# EH403 | Z-Wave LED Floodlight with PIR Motion Detector

The EH403 is an outdoor security floodlight equipped with Z-Wave wireless communication capability. It features a PIR detector to detect motion through movement of heat sources and a lux sensor for determining brightness of its surroundings.

When not connected to a Z-Wave network, EH403 is fully operational as a standalone security floodlight. During hours of darkness its PIR detector turns on the 20W floodlight when it detects movement in the protected area. Its built-in timer will then turn off the floodlight after a preset time has elapsed. During daylight hours, its lux sensor saves energy by deactivating the motion sensor and the floodlight. The lux level and the timer can be set through knobs on the device itself.

When added into a Z-Wave network, EH403 communicates directly with other end devices such as smart plugs, or to report directly to a Z-Wave controller (usually a gateway). It alerts the controller when motion is detected and through Z-Wave commands, the controller can remotely turn on/off the floodlight at any time and be able to configure its lux level and timer setting.

This product supports the S2 security protocol that uses encrypted Z-Wave Plus messages to communicate to other security-enabled Z-Wave Plus products. A security-enabled Z-Wave Plus Controller must be used in order to fully utilize the security features of this product.

Product Overview
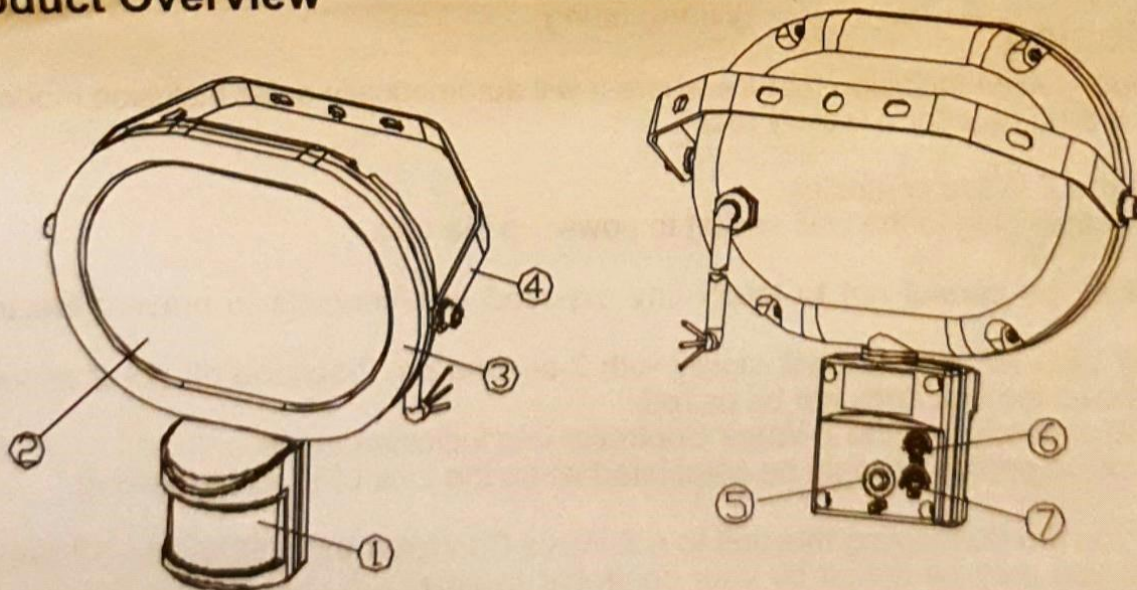
① Z-Wave PIR Detector	⑤ Learn Button
② Toughened glass lens	⑥ Time off Knob
③ Floodlight housing	⑦ Lux Knob
④ Mounting bracket	

Note: Please read this entire instruction manual before you start to install the floodlight.

Adding to Z-Wave Network
Connecting the Power

Before mounting the unit on its final outdoor location, it is recommended to first power up the unit indoors in order to set up its Z-Wave connection and to perform preliminary tests.

