IDCMR-IP-POE-PTZ-20X PTZ Dome Camera Installation Guide



PLEASE READ THIS MANUAL BEFORE USING YOUR CAMERAS, and always follow the instructions for safety and proper use. Save this manual for future reference.

CAUTION

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

NOTE

This equipment has been tested and found to comply with the limits for a Class "A" digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

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Observint makes no representations concerning the legality of certain product applications such as the making, transmission, or recording of video and/or audio signals of others without their knowledge and/or consent. We encourage you to check and comply with all applicable local, state, and federal laws and regulations before engaging in any form of surveillance or any transmission of radio frequencies.

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Regulatory information

FCC information

FCC compliance: This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC conditions

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

Preventive and Cautionary Tips

Before connecting and operating your cameras, please be advised of the following:

- Ensure environmental conditions meet factory specifications.
- Major shocks or jolts to the unit as a result of dropping it may cause damage to the sensitive electronics within the unit.
- Use the device in conjunction with an UPS if possible.

Safety Instructions

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss.

The precaution measure is divided into Warnings and Cautions:

- **Warnings**: Neglecting any of the warnings may cause serious injury or death.
- **Cautions**: Neglecting any of the cautions may cause injury or equipment damage.

Warnings

- All the electronic operation should be strictly compliance with the electrical safety regulations, fire prevention regulations and other related regulations in your local region.
- Do not connect several devices to one power adapter as adapter overload may cause over-heat or fire hazard.
- Please make sure that the power has been disconnected before you wire, install or dismantle the camera.

- If smoke, odors or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.
- If the product does not work properly, please contact your dealer or the nearest service center. Never attempt to disassemble the speed dome yourself. (We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.)

Cautions

- Do not drop the dome or subject it to physical shock, and do not expose it to high electromagnetism radiation. Avoid the equipment installation on vibrations surface or places subject to shock (ignorance can cause equipment damage).
- Do not place the dome in extremely hot, cold, dusty or damp locations, otherwise fire or electrical shock will occur. The operating temperature should be -22 °F ~ 149 °F (-30 °C ~ 65 °C).
- The dome cover for indoor use shall be kept from rain and moisture.
- Exposing the equipment to direct sun light, low ventilation or heat source such as heater or radiator is forbidden (ignorance can cause fire danger).
- Do not aim the speed dome at the sun or extra bright places. A blooming or smear may occur otherwise (which is not a malfunction however), and affecting the endurance of sensor at the same time.
- Please use the provided glove when open up the dome cover, avoid direct contact with the dome cover, because the acidic sweat of the fingers may erode the surface coating of the dome cover.
- Please use a soft and dry cloth when clean inside and outside surfaces of the dome cover, do not use alkaline detergents.
- Please keep all packaging for future use. In case of a failure, use the original packaging to return the camera to the factory. Transportation without the original packaging may result in damage to the camera and incur additional costs.

Read these instructions and keep them in a safe place for future reference.

- Please refer all work related to the installation of this product to qualified service personnel or system installers.
- Do not operate the camera outside of its specified temperature, humidity or power source ratings.
- Install the unit away from heat sources such as radiators, heat registers and stoves.
- Installation of the unit near consumer electronics devices, such as stereo receiver/amplifiers and televisions, is permitted as long as the air surrounding the terminal does not exceed the above mentioned temperature range.
- Handle the camera with care. Do not drop or shake, as this may damage it.
- Do not use strong or abrasive detergents when cleaning the surfaces of this product. When dirt is hard to remove, use a mild detergent and wipe gently.
- Save your system configuration.
- Distributing, copying, disassembling, reverse compiling, reverse engineering, and exporting, in violation of export laws, the software provided with this product is expressly prohibited.

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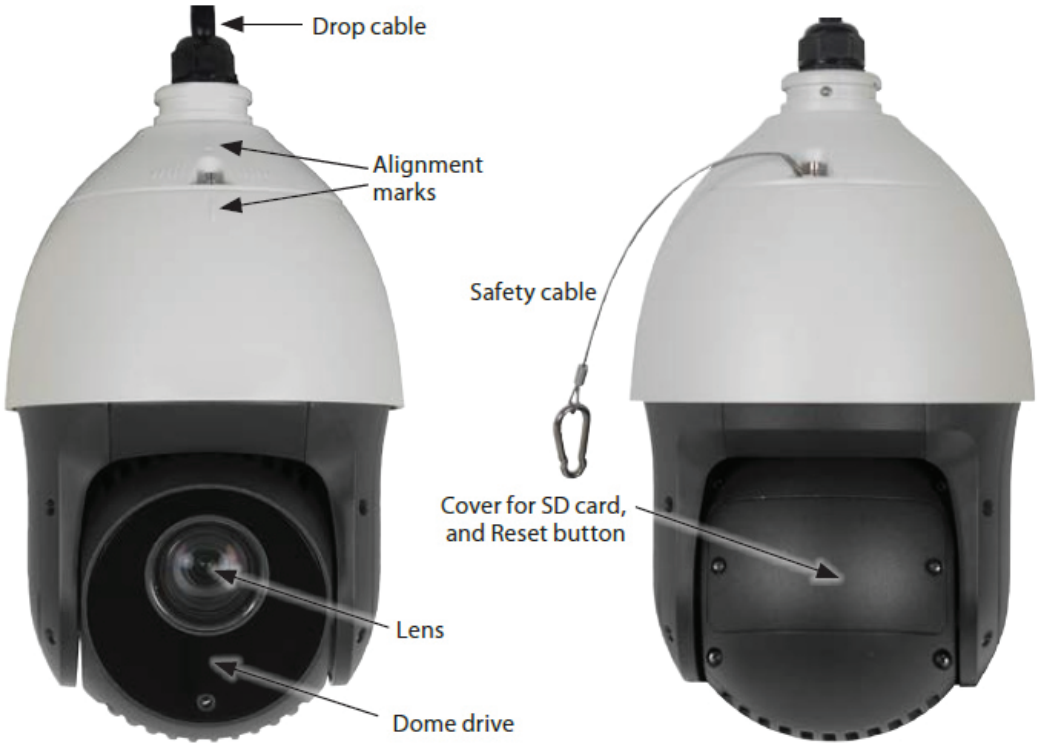
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NOTES

SECTION 1
Overview

Congratulations on purchasing your new IP PTZ camera! This installation guide includes procedures for installing and performing the initial setup of the camera.

The PTZ Dome Camera can capture high quality images in low light environment with its black anti-reflective glass. The black anti-reflective glass increase the luminousness for an IR reach of up to nearly 500 feet. Embedded with a 1/2.8'' progressive scan CMOS chip makes DWDR 2MP real-time resolution possible. With the 20× optical zoom Day/Night lens, the camera offers more details over expansive areas. This camera also features a wide range of functions, including intrusion detection, line crossing detection and audio exception, benefitting users with great improvement on security efficiency, more importantly, with key events / objects being recorded for further forensic needs.



1.1 Features

Basic functions

- High performance sensor, up to 1920 x 1080 resolution
- ±0.1° Preset accuracy
- ONVIF (Open Network Video Interface Forum), CGI (Common Gateway Interface), PSIA (Physical Security Interoperability Alliance), to ensure greater interoperability between different platforms and compatibility

- 3D intelligent positioning function
- Power-off memory function: restore PTZ & lens status after reboot
- IP66 compliant

Functions

- Detections: intrusion detection, line crossing detection, audio exception detection, motion detection
- Recording: edge recording, support smart search in smart NVR
- Support low bit rate, ROI

Camera function:

- Auto iris, auto focus, auto white balance, backlight compensation and auto day & night switch
- Min. Illumination: 0.02 Lux @ (F2.0, AGC ON) (Color), 0.002 Lux @ (F2.0, AGC ON) (B/W)
- Supports 8 privacy masks

PTZ function:

- 360° endless pan range and -15° ~ +90° tilt range
- 400°/s Pan Preset Speed and 200°/s Tilt Preset Speed
- 0.1° ~ 400°/s Manual Pan Speed and 0.1° ~ 200°/s Manual Tilt Speed
- 300 programmable presets; preset image freezing capability
- 8 patrols, up to 32 presets per patrol

Network function:

- H.264/ MJPEG video compression and the latest processing chip and platform
- Built-in web server
- Support Micro SD card local storage, up to 128GB
- Support up to 8 NAS storage; transmit videos from the SD card to the NAS after network recovery
- HTTPS encryption and IEEE 802.1X port-based network access control
- Support dual-stream; H.264/ MJPEG video compression; basic and advanced video configuration; real time video at 1080P
- Multiple network protocols supported: IPv4/IPv6, HTTP, HTTPS, 802.1X, QoS, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, ICMP, DHCP, PPPoE
- 1 audio input and 1 audio output
- 2 alarm inputs and 1 alarm output, alarm linkage support preset, patrol, pattern, recording, relay output, upload center, etc.

