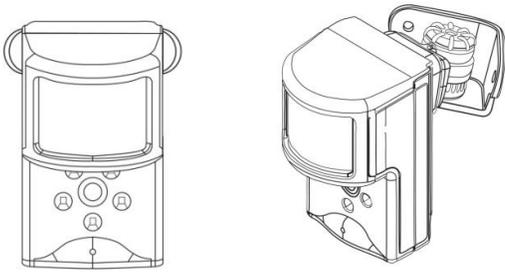


Alarm.com Image Sensor

Installation Guide



PRODUCT SUMMARY

The Image Sensor is a pet immune PIR (passive infrared) motion detector with a built-in camera. The sensor is designed to capture images during alarm or non-alarm events when motion is detected. Users can also initiate image capture on-demand to Peek-In on their property. Images are stored locally and uploaded either automatically when motion is captured during alarm events or manually when requested by the user. Once uploaded, images are available for viewing on the Alarm.com website or an Alarm.com smart phone app. The sensor is battery powered, all wireless, and simple to install and operate. A subscription to an Alarm.com service plan is required.

Highlighted Features

- Battery operated
- Communicates wirelessly to the security control panel
- 35 feet by 40 feet detection coverage area
- Configurable PIR sensitivity and pet immunity settings
- Image: QVGA 320x240 pixels
- Color Images (except in night vision)
- Night vision image capture with infrared flash (black & white)
- Tamper detection, walk test mode, supervision

Service Plan Options

Image capture features require the Alarm.com Interactive Gold Service Plan or either an Alarm.com Basic or Advanced Interactive Service Plan and one of the following Image Sensor add-ons:

- **Image Sensor Alarms**- Includes upload of images from alarm events only.
- **Image Sensor Plus**- Includes upload of images from alarm events and non-alarm events. User can configure *Daily View* schedules to receive images automatically each day or *Peek-In* to initiate an on-demand image capture immediately, or when the next motion occurs. Users can also request images that are captured automatically while the system is *Armed Away* or following a *Disarm* from an *Armed Away* state. Up to 40 captured events can be uploaded per month. Additional image uploads may be added in increments of 20 at an additional charge.

HARDWARE COMPATIBILITY

- **Security Control Panel:** Qolsys IQ Panel
- **Available Zones:** One zone per Image Sensor installed. Up to five Image Sensors may be added per system.

HARDWARE INSTALLATION

1. **Create Alarm.com Customer Account**- Select service plan (including Image Sensor add-on) and register the radio serial number on the Dealer Website.
2. **Registration Test** - Power the panel and initiate a comm-test (Settings → System Tests → Cellular Test) to ensure the radio is communicating with the Alarm.com NOC.
3. **Enroll Sensor in Panel** - To enroll the sensor on an IQ Panel, follow these steps at the control panel:
 - a. Begin with the batteries removed from the sensor.
 - b. On the panel, select the "Settings" icon at the bottom left hand corner of the homepage.
 - c. Enter the installer code (1-1-1-1 by default).
 - d. Select the "Installation" icon.
 - e. Select the "Security Sensors" icon.
 - f. Select the "Auto Learn Sensor" icon.
 - g. Once on the Auto Learn page, insert the batteries into the sensor. Wait (approximately 20 seconds) for the control panel screen to display: "Image Sensor [X] is requesting to be added in your list. Do you want to continue?" The LED on the sensor will turn solid for ~5 seconds once the sensor is detected.
 - h. Click OK.
 - i. In the follow screen, select the sensor type, sensor name, chime type, sensor group and voice prompt settings. Below are the default settings for each.
 - i. Sensor Type ~ Image Sensors
 - ii. Sensor Name ~ Image Sensor
 - iii. Chime Type ~ None
 - iv. Sensor Group ~ 17-IS-Away-Instant Motion
 - v. Voice Prompts ~ Off
 - j. Perform another panel comm-test to be sure that Alarm.com receives the updated device equipment list. This will speed up the sensor initialization process.

