTouch* - NO INSERT**

1-Button

Keypad: ST-1B-NI-XX
Button/Faceplate: SK-1B-NI-XX-E
Description: 1-button - no insert

2-Button

Keypad: ST-2B-NI-XX
Button/Faceplate: SK-2B-NI-XX-E
Description: 2-button - no insert

3-Button

Keypad: ST-3B-NI-XX
Button/Faceplate: SK-3B-NI-XX-E
Description: 3-button - no insert

Keypad: ST-3BRL-NI-XX
Button/Faceplate: SK-3BRL-NI-XX-E
Description: 3-button with raise/lower - no insert

4-Button

Keypad: ST-4B-NI-XX
Button/Faceplate: SK-4B-NI-XX-E
Description: 4-button - no insert

Keypad: ST-4FS-NI-XX
Button/Faceplate: SK-4FS-NI-XX-E
Description: 4-button favorite scene - no insert

Keypad: ST-4S-NI-XX
Button/Faceplate: SK-4S-NI-XX-E
Description: 4-scene with raise/lower - no insert

Keypad: ST-4SIR-NI-XX
Button/Faceplate: SK-4SIR-NI-XX-E
Description: 4-scene with IR receiver and raise/lower - no insert

5-Button

Keypad: ST-5B-NI-XX
Button/Faceplate: SK-5B-NI-XX-E
Description: 5-button - no insert

Keypad: ST-5FS-NI-XX
Button/Faceplate: SK-5FS-NI-XX-E
Description: 5-button favorite scene - no insert

Keypad: ST-5BRL-NI-XX
Button/Faceplate: SK-5BRL-NI-XX-E
Description: 5-button with raise/lower - no insert

XX= Color Code

Wired Keypads - Architectural (cont.)

seeTouch® - NO INSERT (cont.)

6-Button

Keypad: ST-6B-NI-XX
Button/Faceplate: SK-6B-NI-XX-E
Description: 6-button - no insert

Keypad: ST-6BRL-NI-XX
Button/Faceplate: SK-6BRL-NI-XX-E
Description: 6-button with raise/lower - no insert

7-Button

Keypad: ST-7B-NI-XX
Button/Faceplate: SK-7B-NI-XX-E
Description: 7-button - no insert

seeTouch - INSERT

1-Button

Keypad: ST-1B-I-XX
Button/Faceplate: SK-1B-I-XX-E
Description: 1-button - insert

2-Button

Keypad: ST-2B-I-XX
Button/Faceplate: SK-2B-I-XX-E
Description: 2-button - insert

3-Button

Keypad: ST-3B-I-XX
Button/Faceplate: SK-3B-I-XX-E
Description: 3-button - insert

Keypad: ST-3BRL-I-XX
Button/Faceplate: SK-3BRL-I-XX-E
Description: 3-button with raise/lower - insert

4-Button

Keypad: ST-4B-I-XX
Button/Faceplate: SK-4B-I-XX-E
Description: 4-button - insert

Keypad: ST-4FS-I-XX
Button/Faceplate: SK-4FS-I-XX-E
Description: 4-button favorite scenes - insert

seeTouch - INSERT (cont.)

4-Button (cont.)

Keypad: ST-4S-I-XX
Button/Faceplate: SK-4S-I-XX-E
Description: 4-scene with raise/lower - insert

Keypad: ST-4SIR-I-XX
Button/Faceplate: SK-4SIR-I-XX-E
Description: 4-scene with IR receiver and raise/lower - insert

5-Button

Keypad: ST-5B-I-XX
Button/Faceplate: SK-5B-I-XX-E
Description: 5-button - insert

Keypad: ST-5FS-I-XX
Button/Faceplate: SK-5FS-I-XX-E
Description: 5-button favorite scene - insert

Keypad: ST-5BRL-I-XX
Button/Faceplate: SK-5BRL-I-XX-E
Description: 5-button with raise/lower - insert

6-Button

Keypad: ST-6B-I-XX
Button/Faceplate: SK-6B-I-XX-E
Description: 6-button - insert

Keypad: ST-6BRL-I-XX
Button/Faceplate: SK-6BRL-I-XX-E
Description: 6-button with raise/lower - insert

7-Button

Keypad: ST-7B-I-XX
Button/Faceplate: SK-7B-I-XX-E
Description: 7-button - insert

seeTouch - NO BUTTONS

No-Button

Keypad: ST-NB-NONE
Description: No buttons

Keypad: ST-NBIR-NONE
Description: No buttons with IR receiver

XX= Color Code

FRONT ROOM

Wired Keypads - Architectural (cont.)

SIGNATURE SERIES™ KEYPADS

Signature Series keypads allow you to incorporate the functions of HomeWorks® keypads into a sleek, narrow-profile control that fits flush into a door trim, door jamb, or custom cabinetry. *Signature Series* keypads can also be used at standard switch locations throughout your home to add a unique and elegant look.

Keypads feature large, easy-to-use buttons, plus a unique backlit (blue or green) engraving option that makes them readable any time of the day or night. Buttons are rounded, allowing engraving to be displayed at an upward angle for increased readability. *Signature Series* keypads include 3-and 4-button configurations, available with blue or green status indicators.

Signature Series keypads may be mounted with or without a wallbox (WBOX-SA1-Q1).

FINISHES AND COLORS

Signature Series keypads ship with solid metal faceplates. See Appendix F: Colors & Finishes.

ORDERING METHOD

Temporary button labels for *seeTouch* keypads are available in Gray letters (GR) for light colored buttons, or in White letters (WH) for dark colored buttons. Order model number ST-LBL-GR (or WH) for 1 sheet, or model number ST-LBL25-GR (or WH) for a pack of 25 sheets.

1) Order keypad with buttons/faceplate. A prepaid engraving certificate is included.
   HWS-Model-Color

2) After engraving is determined, redeem engraving certificate for engraved button kit with same number of buttons as control.
   HKS-Model-Color-E

SIGNATURE SERIES KEYPADS

3-Button Monaco™ (Blue Status Indicators)

Keypad: HWS-3B-B-XX
Button Kit: HKS-3B-BL-E
Description: 3-button

4-Button *Monaco* (Blue Status Indicators)

Keypad: HWS-4B-B-XX
Button Kit: HKS-4B-BL-E
Description: 4-button

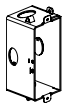
3-Button Monterey™ (Green Status Indicators)

Keypad: HWS-3B-G-XX
Button Kit: For white *Monterey* Keypads only
HKS-3B-WH-E
Button Kit: For non-white *Monterey* Keypads
HKS-3B-BL-E
Description: 3-button

4-Button *Monterey* (Green Status Indicators)

Keypad: HWS-4B-G-XX
Button Kit: For white *Monterey* Keypads only
HKS-4B-WH-E
Button Kit: For non-white *Monterey* Keypads
HKS-4B-BL-E
Description: 4-button

Wallbox



Model: WBOX-SA1-Q1
Description: *Signature Series* wallbox (1 metal box)
Dimensions: See pg. 87

XX= Color Code

Wired Keypads - Architectural (cont.)

ARCHITRAVE™ KEYPADS

Architrave keypads allow you to incorporate the functions of standard-size HomeWorks® keypads into a sleek, narrow-profile control that fits flush into a door trim, door jamb, or custom cabinetry. *Architrave* keypads can also be used at standard switch locations throughout your home, to add a unique and elegant look. *Architrave* keypads can be engraved, below each button, with names of your choosing. *Architrave* keypads may be mounted with or without a wallbox.

FINISHES AND COLORS

Architrave keypads are available with a White (WH) or Bright Brass (BB) metal faceplate. Other metallic finishes are also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

ORDERING METHOD

1) Order keypad with buttons/faceplate. A prepaid engraving certificate is included.
   HWI-Model-Color
2) After engraving is determined, redeem engraving certificate for engraved button kit with same number of buttons as control.
   AR-M4-Model-Color
   (Excludes HWI-LB5-DC1)

ARCHITRAVE KEYPADS

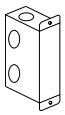
5-Button

Keypad: HWI-KP5-DN-XX
Faceplate only: AR-M4-DN-XX
Description: Door narrow 5-button with master on/off

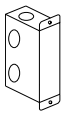
Keypad: HWI-KP5-DW-XX
Faceplate only: AR-M4-DW-XX
Description: Door wide 5-button with master on/off

Keypad: HWI-LB5-DC1-XX
Faceplate only: Custom
Description: 5 large buttons with raise/lower

Wallboxes



Model: 241-399
Description: Wallbox for HWI-KP5-DW/DN (1 metal box)
Dimensions: See pg. 87



Model: 241-663
Description: Wallbox for HWI-LB5-DC1 (1 metal box)
Dimensions: See pg. 87

XX= Color Code

Wired Keypads - Architectural (cont.)

2-BUTTON KEYPAD

The design of this keypad features two large buttons. 2-button keypads are ideal for areas where intuitive control is required. Typical locations include: hallways, entrances, guest rooms, bathrooms, and children's rooms.

This keypad can be engraved on each button with names of your choosing. Engraving can be added by ordering a new faceplate with engraving. Two-button keypads have 2 contact closure inputs on the back of the unit which provide independent function from the front buttons.

FINISHES AND COLORS

Architectural-style 2-Button keypads ship with specified color faceplate. Keypads are available in Architectural Matte finish plastic colors and Architectural Metal finishes. Custom finishes and paint matching are also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

2-BUTTON KEYPAD

2-Button

Keypad:	HWI-2B-XX
Faceplate only:	NT-T8-NFB-XX
Description:	2-button

XX= Color Code

Wired Keypads - Architectural (cont.)

SLIM BUTTON KEYPADS

Slim button keypads provide the largest number of buttons per gang, thereby maximizing control in minimal space. Slim button keypads feature multiple button columns and two large buttons which provide logical partitioning of keypad function.

These keypads can be engraved below each button with names of your choosing. Engraving can be added by returning the faceplate with an engraving schedule or ordering a new faceplate with engraving.

FINISHES AND COLORS

Architectural-style slim button keypads ship with a faceplate. Keypads are available in Architectural Matte finish plastic colors and Architectural Metal finishes. Custom finishes and paint matching are also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

SLIM BUTTON KEYPADS

5-Button

Keypad:	HWI-KP5-XX
Faceplate only:	HW-B1-NFB-XX
Description:	5-button with master on/off

10-Button

Keypad:	HWI-KP10-XX
Faceplate only:	HW-B2-NFB-XX
Description:	10-button with master on/off

15-Button

Keypad:	HWI-KP15-XX
Faceplate only:	HW-B3-NFB-XX
Description:	15-button with master on/off

LARGE BUTTON KEYPADS

The design of this keypad features large, easy-to-use buttons. Large button keypads feature multiple button columns which provide logical partitioning of keypad functions.

These keypads can be engraved on or below each button with names of your choosing. Engraving can be added by returning the faceplate with an engraving schedule or ordering a new faceplate with engraving.

FINISHES AND COLORS

Architectural-style large button keypads ship with a faceplate. Keypads are available in Architectural Matte finish plastic colors and Architectural Metal finishes. Custom finishes and paint matching are also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

LARGE BUTTON KEYPADS

6-Button

Keypad:	HWI-KP-LB6-XX
Faceplate only:	HWI-B4-NFB-XX
Description:	6-button

9-Button

Keypad:	HWI-KP-LB9-XX
Faceplate only:	HWI-B5-NFB-XX
Description:	9-button

XX= Color Code

Wired Keypads - Architectural (cont.)

INTERNATIONAL seeTouch® KEYPADS

The International *seeTouch* keypads feature large, easy-to-use buttons, plus a unique backlit engraving option that makes the keypads readable any time of the day or night. *seeTouch* buttons are rounded, allowing engraving to be displayed at an upward angle for increased readability. *seeTouch* keypads are available with one to seven buttons, allowing you to customize the number of functions to fit your needs.

The flexible design allows the number of buttons — and the configuration of the buttons — to be changed after the keypad is installed.

Wired *seeTouch* models have two contact closure inputs on the back of the unit which provide independent functions from the front buttons. Other options include configurations with infrared receiver and raise/lower buttons.

FINISHES AND COLORS

International *seeTouch* keypads are available in Architectural Matte finish plastic colors and Architectural Metal finishes. Button and insert color may differ. Custom finishes and paint matching are also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. Also See Appendix F: Colors & Finishes.

ORDERING METHODS

1) Order base unit.
   Non-IR: HWIS-NB-NONE
   IR: HWIS-NBIR-NONE
2) Order engraved button/faceplate kit.
   HWIS-Model-Color-E

INTERNATIONAL *seeTouch* KEYPAD - BASE UNITS

Base units


Keypad: HWIS-NB-NONE
Description: Base unit with raise/lower - no buttons


Keypad: HWIS-NBIR-NONE
Description: Base unit with IR receiver and raise/lower - no buttons

INTERNATIONAL *seeTouch* FACEPLATE/BUTTON KITS - NO INSERT

2-Button


Button/Faceplate: HWIS-2B-F-XX-E
Description: 2-button - no insert

3-Button


Button/Faceplate: HWIS-3B-F-XX-E
Description: 3-button - no insert

4-Button


Button/Faceplate: HWIS-4B-F-XX-E
Description: 4-button - no insert

5-Button


Button/Faceplate: HWIS-5BRL-F-XX-E
Description: 5-button with raise/lower - no insert


Button/Faceplate: HWIS-5BIR-F-XX-E
Description: 5-button with IR- no insert

6-Button


Button/Faceplate: HWIS-6BRL-F-XX-E
Description: 6-button with raise/lower - no insert

7-Button


Button/Faceplate: HWIS-7BRL-F-XX-E
Description: 7-button with raise/lower - no insert

8-Button


Button/Faceplate: HWIS-8BRL-F-XX-E
Description: 8-button with raise/lower - no insert


Button/Faceplate: HWIS-8BIR-F-XX-E
Description: 8-button with IR- no insert

10-Button


Button/Faceplate: HWIS-10BRL-F-XX-E
Description: 10-button with raise/lower - no insert

XX= Color Code

Wired Keypads - Architectural (cont.)

INTERNATIONAL seeTouch® FACEPLATE/BUTTON KITS - INSERT

2-Button

Button/Faceplate: HWIS-2B-I-XX-E
Description: 2-button - insert

3-Button

Button/Faceplate: HWIS-3B-I-XX-E
Description: 3-button - insert

4-Button

Button/Faceplate: HWIS-4B-I-XX-E
Description: 4-button - insert

5-Button

Button/Faceplate: HWIS-5BRL-I-XX-E
Description: 5-button with raise/lower - insert

Button/Faceplate: HWIS-5BIR-I-XX-E
Description: 5-button with IR- insert

6-Button

Button/Faceplate: HWIS-6BRL-I-XX-E
Description: 6-button with raise/lower - insert

7-Button

Button/Faceplate: HWIS-7BRL-I-XX-E
Description: 7-button with raise/lower - insert

8-Button

Button/Faceplate: HWIS-8BRL-I-XX-E
Description: 8-button with raise/lower - insert

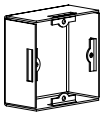
Button/Faceplate: HWIS-8BIR-I-XX-E
Description: 8-button with IR- insert

10-Button

Button/Faceplate: HWIS-10BRL-I-XX-E
Description: 10-button with raise/lower - insert

Wallboxes

Model: EBB-15-RD
Description: Round plastic wallbox for International *seeTouch* Keypads (15 plastic wallboxes)
Dimensions: See pg. 87



Model: EBB-15-SQ
Description: Square metal wallbox for International *seeTouch* Keypads (15 metal wallboxes)
Dimensions: See pg. 87

XX= Color Code

Wired Keypads - Architectural (cont.)

EUROPEAN-STYLE KEYPADS

European-style keypads feature large, rounded buttons, and large LEDs to clearly show lighting status. The unique square shape of this keypad adds distinction to any installation. European-style keypads are available with master raise/lower and/or infrared receiver. Buttons are rounded, allowing engraving to be displayed at an upward angle for increased readability.

FINISHES AND COLORS

European-style keypads are available in Architectural Matte white & black colors only. Metal finish faceplates are sold separately. See Appendix F: Colors & Finishes.

ORDERING METHOD

1) Order keypad with buttons/faceplate. A prepaid engraving certificate is included.
   HWI-Model-Color
2) After engraving is determined, redeem engraving certificate for engraved button/faceplate kit with same number of buttons as control.
   EFP-Model-Color

EUROPEAN-STYLE KEYPADS

2-Button

Keypad: HWI-2SE-XX
Faceplate only: EFP-2B-SL-XX
Description: 2-scene

4-Button

Keypad: HWI-4SE-M-XX
Faceplate only: EFP-4SE-M-XX
Description: 4-scene with off and raise/lower

Keypad: HWI-4SE-IR-XX
Faceplate only: EFP-4SE-IR-XX
Description: 4-scene with off, raise/lower and IR receiver

8-Button

Keypad: HWI-8SE-M-XX
Faceplate only: EFP-8SE-M-XX
Description: 8-scene with off and raise/lower

Keypad: HWI-8SE-IR-XX
Faceplate only: EFP-8SE-IR-XX
Description: 8-scene with off, raise/lower and IR receiver

Wallboxes

Model: EBB-15-RD
Description: Round plastic wallbox for International *seeTouch* Keypads (15 plastic wallboxes)
Dimensions: See pg. 87

Model: EBB-15-SQ
Description: Square metal wallbox for International *seeTouch* Keypads (15 metal wallboxes)
Dimensions: See pg. 87

XX= Color Code

Wired Keypads - Architectural (cont.)

Bang & Olufsen® KEYPADS

The Architectural-style Bang & Olufsen (B&O) keypads feature large, easy-to-use buttons, plus unique color bars that correspond to commands built into the B&O Beo-4™ remote.

Architectural-style B&O models have two contact closure inputs on the back of the unit which provide independent functions from the front buttons. Other options include configurations with infrared receiver and raise/lower buttons.

FINISHES AND COLORS

Architectural-style and European-style B&O keypads are available in White (WH), Black (BL) matte finishes and Satin Nickel (SN) metal finish (with Black buttons). Custom finishes and paint matching are also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. Also See Appendix F: Colors & Finishes.

ORDERING METHOD

1) Order keypad with buttons/faceplate. A prepaid engraving certificate is included.
   STBO-Model-Color or HWBO-Model-Color
2) After engraving is determined, redeem engraving certificate for engraved button/faceplate kit with same number of buttons as control.
   SK-Model-Color or EFP-Model-Color

seeTouch Bang & Olufsen KEYPADS

Architectural-style 4-Button

Keypad: STBO-4SN-XX
Button/Faceplate: SK-4S-NI-XX-E
Description: 4-scene with raise/lower - no insert

Keypad: STBO-4SI-XX
Button/Faceplate: SK-4S-I-XX-E
Description: 4-scene with raise/lower - insert

Keypad: STBO-4SIRN-XX
Button/Faceplate: SK-4SIR-NI-XX-E
Description: 4-scene with IR receiver and raise/lower - no insert

Keypad: STBO-4SIRI-XX
Button/Faceplate: SK-4SIR-I-XX-E
Description: 4-scene with IR receiver and raise/lower - insert

European-style Bang & Olufsen KEYPADS

European-style 4-Button

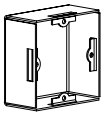
Keypad: HWBO-4SE-IR-XX
Faceplate only: EFP-4SE-IR-XX
Description: 4-scene with off, raise/lower and IR receiver

European-style 8-Button

Keypad: HWBO-8SE-IR-XX
Faceplate only: EFP-8SE-IR-XX
Description: 4-scene with off, raise/lower and IR receiver

Wallboxes for European-style Keypads

Model: EBB-15-RD
Description: Round plastic wallbox for International *seeTouch* Keypads (15 plastic wallboxes)
Dimensions: See pg. 87



Model: EBB-15-SQ
Description: Square metal wallbox for International *seeTouch* Keypads (15 metal wallboxes)
Dimensions: See pg. 87

XX= Color Code

Wired Keypads - Designer

Designer seeTouch® KEYPADS

The Designer-style *seeTouch* keypads feature large, easy-to-use buttons, plus a unique backlit engraving option that makes the keypads readable any time of the day or night. seeTouch buttons are rounded, allowing engraving to be displayed at an upward angle and increasing readability. *seeTouch* keypads are available with one to seven buttons, allowing you to customize the number of functions to fit your need. The flexible design even allows the number of buttons — and the configuration of the buttons — to be changed after the keypad is installed.

All wired *seeTouch* models have two contact closure inputs on the back of the unit which provide independent functions from the front buttons. Other options include configurations with infrared receiver and raise/lower buttons.

FINISHES AND COLORS

Designer-style *seeTouch* keypads are available in Designer Gloss finishes and Satin Colors® Matte finishes. Button and insert color may differ. Refer to *seeTouch* Ordering Guide (367-571) for details. Also See Appendix F: Colors & Finishes.

ORDERING METHODS

Temporary button labels for *seeTouch* keypads are available in Gray letters (GR) for light colored buttons, or in White letters (WH) for dark colored buttons. Order model number ST-LBL-GR (or WH) for 1 sheet, or model number ST-LBL25-GR (or WH) for a pack of 25 sheets.

a) **Engraving will be decided after installation**

1) Order keypad with buttons. A prepaid engraving certificate is included.
   STWD-Model-Color

2) After engraving is determined, redeem engraving certificate.
   SKD-Model-Color-E

b) **Engraving will be decided before installation**

1) Order keypad without buttons.
   Non-IR: ST-NB-NONE
   IR: ST-NBIR-NONE

2) Order engraved button kit.
   SKD-Model-Color-E

seeTouch KEYPADS

1-Button

Keypad*: STWD-1B-XX
Button Kit: SKD-1B-XX-E
Description: 1-button

2-Button

Keypad*: STWD-2B-XX
Button Kit: SKD-2B-XX-E
Description: 2-button

3-Button

Keypad*: STWD-3B-XX
Button Kit: SKD-3B-XX-E
Description: 3-button

Keypad*: STWD-3BRL-XX
Button Kit: SKD-3BRL-XX-E
Description: 3-button with raise/lower

4-Button

Keypad*: STWD-4B-XX
Button Kit: SKD-4B-XX-E
Description: 4-button

Keypad*: STWD-4FS-XX
Button Kit: SKD-4FS-XX-E
Description: 4-button favorite scene

Keypad*: STWD-4S-XX
Button Kit: SKD-4S-XX-E
Description: 4-scene with raise/lower

Keypad*: STWD-4SIR-XX
Button Kit: SKD-4SIR-XX-E
Description: 4-scene with IR receiver

* Claro® Gloss and *Satin Colors* Matte Finishes wallplate sold separately.

XX= Color Code

FRONT ROOM

Wired Keypads - Designer (cont.)

seeTouch® KEYPADS (cont.)

5-Button

Keypad*: STWD-5B-XX
Button Kit: SKD-5B-XX-E
Description: 5-button

Keypad*: STWD-5FS-XX
Button Kit: SKD-5FS-XX-E
Description: 5-button favorite scene

Keypad*: STWD-5BRL-XX
Button Kit: SKD-5BRL-XX-E
Description: 5-button with raise/lower

6-Button

Keypad*: STWD-6B-XX
Button Kit: SKD-6B-XX-E
Description: 6-button

Keypad*: STWD-6BRL-XX
Button Kit: SKD-6BRL-XX-E
Description: 6-button with raise/lower

7-Button

Keypad*: STWD-7B-XX
Button Kit: SKD-7B-XX-E
Description: 7-button

***seeTouch* - NO BUTTONS**

No-Button

Keypad: ST-NB-NONE
Description: No buttons

Keypad: ST-NBIR-NONE
Description: No buttons with IR receiver

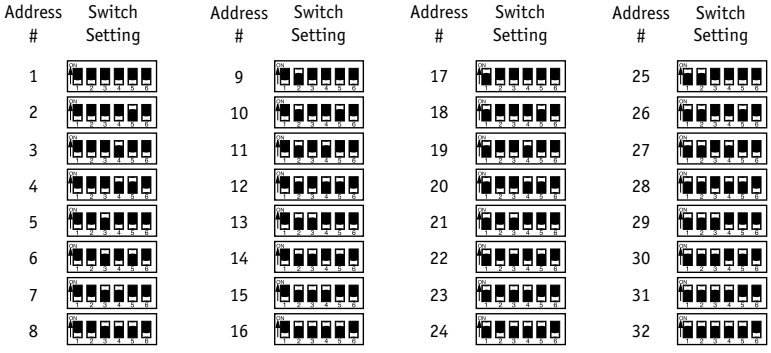
* Claro® Gloss and Satin Colors® Matte Finishes wallplate sold separately.

FRONT ROOM

XX= Color Code

Wired Keypads (cont.)

Model Number	All Wired Keypads.
Input Voltage	15 V⎓ NEC® Class 2 (IEC PELV)
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – NEC® Class 2 (IEC PELV) wire. Lutron® wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Daisy-chain, star, T-tap. Termination not required. Total length of wire on any link cannot exceed 1000 feet (305 m) per wire run. Total length of wire on that link cannot exceed 4000 feet (1220 m). Maximum of 32 devices per processor link that has been configured for keypads. Maximum of 10 keypads per home run.
Low-Voltage Connections	One 4-pin removable terminal block. Terminal block will accept up to four #18 AWG (1.0 mm^2) wires per pin.
Addressing	Via DIP switch located on unit. Units should be addressed before mounting in wall.
Diagnostics	LEDs provide diagnostics for troubleshooting.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Miswire Protection	All terminal block inputs are over-voltage and miswire-protected against wire reversals and shorts.
Mounting	*See Table 1, pg. 40.*
Engraving	Engraving of keypads and/or keypad buttons available.
IR Keypads (except B&O)	Compatible with these Lutron IR transmitters: GRX-IT-WH, GRX-8IT-WH, SPS-4IT-RP, SPS-FSIT-RP, SP-HT-WH. See Appendix C: Infrared (IR) Integration.
B&O IR Keypads	Compatible with Bang & Olufsen® Beo-4® IR transmitters.
Shipping Weight	0.4 lbs. (0.1 kg)
Keypad Link LED Count	*See Table 1, pg. 40.*



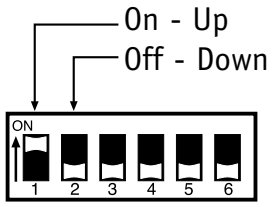


***Figure 1* –Addressing DIP Switches**

Wired Keypads – Addressing DIP Switch Locations

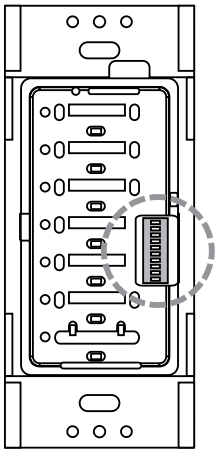


Figure 2 – **seeTouch® Keypads Front View**

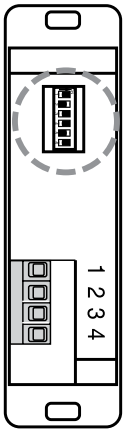


Figure 3 – **Signature Series™ Keypads Rear View**

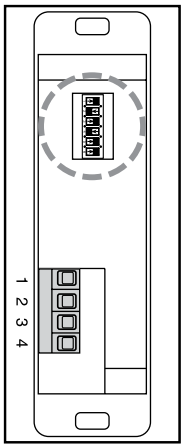


Figure 4 – **Architrave™ Keypads Rear View**

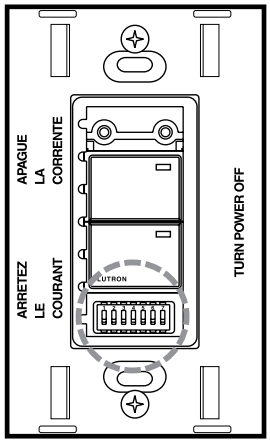


Figure 5 – **2-Button Keypad Front View**

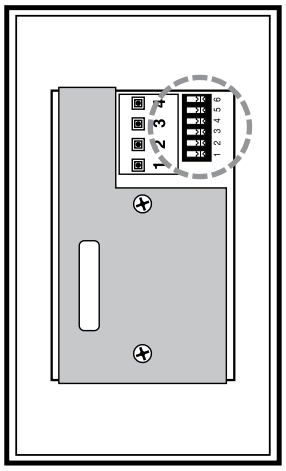


Figure 6 – **Architectural-style Slim and Large Button Keypads Rear View**

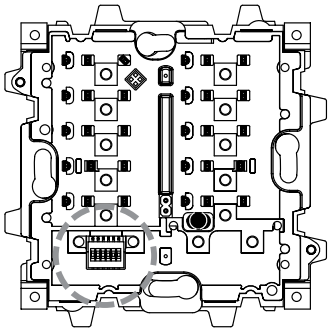


Figure 7 – **International seeTouch Keypads Front View**

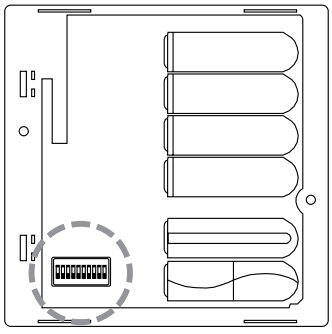
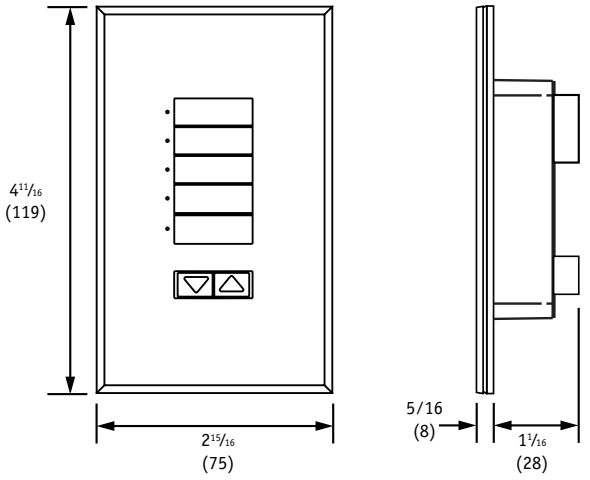


Figure 8 – **European-style Keypads Front View**

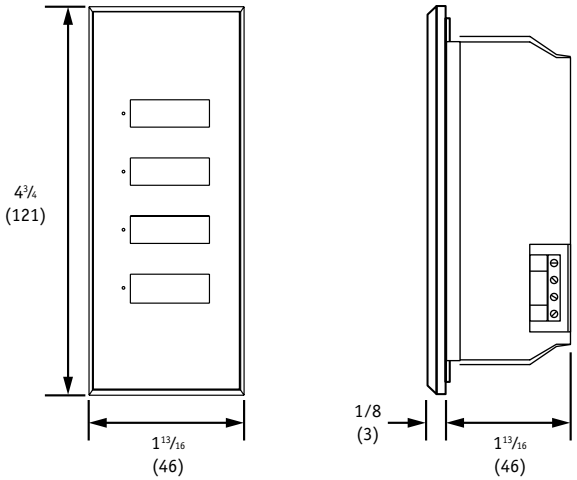
Wired Keypads – Dimensions

Architectural-style Keypads Dimensions - all dimensions are inches (mm)

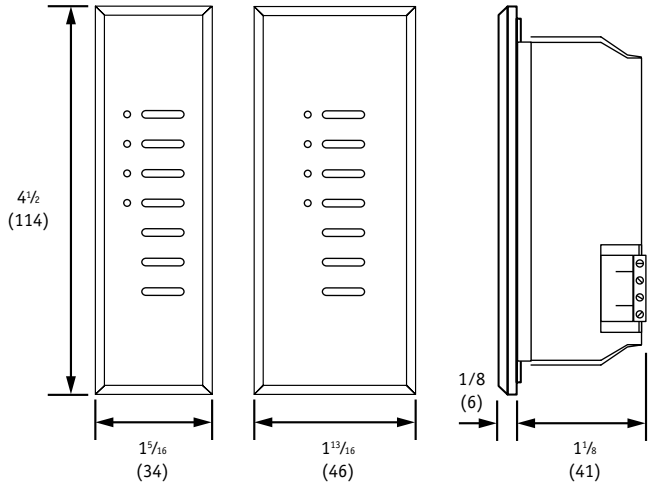
seeTouch



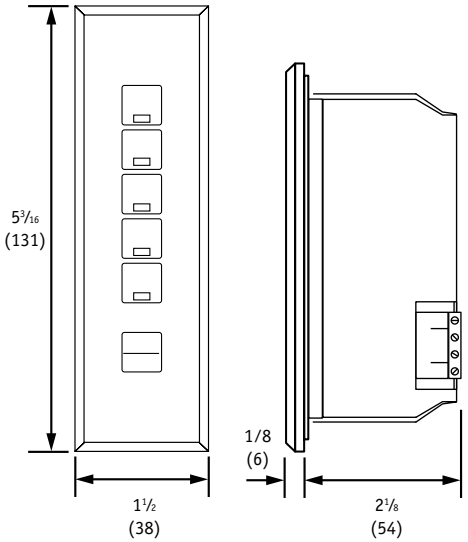
Signature Series[1]



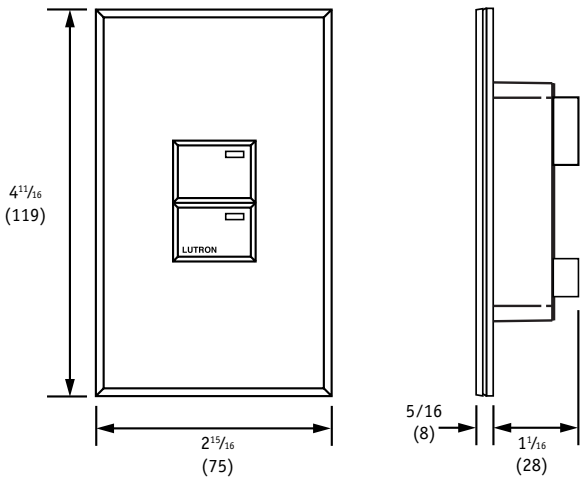
Architrave Narrow[2] **Wide[2]**



Architrave DC1[3]



Two-button



Notes:

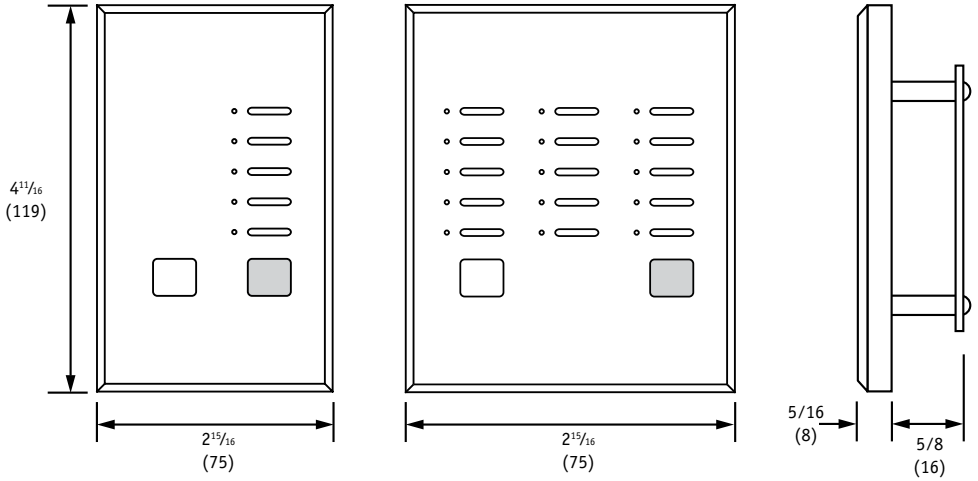
1. May be mounted without wallbox – opening dimensions: 3 5/8 in (91 mm) x 1 7/16 in (36 mm) – or use Lutron wallbox p/n WBOX-SA1-Q1 (*see pg. 87*).
2. May be mounted without wallbox – opening dimensions: 3 1/2 in (90 mm) x 1 1/4 in (32 mm) – or use Lutron wallbox p/n 241-399 (*see pg. 87*).
3. May be mounted without wallbox – opening dimensions: 4 in (102 mm) x 1 1/8 in (29 mm) – or use Lutron wallbox p/n 241-663 (*see pg. 87*).

Wired Keypads – Dimensions (cont'd)

Architectural-style Keypads Dimensions - all dimensions are inches (mm)

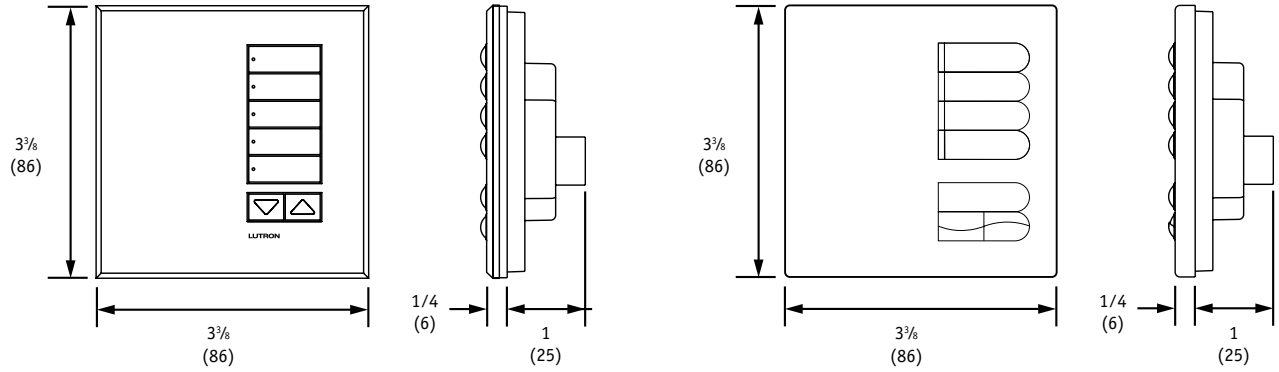
Slim Button (5 & 10 button)
Large Button (6 button)
Two Button

Slim Button (15 button)
Large Button (9 button)



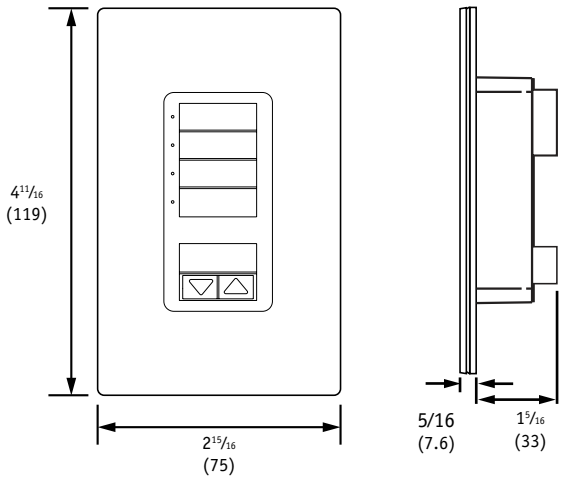
International seeTouch®

European-style



Designer-style Keypads Dimensions - all dimensions are inches (mm)

seeTouch®



FRONT ROOM

Wired Keypads – LED Count and Wallbox Sizes

Control	LED Count[1]	Wallboxes Required
HWI-KP5	5	1-gang US wallbox
HWI-KP10	10	1-gang US wallbox
HWI-KP15	15	2-gang US wallbox
HWI-LB5-DC1	5	Not Required or Lutron® # 241-663
HWI-LB6	6	1-gang US wallbox
HWI-LB9	9	2-gang US wallbox
HWI-KP5-DN	5	Not Required or *Lutron* # 241-399
HWI-KP5-DW	5	Not Required or *Lutron* # 241-399
HWI-2B	10	1-gang US wallbox
seeTouch® All models	15	1-gang US wallbox
International *seeTouch* All models	15	EBB-15-SQ/EBB-15-RD
HWI-2SE	3	EBB-15-SQ/EBB-15-RD
HWI-4SE	4	EBB-15-SQ/EBB-15-RD
HWI-8SE	8	EBB-15-SQ/EBB-15-RD
HWS-3B-G	10	Not Required or WBOX-SA1-Q1
HWS-4B-G	10	Not Required or WBOX-SA1-Q1
HWS-3B-B	10	Not Required or WBOX-SA1-Q1
HWS-4B-B	10	Not Required or WBOX-SA1-Q1
HWI-CCI-8	10	HWI-ENC-CC
HWI-CCO-8	10	HWI-ENC-CC
HWI-HHP-LD	45	N/A
Hybrid Repeater[2]	15	N/A

***Table 1* – Keypad LED Count and Wallbox Information**

[1] *Check the Processor LED Count specification in the processor section of this book to determine maximum LED count. If the amount of LEDs exceeds the processor's maximum LED count, then an Auxiliary Power Supply (see pg. 182) must be used to satisfy LED Count requirements.*

[2] *When powered by the processor, the Hybrid Repeater draws the equivalent of 15 LEDs. When powered by the supplied plug-in adapter, the Hybrid Repeater does not draw an LED count.*

RF Keypads

Wireless Series
Keypad
RF Keypad Link-8.2
Designer-Style/Tabletop

HomeWorks® keypads, available in many styles, colors, and finishes, provide homeowners with a simple and elegant way to operate lights, shades, motorized screens, pumps, thermostats, and many other devices. Keypads have LEDs that provide real-time status indication. Lutron provides custom engraving to clearly identify each button's function.

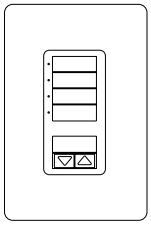
Keypads are available in a variety of button styles and button configurations. Since each button on every keypad model can be programmed to control any lighting load or device on the *HomeWorks* system, choosing a keypad for a particular location requires no more than selecting the desired style and number of buttons. Engraving can be added to any keypad. Please contact Lutron Customer Service or your local Lutron Representative for details.

Each *HomeWorks* RF link is capable of controlling up to 32 RF Keypads.

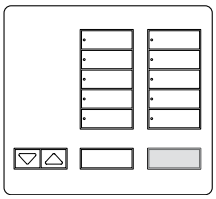
COMMUNICATION TO THE PROCESSOR

Up to 32 RF keypads communicate to an RF processor or an 8 or 4 Series processor with a hybrid repeater. Keypads must be located within 30 feet (9 m) of the RF processor or a hybrid repeater.

Designer-style



seeTouch®



Tabletop

RF Keypads (cont.)

Designer seeTouch® KEYPADS

Designer-style *seeTouch* keypads feature large, easy-to-use buttons, plus a unique backlit engraving option that makes the keypads readable any time of the day or night. *seeTouch* buttons are rounded, allowing engraving to be displayed at an upward angle, increasing readability. *seeTouch* keypads are available with one to seven buttons, allowing you to customize the number of functions to fit your need. The flexible design even allows the number of buttons and the configuration of the buttons to be changed after the keypad is installed.

Options include configurations with infrared receiver and raise/lower buttons.

COLORS AND FINISHES

Designer-style *seeTouch* keypads are available in Designer Gloss finishes and Satin Colors® Matte finishes. Button color may differ from insert color ordered. Refer to *seeTouch* Ordering Guide (367-571) for details. Also see Appendix F: Colors & Finishes.

ORDERING METHODS

Temporary button labels for *seeTouch* keypads are available in Gray letters (GR) for light colored buttons, or in White letters (WH) for dark colored buttons. Order model number ST-LBL-GR (or WH) for 1 sheet, or model number ST-LBL25-GR (or WH) for a pack of 25 sheets.

a) **Engraving will be decided after installation**

1) Order keypad with buttons. A prepaid engraving certificate is included.
   STRD-Model-Color
2) After engraving is determined, redeem engraving certificate.
   SKD-Model-Color-E

b) **Engraving will be decided before installation**

1) Order keypad without buttons.
   Non-IR: STR-NB-NONE
   IR: STR-NBIR-NONE
2) Order engraved button kit.
   SKD-Model-Color-E

seeTouch KEYPADS

1-Button
Keypad*: STRD-1B-XX
Button Kit: SKD-1B-XX-E
Description: 1-button

2-Button
Keypad*: STRD-2B-XX
Button Kit: SKD-2B-XX-E
Description: 2-button

3-Button
Keypad*: STRD-3B-XX
Button Kit: SKD-3B-XX-E
Description: 3-button

Keypad*: STRD-3BRL-XX
Button Kit: SKD-3BRL-XX-E
Description: 3-button with raise/lower

4-Button

Keypad*: STRD-4B-XX
Button Kit: SKD-4B-XX-E
Description: 4-button

Keypad*: STRD-4FS-XX
Button Kit: SKD-4FS-XX-E
Description: 4-button favorite scene

Keypad*: STRD-4S-XX
Button Kit: SKD-4S-XX-E
Description: 4-scene

Keypad*: STRD-4SIR-XX
Button Kit: SKD-4SIR-XX-E
Description: 4-scene with IR receiver

* Claro® Gloss and *Satin Colors* Matte Finishes wallplate sold separately.

XX= Color Code

RF Keypads (cont.)

seeTouch® KEYPADS (cont.)

5-Button

Keypad*: STRD-5B-XX
Button Kit: SKD-5B-XX-E
Description: 5-button

Keypad*: STRD-5FS-XX
Button Kit: SKD-5FS-XX-E
Description: 5-button favorite scene

Keypad*: STRD-5BRL-XX
Button Kit: SKD-5BRL-XX-E
Description: 5-button with raise/lower

6-Button

Keypad*: STRD-6B-XX
Button Kit: SKD-6B-XX-E
Description: 6-button

Keypad*: STRD-6BRL-XX
Button Kit: SKD-6BRL-XX-E
Description: 6-button with raise/lower

7-Button

Keypad*: STRD-7B-XX
Button Kit: SKD-7B-XX-E
Description: 7-button

***seeTouch* - NO BUTTONS**

No-Button

Keypad: STR-NB-NONE
Description: No buttons, no IR receiver

Keypad: STR-NBIR-NONE
Description: No buttons with IR receiver

Keypad: STR-2G-NBIR-NONE
Description: 2-gang, no buttons with IR receiver

* Claro® Gloss and *Satin Colors* Matte Finishes wallplate sold separately.

XX= Color Code

RF Keypads (cont.)

RF Wall-Mounted Keypads

Model Numbers	All RF Wall-Mounted Keypads
Input Voltage	120 V~, 50/60 Hz
Regulatory Approvals	UL, CSA, NOM, FCC, IC
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Addressing	Via the HomeWorks® software, using unique device serial numbers. Units must be installed prior to addressing. Counts as 1 of the 32 keypad addresses on the Processor.
Diagnostics	LEDs provide diagnostics for troubleshooting.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Mounting	STRD-xx, STR-NB-NONE, STR-NBIR-NONE: 1-gang US wallbox STR-2G-NBIR-NONE: 2-gang US wallbox
Engraving	Engraving of keypads and/or keypad buttons available.
IR Keypads	Compatible with these Lutron IR transmitters: GRX-IT-WH, GRX-8IT-WH, SPS-4IT-RP, SPS-FSIT-RP, SP-HT-WH. See Appendix C: Infrared (IR) Integration.
Shipping Weight	0.3 lbs. (0.1 kg)
Keypad Link LED Count	0 (not applicable since not powered by keypad link)

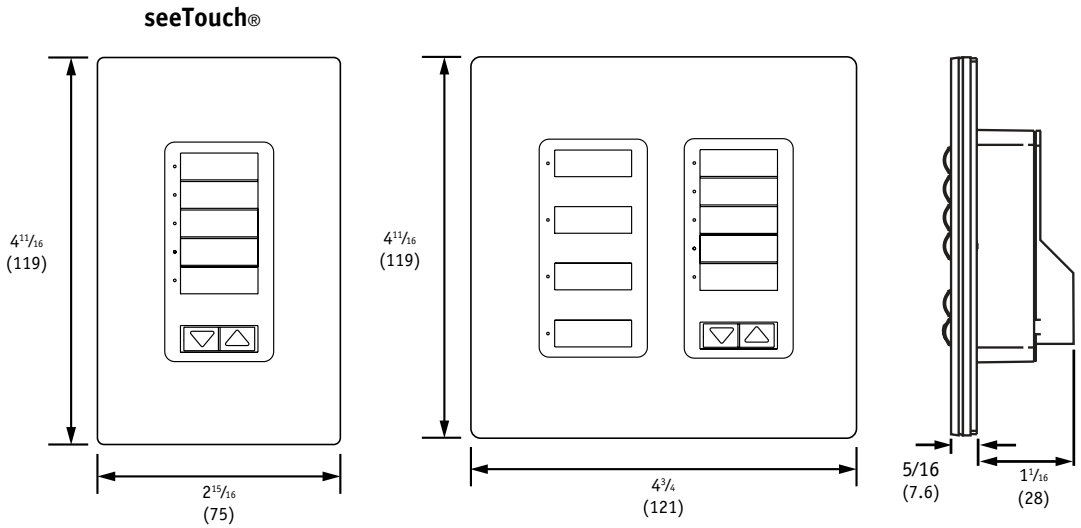


***Figure 1* – Dimensions**
all dimensions are shown as inches (mm)

RF Keypads (cont.)

SLIM AND LARGE BUTTON RF TABLETOP KEYPADS

HomeWorks® RF tabletop keypads provide maximum flexibility to locate the devices where the homeowner can conveniently monitor and control lighting, window treatments, and other home systems. Tabletop keypads are ideal for night stands, coffee tables, and kitchen counters. Keypad buttons are programmed to create a customized control that meets the individual needs of each home.

Keypads have LEDs that provide real-time status indication. Custom engraving is available to clearly identify each button's function. RF tabletop keypads can be part of any system design with RF capability.

The RF tabletop keypads are available with Large Button (5-, 6-, 10-, or 15-button) and Slim Button (5-, 10-, or 15-button) configurations. All of these models also include raise/lower buttons. All units are plug-in/battery combo units.

COLORS AND FINISHES

All RF tabletop keypads are available in Midnight (MN) and Snow (SW). Metal faceplates can be ordered separately keypads. See Appendix F: Colors & Finishes.

COMMUNICATION TO PROCESSOR

All RF tabletop keypads must be located within 30 feet (9 m) of an RF processor or a hybrid repeater. Each *HomeWorks* RF-capable processor can control up to 32 RF keypads. The tabletop keypad counts as one of the 32 RF keypads.

ORDERING METHOD

1) Order keypad with buttons/faceplate. Order a Midnight keypad if a metal faceplate will be used. A prepaid engraving certificate is included.
   HRT-Model-Color
2) After engraving is determined, redeem engraving certificate for engraved faceplate with same number of buttons as control.
   HKT-Model-Color-E

LARGE BUTTON

5-Button

Description: 5-button with raise/lower
Keypad: HRT-5S2RL-XX
Faceplate only: LBK-T5RL-XX-E

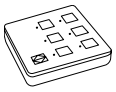
10-Button

Description: 10-button with raise/lower
Keypad: HRT-10S2RL-XX
Faceplate only: LBK-T10RL-XX-E

15-Button

Description: 15-button with raise/lower
Keypad: HRT-15S2RL-XX
Faceplate only: LBK-T15RL-XX-E

6-Button



Description: 6-button with raise/lower
Keypad: HRT-6LRL-C-XX
Faceplate only: HKT-6LRL-XX-E

SLIM BUTTON

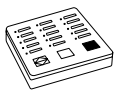
5-Button

Description: 5-button with master on/off and raise/lower
Keypad: HRT-5RL-C-XX
Faceplate only: HKT-5RL-XX-E

10-Button

Description: 10-button with master on/off and raise/lower
Keypad: HRT-10RL-C-XX
Faceplate only: HKT-10RL-XX-E

15-Button



Description: 15-button with master on/off and raise/lower
Keypad: HRT-15RL-C-XX
Faceplate only: HKT-15RL-XX-E

XX= Color Code

RF Keypads (cont.)

Model Numbers	All RF Tabletop Keypads.
Input Voltage	120 V~, 60 Hz (with plug-in 9 V⎓ transformer). 3 V⎓ (with two AAA batteries).
Regulatory Approvals	Plug-in low-voltage transformer: UL Listed for US and Canada, NOM; Keypads: FCC, IC
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Addressing	Via the HomeWorks® software, using unique device serial numbers. Units must be installed prior to addressing. Counts as 1 of the 32 RF keypad addresses on a processor.
Diagnostics	LEDs provide diagnostics for troubleshooting.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	*See Fig. 1, below.*
Mounting	Units powered by plug-in transformer must be located within 5 feet (1.5 m) of a 120 V~ receptacle. Unit must be placed within 30 feet (9 m) of an RF Processor or a Hybrid Repeater.
Shipping Weight	0.3 lbs. (0.1 kg)
Keypad Link LED Count	0 (not applicable since not powered by keypad link)

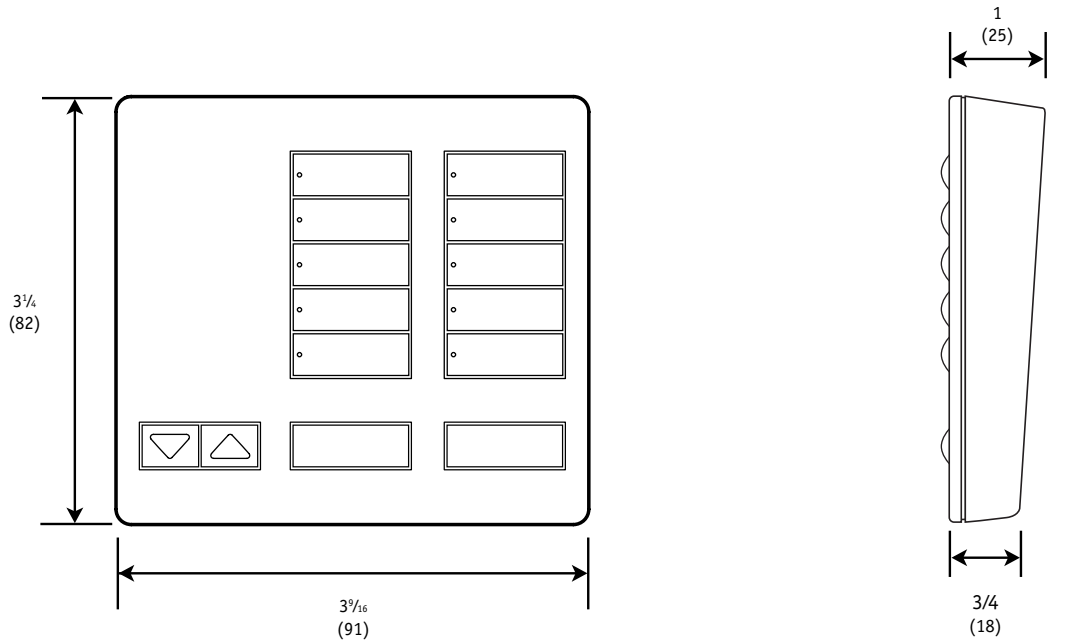
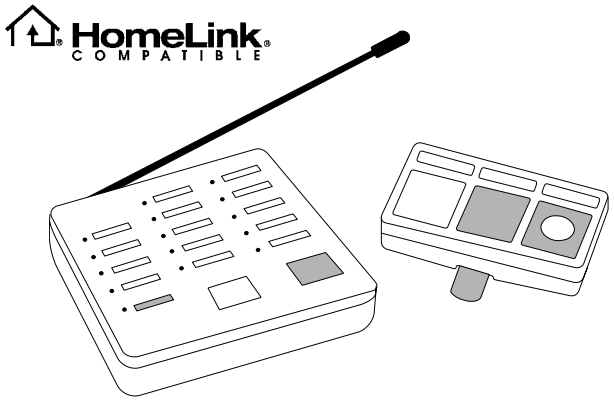


***Figure 1* – Dimensions**
[all dimensions are shown as inches (mm)]
Large Button Model shown - dimensions for all Tabletop Keypads are identical

RF Visor Controls

Wireless Series
Visor Interface
RF Keypad Link-8.2
Car Visor Controls



RF Visor Receiver and Transmitter (HR-VCRX-SW and HR-VCTX-SW)

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RF VISOR RECEIVER AND TRANSMITTER (MODEL # HR-VCRX-SW AND HR-VCTX-SW)

HomeWorks® RF visor controls provide control of lighting and other equipment from your car — with just the touch of a button. The RF visor receiver has four dry contact closure outputs that can be used for garage doors or gates. Turn lights on or off, set scenes, or turn on vacation mode from your car as you are leaving your home. Pre-printed labels are provided to clearly identify each button's function.

Each transmitter provides up to seven functions (3 buttons give seven total press combinations). Up to ten transmitters will work with one receiver. RF visor controls may be used in any system design with RF capability.

The RF visor receiver is a non-aesthetic control and is intended to be mounted in an unseen location.

COLORS AND FINISHES

RF visor controls are available in Snow (SW).

COMMUNICATION TO PROCESSOR

The RF visor receiver must be located within 30 feet (9 m) of an RF processor or a hybrid repeater. Each RF-capable processor can control up to 32 RF keypads. The RF visor receiver counts as one of the 32 RF keypads.

RF Visor Controls (cont.)

Receiver

Model Number	HR-VCRX-SW: Visor Control Receiver
Input Voltage	120 V~, 60 Hz (with plug-in 9 V⎓ transformer).
Regulatory Approvals	Plug-in low-voltage transformer: UL Listed for US and Canada, NOM; Visor Control Receiver: FCC, IC
Line-Voltage Connections	Lutron provides a plug-in low-voltage transformer.
Mounting	Mount with wall bracket (provided) or place on tabletop.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Outputs	Four low-voltage dry contacts. Max. voltage: NEC® Class 2 (IEC PELV) Max. current: 1 A @ 30 V⎓

Transmitter

Model Number	HR-VCTX-SW: Visor Control Transmitter.
Input Voltage	6 V⎓, two CR2032 coin cell batteries (3 V⎓ each; included).
Regulatory Approvals	Meets Society of Automotive Engineers (SAE) Standards. FCC, IC
Function	Provides up to seven functions from three buttons.
Mounting	Removable visor clip.
Range	150 feet (46 m) typical.
Environment	Ambient operating temperature: -40 °C to 113 °C, -40 °F to 235 °F Ambient operating humidity: 0-90% humidity, non-condensing.

All dimensions are shown as inches (mm)

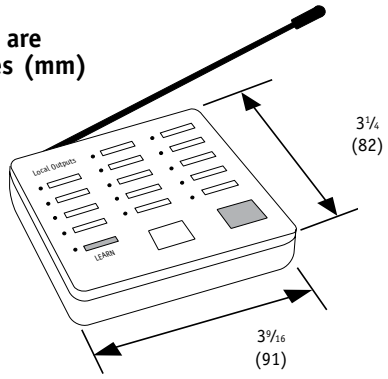


***Figure 1* – HR-VCRX-SW Dimensions**

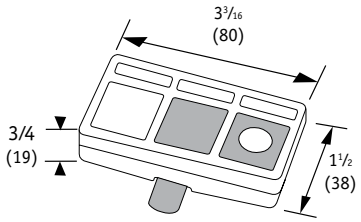


***Figure 2* – HR-VCTX-SW Dimensions**

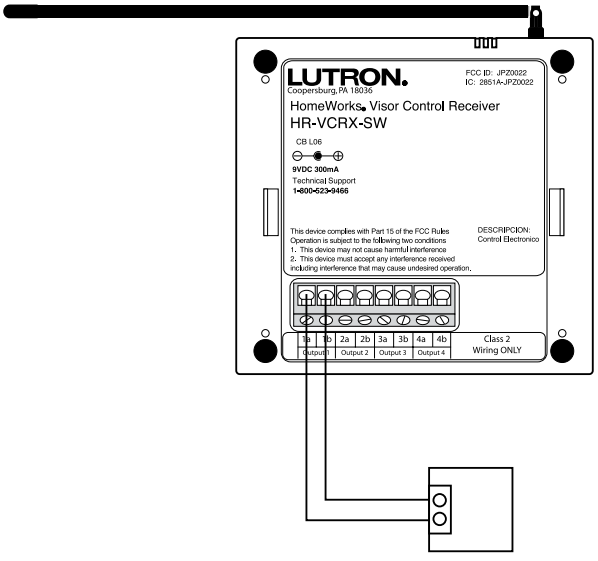


***Figure 3* – Wiring to a CCO device**

Wired Vareo® Local Lighting Controls

8 Series
Local Lighting Controls
D48 Bus
Architectural-Style

LOCAL LIGHTING CONTROLS

Wired *Vareo* local lighting controls function much like standard dimmers and switches, but can be controlled as part of the whole-house lighting control system. Local lighting controls are useful in locations where single circuits of lighting need to be dimmed or switched. Wired *Vareo* dimmers incorporate advanced features such as fade-on/fade-off, long fade-off, and rapid full-on. Wired *Vareo* local lighting controls include a Front Accessible Safety Switch (FASS™) for safe lamp replacement. HomeWorks® wired *Vareo* local lighting controls install in single-pole, 3-way, or 4-way applications.

ACCESSORY CONTROL

Remote switches (VETS-R) are used in conjunction with a wired *Vareo* local lighting control to provide 3-way and 4-way control. Use up to nine VETS-R controls with a single wired *Vareo* local lighting control for switching from up to ten locations.

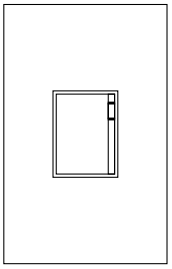
COLORS AND FINISHES

Vareo local lighting controls are available in Architectural matte finish plastic colors and Architectural metal finishes. Custom paint matching is also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

GANGING VAREO CONTROLS

Gang multiple *Vareo* controls together (mounted side-by-side behind a single faceplate) in a series of connected wallboxes for a cleaner look. A scored section or "fin," along each side of the mounting plate is removed, to facilitate ganging of controls. The load rating for each control must be derated when a fin has been broken.

For ganging and derating information, see Table 1 pg. 54.

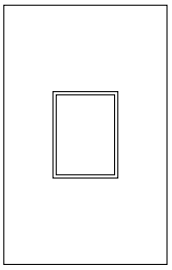


DIMMING CONTROL LOAD RATINGS

HWV-600D dims a single incandescent or magnetic low-voltage circuit up to 600 W/VA from one location.

HWV-1000D dims a single incandescent or magnetic low-voltage circuit up to 1000 W/VA from one location.

HWV-FDB-8A dims a single fluorescent circuit up to 8 A from one location when used with Lutron Hi-lume® and Eco-10® electronic fluorescent dimming ballasts.



SWITCHING CONTROL LOAD RATINGS

HWV-1000NS switches a single circuit of any lighting load type up to 1000 W/VA from one location. HWV-1000NS requires a neutral wire connection.

Note: *For wattages exceeding those listed above or for load types other than those listed, a power booster or interface is required. See pg. 107 for more information.*

INSTALLATION NOTE

Use 3½ in. (89 mm) deep wallboxes for ease of installation.

CONNECTION TO D48 DIMMER INTERFACE

All wired *Vareo* local lighting controls must be connected to a D48 dimmer interface. A dimmer interface is available as a stand-alone component (model # HWI-D48) or as an integral part of processors with model numbers containing "D48" (H8P5-**D48**-120 and H8P5-MI-**D48**-120). Each wired *Vareo* local lighting control communicates with a dimmer interface, via a one pair twisted shielded 18 AWG to 22 AWG (1.0 mm^2 to 0.5 mm^2) cable.

See pg. 131.

Wired Vareo® Local Lighting Controls (cont.)

All HomeWorks® Vareo Local Lighting Controls

Model Numbers	HWV-600D: 600 W/VA Dimming Control. HWV-1000D: 1000 W/VA Dimming Control. HWV-1000NS: 1000 W/VA Switching Control with Neutral Wire. HWV-FDB-8A: Fluorescent Dimming Control. VETS-R: 3- or 4-Way Accessory Control.
Input Voltage	120 V~, 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to -104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Low-Voltage Wire Type	One pair twisted shielded #18 AWG to #22 AWG (1.0 mm^2 to 0.5 mm^2) NEC® Class 2 (IEC PELV) wiring.
Low-Voltage Wiring Configuration	Daisy-chain, star, T-tap, home run. Link terminator not required. Total length of wire on any Dimmer Interface bus cannot exceed 500 feet (150 m). Maximum of four devices per Dimmer Interface bus.
Low-Voltage Connections	Butt-splice (provided). *See Fig. 5, pg. 53*.
Addressing	Via DIP switch located on front of unit underneath the wallplate. The device may be addressed without removing it from the wall. Counts as 1 of 4 addresses on a Vareo bus. *See Fig. 1, pg. 52*.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Air Gap	FASS™ (Front Accessible Service Switch). *See Fig. 4, pg. 53*.
Fail-Safe Operation	In the unlikely event that communication with the processor is interrupted, all *Vareo* Local Lighting Controls will still operate, offering local control.
Dimensions	*See Fig. 2, pg. 53*.
Mounting	Controls mount in standard US wallboxes. For easier installation, Lutron recommends using 3½ in. (89 mm) deep wallboxes. *See Fig. 6, pg. 53*.
Ganging	When ganging *Vareo* Local Lighting Controls, it is necessary to remove side fins and to derate the control. *See Table 1, pg. 54* for specific derating information. If mounting one control above another, leave at least 4½ in. (11.4 cm) vertical spacing between them.
Auxiliary Controls	Use only *Vareo* Auxiliary TapSwitches™ (VETS-R); mechanical 3- or 4-way switches will not work. Up to 9 VETS-R Auxiliary TapSwitches may be used with one *Vareo* Local Dimming or Switching Control.
Shipping Weight	0.6 lb. (0.3 kg)

Wired Vareo® Local Lighting Controls (cont.)

HWV-600D • 600 W Dimming Control

Load Types[1]	Incandescent, magnetic low-voltage[2,3], tungsten halogen, electronic low-voltage[2] (using ELVI-1000 Interface). Output is compatible with Lutron® NGRX-PB-WH and HP 2•4•6™ Power Boosters for dimming applications up to 30,000 W per dimmer.
Maximum Load	no fins broken: 600 W/VA one fin broken: 500 W/VA two fins broken: 300 W/VA
Minimum Load Required	40 W/VA
Line-Voltage Wiring	*See Figs. 10, 12, 13 pg. 55*. Standard single-pole and 3-way wiring.

HWV-1000D • 1000 W Dimming Control

Load Types[1]	Incandescent, magnetic low-voltage[2,3], tungsten halogen, electronic low-voltage[3] (using ELVI-1000 Interface). Output is compatible with Lutron NGRX-PB-WH and *HP 2•4•6* Power Boosters for applications up to 30,000 W.
Maximum Load	no fins broken: 1000 W/VA one fin broken: 900 W/VA two fins broken: 700 W/VA
Minimum Load Required	40 W/VA
Line-Voltage Wiring	*See Figs. 10, 12, 13 pg. 55*. Standard single-pole and 3-way wiring.

HWV-1000NS • 1000 W Switching Control with Neutral Wire

Load Types[1]	Incandescent, magnetic low-voltage[2], tungsten halogen, electronic low-voltage[2], fluorescent with magnetic ballasts[5].
Maximum Load:	no fins broken: 1000 W/VA one fin broken: 700 W/VA two fins broken: 550 W/VA
Minimum Load Required	5 W/VA
Line-Voltage Wiring	*See Figs. 11, 14, 15 pgs. 55, 56*. Single-pole and 3-way wiring. Requires a neutral wire connection in the wallbox.

Wired Vareo® Local Lighting Controls (cont.)

HWV-FDB-8A • 8 A Fluorescent Dimming Control

Load Types[4]	Lutron® Hi-lume® and ECO-10® Fluorescent Dimming Ballasts.
Maximum Load[5]	no fins broken: 8 A, 20 ballasts one fin broken: 6 A two fins broken: 4.5 A
Minimum Load Required	1 ballast
Line-Voltage Wiring	*See Figs. 16, 17 pg. 57*. Requires a neutral wire connection in the wallbox.

VETS-R • 3- or 4-way Accessory Control

Compatible Controls	HWV-600D, HWV-1000D, HWV-1000NS and HWV-FDB-8A.
Maximum Load	See local lighting control.
Minimum Load	See local lighting control.
Line-Voltage Wiring	*See Figs. 12, 13, 14, 15, 17 pgs. 55, 56, 57*. Standard single-pole, 3-way, and 4-way wiring.

(1) To reduce the risk of overheating and possibly damaging other equipment, do not install HWV-600D or HWV-1000D to control receptacles, motor-operated appliances, fluorescent lighting, or electronic low-voltage transformer loads. Do not install HWV-1000NS to control receptacles or motor-operated appliances.

(2) Because low-voltage transformers vary widely in efficiency, the input VA of each transformer should be measured directly. If this is not possible, use the maximum lamp wattage figures for the transformer, which have a built-in safety margin.

(3) For low-voltage applications using the HWV-600D or HWV-1000D, core and coil (magnetic) low-voltage transformers must be used. Do not use any solid-state electronic low-voltage transformers. Operation of a low-voltage circuit with all lamps inoperative or removed may result in current flow in excess of normal levels. To avoid transformer overheating and premature transformer failure, Lutron strongly recommends the following:
- *a) Do not operate low-voltage circuits without operative lamps in place.*
- *b) Replace burned-out lamps as soon as possible.*
- *c) Use transformers that incorporate thermal protection or fuse transformer primary windings to prevent transformer failure due to overcurrent.*

(4) For proper dimming performance, fluorescent lamps must be operated at full intensity for 100 hours prior to dimming.

(5) To determine the maximum load, add the line currents listed on each ballast connected to this control. The total line current can not exceed the maximum load capacity rating of the control. Warning: Do not exceed a maximum of 20 ballasts per control.

