

GV-IP Camera

Hardware Manual



- Box Camera
- Ultra Box Camera
- Arctic Box Camera
- Target Box Camera

Before attempting to connect or operate this product,
please read these instructions carefully and save this manual for future use.

ICH265HISIV104-A-EN



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Caution

Risk of explosion if battery is replaced by an incorrect type.

Dispose of used batteries according to the instructions.

Safety Notice

The GV-IPCAM uses a Lithium battery as the power supply for its internal real-time clock (RTC). The battery should not be replaced unless required!

If the battery does need replacing, please observe the following:

- Danger of Explosion if battery is incorrectly replaced
- Replace only with the same or equivalent battery, as recommended by the manufacturer
- Dispose of used batteries according to the manufacturer's instructions

Options

Optional devices can expand your camera's capabilities and versatility. Contact your dealer for more information.

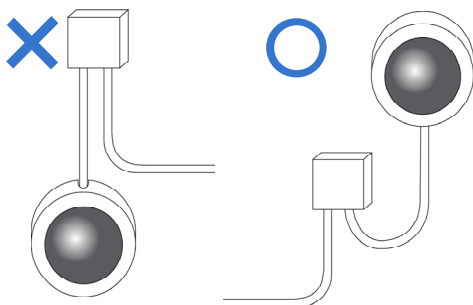
Device	Description
Power Adapter	The power adapter is available for all Box Camera, Ultra Box Camera, and Target Box Camera. Contact your sales representative for the countries and areas supported.
GV-PA191 PoE Adapter	The GV-PA191 PoE adapter is designed to provide power and network connection to the cameras over a single Ethernet cable.
GV-PA482 PoE Adapter	The GV-PA482 PoE adapter is designed to provide power and network connection to GV-BX1500-E / 2400-E / 2510-E / 3400-E / 5300-E / 4700-E / 5310-E over a single Ethernet cable.
GV-POE Switch	The GV-POE Switch is designed to provide power along with network connection for IP devices. The GV-POE Switch is available in various models with different numbers and types of ports.
GV-Mount Accessories	The GV-Mount Accessories provide a comprehensive lineup of accessories for installation on ceiling, wall corner and pole. For details, see <i>GV-Mount Accessories Installation Guide</i> on the Software DVD.

Device	Description
GV-WiFi Adapter	The GV-WiFi Adapter is a plug-and-play device designed to connect GV-BX1200 Series / 1300 series / 1500 series / 2400 series / 2500 series / 3400 series / 4700 series / 5300 series / 5700 series and GV-MFD1501 series / 2401 series / 2501 series / 3401 series / 5301 series to wireless network. This product complies with IEEE 802.11 b/g/n (Draft 3.0) standards for wireless networking.
GV-Relay V2	The GV-Relay V2 is designed to expand the voltage load of GV IP devices. It provides 4 relay outputs, and each can be set as normally open (NO) or normally closed (NC) independently as per your requirement.

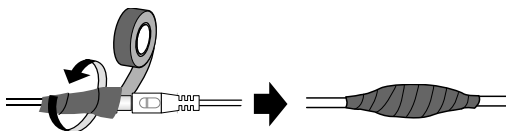
Note for Installing Camera Outdoor

When installing the **IR Arctic Box Camera** outdoor, be sure that:

1. The camera is set up above the junction box to prevent water from entering the camera along the cables.



2. Any PoE, power, audio and I/O cables are waterproofed using waterproof silicon rubber or the like.



3. The silica gel bag loses its effectiveness when the dry camera is opened. To prevent the lens from fogging up, replace the silica gel bag every time you open the camera, and conceal the gel bag in camera within 2 minutes of exposing to open air.

Note for USB Storage and WiFi Adapter

Mind the following limitations and requirements for using USB storage and GV-WiFi Adapter:

1. The USB hard drive must be of 2.5" or 3.5", version 2.0 or above.
2. The USB hard drive's storage capacity must not exceed 2TB.
3. USB flash drives and USB hubs are not supported.
4. External power supply is required for the USB hard drive.
5. To connect a GV-WiFi Adapter, make sure it is connected before the camera is powered on.

Note for Silica Gel Bags

1. The silica gel bag loses its effectiveness when the dry camera is opened. To prevent the lens from fogging up, replace the silica gel bag every time you open the camera, and conceal the gel bag in camera within 2 minutes of exposing to open air.
2. When the camera is shipped, a silica gel bag will be included inside the camera. For the first-time user, replace the silica gel bag prior to the installation to avoid foggy live view.

Chapter 1 Box Camera

The Box Camera is a series of indoor IP cameras consisting of fixed focal and varifocal models in different resolutions. The Box Camera supports lens replacement and features an automatic infrared-cut filter for day and night surveillance. The **super low lux** models are capable of displaying color live view in near darkness. Models equipped with a **mini USB port** can be connected wirelessly through a GV-WiFi Adapter (optional). The **WDR Pro** models can produce clear image for scenes with contrasting intensity of lights (see *1.2.1 Wide Dynamic Range Pro* for details). Models using **P-Iris** allow for precise control of exposure, producing images with better clarity and contrast. For details on related models, see *1.2 Features*. The Box Camera models are detailed below:

Box Camera

Model No.		Specifications	Description
GV-BX120D	Varifocal Lens	Auto Iris, f:2.8 ~ 12 mm, F/1.4, 1/3" CS Lens	1.3 MP, H.264, Low Lux, D/N
GV-BX130D-0		Auto Iris, f: 2.8 ~ 12 mm, F/1.4, 1/3" CS Lens	1.3 MP, H.264, D/N
GV-BX130D-1	Fixed Lens	Fixed Iris, f: 4 mm, F/1.4, 1/3" CS Lens	1.3 MP, H.264, D/N
GV-BX140DW	Varifocal Lens	Fixed Iris, f: 2.8 ~ 12 mm, F/1.4, 1/3" CS Lens	1 MP, H.264, D/N, WDR Pro
GV-BX220D-2		Auto Iris, f: 2.8 ~ 6 mm, F/1.3, 1/3" CS Lens	2 MP, H.264, D/N

Model No.		Specifications	Description
GV-BX220D-3	Varifocal Lens	Auto Iris, f: 2.8 ~ 12 mm, F/1.4, 1/3" CS Lens	2 MP, H.264, D/N
GV-BX320D-0	Varifocal Lens	Auto Iris, f: 3.1 ~ 8 mm, F/1.2, 1/3" CS Lens	3 MP, H.264, D/N
GV-BX320D-1		Auto Iris, f: 2.8 ~ 6 mm, F/1.3, 1/3" CS Lens	
GV-BX520D		Manual Iris, f: 4.5 ~ 10 mm, F/1.6, 1/2" CS Lens	5 MP, H.264, D/N
GV-BX1200-0F	Fixed Lens	Fixed Iris, f: 4 mm, F/1.5, 1/3" CS Lens	1.3 MP, H.264, Low Lux, D/N
GV-BX1300-0F			1.3 MP, H.264, D/N
GV-BX1200-1F	Fixed Lens	Fixed Iris, f: 8 mm, F/1.6, 1/2.5" CS Lens	1.3 MP, H.264, Low Lux, D/N
GV-BX1300-1F			1.3 MP, H.264, D/N
GV-BX1500-1F			1.3 MP, H.264, Super Low Lux, D/N
GV-BX2400-1F			2 MP, H.264, D/N, WDR Pro
GV-BX2500-1F			2 MP, H.264, Super Low Lux, D/N
GV-BX3400-1F			3 MP, H.264, D/N, WDR Pro