IR function:

- 0 Lux minimum illumination
- Up to 492 ft IR distance
- IR light MTBF reaching up to 30,000 hours
- Smart IR mode

1.2 What's in the box

Your camera includes:

- PTZ camera assembly
- Pendant adapter
- Ethernet drop cable seal kit
- Hi-Power PoE injector
- Gloves
- Hex L-wrench
- Thread tape
- Quick installation guide (this document)



Pendant adapter

SECTION 2
Installation

Before you start

- Check the package contents and make sure that the device in the package is in good condition and all the assembly parts are included:
  - PTZ camera assembly
  - Pendant adapter
  - Thread tape
  - Hi-Power PoE injector
  - Gloves
  - Hex L-wrench
  - Quick installation guide (this document)
- Make sure the mounting surface and fasteners are strong enough to withstand at least 8 times the weight of the camera assembly and the mounting bracket.
- For cement walls, use an expansion screw to secure the mounting bracket.

CAUTION

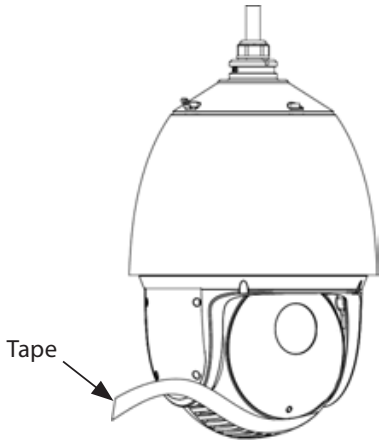
Do not carry the camera by the drop cable.



For outdoor installations, refer to "APPENDIX C Lightning and Surge Protection" on page 28 for additional installation considerations.

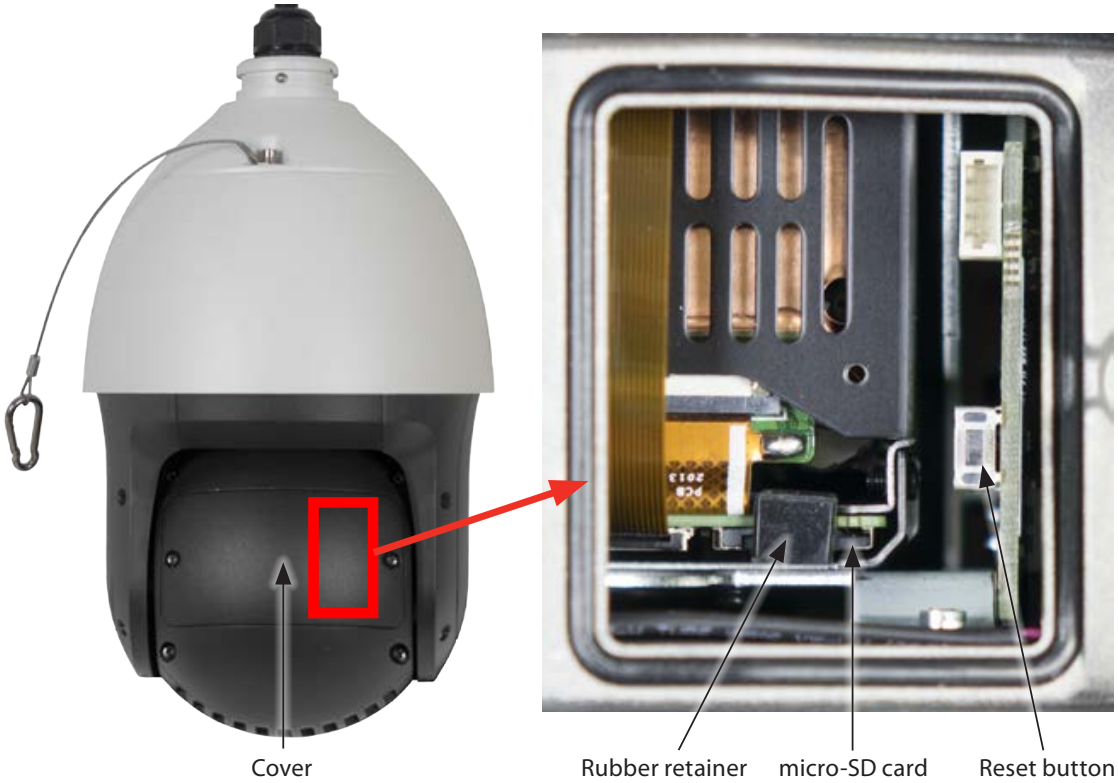
2.1 Remove the camera from the packaging

1. Remove the camera from the protective packaging.
2. Remove tape from the dome drive, if attached.



2.2 Install an micro-SD card in the camera

The micro-SD card in the provides in-camera (local) storage for log information and locally stored video and capture files. Cameras without an SD card cannot provide camera log information, which is valuable for maintenance purposes. Your camera will accommodate a micro-SD card with up to 128 GB of storage. The location of the micro-SD card slot is shown below.



1. Use a Phillips #2 screw driver to remove the back cover of the camera. See the photo above.
2. Insert the micro-SD card into the card slot until it clicks into place.
3. Pull the rubber retainer out and over the edge of the micro-SD card and PC board it attaches to.
4. Reattach the back cover.

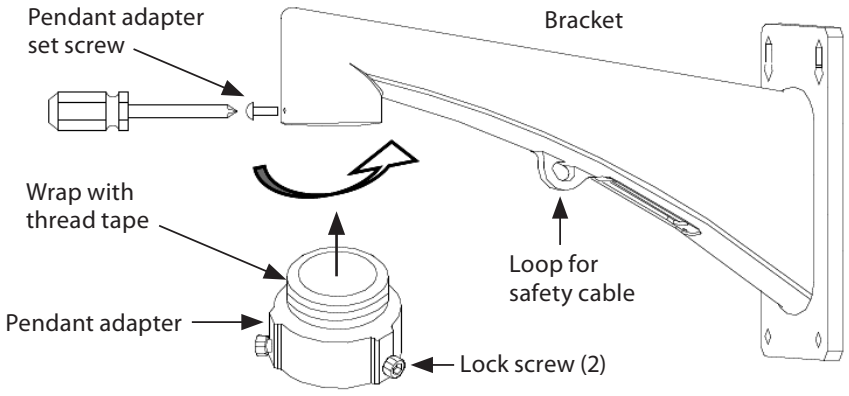
2.3 Camera wall mount installation

Following the instructions below to install the camera using the **Wall Mount Bracket**.

Instructions for mounting the camera with a **Pole Mount PTZ Bracket** or **Corner Mount PTZ Bracket** are very similar.

For these brackets, use the instructions below as a guide. .

1. Determine the best mounting screws and hardware to anchor the mounting bracket with the camera to the mounting surface. Use the following guidelines:
   - For cement wall mounting, use the expansion screw to anchor the bracket.
   - For wooden wall mounting, use self-tapping screw to anchor the bracket.
   - Make sure that the wall is strong enough to withstand more than **8 times** the weight of the camera and the bracket.
2. Using the mounting bracket as a template, mark the location of the mounting screw holes on the mounting surface. Also mark the location of a hole for the camera drop cable. The drop cable will be routed through the mounting bracket and through the mounting surface.
3. Drill holes in the mounting screws and hardware. Also, drill a 1½" diameter hole in the mounting surface for the drop cable.
4. Apply two wrap of the thread tape provided onto the treads of the pendant adapter (see below)