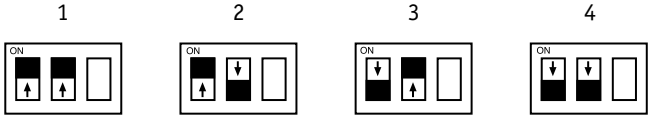
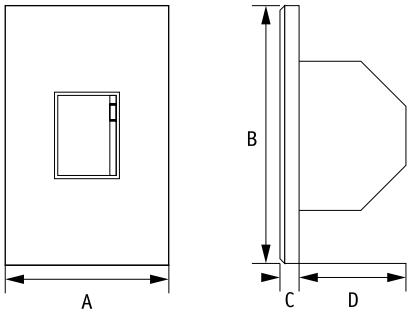


***Figure 1* – DIP Switch Settings**

Wired Vareo® Local Lighting Controls (cont.)



	Inches	mm
A	2¾	70
B	4½	114
C	5/16	7.6
D	1 5/16	32.7

***Figure 2* – Dimensions**

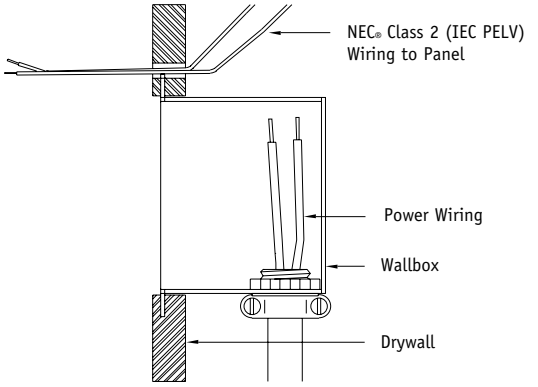


Figure 3* – Wire Installation

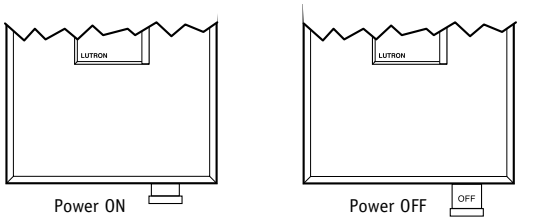


***Figure 4* – FASS™ (Front-Accessible Service Switch)**

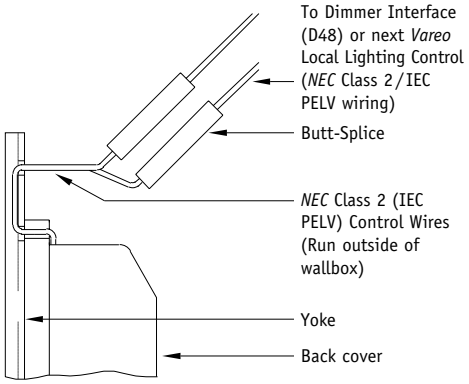


Figure 5* – Class 2 Wire Connection

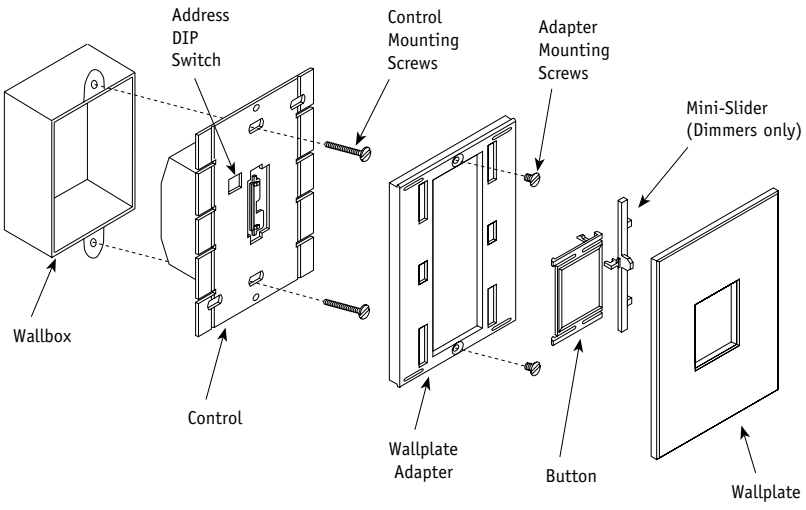


***Figure 6* – Mounting and Parts Identification**

** Consult HomeWorks Application Note #38 for alternative wiring methods.*

Wired Vareo® Local Lighting Controls (cont.)

		Minimum Load	Maximum Load		
Control	**Load Type**	**All Cases**	**Single-Gang**	**End of Gang**	**Middle of Gang**
HWV-600D	Incandescent	40 W/VA	600 W	500 W	400 W
	Magnetic Low Voltage	40 W/VA	450 W/600 VA	400 W/500 VA	300 W/400 VA
HWV-1000D	Incandescent	40 W/VA	1000 W	800 W	650 W
	Magnetic Low Voltage	40 W/VA	800 W/1000 VA	600 W/800 VA	500 W/650 VA
HWV-1000NS	Magnetic Low Voltage	5 W/VA	800 W/1000 VA	550 W/700 VA	400 W/550 VA
	All other lighting	5 W/VA	1000 W	700 W	550 W
HWV-FDB-8A	Lutron Hi-lume or ECO-10 Fluorescent Dimming Ballasts	1 ballast	8 A	6 A	4.5 A
VETS-R	N/A*	N/A*	N/A*	N/A*	N/A*

* See local lighting control

***Table 1* – Minimum and Maximum Load Ratings**

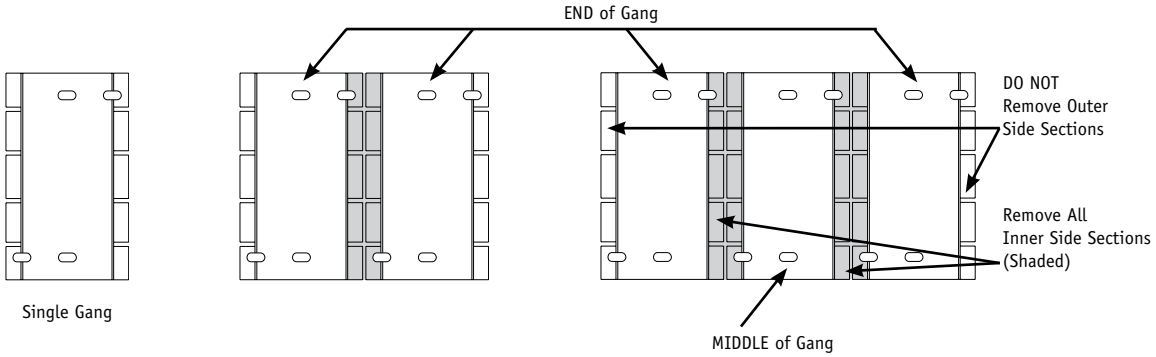


***Figure 7* – Ganging Configuration and Derating Information**

Wired Vareo® Local Lighting Controls (cont.)

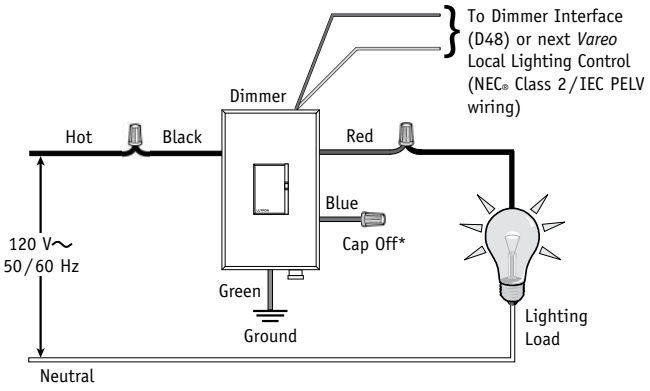


***Figure 10* – HWV-600D and HWV-1000D Single-Location Wiring Diagram**

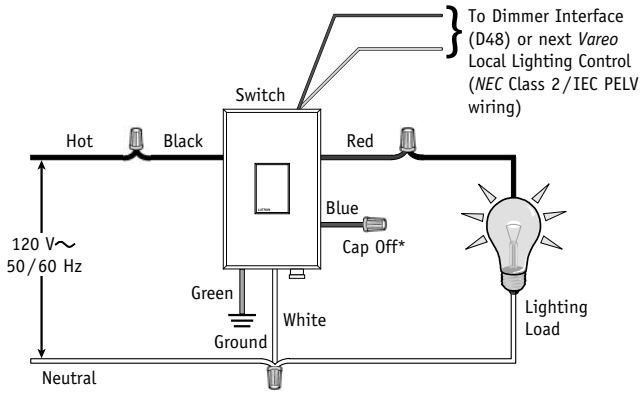


***Figure 11* – HWV-1000NS Single-Location with Neutral Wiring Diagram**

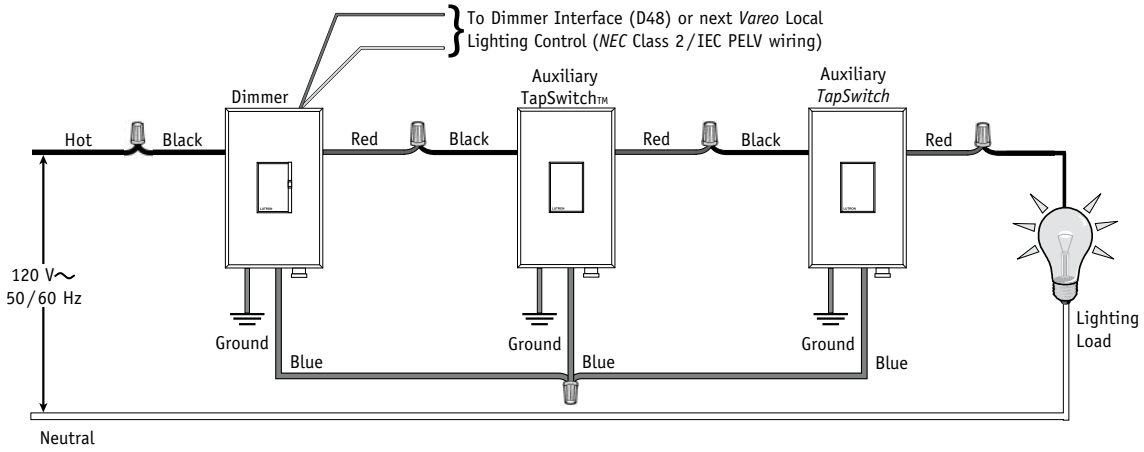


***Figure 12* – HWV-600D and HWV-1000D Multi-Location Wiring Diagram (Control Line Side)**

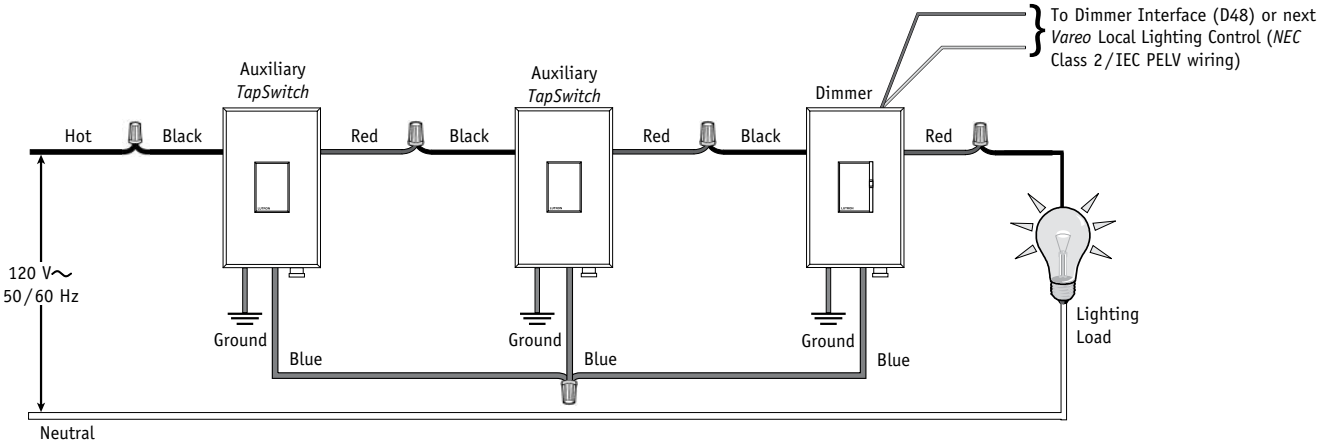


***Figure 13* – HWV-600D and HWV-1000D Multi-Location Wiring Diagram (Control Load Side)**

* When using controls in single-location installations, cut off the uninsulated portion of the control's multi-location wire (blue wire) and cap off using one of the provided wire connectors. **DO NOT** connect the blue wire to any other wiring or to ground.

Wired Vareo® Local Lighting Controls (cont.)

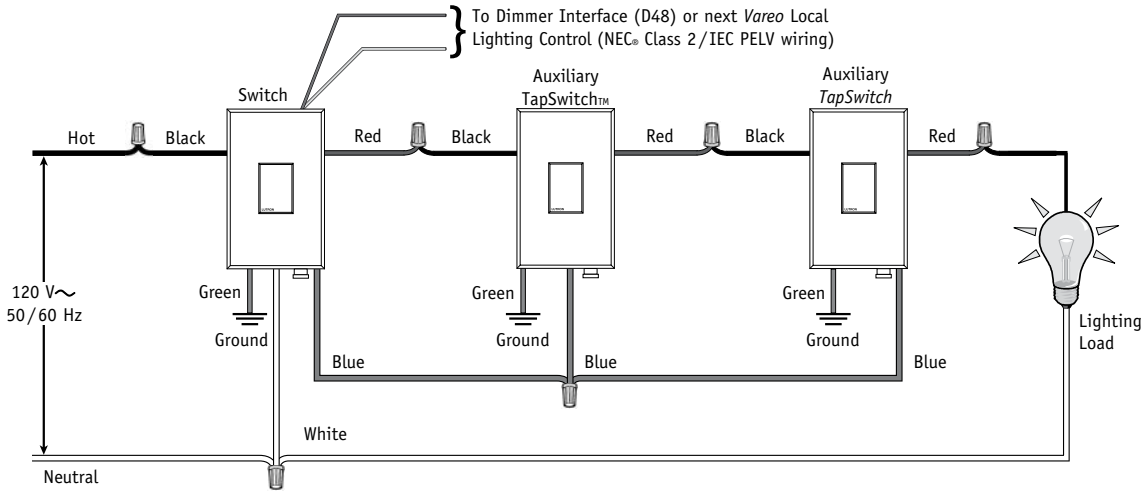


***Figure 14* – HWV-1000NS Multi-Location with Neutral Wiring Diagram (Control Line Side)**

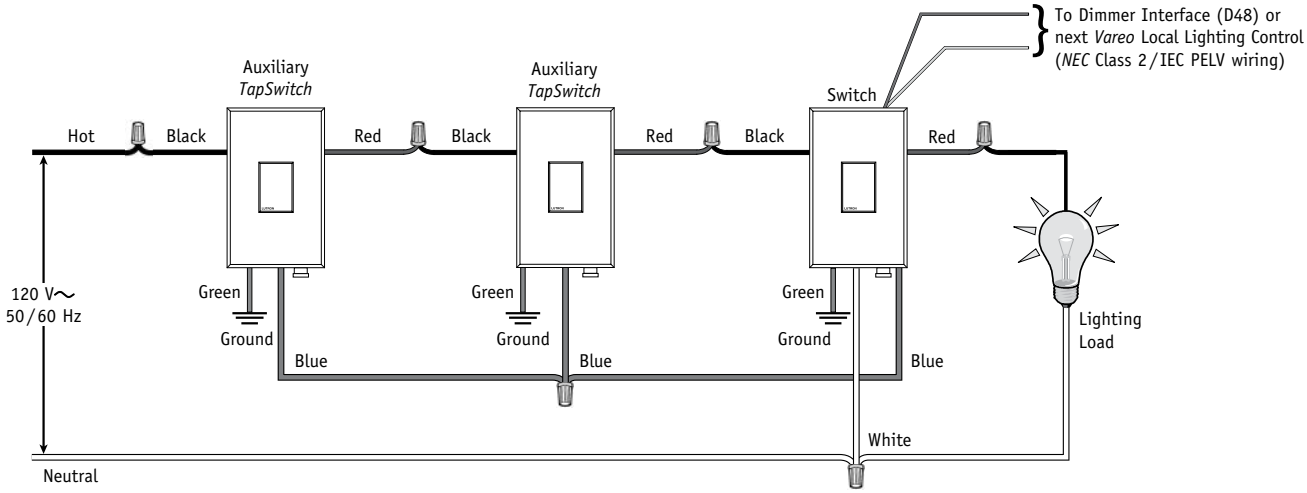


***Figure 15* – HWV-1000NS Multi-Location with Neutral Wiring Diagram (Control Load Side)**

Wired Vareo® Local Lighting Controls (cont.)

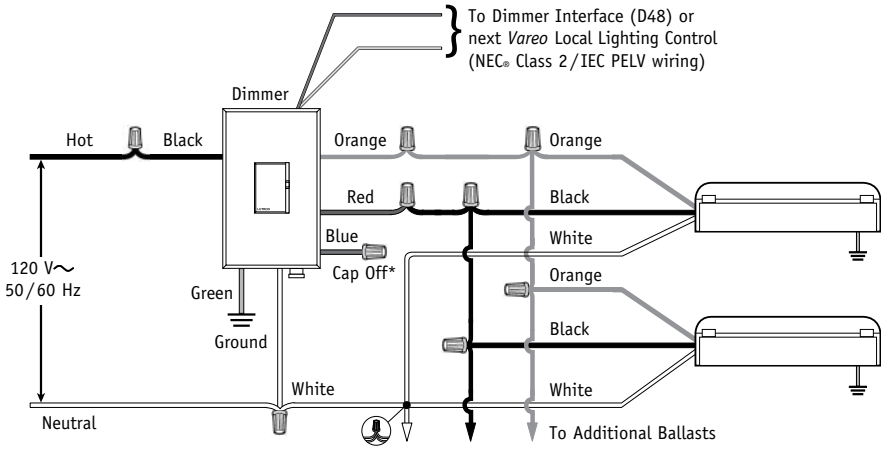


***Figure 16* – HWV-FDB-8A Single-Location Wiring Diagram**

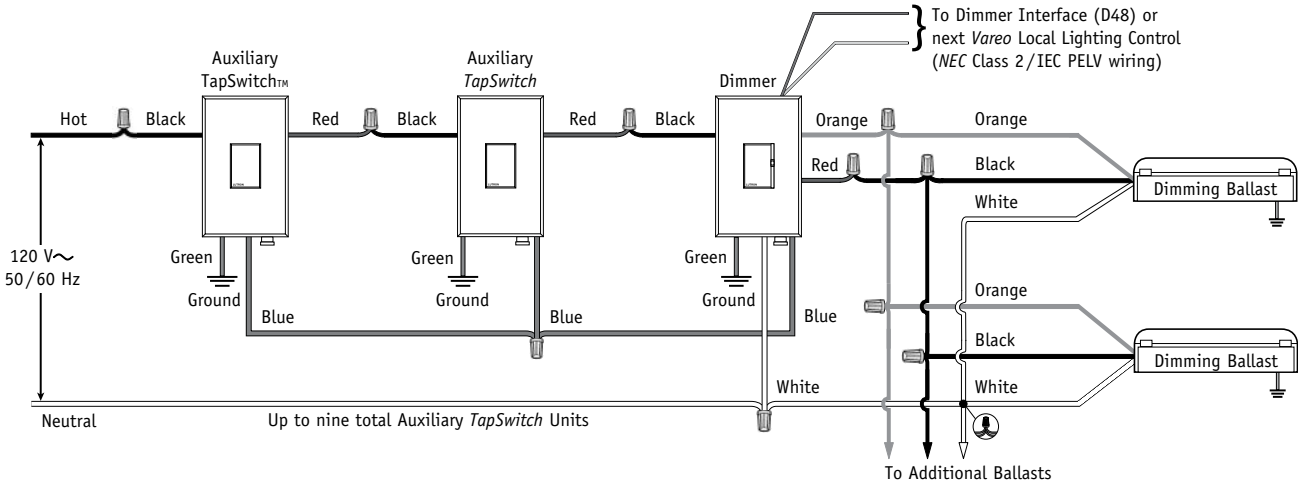


***Figure 17* – HWV-FDB-8A Multi-Location Wiring Diagram**

FRONT ROOM

* When using controls in single-location installations, cut off the uninsulated portion of the control's multi-location wire (blue wire) and cap off using one of the provided wire connectors. **DO NOT** connect the blue wire to any other wiring or to ground.

Wired Maestro® Local Controls

4 Series / 8 Series
Local Controls
H48 Bus
Designer-Style

LOCAL CONTROLS

Wired *Maestro* local controls function much like standard dimmers and switches, but can be controlled as part of the whole-house lighting control system. Local lighting controls are useful in locations where single circuits of lighting need to be dimmed or switched. Local fan-speed controls are useful in locations where control of a single ceiling paddle fan is needed. Wired *Maestro* dimmers incorporate advanced features such as fade-on/fade-off, long fade-to-off, and rapid full-on. In addition, the local control may be programmed similar to a keypad button press with single and double tap functions, turning multiple lights on or off. Wired *Maestro* local controls include a Front Accessible Safety Switch (FASS™) for safe lamp replacement. HomeWorks® wired *Maestro* local controls install in single-pole, 3-way, or 4-way applications.

ACCESSORY CONTROLS

Remote dimmers (HD-RD) and remote switches (HD-RS) are used in conjunction with a wired *Maestro* local control to provide 3-way and 4-way control. Use up to nine HD-RD with a single wired *Maestro* dimmer/fan-speed control for dimming/speed control from up to ten locations. Use up to nine HD-RS with a single wired *Maestro* switch for switching from up to ten locations.

FINISHES AND COLORS

Maestro local controls are available in Designer Gloss and Satin Colors® matte finishes. See Appendix F: Colors & Finishes.

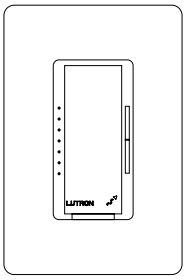
GANGING MAESTRO CONTROLS

Install multiple *Maestro* controls together (mounted side-by-side behind a single faceplate) in a multi-gang wallbox for a cleaner look. The load rating for each control must be derated when ganging with other controls.

For ganging and derating information, see Table 1 pg. 64.

INSTALLATION NOTE

Use 3½ inch (89 mm) deep wallboxes for ease of installation.

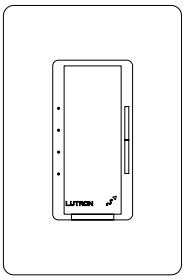


DIMMING CONTROL LOAD RATINGS

HWD-6D and HWD-6ND dim a single incandescent or magnetic low-voltage circuit up to 600 W/VA from one location. HWD-6ND requires a neutral wire connection.

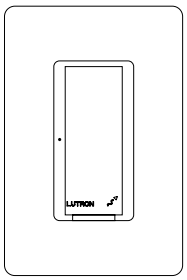
HWD-10D and HWD-10ND dim a single incandescent or magnetic low-voltage circuit up to 1000 W/VA from one location. HWD-10ND requires a neutral wire connection.

HWD-5NE dims a single incandescent or electronic low-voltage circuit up to 500 W from one location. HWD-5NE requires a neutral wire connection.



FAN-SPEED CONTROL (AVAILABLE 3Q08) LOAD RATINGS

HWD-2ANF controls a single ceiling fan up to 2 A from one location. HWD-2ANF requires a neutral wire connection.



SWITCHING CONTROL LOAD RATINGS

HWD-8ANS switches a single circuit of any lighting load type up to 8 A (or a motor load up to 5.8 A [1/4 HP]) from one location. HWD-8ANS requires a neutral wire connection.

Note: *For wattages exceeding those listed above or for load types other than those listed, a neutral wire dimmer (HWD-6ND) and a power booster or interface is required. See pg. 107 for more information.*

CONNECTION TO H48 DIMMER INTERFACE

All wired *Maestro* local controls must be connected to an H48 dimmer interface. A dimmer interface is available as a stand-alone component (model # HWI-H48) or as an integral part of processors with model numbers containing "H48". Each wired *Maestro* local control communicates with a dimmer interface via a one pair twisted shielded 22 AWG to 18 AWG (0.5 mm^2 to 1.0 mm^2) cable.

Wired Maestro® Local Controls (cont.)

All HomeWorks® Wired *Maestro* Local Controls

Model Numbers	HWD-6D: 600 W/VA Incandescent/MLV Dimming Control. HWD-6ND: 600 W/VA Incandescent/MLV Dimming Control with Neutral Wire. HWD-10D: 1000 W/VA Incandescent/MLV Dimming Control. HWD-10ND: 1000 W/VA Incandescent/MLV Dimming Control with Neutral Wire. HWD-5NE: 500 W ELV Dimming Control with Neutral Wire. HWD-2ANF: 2 A Fan Speed Control with Neutral Wire. HWD-8ANS: 8 A Switching Control with Neutral Wire. HD-RD: Accessory Control/Remote Dimmer. HD-RS: Accessory Control/Remote Switch.
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Low-Voltage Wire Type	One pair twisted shielded #18-22 AWG (1.0-0.5 mm^2) NEC® Class 2 (IEC PELV) wiring.
Low-Voltage Wiring Configuration	Daisy-chain, star, T-tap, home run. Link terminator not required. Each *Maestro* bus may have a max 500 feet (152.5 m) per wire run but may not exceed 1000 feet (305 m) total per bus. Maximum of eight devices per Dimmer Interface bus.
Low-Voltage Connections	Butt-splice (provided). *See Fig. 4, pg. 63*.
Addressing	Via the *HomeWorks* software, using unique device serial numbers. Units must be installed prior to addressing. Counts as 1 of 8 addresses on a *Maestro* bus. The device may be addressed without removing it from the wall.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Air Gap	FASS™ (Front Accessible Service Switch).
Fail-Safe Operation	In the unlikely event that communication with the processor is interrupted, all *Maestro* Local Controls will still operate, offering local control.
Dimensions	*See Fig. 1, pg. 63*.
Mounting	Controls mount in standard US wallboxes. For easier installation, Lutron recommends using 3½ in. (89 mm) deep wallboxes.
Ganging	When ganging *Maestro* Local Controls, it is not necessary to remove side fins. However, the control must still be derated. See Table 1 on pg. 64 for specific derating information. If mounting one control above another, leave at least 4½ in. (11.4 cm) vertical spacing between them.
Auxiliary Controls	Use only Lutron® *HomeWorks Maestro* Remote Dimmers or Switches (HD-RD or HD-RS); mechanical 3- or 4-way switches will not work. Up to nine *HomeWorks Maestro* Remote Dimmers or Switches may be connected to the *HomeWorks* Wired *Maestro* Dimmer/Switch/Fan Control. Total length of wire used to connect blue terminals (-5NE: blue wire) may be up to 250 feet (76 m).
Shipping Weight	0.6 lb. (.3 kg)

Wired Maestro® Local Controls (cont.)

HWD-6D • 600 W Incandescent/MLV Dimming Control

Load Types[1]	Incandescent, magnetic low-voltage[2,3], tungsten halogen.
Maximum Load	single-gang: 600 W/VA end gang: 500 W/VA middle gang: 400 W/VA
Minimum Load	50 W/VA
Line-Voltage Wiring	*See Figs. 7, 9, pg. 65*. Standard single-pole, 3-way, and 4-way wiring.

HWD-6ND • 600 W Incandescent/MLV Dimming Control with Neutral Wire

Load Types[1]	Incandescent, magnetic low-voltage[2,3], tungsten halogen, electronic low-voltage[3] (using ELVI-1000 Interface), Lutron® Tu-Wire Fluorescent Dimming Ballasts, and *Lutron* Hi-Lume® and ECO-10® Fluorescent Dimming Ballasts (using GRX-FDBI-16A-120 or Hi-Power 2•4•6™)[4,5]. Output is compatible with Lutron NGRX-PB-WH and *Hi-Power 2•4•6* Power Boosters for applications up to 30,000 W.
Maximum Load	single-gang: 600 W/VA end gang: 500 W/VA middle gang: 400 W/VA
Minimum Load	10 W/VA
Line-Voltage Wiring	*See Figs. 8, 10, pg. 65*. Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HWD-10D • 1000 W Incandescent/MLV Dimming Control

Load Types[1]	Incandescent, magnetic low-voltage[2,3], and tungsten halogen.
Maximum Load	single-gang: 1000 W/VA end gang: 800 W/VA middle gang: 650 W/VA
Minimum Load	50 W/VA
Line-Voltage Wiring	*See Figs. 7, 9, pg. 65*. Standard single-pole, 3-way, and 4-way wiring.

Wired Maestro® Local Controls (cont.)

HWD-10ND • 1000 W Incandescent/MLV Dimming Control with Neutral Wire

Load Types[1]	Incandescent, magnetic low-voltage[2,3], tungsten halogen, electronic low-voltage[3] (using ELVI-1000 Interface), Lutron® Tu-Wire Fluorescent Dimming Ballasts, and *Lutron* Hi-Lume® and ECO-10® Fluorescent Dimming Ballasts (using GRX-FDBI-16A-120 or Hi-Power 2•4•6™)[4,5]. Output is compatible with Lutron NGRX-PB-WH and *Hi-Power 2•4•6* Power Boosters for applications up to 30,000 W.
Maximum Load	single-gang: 1000 W/VA end gang: 800 W/VA middle gang: 650 W/VA
Minimum Load	10 W/VA
Line-Voltage Wiring	*See Figs. 8, 10, pg. 65*. Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HWD-2ANF • 2 A Fan Speed Control with Neutral Wire

Load Types[6]	Single ceiling paddle fan[6].
Maximum Load	single-gang: 2 A end gang: 2 A middle gang: 2 A
Minimum Load	0.08 A
Line-Voltage Wiring	*See Figs. 8, 10, pg. 65*. Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HWD-5NE • 500 W ELV Dimming Control with Neutral Wire

Load Types	Incandescent and electronic low-voltage.
Maximum Load	single-gang: 500 W end gang: 450 W middle gang: 400 W
Minimum Load	40 W
Line-Voltage Wiring	*See Figs. 8, 10, pg. 65*. Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HWD-8ANS • 8 A Switching Control with Neutral Wire

Load Types[1]	All lighting load types, motors.
Maximum Load	single-gang: 8 A lighting, 5.8 A (1/4 HP) motor end gang: 6.5 A lighting, 5.8 A motor middle gang: 5 A lighting, 5 A motor
Minimum Load	10 W/VA
Line-Voltage Wiring	*See Figs. 8, 10, pg. 65*. Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

Wired Maestro® Local Controls (cont.)

HD-RD • 3- or 4-way Remote Dimmer

Compatible Controls	HWD-2ANF, HWD-6D, HWD-6ND, HWD-10D, HWD-10ND and HWD-5NE.
Maximum Load	See local control.
Minimum Load	See local control.
Line-Voltage Wiring	*See Figs. 9, 10, pg. 65*. Standard single-pole, 3-way, and 4-way wiring.

HD-RS • 3- or 4-way Remote Switch

Compatible Controls	HWD-8ANS
Maximum Load	See local lighting control.
Minimum Load	See local lighting control.
Line-Voltage Wiring	*See Fig. 10, pg. 65*. Standard single-pole, 3-way, and 4-way wiring.

(1) To reduce the risk of overheating and possibly damaging other equipment, do not install HWD-6D, HWD-6ND, HWD-10D, or HWD-10ND to control receptacles, motor-operated appliances, fluorescent lighting, or electronic low-voltage transformer loads. Do not install HWD-8ANS to control receptacles. Do not install HRD-2ANF to control receptacles, motor-operated appliances (non-ceiling fan),or any type of lighting load.

(2) Because low-voltage transformers vary widely in efficiency, the input VA of each transformer should be measured directly. If this is not possible, use the maximum lamp wattage figures for the transformer, which have a built-in safety margin.

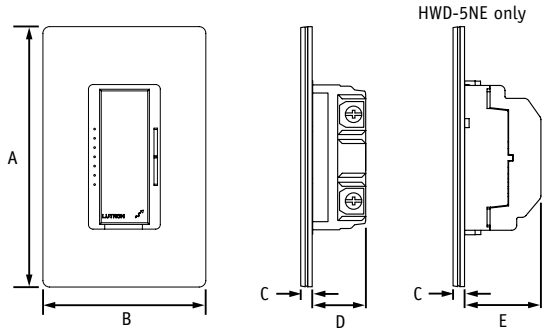
(3) For low-voltage applications using the HWD-6D, HWD-6ND, HWD-10D or HWD-10ND, use with core and coil (magnetic) low-voltage transformers only. Do not use any solid-state electronic low-voltage transformers. Operation of a low-voltage circuit with all lamps inoperative or removed may result in current flow in excess of normal levels. To avoid transformer overheating and premature transformer failure, Lutron strongly recommends the following:
a) Do not operate low-voltage circuits without operative lamps in place.
b) Replace burned-out lamps as soon as possible.
c) Use transformers that incorporate thermal protection or fuse transformer primary windings to prevent transformer failure due to overcurrent.

(4) For proper dimming performance, fluorescent lamps must be operated at full intensity for 100 hours prior to dimming.

(5) To determine the maximum load, add the line currents listed on each ballast connected to this control. The total line current can not exceed the maximum load capacity rating of the control. Warning: Do not exceed a maximum of 20 ballasts per control.

(6) Fan Speed Control: Use to control a single paddle-type ceiling fan that has a permanent split-capacitor motor. Do not use to control shaded-pole type motors (i.e. exhaust fans) or lighting.

Wired Maestro® Local Controls (cont.)



	Inches	mm
A	$4^{11}/_{16}$	119
B	$2^{15}/_{16}$	75
C	$^{5}/_{16}$	7.6
D	$1^{1}/_{8}$	29.8
E	$1^{3}/_{8}$	34.8

***Figure 1* – Dimensions**

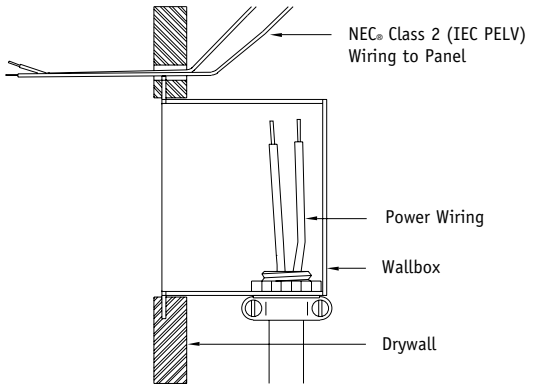


Figure 2* – Wire Installation

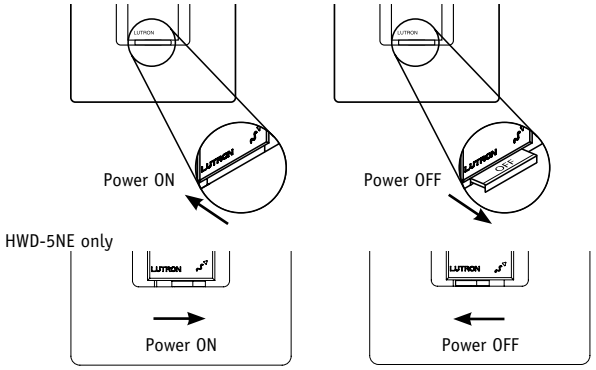


***Figure 3* – FASS™ (Front-Accessible Service Switch)**

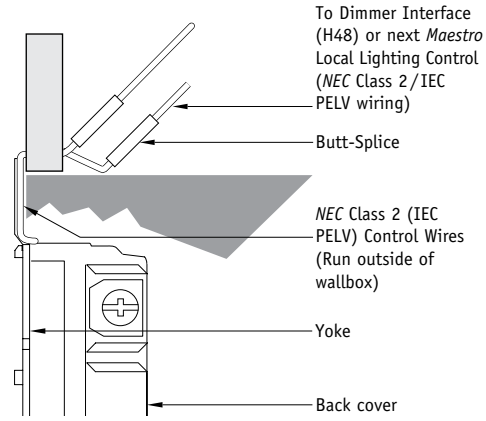


Figure 4* – Class 2 Wire Connection

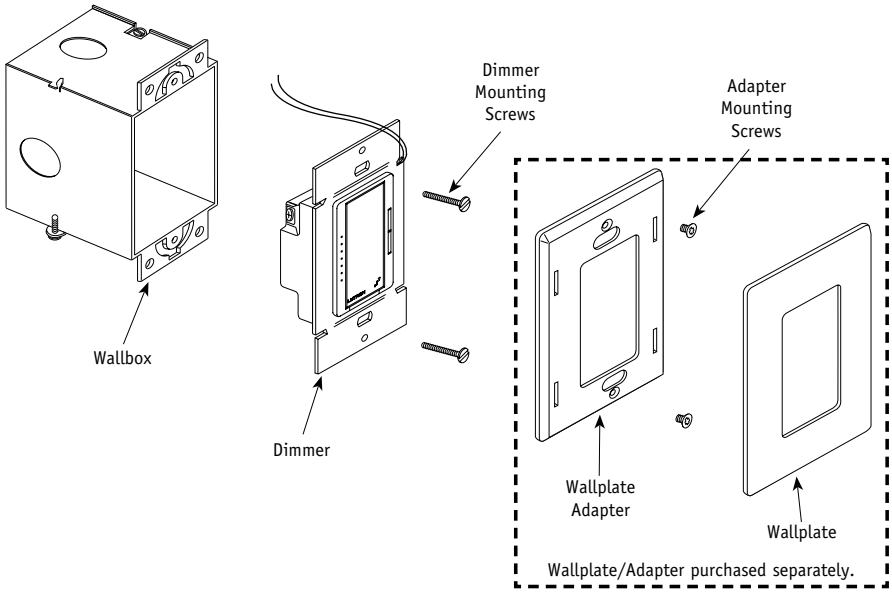


***Figure 5* – Mounting and Parts Identification**

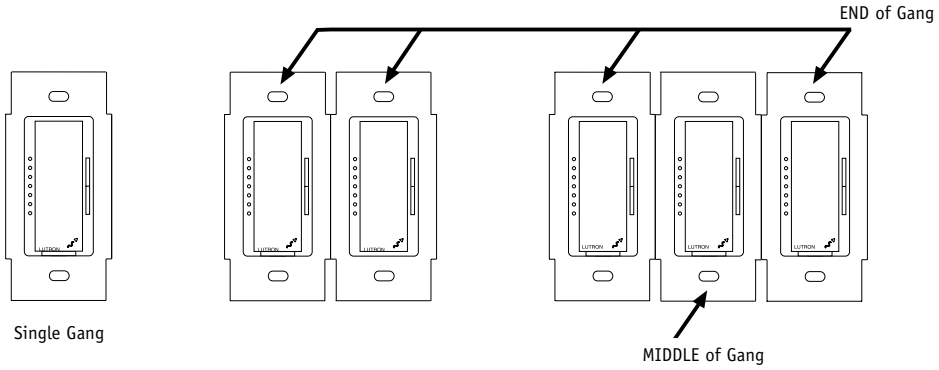
***** *Consult HomeWorks Application Note #38 for Alternate wiring methods.*

Wired Maestro® Local Controls (cont.)

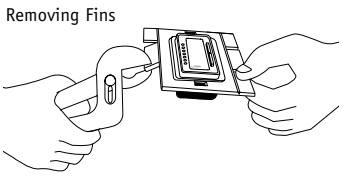
		Minimum Load	Maximum Load		
Control	**Load Type**	**All Cases**	**Single-Gang**	**End of Gang**	**Middle of Gang**
HWD-6D	Incandescent	50 W / VA	600 W	500 W	400 W
	Magnetic Low Voltage	50 W / VA	450 W / 600 VA	400 W / 500 VA	300 W / 400 VA
HWD-6ND	Incandescent	10 W / VA	600 W	500 W	400 W
	Magnetic Low Voltage	10 W / VA	450 W / 600 VA	400 W / 500 VA	300 W / 400 VA
HWD-10D	Incandescent	50 W / VA	1000 W	800 W	650 W
	Magnetic Low Voltage	50 W / VA	800 W / 1000 VA	600 W / 800 VA	500 W / 650 VA
HWD-10ND	Incandescent	10 W / VA	1000 W	800 W	650 W
	Magnetic Low Voltage	10 W / VA	800 W / 1000 VA	600 W / 800 VA	500 W / 650 VA
HWD-5NE	Electronic Low Voltage	40 W	500 W	450 W	400 W
HWD-8ANS	Lighting	10 W / VA	8 A	6.5 A	5 A
	Motor	0.083 A	5.8 A (1/4 HP)	5.8 A	5 A
HWD-2ANF	Ceiling Fan	0.083 A	2 A	2 A	2 A
HD-RD	N/A*	N/A*	N/A*	N/A*	N/A*
HD-RS	N/A*	N/A*	N/A*	N/A*	N/A*

* See local control

***Table 1* – Minimum and Maximum Load Ratings**



-8ANS Only:
-8ANS controls have fins that need to be removed for multigang installations.



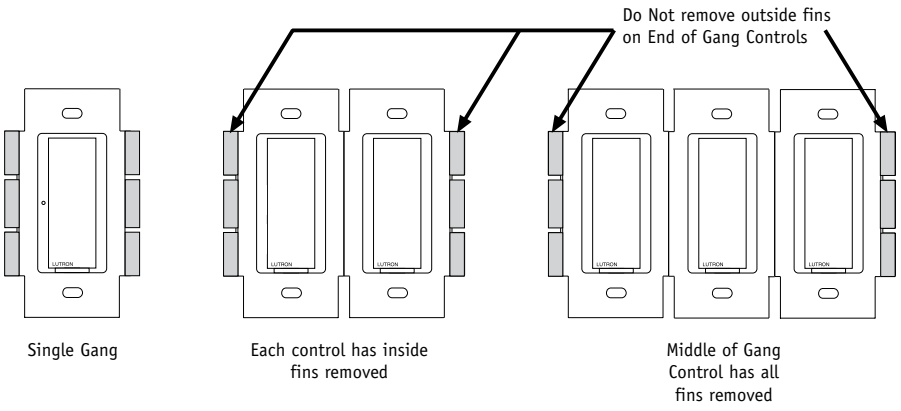


***Figure 6* – Ganging Configuration and Derating Information**

Wired Maestro® Local Controls (cont.)

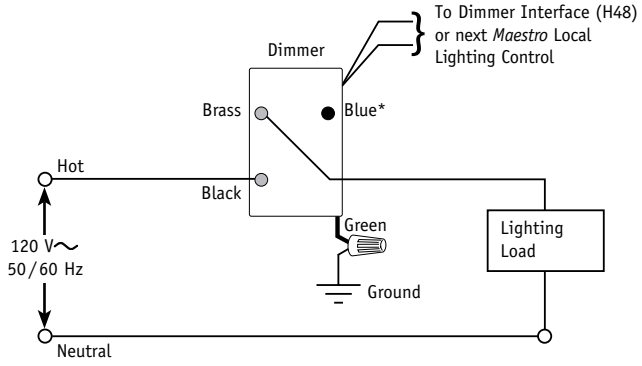


***Figure 7* – HWD-6D and HWD-10D Single-Location Wiring Diagram**

Terminal Color	Wire Color (-5NE)
Brass	Yellow
Silver	White
Blue	Blue
Black	Black

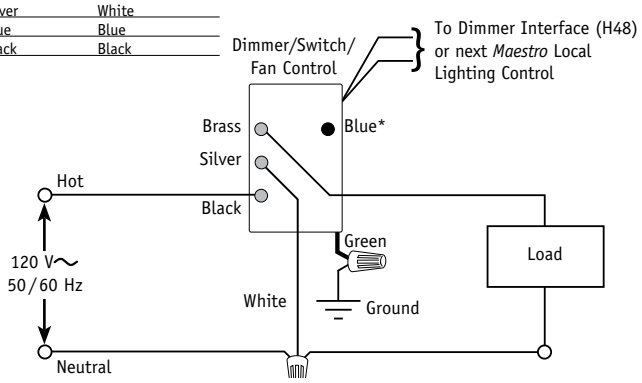


***Figure 8* – HWD-2ANF, HWD-6ND, HWD-10ND, HWD-5NE, and HWD-8ANS Single-Location with Neutral Wiring Diagram**

***** When using controls in single-location installations, tighten the control's blue terminal (-5NE: cap off blue wire). **DO NOT** connect the blue terminal (-5NE: blue wire) to any other wiring or to ground.

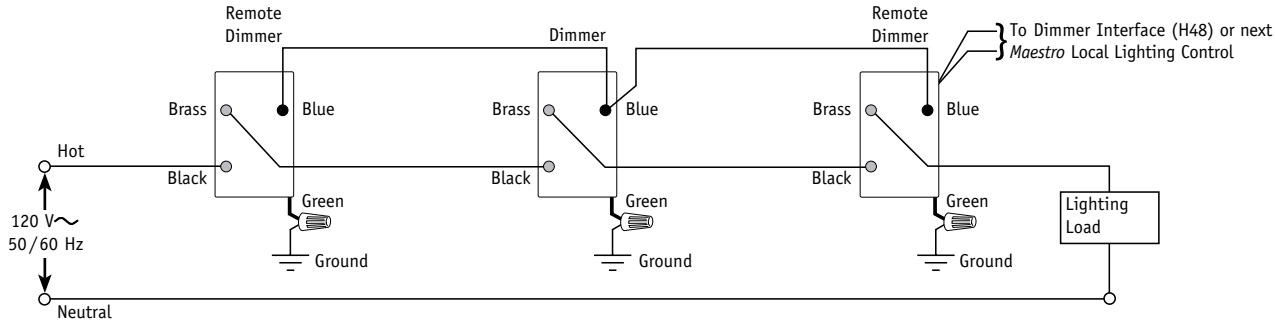
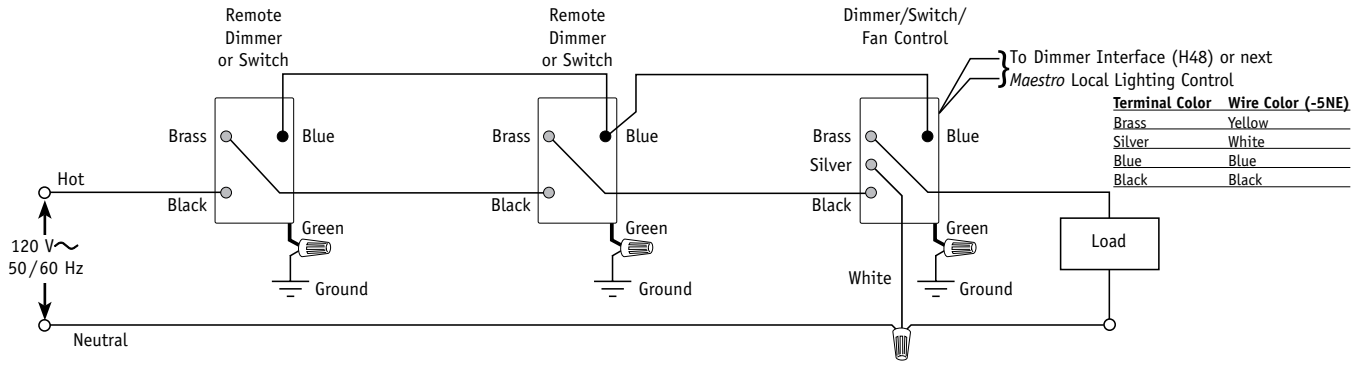


***Figure 9* – HWD-6D and HWD-10D Multi-Location Installation[1]**



Terminal Color	Wire Color (-5NE)
Brass	Yellow
Silver	White
Blue	Blue
Black	Black

***Figure 10* – HWD-2ANF, HWD-6ND, HWD-10ND, HWD-5NE, and HWD-8ANS Multi-Location Installation with Neutral[1, 2]**

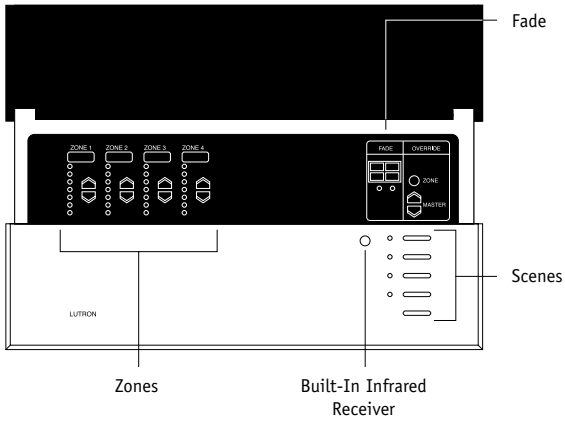
[1] Up to nine HomeWorks® *Maestro* Remote Dimmers or Switches may be connected to the *HomeWorks* Wired *Maestro* Dimmer/Switch/Fan Control. Total length of wire used to connect blue terminals (-5NE: blue wire) may be up to 250 feet (76 m).

[2] Neutral wire Dimmers/Switches/Fan Controls must be connected on the lighting load side of a multi-location installation.

GRAFIK Eye® Multi-Zone Local Lighting Controls

4 Series / 8 Series
Local Lighting Controls
Grafik Eye/WPM Link
Architectural-Style

GRAFIK Eye preset local lighting controls allow you to easily create and recall multiple lighting scenes for the changing activities that occur in a room. Up to 16 preset scenes can be stored in each *GRAFIK Eye* control, making them ideal for home theaters, living rooms, and dining rooms. *GRAFIK Eye* preset scenes can be easily adjusted manually at the control at any time. *GRAFIK Eye* controls are available to dim or switch two, three, four, or six zones of incandescent, magnetic low-voltage, or neon/ cold cathode lighting loads.



***GRAFIK Eye* Preset Local Lighting Control (GRX-IA-4 shown)**

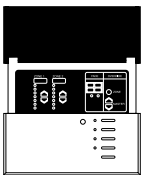
FINISHES AND COLORS

GRAFIK Eye preset local lighting controls are available in Architectural matte finish plastic colors, Architectural metal finishes, Satin Colors®, and select designer gloss colors. Custom paint matching is also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

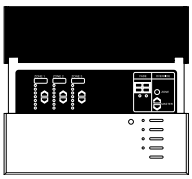
CONNECTION TO WIRED PROCESSOR

HomeWorks® wired processors have configurable links (*see pg. 90* for processor details), each capable of controlling up to eight *GRAFIK Eye* controls or Wallbox Power Modules. This connection requires two pair — one pair #18 AWG (1.0 mm²), one pair #18-22 AWG (1.0-0.5 mm²) twisted shielded — NEC® Class 2 (IEC PELV) wire. Lutron® wire model # GRX-CBL-346S-500 may be used. The maximum cable length is 2000 feet (610 m), and this link must be wired in a daisy-chain configuration.

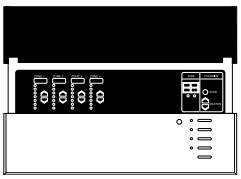
INSTALLATION NOTES



2-Zone
2-gang
US wallbox



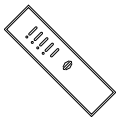
3-Zone
3-gang
US wallbox



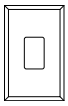
4-Zone (pictured) and 6-Zone
4-gang
US wallbox

Note: *Use 3½ inch (89 mm) deep masonry wallboxes for ease of installation of* GRAFIK Eye *Control Units. See pg. 68.*

ACCESSORY CONTROLS



Hand-held Infrared Remote Control Transmitters
GRX-IT-WH, GRX-8IT-WH (White Only)
Controls four (or eight) scenes plus master raise/lower and off. Recalls or fine tunes light levels. Turns lighting on or off.



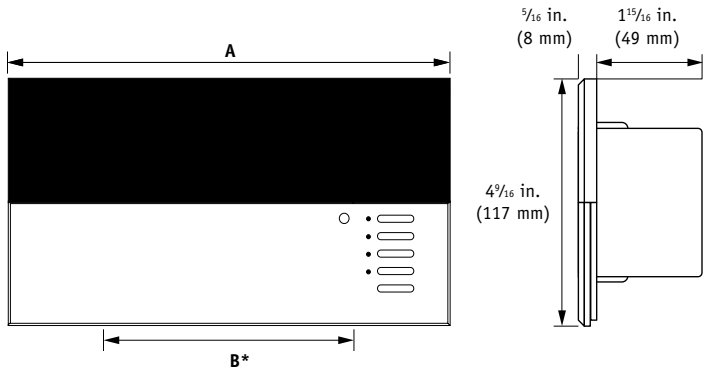
On/Off Doorway Control
NTGRX-1S
Switches lighting on or off from a remote wall location. Line/main voltage control (functions as 3-way switch).

GRAFIK Eye® Multi-Zone Local Lighting Controls (cont.)

Control Units

Model Numbers	GRX-IA-2, GRX-IA-3, GRX-IA-4, GRX-IA-6: Allows scene and zone control from HomeWorks®. GRX-MR-2, GRX-MR-3, GRX-MR-4, GRX-MR-6: Allows scene control from *HomeWorks*.
Input Voltage	120 V~, 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Load Types	Incandescent, magnetic low-voltage, neon/cold cathode, Lutron® Tu-Wire Fluorescent Dimming Ballasts, *Lutron* Hi-Lume® and ECO-10® Fluorescent Dimming Ballasts (requires GRX-FDBI-16A-120 or Hi-Power 2•4•6™), electronic low-voltage (requires ELVI-1000 or *Hi-Power 2•4•6*). Outputs are compatible with Lutron® NGRX-PB-WH, and *Hi-Power 2•4•6* Power Boosters for higher wattage applications.
Maximum Load	2-zone: 1200 W/VA per control unit, 800 W/VA per zone. 3-zone: 1500 W/VA per control unit, 800 W/VA per zone. 4-zone: 1920 W/VA per control unit, 800 W/VA per zone. 6-zone: 1920 W/VA per control unit, 800 W/VA per zone.
Minimum Load	25 W/VA per zone.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Line-Voltage Connections	*See Fig. 4, pg. 69*.
Low-Voltage Wire Type	Two pair [one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded] NEC® Class 2 (IEC PELV) wire. Lutron wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Configuration	Maximum of 2000 feet (610 m) total. Must be wired in a daisy-chain configuration. *See Fig. 5, pg. 69*.
Low-Voltage Wiring Connection	One 4-pin removable terminal block. Each of the four terminals will accept up to two #18 AWG (1.0 mm^2) wires. Do not connect Terminal 2 on processor communication link connector.
Addressing	Via 7-segment display. Use 1 of 8 addresses on a *GRAFIK Eye*/WPM link.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Air Gap	Provided when all circuits are off.
Fail-Safe Operation	In the unlikely event that communication with the processor is interrupted, all *GRAFIK Eye* Preset Local Lighting Controls will still operate, offering local control.
Dimensions	*See Fig. 1, pg. 68*.
Mounting	2-zone: 2-gang US wallbox, 3-zone: 3-gang US wallbox, 4-zone: 4-gang US wallbox, 6-zone: 4-gang US wallbox, 2¾ in. (70 mm) deep minimum, 3½ in. (89 mm) deep recommended for ease of wiring. If mounting one control above another, leave at least 4½ in. (11.4 cm) vertical spacing between them.
Shipping Weight	2 lbs. (0.9 kg)

GRAFIK Eye® Multi-Zone Local Lighting Controls (cont.)



	A	B*
GRX-MR-2/ IA-2	5 9/16 in. (144 mm)	1 13/16 in. (46 mm)
GRX-MR-3/ IA-3	7 1/4 in. (184 mm)	3 5/8 in. (92 mm)
GRX-MR-4 IA-4 GRX-MR-6/ IA-6	8 5/16 in. (227 mm)	5 7/16 in. (138 mm)

** Dimensions between mounting holes.*

***Figure 1* – Front and Side View Dimensions**

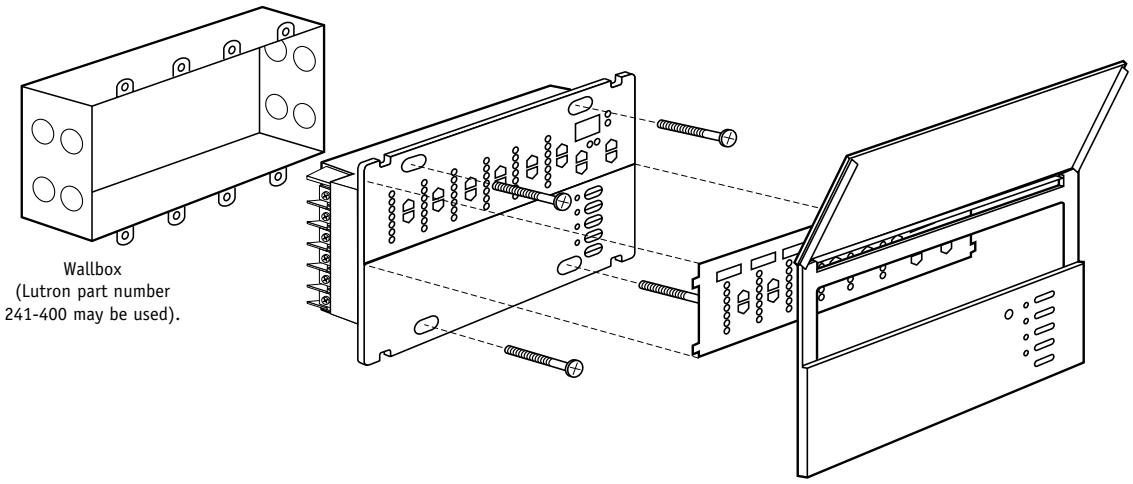


***Figure 2* – Mounting**

GRAFIK Eye® Multi-Zone Local Lighting Controls (cont.)

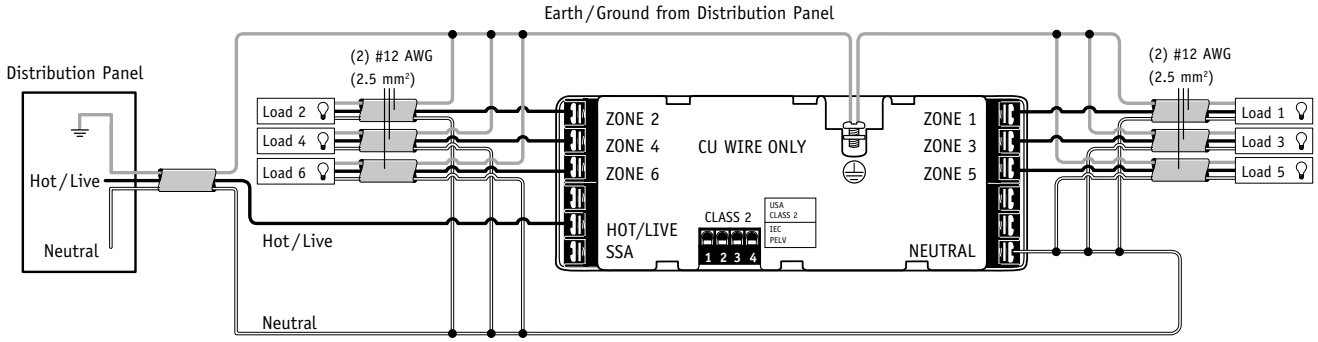
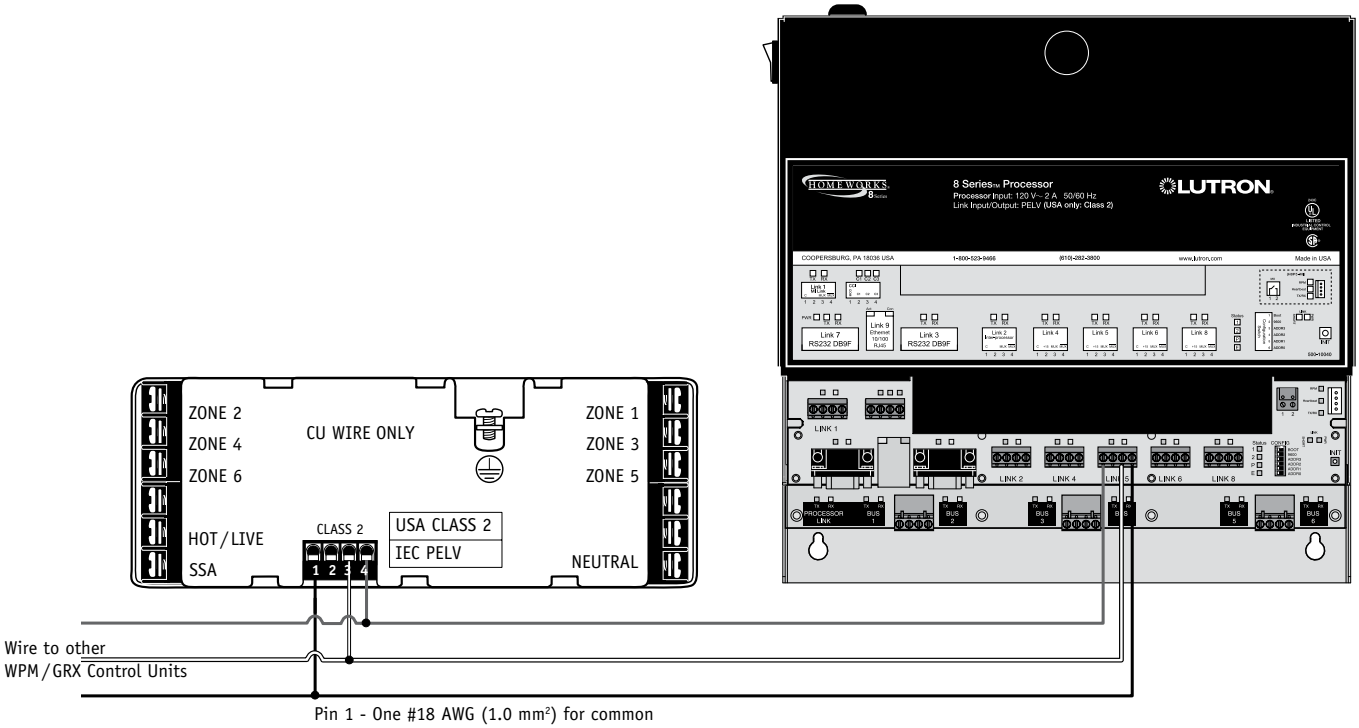


***Figure 4* – Line-Voltage Wiring Diagram**



Pin 1 - One #18 AWG (1.0 mm²) for common
Pin 2 - Do not connect
Pins 3 and 4 - One pair #18-22 AWG (1.0-0.5 mm²) twisted/shielded for data

NOTE: *GRAFIK Eye* Control Units can be connected to any of the configurable links.

***Figure 5* – Connection to Wired Processor**

RF Maestro® Local Controls

Wireless Series
Local Controls
RF Dimmer Link-8.1
Designer-Style

LOCAL CONTROLS

RF *Maestro* local controls function much like standard dimmers and switches, but can be controlled as part of the whole-house lighting control system. Local lighting controls are useful in locations where single circuits of lighting need to be dimmed or switched. Local fan-speed controls are useful in locations where control of a single ceiling paddle fan is needed. RF *Maestro* dimmers incorporate advanced features such as fade-on/fade-off, long fade-off, and rapid full-on. In addition, the local controls may be programmed similar to a keypad button press with single and double tap functions, turning multiple lights on or off. RF *Maestro* local controls include a Front Accessible Service Switch (FASS™) for safe lamp replacement. HomeWorks® RF *Maestro* local controls install in single-pole, 3-way, or 4-way applications.

ACCESSORY CONTROL

Remote dimmers (HD-RD) and remote switches (HD-RS) are used in conjunction with a RF Maestro local control to provide 3-way and 4-way control. Use up to nine HD-RD with a single RF *Maestro* dimmer/fan-speed control for dimming/speed control from up to ten locations. Use up to nine HD-RS with a single RF *Maestro* switch for switching from up to ten locations. *See pg. 77.*

FINISHES AND COLORS

Maestro local controls are available in designer gloss and Satin Colors® matte finishes. See Appendix F: Colors & Finishes.

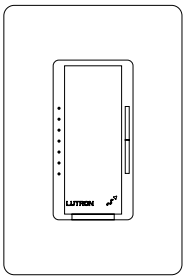
GANGING *MAESTRO* CONTROLS

Install multiple *Maestro* controls together (mounted side-by-side behind a single faceplate) in a multi-gang wallbox for a cleaner look. The load rating for each control must be derated when ganging with other controls.

For ganging and derating information, see Table 1 pg. 76.

INSTALLATION NOTE

Use 3½ inch (89 mm) deep wallboxes for ease of installation.

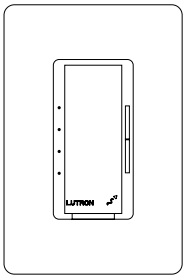


DIMMING CONTROL LOAD RATINGS

HRD-6D and HRD-6ND dim a single incandescent or magnetic low-voltage circuit up to 600 W/VA from one location. HRD-6ND requires a neutral wire connection.

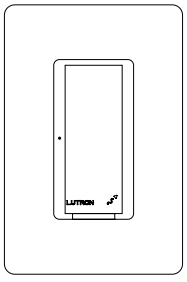
HRD-10D and HRD-10ND dim a single incandescent or magnetic low-voltage circuit up to 1000 W/VA from one location. HRD-10ND requires a neutral wire connection.

HRD-5NE dims a single incandescent or electronic low-voltage circuit up to 500 W from one location. HWD-5NE requires a neutral wire connection.



FAN-SPEED CONTROL LOAD RATINGS

HRD-2ANF controls a single ceiling fan up to 2 A from one location. HRD-2ANF requires a neutral wire connection.



SWITCHING CONTROL LOAD RATINGS

HRD-8ANS switches a single circuit of any lighting load type up to 8 A (or a motor load up to 5.8 A [1/4 HP]) from one location. HRD-8ANS requires a neutral wire connection.

Note: *For wattages exceeding those listed above or for load types other than those listed, a neutral wire dimmer (HRD-6ND) and a power booster or interface is required. See pg. 107 for more information.*

COMMUNICATION TO PROCESSOR

All RF *Maestro* local lighting controls must be located within 30 feet (9 m) of an RF processor or a hybrid RF/wired repeater. Each *HomeWorks* RF-capable processor can control up to 64 RF local controls.

RF Maestro® Local Controls (cont.)

All HomeWorks® RF Maestro Local Controls

Model Numbers	HRD-6D: 600 W/VA Incandescent/MLV Dimming Control. HRD-6ND: 600 W/VA Incandescent/MLV Dimming Control with Neutral Wire. HRD-10D: 1000 W/VA Incandescent/MLV Dimming Control. HRD-10ND: 1000 W/VA Incandescent/MLV Dimming Control with Neutral Wire. HRD-5NE: 500 W ELV Dimming Control with Neutral Wire. HRD-2ANF: 2 A Fan Speed Control with Neutral Wire. HRD-8ANS: 8 A Switching Control with Neutral Wire. HD-RD: Accessory Control/Remote Dimmer. HD-RS: Accessory Control/Remote Switch.
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM, FCC, IC
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Air Gap	FASS™ (Front Accessible Service Switch). *See Fig. 2, pg. 75.*
Addressing	Via the *HomeWorks* software, using unique device serial numbers. Units must be installed prior to addressing. Counts as 1 of the 64 dimmer addresses on the RF dimmer link.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Fail-Safe Operation	In the unlikely event that communication with the processor is interrupted, all *Maestro* local controls will still operate, offering local control.
Dimensions	*See Fig. 1, pg. 75.*
Mounting	Controls mount in standard US wallboxes. For easier installation, Lutron recommends using 3½" (89 mm) deep wallboxes. If mounting one control above another, leave at least 4½" (11.4 cm) vertical spacing between them. Unit must be placed within 30 feet (9 m) of a hybrid RF/wired repeater or an RF processor.
Ganging	When ganging RF *Maestro* local controls, it is necessary to derate the control. *See Table 1, pg. 76* for specific derating information.
Auxiliary Controls	Use only *Maestro* remote dimmers or switches (HD-RD or HD-RS); mechanical 3- or 4-way switches will not work. Up to nine *Maestro* remote dimmers or switches may be used with one Maestro local dimming/fan speed or switching control. *See pg. 77.*
Shipping Weight	0.6 lb. (0.3 kg)

RF Maestro® Local Controls (cont.)

HRD-6D • 600 W Incandescent/MLV Dimming Control

Load Types[1]	Incandescent, magnetic low-voltage[2,3], and tungsten halogen.
Maximum Load	single-gang: 600 W/VA end gang: 500 W/VA middle gang: 400 W/VA
Minimum Load	50 W/VA
Line-Voltage Wiring	*See Figs. 5, 7, pg. 77*. Standard single-pole, 3-way, and 4-way wiring.

HRD-6ND • 600 W Incandescent/MLV Dimming Control with Neutral Wire

Load Types[1]	Incandescent, magnetic low-voltage[2,3], tungsten halogen, electronic low-voltage[3] (using ELVI-1000 Interface), and Lutron® Hi-Lume® and ECO-10® Fluorescent Dimming Ballasts (using GRX-FDBI-16A-120 or Hi-Power 2•4•6™)[4,5]. Output is compatible with *Lutron* NGRX-PB-WH and *Hi-Power 2•4•6* Power Boosters for applications up to 30,000 W.
Maximum Load	single-gang: 600 W/VA end gang: 500 W/VA middle gang: 400 W/VA
Minimum Load	10 W/VA
Line-Voltage Wiring	*See Figs. 6, 8, pg. 77*. Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HRD-10D • 1000 W Incandescent/MLV Dimming Control

Load Types[1]	Incandescent, magnetic low-voltage[2,3], and tungsten halogen.
Maximum Load	single-gang: 1000 W/VA end gang: 800 W/VA middle gang: 650 W/VA
Minimum Load	50 W/VA
Line-Voltage Wiring	*See Figs. 5, 7, pg. 77*. Standard single-pole, 3-way, and 4-way wiring.