1. Wire up the unit to a cable plug using a wiring fitting as shown below.

   Follow exactly the wire colors as below:
   - BROWN (Live) wire to the mains live connection.
   - BLUE (Neutral) wire to the mains neutral connection.
   - GREEN/YELLOW wire to the mains earth cable.

L = Brown
N = Blue
Earth = Green/Yellow

Wiring fitting
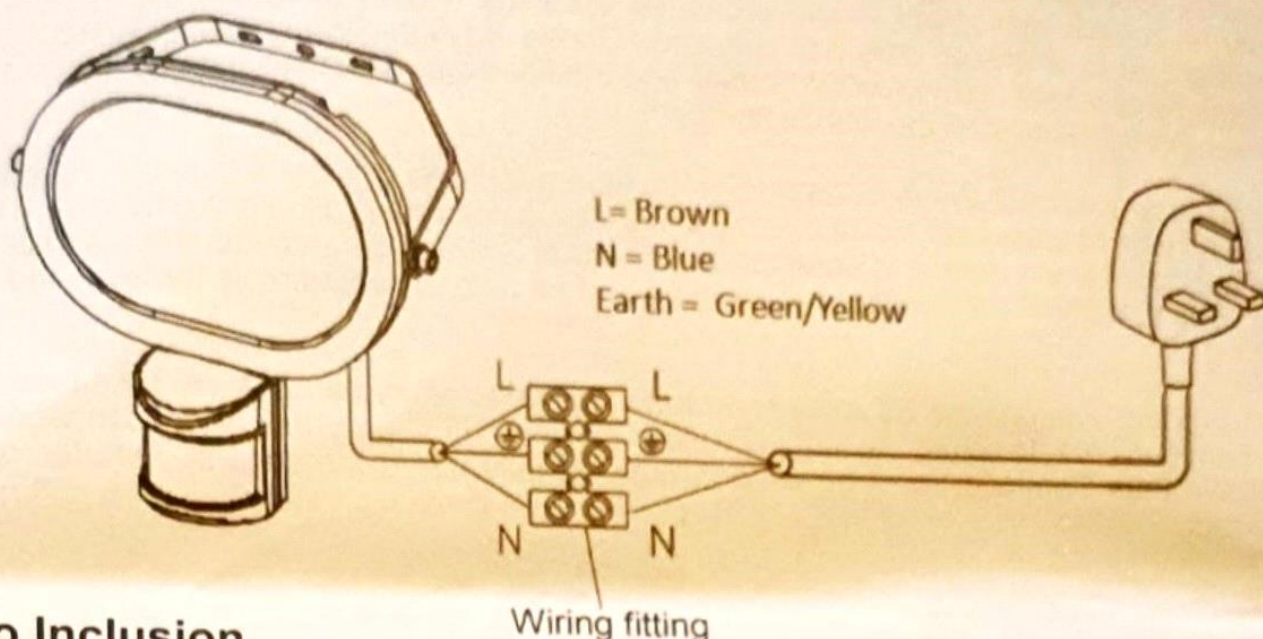
Auto Inclusion

The unit supports Auto Inclusion feature where it will automatically enter Inclusion mode when first powered up after a factory reset.

2. Prepare the Z-Wave controller.
3. Plug the cable plug to the wall socket to power up the unit.

   WARNING: be careful not to touch any exposed wire/contacts to prevent electrical shock!
4. The Link LED will start to blink slowly with 2-second on, 2-second off (for 2 minutes) which shows the unit does not be paired.
5. Within 30 seconds, put the Z-Wave Controller into inclusion mode.
6. The Inclusion process should be completed when the Link LED stops blinking.

   Note: If you are connecting this unit to a Z-Wave Controller that utilizes the S2 security protocol, you may be asked by your controller to enter a 5-digit Device Specific Key (DSK) that is unique to each unit. This can be found in one of two places:
   - on the QR code label on the back of the unit
   - on the insert card inside the packaging.

