Preface

Thank you for purchasing the TV-IP322P SecurView™ Outdoor PoE Megapixel Day/Night Internet Camera, a standalone system that can be connected directly to an Ethernet or Fast Ethernet network.

The camera is equipped with megapixel CMOS sensor, allowing you to capture high quality image with the resolution of up to 1280 x 1024. Additionally, the camera features the IR (Infrared) LEDs and ICR function (IR Cut Filter). The ICR function enables the camera to capture the clear image under sunlight and increase the amount of light for IR LEDs in the dark by changing the filter automatically. The camera also provides the audio and microphone ports, allowing you to transfer sound from/to the camera.

Compared to the conventional PC Camera, this camera features a built-in CPU and web-based solutions that can provide a cost-effective solution to transmit the real-time high-quality video images and sounds synchronously for monitoring. The camera can be managed remotely, so that you can use a web browser to access and control it from any desktop/notebook computer over the Intranet or Internet.

Compliant with IEEE802.3af PoE (Power over Ethernet) standard, the camera provides you with more flexibility of camera installation according to your application. The camera can be powered by the Ethernet, so that you can place the camera anywhere without a power outlet supported.

The trouble-free installation procedures and web-based interface allow you to integrate it into your network fast and easy. With comprehensive applications supported, the Internet camera is your best solution for remote monitor, high quality, and high performance video images.
This *Advanced Installation Guide* provides you with the instructions and illustrations on how to use your camera, which includes:

**Chapter 1**  **Introduction to Your Camera** describes the features of the camera. You will also know the components and functions of the camera.

**Chapter 2**  **Hardware Installation** helps you install the camera according to your application environment. You can use this camera at home, at work, at any where you want.

**Chapter 3**  **Accessing the Camera** lets you start using your camera without problem. The camera can be set up easily and work within your network environment instantly.

**Chapter 4**  **Configuring the Camera** guides you through the configuration of the camera using the Web browser on your PC.

**Chapter 5**  **Using SecurView™ Pro** shows you the detail instructions on operating SecurView™ Pro software.

**Chapter 6**  **How to Access the Camera Behind a Router** provides the instruction how to setup your DDNS.

**Chapter 7**  **Appendix** provides the specification of the camera and some useful information for using your camera.

**NOTE**  The illustrations and configuration values in this guide are for reference only. The actual settings depend on your practical application of the camera.

**NOTE**  All trademarks and logos are the property of the respective trademark owners.
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CHAPTER 1
INTRODUCTION TO YOUR CAMERA

1.1 Checking the Package Contents

Unpack the package and check the items contained in the package carefully. You should have the following:

- 1 x TV-IP322P
- 1 x Multi-Language Quick Installation Guide
- 1 x CD-ROM (Utility & User’s Guide)
- 1 x Desiccant **
- 2 x GPIO Connector
- 1 x Spiral Cable Wrap
- 1 x Camera Mounting Bracket Kit*
- 1 x Power Adapter (12V DC, 1.5A)

NOTE Once any item contained is damaged or missing, contact the authorized dealer of your locale.

* The provided screws included: (1) screws and washers for assembling the camera shield; (2) expansion screws for mounting the camera to the wall.

** The camera provides two packs of desiccant: one pack is pre-installed inside the camera compartment before shipment; the extra pack is provided for replacement while you open the back cover in the future.
1.2 Getting to Know the Camera

- The Camera and the Shield

* Shield* is used to protect the camera during inclement weather.

- Lens Assembly with IR LEDs

- Connectors: Power, Audio, Mic, GPIO, LAN

* There are various positions of screw hole on the shield, allowing you to move the shield forward/backward according to your needs. For example, it will protect the camera lens well during rainy day by adjusting the shield forward.
The Connectors

The camera's connectors are collected into a bundle of cable on the back panel of the camera, allowing you to connect the external devices in a well-ordered way while you are installing the camera onto the wall (or ceiling).

1. **Power:** Connects the power adapter to supply power to the camera.

2. **GPIO:** Connects the external device that features additional controlling function, such as motion detection, event triggering, alarm notification, and a variety of external control functions.

   **NOTE** Please attach the external GPIO adapters before connecting to the external device to GPIO port.

3. **Audio Out:** Connects an external audio device (such as the active speaker) to deliver sound via the camera.

4. **Mic In:** Connects an external microphone to receive the on-the-spot sound where the camera is installed.
LAN: Plugs the provided Ethernet cable to connect to your local area network (LAN). The LAN port of the camera supports the NWay protocol so that the camera can detect the network speed automatically.
1.3 Features and Benefits

- **H.264/MPEG4/MJPEG Multi-codec Supported**
  The camera provides you with excellent images by the H.264/MPEG4/ MJPEG multi-codec selectable technology, allowing you to adjust image size and quality, and bit rate according to the networking environment.

- **High Resolution Surveillance**
  Equipped with a megapixel CMOS sensor, the high performance camera is designed for your professional surveillance and security applications. The image resolution is up to 1280 x 1024. In addition, the minimum illumination of the sensor is 0 lux, providing a truly day & night functions that allows you to capture image even in low-light conditions.

- **Multiple Profiles Supported**
  The camera supports multiple profiles simultaneously, so that you can separately set up different image settings (such as image quality and frame rate) for the video types of the camera: H.264, MPEG4, MJPEG, and 3GPP.

- **Flexible Audio Capability**
  The camera allows you to connect the external microphone to receive on-the-spot audio via the Internet, allowing you to monitor the on-site voice. In addition, you can connect an external active speaker to the camera to speak through the camera (supporting mono audio only).

