A Complete Guide to Wireless Sensing Solutions with technical information and applications
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>4-9</td>
</tr>
<tr>
<td>TRANSMITTERS</td>
<td>11-18</td>
</tr>
<tr>
<td>WS5**-IWR: RF SELF-POWERED PIR OCC SENSOR</td>
<td>12-13</td>
</tr>
<tr>
<td>WS5C04-IW: RF SELF-POWERED PIR OCC SENSOR</td>
<td>14</td>
</tr>
<tr>
<td>WS3PC-0IW: RF SELF-POWERED WIRELESS LIGHT SENSOR</td>
<td>15</td>
</tr>
<tr>
<td>WS505-P*: SINGLE PUSH ON/OFF REMOTE SWITCH</td>
<td>16-17</td>
</tr>
<tr>
<td>WS505-O*: 1-GANG SINGLE ROCKER DECORA™ SWITCH</td>
<td>16-17</td>
</tr>
<tr>
<td>WS505-O2*: 1-GANG DUAL ROCKER DECORA™ SWITCH</td>
<td>16-17</td>
</tr>
<tr>
<td>WS505-E0*: 3 X 3 SINGLE ROCKER SWITCH</td>
<td>16-17</td>
</tr>
<tr>
<td>WS505-E2*: 3 X 3 DUAL ROCKER SWITCH</td>
<td>16-17</td>
</tr>
<tr>
<td>WS505-ROW: HANDHELD 4-BUTTON REMOTE</td>
<td>16-17</td>
</tr>
<tr>
<td>WS505-H2W: HOTEL KEY CARD HOLDER</td>
<td>16-17</td>
</tr>
<tr>
<td>WS00T: SWITCH LEG TRANSMITTERS</td>
<td>18</td>
</tr>
<tr>
<td>WS00LT: SWITCH LEG TRANSMITTERS WITH THREADED MOUNT</td>
<td>18</td>
</tr>
<tr>
<td>RECEIVERS</td>
<td>19-32</td>
</tr>
<tr>
<td>WS510-O0DZ: BASIC RF WALL SWITCH RECEIVER</td>
<td>20-23</td>
</tr>
<tr>
<td>WS510-O0DZ: BASIC RF WALL SWITCH RECEIVER, NON-NEUTRAL</td>
<td>20-23</td>
</tr>
<tr>
<td>WS510-O0UZ: ADVANCED RF WALL SWITCH RECEIVER</td>
<td>20-23</td>
</tr>
<tr>
<td>WS510-O0UZ: ADVANCED RF WALL SWITCH RECEIVER, NON-NEUTRAL</td>
<td>20-23</td>
</tr>
<tr>
<td>WS510-O2DZ: ADVANCED RF WALL SWITCH RECEIVER</td>
<td>20-23</td>
</tr>
<tr>
<td>WSP05: 3-WIRE RELAY RECEIVER (120/240/277V)</td>
<td>24-26</td>
</tr>
<tr>
<td>WSP12: 5-WIRE RELAY RECEIVER (120/240/277V)</td>
<td>24-26</td>
</tr>
<tr>
<td>WSP02-R10: 5-WIRE RELAY RECEIVER (24V)</td>
<td>24-26</td>
</tr>
<tr>
<td>WST05: 3-WIRE RELAY RECEIVER WITH THREADED MOUNT</td>
<td>24-26</td>
</tr>
<tr>
<td>WST12: 5-WIRE RELAY RECEIVER WITH THREADED MOUNT</td>
<td>24-26</td>
</tr>
<tr>
<td>WST02-R10: 5-WIRE RELAY RECEIVER WITH THREADED MOUNT</td>
<td>24-26</td>
</tr>
<tr>
<td>WSG05-D0T: PLUG-IN DIMMER RECEIVER</td>
<td>28-29</td>
</tr>
<tr>
<td>WSG05-S1T: PLUG-IN ON/OFF RELAY RECEIVER</td>
<td>28-29</td>
</tr>
<tr>
<td>WSG05-S4T: PLUG-IN ON/OFF RELAY RECEIVER</td>
<td>28-29</td>
</tr>
<tr>
<td>WSG05-S1T: PLUG-IN DIMMER RECEIVER</td>
<td>28-29</td>
</tr>
<tr>
<td>WS000-S: THERMOSTAT</td>
<td>30-32</td>
</tr>
<tr>
<td>TRANSCIEVERS</td>
<td>33-40</td>
</tr>
<tr>
<td>WSD02-010: RF CONSTANT VOLTAGE LED DIMMER</td>
<td>34-35</td>
</tr>
<tr>
<td>WSD02-020: CONSTANT VOLTAGE LED DIMMER</td>
<td>34-35</td>
</tr>
<tr>
<td>WSD01-001: 0-10V RF DIMMER WITH ON/OFF CONTROL</td>
<td>34-35</td>
</tr>
<tr>
<td>WSO0C-02D: 2-CHANNEL ROOM CONTROLLER</td>
<td>36-40</td>
</tr>
<tr>
<td>WSO0C-30D: 3-CHANNEL ROOM CONTROLLER</td>
<td>36-40</td>
</tr>
<tr>
<td>WSO0C-40D: 4-CHANNEL ROOM CONTROLLER</td>
<td>36-40</td>
</tr>
<tr>
<td>WSO0C-50D: 5-CHANNEL SHADE CONTROLLER</td>
<td>36-40</td>
</tr>
<tr>
<td>WSPAS-LV4: 4-CHANNEL RELAY RECEIVER</td>
<td>36-40</td>
</tr>
<tr>
<td>WSPAS-LV8: 8-CHANNEL RELAY RECEIVER</td>
<td>36-40</td>
</tr>
<tr>
<td>ACCESSORIES</td>
<td>41-43</td>
</tr>
<tr>
<td>WSRF-30D: RS-232 SERIAL BOX DATA INTERFACE</td>
<td>42</td>
</tr>
<tr>
<td>WSME1-010: SIGNAL STRENGTH METER</td>
<td>43</td>
</tr>
<tr>
<td>APPLICATIONS/WIRING DIAGRAMS</td>
<td>45-54</td>
</tr>
<tr>
<td>DIMENSIONAL DIAGRAMS</td>
<td>55-58</td>
</tr>
<tr>
<td>PRODUCT COMPATIBILITY MATRIX</td>
<td>59-60</td>
</tr>
</tbody>
</table>
Transmitters

Self-powered wireless technology means no new wiring is required. Leviton LevNet RF Self-Powered Wireless Solutions are easy to install and maintenance-free, reducing ongoing manual work and material costs while reducing energy. EnOcean® technology allows energy harvesting LevNet RF Transmitters to operate indefinitely without the use of batteries. The kinetic motion of a switch activation, light on a solar cell or temperature differentials in the environment provide power to LevNet RF Transmitters, allowing zero maintenance wireless devices.
INTRODUCTION

Our discussion of Leviton’s new LevNet RF self-powered system begins with EnOcean GmbH, the originator of this technology, EnOcean manufactures and markets maintenance-free self-powered Sensor solutions for use in commercial and industrial installations.

In April, 2008, Leviton Manufacturing and other leading companies formed the EnOcean Alliance to establish the specifications for the interoperability of products based on EnOcean’s wireless, self-powered technology.

Together with its partners, EnOcean is promoting the worldwide use of this technology, which serves as an essential element in the design of energy-efficient buildings.

Leviton’s LevNet RF line of feature-rich, robust products are perfect for an endless list of applications, including:

- Basic Lighting Controls
- Hotel Room Energy Saving Control
- Bi-Level Lighting Control
- Problem Solving Solutions
- Title 24 Compliance/Energy Savings
- LEED Certified Building Points
- Integrated Temperature and Climate Controls
- Ecological/Green Buildings
- Energy Management

ENOECEAN TECHNOLOGY

EnOcean’s technology consists of miniaturized energy harvesting modules and ultra low power radio technology.

By harvesting the minute energy changes that are created by ordinary events (pressing a button, changes in temperature), EnOcean technology-based products generate enough energy to not only process the Sensory data but also to communicate with other devices by generating and wirelessly transmitting signals. Such energy harvesting precludes the need for a battery or other additional power source.

RADIO FREQUENCY SIGNAL CONSIDERATIONS

With no new wiring required, installation is quick and easy utilizing existing wiring and takes only minutes to configure. Easy installation for occupancy sensing, ON/OFF multi-location (3-way and 4-way) switching control for lights, bi-level lighting, and HVAC control make LevNet RF the preferred solution for retrofit and new construction applications.

Leviton’s LevNet RF self-powered solutions are all easy to install and are maintenance-free. This means that LevNet RF products not only save energy but also increase return on investment (ROI) and company profits.

Leviton’s full line of LevNet RF Receivers, Transmitters, and Transceivers (Transmitter-Receiver in one) seamlessly work together in an easy to set up network.

1. The number of receiving nodes in a given area that are required for a reliable radio frequency (2.4GHz) system vary about four times as many receiving nodes as with a 315/433MHz system.

2. By keeping energy consumption extremely low, a self-powered battery-free system is possible.

3. By choosing EnOcean technology-based products, you are assured access to the largest spectrum of interoperable products for commercial building, home, and industrial automation.

WIRELESS SIGNAL SPECIFICATIONS

For countries (Europe and others) that adhere to the R&TTE specification, the EnOcean wireless signals are transmitted using an 868 MHz frequency band. In North America and other countries that have adopted the FCC specification, a 315 MHz frequency band is used. In an EnOcean system, 1ms messages are wirelessly transmitted at a rate of 25kbps.

Each message is transmitted 3-5 times, depending on the device, 5-30ms apart, and at random intervals, to help reduce the likelihood of transmission errors and collisions.

The range of EnOcean wireless Sensors is about 900 feet (300 meters) in the open and up to 100 feet (33 meters) inside buildings. Each EnOcean module comes with a unique 32-bit identification number to exclude any possibility of overlap with other wireless switches.

PRODUCT OVERVIEW

There are three main types of LevNet RF products: Transmitters, Receivers, and Transceivers (Transmitter-Receiver in one). A fourth type or category might best be referred to as accessories.

A Transmitter, such as a switch, generates a wireless RF control signal (e.g., “ACTUATE RELAY”). All Transmitters are self-powered completely wireless products which can be located anywhere and send transmission signals.

A Receiver, such as the RF Wall Switch Receiver or 3-Wire Relay Receiver, receives a control signal from a Transmitter and performs the appropriate action (e.g., activate or deactivate the relay). All Receivers are connected to a power source and a load which the Receiver then operates when the RF signal is received.

A Transceiver acts as both a Transmitter (when it is generating a RF signal) and as a Receiver (when it receives and processes an RF signal generated by a Transmitter). The Transceiver can also be used as a repeater where it utilizes the Receiver and then re-transmits the RF signal.

Examples of Transceivers include the 3-, 3-, and 4-Channel Room Controllers.

Leviton first introduced its line of occupancy sensing combined with radio frequency and self-powered technologies in early 2009.

Today, Leviton’s latest innovative line of RF self-powered solutions offers additional energy savings on top of labor and material savings with the following products:

Receivers: Basic and Advanced Wall Switch Receivers, 3- and 5-Wire Relay Receivers, Plug-In Receivers, Thermostat Receivers


Transceivers: Room Controllers, Shade Controller, Dimmer Controllers, 4- and 8-Channel Relay Controllers

Accessories: RS-232 Serial Box, Signal Strength Meter, Power Packs, Industrial Wireless Relay
**DESIGN CONSIDERATIONS**

**RANGE OF RADIO SIGNALS**

Radio signals are electromagnetic waves and as such the signal becomes weaker the further it travels; i.e., the range is limited and finite.

Radio coverage is further decreased by specific materials found in the direction of the propagation. While radio waves can penetrate walls, they are dampened more than on a direct line-of-sight path.