The sensor is now learned into the panel. Sensors are enrolled in group 17 by default. To change the sensor group after the sensor is enrolled, use the *Edit Sensor* icon under Settings → Installation → Security Sensors. Image Sensors may be enrolled in

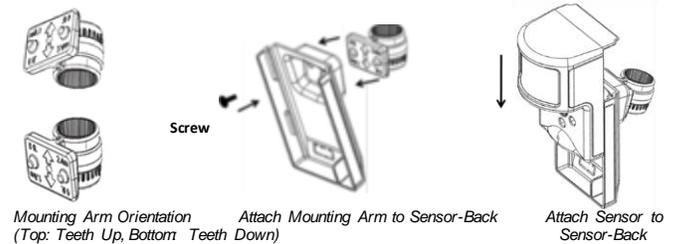
groups 15, 17, 20, 25 or 35. After enrollment, be sure to keep the sensor and panel powered so the sensor can complete an initialization process with the Alarm.com Network Operations Center. This process will take several minutes. Images cannot be captured until initialization is complete.

4. Choose Sensor Location and Mount

- a. **Determine sensor mounting location** based on installation scenario and criteria noted in the "Installation Guidelines." For best image capture, the target capture areas should be centered in the frame. (e.g. If customer wants to capture people coming through door, the doorway should be centered in camera/PIR view.)
- b. **Verify RF communication prior to mounting**-To verify RF signal strength, tamper sensor and place near mounting location. Activate PIR for 2 minutes. Check signal strength report at the panel under Settings → System Tests → Image Sensor Test → select "View" for the Image Sensor in test → [signal strength].

The sensor performs best when the signal strength is above 40%. The signal strength must be greater than 30% for sensor to function properly. Signal strength can fluctuate depending on environmental conditions and interference, so be sure that the signal is consistently in range.

- c. **Determine desired mounting angle** for customer scenario; attach mounting arm to sensor-back and re-attach sensor to sensor-back. The mounting arm attaches to the back of the sensor and allows the sensor angle to vary based on the application. To obtain the full 35' x 40' coverage area, the sensor should be mounted at a 6° downward angle. This corresponds to a "teeth up" orientation of the mounting arm. For most smaller areas in residential installations, the arm can be mounted with the "teeth down" for a deeper angle (18°). Secure the back of the sensor to the mounting arm with the provided screw. If the camera will be mounted perpendicular to the wall, the sensor can be mounted without the mounting arm/bracket directly on the wall, at a 12° angle.

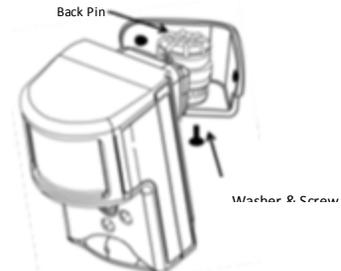


- d. **Choose applicable mounting bracket** for customer scenario. The sensor hardware packet contains 2 mounting brackets for different mounting scenarios. Use the provided large screws and anchors to attach the bracket to the wall.



Mark location of bracket holes on mounting surface at a height of 8 feet for maximum coverage area. (Leave at least 3 inches of clearance above the sensor to allow for battery replacement without uninstalling the mounting bracket.)

- e. **Place sensor with arm on mounting bracket.** Adjust the horizontal positioning of the sensor to point towards the desired coverage area. To adjust positioning, lift the mounting arm at least 1/3 of the way off the bracket and rotate the arm.
- f. **Secure the mounting arm location** by sliding lock pin into the hole. Use the washer and remaining small screw to secure the lock pin by screwing upwards through the bottom of the hole in the mounting bracket. (*Note: To make it easier to adjust PIR/camera field of view in step 6, complete this step after horizontal sensor positioning is finalized.*)



5. Complete PIR Testing & Verify RF Coverage

Verify that PIR coverage adequately covers area by performing a walk test. (See "Programming" section for more details.) Verify that the sensor signal strength is strong while mounted. **The signal strength must be above 30% for the sensor to function properly.**

6. Test Image Capture

To conserve the customer's monthly image upload quota, automatic alarm uploads are disabled for the first four hours after any new sensor (Image Sensor or other) is installed into the system. Installers can verify sensor positioning and test image captures directly

on the panel without having to access the customer's account or deducting from the customer's monthly upload quota. If possible, installers should also test night vision captures to ensure sensor infrared flash will not be reflecting off surfaces and washing out images.