Model No.		Specifications	Description
GV-BX1200-2F	Fixed Lens	Fixed Iris, f: 12 mm, F/1.6, 1/2.5" CS Lens	1.3 MP, H.264, Low Lux, D/N
GV-BX1300-2F			1.3 MP, H.264, D/N
GV-BX1500-2F			1.3 MP, H.264, Super Low Lux, D/N
GV-BX2400-2F			2 MP, H.264, D/N, WDR Pro
GV-BX2500-2F			2 MP, H.264, Super Low Lux, D/N
GV-BX3400-2F			3 MP, H.264, D/N, WDR Pro
GV-BX1200-3V	Varifocal Lens	Auto Iris, f:2.8 ~ 12 mm, F/1.4, 1/2.7" CS Lens	1.3 MP, H.264, Low Lux, D/N
GV-BX1300-3V			1.3 MP, H.264, D/N
GV-BX1500-3V			1.3 MP, H.264, Super Low Lux, D/N
GV-BX2500-3V			2 MP, H.264, Super Low Lux, D/N
GV-BX2600		Auto Iris, f:3 ~ 10.5 mm, F/1.4, 1/2.7" CS Lens	2 MP, H.264, Super Low Lux, D/N, WDR Pro
GV-BX3400-5V		Auto Iris, f: 2.8 ~ 6 mm, F/1.3, 1/3" CS Lens	3 MP, H.264, D/N, WDR Pro

GV-BX5300-6V		Manual Iris, f: 4.5 ~ 10 mm, F/1.6, 1/2" CS Lens	5 MP, H.264, D/N
GV-BX1500-8F	Fixed Lens	Fixed Iris, f: 2.8 mm, F/1.8, 1/2.5" CS Lens	1.3 MP, H.264, Super Low Lux, D/N
GV-BX2500-8F			2 MP, H.264, Super Low Lux, D/N
GV-BX3400-8F			3 MP, H.264, D/N, WDR Pro
GV-BX5300-8F			5 MP, H.264, D/N
GV-BX4700-8F		Fixed Iris, f: 2.8 mm, F/1.8, 1/2.5" CS Lens	4 MP, H.265, Super Low Lux, D/N, WDR Pro
GV-BX2700-8F		Fixed Iris, f: 2.8 mm, F/1.8, 1/2.5" CS Lens	2 MP, H.265, Super Low Lux, D/N, WDR Pro
GV-BX5700-8F		Fixed Iris, f: 2.95 mm, F/2.0, 1/1.8" CS Lens	5 MP, H.265, Low Lux, D/N, WDR
GV-BX12201	Varifocal Lens	DC drive Iris, f: 4.1 ~ 9 mm, F/1.6, 1/1.8" CS Lens	12 MP, H.264, D/N

P-Iris Models

Model No.		Specifications	Description
GV-BX1500-3V	Varifocal Lens	P-Iris, f: 3 ~ 10.5 mm, F/1.4, 1/2.5" CS Lens	1.3 MP, H.264, Super Low Lux, D/N
GV-BX2500-3V			2 MP, H.264, Super Low Lux, D/N
GV-BX3400-3V			3 MP, H.264, D/N, WDR Pro
GV-BX2700-3V		P-Iris, f: 3 ~ 10.5 mm, F/1.4, 1/2.7" CS Lens	2 MP, H.265, Super Low Lux, D/N, WDR Pro
GV-BX4700-3V		P-Iris, f: 3 ~ 10.5 mm, F/1.4, 1/2.7" CS Lens	4 MP, H.265, Super Low Lux, D/N, WDR Pro
GV-BX5300-6V		P-Iris, f: 3.3 ~ 10.5 mm, F/1.4, 1/2.5" CS Lens	5 MP, H.264, D/N
GV-BX5700-3V		P-Iris, f: 3.6 ~ 10 mm, F/1.5, 1/1.8" CS Lens	5 MP, H.265, Low Lux, D/N, WDR

1.1 Packing List

1.1.1 For H.265 Cameras

- Box Camera
- Terminal Block (2-Pin and 3-Pin)
- Fixed Focal or Varifocal Megapixel Lens
- Six Lens Rings (only for Varifocal Lens)
- Video Out Wire
- Camera Holder
- Holder Screw x 2
- GV-IPCAM Software DVD
- GV-Software DVD
- Warranty Card

1.1.2 For H.264 Cameras

- Box Camera
- Terminal Block (2-Pin and 3-Pin)
- Fixed Focal or Varifocal Megapixel Lens
- Six Lens Rings (only for Varifocal Lens)
- Video Out Wire
- Camera Holder
- Holder Screw x 2
- Power Adapter
- GV-IPCAM Software DVD
- GV-Software DVD
- Warranty Card

Note: The power adapter can be excluded upon request.

1.2 Features

- Image sensor

Camera Model	Image Sensor
GV-BX120D GV-BX1200 Series	1/3" progressive scan low lux CMOS
GV-BX130D Series GV-BX1300 Series GV-BX220D Series GV-BX320D Series GV-BX520D GV-BX5300 Series	1/2.5" progressive scan CMOS
GV-BX1500 Series	1/3" progressive scan super low lux CMOS
GV-BX2500 Series GV-BX2600 GV-BX2700 Series	1/2.8" progressive scan super low lux CMOS
GV-BX2400 Series GV-BX3400 Series	1/3.2" progressive scan CMOS
GV-BX4700 Series	1/3" progressive scan CMOS
GV-BX5700 Series	1/1.8" progressive scan CMOS
GV-BX12201	1/1.7" progressive scan CMOS

- Frame Rate

Camera Model	Frame Rate
GV-BX120D GV-BX130D Series GV-BX1200 Series GV-BX1300 Series GV-BX1500 Series	Up to 30 fps at 1280 x 1024
GV-BX140DW	Up to 30 fps at 1280 x 720
GV-BX220D Series GV-BX2400 Series GV-BX2500 Series GV-BX2600 GV-BX2700 Series	Up to 30 fps at 1920 x 1080
GV-BX320D Series GV-BX3400 Series	Up to 20 fps at 2048 x 1536
GV-BX520D GV-BX5300 Series	Up to 10 fps at 2560 x 1920
GV-BX4700 Series	Up to 25 fps at 2560 x 1440 Up to 30 fps at 2048 x 1520
GV-BX5700 Series	Up to 30 fps at 2592 x 1944
GV-BX12201	Up to 15 fps at 4000 x 3000 Up to 30 fps at 3840 x 2160

- Dual streams from H.264 or MJPEG
- Dual streams from H.265, H.264 or MJPEG (for GV-BX2700 Series / 4700 Series / 5700 Series)
- Day / Night function (with removable IR-cut filter)
- Wide Dynamic Range Pro
(for GV-BX140DW / 2400 Series / 2500 Series / 2600 / 2700 Series / 3400 Series / 4700 Series)
- P-Iris for auto iris adjustment (for GV-BX1500-3V / 2500-3V / 2700-3V / 3400-3V / 4700-3V / 5300-6V / 5700-3V)
- Defog

- Two-way audio
- One sensor input and alarm output
- TV-out support
- Micro SD card slot (SD/SDHC) for local storage (GV-BX2700 Series / 4700 Series / 5700 Series support SDXC card as well)
- NAS recording (for Box Camera using firmware V3.0 or later)
- Recording assigned by GV-Edge Recording Manager (Windows & Mac) for Box Camera using firmware V3.0 or later
- Mini USB slot for WiFi Adapter or a USB hard drive (for GV-BX1200 Series / 1300 Series / 1500 Series / 2400 Series / 2500 Series / 2600 / 2700 Series / 3400 Series / 4700 Series / 5300 Series / 5700 Series only)
- 3D noise reduction (for GV-BX1500 Series / 2500 Series / 2600 / 2700 Series / 4700 Series / 5700 Series)
- 2D noise reduction (except GV-BX1500 Series / 2500 Series / 2600)
- Smart streaming (for GV-BX2700 Series / 4700 Series / 5700 Series)
- Motion detection
- Tampering alarm
- Privacy mask
- Text overlay
- Video Analysis (GV-BX2600 only)
- IP address filtering
- DC 12V and PoE (IEEE 802.3af)
- Megapixel lens
- Support for iPhone, iPad, Android and 3GPP
- 31 languages on Web interface
- ONVIF (Profile S) conformant

Note: GV-BX12201 does not support the memory card and external USB hard drive for local storage.