- **Supports RTSP**
  The camera supports RTSP (Real Time Streaming Protocol), which is a technology that allows you to view streaming media via the network. You can view the real-time video with the Quick Time player or RealPlayer. To view the real-time streaming image on your computer, open the Web browser and enter the RTSP link: rtsp://(IP address of the camera)/mpeg4
Remote Control Supported
By using a standard Web browser or the bundled SecurView™ Pro software application, the administrator can easily change the configuration of the camera via Intranet or Internet.
In addition, the camera can be upgraded remotely when a new firmware is available. The users are also allowed to monitor the image and take snapshots via the network.

I/O Connectors and RS-485 Provided
The I/O connectors (IN/OUT) of the camera provide the physical interface to send and receive digital signals to a variety of external alarm devices (such as motion detection, event triggering, alarm notification, and a variety of external control functions).
The pins TX+ & TX- of the I/O connectors are used for RS-485 data transmission, which allow you to connect a special featured device (such as an external camera stand with rotation function) and then configure the settings and control the device from the GPIO Trigger window of Web Configuration.

Multiple Platforms Supported
The camera supports multiple network protocols, including TCP/IP, SMTP e-mail, HTTP, and other Internet related protocols. Therefore, you can use the camera in a mixed operating system environment, such as Windows 7, Vista and XP.

Multiple Applications Supported
Through the remote access technology, you can use the cameras to monitor various objects and places for your own purposes. For example, babies at home, patients in the hospital, offices and banks, and more. The camera can capture both still images and video clips, so that you can keep the archives and restore them at any time.

IR LEDs and IR CUT Filter Supported
The IR LEDs around the lens assembly enables the camera capture image even in the dark environment. The night vision distance of the IR LEDs is up to 20M. The IR CUT Filter helps the camera increase the amount of light for IR LEDs by changing the filter
automatically. This allows the camera to capture clear image whenever the environment light changed.

- **PoE Supported**
  PoE (Power over Ethernet) standard enables the camera to be powered by the Ethernet, which simplifies your surveillance system by eliminating the need of power outlet. The PoE camera features both stability and security, providing a cost-saving solution to your application of Internet camera.

Please make sure that you remove the power adapter when the camera power is supplied through PoE.
1.4 System Requirement

- Networking
  - LAN 10 Base-T Ethernet or 100Base-TX Fast Ethernet; Auto-MDIX.
  - PoE IEEE 802.3af PoE

- Accessing the Camera using Web Browser
  - Platform Microsoft® Windows® 7/Vista/XP
  - CPU Intel Pentium III 800MHz or above
  - RAM 512MB
  - Resolution 800x600 or above
  - User Interface Microsoft® Internet Explorer® 6.0 or above

- Accessing the Camera using SecurView™ Pro
  - Platform Microsoft® Windows® 7/Vista/XP
  - Resolution 1024 x 768 or above

- Hardware Requirement:
  - 1 ~ 8 cameras Intel Core 2 Duo; 2GB RAM
  - 9 ~ 32 cameras Intel Core 2 Quad; 4GB RAM

NOTE: It is highly recommended that using a high performance computer to monitor multiple cameras.
CHAPTER 2

HARDWARE INSTALLATION
2.1 Assembling the Camera Mounting Bracket

Assemble the sun visor and camera mounting bracket to the camera by using the provided screws and washers, and then the camera can be mounted on the wall (or ceiling) securely through the three screw holes on the base of the holder.

- Adjust the camera position

Once you have mounted the camera to the wall (or ceiling), you need to adjust the camera position to focus on the location where you want to monitor. You can adjust the camera position easily by using the swivel ball on the camera holder.

2.2 Mounting the Camera

The expansion screws in the package are used to mount the camera on the wall (or ceiling). The following illustration provides one example of the camera installation. You can mount the camera flexibly according to your outdoor surveillance application.

a. Place the bracket against the wall. Mark the three holes with a pencil.

b. Drill holes for the provided screws anchors at each marked position.

c. Align the mounting bracket with the screw anchors, and then use the provided screws to secure it.

d. Secure the camera to the mounting bracket.

e. Adjust the swivel on the mounting bracket to desired position.

- Waterproofing

The camera is designed featuring waterproof. However, you need to protect the connectors from water soak. For example, you can tape the...
junction points of the connectors while you connect the cables or purchase a weatherproof cable/power cord protector.

2.3 Installing the Memory Card

The camera provides a SD card slot that allows you to install the memory card (not included in the package) to store files.

To install the memory card:

1. Remove the back cover of the camera by unscrewing the three screws.

2. Locate the SD card slot inside the camera, and then insert the memory card into the slot.

3. Replace the back cover and then screw the three screws.
2.4 Applications of the Camera

The camera can be applied in multiple applications, including:

- Monitor local and remote places and objects via Internet or Intranet.
- Capture still images and video clips remotely.
- Upload images or send email messages with the still images attached.

The following diagram explains one of the typical applications for your camera and provides a basic example for installing the camera.

**NOTE** The camera’s connectors are not waterproof. Please have the connectors protected by waterproof housing.
CHAPTER 3

ACCESSING THE CAMERA

3.1 Using IP Setup

The camera comes with a conveniently utility, IP Setup, which is included in the Installation CD-ROM, allowing you to search the camera on your network easily.

1. Insert the Installation CD-ROM into your computer’s CD-ROM drive to initiate the Auto-Run program.

![IP Setup Interface](image)
2. Click the **IP Setup** from the Auto-Run menu screen. Then IP Setup Wizard will appear. Click "**Next**" when the **Welcome to the IPSetup Setup Wizard** appears.