7. Turn on the floodlight using the controller to check if the auto inclusion is working properly.

If Auto Inclusion fails, refer to the Troubleshooting section regarding Manual Inclusion

Mounting the Unit

Choosing the location

The recommended location for the floodlight is outside the house under the eaves or other shaded areas where it is not directly exposed to sunlight.

- Do not aim its PIR detector facing a window or direct sunlight, otherwise poor triggering response may occur..

- Avoid aiming the PIR Detector at pools, heating vents, air conditioners or objects that may change temperature.

- Avoid aiming the PIR Detector at trees or shrubs or where the movement of pets or animals may be detected

- Where possible, mount the unit so that the path of an intruder would cut across the fan pattern rather than directly towards the detector.
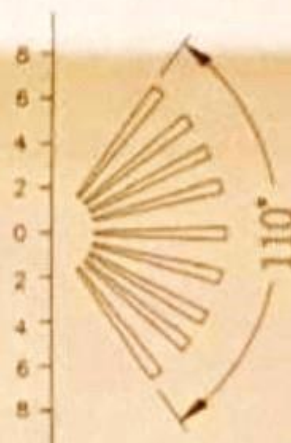

PIR less sensitive   PIR more sensitive

For the best results, mount the floodlight onto normal brickwork 1.8~2.0m above the ground. At this height, the unit will detect movement within its 110 degrees fan-shaped detection pattern up to 8m depending on adjustment. .


Top view

Side view

SAFETY PRECAUTION

- DO NOT install when it is raining.
- Isolate the power supply before installation.
- Ensure that local Wiring and Building regulations are complied with.
- The unit is supplied with a pre-wired supply cable this must be used and must not be removed.
- Ensure that the power supply is protected by a 6amp circuit breaker or 5amp fuse.
- Ensure minimum distance of 2.0m away from lighted objects.
- The unit must be installed vertically with the PIR at the bottom of the unit.
- The unit can be corner mounted if preferred.
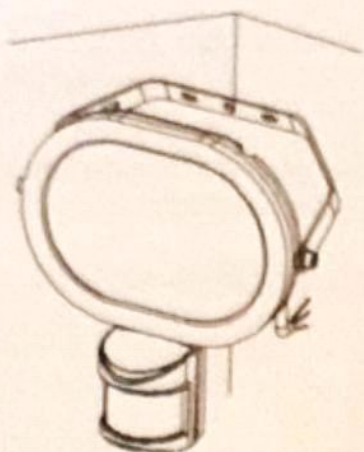
Installation & Wiring instructions

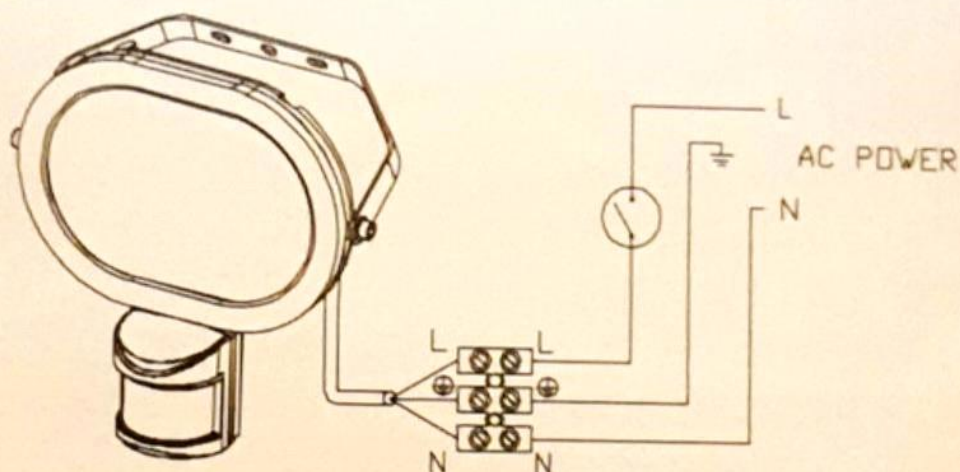1. Use the mounting bracket to mark the position of the mounting holes.
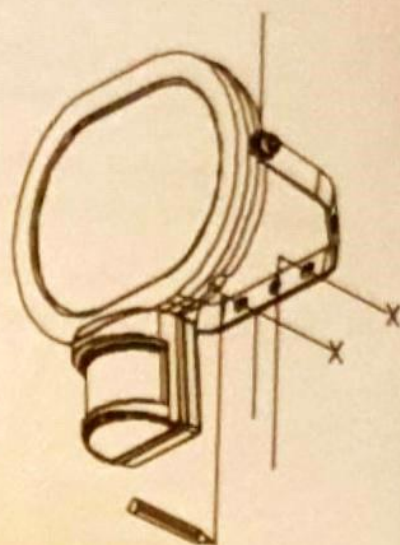
2. Drill the holes and insert suitable wall plugs
3. Fix the mounting bracket to the wall using suitable screws.