To request test images from the panel, go to Settings → System Tests → Image Sensor Test → select "View" for the Image Sensor in test → Sensor Tests → Request Peek-In. An image will be requested from the sensor and sent to the control panel for viewing under Camera/Image → Image Sensor and will also be displayed in the customer's *Image Gallery* on the Customer Website. These images will not be counted against the customer's monthly upload quota.

PIR Lens and Camera Coverage Diagrams

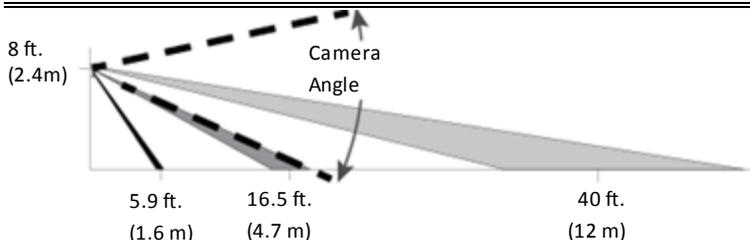


Figure 1. Side View: PIR Lens Coverage

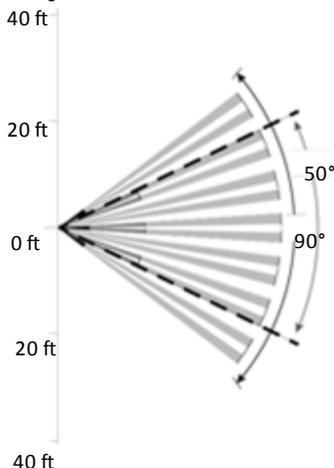


Figure 2. Top View: PIR Lens Coverage

As indicated in Figure 2, the camera coverage area is narrower than the PIR coverage area. When installing, mount sensor where subjects are likely to be centered in or across PIR and camera field of view.

INSTALLATION GUIDELINES

Before permanently mounting the Image Sensor, evaluate potential locations and consider the following factors to ensure optimal performance and false alarm protection:

Range-Is the location close enough to the security panel to ensure adequate signal strength?

False Alarm Immunity- Is installation location false alarm prone? Reduce the risk of motion-triggered false alarms by making sure the location is free of vibration and the device will not face a local heat source, window, or areas with high pet activity. (Also, make sure area is free of elevated surfaces where pets may climb.)

Capture Orientation- Is the location ideally suited for detecting motion and capturing images when there is an intruder or activity? Consider where the subject is likely to enter the area and whether or not they will be facing the sensor.

Lighting Conditions- How good is the artificial and natural light? Will daytime and nighttime lighting conditions ensure adequate image quality?

- If possible, locate sensor within 100 ft of the panel especially if there are many walls between the sensor & panel, or if the panel and sensor are located on different floors. While the transmitter may have an open air range of 400 ft, installation site conditions can reduce range considerably.
- Avoid facing the sensor toward or close to areas that may affect communication such as metallic objects or electronics likely to produce interference. Verify sensor RF communication at panel, even if within recommended distance.
- For optimal detection capabilities, mount the sensor where someone will most likely walk across the sensor coverage area as opposed to directly towards the sensor.
- By default, the Image Sensor is set to "Normal" sensitivity. A more sensitive motion profile ("High") and a less sensitive profile providing pet immunity for pets up to 40 lbs ("Low") can be selected at the control panel or through the Alarm.com Dealer Website.
- The Image Sensor is designed for indoor use only and should not be installed outdoors. For proper operation in pet immune applications, the room should be kept between 60° and 110° F.

- To maximize night vision image quality, do not orient sensor towards surfaces that will create glare when infrared flash occurs. Avoid orienting the sensor such that the ceiling or adjacent walls are in the camera field of view.

- The sensor must be mounted on a flat wall surface (do not set on shelf) free of vibrations.