For example, wood, plaster and uncoated glass might result in an up to 10% range reduction; brick and pressboard might result in an up to 35% range reduction; and, ferro concrete might result in an up to 90% reduction.

Many factors serve to reduce the radio range, from the type of antenna used, where the antenna is mounted, and the presence of people and other objects. Therefore, reserve in the range planning is needed to achieve reliability:

- Under ideal conditions (e.g., in a board room with no obstacles, good antenna design and good antenna positions), LevNet RF products have an approximate 100 foot range.
- If a room is filled with furniture and people, with penetration through walls, LevNet RF products have an approximate 60 foot range if the Transmitter and Receiver have good antenna design and good antenna positions.
- Under the same conditions but with neither a good antenna design nor good antenna placement, LevNet RF products have an approximate 30 foot range.
- Metal faceplates or mounting to metal can further result in range reduction, proper wireless pathway planning and careful mounting location selection in these applications is essential.

**RADIO SHADOW**

Large metal objects reflect electromagnetic waves and create “radio shadows” (areas where there are no or weak radio signals). Position the Transmitter and/or Receiver away from metal objects or use a repeater.

**PENETRATION ANGLE**

The angle at which the transmitted signal hits the wall—steeper the angle the greater the effective wall thickness—can reduce range. Reposition the transmitting and/or receiving device such that the signal is transmitted as directly as possible through the wall.

**ANTENNA INSTALLATION**

When using devices with an internal receiving antenna, the device should not be installed on the same side of the wall/ceiling as the Transmitter.

Near a wall, the radio waves are likely to be subject to interfering dispersions or reflections. Position the antenna on the opposite or connecting wall.

When using devices with an external antenna, the ideal antenna installation place is a central location in the room, at least 4 inches away from the wall corner or concrete ceiling.

**SOURCES OF INTERFERENCE**

The distance between a LevNet RF Transmitter and a different high-frequency source of interference (e.g., poorly designed electronic ballasts, motors, computers, and audio/video equipment) should be at least 20 inches (50cm).

**USE OF REPEATERS**

In cases of poor reception, it may be helpful to use a repeater. LevNet RF repeaters do not require any configuration/programming and are put into operation by simply connecting them to the supply voltage.
SIGNAL STRENGTH METER
Consider using Leviton’s Signal Strength (Field Intensity) Meter, which allows the installer to determine the ideal mounting positions for Sensors and Receivers and to check for faulty RF pathways in already-installed devices. Additional third party signal meters (such as Probare) can be purchased to determine signal strength or source of noise.

PLANNING COMMERCIAL INSTALLATIONS
LevNet RF solutions are most widely used to reduce energy usage in single-room applications. Designing single-room self-powered RF systems to maximize energy savings mitigates many of the RF reliability concerns. Larger network (whole building) RF systems often have reliability issues and ongoing network maintenance concerns.

Radio coverage in commercial buildings is usually restricted by fire safety walls that can create radio shadows. Using a building floor plan, mark all radio shadow areas (e.g., fire protection walls, lavatories, staircases, elevator shafts, supply areas). Avoiding the marked areas, use a compass to draw circles (with a scaled radius of 30-40 feet) such that the center points of the circles represent the ideal LevNet RF device mounting locations and the circles overlap each other for optimum coverage. If possible, it is advisable to implement a redundant radio Receiver path.

PLANNING RESIDENTIAL INSTALLATIONS
For applications restricted to one or two rooms, the direct transmission range is usually adequate. For whole-house applications up to 4300 SF, a repeater should be used and placed in a central location. For multi-family units or high-rise buildings, use a separate radio system (network) on each flat.

DESIGNING YOUR SYSTEM
Designing your system is a very simple 4 step process with LevNet RF:

Step 1: Determine the LOADS to be controlled.
Step 2: Select the appropriate wired RF Receiver and/or Transceiver for mounting or controlling the LOAD.
Step 3: Select the appropriate Self Powered RF Transmitter (Sensor or switch)
Step 4: (installation at the project site) install the Receiver’s, then pair the Transmitters, and install the Transmitters at the desired location.

TIP: A good way to visualize your wireless system is to imagine that the “wires” connecting each device are invisible wires or “unique addresses.”

HOW TO PUT IT ALL TOGETHER
Step 1: Determine what LOADS you want to control – lighting, HVAC, lamp, TV, etc.
Step 2: Pick the appropriate RF RECEIVER and/or TRANSCEIVER
Step 3: Pick the appropriate Self-Powered Wireless RF TRANSMITTER (sensor or switch)
TRANSMTTERS

- WSC**-RW  RF SELF-POWERED PIR OCC SENSOR
- WSC04-10W  RF SELF-POWERED PIR OCC SENSOR
- WSPEC-00W  RF SELF-POWERED WIRELESS LIGHT SENSOR
- WS505-P*  SINGLE PUSH ON/OFF REMOTE SWITCH
- WS510-D*  1-GANG SINGLE ROCKER DECORA™ SWITCH
- WS505-02*  1-GANG DUAL ROCKER DECORA™ SWITCH
- WS505-03*  3X3 SINGLE ROCKER SWITCH
- WS505-03*  3X3 DUAL ROCKER SWITCH
- WS505-40W  HANDHELD 4-BUTTON REMOTE
- WS505-H0W  HOTEL KEY CARD HOLDER
- WSSLT  SWITCH LEG TRANSMITTERS
- WSTLT  SWITCH LEG TRANSMITTERS WITH THREADED MOUNT

- TITAN
- LEVITON
- LEVITON
FEATURES

- Zero Power Consumption: solar power provides the energy to keep the device ON and Sensor technology turns the lights OFF
- Zero External Power Required: with no power wire limitations, this enables the installer to place the Sensor in the optimal location for PIR dependability
- Self-Powered, Self-Charging: angled solar cells optimal for light collection
- Quick Charge Time to Operation: self-powered technology enables the Sensor to be operational after a minimum charge time of 1 minute
- True Wireless: Sensors are self-powered and communicate with all LevNet RF and EnOcean Receivers via radio frequency

DESCRIPTION

The Wireless Occupancy Sensors (WSCxx-RW) have built-in solar cells that draw on available ambient light to power themselves and can operate for up to 48 hours in total darkness. Batteries are not required for continuous operation, however batteries can be added as an option for applications without available ambient light. The zones can be configured (masked) to block out unwanted traffic zones (i.e. outside hallway traffic).

For improved detection, the Sensors use an enhanced PIR element located directly behind a unique multi-zone optical lens. This exclusive Fresnel lens enhances twice as many zones of detection as Traditional Sensors.


APPLICATIONS

- Recessed
- Conference rooms
- Classrooms
- Executive Offices
- Restrooms
- Daycare Facilities

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSC15-RW</td>
<td>LevNet RF Self-Powered PIR OCC Sensor, 4500F</td>
</tr>
<tr>
<td>WSC15-IRW</td>
<td>LevNet RF Self-Powered PIR OCC Sensor, 15000F</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL

- Frequency: 315MHz
- Range: up to 100 feet
- Transmission Interval: 60 seconds (+/- 10 seconds)
- Minimum Light Required: 4FC (400 LUX)
- Solar Cell Operating Range: 4FC (40-1500 LUX)
- Minimum Charge Time: 1 minute @ 20FC (200 LUX)
- Maximum Charge Time: 8 hours @ 20FC (200 LUX)
- Maintain Charge Time: 3 hours per 24 hours @ 20FC (2000 LUX)
- Operating Life at Full Charge: 48 hours
- Optional Battery Life: 10 years
- Operating Temperature Range: 32°F to 104°F (0°C to 40°C)
- Storage Temperature Range: -4°F to 131°F (-20°C to 55°C)
- Relative Humidity: 3% to 95%, non-condensing
- Usage: Indoors only
- Mounting Height: 8-12 feet

LISTINGS AND WARRANTY

- Listings: CEC Title 24 Compliant, FCC Certified for wireless communication
- Warranty: Limited 5-year

SENSOR PAIRING (WITH WSS10 Basic)

1. Press the WSS10 switchpad for about 1.5 seconds or until the LED blinks amber to enter programming. The WSS10 LED will flash amber once per second to indicate that you may select Rocker Mode (the mode does not matter for an Occupancy Sensor--DIP switches in the WSS10 dictate how the WSS10 will operate with the Sensor).
2. Press and hold the switch for five seconds to enter Pairing Mode. The WSS10 LED will blink red to indicate that no Receiver has yet been paired, if green LED is flashing then a Transmitter is currently paired.
3. Press and release the Transmitter. The WSS10 LED will turn amber for one second and then flash green once per second to indicate that it has been paired with one Transmitter. The load will also change state for one second and then back to its original state as a confirmation of the pairing. (To clear the Occupancy Sensor from the WSS10, press the LEARN button again.)
4. Set the WSS10 dip switches as per the chart above to configure the Occupancy Sensor operation.

SENSOR OPERATION

The Sensor is a self-powered and very efficient Transmitter. The operation is simple in that it sends an RF signal packet every 60 seconds and requires and additional Receiver unit connected to the load. The Receiver units contain all of the firmware and feature sets that are normally housed within traditional Occupancy Sensors.

The factory settings are (featured in the receiver units):
- **Walk-Through disabled**: This feature is only used in the Auto-ON mode and is useful when a room is momentarily occupied. With this feature enabled, the Sensor will turn the lights OFF shortly after the person leaves the room. The walk-through feature works in the following manner: When a person enters the room, the lights will turn ON. If the person leaves the room before the walk-through time-out of 2.5 minutes, the Sensor will turn the lights OFF within 2.5 minutes of no occupancy detected. If the room is occupied for longer than 2.5 minutes, the Sensor will turn the Occupied Mode with the time-out duration specified by the Dip Switch setting.
- **Time Delay**: This feature is factory set to 10 minutes, also has four timeout settings: 2 (test only), 10, 20, or 30 min.
- **Manual Mode (Manual ON/Auto OFF)**. When entering the room, the wireless momentary switch will need to be manually turned ON. The wireless Occupancy Sensor will keep the lights ON until the room is vacant and then turn the lights OFF after the specified timeout period.

The WSS10 has a single switch pad that toggles the relay and its corresponding load, ON and OFF. If the relay is OFF, the relay will turn ON when the push-button is pressed, and remain ON in the presence of motion. In the absence of motion, the Sensor Unit will time out and turn relay OFF. If in Auto ON/Auto OFF, the time delay will start once the space is occupied and will be reset to maximum as long as occupancy is registered every 60 seconds. Once the space is vacated, the time delay will run its duration and turn the relay OFF once expired.

**NOTES:**
- When the lights are on, the Motion Indicator LED will blink red (1 blink per minute) every time motion is detected.
- When the Timeout expires and the relay turns OFF, in Manual-ON mode, a 30 second vacancy confirmation exists to turn the relay back ON.
- In Manual-ON mode, the button must be pressed to turn the lights ON. In the absence of motion, the unit will time out and turn the lights OFF.
**DESCRIPTION**

These RF products combine Leviton’s occupancy sensing technology with self-powered and wireless technologies, developed and licensed from EnOcean®.

The Wireless Occupancy Sensor has a built-in solar cell that draws on available room light to power itself and can operate for up to 48 hours without the need for batteries or external power in standard manual-ON/Auto-OFF mode. Batteries are required for continuous uninterrupted Auto-ON operation.

The Sensor uses a small detector located directly behind a unique multi-zone optical lens. This exclusive Fresnel lens establishes dozens of zones of detection, which can be configured (manual masking) to block out unwanted traffic zones (i.e. outside hallway traffic). The Sensor responds to any source of heat within the range of detection, including the heat emitted by the human body; however, the Sensor is only triggered when the source of heat moves from one zone of sensing to another. Stationary heat sources will not trigger the Sensor.

