ELK-6030 Wireless PIR Motion Sensor

APPLICATION & OVERVIEW

The ELK-6030 Wireless PIR Motion Sensor is designed for use with control/transceivers that accept Elk's two-way technology; such as the ELK-M1XRFTW. It is intended for use in residential and light commercial installations and incorporates many features designed to ensure its reliable performance.

The dual element pyroelectric sensor in the 6030 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 creates a temperature change in the sensor's zones, which is then processed to determine if the occurrence qualifies as a legitimate motion detect event. If it does then the built-in radio will be triggered.

The two-way radio (RF) in the 6030 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 6030 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 6030 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, both selected via DIP Switch #4. After the sleep cycle expires the sensor will once again be capable of transmitting a new event.

The 6030 introduces the industry's first Security/Convenience Light.[™] This high-intensity white LED projects a beam of light out in front of the sensor. It offers five (5) activation/operation modes: 1)Flash during any audible alarm activation as a visual deterent. 2)On Solid for a timed period when motion is detected and control is armed to the Away mode. (This can be disabled or modified so that it only works during certain conditions or time periods) 3)Flash on command for a timed period as a special attention grabber or general purpose indicator. 4)On Solid on command for a timed period to illuminate the immediate area (camera surveillance, etc.) 5)Quick blip in walk test mode when a coverage zone is tripped.

PACKAGE CONTENTS

- 1 6030 PIR electronics assembly & back housing
- 1 Standard swivel bracket, locking disc, screws & anchors
- 1 Blanking plug
- 2 CR123A Lithium Batteries
- 1 Cover locking screw



Installation and Setup Guide



UNIQUE 'INDUSTRY FIRST' SECURITY/CONVENIENCE LIGHT TM

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
- Green/Red (Bi-Color) RF Acknowledge LED
- White LED Security/Convenience Light [™]
- Long life Lithium batteries {supplied}
- Low battery trouble signal
- · Sleep Cycle "Battery Saver" (2 time settings)
- · Hourly supervision (check-in) signals
- Cover tamper protection
- Swivel mounting bracket included
- · Optional deluxe 90° swivel bracket for ceilings sold separately

SPECIFICATIONS

- Dimensions: 2.8"W x 4.4"H x 1.9"D
- Mounting Height: 6 1/2 to 7 1/2' ft
- · Sensor: Dual element pyroelectric
- Coverage: 39 ft x 49 ft (12m x 15m) @ 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: Green/Red (Bi-Color) 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 μ A
- Operating Temp: 32° to +120° degrees F
- Humidity: 95% RH (max.), non-condensing
- Frequency: 902 928 Mhz channel hopping



For the latest downloadable version of this manual visit our website: http://www.elkproducts.com ELK-6030 PIR Installation Manual

GUIDELINESFORUSE

The 6030 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 ELK-6030 be located within 100 feet of the control/transceiver. While an open-air range of 400 feet 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 an intruder is most likely to walk <u>across</u> 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 6 1/2 to 7 1/2 ft. 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. Understand that infra-red 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.

Motion Sensors are not recommended for areas where a pet can roam. Pets can and will trigger a motion sensor.

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



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

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INSTALLATION

 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!





To mount with the supplied 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 and small screw provided. Do not tighten this screw until the angle and direction have been adjusted as required.



Figure 4. Standard Swivel Mounting

NOTE: A deluxe 90° swivel bracket may be purchased and used in lieu of the standard swivel bracket. The deluxe 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. Refer to page 4. Sensor must be enrolled into the control using one of the following two methods.

3. SENSOR ENROLLMENT FROM KEYPAD

- 3.1 Make sure the M1XRFTW Transceiver is powered up and enrolled with the M1 Control.
- 3.2 Enter M1 Keypad Installer Programming and navigate to Menu: 14-Wireless Setup
- 3.3 Scroll up to sub-menu:3:Learn Sel Wireless Transmtr and press Select (right arrow).
- 3.4 Scroll to and select an unassigned **WZone** (wireless zone) and press **Learn** (right arrow) to enroll.
- 3.5 Insert the Batteries into the 6030 as soon as the keypad displays: Push Transmitter Button. The M1G will speak; "Press transmitter button for zone xx". If successful the Keypad will chime and briefly display the 6 digit TXID code of the sensor. If a TXID is not displayed then enrollment was not successful. Should this happen, remove the batteries, wait 5 seconds, and re-insert.

