

APPLICATION & OVERVIEW

The Ness LUX-TWR Wireless PIR Motion Sensor is designed for use with control/transceivers that accept Ness two-way technology. Lux is intended for use in residential and light commercial installations and incorporates many advanced features designed to ensure its reliable performance.

The dual element pyro-electric sensor detects movement within a specific coverage area by sensing the infrared energy that is emitted from an intruder moving across the sensor's field of view. A change in the infrared energy across multiple detection zones is then processed to determine if the occurrence qualifies as a legitimate motion detection event. If it does then an alarm signal is transmitted to the controller.

The two-way radio (RF) in the LUX-TWR transmits alarm, tamper, supervisory, and low battery messages to the control/receiver. Each sensor has a unique TXID number which is enrolled into the control during installation. With its two-way capability, the LUX-TWR radio listens after every transmission for a positive acknowledgment from the control. This makes the sensor very energy efficient since it doesn't waste battery power repeating transmissions unless they are not acknowledged.

Like all battery powered motion detectors, the LUX-TWR has a mandatory sleep cycle function to help extend the battery life. After detecting motion, the sensor's radio will transmit the event to the control and wait for acknowledgment. Upon acknowledgment the sensor will enter the mandatory sleep cycle. During the sleep cycle time it cannot transmit additional events. There are two (2) time choices for the sleep cycle selected via DIP Switch #4. After the sleep cycle expires the sensor will once again be capable of transmitting a new event.

The LUX-TWR includes the unique Ness LUX Security/Convenience Light™ with a bright white LED providing lighting for safety and convenience.

PACKAGE CONTENTS

- 1 - LUX-TWR PIR electronics assembly & back housing
- 1 - Standard swivel bracket, locking disc, screws & anchors
- 1 - Blanking plug
- 2 - CR123A Lithium Batteries
- 1 - Cover locking screw
- 1 - Bracket locking screw



lux

With unique security/night light!

FEATURES

- Wireless two-way communication
- Dual element pyroelectric sensor
- Selectable pulse count
- Selectable Hi/Lo range
- Excellent immunity from white light, RF, and ESD interference
- Bi-Colour RF Acknowledge LED (Green + Org/Red)
- Security/Convenience™ LED (White)
- Long life Lithium batteries supplied
- Low battery trouble signal
- Sleep Cycle "Battery Saver" (2 time settings)
- Periodic (64 min.) Supervisory check-in
- Cover tamper protection
- Swivel mounting bracket included
- Optional deluxe 90° swivel bracket for ceilings sold separately

SPECIFICATIONS

- Dimensions: 112(h) x 72(w) x 48(d) mm
- Mounting Height: 2.1m – 2.4m
- Sensor: Dual element pyroelectric
- Coverage: Hi Range = 15m x 15m @ 88.2°
Lo Range = 12m x 12m @ 88.2°
20 dual element zones (2 Long, 10 intermediate, 4 mid, 4 short)
plus look down (creep zone)
- Pulse Count: 1-2 or 3-4, selectable
- Sleep Time: Selectable 30 sec. or 120 sec.
- RF Signal Acknowledge Indication: Bi-Colour LED
- Security/Convenience Light: White LED
- Warm Up Period: 10 seconds
- Operating Voltage: 3.0 Volts DC
- Battery Type & Size: 2 x Lithium CR123A
- Quiescent Current: < 10 µA
- Operating Temp: 0° to +50° C
- Humidity: 95% RH (max.), non-condensing
- Frequency: 902 - 928 Mhz channel hopping

GUIDELINES FOR USE

The LUX-TWR Sensor is for indoor use only. It may be mounted directly on a wall or in a corner, with or without the supplied swivel bracket.

It is recommended that the LUX-TWR be located within 30m of the control/transceiver. While an open-air range of 100m or more is possible, adverse indoor and environmental conditions can significantly reduce the actual transmission range. Small changes to the sensor's mounting can often make a big difference in transmission range.

Always locate the sensor where a person is most likely to walk across the coverage pattern. Aim the sensor so that it faces inward toward a solid reference point such as a wall. Corner mounting often provides the best detection coverage. See Figure 1.

Choose the location and mounting height carefully. For optimum performance the recommended mounting height should be 2.1m ~ 2.4m. The surface must be solid and free of any noticeable vibrations. As with all PIR sensors, select a location that avoids direct sunlight, glass windows, fireplaces, heating or cooling sources, and areas of high humidity. Always ensure the sensor has a clear line of sight of the area to be protected. Note that infrared energy does not pass through solid objects, including glass.

DO NOT mount a wireless sensor near metal duct work or other large metallic surfaces that might shield or adversely affect the RF signals. Prior to permanent mounting, we recommended a walk test be performed with the control/transceiver to verify acceptable operation of the wireless sensor at its intended location.

