

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

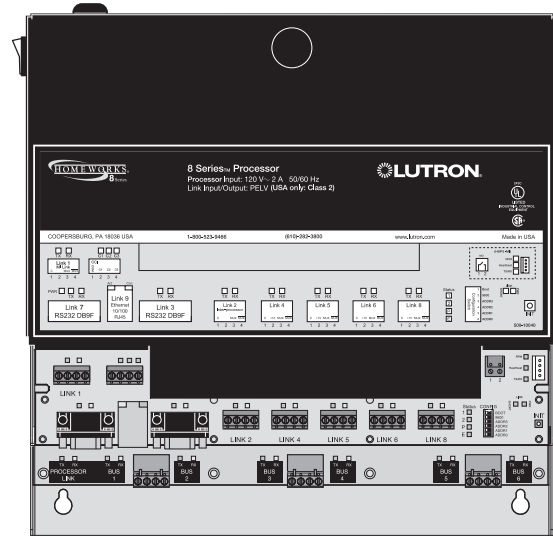
8 Series P5 processors may be used with any and all HomeWorks products, providing the most style and finish options. Remote power modules and Vario® lighting controls are unique dimming options for the 8 Series. Remote power modules also include an adaptive dimming module, quiet fan-speed control, relay,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

4 SERIES

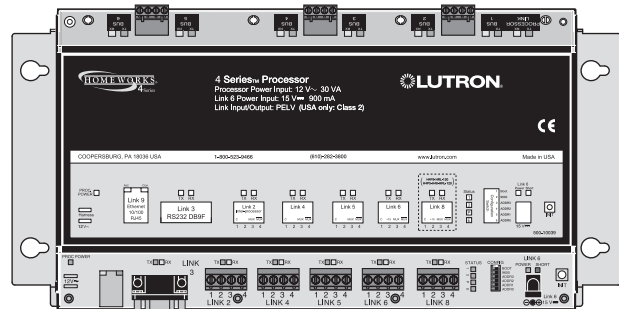
4 Series P5 processors are typically used with designer-style HomeWorks products. Dimming is accomplished via Maestro® local controls, wallbox power modules, or GRAFIK Eye® controls. A 4 Series P5 processor with hybrid repeater link can communicate with wireless devices by connecting a hybrid repeater.

WIRELESS SERIES

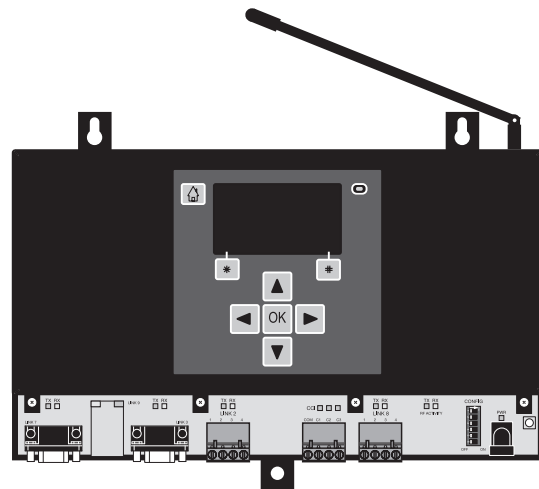
Wireless Series P5 processors are used with wireless designer-style HomeWorks products. Wireless series products provide the simplest retrofit installations, since no communication wires are required. Dimming is accomplished via Maestro® local controls and RF lamp dimmers.



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



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



**Wireless Series P5 Processor
(HRP5-120)**

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 architectural-style system should be done via GRAFIK Eye® control units and wallbox power modules for an architectural-style system.

Table 1 - Processor Comparison

H8P5-MI-H48-120

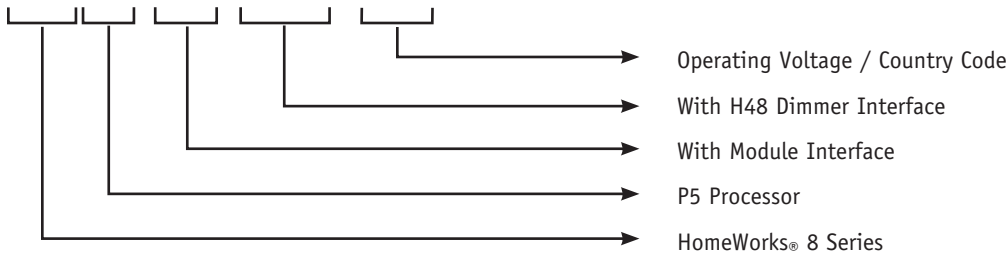


Figure 1 - Example Model Number

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).