RF Maestro® Local Controls (cont.)

HRD-10ND • 1000 W Incandescent/MLV Dimming Control with Neutral Wire

Load Types[1]	Incandescent, magnetic low-voltage[2,3], tungsten halogen, electronic low-voltage[3] (using ELVI-1000 Interface), and Lutron® Hi-Lume® and ECO-10® Fluorescent Dimming Ballasts (using GRX-FDBI-16A-120 or Hi-Power 2•4•6™)[4,5]. Output is compatible with *Lutron* NGRX-PB-WH and *Hi-Power 2•4•6* Power Boosters for applications up to 30,000 W. *See pg. 107.*
Maximum Load	single-gang: 1000 W/VA end gang: 800 W/VA middle gang: 650 W/VA
Minimum Load	10 W/VA
Line-Voltage Wiring	*See Figs. 6, 8, pg. 77.* Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HRD-2ANF • 2 A Fan Speed Control with Neutral Wire

Load Types[1]	Single ceiling paddle fan.
Maximum Load	single-gang: 2 A end gang: 2 A middle gang: 2 A
Minimum Load	0.083 A
Line-Voltage Wiring	*See Figs. 6, 8, pg. 77.* Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HRD-5NE • 500 W ELV Dimming Control with Neutral Wire

Load Types	Incandescent and electronic low-voltage.
Maximum Load	single-gang: 500 W end gang: 450 W middle gang: 400 W
Minimum Load	40 W
Line-Voltage Wiring	*See Figs. 6, 8, pg. 77.* Single-pole, 3-way, and 4-way wiring. Requires a neutral wire connection in the wallbox.

HRD-8ANS • 8 A Switching Control with Neutral Wire

Load Types[1]	Incandescent, magnetic low-voltage[2], electronic low-voltage, fluorescent[5], and motors.
Maximum Load	single-gang: lighting 8 A motor 5.8 A (1/4 HP) end gang: lighting 6.5 A motor 5.8 A middle gang: lighting 5 A motor 5 A
Minimum Load	lighting 10 W/VA motor 0.083 A
Line-Voltage Wiring	*See Figs. 6, 8, pg. 77.* Requires a neutral wire connection in the wallbox.

RF Maestro® Local Controls (cont.)

HD-RD • 3- or 4-way Remote Dimmer

Compatible Controls	HRD-6D, HRD-6ND, HRD-10D, HRD-5NE, HRD-2ANF and HRD-10ND.
Maximum Load	See local control.
Minimum Load	See local control.
Line-Voltage Wiring	*See Figs. 7, 8, pg. 77*. Standard single-pole, 3-way, and 4-way wiring.

HD-RS • 3- or 4-way Remote Switch

Compatible Controls	HRD-8ANS
Maximum Load	See local control.
Minimum Load	See local control.
Line-Voltage Wiring	*See Fig. 8, pg. 77*. Standard single-pole, 3-way, and 4-way wiring.

(1) To reduce the risk of overheating and possibly damaging other equipment, do not install HRD-6D, HRD-6ND, HRD-10D, or HRD-10ND to control receptacles, motor-operated appliances, fluorescent lighting, or electronic low-voltage transformer loads. Do not install HRD-8ANS to control receptacles. Do not install HRD-2ANF to control receptacles, motor-operated appliances (non-ceiling fan),or any type of lighting load.

(2) Because low-voltage transformers vary widely in efficiency, the input VA of each transformer should be measured directly. If this is not possible, use the maximum lamp wattage figures for the transformer, which have a built-in safety margin.

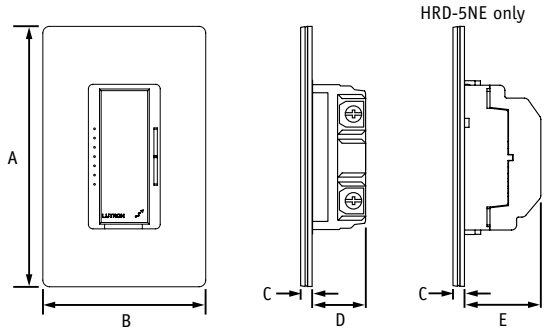
(3) For low-voltage applications using the HRD-6D, HRD-6ND, HRD-10D or HRD-10ND, use with core and coil (magnetic) low-voltage transformers only. Do not use any solid-state electronic low-voltage transformers. Operation of a low-voltage circuit with all lamps inoperative or removed may result in current flow in excess of normal levels. To avoid transformer overheating and premature transformer failure, Lutron strongly recommends the following:
a) Do not operate low-voltage circuits without operative lamps in place.
b) Replace burned-out lamps as soon as possible.
c) Use transformers that incorporate thermal protection or fuse transformer primary windings to prevent transformer failure due to overcurrent.

(4) For proper dimming performance, fluorescent lamps must be operated at full intensity for 100 hours prior to dimming.

(5) To determine the maximum load, add the line currents listed on each ballast connected to this control. The total line current can not exceed the maximum load capacity rating of the control. Warning: Do not exceed a maximum of 20 ballasts per control.

(6) Fan Speed Control: Use to control a single paddle-type ceiling fan that has a permanent split-capacitor motor. Do not use to control shaded-pole type motors (i.e. exhaust fans) or lighting.

RF Maestro® Local Controls (cont.)



	Inches	mm
A	$4^{11}/_{16}$	119
B	$2^{15}/_{16}$	75
C	$^{5}/_{16}$	7.6
D	$1^{1}/_{8}$	35
E	$1^{3}/_{8}$	34.8

***Figure 1* – Dimensions**

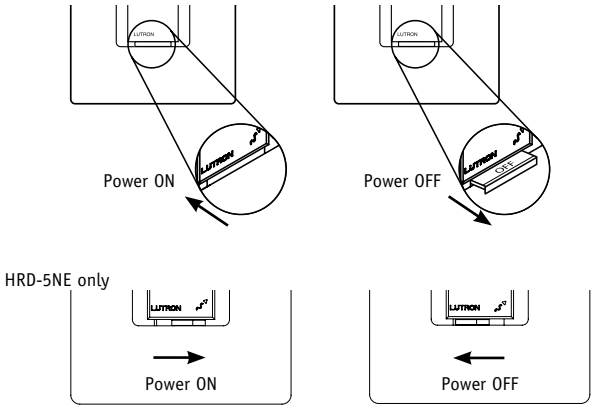


***Figure 2* – FASS™ (Front-Accessible Service Switch)**

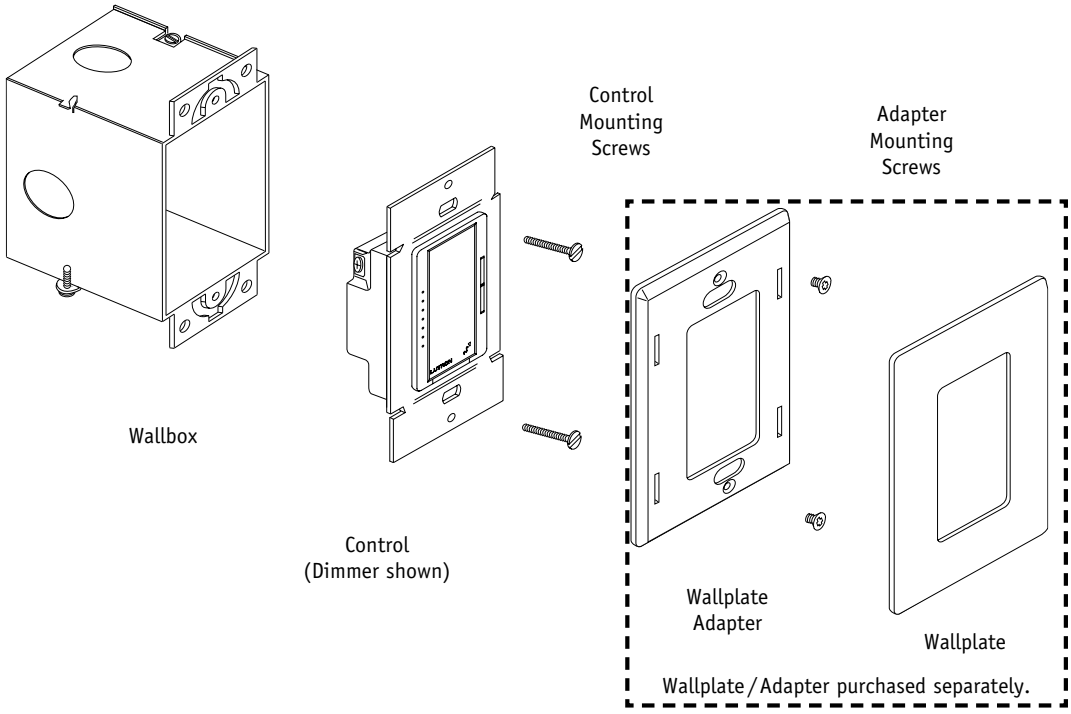


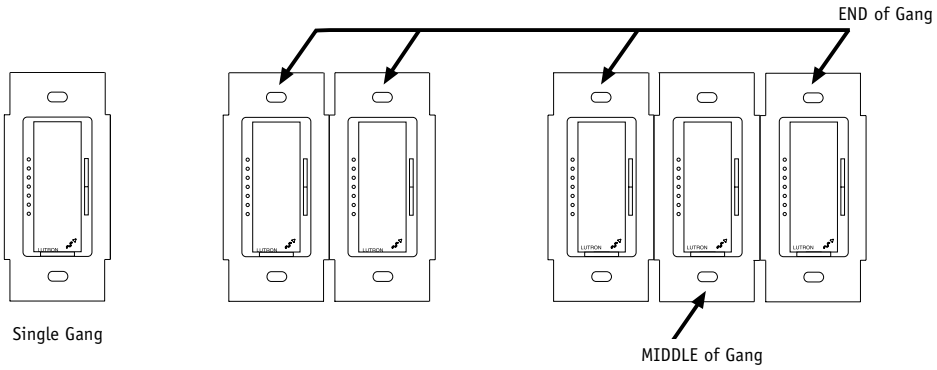
***Figure 3* – Mounting and Parts Identification**

RF Maestro® Local Controls (cont.)

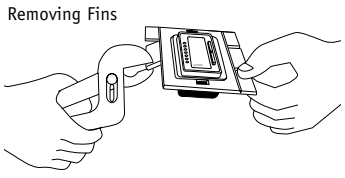
		Minimum Load	Maximum Load		
Control	**Load Type**	**All Cases**	**Single-Gang**	**End of Gang**	**Middle of Gang**
HRD-6D	Incandescent	50 W/VA	600 W	500 W	400 W
	Magnetic Low Voltage	50 W/VA	450 W/600 VA	400 W/500 VA	300 W/400 VA
HRD-6ND	Incandescent	10 W/VA	600 W	500 W	400 W
	Magnetic Low Voltage	10 W/VA	450 W/600 VA	400 W/500 VA	300 W/400 VA
HRD-10D	Incandescent	50 W/VA	1000 W	800 W	650 W
	Magnetic Low Voltage	50 W/VA	800 W/1000 VA	600 W/800 VA	500 W/650 VA
HRD-10ND	Incandescent	10 W/VA	1000 W	800 W	650 W
	Magnetic Low Voltage	10 W/VA	800 W/1000 VA	600 W/800 VA	500 W/650 VA
HRD-5NE	Electronic Low Voltage	40 W	500 W	450 W	400 W
HRD-8ANS	Lighting	10 W/VA	8 A	6.5 A	5 A
	Motor	0.083 A	5.8 A (1/4 HP)	5.8 A	5 A
HRD-2ANF	Ceiling Fan	0.083 A	2 A	2 A	2 A
HD-RD	N/A*	N/A*	N/A*	N/A*	N/A*
HD-RS	N/A*	N/A*	N/A*	N/A*	N/A*

* See local control

***Table 1* – Minimum and Maximum Load Ratings**



-8ANS Only:
-8ANS controls have fins that need to be removed for multigang installations.



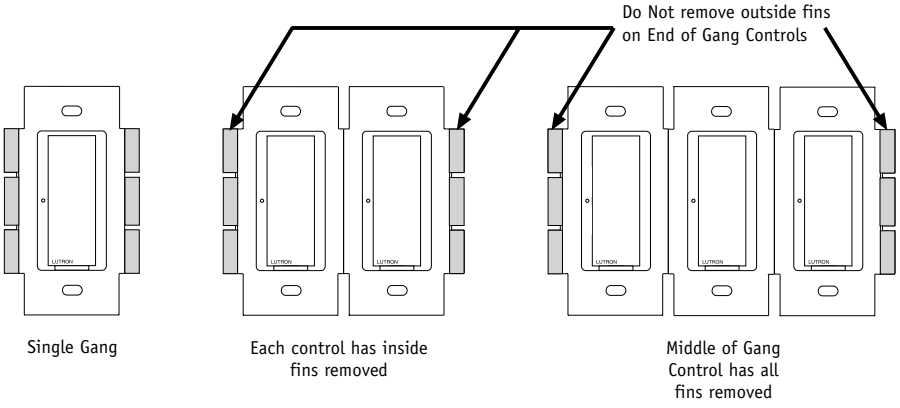


***Figure 4* – Ganging Configuration and Derating Information**

RF Maestro® Local Controls (cont.)

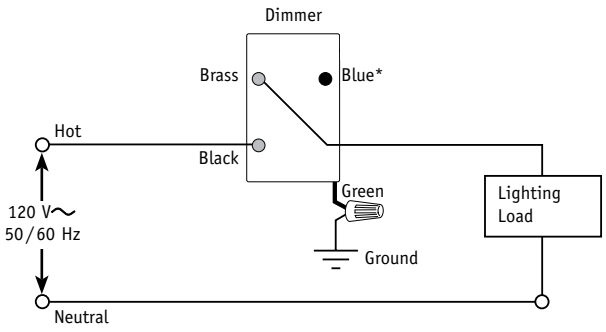


***Figure 5* – HRD-6D and HRD-10D Single-Location Wiring Diagram**

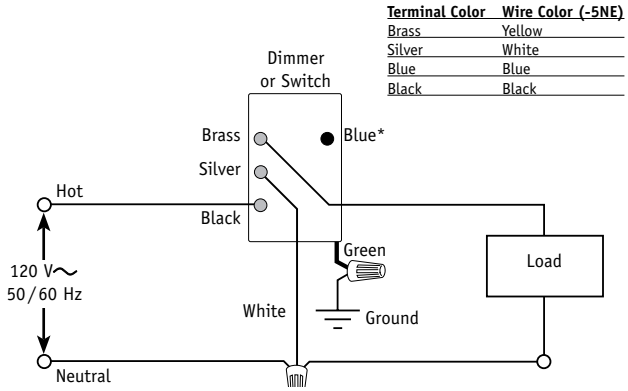


***Figure 6* – HRD-2ANF, HRD-6ND, HRD-10ND, HRD-5NE, and HRD-8ANS Single-Location with Neutral Wiring Diagram**

***** When using controls in single-location installations, tighten the control's blue terminal (-5NE: cap off blue wire). **DO NOT** connect the blue terminal (-5NE: blue wire) to any other wiring or to ground.

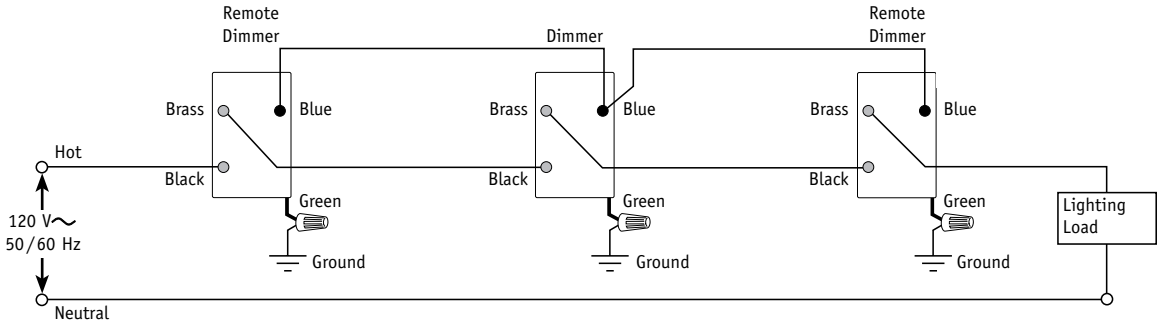


***Figure 7* – HRD-6D and HRD-10D Multi-Location Installation[1]**

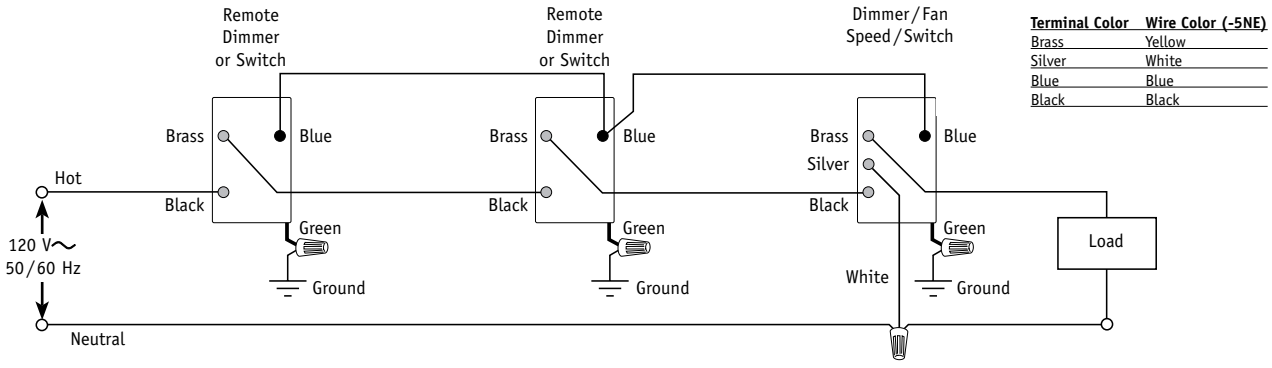


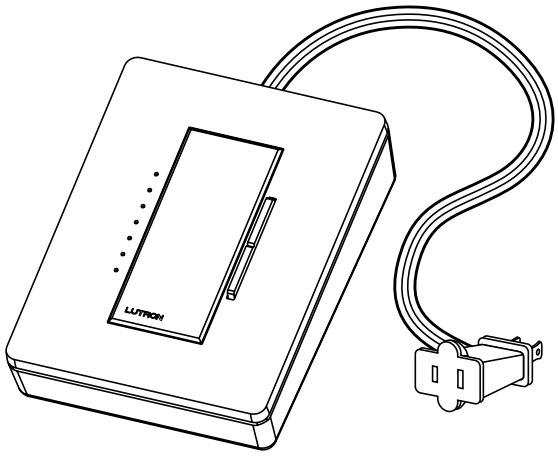
***Figure 8* – HRD-2ANF, HRD-6ND, HRD-10ND, HRD-5NE, and HRD-8ANS Multi-Location Installation with Neutral[1, 2]**

[1] Up to nine HomeWorks® *Maestro* Remote Dimmers or Switches may be connected to the *HomeWorks* RF *Maestro* Dimmer or Switch. Total length of wire used to connect blue terminals (-5NE: blue wire) may be up to 250 feet (76 m).

[2] Neutral wire Dimmers/Fan Speed Controls/Switches must be connected on the lighting load side of a multi-location installation.

RF Lamp Dimmer

Wireless Series
Local Lighting Controls
RF Dimmer Link-8.1
Tabletop



RF Lamp Dimmer (HRT-3LD)

RF LAMP DIMMER (MODEL # HRT-3LD-XX)

HomeWorks® RF lamp dimmers allow table and floor lamps to be included in the *HomeWorks* lighting control system. Each RF lamp dimmer controls one table or floor lamp with simple and intuitive buttons for on/off and raise/lower. Simple to install, RF lamp dimmers are plugged into any standard wall outlet. Built-in intelligence allows each RF lamp dimmer to be controlled from the *HomeWorks* keypad in the home, as well as from touchscreens, universal remotes, and home automation controls.

RF lamp dimmers incorporate advanced features such as fade-on/fade-off, long fade-to-off, and rapid full-on. In addition, the local control may be programmed similar to a keypad button press with single and double tap functions, turning multiple lights on or off. RF lamp dimmers may be used in any system design with RF capability.

FINISHES AND COLORS

RF lamp dimmers are available in Snow (SW) and Midnight (MN).

DIMMING CONTROL LOAD RATINGS

HRT-3LD dims a single incandescent or magnetic low-voltage circuit up to 300 W/VA.

COMMUNICATION TO PROCESSOR

The RF lamp dimmers must be located within 30 feet (9 m) of an RF processor or a hybrid repeater. Each *HomeWorks* processor can control up to 64 RF local controls.

RF Lamp Dimmer (cont.)

Model Number	HRT-3LD: Lamp dimming control.
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM, FCC, IC
Load Types	Incandescent, magnetic low-voltage[1,2], tungsten halogen.
Maximum Load	300 W/VA
Minimum Load	10 W/VA
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Addressing	Via the HomeWorks® software, using unique device serial numbers. Units must be installed prior to addressing. Counts as 1 of the 64 dimmer addresses on the RF link.
Diagnostics	LEDs provide diagnostics for troubleshooting.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Fail-Safe Operation	In the unlikely event that communication with the processor is interrupted, all Maestro® local controls will still operate, offering local control.
Dimensions	2 15/16 in (75 mm) x 4 11/16 in (119 mm) x 15/16 in (24 mm) See Fig. 1 below.
Shipping Weight	0.75 lbs. (0.34 kg)

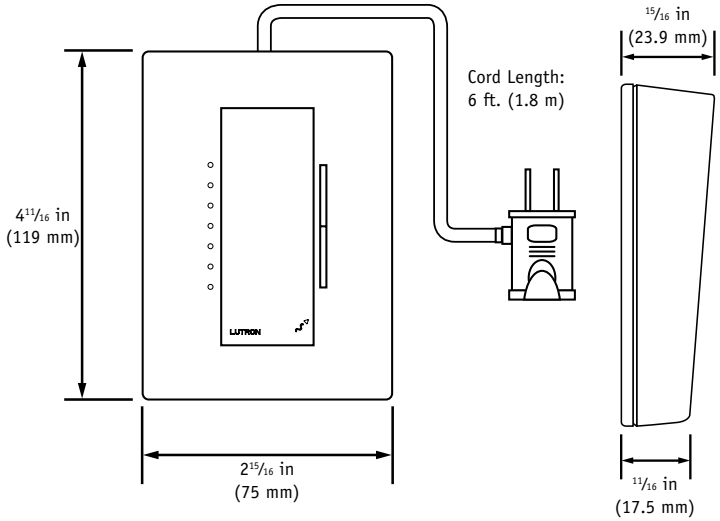


***Figure 1* – Dimensions**

Plug lamp cord into back of RF Lamp dimmer plug. Plug RF lamp dimmer plug into any standard wall outlet.

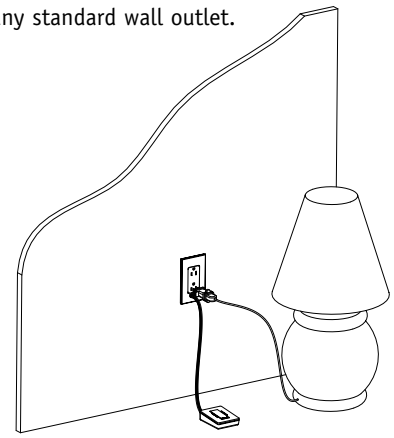


***Figure 2* – Installation**

(1) Because low-voltage transformers vary widely in efficiency, the input VA of each transformer should be measured directly. If this is not possible, use the maximum lamp wattage figures, which have a built-in safety margin.

(2) For low-voltage applications using the HRT-3LD use with core and coil (magnetic) low-voltage transformers only. Do not use any solid-state electronic low-voltage transformers. Operation of a low-voltage circuit with all lamps inoperative or removed may result in current flow in excess of normal levels. To avoid transformer overheating and premature transformer failure, Lutron strongly recommends the following:
a) Do not operate low-voltage circuits without operative lamps in place.
b) Replace burned-out lamps as soon as possible.
c) Use transformers that incorporate thermal protection or fuse transformer primary windings to prevent transformer failure due to overcurrent.

Receptacles and Plug for Dimming Use

4 / 8 / Wireless Series
Accessories
N/A
Architectural & Designer-Style

The receptacles and plug for dimming use allow lamps to be dimmed by HomeWorks® system dimming controls.

DIMMING RECEPTACLES

Dimming receptacles work just like standard receptacles, but are designed to reject standard plugs. Lutron® dimming receptacles will only accept a *Lutron* dimmable lamp plug. By accepting only the special dimmable plugs, these receptacles are certified to be controlled by a dimmer or dimming module. Duplex dimming receptacles denoted by DFDU, have two dimming receptacles. Half dimming receptacles, denoted by HFDU, have one dimming receptacle and one standard receptacle.

DIMMABLE LAMP PLUG (RP-FDU-10-)

Dimmable lamp plugs easily replace the existing plugs on lamps. The plug separates for access to the screw terminals, where the lamp cord is attached after cutting off the original plug.

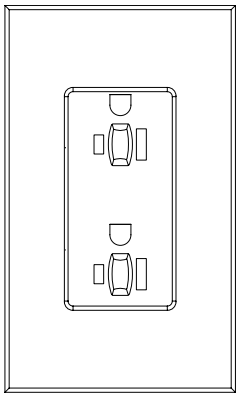
FINISHES AND COLORS

Dimming receptacles are available in Architectural matte finish plastic colors, Architectural metal finishes, and Satin Colors® finishes. Custom paint matching is also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

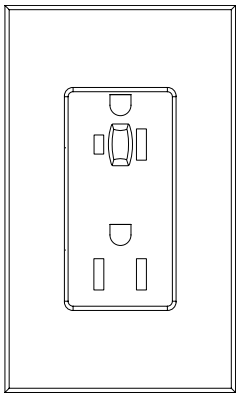
Dimmable lamp plugs are available in White (WH) or Brown (BR).

LOAD RATINGS

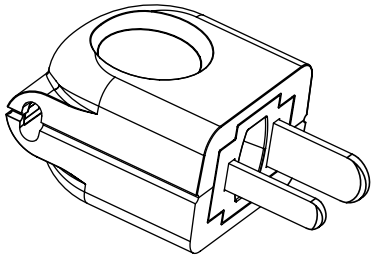
The NTR-15-DFDU is a 15 A receptacle. The NTR-20-DFDU is a 20 A receptacle. The NTR-15-HFDU is a 15 A receptacle. The NTR-20-HFDU is a 20 A receptacle. The maximum load that may be connected to a dimming receptacle is also limited by the dimming control's rating. The RP-FDU-10 is a 10 A plug.



Duplex Dimming Receptacle (NTR-15-DFDU-)



Half Dimming Receptacle (NTR-15-HFDU-)



Dimmable Lamp Plug (RP-FDU-10-)

FRONT ROOM

Receptacles and Plug for Dimming Use (cont.)

Dimming Receptacles

Model Number	NTR-15-DFDU-: 15 A Architectural-style duplex dimming receptacle NTR-20-DFDU-: 20 A Architectural-style duplex dimming receptacle NTR-15-HFDU-: 15 A Architectural-style half dimming receptacle NTR-20-HFDU-: 20 A Architectural-style half dimming receptacle SCR-15-DFDU-: 15 A Designer-style duplex dimming receptacle SCR-20-DFDU-: 20 A Designer-style duplex dimming receptacle SCR-15-DFDU-: 15 A Designer-style half dimming receptacle SCR-20-DFDU-: 20 A Designer-style half dimming receptacle
Input Voltage	125 V~ 60 Hz
Regulatory Approvals	UL, CSA, NOM
Load Types	Specified by dimming control
Maximum Load	NTR-15-DFDU-: 15 A, not to exceed load rating of controlling device(s) NTR-20-DFDU-: 20 A, not to exceed load rating of controlling device(s) NTR-15-HFDU-: 15 A, not to exceed load rating of controlling device(s) NTR-20-HFDU-: 20 A, not to exceed load rating of controlling device(s) SCR-15-DFDU-: 15 A, not to exceed load rating of controlling device(s) SCR-20-DFDU-: 20 A, not to exceed load rating of controlling device(s) SCR-15-DFDU-: 15 A, not to exceed load rating of controlling device(s) SCR-20-DFDU-: 20 A, not to exceed load rating of controlling device(s)
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Dimensions	$2\frac{23}{32}$" (69 mm) x $4\frac{9}{16}$" (116 mm) *see figure 1, page 86*
Shipping Weight	0.2 lbs. (0.1 kg)

Dimmable Lamp Plug

Model Number	RP-FDU-10-: Lamp Plug for dimming use
Input Voltage	125 V~ 60 Hz
Regulatory Approvals	UL, CSA, NOM
Load Types	Specified by dimming control
Maximum Load	10 A
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Dimensions	*See figure 2, page 86*
Shipping Weight	0.1 lb. (0.05 kg)

Receptacles and Plug for Dimming Use (cont.)

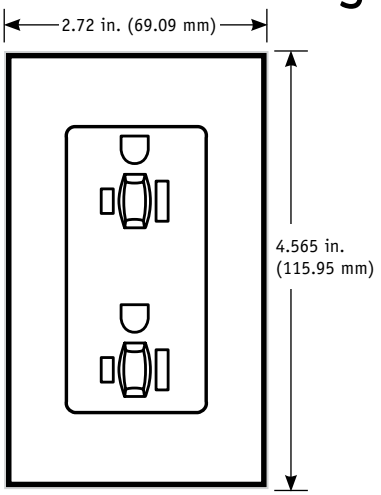


***Figure 1* – Receptacle Dimensions**

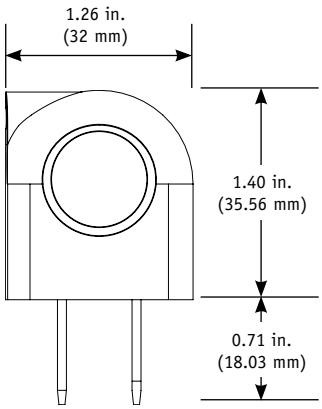


***Figure 2* – Plug Dimensions**

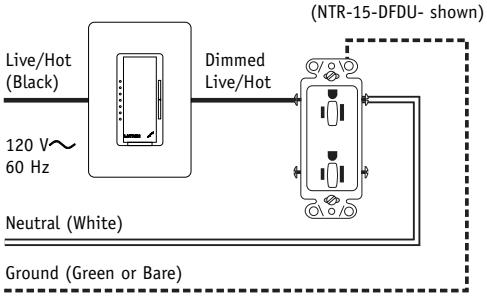


***Figure 3* – Duplex Receptacle Wiring (Outlets controlled together)**

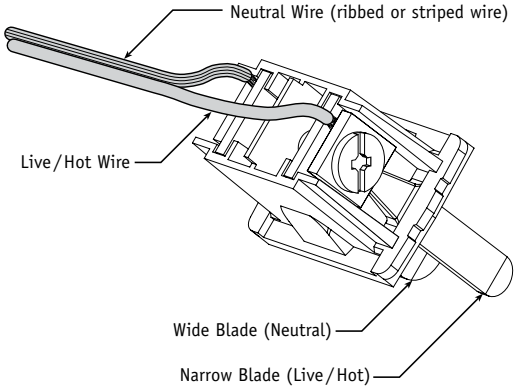
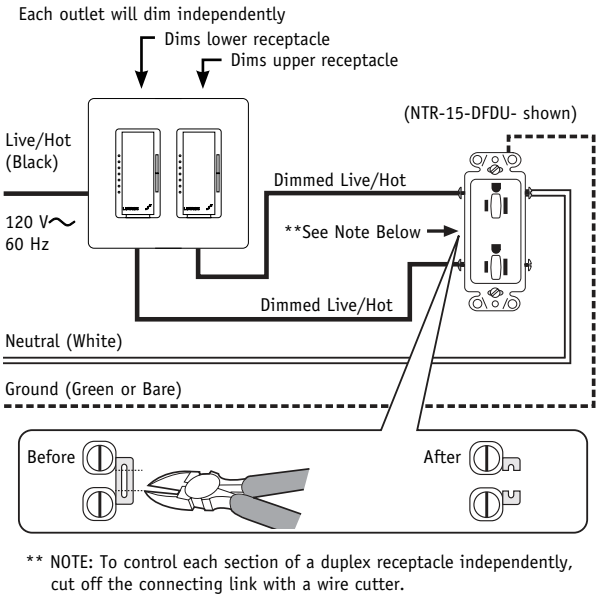


***Figure 4* – Plug Wiring**



** NOTE: To control each section of a duplex receptacle independently, cut off the connecting link with a wire cutter.

***Figure 5* – Receptacle Wiring (Duplex Outlets controlled independently or Half-Dimming)**

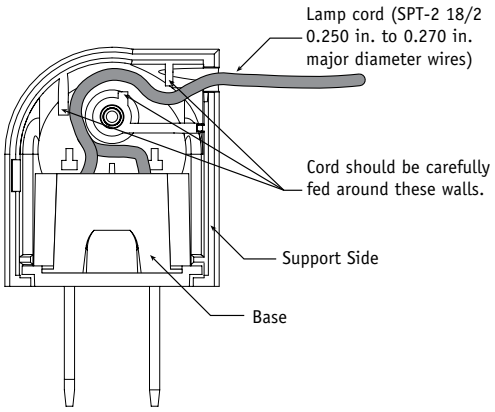


***Figure 6* – Plug Assembly**

Architectural-style Coordinating Accessories

Switches

Model: NT-1PS-XX
Description: 20 A 120/277 V~, single-pole

Model: NT-3PS-XX
Description: 20 A 120/277 V~, 3-way

Model: NT-4PS-XX
Description: 20 A 120/277 V~, 4-way

Receptacles

Model: NTR-15-XX
Description: 15 A 125 V~

Model: NTR-20-XX
Description: 20 A 125 V~

GFCI Receptacles

Model: NTR-15-GFCI-XX
Description: 15 A 125 V~

Model: NTR-20-GFCI-XX
Description: 20 A 125 V~

Isolated Ground Receptacles[1]

Model: NTR-15-IG-OR-XX
Description: 15 A 125 V~

Model: NTR-20-IG-OR-XX
Description: 20 A 125 V~

Cable TV Jack

Model: NT-CJ-XX
Description: F-style, 75-0hm

Telephone Jacks

Model: NT-PJ-XX
Description: Single – 6-conductor RJ11

Model: NT-PJ8X2-XX[2]
Description: Double – 8-conductor RJ45, category 5

Model: NT-PJ8X3-XX[2]
Description: Triple – 8-conductor RJ45, category 5

Telephone/Cable TV Jack[2]

Model: NT-PJ8CJ-XX
Description: 8-conductor RJ45, category 5 and F-style, 75-0hm

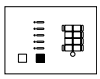
Multi-Port Frame

Model: NT-6PF-XX
Description: Six-port frame
Compatible with Hubbell Xcelerator™ telephone and data jacks and Hubbell Snap-fit modules including BNC, RCA, S-video, F-type, and fiber optic connectors.

Integrating Multiple Controls

For a seamless look, keypads and Vareo® local lighting controls can be combined behind a common, custom-made wallplate. All Architectural color and finish choices are available for custom wallplates. Custom backbox configurations may be required.

Integrating Other Controls



Other manufacturers' controls can be ganged with HomeWorks® keypads using a custom wallplate. Examples include AMX, Audioaccess®, Elan, Linn, and B&W™. All Architectural color and finish choices are available. Custom backbox configurations may be required. Consult your Lutron Customer Service Representative.

Hubbell Xcelerator is a trademark of Hubbell Premise Wiring.

Audioaccess is a registered trademark of Madrigal Audio Laboratories, Inc.

B&W is a trademark of B&W Loudspeakers Ltd.

FRONT ROOM

[1] The isolated ground receptacle is orange; wallplate is the specified color. Receptacle can be special ordered to match wallplate color. Contact your Lutron Representative or Customer Service.

[2] Wallplate and insert match specified color. Device (e.g., jack) and device trim are White for Ivory, White, and Beige products; Black for Gray, Brown, Black, custom, and special metal products.

XX= Color Code

Architectural-style Coordinating Accessories (cont.)

HAND-HELD INFRARED TRANSMITTERS

Hand-held Infrared Transmitters select and adjust scenes up to 50 feet (15 m). Use scene selection buttons to select two, four or eight scenes and off (depending on model), and raise/lower buttons to brighten or dim the selected scene. See Appendix C: Infrared (IR) Integration.

1-Button

Model: SP-HT-WH
Description: 1-button with raise/lower (White)

2-Button

Model: SPS-FSIT-RP
Description: 2-buttons with raise/lower (Royal Plum)

4-Button

Model: GRX-IT-WH
Description: 4-buttons with off and raise/lower (White)

4-Button

Model: SPS-4IT-RP
Description: 4-buttons with off and raise/lower (Royal Plum)

8-Button

Model: GRX-8IT-WH
Description: 8-buttons with off and raise/lower (White)

MULTI-GANG WALLPLATES

1-Gang

Model: NT-L-NFB-XX
Description: 1 Vareo® opening

1-Gang

Model: NT-R-NFB-XX
Description: 1 receptacle opening

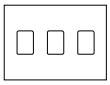
2-Gang

Model: VWP-2-XX
Description: 2 Vareo® openings

Model: VWP-2CR-XX
Description: 1 *Vareo* opening, 1 receptacle opening

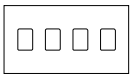
Model: VWP-2RC-XX
Description: 1 receptacle opening, 1 *Vareo* opening

Model: VWP-2R-XX
Description: 2 receptacle openings



3-Gang

Model: VWP-3-XX
Description: 3 *Vareo* openings



4-Gang

Model: VWP-4-XX
Description: 4 openings

FINISHES AND COLORS

All Architectural-style coordinating accessories and wallplates are available in Architectural Matte finish plastic colors and Architectural Metal finishes. Custom paint matching is also available. Please contact Lutron Customer Service or your local Lutron Representative for details and pricing. See Appendix F: Colors & Finishes.

XX= Color Code

Designer-style Coordinating Accessories

Notes: *Use the SC prefix when ordering* Satin Colors® *Accessories. Use the CA prefix when ordering* Claro® *Gloss Accessories.*

Switches

Model: SC-1PS-XX
CA-1PSH-XX
Description: 15 A 120/277 V~, single-pole

Model: SC-3PS-XX
CA-3PSH-XX
Description: 15 A 120/277 V~, 3-way

Model: SC-4PS-XX
CA-4PSH-XX
Description: 15 A 120/277 V~, 4-way

Receptacle

Model: SCR-15-XX
CAR-15H-XX
Description: 15 A 125 V~

Model: SCR-20-XX
Description: 20 A 125 V~

GFCI Receptacle

Model: SCR-15-GFCI-XX
CAR-15-GFCIH-XX
Description: 15 A 125 V~

Model: SCR-20-GFCI-XX
Description: 20 A 125 V~

Cable TV Jack

Model: SC-CJ-XX
CA-CJH-XX
Description: F-style, 75-Ohm coaxial cable

Telephone Jack

Model: SC-PJ-XX
CA-PJH-XX
Description: 6-conductor, RJ11

Multi-Port Frame

Model: SC-6PF-XX
CA-6PF-XX
Description: Six-port frame
Compatible with Hubbell Xcelerator™ telephone and data jacks and Hubbell Snap-fit modules including BNC, RCA, S-video, F-type, and fiber optic connectors.

Hubbell Xcelerator is a trademark of Hubbell Premise Wiring.

Integrating Other Controls

Other manufacturers' decorator controls can be ganged with HomeWorks® controls using a *Claro* or *Satin Colors* wallplate. All Designer-style color and finish choices are available.

HAND-HELD INFRARED TRANSMITTERS

Hand-held infrared transmitters select and adjust scenes up to 50 feet (15 m). Use scene selection buttons to select two, four or eight scenes and off (depending on model), and raise/lower buttons to brighten or dim the selected scene. See Appendix C: Infrared (IR) Integration.

1-Button

Model: SP-HT-WH
Description: 1-button with raise/lower (White)

2-Button

Model: SPS-FSIT-RP
Description: 2-buttons with raise/lower (Royal Plum)

4-Button

Model: GRX-IT-WH
Description: 4-buttons with off and raise/lower (White)

4-Button

Model: SPS-4IT-RP
Description: 4-buttons with off and raise/lower (Royal Plum)

8-Button

Model: GRX-8IT-WH
Description: 8-buttons with off and raise/lower (White)

XX= Color Code

Designer-style Coordinating Accessories (cont.)

Note: *Use the SC prefix when ordering* Satin Colors® *Matte Finishes Wallplates.*
Use the CW prefix when ordering Claro® *Designer Gloss Color Wallplates.*

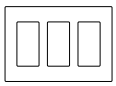
WALLPLATES

1-Gang

Model: SC-1-XX
CW-1-XX
Description: 1-gang screwless wallplate

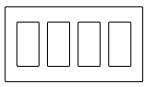
2-Gang

Model: SC-2-XX
CW-2-XX
Description: 2-gang screwless wallplate



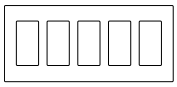
3-Gang

Model: SC-3-XX
CW-3-XX
Description: 3-gang screwless wallplate



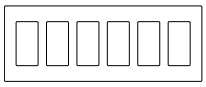
4-Gang

Model: SC-4-XX
CW-4-XX
Description: 4-gang screwless wallplate



5-Gang

Model: SC-5-XX
CW-5-XX
Description: 5-gang screwless wallplate



6-Gang

Model: SC-6-XX
CW-6-XX
Description: 6-gang screwless wallplate

FINISHES AND COLORS

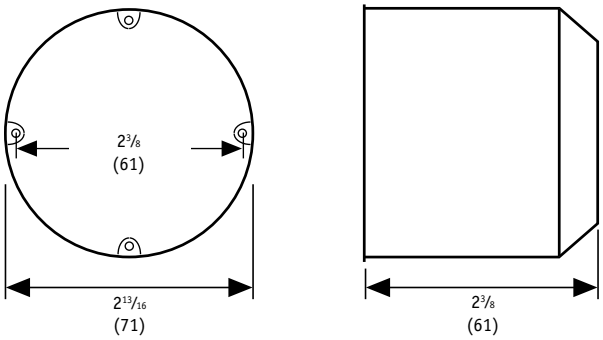
All Designer-style coordinating accessories and wallplates are available in Designer Gloss finishes and *Satin Colors* Matte finishes. See Appendix F: Colors & Finishes.

XX= Color Code

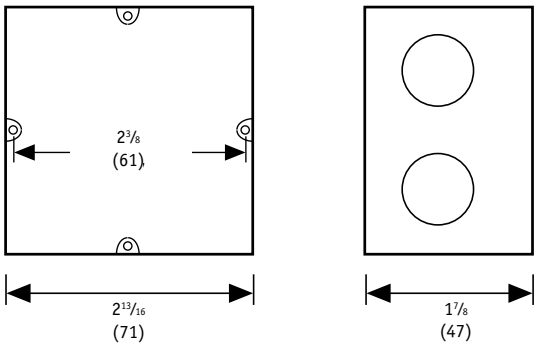
Wallbox Dimensions

Wallbox Dimensions - all dimensions are inches (mm)

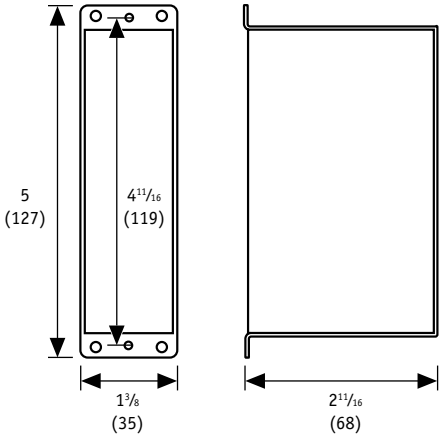
EBB-15-RD



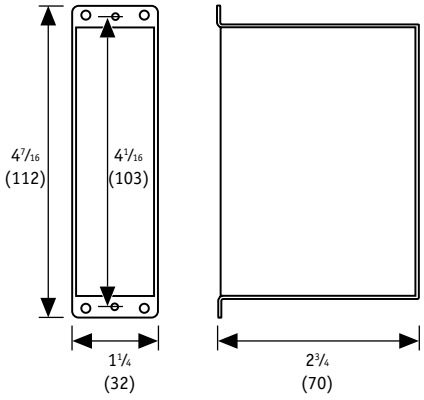
EBB-15-SQ



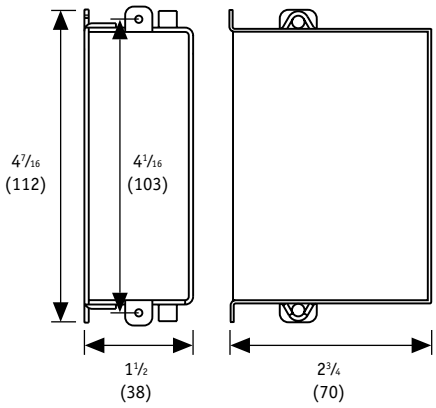
241-663



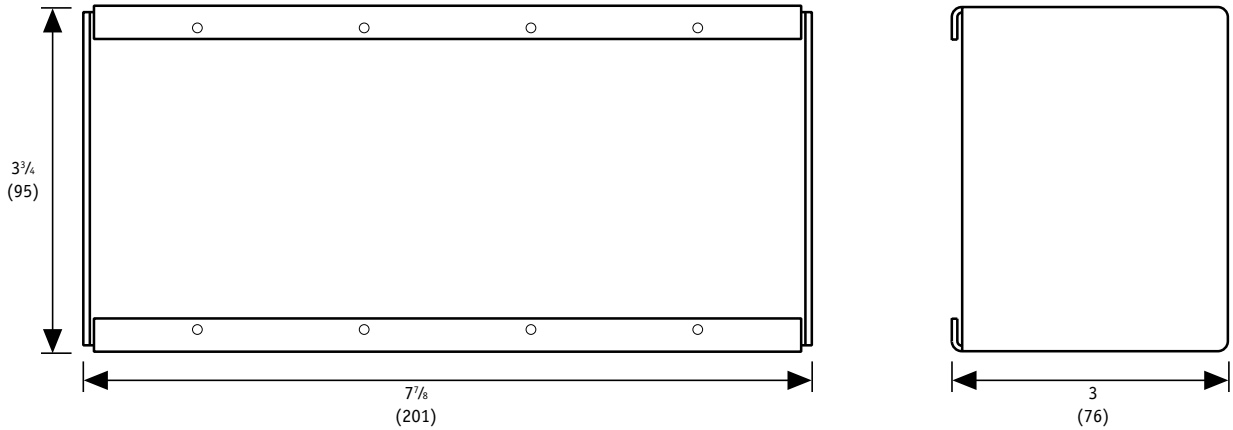
241-399



WBOX-SA1-Q1



241-400



FRONT ROOM

Notes:

Back Room Equipment

P5 Processors

4/8/Wireless Series
Processors
Inter-Processor Link
N/A

HomeWorks® processors comprise the major communication hub of a *HomeWorks* system. Each processor has communication links, which allow the processor to interact with various system components. System components communicate with a processor through low-voltage wiring or radio frequency. Some wired components must be connected to the processor through an interface. These interfaces are available as stand-alone or built-in components, in specific models of processors.

8 SERIES

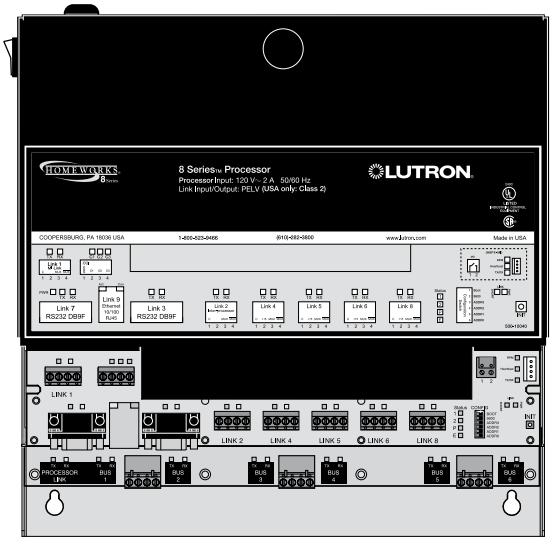
8 Series P5 processors may be used with any and all *HomeWorks* products, providing the most style and finish options. Remote power modules and Vareo® lighting controls are unique dimming options for the 8 Series. Remote power modules also include an adaptive dimming module, quiet fan-speed control, relay, and motor modules. An 8 Series P5 processor can communicate with wireless devices by connecting a hybrid repeater.

4 SERIES

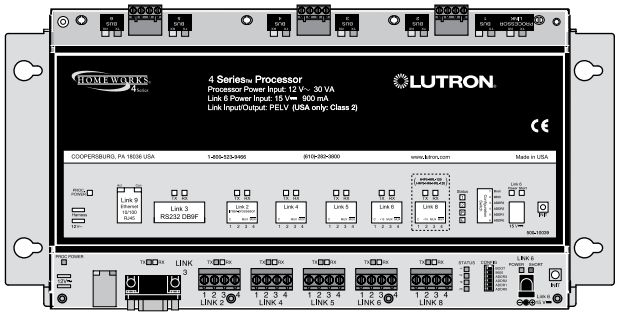
4 Series P5 processors are typically used with designer-style *HomeWorks* products. Dimming is accomplished via Maestro® local controls, wallbox power modules, or GRAFIK Eye® controls. A 4 Series P5 processor with hybrid repeater link can communicate with wireless devices by connecting a hybrid repeater.

WIRELESS SERIES

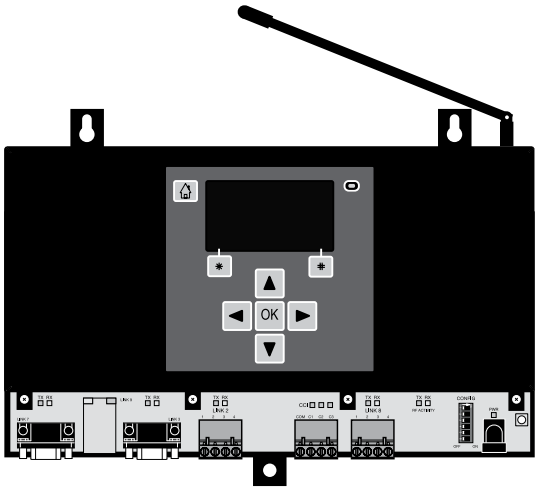
Wireless Series P5 processors are used with wireless designer-style *HomeWorks* products. Wireless series products provide the simplest retrofit installations, since no communication wires are required. Dimming is accomplished via `Maestro® local controls and RF lamp dimmers.



8 Series P5 Processor
(H8P5-MI-H48-120 shown)



4 Series P5 Processor
(H4P5-H48-HRL-120 shown)



Wireless Series P5 Processor
(HRP5-120)

BACK ROOM

P5 Processors (cont.)

	Model Number	Module Interface	Dimmer Interface	# Configurable Links	Hybrid Repeater Link	# RS-232 Ports	# Keypad LEDs Powered	# Integral CCIs	Aesthetic Style	Panel/ Enclosure
8 Series	H8P5-120	Add-on[1]	Add-on[1] (D48 or H48)	4	Yes (configurable link #8)	2	350	3	Architectural/ Designer	HWI-LV32-120
	H8P5-D48-120	Add-on[1]	D48 Included	3	Yes (configurable link #8)	2	350	3	Architectural/ Designer	HWI-LV32-120
	H8P5-H48-120	Add-on[1]	H48 Included	3	Yes (configurable link #8)	2	350	3	Architectural/ Designer	HWI-LV32-120
	H8P5-MI-120	Included	Add-on[1] (D48 or H48)	4	Yes (configurable link #8)	2	350	3	Architectural/ Designer	HWI-PNL-8
	H8P5-MI-D48-120	Included	D48 Included	3	Yes (configurable link #8)	2	350	3	Architectural/ Designer	HWI-PNL-8
	H8P5-MI-H48-120	Included	H48 Included	3	Yes (configurable link #8)	2	350	3	Architectural/ Designer	HWI-PNL-8
4 Series	H4P5-120	Not Available	Add-on[1] (H48 only)	3	No	1	150	0	Designer[3]	HWI-LV24-120
	H4P5-HRL-120	Not Available	Add-on[1] (H48 only)	3	Yes	1	150	0	Designer[3]	HWI-LV24-120
	H4P5-H48-120	Not Available	H48 Included	2	No	1	150	0	Designer[3]	HWI-LV24-120
	H4P5-H48-HRL-120	Not Available	H48 Included	2	Yes	1	150	0	Designer[3]	HWI-LV24-120
Wireless Series	HRP5-120	Not Available	Unnecessary	0	Yes	2	N/A[2]	3	Designer[3]	Unnecessary

1 = Add-on components must be purchased separately and installed in an enclosure (not within the processor).

2 = Wireless series keypads are powered individually by their local 120 V~ connection.

3 = Architectural-style keypads will work with a 4 Series processor; however, since Maestro® local controls are designer-style, all dimming in an architectual-style system should be done via GRAFIK Eye® control units and wallbox power modules for an architectural-style system.

Table 1 **- Processor Comparison**

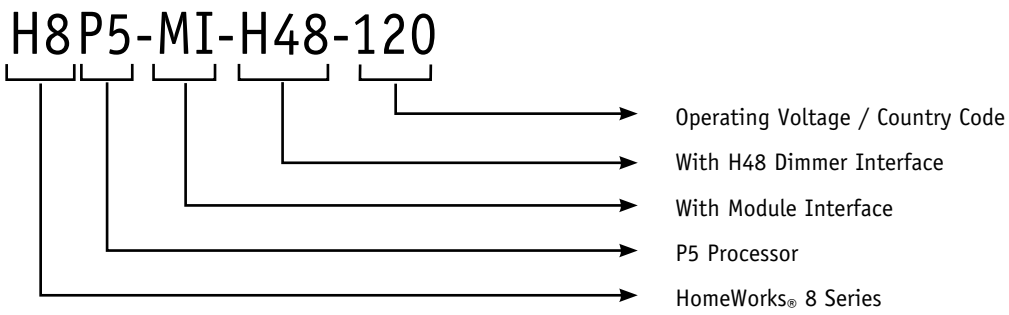


Figure 1 **- Example Model Number**

BACK ROOM

P5 Processors (cont.)

PROCESSOR LINKS

Each processor has several communication links, which allow the processor to interact with other equipment. Some links are designated for specific equipment connections. Other links are configurable through the HomeWorks® software, allowing the system to be tailored to meet the needs of the installation.

Communication Link 1 (8 Series only): This link is designated for communication with module interfaces or specification grade panel interfaces only. It must be wired in a daisy-chain configuration and requires a link terminator at the last interface only – when the total cable length exceeds 50 feet (15 m) – since processor link 1 has an integral link terminator. No termination is required at the processor.

Communication Link 2: This link is designated for communication between processors. It must be wired in a daisy-chain configuration and requires terminators at both ends of the link when the total cable length exceeds 50 feet (15 m).

Communication Links 3 and 7: These links are multi-purpose RS-232 ports. One port is initially used for uploading the programming information to the processor. When they are not being used for programming, the RS-232 ports can be used for two-way serial communications with A/V equipment, security systems, HVAC, and home automation controls. Maximum cable length is 50 feet (15 m). Link 7 is not available on a 4 Series processor.

Communication Links 4, 5, and 6: Each of these links can be configured to communicate with one of the following: keypads (including interfaces such as CCI, CCO, TEL9), wired Vareo® local lighting controls (via a D48 dimmer interface on 8 Series only), wired Maestro® local controls (via an H48 dimmer interface) and/or Sivoia QED® controllable window treatments (via an HWI-Q96), or GRAFIK Eye® preset local lighting controls and wallbox power modules. *See Table 2 on pg. 93.*

Communication Link 8: This link is different on each processor. On an 8 Series P5 processor, this link may be configured for any of the functions listed for links 4, 5, and 6 or as a hybrid repeater link. On a 4 Series P5 processor, this is an optional link dedicated to hybrid repeaters. On a wireless series P5 processor, it is both a dedicated hybrid repeater link, and a virtual RF link for the wireless series P5 processor, providing connection to wireless series lighting/fan-speed/shade controls (8.1), keypads (8.2) and repeaters (8.3). Note that wired and RF hybrid repeaters share link 8.3.

Communication Link 9:
This link is a dedicated ethernet port. The ethernet port can be used for uploading programming information or for integration with third-party equipment. Maximum cable length is 328 feet (100 m).

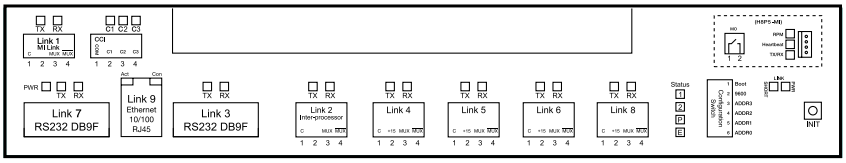


***Figure 2* - 8 Series P5 Processor Link Identification**

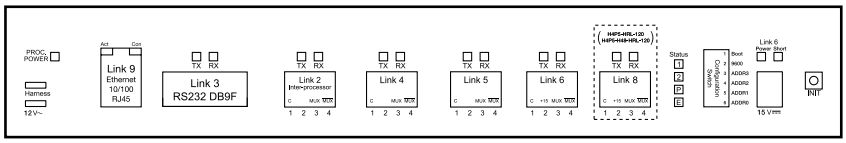


***Figure 3* - 4 Series P5 Processor Link Identification**

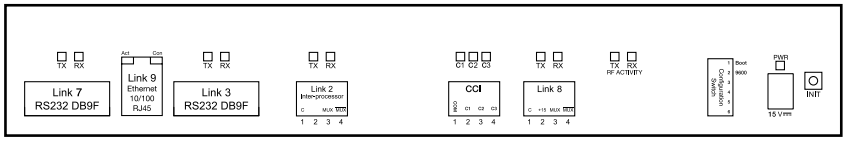


***Figure 4* - Wireless Series P5 Processor Link Identification**

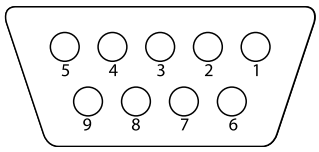
P5 Processors (cont.)

Link Number	Configurable	Function	Capacity	Wiring	Terminators
1	No	Module Interface (MI) Link	16 MIs (each controlling up to 8 RPMs)	Daisy-chain, 1000 ft (305 m) total, type A	Last MI[1]
2	No	Inter-processor Link	16 processors	Daisy-chain, 1000 ft (305 m) total, type A	First & last processors[1]
3, 7	No	RS-232 Port	N/A	Daisy-chain, 1000 ft (305 m) total, type B	No
4, 5, 6	Yes	Keypad Link	32 keypads, contact closure interfaces, and telephone interfaces	Any configuration, 1000 ft (305 m) per wire run, 4000 ft (1220 m) total, type A, max. 10 keypads per home run	No
		D48 Dimmer Interface Link	4 D48s (each controlling up to 48 wired Vareo® controls)	Daisy-chain, 1000 ft (305 m) total, type A	Processor & last D48, if required[1]
		H48 Dimmer Interface/Q96 Integrator Link	4 H48s (each controlling up to 48 wired Maestro® controls) and Q96s (each controlling up to 96 Sivoia QED®)	Daisy-chain, 1000 ft (305 m) total, type A	Processor & last H48/Q96, if required[1]
		GRAFIK Eye® Link	8 *GRAFIK Eye* control units and wallbox power modules	Daisy-chain, 1000 ft (305 m) total, type A	No
8 (8 Series™)	Yes	Any of the functions for links 4, 5, and 6	See above	See above	See above
		Hybrid Repeater Link	5 hybrid repeaters	Daisy-chain, 1000 ft (305 m) per wire run, 4000 ft (1220 m) total, type A	Processor & last hybrid repeater, if required[1]
8 (4 Series™ or Wireless Series™)	No	Hybrid Repeater Link	5[2] hybrid repeaters	Daisy-chain, 1000 ft (305 m) per wire run, 4000 ft (1220 m) total, type A	Processor & last hybrid repeater, if required[1]
9	No	Ethernet Link	N/A	Point-to-point[3], 328 ft (100 m)	No

1 = Termination only required if cable length exceeds 50 feet (15 m).
2 = The wireless series processor counts as the first hybrid repeater on the link.
3 = Crossover cable required for direct connection with PC or laptop.

***Table 2* - Link Specifications**

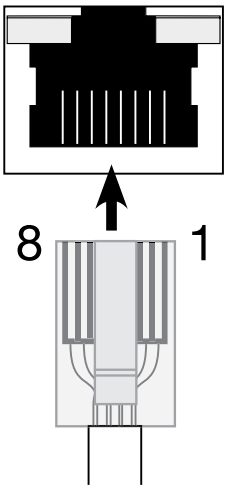
P5 Processors (cont.)



Pin Number	Pin Name	Description for Processor	Required for Hardware Handshaking	Required for Simple Communications[1]
1	DCD	Data Carrier Detect (input)		
2	TXD	Transmit Data (output)[1]	X	X
3	RXD	Receive Data (input)[1]	X	X
4	DSR	Data Set Ready (input)	X	
5	GND	Ground	X	X
6	DTR	Data Terminal Ready (output)	X	
7	CTS	Clear To Send (input)	X	
8	RTS	Request To Send (output)	X	
9	RI	Ring Indicate (input)		

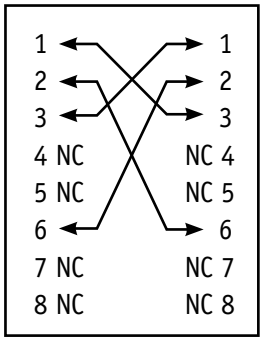
1 = Hardware handshaking disabled for simple communications

Table 3 **- RS-232 Port Specifications**



PIN	Processor	Ethernet Hub/Switch
1	Transmit +Ve	Receive +Ve
2	Transmit -Ve	Receive -Ve
3	Receive +Ve	Transmit +Ve
4	No Connection	No Connection
5	No Connection	No Connection
6	Receive -Ve	Transmit -Ve
7	No Connection	No Connection
8	No Connection	No Connection

Table 4 **- Ethernet Port Configuration**



A crossover cable is used when connecting the processor directly to a laptop or other non-hub device.

Figure 5 **- Crossover Cable Configuration**

BACK ROOM

8 Series P5 Processors

Model Numbers	H8P5-120: Wired Processor only. H8P5-D48-120: Wired Processor with one integral Dimmer Interface (D48). H8P5-H48-120: Wired Processor with one integral Dimmer Interface (H48). H8P5-MI-120: Wired Processor with one integral Module Interface. H8P5-MI-D48-120: Wired Processor with one integral Module Interface and one integral Dimmer Interface (D48). H8P5-MI-H48-120: Wired Processor with one integral Module Interface and one integral Dimmer Interface (H48).
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Heat Generated Fully Loaded	18 BTUs per hr.
Line-Voltage Connections	Mates with Lutron-provided 2-pin pigtail on DIN-rail terminal block. Power switch provided on top left of processor. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m)
Low-Voltage Wire Type	Two pair — one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded — NEC® Class 2 (IEC PELV) cable.
Low-Voltage Wiring Configuration	All processors in a multi-processor system must have the inter-processor communication links connected in a daisy-chain configuration.
Low-Voltage Connections	4-pin removable terminal block. Each of the four terminals will accept up to two #18 AWG (1.0 mm^2) wires. Up to two standard female DB-9 serial RS-232 connections and one RJ-45 standard ethernet connection.
Addressing	Via DIP Switch. Counts as 1 of 16 processor addresses. *See Fig. 7, pg. 96.*
Diagnostics	Power LED, Communication link power short circuit LED, Links 1-8 Tx and Rx LEDs.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Miswire Protection	All terminal block inputs are over-voltage and miswire protected against wire reversals and shorts.
Power-Failure Memory	Lithium battery provides a minimum of ten years of data retention.
Internal Timeclock	Accuracy ± 1 minute per year (specified as during data retention time).
Mounting	HWI-PNL-8: Processor mounts at bottom of panel. *See Fig. 10, pg. 98.* HWI-LV32-120: Processor mounts at top of enclosure. *See Fig. 9, pg. 98.*
Mounting Hole Locations	*See Fig. 6, pg. 96.*
Shipping Weight (all model numbers)	9 lbs. (4.1 kg)

8 Series P5 Processors (cont.)

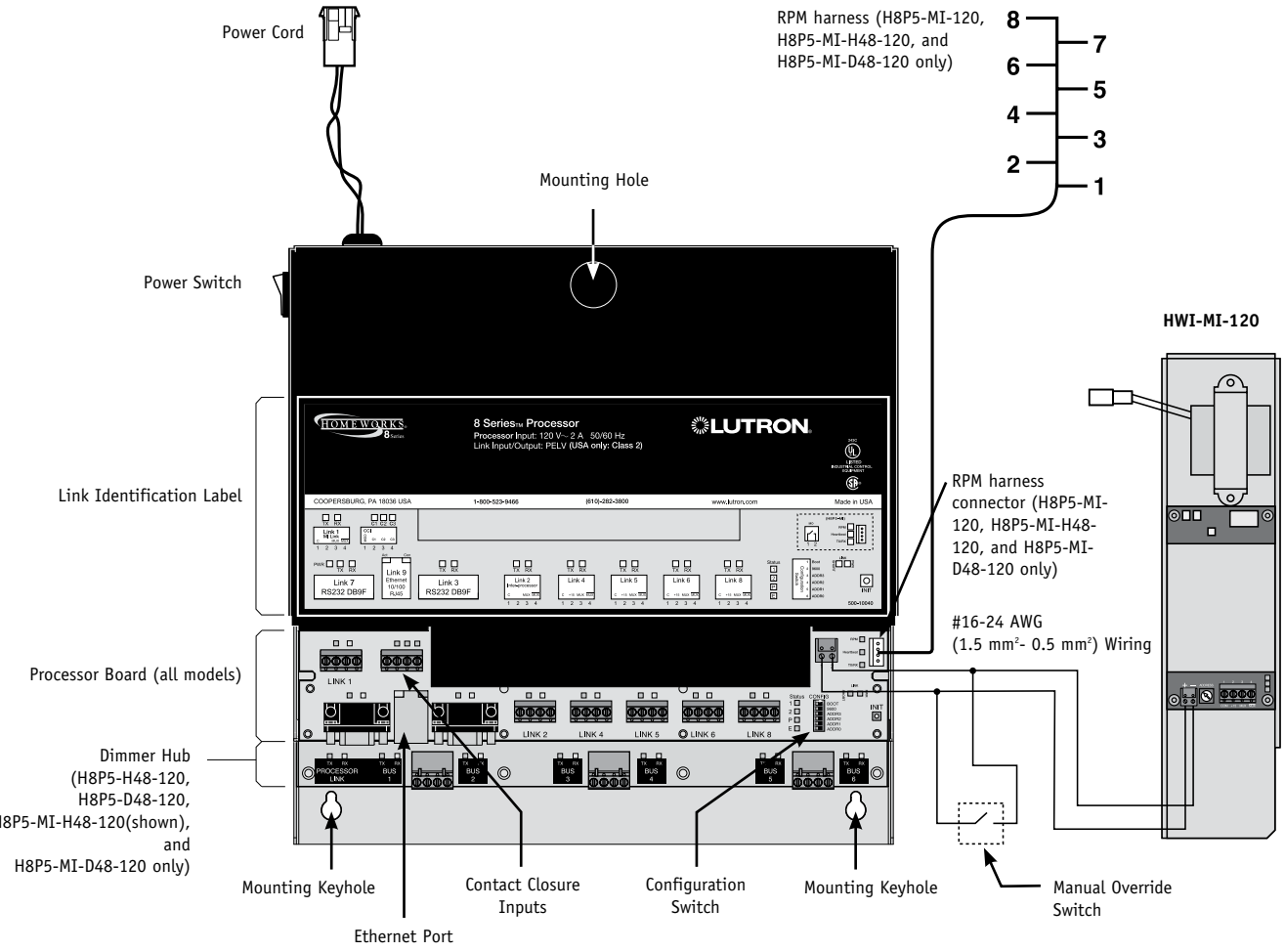
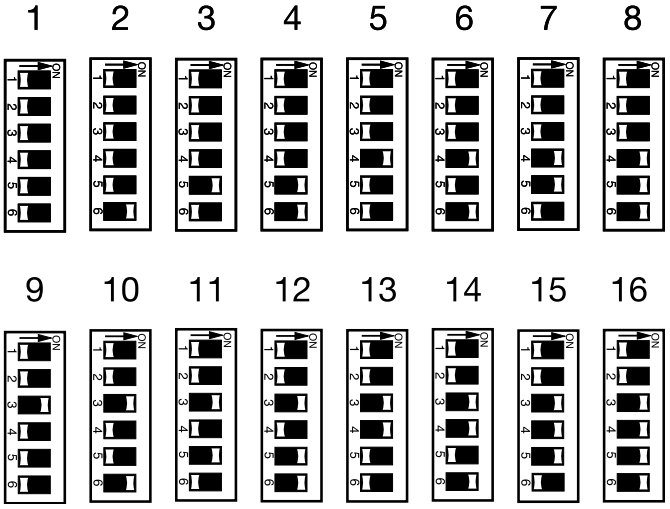
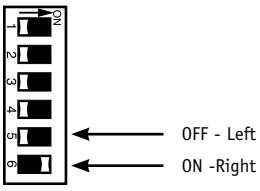


Figure 6 **- 8 Series P5 Processor (H8P5-MI-H48-120 shown)**



Example: Setting Switch #6 ON.



