

# VST-852Pro-Ultra NT PIR Motion Sensor Camera

## Introduction

VST-852Po-Ultra is a ZigBee passive infrared (PIR) motion sensor camera with pet-immune function. It is capable of sending wireless signals and captured images (picture quality of up to 640 x 480 pixels) to the coordinator in the ZigBee network upon movement detection.

The PIR Camera is designed to give a typical detection range of 12 meters when mounted at 2 meters above ground. It has a pet-immune range of 7 meters and will not trigger false alarm from you household pets within this distance.

The PIR Camera utilizes ZigBee technology for wireless signal transmission. ZigBee is a wireless communication protocol that is reliable and has low power consumption and high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and coordinated for data exchange and signal transmission

The PIR Camera serves as an end device in the ZigBee network. It can be included in the ZigBee network to transmit signal upon activation, but cannot permit any other ZigBee device to join the network through the PIR.

## Parts Identification

### 1. Flash LED

The Flash LED delivers sufficient light for image capture under low lighting condition.

Both the Flash LED and the Blue LED will flash once when the Function Button is pressed for 10 seconds to indicate the PIR Camera has been reset.

### 2. IR Sensor

The sensor is intended to detect moving objects.

### 3. PIR Camera Lens

### 4. Blue LED/Function Button

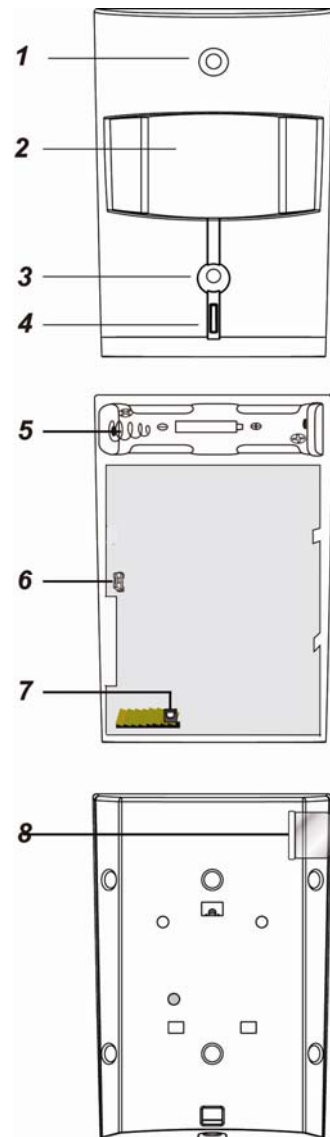
#### LED Indication:

The Blue LED lights up in the following conditions:

- The Blue LED flash once every 20 minutes  
The PIR Camera has lost connection to its current ZigBee network.
- The Blue LED lights up for 30 seconds:  
The PIR Camera is warming up when fault(s) exists in the PIR Camera.
- The Blue LED flashes twice quickly:  
The PIR Camera has successfully joined a ZigBee network after factory reset.
- The Blue LED lights up for 2 seconds under normal operation:  
The PIR Camera has detected a movement when fault(s) exists in the PIR Camera.
- The Blue LED flashes rapidly  
PIR Camera is transmitting pictures to the coordinator of the ZigBee network when fault(s) exists in the PIR Camera.
- The Blue LED and Flash LED flash once  
PIR Camera has been reset.

#### Function Button Usage:

- Press the button once to send a supervision signal.
- To reset the PIR Camera:  
Press and hold the button for 10 seconds. Release the button when both the Flash LED and the Blue LED flash once



## 5. Battery Compartment

## 6. Jumper Switch (JP2)



### Jumper On

The jumper link is inserted connecting the two pins.



### Jumper Off

if the jumper link is removed or “parked” on one pin.

- Jumper On: After transmitting for a detected movement, any further movement detection will transmit the event code again (and the captured images) (**default**).
- Jumper Off: PIR Camera has a “**sleep time**” of approximately 1 minute to conserve power.

## 7. Jumper Switch (JP1)



### Jumper On

The jumper link is inserted connecting the two pins.



### Jumper Off

if the jumper link is removed or “parked” on one pin.

- Jumper On: the Blue LED is enabled (**default**).
- Jumper Off: the Blue LED is disabled.

## 8. Battery Insulator

## Features

### ● **Image Capture**

When the alarm system is armed, the PIR Camera will capture 3 alarm images (Quality: 640 x 480 resolution, or VGA) upon movement detection. You can also manually request the PIR Camera to take a picture through CIE. The captured images will be transferred to ZigBee coordinator or CIE for user to view.