Rapid-Enroll will auto advance to the next wireless zone in sequence and wait for the next sensor. Repeat the previous step for each new sensor.

- 3.6 After all wireless sensors are enrolled, press the ELK or Select Wireless key to stop Rapid-Enroll.
- 3.7 Set the Loop ID. This sets which sensor input is to be assigned to the wireless zone, allowing multi-input sensors to be used. Since the 6030 Sensor is a single input device it will always identify itself as Loop "2". The M1 default for all wireless zones is Loop "0". Change this by scrolling to the wireless zone and pressing the HW (left arrow) button. An 8 digit number (the TXID in decimal) will now display followed by Loop = 0. Move the cursor to the right (press RIGHT arrow) and enter a "2". Press the ELK key or the Select Wireless key to back out.
- 3.8 <u>Set Supervision Type</u> Set this to "1" (Normal Supervision). This informs the control to expect a supervisory check-in report from the 6030 Sensor approximately every 64 minutes. A separate M1 option sets the number of missed check-ins that will be allowed before a sensor is declared missing. To view/change the supervisory type press the ELK or the Select Wireless key to locate Sub-Menu: 2:Xmit Transmitter Opt. Scroll to the desired wireless zone, press Select (right arrow) and scroll to Option 2: Supervision Type. If set to "0" the control will not expect a supervisory check-in.
- 3.8 <u>PIR Auto Restore</u> Do Not Enable. The 6030 PIR will transmit a restore after each alarm. This option is included in the M1 to support other brands of wireless PIRs that do not transmit restorals.
- 3.9 **PROGRAM THE ZONE DEFINITION** This must be done from Keypad Menu **5** - **Zone Definitions** for all new enrolled wireless zones.



Figure 5. Back View of Sensor

4. SENSOR ENROLLMENT FROM ELKRP

- 4.1 Launch the ElkRP PC software and open the desired Customer Account file.
- 4.2 Click the "+" next to Zones (Inputs) to expand the view. Look to see if there are any existing wireless zone groups. If there are none then it will be necessary to add or create a new group. To create a wireless group, right click on Zones (Inputs) and click New Wireless Zones. Place a check mark in the box to be added, starting with Group 2). Click OK. Repeat if more wireless groups are required.

NOTE: The M1 Control requires all expanded zones to be defined in groups of 16. E.G. Zones 17-32 = Group 2, zones 33-48 = Group 3, etc. And it requires the M1XRFTW Two-Way Transceiver to always be enrolled as the first expander (databus address 2). For this reason, the first group of wireless sensors must be defined as group 2. M1 allows a maximum of 144 wireless zones, therefore the last potential wireless zone will be Zone 160. So, If a large number wireless zones is ever anticipated, it would be a good idea to avoid conflict with any future Hardwired Zones in the 17 to 160 range by NOT enrolling any Hardwired Zone Expanders (M1XIN) at data bus addresses below 10.

- 4.3 Double click on Wireless Group _ (the group just added) and double click one zone at a time to define the Zone Name, Definition, Type, Attributes, etc.
- 4.4 The next step is to enter the sensor's TXID and the other wireless setup data. This may be done directly from each zone definition screen (click the Wireless Setup button) OR from the separate Wireless Setup menu accessed from the folders column.
- 4.5 Place a check mark in the Enabled box.
- 4.6 Set Supervision type to "1" (Normal Supervision) for the 6030 Sensor. A setting of "0" means the control will not expect a supervisory check-in from the sensor. For additional details refer to Supervision on the previous page.
- 4.7 Skip past the block titled: This device is a PIR (auto restore). <u>Do Not Enable</u>. The 6030 PIR will transmit a restore after each alarm as long as all functions return to normal. This M1 option is for other supported brands of wireless PIRs that do not transmit restorals.
- 4.8 Skip to the **TXID** box and enter the Sensor TXID that is printed on the small label attached to the sensor.
- 4.9 Skip to the LOOP box and enter a 2.
- 4.10 Click **Save**. Repeat the entire step 4 for each additional Wireless Zone and Sensor.



Figure 6. Front View of Sensor

5. DIP SWITCH OPTION SETTINGS



PULSE COUNT (Switch 6)



RANGE (Switch 5)

- LO Sensor is set for the shorter detection range (approximately 39ft.)
- HI Sensor is set for the longest detection range (approximately 49ft.)