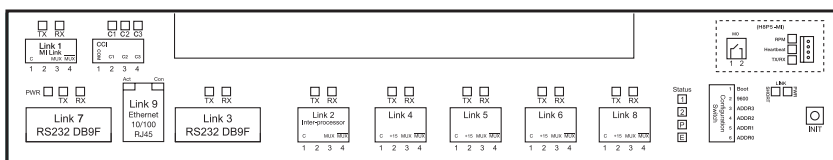


Figure 2 - 8 Series P5 Processor Link Identification

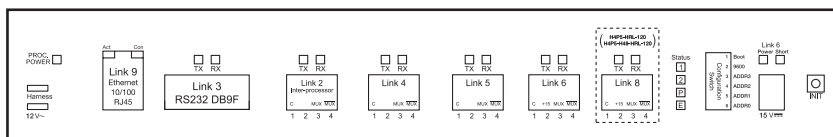


Figure 3 - 4 Series P5 Processor Link Identification

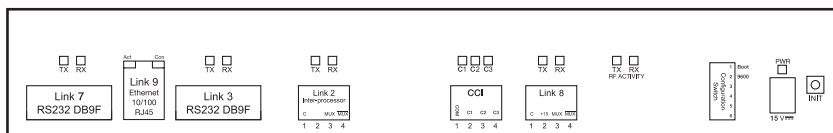


Figure 4 - Wireless Series P5 Processor Link Identification

BACK ROOM

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 |

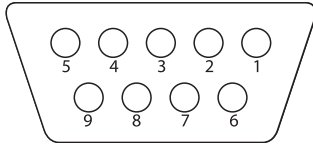
1 = Termination only required if cable length exceeds 50 feet (15 m).

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

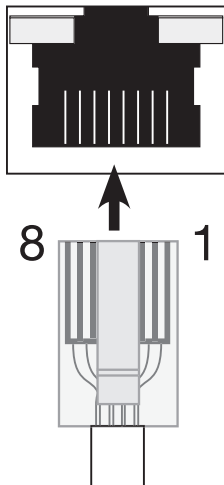
P5 Processors (cont.)



| 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) | | |

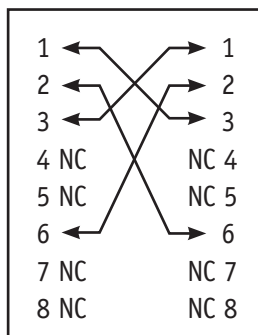
¹ = Hardware handshaking disabled for simple communications

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

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 \sim 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. <i>See Fig. 7, pg. 96.</i> |
| 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 \pm 1 minute per year (specified as during data retention time). |
| Mounting | HWI-PNL-8: Processor mounts at bottom of panel. <i>See Fig. 10, pg. 98.</i> HWI-LV32-120: Processor mounts at top of enclosure. <i>See Fig. 9, pg. 98.</i> |
| Mounting Hole Locations | <i>See Fig. 6, pg. 96.</i> |
| Shipping Weight (all model numbers) | 9 lbs. (4.1 kg) |