**APPLICATIONS**

- Retrofits
- Conference rooms
- Private Offices
- Restrooms
- New Construction
- Classrooms
- Executive Offices
- Daycare Facilities

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>WSC04-00W</td>
<td>Wireless Self-Powered PIR Occupancy Sensor, 450SF</td>
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**ENVIRONMENTAL**

- Operating Temperature Range: 32°F to 104°F (0°C to 40°C)
- Storage Temperature Range: 32°F to 104°F (0°C to 40°C)
- Relative Humidity: 9% to 95%, non-condensing
- Usage: Indoors only

**SPECIFICATIONS**

- Battery Life: 10 years
- Operating Life at Full Charge: 48 hours
- Operating Temperature Range: 32°F to 104°F (0°C to 40°C)
- Storage Temperature Range: 4°F to 158°F (-20°C to 70°C)
- Relative Humidity: 9% to 95%, non-condensing
- Usage: Indoors only
- Mounting Height: 8-12 feet

**FIELD-OF-VIEW**

- Minor Motion
- Major Motion

**APPLICATIONS**

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>WSCPC-00W</td>
<td>LevNet RF Self-Powered Light Sensor</td>
</tr>
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**ENVIRONMENTAL**

- Operating Temperature: 33°F (1°C)
- Frequency: 315 MHz
- Range: 50-150 feet
- Photocell: 0-94.8 FC (0-1020 LUX)
- Transmission Interval: Upon > 20 FC (200 LUX) changes
- Minimum Light Required: 4 FC (40 LUX)
- Solar Cell Operating Range: 4-100 FC (40-1000 LUX)
- Solar Cell Operating Life: 10 years
- Transmission Stability: ±12% of the output
- Maintain Charge Time: 3 hours per 24 hours @ 20 FC (200 LUX)
- Full Charge Time: ~8 hours @ 100 FC (1000 LUX)
- Optional Battery Life: 10 years
- Operating Life at Full Charge: 48 hours
DESCRIPTION

**SINGLE PUSH ON/OFF REMOTE SWITCH (WSS05-P0X)**
Leviton Wireless Self-Powered Push ON/OFF Remote Switches (WSS05-P0X) work in conjunction with the Wireless Occupancy Sensors (WSCxx-1x*) and the Wall Switch Receivers (WSS10-ODZ and WSS10-GDZ) to provide an optimal solution for retrofit lighting needs. The Push ON/OFF Remote Switch can be used to control lights from multiple locations. It can also be used for convenient multi-location (3-way or 4-way) switching solution, eliminating the need to pull additional wiring.

**SINGLE ROCKER DECORA™ SWITCH (WSS05-0DX) / DUAL ROCKER DECORA™ SWITCH (WSS05-02X) / 3 X 3 SINGLE ROCKER SWITCH (WSS05-0E0) / 3 X 3 DUAL ROCKER SWITCH (WSS05-0E2)**
Control one light or one group of lights with the Wireless Self-Powered Single Rocker Switch. One switch can control an unlimited number of LevNet RF Receivers that are within range. Control two lights or two groups of lights with the Wireless Self-Powered Dual Rocker Switch. Each rocker can separately control an unlimited number of LevNet RF Receivers that are within range.

**HANDHELD 4-BUTTON REMOTE (WSS05-R0W)**
Control two lights or two groups of lights with the Handheld Remote. Each rocker can separately control an unlimited number of LevNet RF Receivers that are within range. The Remote has four buttons - programmable to control up to four individual Receivers or dependent groups. Small enough to fit in the palm of your hand, you can also keep it in your pocket, on a table, or leave it in your car to turn lights ON as you pull up to a building or house.

**HOTEL KEY CARD HOLDER (WSS05-H0W)**
The Wireless Self-Powered Hotel Key Card Holder is designed to create energy saving solutions for the hospitality industry. Energy is saved by ensuring that no devices are left ON when the room is not in use. Inserting a Key Card provides the energy to transmit an RF signal to LevNet RF Receivers that control lights or other devices in the room.

**APPLICATIONS**
- New Construction
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<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSS05-P*</td>
<td>Single Push ON/OFF Remote Switch</td>
</tr>
<tr>
<td>WSS05-D*</td>
<td>1-Gang Single Rocker Decora™ Switch</td>
</tr>
<tr>
<td>WSS05-D2*</td>
<td>1-Gang Dual Rocker Decora™ Switch</td>
</tr>
<tr>
<td>WSS05-E0*</td>
<td>3 x 3 Single Rocker Switch</td>
</tr>
<tr>
<td>WSS05-E2*</td>
<td>3 x 3 Dual Rocker Switch</td>
</tr>
<tr>
<td>WSS05-R0W</td>
<td>Handheld 4-Button Remote</td>
</tr>
<tr>
<td>WSS05-H0W</td>
<td>Hotel Key Card Holder</td>
</tr>
</tbody>
</table>

*Available in White (-W), Ivory (-I), Light Almond (-T), Gray (-G), and Ebony (-E).

**SPECIFICATIONS**

**LEVNET RF REMOTE SWITCHES**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>315MHz-n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>50-150&quot;</td>
</tr>
<tr>
<td>Transmission Interval</td>
<td>Human touch</td>
</tr>
<tr>
<td>Transmission Time</td>
<td>Milliseconds</td>
</tr>
<tr>
<td>Transmissions</td>
<td>3-5 packets per press or release</td>
</tr>
<tr>
<td>Mechanical Cycles</td>
<td>&gt;50,000</td>
</tr>
<tr>
<td>Device Address</td>
<td>Unique from factory</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Self-generated when Switch is pressed or Key Card is inserted into the switch</td>
</tr>
<tr>
<td>Output Channels</td>
<td>Only limited by number of Receivers in range</td>
</tr>
<tr>
<td>Usage</td>
<td>Indoors only</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>32°F to 104°F (0°C to 40°C)</td>
</tr>
<tr>
<td>Radio Certification</td>
<td>FCC Certified for Wireless Communication (U.S.), I.C. Certified (Canada)</td>
</tr>
<tr>
<td>Warranty</td>
<td>Limited Five-Year</td>
</tr>
</tbody>
</table>

**LEVNET RF SELF-POWERED REMOTE SWITCHES**

<table>
<thead>
<tr>
<th>Rockers</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSS05-0D: 1 Rocker, 2 Pushbuttons</td>
<td></td>
</tr>
<tr>
<td>WSS05-0D2: 2 Rockers, 4 Pushbuttons</td>
<td></td>
</tr>
<tr>
<td>WSS05-0E0: 1 Rocker, 2 Pushbuttons</td>
<td></td>
</tr>
<tr>
<td>WSS05-0E2: 2 Rockers, 4 Pushbuttons</td>
<td></td>
</tr>
</tbody>
</table>

**HOTEL KEY CARD SWITCH (WSS05-H0W)**

<table>
<thead>
<tr>
<th>Card Slot</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Card B, card O, U, J)</td>
<td>4.52” H x 2.78” W x 1.38” D (11.48mm x 70.6mm x 35.1mm)</td>
</tr>
<tr>
<td>2.125” W x 3” L (54mm x 76mm) (standard credit card size)</td>
<td></td>
</tr>
</tbody>
</table>

**RECOMMENDED CARD SIZE**

- Operating Temperature Range: -13°F to +149°F (-25°C to +65°C)

**TRANSMITTERS**

- Transmitters

**RECEIVERS**

- Receivers

---

**Page 16**
**DESCRIPTION**

**SWITCH LEG TRANSMITTER (SLT)**

To control loads, the LevNet RF Switch Leg Transmitter (SLT) replaces wires between an electrical load and a switch with an RF control signal. The SLT connects in line to a standard switch or other device where there is no power (example: a switch leg) to a standard switch and transmits a signal to remote RF Receivers which are connected to and controlling loads. The SLT senses the power state of a wired switch, light, or other device and transmits it to a LevNet RF Receiver to control another load.

**4-CHANNEL SLT TRANSMITTER**

The LevNet RF 4-Channel SLT connects four general purpose input/output (GPIO) signals from the HVAC to sync with lighting controls and features inputs for 0-30VDC or dry contacts. Replacing wires between an electrical load and a switch with an RF control signal, the SLT connects to a standard switch and controls LevNet RF Receivers. LevNet RF Receivers that are connected to an electrical load and programmed to respond to an SLT will mirror the status of the lighting or building management systems.

**APPLICATIONS**

- Retrofits
- Conference rooms
- Private Offices
- Restrooms
- New Construction
- Classrooms
- Executive Offices
- Daycare Facilities

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSSLT-010</td>
<td>Switch Leg Transmitter, 120VAC</td>
</tr>
<tr>
<td>WSSLT-010T</td>
<td>Switch Leg Transmitter, Threaded Mount, 120VAC</td>
</tr>
<tr>
<td>WSSLT-010R</td>
<td>Switch Leg Transmitter, 24VAC</td>
</tr>
<tr>
<td>WSSLT-GP0</td>
<td>4-Channel Switch Leg Transmitter</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

**LEVNET RF Transmitters**

- **Range**: 50-150 foot
- **Frequency**: 315MHz
- **Operating Temperature**: -14°F to +122°F (-10°C to +50°C)
- **Addressing**: Factory set unique ID (1 of 4 billion)
- **Radio Certification**: FCC Certified for Wireless Communication (U.S.), IC Certified (Canada)

**SWITCH LEG Transmitter (WSSLT-010/WSLT-010/WSSLT-R10)**

- **Power Supply Input**: WSSLT-010: 120VAC, 50/60Hz
  - WSSLT-010T: 120VAC, 50/60Hz
  - WSSLT-010R: 24VAC, 50/60Hz
- **Power Consumption**: <1 Watt
- **Listings**: ETL (UL), CE, UL2444, ETL (Canada) CSA C22.2 No. 1504

**4-CHANNEL SLT (WSSLT-GP0)**

- **Power Supply Input**: 8-28 VDC, 40 mA

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**RECEIVERS**

- WSS10-0DZ BASIC RF WALL SWITCH RECEIVER
- WSS10-GDZ BASIC RF WALL SWITCH RECEIVER, NON-NEUTRAL
- WSS10-0LZ ADVANCED RF WALL SWITCH RECEIVER
- WSS10-GLZ ADVANCED RF WALL SWITCH RECEIVER, NON-NEUTRAL
- WSP05 3-WIRE RELAY RECEIVER (120/240/277V)
- WSP12 5-WIRE RELAY RECEIVER (120/240/277V)
- WSP02-R10 5-WIRE RELAY RECEIVER (24V)
- WST05 3-WIRE RELAY RECEIVER WITH THREADED MOUNT
- WST12 5-WIRE RELAY RECEIVER WITH THREADED MOUNT
- WST02-R10 5-WIRE RELAY RECEIVER WITH THREADED MOUNT
- WSG05-D1T PLUG-IN DIMMER RECEIVER
- WSG05-S1T PLUG-IN ON/OFF RELAY RECEIVER
- WS07H-S THERMOSTAT
DESCRIPTION

The Leviton line of RF Wall Switch Receivers (WSS10-CD/ GD and WSS10-O/U/GU) work in conjunction with the Wireless Occupancy Sensors (WSOSxx) and the Wireless Remote Switch (WSOS) to provide an optimal solution for retrofit lighting needs. The Wall Switch Receiver can be installed in place of traditional single-pole wall switches and fits in a standard single-gang wall box. No additional wiring is required. These components are compatible with incandescent, fluorescent and low-voltage lighting. The Receiver responds to signals from the Wireless Occupancy Sensor, automatically shutting OFF lights when the room is vacant. Lights are automatically activated upon entry in Auto-ON mode by the Wireless Occupancy Sensor. The Receiver features a single manual-on/override switch that can be used to toggle the ON/OFF status of the light load while an area is occupied.