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.



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

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SECURITY/CONVENIENCE LED (Switch 3)

- NO Sec/Convenience LED is NOT ENABLED except for the Walk Test Mode.
- YES Sec/Convenience LED is ENABLED for other functions besides just the Walk Test Mode. See back page for details.

RF ACK "Alarm" LED (Switch 2)

- NO RFACK LED (Green/Red) is NOT ENABLED except during the Walk Test Mode.
- YES RF ACK LED (Green/Red) is ENABLED. It should blink Green or Red after each detect.
- Green = Sensor transmitted and received a positive ACK (acknowledgment) from the Control/ Transceiver.
- Red = Sensor transmitted (or attempted to) but it did not receive an ACK (acknowledgment) from the Control/Transceiver.

FUTURE (Switch 1)

N/A This switch is not currently utilized.

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

WALK TESTING

Walk testing is a way to verify that a sensor has been installed in the optimum location and is working properly. This involves taking short and deliberate steps 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 is indicating that the sensor transmitted and was acknowledged by the control/transceiver. For more information read the paragraph titled: RF ACK (Acknowledge) GREEN/RED 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.

There are two methods for Walk Testing.

 <u>Sensor</u> 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.

NOTE: Sensor Walk Test can be forced to end by either arming the M1 (any arm mode) or by entering and exiting the System Walk Test mode.

 System Walk Test - This is started by activating Keypad User Menu 3 - Walk Test Area. A wireless command is sent to the 6030 telling it to join the System Walk Test mode. As each sensor is tripped the keypad will chime and display visual results. The M1 will speak the relative signal strength of each sensor's transmission. Press the asterisk (*) key to end this walk test mode.

NOTE: Two-way commands are not immediate. It can take several seconds for the sensor to receive the command to enter or exit the walk test mode.

RF ACK (Acknowledge) GREEN/RED LED

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

- **GREEN blink =** Sensor has successfully transmitted a signal to the control/transceiver and the signal was positively acknowledged.
- RED blink = Sensor was not successful in transmitting to the control/transceiver after multiple attempts. POSSIBLE CAUSE: a)The distance between the sensor and the transceiver may be too great. b)The control/transceiver might be off-line or unpowered. Check the following:
 - A. Verify that the M1XRFTW Transceiver is powered on and that its status LED is blinking.
 - B. Verify that the M1 Control is powered on.
 - C. Trip a different wireless sensor to determine if it can successfully communicate.
 - C. If steps A,B, & C are OK, temporarily move the failed sensor closer to the transceiver and retest. If sensor successfully communicates at the closer range then it may be necessary to:
 - Relocate the transceiver to a closer and more central location to this and all other sensors. OR
 - Purchase and install an additional "remote" transceiver to cover the area where this sensor was mounted.

DISABLING THE RF ACK LED

DIP Switch #2 allows the RF ACK (Acknowledge) LED to be disabled for regular operation. This prevents 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 RF ACK LED.

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

ANTI-TAMPER SWITCH

This switch detects the separation of the front housing from the backplate. When this is tripped a signal is transmitted to the control/transceiver, causing the associated zone to become violated. Snapping the front housing back onto the backplate transmits a restoral. Note: Tamper can be ignored for any sensor (zone) by setting its Zone Type to 1=Normally Closed.

FUNCTIONAL 'SYSTEM' TESTING

A system test should be done by physically walking across the 6030 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.

BATTERIES

The 6030 battery compartment holds 2 x CR123A Lithium batteries. The estimated service life of these batteries is 5 to 7 years in typical residential usage 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 6030 sensor

Battery #2 (upper) is not-supervised for low voltage. This battery is a secondary (reserve) power source for the 6030 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 6030 can draw power either battery, but the White Convenience LED can only draw power from Battery #2.

To clear a sensor low battery trouble condition, install new batteries and then trip the sensor a couple of times. This clears the low battery trouble and sends "all good" to the control/transceiver.

Caution: Excessive use of the White Security/ Convenience LED will rapidly reduce the life of Battery #2. More importantly, because the 6030 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 CR123A 3V Lithiums. Replace both batteries at the same time. If possible, both batteries should have the same manufactured date code. Replacements can be obtained from Alarm Distributors.