1.2.1 Wide Dynamic Range Pro

Objects may appear as silhouettes when they are backed with intense lights. The Wide Dynamic Range Pro (WDR Pro) is designed to solve this problem using a WDR sensor. In **GV-BX140DW**, **GV-BX2400 Series**, **GV-BX2600**, **GV-BX2700 Series**, **GV-BX3400 Series** and **GV-BX4700 Series**, the WDR sensor is able to process the image and show details in bright and dark areas at the same time. An example of WDR Pro in action is shown below.

No WDR: underexposure



WDR: perfect exposure



For GV-IPCam models that support WDR, the WDR effect is achieved through software programming.

1.3 Overview

1.3.1 GV-BX120D / 130D Series / 140DW / 220D Series / 320D Series / 520D

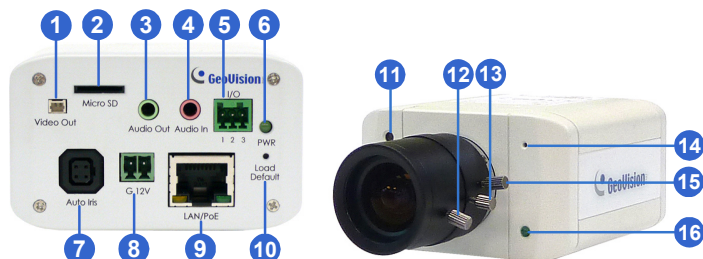


Figure 1-1

Note:

1. The Auto Iris connector (No. 7) is only functional in GV-BX120D, GV-BX130D-0, GV-BX220D and GV-BX320D.
2. The Light Sensor (No.11) is only available in GV-BX140DW. Keep the Light Sensor unobscured for accurate light detection.
3. The Iris Screw (No.13) is only available for GV-BX520D.
4. The Zoom Screw (No. 15) is not available for GV-BX130D-1.

No.	Name	Description
1	Video Out	Connects to a portable monitor for setting the focus and angle of Box Camera during initial installation.
2	Memory Card Slot	Inserts a micro SD card (SD/SDHC, version 2.0 only, Class 10) to store recording data.

No.	Name	Description
3	Audio Out	Connects a speaker for audio output.
4	Audio In	Connects a microphone for audio input.
5	I/O Terminal Block	For details, see <i>1.6 I/O Terminal Block</i> .
6	Power LED	Indicates the power is supplied. For detail, see the table below.
7	Auto Iris Connector	Plug the iris control cable to the connector.
8	DC 12V Port	Connects to power.
9	LAN / PoE	Connects to a 10/100 Ethernet or PoE.
10	Default	Restores the camera to the factory default. For details, see <i>1.7 Loading Factory Default</i> .
11	Light Sensor	Detects light to switch between day and night mode.
12	Focus Screw	Adjusts the focus of the camera.
13	Iris Screw	Adjusts the iris of the camera.
14	Microphone	Records the sounds.
15	Zoom Screw	Adjusts the zoom of the camera.
16	Status LED	Turns on when the unit is ready for use. For detail, see the table below.

LED	Description
Power LED turns green	The system powers on and succeeds to boot up.
Status LED turns green	The system is ready for use.

1.3.2 GV-BX1200 Series / 1300 Series / 1500 Series / 2400 Series / 2500 Series / 2600 / 2700 Series / 3400 Series / 4700 Series / 5300 Series / 5700 Series / 12201

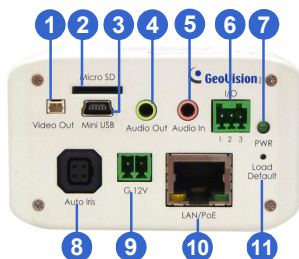


Figure 1-2-1



Figure 1-2-2:
GV-BX1200 Series / 1300 Series / 1500 Series / 2400 Series / 2500 Series / 2600 / 2700 Series / 3400 Series / 4700 Series / 5300 Series / 5700 Series



Figure 1-2-1:
GV-BX12201

Note:

1. The Auto Iris Connector (No. 8) is only functional for varifocal models of GV-BX1200 / 1300 / 1500 / 2400 / 2500 / 2600 / 2700 / 3400 / 4700 / 5700.
2. The Iris Screw (No. 12) is only available in GV-BX5300-6V.
3. The Zoom Screw (No. 13) is only available for varifocal models of GV-BX1200 / 1300 / 1500 / 2400 / 2500 / 2600 / 2700 / 3400 / 4700 / 5300 / 5700 / 12201.
4. The Memory Card Slot (No. 2) is currently not supported for GV-BX12201.
5. Mini USB Slot (No. 3) connected to USB hard drive is currently not supported for GV-BX12201.
6. Built-in microphone is not available for GV-BX2600.

No.	Name	Description
1	Video Out	Connects to a portable monitor for setting the focus and angle of Box Camera during initial installation.
2	Memory Card Slot	Inserts a micro SD card (SD/SDHC, version 2.0 only, Class 10) to store recording data.
3	Mini USB Slot	Connects to a GV-WiFi Adapter or a USB hard drive.
4	Audio Out	Connects a speaker for audio output.
5	Audio In	Connects a microphone for audio input.
6	I/O Terminal Block	Connects to I/O devices. For details, see 1.6 I/O Terminal Block.
7	Power LED	Indicates the power is supplied. For detail, see the table below.
8	Auto Iris Connector	Plug the iris control cable to the connector.
9	DC 12V Port	Connects to power.

No.	Name	Description
10	LAN / PoE	Connects to a 10/100 Ethernet or PoE.
11	Default	Restores the camera to factory default. For details, see 1.7 Loading Factory Default.
12	Iris Screw	Adjusts the iris of the camera.
13	Zoom Screw	Adjusts the zoom of the camera.
14	Microphone	Records the sounds.
15	Focus Screw	Adjusts the focus of the camera.
16	Status LED	Turns on when the unit is ready for use. For detail, see the table below.

LED	Description
Power LED turns green	The system powers on and succeeds to boot up.
Status LED turns green	The system is ready for use.

1.4 Connecting the Camera

The Box Camera is designed for indoor use. Please make sure the installing site is shielded from rain and moisture.

1.4.1 GV-BX120D / 130D Series / 140DW / 220D Series / 320D Series / 520D

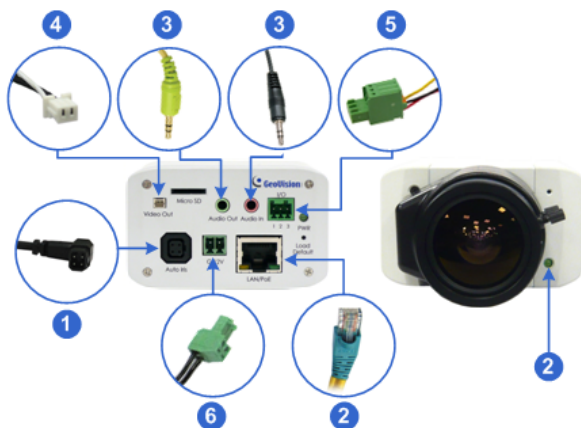


Figure 1-3

1. If you are using an auto iris model, plug the iris control cable to the Auto Iris Connector on the camera.
2. Use a standard network cable to connect the camera to your network.
3. Optionally connect a speaker and an external microphone.
4. Optionally connect a monitor using a Video Out wire. Enable this function by selecting your signal format at the **TV Out** field on the Web interface. See 4.1.1 *Video Settings, GV-IPCam Firmware Manual*.

5. Optionally connect to input / output devices or an infrared illuminator. For details, see *1.5.2 Infrared Illuminator* and *1.6 I/O Terminal Block*.
6. Connect power using one of the following methods:
 - plugging the power adapter to the power port.
 - using the Power over Ethernet (PoE) function and the power will be provided over the network cable.
7. The status LED of the camera will be on.
8. You are ready to access the live view, adjust the image clarity and configure the basics. See *Getting Started, Chapter 2, GV-IPCam Firmware Manual*.