8 Series P5 Processors (cont.)

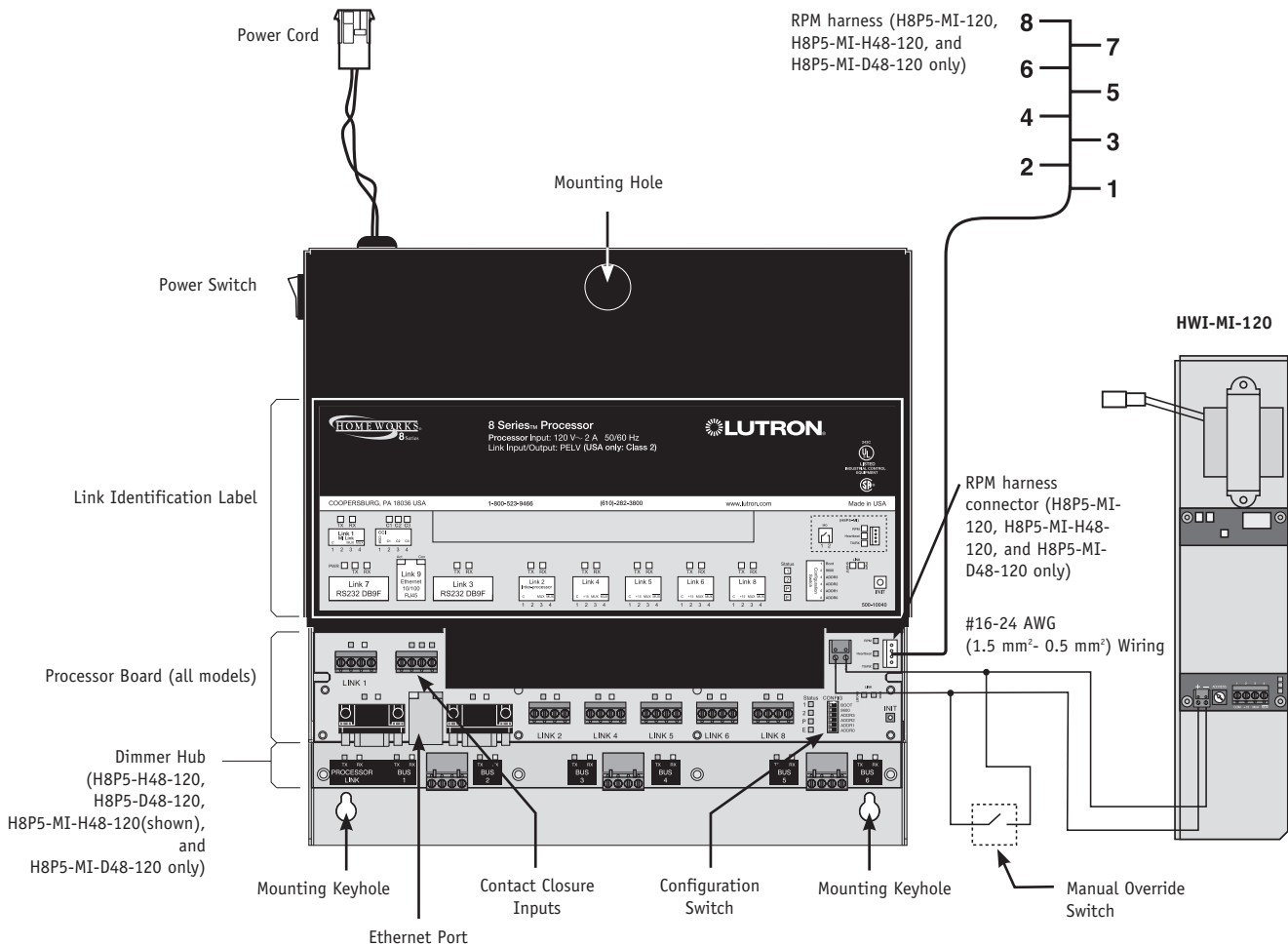


Figure 6 - 8 Series P5 Processor (H8P5-MI-H48-120 shown)

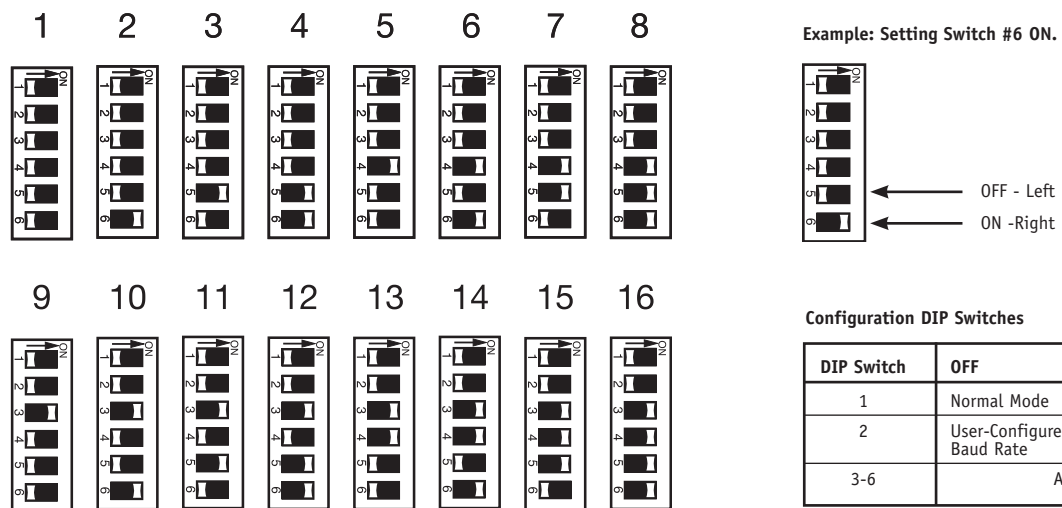


Figure 7 - Address DIP Switch Settings (configure switch S1)