Installation in areas where animals can roam is not recommended unless the sensor is a Ness Pet Aware model.

Windows should be kept closed in any area which has an armed motion sensor.

PROGRAMMING TO A CONTROLLER

For Two Way Radio programming to your controller refer to the controller/control panel's manual.

INSTALLATION

1. **OPENING THE HOUSING** - Remove the locking screw along the bottom (if installed). Push in the retainer tab and lift the front away from the backplate.

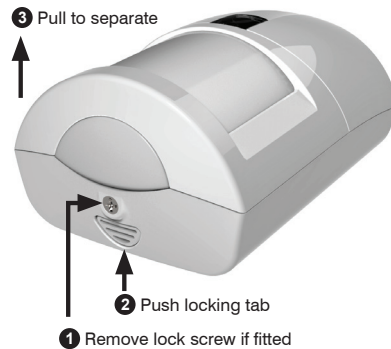


Figure 2. Opening the Housing

2. **MOUNTING** - To mount directly onto a wall WITHOUT the swivel bracket, start by inserting the supplied blanking plug into bracket mounting hole. This is very important! See Figure 3. Next, locate the 9 dimple marks on the inside of the backplate. Choose 2 (or more) of these for use as the screw mounting holes. Drill out the necessary holes using 1/8" bit. To prevent air or contaminants from getting into the sensor, DO NOT leave any exposed or unused holes!

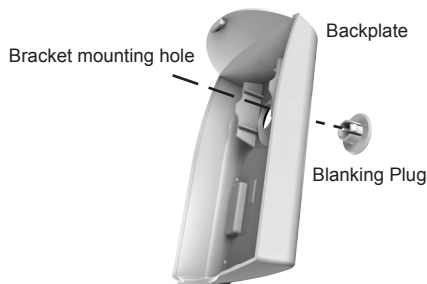


Figure 3. Prep for Wall Mounting (No Bracket)

To mount with the standard Swivel Bracket, start by attaching the bracket's base to the wall in the chosen location. Next, fit the backplate over the bracket and install the locking disc with bracket screw provided. Do not tighten this screw until the angle and direction have been adjusted as required.

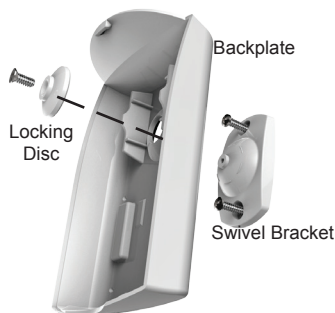


Figure 4. Standard Swivel Mounting

NOTE: The optional Deluxe Swivel Bracket (106-169) may be purchased separately. The deluxe bracket provides wall or ceiling mounting with a wider range of vertical and horizontal adjustment. Refer to page 4.

BATTERIES

The LUX-TWR holds 2 x CR123A Lithium batteries. The estimated service life is 5 to 7 years in a typical residential installation with the Sleep Cycle set to LG (Long).

Battery #1 (lower) is supervised for low voltage. When the sensor detects the voltage has reached 2.6 VDC or less (under load), a Sensor Low Battery trouble will be transmitted to the control/transceiver. This trouble will be attached to all future transmissions until fresh new batteries are installed. Battery #1 is the primary power source for all critical functions (motion detect and radio transmission) of the LUX-TWR sensor.

Battery #2 (upper) is not-supervised for low voltage. This battery is a secondary (reserve) power source for the LUX-TWR critical functions, but it is the primary (sole) power source for the White Security/Convenience LED. The White Security/Convenience LED will not operate without a good battery installed in Battery #2 location.

We strongly recommend installing a battery in both locations. These 2 batteries are electrically isolated in such a way that critical functions of the LUX-TWR can draw power from either battery, but the White Convenience LED can only draw power from Battery #2.

To clear a sensor low battery trouble condition, remove old batteries and WAIT AT LEAST 20 seconds before installing new batteries. Once the new batteries are installed, trip the sensor a couple of times. This should send an "all good" and clear the low battery trouble.

Caution: Excessive use of the White Security/Convenience LED will reduce the life of Battery #2. More importantly, because the LUX-TWR sensor is able to tap into Battery #2 for secondary power, any reduction of its life naturally reduces the overall operational life of the sensor. If maximum sensor operational life is the top priority, the Security/Convenience LED may be disabled by turning DIP Switch #3 OFF.

BATTERY REPLACEMENT

Use only approved 3V Lithium batteries. Replace both batteries at the same time and with same date code if possible. Replacements can be obtained from Ness Corporation or distributors.