Configuration DIP Switches

DIP Switch	OFF	ON
1	Normal Mode	Boot Mode
2	User-Configured Baud Rate	9600 Baud
3-6	Address	

Figure 7 **- Address DIP Switch Settings (configure switch S1)**

BACK ROOM

8 Series P5 Processors (cont.)

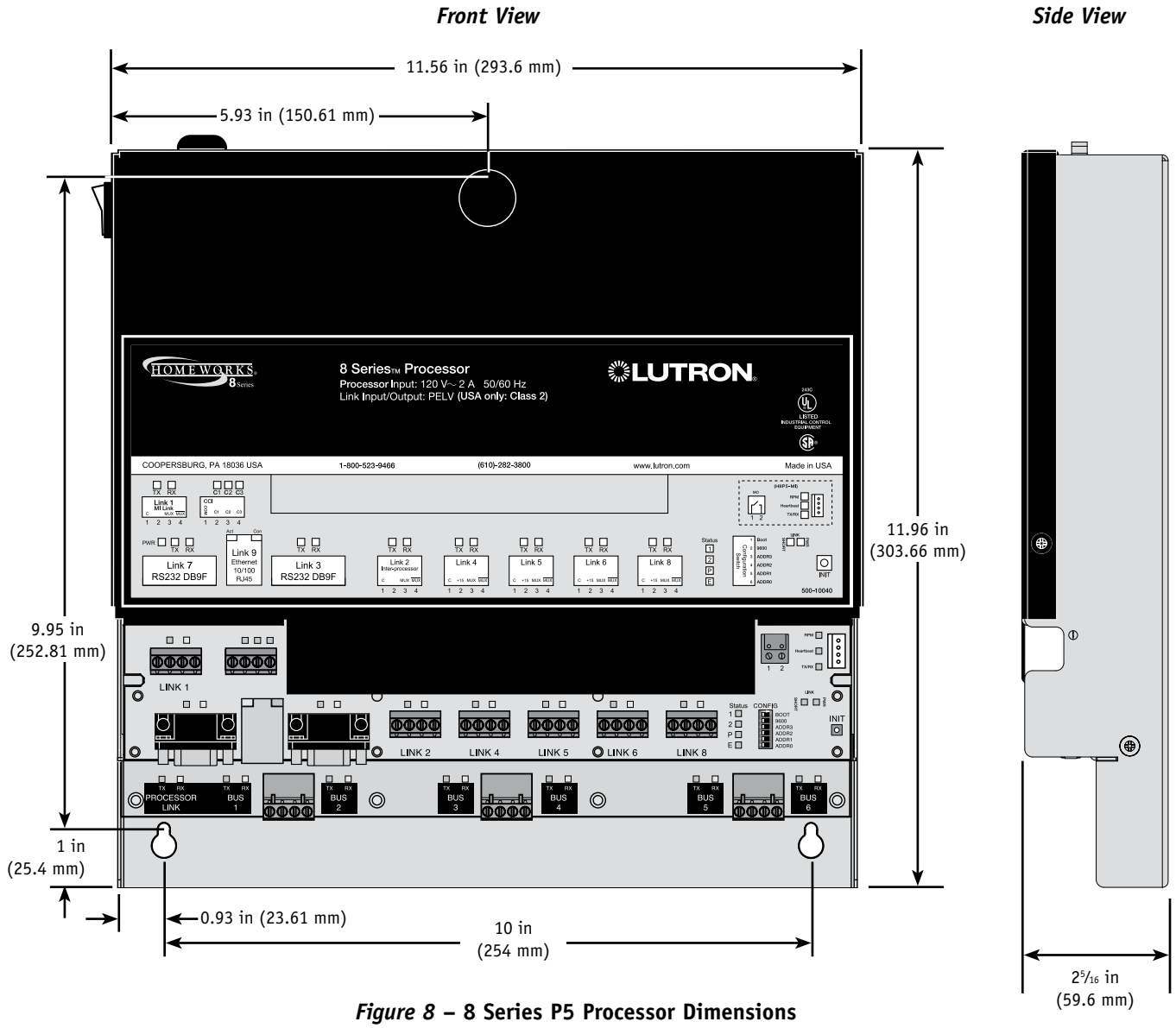


***Figure 8* – 8 Series P5 Processor Dimensions**

8 Series P5 Processors (cont.)

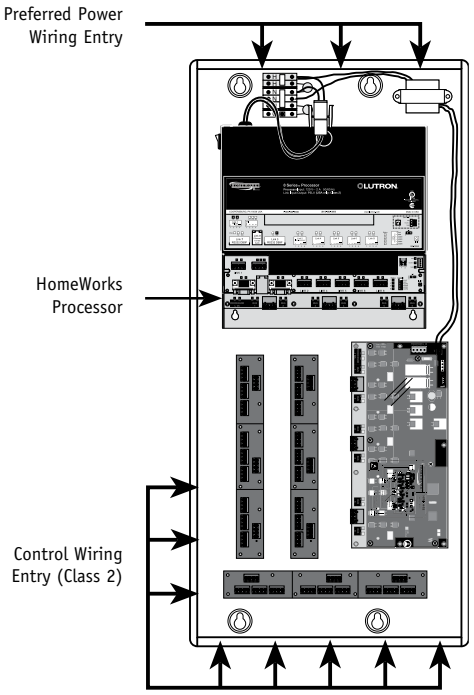


***Figure 9* – Mounting Location in an HWI-LV32-120**

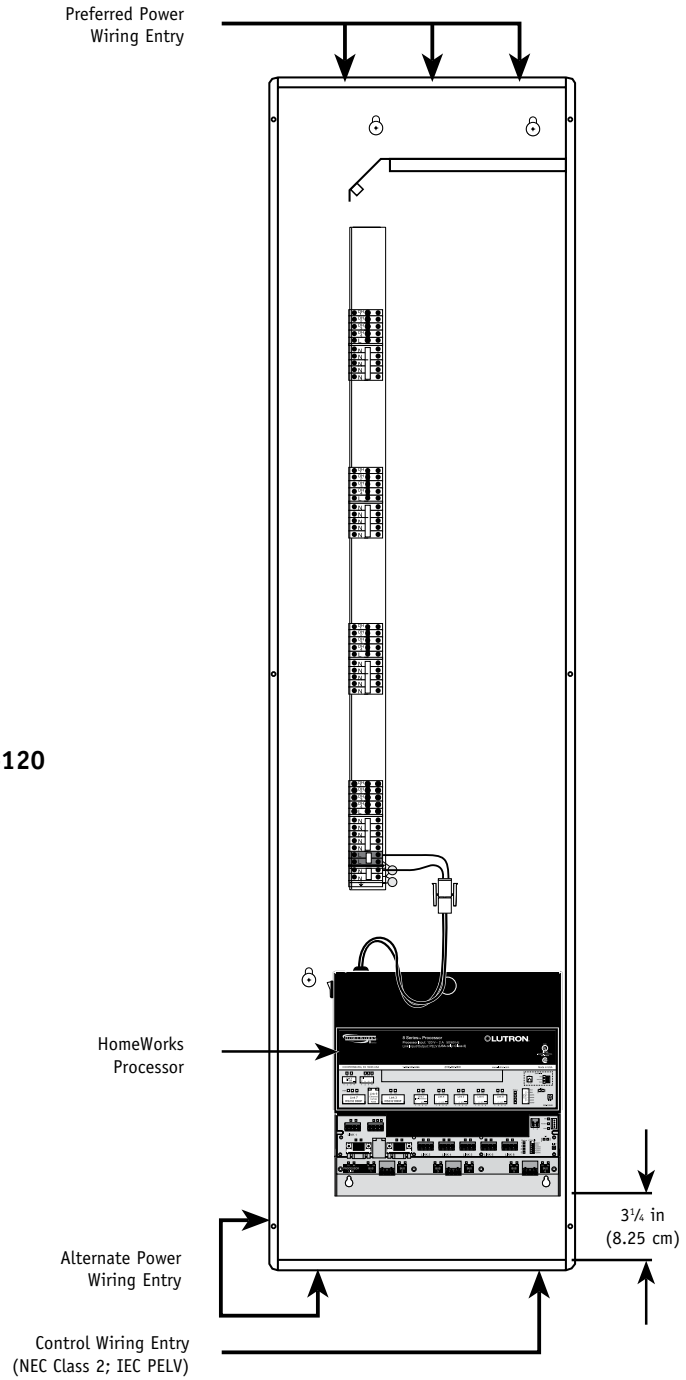


***Figure 10* – Mounting Location in an HWI-PNL-8**

4 Series P5 Processors

Model Numbers	H4P5-120: Wired Processor only. H4P5-HRL-120: Wired Processor with Hybrid Repeater Link. H4P5-H48-120: Wired Processor with one integral Dimmer Interface (H48). H4P5-H48-HRL-120: Wired Processor with one integral Dimmer Interface (H48) and a Hybrid Repeater Link.
Input Voltage	Processor power: 24 V~ 50/60 Hz provided by HWI-LV24-120 enclosure Link 6 & 8 power: 15 V⎓ 300 mA provided by plug-in adapter (included)
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Heat Generated (Power Supplies)	36 BTUs per hr.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm^2), one pair #18 AWG to #22 AWG(1.0 to 0.5 mm^2) twisted shielded – Class 2 cable.
Low-Voltage Wiring Configuration	All processors in a multi-processor system must have the inter-processor communication links connected in a daisy-chain configuration.
Low-Voltage Connections	4-pin removable terminal block. Each of the four terminals will accept up to two #18 AWG (1.0 mm^2) wires. One standard female DB-9 serial RS-232 connections and one RJ-45 standard ethernet connection.
Addressing	Via DIP Switch. Counts as 1 of 16 processor addresses. *See Fig. 11, pg. 100.*
Diagnostics	Power LED, Communication link power short circuit LED, Links 1-8 Tx and Rx LEDs.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Miswire Protection	All terminal block inputs are over-voltage and miswire protected against wire reversals and shorts.
Power-Failure Memory	Lithium battery provides a minimum of ten years of data retention.
Internal Timeclock	Accuracy ± 1 minute per year (specified as during data retention time).
Mounting	HWI-LV24-120: Processor mounts vertically at top of enclosure. *See Fig. 12, pg. 100.*
Mounting Hole Locations	*See Fig. 10, pg. 100.*
Shipping Weight (all model numbers)	7.0 lbs. (3.2 kg)

4 Series P5 Processors (cont.)

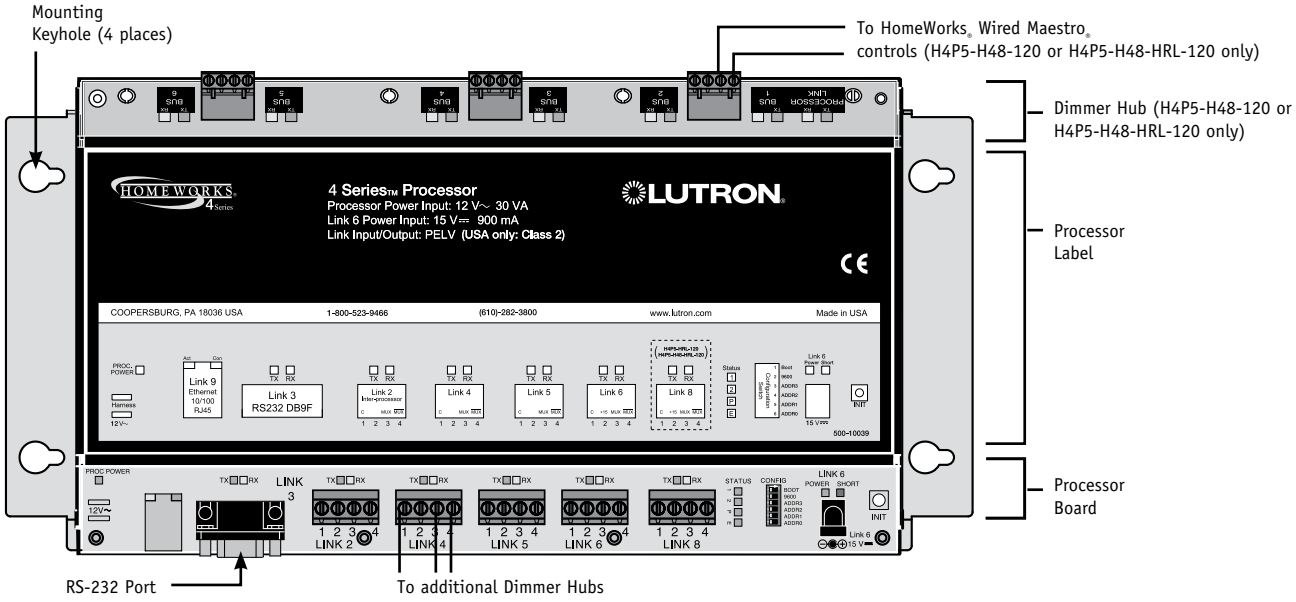
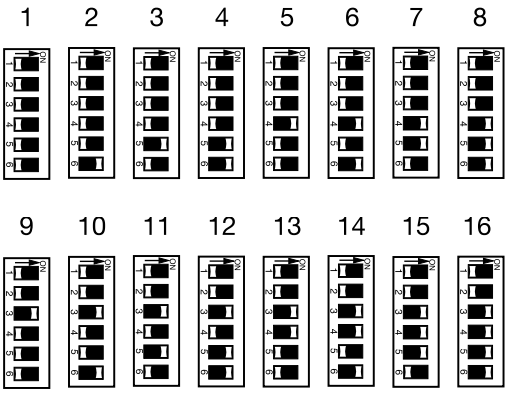


***Figure 10* – 4 Series P5 Processor (H4P5-H48-HRL-120 shown)**

Configuration Switch Functions

DIP Switch	Function
1	Boot Mode. Unless prompted by the *HomeWorks* software, this switch should always be in the DOWN position.
2	UP = 9600 Baud, DOWN = User selected Baud.
3-6	Processor Address. See below.



Example: DIP Switch #6 ON

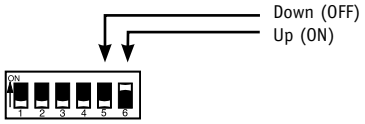


***Figure 11* – Address DIP Switch Settings**

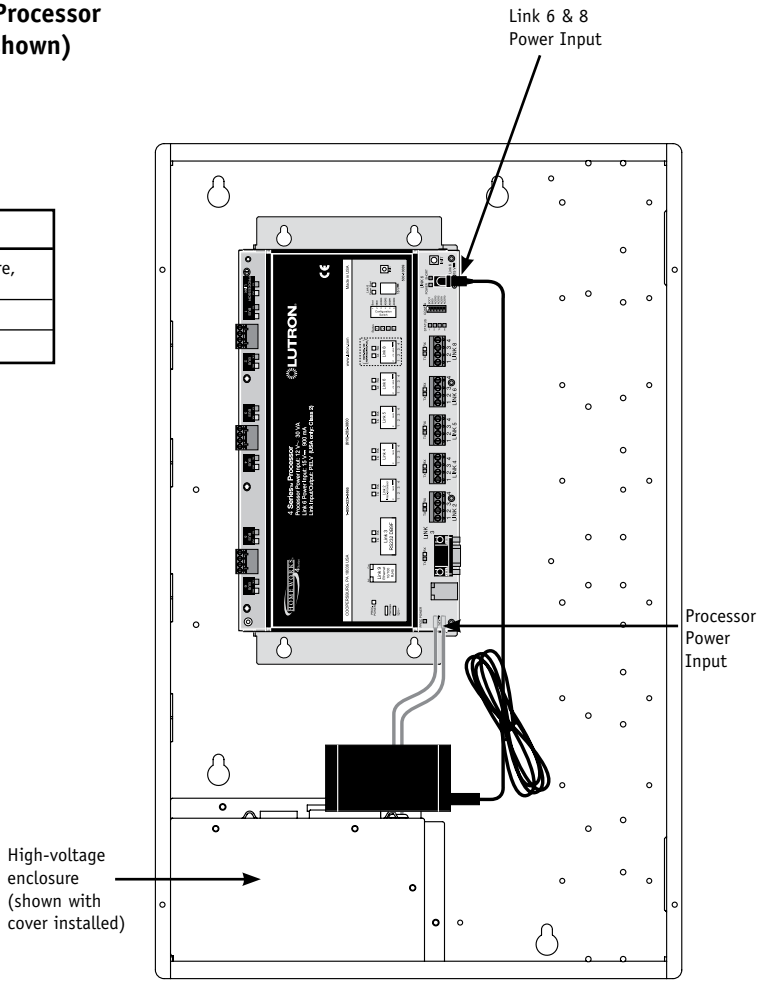


***Figure 12* – Mounting Location in an HWI-LV24-120**

BACK ROOM

4 Series P5 Processors (cont.)

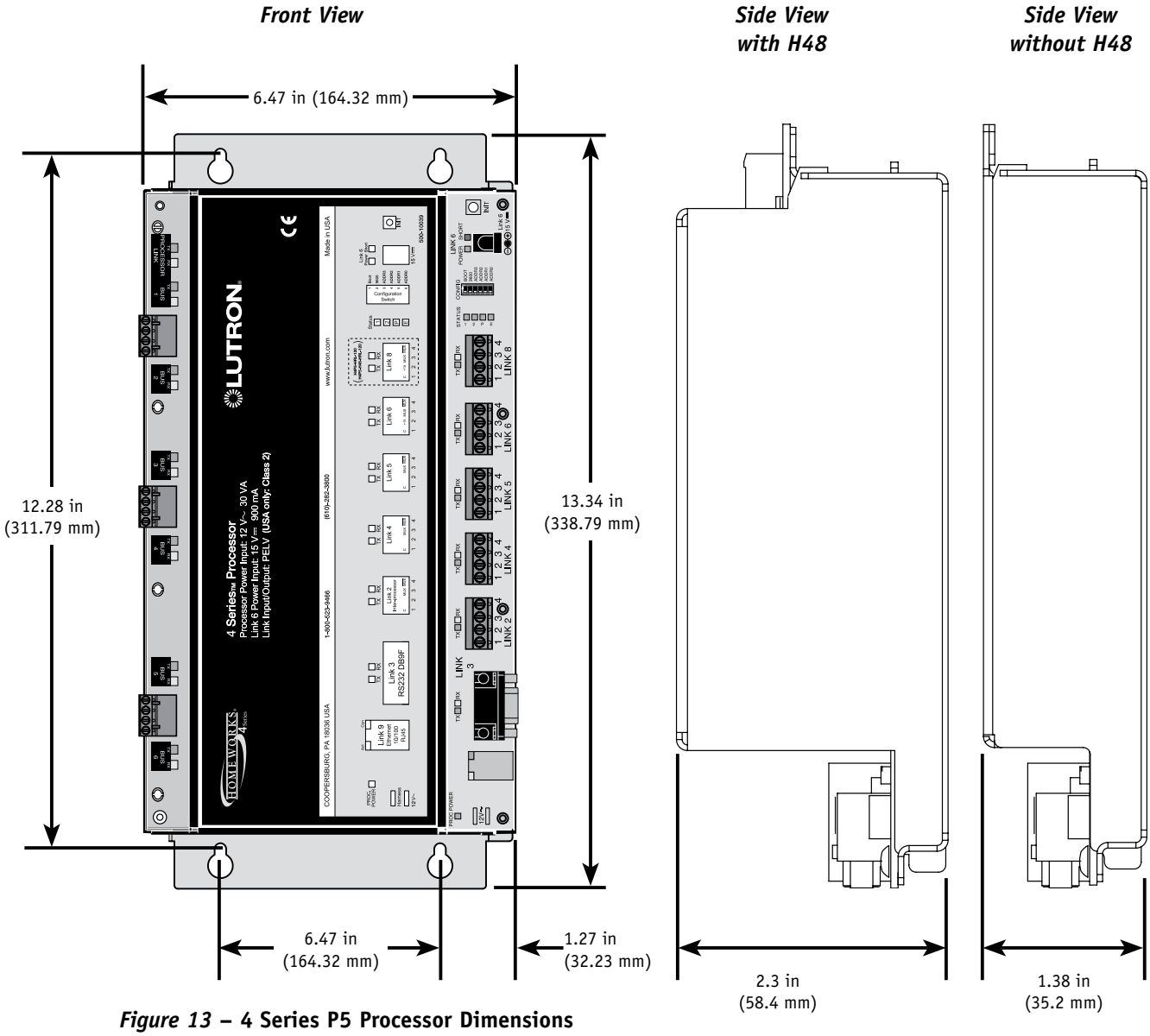


***Figure 13* – 4 Series P5 Processor Dimensions**

BACK ROOM

Wireless Series P5 Processor

Model Number	HRP5-120: RF Processor
Input Voltage	15 V⎓ supplied by provided 120 V~ transformer
Regulatory Approvals	Processor: FCC, IC; Plug-in adapter: UL
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Heat Generated (Power Supply)	18 BTUs per hr.
Line-Voltage Connections	Lutron provides a plug-in low-voltage transformer with a 5-foot cord.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – NEC Class 2 (IEC PELV) cable.
Low-Voltage Wiring Configuration	All processors in a multi-processor system must have the inter-processor communication links connected in a daisy-chain configuration.
Low-Voltage Connections	4-pin removable terminal block. Each of the four terminal will accept up to two #18 AWG (1.0 mm^2) wires. Two standard female DB-9 serial RS-232 connections & one RJ-45 standard ethernet connection.
Addressing	Via the LCD display. Counts as 1 of 16 processor addresses.
Diagnostics	LCD display, Power LED, Links 2, 3, 7, and 8 Tx and Rx LEDs.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41. Refer to Application Note #97 “Lightning/Surge Protection for HomeWorks® Devices” for more information.
Miswire Protection	All terminal block inputs are over-voltage and miswire protected against wire reversals and shorts.
Power-Failure Memory	Lithium battery provides a minimum of ten years of data retention.
Internal Timeclock	Accuracy ± 1 minute per year (specified as during data retention time).
Dimensions	*See Fig. 15, pg 103*.
Mounting	This enclosure is designed to be surface-mounted using the three pre-drilled holes in the mounting flange. Unit is self-contained in an enclosure. Lutron provides a plug-in transformer with a 5-foot cord. The transformer requires a 120 V~ receptacle. Do NOT mount the wireless processor in a metal enclosure.
Mounting Hole Locations	*See Fig. 15, pg 103*.
RF Coverage	Approximately 2500 square feet (232 m^2) of living space.
Frequency	431.0 MHz to 437.0 MHz
# of Channels	60
Range	60 ft. RF processor to repeater; 30 ft. RF processor to dimmer/keypad/interface
Shipping Weight	5.6 lbs. (2.5 kg)

Wireless Series P5 Processor (cont.)

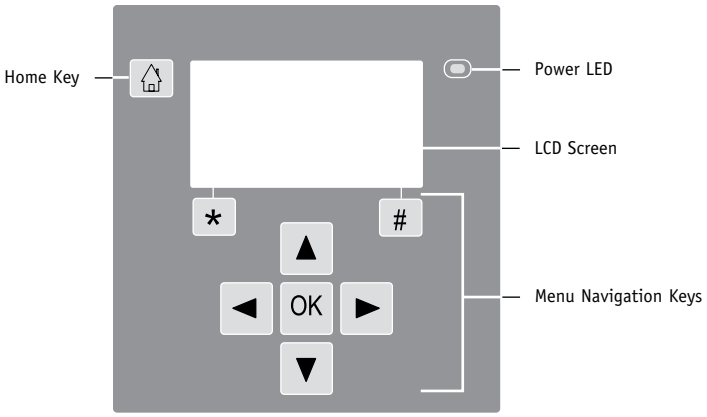


***Figure 14* – Wireless Series P5 Processor LCD Display**

Configuration Switch Functions

DIP Switch	OFF	ON
1	Normal Mode	Boot Mode
2	User-Configured Baud Rate	9600 Baud
3	Normal Mode	Not Used
4	Normal Mode	Not Used
5	Normal Mode	Not Used
6	Normal Mode	Not Used

Example: DIP Switch #6 ON.

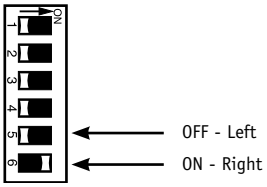


***Table 15* – DIP Switch Settings**

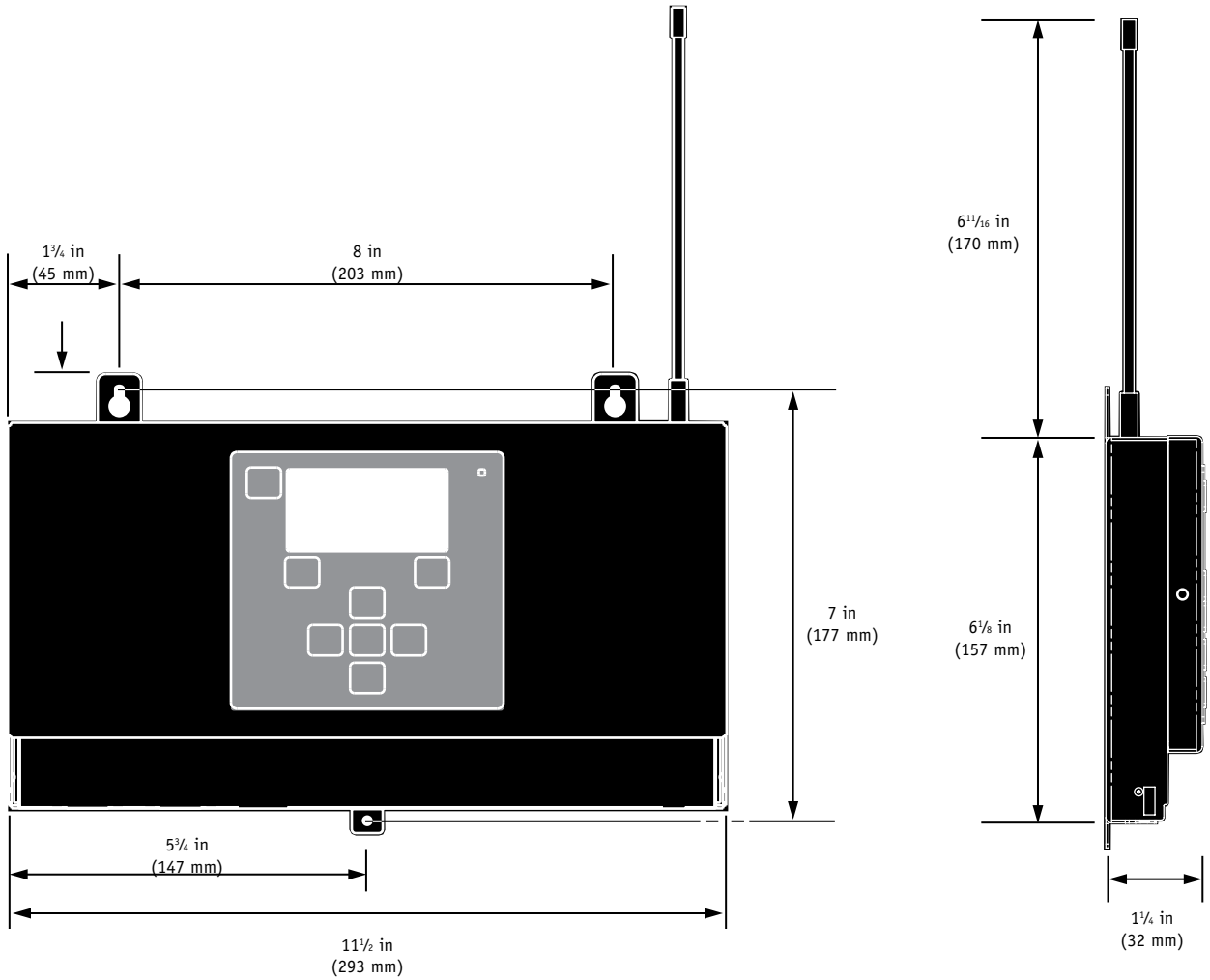
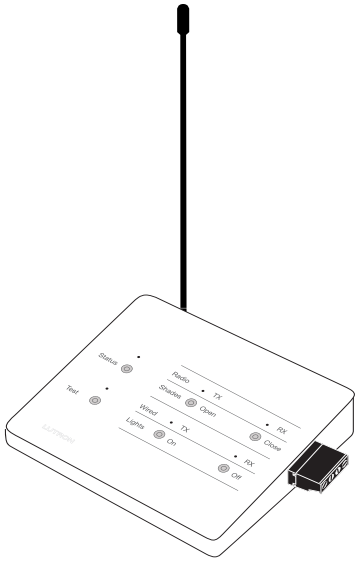


***Figure 16* – Dimensions and Mounting Hole Locations**

Hybrid Repeater

All Series
Repeater
Hybrid Repeater Link-8.3
N/A



Hybrid Repeater (HR-REP-120)

HYBRID REPEATER (MODEL # HR-REP-120)

The HomeWorks® hybrid repeater adds RF coverage to an RF processor or an RF-capable wired processor. Each hybrid repeater covers approximately 2,500 square feet (232m²) of living space. Up to four repeaters can be added to each RF processor; up to five can be added to each RF-capable wired processor.

COMMUNICATION TO PROCESSOR

The hybrid repeater connects to 4 or 8 Series P5 processors on link 8. Additional repeaters (up to 5 repeaters per wired processor) must be within 60 feet (18 m) of another repeater for RF communication. Or, they may be wired in a daisy-chain configuration to the processor or another repeater. On a Wireless Series processor, repeaters (up to 4 repeaters per RF processor) may be wired in a daisy-chain configuration to link 8, or they can communicate using RF if within 60 feet (18 m) of the processor or another repeater.

RF SYSTEM COMMUNICATION

All *Homeworks* RF devices must be located within 30 feet (9 m) of a hybrid repeater or an RF Processor. Multiple hybrid repeaters may be necessary to provide adequate coverage.

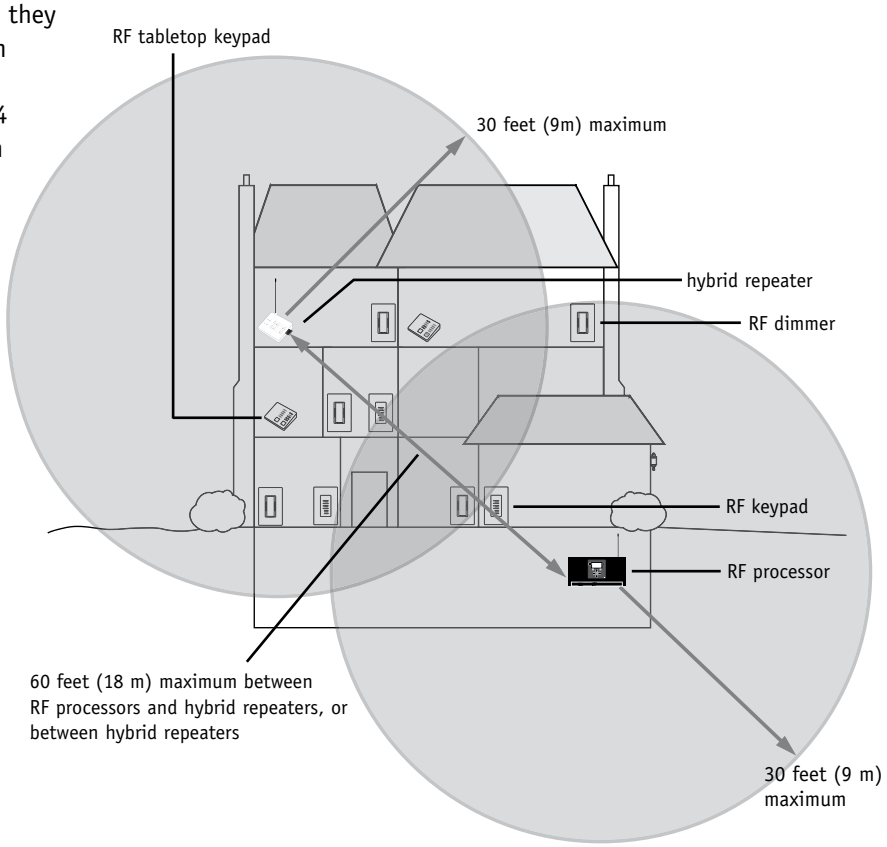


***Figure 1* – RF Coverage**

BACK ROOM

Hybrid Repeater (cont.)

Model Number	HR-REP-120: Provides additional RF coverage area to any wireless-capable processor.
Input Voltage	15 V⎓; powered by included transformer or by link 8 on processor.
Regulatory Approvals	Hybrid Repeater: FCC, IC; Transformer: UL
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm²), one pair #18-22 AWG (1.0-0.5 mm²) twisted shielded – NEC Class 2 (IEC PELV) wire. Lutron® wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Daisy-chain. Termination not required. Total length of wire cannot exceed 1000 feet (305 m) per wire run.
Low-Voltage Connections	One 4-pin removable terminal block. Terminal block will accept up to four #18 AWG (1.0 mm²) wires. Pin 2 should not be connected if using included transformer.
Addressing	Via the HomeWorks® software, using unique device serial numbers. Units must be installed prior to addressing. Counts as 1 of 4 repeater addresses on a wireless series processor, or as 1 of 5 on a 4 or 8 Series P5 processor.
Diagnostics	Test button provides RF communication check. LEDs show communication link status.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	*See Fig. 2, below.*
Mounting	*See Fig. 4, pg. 106*. Lutron provides a plug-in transformer with a 5-foot cord. The transformer requires a 120 V~ receptacle.
Coverage	Approximately 2500 square feet (232 m²) of living space.
Shipping Weight	1.5 lbs. (0.7 kg)
Keypad LED Count	15 Keypad LEDs (if powered via Link 8)

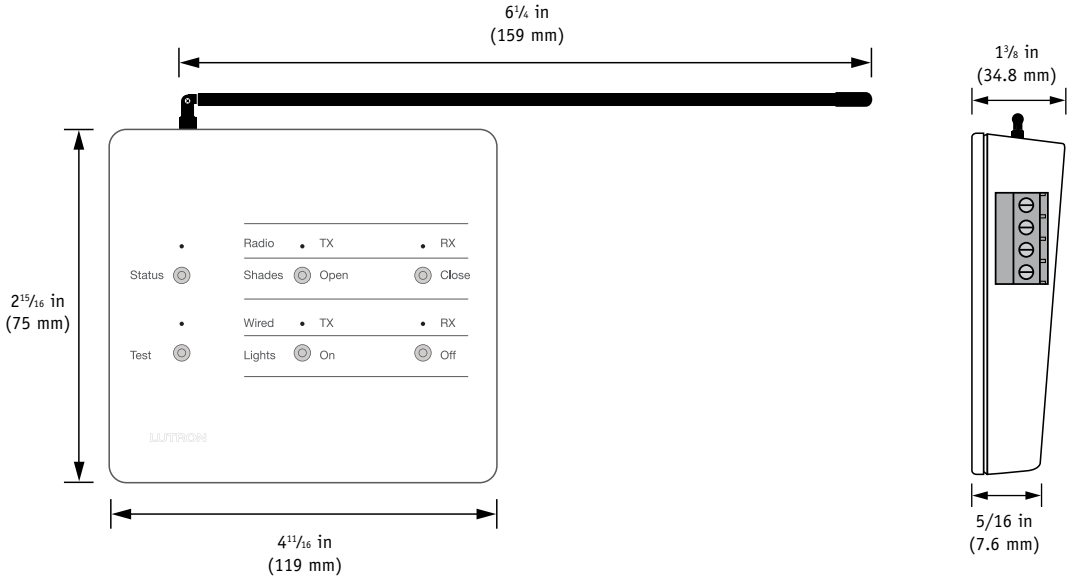


***Figure 2* – Dimensions**

Hybrid Repeater (cont.)

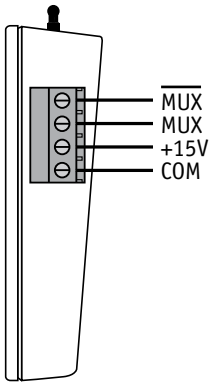
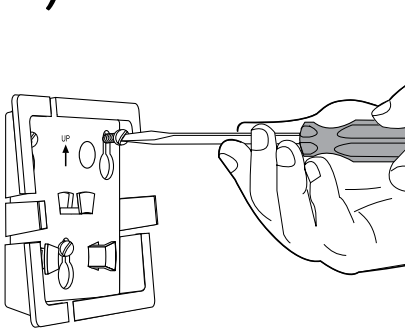
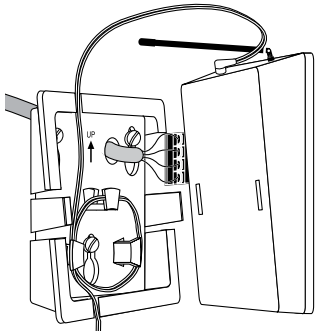


***Figure 3* – Wiring Diagram**



Attach mounting bracket to wall using the supplied screws and wall anchors.



Wrap excess power supply cord around the cord holder. Align device and snap onto mounting bracket.

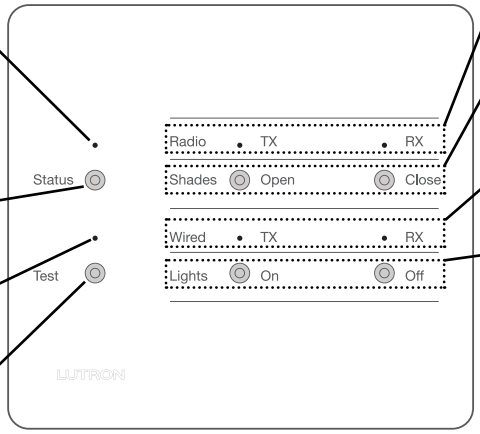
***Figure 4* – Mounting**

STATUS LED
Indicates the status of the HomeWorks® system. Note: When the hybrid repeater is powered, but has not yet been assigned an address from the *HomeWorks* software, the STATUS and TEST LEDs will be dimly illuminated.

STATUS BUTTON
Used when addressing the hybrid repeater from the *HomeWorks* software.

TEST LED
A slow flash indicates RF communications tests are in progress.

TEST BUTTON
Activates RF communication tests. To activate the tests, press and hold the TEST Button until the TEST LED begins to flash. Note: For communication tests, the hybrid repeater, *HomeWorks* processor, and other RF devices must first be configured and addressed using the *HomeWorks* software.



RF TX/RX LEDs
Indicate RF link activity.

SHADES OPEN/CLOSE BUTTONS
Opens or Closes all RF Shades in the *HomeWorks* system.

WIRED TX/RX LEDs
Indicate wired link activity.

LIGHTS ON/OFF BUTTONS
Turns On or Off all supported RF dimmers and switches.

***Figure 5* – Operation**

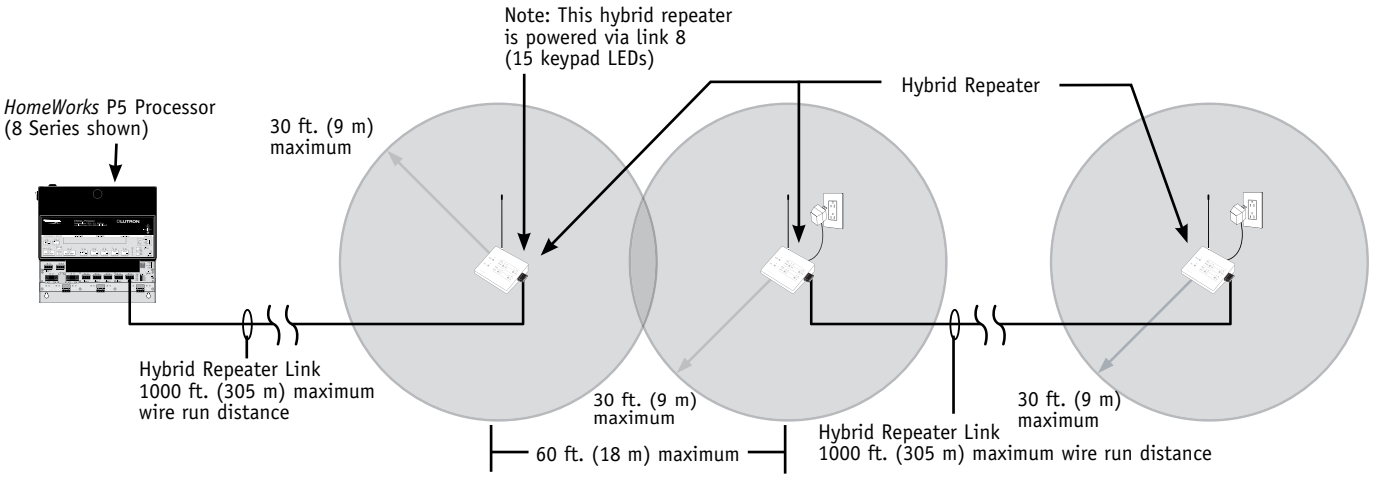


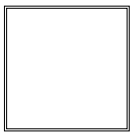
***Figure 6* – Example Wiring and RF Configuration**

BACK ROOM

Power Boosters and 120 V Interfaces

4/8/ Wireless Series
Power Interfaces
N/A
N/A

Power Boosters and 120 V Interfaces work with specific load types and/or increase the zone capacity of Wired Vareo® Local Lighting Controls, Wired and RF Maestro® Local Lighting Controls with neutral wire, GRAFIK Eye® Preset Local Lighting Controls, and Remote Power Modules. Power Boosters and 120 V Interfaces are typically installed in electrical closets or other hidden locations, since they do not need to be accessed during normal operation of the HomeWorks® system.



POWER BOOSTER (MODEL # NGRX-PB-WH)

Single-zone interface to dim incandescent, magnetic low-voltage, and neon/cold-cathode (low/normal power factor transformers) sources. Maximum power capacity 1920 W/VA @ 120 V~.

FLUORESCENT INTERFACE (MODEL # GRX-FDBI-16A-120)

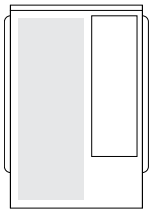
Single-zone interface to dim or switch Lutron® Hi-lume® Fluorescent Ballasts. Maximum capacity 16 A (dimming) or 10 A (switching) @ 120 V~.

ELECTRONIC LOW-VOLTAGE INTERFACE (MODEL # ELVI-1000)

Single-zone interface to dim electronic low-voltage lighting. Maximum capacity 1000 W @ 120 V~.

SYNTHETIC MINIMUM LOAD (MODEL # LUT-LBX-WH)

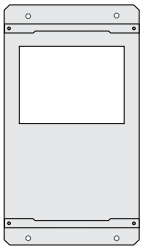
The Synthetic Minimum Load presents a simulated load to the dimmer to meet the minimum load requirements, even when the actual load is smaller. Single-circuit input: 120 V~ 100 mA.



HI-POWER BOOSTERS (MODEL # HP-2, HP-4, HP-6)

Single-zone interface to dim or switch incandescent, magnetic low-voltage, electronic low-voltage, neon/cold cathode (low/normal power factor transformers), Lutron Fluorescent Dimming Ballasts, fluorescent non-dim, and HID (High Intensity Discharge) lamps.

Maximum capacity is 1920 W/VA for HP-2, 3840 W/VA for HP-4, and 5760 W/VA for HP-6 @ 120 V. Up to five Hi-Power Boosters can be daisy-chained for additional capacity. Hi-Power Boosters are designed to be surface-mounted.



0-10 VOLT INTERFACE (MODEL # GRX-TVI)

Single-zone interface to dim or switch fluorescent lights that have *Lutron* ECO-10® (TVE Series) Electronic Dimming Ballasts.

Dims and switches any 0-10 V electronic fluorescent dimming ballast powered by 100-277 V. Ballast must supply 0-10 V signal. Switches up to 5 A of electronic capacitive fluorescent ballasts.

Also switches motors - 1/4 HP @ 100-127 V~, 1/2 HP @ 200-277 V~.

Requires 100-120 V~ or 200-240 V~ power for proper operation.

INSTALLATION NOTES:

For models NGRX-PB-WH, GRX-FDBI-16A-120, and ELVI-1000, use 3½ inch (89 mm) deep masonry wallboxes for ease of installation. The use of a Power Booster or Interface removes the lighting load from the controlling device (Wired Vareo, Wired and RF Maestro Local Lighting Controls, GRAFIK Eye Preset Local Lighting Controls, or Remote Power Modules) and replaces it with a 40 W "dummy load." This 40 W load satisfies the minimum load requirements for the controlling device.

See pgs. 109-110, 113-114, 117.

Note: *All measurements have been rounded to 1/16 inch.*

Power Boosters and 120 V Interfaces (cont.)

Wallbox-Mounted Power Booster and Interfaces

Model Numbers	NGRX-PB-WH: Power Booster. ELVI-1000: Electronic Low-Voltage Interface. GRX-FDBI-16A-120: Fluorescent Dimming Ballast Interface. LUT-LBX: Synthetic Minimum Load
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Load Types	NGRX-PB-WH[1]: Incandescent, magnetic low-voltage, neon/cold-cathode. ELVI-1000[1,2]: Electronic low-voltage GRX-FDBI-16A-120[1]: Lutron® Hi-lume® or ECO-10® Fluorescent Dimming Ballasts. LUT-LBX: Incandescent, magnetic and electronic low-voltage, neon/cold-cathode, Lutron TuWire® Fluorescent Dimming Ballasts, LED.
Maximum Load	NGRX-PB-WH[1]: 1920 W/VA ELVI-1000[1,2]: 1000 W GRX-FDBI-16A-120[1]: 16 A (up to 20 ballasts) LUT-LBX: Up to dimmer minimum
Minimum Load	NGRX-PB-WH, ELVI-1000: 25 W/VA GRX-FDBI-16A-120: 1 ballast LUT-LBX: None
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Heat Generated Fully Loaded	NGRX-PB-WH, ELVI-1000: 82 BTUs per hr. GRX-FDBI-16A-120: 18 BTUs per hr. LUT-LBX: 35 BTUs per hr.
Line-Voltage Connections	*See Figs. 2 - 7, pgs. 109, 110.*
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	*See Fig. 1, below.*
Mounting	2-gang US wallbox, 2¾ in (70 mm) deep minimum, 3½ in (89 mm) deep recommended for easier wiring.
Terminals	Each terminal will accept two 12 AWG (2.5 mm²) wires.
Shipping Weight	1 lb. (0.5 kg)

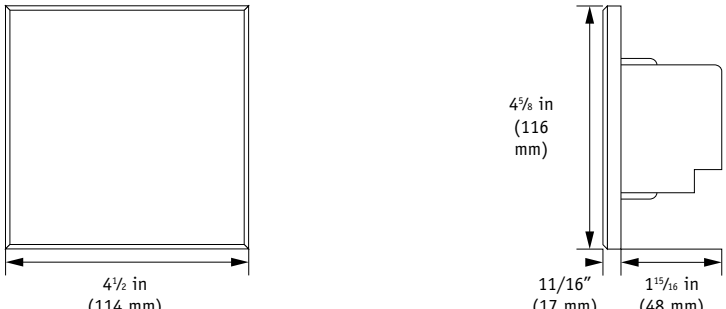


***Figure 1* – Dimensions**

[1] *Power Boosters cannot be controlled by non-system* Vareo® *Controls, non-system* Maestro® *Controls and non-neutral wire* HomeWorks® *Maestro Controls.*

[2] *It is permissible to power both incandescent and electronic low-voltage loads together on the same zone through the ELVI-1000. Up to 300 W of the interface's 1000 W capacity can be incandescent.*

BACK ROOM

Power Boosters and 120 V Interfaces (cont.)

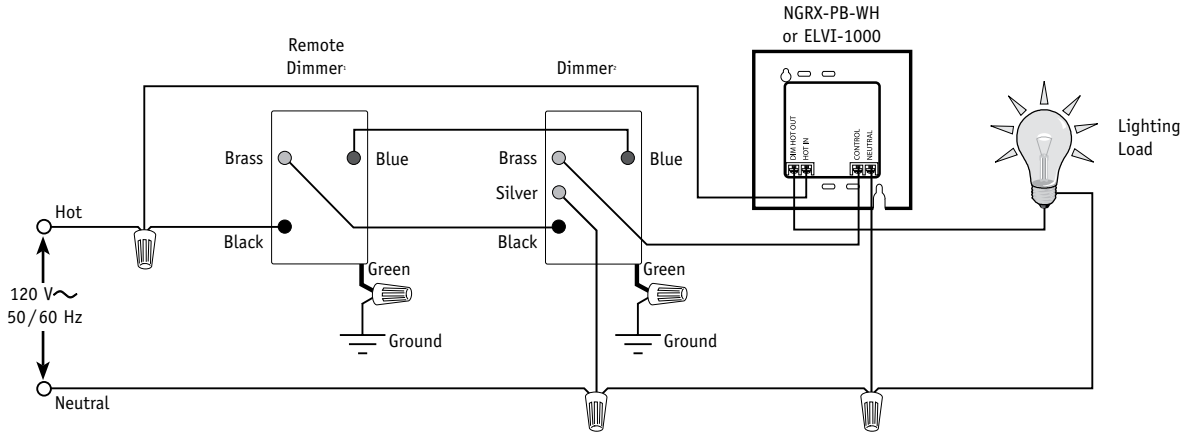


***Figure 2* – NGRX-PB-WH and ELVI-1000 Installation with HomeWorks® Maestro®**

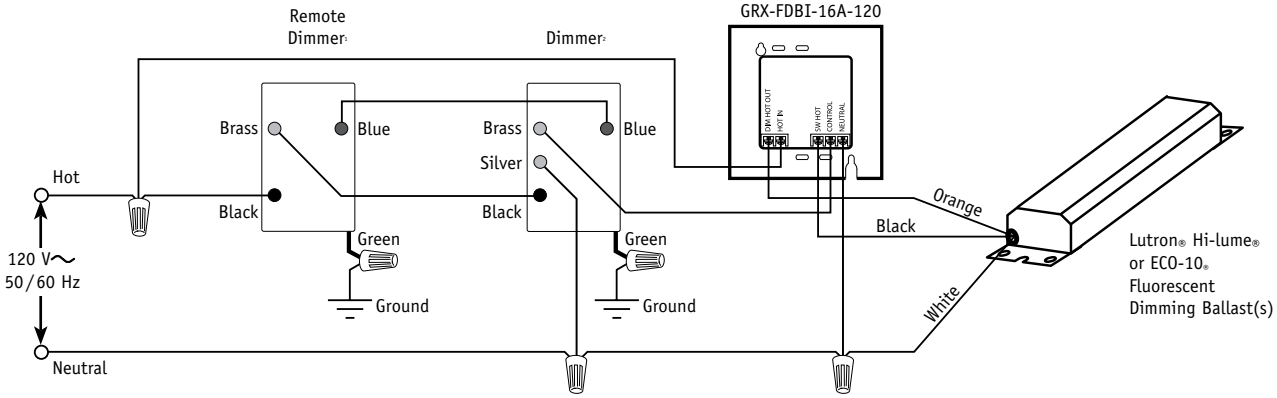


Figure 3* – GRX-FDBI-16A-120 Installation with *HomeWorks Maestro

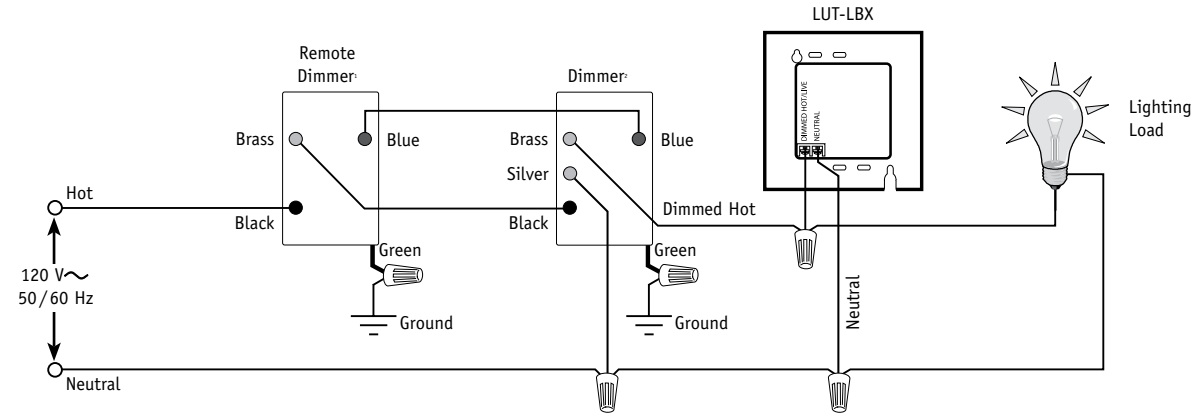


Figure 4* – LUT-LBX Installation with *HomeWorks Maestro

[1] Up to nine *HomeWorks Maestro* Remote Dimmers may be connected to a *HomeWorks Maestro* Dimmer. Total Blue terminal wire length may be up to 250 feet (76 m).

[2] Neutral wire dimmers must be connected on the lighting load side of a multi-location installation.

Power Boosters and 120 V Interfaces (cont.)

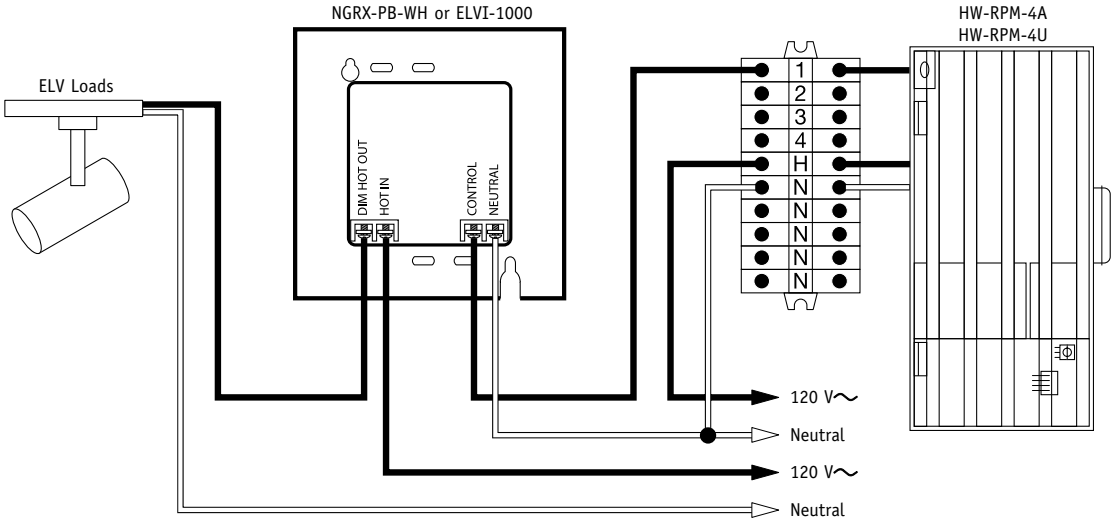


***Figure 5* – NGRX-PB-WH or ELVI-1000 Installation with Remote Power Modules**

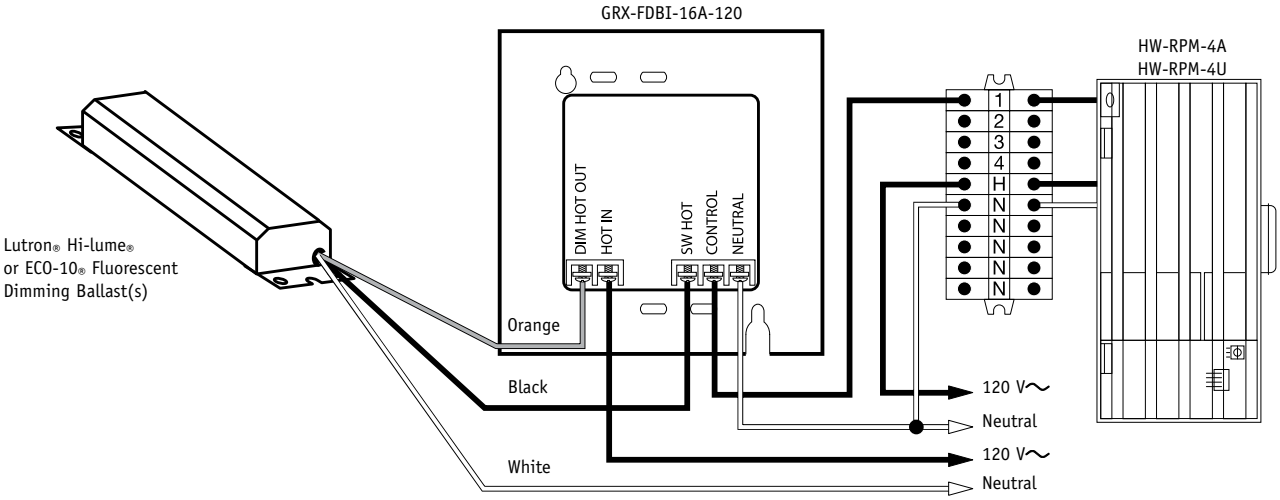


***Figure 6* – GRX-FDBI-16A-120 Installation with Remote Power Modules**

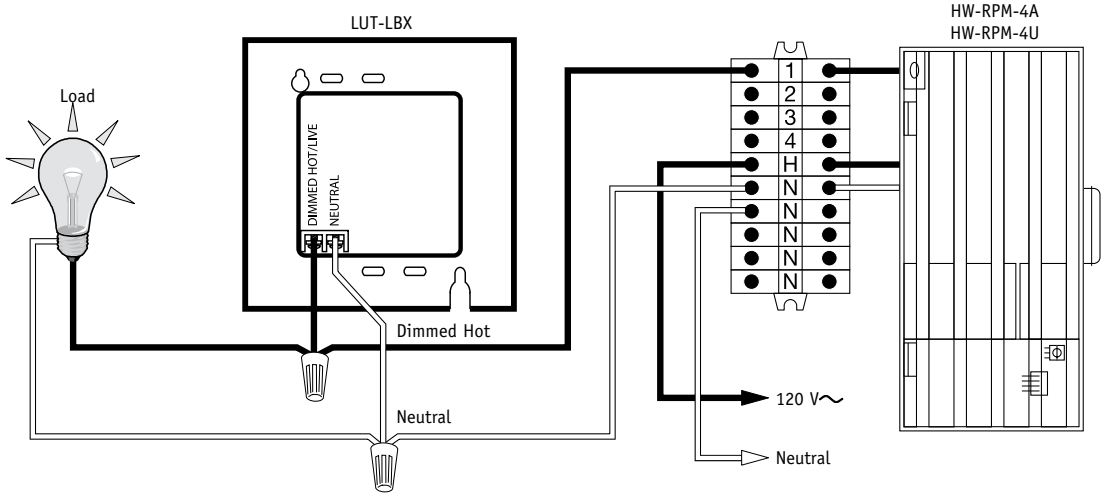


***Figure 7* – LUT-LBX Installation with Remote Power Modules**

BACK ROOM

Power Boosters and 120 V Interfaces (cont.)

Hi-Power 2•4•6™ Hi-Power Modules

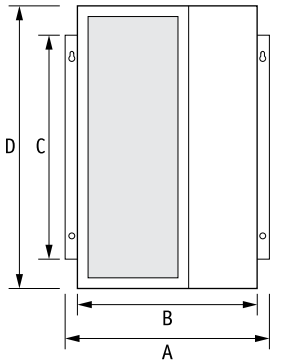
Model Numbers	HP-2: Hi-Power Module with 1 output. HP-4: Hi-Power Module with 2 outputs. HP-6: Hi-Power Module with 3 outputs.
Input Voltage	Control Circuit: 120 V~ 20 A per Hi-Power Booster Module Load Circuit[1], 120 V~ or 277 V~[2] 50/60 Hz
Regulatory Approvals	UL
Load Types	Incandescent, magnetic/electronic low-voltage (forward-phase), neon/cold cathode[3] Hi-lume®, ECO-10®, and Tu-Wire® Fluorescent Dimming Ballast, Fluorescent non-dimmed (non-capacitive), and metal halide.
Maximum Load Per Output	Dimmed: 16 A 1920 W/VA or 20 ballasts. Switched: 10 A 1200 W/VA or 20 ballasts.
Minimum Load Per Output	25 W/VA or 1 ballast.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Heat Generated Fully Loaded	82 BTUs per hr. per output.
Line-Voltage Connections	*See Figs. 3, 4, 5, pgs. 113, 114.*
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	10⅜ in (259 mm) x 9¼ in (231 mm) x 14¾ in (368 mm). *See Fig. 1, pg. 112.*
Mounting	Modules must be surface-mounted with adequate air space as indicated in *Fig. 2, pg. 112.*
System Capacity	Up to five HP-6 Modules per zone for a maximum of 30,000 W/VA.
Shipping Weight	16 lbs. (7.3 kg)

[1] Any load circuit can be connected to any phase. Each load circuit may be connected to a different load type; however, load types cannot be mixed on the same circuit.

[2] 277 V Hi-lume®, FDB, or ECO-10® fluorescent, 277 V magnetic low-voltage, or 277 V switched loads only.

[3] For neon/cold cathode light sources, consult Application Note No. 25, available on the Lutron Website or by using fax-on-demand, (800) 523-9466.

Power Boosters and 120 V Interfaces (cont.)



	Inches	mm
A	10 3/8	259
B	9 3/8	234
C	9 1/4	231
D	14 3/4	368
Depth	5 3/4	144

***Figure 1* – Dimensions**

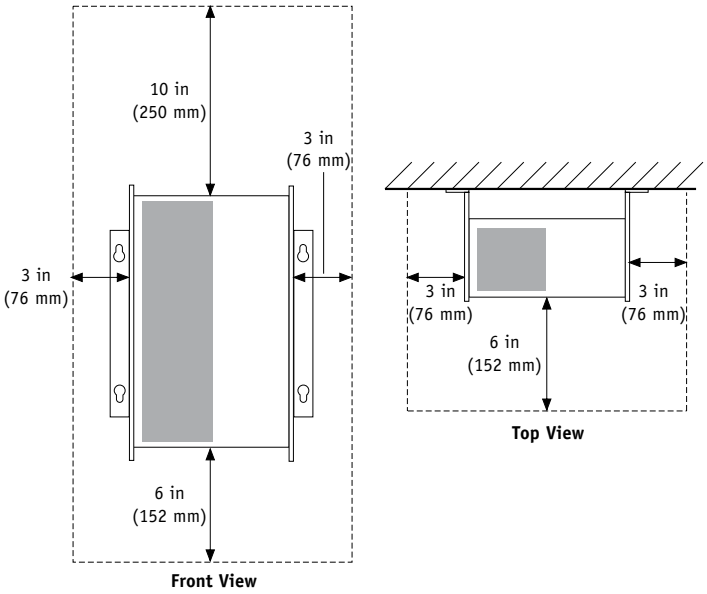


***Figure 2* – Required Mounting Clearance**

BACK ROOM

Power Boosters and 120 V Interfaces (cont.)

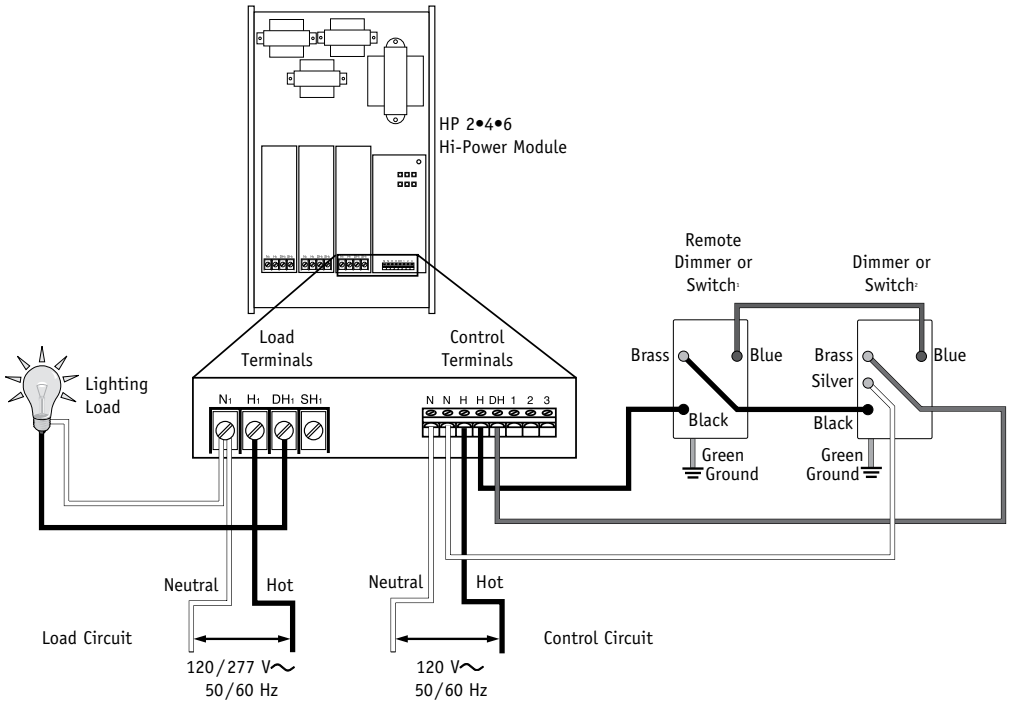


***Figure 3* – HP 2•4•6™ Installation with HomeWorks® Maestro®**

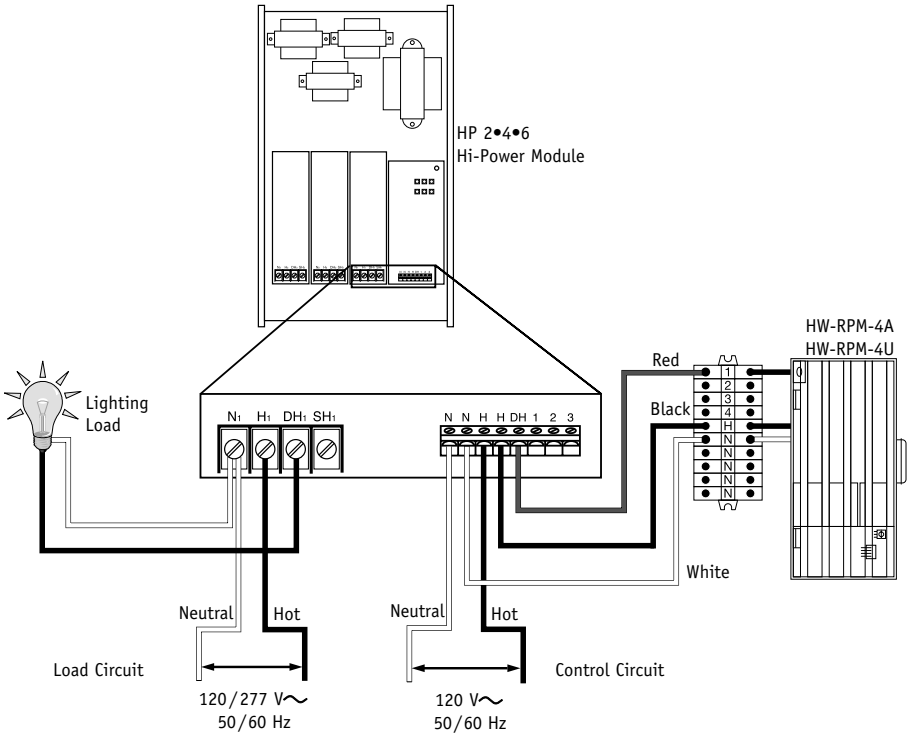


***Figure 4* – HP 2•4•6 Installation with Remote Power Modules**

[1] Up to nine *HomeWorks Maestro* Remote Dimmers or Switches may be connected to the *HomeWorks* Wired *Maestro* Dimmer or Switch. Total Blue wire length may be up to 250 feet (76 m).

[2] Neutral wire Dimmers or Switches must be connected on the lighting load side of a multi-location installation.

Power Boosters and 120 V Interfaces (cont.)