BACK ROOM

8 Series P5 Processors (cont.)

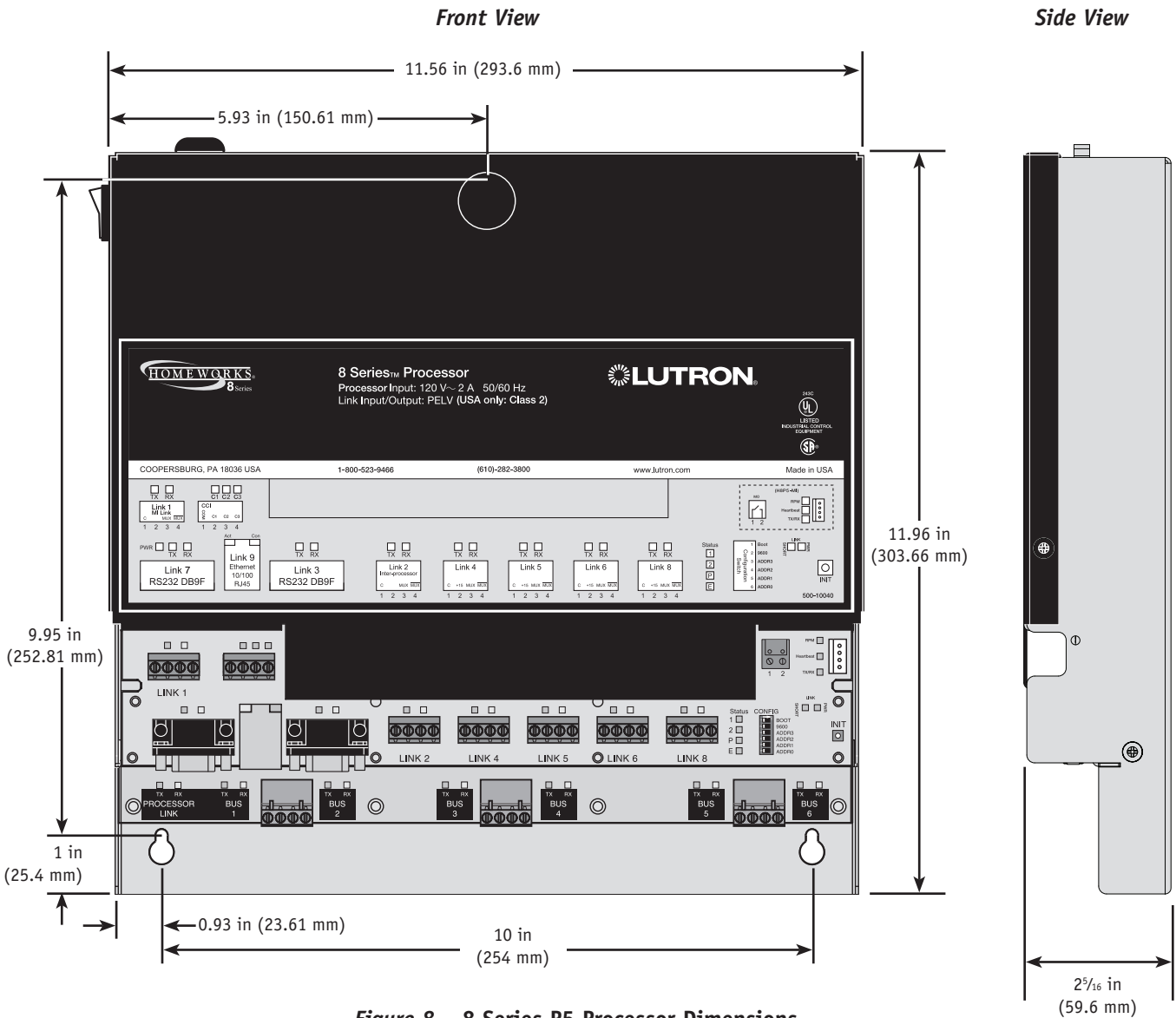


Figure 8 – 8 Series P5 Processor Dimensions

BACK ROOM

8 Series P5 Processors (cont.)

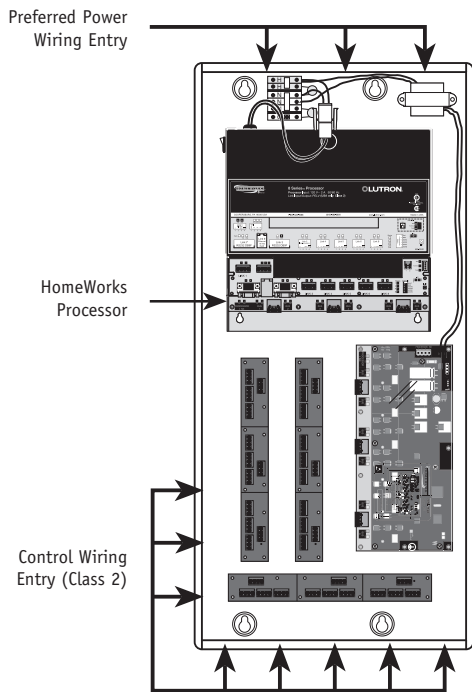


Figure 9 – Mounting Location in an HWI-LV32-120

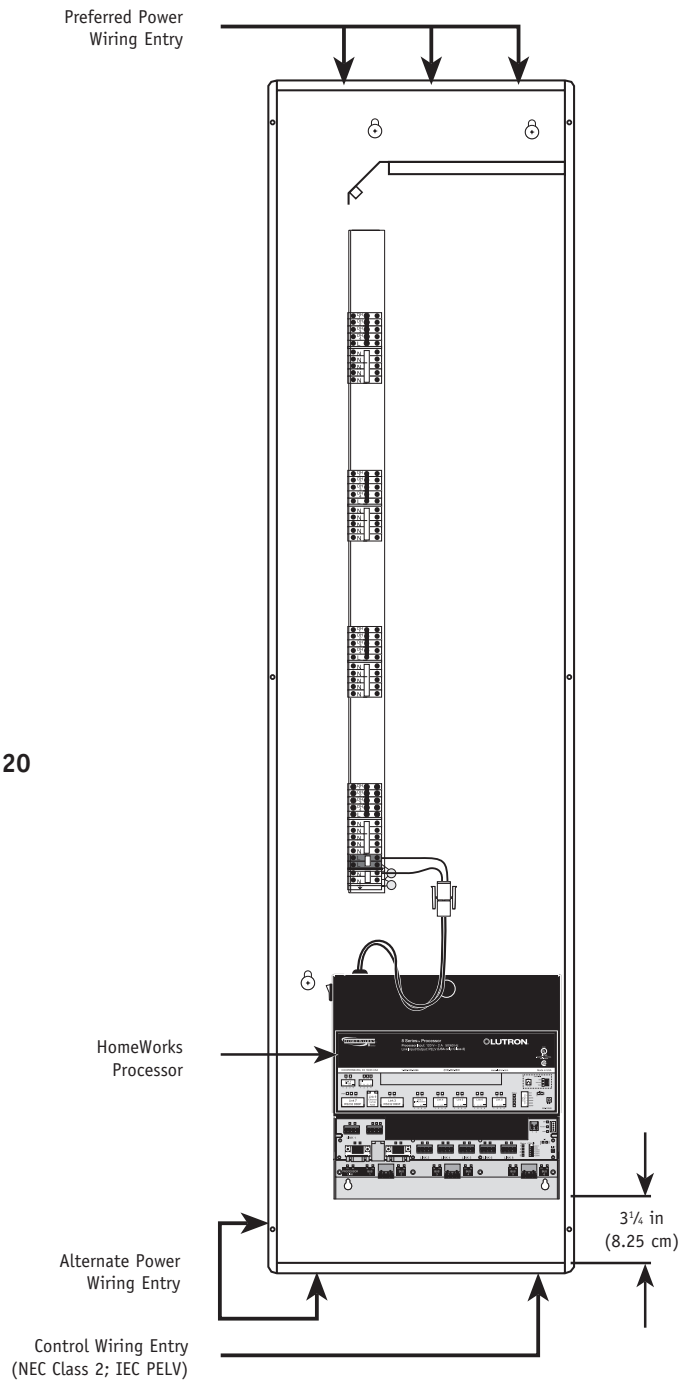


Figure 10 – Mounting Location in an HWI-PNL-8

BACK ROOM

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 \sim 50/60 Hz provided by HWI-LV24-120 enclosure Link 6 & 8 power: 15 V \equiv 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. <i>See Fig. 11, pg. 100.</i> |
| 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 \pm 1 minute per year (specified as during data retention time). |
| Mounting | HWI-LV24-120: Processor mounts vertically at top of enclosure. <i>See Fig. 12, pg. 100.</i> |
| Mounting Hole Locations | <i>See Fig. 10, pg. 100.</i> |
| Shipping Weight (all model numbers) | 7.0 lbs. (3.2 kg) |