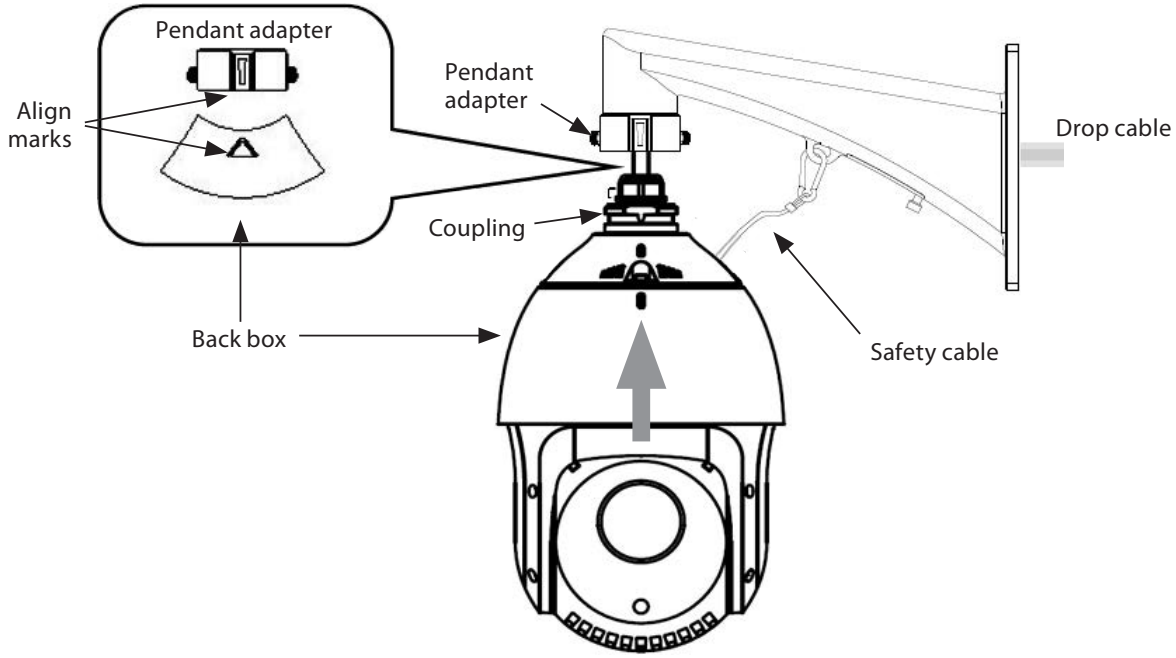


Attach pendant adapter to mounting bracket

5. Screw the pendant adapter onto the end of the mounting bracket. Tighten the set screw to secure the adapter to the bracket.

6. Clip the safety cable to the loop on the camera mounting bracket.

7. Route the camera drop cable through the mounting bracket, then clip the safety cable onto the loop in the mounting bracket.



8. Fit the camera coupling into the pendant adapter, then twist the camera to align the marks on the pendant adapter and the camera back box. See the figure above.

9. Tighten the two lock screws on the pendant adapter to secure the camera to the mounting bracket.

10. Feed the camera drop cable through hole drilled at the mounting location, then anchor the mounting bracket to the wall.

2.4 Ceiling mounting

Following the instructions below to install the camera using the **Ceiling Mount Bracket**.

1. Determine the best mounting screws and hardware to anchor the mounting bracket with the camera to the mounting surface. Use the following guidelines:
   - For cement ceiling mounting, use the expansion screw to anchor the bracket.
   - For wooden ceiling mounting, use self-tapping screw to anchor the bracket.
   - Make sure that the ceiling is strong enough to withstand more than **8 times** the weight of the camera and the bracket.

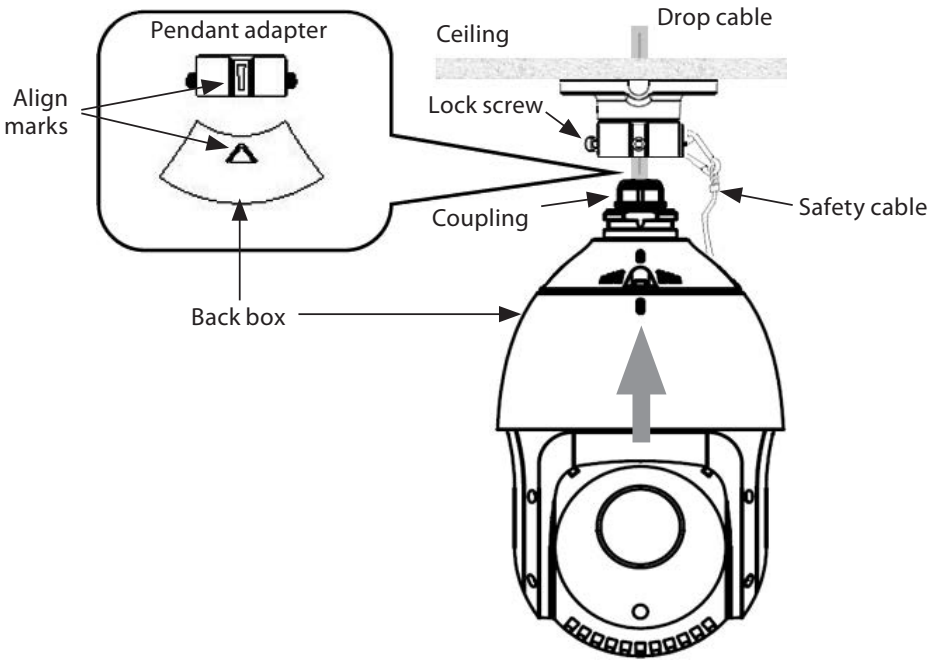
2. Using the mounting bracket as a template, mark the location of the mounting screw holes on the ceiling.

3. If the camera drop cable will be routed through the ceiling, mark the location of a hole for the camera drop cable. The drop cable will be routed through the mounting bracket and can be routed either through the mounting surface or out the side of the mounting bracket.

4. Drill holes in the mounting screws and hardware. Also, drill a 1½" diameter hole in the mounting surface for the drop cable.

5. Clip the safety cable to the loop on the camera mounting bracket.

6. Route the camera drop cable through the mounting bracket, then clip the safety cable onto the loop in the mounting bracket.



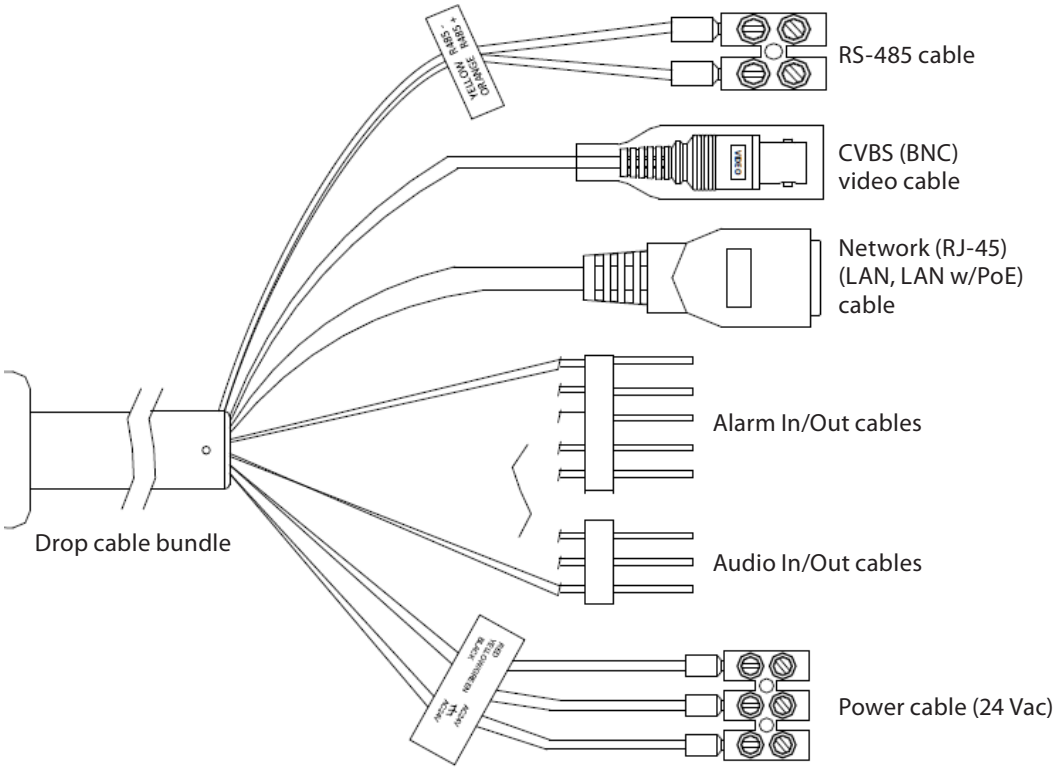
7. Fit the camera coupling into the ceiling mounting bracket, then twist the bracket to align the marks on the bracket and the camera back box. See the figure above.

8. Tighten the two lock screws on the ceiling bracket to secure the camera to the mounting bracket.

9. Feed the camera drop cable through hole drilled at the mounting location, then anchor the mounting bracket to the ceiling.

2.5 Connecting the cables

Drop cables connectors for the IDCMR-IP-POE-PTZ-20X are shown below. Each wire is labeled with its purpose.