1.4.2 GV-BX1200 Series / 1300 Series / 1500 Series / 2400 Series / 2500 Series / 2600 / 2700 Series / 3400 Series / 4700 Series / 5300 Series / 5700 Series / 12201

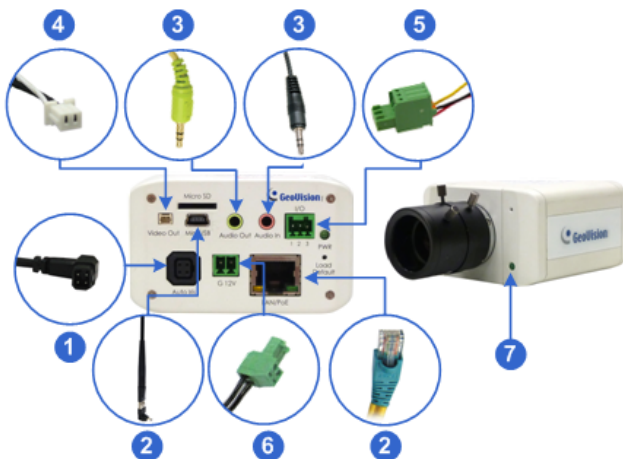


Figure 1-4

1. If you are using an auto iris model, plug the iris control cable to the Auto Iris Connector on the camera.
2. Connect to network using one of the following methods:
 - Wired Connection: Use a standard network cable to connect the camera to your network and optionally connect a USB hard drive to the mini USB port.
 - Wireless Connection: Connect a GV-WiFi Adapter (optional accessory).
3. Optionally connect a speaker and an external microphone.

4. Optionally connect a monitor using a Video Out wire. Enable this function by selecting your signal format at the TV Out field on the Web interface. See *4.1.1 Video Settings, GV-IPCam Firmware Manual*.
5. Optionally connect to input / output devices or an infrared illuminator. For details, see *1.5.2 Infrared Illuminator* and *1.6 I/O Terminal Block*.
6. Connect power using one of the following methods:
 - plugging the power adapter to the power port.
 - using the Power over Ethernet (PoE) function and the power will be provided over the network cable.
7. The status LED of the camera will be on.
8. You are ready to access the live view, adjust the image clarity and configure the basics. See *Getting Started, Chapter 19, GV-IPCam Firmware Manual*.

Note: For details on limitations and requirements of the mini USB port, refer to the *Note for USB Storage and WiFi Adapter* at the beginning of this manual.

1.5 Accessory Installation

1.5.1 C-Mount Lenses

If you use a C-mount lens, it requires a certain distance from the camera's imaging chip to focus the lens. Mount the supplied C-mount lens adapter / lens ring to the camera, and then secure the lens onto the camera body.

Three types of C-mount lens rings are provided for Box Camera:

- 0.188 mm (transparent color) x 2
- 0.125 mm (black color with a glossy surface) x 2
- 0.254 mm (black color with a matt surface) x 2

For GV-BX140DW, a 0.125 mm is provided.

Note: The C-mount lens rings are specially designed for Box Camera. Besides the supplied C-mount lens rings, each of these models has already included with the necessary lens ring.



Figure 1-5

1.5.2 Infrared Illuminators (Optional)

If you use an infrared (IR) illuminator with I/O function, follow the steps below to install it.

1. Connect the infrared illuminator to the terminal block on the camera.
See *1.6 The I/O Terminal Block*.
2. Access the Web interface of the camera.
3. Select **Video and Motion**, select **Video Settings**, select **Streaming 1** and set the **IR Check Function** setting to **Trigger by Input**.
4. Click **Apply**.

For details on the **Trigger by Input** function, see *4.1.1 Video Settings, GV-IPCam Firmware Manual*.

1.6 I/O Terminal Block

The terminal block, located on the back panel of the Box Camera, provides the interface to one input and one output devices. The I/O terminal block can be used for applications such as motion detection, event alerts via E-Mail and FTP, and center monitoring through Center V2 and VSM.

1.6.1 Pin Assignment

The pin assignment for the I/O terminal block:

For the output point, please check if your output device meets the following **Absolute Maximum Ratings** before connecting it to the output point.

Breakdown Voltage	277V AC, 30V DC
Continuous Load Current	5A (NO), 3A (NC)
Note: Absolute Maximum Ratings are those values beyond which damage to the camera may occur. Continuous operation of the camera at the absolute rating level may affect the camera reliability.	

The Box Camera support one digital input and one digital output of dry contact.

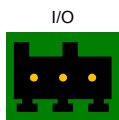


Figure 1-6

Pin	Function
1	Digital Input
2	GND
3	Digital Output

For details on how to enable an installed I/O device, see 4.2 I/O Settings, *GV-IPCam Firmware Manual*.

1.6.2 Connecting to GV-Relay V2 (Optional)

The Box Camera can only drive a maximum load of **200mA 5V DC**. To expand the maximum voltage load to **10A 250V AC**, **10A 125V AC** or **5A 100V DC**, connect the camera to a GV-Relay V2 module (optional product). Refer to the figure and table below.

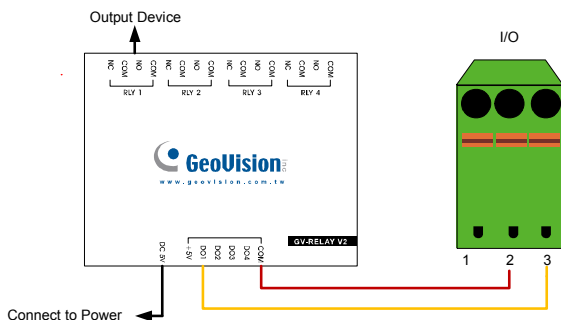


Figure 1-7

GV-Relay V2	I/O Terminal Block
COM	Pin 2 (GND)
DO1	Pin 3 (Digital Output)

1.7 Loading Factory Default

1. Keep the power and network cables connected to the camera.
2. Use a pin to press and hold the **default** button on the back panel of the camera.

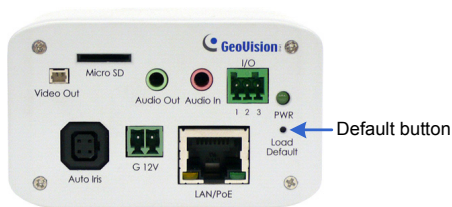


Figure 1-8

3. Release the **default** button when the **status LED** blinks. This shall take about 8 seconds.



Figure 1-9

4. When the **status LED** fades, the process of loading default settings is completed and the camera reboots automatically.

Chapter 2 IR Arctic Box Camera

The IR Arctic Box Camera is a series of outdoor cameras designed for environments of extreme temperatures. The cameras adhere to IP67 and IK10 protection standards, and are equipped with IR LEDs and removable IR-cut filter for day and night surveillance. The GV-BX2400-E / 3400-E / 4700-E are equipped with WDR Pro to produce clear image for scenes containing contrasting intensity of lights (see 2.2.1 *Wide Dynamic Range Pro* for details). Models using P-Iris allow for precise control of exposure, producing images with better clarity and contrast.