4 Series P5 Processors (cont.)

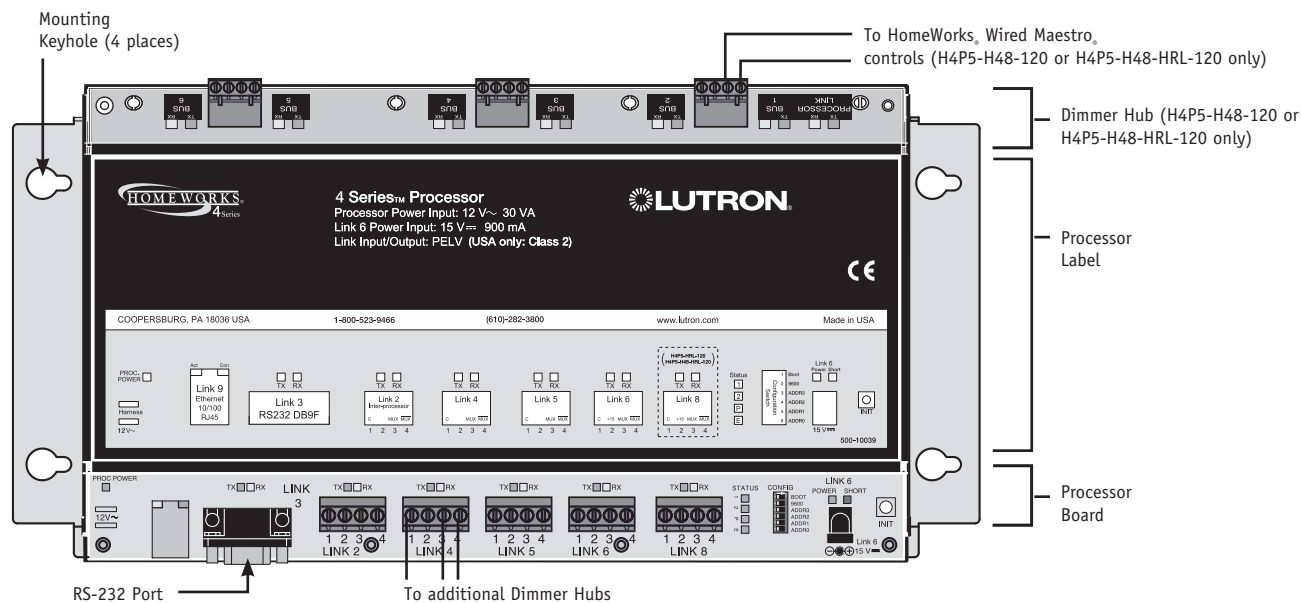
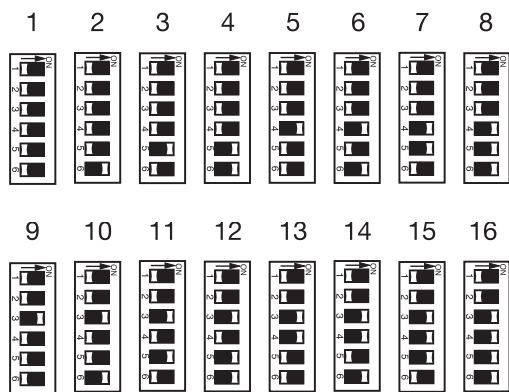


Figure 10 – 4 Series P5 Processor (H4P5-H48-HRL-120 shown)

Configuration Switch Functions

| DIP Switch | Function |
|------------|---|
| 1 | Boot Mode. Unless prompted by the <i>HomeWorks</i> 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