PROGRAMMING

The Image Sensor is enrolled in the control panel via the Security Sensors menu. Additional programming options available for configuring and testing include:

A. PIR Sensitivity Settings

By default, the Image Sensor is configured with a standard motion sensitivity profile ("Normal"). The sensor can also be set to a more sensitive motion profile ("High") and a less sensitive profile with pet immunity for pets up to 40 lbs ("Low"). The sensitivity can be configured through the control panel or Alarm.com Dealer Website.

On the IQ Panel, enter the "Image Sensor Test" menu under Settings → System Tests. Select the "View" button for the sensor to configure. Select "Set PIR Sensitivity" and choose the desired motion profile. Once selected, the new motion profile setting should be listed next to "PIR sensitivity."

(Note: Using the high sensitivity profile increases the risk of false alarms, especially if the sensor is facing windows or sources of heat. When mounting the sensor near windows or heat sources use caution and select the "Low" PIR sensitivity setting.)

B. PIR Activation and Test Mode

During normal operation, the PIR can be activated at most once every three minutes while the system is disarmed. There is a 30-second delay after powering before PIR detection is active. For the first 3 minutes after a sensor is enrolled in a network, the sensor will enter PIR test mode and the sensor LED will illuminate for 3 seconds on each motion activation (at most every 8 seconds). For additional testing time, put the sensor into test mode via the control panel or by tampering the sensor.

To enter the 3 minute test mode on the IQ Panel, enter the "Image Sensor Test" menu under Settings → System Tests. Select the "View" button for the sensor to configure. Select "Sensor Tests" and then press "Start PIR Test". The screen will display "The PIR test is now in progress."

(Note: It may take up to 30 seconds for test mode to take effect after requesting "Start PIR Test" at the panel.)

C. Tamper and Malfunction Reports

By default, trouble conditions (malfunction, tamper & low battery) are displayed in the "Alerts" tab under the "Status" icon from the homepage. Trouble conditions are always reported to the Alarm.com Customer Website and customers will receive tamper/low battery/malfunction notifications if they are subscribed, regardless of the panel setting.

A built-in accelerometer detects movement or re-positioning of the Image Sensor and will initiate a tamper whenever a change in sensor orientation is detected. Reporting will take place even if the sensor back plate remains in place. The tamper will automatically be cleared after the sensor has been returned to the upright position and no movement has been detected for 5 minutes. A tamper can also be cleared by resetting the sensor.

D. Sensor LED

By default, the image sensor LED will not illuminate when activated by motion unless the sensor is in test mode. The LED can be enabled via the Alarm.com Dealer Website for each Image Sensor on a customer's account. When enabled, the LED will illuminate for 3 seconds on motion activations (at most every 3 minutes while disarmed).

E. Image Capture Settings

Capture settings are configured automatically for each sensor based upon the customer's Image Sensor service plan so it is important to enroll the customer in a service plan before enrolling the sensor.

Alarms & Image Sensor Plus Plan:

- Captures motion-activated images while the system is *Armed Away* to catch potential intruders before the alarm sounds. Continues to capture images until the system is *Disarmed*. On the Alarms Plan, these images are not sent or available to the customer unless there is an alarm event. On the Plus Plan, the customer has an option of requesting any images captured, even if an alarm is not triggered.
- Captures motion-activated images on an instant alarm (panic, etc.) or an alarm from *Armed Stay* after an initialization period (up to a 30 second delay).
- Automatically transmits up to 5 motion-activated image events (with 2 images/event) to Alarm.com and sends images to recipients as selected by the customer. Images are automatically selected for transmission, which begins when the panel issues an alarm locally (pending alarm) and ends when the panel is *Disarmed*, or after 5 minutes (whichever comes first).

Plus Plan Only:

- Captures the first motion event after the panel is *Disarmed* from *Armed-Away*.
- Customers have the ability to request non-alarm images (such as entry delay or post-disarm) to be uploaded and sent to them (up to their monthly upload quota).
- Customers can request property *Peek-In* images to be taken and sent to them right away or on the next motion activity (up to their monthly upload quota).
- Customer can configure *Daily View* rules that automatically capture and upload the first motion event during a specific time period each day.