IR Arctic Box Camera

Model No.		Specifications	Description
GV-BX120D-E	Varifocal Lens	Auto Iris, f: 2.8 ~ 12 mm, F/1.4, 1/3" CS Lens	1.3 MP, H.264, Low Lux, D/N
GV-BX220D-E		Auto Iris, f: 2.8 ~ 6 mm, F/1.3, 1/3" CS Lens	2 MP, H.264, D/N
GV-BX320D-E		Auto Iris, f: 2.8 ~ 6 mm, F/1.3, 1/3" CS Lens	3 MP, H.264, D/N
GV-BX520D-E		Manual Iris, f: 4.5 ~ 10 mm, F/1.6, 1/2" CS Lens	5 MP, H.264, D/N
GV-BX1500-E		Auto Iris, f: 3 ~ 10.5 mm, F/1.4, 1/2.7" CS Lens	1.3 MP, H.264, Super Low Lux, D/N
GV-BX2400-E GV-BX3400-E		Auto Iris, f: 3 ~ 10.5 mm, F/1.4, 1/2.7" CS Lens	2 MP / 3 MP, H.264, D/N, WDR Pro
GV-BX4700-E		Auto Iris, f: 3 ~ 10.5 mm, F/1.4, 1/2.7" CS Lens	4 MP, H.265, D/N, WDR Pro

Model No.		Specifications	Description
GV-BX5300-E	Varifocal Lens	Manual Iris, f: 4.5 ~ 10 mm, F/1.6, 1/2" CS Lens	5 MP, H.264 D/N
GV-BX2510-E	Motorized Varifocal Lens	P-Iris, f: 3.7 ~ 9 mm, F/1.2, 1/2", ø 14 mm mount	2 MP, H.264, Super Low Lux, D/N
GV-BX5310-E		P-Iris, f: 4.5 ~ 9 mm, F/1.2, 1/2", ø 14 mm mount	5 MP, H.264 D/N

2.1 Packing List

**For GV-BX120D-E / 220D-E / 320D-E / 520D-E / 1500-E / 2400-E /
3400-E / 4700-E / 5300-E**

- IR Arctic Box Camera
- Screw Anchor x 4
- Screw x 4
- Washer x 4
- 4 mm Torx Wrench
- 5 mm Torx Wrench
- Silica Gel Bag x 2
- Adhesive Tape for Silica Gel Bag x 2
- GV-IPCAM Software DVD
- GV-Software DVD
- Warranty Card

Note: Optionally purchase a GV-PA482 PoE Adapter for GV-BX1500-E / 2400-E / 3400-E / 4700-E / 5300-E.

For GV-BX2510-E / 5310-E

- IR Arctic Box Camera
- Screw Anchor x 4
- Screw x 4
- Washer x 4
- 5 mm Torx Wrench
- Silica Gel Bag
- Adhesive Tape for Silica Gel Bag
- Power Adapter (DC 48V, 2.5A, 120 W max.)
- GV-IPCAM Software DVD
- GV-NVR Software DVD
- Warranty Card

Note: Optionally purchase a GV-PA482 PoE Adapter for GV-BX2510-E / 5310-E.

2.2 Features

- Image sensor

Camera Model	Image Sensor
GV-BX120D-E	1/3" progressive scan low lux CMOS
GV-BX1500-E	1/3" progressive scan super low lux CMOS
GV-BX220D-E GV-BX320D-E GV-BX520D-E GV-BX5300-E	1/3.2" progressive scan CMOS
GV-BX2510-E	1/2.8" progressive scan super low lux CMOS
GV-BX2400-E GV-BX3400-E GV-BX5310-E	1/2.5" progressive scan CMOS
GV-BX4700-E	1/3" progressive scan super low lux CMOS

- Dual streams from H.264 or MJPEG
- Dual streams from H.264, H.265 or MJPEG (for GV-BX4700-E)
- Frame rate:

Camera Model	Frame Rate
GV-BX120D-E GV-BX1500-E	Up to 30 fps at 1280 x 1024
GV-BX220D-E GV-BX2400-E GV-BX2510-E	Up to 30 fps at 1920 x 1080
GV-BX320D-E GV-BX3400-E	Up to 20 fps at 2048 x 1536
GV-BX520D-E GV-BX5300-E GV-BX5310-E	Up to 10 fps at 2560 x 1920
GV-BX4700-E	Up to 25 fps at 2560 x 1440 Up to 30 fps at 2048 x 1520

- Day / Night function (with removable IR-cut filter)
- Wide Dynamic Range Pro (for GV-BX2400-E / 3400-E / 4700-E)
- Defog
- Ingress protection (IP67)
- P-Iris for auto iris adjustment (for GV-BX2510-E / 5310-E)
- Vandal resistance (IK10 for metal casing)
- Built-in heater and fan
- Support for TV-out
- Micro SD card slot (SD/SDHC) for local storage (for GV-BX2510-E / 5310-E)
- NAS recording
- Recording assigned by GV-Edge Recording Manager (Windows & Mac)
- Two-way audio
- One sensor input and one sensor output (for GV-BX2510-E / 5310-E)
- 3D noise reduction (for GV-BX1500-E / 2510-E / 4700-E)
- 2D noise reduction (except GV-BX1500-E / 2510-E / 4700-E)
- Smart Streaming(for GV-BX4700-E)
- Motion detection
- Tampering alarm
- Privacy mask
- Text overlay
- IP address filtering
- Power supplied through PoE+ (IEEE 802.3at, Except GV-BX2510-E / 5310-E)
- Power supplied through AC / DC / PoE++ (50W, for GV-BX2510-E / 5310-E)
- Megapixel lens
- Support for iPhone, iPad, Android and 3GPP
- 31 languages on Web interface
- ONVIF (Profile S) conformant

2.3 Overview

2.3.1 GV-BX120D-E / 220D-E / 320D-E / 520D-E / 1500-E / 2400-E / 3400-E / 4700-E / 5300-E

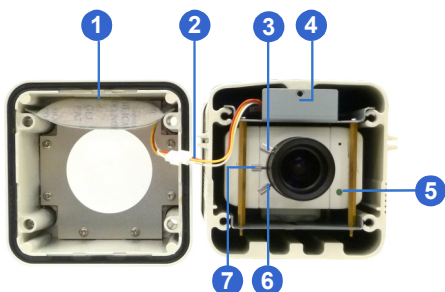


Figure 2-1

Note: The Iris Screw (No. 7) is only available in GV-BX520D-E and GV-BX5300-E.

No.	Name	Description
1.	Silica gel bag	Desiccant that keeps the camera housing dry.
2.	IR power plug	Supplies power to the built-in IR LEDs.
3.	Focus Screw	Adjusts the focus of the camera.
4.	Module screw	Holds the module in place.
5.	Status LED	Turns on when the camera is ready for use.
6.	Zoom Screw	Adjusts the zoom of the camera.
7.	Iris Screw	Adjusts the iris of the camera.

2.3.2 GV-BX2510-E / 5310-E

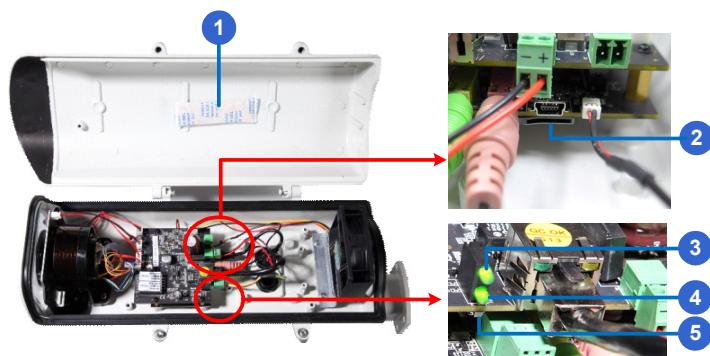


Figure 2-2

No.	Name	Description
1.	Silica gel bag	Desiccant that keeps the camera housing dry.
2.	Memory Card Slot	Inserts a micro SD card (SD/SDHC, version 2.0, Class 10) to store recording data.
3.	Power LED	Turns on when the camera is supplied with power.
4.	Status LED	Turns on when the camera is ready for use.
5.	Default	Resets all configurations to factory default. For details, see 2.7 Loading Factory Default.

2.4 Installation

The IR Arctic Box Camera is designed for outdoor use. Follow the steps below to install your camera.

1. Mark the installation site and drill four holes for screw anchors.
2. Insert the supplied screw anchors.
3. Secure the camera to the wall using the supplied washers and screws.