![Welcome to the IPSetup Setup Wizard](image)

3. Click "**Browse**" to choose the desired destination location. By default, the destination location is C:\Program Files\TRENDnet\IPSetup. Then Click "**Next**".

![Select Installation Folder](image)
4. Click “Next” to confirm the IPSsetup software to be installed to the computer.

5. When the Installation Complete window appears, click “Finish”.

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6. After installing the IPSetup utility, the application is automatically installed to your computer, and creates a folder in “\Start\Program\TRENDnet\IPSetup”.

7. Click Start > Programs > TRENDnet > IPSetup, and then click IPSetup

8. The IPSetup window will appear. It will search the Camera within the same network.
- **Camera Display Area:** It shows the connected camera(s) within the same network. By default, the IP setting on the Camera is set up DHCP. If you have DHCP server, the camera will automatic get the IP address from DHCP server. If you do not have DHCP server on your network, it will show the default IP as 192.168.10.30.

Double click the IP address; it will link to Camera’s Web Configuration page.

- **Change IP:** Click this button to bring up the following window. It allows you to change the IP Address. You can select either **Static IP** or click **DHCP**. Then, enter the Administrator ID & password. By default ID/password is: admin. When complete, click “**Change**”.

![Change IP Address Window]

- **Search:** Click this button to search the connected camera within the network.

- **Exit:** Click this button to exit the program.
3.2 Accessing to the Camera

By default, the IP setting on the camera is set to DHCP. It is recommend to use IPSetup to find the camera’s IP address. Once you find the IP address of the camera, click Link to access the camera’s web page.

**TIP** If the camera cannot get the IP address from DHCP server, you can access the camera by manually entering the default IP address: 192.168.10.30

When the login window appears, enter the default User name (admin) and password (admin) and press OK to access to the main screen of the camera’s Web Configuration.

**NOTE** If you are the first time to access the camera, you will be asked to install a new plug-in for the camera. Permission request depends on the Internet security settings of your computer. Click Yes to proceed.
The Main screen will appear as below:

![Main screen of the Web Configuration](image)

The Main screen of the Web Configuration provides you with the useful information and functions, including:

1. **Live View/Setup Switch:**
   - Click the **Setup** button to configure the camera. For details, see Chapter 4.
   - Click the **Live View** button to return to the Main screen to view the live view image.

2. **Compression Buttons:** Select to transmit and record the video using **H.264**, **MPEG4**, or **MJPEG** compression.

3. **Function Buttons:** Use these buttons to control the audio, video, and trigger functions.
   - **Manual Record** allows you to record and save a video clip.
• **Snapshot** allows you to capture and save a still image.

• **Browse** allows you to assign the destination folder to store the video clips and still images.

• **Talk** allows you to speak out through the camera. Please note only one user is allowed to use this function at a time.

• **Listen** allows you to receive the on-site sound and voice from the camera.

• **Trigger Out** allows you to trigger on/off the GPIO output manually.

• **Multicast** allows you to change the camera’s transmission type between multicast/unicast.

4 **Live View Image:** Displays the real-time video image of the connected camera. The compression mode is displayed above the Live View image.

5 **Zoom Buttons:** Click the zoom buttons to zoom in/out the live view image.

6 **Camera Information** – Display the camera’s location and the current date & time. The information can be modified in the Web Configuration.

**NOTE** If your computer use Microsoft® Windows® 7/Vista platform, you may not find the recorded files that are saved by **Snapshot** or **Manual Record**. You need to disable the protected mode of Security in the IE Browser through the following steps:

Please follow the below Steps:

1. Open IE Browser
2. Select **Tools** → **Internet Options**
3. Select **Security**
4. Uncheck the ”**Enable Protected Mode**” then press **OK**
3.3 Configuring the IP Address of the Computer

If you are failed to access to the camera, please check the IP address of your computer. When you connect the camera to your computer directly to proceed with configuration of the camera, you need to set up the IP addresses to be in the same segment for the two devices to communicate.

1. On your computer, click Start > Control Panel to open the Control Panel window.

2. Double-click Network Connection to open the Network Connection window.

3. Right-click Local Area Connection and then click Properties from the shortcut menu.

4. When the Local Area Connection Properties window appears, select the General tab.

5. Select Internet Protocol [TCP/IP] and then click Properties to bring up the Internet Protocol [TCP/IP] Properties window.

6. To configure a fixed IP address that is within the segment of the camera, select the Use the following IP address option. Then, enter an IP address into the empty field. The suggested IP address is 192.168.10.x (x is 1~254 except 30), and the suggested Subnet mask is 255.255.255.0.

7. When you are finished, click OK.
CHAPTER 4

CONFIGURING THE CAMERA

4.1 Using the Web Configuration

You can access and manage the camera through the Web browser and the provided software application UltraView Pro. This chapter describes the Web Configuration, and guides you through the configuration of the camera by using the Web browser.

To configure the camera, click on the Main screen of Web Configuration. The Web Configuration will start from the Basic page.

The Web Configuration contains the settings that are required for the camera in the left menu bar, including Smart Wizard, Basic, Network, Video/Audio, Event Server, Motion detect, Event Config, Tools, RS-485, SD Card, and Information.
4.2 Using Smart Wizard

The camera’s Smart Wizard lets you configure your camera easily and quickly. The wizard will guide you through the necessary settings with detailed instructions on each step.

To start the wizard, click **Smart Wizard** in the left menu bar.

**Step 1. Camera Settings**
By default, the camera name is set as model number. Change the name if necessary. Enter the location and administrator password twice.
Step 2. IP Settings
Set up the IP setting, DHCP, Static IP or PPPoE.