APPLICATIONS

- Retrofits
- Conference rooms
- Private Offices
- Restrooms
- New Construction
- Classrooms
- Executive Offices
- Daycare Facilities

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSS10-CD</td>
<td>Basic Wall Switch Receiver</td>
</tr>
<tr>
<td>WSS10-CGD</td>
<td>Basic Wall Switch Receiver, Non-Neutral</td>
</tr>
<tr>
<td>WSS10-CL</td>
<td>Advance Wall Switch Receiver</td>
</tr>
<tr>
<td>WSS10-CLG</td>
<td>Advance Wall Switch Receiver, Non-Neutral</td>
</tr>
</tbody>
</table>

PROGRAMMING MODES

The WSS10 Basic has two programming modes: LEARN and CLEAR. LEARN mode is used when pairing the WSS10 with one or more Transmitters. CLEAR mode is used to clear the WSS10 of all previously stored pairings.

OPERATING MODES

The WSS10 Advanced has four operating modes: ROCKER, MOMENTARY, TOGGLE, and SCENE. Operating modes are used for pairing transmitters, selecting the desired operation you wish the transmitter button pad to perform. Selecting ROCKER mode enables the WSSS to operate as a rocker switch. In ROCKER mode, pressing and releasing the top pad turns the lights ON and pressing and releasing the bottom pad turns the lights OFF. Selecting MOMENTARY mode enables the WSSS to operate as a momentary switch. In MOMENTARY mode, pressing the pad turns the lights ON, and pressing and releasing the same pad turns the lights OFF. Selecting TOGGLE mode enables the WSSS to operate as a toggle switch. In TOGGLE mode, pressing and releasing the pad turns the lights ON, and pressing and releasing the same pad turns the lights OFF. Selecting SCENE mode enables the WSSS to operate as a SCENE controller. In SCENE mode, pressing and releasing the pad will turn a group of lights ON or OFF to create a lighting scene. (Note: at the time of the publication of this manual SCENE mode is not currently available.)

TRANSMITTER-RECEIVER PAIRING

Pairing is the process by which the address of a Transmitter is stored in a Receiver, thereby linking the two. This allows the ON/OFF “commands” of the Transmitter to be understood and executed by the Receiver.

The pairing process involves putting the Receiver in PAIRING mode, followed by LEARN mode, and then activating the Transmitter. Each type of Receiver has its own type of method for entering PAIRING and LEARN modes. The WSS10 Basic enters PAIRING mode by holding down the switchpad for 15 seconds, and then enters LEARN mode by pressing and holding the switchpad for five seconds. The WSS10 Advanced enters PAIRING mode by holding down the switchpad for 15 seconds, selecting the operation mode and then enters LEARN mode by pressing and holding the switchpad for five seconds.

Always pair the devices before the installation. Receivers automatically reduce their listening range to under 15 feet when in PAIRING mode.

SENSOR PAIRING (WITH WSS10 BASIC (-OD/-GD))

1. Press the WSS10 switchpad for about 15 seconds or until the LED blinks amber to enter programming mode.
2. Press the switchpad to select LEARN (pairing) mode or CLEAR mode. The amber LED will blink once for LEARN mode and twice for CLEAR mode. Pressing the switchpad will toggle between the two modes. Ensure that you have selected LEARN mode.
3. To enter LEARN mode, press and hold the switchpad for five seconds or until the LED changes color. The LED will blink red if no Transmitters have been paired or green if one or more Transmitters have been paired. The frequency of the blinking green LED is based on how many devices have been paired.
4. Press and release a Transmitter button to pair it with this Receiver. The WSS10 LED will hold amber temporarily to indicate that the pairing process has been completed. The LED will then blink green with a frequency indicative of the number of devices that have been paired. To clear the “paired” device from the Receiver, tap the Transmitter button again.
5. Repeat Step 4 until all Transmitters have been paired.
6. The WSS10 will auto exit in 20 seconds.
7. Set the WSS10 DIP switches as per the chart found later in this section to configure the Occupancy Sensor operation.

SENSOR PAIRING (WITH WSS10 ADVANCED (-O/U/-GU))

1. Press the WSS10 switchpad for about 15 seconds or until the LED blinks amber to enter programming mode.
2. Select the operating mode (ROCKER, MOMENTARY, TOGGLE, or SCENE) by tapping the switchpad until the LED indicates you are in the correct mode. The LED will blink once per second for ROCKER mode, twice per second for MOMENTARY mode, three times per second for TOGGLE mode, and four times per second for SCENE mode.
3. To enter LEARN mode, press and hold the switchpad for five seconds or until the LED changes color. The LED will blink red if no Transmitters have been paired or green if one or more Transmitters have been paired. The frequency of the blinking green LED is based on how many devices have been paired.
4. Press and release a Transmitter button to pair it with this Receiver. The WSS10 LED will hold amber temporarily to indicate that the pairing process has been completed. The LED will then blink green with a frequency indicative of the number of devices that have been paired. To clear the “paired” device from the Receiver, tap the Transmitter button again.
5. Repeat Step 4 until all Transmitters have been paired.
6. The WSS10 will auto exit in 20 seconds.
7. Set the WSS10 DIP switches as per the chart found later in this section to configure the Occupancy Sensor operation.
**SPECIFICATIONS**

- **Input Voltage**: 120-230-277V AC
- **Output Channels**: Form C Latching Relay
- **Operational Frequency**: 50/60Hz
- **Power Consumption**: 120V < 1/2 Watt, 277V < 3/4 Watt
- **Communication Frequency**: 315MHz
- **Memory**: Stores up to 10 Transmitter IDs
- **Range**: 50-150 feet (no neutral loses 25')
- **Button Pairing Modes**: Basic: WSS0S-P, WSSC; Advanced: Rocker, Momentary, and Toggle
- **Vacancy Confirmation**: 30 seconds
- **Load Rating**:
  - Incandescent: 800W @ 120V
  - Fluorescent Ballasts: 1200VA @ 120V, 2700VA @ 277V
  - Motor: 1/4 HP
  - For non-neutral models: 25W minimum load required
- **Wire Designation**: Line-Black, Load-Blue, Neutral-White (Neutral Required models only)

**ENVIRONMENTAL**

- **Operating Temperature Range**: 32°F to 104°F (0°C to 40°C)
- **Storage Temperature Range**: 32°F to 104°F (0°C to 40°C)
- **Relative Humidity**: 0% to 95%, non-condensing
- **Usage**: Indoors only

**OTHER**

- **Listings**: C-ETL/ETL Listed to UL508, CEC Title 24 Compliant, FCC Certified for wireless communication
- **Warranty**: Limited 5-year

---

**SENSOR OPERATION (WHEN PAIRED WITH A WSS10)**

The Sensor is a self-powered and very efficient Transmitter. The Sensor sends an RF signal packet every 60 seconds (+/-10 seconds) and requires a Receiver unit connected to the load. The receiver will accept the transmitted signal and visually validate it with a red (accepted) LED flash. This then starts or resets the time delay to maximum within the receiver. The Receiver units contain all of the firmware and feature set typically found in traditional Occupancy Sensors. (as seen below)

The factory settings are: Manual Mode enabled. When entering the room, the wireless momentary switch will need to be manually turned ON. The wireless Occupancy Sensor will keep the lights ON until the room is vacant and then turn the lights OFF after the specified timeout period.

**Time Delay: Factory set to 10 minutes, also has four timeout settings: 2 (test only), 10, 20, or 30 min.**

**Walk-Through disabled.** This feature is only used in the Auto-ON mode when a room is momentarily occupied. With this feature, the Sensor will turn the lights OFF shortly after the person leaves the room. When a person enters the room, the lights will turn ON. If the person leaves the room before the walk-through time-out of 2.5 minutes, the Sensor will turn the lights OFF within 2.5 minutes of no occupancy detected. If the room is occupied for longer than 2.5 minutes, the Sensor will enter the Occupied Mode with the time-out duration specified by the Dip Switch setting. The WSS10 has a single switch pad that toggles the relay and its corresponding load ON and OFF. If the relay is OFF, the relay will turn ON when the push-button is pressed, and remain ON in the presence of motion. In the absence of motion, the Sensor Unit will time out and turn the relay OFF. If in Auto ON/Manual OFF mode, the time delay will start once the space is vacant.

**NOTES:**

1. When the lights are on, the Motion Indicator LED will blink red (1 blink per minute) every time motion is detected.
2. When the Time-Out expires and the relay turns OFF, in Manual ON mode, a 30 second vacancy confirmation exists to turn the relay back ON.
3. In Manual-ON mode, the button must be pressed to turn the lights ON. In the absence of motion, the unit will time out and turn the lights OFF.

**SENSOR CONFIGURATION (USING WSS10)**

![Sensor Configuration Diagram]
DESCRIPTION

3-WIRE RELAY RECEIVERS

The 3-Wire Relay Receiver is the most basic of the LevNet RF Receivers. It is used to control one light or one group of lights by wiring the Receiver between the device and the power source. A LevNet RF Remote Switch or Sensor is used to control the Receiver. One Receiver can learn up to 30 Wireless Transmitters. LevNet RF single channel relay Receivers allow lights to be controlled by any combination of LevNet RF Switches, Remotes, and Sensors. The line-voltage relays help simplify advanced wireless lighting control. For larger load ratings or motor load control, see the 5-Wire Relay Receiver.

5-WIRE RELAY RECEIVERS

The 5-Wire Relay Receiver is used to control larger lighting loads or groups and motor loads such as fans, pumps, and gates. The Receiver includes isolated contacts that can switch power from a different circuit. Simply install the Receiver at the load location and install as many as 30 Wireless Transmitters anywhere within range. LevNet RF single channel relay Receivers allow lights and fans to be controlled by LevNet RF Switches and Sensors. The line-voltage relays help simplify advanced wireless lighting control. Threaded Nipple Mount versions include a repeater feature that is disabled from the factory but can be enabled if required in an application. These models also have an external antenna for optimal troubleshooting in range challenging scenarios.

APPLICATIONS

- Retracts
- Conference rooms
- Private Offices
- Restrooms
- Executive Offices
- Daycare Facilities

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3P05-010</td>
<td>3-Wire Relay Receiver, 120VAC, 50W</td>
<td>WST05-010</td>
<td>3-Wire Relay Receiver, Threaded Mount, 120VAC, 50W</td>
</tr>
<tr>
<td>W3P05-020</td>
<td>3-Wire Relay Receiver, 277VAC, 120W</td>
<td>WST05-020</td>
<td>3-Wire Relay Receiver, Threaded Mount, 277VAC, 120W</td>
</tr>
<tr>
<td>W3P05-080</td>
<td>3-Wire Relay Receiver, 240VAC, 100W</td>
<td>WST05-080</td>
<td>3-Wire Relay Receiver, Threaded Mount, 240VAC, 100W</td>
</tr>
<tr>
<td>W3P12-010</td>
<td>5-Wire Relay Receiver, 120VAC, 150W</td>
<td>WST12-010</td>
<td>5-Wire Relay Receiver, Threaded Mount, 120VAC, 150W</td>
</tr>
<tr>
<td>W3P12-020</td>
<td>5-Wire Relay Receiver, 277VAC, 320W</td>
<td>WST12-020</td>
<td>5-Wire Relay Receiver, Threaded Mount, 277VAC, 320W</td>
</tr>
<tr>
<td>W3P12-080</td>
<td>5-Wire Relay Receiver, 240VAC, 300W</td>
<td>WST12-080</td>
<td>5-Wire Relay Receiver, Threaded Mount, 240VAC, 300W</td>
</tr>
<tr>
<td>W3P02-010</td>
<td>5-Wire Relay Receiver, 24VAC, 360W</td>
<td>WST02-010</td>
<td>5-Wire Relay Receiver, Threaded Mount, 24VAC, 360W</td>
</tr>
</tbody>
</table>

PROGRAMMING BUTTONS

The 3- and 5-Wire Relay Receivers have two programming buttons: LEARN and CLEAR. The LEARN button is used when pairing a Receiver with one or more Transmitters. The CLEAR button is used to clear a Receiver of all previously stored pairings and can also manually switch the relay.