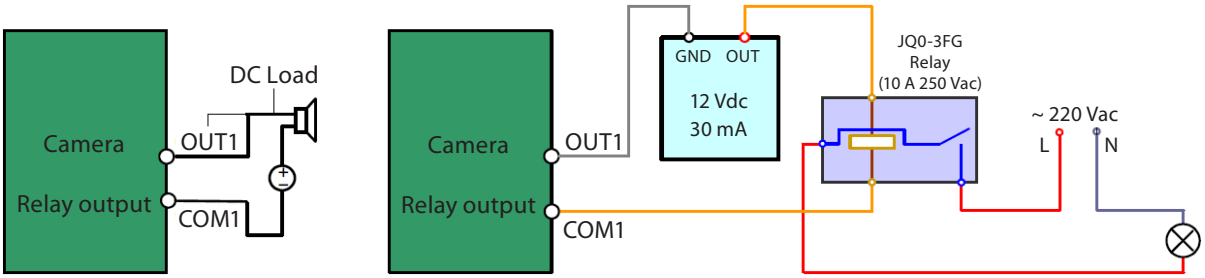
Connect the camera to other devices as needed in the order shown below.

Alarm Input/Output cables

The alarm input/output drop cable bundle provides five wires, ALARM_IN1, ALARM_IN2, ALARM_OUT1, ALARM_COM1 and ALARM_GND. These wires are color coded and labeled.

These connection use the ALARM_IN1 and ALARM_GND wires for alarm input 1, and ALARM_IN2 and ALARM_GND wires for alarm input 2. Alarm inputs normally connect normally open (NO) or normally closed (NC) sensor contacts. The normal contact state is configurable in the camera setup menus.

Connect the camera alarm output drop cables to an alarm reporting device. See the Specifications section for interface requirements and the diagram below. These connection use the ALARM_OUT1 and ALARM_COM1 wires.



The alarm output provides the relay output (no voltage). An external power supply is required when it connects to the alarm device. With a DC power supply (left diagram), the input voltage must be no more than 12 Vdc, 30 mA. For AC power supply (right diagram), the external relay must be used to prevent damages to the camera and avoid the risk of electric shock.

Audio cable

The Audio drop cable provides three wires: AUDIO_OUT, AUDIO_IN and AUDIO_GND (ground). These wires are color coded and labeled.

Connect the AUDIO_IN and AUDIO_GND wires to a line level audio input source. The input signal must be 2 ~ 2.4 Vp-p at 1 KΩ ± 10% input impedance.

Connect the AUDIO_OUT and AUDIO_GND wires to a line level audio receiver (impedance 600 Ω).

RS-485 cables

Connect the RS485+ and RS485- drop cable wires to an RS-485 controller or an NVR with an RS-485 network interface. PTZ features can also be controlled through the camera network (browser) interface, and through a supported NVR PTZ control panel. These wires are color coded and labeled.

Video cables

The video drop cable provides a BNC connector with a CVBS signal for connection to any compatible monitor. The feature is useful for maintenance and for showing the live view display on a local monitor.

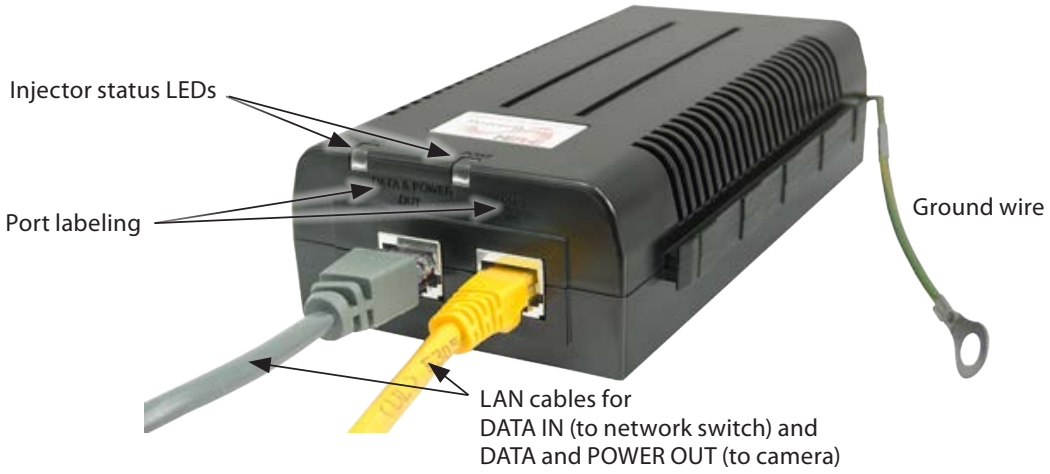
Network (LAN) cable

Connect the network LAN drop cable to a router (switch) through an Ethernet drop cable with an RJ-45 connector. If the drop cable RJ-45 connector is exposed to moisture or dust, apply the Ethernet drop cable seal kit provided. In some network configurations, the LAN cable can connect directly to a Network Video Recorder (NVR) with a built-in network switch.

Power cables

You can power the camera directly by applying 24 Vac power to the drop cable power screw-down connectors. Refer to "APPENDIX D 24 Vac Wire Gauge and Transmission Distance" on page 29 for more information.

The LAN cable can also provide Hi-PoE to the camera. A Hi-PoE injector is provided. A typical PoE injector is shown below.



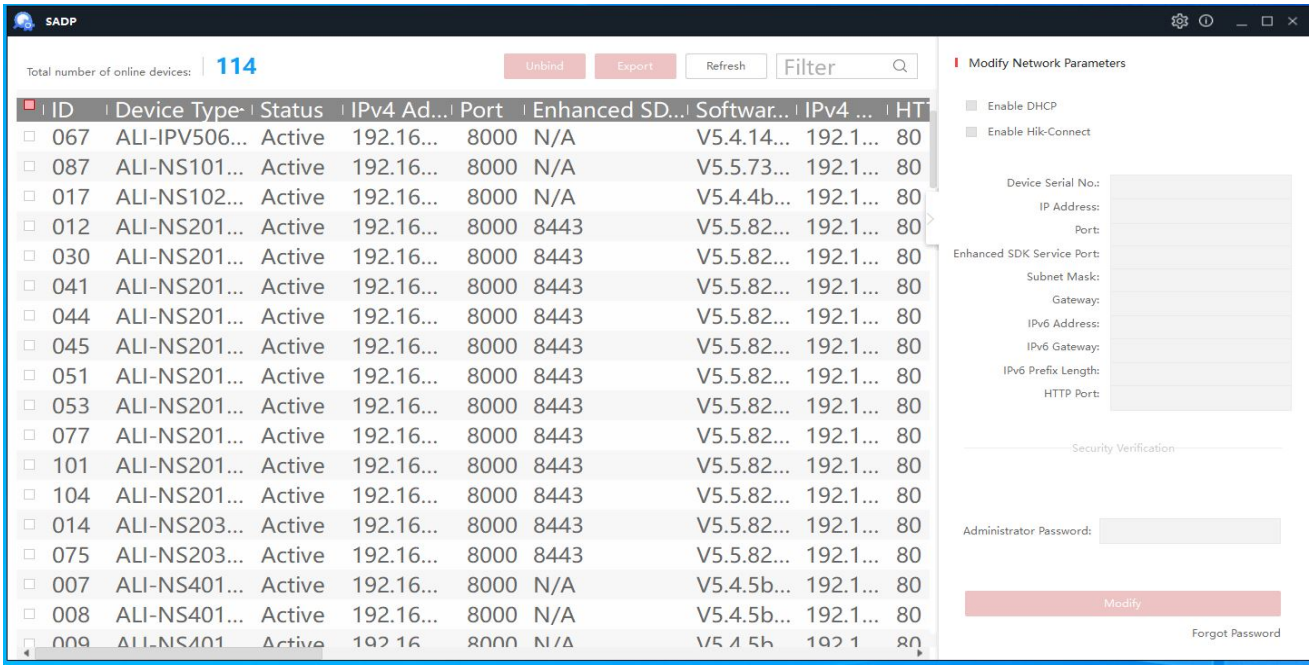
To use the injector:

1. Connect the injector ground wire to an earth ground terminal. (**NOTE**: Not all PoE injectors have a ground wire.)
2. Connect a LAN drop cable between the network switch and the DATA IN port on the injector.
3. Connect a LAN drop cable between the injector DATA and POWER OUT port and the camera LAN drop cable.
4. Plug the power cable provided (not shown) for the PoE injector into the jack on the injector, then into a standard 120 Vac electrical outlet.

After power is applied to the camera, the camera will perform initial motion checks. Allow these motion checks to complete before continuing (~ 1 minute).

Step 1. Install the SADP Software

1. Download the SADP Tool from the website: https://www.larsonelectronics.com/images/upload/SADPTool.zip. At the time this document was published, the file is named: ***SADPTool.zip*** and is 115 MB.
2. Un-zip the file on a computer with Microsoft Windows (Windows 7 or newer) that is connected to the LAN where your camera is connected.
3. Run the file contained in the zip file: ***SADPTool.exe***. Follow the on-screen instructions to install the file.
   NOTE : Be sure to allow the software administrative access or it will not work properly.
4. Open the SADPTool application. When the application opens, it automatically "discovers" and lists all compatible devices on the LAN. The discovery of devices can take several minutes. See below.