SENSOR RESET BUTTON

Insert a paperclip into the hole on the front of the sensor to access the reset button. Press and hold for 3 seconds to power cycle the sensor. Press and hold a full 10 seconds until the sensor LED flashes rapidly to reset the sensor and clear it from its network. The

sensor must be reset prior to enrolling in a new network.
 (Note: The sensor can only be cleared from its network using the reset button if it is currently not communicating with its network. If the sensor is still communicating with its network, clear sensor by deleting it from the system it is enrolled in.)



Insert Paperclip to access reset button

Figure 3. Sensor Reset Button

BATTERY REPLACEMENT

When a sensor's batteries are low, the panel will display a low battery alert for the sensor. Notifications are also issued via the Alarm.com platform if the customer has subscribed to this notification type.

To replace the sensor batteries, slide the front of the sensor up off the sensor-back. (No need to remove or un-mount entire sensor-back and mounting arm.) To maximize battery life, replace the sensor batteries with 2 AA 1.5v Energizer Ultimate Lithium batteries. Dispose of used batteries according to the battery manufacturer instruction and following local regulations.

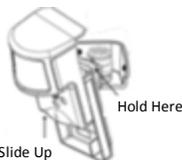


Figure 4. Removing Sensor for Battery Replacement

(Note: The operation of the sensor with alkaline batteries has not been verified for compliance with UL standards.)

OTHER FEATURE COMPATIBILITY

Two-Way Voice Compatibility

When the Image Sensor is installed on a system with Two-Way Voice, image transmission during an alarm may be interrupted by the two-way session. Image transmission will resume once the call has terminated. Images cannot be transmitted while a call is in session.

Z-Wave Compatibility

All IQ Panels are compatible with both the Image Sensor and Z-Wave devices. No additional hardware is needed

TROUBLESHOOTING

General Troubleshooting Steps

- ☑ **Verify Radio Signal Strength:** If the radio is having a problem signaling, motion activations and image transmission may be delayed or cancelled.
- ☑ **Verify Image Sensor RF Signal Strength:** The signal strength must be above 30% for the sensor to function properly.
- ☑ **Verify Image Sensor Service Plan:** Image capture functionality depends on the customer's service plan. Be sure the proper Image Sensor add-on is selected; delete sensor and re-enroll.

Sensor Not Enrolling

- ☑ **Verify Sensor is Receiving Power:** After inserting batteries, the sensor LED should illuminate or flash within 10 seconds.
- ☑ **Verify Sensor is Not Communicating with Another Network:** If the sensor has been previously enrolled in a different system or daughterboard, delete the sensor from the system and hold the sensor reset button for 10 seconds to clear the sensor before attempting to enroll the sensor in a new network.

Sensor Non-Responsive

- ☑ **Verify Range:** Under the "Image Sensor Test" menu, select "View" for the respective Image Sensor and verify under "Signal strength" that the sensor is registering a strong signal. If signal strength is low, move non-responsive sensor closer to control panel, verify signal strength and see if communication resumes.
- ☑ **Replace Batteries:** Check battery level at the panel (located on individual Image Sensor pages within "Image Sensor Test") and install fresh sensor batteries.

False Motion Activations

- ☑ **Check Environmental Elements:** Heating or cooling elements may adversely affect sensor performance. Test sensor with and without these elements to determine interference.
- ☑ **Check Sensor Positioning:** The sensor may not be properly positioned to capture the desired motion. Check horizontal positioning of sensor and re-mount as necessary.
- ☑ **Check PIR Sensitivity Setting:** Verify that the proper sensor motion profile has been selected through the setup menu or select a less sensitive profile.

Sensor Tamper

- ☑ The sensor detects changes in sensor orientation and can register a tamper regardless of the sensor-back being removed. A tamper will automatically be cleared after the sensor has been returned to the upright position and has not detected any tamper activity for 5 minutes. With the sensor mounted, the tamper may also be cleared by holding the sensor reset button for 3 seconds to initiate a power cycle.