OPERATING MODES

The 3- and 5-Wire Relay Receivers have four operating modes: ROCKER, MOMENTARY, TOGGLE, and SCENE.

- **ROCKER MODE**: In ROCKER mode (default) the Receiver responds only on a Transmitter press and not on the release. For example, one end of the rocker on a wireless light switch will activate the relay (turn the light ON) when pressed and the opposite end of the same rocker will deactivate the relay (turn the light OFF) when pressed. Motion detectors learned in this mode will provide Manual-ON/Auto-OFF operation.

- **MOMENTARY MODE**: In MOMENTARY mode, each end of the rocker programs separately to one or more receivers. When a rocker is pressed the output on the Receiver will activate (turning the electrical load ON). When the rocker is released the output will deactivate (turning the electrical load OFF). Motion detectors learned in this mode will provide Auto-ON/Auto-OFF operation.

- **TOGGLE MODE**: In TOGGLE mode, each end of the rocker acts as a separate button. Each end of the rocker programs separately. When the rocker is pressed the output of the Receiver will always change state (OFF, it will turn ON; ON, it will turn OFF). Like ROCKER mode, the output status only changes when a button is pressed and is ignored on the release.

- **SCENE MODE**: In SCENE mode, a user can create a preset “scene” with some lights ON and some lights OFF by pressing one button. In SCENE mode, each end of the rocker acts as a separate button. Each end of the rocker programs separately. To create a “scene,” a load is set to its desired state, then while in SCENE programming mode an end of a switch rocker is associated with a Receiver or Receiver output controlling the load. The desired state for the load will then occur whenever that end of the rocker is pressed. Multiple Receivers and/or Receiver outputs can be programmed in the same way to the same end of a rocker; this creates a “scene” that will come up whenever that switch is pressed. Each end of a single rocker can activate a different scene.
**3-WIRE RELAY RECEIVERS**

- **RANGE**: 50-150 feet
- **POWER SUPPLY INPUT**:
  - WSx05-010: 120VAC, 50/60Hz
  - WSx05-020: 277VAC, 50/60Hz
  - WSx05-080: 240VAC, 50/60Hz
- **MAX LOADS/CONTACT RATINGS**:
  - **Tungsten/Incandescent**
    - WSx05-010: 500W
    - WSx05-020: 1150W
    - WSx05-080: 1000W
  - **Fluorescent Ballast**
    - 3A
  - **General Duty**
    - 16A
  - **A300 Pilot Duty**
    - Wx05s0-010: 120VA
    - Wx05s0-020: 277VA
    - Wx05s0-080: 240VA

**5-WIRE RELAY RECEIVERS**

- **RANGE**: 50-150 feet
- **POWER SUPPLY INPUT**:
  - Wx12s0-010: 120VAC, 50/60Hz
  - Wx12s0-020: 277VAC, 50/60Hz
  - Wx12s0-080: 240VAC, 50/60Hz
  - Wx02-R10: 240VAC, 50/60Hz
- **MAX LOADS/CONTACT RATINGS**:
  - **Tungsten/Incandescent, N.O. Contacts/N.C. Contacts**
    - 1550W @ 120VAC / 500W @ 120VAC
    - 3000W @ 240VAC / 1000W @ 240VAC
    - 3400W @ 277VAC / 1100W @ 277VAC
  - **Fluorescent Ballast**
    - 8A (N.O. Contacts)
  - **General Duty**
    - 16A (N.O. Contacts), 8A (N.C. Contacts)
  - **A300 Pilot Duty**
    - 72VA @ 24VAC, 240VA @ 120VAC, 830VA @ 277VAC
  - **Motor Load**
    - 600VA, 10 FLA, 1/2HP @ 120VAC, 1HP @ 240VAC
  - **Other Devices**
    - 16A

**OUTPUT CHANNELS**

- **3-WIRE RELAY RECEIVERS**: 1 FORM A Relay
- **5-WIRE RELAY RECEIVERS**: 1 FORM C Relay COM, N.O., N.C.

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**SPECIFICATIONS**

**LEVNET RF LINE VOLTAGE RECEIVERS**

**RANGE**: 50-150 feet
**POWER SUPPLY INPUT**:
- WSx05s0-010: 120VAC, 50/60Hz
- WSx05s0-020: 277VAC, 50/60Hz
- WSx05s0-080: 240VAC, 50/60Hz

**MAX LOADS/CONTACT RATINGS**

- **Tungsten/Incandescent**
  - WSx05s0-010: 500W
  - WSx05s0-020: 1150W
  - WSx05s0-080: 1000W

- **Fluorescent Ballast**
  - 3A

- **General Duty**
  - 16A

- **A300 Pilot Duty**
  - Wx05s0-010: 120VA
  - Wx05s0-020: 277VA
  - Wx05s0-080: 240VA

**TRANSMITTER PAIRING**

1. Press and hold the LRN button (for approximately 3 seconds) until the load starts flashing once per second. The Receiver will be in ROCKER mode. (Press and hold the CLR button for approximately 3 seconds until the load starts flashing to CLEAR ALL, after which the Receiver will be in ROCKER mode.)
2. Press and hold the LRN button for approximately 3 seconds to advance to the next mode. The load will flash faster.
3. Press and release a Transmitter button to pair it with this Receiver. The load will hold ON to acknowledge the pairing.
4. Repeat Step 3 until all Transmitters have been paired.
5. The Receiver will auto exit in 20 seconds.

**MEMORY STORES UP TO 30 TRANSMITTER IDS**

**OPERATING TEMPERATURE**: 14°F to +122°F (-10°C to +50°C)
**STORAGE TEMPERATURE**: -4°F to +176°F (-20°C to +80°C)
**ENDURANCE**: 10,000,000 Minimum Mechanical Cycles
**DIMENSIONS**: 2.11” H x 1.73” W x 1.09” D (54mm x 44mm x 28mm)
**WEIGHT**: 0.09 (141.75g)
**LISTINGS**: ETL (U.S.), UL244A (Canada), CSAc22.2#156
**RADIO CERTIFICATION**: FCC Certified for Wireless Communication (U.S.), IC Certified (Canada)

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**3-WIRE RELAY RECEIVERS**

**MAX LOADS/CONTACT RATINGS**

- **Tungsten/Incandescent**
  - WSx05-010: 500W
  - WSx05-020: 1150W
  - WSx05-080: 1000W

- **Fluorescent Ballast**
  - 3A

- **General Duty**
  - 16A

- **A300 Pilot Duty**
  - Wx05s0-010: 120VA
  - Wx05s0-020: 277VA
  - Wx05s0-080: 240VA

- **Output Channels**: 1 FORM A Relay

---

**5-WIRE RELAY RECEIVERS**

**MAX LOADS/CONTACT RATINGS**

- **Tungsten/Incandescent, N.O. Contacts/N.C. Contacts**
  - 1550W @ 120VAC / 500W @ 120VAC
  - 3000W @ 240VAC / 1000W @ 240VAC
  - 3400W @ 277VAC / 1100W @ 277VAC

- **Fluorescent Ballast**
  - 8A (N.O. Contacts)

- **General Duty**
  - 16A (N.O. Contacts), 8A (N.C. Contacts)

- **A300 Pilot Duty**
  - 72VA @ 24VAC, 240VA @ 120VAC, 830VA @ 277VAC

- **Motor Load**
  - 600VA, 10 FLA, 1/2HP @ 120VAC, 1HP @ 240VAC

- **Other Devices**
  - 16A

- **Output Channels**: 1 FORM C Relay COM, N.O., N.C.

---

**ENDurance**: 10,000,000 Minimum Mechanical Cycles
**DIMENSIONS**: 2.11” H x 1.73” W x 1.09” D (54mm x 44mm x 28mm)
**WEIGHT**: 0.09 (141.75g)
**LISTINGS**: ETL (U.S.), UL244A (Canada), CSAc22.2#156
**RADIO CERTIFICATION**: FCC Certified for Wireless Communication (U.S.), IC Certified (Canada)

---

**TRANSFORMER RECEIVING**

- **RANGE**: 50-150 feet
- **FREQUENCY**: 315MHz
- **MEMORY STORES UP TO 30 TRANSMITTER IDS**
- **OPERATING TEMPERATURE**: 14°F to +122°F (-10°C to +50°C)
- **STORAGE TEMPERATURE**: -4°F to +176°F (-20°C to +80°C)
- **ENDURANCE**: 10,000,000 Minimum Mechanical Cycles
- **DIMENSIONS**: 2.11” H x 1.73” W x 1.09” D (54mm x 44mm x 28mm)
- **WEIGHT**: 0.09 (141.75g)
- **LISTINGS**: ETL (U.S.), UL244A (Canada), CSAc22.2#156
- **RADIO CERTIFICATION**: FCC Certified for Wireless Communication (U.S.), IC Certified (Canada)
LEVENET RF PLUG-IN RECEIVERS

FEATURES
- Easy-to-use: fast installation – plugs into any 120V outlet; run zero switch-leg wires; DIM (WSG0S-D1T only) or ON/OFF (WSG0S-S1T) control of lights
- Reliable range: compatible with all LevNet RF Switches; error checking ensures response only to appropriate Switches; a single Transmitter can control unlimited Dimmers (WSG0S-D1T only) or ON/OFF Relay Receivers (WSG0S-S1T) within range
- Ultra smooth wireless light dimming: for architectural lighting, daylighting, load shedding, and manual-ON/OFF and auto-OFF controls (WSG0S-D1T only)

DESCRIPTION

PLUG-IN DIMMER/RELAY RECEIVER (WSG0S-D1T)
The Plug-in Dimmer Receiver provides dimming control of lamps and other devices. Simply plug a lamp into the Dimmer Receiver, and then plug the Dimming Receiver into a standard electrical outlet. The lamp may then be controlled using Wireless Self-Powered Switches or Sensors.

PLUG-IN ON/OFF RELAY RECEIVER (WSG0S-S1T)
The LevNet RF Plug-In ON/OFF Relay Receiver responds to compatible LevNet RF Switches and Transmitters to provide ON/OFF control of lights, TVs, and other plug-in devices. The Plug-In ON/OFF Receiver may optionally be used to control electrical loads using signals from Sensors.

APPLICATIONS
- New Construction
- Conference rooms
- Classrooms
- Executive Offices
- Restrooms
- Daycare Facilities

ORDERING INFORMATION

CAT NO. DESCRIPTION
WSG0S-D1T Plug-In Dimmer Receiver, 120VAC, 500W
WSG0S-S1T Plug-In ON/OFF Relay Receiver, 120VAC, 150W

SPECIFICATIONS

LEVENET RF PLUG-IN RECEIVERS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>50-150 feet</td>
</tr>
<tr>
<td>Power Supply Input</td>
<td>120VAC, 60Hz</td>
</tr>
<tr>
<td>Dimmer Output (WSG0S-D1T)</td>
<td>120VAC, 300W max (resistive) incandescent or other dimmable loads only – no motor loads</td>
</tr>
<tr>
<td>Output Channels</td>
<td>1 dimming or ON/OFF output</td>
</tr>
<tr>
<td>Output Rating (WSG0S-S1T)</td>
<td>6A 3A 1500W No-Motor Loads</td>
</tr>
<tr>
<td>General</td>
<td>Ballast Tungsten Motor</td>
</tr>
</tbody>
</table>

PROGRAMMING BUTTONS
The Plug-In Receivers have two programming buttons: LEARN and CLEAR. The LEARN button is used when pairing a Receiver with one or more Transmitters. CLEAR mode is used to clear a Receiver of all previously stored pairings and can also manually switch the relay.

OPERATING MODES
The Plug-In Receivers have four operating modes: ROCKER, MOMENTARY, TOGGLE, and SCENE.