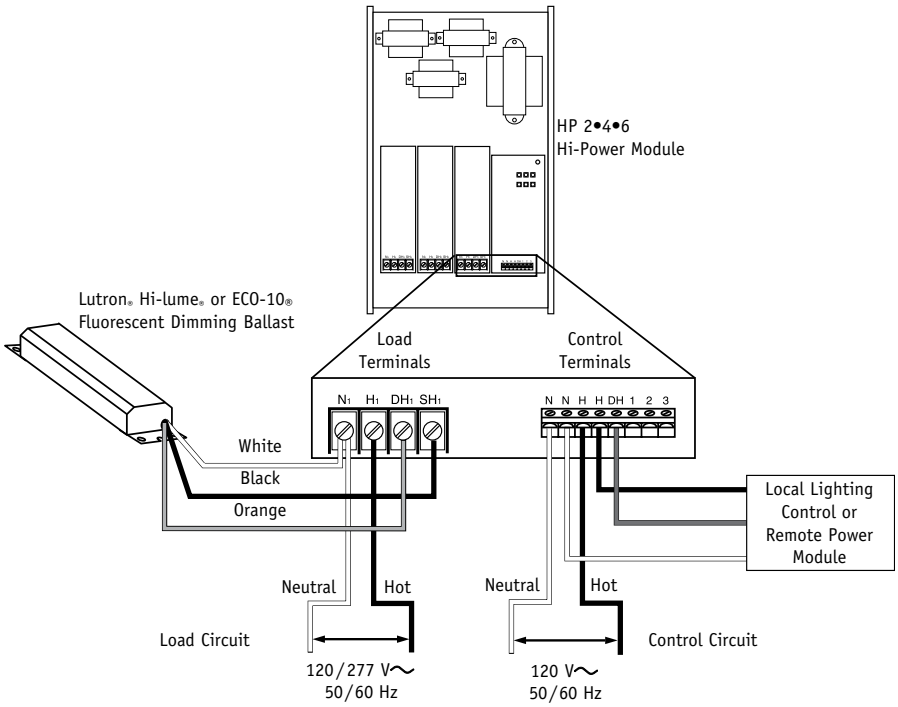


***Figure 5* – HP 2•4•6™ Installation with a Fluorescent Dimming Ballast**

BACK ROOM

Power Boosters and 120 V Interfaces (cont.)

Ten Volt Interface

Model Numbers	GRX-TVI		
Input Voltage	100-127 V~/220-240 V~ 50/60 Hz H2/L2 Terminal: 20 mA DH2/DL2 Terminal: 100 mA		
Regulatory Approvals	UL, CSA, CE, C-Tick		
Load Types	Switched: Incandescent, magnetic/electronic low-voltage, neon/cold cathode, fluorescent non-dimmed (capacitive), metal halide, and motors. Dimmed: ECO-10® (TVE Series) fluorescent dimming ballasts, other manufacturers' 0-10 V dimming ballasts (0-10 V source only)		
Maximum Load Per Output	Dimmed:	ECO-10® (TVE Series)	16 A @ 100-127 V~/200-277 V~
		Other 0-10 V ballasts	16 A @ 100-127 V~/200-277 V~ 10 A @ 230 V~ (CE)
	Switched:	Motors	1/4 HP @ 100-120 V~ 1/2 HP @ 200-277 V~ 1/2 HP @ 230 V~ (CE)
		Other loads listed above	16 A @ 100-127 V~/200-277 V~ 10 A @ 230 V~ (CE)
0-10 V Output	10 µA-300 mA — sinks current only (maximum 150 Lutron® ballasts). Conforms to Annex E of IEC60929		
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.		
Cooling Method	Passive cooling.		
Heat Generated	18 BTUs per hr.		
Line-Voltage Connections	*See Figs. 2, 3, pg. 117.*		
ESD Protection	Meets or exceeds the IEC 60929 standard.		
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.		
Dimensions	12½ in (318 mm) x 6$^{1}/_{10}$ in (155 mm) x 3$^{3}/_{10}$ in (84 mm). *See Fig. 1, pg. 116.*		
Mounting	Must be surface-mounted as indicated in *Fig. 1, pg. 116.*		
Shipping Weight	4.25 lbs. (2 kg)		

Power Boosters and 120 V Interfaces (cont.)

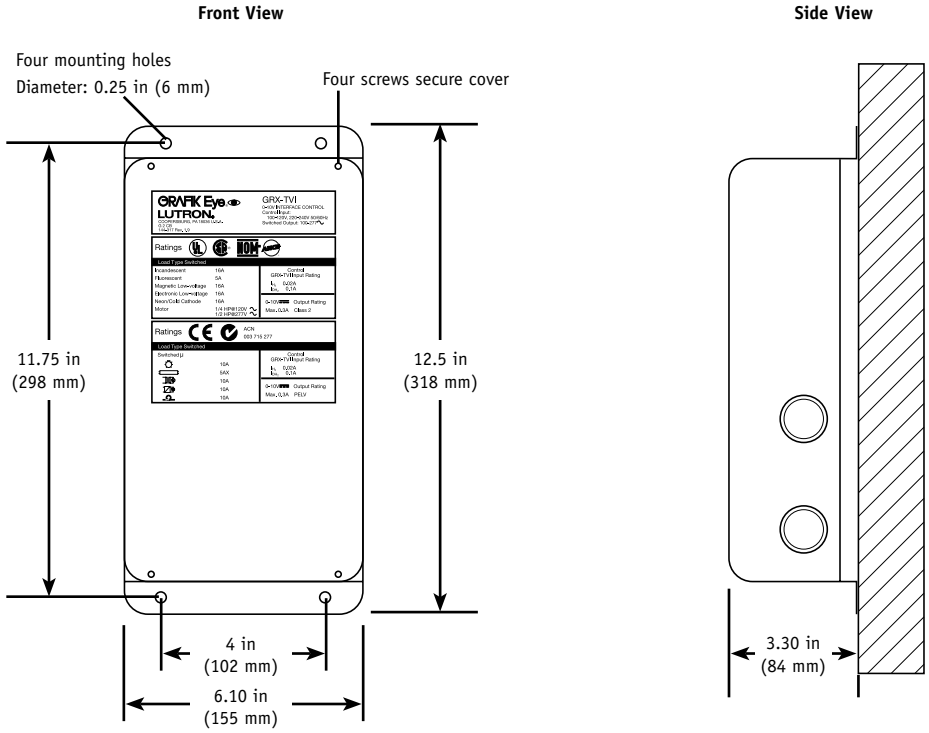


***Figure 1* – GRX-TVI Dimensions and mounting**

Power Boosters and 120 V Interfaces (cont.)

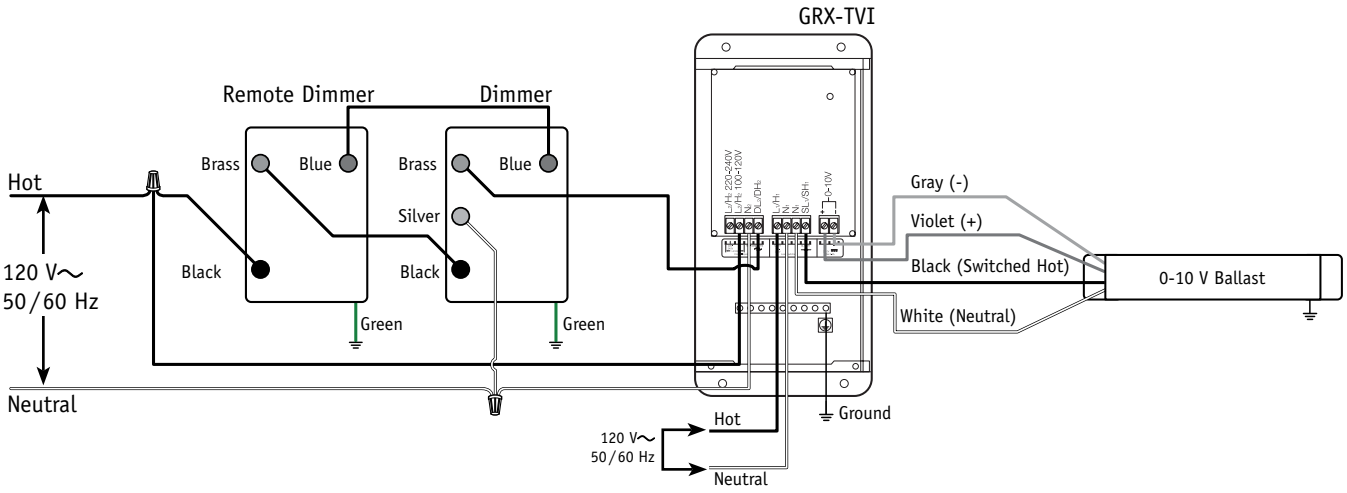


***Figure 2* – GRX-TVI Installation with HomeWorks® Maestro®**

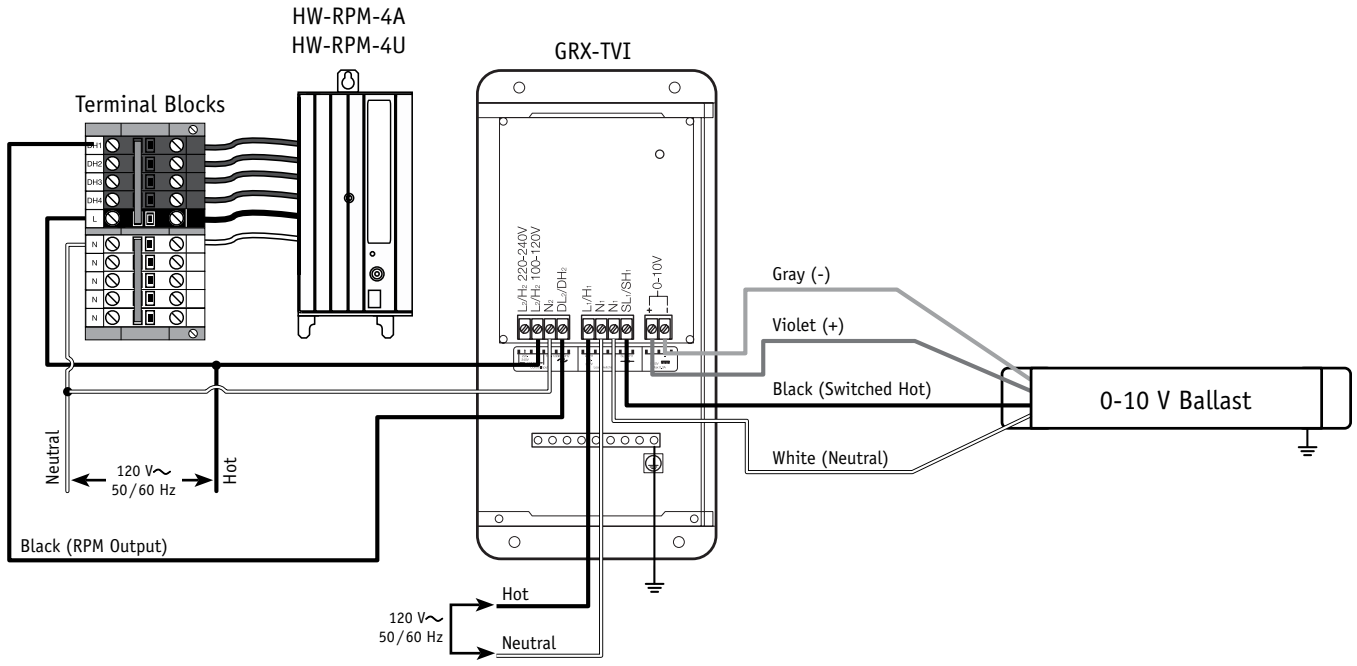


***Figure 3* – GRX-TVI Installation with Remote Power Modules**

[1] Up to nine *HomeWorks Maestro* Remote Dimmers or Switches may be connected to the *HomeWorks* Wired *Maestro* Dimmer or Switch. Total Blue terminal wire length may be up to 250 feet (76 m).

[2] Neutral wire Dimmers or Switches must be connected on the lighting load side of a multi-location installation.

BACK ROOM

Filter Choke

8 Series
Power Interfaces
N/A
N/A

High Inductance Filter Chokes provide additional inductance, to eliminate or reduce audible lamp buzz for two lighting zones. The HW-HIFC-10-2 mounts in a HWI-PNL-8 panel in place of RPM module 8. Lamp Debuzzing Coils are also available for additional filtering (contact Lutron Technical Support for details).

If a larger number of circuits need to be filtered, consider using Specification Grade Panels instead of RPMs. Each circuit of a Specification Grade Panel has a dedicated filter choke.

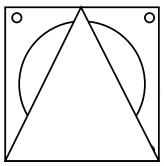


***Figure 1* – High Inductance Filter Choke**

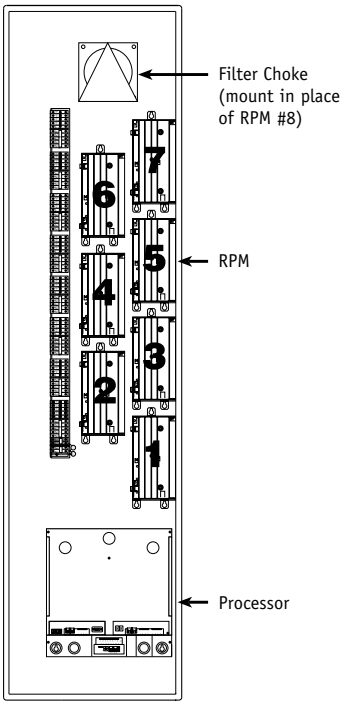


***Figure 2* – Mounting Location**

Model Number	HW-HIFC-10-2: High Inductance Filter Chokes (pair).
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA
Maximum Load	10 A per choke, 2 chokes may be connected in parallel for up to 20 A capacity.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling.
Heat Generated	103 BTUs per hr.
Mounting	Mounts in upper portion of HWI-PNL-8. **Note:** RPM number 8 cannot be used in panels with an HW-HIFC-10-2.
Shipping Weight	5 lb. (2.25 kg)
Chokes per Assembly	2
Max. Number of Assemblies per Panel	1
Current Rise	320 microseconds or greater, measured from 10% to 90% of total current rise for a 1250 W load at 90% conduction. Current rise time shall be 315 microseconds or greater for a 650 W load at 90% conduction. At any point on the waveform, the current rise rate shall not exceed 45 milliamperes per microsecond with a 650 W load.

Wallbox Power Module

4/8 Series
Remote Dimming Controls
Grafik Eye®/WPM Link
N/A

WALLBOX POWER MODULE (HWI-WPM-6D-120)

HomeWorks® Wallbox Power Modules (WPM) control six independent zones of lighting and fit in a 4-gang wallbox. The WPMs are designed to be placed in closets, equipment rooms, and other locations in the home where it is "hidden" from view. Homeowners use system keypads to control the WPM.

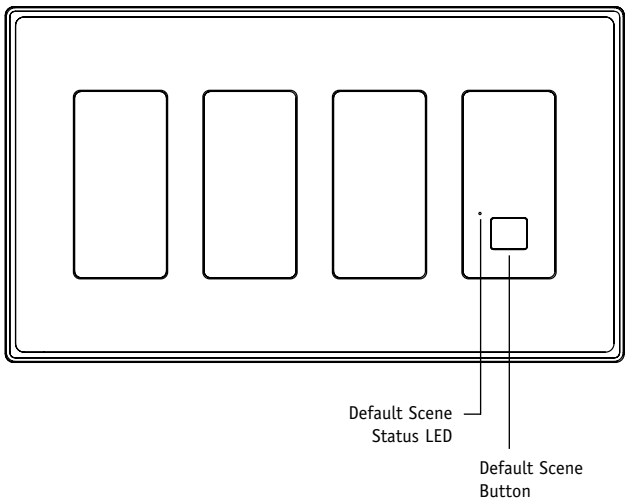
CONNECTION TO WIRED PROCESSOR

The WPMs are wired like a six-zone GRAFIK Eye® control unit. Each *HomeWorks* wired processor has a minimum of three configurable links (see pg. 90 for processor details), each capable of controlling up to eight WPM or *GRAFIK Eye* control units. This connection requires two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used. The maximum cable length is 2000 feet (610 m). This link must be wired in a daisy-chain configuration.

The wattage and load type specifications of the WPM are the same as a six-zone *GRAFIK Eye* control unit. All connections on the back of the WPM are identical to those on the six-zone *GRAFIK Eye* control unit. See *GRAFIK Eye* multi-zone local lighting controls on pg. 66.

DEFAULT SCENE BUTTON

Each WPM has a default scene button on the front of the unit that allows a user to toggle between a preprogrammed scene (defined in the *HomeWorks* software) and OFF. This scene is stored inside the WPM and can be accessed at any time. The default scene provides "failsafe" operation, allowing the WPM to be controlled locally in the unlikely event communication to the processor is interrupted. Connect an NTGRX-1S control to the SSA input to allow remote operation of the default scene.



Wallbox Power Module
(HWI-WPM-6D-120)

WPM BENEFITS:

- Provides a cost-effective dimming solution to jobs with lower wattage loads
- Reduces overall job cost by up to 5-20% when less than 96 control zones are required
- Install in yachts, luxury buses, small condominiums, or anywhere space is a premium
- Add remote zones without installing an enclosure

Note: *Use 3½ inch (89 mm) deep masonry wallboxes for ease of installation of Wallbox Power Modules.*

Wallbox Power Module (cont.)

Model Number	HWI-WPM-6D-120: Control six independent zones of lighting.
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Load Types	Incandescent, magnetic low-voltage, neon/cold cathode, fluorescent (requires GRX-FDBI-16A-120 or Hi-Power 2•4•6™), electronic low-voltage (requires ELVI-1000 or *Hi-Power 2•4•6*). Outputs are compatible with Lutron® NGRX-PB-WH and *Hi-Power 2•4•6* Power Boosters for higher wattage applications, and LUT-LBX for low-wattage loads.
Maximum Load	1920 W/VA per control unit, 800 W/VA per zone.
Minimum Load	25 W/VA per zone.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Heat Generated Fully Loaded	82 BTUs per hr.
Line-Voltage Connections	*See Fig. 6, pg. 122*.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. Lutron wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Maximum of 2000 feet (610 m) total. Must be wired in a daisy-chain configuration. *See Fig. 5, pg. 122*.
Low-Voltage Connections	One 4-pin removable terminal block. Each of the four terminals will accept up to two #18 AWG (1.0 mm^2) wires. Do not connect Terminal 2 on processor communication link connector.
Addressing	Via rotary dial located behind faceplate. Use 1 of 8 addresses on a GRAFIK Eye® link.
Diagnostics	LED provided to indicate proper communications with processor.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Air Gap	Provided when all six circuits are off.
Fail-Safe Operation	In the unlikely event that communication with the processor is interrupted, all wallbox power modules will still operate, offering local control.
Dimensions	*See Figs. 1, 2, pg. 121*.
Mounting	4-gang US wallbox, 2¾ in (70 mm) deep minimum, 3½ in (89 mm) deep recommended for ease of wiring. If mounting one control above another, leave at least 4½ in (11.4 cm) vertical spacing between them.
Shipping Weight	2 lbs. (0.9 kg)

Wallbox Power Module (cont.)

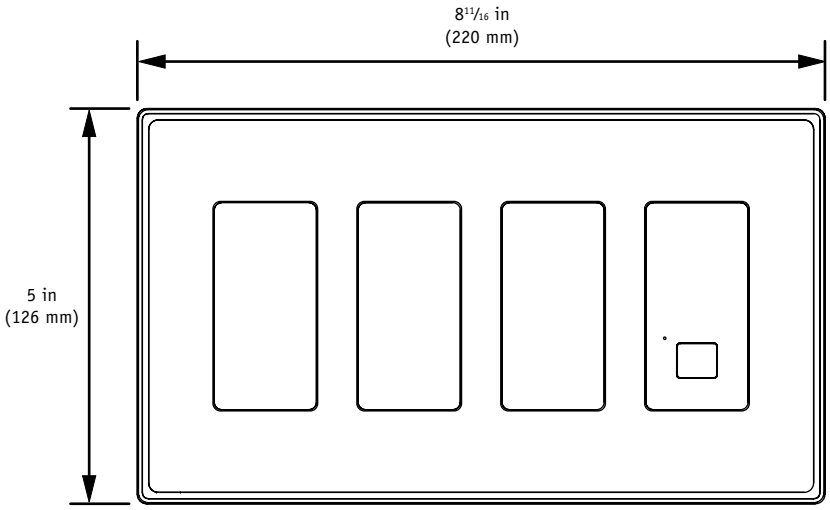


***Figure 1* – Front View Dimensions**

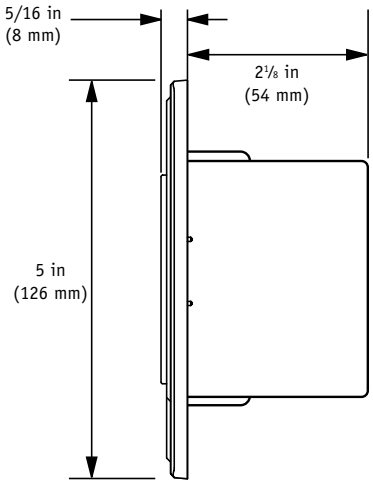


***Figure 2* – Side View Dimensions**

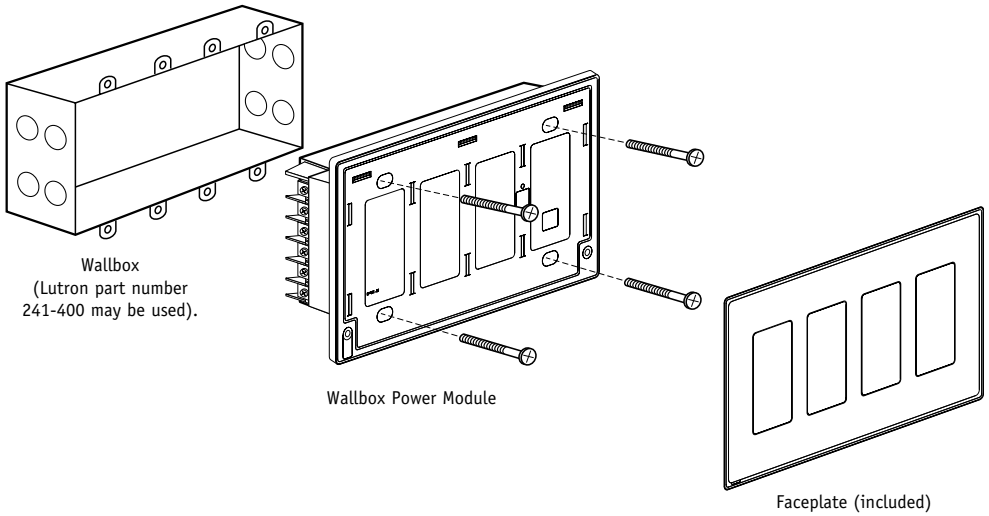


***Figure 3* – Mounting**

BACK ROOM

Wallbox Power Module (cont.)

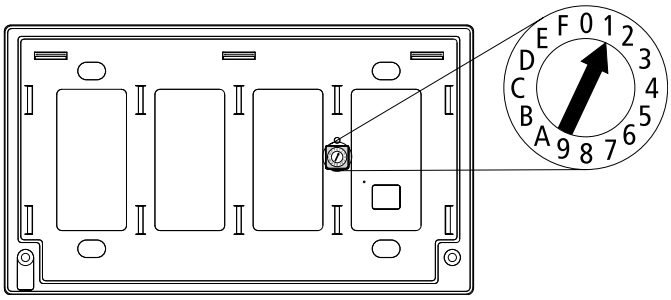


***Figure 4* – Rotary Address Dial Location**
(faceplate removed)

Position	Proper Module Output/Purpose
0	All Zones OFF
1-8	Address for normal operation
9	Zone 1 Full ON, all others OFF
A	Zone 2 Full ON, all others OFF
B	Zone 3 Full ON, all others OFF
C	Zone 4 Full ON, all others OFF
D	Zone 5 Full ON, all others OFF
E	Zone 6 Full ON, all others OFF
F	All Zones Full ON

***Table 1* – Rotary Address Dial Operation**

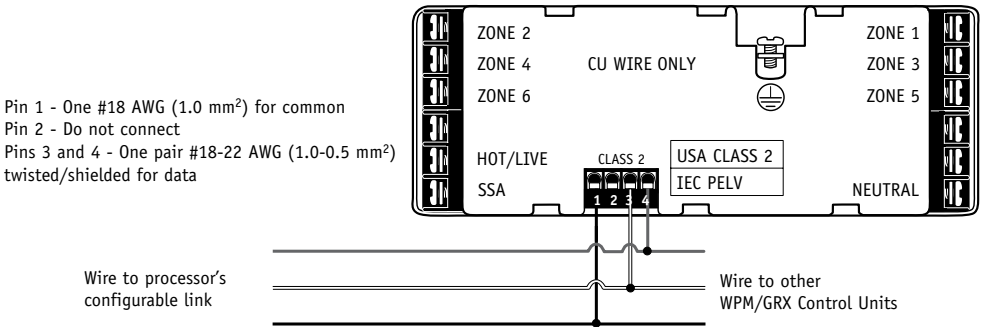


***Figure 5* – Connection to Wired Processor**

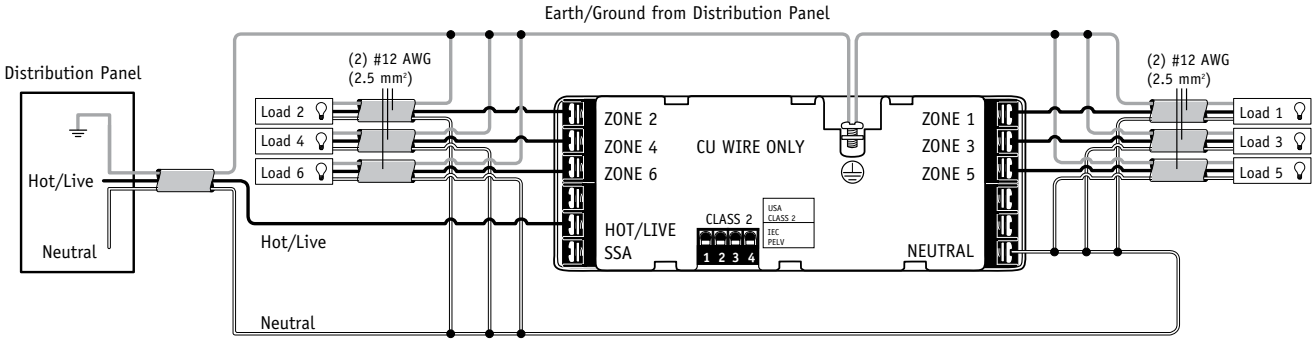


***Figure 6* – Line-Voltage Wiring Diagram**

[1] *Connection between #2 terminals is not made between a Wired Wallbox Power Module and the* HomeWorks® *Processor. Connection between #2 terminals is not made between two Wired Wallbox Power Modules or* GRAFIK Eye® *control units.*

Remote Power Modules

8 Series
Remote Dimming Controls
MI Bus
N/A

HomeWorks® Remote Power Modules (RPMs) are used to control lighting, motor, and fan loads. There are several different models of RPMs. Each model controls specific load types, as noted below. The RPMs are mounted in one of four remote power panels. Model # HWI-PNL-8 and HWBP-8D house up to eight RPMs, model # HWI-PNL-5 houses up to five RPMs, and model # HWBP-2S houses up to two RPM-4Rs.

DIMMING MODULE (MODEL # HW-RPM-4U-120)

Each of the four outputs of the dimming module directly dims or switches incandescent[1], magnetic low-voltage[1], neon/cold cathode, or fluorescent (Tu-Wire®) lighting. Each of the four outputs directly switches electronic low-voltage lighting. The total capacity of a dimming module is 16 A @ 120 V~ (1920 W/VA)[2], comprised of any combination of load types. The total load capacity may be divided among the four outputs in any manner.

ADAPTIVE DIMMING MODULE (MODEL # HW-RPM-4A-120)

Each of the four outputs of the adaptive dimming module auto-senses the load type, and can dim incandescent[1], magnetic low-voltage[1], electronic low-voltage or neon/cold cathode. The adaptive module uses our RTISS-TE™ technology to supply stable power to the lights even in harsh power line conditions. The total load capacity of the module is 16 A @ 120 V~ (1920 W/VA)[2]. The total load capacity of any individual output is 10 A (1200 W/VA)[2].

QUIET FAN SPEED CONTROL MODULE (MODEL # HW-RPM-4FSQ-120)

Each of the four outputs of the fan module controls a single ceiling fan. Each output uses quiet speed control technology that eliminates fan motor buzzing. There are five available speeds: off, low, medium, medium-high, and high. Each output is rated to control a single ceiling fan load up to 2 A @ 120 V~.

MOTOR MODULE (MODEL # HW-RPM-4M-120)

Each motor module controls four 3-wire 120 V~ motors for applications such as shades, draperies, and hurricane shutters. Individual control outputs use two mechanically interlocked relays for directional control that prevents simultaneous operation of both outputs. Maximum relay contact rating is 1/4 HP, 5 A @ 120 V~ for motor loads, and 3 A @ 120 V~ for tungsten loads.

POWER RELAY MODULE (MODEL # HW-RPM-4R)

Each of the four outputs of the power relay module directly switches incandescent, neon/cold cathode, magnetic low-voltage, electronic low-voltage, fluorescent, or high intensity discharge (HID), making this module ideal for high-wattage applications, such as landscape and security lighting. The total capacity of a power relay module is 64 A @ 120 V~ (7680 W/VA). The total load capacity of any individual output is limited to 16 A @ 120 V~ (1920 W/VA), 1/3 HP.

CONNECTION TO MODULE INTERFACE

All RPMs must be connected to a module interface housed within the same panel enclosure. If a processor is located in the same enclosure as RPMs, a processor with an integral module interface must be used. RPMs within an enclosure are connected to the module interface using a Lutron-provided harness. To minimize the effects of single power supply failure, each RPM is powered by its own internal power supply.

TECHNOLOGY

RTISS®: Real-Time Illumination Stability System. This Lutron® patented filter circuit technology compensates for incoming line-voltage variations, such as changes in RMS (Root Mean Square) voltage, frequency shifts, harmonics, and line noise.

RTISS-TE™: Real-Time Illumination Stability System, Trailing Edge. Same as *RTISS*, but operates on the trailing edge of the ac sine wave. This allows for true instantaneous voltage compensation.

Softswitch™: Our exclusive *Softswitch* circuitry prevents the relay contacts from arcing. Even when fully loaded, the arc reduction extends a relay's average rated life to more than 1,000,000 on/off cycles.

[1] In rare cases, incandescent lamps and magnetic low-voltage transformers will "buzz" or "hum." The HW-HIFC-10-2 Filter Choke assembly reduces this hum. The Filter Choke Assembly can be installed in place of module 8 in an HWI-PNL-8 Remote Power Panel. *See pg. 118 for additional information.*

[2] For higher wattages or for load types other than those listed, a Power Booster or Interface is required. *See pg. 107 for more information.*

Remote Power Modules (cont.)

Position	Module Output/Purpose
0	All outputs OFF
1-8	Address for normal operation
9, A	Not used
B	Output 1 ON Use for temporary lighting and zone testing
C	Output 2 ON Use for temporary lighting and zone testing
D	Output 3 ON Use for temporary lighting and zone testing
E	Output 4 ON Use for temporary lighting and zone testing
F	All outputs ON Use for temporary lighting and zone testing

***Table 1* — Address Switch position for HW-RPM-4U, 4A, 4R, 4FSQ**

Position	Module Output/Purpose
0	All relays OFF
1-8	Address for normal operation
9, A-D	Not used
E	All raise relays ON Use for directional motor testing
F	All lower relays ON Use for directional motor testing

***Table 2* — Address Switch position for HW-RPM-4M**

Unit LED Status	Possible Cause
Off	No Power or Defective Module
1 blink per sec.	Normal Operation "Heartbeat"
1 blink per 7 seconds "lighthouse"	Not communicating with processor: open control harness; module set on invalid or diagnostic address; system not properly configured or addressed in HomeWorks software
4 blinks; pause; repeat	Module in Manual Override

***Table 3* — Diagnostic LED status for HW-RPM-4U, 4A, 4R, 4M, 4FSQ**

Zone LED Status	Load Status	Description
Off	OFF	Normal; Load Off
Continuously On	ON	Inc./Electronic Dimmer
1 blink per second	ON	Magnetic Dimming
Error Codes		
1 blink; pause; repeat	OFF	Load Short Circuit/Overload[1]
2 blinks; pause; repeat	OFF	Inductive Load[2]
3 blinks; pause; repeat	ON Full	Shorted Component[3]
4 blinks; pause; repeat	OFF	DC Detection[4]

1. Locate and repair fault. Cycle power to RPM.
2. Check software configuration. MLV load detected with ELV software setting.
3. Replace RPM. Internal device (FET) shorted.
4. Possible faulty MLV load.

***Table 4* — Zone Diagnostic LED Status (4A only)**

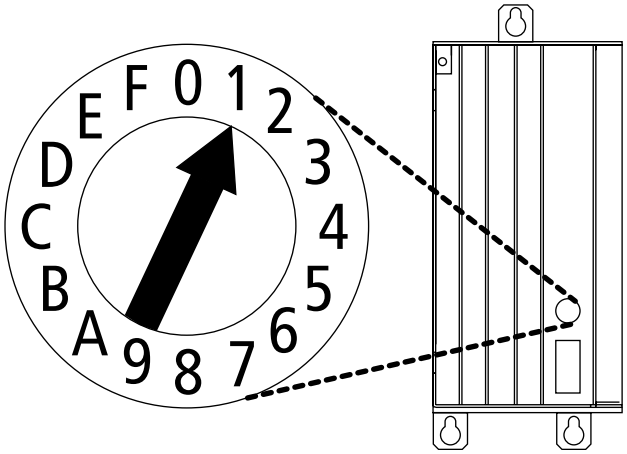


***Figure 3* — Enlarged view of Address Switch**

Remote Power Modules (cont.)

All Remote Power Modules

Model Numbers	HW-RPM-4U-120: Dimming Module. HW-RPM-4A-120: Adaptive Dimming Module. HW-RPM-4FSQ-120: Quiet Fan Speed Control Module. HW-RPM-4M-120: Motor Module. HW-RPM-4R: Power Relay Module.
Input Voltage	RPM-4U, RPM-4A, RPM-4M, RPM-4E, RPM-4FSQ: 120 V~ 50/60 Hz RPM-4R: 100-277 V~ 50/60 Hz
Number of Outputs	4
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Heat Generated Fully Loaded	HW-RPM-4U-120: 82 BTUs per hour HW-RPM-4A-120: 82 BTUs per hour HW-RPM-4FSQ-120: 18 BTUs per hour HW-RPM-4M-120: 18 BTUs per hour HW-RPM-4R: 18 BTUs per hour
Line-Voltage Connections	Separate line-voltage feeds at the DIN rail terminal blocks for each RPM. Terminal blocks should be tightened to 3.5 in.-lbs. to 5.0 in.-lbs. (0.40 N•m to 0.57 N•m).
Low-Voltage Communications	Via Lutron-provided communication harness.
Addressing	Via rotary switch. Counts as 1 of 8 RPM addresses per MI. *See pg. 124.*
Diagnostics	LED provided to indicate proper communications with Module Interface.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Air Gap	4U, 4A, 4FSQ, 4M: Provided when all four circuits are off. 4R: Individual output airgap is provided when each circuit is off.
Fail-Safe Operation	Rotary switch on the RPM allows for manual operation of each load.
Dimensions	3⅞ in (99 mm) wide x 7 in (178 mm) high
Mounting	HWI-PNL-8 and the HWBP-8D remote power panels will hold up to 8 RPMs. HWI-PNL-5 remote power panel will hold up to 5 RPMs. HWBP-2S rremote power panel will hold up to 2 RPM-4Rs. **Note:** RPMs may hum slightly and internal relays will click when in use. Mount where such noise is acceptable. Locate at least 6 feet (1.8 m) away from sensitive electronic equipment.
Shipping Weight	2.2 lbs. (1.0 kg)
Minimum Load	25 W/VA per output.
Lamp Buzz	Lamp debuzzing coils are available from Lutron to reduce lamp filament buzzing. (Lutron® model # HW-HIFC-10-2, LDC-10-TCP, or LDC-16-TCP).

Remote Power Modules (cont.)

HW-RPM-4U-120 • Dimming Module

Load Types	Incandescent[1], magnetic low-voltage[1], electronic low-voltage[2], neon/cold cathode, Lutron® Tu-Wire® Fluorescent Dimming Ballasts, or Lutron Hi-Lume® and ECO-10® Fluorescent Dimming Ballasts (using GRX-FDBI-16A-120 Interface). Outputs are compatible with Lutron NGRX-PB-WH, and HP 2•4•6 Power Boosters for higher wattage applications.
Maximum Load	For 20 A branch circuit, total load per module: 16 A continuous, total load per switch leg: 16 A continuous. For 15 A branch circuit, total load per module: 12 A continuous, total load per switch leg: 12 A continuous.
Wiring	*See Fig. 1, pg. 128*. Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm²) wire or two #18-16 AWG (1.0-1.5 mm²) wires.
Technology	Forward phase control using triac technology with RTISS® line noise filtering.
Interference Suppression	EMI/RFI suppression circuitry.
Air Gap	Provided when all four circuits are off.

HW-RPM-4A-120 • Adaptive Dimming Module

Load Types	Incandescent[1], magnetic low-voltage[1], electronic low-voltage, and neon/cold cathode.
Maximum Load	For 20 A branch circuit, total load per module: 16 A continuous, total load per switch leg: 10 A continuous. For 15 A branch circuit, total load per module: 12 A continuous, total load per switch leg: 10 A continuous.
Wiring	*See Fig. 1, pg. 128*. Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm²) wire or two #18-16 AWG (1.0-1.5 mm²) wires.
Technology	Patented Adaptive load-sensing FET technology with RTISS-TE™ line noise filtering.
Interference Suppression	EMI/RFI suppression circuitry.
Air Gap	Provided when all four circuits are off.

HW-RPM-4FSQ-120 • Quiet Fan Speed Control Module

Load Type	Ceiling fan.
Maximum Load	2 A per output, single ceiling fan.
Wiring	*See Fig. 1, pg. 128*. Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm²) wire or two #18-16 AWG (1.0-1.5 mm²) wires.
Technology	Switched capacitor quiet control circuitry.
Number of Speeds	Five: off, low, medium, medium-high, high.
Interference Suppression	EMI/RFI suppression circuitry.
Air Gap	Provided when all four circuits are off.

[1] In rare cases, incandescent lamps and magnetic low-voltage transformers will "buzz" or "hum". The HW-HIFC-10-2 filter choke assembly reduces this hum. The filter choke assembly can be installed in place of the top RPM in an HWI-PNL-8 Remote Power Panel.

[2] HW-RPM-4U-120 requires ELVI-1000 to dim ELV loads. No interface required to switch ELV with the HW-RPM-4U-120. Use the HW-RPM-4A-120 to eliminate need for this interface.

Remote Power Modules (cont.)

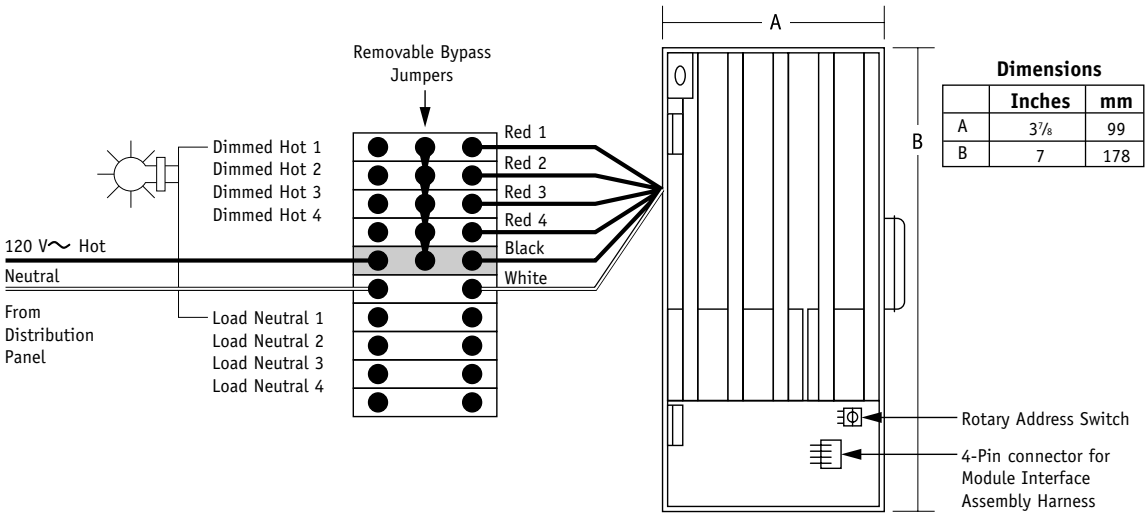
HW-RPM-4M-120 • Motor Module

Load Types	Bi-directional three-wire 120 V~ motor loads, or incandescent non-dim. Outputs are not rated for switching electronic low-voltage or electronic ballasts.
Maximum Load	For 20 A branch circuit, 1/4 HP per circuit. 5 A maximum per circuit for motor loads, 3 A maximum per circuit for tungsten loads.
Wiring	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Requires that four additional terminal blocks (included) be mounted onto the DIN rail assembly. *See Fig. 2, pg. 128*.
Technology	Relay switching, mechanical-interlocked relays guarantee motor protection.
Interference Suppression	EMI/RFI suppression circuitry.
Air Gap	Provided when all four circuits are off.

HW-RPM-4R • Power Relay Module (120 V-277 V) Softswitch®

Load Types	Non-dim loads.
Maximum Load	For 20 A branch circuits, total load per RPM: 64 A continuous, total load per switch leg: 16 A continuous, 1/3 hp For 15 A branch circuits, total load per RPM: 48 A continuous, total load per switch leg: 12 A continuous, 1/3 hp
Wiring	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Requires the installation of four additional gray terminal blocks (included) and three additional black terminal blocks (included) to be mounted on to the DIN rail assembly. *See Fig. 3, pg. 128*. Gray terminal blocks accept one #18-8 AWG (1.0-10 mm^2) wire or two #16-12 AWG (1.5-4.0 mm^2) wires.
Technology	Relay switching with Softswitch patented triac arc suppression technology utilized for million-cycle relay life.
Interference Suppression	EMI/RFI suppression circuitry.
Air Gap	Provided when each circuit is off.

Remote Power Modules (cont.)



Dimensions

	Inches	mm
A	3⅞	99
B	7	178

***Figure 1* – HW-RPM-4U-120, HW-RPM-4A-120 and HW-RPM-4FSQ-120**

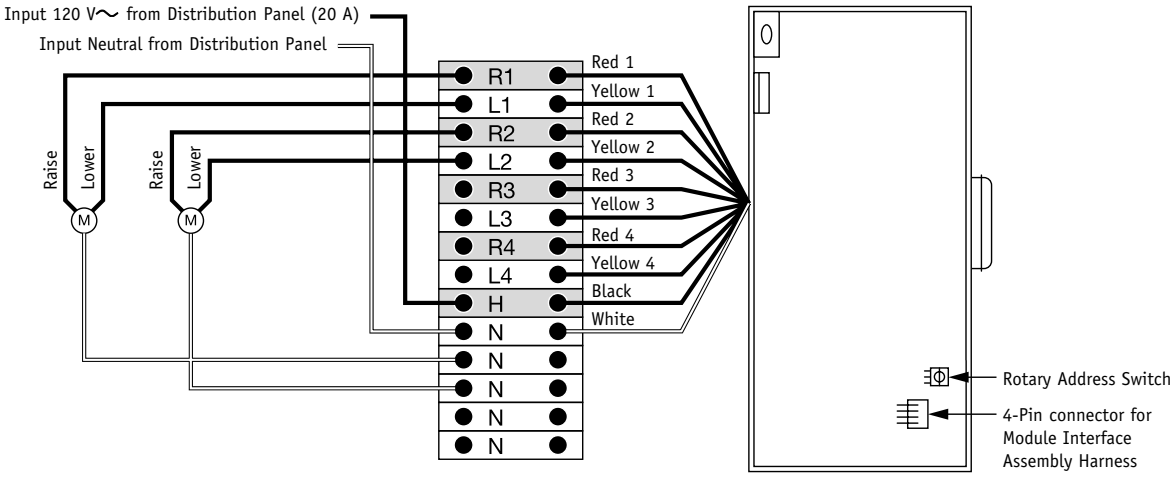


***Figure 2* – HW-RPM-4M-120**

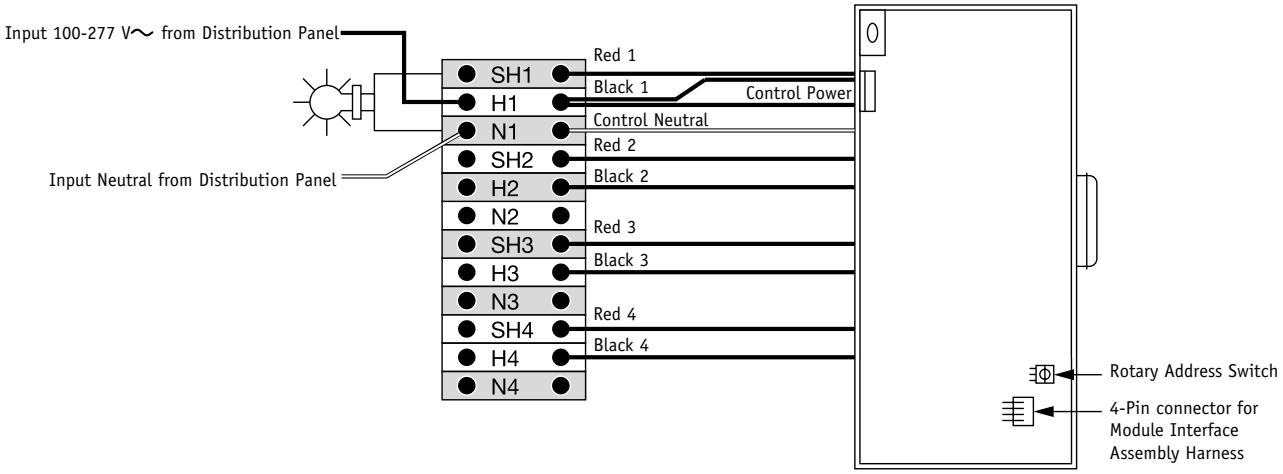


***Figure 3* – HW-RPM-4R**

BACK ROOM

D48 Dimmer Interface

8 Series
Dimmer Interface
D48 Link
N/A

Each D48 dimmer interface controls up to 48 wired Vareo® local lighting controls and are available in two configurations: either integral to a HomeWorks® wired processor or as a stand-alone component. *See Table 1, pg. 90 for processor details.*

STAND-ALONE DIMMER INTERFACES (MODEL # HWI-D48)

Each stand-alone dimmer interface (model # HWI-D48) expands the capacity of the *HomeWorks* wired processor by providing control of up to 48 additional wired *Vareo* Local lighting controls. Each stand-alone dimmer interface installs in either a 32-inch (81 cm) low-voltage enclosure (model # HWI-LV32-120) with a wired processor or in a 17-inch (43 cm) low-voltage enclosure (model # HWI-LV17-120).

INTEGRAL D48 DIMMER INTERFACE

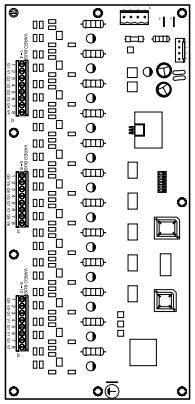
Certain *HomeWorks* wired processors contain integral D48 dimmer interfaces, allowing up to 48 wired *Vareo* local lighting controls to be connected directly to the processor. Processors with integral dimmer interfaces may be installed in either a 59-inch (150 cm) remote power panel (model # HWI-PNL-8) or in a 32-inch (81 cm) low-voltage enclosure (model # HWI-LV32-120). The integral D48 dimmer interface is always address "0," and wired to Link 4.

LOCAL LIGHTING CONTROL COMMUNICATIONS

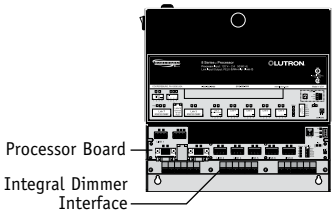
Each D48 dimmer interface has twelve communication buses that are used to communicate with the wired local lighting controls. Each of the twelve buses support a maximum of four uniquely-addressed wired *Vareo* local lighting controls. The maximum total cable length for each communication bus is 500 feet (152 m). Buses may be wired in a daisy-chain, home run, star, or T-tap configuration.

CONNECTION TO WIRED PROCESSOR

Each *HomeWorks* wired processor has configurable links, each capable of controlling up to four dimmer interfaces, one of which may be integral to the processor. No more than four dimmer interfaces can be connected to a single processor. All dimmer interfaces must be connected to the same configurable link. This connection requires two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used. The maximum cable length is 1,000 feet (305 m), and this link must be wired in a daisy-chain configuration.



Stand-Alone Dimmer Interface (HWI-D48)



Integral Dimmer Interface (H8P5-D48-120 or H8P5-MI-D48-120)

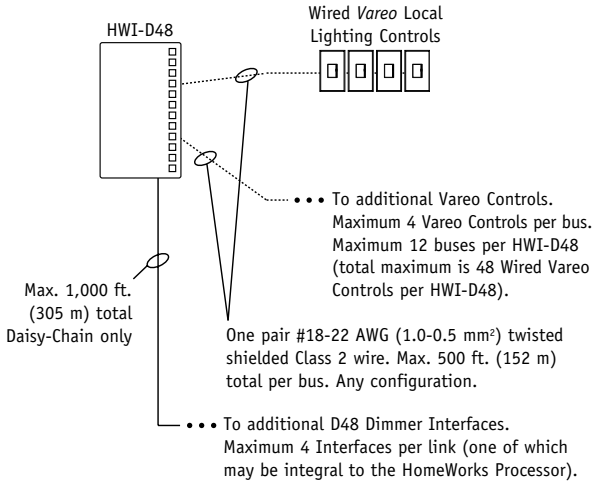


***Figure 1* – Communication Wiring**

BACK ROOM

D48 Dimmer Interface

Specifications apply to HWI-D48 Stand-Alone Dimmer Interfaces and to Dimmer Interfaces integral to processors

Model Numbers	HWI-D48-120: Stand-Alone D48 Dimmer Interface. H8P5-D48-120: 8 Series P5 Processor with integral D48 Dimmer Interface. H8P5-MI-D48-120: 8 Series P5 Processor with integral D48 Dimmer Interface.
Capacity	Controls up to 48 wired Vareo® local lighting controls.
Input Voltage	Stand-Alone: 12 V~ from power supply in the HWI-LV17-120 or HWI-LV32-120. Integral: Pre-wired in processor from factory.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Low-Voltage Wire Type	Processor to D48 wire: Two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. Lutron® wire model #GRX-CBL-346S-500 may be used. D48 to wired *Vareo* local lighting control wire: One pair #22 AWG (0.5 mm^2) twisted shielded Class 2 wire.
Low-Voltage Wiring Configuration	Between processor and D48s: daisy-chain only. Termination required if total cable length exceeds 50 feet (15 m). Total length of wire on any link cannot exceed 1000 feet (305 m). Maximum four D48s per processor link that has been configured for dimmer interfaces. Between D48 and wired *Vareo* local lighting controls: daisy-chain NOT required (star, T-tap, daisy-chain, etc. all permitted). Termination not required. Total length of wire on any *Vareo* bus cannot exceed 500 feet (150 m). Maximum four *Vareo* local lighting controls per D48 *Vareo* bus. Maximum twelve dimmer buses per D48. See Fig. 1, pg. 129.
Low-Voltage Connections	Wired processor: One 4-pin removable terminal block. Each terminal will accept up to two #18 AWG (1.0 mm^2) wires. Wired *Vareo* local lighting control: Twelve 2-pin removable terminal blocks. Each terminal will accept up to two #18 AWG (1.0 mm^2) wires.
Addressing	Stand-alone: Via DIP Switch. Counts as 1 of 4 D48 addresses. *See Fig. 3, pg. 131.* Integral: Factory-set to address 1.
Diagnostics	Dimmer and processor communications, heartbeat, and power LEDs.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Miswire Protection	RS-485 ports are over-voltage protected and miswire-protected against wire reversals and shorts. *Vareo* buses are miswire-protected against gray-violet shorts and reversals.
Dimensions	5¼ in (13.3 cm) x 11¼ in (28.6 cm)
Mounting	Stand-alone: Mount inside HWI-LV32-120 or HWI-LV17-120. Integral: Pre-mounted in wired processor H8P5-D48-120 or H8P5-MI-D48-120.
Shipping Weight	1 lb. (0.45 kg)

D48 Dimmer Interface (cont.)

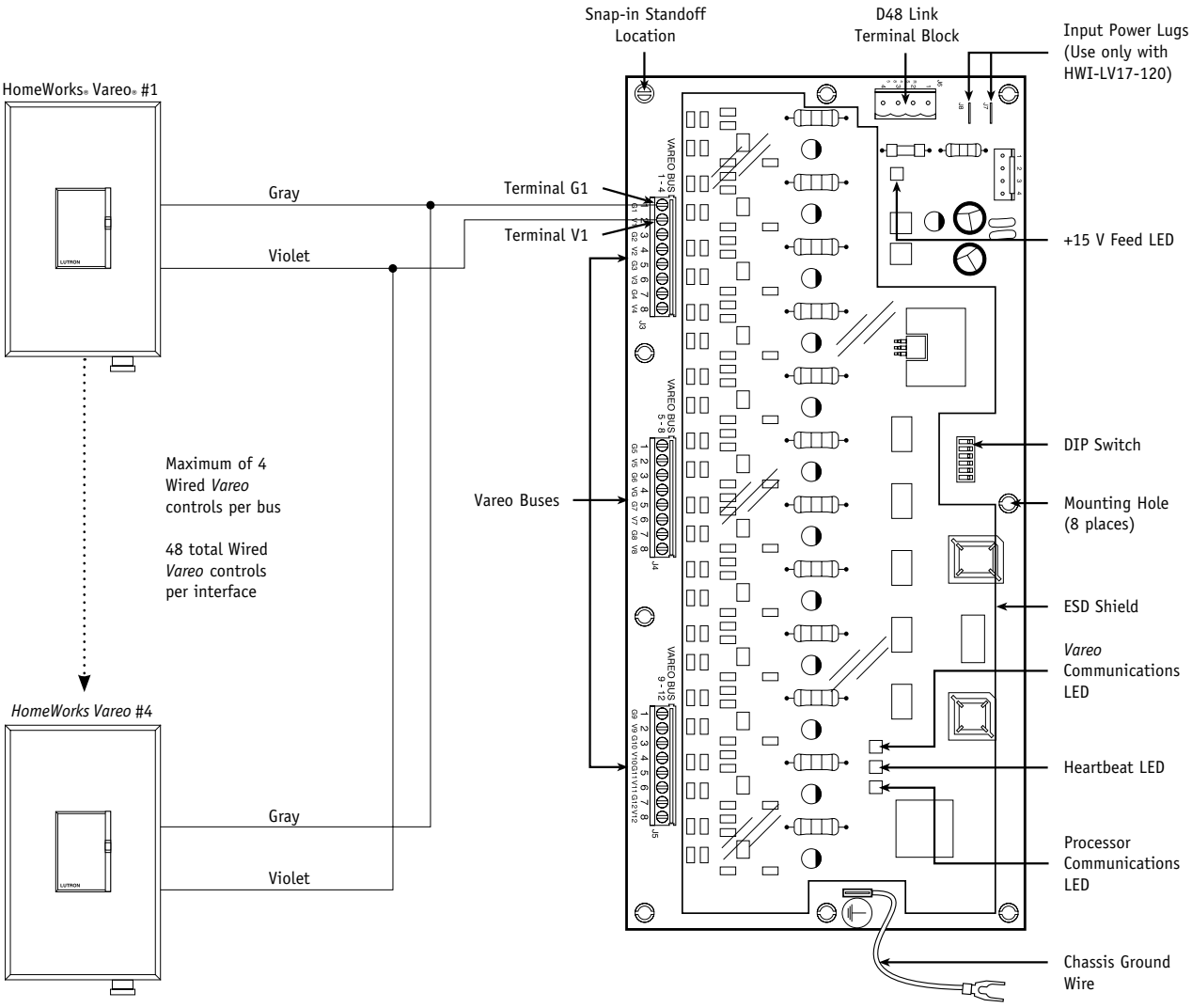


***Figure 2* – Wiring and Callouts**

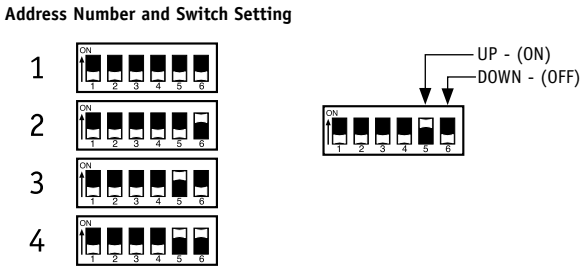


***Figure 3* – DIP Switch Settings**

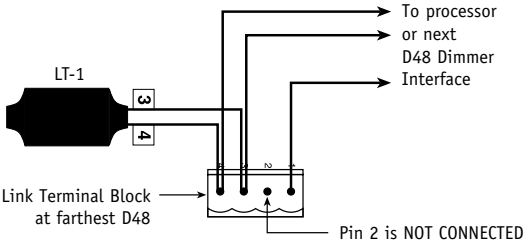


***Figure 4* – LT1 Installation**

BACK ROOM

H48 Dimmer Interface

4/8 Series
Dimmer Interface
H48/Q96 Link
N/A

Each H48 dimmer interface controls up to 48 wired Maestro® local controls and is available in two configurations: either integral to a HomeWorks® wired processor or as a stand-alone component. *See Table 1, pg. 90 for processor details.*

STAND-ALONE DIMMER INTERFACE (MODEL # HWI-H48)

Each stand-alone dimmer interface (model # HWI-H48) expands the capacity of the *HomeWorks* wired processor by providing control of up to 48 additional wired *Maestro* local controls. Each stand-alone dimmer interface installs in either a 32-inch (81 cm) low-voltage enclosure (model # HWI-LV32-120) with a processor or in a 17-inch (43 cm) low-voltage enclosure (model #HWI-LV17-120).

INTEGRAL H48 DIMMER INTERFACE

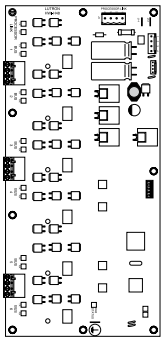
Certain *HomeWorks* wired processors contain integral H48 dimmer interfaces, allowing up to 48 wired *Maestro* local controls to be connected directly to the processor. Processors with integral dimmer interfaces may be installed in either a 59-inch (150 cm) remote power panel (model # HWI-PNL-8) or in a 32-inch (81 cm) low-voltage enclosure (model # HWI-LV32-120). The integral H48 dimmer interface is always address "1," and wired to Link 4.

LOCAL LIGHTING CONTROL COMMUNICATIONS

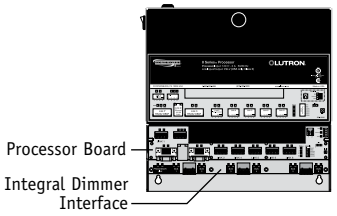
Each H48 dimmer interface has six communication buses that are used to communicate with the wired local controls. Each of the six buses support a maximum of eight uniquely-addressed wired *Maestro* local controls. Each *Maestro* bus may have a max 500 ft (152.5 m) per wire run but may not exceed 1000 ft (305 m) total per bus. Buses may be wired in a daisy-chain, home run, star, or T-tap configuration.

CONNECTION TO WIRED PROCESSOR

Each *HomeWorks* wired processor has configurable links, each capable of controlling up to four dimmer interfaces, one of which may be integral to the processor. No more than four dimmer interfaces can be connected to a single processor. All dimmer interfaces must be connected to the same configurable link. This connection requires two pair – one pair #18 AWG (1.0 mm²), one pair #18-22 AWG (1.0-0.5 mm²) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used. The maximum cable length is 1000 ft (305 m), and this link must be wired in a daisy-chain configuration.



Stand-Alone Dimmer Interface (HWI-H48)



Integral Dimmer Interface - shown in 8 Series processor (H8P5-H48-120, H8P5-MI-H48-120, H4P5-H48-120, or H4P5-H48-HRL-120)

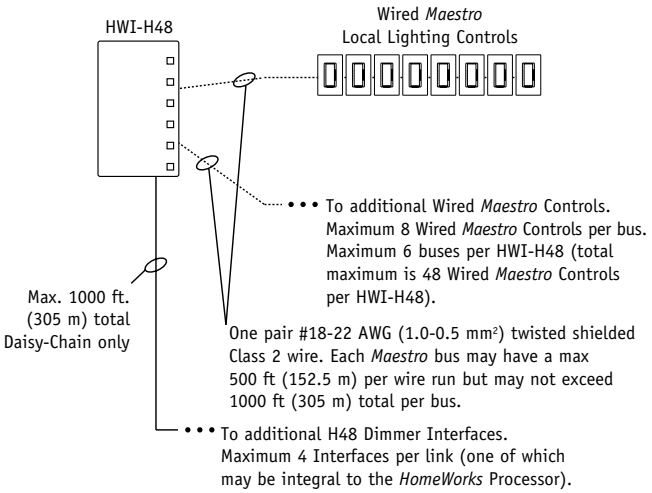


***Figure 1* – Communication Wiring**

H48 Dimmer Interface (cont.)

Specifications apply to HWI-H48 Stand-Alone Dimmer Interface and to Dimmer Interface integral to processors

Model Numbers	HWI-H48-120: Stand-Alone H48 Dimmer Interface. H8P5-H48-120: 8 Series Wired Processor with integral H48 Dimmer Interface. H8P5-MI-H48-120: 8 Series Wired Processor with integral Module Interface and H48 Dimmer Interface. H4P5-H48-120: 4 Series Wired Processor with integral H48 Dimmer Interface. H4P5-H48-HRL-120: 4 Series Wired Processor with integral H48 Dimmer Interface and Hybrid Repeater Link.
Capacity	Controls up to 48 wired Maestro® local lighting controls.
Input Voltage	Stand-alone: 12 V~ from power supply in the HWI-LV17-120 or HWI-LV32-120. Integral: Pre-wired in processor from factory.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Low-Voltage Wire Type	Processor to H48 wire: Two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used. H48 to wired *Maestro* local control wire: One pair #22 AWG (0.5 mm^2) twisted shielded Class 2 wire.
Low-Voltage Wiring Configuration	Between processor and H48s: Daisy-chain only. Termination required if total cable length exceeds 50 feet (15 m). Total length of wire on any link cannot exceed 1000 feet (305 m). Maximum four H48s per processor link that has been configured for Dimmer Interfaces H48/Q96. Between H48 and wired *Maestro* local controls: Daisy-chain NOT required (star, T-tap, daisy-chain, etc. all permitted). Termination not required. Each *Maestro* bus may have a max 500 feet (152.5 m) per wire run but may not exceed 1000 feet (305 m) total per bus. Maximum eight *Maestro* local controls per H48 Maestro bus. Maximum six dimmer buses per H48. See Fig. 1, pg. 132.
Low-Voltage Connections	Wired Processor: One 4-pin removable terminal block. Terminal block will accept up to two #18 AWG (1.0 mm^2) wires. Wired *Maestro* local control: Six 2-pin removable terminal blocks. Each terminal will accept up to two #18 AWG (1.0 mm^2) wires.
Addressing	Stand-alone: Via DIP Switch. Counts as 1 of 4 H48 addresses. *See Fig. 3, pg. 134.* Integral: Factory-set to address 1.
Diagnostics	Dimmer and processor communications, heartbeat, and power LEDs.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Miswire Protection	*Maestro* buses are miswire-protected against gray-violet shorts. H48 buses are non-polarized.
Dimensions	5¼ in (13.3 cm) x 11¼ in (28.6 cm)
Mounting	Stand-alone: Mount inside HWI-LV32-120 or HWI-LV17-120. Integral: Pre-mounted in wired processor H8P5-H48-120, H8P5-MI-H48-120, H4P5-H48-120, or H4P5-H48-HRL-120.
Shipping Weight	1 lb. (0.45 kg)

H48 Dimmer Interface (cont.)

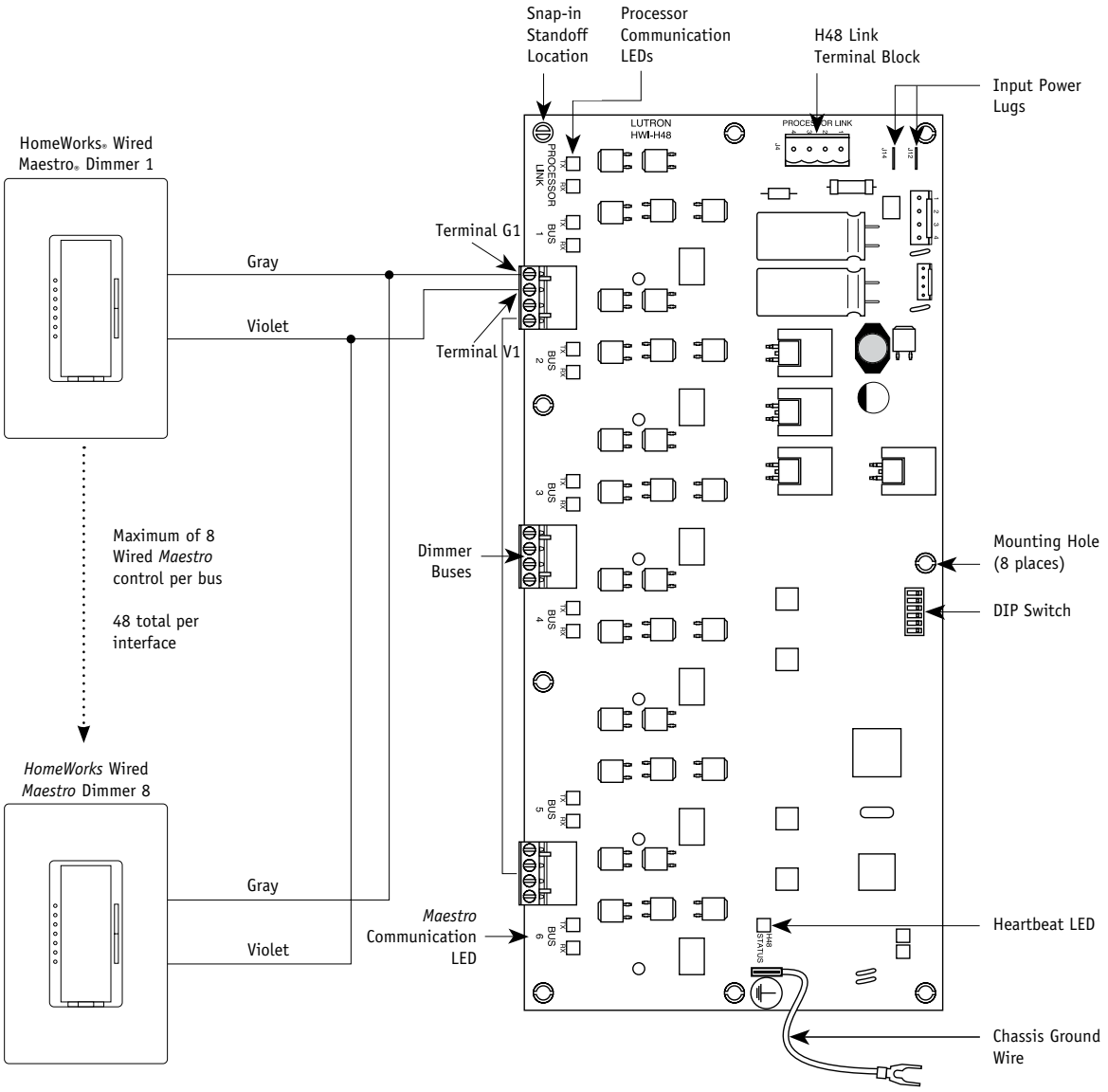


***Figure 2* – Wiring Callouts**

Address Number and Switch Setting

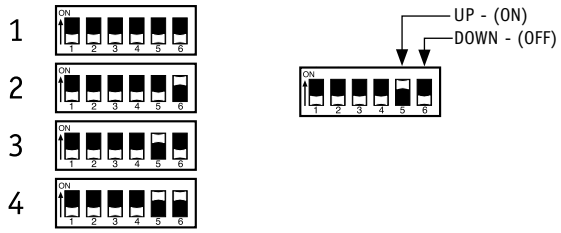
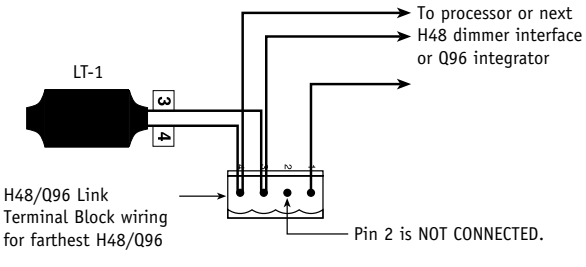


***Figure 3* – DIP Switch Settings**



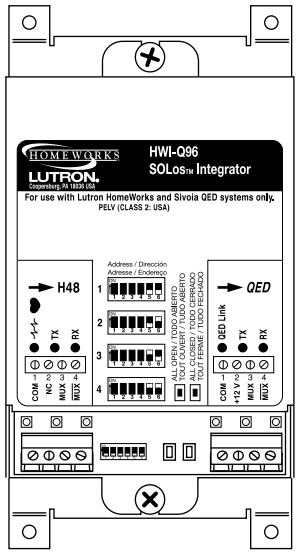
Note: Do not use an LT1 on a Dimmer Bus Link.