Step 2. "Activate" Inactive Camera

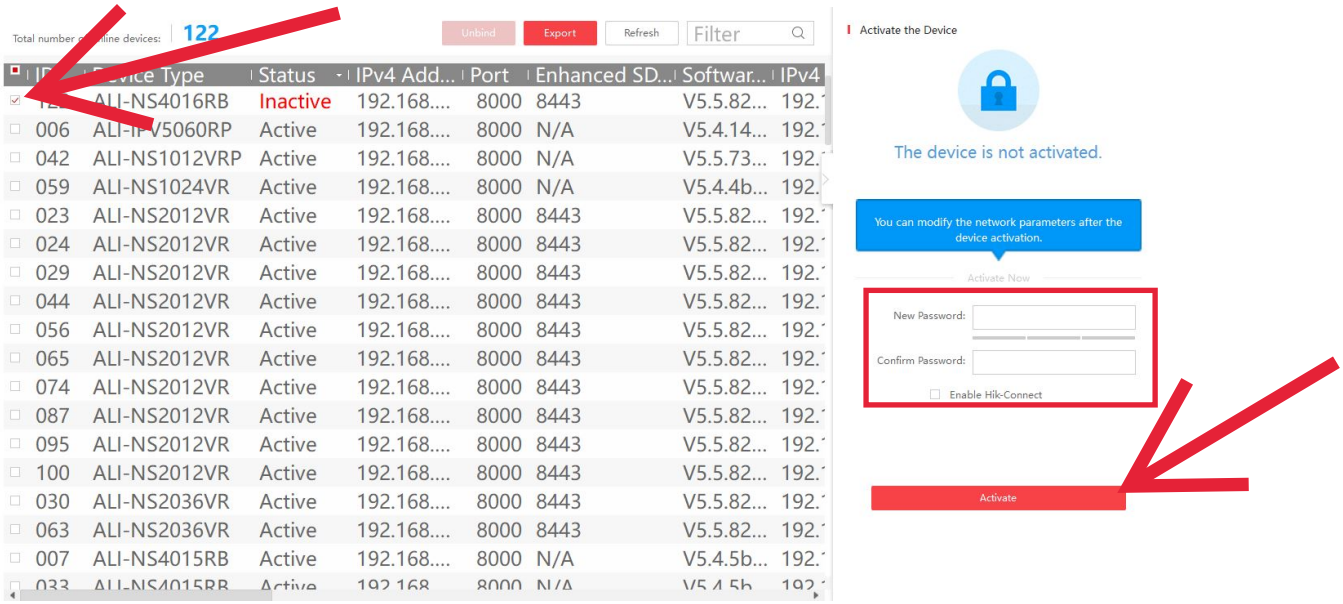
NOTE: Cameras are activated when shipped with the default IP Address of 192.168.3.xxx. The last set of numbers in your IP address will be random, but will always be in the 192.168.3.xxx subnet. Network settings may be changed in the SADP Tool. See *Step 3. Modify Network Parameters*

DEFAULTS: Username: admin Password: 12345abc!

When a camera is first installed, or reset to its factory configuration, it must be "Activated" before it can be used. In the SADP Tool, "Inactive" devices have a **Security** status of **Inactive**. A device is "Activated" when a password is assigned to the ***admin*** username of the device.

In the example below, a camera is activated and configured for its network.

1. Scan through the list of devices the SADP Tool discovered for the Inactive device you want to activate (see below). Click on the device in the list to highlight it, and then click the select box to check it.



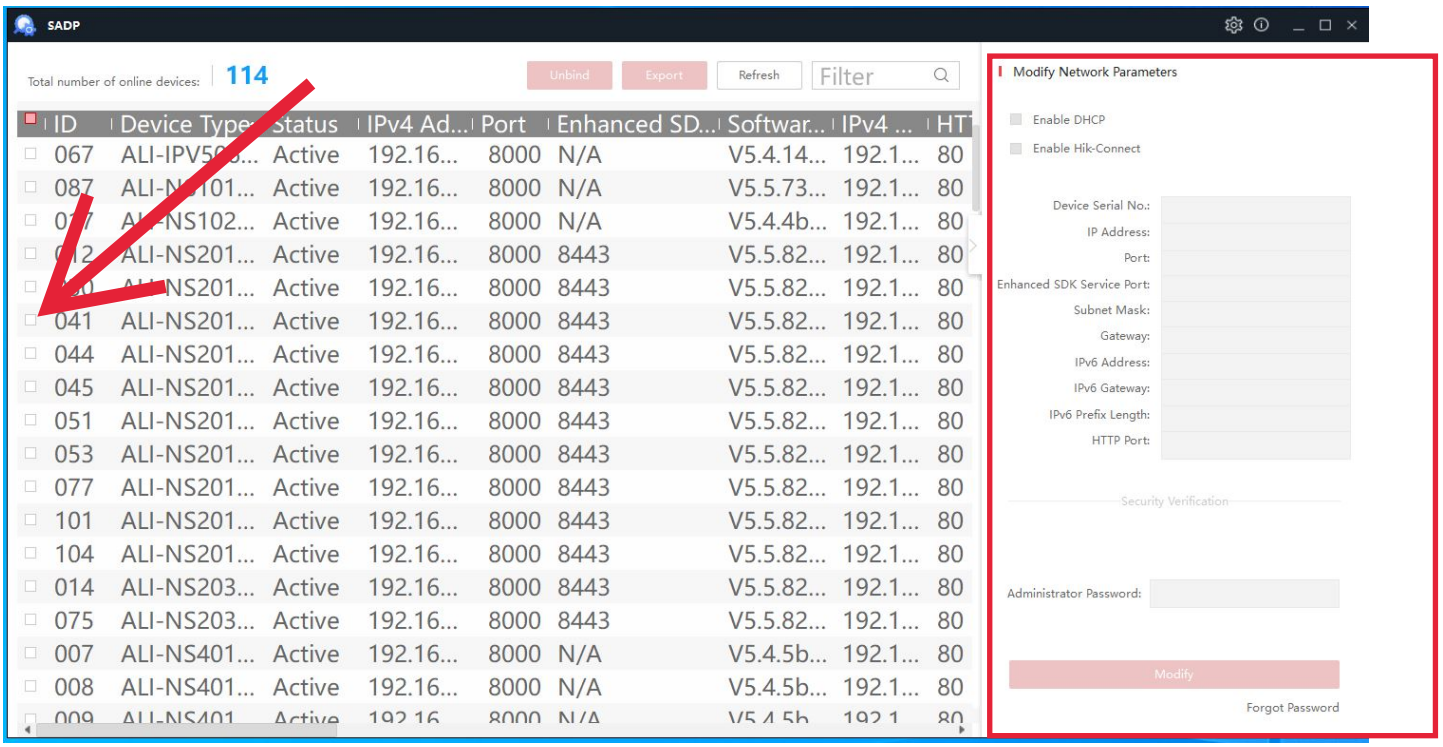
2. In the Device Activation window, create a password for the *admin* (administrator) username:

   a. In the Device Activation window, enter a password for *admin* in the **New Password** field. Use a combination of uppercase, lowercase alphabetic characters and numbers to create a “Strong” password. The rating is shown beneath the field. See above.
   b. Enter the *admin* password again in the **Confirm** field, and then click **Activate**.
   c. Record your *admin* password for reference later.

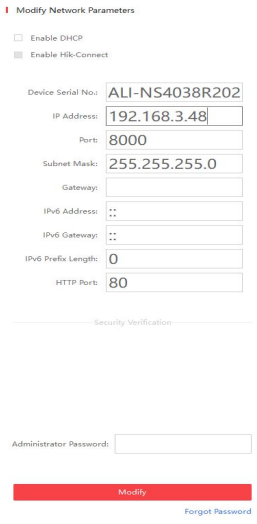
CAUTION: *If you lose your **admin** (administrator) password, you cannot configure the device or restore it to its factory settings. To reset you password, **call** your support organization for specific instructions.*

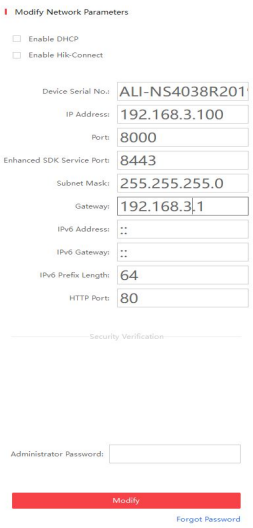
Step 3. Modify Network Parameters

1. In the list of devices discovered, find the device you want to change the network settings for, click the select box to check it, and then see the **Modify Network Parameters** window. See below.