TRANSINUER-RECEIVER PAIRING
Pairing is the process by which the address of a Transmitter is stored in a Receiver, thereby linking the two. This allows the ON/OFF “commands” of the Transmitter to be understood and executed by the Receiver.

The pairing process involves putting the Receiver in PAIRING mode, selecting the OPERATING mode, and then activating the Transmitter. Each type of Receiver has its own type of method for entering PAIRING and LEARN modes.

The Plug-In Receivers enter PAIRING mode by holding down the LRN button (for approximately 3 seconds) until the load starts flashing. The Plug-In Receivers advance through the operating modes by pressing and holding the LRN button (for approximately 3 seconds) until the load starts flashing faster. The LOAD will blink once per second for ROCKER mode, twice per second for MOMENTARY mode, three times per second for TOGGLE mode, and four times per second for SCENE mode.

Always pair the devices before the installation. Receivers automatically reduce their listening range to under 15 feet when in PAIRING mode.

When pairing an Occupancy Sensor with a Receiver that is placed in ROCKER mode, the Sensor will be in Manual ON/ Auto OFF mode with a 15-minute Time Delay. When pairing an Occupancy Sensor with a Receiver that is placed in MOMENTARY mode, the Sensor will be in Auto ON/Auto OFF mode with a 15-minute Time Delay. When pairing an Occupancy Sensor with a Receiver that is placed in TOGGLE mode, the Sensor will be in Manual ON/Auto OFF mode with a 15-minute Time Delay and a 3-minute Walk-Through. The exception to this rule is the WSG10 Receiver. This receiver has added flexibility for sensor features through the dip switch configurations.

TRANSMITTER PAIRING
1. Press and hold the LRN button (for approximately 3 seconds) until the load starts flashing once per second. The Receiver will be in ROCKER mode. (Press and hold the CLR button for approximately 3 seconds until the load starts flashing to CLEAR ALL, after which the Receiver will be in ROCKER mode.)
2. Press and hold the LRN button for approximately 3 seconds to advance to the next mode. The load will flash faster.
3. Press and release a Transmitter button to pair it with this Receiver. The load will hold ON to acknowledge the pairing.
4. Repeat Step 3 until all Transmitters have been paired.
5. The Receiver will auto exit in 20 seconds.
### Specifications

**THERMOSTAT (WSOTH-S)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>50-150 Feet</td>
</tr>
<tr>
<td>Frequency</td>
<td>315KHz</td>
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<tr>
<td>Input Voltage</td>
<td>24VAC</td>
</tr>
<tr>
<td>Load Rating</td>
<td>1.5A/circuit</td>
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<tr>
<td>Temperature Monitor Range</td>
<td>32.0°F to 99.9°F (0.0°C to 37.7°C)</td>
</tr>
<tr>
<td>Temperature Set Point Range</td>
<td>60°F to 85°F (15.5°C to 29.5°C)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>14°F to 131°F (-10°C to 55°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-4°F to 131°F (-20°C to 55°C)</td>
</tr>
<tr>
<td>Sampling Rule</td>
<td>Every 5 seconds</td>
</tr>
<tr>
<td>Display Format</td>
<td>Liquid crystal display (60)</td>
</tr>
<tr>
<td>Fan Control</td>
<td>Selectable: Auto/Cycle, Low, Medium, High, Economy, Off</td>
</tr>
<tr>
<td>Memory</td>
<td>Stores up to 30 switch ids</td>
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<tr>
<td>Accuracy</td>
<td>+/-1°F (0.5°C)</td>
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<tr>
<td>Heat/Cool Control</td>
<td>1 Heat and 1 cool circuit, heat pump reversing valve circuit</td>
</tr>
<tr>
<td>Temperature Setting</td>
<td>Pushbutton</td>
</tr>
<tr>
<td>Fan Selection</td>
<td>Pushbutton</td>
</tr>
<tr>
<td>Dimensions</td>
<td>3.5” x 5” x 1.57” (88.9mm x 127mm x 39.9mm)</td>
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</tbody>
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### Ordering Information

**CAT NO.**

<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSOOTH-S</td>
<td>Thermostat</td>
</tr>
</tbody>
</table>

### Applications

- Retrofits
- Conference rooms
- Private Offices
- Executive Offices
- Restrooms
- New Construction
- Classrooms
- Daycare Facilities

### Description

The LevNet RF Thermostat allows quick and easy implementation of energy-saving HVAC controls without running any new wire. The Thermostat receives RF signals from LevNet RF Transmitters such as Occupancy Sensors, Key Card Holders, Door/Window Switches, Room Temperature Sensors, and more. When the Thermostat receives an “occupied” signal, it adjusts temperature setpoints to a narrow preset occupied range (i.e. 70°F to 72°F). When the Thermostat receives an “unoccupied” signal, it adjusts temperature setpoints to a wider ‘Economy’ range (i.e. 62°F to 86°F). This conserves energy in unoccupied rooms of a building.

### Programming the Thermostat

Programming the Thermostat requires the following general steps:

1. Connect the Thermostat to a 24VAC power source for initial setup, but do not connect other wires until programming is complete. Also, prevent all other wires from touching during this process to avoid damaging the Thermostat. Programming mode has a 10-minute time limit. After 10 minutes the Thermostat will resume normal operation.

2. Place the Thermostat into programming mode by pressing and holding the UP and DOWN arrows while sliding the °F/°C switch to the opposite side. 00 will appear on the display. Do not use the °F/°C switch again until programming is complete.

3. Press either the UP or DOWN arrow button to find Access Code 43 (Configuration Mode) and then press the Fan button.

4. Press either the UP or DOWN button to scroll through the menu to reach the desired parameter and then press the Fan button. (See the Installation data sheet for more information regarding the menu.)

5. Press either the UP or DOWN arrow button to reach the desired change.

6. Press the Fan button to return to the program menu.

7. Press the UP or DOWN arrow button until End/Prog appears on the display.

8. Press the Fan button to save changes and exit the program mode. You will need to re-enter programming mode to access a different code.

9. Place the Thermostat into programming mode by pressing and holding the UP and DOWN arrows while sliding the °F/°C switch to the opposite side. 00 will appear on the display. Do not use the °F/°C switch again until programming is complete.

10. Press either the UP or DOWN arrow button to find Access Code 79 (Field Programming Mode) and then press the Fan button.

11. Press either the UP or DOWN button to scroll through the menu to reach the desired parameter and then press the Fan button. (See the Installation data sheet for more information regarding the menu.)

12. Press either the UP or DOWN arrow button to reach the desired change.

13. Press the Fan button to return to the program menu.

14. Press the UP or DOWN arrow button until End/Prog appears on the display.

15. Press the Fan button to save changes and exit the program mode. You will need to re-enter programming mode to access a different code.

16. Place the Thermostat into programming mode by pressing and holding the UP and DOWN arrows while sliding the °F/°C switch to the opposite side. 00 will appear on the display. Do not use the °F/°C switch again until programming is complete.

17. Install the Thermostat using the instructions provided by the Installation data sheet.
PROGRAMMING THE RADIO RECEIVER

The Thermostat can be configured to operate with many Leviton Transmitters. Depending on the Transmitter type and the intended application, the Thermostat will need to be programmed to operate in ROCKER mode (Learning Mode 0), MOMENTARY mode (Learning Mode 1), TOGGLE mode (Learning Mode 2), or SCENE mode (Learning Mode 3). Multiple modes can be used with one Thermostat. For Transmitter installation instructions, see appropriate installation guide. Select the desired Learn Mode below to program the Thermostat.

CLEAR MODE
To clear the switch memory within the Thermostat, press and hold the UP and DOWN buttons until CLR appears on the display (approximately 10 seconds).

ROCKER MODE: LEARN MODE 0
ROCKER Mode is usually used with Leviton Wireless Light Switches. The Thermostat is put into Occupied mode when the top of the rocker switch is pressed and Unoccupied mode when the bottom of the rocker switch is pressed.

1. Place the Thermostat into Learn Mode by pressing and holding the UP and DOWN buttons until LRN appears on the display (approx. 5 seconds). The display will alternate between LRN and 0 indicating that it is in Learn Mode 0 (ROCKER mode).
2. Press one of the rockers on the Leviton Wireless Light Switch. The display on the Thermostat will briefly display ADD indicating that it has added that Transmitter.
3. The display will resume alternating between LRN and 0. Add more Transmitters as desired for this mode (up to 30). The small digit on the display will indicate the number of Receivers in memory for each mode.
4. To delete a Transmitter from the Thermostat, press the wireless light switch again. The display on the Thermostat will briefly display DEL indicating that it has deleted that Transmitter.
5. Exit Learn Mode by pressing and holding the UP and DOWN buttons until LOC appears on the display or wait 30 seconds to normal operating mode. This indicates that all learned Transmitters have been locked into memory on the Thermostat.

MOMENTARY MODE: LEARN MODE 1
MOMENTARY Mode is used with Leviton Wireless Key Card Switches. The Thermostat will be in Occupied mode when the key card is inserted and Unoccupied when the key card is removed.

1. Place the Thermostat into Learn Mode by pressing and holding the UP and DOWN buttons until LRN appears on the display. The display will alternate between LRN and 0 indicating that it is in Learn Mode 0.
2. Press and release the UP button. The display will alternate between LRN and 1, indicating that it is in Learn Mode 1 (MOMENTARY Mode).
3. Insert a key card into an Leviton Key Card Access Switch. The display on the Thermostat will briefly display ADD indicating that it has added that Transmitter.
4. The display will resume alternating between LRN and 1. Add more Transmitters as desired for this mode.
5. To delete a Transmitter from the Thermostat, remove the key card (if inserted) of a learned switch and insert it again. The display on the Thermostat will briefly display DEL indicating that it has deleted that Transmitter from memory.
6. Exit Learn Mode by pressing and holding the UP and DOWN buttons until LOC appears on the display or wait 30 seconds to normal operating mode. This indicates that all learned Transmitters have been locked into memory on the Thermostat.

TOGGLE MODE: LEARN MODE 2
TOGGLE Mode will be available for future product releases.

1. Place the Thermostat into Learn Mode by pressing and holding the UP and DOWN buttons until LRN appears on the display. The display will alternate between LRN and 0 indicating that it is in Learn Mode 0.
2. Press and release the UP button. The display will alternate between LRN and 1, indicating that it is in Learn Mode 1 (MOMENTARY Mode).
3. Press and release the UP button. The display will alternate between LRN and 2, indicating that it is in Learn Mode 2 (TOGGLE Mode).
4. Press the transmit button on the desired Transmitter. The display on the Thermostat will briefly display ADD indicating that it has added that Transmitter.
5. The display will resume alternating between LRN and 2. Add more Transmitters as desired for this mode.
6. To delete a Transmitter from the Thermostat, press the learned transmit button again. The display on the Thermostat will briefly display DEL indicating that it has deleted that Transmitter.
7. Exit Learn Mode by pressing and holding the UP and DOWN buttons until LOC appears on the display or wait 30 seconds to normal operating mode. This indicates that all learned Transmitters have been locked into memory on the Thermostat.

