Wireless Power Pack Load Controller

Overview

Intelligent Lighting Controls wireless power pack controllers switch on/off power to a connected lighting load as directed by wirelessly linked sensors, photocells, and wall controls. Additionally, the unit’s 0-10V dimming option greatly simplifies applications where dimming control from multiple switch locations is required. For applications where a hybrid wireless/wired architecture is desired, this wireless power pack can also be ordered with auxiliary low voltage connections.

The ILC wireless power pack is rated to switch fully loaded circuits and utilizes a powerful microprocessor to optimize its switching timing, ensuring long relay life even when controlling high-inrush LED lighting. As with all ILC products, these power packs are easy to install and incorporate features which reduce contractor labor time. An elongated chase nipple with snaps for quick installation and an optional snap-on low voltage wire chamber make for a hassle free contractor experience. All ILC products are proudly made in the USA.

Basic Operation

A received wireless message indicating occupancy from one or more wirelessly linked sensors will trigger the pack’s integrated relay to close. When configured for Vacancy operation, an ON switch message is required from a wirelessly linked wall station to initially trigger lights. Once closed, line voltage will flow through the relay and turn on the connected lighting load. The wireless power pack maintains a master time delay that is reset every time a linked sensor reports occupancy. Lights will be switched off once there hasn’t been an occupancy message reported for the duration of the time delay. If linked to a photocell, the unit receives light level readings and controls connected lighting according to its photocell operating mode.

Features

- Wirelessly Links to Sensors, Photocells, & Wall Stations
- Links in Seconds up to 50 Remote Devices
- Switches Up to 20A Line Voltage Loads
- Electronically Timed Switching Ensures Long Relay Life
- Integrated Test/Programming Button
- Plenum Rated (UL 2043)
- Configurable Time Delays and Operational Modes (e.g. Occupancy/Vacancy)
- Configurable Daylight Harvesting & Photocell Modes
- Optional 0-10V Dimming Output for Partial On & Partial Off Operation
- Optional Wired Connectivity to Low Voltage Sensors & Wall Stations
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Specifications

Electrical

- Operating Voltage
  - 120/277 VAC, Single Phase, 50/60 Hz
- Class 2 Power Output
  - 18 VDC @ 70 mA (-AX version), higher output when unloaded

Load Ratings

- 20A @ 120 VAC - General Purpose Plug Load
- 20A @ 120/277 VAC - General Purpose, Tungsten, Magnetic Ballast
- 16A @ 120/277 VAC - Electronic Ballast, LED Driver

DC Load Ratings

- 20A @ 28 VDC (MAX)
- 1A @ 5 VDC (MIN)

Dimming Load

- (Models with -D2 option only)
  - 50mA, (0-10 VDC ballasts or drivers compliant with IEC 60929 Annex E.2)

Motor Load

- 1 HP

ESD Immunity

- Tested to withstand electrostatic discharge without damage or memory loss

Environmental

- Operating Temp
  - 32°F to 122°F (0°C to 50°C)
- Relative Humidity
  - 0-95% Non-Condensing Indoor Use Only

Code Compliance

- These power packs can be used to meet ASHRAE 90.1, IEC, & Title 24 energy code requirements

Wireless

- Range
  - 80’ line of site w/o obstruction
  - 40’ with obstruction (walls/floors)
- Frequency
  - 915 MHz ISM Band
- Wireless Linking
  - Simple 3 sec. Push Button Process
- Security
  - All Wireless Data is Encrypted

Physical

- Size
  - 3.00” H x 2.25” W x 1.88” D (7.62 cm x 5.72 cm x 4.78 cm)
- Weight
  - 6.00 oz.
- Color
  - Blue
- Mounting
  - 1/2” Knockout
- Test / Programming Button
  - Bi-color White & Blue

Operation

- Operating Modes
  - Occupancy & Vacancy
  - Partial On/Off (-D2 option)
  - Daylight Harvesting (-D2 option)
  - On/Off/Inhibit Photocell
- Time Delay Options
  - 1, 5, 10, 15, 20, 30 min.