Step 3. Email Settings
Enter the mail server information. If you are using a free mails server, select the SSL and/or STARTTLS according to the mail server requirement.
Step 4. Confirm Settings
Click **Apply** to finish the setting or click **Prev** to change the previous setting or click **Cancel** to disregard all setting.
4.3 Basic Setup

The Basic menu contains three sub-menus that provide the system settings for the camera, such as the Camera Name, Location, Date & Time, and User management.
4.3.1 Basic >> System

- **Basic**: This item allows you to assign the camera name and location.
  - **Camera Name**: Enter a descriptive name for the camera, which will help you to identify the camera when you have multiple cameras on your network. By default, the camera name is set as the model number.
  - **Location**: Enter a name where the camera is located

- **Indication LED**: This item allows you to set the LED illumination as desired. The available options include: **Normal** and **OFF**.

- **IR CUT & IR LED**: The camera features ICR function (IR CUT Filter) and IR LED, allowing you to capture clear image when environment light changed.
  - **IR CUT Control**: Set the ICR function (IR CUT filter) for the camera: **Auto** mode or **Schedule** mode.
    In Auto mode, the lens filter will be switched automatically to capture black and white image when the change of environment light is detected by the camera’s light sensor.
  - **IR LED**: Enable or disable the camera’s IR LED manually by selecting **ON** or **OFF**.
4.3.2 Basic >> Date & Time

- **Date and Time**: Enter the correct date and time for the camera.
  - **TimeZone**: Select the proper time zone from the pull-down menu.
  - **Synchronize with PC**: Select this option and click **Apply**. The date & time settings of the camera will be synchronized with the connected computer.
  - **Synchronize with NTP Server**: Select this option and enter the NTP Server IP address, then click **Apply**. The date/time will be synchronized from the NTP Server. By default, the update interval is set to 6 hours.
  - **Manual**: Select this option to set the date and time manually. When done, click **Apply**.
4.3.3  Basic >> User

- **Administrator**: To prevent unauthorized access to the camera’s Web Configuration, you are strongly recommend to change the default administrator password. Type the administrator password twice to set and confirm the password.

- **General User**
  - **User Name**: Enter the user’s name you want to add to use the camera.
  - **Password**: Enter the password for the new user.
  - **UserList**: Display the existing users of the camera. To delete a user, select the one you want to delete and click **Delete**.

When you are finished, click **Add/Modify** to add the new user to the camera. To modify the user’s information, select the one you want to modify from **UserList** and click **Add/Modify**.
Guest
- **User Name:** Enter the guest’s name you want to add to use the camera.
- **Password:** Enter the password for the new guest.

**UserList:** Display the existing guests of the camera. To delete a user, select the one you want to delete and click **Delete.**

**NOTE** The “General User” can access the camera and control the Function buttons of the camera’s Web Configuration; the “Guest” can only view the live view image from the Main screen of the Web Configuration while accessing the camera. Only the “Administrator” is allowed to configure the camera through the Web Configuration. The maximum 12 user accounts.

**Direct Video Stream Authentication:**
To stream the video directly without going through the configuration page, you can access it via Internet.
- **Enable:** User needs to enter user name and password to stream the camera.
- **Disable:** User can stream the camera without entering the user name and password.

Examples of the direct link to video:
- **H.264 Mode**
  http://camera_ip_address:port number/h264view.htm

- **MPEG4 Mode**
  http://camera_ip_address:port number/mpgview.htm

- **MJPEG Mode**
  http://camera_ip_address:port number/jpgview.htm

**NOTE** This feature is enabled by default, and for security reason, it is recommended to have the feature enabled at all time.
4.4 Network Settings

The Network menu contains two sub-menus that provide the network settings for the camera, such as the IP Setting, DDNS Setting, and IP Filter.

4.4.1 Network >> Network

- **IP Setting**: This item allows you to select the IP address mode and set up the related configuration. The default setting is **DHCP** mode enabled.
  - **DHCP**: Select this option when your network uses the DHCP server. When the camera starts up, it will be assigned an IP address from the DHCP server automatically.
- **Static IP**: Select this option to assign the IP address for the camera directly. You can use IPFinder to obtain the related setting values.

<table>
<thead>
<tr>
<th>IP</th>
<th>Enter the IP address of the camera. The default setting is <strong>192.168.10.30</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subnet Mask</td>
<td>Enter the Subnet Mask of the camera. The default setting is <strong>255.255.255.0</strong>.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>Enter the Default Gateway of the camera. The default setting is <strong>192.168.10.1</strong>.</td>
</tr>
<tr>
<td>Primary/Secondary DNS</td>
<td>DNS (Domain Name System) translates domain names into IP addresses. Enter the Primary DNS and Secondary DNS that are provided by ISP.</td>
</tr>
</tbody>
</table>

- **PPPoE**: Select this option when you use a direct connection via the ADSL modem. You should have a PPPoE account from your Internet service provider. Enter the **User Name** and **Password**. The camera will get an IP address from the ISP as starting up.

**NOTE** Once the camera get an IP address from the ISP as starting up, it automatically sends a notification email to you. Therefore, when you select PPPoE as your connecting type, you have to set up the email or DDNS configuration in advance.

- **DDNS Setting**: With the Dynamic DNS feature, you can assign a fixed host and domain name to a dynamic Internet IP address. To set up the DDNS:
  1. Select the **Enable** option to enable this feature.
  2. Select the **Provider** from the pull-down list.
  3. Enter the required information in the **Host Name**, **User Name**, and **Password** boxes.