1. Remove sensor from back housing.

- 2. Observe correct polarity when installing the new batteries. Do not bend or damage the metal battery holder contacts. Approved Batteries: 3V Lithium -Panasonic CR123A, Duracell DL123A, Varta CR123A, Sanyo CR123A
- 3. 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 212° F (100° C). Dispose of used batteries properly. Keep away from children.



ACTIVATING THE WHITE SECURITY/CONVENIENCE LIGHT ™

This high-intensity LED projects light out the front of the sensor. There are five (5) modes of operation: 1)Flash during an audible alarm activation. 2)On Solid when motion is detected and either the control is armed AWAY mode or when output 4 is On. 3) Flash on command from control. 4)On Solid by command from control. 5)Quick blip in walk test mode when motion is detected. Note: For all conditions EXCEPT Walk Test, the white LED may be totally disabled by DIP Switch #3.

1) Flash upon audible alarm activation

If DIP Switch #3 is ON, ANY audible alarm activation from the Control (not Silent 24hr Police) will cause the White LED to flash. This flash will continue until either the Alarm Cutoff timer expires, the Control is disarmed, or Battery #2 (the upper battery) is drained.

Note: The 6030 reacts to two-way wireless commands from the M1 Control. Please understand that it can take several seconds for the 6030 to receive a command. The time delay is typically 8 seconds or less. Be prepared for this delay during testing and operation. Do not expect instantaneous reaction.

Activating the white LED via ElkRP Rules

The white LED may be controlled via ElkRP Rules using M1 Outputs 4, 5, & 6. These outputs do not appear on the M1 board and are generally only used as rule flags. The 6030 detects the state of these 3 outputs and performs as follows:

2) On Solid if Motion Detected while armed to Away Any motion detected while the control is armed to AWAY mode will result in the white LED turning On for approx. 18 seconds. {DIP Switch #3 must be ON} OR

On Solid if Motion Detected and Output 4 is on Any motion detected while M1 Output 4 is On will cause the white LED to turn On for approx. 18 seconds. Additional motion can restart this time. Output 4 can be turned On at a specific time, date, or condition using an ElkRP rule. E.G. "When Sunset - Then Turn Output 4 On." Use another ElkRP rule to turn Output 4 Off when this LED action is no longer desired. E.G. "When Sunrise - Then Turn Output 4 Off."

3) Flash - on command [M1 Output 5]

When the 6030 sees M1 Output 5 turn On it will start the white LED flashing for approx. 18 seconds. Output 5 can be turned On at a specific time, date, or condition using an ElkRP rule. E.G. "When 5:30PM (Close Time?) - Then Turn Output 5 On for 15 seconds." (15 seconds is an arbitrary value) The crucial point is that Output 5 must first be turned Off before it can again be turned back On to restart the white LED Flash.

Solid On - on command [M1 Output 6]

When the 6030 sees M1 Output 6 turn On it will turn the white LED On Solid for approx. 18 seconds. Output 6 can be turned On at specific time, date, or condtion using an ElkRP rule. E.G. When Entry Delay Starts - Then Turn Output 6 On for 15 seconds." (15 seconds is an arbitrary value) The crucial point is that Output 6 must first be turned Off before it can be turned back On to restart the white LED Solid On.

Examples of Rules for the Security/Convenience Light: Whenever Sunset

Then Turn On Output 4 On.

Whenever Sunrise Then Turn Off Output 4 Off.

Whenever Time is 6:00pm (e.g. dinner time) Then Turn On Output 5 for 15 seconds.

Whenever Entry Delay Starts Then Turn On Output 6 for 15 seconds.

NOTES: DIP Switch #3 allows each individual 6030 sensor to be excluded from the above operations.

OPTIONAL DELUXE 90° SWIVEL MOUNT



Figure 8. Deluxe 90° Swivel Bracket (Separate purchase P/N: ELK-603022)

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.

LIMITATIONS

While the 6030 Passive Infrared (PIR) Motion Detector is a highly reliable intrusion 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.

LIMITED WARRANTY

The 6030 Wireless PIR Sensor is warranted to be free from defects and workmanship for a period of 2 years from date of manufacture. Batteries used with wireless devices are not warranted. Elk makes no warranty, express or implied, including that of merchantability or fitness for any particular purpose with regard to batteries used with wireless devices. Refer to Elk's website for full warranty statement and details.

FCC COMPLIANCE STATEMENT:

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

Part # Description FCC ID # ELK-6030 Wireless PIR Sensor TMA FI K-6030

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