Code Compliance

- These power packs can be used to meet ASHRAE 90.1, IEC, & Title 24 energy code requirements

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### ORDERING INFO

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>FUNCTIONALITY</th>
<th>VOLTAGE</th>
<th>OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILC-SWX</td>
<td>Wireless Power Pack Load Controller, 20A</td>
<td>120/277 V</td>
<td>None</td>
</tr>
<tr>
<td>ACCESSORY</td>
<td>DESCRIPTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ILC-SWX-999</td>
<td>Snap-On Low Voltage Wiring Chamber</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### INSTALLATION

**POWER PACK**

- LED INDICATOR
- TEST/PROGRAMMING BUTTON
- CHASE NIPPLE HAS SNAPS THAT ENABLE QUICK INSTALLATION THROUGH ANY 1/2” KNOCKOUT

**LOW VOLTAGE Wiring Chamber (Optional)**

- PROVIDES 3 KNOCKOUTS FOR CONDUIT CONNECTIONS
- *CONNECT LOW VOLTAGE CHAMBER TO CONDUIT BEFORE CONNECTING TO POWER PACK. CONDUIT SHOULD BE APPROPRIATELY SUPPORTED BY OTHER MEANS AND NOT USE THE LOW VOLTAGE CHAMBER FOR SUPPORT

### WIRING

#### MODEL #: ILC-SWX-950

- **CLASS 2 WIRING**
  - BLK: 120 VAC
  - YEL: 277 VAC
- **CLASS 1 WIRING**
  - BLU: RELAY CONNECTIONS (2)
  - WHT: NEUTRAL
- *CAP UNUSED BLACK OR YELLOW WIRE

#### MODEL #: ILC-SWX-950-D2

- **CLASS 2 WIRING**
  - BLK: 120 VAC
  - YEL: 277 VAC
- **CLASS 1 WIRING**
  - BLU: RELAY CONNECTIONS (2)
  - WHT: NEUTRAL
  - VIO:
- *CAP UNUSED BLACK OR YELLOW WIRE

#### MODEL #: ILC-SWX-950-AX

- **CLASS 2 WIRING**
  - BLK: 120 VAC
  - YEL: 277 VAC
- **CLASS 1 WIRING**
  - BLU: RELAY OUTPUTS (2)
  - WHT: NEUTRAL
- *CAP UNUSED BLACK OR YELLOW WIRE

#### MODEL #: ILC-SWX-950-AX-D2

- **CLASS 2 WIRING**
  - BLK: 120 VAC
  - RED: SWITCH INPUT
  - BAN: RELAY STATUS OUTPUT
- **CLASS 1 WIRING**
  - BLU: RELAY CONNECTIONS (2)
  - YEL: VIO
  - WHT: NEUTRAL
- *CAP UNUSED BLACK OR YELLOW WIRE
COMPATIBLE WIRELESS DEVICES

The below chart lists the devices that can be used in a ILC wireless application. Note that sensors, photocells, and remote switch & dimmer devices are transmit only devices and therefore must be linked to a load controller for switching and/or dimming of lighting.

<table>
<thead>
<tr>
<th>MODEL #</th>
<th>DESCRIPTION</th>
<th>WIRELESS TYPE</th>
<th>POWER TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILC-SWX-201-B</td>
<td>Small Motion 360° Sensor, PIR</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-202-B</td>
<td>Large Motion 360° Sensor, PIR</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-211-B</td>
<td>Small Motion 360° Sensor, PIR w/ Integrated Daylight Harvesting Photocell</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-212-B</td>
<td>Large Motion 360° Sensor, PIR w/ Integrated Daylight Harvesting Photocell</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-401-B</td>
<td>Wide View Sensor, PIR</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-402-B</td>
<td>Long Range Hallway Sensor, PIR</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-250-B</td>
<td>Daylight Harvesting &amp; On/Off Photocell</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-851-xx</td>
<td>Wall Switch Load Controller, No Neutral Required, &lt;xx = color&gt;</td>
<td>Transmit &amp; Receive</td>
<td>120-277 VAC</td>
</tr>
<tr>
<td>ILC-SWX-852-B-xx</td>
<td>Remote Switch (On/Off), &lt;xx = color&gt;</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-854-B-xx</td>
<td>Remote Dimming Switch (On/Off, Raise/Lower), &lt;xx = color&gt;</td>
<td>Transmit</td>
<td>Battery</td>
</tr>
<tr>
<td>ILC-SWX-950</td>
<td>Power Pack Load Controller, 20A</td>
<td>Transmit &amp; Receive</td>
<td>120/277 VAC</td>
</tr>
<tr>
<td>ILC-SWX-950-D2</td>
<td>Power Pack Load Controller, 20A, 0-10V Dimming</td>
<td>Transmit &amp; Receive</td>
<td>120/277 VAC</td>
</tr>
<tr>
<td>ILC-SWX-950-AX</td>
<td>Hybrid Wireless/Wired Power Pack Load Controller, 20A</td>
<td>Transmit &amp; Receive</td>
<td>120/277 VAC</td>
</tr>
<tr>
<td>ILC-SWX-950-AX-D2</td>
<td>Hybrid Wireless/Wired Power Pack Load Controller, 20A, 0-10V Dimming</td>
<td>Transmit &amp; Receive</td>
<td>120/277 VAC</td>
</tr>
</tbody>
</table>