**NOTE** You have to sign up for DDNS service with the service provider before configuring this feature. Please refer to Chapter 6 for detail information.

- **UPnP**: The camera supports UPnP (Universal Plug and Play), which is a set of computer network protocols that enable the device-to-
device interoperability. In addition, it supports port auto mapping function so that you can access the camera if it is behind an NAT router or firewall. Select the **Enable** option to enable this feature.

- **Ports Number**
  - **HTTP Port**: The default HTTP port is **80**.

**NOTE** If the camera is behind an NAT router of firewall, the suggested port to be used is from 1024 to 65535.

### 4.4.2 Network >> Network >> Advanced

#### HTTPS
- **Enable**: Select this option to enable HTTPS, which is a secure protocol to provide authenticated and encrypted communication within your network.
- **HTTPS Port**: Assign a HTTPS port in the text box. The default HTTPS port is **443**.
Bonjour: The devices with Bonjour will automatically broadcast their own services and listen for services being offered for the use of others. If your browser with Bonjour, you can find the camera on your local network without knowing its IP address.

The Apple Safari is already with Bonjour. You can download the complete Bonjour for Internet Explorer browser from Apple's web site by visiting http://www.apple.com/bonjour/.

RTSP

- RTSP Streaming: Selection the Authentication as Disable or Enable to configure the transmission of streaming data within the network. The default RTSP Port (Real Time Streaming Protocol) is 554.

- Multicast settings: Configure the following settings so that you can deliver information from your camera to a set of receivers.

<table>
<thead>
<tr>
<th>Group IP</th>
<th>Assign a category of IP addresses to receive the information from the camera.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.264 Port</td>
<td>Assign a multicast port for H.264 in the text box. The default port is 1234.</td>
</tr>
<tr>
<td>MPEG4 Port</td>
<td>Assign a multicast port for MPEG4 in the text box. The default port is 1236.</td>
</tr>
<tr>
<td>Audio Port</td>
<td>Assign a multicast port for audio in the text box. The default port is 1238.</td>
</tr>
<tr>
<td>TTL</td>
<td>Set the TTL value from 1 to 255, which is used to modify the time to live field in the IP header.</td>
</tr>
</tbody>
</table>

QoS

- Live Video DSCP: Assign the DSCP (DiffServ Code Point) of the stream video from the camera.

- Live Audio DSCP: Assign the DSCP (DiffServ Code Point) of the stream audio from the camera.
4.4.3 Network >> IP Filter

The IP Filter setting allows the administrator of the camera to limit the users within a certain range of IP addresses to access the camera.

To disable this feature, select the **Disable** option; otherwise, select the **Accept** option to assign the range of IP addresses that are allowed to access the camera, or select the **Deny** option to assign the range of IP addresses that are blocked to access the camera.

- **Disable**: Select this option to disable the IP Filter function of the camera.

- **Accept IPv4**: Assign a range of IP addresses that are allowed to access the camera by entering the **Start IP address** and **End IP address** options. When you are finished, click **Add** to save the range setting. You can repeat the action to assign multiple ranges for the camera.

  For example, when you enter 192.168.10.50 in Start IP Address and 192.168.10.80 in End IP Address, the user whose IP address...
located within 192.168.10.50 ~ 192.168.10.80 will not be allowed to access the camera.

- **IPv6:** Enter the **IP Address** that is allowed to access the camera.

**Deny**

- **IPv4:** Assign a range of IP addresses that are blocked to access the camera by entering the **Start IP address** and **End IP address** options. When you are finished, click **Add** to save the range setting. You can repeat the action to assign multiple ranges for the camera.

  For example, when you enter 192.168.10.50 in Start IP Address and 192.168.10.80 in End IP Address, the user whose IP address located within 192.168.10.50 ~ 192.168.10.80 will not be allowed to access the camera.

- **IPv6:** Enter the **IP Address** that is not allowed to access the camera.
4.5 Setting up Video & Audio

The Video & Audio menu contains four sub-menus that provide the video and audio settings for the camera.
4.5.1 Video & Audio >> Camera

- **Image Setting**
  - **Black Level:** Adjust the brightness level from 0 ~ 5.
  - **Brightness:** Adjust the brightness level from 0 ~ 100.
  - **Saturation:** Adjust the colors level from 0 ~ 100.
  - **Sharpness:** Adjust the sharpness level from 0 ~ 100.

**TIP** Click **Default** to restore the default settings of the three options above.

- **Mirror:** Select **Vertical** to mirror the image vertically, or select **Horizontal** to mirror the image horizontally.

- **Light Frequency:** Select the proper frequency according to the camera’s location to reduce the noise: **50Hz** or **60Hz**.

- **AE Control:** Select AE (Auto Exposure) speed as **Fast**, **Normal** or **Slow**.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Frequency</th>
<th>AE Control (Day Time) min. shutter speed</th>
<th>AE Control (Night Time) min. shutter speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fast</td>
<td>Normal</td>
</tr>
<tr>
<td>VGA</td>
<td>60Hz</td>
<td>1/120s</td>
<td>1/60s</td>
</tr>
<tr>
<td></td>
<td>50Hz</td>
<td>1/100s</td>
<td>1/50s</td>
</tr>
<tr>
<td>SXGA</td>
<td>60Hz</td>
<td>1/120s</td>
<td>1/60s</td>
</tr>
<tr>
<td></td>
<td>50Hz</td>
<td>1/100s</td>
<td>1/50s</td>
</tr>
</tbody>
</table>

- **Night Mode:** Select to capture **Color** or **Mono** image when in dark environment.
4.5.2 Video & Audio >> Video

- **Video Resolution:** Select the desired video resolution from the four formats: **SXGA, VGA, QVGA** and **QQVGA**. The higher setting (VGA) obtains better video quality while it uses more resource within your network.