Wiring instructions

WARNING: Isolate the mains power supply to prevent electrical shock.

4. It is recommended to add an internal single pole wall switch to allow easy control of the unit.

5. Connect the mains power supply to the pre-wired cable provided with the fitting as shown above. If the connection is made outdoors a suitable waterproof IP box must be used to make the connections.

Follow exactly the wire colors as below:
- BROWN (Live) wire to the mains live connection via a wall switch
- BLUE (Neutral) wire to the mains neutral connection.
- GREEN/YELLOW wire to a suitable earth point. The unit must be earthed.

Note: Do not remove the pre-wired supply cable. This will invalidate the warranty.

4

6. When completed, turn the knobs of Time-Off on the unit to "T" mark, and turn the knob of Lux on the unit to the "✳" mark.

7. Reinstate the power supply to the floodlight and switch on the wall switch, if installed. When the PIR is triggered, the LED of the PIR will blink once and the floodlight will turn on for around 5 seconds then turn off,. It is now in 'test mode'.

Warm-Up

It will take approximately 5 seconds for the PIR detector to warm up after powered on. During this period the floodlight will turn on. When the floodlight turns off, the warm-up procedure is complete and the PIR detector is ready.

Walk Test

The user can perform a walk test to ensure the PIR detector's range falls within the desired area of coverage. This test also checks if the unit is still within the communication range of the Z-Wave controller.

1. Walk through its PIR Detector coverage area. The floodlight turns on when you move and turns off after approximately 5 seconds. Wait for the floodlight to turn off before moving again to test.
2. If necessary, tilt the floodlight to achieve desired result. The floodlight may be tilted downwards by up to 30° to light the area directly under it. Tilting by more than 30° may cause issues with the lux sensor as light reflected back from the area under the floodlight may switch the lux sensor to daylight mode hence turning the floodlight off.
3. When you are satisfied with the coverage area you can now set the desired Time period and Lux level.

Time and Lux adjustment

You can set desired Time period and Lux level through:
(i) the Z-Wave controller if the unit is already connected to it, or
(ii) manually adjusting the knobs on the unit if not connected to a Z-Wave network. The following section describes the steps for manual setting.

(1) Time adjustment
   Time-off knob controls how long the floodlight will stay on after the motion is detected. Turn the TIME control knob towards the + sign to increase how long the floodlight stays on (up to about 12 minutes) or towards the T to decrease (down to about 8 seconds). The recommended setting for Time control is approximately midpoint of the scale (approximately 5 minutes).

About 5 seconds   About 12 minutes

(2) Lux adjustment

The LUX adjustment sets the brightness level threshold that will activate the motion sensor. The Lux control can be adjusted between T (always triggered regardless of light level) and the moon symbol (triggered on only during hours of darkness). The adjustable Lux range is about 30 - 200 Lux.

| Always ON | During hours of darkness |

1. To set the lux level, turn the Time-off knob to "T" for maximum response.
2. Turn the LUX control knob to the "moon" (dusk) position.
3. Wait until the ambient light level reaches the level of darkness at which you wish the floodlight to activate.
4. Slowly rotate the Lux knob anti-clockwise while keep creating motion during the process until the floodlight turns on. At this position the light will operate at approximately the same level of darkness each evening.
5. Set the Time-off knob back to the desired preset time.
6. When completed, tighten the two Allen screws on the side of the floodlight body to secure its position

Note: When connected to a Z-Wave controller, the manual settings will be overwritten by the settings through the Z-Wave controller.