***Figure 4* – LT1 Installation**

BACK ROOM

Q96 Integrator for HomeWorks® and Sivoia QED®

4/8 Series
QED Interface
H48/Q96 Link
N/A



Q96 Integrator for *HomeWorks* and *Sivoia QED* (HWI-Q96)

Q96 INTEGRATOR FOR HOMEWORKS AND SIVOIA QED (MODEL# HWI-Q96)

The Q96 integrator allows the *HomeWorks* system to precisely control up to 96 individual *Sivoia QED* shades and draperies. Shades or draperies can be set to OPEN, CLOSED, or anywhere in between. There is no need to group shades in hardware because the Q96 integrator provides flexibility to accomplish any grouping via software.

INSTALLATION INFORMATION

The Q96 integrator can be mounted in a *HomeWorks* low-voltage enclosure in place of any contact closure interface board (HWI-CCI or HWI-CCO). See low-voltage enclosure instructions to determine where contact closure interface boards can be mounted on page 155. If space does not permit an enclosure, the Q96 integrator can be mounted as a stand-alone device.

The Q96 receives its power from the *Sivoia QED* shades. A minimum of 2 shades must be connected to power the Q96.

CONNECTION TO WIRED PROCESSOR

The Q96 integrator connects to a configurable link configured for H48/Q96. Up to four Q96 integrators can be connected to a H48/Q96 configurable link. Note that Q96 integrators and H48 dimmer interface boards can be used on the same link as long as their number does not exceed 4 and the total number of lighting/shading zones does not exceed 256 per processor.

For additional details on Q96 integrator & *Sivoia QED* wiring, see Appendix B: *Sivoia QED* Overview.

Q96 Integrator for HomeWorks® and Sivoia QED™ (cont.)

Model Number	HWI-Q96: Q96 Integrator for *HomeWorks* and *Sivoia QED*
Input Voltage	12 V⎓ (from pin 2 of *Sivoia QED* link)
Regulatory Approvals	Class 2 device
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. Lutron wire model # GRX-CBL-346S-500 may be used. For connection to *Sivoia QED* link, the #18 AWG wire must be used for +12 V and Common. **Note:** HWI-Q96 derives its power from the *Sivoia QED* link.
Low-Voltage Wiring Configuration	Between processor and Q96: Daisy-chain only. Termination required if total cable length exceeds 50 feet (15 m). Total length of wire on any link can not exceed 1000 feet (305 m). Maximum of four Q96 integrators and H48 dimmer interfaces per processor link configured for H48/Q96. Between Q96 and *Sivoia QED* commuication link: Daisy-chain or home run. Termination not required. Maximum of 96 *Sivoia QEDs* per link. Total wire run distance for the entire *Sivoia QED* system can not exceed 4000 feet (1220 m).
Low-Voltage Connections	Between processor and Q96: One 4-pin removable terminal block. Terminal block will accept up to two #18 AWG (1.0 mm^2) wires. Between Q96 and *Sivoia QED*: One 4-pin removable terminal block. Terminal block will accept up to two #18 AWG (1.0 mm^2) wires.
Addressing	Via DIP switch. Set DIP switches 5-6 to give the Q96 a unique address from 1 to 4. DIP switches 1-4 should always be in the down position. Counts as one address on the H48/Q96 link. *See Fig. 3, pg. 137.*
Diagnostics	Between processor and Q96: The *HomeWorks* "heartbeat" LED will be flashing to indicate communication with the processor. If the LED is off, check the connections. Between the Q96 and *Sivoia QED*: The *Sivoia QED* TX and RX communication LEDs are normally off. After limits have been set for each QED, Use the 'All Open' or 'All Closed' button and check the *Sivoia QED* communications LEDs (TX and RX) for flashing after the button is pressed.
ESD Protection	Meets or exceeds IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41
Dimensions	*See Fig. 1, pg. 137.*
Mounting	Mounts in the following enclosures: HWI-LV32-120, , HWI-LV24-120, HWI-LV17-120, and HWI-ENC-CC
Shipping Weight	1.3 lbs. (0.59 kg)

Q96 Integrator for HomeWorks® and Sivoia QED™ (cont.)

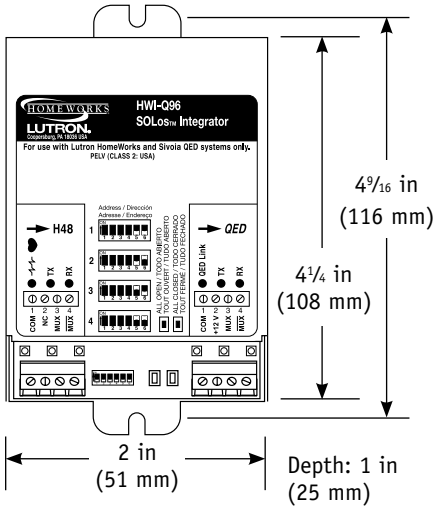
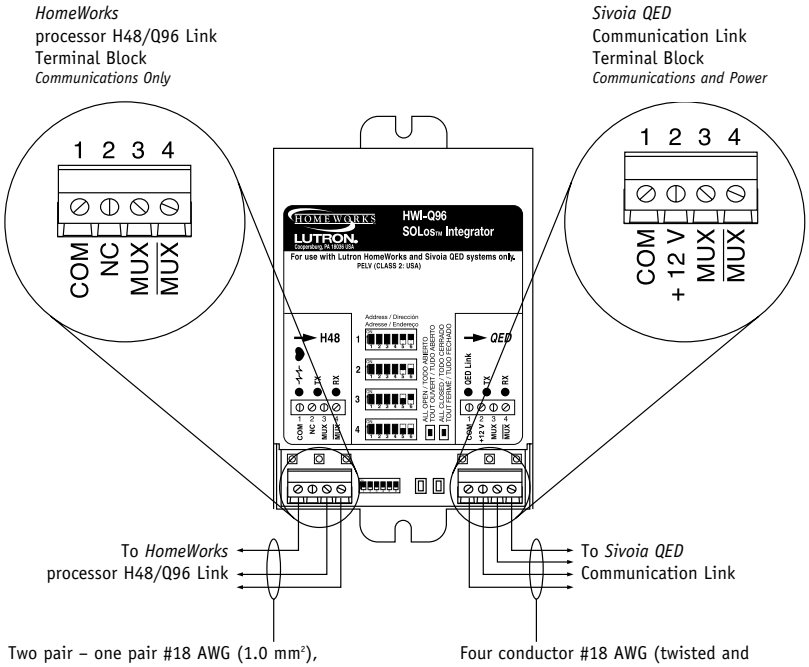


***Figure 1* – Dimensions**



Two pair – one pair #18 AWG (1.0 mm²), one pair #22-18 AWG (0.5-1.0 mm²) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used so long as one of the #18 AWG wires is used for Common (terminal 1). Do not connect terminal 2.

Max. 1000 ft. (305 m) total wire run distance. Daisy-chain wiring configuration only.

Four conductor #18 AWG (twisted and shielded) Class 2 wire. *Lutron* wire model # GRX-CBL-346S-500 may be used if the #18 AWG wires are used for +12 V and Common (terminals 1 & 2).

Max. 4000 ft. (1 220 m) total wire run distance for *Sivoia QED* system. Home run or daisy-chain wiring configuration.

***Figure 2* – Communication Wiring**

Address Number and Switch Setting

Set DIP switches 5-6 to give the HWI-Q96 a unique *HomeWorks* H48/Q96 Link address from 1 to 4. DIP Switches 1-4 should always be in the OFF (DOWN) position.

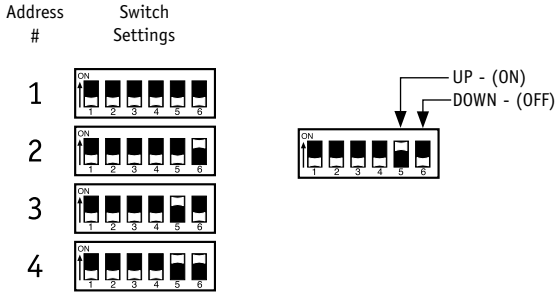
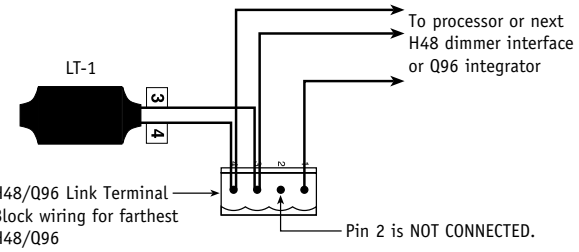


***Figure 3* – DIP Switch Settings**



Note: Do not use an LT1 on a Dimmer Bus Link.

***Figure 4* – LT1 Installation**

BACK ROOM

Module Interface

8 Series
Control Interfaces
MI Link
N/A

Module interfaces control up to eight Remote Power Modules (RPMs) and are available in two configurations: either integral to a HomeWorks® 8 Series processor or as a stand-alone component. Each *HomeWorks* 8 Series processor controls up to 16 module interfaces (one of which may be integral to the processor) and/or spec grade panel interfaces.

STAND-ALONE MODULE INTERFACE (MODEL # HWI-MI-120)

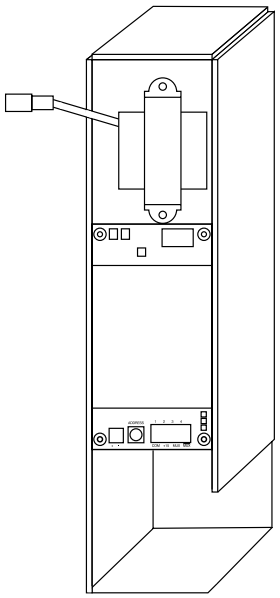
A stand-alone module interface controls up to eight RPMs in a remote power panel enclosure that does not contain a processor. In this configuration, the module interface manages communication between the RPMs and a wired processor located in a separate enclosure. A stand-alone module interface derives power from its own internal power transformer. A stand-alone module interface installs in a 59-inch (150 cm) remote power panel (model # HWI-PNL-8 and HWBP-8D) with up to eight RPMs, in a 32-inch (81 cm) remote power panel (model # HWI-PNL-5) with up to five RPMs, or in a 24-inch (61 cm) Remote Power Panel (model # HWBP-2S) with up to two RPM-4Rs.

INTEGRAL MODULE INTERFACE

Three of the 8 Series processors (model # H8P5-MI-120, H8P5-MI-H48-120 and H8P5-MI-D48-120) contain integral module interfaces, allowing up to eight RPMs to be installed in the same enclosure as a processor. Integral module interfaces receive power from the processor's internal power supply. These processors with integral module interfaces must always be installed in a 59-inch (150 cm) remote power panel (model # HWI-PNL-8). The integral module interface is always address "0".

MANUAL OVERRIDE CAPABILITIES

A manual override input is provided on each module interface, allowing a pre-determined lighting scene to be activated from designated override switches installed anywhere in the home.



Stand-Alone Module Interface (HWI-MI-120)

CONNECTION TO WIRED PROCESSOR

Each *HomeWorks* 8 Series processor has one communication link (Link 1) dedicated to the control of up to 16 MIs. This connection must be daisy-chained and requires two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used.

Module Interface (cont.)

Specifications apply to HWI-MI-120 Stand-Alone Module Interfaces and to Module Interfaces integral to HomeWorks® Processors

Model Numbers	HWI-MI-120: Stand-Alone Module Interface. H8P5-MI-120: 8 Series Wired Processor with integral Module Interface. H8P5-MI-D48-120: 8 Series Wired Processor with integral Module Interface and D48 Dimmer Interface. H8P5-MI-H48-120: 8 Series Wired Processor with integral Module Interface and H48 Dimmer Interface.
Input Voltage	When integral to a processor, the MI is powered by 15 V⎓ provided by terminals 1 and 2 on the processor communications link connector. When a stand-alone MI is used, it is powered by a separate line-voltage feed (120 V~ 50/60 Hz) at the DIN rail terminal blocks and should not have terminal 2 connected on the processor communications link connector.
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm²), one pair #18-22 AWG (1.0-0.5 mm²) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Maximum wire length of 1000 feet (305 m). Must be wired in a daisy-chain configuration. Terminators required if total cable length exceeds 50 feet (15 m).
Low-Voltage Connections	One 4-pin removable terminal block. Each of the four terminals will accept up to two #18 AWG (1.0 mm²) wires.
Addressing	Via rotary switch. Counts as 1 of 16 MI addresses on an MI link.
Diagnostics	Three LEDs for troubleshooting communications with the processor and the RPMs.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Miswire Protection	All terminal block inputs are over-voltage and miswire protected against wire reversals and shorts.
Fail Safe Operations	The manual override scene is activated for all RPMs connected to the MI by closing a switch that is wired between the two manual override terminals. The switch (or relay) contacts must be rated for switching 50 mA at 30 V⎓. A single switch can be used for multiple MIs wired in parallel, but proper polarity must be maintained across all units. In this configuration, the switch must be rated for the sum of the current for all of the MIs connected (e.g., six MIs wired to a single manual override switch requires a switch rated for 300 mA at 30 V⎓).
Mounting Dimensions	*See Fig. 1, pg. 140.*
Mounting	*See Fig. 2, 3, 4, 5, pg. 140.* An integral MI is mounted within the processor housing (H8P5-MI-120, H8P5-MI-D48-120 or H8P5-MI-H48-120). A stand-alone MI mounts in the lower right-hand corner of a panel enclosure (HWI-PNL-8 , HWBP-8D, HWI-PNL-5, and HWBP-2S).
Shipping Weight	4 lbs. (1.8 kg)
Output	Compatible with HW-RPM-4U dimming module, HW-RPM-4A adaptive dimming module, HW-RPM-4FSQ fan speed module, HW-RPM-4M motor module, and HW-RPM-4R power relay module.

Module Interface (cont.)

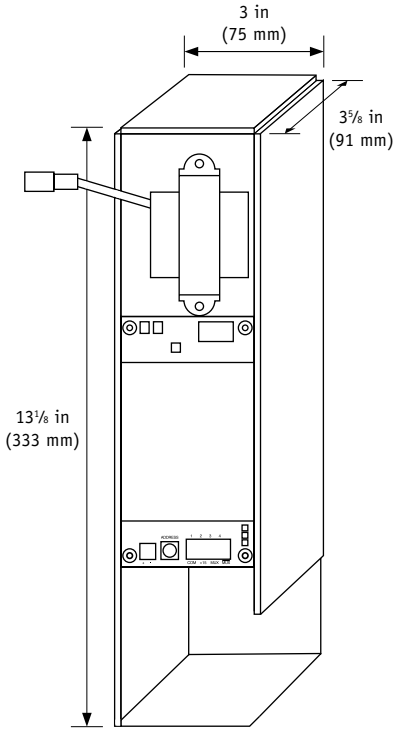


***Figure 1* – HWI-MI-120 Dimensions**

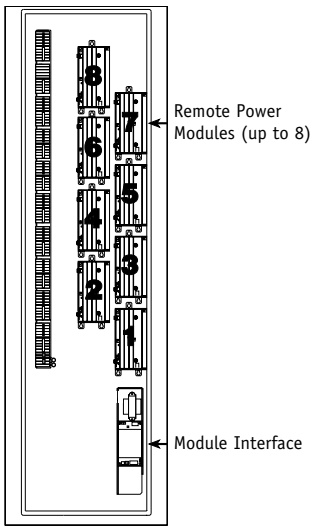


***Figure 3* - HWI-MI-120 Mounted in a HWI-PNL-8 Enclosure**

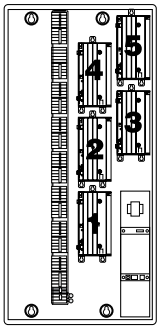


***Figure 4* - HWI-MI-120 Mounted in a HWI-PNL-5 Enclosure**

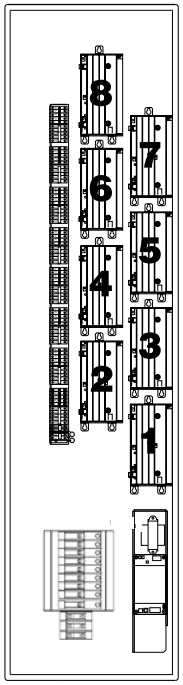


***Figure 2* – HWI-MI-120 Mounted in a HWBP-8D Enclosure**

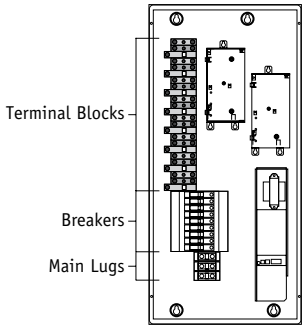


***Figure 5* – HWI-MI-120 Mounted in a HWBP-2S Enclosure**

BACK ROOM

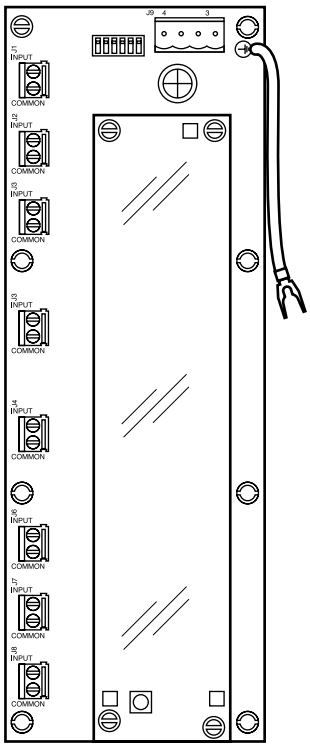
Contact Closure Interfaces

4/8 Series
Contact Closure Interface
Keypad Link
N/A

Contact closure interfaces allow simple integration of the HomeWorks® system with other equipment throughout the house. Equipment such as driveway sensors, occupancy sensors, photocells, and security systems are able to activate lighting scenes and other *HomeWorks* system events through the use of contact closure input interfaces (HWI-CCI-8 and HR-CCI-6-SW). Equipment such as shades, screens, gates, spas, and thermostats can be controlled by the *HomeWorks* system through the use of contact closure output interfaces (HWI-CCO-8). In addition, both the HWI-CCI-8 and the HWI-CCO-8 provide an infrared (IR) input that can be used to initiate *HomeWorks* system events using IR remote controls.

The HWI-CCI-8 and HWI-CCO-8 interfaces can be mounted in any of three different enclosures: HWI-LV32-120, HWI-LV17-120, and HWI-ENC-CC.

***Note**: Wired* seeTouch® *keypads (pgs. 24, 34) and wired 2-button keypads (pg. 28) also include contact closure inputs.*



Wired Contact Closure Input Interface (HWI-CCI-8)

CONNECTION TO WIRED PROCESSOR

Each interface uses one keypad address. Up to 32 can be directly connected to a configurable link on a *HomeWorks* wired processor using two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 cable. Contact closure interfaces must reside on a link that has been configured for keypads, and may be wired in a daisy-chain, home run, or T-tap configuration. The maximum total cable length of any wire run is 1000 feet (305 m) with up to 10 keypads or interfaces. The maximum total cable length is 4000 feet (1220 m).

CONTACT CLOSURE INPUT INTERFACES

Many electronic systems and devices have the capability to provide status or control in the form of dry contact closure (relay/switch) outputs. Each individual device output can be connected to one of the contact closure inputs (CCIs) on a contact closure input interface. These contact closure inputs are programmed in the same fashion as the buttons on a *HomeWorks* keypad. For example, a driveway sensor can be connected to a CCI interface and programmed to activate a "Welcome Home" scene.

Each of the contact closure inputs can be individually programmed as normally-open or normally-closed.

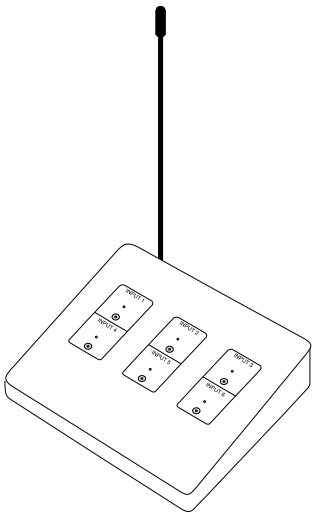
WIRED CONTACT CLOSURE INPUT INTERFACE (MODEL # HWI-CCI-8)

Each dry contact closure input has an LED indicator that shows the state of the connected device. The contact closure input interface has an IR receiver that is programmed independently of the contact closure inputs. This receiver allows Lutron® hand-held IR transmitters (SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH) to function as "wireless keypads" when used in conjunction with standard IR repeater systems.
The *Lutron* IR codes can be learned by most learning remotes, allowing audio/video remotes to control the *HomeWorks* system.

Contact Closure Interfaces (cont.)

RF CONTACT CLOSURE INPUT INTERFACE (MODEL # HR-CCI-6-SW)

Devices that provide contact closure outputs are not always located near the processor. RF CCI interfaces can be distributed throughout the home, locating them near the devices to which they are interfacing. The RF CCI interface has six contact closure inputs which are programmed in the same fashion as the buttons on a HomeWorks® keypad. Six buttons allow you to test each contact closure input's programming from the front of the control. Each dry contact closure input has an LED indicator that shows the state of the connected device.



RF Contact Closure Input Interface (HR-CCI-6-SW)

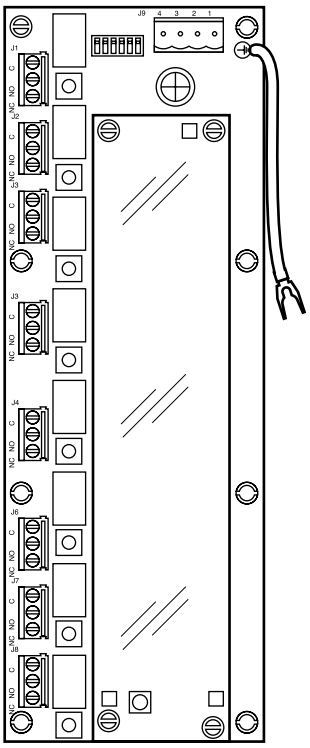
COMMUNICATION TO PROCESSOR

All RF CCI interfaces must be located within 30 feet (9 m) of an RF processor or a hybrid repeater. Each *HomeWorks* RF-capable processor can control up to 32 RF keypads. The RF CCI interfaces counts as one of the 32 RF keypads on RF Link 8.2.

WIRED CONTACT CLOSURE OUTPUT INTERFACE (MODEL # HWI-CCO-8)

Many electronic devices have dry contact closure inputs, allowing them to be controlled by an external system. The HomeWorks® system uses the contact closure output board to control pumps, thermostats, audio/video, and other equipment supplied with dry contact closure inputs. Each contact closure output (CCO) interface has eight individually-controlled contact closure outputs and eight corresponding push buttons with LED indicators. When placed in "manual control mode," the push buttons on the board are used to change the state of each relay, allowing functional testing of the devices that are being controlled. Both normally-open and normally-closed relay contacts are provided for each CCO, and each output can be programmed to provide either momentary (pulsed) or maintained (latching) functionality.

These CCOs can be assigned to any keypad button or time-clock event in the same manner as any lighting load. The CCO Interface has an IR receiver that is programmed independently of the contact closure outputs. This receiver allows Lutron® hand-held IR transmitters (SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH) to function as "wireless keypads" when used in conjunction with standard IR repeater systems. The *Lutron* IR codes can be learned by most learning remotes, allowing audio/video remotes to control the lighting control system.



Wired Contact Closure Output Interface (HWI-CCO-8)

BACK ROOM

Contact Closure Interfaces (cont.)

Model Number	HWI-CCI-8: Wired Contact Closure Input Interface.
Input voltage	15 V⎓ (from HomeWorks® Processor Keypad Link).
Input Types	Inputs can be used with ground-referenced, solid-state outputs if the outputs have an on-state saturation voltage of less than 2 V⎓ at 10 milliamperes and an off-state leakage of less than 50 microamperes. Dry contact or solid-state outputs must be capable of switching 15 V⎓ at 10 milliamperes. If there is any question as to whether a device is compatible with these specifications, contact the manufacturer of the device.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Contact Closure Input Connections	Eight 2-terminal removable connectors, one per input. Each terminal will accept up to four #18 AWG (1.0 mm²) wires.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm²), one pair #18-22 AWG (1.0-0.5 mm²) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Daisy-chain, star, T-tap. Termination not required. Total length of wire on any link cannot exceed 1000 feet (305 m) per wire run. Total length of wire on that link cannot exceed 4000 feet (1220 m). Maximum of 32 devices per processor link that has been configured for keypads.
Low-Voltage Connection	One 4-pin removable terminal block. Terminal block will accept up to two #18 AWG (1.0 mm²) wires.
Addressing	Via DIP switch. Units should be addressed before mounting. Counts as 1 of 32 addresses on the keypad link.
Diagnostics	Link LED for troubleshooting communications with *HomeWorks* Processor. IR receiver has a talk back LED that flashes when IR is received. IR receiver also has an LED that flashes when a valid Lutron IR command has been received. Each input has a feedback LED that turns on when the input is shorted.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	3 in (76 mm) x 8½ in (216 mm)
Keypad Link LED Count	10
Mounting	Mounts in the following enclosures: HWI-LV32-120, HWI-LV24-120, HWI-LV17-120 and HWI-ENC-CC.
IR Receiver	Are compatible with these Lutron IR transmitters only: SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH. An IR flasher can be mounted directly to the clear plastic shield over the IR receiver. *See Fig. 2, pg. 144*. Also see Appendix C: Infrared (IR) Integration.
Shipping Weight	0.5 lb. (0.3 kg)

Contact Closure Interfaces (cont.)

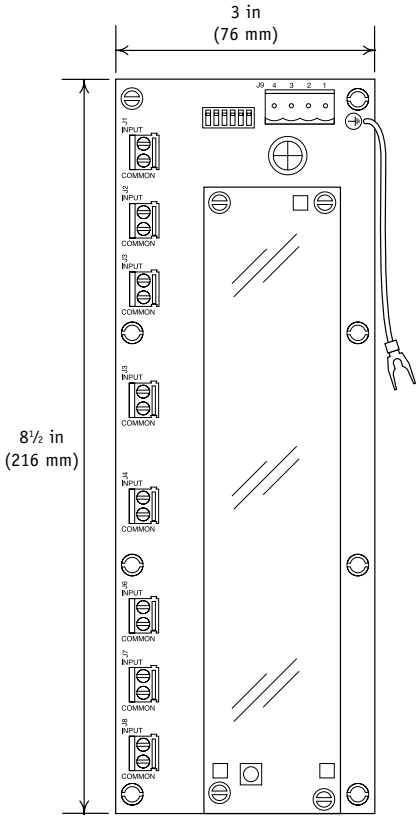


***Figure 1* – HWI-CCI-8 Dimensions**

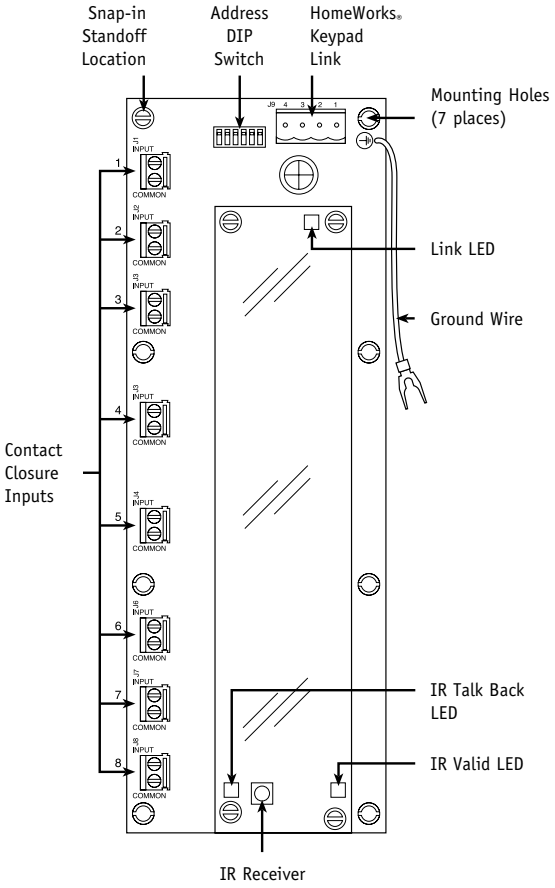


***Figure 2* – HWI-CCI-8 Parts Identification**

Contact Closure Interfaces (cont.)

Model Number	HR-CCI-6-SW: RF Contact Closure Input Interface.
Input Voltage	9 V⎓ transformer (provided)
Regulatory Approvals	HR-CCI-6-SW: FCC, IC; Transformer: UL, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Line-Voltage Connections	Lutron provides a plug-in low-voltage transformer.
Input Types	Inputs can be used with ground-referenced, solid-state outputs if the outputs have an on-state saturation voltage of less than 1 V⎓ at 2 milliamperes and an off-state leakage of less than 10 microamperes at 12 V⎓. Dry contact or solid-state outputs must be capable of switching 15 V⎓ at 10 milliamperes. Outputs must stay in the open or closed state for at least 40 milliseconds to be recognized by the interface, If there is any question as to whether a device is compatible with these specifications, contact the manufacturer of the device.
Contact Closure Input Connections	8 position terminal block, 6 input connections, 2 common connections. Each terminal will accept up to two #18-22 AWG (1.0 -0.5 mm^2) wires.
Addressing	Via the HomeWorks® software. Units must be installed prior to addressing.
Diagnostics	Six buttons allow you to test each contact closure input's programming from the front of the control. Each dry contact closure input has an LED indicator that shows the state of the connected device.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	*See Fig. 1, pg. 146*.
Mounting	Unit must be located within 5 feet (1.5 m) of a 120 V~ receptacle. Unit must be placed within 30 feet (9 m) of an hybrid repeater or an RF processor.
Shipping Weight	1.5 lbs. (0.7 kg)

Contact Closure Interfaces (cont.)

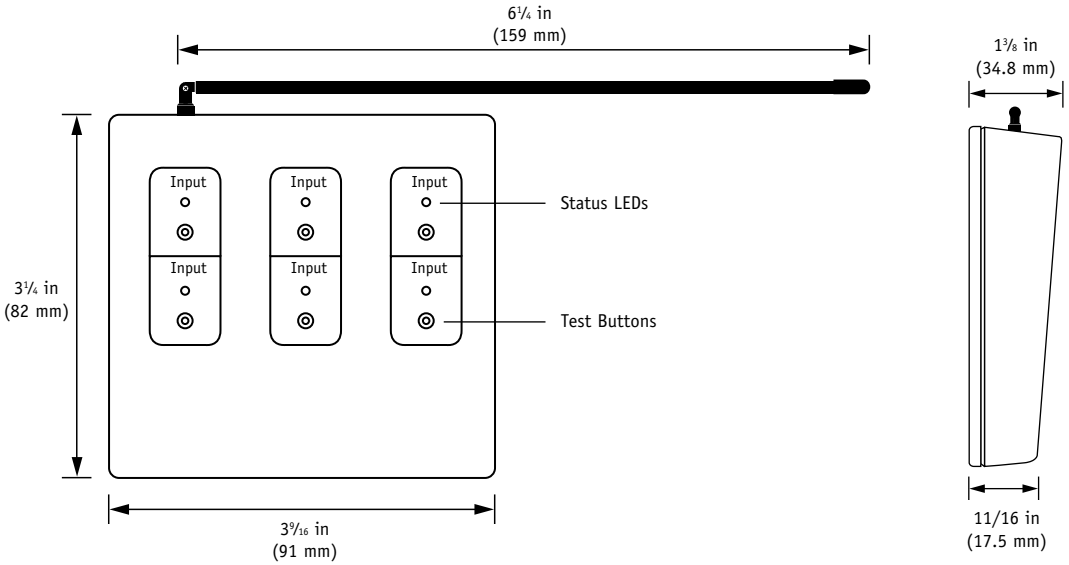


***Figure 1* – HR-CCI-6-SW Dimensions**

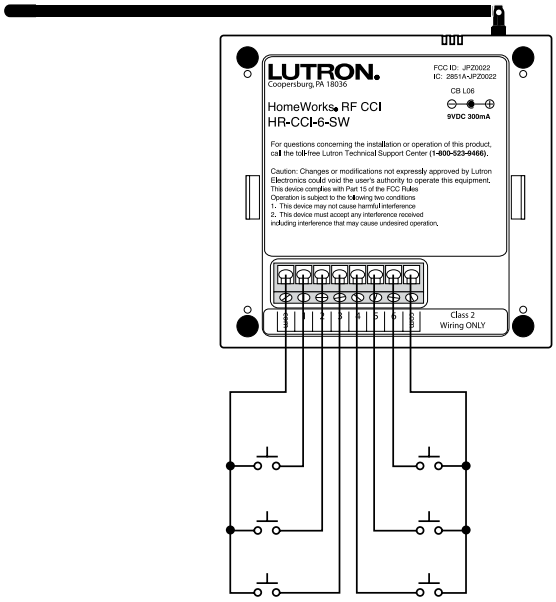


***Figure 2* – HR-CCI-6-SW Wiring**

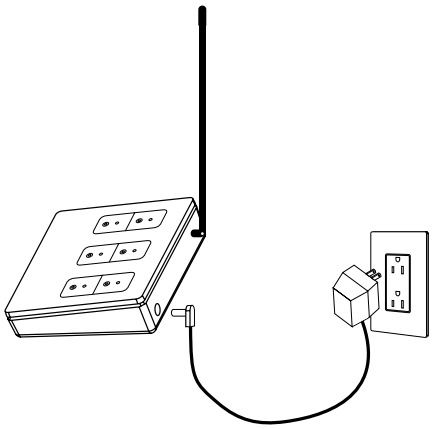


***Figure 3* – HR-CCI-6-SW Installation**

BACK ROOM

Contact Closure Interfaces (cont.)

Model Number	HWI-CCO-8: Wired Contact Closure Output Interface.
Input Voltage	15 V⎓ (from HomeWorks® processor keypad link).
Relay Contact Ratings	*See Table 1, pg. 148*.
Relay Outputs	Each output can be normally-open (NO) and normally-closed (NC). Outputs can be programmed to provide either momentary (pulsed) or maintained (latching) functionality.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Contact Closure Output Connections	Eight 3-terminal (normally-open, normally-closed, common) non-removable connectors, one per output. Each terminal will accept up to four #18 AWG (1.0 mm^2) wires.
Low-Voltage Wire Type	Two pair—one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded—Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Daisy-chain, star, T-tap. Termination not required. Total length of wire on any link cannot exceed 1000 feet (305 m) per wire run. Total length of wire on that link cannot exceed 4000 feet (1220 m). Maximum of 32 devices per processor link that has been configured for keypads.
Low-Voltage Connections	One 4-pin removable terminal block. Terminal block will accept up to two #18 AWG (1.0 mm^2) wires.
Addressing	Via DIP switch. Units should be addressed before mounting. Counts as 1 of 32 addresses on the keypad link.
Diagnostics	Link LED for troubleshooting communications with processor IR receiver has a talk back LED that flashes when IR is received and a valid IR LED that flashes when a valid Lutron IR command has been received. Each output has a feedback LED that turns on when the normally-open contact is connected to common. Using one of the DIP switches, the HWI-CCO-8 can be placed into manual control mode. While in manual control mode, the state of each relay can only be toggled by pressing the corresponding button.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	3 in (76 mm) x 8½ in (216 mm)
Keypad Link LED Count	10
Mounting	Mounts in the following enclosures: HWI-LV32-120, HWI-LV24-120, HWI-LV17-120, and HWI-ENC-CC.
IR Receiver	Are compatible with these Lutron IR transmitters only: SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH. An IR flasher can be mounted directly to the clear plastic shield over the IR receiver. *See Fig. 2, pg. 148*. Also see Appendix C: Infrared (IR) Integration.
Shipping Weight	0.5 lb. (0.3 kg)

Contact Closure Interfaces (cont.)

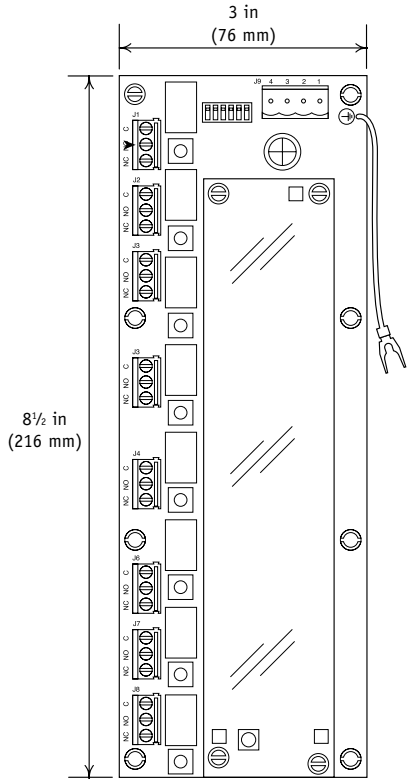


***Figure 1* – HWI-CCO-8 Dimensions**

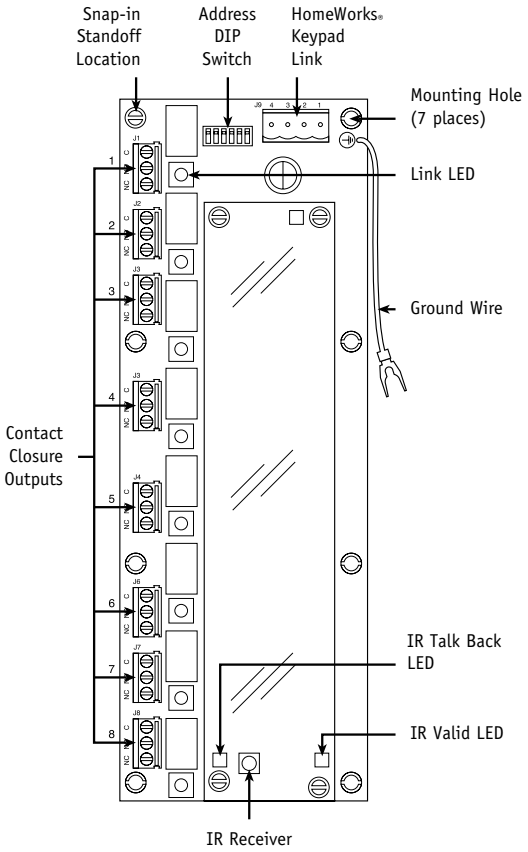


***Figure 2* – HWI-CCO-8 Parts Identification**

Voltage	Resistive Load	Inductive Load
Up to 30 V⎓	1 A	0.2 A
Up to 30 V~	0.5 A	0.1 A
Up to 60 V⎓	1 A	Do not use HWI-CCO-8
Up to 42.4 V~	0.5 A	Do not use HWI-CCO-8

***Table 1* – HWI-CCO-8 Relay Contact Ratings**

Remote Power Feed-Through Panels

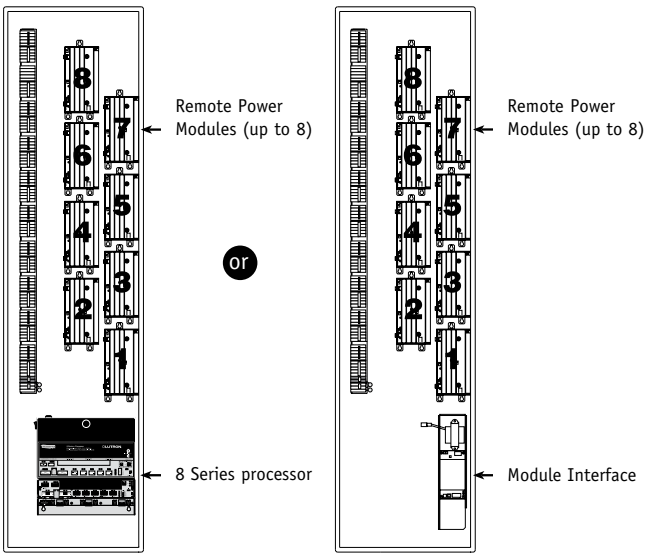
8 Series
Panels & Enclosures
N/A
N/A

Remote power feed-through panels are available in two different sizes, each of which may be either surface-mounted or recess-mounted, in an electrical closet or other equipment room. The number of remote power panels—and the types of components within them—may be specified to fit the size, lighting plan, and design of a home. Remote power panels may be distributed throughout the home for added flexibility during installation of the line-voltage wiring.

Remote power feed-through panels may contain HomeWorks® remote power modules and 8 Series processors or module interfaces. A few of the possible configurations are shown below.

EIGHT-MODULE REMOTE POWER FEED-THROUGH PANEL (MODEL # HWI-PNL-8)

Accommodates one of the following combinations of components:



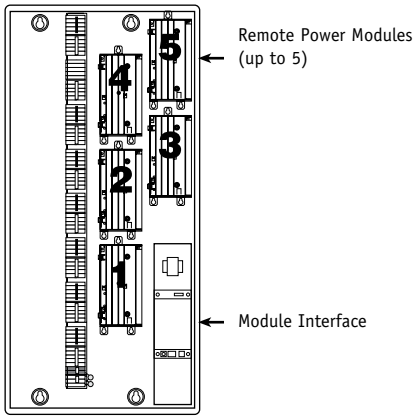
- 1 8 Series processor
- Up to 8 remote power modules[1]

- 1 module interface
- Up to 8 remote power modules[1]

[1] One HW-HIFC-10-2 filter choke may be installed in place of module 8, *see pg. 118*.

FIVE-MODULE REMOTE POWER FEED-THROUGH PANEL (MODEL # HWI-PNL-5)

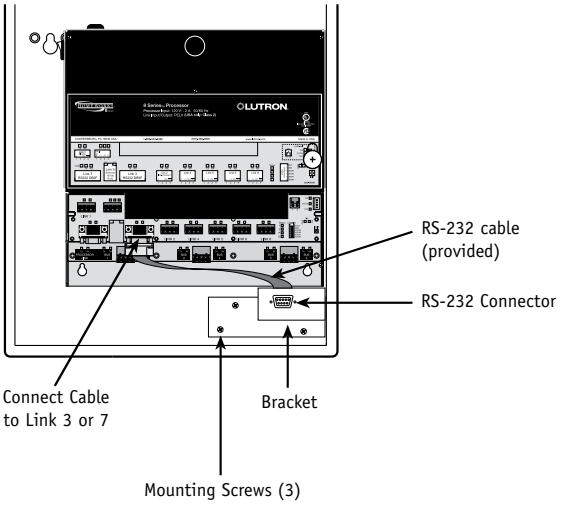
Accommodates the following combination of components:



- 1 module interface
- Up to 5 remote power modules

Note: HWI-PNL-5 **cannot** house a HomeWorks Processor

KIT FOR PERMANENT RS-232 CONNECTION IN HWI-PNL-8 (MODEL # HWI-KIT-RS232)

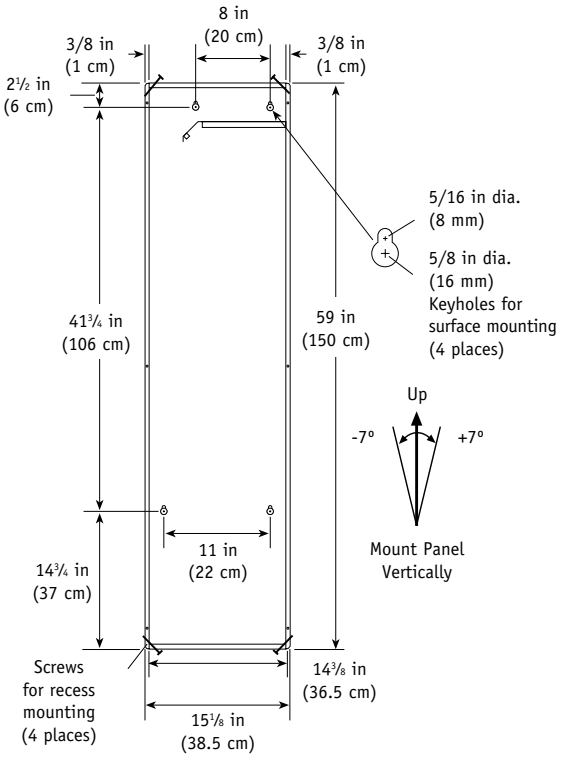


Note: HWI-KIT-RS232 can be installed in HWI-PNL-8, allowing for a connection to RS-232 port without removing the panel cover.

Remote Power Feed-Through Panels (cont.)

Model Number	HWI-PNL-8: Eight-Module Remote Power Feed-Through Panel.
Capacity	Eight RPMs (HW-RPM-4A, HW-RPM-4U, HW-RPM-4FSQ, HW-RPM-4M, and HW-RPM-4R) in any combination and one module interface or 8 Series processor. *See Fig. 3, pg. 151*.
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked.
Heat Generated Fully Loaded	750 BTUs per hr. maximum.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C. DIN rail-mounted terminal blocks provided for line-voltage remote power module wiring and processor/MI power. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). *See Fig. 2, pg. 151*.
DIN Rail Terminal Blocks	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). All terminal blocks are shipped with bypass jumpers installed. After verifying that each circuit is wired correctly, remove the bypass jumpers for system operation.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	May be surface-mounted or flush-mounted. Panel fits between standard 16 in (406 mm) on-center stud framing. When flush mounting in a 2x4 stud bay, to accomodate the depth of the panel – 4⅛ in (10.5 cm) – the sheetrock must be built out or a frame must be constructed. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Remote power panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	14⅜ in (36.5 cm) x 59 in (150 cm) x 4⅛ in (10.5 cm) *See Fig. 1, pg. 151*.
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Cover is attached using eight phillips-head screws.
Shipping Weight	25 lbs. (11.4 kg) without RPMs

Remote Power Feed-Through Panels (cont.)



Note: *The panel is 4⅛ in (10.5 cm) deep past cover mounting tabs.*

***Figure 1* – Panel Dimensions and Mounting**

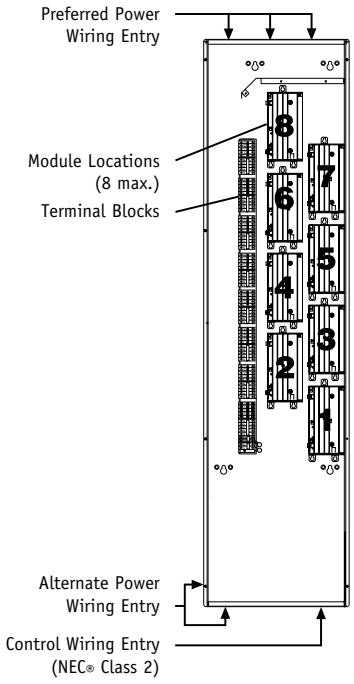
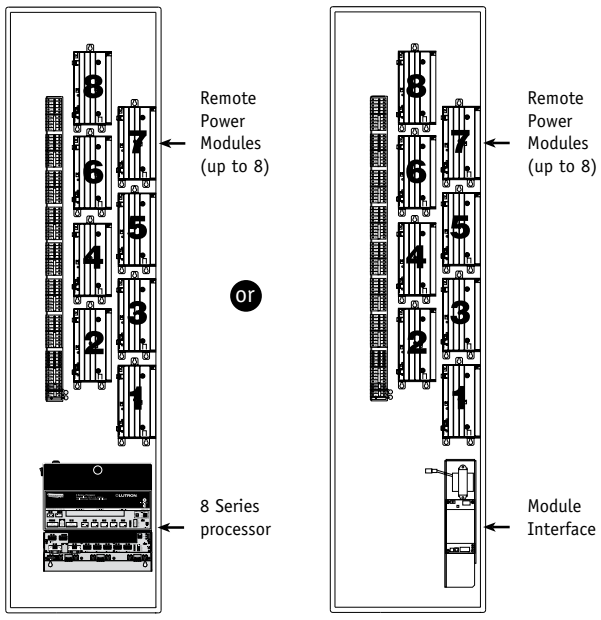


***Figure 2* – Wiring Entry**



- 1 8 Series processor
- Up to 8 remote power modules[1]

- 1 module interface
- Up to 8 remote power modules[1]

[1] One HW-HIFC-10-2 filter choke may be installed in place of module 8.

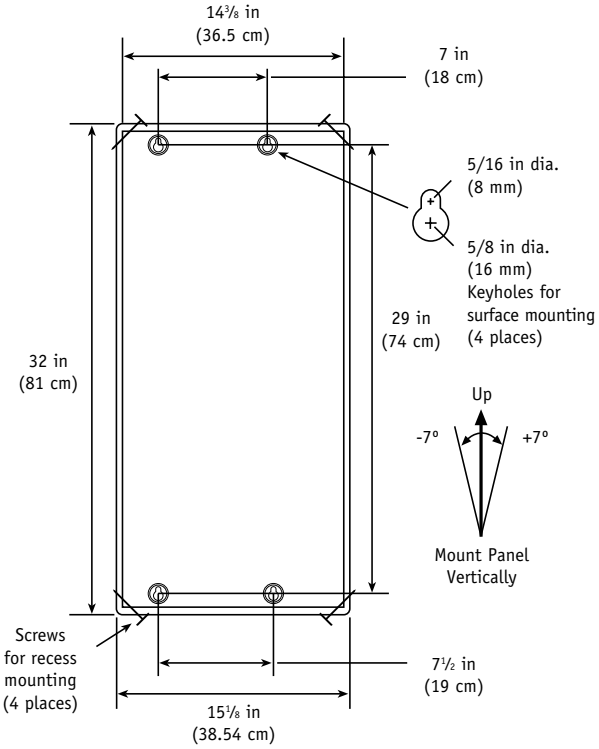
***Figure 3* – Panel Configurations**

BACK ROOM

Remote Power Feed-Through Panels (cont.)

Model Number	HWI-PNL-5: Five-Module remote power feed-through panel.
Capacity	Five RPMs (HW-RPM-4A, HW-RPM-4U, HW-RPM-4FSQ, HW-RPM-4M, and HW-RPM-4R) in any combination and one module interface. *See Fig. 2, pg. 153*.
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked.
Heat Generated Fully Loaded	475 BTUs per hr. maximum.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C. DIN rail-mounted terminal blocks provided for line-voltage remote power module wiring and processor/MI power. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). *See Fig. 2, 3 pg. 153*.
DIN Rail Terminal Blocks	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). All terminal blocks are shipped with bypass jumpers installed. After verifying that each circuit is wired correctly, remove the bypass jumpers for system operation.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	May be surface-mounted or flush-mounted. Panel fits between standard 16 in (406 mm) on-center stud framing. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Remote power panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	14 3/8 in (36.5 cm) x 32 in (81 cm) x 3 7/8 in (9.8 cm) *See Fig. 1, pg. 153*.
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Cover is attached using six phillips-head screws.
Shipping Weight	18 lbs. (8.6 kg) without RPMs

Remote Power Feed-Through Panels (cont.)



Note: *The panel is 3⅞ in (9.8 cm) deep past cover mounting tabs.*

***Figure 1* – Panel Dimensions and Mounting**

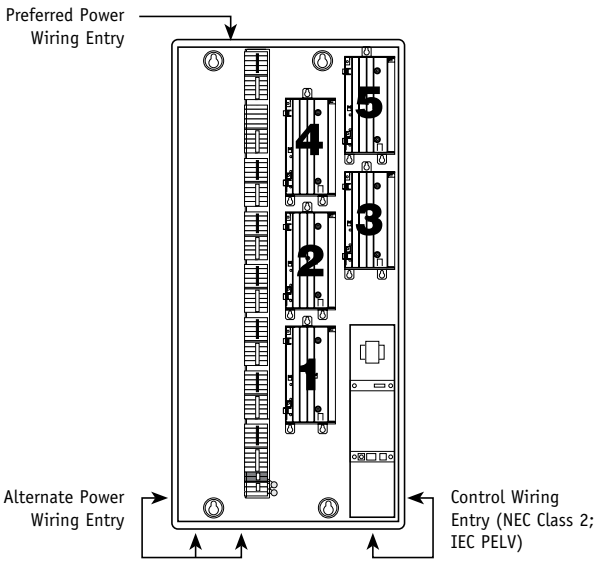
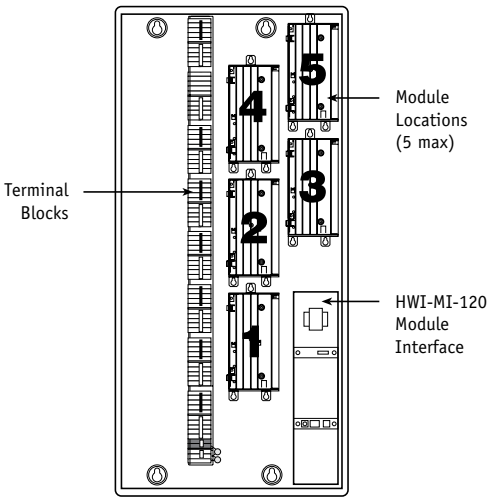


***Figure 2* – Wiring Entry**



- 1 Module Interface
- Up to 5 Remote Power Modules

***Figure 3* – Panel Configuration**

BACK ROOM

Remote Power Panels with Breakers

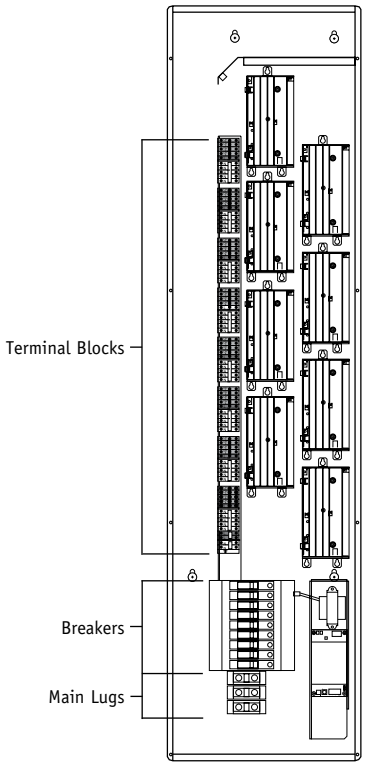
8 Series
Panels & Enclosures
N/A
N/A

Remote power panels with breakers are available in two different sizes, each of which may be either surface-mounted or recess-mounted, in an electrical closet or other equipment room. The number of remote power panels—and the types of components within them—may be specified to fit the size, lighting plan, and design of a home.

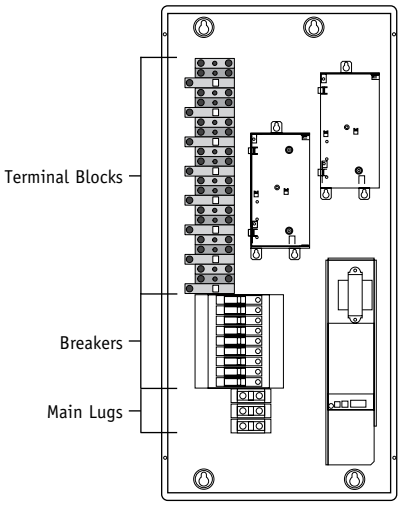
Both the HWBP-8D and HWBP-2S include factory-installed wiring from the breakers to the terminal blocks. Remote power panels may be distributed throughout the home for added flexibility during installation of the line-voltage wiring.

Remote power panels with breakers require only one feed from the main distribution panel, reducing the number of wiring connections required (feed-through panels require up to nine separate feeds).

Remote power panels with breakers may contain remote power modules and a module interface. Panels with breakers may not contain HomeWorks® processors.



Remote Power Panel with Breakers (HWBP-8D)

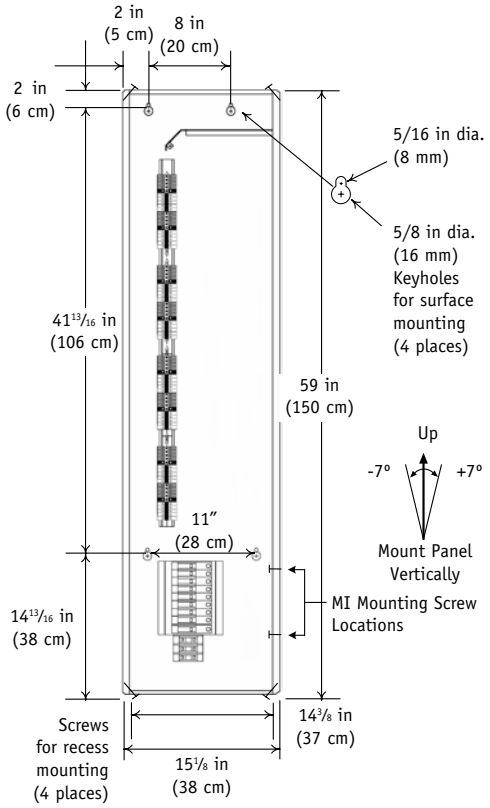


Remote Power Panel with Breakers (HWBP-2S)

Remote Power Panels with Breakers (cont.)

Model Numbers	Single Phase: HWBP-8D-15-120L3: 15 A circuit breakers for up to 8 RPMs (4A, 4U, 4M, 4FSQ). HWBP-8D-20-120L3: 20 A circuit breakers for up to 8 RPMs (4A, 4U, 4M, 4FSQ). Three Phase: HWBP-8D-15-120L4: 15 A circuit breakers for up to 8 RPMs (4A, 4U, 4M, 4FSQ). HWBP-8D-20-120L4: 20 A circuit breakers for up to 8 RPMs (4A, 4U, 4M, 4FSQ).
Capacity	Eight RPMs (HW-RPM-4A, HW-RPM-4U, HW-RPM-4FSQ, and HW-RPM-4M) and one module interface. *See Fig. 3, pg. 156*.
Input Voltage	Single phase: 120 V~/240 V~ 1-phase 3-wire 175 A max feed. Three phase: 120 V~/208 V~ 3-phase 4-wire 175 A max feed.
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling.Mount in a place where the vented cover will not be blocked.
Heat Generated Fully Loaded	750 BTUs per hr. maximum.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C. DIN rail-mounted terminal blocks provided for line-voltage remote power module wiring and MI power. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). *See Fig. 2, 3 pg. 156*.
DIN Rail Terminal Blocks	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). All terminal blocks are shipped with bypass jumpers installed. After verifying that each circuit is wired correctly, remove the bypass jumpers for system operation.
Arc Fault Circuit Interruptor (AFCI) Breakers	These panels can be ordered with AFCI breakers or the AFCI breakers can be installed in the field. Contact Lutron Customer Service for ordering details.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	Must be installed in a way to provide sufficient access and working space according to National Electrical Code (NEC). May be surface-mounted or flush-mounted. Panel fits between standard 16 in (406 mm) on-center stud framing. When flush mounting in a 2x4 stud bay, to accomodate the depth of the panel – 4⅛ in (10.5 cm) – the sheetrock must be built out or a frame must be constructed. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Remote power panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	14⅜ in (36.5 cm) x 59 in (150 cm) x 4⅛ in (10.5 cm) *See Fig. 2, pg. 156*.
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Cover is attached using eight phillips-head screws.
Shipping Weight	55 lbs. (25 kg) without RPMs

Remote Power Panels with Breakers (cont.)



Note: *The panel is 4 1/8 in (10.5 cm) deep past cover mounting tabs.*

***Figure 1* – HWBP-8D Dimensions and Mounting**

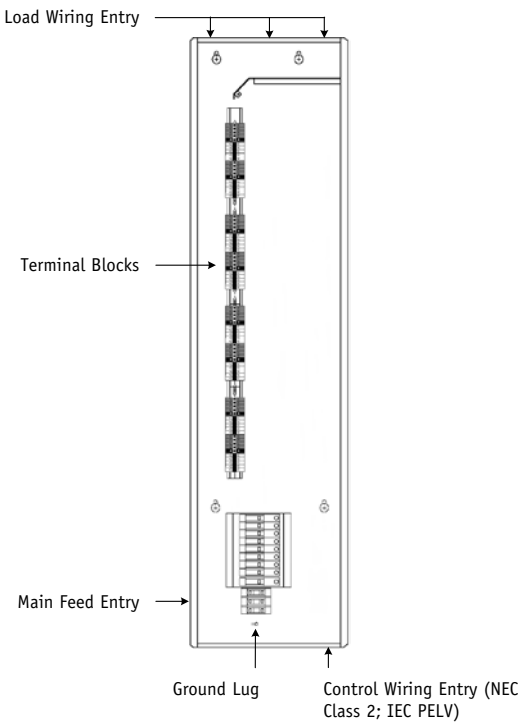


***Figure 2* – HWBP-8D Wiring Entry**

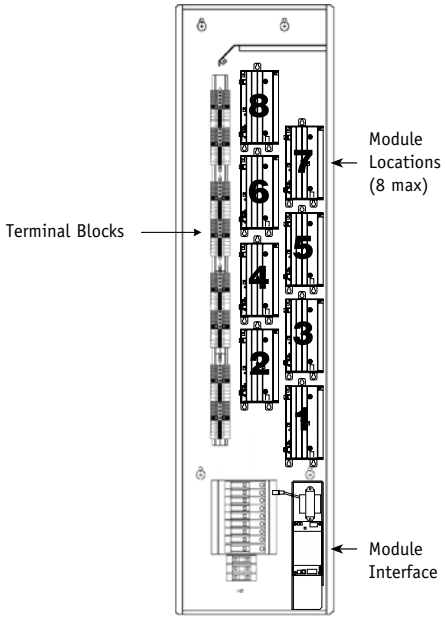
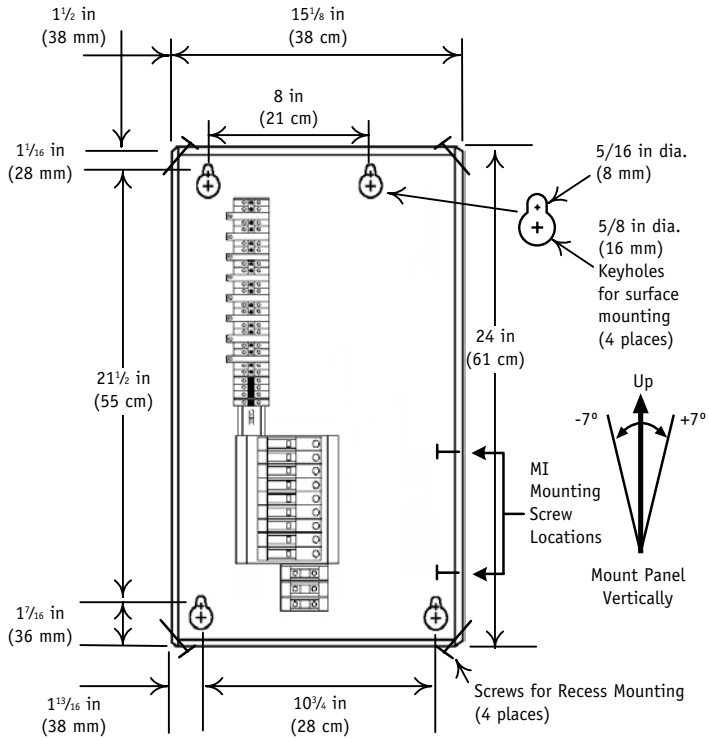


***Figure 3* – HWBP-8D Configuration**

Remote Power Panels with Breakers (cont.)

Model Numbers	Single Phase: HWBP-2S-15-120L3: 15 A circuit breakers for up to 2 HW-RPM-4R modules. HWBP-2S-20-120L3: 20 A circuit breakers for up to 2 HW-RPM-4R modules. Three Phase: HWBP-2S-15-120L4: 15 A circuit breakers for up to 2 HW-RPM-4R modules. HWBP-2S-20-120L4: 20 A circuit breakers for up to 2 HW-RPM-4R modules.
Capacity	Two HW-RPM-4R modules and one module interface. *See Fig. 3, pg. 158*.
Input Voltage	Single phase: 120 V~/240 V~ 1-phase 3-wire 175 A max feed. Three phase: 120 V~/208 V~ 3-phase 4-wire 175 A max feed.
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked.
Heat Generated Fully Loaded	101 BTUs per hr. maximum.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C. DIN rail-mounted terminal blocks provided for line-voltage Remote Power Module (RPM) wiring and MI power. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). *See Fig. 2, 3 pg. 158*.
DIN Rail Terminal Blocks	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). All terminal blocks are shipped with bypass jumpers installed. After verifying that each circuit is wired correctly, remove the bypass jumpers for system operation.
Arc Fault Circuit Interruptor (AFCI) Breakers	These panels can be ordered with AFCI breakers or the AFCI breakers can be installed in the field. Contact Lutron Customer Service for ordering details.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	Must be installed in a way to provide sufficient access and working space according to National Electrical Code (NEC). May be surface-mounted or flush-mounted. Panel fits between standard 16 in (406 mm) on-center stud framing. When flush mounting in a 2x4 stud bay, to accomodate the depth of the panel – 4⅛ in (10.5 cm) – the sheetrock must be built out or a frame must be constructed. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Remote power panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	14⅜ in (36.5 cm) x 24 in (61 cm) x 4⅛ in (10.5 cm) *See Fig. 1, pg. 158*.
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	19 lbs. (8.6 kg) without RPMs

Remote Power Panels with Breakers (cont.)



Note: *The panel is 4⅛ in (10.5 cm) deep past cover mounting tabs.*

***Figure 1* – HWBP-2S Dimensions and Mounting**

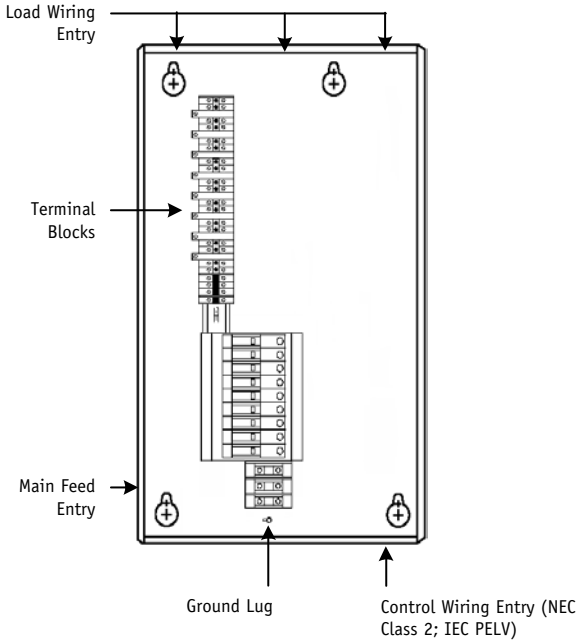
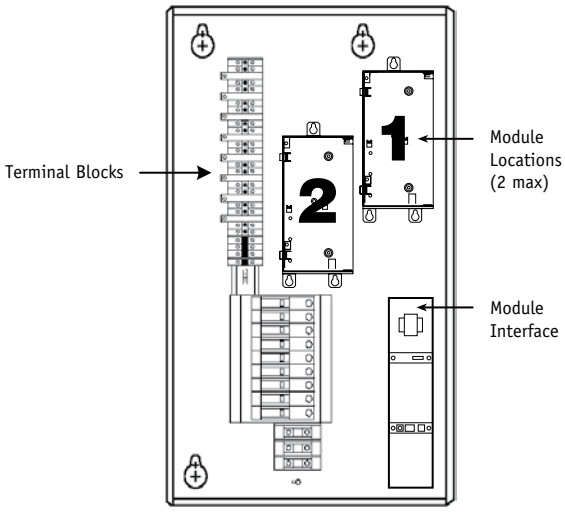


***Figure 2* – HWBP-2S Wiring Entry**



- 1 Module Interface
- Up to 2 RPM 4R's

***Figure 3* – HWBP-2S Configuration**

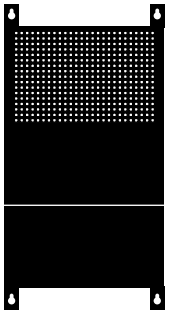
BACK ROOM

Specification Grade Dimming Panels

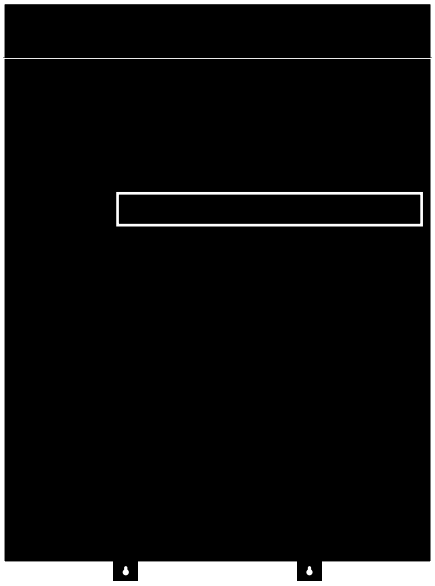
8 Series
Panels & Enclosures
N/A
N/A

The Specification Grade Panel is meant for extreme dimming applications where high performance and minimized filament noise are paramount. Specification Grade Panels utilize high inductance toroidal chokes on every circuit, thus minimizing filament noise (buzz) as well as minimizing electrical noise associated with dimming that may interfere with sensitive equipment such as audio/video and computers. The Specification Grade Panel contains a Specification-Grade Panel Interface (SPI), which allows it to wire onto the 8 Series processor's MI link (Link 1) with other HomeWorks® dimming panels.