- **Video Quality:** Select the desired image quality from five levels: **Lowest, Low, Medium, High,** and **Highest.**

- **Frame Rate:** Select **Auto** or a proper setting depending on your network status.

- **MPEG4**

  - **Video Resolution:** Select the desired video resolution from the three formats: **VGA, QVGA** and **QQVGA**. The higher setting (VGA) obtains better video quality while it uses more resource within your network.

  - **Video Quality:** Select the desired image quality from five levels: **Lowest, Low, Medium, High,** and **Highest.**
- **Frame Rate**: Select *Auto* or a proper setting depending on your network status.

- **MJPEG**
  
  - **Video Resolution**: Select the desired video resolution from the four formats: *SXGA*, *VGA*, *QVGA* and *QQVGA*. The higher setting (VGA) obtains better video quality while it uses more resource within your network.
  
  - **Video Quality**: Select the desired image quality from five levels: *Lowest*, *Low*, *Medium*, *High*, and *Highest*.
  
  - **Frame Rate**: Select *Auto* or a proper setting depending on your network status.

  **NOTE**  The camera supports H.264, MPEG4 and MJPEG compression. Please note that that MJPEG mode captures the images in JPEG format, which requires higher bandwidth to view smooth video. You can control the bandwidth of each connection well through the setting options above. For the bandwidth information, refer to the *Appendix, Bandwidth Reference Guide*.

- **3GPP**: The camera supports 3GPP specification. Select the *Disable* option to disable this feature. Otherwise, select *3GPP Without Audio* or *3GPP With Audio* to transfer the video clips without or with audio.

  If you use a mobile phone that supports 3GPP, you can also view the real-time streaming image captured by the camera on your phone (with the default player on the phone) by entering the RTSP link: `rtsp://(IP address of the camera)/3gp`.

  **NOTE**  Your mobile phone and the service provider must support 3GPP function. Please contact your service provider when you are failed to use this service.
4.5.3  Video & Audio >> Audio

- **Camera Microphone In:** Select the **Enable** option to enable the camera’s audio function, so that you can receive the on-site sound and voice from the camera.

- **Camera Speaker Out:** Select the **Enable** option to enable the camera’s external speaker function, so that the connected speaker can play the sound and voice through the camera.

You can set the speaker’s volume by entering the proper value in the **Volume** option. The default setting is **90**.
4.5.4 Video & Audio >> Overlay / Mask

This sub-menu is used to set the image overlay and mask feature of the camera.

- **Image Overlay:** This item allows you to set the image overlay.

  In the **Image File** option, click **Browse** to select the image file from your computer, and then click **Upload**. You can click **Preview** to check the image size and adjust the image position before clicking **Upload**. The preview image area is displayed with red dotted line. If you want to remove the preview image before uploading, click **Delete**.

  Since you click **Upload**, the preview image area is displayed with white dotted line. Click **Enable** and set the transparency setting by whether selecting the **Transparent** option or not.

  When done, click **Apply**. You can see the image overlay on the live view image when you click **Live View**.
NOTE The width and height of the input overlay graphic should be multiple of 4 at a maximum size of 43690 pixels, and in JPG or BMP (24-bit RGB) format.

- Privacy Mask: This item allows you to configure up to two mask areas.
  
  Select the area 1 or 2 from the Window pull-down list, and then click Enable. You can change the size and position of the area by holding and dragging the mouse.
  
  You can also change the color of the mask area by clicking the Color box and then selecting the color you want.
  
  When done, click Apply. You can see the mask area(s) on the live view image when you click Live View.

4.5.6 Video & Audio >> Overlay / Mask >> Text Overlay

This page is used to set the text overlay feature of the camera, including the following three options: date & time, heading text, and background transparency setting.

- Include Date & Time: Select this option to display the date & time information on the live view image.

- Include Text: Select this option and enter your heading text in the box to display the text information on the live view image.

- Enable Opaque: Select this option to display the overlay text with a background color.
For example, when you select the **Include Date & Time** and **Include Text** options and click **Apply**, you can see the related information displayed on the live view image when you click the **Live View** button.
4.6 Event Server Configuration

The Event Server menu contains four sub-menus that allow you to upload images to FTP, send emails that include still images, and store the images to a NAS system.

When you complete the required settings for HTTP, FTP, Email, or Network Storage, click **Test** to test the related configuration is correct or not. Once the camera connects to the server successfully, click **Apply**.
### 4.6.1 Event Server Setting >> HTTP

#### HTTP Notify For Motion Trigger
Send the query parameter via an HTTP notification when an event is triggered.
- **Host:** Enter the IP of the HTTP server
- **Port:** Enter the Port number of the HTTP server
- **User Name:** Enter the username of the HTTP server
- **Password:** Enter the password of the HTTP server
- **Query:** Enter the query parameter for the request if necessary
Example:
Host: 192.168.10.1
Port: 80
Query: xxx.cgi?name1=value1&name2=value2
Ex: cgi/event.cgi?status=#s&time=#t&model=modelname

Result:
http://192.168.10.1:80/cgi/event.cgi?status=#s&time=#t&model=modelname

4.6.2 Event Server Setting >> FTP

![Event Server Setting FTP](image)

- **FTP**
  - **Host Address**: Enter the IP address of the target FTP server.
  - **Port Number**: Enter the port number used for the FTP server.
  - **User Name**: Enter the user name to login into the FTP server.
  - **Password**: Enter the password to login into the FTP server.
  - **Directory Path**: Enter the destination folder for uploading the images. For example, test.
  - **Passive Mode**: Select the Enable option to enable passive mode.
- **FTP Upload with**: Select upload to FTP with one snapshot image or a series image in pre-event/post-event time when event triggered.