WIRELESS LINKING (PAIRING)

Linking a wireless power pack to a wireless sensor, photocell, or remote wall station is quickly done via the following procedure:

**Step 1.** Enter learn (pairing) mode by holding down the power pack’s button for 3 seconds until the LED starts alternating white then blue, then release.

**Step 2.** At the sensor, photocell, or remote wall station, hold down the programming button for 3 seconds until the LED starts alternating white then blue. Releasing will link the device with the wireless power pack in learn mode (see note 1 below). The lighting load being controlled will also be toggled off/on as a visual indication of success.

**Step 3.** Repeat step 2 to link additional devices.

**Step 4.** When all devices have been linked, exit learn mode on the power pack by pressing the button 1 time. Learn mode will also be automatically closed after 15 minutes of no new devices being linked.

**Note 1:** When in learn mode, the alternating LED colors on the power pack will periodically pause and blink out the total number of linked devices. There will be no blinks during the pause until the first device is linked.
GENERAL WIRELESS OPERATION

- By default, every ~60 seconds wireless sensors transmit a status message whether or not occupancy was detected during the previous period.
- Referred to as the sensor’s "heartbeat", this period can be reduced to ~30 seconds although this will decrease expected battery life.
- If a sensor transmitted “unoccupied” at its last heartbeat, any new occupancy detection event will be transmitted immediately.
- If a sensor transmitted “occupied” at its last heartbeat, new occupancy events will only be transmitted at the heartbeat interval, thus conserving battery life.
- All wirelessly linked wall switch load controllers and/or power packs have a master time delay that is reset every time a linked sensor reports occupancy. Lights will be switched off once all linked sensors have continuously reported unoccupied for the duration of the time delay.
- If a wall switch load controller does not receive a heartbeat transmission from a linked sensor for 10 minutes it will blink out an error code (4 blue blinks, followed by a pause). If more than one sensor is linked, the sensor heartbeat from all sensors must have stopped for the error warning to begin blinking.

PHOTOCELL OPERATION

- The Ambient Setpoint and Photocell Operating Mode are settings stored within the wall switch controller. For all photocell applications (e.g. daylight harvesting), the power pack controller receives the light level readings being transmitted every 15 seconds by wirelessly linked photocells. The controller will then dim, turn off, or turn on connected lighting in order to maximize energy savings while maintaining desired minimum light level.
- The setpoint value initially is established by the running the Auto-Setpoint calibration procedure that is built into the wireless photocell. Once initially determined, the setpoint can be changed at the power pack controller by selecting from a list of values.
- The wireless power pack controller will only listen to a single wireless photocell sensor. If more than one is wirelessly linked, the unit that last ran the auto-setpoint calibration procedure will be used.
- The photocell control algorithm compensates for the contribution of the controlled lighting to the overall light level of the space. This prevents lights from cycling back on shortly after they are switched off by the photocell operation.
- When the unit’s Photocell Operating Mode is set to Daylight Harvesting to Off, On/Off Operation, or Inhibit Operation, there is a 45 second transition time after the ambient light level falls below the setpoint to when the connected lighting is switched on. During this transition time, the LED on the power pack controller will be slowly blinking blue.
- When the unit’s Photocell Operating Mode is set to Daylight Harvesting to Off or On/Off Operation, there is a 5 minute transition time after the ambient light level surpasses the setpoint to when the connected lighting is switched off. During this transition time, the LED on the power pack controller will be slowly blinking blue.
- Whenever lights are being held off due to the photocell, the blue LED will double blink every 15 seconds.
- Dimming from high trim to low trim (or in reverse) due to daylight harvesting requires ~1.5 minutes.