### ● **Warm Up Period**

When the ZigBee network coordinator or system control panel enters arm mode, or when PIR Camera is put into Test Mode, the PIR Camera will warm up for 30 seconds. Do not trigger the PIR Camera during the 30-second warm up period. If the PIR Camera is under low battery, the Blue LED will light up during the warm up period.

### ● **Sleep Timer**

When **Jumper Switch 2** is set to Off, the PIR Camera has a “**sleep time**” of approximately 1 minute to conserve power. After transmitting for a detected movement, the PIR Camera will not retransmit for 1 minute. Any detected movement during this period will extend the sleep time by another minute. Continuous movement in front of the PIR Camera will therefore not exhaust the battery.

### ● **Battery and Low Battery Detection**

The PIR Camera uses two **1.5V “AA” Lithium batteries** in series connection as its power source. The batteries are pre-installed in the PIR Camera. To activate the batteries, pull out the battery insulator.

The PIR Camera features Low Battery Detection function. When the battery voltage is low, the PIR Camera will transmit Low Battery signal to the coordinator in ZigBee network. If movement is detected under Low Battery condition, the Blue LED will light up for 2 seconds.

When changing battery, after removing the old battery, press the Function Button twice to fully discharge before inserting new batteries

### ● **Supervision**

The PIR Camera will transmit a supervision signal to report its condition regularly according to user setting. The factory default interval is 30 minutes. The user can also press the Function Button once to transmit a supervision signal manually.

### ● **Test Mode**

- Test mode is for you to check the PIR camera’s detection range (not shooting coverage).
- To enter Test mode, press and hold the Function button over 3 seconds and release the button to enter the Test mode for 3 minutes.
- The PIR camera will warm up for 30 seconds. Please do not trigger the Camera during this warming-up period.
- After the warm-up period, you can trigger PIR camera to check IR detection range. If PIR camera is triggered, the Blue LED will light up for 2 seconds.

## ZigBee Network Setup

### ● **ZigBee Device Guideline**

ZigBee is a wireless communication protocol that is reliable, has low power consumption and has high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and coordinated for data exchange and signal transmission.

Due to the fundamental structure of ZigBee network, ZigBee device will actively seek and join network after powering on. Since performing a task in connecting network may consume some power, it is required to follow the instructions to avoid draining battery of a ZigBee device

- Ensure your ZigBee network router or coordinator is powered on before inserting battery into the ZigBee device.
- Ensure the ZigBee network router or coordinator is powered on and within range while a ZigBee device is in use.
- Do not remove a ZigBee device from the ZigBee network router or coordinator without removing the battery from a ZigBee device.

### ● **Joining the ZigBee Network**

As a ZigBee device, the PIR Camera needs to join a ZigBee network to transmit signal when a movement is detected. Please follow the steps below to join the device into the ZigBee network.

**The PIR Camera can only join ZigBee network within 3 minutes after power on.**

1. Pull out the battery insulator to activate batteries.
2. **Within 3 minutes after power on**, Press and hold the function button for 10 seconds, release the button when both the Blue LED and flash LED flash once.. Please make sure to enable the permit-join feature on the router or coordinator of your ZigBee network.
3. After joining the ZigBee network, the PIR Camera will be registered in the security system in the network automatically. Please check the ZigBee network coordinator, system control panel, or CIE (Control and Indicating Equipment) to confirm if joining and registration is successful.
4. After joining the ZigBee network, if the PIR Camera loses connection with the ZigBee network, the LED will flash 20 minutes to indicate. Please check your ZigBee network condition and PIR Camera signal range to correct the situation.

### ● **Factory Reset**

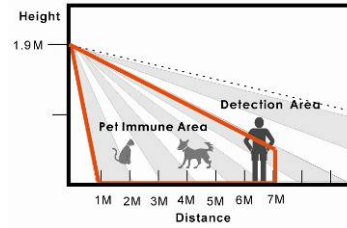
If you want to remove the PIR Camera from the current network and join a new network, you need to use the Factory Reset function to clear the PIR Camera for its stored setting and information first before it can join another network. To perform Factory Reset:

1. The PIR Camera can only be reset **within 3 minutes** after power up. If the PIR Camera has been powered up for more than 3 minutes, remove and reinsert the battery.
2. Press and hold the function button for 10 seconds, release the button when both the Blue LED and flash LED flash once.
3. The PIR Camera has been reset to factory default setting with all its previous network information removed. It will now actively search for available ZigBee network again and join the network automatically.
4. If the PIR Camera successfully joins a ZigBee network, the Blue LED will flash twice to indicate.