**NOTE** Depending on the network environment, your network may not be able to upload all the screen shots that was set to FTP server.

### 4.6.3 Event Server Setting >> Email

![Event Server Setting Email Window](image)

- **Email**
  - **SMTP Server Address**: Enter the mail server address. For example, [mymail.com](http://mymail.com). If you are using a free mail service (e.g. Google Gmail®, Yahoo®, Hotmail®), please enter the SMTP server address from the service provider.
  - **Sender Email Address**: Enter the email address of the user who will send the email. For example, [John@mymail.com](mailto:John@mymail.com).
- **SMTP Port:** Assign the SMTP port in the text box. The default SMTP port is 25. If the mail server requires an encrypted connection, you should check the SSL option.

- **SSL / STARTTLS:** Most free email services require an encrypted connection. If you are using a free email service, please check the mail server requirement and select the options that apply to the server.

- **Authentication Mode:** Select None or SMTP according to the mail server configuration.

- **Sender User Name:** Enter the user name to login the mail server.

- **Sender Password:** Enter the password to login the mail server.

- **Receiver #1 Email Address:** Enter the first email address of the user who will receive the email.

- **Receiver #2 Email Address:** Enter the second email address of the user who will receive the email.

- **Send Email With:** Select the attachment type that is to be added to the email.

- **Wan IP Change Notify**

  Select the option to enable the system to notify you when the WAN IP address changed.

**NOTE** Depending on the network environment, your network may not be able to send all the screen shots that was set to your email account.
4.6.4  Event Server Setting >> Network Storage

- **Samba Server Address**: Enter the IP address of the Network Storage server.

- **Share**: Assign the folder on the Network Storage server to share the files to users.

- **Path**: Assign the path for uploading the files on the Network Storage server. For example, **Test**.

- **User Name**: Enter the user name to login into the Network Storage server.

- **Password**: Enter the password to login into the Network Storage server.

- **Split By**: When the file is too large to upload smoothly, use this option to split it by selecting **File Size** or **Recording Time**.

- **When Storage Full**: Select **Stop Recording** or **Recycle – Delete Oldest Folder** when the storage space on the Network Storage server is full.
- **Encode Format**: Select **MPEG4** or **H.264** as the encode format while recording.
- **File Format**: Select **MP4** or **AVI** as the file format while recording.

**NOTE**  The recorded video files in Network Storage are enclosed by AVI format without audio.

### 4.6.5 Event Server Setting >> Instant Message

The camera supports the Jabber IM service, so that you can send an instant message once you have a Jabber account. For more information of Jabber, please visit the Jabber Website at: [http://jabber.org/Main_Page](http://jabber.org/Main_Page). The information show above is using google talk.
- **Instant Message**

- **Jabber ID**: Enter your user ID to login into the Jabber IM service.
- **Jabber Password**: Enter the password to login into the Jabber IM service.
- **Manually Specify Server Host/Port**: Select the Enable option to manually configure the Jabber server settings.
- **Jabber Server Address**: Enter the Jabber server address manually.
- **Jabber Port**: Assign the Jabber port manually in the text box.
- **Encrypt Connection**: Select the **Enable** option to secure the connection.
- **Encrypt Authentication**: Select the **Enable** option to secure the connection.
- **Receiver**: Enter the receiver’s information.
- **Message**: Enter the message that is to be sent.
4.7 Motion Detect

The Motion Detect menu contains the command and option that allow you to enable and set up the motion detection feature of the camera. The camera provides three detecting areas.

To enable the detecting area, select **Window 1/2/3** from the pull-down list, and then select **Enable**. When the detecting area is enabled, you can use the mouse to move the detecting area and change the area coverage.

- **Name**: Assign a name to the detecting area.
- **Threshold**: Move the slide bar to adjust the level for detecting motion to record video.

**NOTE**  Sliding the Threshold bar to the right will decrease the sensitivity of motion detection; sliding the Threshold bar to the left will increase the sensitivity of motion detection.
4.8 Event Configuration

The Event Config menu contains five sub-menus that provide the commands to configure event profiles.
4.8.1 Event Configuration >> General Setting

- **General**
  - **Snapshot/Recording Subfolder**: You can assign a descriptive name for the subfolder to save the captured image/video files. Otherwise, leave this option blank to use the default setting.
  - **Storage Recording Time Per Event**: Limit the recording time while you are using the Network Storage solution.
  - **GPIO Trigger Out Retention Time Per Event**: Limit the retention time of the GPIO Trigger Out function.

4.8.2 Event Configuration >> Arrange Schedule Profile

- **Schedule Profile**: This sub-menu displays the scheduled profile(s). To customize the profile, click **Add** and then enter a descriptive name for the profile in the prompt dialog window. After entering the profile name, click **OK** and the profile is added to the Schedule
Profiles list. To delete the profile, select the profile in the list and click **Delete**.

- **Profile Name**: Display the profile name that you select in the Schedule Profiles list.

- **Weekdays**: Select the weekday(s) that you want to separately assign in the schedule profile. The weekday that has been assigned will be displayed with green color.

- **Time List**: Display the time period that you have assigned within the selected weekday. To assign the same time period to every weekday, click **Copy this to all weekdays**; click **Delete this from all weekdays** to remove the selected time period from every weekday. Click Delete to remove the selected time period.