1. Remove sensor from back housing.
2. Remove both old batteries from sensor.
3. **WAIT AT LEAST 20 SECONDS** before installing new batteries.
Note that LUX is supplied with both batteries fitted in reverse for safe transportation.
Note the correct polarity when inserting the batteries. Installing the batteries in reverse will not harm the unit but it will not operate correctly.
Do not bend or damage the metal battery holder contacts. Approved 3.0 Lithium Batteries are Ultralife C&17335, Panasonic CR123A, Duracell DL123A, Sanyo CR123A,
4. Re-test sensor operation with the control.

BATTERY WARNING: Risk of fire, explosion and burns. Do not attempt to recharge or disassemble. Do not incinerate or expose to heat above 100°C. Dispose of used batteries properly. Keep away from children.

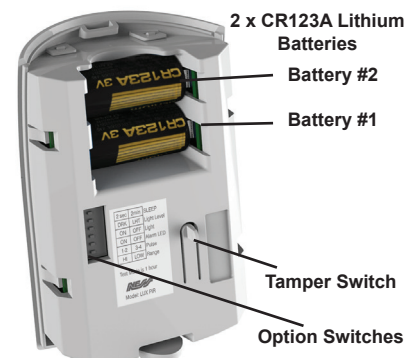


Figure 5. Back View of Sensor

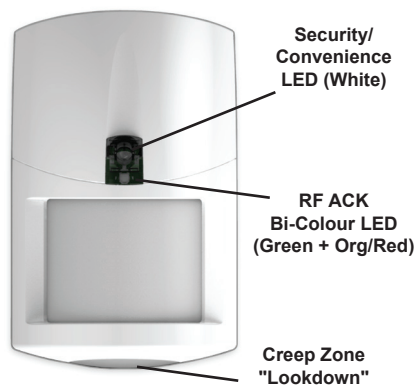


Figure 6. Front View of Sensor

COVERAGE PATTERNS

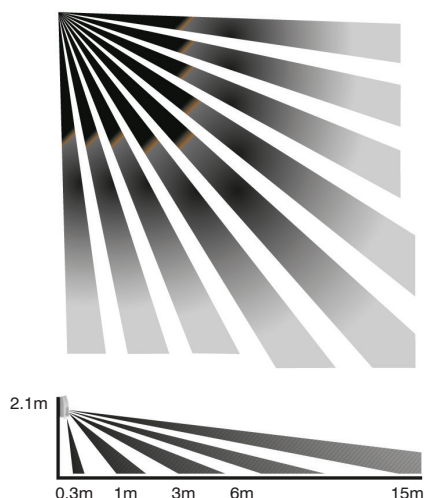


Figure 1. Top and Side Views (assumes range is set to "HI")

ANTI-TAMPER SWITCH

This switch detects the separation of the front housing from the backplate, resulting in a signal being transmitted to the control/transceiver that will cause the associated zone to become violated. Snapping the front housing back onto the backplate will transmit a restoral.

5. DIP SWITCH OPTION SETTINGS

ON	OFF			
☐	☒	1 - 2	3 - 4	PULSE COUNT
☐	☒	HI	LO	RANGE
☐	☒	SH	LG	SLEEP CYCLE
☒	☐	YES	NO	SEC/CONV. LED
☐	☒	NO	YES	RF ACK. LED
☐	☒	N/A	N/A	FUTURE USE

Factory defaults shown

Figure 7. DIP Switches

PULSE COUNT (Switch 6)

- ☐ 1 - 2 Sensor must detect 1 or 2 events in the coverage area before an alarm is created.
- ☐ 3 - 4 Sensor must detect 3 or 4 events in the coverage area before an alarm is created.

RANGE (Switch 5)

- ☐ LO Sensor is set for the shorter detection range (approximately 12m.)
- ☐ HI Sensor is set for the longest detection range (approximately 15m.)

SLEEP CYCLE (Switch 4)

To extend battery life, a mandatory sleep cycle (2 time settings) begins after each alarm transmission. After the Sleep Cycle expires, there must be ~8 seconds of quiet (no movement) before the sensor will be allowed to detect and send another radio transmission.

- ☐ LG Long (120 secs.) Until this timer expires the sensor cannot transmit another event.
- ☐ SH Short (30 secs.) Until this timer expires the sensor cannot transmit another event.

SECURITY/CONVENIENCE LED (Switch 3)

- ☐ NO Sec/Convenience LED is NOT ENABLED except for the Walk Test.
- ☐ YES Sec/Convenience LED is ENABLED for other functions other than Walk Test and audible alarms. See back page for details.

RF ACK LED (Switch 2)

- ☐ NO RF ACK (Green) LED is NOT ENABLED except during the Walk Test Mode.
- ☐ YES RF ACK (Green) LED is ENABLED, and should blink Green upon a detect and positive acknowledgment from the control.