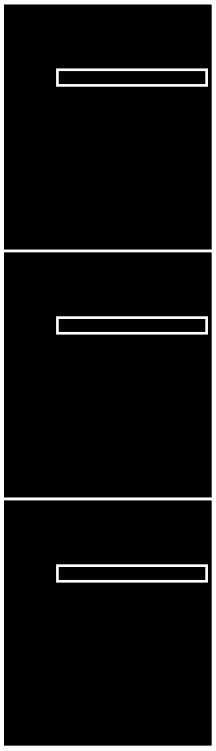
THREE- AND FOUR-CIRCUIT DIMMING PANELS (MODEL # HS3-AND HS4-)



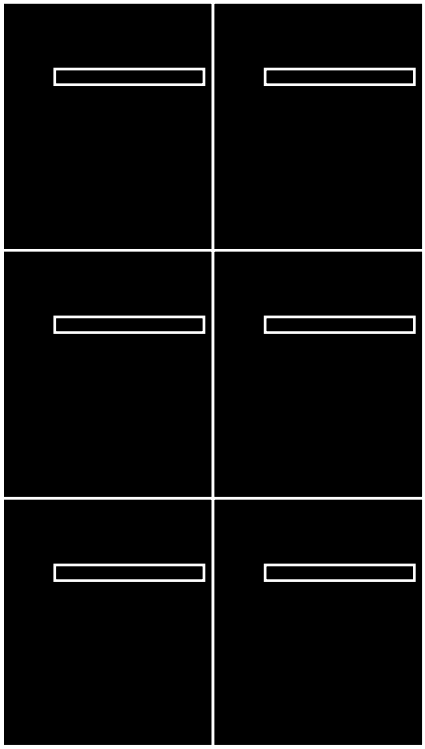
EIGHT-, SIXTEEN-, AND TWENTY-FOUR-CIRCUIT DIMMING PANELS (MODEL # HS8-, HS16-, AND HS24-)



THIRTY-SIX-CIRCUIT DIMMING PANELS (MODEL # HS36-)

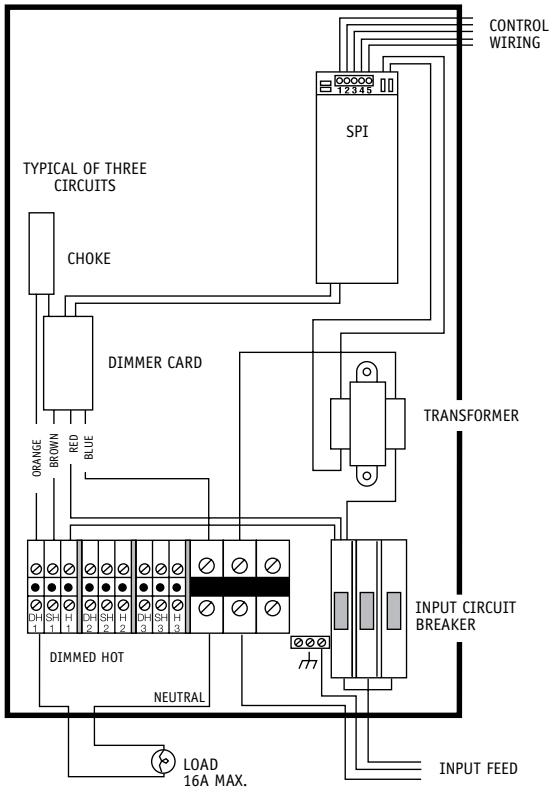


SEVENTY-TWO-CIRCUIT DIMMING PANELS (MODEL # HS72-)

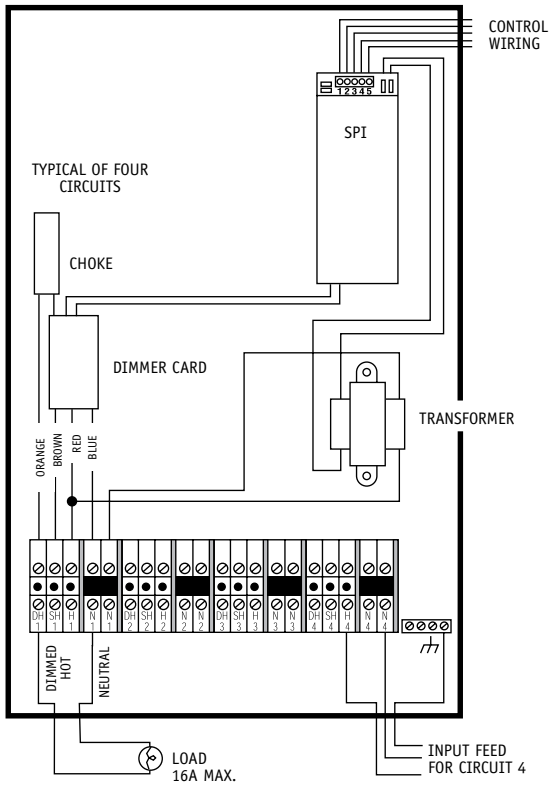


Specification Grade Dimming Panels (cont.)

THREE-CIRCUIT DIMMING PANEL (MODEL # HS3-)



FOUR-CIRCUIT DIMMING PANEL (MODEL # HS4-)



HS3 and HS4 Model Numbers

Number of Cicuits	Feed Voltage	Feed Type	Maximum Feed	Panel Feed/Branch Circuit Breakers[1]	Model Number
HS3	120 V~	3Ø, 4W	15 A	15 A	HS3-120M-15
			20 A	20 A	HS3-120M-20
HS4	120 V~	Feed Through	15 A	15 A[2]	HS4-120FTML
			20 A	20 A[2]	HS4-120FTML

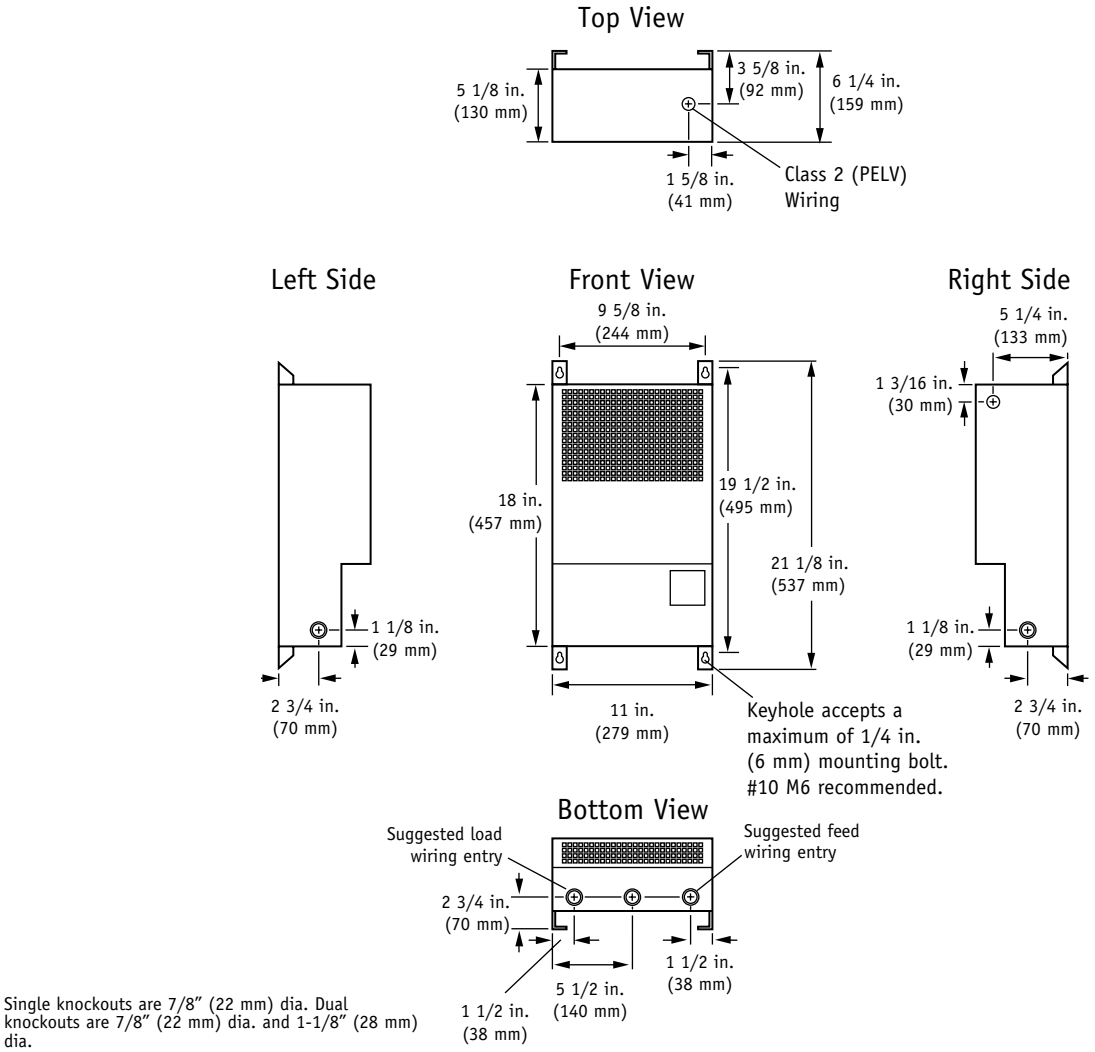
Wire Sizes

Panel	Wiring	Termination	Wire Sizes
HS3	Hot/Live	Breaker	14 AWG to 10 AWG (2.5 mm² to 4.0 mm²)
	Neutral	Neutral Lug	14 AWG to 8 AWG (2.5 mm² to 6.0 mm²)
	Load	Terminal Blocks	14 AWG to 10 AWG (2.5 mm² to 4.0 mm²)
HS4	Hot/Live	Terminal Blocks	14 AWG to 10 AWG (2.5 mm² to 4.0 mm²)
	Neutral	Terminal Blocks	14 AWG to 10 AWG (2.5 mm² to 4.0 mm²)
	Load	Terminal Blocks	14 AWG to 10 AWG (2.5 mm² to 4.0 mm²)

Specification Grade Dimming Panels (cont.)

Input Voltage	*See HS3 and HS4 Model Numbers, pg. 160*
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked. *See pg 162.*
Heat Generated Fully Loaded	685 BTUs per hr. maximum.
Arc Fault Circuit Interruptor (AFCI) Breakers	These panels can be ordered with GFCI (Ground-Fault Circuit Interruptor) or AFCI (Arc-Fault Circuit Interruptor) breakers. Contact Lutron Customer Service for ordering details.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	Must be installed in a way to provide sufficient access and working space according to the National Electrical Code (NEC). Surface-mounted. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	14⅜ in (36.5 cm) x 24 in (61 cm) x 3 in (9.8 cm) *See Fig. 1, pg. 162.*
Construction	Enclosure: Painted (black) 16 US gauge steel. Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	HS3: 20 lbs. (9.1 kg) without packaging HS4: 21 lbs. (9.5 kg) without packaging

Specification Grade Dimming Panels (cont.)

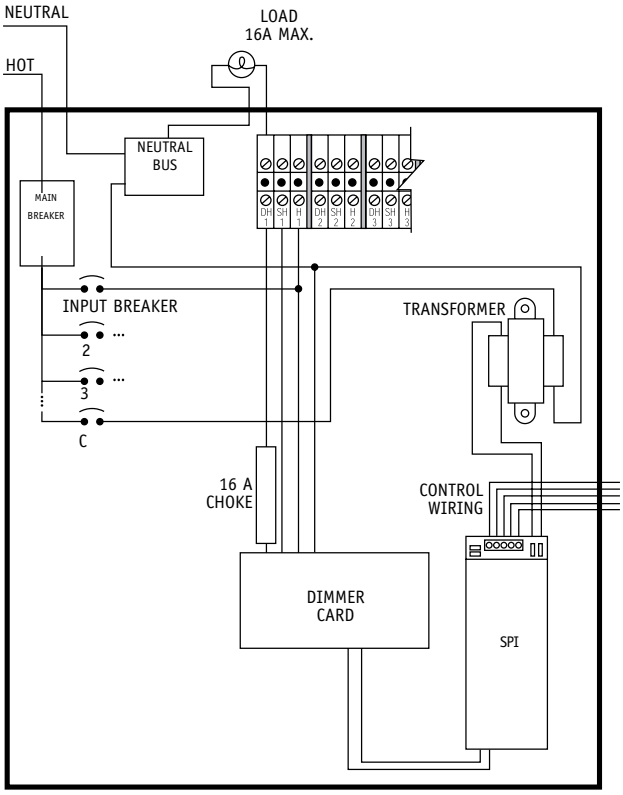


Single knockouts are 7/8" (22 mm) dia. Dual knockouts are 7/8" (22 mm) dia. and 1-1/8" (28 mm) dia.

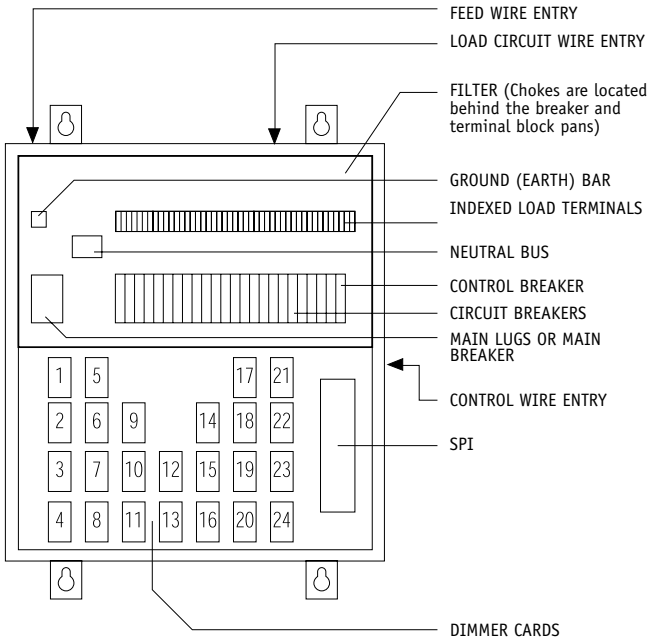
Figure 1 - HS3 and HS4 Dimensions and Conduit Entry

Specification Grade Dimming Panels (cont.)

EIGHT-CIRCUIT, SIXTEEN-CIRCUIT, AND TWENTY-FOUR-CIRCUIT DIMMING PANELS (MODEL # HS8-, HS16-, HS24-)



HS8 through 24 Components



BACK ROOM

Specification Grade Dimming Panels (cont.)

HS8, HS16 and HS24 Model Numbers

Number of Cicuits	Feed Voltage	Feed Type	Panel Feed	Maximum Feed	Panel Feed/Branch Circuit Breakers[1]	Model Number
HS8	120 V~	1Ø, 2W	Main Lugs Only	175 A	15 A	HS8-1202ML-15
					20 A	HS8-1202ML-20
		1Ø, 3W	Main Lugs Only	175 A	15 A	HS8-1203ML-15
					20 A	HS8-1203ML-20
			60 A Main Breaker	60 A	15 A	HS8-1203M60-15
			80 A Main Breaker	80 A	20 A	HS8-1203M80-20
		3Ø, 4W	Main Lugs Only	175 A	15 A	HS8-1204ML-15
					20 A	HS8-1204ML-20
			50 A Main Breaker	50 A	15 A	HS8-1204M50-15
			60 A Main Breaker	60 A	20 A	HS8-1204M60-20
			Dual Tap Main Lugs	225 A	15 A	HS8-1204DTML-15
					20 A	HS8-1204DTML-20
HS16	120 V~	1Ø, 3W	Main Lugs Only	175 A	15 A	HS16-1203ML-15
					20 A	HS16-1203ML-20
			125 A Main Breaker	125 A	15 A	HS16-1203M125-15
			175 A Main Breaker	175 A	20 A	HS16-1203M175-20
		3Ø, 4W	Main Lugs Only	175 A	15 A	HS16-1204ML-15
					20 A	HS16-1204ML-20
			100 A Main Breaker	100 A	15 A	HS16-1204M100-15
			125 A Main Breaker	125 A	20 A	HS16-1204M125-20
			Dual Tap Main Lugs	225 A	15 A	HS16-1204DTML-15
					20 A	HS16-1204DTML-20
HS24	120 V~	1Ø, 3W	Main Lugs Only	225 A	15 A	HS24-1203ML-15
					20 A	HS24-1203ML-20
		3Ø, 4W	Main Lugs Only	175 A	15 A	HS24-1204ML-15
					20 A	HS24-1204ML-20
			125 A Main Breaker	125 A	15 A	HS24-1204M125-15
			175 A Main Breaker	175 A	20 A	HS24-1204M175-20
			Dual Tap Main Lugs	225 A	15 A	HS24-1204DTML-15
					20 A	HS24-1204DTML-20

Wire Sizes

Wiring	Termination	Wire Sizes
Hot/Live/Neutral	Main Lugs Only	14 AWG to 2/0 AWG (2.5 mm^2 to 70 mm^2)
	Dual-Tap Main Lugs	6 AWG to 4/0 AWG (16 mm^2 to 95 mm^2)
	50 A to 100 A Main Breakers	14 AWG to 1/0 AWG (2.5 mm^2 to 50 mm^2)
	125 A to 175 A Main Breakers	4 AWG to 350 KCMIL/MCM (25 mm^2 to 185 mm^2)
Load	Terminal Blocks	14 AWG to 10 AWG (2.5 mm^2 to 4.0 mm^2)

Specification Grade Dimming Panels (cont.)

Input Voltage	*See HS8, HS16 and HS24 Model Numbers, pg. 164.*
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked. *See pg 166.*
Heat Generated Fully Loaded	HS8: 1365 BTUs per hr. maximum. HS16: 2725 BTUs per hr. maximum. HS24: 4085 BTUs per hr. maximum.
Arc Fault Circuit Interruptor (AFCI) Breakers	These panels can be ordered with GFCI (Ground-Fault Circuit Interruptor) or AFCI (Arc-Fault Circuit Interruptor) breakers. Contact Lutron Customer Service for ordering details.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	Must be installed in a way to provide sufficient access and working space according to the National Electrical Code (NEC). Surface-mounted. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	*See Fig. 1, pg. 166.*
Construction	Enclosure: Painted (black) 16 US gauge steel. Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	HS8: 115 lbs. (52 kg) without packaging HS16: 145 lbs. (66 kg) without packaging HS24: 175 lbs. (80 kg) without packaging

Specification Grade Dimming Panels (cont.)

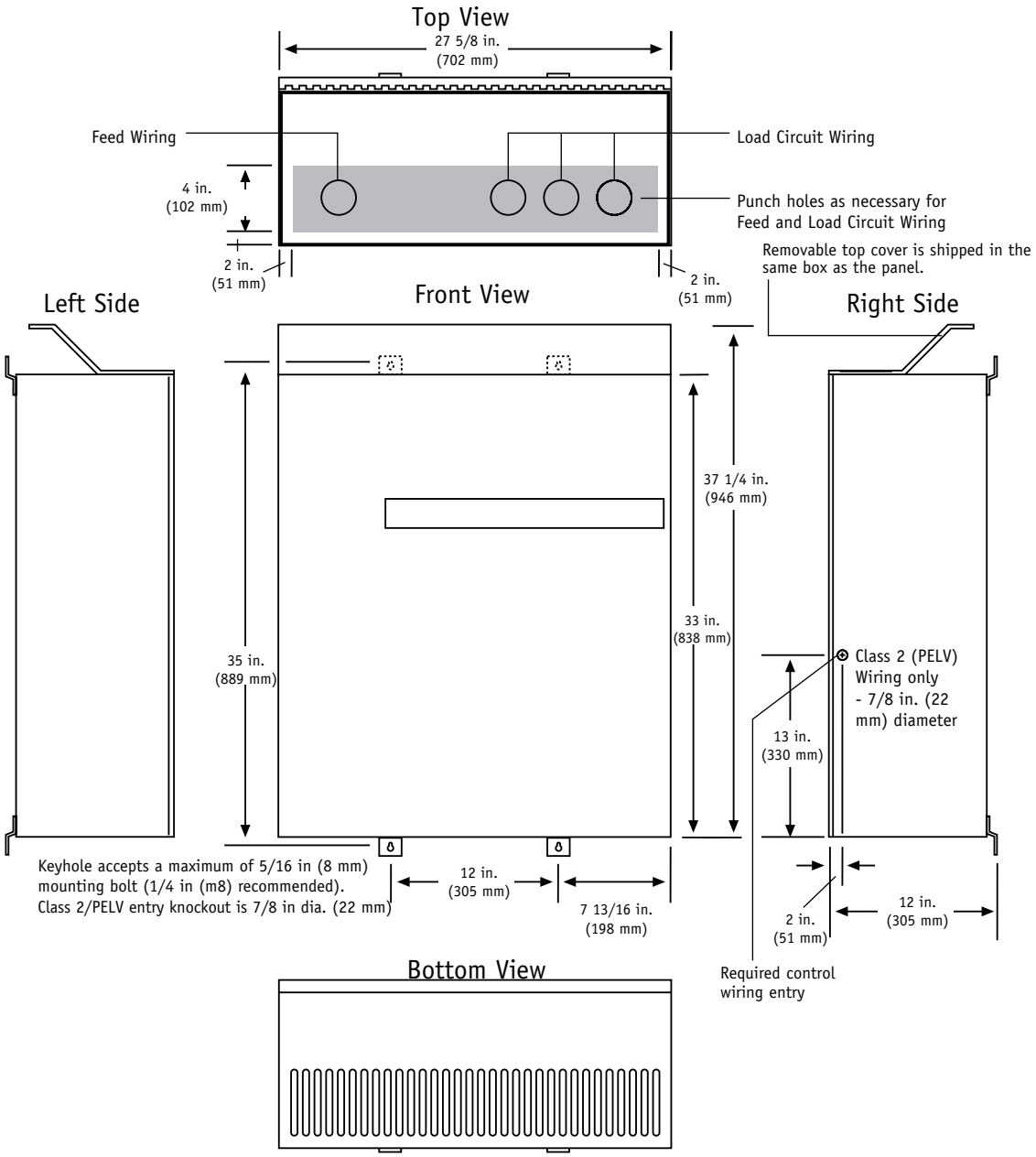
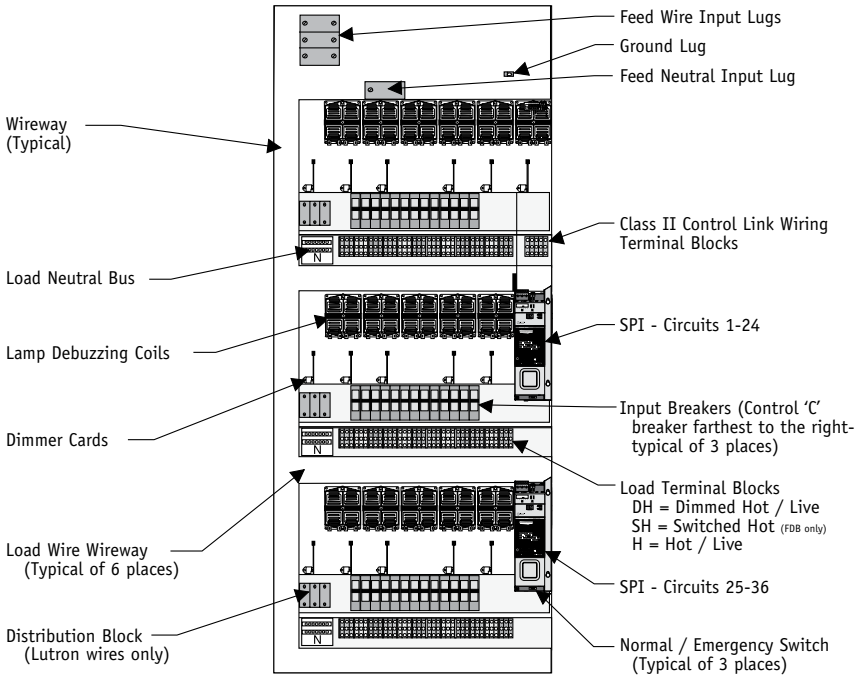


Figure 1 - HS8, HS16 and HS24 Dimensions and Conduit Entry

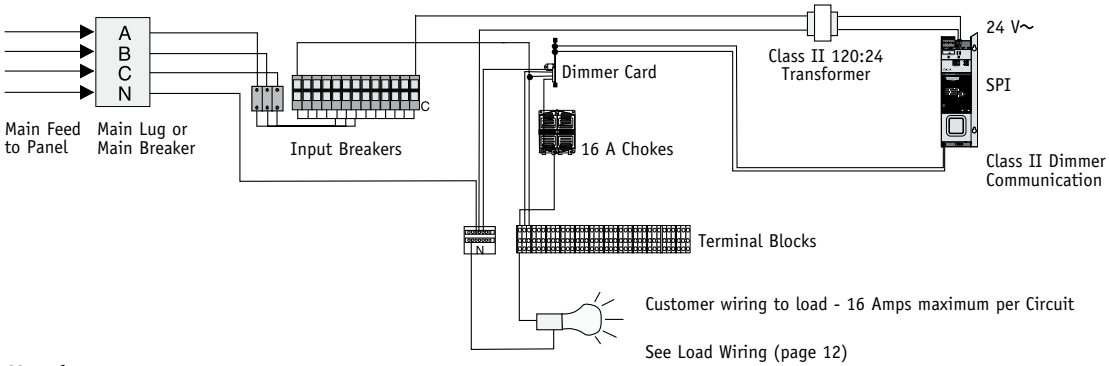
Specification Grade Dimming Panels (cont.)

THIRTY-SIX-CIRCUIT DIMMING PANEL
(MODEL # HS36-)



Internal Wiring

(Only One Representative Circuit Shown)



HS36 Model Numbers

Number of Cicuits	Feed Voltage	Feed Type	Panel Feed	Maximum Feed	Panel Feed/Branch Circuit Breakers[1]	Model Number
HS36	120 V~	3Ø, 4W	Main Lugs Only	750 A	15 A	HS36-1204ML-15
					20 A	HS36-1204ML-20
			200 A Main Breaker	200 A	15 A	HS36-1204M200-15
			250 A Main Breaker	250 A	20 A	HS36-1204M250-20

Wire Sizes

Wiring	Termination	Wire Sizes
Hot/Live/Neutral	Main Lugs Only	Parallel 4/0 AWG to 500 KCMIL/MCM (95 mm^2 to 240 mm^2)
	200 A to 400 A Main Breakers	1/0 AWG to 600 KCMIL/MCM (50 mm^2 to 300 mm^2)
Load	Terminal Blocks	14 AWG to 10 AWG (2.5 mm^2 to 4.0 mm^2)

BACK ROOM

Specification Grade Dimming Panels (cont.)

Input Voltage	*See HS36 Model Numbers, pg. 167.*
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked.
Heat Generated Fully Loaded	HS36: 4350 BTUs per hr. maximum.
Arc Fault Circuit Interruptor (AFCI) Breakers	These panels can be ordered with GFCI (Ground-Fault Circuit Interruptor) or AFCI (Arc-Fault Circuit Interruptor) breakers. Contact Lutron Customer Service for ordering details.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	Must be installed in a way to provide sufficient access and working space according to National Electrical Code (NEC). Surface-mounted. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	*See Fig. 1, pg. 169.*
Construction	Enclosure: Painted (black) 16 US gauge steel. Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	HS36: 325 lbs. (147 kg) without packaging

Specification Grade Dimming Panels (cont.)

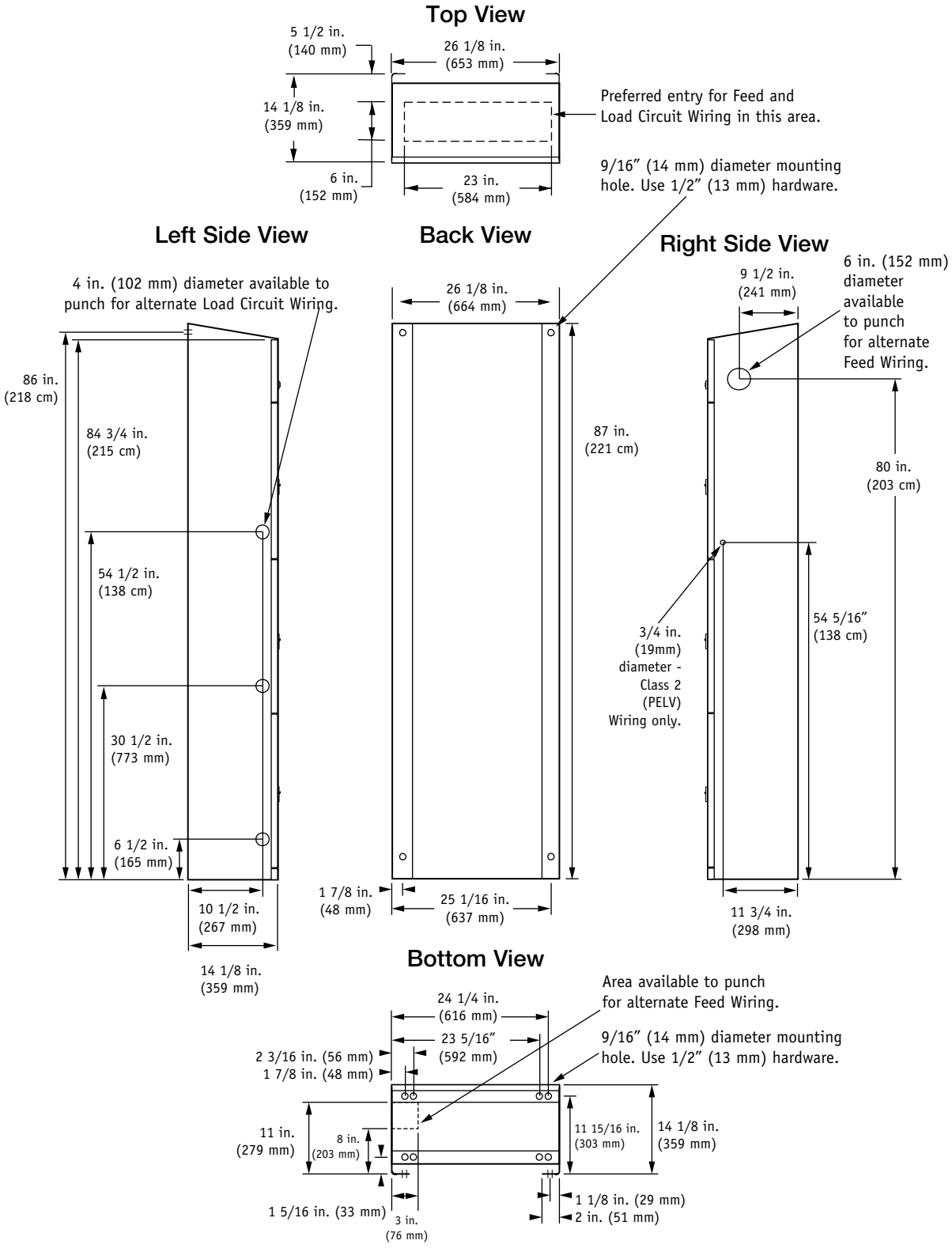
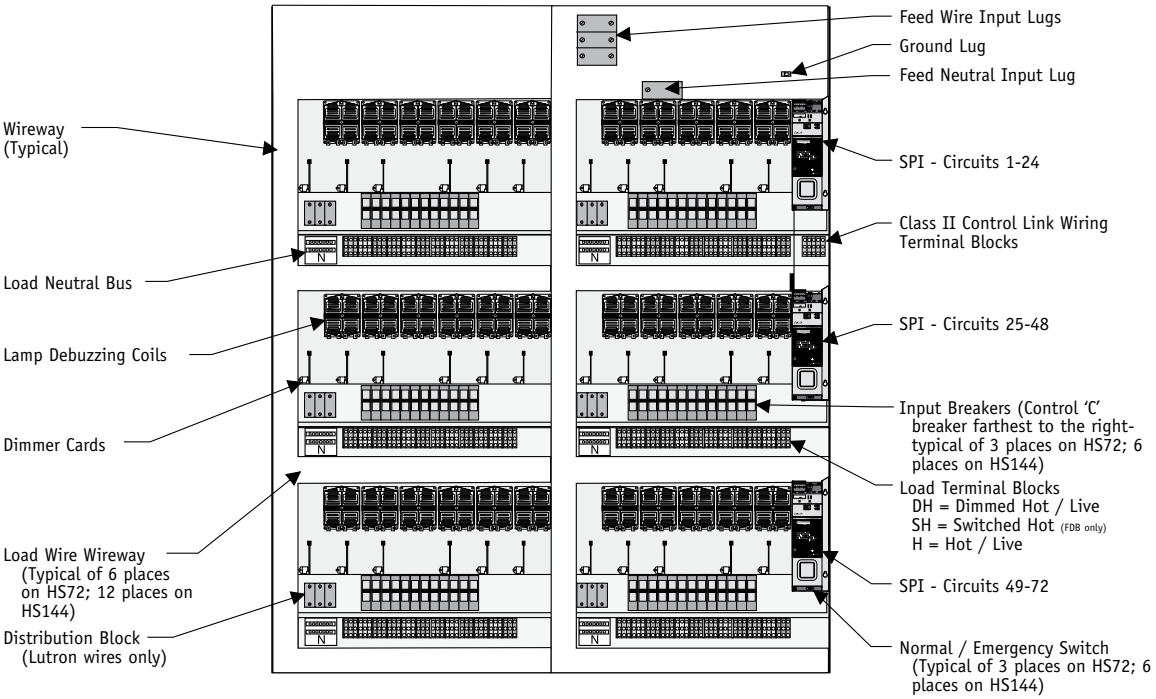


Figure 1 - HS36 Dimensions and Conduit Entry

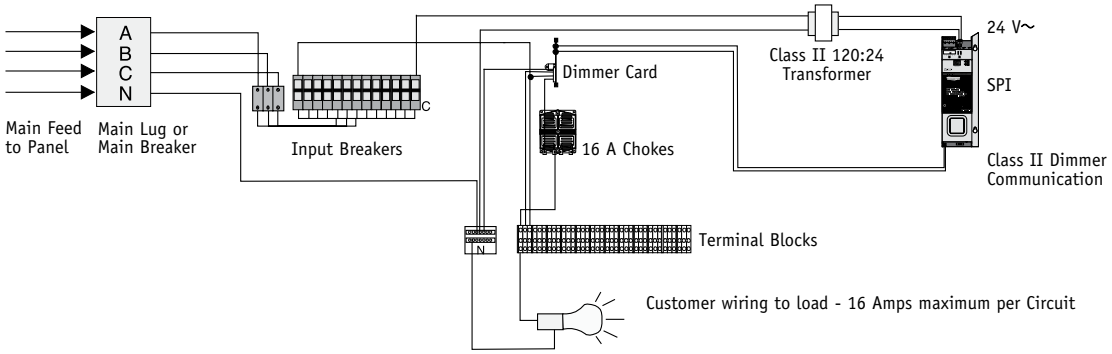
Specification Grade Dimming Panels (cont.)

SEVENTY-TWO-CIRCUIT DIMMING PANELS
(MODEL # HS72-)



Internal Wiring

(Only One Representative Circuit Shown)



HS72 Model Numbers

Number of Cicuits	Feed Voltage	Feed Type	Panel Feed	Maximum Feed	Panel Feed/Branch Circuit Breakers[1]	Model Number
HS72	120 V~	3Ø, 4W	Main Lugs Only	750 A	15 A	HS72-1204ML-15
					20 A	HS72-1204ML-20
			350 A Main Breaker	350 A	15 A	HS72-1204M350-15
			400 A Main Breaker	400 A	20 A	HS72-1204M400-20

Wire Sizes

Wiring	Termination	Wire Sizes
Hot/Live/Neutral	Main Lugs Only	Parallel 4/0 AWG to 500 KCMIL/MCM (95 mm^2 to 240 mm^2)
	200 A to 400 A Main Breakers	1/0 AWG to 600 KCMIL/MCM (50 mm^2 to 300 mm^2)
Load	Terminal Blocks	14 AWG to 10 AWG (2.5 mm^2 to 4.0 mm^2)

BACK ROOM

Specification Grade Dimming Panels (cont.)

Input Voltage	*See HS72 Model Numbers, pg. 170.*
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked.
Heat Generated Fully Loaded	HS72: 8700 BTUs per hr. maximum.
Arc Fault Circuit Interruptor (AFCI) Breakers	These panels can be ordered with GFCI (Ground-Fault Circuit Interruptor) or AFCI (Arc-Fault Circuit Interruptor) breakers. Contact Lutron Customer Service for ordering details.
Ground Bar Terminals	24 ground termination points.
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed.
Mounting	Must be installed in a way to provide sufficient access and working space according to National Electrical Code (NEC). Surface-mounted. Panel must be mounted vertically (+/- 7 degrees from vertical). Allow at least 12 in (30 cm) air space at top and bottom and a minimum of 12 in (30 cm) clearance in front of panel, or allow air space as required by local codes (whichever is greater). Panels will hum slightly and internal relays will click while in use. Mount where such noise is acceptable. Mount the panel so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring.
Dimensions	*See Fig. 1, pg. 172.*
Construction	Enclosure: Painted (black) 16 US gauge steel. Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	HS72: 650 lbs. (295 kg) without packaging

Specification Grade Dimming Panels (cont.)

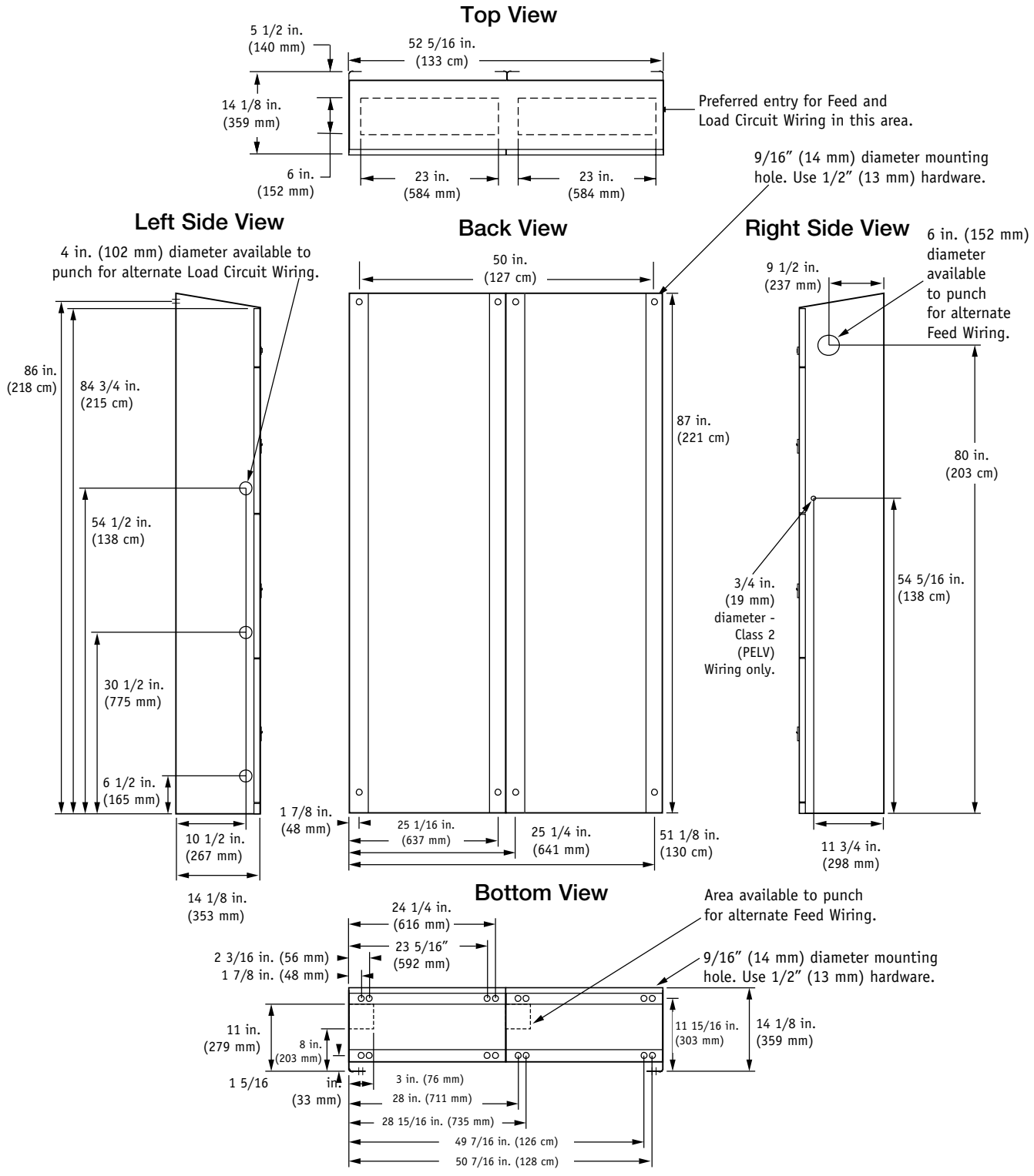


Figure 1 - HS72 Dimensions and Conduit Entry

Low-Voltage Enclosures

4/8 Series
Panels & Enclosures
N/A
N/A

Low-voltage enclosures are available in various sizes, each of which may be either surface-mounted or flush-mounted in an electrical closet or equipment room. Both the number of enclosures and the types of components within them are customized to fit the size, lighting plan, and design of a home. Low-voltage enclosures can be distributed throughout the home near the rooms they are controlling, to provide maximum flexibility during installation of the low-voltage wiring. Low-voltage enclosures cannot house remote power modules (RPMs).

32-INCH LOW-VOLTAGE ENCLOSURE (MODEL # HWI-LV32-120)

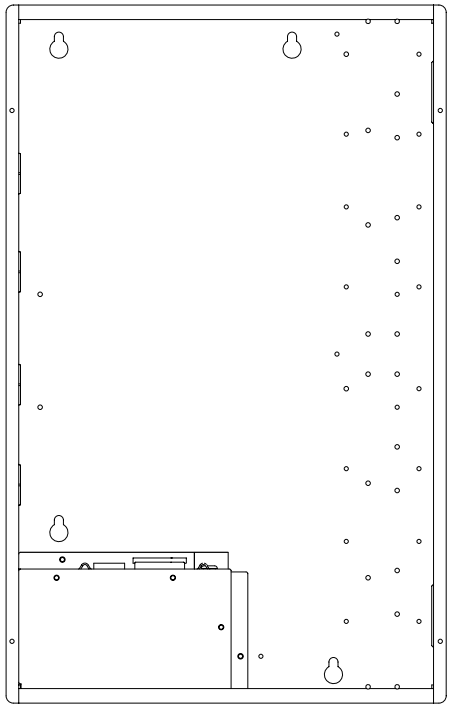
Thirty-two-inch low-voltage enclosures accommodate several components including 8 Series processors, dimmer interfaces (HWI-D48-120 or HWI-H48), wired contact closure interfaces (HWI-CCO-8 or HWI-CCI-8), and wire landing boards (HWI-WLB).

32-INCH CONTACT CLOSURE INTERFACE SUBPLATE(MODEL # HWI-SUB32-CC9)

The HomeWorks® contact closure interface subplate installs in the HWI-LV32-120 enclosure allowing up to nine contact closure interfaces (HWI-CCI-8 or HWI-CCO-8) to be mounted in one panel. Install the HWI-SUB32-CC9 using the three processor mounting screws already installed in the enclosure, plus two additional screws provided with the HWI-SUB32-CC9.

24-INCH LOW-VOLTAGE ENCLOSURE (MODEL # HWI-LV24-120)

Twenty-four-inch low-voltage enclosures provide a compact housing for mounting the 4 Series processor and up to two contact closure interfaces (HWI-CCO-8 or HWI-CCI-8) and/or wire landing boards (HWI-WLB). The enclosure accepts one 120 V feed to power the processor, which is self-contained in an enclosed high-voltage area, thus allowing access to only the low-voltage connections when the front cover is removed.



Low-Voltage Enclosure (HWI-LV24-120)

17-INCH LOW-VOLTAGE ENCLOSURE (MODEL # HWI-LV17-120)

Seventeen-inch low-voltage enclosures accommodate several components including dimmer interfaces (HWI-D48 or HWI-H48), contact closure interfaces (HWI-CCI-8 or HWI-CCO-8), and wire landing boards (HWI-WLB).

10-INCH LOW-VOLTAGE ENCLOSURE (MODEL # HWI-ENC-CC)

The 10-inch low-voltage enclosure accommodates one contact closure interface (HWI-CCI-8 or HWI-CCO-8).

Low-Voltage Enclosures (cont.)

32-inch Low-Voltage Enclosure

Model Number	HWI-LV32-120: 32-inch Low-Voltage Enclosure.
Capacity	One HomeWorks® 8 Series processor, one dimmer interface (HWI-H48 or HWI-D48), three wire landing boards (HWI-WLB). *See Fig. 6, pg. 181*. One *HomeWorks* 8 Series processor, two contact closure boards (HWI-CCI-8 or HWI-CCO-8), two wire landing boards (HWI-WLB). *See Fig. 6, pg. 181*. One contact closure board subplate (HWI-SUB32-CC9). *See Fig. 7, pg. 177*.
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C. DIN rail-mounted terminal blocks for power feed for *HomeWorks* processor (located at top left corner of panel). Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m).
DIN Rail Terminal	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m).
Dimensions	$14\frac{3}{8}$ in (36.5 cm) x 32 in (81 cm) x $3\frac{7}{8}$ in (9.8 cm)
Mounting	Enclosure can be surface-mounted or flush-mounted. Enclosure fits between standard 16 in (406 mm) on-center stud framing. Mount the enclosure so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring. *See Fig. 1, pg. 177*.
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	18 lbs. (8.2 kg)

32-inch Contact Closure Interface Subplate

Model Number	HWI-SUB32-CC9: Contact Closure Interface Subplate.
Capacity	Up to nine contact closure boards (HWI-CCO-8 or HWI-CCI-8) can be installed on the subplate.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Dimensions	14 in (35.5 cm) x 27 in (68.9 cm)
Mounting	This subplate can only be installed in the HWI-LV32 enclosure.
Construction	Galvanized sheet metal (unpainted).
Shipping Weight	7 lbs. (3.2 kg)

Low-Voltage Enclosures (cont.)

24-inch Low-Voltage Enclosure

Model Number	HWI-LV24-120: 24-inch Low-Voltage Enclosure
Capacity	One HomeWorks® 4 Series processor and two contact closure boards (HWI-CCI-8 or HWI-CCO-8). *See Fig. 8, pg. 179*. One *HomeWorks* 4 Series processor and two wire landing boards (HWI-WLB). *See Fig. 8, pg. 179*.
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C. Use supplied wire connectors to connect to corresponding power supply terminals.
Dimensions	15⅛ in (39 cm) x 24 in (61 cm) x 4⅛ in (10.5 cm)
Mounting	Enclosure may be surface-mounted or flush-mounted. Enclosure fits between standard 16 in (406 mm) on-center stud framing. Mount the enclosure so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring. *See Fig. 3, pg. 177*.
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover. Cover is attached using four philips-head screws.
Shipping Weight	17 lbs. (7.7 kgs)

Low-Voltage Enclosures (cont.)

17-inch Low-Voltage Enclosure

Model Number	HWI-LV17-120: 17-inch Low-Voltage Enclosure.
Capacity	One dimmer interface (HWI-H48 or HWI-D48) and one wire landing board (HWI-WLB). *See Fig. 9, pg. 180.* One contact closure board (HWI-CCI-8 or HWI-CCO-8) and one wire landing board (HWI-WLB). *See Fig. 9, pg. 180.* Two contact closure boards (HWI-CCI-8 or HWI-CCO-8). *See Fig. 9, pg. 180.*
Input Voltage	120 V~ 50/60 Hz
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C, 120 V~–12 V~ transformer mounted in top left corner for powering a dimmer interface (HWI-D48 or HWI-H48). Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). *See Fig. 4, pg. 177.*
Dimensions	9¼ in (23 cm) x 17¼ in (44 cm) x 3⅞ in (9.8 cm)
Mounting	Enclosure may be surface-mounted or flush-mounted. Enclosure fits between standard 16 in (406 mm) on-center stud framing. Mount the enclosure so that line-voltage wiring will be at least 6 feet (1.8 m) from audio or electronic equipment and its wiring. *See Fig. 4, pg. 177.*
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	16 lbs. (7.3 kg)

10-inch Low-Voltage Enclosure

Model Number	HWI-ENC-CC: 10-inch Low-Voltage Enclosure.
Capacity	One contact closure interface (HWI-CCO-8 or HWI-CCI-8).
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Dimensions	4½ in (10 cm) x 10¼ in (26 cm) x 3⅞ in (9.8 cm)
Mounting	May be surface-mounted or flush-mounted. *See Fig. 5, pg. 178.*
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Cover is attached using four phillips-head screws.
Shipping Weight	6 lbs. (2.7 kg)

Low-Voltage Enclosures (cont.)

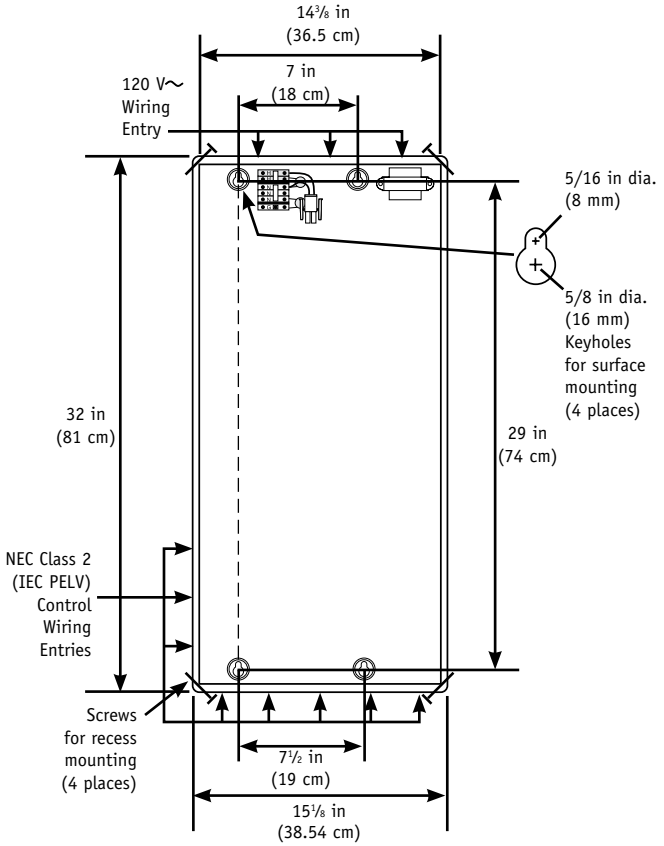


***Figure 1* – Dimensions and Mounting (HWI-LV32-120)**

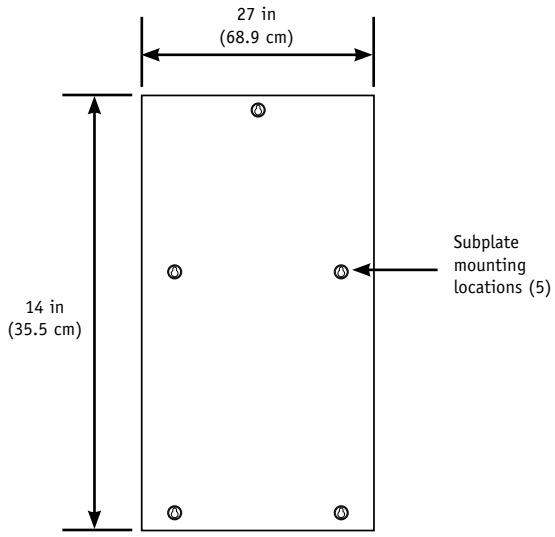


***Figure 2* – Mounting (HWI-SUB32-CC9)**

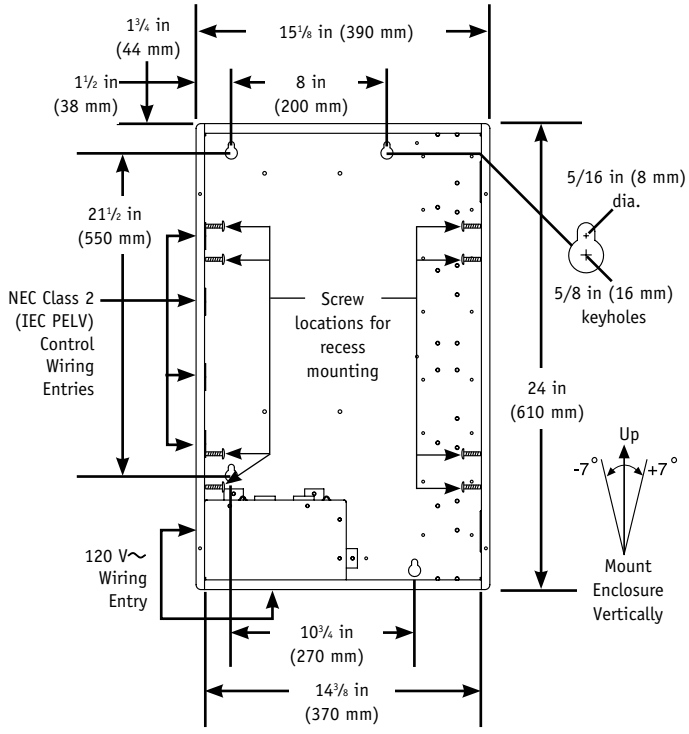


***Figure 3* – Dimensions and Mounting (HWI-LV24-120)**

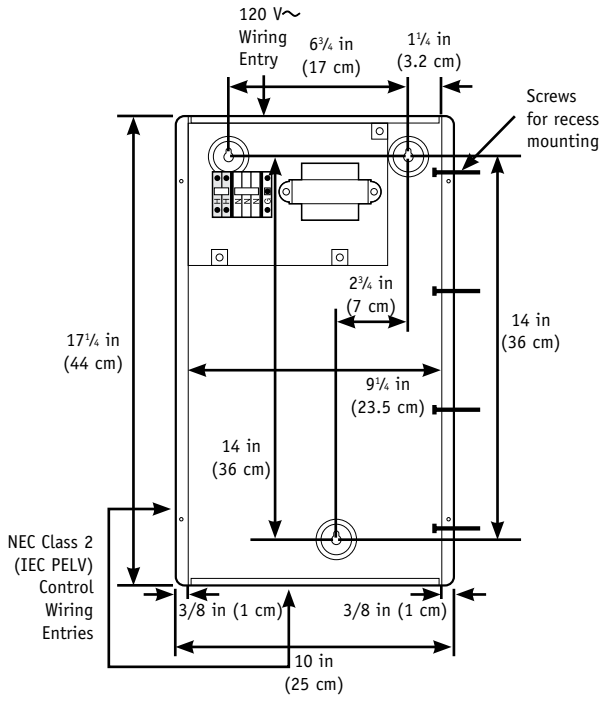


***Figure 4* – Dimensions and Mounting (HWI-LV17-120)**

Low-Voltage Enclosures (cont.)

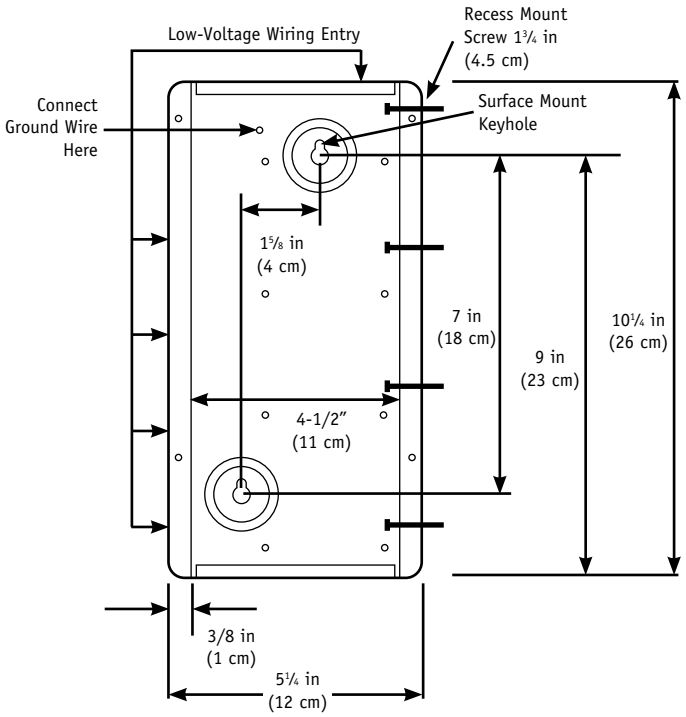
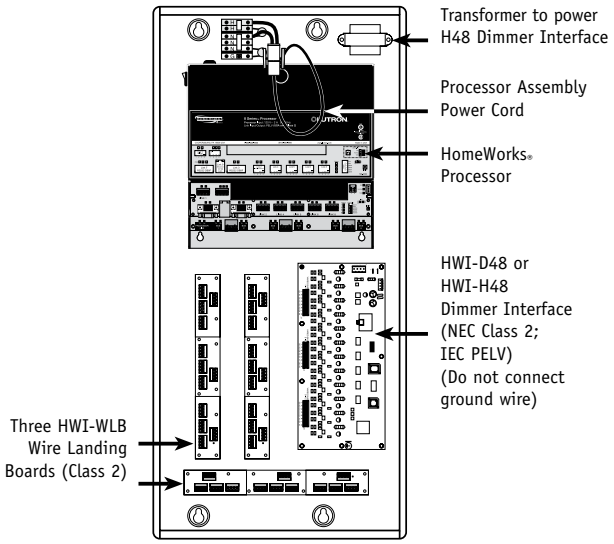
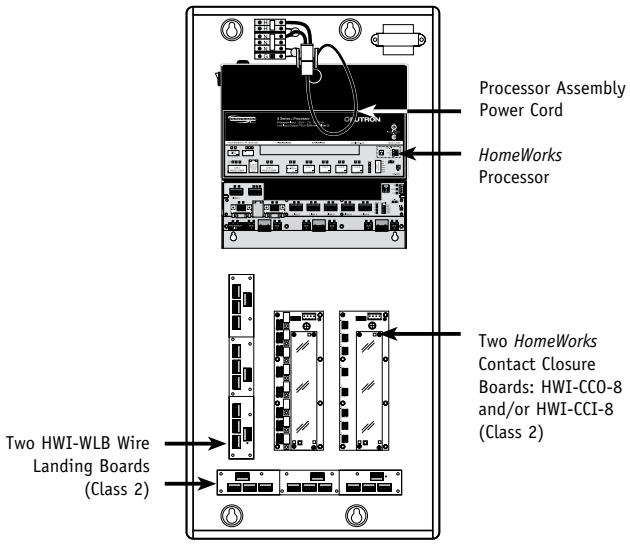


***Figure 5* – Dimensions and Mounting (HWI-ENC-CC)**



- 1 8 Series processor
- Up to 3 wire landing boards
- 1 dimmer interface

or

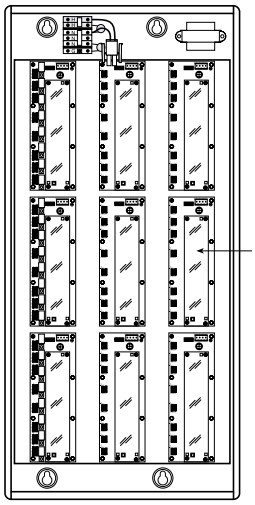


- 1 8 Series processor
- Up to 2 wire landing boards
- Up to 2 contact closure interfaces

***Figure 6* – HWI-LV32-120 Configurations**

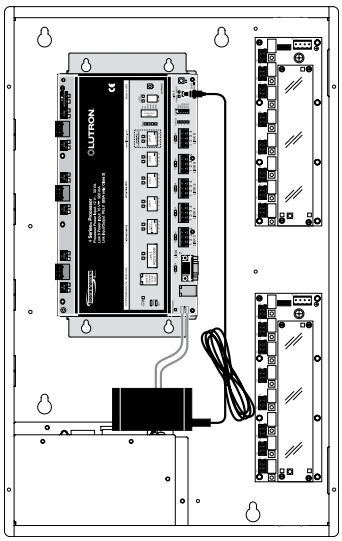
BACK ROOM

Low-Voltage Enclosures (cont.)



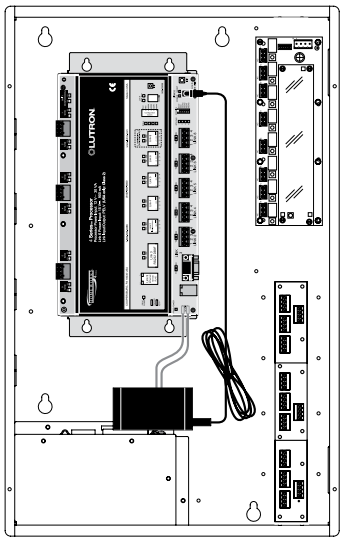
- Up to 9 contact closure interfaces

***Figure 7*– HWI-SUB32-CC9 Configuration**



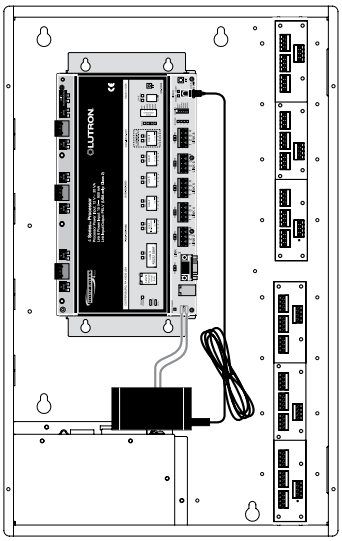
- 1 4 Series processor
- Up to 2 contact closure interfaces

or



- 1 4 Series processor
- contact closure interface
- wire landing board

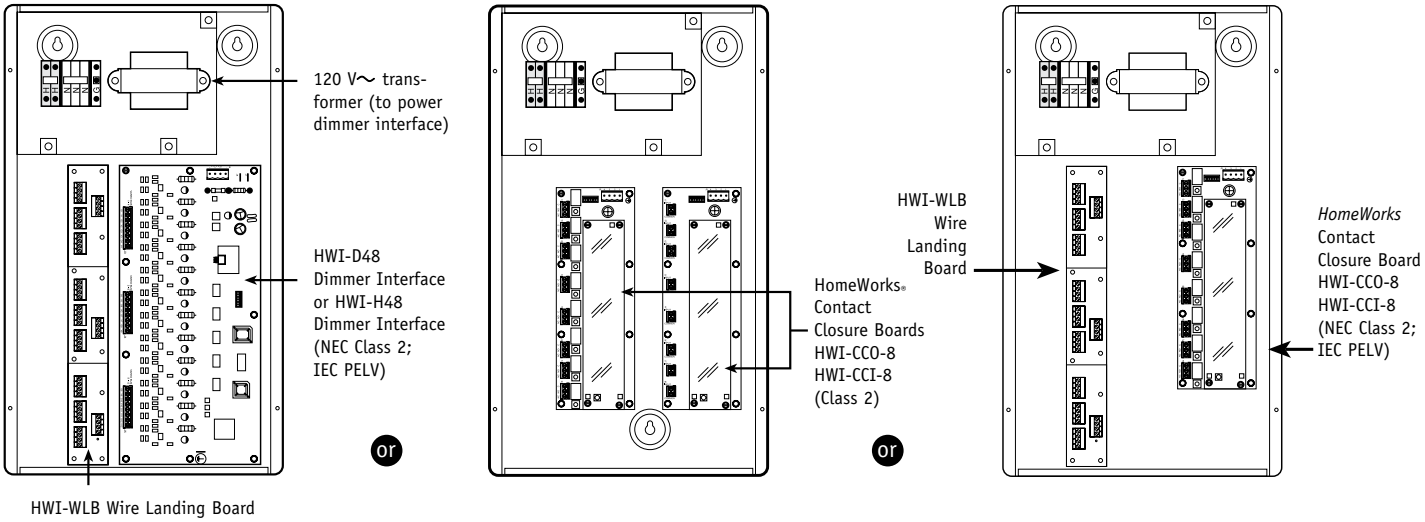
or



- 1 4 Series processor
- Up to 2 wire landing boards

***Figure 8*– HWI-LV24-120 Configurations**

Low-Voltage Enclosures (cont.)

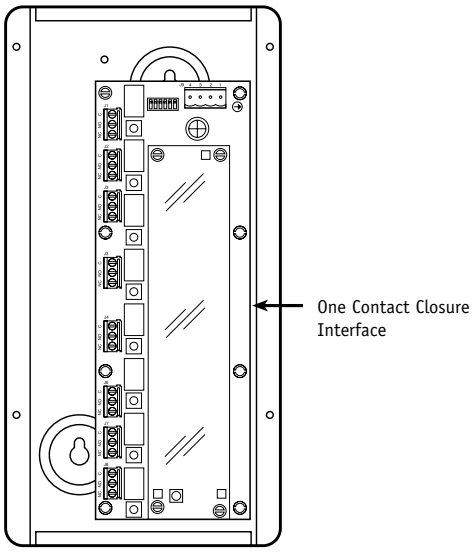


- 1 dimmer interface
- 1 wire landing board

- up to 2 contact closure interfaces

- 1 contact closure interfaces
- 1 wire landing board

***Figure 9* – HWI-LV17-120 Configurations**



- 1 contact closure interfaces

***Figure 10* – HWI-ENC-CC Configuration**

BACK ROOM

Wire Landing Board

4/8 Series
Panel Accessories
N/A
N/A

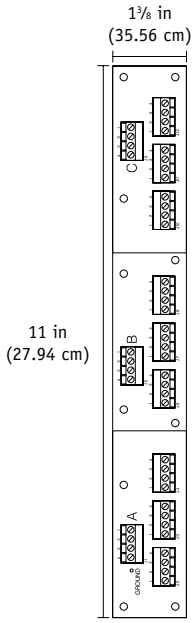


***Figure 1* – Dimensions**

WIRE LANDING BOARD
(MODEL # HWI-WLB)

The wire landing board is a wiring aid consisting of a printed circuit board with three sets of four terminal blocks. Each of these sets of terminal blocks is connected pin-to-pin, simplifying home run wiring. The wire landing board is installed in a low-voltage enclosure (*see pg. 178-180 for more information*).

Model Number	HWI-WLB: Wire Landing Board.
Low-Voltage Connections	Three groups of 4-position removable terminal blocks. Terminal blocks will accept up to two #18 AWG (1.0 mm²) wires. *See Fig. 2, below*.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Mounting	Mounts in the following enclosures: HWI-LV32-120, HWI-LV24-120, and HWI-LV17-120.
Shipping Weight	0.5 lbs. (0.3 kg)

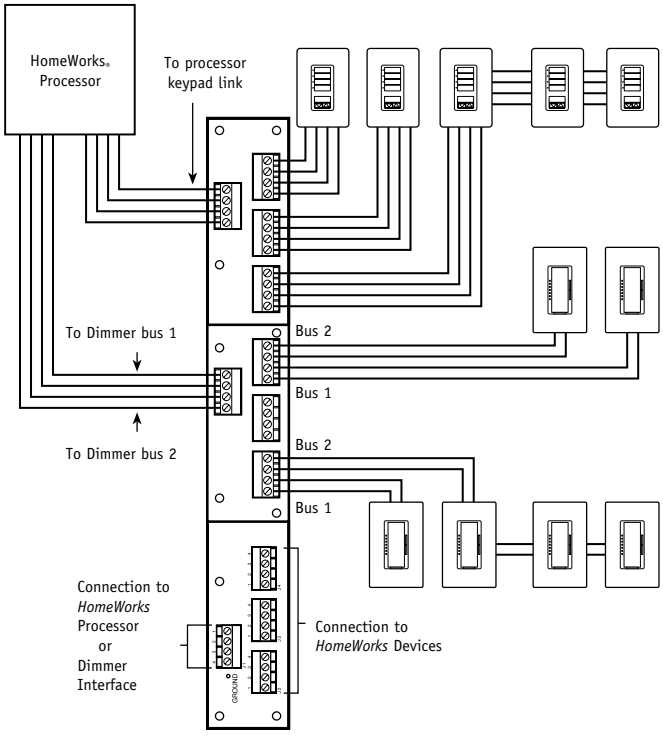
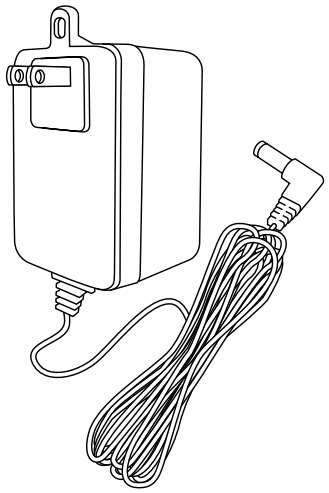


***Figure 2* – Wiring Diagram**

Auxiliary Power Supplies

4/8 Series
Power Supplies
Keypad Link
N/A

The auxiliary power supplies are additional 15 V⎓ power sources that are used to power additional keypads and contact closure interfaces, when the power supply capacity of the processor is exceeded. A 4 Series P5 processor can power a maximum of 150 LEDs. An 8 Series P5 processor can power a maximum of 350 LEDs. Wireless series processors do not power keypads because each RF keypad is powered locally. For keypad LED counts, see Table 1 on pg. 40.



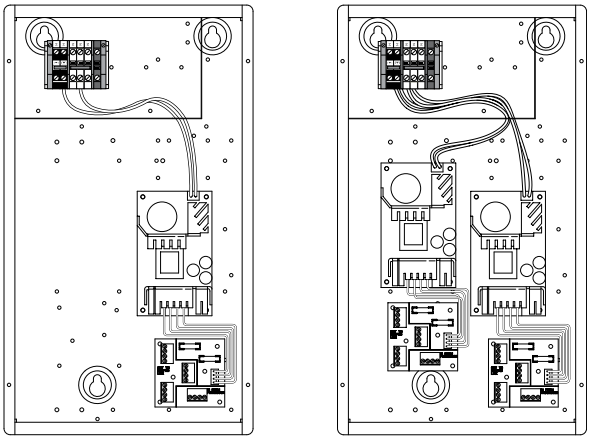
Plug-In Auxiliary Power Supply (T120-15DC-9-BL)

PLUG-IN AUXILIARY POWER SUPPLY (MODEL # T120-15DC-9-BL)

The plug-in auxiliary power supply can power a maximum of 150 additional LEDs.