SCENE MODE: LEARN MODE 3
For Future Product Releases

TRANSCEIVERS
WS5D02-010 RF CONSTANT VOLTAGE LED DIMMER
WS5D02-020 CONSTANT VOLTAGE LED DIMMER
WS001-001 0-10V RF DIMMER WITH ON/OFF CONTROL
WS0RC-200 2-CHANNEL ROOM CONTROLLER
WS0RC-300 3-CHANNEL ROOM CONTROLLER
WS0RC-400 4-CHANNEL ROOM CONTROLLER
WS0RC-500 2-CHANNEL SHADE CONTROLLER
WSPAS-1V4 4-CHANNEL RELAY RECEIVER
WSPAS-1V8 8-CHANNEL RELAY RECEIVER
SPECIFICATIONS

**RF CONSTANT VOLTAGE LED DIMMER** (WSD02-010)

- **Range**: 50-150 feet
- **Frequency**: 315MHz
- **Memory**: Stores up to 30 Transmitter IDs
- **Power Supply Input Rating**: 8-28VDC, 40mA (not incl. load current)
- **Sensor Input Rating**: 0-28VDC, <1V is Low, >3V is High
- **Output Rating, Constant voltage**: 0-28VDC, 5A max
- **Output Rating, Switched Output**: 5A DC, Isolated, 30VDC Max
- **Input Channels**: 1 Motion Detector / Sensor Input, 1 Wired Control Switch
- **Output Channels**: 1 Output PWM Dimming, 1 Output 0-10V, 1 Switch Output
- **Operating Temperature**: -13°F to 140°F (-25°C to +60°C)
- **Storage Temperature**: -40°F to 140°F (-40°C to +60°C)
- **Dimensions**: 2.88” W x 1.30” H x 0.67” D (73mm x 33mm x 17mm)
- **Radio Certification**: FCC Certified for Wireless Communication (U.S.), IC Certified (Canada)

**0-10V RF DIMMER** (WSD01-001)

- **Power Supply Input Rating**: 8-28VDC, 40mA (not incl. load current)
- **Sensor Input Rating**: 0-28VDC, <1V is Low, >3V is High
- **Output Rating, Constant voltage**: 0-28VDC, 4mA, 0-10V Output
- **Output Rating, Switched Output**: 5A DC, Isolated, 30VDC Max
- **Input Channels**: 1 Motion Detector / Sensor Input
- **Output Channels**: 1 Output PWM Dimming
- **Operating Temperature**: -13°F to 140°F (-25°C to +60°C)
- **Storage Temperature**: -40°F to 140°F (-40°C to +60°C)
- **Dimensions**: 2.88” W x 1.30” H x 0.67” D (73mm x 33mm x 17mm)
- **Radio Certification**: FCC Certified for Wireless Communication (U.S.), IC Certified (Canada)

FEATURES

- **Power consumption**: save 70% over other wireless technologies
- **Long operation**: with a 50-150’ range, LevNet RF provides the longest reliable range in the industry
- **Easy-to-use**: programs in seconds, run zero switch-leg or traveler wires
- **Reliable operation**: error checking ensures Receiver only responds to appropriate Transmitters on all packet transfers
- **Save energy**: connect the LED Dimmer or dimming Receiver to a LevNet RF Sensor or program all lights to respond to a single master Switch

DESCRIPTION

LevNet RF Dimmer Modules receive signals from LevNet RF Sensors, Switches and Transmitters to control lighting. Self-powered wireless technology eliminates control switch wiring making them the ideal solution for retrofits and new construction. Installation is quick and easy with no additional wiring required. It takes only minutes to install and configure.

**CONSTANT VOLTAGE LED DIMMER** (WSD02-010 | WSD02-020)

Available with or without RF capabilities, the LevNet RF Constant Voltage LED Dimmers deliver 65,000 pulse width modulation (PWM) dimming steps to provide seamless and continuous dimming through all light levels. The RF LED Dimmer (WSD02-010) responds to wireless switches and other Transmitters. Both models can dim and turn OFF lights based on signals from wired Sensors detecting occupancy or available natural light. A single Transmitter can control an unlimited number of RF Dimmers in range. The RF LED Dimmer also functions as a repeater.

**0-10V RF DIMMER WITH ON/OFF CONTROL AND SENSOR INPUT** (WSD01-001)

The LevNet RF 0-10V RF Dimmer responds to wireless switches and Transmitters to control dimmable LED power supplies, dimmable fluorescent ballasts or actuators. The Dimmer can also turn OFF or dim lights based on signals from wireless or wired Sensors detecting occupancy or available natural light. A single Transmitter can control an unlimited number of 0-10V Dimmers in range. The 0-10V Dimmer also functions as a repeater.

APPLICATIONS

- Refretts
- Conference rooms
- Private Offices
- Restrooms
- New Construction
- Classrooms
- Executive Offices
- Daycare Facilities

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>CAT NO.*</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>WSD02-010</td>
<td>RF Constant Voltage LED Dimmer with Wireless Capability</td>
</tr>
<tr>
<td>WSD02-020</td>
<td>Constant Voltage LED Dimmer (without wireless capability)</td>
</tr>
<tr>
<td>WSD01-001</td>
<td>0-10V RF Dimmer with ON/OFF Control and Sensor Input</td>
</tr>
</tbody>
</table>

**TRANSmitter-RECEIVER PAIRING**

When pairing an Occupancy Sensor with a Receiver that is placed in ROCKER mode, the Sensor will be in Manual ON/ Auto OFF mode with a 15-minute Time Delay. When pairing an Occupancy Sensor with a Receiver that is placed in MOMENTARY mode, the Sensor will be in Auto ON/Auto OFF mode with a 15-minute Time Delay. When pairing an Occupancy Sensor with a Receiver that is placed in TOGGLE mode, the Sensor will be in Auto ON/Auto OFF mode with a 15-minute Time Delay and a 3-minute Walk-Through. The exception to this rule is the WSS51 Receiver. This receiver has added flexibility for sensor features through the dip switch configurations.
DESCRIPTION

2, 3 AND 4-CHANNEL ROOM CONTROLLER (WS0RC-200 | WS0RC-300 | WS0RC-400)

The LevNet RF Low-Voltage Room Controller was engineered to provide manual-ON/OFF and auto-OFF controls for lighting systems. The Room Controller is designed to save energy by automatically turning OFF lights when no one is in a room. The 2, 3, and 4-Channel Room Controllers provide integrators an easy way to add LevNet RF controls to new or existing systems such as lighting control, security, and more. The room controllers are unique with exclusive features to optimize complete room synchronization during operation. These devices use a Transceiver which allows for a repetitive transmission upon each activation assuring all loads activate according to the signal sent. Rooms controllers can also be connected to any low voltage device and become a Transmitter, thus turning any low-voltage control into a radio frequency product.

2-CHANNEL SHADE CONTROLLER (WS0RC-500)

The LevNet RF Shade Controller enables manual and automatic control of window shades and blinds using LevNet RF Switches and Sensors. One Shade Controller can control two different shade motors. The Shade Controller allows integrators to easily add LevNet RF controls to motorized window shades, blinds, and coverings.

4- AND 8-CHANNEL RELAY RECEIVER (WSPAS-LV4 | WSPAS-LV8)

The Low-Voltage Relay Receiver controls up to four (or eight) devices or groups of devices and connects LevNet RF Switches and Sensors to new or existing control systems. The Low-Voltage Relay Receiver responds to up to 80 different Transmitters and provides four or eight output channels (dry contact or 8-30V for relay and contactor applications).

APPLICATIONS

- Retrofits
- Conference rooms
- Private Offices
- Restrooms
- New Construction
- Classrooms
- Executive Offices
- Daycare Facilities

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>CAT NO.</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>WS0RC-200</td>
<td>2-Channel Room Controller, 2 Inputs, 2 Outputs, 8-30VDC</td>
</tr>
<tr>
<td>WS0RC-300</td>
<td>3-Channel Room Controller, 1 Input, 3 Outputs, 8-30VDC</td>
</tr>
<tr>
<td>WS0RC-400</td>
<td>4-Channel Room Controller, 0 Input, 4 Outputs, 8-30VDC</td>
</tr>
<tr>
<td>WS0RC-500</td>
<td>2-Channel Shade Controller, 8-30VDC</td>
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<tr>
<td>WSPAS-LV4</td>
<td>4-Channel Relay Receiver, 8-30VAC or 8-30VDC</td>
</tr>
<tr>
<td>WSPAS-LV8</td>
<td>8-Channel Relay Receiver, 8-30VAC or 8-30VDC</td>
</tr>
</tbody>
</table>

LEVNET RF LOW-VOLTAGE TRANSCEIVERS

ROOM CONTROLLER REPEATER FUNCTION

Leviton has a repeater feature designed into selected devices that extend the range of operation in certain environments. A repeater re-transmits a copy of every signal received, and many repeaters also function as receivers. It is recommended that no more than two repeaters are active within range of any Leviton Transmitter or Receiver. For best performance, repeater should be installed high above the floor in a central location, minimizing the number of walls of other obstructions between the repeater and the receiver to receive the strongest possible repeated signal.

To deactivate Repeater mode, cycle power to the repeater while holding down the LRN button and continue to hold the LRN button for five seconds after power returns. The output will blink once to indicate that Repeater mode is now inactive. To activate Repeater mode repeat the same procedure. The output will blink twice to indicate that Repeater mode is now active. These settings are saved in non-volatile memory and will be maintained even if power is cycled.

PROGRAMMING

ROCKER MODE PROGRAMMING INSTRUCTIONS

1. Read all ROCKER Mode programming steps before taking any action to program receiver in ROCKER Mode.
2. Enter ROCKER Mode for Output 1 by pressing and holding the LRN button for 0.5 seconds. The electrical load connected to the Receiver will begin turning ON and OFF in a slow pattern. Release the LRN button.
3. When associating a wireless light switch to the Receiver, press one end of a switch rocker. When associating a Transmitter other than a wireless light switch, press the LEARN button on the Leviton Transmitter (see appropriate Transmitter starter guide). The load will stay ON for about 3 seconds indicating that the Receiver has stored the Transmitter’s unique ID in its memory.
4. To program a second Transmitter to communicate with this Receiver, wait until toggling of the load resumes. Repeat the instructions in Step 3 and Step 4 until the unique IDs of all desired Transmitters are stored in the memory of the receiver (up to 30).
5. Enter LEARN mode for Output 2 by briefly pressing and releasing the LRN button. The Power LED will blink twice indicating that Output 2 is in LEARN mode. Output 2 will be in the same programming mode that Output 1 was just in. Additionally, the electrical load connected to output 2 will begin toggling ON and OFF in a slow pattern. Follow Steps 3 and 4 to program transmitters to Output 2.
6. Repeat Step 5 by following by Steps 3 and 4 to program transmitters to Output 3.
7. (Optional) Press the TEACH button on a wireless motion detector to associate it with the channel currently being learned. To learn or delete a wired motion detector input to/from an output channel, allow the motion detector to see movement while learning the corresponding output, or toggle the wired motion detector input with a wire. If the wired motion detector input changes while in Programming Mode, the input will be added to or deleted from the output being learned.
8. To exit LEARN mode, just wait; the Receiver automatically exits LEARN mode after 30 seconds (indicated by the cessation of the toggling of the electrical load). Alternatively, the LRN button may be pressed for about 2 seconds to exit LEARN mode.
LEVENET RF LOW-VOLTAGE TRANSCIEVERS

MOMENTARY MODE PROGRAMMING INSTRUCTIONS
1. Read all ROCKER mode programming steps before taking any action to program an output of the receiver in MOMENTARY mode.
2. While the output is in ROCKER mode, press and hold the LRN button for about 3 seconds. This activates MOMENTARY mode for the currently selected output. The electrical load connected to the output will begin toggling ON and OFF in a fast pattern.
3. Follow Steps 3-8 of "ROCKER MODE PROGRAMMING INSTRUCTIONS."

TOGGLE MODE PROGRAMMING INSTRUCTIONS
1. Read all ROCKER and MOMENTARY mode programming steps before taking any action to program an output of the Receiver in TOGGLE mode.
2. While the output is in MOMENTARY mode, press and hold the LRN button for about 3 seconds. This activates TOGGLE mode for the output. The electrical load connected to the output will pause briefly, then continue turning ON and OFF in a fast pattern.
3. Follow Steps 3-8 of "ROCKER MODE PROGRAMMING INSTRUCTIONS."