Operation

Z-Wave Group

The unit supports either one of two Z-Wave Association Groups:

Group 1: Association with 1 Controller node.

Group 2: Association with 4 nodes (i.e. end devices such as smart plugs and other lighting controllers). This allows the PIR detector on the unit to transfer commands directly to other Z-Wave end devices without the participation of the controller. This has the effect that when its detector triggers, all devices associated with unit will be operated.

Table below are control commands that can be sent from the controller. Refer to Programming section for details on sending these commands.

Commands from Controller	Commands
Turn on Floodlight	Switch Binary Set On/ Basic Set On
Turn off Floodlight	Switch Binary Set Off/ Basic Set Off. Note: The floodlight will revert back to its own self control only after this command is sent.
Set Timer	Configuration settings, Parameter 1
Set Lux level	Configuration settings, Parameter 2
Read Lux level	Multilevel sensor : 0x03

Table below shows the alerts sent by the unit whenever an event occurs. Refer to Programming section for details of these notifications.

Sensor Event		Floodlight behavior	Z-Wave commands/notification	Remark
Lux sensor	PIR sensor			
Daylight	Trigger	Off	When Trigger: - Notification, *PIR Trigger ON : Group 1* When timer expire : - Notification, *PIR Trigger OFF: Group 1*	Z-Wave command is sent even if floodlight is off
Night, or Lux knob set to "T"	Trigger	On, until timer expires	When Trigger: - Notification, *PIR Trigger ON : Group 1* - *Switch Binary Report : Group 1* - *Basic Set On : Group 2* When timer expire : - Notification, *PIR Trigger OFF: Group 1* - *Switch Binary Report : Group 1* - *Basic Set Off : Group 2*	

Other Events	Floodlight behavior	Z-Wave commands/notification	Remark
1st power on	On for 5 seconds	Notification : *First Power Up : Group 1*	
Device Factory reset	NA	Device Reset Locally Notification : *Group 1*	

Programming

Z-Wave Plus Info

Role Type	Node Type	Installer Icon	User Icon
Slave Always ON	Z-Wave Plus node	Sensor Notification Device Type (Home Security)	Sensor Notification Device Type (Home Security)

Association Command Class

Group	Max Node
1	1
2	4

Version

Protocol Library	3 (Slave_Enhance_232_Library)
Protocol Version	4.3D (6.71.01)

Manufacturer

Manufacturer ID	Product Type	Product ID
0x0060	0x0012	0x0001

AGI (Association Group Information) Table

Group	Profile	Command Class & Command (List) N bytes	Group Name(UTF-8)
1	General	Device Reset Locally Notification Notification Report Binary Report Sensor Multilevel Report	Lifeline
2	Control	Basic Set	PIR Control

Notification Report

Event	Type	Event	Event Parameters Length	Event Parameters
First power up	0x08	0x01	0x00	
PIR Trigger ON	0x07	0x08	0x00	

PIR Trigger OFF	0x07	0x00	0x01	0x08

Switch Binary: LED Floodlight Status

Switch Binary Report (value)	Description
0x00	Floodlight is off
0xFF	Floodlight is on

Z-Wave Configuration settings

1. PIR Trigger Off period: Period to send Trigger Off command after PIR is triggered. Before this period expires, the PIR will not be able to detect any subsequent motion.

Parameter	Size	Range	Default
1	2	8~720 secs	15

2. Lux sensor threshold: Lux level to activate the PIR. When the lux level falls below this threshold and the PIR gets triggered, the unit emits a Basic Set Command (Value=0xFF) and turns on its floodlight. This overwrites the Lux level set by the Lux knob.