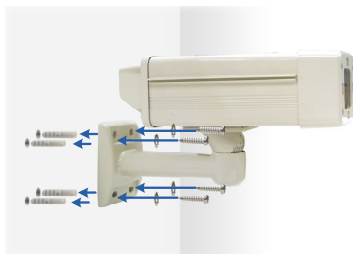


Figure 2-3

4. Connect the camera with wires and cables. See *2.5 Connecting the Camera*.
5. Access the live view. See *2.1 Accessing the Live View, GV-IPCam Firmware Manual*.
6. Based on the live view, adjust the angle of the camera. Loosen the indicated screw with the supplied big torx wrench and adjust the joint.



Figure 2-4

Tilt Adjustment



Figure 2-5

Pan Adjustment



Figure 2-6

7. For **GV-BX120D-E / 220D-E / 320D-E / 520D-E / 1500-E / 2400-E / 3400-E / 4700-E / 5300-E**, adjust for image clarity based on the live view.
 - A. Unscrew the cover with the supplied 4 mm torx wrench.

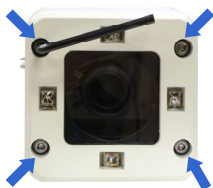


Figure 2-7

- B. Hold and unplug the connector.

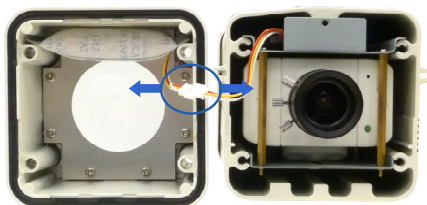


Figure 2-8

IMPORTANT: Unscrew and remove the cover carefully. Pulling the cover off may cause damages to the inner wiring of the camera.

- C. Adjust the focus, zoom and iris screws. For a more precise focus, use GV-IP Device Utility. For details, see 2.2 *Adjusting Image Clarity*, *GV-IPCam Firmware Manual*.

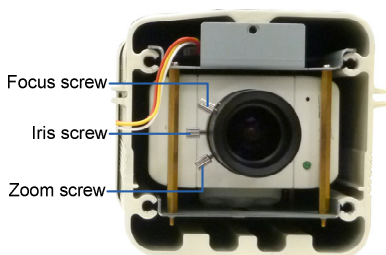


Figure 2-9

Note: Only GV-BX520D-E and GV-BX5300-E contain an iris screw.

- D. Replace the silica gel bag. Paste the sticker to the silica gel bag. Press the sticker several times onto the camera cover to make sure it adheres properly.

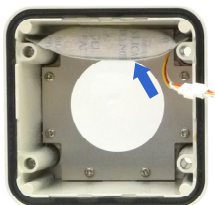


Figure 2-10

- E. Follow steps 7B and 7A to plug the connector back and close the camera cover.
8. For **GV-BX2510-E / 5310-E**, optionally insert a memory card.
- A. Open the camera cover using the supplied torx wrench.



Figure 2-11

- B. Insert a memory card to the card slot.

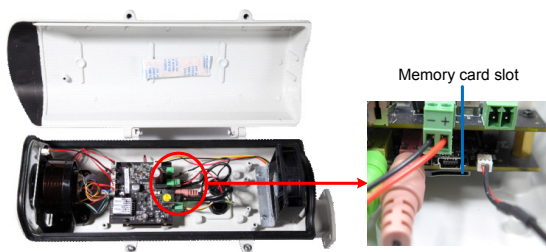


Figure 2-12

- C. Replace the silica gel bag. Paste the sticker to the silica gel bag. Press the silica gel bag several times onto the camera cover to make sure it adheres properly.

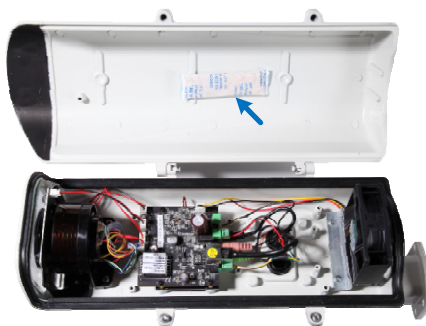


Figure 2-13

- D. Follow step 8A to close the camera cover.

2.5 Connecting the Camera

2.5.1 GV-BX120D-E / 220D-E / 320D-E / 520D-E / 1500-E / 2400-E / 3400-E / 4700-E / 5300-E

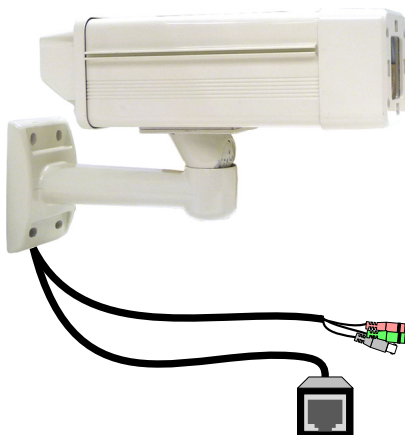


Figure 2-14

No.	Wire	Definition
1	RJ-45	PoE
2	Black BNC	TV out
3	Green RCA	Audio Out
4	Pink RCA	Audio In

1. Optionally connect a speaker (green) and an external microphone (pink).
2. Optionally connect a monitor using a Video Out wire. Enable this function by selecting your signal format at the **TV Out** field on the Web interface. See *4.1.1 Video Settings, GV-IPCam Firmware Manual*.
3. Connect the camera to a GV-PA482 PoE Adapter to supply power and network access. For detailed instruction, see step 3 of *For GV-BX25010-E / 5310-E* in the next section of Chapter 2.
4. The status LED of the camera will be on.
5. You are ready to access the live view.

2.5.2 GV-BX2510-E / 5310-E



Figure 2-15

No.	Wire	Definition
1.	Green RCA	Audio Out
2.	Pink RCA	Audio In
3.	Brown wire	Digital Output
4.	Yellow wire	Digital Input
5.	White wire	GND
6.	Terminal Block	DC 48V
7.	BNC	TV Out
8.	RJ-45	Ethernet/PoE

1. Optionally connect the audio out (green), audio in (pink), digital output (brown), digital input (yellow), and GND.

2. Optionally connect a monitor using a Video Out wire. Enable this function by selecting your signal format at the **TV Out** field on the Web interface. See *4.1.1 Video Settings, GV-IPCam Firmware Manual*.
3. Supply the camera with power and network access using one of the following methods:
 - Use a GV-PA482 Power over Ethernet adapter to connect the camera to power and network as illustrated below. GV-PA482
 - PoE adapter is an optional accessory. For detail, see *Options* in the manual.

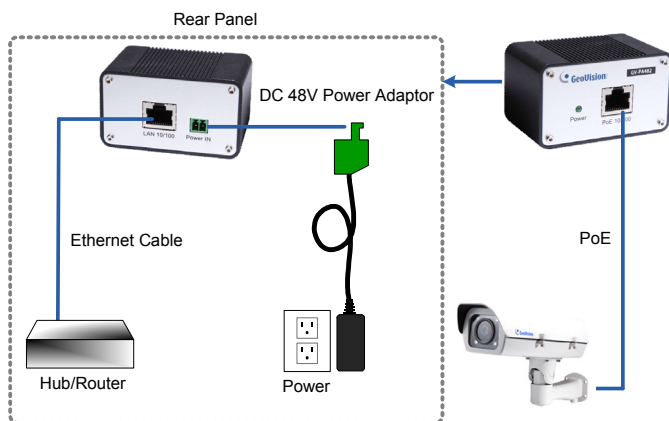


Figure 2-16

- Use the supplied power adapter. Connect the black wire of the power adaptor to the plus (+) port and the white wire to the negative (-) port. Connect the camera to network with a network cable.



Figure 2-17

4. You are ready to access the live view.

2.6 Notice for Using the IR Arctic Box Camera

For **GV-BX120D-E / 220D-E / 320D-E / 520D-E / 1500-E / 2400-E / 3400-E / 4700-E / 5300-E**, make sure that you:

- enable IR LED function on the Web interface after loading the default settings.
- disable the status LED to reduce reflection when a green light spot appears on the live view.