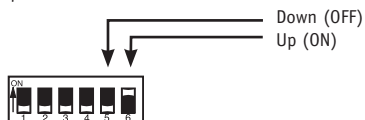


Figure 11 – Address DIP Switch Settings

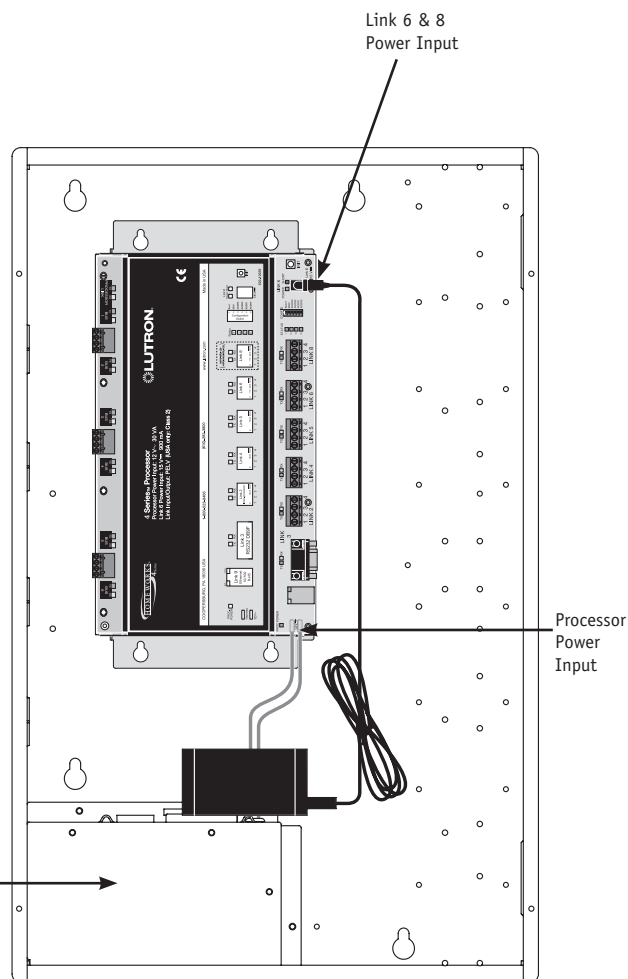
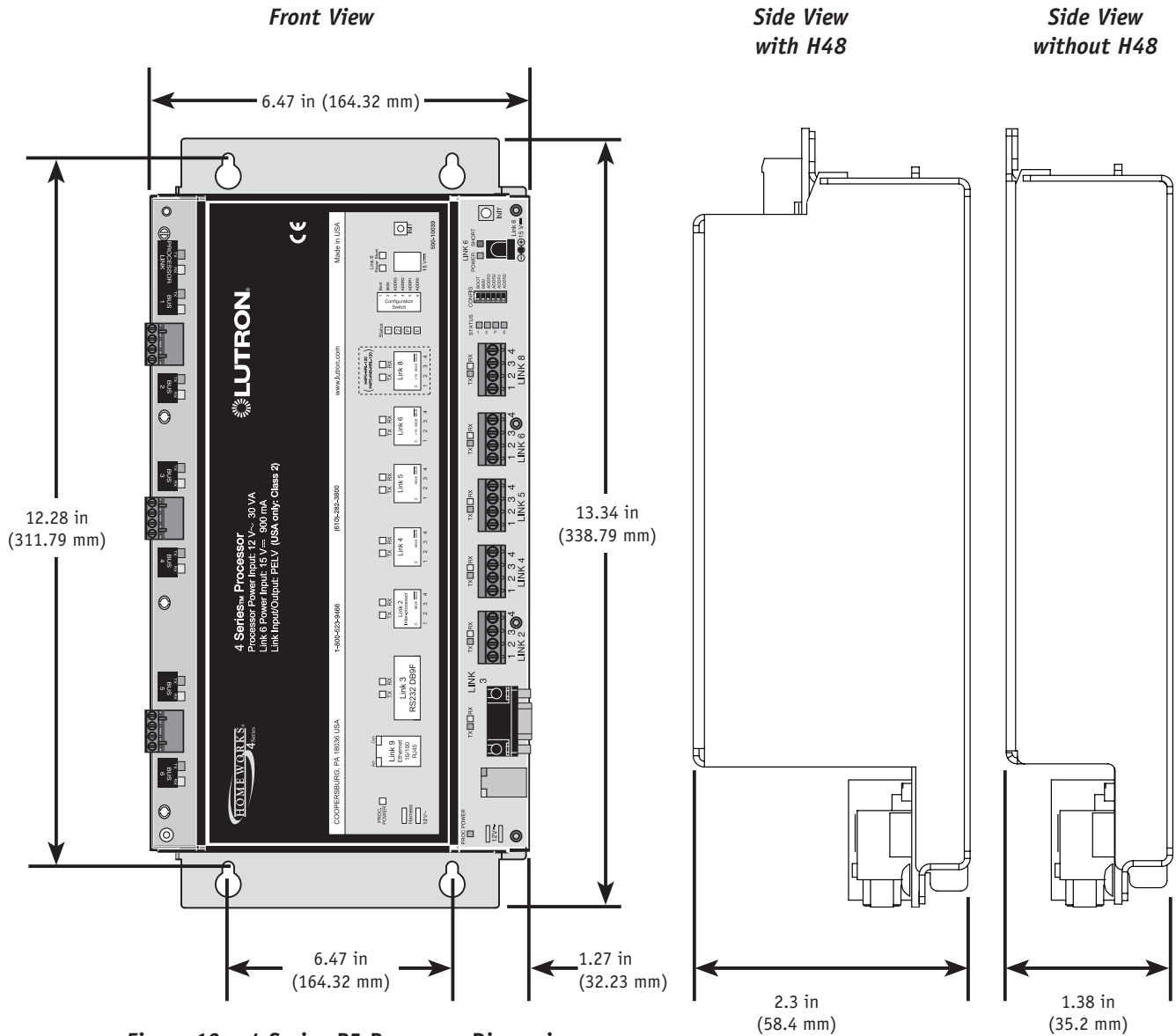


Figure 12 – Mounting Location in an HWI-LV24-120

4 Series P5 Processors (cont.)



BACK ROOM

Wireless Series P5 Processor

| | |
|----------------------------------|--|
| Model Number | HRP5-120: RF Processor |
| Input Voltage | 15 V \equiv supplied by provided 120 V \sim 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 \pm 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 \sim 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.)