2. In the Modify Network Parameters window, edit the correct network parameters, and then enter the *admin* user password in the field at the bottom.
   a. **Enable DHCP**: You can select **Enable DHCP** to acquire compatible network settings from a DHCP server installed on the LAN. However, these settings can be changed by the DHCP server. Since it is recommended to use a static IP address, you can use DHCP to acquire compatible network settings, and then uncheck **Enable DHCP** and save that configuration to retain the new network parameters.
   b. In the example below, the IPv4 address was changed to 192.168.3.100, and the IPv4 Gateway was changed to 192.168.3.1. These settings were determined to be compatible with the network switch and other devices that share the same network.





3. Click **Modify** to save your settings.

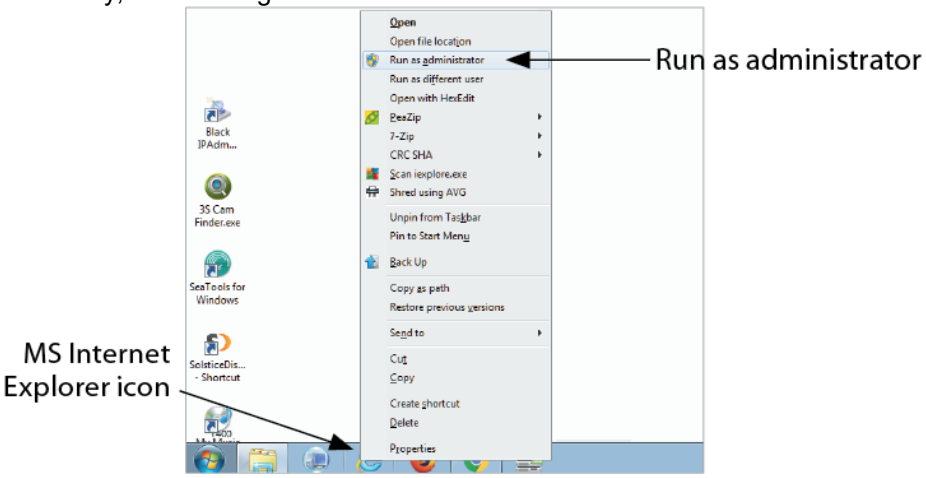
Step 4. Login to the camera

Microsoft Internet Explorer is used to access your camera remotely. Internet Explorer must run as an Administrator to use all features available through a remote login to the camera.

Setting MS Internet Explorer to run as an Administrator

Windows 7: To run Internet Explorer as an Administrator:

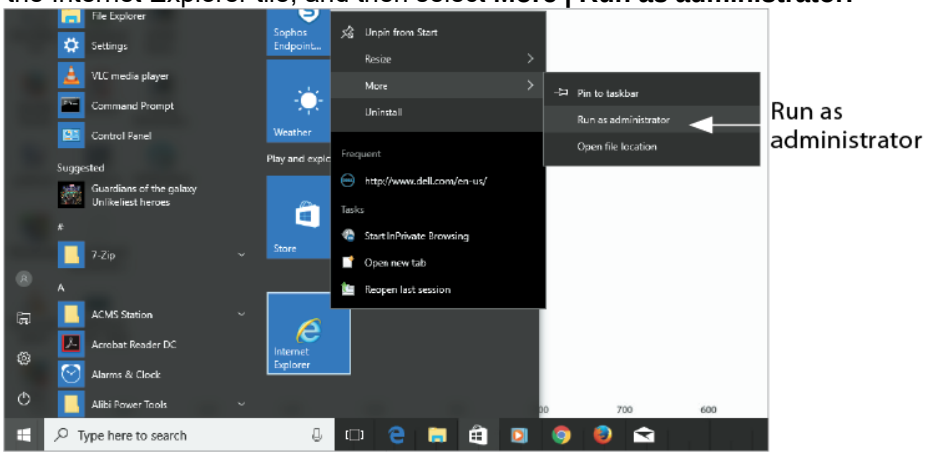
1. Find or create an IE icon on your computer desktop.
2. Hold down the shift key, and then right-click on the IE icon.



3. Click **Run as Administrator** in the pop-up menu.

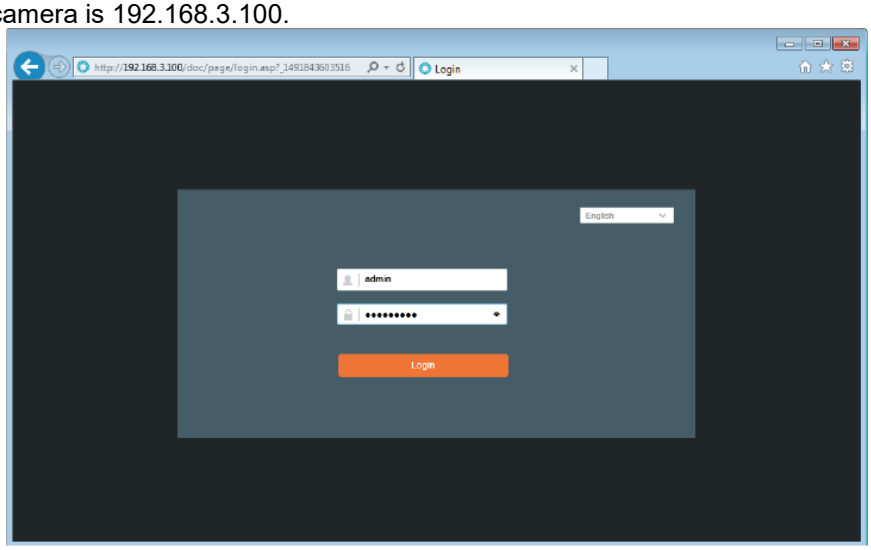
Windows 10: To run IE as an Administrator:

1. Find IE in the start menu. Usually this is found in the **Windows Accessories** group.
2. Pin the entry to **Start.**
3. Right click on the Internet Explorer tile, and then select **More | Run as administrator.**

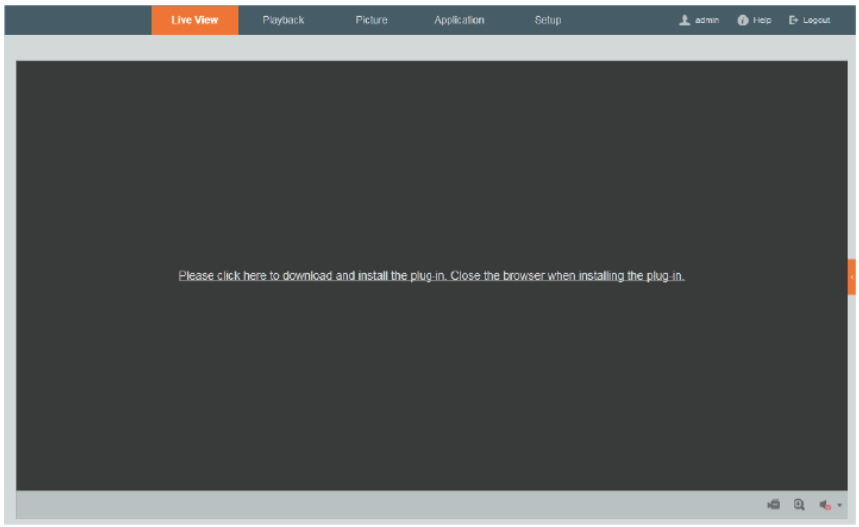


To login to the camera from a computer on the same LAN:

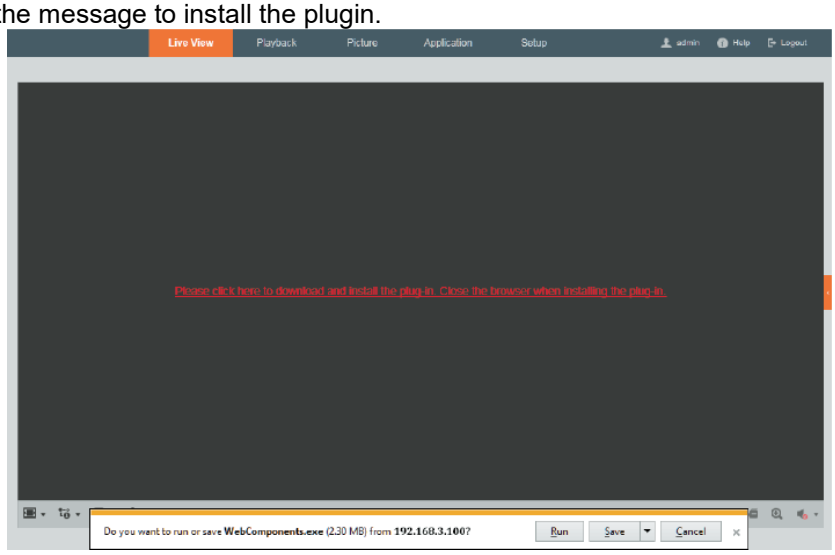
1. Open your IE browser and enter the IP address of the camera in the URL field. In the example below, the IP address of the camera is 192.168.3.100.