WALL-MOUNTED AUXILIARY POWER SUPPLY (MODEL # PPS1-120-15DC-3A & PPS2-120-15DC-3A)

The wall-mounted auxiliary power supplies can power a maximum of 500 additional LEDs (PPS1) or 1000 additional LEDs (PPS2).



Wall-Mounted Auxiliary Power Supplies (PPS1-120-15DC-3A and PPS2-120-15DC-3A)

BACK ROOM

Auxiliary Power Supplies (cont.)

Plug-In Auxiliary Power Supply

Model Number	T120-15DC-9-BL: A wall plug-in transformer power supply used to support an additional 150 LEDs on a wired keypad link.
Input Voltage	120 V~ 60 Hz 19 W
Regulatory Approvals	UL, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Line-Voltage Connections	Wall plug-in.
Output Voltage	15 V⎓
Output Current	900 mA
Dimensions	2¼ in (5.715 cm) x 3½ in (8.89 cm) x 2 in (5.08 cm); cord length is 6 feet (1.8 m)
Mounting	Wall plug-in with 6-foot cord must be spliced into keypad link and reach a 120 V~ receptacle. The transformer may be screwed into the receptacle's faceplate.
Shipping Weight	1.8 lbs. (0.8 kg)

Wall-Mounted Auxiliary Power Supply

Model Number	PPS1-120-15DC-3A: An enclosure-mounted power supply used to support an additional 500 LEDs on a wired keypad link. PPS2-120-15DC-3A: An enclosure-mounted power supply used to support an additional 1000 LEDs on a wired keypad link.
Input Voltage	PPS1-120-15DC-3A: 120 V~ 50/60 Hz 360 W PPS2-120-15DC-3A: 120 V~ 50/60 Hz 720 W
Regulatory Approvals	UL, CSA
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling. Mount in a place where the vented cover will not be blocked.
Heat Generated Fully Loaded	PPS1-120-15DC-3A: 65 BTUs per hr. maximum. PPS2-120-15DC-3A: 130 BTUs per hr. maximum.
Line-Voltage Connections	Use copper wire only, supply conductors 60/75 °C. DIN rail-mounted terminal blocks for power supply feed located at top left corner of panel. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m). *See Fig. 3, pg. 184.*
DIN Rail Terminal Blocks	Terminal blocks will accept one #18-10 AWG (1.0-2.5 mm^2) wire or two #18-16 AWG (1.0-1.5 mm^2) wires. Terminal blocks should be tightened to 3.5-5.0 in.-lbs. (0.40-0.57 N•m).
Output Voltage	15 V⎓
Output Current	6 A Max. (3 A max per input/output board)
Dimensions	9¼ in (23 cm) x 17¼ in (44 cm) x 3⅞ in (9.8 cm)
Mounting	Enclosure may be surface-mounted or flush-mounted. *See Fig. 3, pg. 184.*
Construction	Enclosure: 16-gauge galvanized sheet metal (unpainted). Cover: Painted (black) metal cover with ventilation holes. Attach using four phillips-head screws.
Shipping Weight	13 lbs. (5.9 kg)

Auxiliary Power Supplies (cont.)

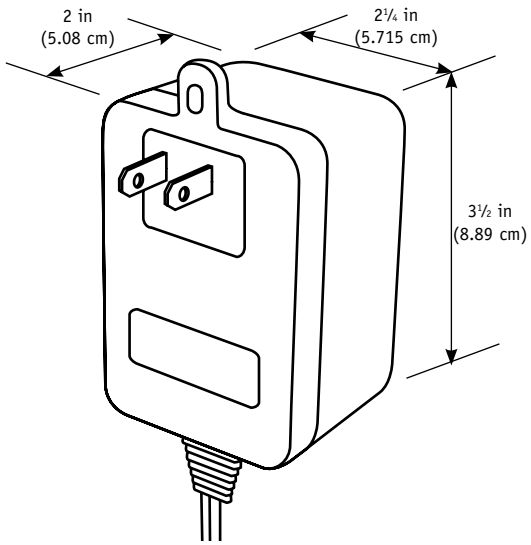


***Figure 1* – T120-15DC-9-BL Dimensions**

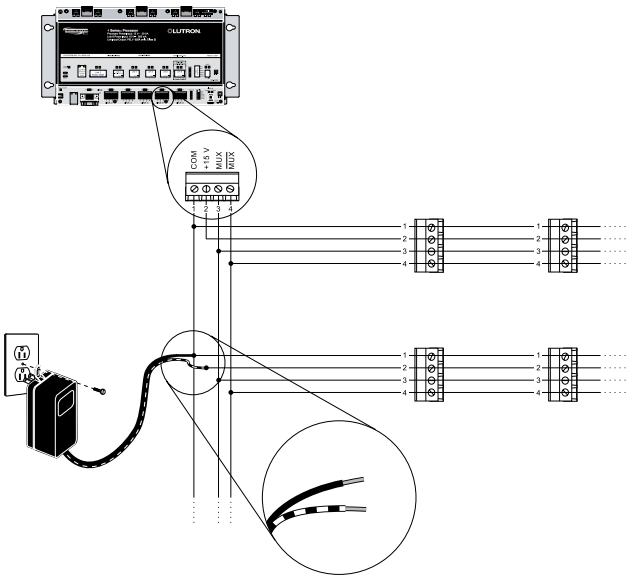


***Figure 2* – T120-15DC-9-BL Low-Voltage Wiring**

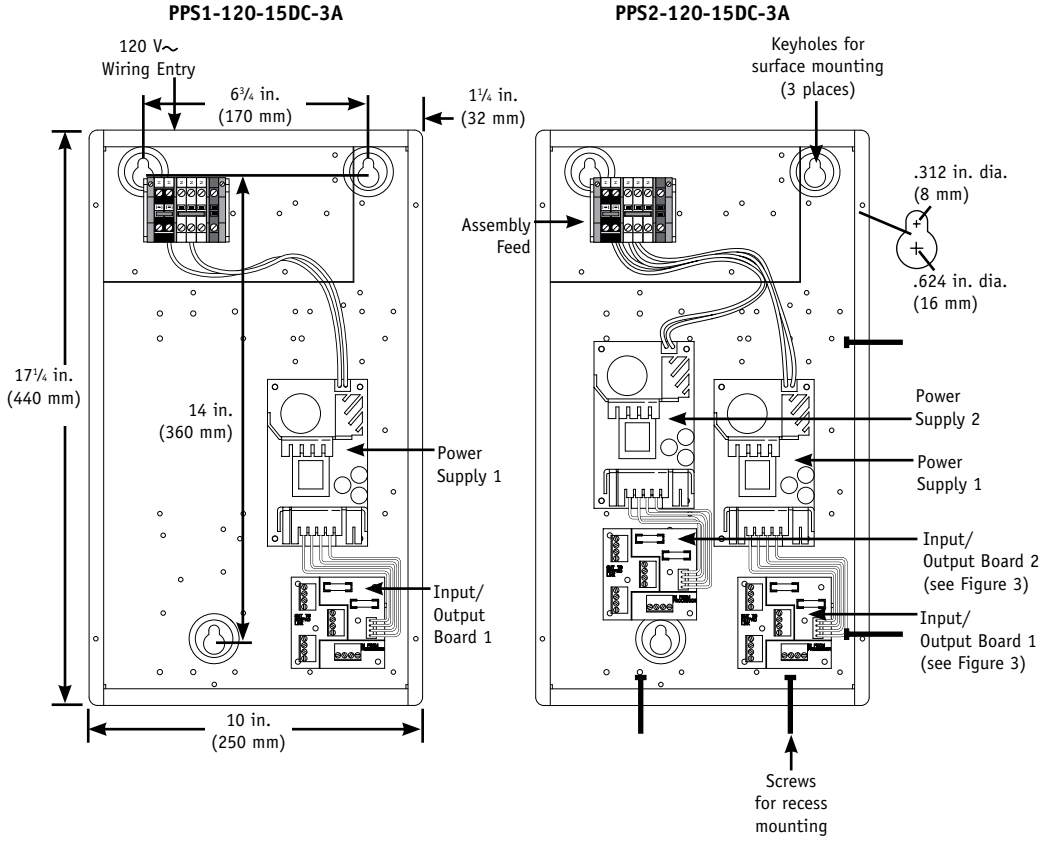


***Figure 3* – PPS Dimensions and Mounting**

BACK ROOM

Auxiliary Power Supplies (cont.)

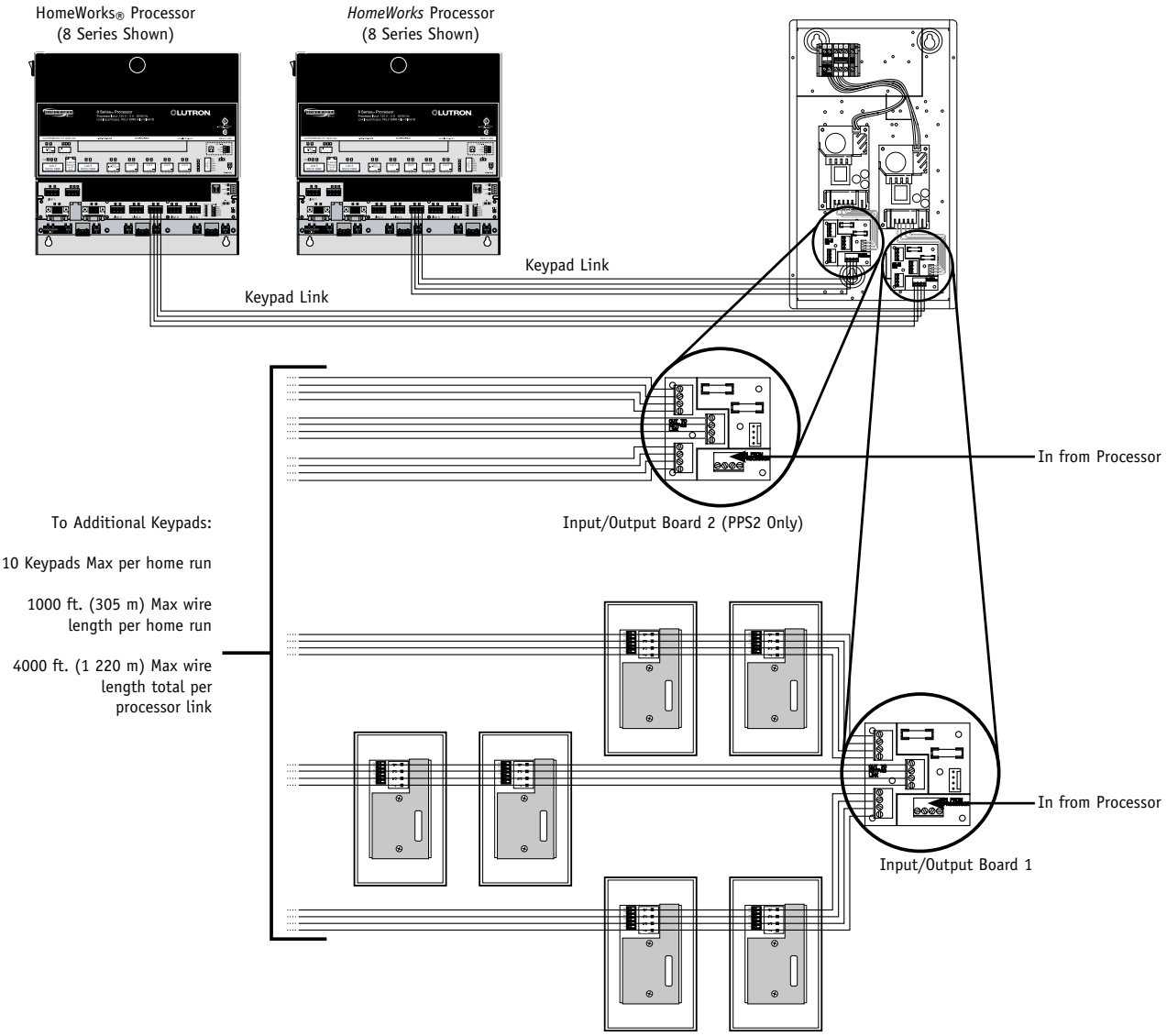


***Figure 4* – PPS Low-Voltage Wiring**

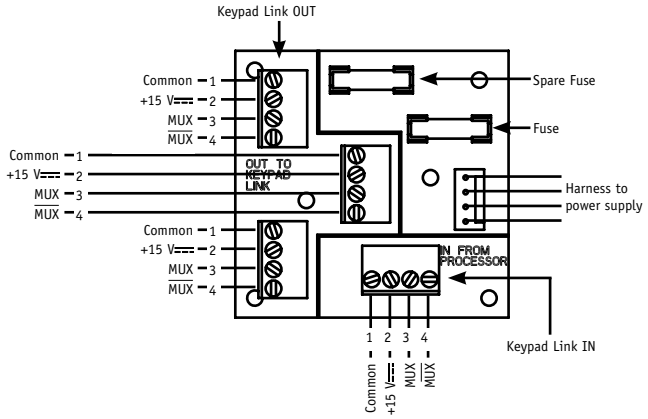


***Figure 5* – PPS Input/Output Board Wiring Detail**

BACK ROOM

Link Extender

4/8 Series
Panel Accessory
MI, Inter-Processor, Hybrid Repeater
N/A

Model Number	LUT-LINK-EXT: Extends the total cable length allowed for use on the inter-processor, module interface, and hybrid repeater links from 1000 feet (305 m) to 2000 feet (610 m).
Input Voltage	100–120 V~, 220–240 V~ 50/60 Hz (line-voltage input not to be used in CE countries).
Regulatory Approvals	UL, CSA
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Line-Voltage	Use copper wire only, supply conductors 60/75 °C.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm^2), one pair #18-22 AWG (1.0-0.5 mm^2) twisted shielded – Class 2 wire. *See Figs. 3, 4, 5 pgs 187-188.*
Low-Voltage Wiring Configuration	Inter-processor link: *See Fig. 3, pg 187.* Hybrid repeater link See fig. 5 pg. 188 Module interface link: *See Fig. 4, pg 187.*
Low-Voltage Connections	Two 4-pin removable terminal blocks. Each terminal will accept up to four #18 AWG (1.0 mm^2) wires.
Addressing	This unit does not require an address.
Diagnostics	LEDs provide diagnostics for troubleshooting communication on the links.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	7¾ in (197 mm) x 5 in (127 mm) x 2½ in (64 mm)
Mounting	Mounts on a standard 4 in X 4 in junction box. *See Fig. 1.*
Shipping Weight	2.4 lbs. (1.1 kg)
Using Special Cable	Special NEC® Class 2 (IEC PELV) communication cable can be used to extend the total cable length allowed for use on the inter-processor, module interface, and hybrid repeater links from 1000 feet (305 m) to 4000 feet (1 220 m) without the use of a link extender, and from 2000 feet (610 m) to 8000 feet (2 240 m) with the use of a link extender. Refer to HomeWorks® Application Note #62 for details and special cable specifications.

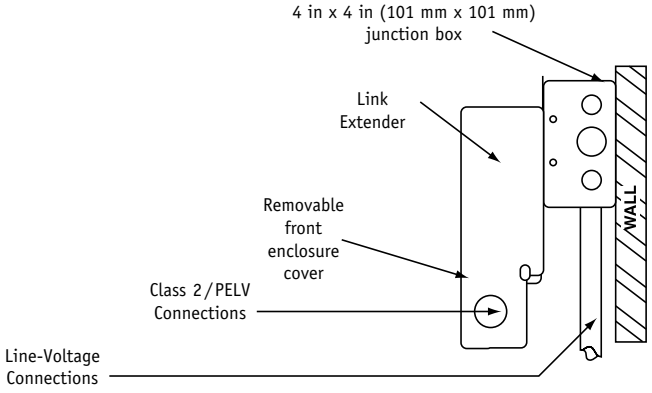


***Figure 1* – Mounting Diagram**

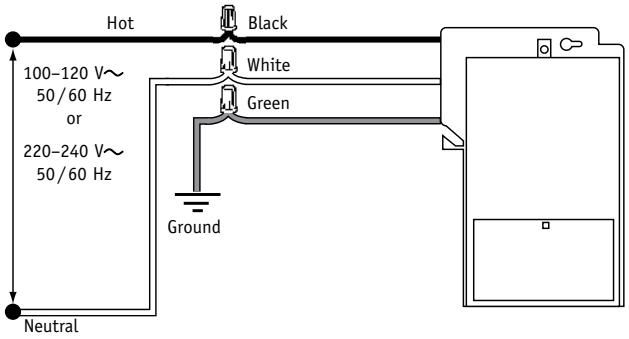
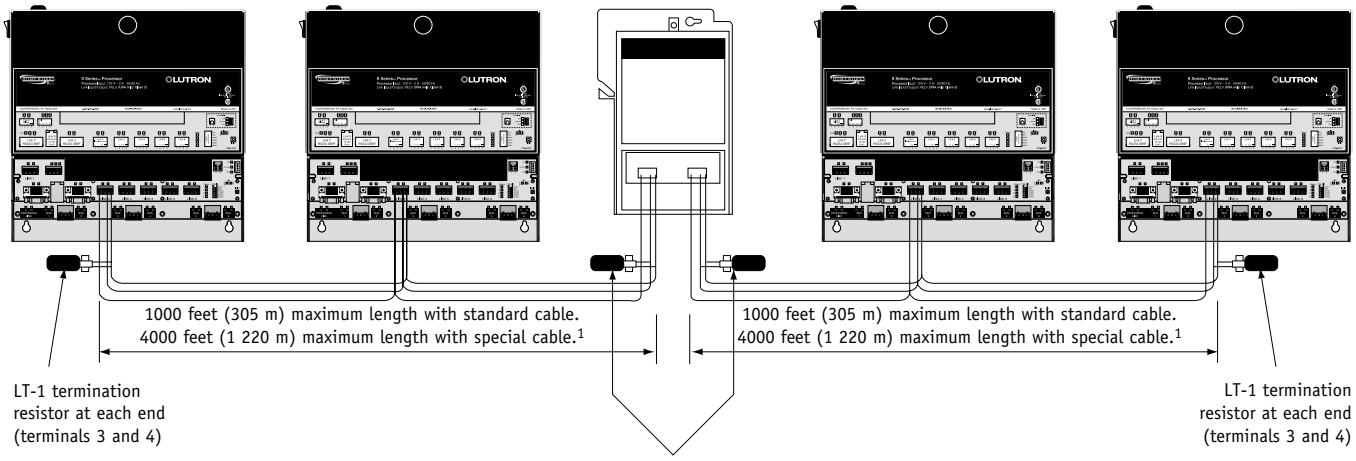


***Figure 2* – Line-Voltage Wiring Diagram**

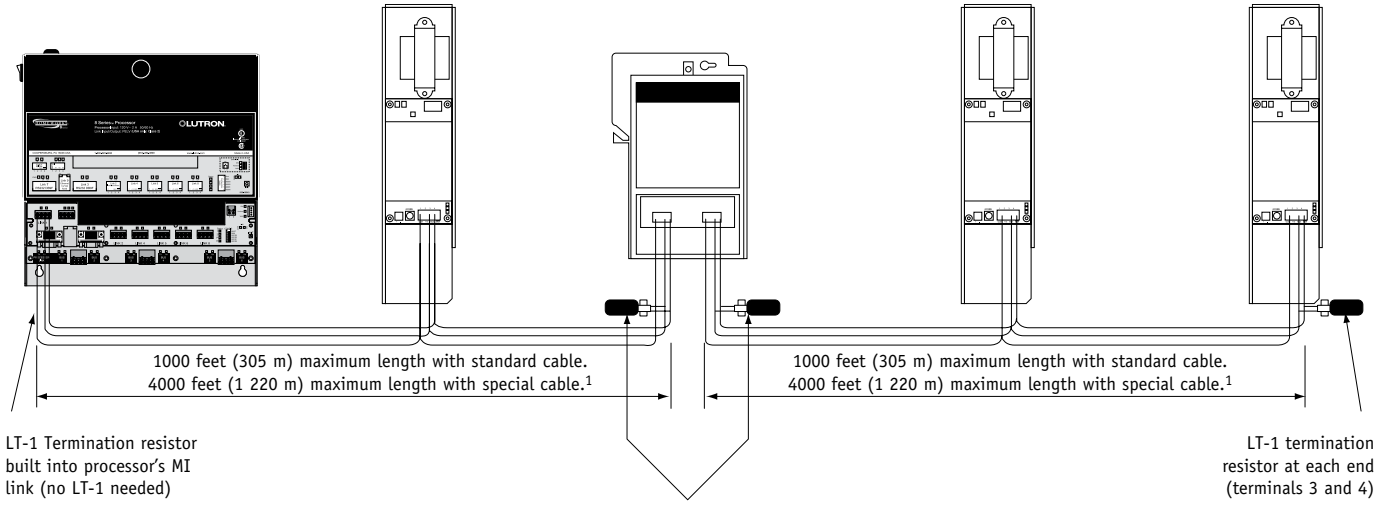
BACK ROOM

Link Extender (cont.)



Note: *Only one Link Extender can be used on a link.*

***Figure 3* – Inter-Processor Link Wiring Diagram with LUT-LINK-EXT**



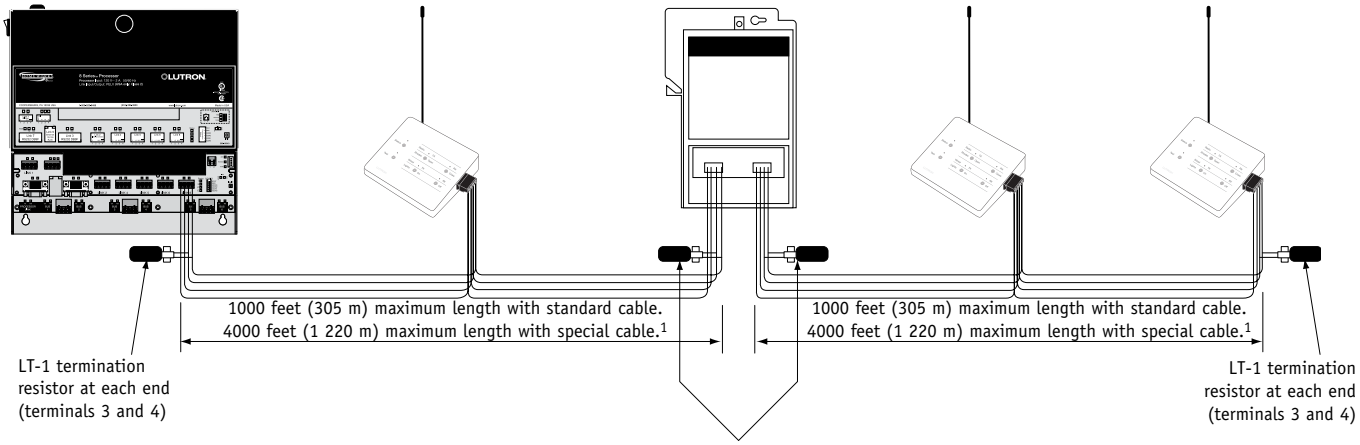
Note: *Only one Link Extender can be used on a link.*

***Figure 4* – Module Interface Link Wiring Diagram with LUT-LINK-EXT**

BACK ROOM

[1] For information on special cable applications, see HomeWorks® Application Note # 62.

Link Extender (cont.)

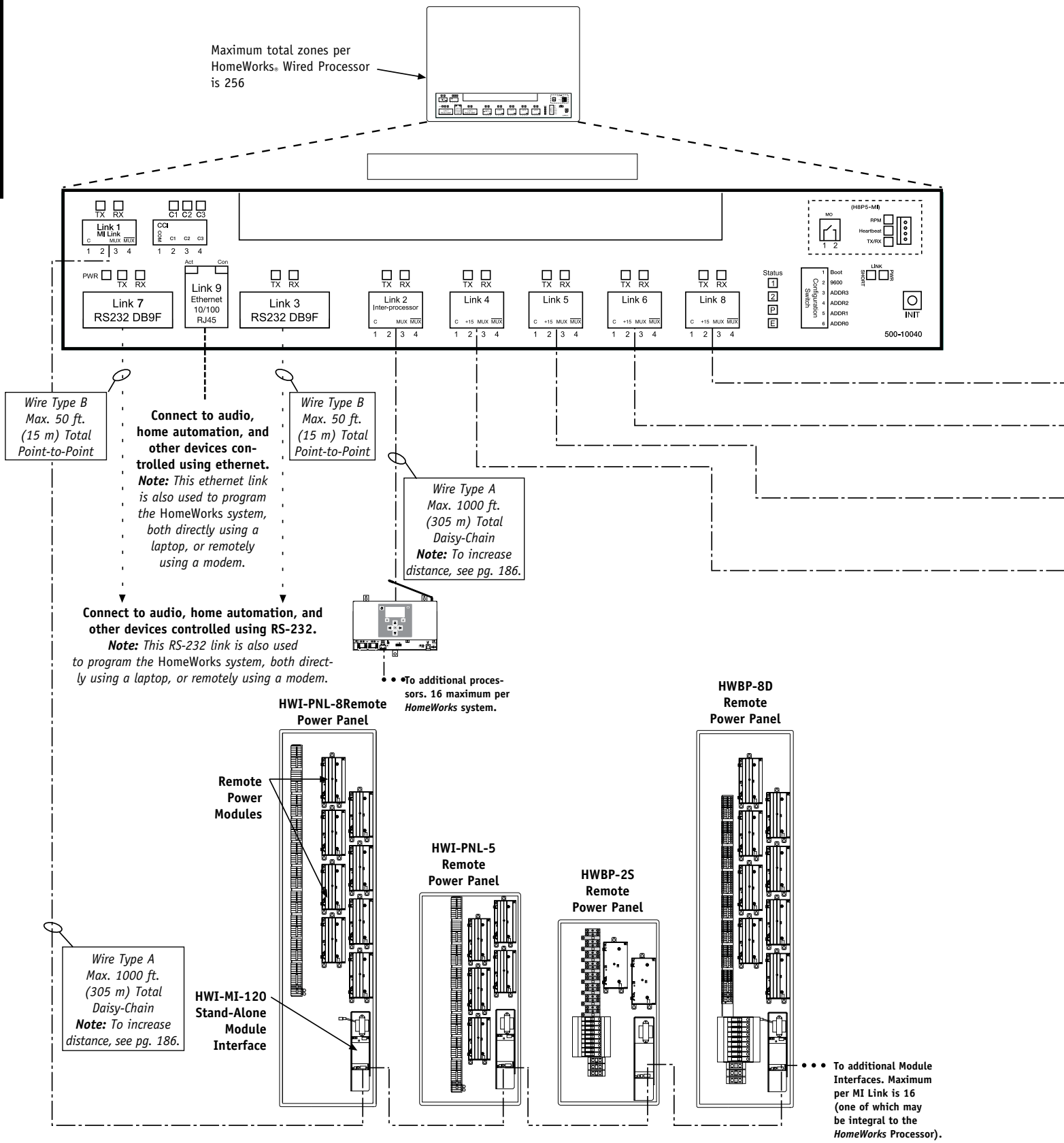


Note: *Only one Link Extender can be used on a link.*

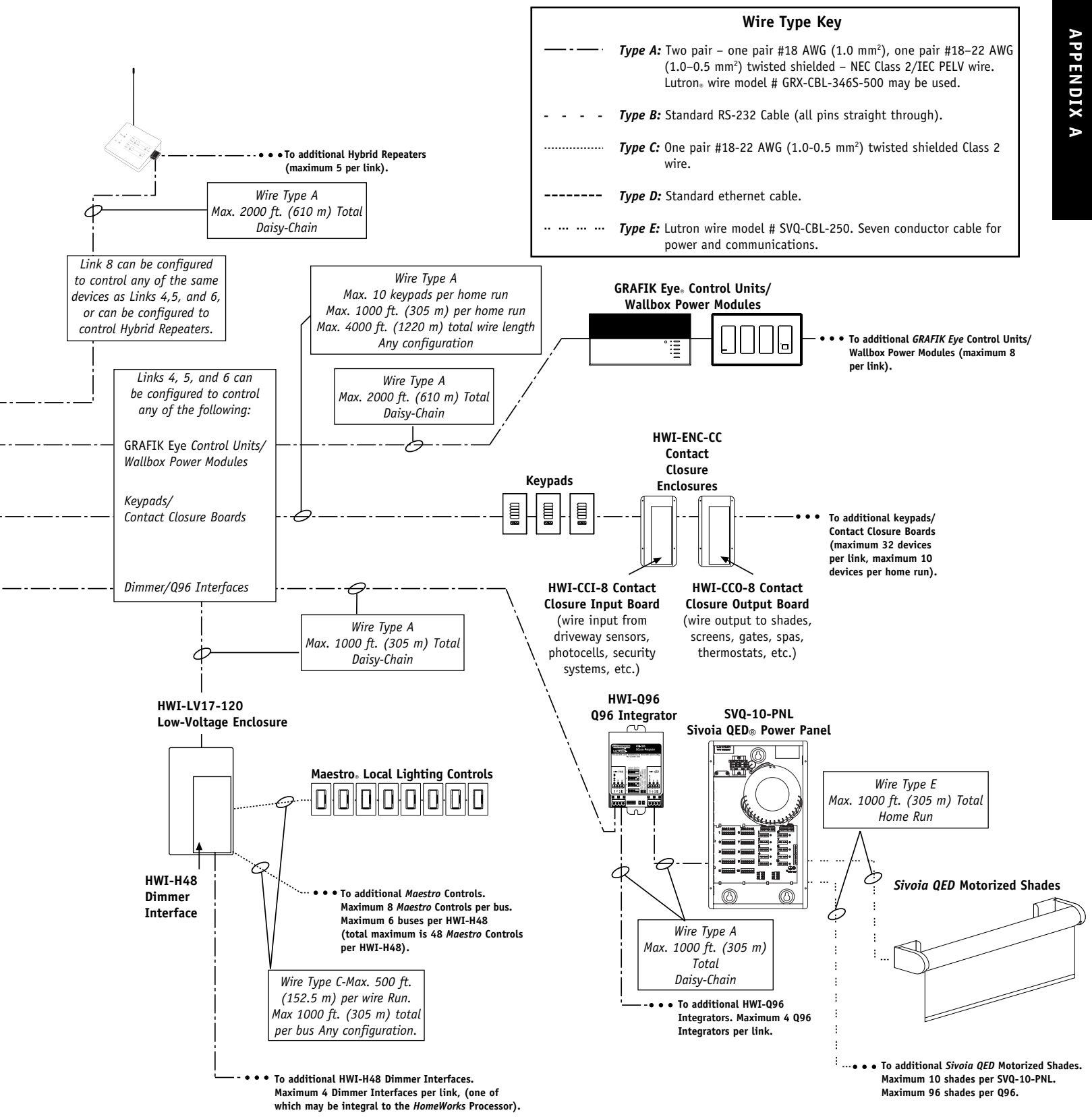
***Figure 5* – Hybrid Repeater Link Wiring Diagram with LUT-LINK-EXT**

Appendices

Appendix A: Wiring and Communication Overview



Appendix A: Wiring and Communication Overview (cont.)



Appendix B: Sivoia QED® Overview

Sivoia Quiet Electronic Drive

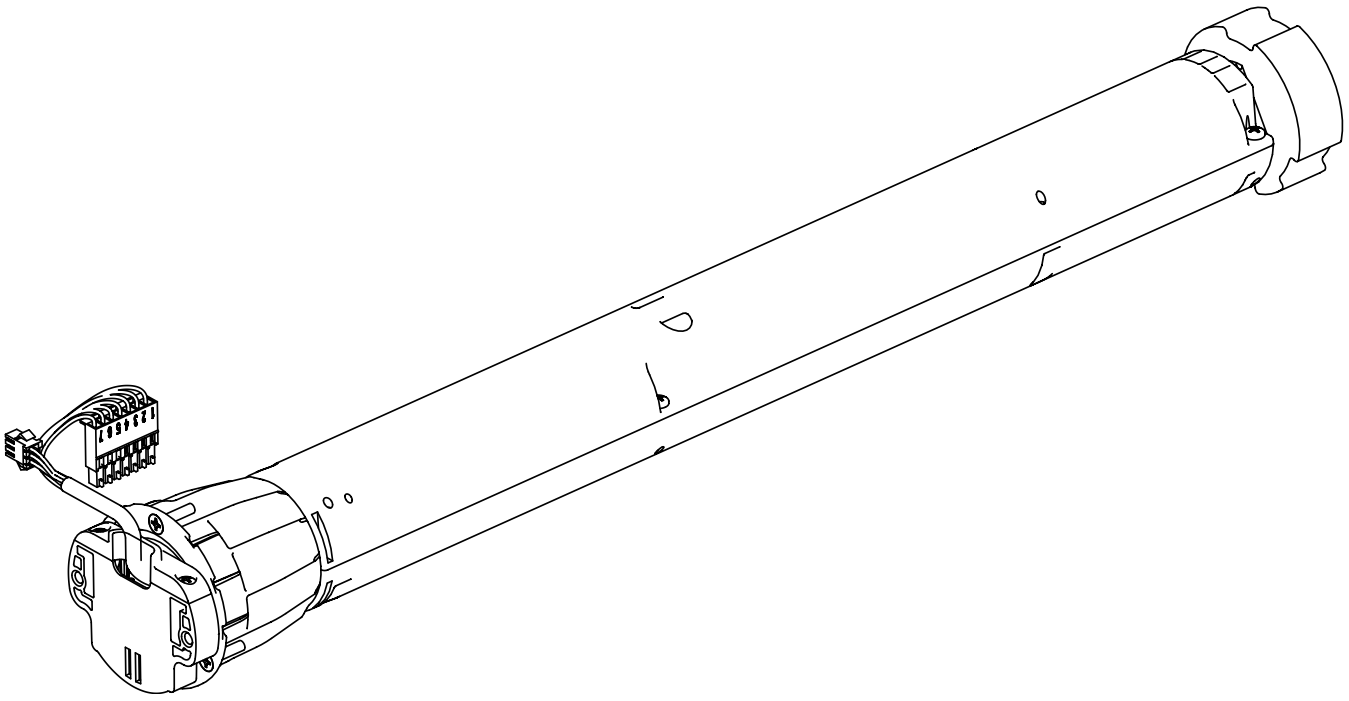
HomeWorks® can directly control shades and draperies using the *Sivoia QED* system. *HomeWorks* connects to the *Sivoia QED* system with the Q96 integrator (see pg. 135)

The Electronic Drive Unit (EDU) is the brain of the *Sivoia QED* system. It controls the movement of the shade, keeps track of the shade's position, and adjusts it to the programmed level selected by the user. Each EDU counts as one zone on the *HomeWorks* system.

Unit Features and Benefits:

- Ultra-quiet operation: will not exceed 44 dBA measured 3 feet from the EDU.
- Smooth, silent starts and stops.
- Ten year power failure memory.
- Monitors shade position at all times.
- 24 V~ low-voltage power allows *Sivoia QED* to be installed by low-voltage contractors.
- Shades smoothly move in unison and stop in exact alignment within ±1/16" accuracy.

For more information on *Sivoia QED*, refer to the *Sivoia QED* Technical Reference Guide (P/N 367-592).



Sivoia QED Electronic Drive Unit
(shown without fabric)

Appendix B: Sivoia QED® Overview (cont.)

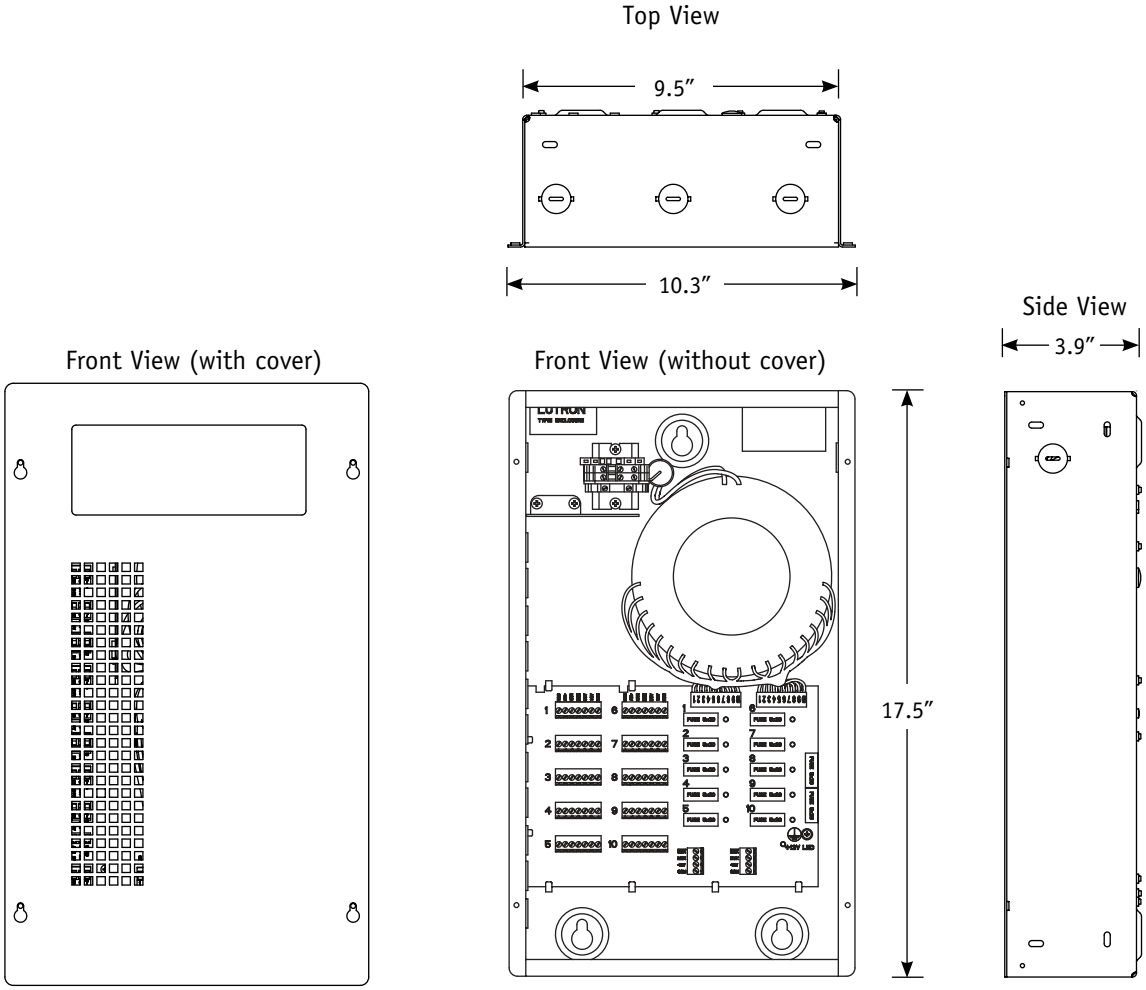
***Sivoia QED* Power Panel**

Sivoia QED power panels simplify wiring and organize installations that require multiple transformers. The power panel consists of a 10-output transformer, ten fuses (with two replacement fuses), and terminals for easy wiring. Each output is 100 VA and can power one EDU.

Each panel has ten 7-pin connectors for EDUs, each connector is supplied with power for an EDU. The panel contains a bus that connects the four communication link wires from each EDU into a single 4-wire output. The panel accommodates home run wiring with 7-pin EDU connectors for up to ten EDUs.

Note: Maximum feed breaker size of 30 A. Each terminal block will accept one #18 AWG to 10 AWG (1.5 mm^2 to 2.5 mm^2) wire.

Power panels must be grounded for safe operation and installed by a licensed electrician, adhering to all local and national codes.



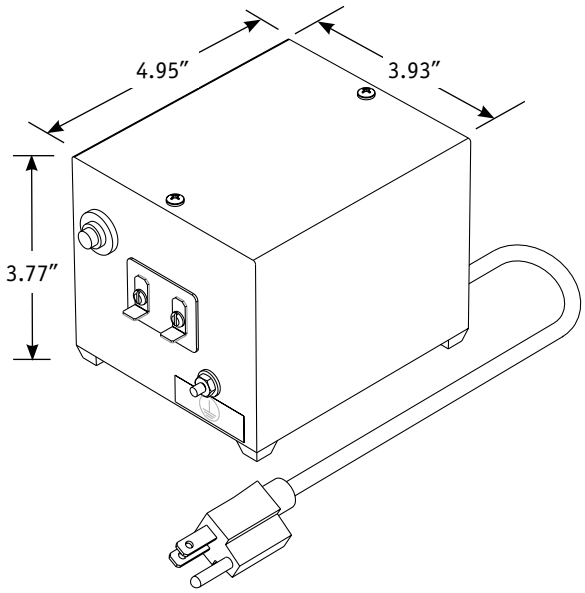
SVQ-10-PNL Dimensions

Appendix B: Sivoia QED® Overview (cont.)

***Sivoia QED* Power Transformers**

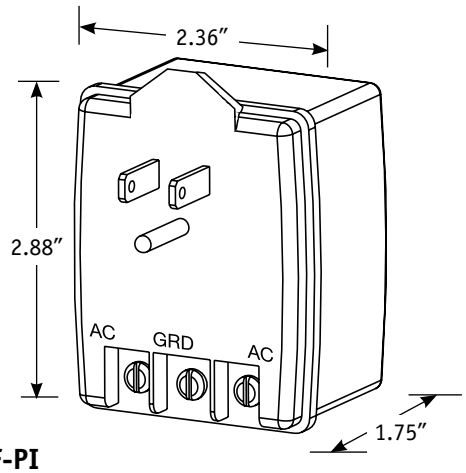
Determining which transformer to use depends upon the size of the shade the EDU needs to operate. For up to 50 square feet of fabric, the 50 VA transformer is sufficient. For *Sivoia QED* treatments up to 100 square feet (225 square feet with *Sivoia QED* High-Torque), either of the 100 VA transformers can be used.

Note: One transformer may only power one EDU. All transformers must be earth-grounded.



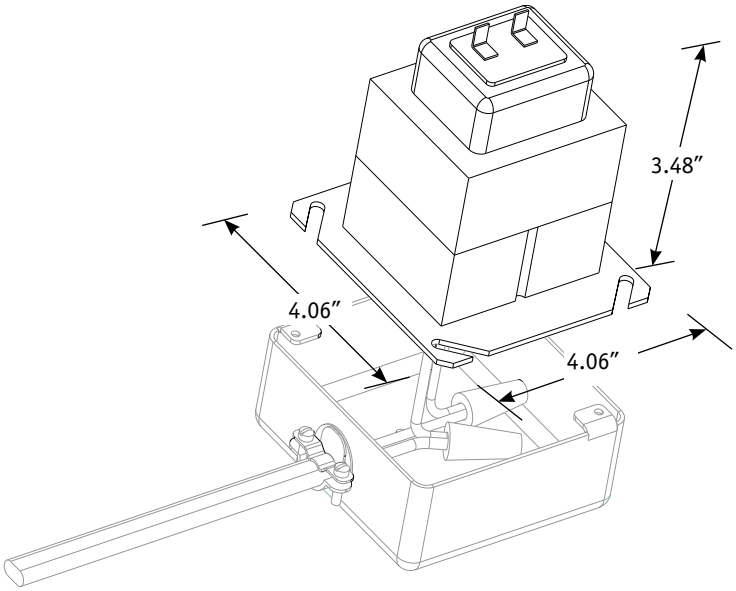
SV-100SF-PI

100 VA Plug-In Transformer for up to 100 square feet of fabric (225 square feet with *Sivoia QED* High-Torque) (supplied with 66 in. cord)



SV-50SF-PI

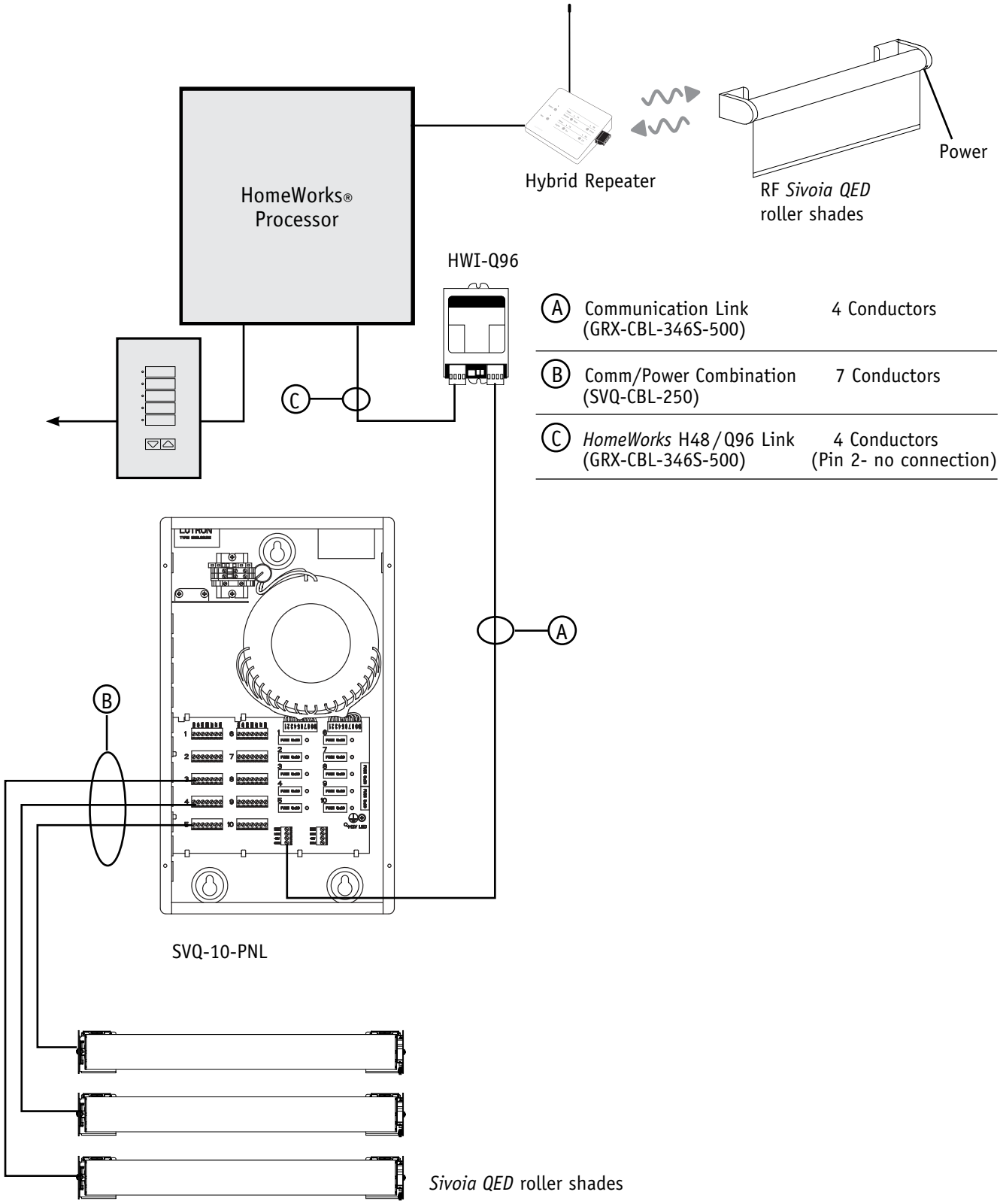
50 VA Plug-In Transformer
for up to 50 square feet of fabric



SV-100SF-JBOX

100 VA Junction Box Mount Transformer
for up to 100 square feet of fabric (225 square feet with *Sivoia QED* High-Torque)

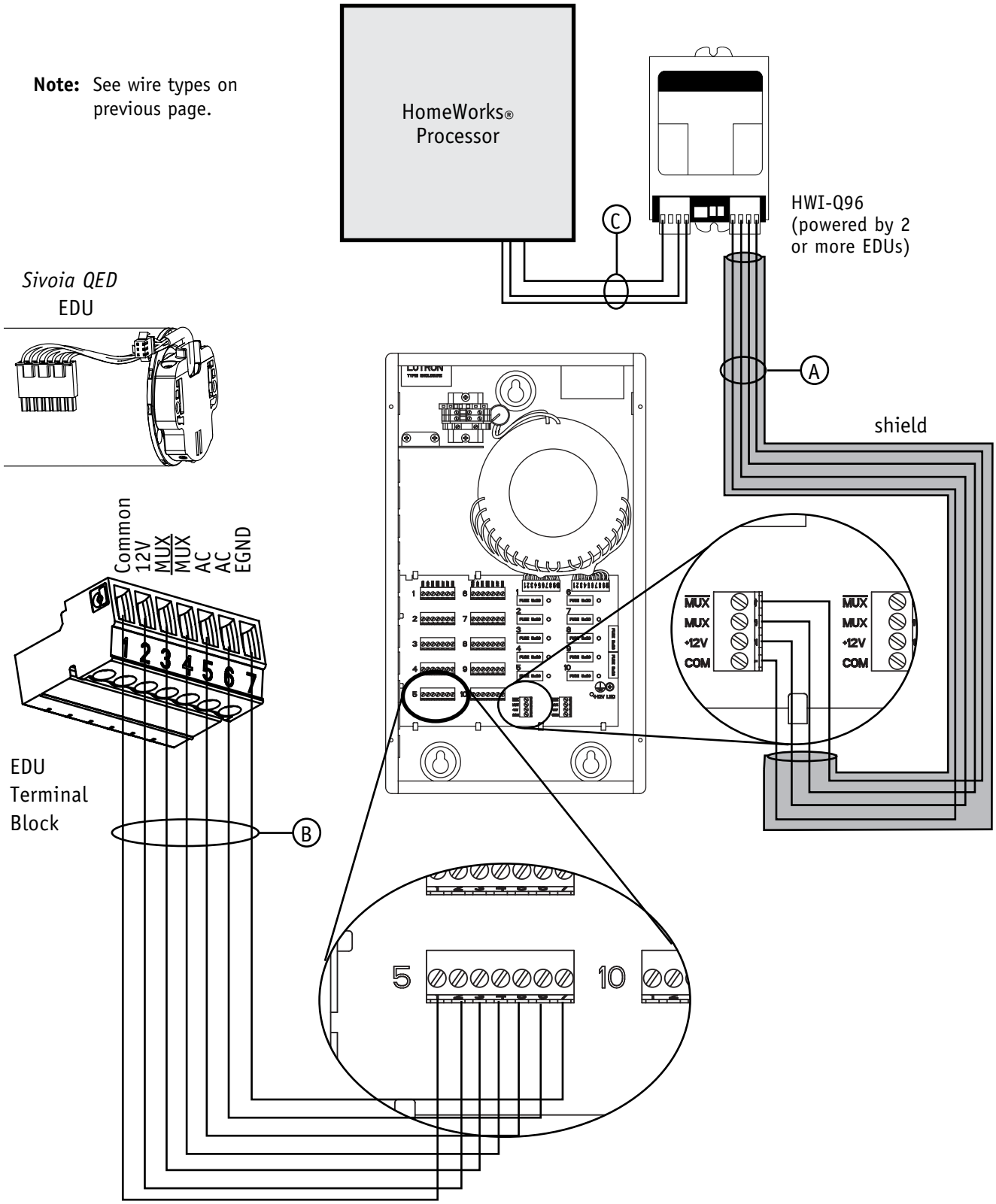
Appendix B: Sivoia QED® Overview (cont.)



***Sivoia QED* Wiring Overview**

Appendix B: Sivoia QED® Overview (cont.)

Note: See wire types on previous page.

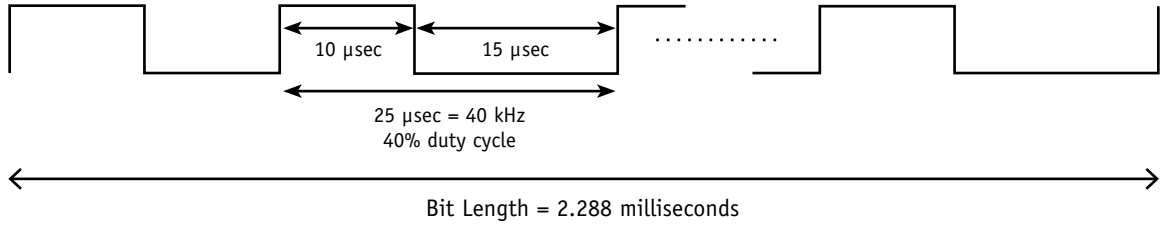


***Sivoia QED* Wiring Detail**

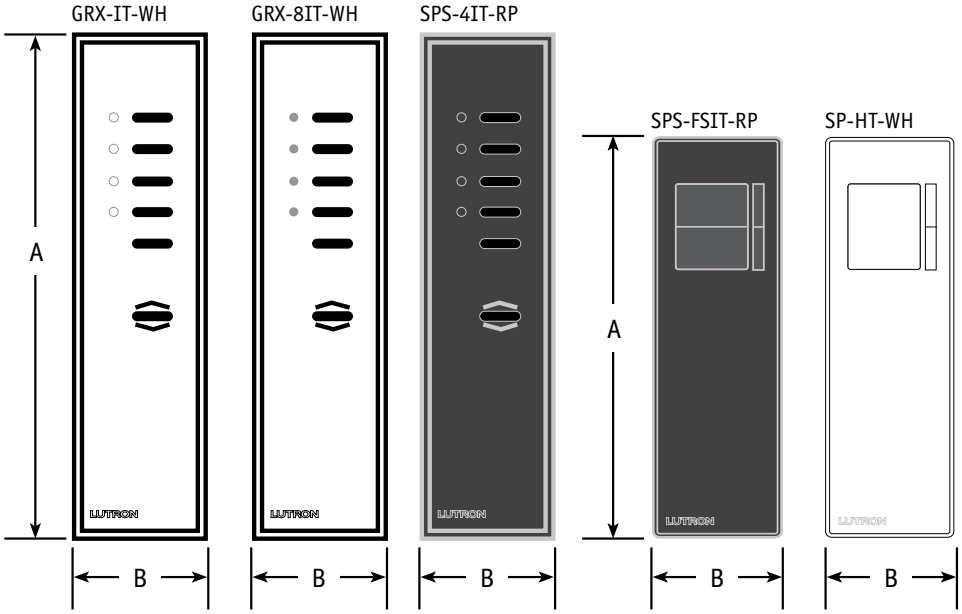
Appendix C: Infrared (IR) Integration

Lutron Infrared Technical Specifications

IR Carrier Frequency	40.0 kHz
Duty Cycle	40%
Single Bit Time	2.288 milliseconds
Baud Rate	437 bps
Command Length	36 bits
Command Duration	82.368 milliseconds
Logic One	Presence of IR modulated at 40.0 kHz
Logic Zero	Absence of IR
Transmit Order	Transmit the most significant bit first
General Function	IR code is transmitted while a button is held down
Timeout Function	Timeouts may not occur until at least seven seconds of continuous IR transmission has taken place



IR Duty Cycle



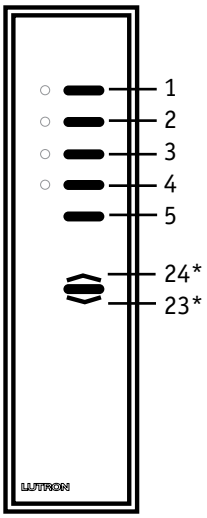
Model	A	B
GRX-IT-WH	5 11/16	1 1/2
GRX-8IT-WH	5 11/16	1 1/2
SPS-4IT-RP	5 11/16	1 1/2
SPS-FSIT-RP	4 9/16	1 1/2
SP-HT-WH	4 9/16	1 1/2

IR remote Dimensions

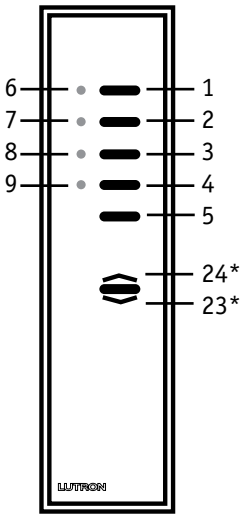
Appendix C: Infrared (IR) Integration (cont.)

Lutron IR Remote Button Maps

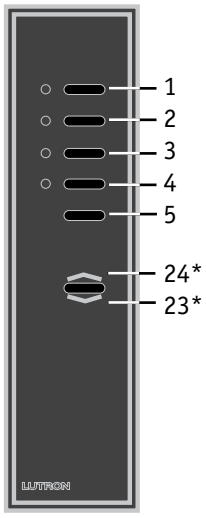
GRX-IT-WH



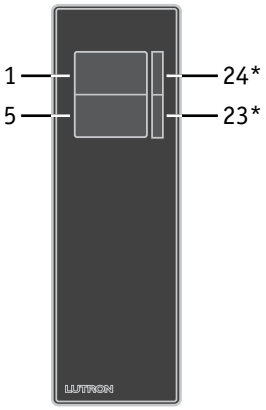
GRX-8IT-WH



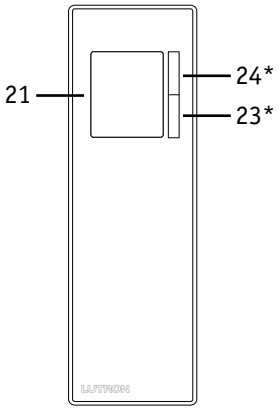
SPS-4IT-RP



SPS-FSIT-RP



SP-HT-WH



Many universal IR learning remotes come pre-loaded with some or all of the Lutron IR codes above. Additionally, many universal IR learning remotes are capable of learning the Lutron IR codes. Please check with the IR remote control manufacturer.

* When used with STRD-2G-9BIR-NONE keypads, Button 23 is changed to Button 18 and Button 24 is changed to Button 19.

Appendix D: Model Number Index

Appendix D: Model Number Index (cont.)

Appendix D: Model Number Index (cont.)

Appendix E: Trademarks and Patents

Registered Trademarks

The following are registered trademarks of Lutron Electronics Co., Inc. in the United States: Lutron; Ariadni; Attache (stylized); Aurora; Aviena; Centurion; Chronos; Claro; Credenza; Dalia; Dimming by Lutron; Diva, Earn & Learn; Eco-Dim; ECO-10; Faedra; Fandial; Fassada, Glyder; Grafik Eye; Grafik 6000; Hi-lume; HomeWorks; Lumea (word mark & stylized); Lutron Dimmers Save Energy (& design); Maestro; Maestro IR; Maestro Wireless; microWATT (stylized); Milenyia; Nova, Nova T☆; Orion; Osprey; Personna; Qoto; RadioRA; Radiotouch; Ranax; Rania; RTISS Equipped; RTISS Equipped (& design); Satin Colors; Save Energy & Design; Seetouch; Sheershade; Sivoia; Sivoia QED; Skylark; Softswitch; Softswitch128; Solaris; Spacer; Spacer System; T☆; Telume; The Sunburst logo, The Ultimate Home Theater Experience; Toggler, Tu-Wire; Vareo; Versaplex; Viseo; and U.S. Trademarks 1,617,349; 1,624,489; 1,624,490; 1,626,714; 1,638,913 and 3,061,904.

Trademarks

The following are trademarks of Lutron Electronics Co., Inc.:
Abella; Achitrave; Athena; Ceana; Classico; Digital Micronet; Digital MicroWATT; Dim-N-Glo; Diva Duo; Earn & Learn Express; EcoSystem; FASS; Favorite Scene; Grafik 5000; Grafik 7000; Grafik Eye Designer; Grafik Eye Liaison; Grafik Integrale; Grafik RA; hand; Harmony; Hi-lume Compact SE; Hi-Power 2•4•6; HomeServe; HomeWorks Interactive; LCP128; LuMaster; Lumea2 (stylized); Lustra; Lutron Controls Your Light; Lyneo; Maestro Duo; micros; microPS; Millennium; Piedra; Omnislide; One Spec; Pre-Pack; Serena; SmartDimmer; SOLos; Spec Editor; Sunata; Symphony; TapSwitch; Vibrato; Vierti; Zone Capture and 2Link.

Utility Patents

These products may be covered by one or more of the following US patents:

4,835,816	5,248,919	5,949,200	6,687,487	7,075,254
4,889,999	5,262,678	5,962,979	6,727,446	7,085,627
4,924,151	5,309,068	5,982,103	6,734,381	7,091,672
4,924,349	5,357,170	5,987,205	6,774,328	7,105,763
4,939,383	5,359,231	5,990,635	6,784,622	7,111,952
4,947,054	5,399,940	6,005,308	6,791,279	7,116,055
5,001,386	5,430,356	6,037,721	6,794,830	7,116,056
5,017,837	5,463,286	6,046,550	6,796,356	7,126,291
5,038,081	5,467,266	6,091,205	6,796,357	7,142,932
5,041,763	5,499,930	6,100,659	6,803,728	7,163,044
5,055,742	5,510,679	6,111,368	6,839,165	7,166,970
5,099,193	5,530,322	6,169,377	6,845,806	7,190,124
5,105,336	5,555,150	6,188,181	6,902,141	7,190,125
5,144,205	5,633,540	6,225,760	6,917,167	7,193,404
5,144,278	5,637,930	6,310,140	6,927,547	7,196,476
5,146,153	5,637,964	6,313,588	6,935,403	7,198,523
5,170,068	5,671,387	6,346,781	6,969,959	7,208,887
5,173,643	5,736,965	6,347,028	6,982,528	7,224,124
5,178,350	5,798,581	6,380,692	6,983,783	7,240,716
5,180,886	5,808,417	6,380,696	6,992,612	7,242,150
5,187,655	5,838,226	6,452,344	6,994,145	7,247,999
5,191,265	5,841,239	6,497,267	7,002,301	7,259,519
5,191,971	5,848,054	6,528,957	7,005,762	7,259,524
5,196,782	5,848,634	6,545,434	7,051,782	7,281,565
5,207,317	5,864,212	6,642,669	7,061,189	7,285,919
5,224,029	5,905,442	6,646,843	7,061,191	7,310,559
5,237,207	5,909,087	6,667,578	7,063,124	
5,237,264	5,942,727	6,674,248	7,071,634	

...and corresponding foreign patents.

Appendix E: Trademarks and Patents (cont.)

Design Patents

These products may be covered by one or more of the following US patents:

D227,577	D442,558	D494,138	D538,756	D547,273
D241,853	D450,043	D496,003	D538,759	D547,274
D249,141	D453,742	D496,335	D539,233	D547,731
D253,342	D456,783	D505,922	D539,234	D547,732
D253,532	D457,863	D506,447	D539,235	D547,733
D254,001	D461,782	D506,731	D539,236	D547,734
D285,066	D462,322	D507,244	D539,237	D547,735
D287,242	D463,382	D509,804	D539,238	D548,194
D301,304	D465,460	D509,805	D539,757	D550,163
D311,371	D465,770	D510,072	D539,758	D550,164
D311,485	D466,090	D510,073	D540,266	D550,165
D342,234	D466,091	D510,074	D540,267	D550,166
D344,068	D466,484	D515,512	D540,748	D550,632
D344,264	D471,879	D515,513	D541,221	D551,176
D353,798	D471,880	D515,514	D541,222	D551,177
D364,141	D472,221	D515,516	D541,223	D551,178
D365,264	D472,526	D516,040	D541,224	D551,179
D370,663	D472,527	D516,041	D541,755	D551,536
D378,814	D475,024	D516,042	D542,226	D551,630
D387,736	D475,025	D516,043	D542,227	D551,631
D389,461	D477,289	D516,512	D542,229	D552,042
D389,805	D477,290	D517,021	D542,231	D553,584
D391,924	D477,572	D517,498	D542,737	D554,071
D395,037	D477,573	D517,503	D542,742	D554,072
D396,448	D477,574	D518,447	D543,158	D554,073
D404,013	D477,575	D522,464	D543,510	D557,216
D412,491	D477,576	D525,948	D543,511	D557,662
D412,315	D477,577	D526,969	D543,951	D557,664
D421,246	D477,578	D527,711	D544,450	D557,665
D421,399	D478,054	D528,404	D545,770	D558,151
D422,567	D478,554	D528,992	D545,771	D558,686
D422,969	D479,206	D529,871	D546,293	D559,198
D428,855	D479,207	D533,843	D546,294	D559,710
D431,199	D481,365	D533,844	D546,296	D559,791
D436,579	D482,007	D534,872	D546,771	D560,618
D436,930	D484,392	D535,950	D546,775	D560,619
D437,585	D485,534	D536,671	D546,776	D561,115
D437,834	D487,429	D537,046	D546,777	D562,260
D439,220	D490,061	D538,238	D546,778	D563,901
D442,723	D490,780	D538,755	D546,779	

...and corresponding foreign patents.

Appendix F: Colors and Finishes

	Designer-Style		Architectural-Style		
KEYPADS	**Satin**	**Gloss**	**Matte**	**Metal**	**Other**
Wired Keypads					
seeTouch®	●	●	●	●	
Signature Series™					1
Architrave™					2
2-Button			●	●	
Architectural-Style Slim-Button			●	●	
Large-Button			●	●	
International *seeTouch*			●[3]	●[3]	3
European-Style			●[4]	●[4]	4
RF Keypads					
seeTouch	●	●			
Tabletop with *seeTouch* Style Buttons				●[5]	5
Tabletop Slim-Button				●[5]	5
Tabletop Large-Button				●[5]	5
Car Visor Controls					6
LOCAL LIGHTING CONTROLS					
Vareo® Lighting Controls			●	●	
Maestro® Lighting and Fan Speed Controls	●	●			10
GRAFIK Eye® Multi-Zone Lighting Controls	●[7]	●[7]	●	●	7
Dimming Receptacles	●		●	●	
Dimmable Lamp Plug					8
RF Lamp Dimmers					9
COORDINATING ACCESSORIES					
Architectural-Style Accessories			●	●	
Designer-Style Accessories	●	●			10

1 Signature Series keypads are architectural-style door jamb controls that come in the following metals: White (WH) - Monterey only, Bright Brass (BB), Satin Nickel (SN), Bright Chrome (BC), Field-Paintable (FP), Unfinished Brass (UB), and 24K Gold-Plated (AU)

2 Architrave keypads are architectural-style door jamb controls that come in the following metals: White (WH) and Bright Brass (BB)

3 International *seeTouch* controls are architectural-style controls available in International Matte Finishes, Standard Metal Finishes, and Special Metal Finishes. Metal Finishes ship with Black (BL) buttons.

4 Available in Black & White only, metal faceplates sold separately

5 Tabletop keypads are available in Snow (SW) or Midnight (MN) plastic; metal faceplates (used with Midnight keypads) are available in all Architectural Metals

6 Car Visor Controls are only available in White (WH) plastic

7 GRAFIK Eye controls are architectural-style controls, but are offered in many designer colors, including all Satin Colors and the following gloss colors: White (GWH), Ivory (GIV), Almond (GAL), Light Almond (GLA)

8 Dimmable Lamp Plug available in White (WH) & Brown (BR) only.

9 RF Lamp Dimmers are only available in Snow (SW) or Midnight (MN)

10 Stainless Steel wallplates available. It is recommended to use Stainless Steel with Midnight or Black controls.

Appendix F: Colors and Finishes (cont.)

Satin Finishes

- Hot HT
- Merlot MR
- Plum PL
- Turquoise TQ
- Taupe TP
- Eggshell ES
- Biscuit BI
- Snow SW
- Palladium PD
- Midnight MN
- Sienna SI
- Terracotta TC
- Greenbriar GB
- Bluestone BG
- Mocha Stone MS
- Goldstone GS
- Desert Stone DS
- Stone ST
- Limestone LS

Standard Metal Finishes

- Satin Brass SB
- Bright Brass BB
- Bright Chrome BC

Anodized Metal Finishes

- Clear Anodized Aluminum CLA
- Black Anodized Aluminum BLA
- Brass Anodized Aluminum BRA

Gloss Finishes

- White WH
- Ivory IV
- Almond AL
- Light Almond LA
- Gray GR
- Brown BR
- Black BL

Matte Finishes

- White WH
- Beige BE
- Ivory IV
- Gray GR
- Brown BR
- Black BL
- SI Sienna
- Almond AL
- Light Almond LA

Int'l Matte Finishes

- Arctic White AW
- Argentum AG
- Mica MC

Special Metal Finishes

- Antique Brass QB
- Antique Bronze QZ
- Satin Chrome SC
- Satin Nickel SN
- Bright Nickel BN
- Gold-Plated AU

Other Metal Finishes

- Stainless Steel SS (Wallplates Only)

Notes:

- *All products may not be offered in all colors; see chart on previous page.*
- *Wall controls and accessories with metal faceplates are supplied with black plastic inserts. Due to printing limitations, colors and finishes shown cannot be guaranteed to perfectly match actual product colors.*
- *Gloss colors meet NEMA color standards where standards exist.*
- *Biscuit (BI) is color matched to Kohler®/American Standard® kitchen and bath products. Hot (HT) is color matched to Corian® solid surface products.*

http://www.lutron.com/homeworks (public website)
http://resi.lutron.com (password-protected resource website)

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