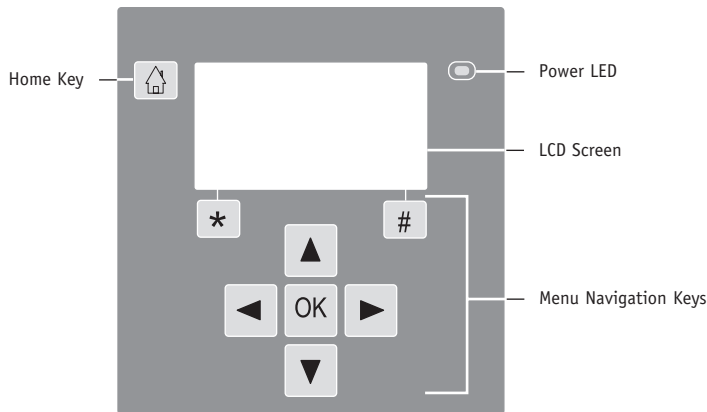


Figure 14 – Wireless Series P5 Processor LCD Display

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.

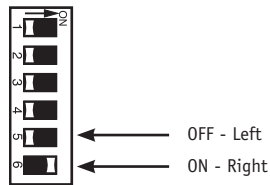


Table 15 – DIP Switch Settings

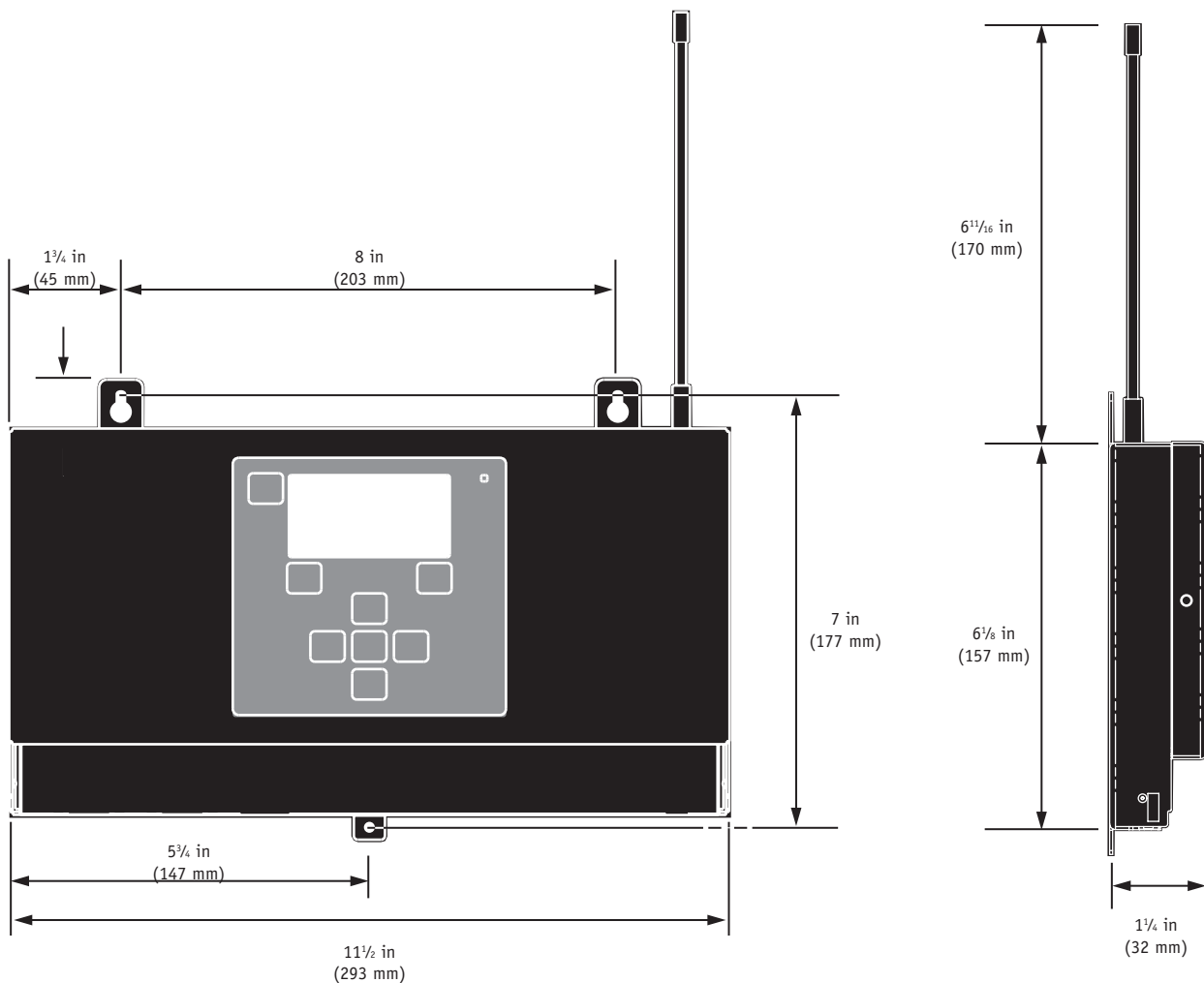


Figure 16 – Dimensions and Mounting Hole Locations