# Installation

## ● **Installation Guideline**

- The PIR Camera is designed to be mounted on either a flat surface or in a corner situation with fixing screws and plugs provided.
- The base has knockouts, where the plastic is thinner, for mounting purpose. two knockouts are for surface fixing and four knockouts are for corner fixing as shown in the picture
- **It is recommended to install the PIR Camera in the following locations.**
  - Mount where the animals cannot come to the detection area by climbing on furniture or other objects.
  - Don't aim the detector at stairways the animals can climb on.
  - In a position such that an intruder would normally move across the PIR's field of view.
  - Between 1.9 and 2m above ground for best performance. When mounted at 1.9 meters above ground, it gives a typical PET IMMUNE range of 7 meters. As the PIR Pet-Immune Camera is higher from above ground, it gives a farther PET IMMUNE range.
  - In a corner to give the widest view.
  - Where its field of view will not be obstructed e.g. by curtains, ornaments etc.
  - For a small 3 to 5m room, install between 1.9 to 2m above ground.
- **Limitations**
  - Do not position a PIR Camera to look directly at a door protected by a Door Contact, this could cause the Door Contact and PIR Camera radio signals to be transmitted at the same instant when entering, canceling each other out.
  - Do not install the PIR Camera completely exposed to direct sunlight.
  - Avoid installing the PIR Camera in areas where devices may cause rapid change of temperature in the detection area, i.e. air conditioner, heaters, etc.
  - Avoid large obstacles in the detection area.
  - Not pointing directly at sources of heat e.g. Fires or boilers, and not above radiators.
  - Avoid moving objects in the detection area i.e. curtain, wall hanging etc.



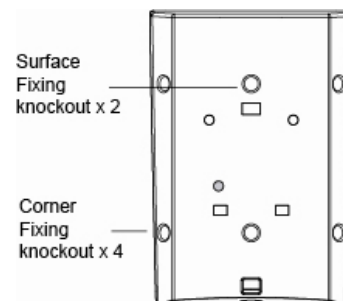
## ● **Using PIR Camera with ZigBee Router**

### **IMPORTANT NOTE**

If PIR Camera installation location is away from your system control panel and requires ZigBee routers to improve signal strength. **DO NOT** use a ZigBee Router without backup battery. A ZigBee router without battery will be powered down during AC power failure and the PIR Camera connected to the router will lose connection with ZigBee network. Plan your PIR Camera installation location using only ZigBee router with backup battery.

## ● **Mounting the PIR Camera**

- **Surface mounting:**
  1. Remove the cover.
  2. Depend on mounting location, Break through either the 2 Surface knockouts at the center, or the 4 Corner knockouts on the edge of the back cover
  3. Use the holes as template to drill holes on the mounting location.
  4. Insert the wall plugs if fixing it into plaster or brick.
  5. Screw the base into the wall plugs.
  6. Screw the cover back onto its base.



## Appendix (For developers only)

- **PIR Camera Cluster ID**

Device ID: <b>852_DEVICEID: 0x404</b> (proprietary)	
Endpoint: <b>0x01</b>	
<b>Server Side</b>	<b>Client Side</b>
<b>Mandatory</b>	
Basic (0x0000)	<i>None</i>
IAS Zone(0x0500)	
<b>Optional</b>	
<i>_852_Cluster(0x0503)</i> (proprietary)	<i>None</i>

- **Attribute of Basic Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 –0xff	Read only	0x01	M
0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 –0xff	Read only	0x00	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 –0xff	Read only	0	O
0x0004	<i>ManufacturerName</i>	Character String	0 – 32 bytes	Read only	Climax Technology	O
0x0005	<i>ModelIdentifier</i>	Character string	0 – 32 bytes	Read only	(Model Version)	O
0x0006	<i>DateCode</i>	Character String	0 – 16 bytes	Read only		O
0x0007	<i>PowerSource</i>	8-bit	0x00 –0xff	Read only		M
0x0010	<i>LocationDescription</i>	Character String	0 – 32 bytes	Read / Write		O
0x0011	<i>PhysicalEnvironment</i>	8-bit	0x00 –0xff	Read / Write	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00 –0x01	Read / Write	0x01	M

- **Attribute of IAS Zone Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0001	<i>ZoneState</i>	8-bit Enumeration	All	Read only	0x00	M
0x0002	<i>ZoneType</i>	8-bit Enumeration	All	Read only		M
0x0003	<i>ZoneStatus</i>	16-bit bitmap	All	Read only	0x00	M
0x0010	<i>IAS_CIE_ADDRESS</i>	IEEE ADDRESS	Valid 64bit IEEE address	Read / Write		M
0x0011	<i>ZONE_ID</i>	Unsigned 8-bit integer	All	Read only	0xFF	M

## **Federal Communication Commission Interference Statement**

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 of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- . Consult the dealer or an experienced radio/TV technician for help.

**FCC Caution:** To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

## **FCC Radiation Exposure Statement**

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 0.5 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 0.5 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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.