2.6.1 Enabling IR LED after Loading Default

Each GV-IR Arctic Box Camera is equipped with 4 IR LEDs to provide infrared illumination at night. The factory-loaded setting for the IR LED function is **enabled**. If you have restored the camera to default settings, please follow the steps below to enable the IR LED function.

1. In the left menu of Web interface, select **Video Settings** and then **Streaming 1**.
2. Enable **Trigger IR by D/N** in IR Check Function.

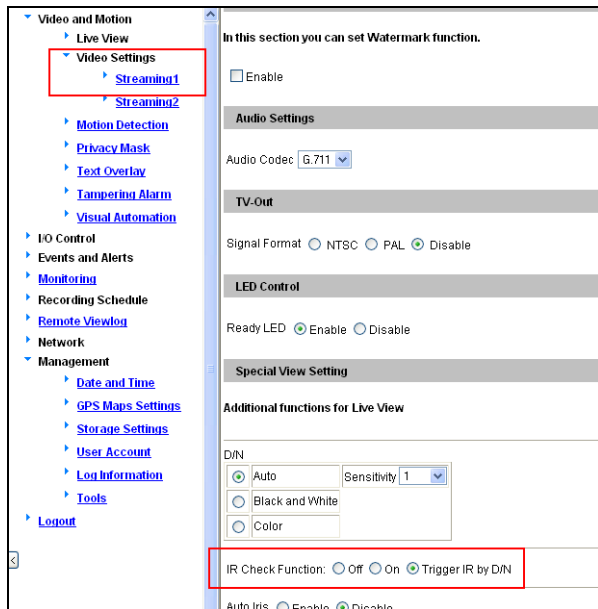


Figure 2-18

3. Click **Apply**.

2.6.2 Disabling Status LED under Low Light Conditions

If you have a green light spot on the live view, this is likely due to insufficient light at the installation site, which causes the status LED to reflect on the camera cover. In this case, it is advisable that you disable the status LED.

1. In the left menu of Web interface, select **Video Settings** and then **Streaming 1**.
2. Select **Disable** in LED Control.

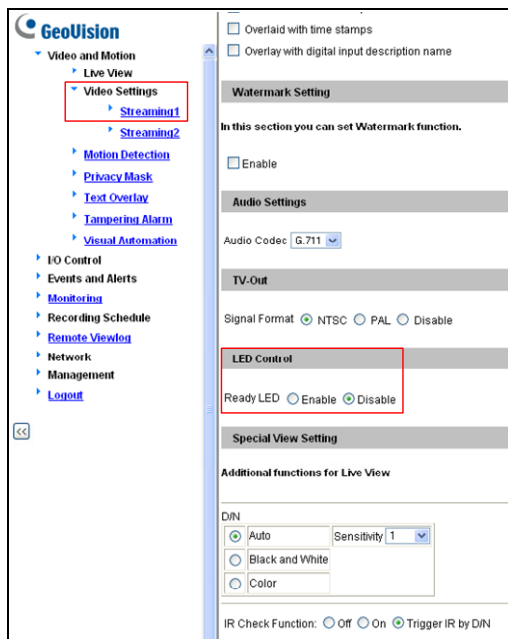


Figure 2-19

3. Click **Apply**.

2.7 Loading Factory Default

Note that only **GV-BX2510-E** and **GV-BX5310-E** are equipped with a default button.

Press and hold the **default** button for about 8 seconds to restore the factory default. After the **status LED** blinks, release the **default** button. For details see *1.7 Loading Factory Default*.

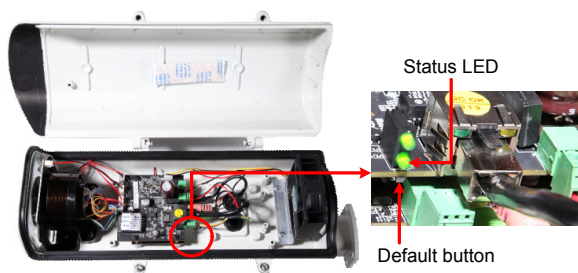


Figure 2-20

Chapter 3 Ultra Box Camera

The Ultra Box Camera is a series of light-weighted cameras designed for indoor usage. Equipped with IR-cut filter and built-in IR LEDs, the Ultra Box Camera provides excellent image quality. The camera supports PoE and can be installed intuitively. Nine models of varying resolutions and focal lengths are available.

Model No.		Specifications	Description
GV-UBX1301-0F GV-UBX1301-1F GV-UBX1301-2F	Fixed Lens	Fixed Iris, f: 2.8 mm, F/2.0, 1/3" M12 Mount	1.3 MP, H.264, D/N
GV-UBX2301-0F GV-UBX2301-1F GV-UBX2301-2F		Fixed Iris, f: 4 / 8 mm, F/1.6, 1/3" M12 Mount	2 MP, H.264, D/N
GV-UBX3301-0F GV-UBX3301-1F GV-UBX3301-2F			3 MP, H.264, D/N

3.1 Packing List

- Ultra Box Camera
- Supporting rack
- Screw x 3
- Screw anchor x 3
- Power Adapter
- GV-IPCAM Software DVD
- GV-Software DVD
- Warranty Card

Note: The power adapter can be excluded upon request.

3.2 Features

- 1/2.5" progressive scan CMOS
- Dual streams from H.264 or MJPEG
- Frame rate

Camera Model	Frame Rate
GV-UBX1301 Series	Up to 30 fps at 1280 x 1024
GV-UBX2301 Series	Up to 30 fps at 1920 x 1080
GV-UBX3301 Series	Up to 20 fps at 2048 x 1536

- Intelligent IR
- Day and night function (with removable IR-cut filter)
- Wide Dynamic Range (WDR)
- Defog
- Built-in micro SD card slot (SD/SDHC) for local storage
- NAS recording
- Recording assigned by GV-Edge Recording Manager (Windows & Mac)
- Two-way audio
- 2D noise reduction
- Motion detection
- Tampering alarm
- Text overlay
- Privacy mask
- IP address filtering
- DC 5V / PoE (IEEE 802.3af)
- Megapixel lens
- Support for iPhone, iPad, Android and 3GPP
- 31 languages on Web interface
- ONVIF (Profile S) conformant

3.3 Overview



Figure 3-1

No.	Name	Description
1	Audio Out	Connects a speaker for audio output.
2	Default	Resets the camera to factory default. For details, see 3.6 <i>Loading Factory Default</i> .
3	LAN / PoE	Connects to a 10/100 Ethernet or PoE.
4	Microphone	Records sounds.
5	Memory Card Slot	Inserts a micro SD card (SD/SDHC, version 2.0 only, Class 10) to store recording data.
6	DC 5V Terminal Block	Connects to power.

LED Indicator	Description
 Status LED	The status LED turns on (green) when the system is ready for use.
 Power LED	The power LED turns on (green) when power is supplied to the camera.

3.4 Installation

You can stand the Ultra Box Camera on a plain surface or install it to wall and ceiling. Follow the steps below to install, connect and adjust your Ultra Box Camera.

1. To install the device on the wall/ceiling, put the supporting rack on the desired location and make marks for screw anchors.



Figure 3-2

2. Drill the marks and insert the screw anchors.
3. Secure the supporting rack onto the wall/ceiling using the supplied screws.
4. Secure the camera onto the supporting rack and fasten the indicated screw.



Figure 3-3

5. Connect the network and power cables to the camera. See 3.5 *Connecting the Camera*.
6. Access the live view. See 2.1 *Accessing the Live View, GV-IPCam Firmware Manual*.
7. Adjust the angle of the camera based on live view and fasten the indicated screw.



Figure 3-4

3.5 Connecting the Camera



Figure 3-5

1. Connect power using one of the following methods:
 - Plug the power adapter to the 5V terminal block. The power adapter is an optional device. For detail, see *Options* in the manual.
 - Use the Power over Ethernet (PoE) function and the power will be provided over the network cable.