Images Not Captured

- ☑ **Check Service Plan:** Make sure the account has the proper Image Sensor add-on. Images cannot be captured without an Image Sensor service plan. For alarm functionality, add the "Image Sensor Alarms" plan. For alarms and enhanced functionality, add the "Image Sensor Plus" plan.

- ☑ **Verify Sensor Rules:** Make sure the sensor initialization process has been completed. On the Dealer Website, make sure that the sensor rules have been confirmed using the "Rules Confirmed" column.
- ☑ **Enable Auto Uploads:** During the first four hours after any sensor is enrolled onto the system, alarm images will not automatically be uploaded to Alarm.com. Automatic uploads are automatically enabled after four hours. Enable uploads sooner from the Dealer Website. On the Image Sensor Plus plan, view and request captured images from any test alarms from the Customer Website.
- ☑ If the camera LED is blinking, refer to this chart for LED trouble diagnostics.

Image Sensor Red Status LED Activity Reference		
Device Status or Error	LED Pattern	Duration of LED Pattern
Sensor Power-Up	Solid for 5 Seconds	Approximately first 5 seconds after powering.
Sensor Joins or Rejoins Network	Solid for 5 Seconds	First 5 seconds after sensor joins a new network (during enroll process) or rejoins its existing network.
Searching for Network to Join	Fast Blink for 5 Seconds at a Time	Repeats pattern for up to 60 seconds after powering until the sensor enrolls in a network.
Attempting to Rejoin Network	Slow Blink for 5 Seconds at a Time	Repeats pattern for up to 60 seconds after power cycle until the sensor reconnects to its network. (Note: This means the sensor has already been enrolled into a network and is trying to connect to it. If attempting to enroll sensor in a new network, hold reset button for a full 10 seconds (until LED blinks rapidly) to clear the old network before adding to new network.)
Motion Test Mode	Solid for 3 Seconds at a Time	Repeats for each motion activation during the 3 minutes after sensor joins network, has been tampered, or is placed in PIR test mode. (Note: In test mode, there is an 8 second "sleep" timeout between motion trips.)
Network Communication Problem	Fast Blink for 1 Second at a Time	Pattern begins after 60 seconds of searching for (and unsuccessfully joining) a network and repeats until RF communication is restored. Pattern persists as long as the sensor is not enrolled in a network or cannot connect to current network.

TECHNICAL SPECIFICATIONS

Alarm.com Model Number: ADC-IS-200-IQ

Qolsys Part Number: QS-8100-P01-INDV

Power Source: Optimal: 2 AA 1.5v Energizer Ultimate Lithium Batteries. Acceptable: 2 AA 1.5v alkaline batteries (battery life may be reduced significantly).

Expected Battery Life: Approximately 2 years for lithium batteries. Battery life varies by use case depending on certain factors such as weak signal strength and frequency of motion activations, image captures, and IR flashes.

Voltage Thresholds: With lithium batteries, low battery alerts are issued at 3.05V. The sensor cannot operate when the voltage reads below 1.95V.

Operating Temperature Range: 32° to 110°F for non-pet applications, 60° to 110°F for pet applications. Alkaline batteries are not suitable for temperatures below 50° F.

Weight: 3.1 oz. (with batteries, without mounting accessories)

Dimensions: 3.1" h x 1.8" w x 2.3" d

Supervisory Signal: Configurable (4, 12, or 24 hours)

Wireless Signal Range: Greater than 400 ft open air

Color: White

Recommended Mounting Height: 8 ft

Recommended Mounting Angle: 6° for large coverage area and rooms greater than 30 ft ("teeth up" on mounting arm); 18° for rooms less than 30 ft ("teeth down" on mounting arm)

Motion Profiles & Sensor Range: Normal (up to 30 ft, default), High (up to 35 ft), Low (up to 25 ft)

REGULATORY INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: (1) Reorient or relocate the receiving antenna. (2) Increase the separation between the equipment and receiver. (3) Connect the equipment into an outlet on a circuit different from that which the receiver is connected. (4) Consult the dealer or an experienced radio/TV technician for help. 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.

FCC ID: YL6-143IS10 IC: 9111A-143IS10