2. In the login window, enter ***admin*** for the **User Name** and password you created in the **Password** field, then click **Login.**
3. If this is the first time you are logging into a camera, you may see the message in the following screen. If this appears, follow the sub-steps below.



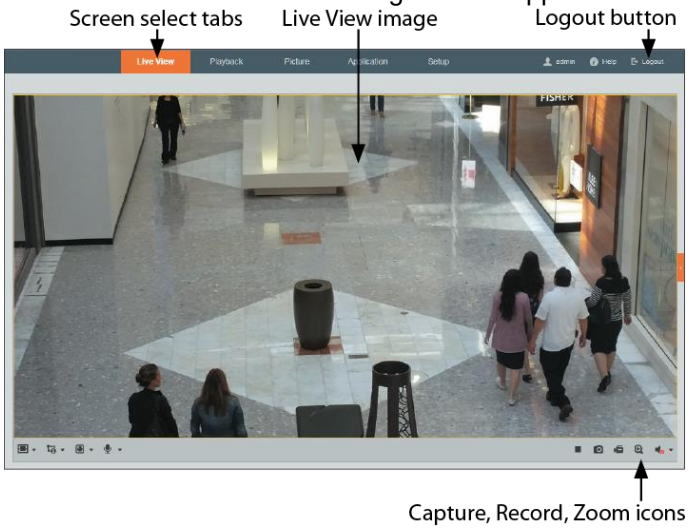
a. Click on the message to install the plugin.



b. In the message bar at the bottom of the screen, click **Run**. Follow the on-screen instructions to install ***WebComponents***. When the following screen opens, click **Finish**.



The Live View screen with the camera video image should appear.



For more information about the IE browser interface to your camera, go to LarsonElectronics.com for the latest **IP Camera User Manual** for your camera.

NOTE: *Most IP cameras have a* **Reset** *button for returning the camera configuration to its factory settings. The reset button needs to be pressed with the camera disconnected from power. Continue holding the reset button down and plug the camera back into power and continue to hold the reset button for an additional 30 - 45 seconds.*

NOTE: *For more details on using the functions of this camera, refer to the instruction manual for the Camera Management Software (CMS) you are using.*

THESE INSTRUCTIONS MAY NOT COVER ALL DETAILS OR VARIATIONS OF THIS PRODUCT FOR YOUR EQUIPMENT OR INSTALLATION REQUIREMENTS. SHOULD FURTHER INFORMATION NOT COVERED BY THESE INSTRUCTIONS BE REQUIRED, PLEASE CONTACT LARSON ELECTRONICS BY EMAIL AT SALES@LARSONELECTRONICS.COM OR BY PHONE AT 1-877-348-9680 FOR FURTHER ASSISTANCE.

PLEASE VISIT LARSONELECTRONICS.COM FOR **WARRANTY** AND **RETURN** INFORMATION.

APPENDIX A
Specifications

Camera Module	
Image Sensor	1/2.8" Progressive Scan CMOS
Min. Illumination	F1.5, AGC On: Color: 0.02 lux, B/W : 0.002 lux, 0 lux with IR
Max. Image Resolution	1920 x 1080
Focal Length	4.7 ~ 94.0 mm, 20×
Digital Zoom	16×
Zoom Speed	Approx. 3 s (optical Wide ~ Tele)
Angle of View	58.3 ~ 3.2 degree (Wide ~ Tele)
Min. Working Distance	10 ~ 1,000 mm (Wide~Tele)
Aperture Range	F1.6 ~ F3.5
Focus Mode	Auto / Semiautomatic / Manual
DWDR	Support
S/N Ratio	≥ 52 dB
Shutter Time	1 ~ 1/10,000 s
AGC	Auto / Manual
White Balance	Auto / Manual / ATW / Indoor / Outdoor / Daylight lamp / Sodium lamp
Day & Night	IR Cut Filter
Privacy Mask	8 privacy masks programmable
Enhancement	3D DNR, Defog, HLC/BLC
Pan and Tilt	
Range	Pan: 360° endless; Tilt: -15° ~ 90° (Auto Flip)
Speed	Pan Manual Speed: 0.1° ~ 400°/s, Pan Preset Speed: 400°/s, Tilt Manual Speed: 0.1° ~ 200°/s, Tilt Preset Speed: 200°/s
Number of Preset	300
Patrol	8 patrols, up to 32 presets per patrol
Park Action	Preset / Patrol / Pattern / Pan scan / Tilt scan / Random scan / Frame scan / Panorama scan
Scheduled Task	Auto scan / Frame scan / Random scan / Patrol / Pattern / Preset / Panorama scan / Tilt scan / Dome reboot / Dome adjust / Aux output
Features	
Detection	Intrusion detection, Line crossing detection, Audio exception detection, Motion detection
ROI encoding	Support 4 areas with adjustable levels
Infrared	
IR Distance	Up to 492 ft (150 m)
IR Intensity	Automatically adjusted, depending on the zoom ratio

Alarm	
Alarm I/O	2/1
Alarm Trigger	Intrusion detection, Line crossing detection, Audio exception detection, Motion detection, Dynamic analysis, Tampering alarm, Network disconnect, IP address conflict, Storage exception
Alarm Action	Preset, Patrol, Pattern, Recording, Relay output, Upload center, Upload FTP, Email linkage
Input/Output	
Audio Input	1 Mic in / Line in interface, line input: 2 ~ 2.4 Vp-p; output impedance: 1 KΩ ± 10%
Audio Output	1 Audio output interface, line level, impedance: 600 Ω
Network	
Ethernet	10BASE-T / 100BASE-TX, RJ-45 connector
Main Stream (NTSC)	30 fps (1920×1080), 30 fps (1280×1720)
Sub Stream (NTSC)	60 Hz: 30 fps (704×1480), 30 fps (352×1240), 30 fps (320×1240)
Image Compression	H.264 / MJPEG
Audio Compression	G.711ulaw / G.711alaw / G.726 / MP2L2 / G.722
Protocols	IPv4 / IPv6, HTTP, HTTPS, 802.1X, QoS, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, ICMP, DHCP, PPPoE
Simultaneous Live View	Up to 20 users
Mini SD Memory Card	Support up to 128 GB micro-SD / SDHC / SDXC card. Supports edge recording
User/Host Level	Up to 32 users, 3 Levels: Administrator, Operator and User
Security Measures	User authentication (ID and password); Host authentication (MAC address); IP address filtering
System Integration	
Application programming	Open-ended API, support ONVIF, PSIA and CG
Web Browser	Internet Explorer® 7.0 or above, Apple® Safari® 5.02 or above, Mozilla® Firefox® 5 or above, Google Chrome™ 18 or above
Power	High-PoE & 24 Vac, Max. 30 W
Working Temperature	-22°F ~ 149°F (-30°C ~ 65°C)
Humidity	90% or less
Protection Levels	IP66, TVS 4,000V lightning protection, surge protection and voltage transient protection
Certifications	FCC, CE, UL, RoHS, IEC / EN 61000, IEC / EN 55022, IEC / EN 55024, IEC / EN60950-1
Dimensions	Φ10.50 in × 14.38 in (Φ266.6 mm × 365.2 mm)
Weight (approx.)	8.81 lb (4 kg)
Mount options	PTZCL: Ceiling Mount Bracket PTZWB: Wall Mount Bracket PTZPM: Pole Mount PTZ Bracket PTZCM: Corner Mount PTZ Bracket
Supplied accessories	
	Installation Guide, HPoE Midspan injector, installation hardware