Parameter	Size	Range	Default
2	2	30~200	50

3. Lux auto report:

Parameter	Size	Range	Default
3	2	0~1440 minutes	0(Off)

4. Multilevel Sensor : Reads back the lux level measured. (Tolerance of ±30 lux. Level above 250 will be read back as 250)

Sensor Type	Precision	Scale	Size	Sensor Value
0x03	0	1	2	<250

Command Classes

The module supports Command Classes including...
- COMMAND_CLASS_ZWAVEPLUS_INFO_V2
- COMMAND_CLASS_ASSOCIATION_V2*
- COMMAND_CLASS_ASSOCIATION_GRP_INFO*
- COMMAND_CLASS_TRANSPORT_SERVICE_V2
- COMMAND_CLASS_VERSION_V2*
- COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2*
- COMMAND_CLASS_DEVICE_RESET_LOCALLY*
- COMMAND_CLASS_POWERLEVEL*
- COMMAND_CLASS_SECURITY
- COMMAND_CLASS_SECURITY_2
- COMMAND_CLASS_SUPERVISION*
- COMMAND_CLASS_FIRMWARE_UPDATE_MD_V4*
- COMMAND_CLASS_NOTIFICATION_V4*
- COMMAND_CLASS_SWITCH_BINARY*
- COMMAND_CLASS_SENSOR_MULTILEVEL_V7*
- COMMAND_CLASS_CONFIGURATION*

*Items marked an asterisk are secure command classes.

Troubleshooting

Table below lists typical problems encountered:

Symptom	Possible Cause	Recommendation
Floodlight does not turn on for 5 seconds after power is connected.	Power is not connected properly.	Check if wall switch is on. Confirm wiring is correct. Check supply breaker / fuse.
Cannot carry out inclusion and association	Floodlight already paired to another Z-Wave Controller.	Perform a factory reset.
Floodlight flashes on and off		The unit's lux sensor is being triggered off by reflected light
Z-Wave controller cannot communicate with the unit	Out of range.	1. Relocate the controller closer to the unit. 2. Install a Z-Wave repeater such as smart plugs or other AC devices that can operate as a Repeater.
Floodlight remains on	PIR detector triggered by unknown heat source.	1. Check time setting 2. Cover its PIR Detector with black insulating tape. If after the timer expires and the floodlight turns off this indicates that the PIR Detector can see a moving heat source e.g: radiator, heater, boiler outlet, open window, open exterior door or moving branches or bushes retaining heat from the daytime period.

Manual Inclusion/Exclusion

The table below lists the several steps involved when adding or removing the unit from the Z-Wave network.

Action/Status	Description	LED indication
No node ID	The Z-Wave Controller does not allocate a node ID to the unit.	2-second on, 2-second off for 2 minutes.
Auto Inclusion	The power is applied for the first time and no node ID has been stored in the module, or after executing reset.	LED blinks rapidly during Inclusion, LED stops blinking when Inclusion is complete.
Manual Inclusion	1. Put the Z-Wave Controller into inclusion mode.	LED blinks rapidly during Inclusion, LED stops blinking when Inclusion is complete
	2. Press the tamper switch 3 times within 1.5 seconds to put the unit into inclusion mode.	
Exclusion	1. Put the Z-Wave Controller into exclusion mode.	
	2. Press the tamper switch 3 times within 1.5 seconds to put the unit into exclusion mode.	
Factory Reset (This procedure should only be used when the controller is inoperable.)	1. Press the tamper switch 3 times within 1.5 seconds to put the unit into exclusion mode.	
	2. Within 1 second of step 1, press the tamper switch again and hold until LED is off (about 5 seconds).	
	3. Node ID is excluded. The device reverts to factory default state and will be in auto-inclusion mode for 4 minutes.	

✕ Failed or successful results in including/excluding the ID can be viewed on the Z-Wave Controller.