SCENE MODE PROGRAMMING INSTRUCTIONS
1. Read all ROCKER, MOMENTARY, and TOGGLE mode programming steps before taking any action to program an output of the receiver in SCENE mode.
2. Before programming a scene, have the desired scene planned out and know the state in which each load will need to be.
3. For all loads in the scene that will be ON, program the corresponding Receiver or Receiver output with a wireless light switch in ROCKER mode. (Refer to "ROCKER MODE PROGRAMMING INSTRUCTIONS").
4. Turn ON all of the desired loads that will be ON in the scene.
5. For each load in the scene, while the Receiver or Receiver output connected to the load is in TOGGLE mode, press and hold the LRN button for about 3 seconds. This activates SCENE mode. The electrical load connected to the Receiver or Receiver output will pause briefly, then continue turning ON and OFF in a fast pattern.
6. For each load in the scene, while the connected Receiver or Receiver output is in SCENE mode, press the end of a switch-roller that will act as the scene button. The load will stay ON for about 3 seconds indicating that the Receiver has stored the Transmitter’s unique ID in its memory.
7. For each load in the scene that will be ON, and was programmed in ROCKER Mode (See Step 3 of "SCENE MODE PROGRAMMING INSTRUCTIONS"), selectively delete the switch from ROCKER Mode. While the Receiver or Receiver output connected to the load is still in SCENE mode, enter into ROCKER mode by pressing and holding the LRN button for about 3 seconds. The load will pause toggling ON and OFF quickly, then resume toggling slowly. Press the associated switch. The load will stay OFF for about 3 seconds, indicating that the receiver has deleted the switch’s ID from memory.
8. To exit Learn Mode, just wait, the receiver automatically exits Learn Mode after 30 seconds (indicated by the ceasing of the toggling of the electrical load). Alternatively, the LRN button may be pressed for about 2 seconds to exit Learn Mode.

SELECTIVE DELETING: Follow the LEARN mode steps above to delete a Transmitter from a Receiver’s memory. Upon pressing the button on the desired Transmitter (See ROCKER MODE PROGRAMMING INSTRUCTIONS, Step 3) the load will stay OFF for about 3 seconds indicating that the Receiver has removed the Transmitter’s unique ID from its memory. To delete a wired motion detector from the memory, toggle the input while in LEARN mode.

CLEAR ALL: If the CLR button is pressed and held for about 2 seconds, the entire memory of the receiver will be deleted. The receiver will instantly enter the default programming mode (ROCKER mode) indicated by the electrical load turning ON and OFF. This will delete any motion detectors from memory, and all outputs are restored to Manual-ON/ Manual-OFF mode.

CLEAR ONE OUTPUT CHANNEL: First enter LEARN mode by repeatedly pressing the LRN button until the desired relay’s light is blinking. Hold down the clear button for about 2 seconds. This will clear the entire memory for that output, leaving the other outputs intact. This will delete any motion detectors (wired or wireless) from this channel, returning it to Manual-ON/Manual-OFF mode.

ADVANCED PROGRAMMING OPTIONS
INVERTED OUTPUT MODE: The Receiver supports the Inverted Output Mode of operation. In the default configuration, the N.O. relay contact is open (not connected) when not active, and closed (connected) when active. When the outputs are in Inverted Output Mode, the N.C. contact is closed when not active and open when active. Inverting the outputs may be used to emulate a normally closed relay that opens when a switch is activated. One common use for this mode is for magnetic door release controls. The output is ON and the door-hold electromagnet is active until a Momentary switch is activated, deactivating the electromagnet and allowing the door to close. The magnet is reactivated as soon as the switch is released.

INVERTED OUTPUT MODE PROGRAMMING INSTRUCTIONS
1. Turn the power to the receiver OFF.
2. Press and hold the CLR button for 5 seconds while turning on the power. The load will blink twice to indicate activation of Inverted Output Mode. To change back to normal operating mode, repeat Steps 1 and 2. The load will blink once to indicate normal (non-inverted) mode. The state of this mode is stored in nonvolatile memory and is maintained even if the power is removed.

TRANSMITTER-RECEIVER PAIRING
When pairing an Occupancy Sensor with a Receiver that is placed in ROCKER mode, the Sensor will be in Manual ON/ Auto OFF mode with a 15-minute Time Delay. When pairing an Occupancy Sensor with a Receiver that is placed in MOMENTARY mode, the Sensor will be in Auto ON/Auto OFF mode with a 15-minute Time Delay. When pairing an Occupancy Sensor with a Receiver that is placed in TOGGLE mode, the Sensor will be in Auto ON/Auto OFF mode with a 15-minute Time Delay and a 3-minute Walk-Through. The exception to this rule is the WSS10 Receiver. This receiver has added flexibility for sensor features through the dip switch configurations.
### LEVNET RF LOW-VOLTAGE TRANSCIEVERS

#### SPECIFICATIONS

**LEVNET RF LOW-VOLTAGE RECEIVERS**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>50-150 feet</td>
</tr>
<tr>
<td>Frequency</td>
<td>315MHz</td>
</tr>
<tr>
<td>Radio Certifications</td>
<td>FCC Certified for Wireless Communication (U.S.), I.C. Certified (Canada)</td>
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</tbody>
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**2, 3 AND 4-CHANNEL ROOM CONTROLLER (WS0RC-200 | WS0RC-300 | WS0RC-400)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Channels</td>
<td>WS0RC-200: 2-in/2-out • WS0RC-300: 1-in/3-out • WS0RC-400: 0-in/4-out</td>
</tr>
<tr>
<td>Power Supply Input</td>
<td>8-30VDC, 40mA</td>
</tr>
<tr>
<td>Output Rating</td>
<td>0-30VDC, 130mA max</td>
</tr>
<tr>
<td>Relay Driver</td>
<td>30VDC max, 100mA max</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-13°F to +140°F (-25°C to +60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F to +140°F (-40°C to +60°C)</td>
</tr>
<tr>
<td>Vacancy Timeout</td>
<td>15 minutes (when motion detectors are learned)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>2.88” W x 1.30” H x 0.67” D (73.15mm x 33.02mm x 17.02mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.7oz (20g)</td>
</tr>
<tr>
<td>Antenna</td>
<td>Attached Whip Antenna (5.85”)</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

- WSQRF-300
- RS-232 SERIAL BOX DATA INTERFACE
- WSME-010  SIGNAL STRENGTH METER

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**2-CHANNEL SHADE CONTROLLER (WS0RC-500)**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Number Output Channels</td>
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<tr>
<td>Power Supply Input</td>
<td>8-30VDC, 40mA</td>
</tr>
<tr>
<td>Output Rating</td>
<td>0-30VDC, 130mA max</td>
</tr>
<tr>
<td>Relay Driver</td>
<td>30VDC max, 100mA max</td>
</tr>
<tr>
<td>Dimensions</td>
<td>2.88” W x 1.30” H x 0.67” D (73.15mm x 33.02mm x 17.02mm)</td>
</tr>
<tr>
<td>Antenna</td>
<td>Attached Whip Antenna (5.85”)</td>
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**4- AND 8-CHANNEL RELAY TRANSCIEVER (WSPAS - LV4 | WSPAS - LV8)**

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<th>Feature</th>
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<tr>
<td>Power Supply Input</td>
<td>8-58VAC or 8-30VDC, 250mA max</td>
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<tr>
<td>Output Channels</td>
<td>WSPAS-LV4: 4, Form C – N.O. and N.C. Dry Contacts • WSPAS-LV8: 8, Form A – N.O. Dry Contacts</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-13°F to +140°F (-25°C to +60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F to +140°F (-40°C to +60°C)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>5.12” W x 3.23” H x 1.10” D (130.55mm x 81.53mm x 27.94mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>4oz. (113.40g)</td>
</tr>
</tbody>
</table>
RS-232 SERIAL BOX DATA INTERFACE (WSORF-300)

- Easy-to-use: transmits and receives wirelessly
- Simple wireless controls systems: computer system integration, architectural lighting, daylighting, load shedding.

DESCRIPTION

The RF Serial Box is a high performance data interface radio Receiver that can be connected to any system that uses an RS-232 serial port. The device receives radio packets from LevNet RF Switches and Sensors.

APPLICATIONS

- Retrofits
- Conference rooms
- Private Offices
- Restrooms

ORDERING INFORMATION

<table>
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<tr>
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<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>WSORF-300</td>
<td>RS-232 Serial Box Data Interface</td>
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SPECIFICATIONS

<table>
<thead>
<tr>
<th>LEVNET RF ACCESSORIES</th>
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</thead>
<tbody>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Radio Certification</td>
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</table>

RS-232 SERIAL BOX DATA INTERFACE (WSORF-300)

- Power Supply Input: 8-28VAC or 8-30VDC
- Current: 25mA @ 12VDC, 15mA @ 24VDC
- Operating Temp: -13°F to +140°F (-25°C to +60°C)
- Storage Temp: -40°F to +140°F (-40°C to +60°C)
- Dimensions: 5.12” W x 3.21” H x 1.10” D (130.05mm x 81.53mm x 27.94mm)
- Serial Port Settings: 9600 baud, 8 bits, no parity, 1 stop bit

SIGNAL STRENGTH METER (WSMET-010)

- Simple range planning: detects valid radio packets and display received signal strength; measures strength of interference; verifies network plan by testing wireless coverage through a building prior to installation of equipment

DESCRIPTION

The Signal Strength Meter is a mobile tool for measuring and indicating the received field strength (RSSI) of EnOcean telegrams and disturbing radio activity at 315 MHz. It supports electrical installers during the planning and troubleshooting phase and enables them to verify whether the installation of LevNet RF Transmitters and Receivers is possible at the positions planned. This device is a must have for anyone regularly installing LevNet RF wireless controls.

APPLICATIONS

- Retrofits
- Conference rooms
- Private Offices
- Restrooms

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<td>WSMET-010</td>
<td>Signal Strength Meter</td>
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SPECIFICATIONS

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</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Radio Certification</td>
</tr>
</tbody>
</table>

SIGNAL STRENGTH METER (WSMET-010)

- Power Supply: 9VDC battery
- Receiver Sensitivity: -95dBm
- Channel Bandwidth: 28bit/b
- RF Data Rate: 1200bps
Transmitters

Self-powered wireless technology means no new wiring is required. Leviton LevNet RF Self-Powered Wireless Solutions are easy to install and maintenance-free, reducing ongoing manual work and material costs while reducing energy. EnOcean® technology allows energy harvesting LevNet RF Transmitters to operate indefinitely without the use of batteries. The kinetic motion of a switch actuation, light on a solar cell or temperature differentials in the environment provide power to LevNet RF Transmitters, allowing zero maintenance wireless devices.

APPLICATIONS/WIRING DIAGRAMS

TRANSMITTERS
RECEIVERS
TRANSEIVERS
ACCESSORIES
WSSLT-010 - LEVNET RF SYSTEM FOR CONTROLLING A THERMOSTAT BASED ON THE STATE OF THE LIGHTS IN A ROOM

WSOS-H0W - DISABLE HVAC UNIT WHEN KEY CARD IS REMOVED FROM KEY CARD SWITCH

WSOS-H0W - KEY CARD HOLDER

TRANSMITTERS
RECEIVERS
TRANSCIVERS
ACCESSORIES
Self-powered wireless technology means no new wiring is required. Leviton LevNet RF Self-Powered Wireless Solutions are easy to install and maintenance-free, reducing ongoing manual work and material costs while reducing energy. EnOcean® technology allows energy harvesting LevNet RF Transmitters to operate indefinitely without the use of batteries. The kinetic motion of a switch actuation, light on a solar cell or temperature differentials in the environment provide power to LevNet RF Transmitters, allowing zero maintenance wireless devices.
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<tr>
<td>P12345678</td>
<td>Wireless Receiver, 12VDC</td>
<td>P98765432</td>
<td>Wireless Receiver, 9VDC</td>
<td>P0123456</td>
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<td>P23456789</td>
<td>Wireless Receiver, 24VDC</td>
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<td>A12345678</td>
<td>Wireless Switch</td>
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