The power and status LEDs shall turn on (green).

2. Use a standard network cable to connect the camera to your network.
3. Optionally connect a speaker.
4. Insert a micro SD card (SD/SDHC, version 2.0 only, Class 10).
5. You are ready to access the live view, adjust the image clarity and configure the basics. See *Getting Started, Chapter 2, GV-IPCam Firmware Manual*.

3.6 Loading Factory Default

Press and hold the **default** button for about 8 seconds to restore the factory default. After the **status LED** blinks, release the **default** button. When the status LED turns on (green), the camera is ready for use. For details see *1.7 Loading Factory Default*.

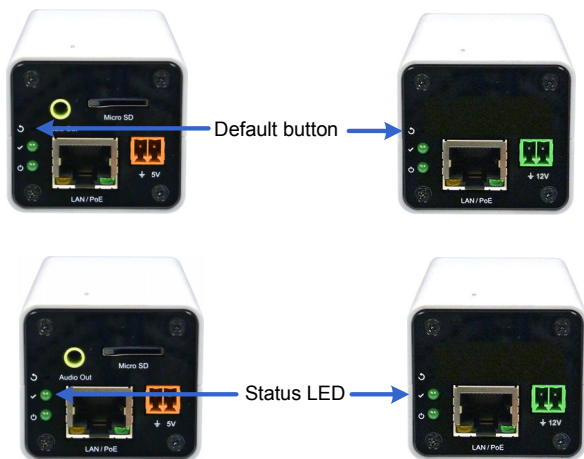


Figure 3-6

Chapter 4 Target Box Camera

The Target Box Camera (GV-EBX) is a series of light-weighted cameras designed for indoor usage. Equipped with IR-cut filter and built-in IR LEDs, the camera is an entry-level surveillance solution with all the essential features and excellent image quality. The camera supports PoE and can be installed intuitively.

Model No.	Iris	Specifications	Description
GV-EBX1100-0F	Fixed Lens	Fixed Iris, f: 2.8 mm, F/2.0, 1/2.7" M12 Mount	1.3 MP, H.264, Low Lux, D/N
GV-EBX2100-0F			2 MP, H.264, Low Lux, D/N
GV-EBX1100-2F		Fixed Iris, f: 3.8 mm, F/1.8, 1/2.7" M12 Mount	1.3 MP, H.264, Low Lux, D/N
GV-EBX2100-2F			2 MP, H.264, Low Lux, D/N

4.1 Packing List

- Target Box Camera
- Supporting Rack
- Screw x 3
- Screw Anchor x 3
- GV-IPCAM Software DVD
- GV-Software DVD
- Warranty Card

Note: Power adapter can be purchased upon request.

4.2 Features

- 1/3" progressive scan low lux CMOS for GV-EBX1100 Series
- 1/2.8" progressive scan low lux CMOS for GV-EBX2100 Series
- Dual streams from H.264 or MJPEG
 - Up to 30 fps at 1280 x 1024 for GV-EBX1100 Series
 - Up to 25 fps at 1920 x 1080 for GV-EBX2100 Series
- Intelligent IR
- Day and night function (with removable IR-cut filter)
- Built-in microphone
- Wide Dynamic Range (WDR)
- Defog
- Motion detection
- Tampering alarm
- Text overlay
- Privacy mask
- IP address filtering
- DC 12V / PoE (IEEE 802.3af)
- Megapixel lens
- NAS Recording
- Recording assigned by GV-Edge Recording Manager (Windows & Mac)
- Support for iPhone, iPad, Android and 3GPP
- 31 languages on Web interface
- ONVIF (Profile S) conformant

Note: For optimal performance and compatibility, it is highly recommended to use a GV-NAS System.

4.3 Overview

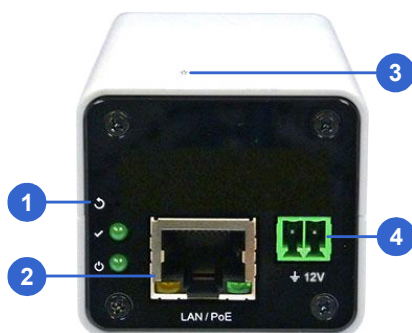


Figure 4-1

No.	Name	Description
1	Default	Resets the camera to factory default. For details, see <i>4.6 Loading Factory Default</i> .
2	LAN / PoE	Connects to a 10/100 Ethernet or PoE.
3	Microphone	Records sounds.
4	DC 12V Terminal Block	Connects to power.

LED Indicator	Description
 Status LED	The status LED turns on (green) when the system is ready for use.
 Power LED	The power LED turns on (green) when power is supplied to the camera.

4.4 Installation

You can stand the Target Box Camera on a plain surface or install it to wall and ceiling. Follow the steps below to install, connect and adjust your Target Box Camera.

1. To install the device on the wall/ceiling, put the supporting rack on the desired location and make marks for screw anchors.



Figure 4-2

2. Drill the marks and insert the screw anchors.
3. Secure the supporting rack onto the wall/ceiling using the supplied screws.
4. Secure the camera onto the supporting rack and fasten the indicated screw.



Figure 4-3

5. Connect the network and power cables to the camera. See 4.5 *Connecting the Camera*.
6. Access the live view. See 2.1 *Accessing the Live View, GV-IPCam Firmware Manual*.
7. Adjust the angle of the camera based on live view and fasten the indicated screw.



Figure 4-4

4.5 Connecting the Camera

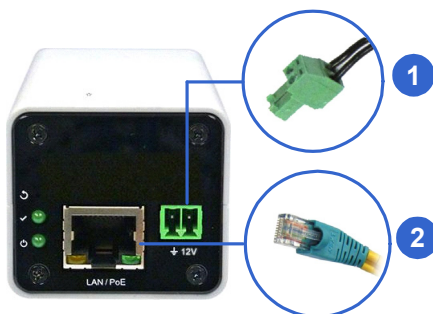


Figure 4-5

1. Connect power using one of the following methods:
 - Plug the power adapter to the 12V terminal block. The power adapter is an optional device. For detail, see *Options* in the manual.
 - Use the Power over Ethernet (PoE) function and the power will be provided over the network cable.

The power and status LEDs shall turn on (green).

2. Use a standard network cable to connect the camera to your network.
3. You are ready to access the live view, adjust the image clarity and configure the basics. See *Getting Started, Chapter 2, GV-IPCam Firmware Manual*.

4.6 Loading Factory Default

Press and hold the **default** button for about 8 seconds to restore the factory default. After the **status LED** blinks, release the **default** button. When the status LED turns on (green), the camera is ready for use. For details see *1.7 Loading Factory Default*.

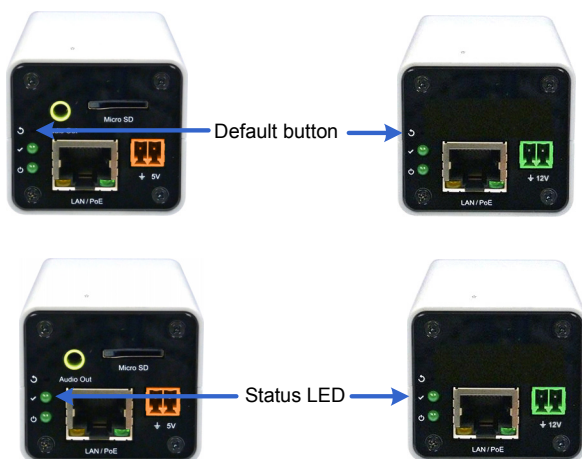


Figure 4-6

Appendix

A. Supported Lenses for Box Camera

Provider	Model No.
Fujian Forecam Optics	RV0409D.IR
	RV0515D.IR
	RV0820D.IR
EVETAR	EVD03618F-IR
	EVD04218F-IR
	EVD06018F-IR
	EVD08018F-IR
	EVD12018F-IR
	EVD16018F-IR
Pentax	TS3VP213ED-M