LEADER / FOLLOWER OPERATION (i.e. REPEATING & MULTI-ZONE)

- Power pack controllers can be configured to “follow” another power pack controller (referred to as the “leader”) for purposes of extending the wireless range of a control zone. For example, a sensor and a power pack controller that are not within wireless range of each other (e.g. at either end of a long hallway) can be functionally linked by wirelessly linking each unit to an additional power pack controller installed in the middle of the hallway. The power pack at the end of the hallway would be configured to “follow” the state of the power pack in the middle of the hallway.
- The “leader/follower” functionality of power pack controllers can also be used to accommodate multi-zone daylight harvesting applications. The leader would be wired to control the primary daylight zone that contains the daylight harvesting photocell, with one or more follower power packs controlling the lights in secondary daylight zones (i.e. zones located further from the windows). The follower packs can then be configured to control the lights a percentage brighter than the leader.

DIMMING OPERATION

- There are always 20 equal steps of dim level (voltage) adjustment from high trim to low trim (or reverse) when using an ILC-SWX-850-B wireless remote dimmer.
- For areas such as stairwells, the ILC-SWX-950-D2 unit can be used to achieve Partial Off operation where lighting is at the full bright level when occupied and dropped to the 50 (level is configurable) during unoccupied periods.
- Partial On operation can be achieved by the ILC-SWX-950-D2 unit. In this configuration 0-10V lighting is turned on to a configurable Partial On Level when triggered from an occupancy sensor or switch. Lighting can then be adjusted to any level via a wirelessly linked ILC-SWX-850-B remote dimmer. Alternatively, if the ON button is pushed on a wirelessly linked ILC-SWX-852-B or ILC-SWX-854-B remote switch, lighting will be stepped up to 100% (level is user configurable). Lighting can be turned off manually via an OFF switch press on either the ILC-SWX-852-B, ILC-SWX-854-B wireless remote switch (or single button push on a ILC-SWX-851 switch controller).
- Configurable dimming parameters include Turn On / Partial On Level, Turn Off Scheme, Fade On/Fade Off Rates, and High/Low Dimming Trim Levels.
- A model ILC-SWX-801-xx wired momentary switch can be wired to a ILC-SWX-950-AX-D2 model power pack to trigger the 3 step sequence of operation (i.e. Partial On, Full On, Off). Other manufacturer’s switches may also be utilized.

HYBRID WIRED / WIRELESS OPERATION

- A ILC-SWX-950-AX or ILC-SWX-950-AX-D2 power pack wirelessly retransmit any switch signals received on its brown input wire (typically from a SWX-801 or SWX-803 momentary switch or a low voltage wall switch sensor). To receive the retransmitted switch signals, a remote load controller (i.e. another ILC-SWX-950 power pack or ILC-SWX-851 wall switch controller) will need to be linked to the transmitting power pack.
### POWER PACK CAPACITY (SWX-950-AX-(D2) MODELS ONLY)

**ILC-SWX-950-AX-(D2)** series power packs can supply power to several occupancy sensors and low voltage wall switches. Following the below formula ensures adequate power will be available.

\[
\text{TOTAL POWER REQUIRED} = (\text{# of PIR SENSORS} \times 2\text{mA}) + (\text{# of DUAL TECH SENSORS} \times 10\text{mA}) + (\text{# of SWITCHES} \times 2\text{mA}) < (\text{# of ILC-SWX-950-AX} \times 70\text{ mA})
\]

<table>
<thead>
<tr>
<th>PIR SENSORS</th>
<th>TOTAL POWER REQUIRED</th>
<th>DUAL TECH SENSORS</th>
<th>TOTAL POWER REQUIRED</th>
<th>LOW VOLTAGE WALL SWITCHES</th>
<th>TOTAL POWER REQUIRED</th>
<th>POWER SUPPLIED BY ONE ILC-SWX-950-AX</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>30mA</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>2 4 34mA &lt; 70mA</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>+</td>
<td>5</td>
<td>50mA</td>
<td>+</td>
<td>2 4 54mA &lt; 70mA</td>
</tr>
<tr>
<td>3</td>
<td>6mA</td>
<td>+</td>
<td>3</td>
<td>30mA</td>
<td>+</td>
<td>2 4 40mA &lt; 70mA</td>
</tr>
</tbody>
</table>

### FCC INFORMATION (FCC ID: 2AVRY-SWX0003)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes and Modifications not expressly approved by BLP Technologies can void your authority to operate this equipment under Federal Communications Commission’s rules.

### INDUSTRY CANADA INFORMATION (IC: 26012-0003)

This device complies with Industry Canada license-exempt RSS standards). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes : (1) l’appareil ne doit pas produire de brouillage, et (2) l’utilisateur de l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.