Green = Sensor transmitted and received a positive ACK (acknowledgment) from the Control/Transceiver.

Org/Red = Sensor attempted to transmit but did not receive an ACK (acknowledgment) from the Control/Transceiver.

FUTURE (Switch 1)

- ☐ N/A This switch is not currently used.

6. After enrolling the sensor into the control and setting the Option Switches, reposition sensor over the back housing and snap it into place. This action will activate the Walk Test mode for the next 10 minutes. Perform an immediate Walk Test according to the procedure that follows.

7. If the swivel mount bracket was used then it will be possible to adjust (fine tune) the Sensor coverage. If the swivel bracket was not used, and the sensor was fixed mounted to the wall, the coverage pattern is based on the mounting height and position.

8. After Walk Testing has been completed, secure the sensor to the back housing using the locking screw provided (small countersunk screw).

FUNCTIONAL 'SYSTEM' TESTING

A system test should be done by physically walking across the LUX-TWR coverage pattern while the system is fully armed. NOTE: Allow time for the Sleep Cycle Timer to expire before testing. Always notify the Central Monitoring Station prior to performing any testing.

WALK TEST

Walk test is a way to verify that the sensor is operating as desired and in the optimum location. Slow and short steps should be taken across the coverage zones in both directions. When motion is detected, the White LED should blink once followed by a quick blink of the Green RF ACK LED. The Green LED indicate that the sensor transmitted an alarm signal and that the control/transceiver acknowledged that transmission. See paragraph titled: RF ACKnowledge LED

NOTE: Walk Test mode bypasses the Sleep Cycle timer allowing the Sec./Convenience LED and the RF ACK LED to operate regardless of DIP switches 2, 3, and 4.

SENSOR WALK TEST

This is started by opening and closing the sensor housing to violate the tamper switch. Sensor Walk Test will end after 10 minutes.

RF ACKnowledge (Green) LED

This LED is located in the clear lens on the sensor front. It's a bi-Colour LED providing visual status of the two-way acknowledge (response) from the control/transceiver. In bright lighting conditions this LED may be difficult to see. DIP Switch #2 allows the Green LED to be disabled for all operations except the Walk Test Mode.

GREEN blink = Sensor has successfully transmitted a violation (alarm) transmission to the transceiver and that signal has been received and acknowledged by the transceiver. The green blink is not provided for a sensor restore transmission..

ORG/RED blink = Sensor was not successful in transmitting after multiple attempts.

DISABLING RF ACKnowledge (Green) LED

DIP Switch #2 allows the RF ACKnowledge (Green) LED to be disabled for regular operation, helping prevent unauthorized persons from learning the coverage patterns. It also helps extend battery life. Place DIP Switch #2 in the "NO" position to disable the RF ACK LED, or in the "YES" position to enable the RFACK LED.

NOTES: DIP Switch #2 does not disable this LED from working in the Walk Test Mode.

OPTIONAL DELUXE 90° SWIVEL MOUNT

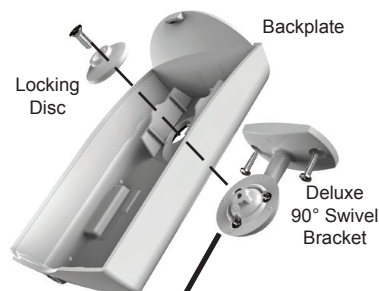


Figure 8. Optional 106-169 Deluxe 90° Swivel Bracket

A deluxe 90° swivel bracket may be purchased and used in lieu of the standard swivel bracket. This bracket has a short extended arm and allows the sensor to be aimed at up to a 90° offset from the wall or base. This bracket also allows the sensor to be drop mounted from a ceiling.



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Specifications may change without notice.



LIMITATIONS

While the LUX-TWR Passive Infrared (PIR) Motion Detector is a highly reliable motion detection device, it does not offer guaranteed protection against burglary. Any intrusion detection device is subject to compromise or failure to warn for a variety of reasons:

PIR Detectors can only detect movement within a specific coverage area as diagrammed in this manual. To detect movement, the PIR Detector senses the infrared energy that is emitted from an intruder moving across the sensor's field of view.

PIR Detectors do not provide volumetric area protection. They create multiple beams of protection. Intrusion can only be detected in unobstructed areas covered by those beams.

PIR Detectors cannot detect motion or intrusion that takes place behind walls, ceilings, floors, closed doors, glass partitions, glass doors, or windows.

The radio transceiver only provides communications. It does not have anything to do with detecting motion.

The LUX-TWR PIR is not a Life Safety device. The Security/Convenience Light feature is not a substitute for, nor should it ever be utilized as a substitute for a visual notification appliance.