APPENDIX B
Definitions

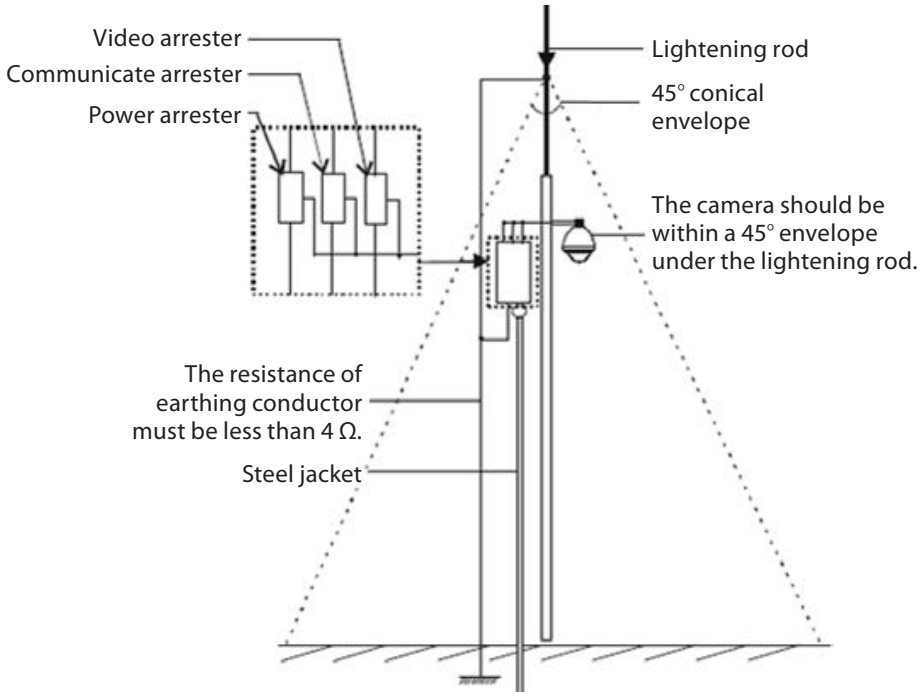
3D Digital Noise Reduction	Comparing with the general 2D digital noise reduction, the 3D digital noise reduction function processes the noise between two frames besides processing the noise in one frame resulting in clearer video.
3D Positioning	In the client software, use the click left mouse button on the desired position in the video image, and then drag a rectangle area in the lower right direction. The dome system will move the position to the center and allow the rectangle area to zoom in. Use the left key of the mouse to drag a rectangle area in the upper left direction to move the position to the center and allow the rectangle area to zoom out.
Auto Flips	In manual tracking mode, when a target object goes directly beneath the dome, the video will automatically flips 180 degrees in horizontal direction to maintain continuity of tracking. This function can also be realized by auto mirror image depending on different camera models.
Auto Focus	The auto focus enables the camera to focus automatically to maintain clear video images.
Backlight Compensation (BLC):	If you focus on an object against strong backlight, the object will be too dark to be seen clearly. The BLC function can compensate light to the object in the front to make it clear. This can cause an over-exposure of the background where the light is strong.
Day/Night Auto Switch	The speed domes deliver color images during the day. And as light diminishes at night, the speed domes switch to night mode and deliver black and white images with high quality.
Label Display	The on-screen label of the preset title, time and dome name can be displayed on the monitor. The displays of time and speed dome name can be programmed.
Limit Stops:	The dome can be programmed to move only within the limit stops (left/right, up/down).
Park Action	This feature allows the dome to start a predefined action automatically after a period of inactivity.
Patrol	A patrol is a memorized series of pre-defined preset function. The scanning speed between two presets and the dwell time at the preset are programmable.
Pattern	A pattern is a memorized series of pan, tilt, zoom, and preset functions. By default the focus and iris are in auto status during the pattern is being memorized.
Power Off Memory	The dome supports the power off memory capability with the predefined resume time. It allows the dome to resume its previous position after power is restored.
Preset Freezing:	This feature freezes the scene on the monitor when the dome is moving to a preset. This allows for smooth transition from one preset scene to another. This also guarantees that a masked area will not be revealed when the dome is moving to a preset.
Presets	A preset is a predefined image position. When the preset is called, the dome will automatically move to the defined position. The presets can be added, modified, deleted and called.
Privacy Mask	This function allows you to block or mask certain area of a scene, for preventing the personal privacy from recording or live viewing. A masked area will move with pan and tilt functions and automatically adjust in size as the lens zooms telephoto and wide.
Proportional Pan/Tilt	Proportional pan/tilt automatically reduces or increases the pan and tilt speeds according to the amount of zoom. At telephoto zoom settings, the pan and tilt speeds will be slower than at wide zoom settings. This keeps the image from moving too fast on the live view image when there is a large amount of zoom.
Scan Modes:	The dome provides five scan modes: auto scan, tilt scan, frame scan, random scan and panorama scan.
Scheduled Task	A time task is a preconfigured action that can be performed automatically at a specific date and time. The programmable actions include: auto scan, random scan, patrol 1-8, pattern 1-4, preset 1-8, frame scan, panorama scan, tilt scan, day, night, reboot, PT adjust, Aux Output, etc.

Slow Shutter	With this feature, the camera will automatically extend the exposure time in low illumination conditions to maintain clear video images. The feature can be enabled or disabled.
User Management	The camera allows you to edit users with different levels of permission. Multiple users are allowed to simultaneously access and control the same camera through the network.
White Balance (WB)	White balance can remove the unrealistic color casts. White balance is the white rendition function of the camera to adjust the color temperature according to the environment automatically.
Wide Dynamic Range (WDR)	The WDR function helps the camera provide clear images even with back lit environments. When there are both very bright and very dark areas in the field of view, WDR balances the brightness level of the whole image and provide clearer images and details.

APPENDIX C
Lightning and Surge Protection

This product includes TVS plate lightning protection technology to prevent damage caused by a pulse signal that is below 3000 watts from sources such as lighting, surging, etc. Protection measures must be taken to ensure electrical safety.

- The distance between signal transmission line and high-voltage equipment or high-voltage cable is at least 50 m.
- Outdoor wiring should better be along the eaves as much as possible.
- In the open field, wiring should be buried underground in sealed steel pipe with one-point grounding. Overhead routing method is not acceptable.
- In regions with thunderstorms or where high induction voltage are present (such as high-voltage transformer substation), high power lightning protection apparatus and lightning conductor are necessary.
- The design for installation and wiring with lightning protection and grounding should be combined with the lightning protection consideration of the building, and conform to the relevant national and industry standards.
- The system should ensure equi-potential grounding. Grounding equipment must satisfy both system anti-jamming and electric safety. It must not allow short circuit and open circuit with the zero conductor of strong grid. When the system is singularly ground, the resistance must less than 4 Ω and the cross-sectional area of the grounding cable must be no less than 25 mm^2. For grounding instructions, refer to local electrical codes and this manual.



Lightning & Surge Protection

APPENDIX D
24 Vac Wire Gauge and Transmission Distance

The following table shows the recommended maximum distance adopted for the different wire sizes when the 24 Vac voltage loss is less than 10%. For the AC driven device, the maximum voltage loss rate allowable is 10%. For example, for a device with the rating power of 80 VA which is installed 35 feet (10 m) from the transformer, the minimum wire gauge required is 0.8000 mm.

Table 1. Table of wire gauge standards

Distance: ft (m)	Wire Gauge (mm)			
Power (VA)	**0.8000**	**1.000**	**1.250**	**2.000**
10	283 (86)	451 (137)	716 (218)	1811 (551)
20	141 (42)	225 (68)	358 (109)	905 (275)
30	94 (28)	150 (45)	238 (72)	603 (183)
40	70 (21)	112 (34)	179 (54)	452 (137)
50	56 (17)	90 (27)	143 (43)	362 (110)
60	47 (14)	75 (22)	119 (36)	301 (91)
70	40 (12)	64 (19)	102 (31)	258 (78)
80	35 (10)	56 (17)	89 (27)	226 (68)
90	31 (9)	50 (15)	79 (24)	201 (61)
100	28 (8)	45 (13)	71 (21)	181 (55)
110	25 (7)	41 (12)	65 (19)	164 (49)
120	23 (7)	37 (11)	59 (17)	150 (45)
130	21 (6)	34 (10)	55 (16)	139 (42)
140	20 (6)	32 (9)	51 (15)	129 (39)
150	18 (5)	30 (9)	47 (14)	120 (36)
160	17 (5)	28 (8)	44 (13)	113 (34)
170	16 (4)	26 (7)	42 (12)	106 (32)
180	15 (4)	25 (7)	39 (11)	100 (30)
190	14 (4)	23 (7)	37 (11)	95 (28)
200	14 (4)	22 (6)	35 (10)	90 (27)

Table 2. Wire Gauge Standards

Bare Wire Gauge (mm)	American Wire Gauge AWG	Cross-sectional Area of Bare Wire (mm^2)
0.750	21	0.4417
0.800	20	0.5027
0.900	19	0.6362
1.000	18	0.7854
1.250	16	1.2266
1.500	15	1.7663
2.000	12	3.1420
2.500		4.9080
3.000		7.0683