- **Start/End Time**: Enter the start and end time and then click **Add** to assign a time period within in the selected weekday.
4.8.3  Event Configuration >> Motion Detect Trigger

- **Motion Detect Trigger**: Select the **Enable** option to enable the trigger function of the camera, so that you can send captured images within the detecting area to the FTP server, email receiver, or the Network Storage server. You have to configure corresponding settings, such as FTP server and email server, to enable this feature. Please note that you have to configure the related settings before enabling these features.

- **Schedule Profile**: Select a schedule profile from the pull-down list.

- **Action**: Set the **Trigger Out** function or select the destination that the captured images will be sent to: , or **Record to SD Card**, **Record to Network Storage**, **Send Email**, **FTP Upload**, or **Instant Message**.
### 4.8.4 Event Configuration >> Schedule Trigger

You can separately configure the schedule for trigger function of the camera by **Email**, **FTP**, or **Network Storage**. Select the **Enable** option on each item, and then select a **Schedule Profile** from the pull-down list and set the **Interval** time.

**NOTE** If the setting value of the **Network Storage Recording Time Per Event** option in General Setting is longer than the **Interval** time in Network Storage Schedule, the recorded file will be a continuous video clip.

For example, if you set the **Network Storage Recording Time Per Event** as 10 seconds and the **Interval** as 5 seconds, recorded file becomes a non-stop video clip because the camera will record a 10-second video clip every 5 seconds.
4.8.5 Event Configuration >> GPIO Trigger

- **GPIO Trigger**: Select the **Enable Trigger In 1/2** option to enable the GPIO trigger function of the camera, so that you can set Trigger Out function or send captured images within the detecting area to the SD card, FTP server, email receiver, Network Storage server, or send an instant message. Event server has to be configured prior to using the functions.

- **Schedule Profile**: Select a schedule profile from the pull-down list.

- **Action**: Set the **Trigger Out** function or select the destination that the captured images will be sent to: Record to SD Card, Record to Network Storage, Send Email, FTP Upload, or Instant Message.
4.9 Tools

The Tools menu provides the commands that allow you to restart or reset the camera. You can also backup and restore your configuration, and upgrade the firmware for the camera.
- **Factory Reset:** Click **Reset** to restore all factory default settings for the camera. You can also do the physical reset by press the reset button on the camera. Remove the front cover of the camera and press the reset button as indicates below.

- **System Reboot:** Click **Reboot** to restart the camera just like turning the device off and on. The camera configuration will be retained after rebooting.

- **Configuration:** You can save your camera configuration as a backup file on your computer. Whenever you want to resume the original settings, you can restore them by retrieving the backup file.
  - **Backup:** Click **Get the backup file** to save the current configuration of the camera.
  - **Restore:** Click **Browse** to locate the backup file and then click **Restore**.

- **Update Firmware:** You can upgrade the firmware for your camera once you obtained a latest version of firmware.
  - **Current Firmware Version:** This item displays the current firmware version.
  - **Select the firmware:** Click **Browse** to locate the backup file and then click **Update**.

**NOTE** Make sure to keep the camera connected to the power source during the process of upgrading firmware. Otherwise, the camera might be damaged because of failure of upgrading firmware.
4.10 RS-485

The RS-485 menu provides the control settings for external device through the I/O port.
4.10.1  RS-485 >> RS-485 Setting

Select the Enable option and complete the required configuration to use the RS-485 function of the device.

- **Popular Protocol Setting**: Select a Protocol (Pelco-D or Pelco-P) and then select a Camera ID.

- **Custom Protocol Setting**: Select this option to configure the commands protocol manually. You can click Test to test each command that you have assigned. In the Name and Command string boxes, you can customize more buttons for your needs. Please note that the setting values in the Command string boxes should be from the connected external device (please refer to the manual of the connected device).
4.10.2 RS-485 >> Patrol

The **Patrol** function provides the patrol control settings for the connected camera.

- **Preset Position**
  
  To set the preset position for the connected camera:

  1. Use the Navigation buttons to move the camera lens to the desired position.
  2. Select a Position number (Home, 2~32) from the **Preset Position** pull-down list.
  3. Enter the descriptive name for the location in the text box.
  4. Click **Apply**.
     - **Pan Speed**: Adjust the moving speed (1 ~ 10) while panning the lens.
     - **Tilt Speed**: Adjust the moving speed (1 ~ 10) while tilting the lens.
- **Zoom Speed**: Adjust the speed (1 ~ 10) while zooming the lens.
- **Focus Speed**: Adjust the speed (1 ~ 10) while focusing the lens.
- **Zoom In/Zoom Out**: Click to zoom in/out the live view image.
- **Focus Far/Focus Near**: Click to adjust the focus by far/near.

**Patrol Position**

This field allows you to set the positions for camera’s patrolling:

1. Select a preset position from the **Preset Position** pull-down list, and then click **Add to be Patrol Position**. The preset position will be added to the **Patrol Path** list.

2. From the **Patrol Path** list, you can change the patrolling order by selecting a position and clicking **Up** or **Down**. You can also delete a position by clicking **Remove**.

3. You can change the stay time for each position when the camera is patrolling. Select a position in the Patrol Path list and then enter a time setting in the text box below the Stay Time list. Click **Update** to save the setting. The **Stay Time** list displays the current setting for each position.

4. When done, click **Save**.
4.11 Setting up the SD Card

The SD Card menu allows you to set the SD card function installed in the camera.
4.11.1 SD Card >> SD Card Setting

- **SD Card Dismount:** Click **Dismount** to safely remove the SD card that is installed in the camera.

  **Note:** You must disable the event trigger in order to dismount the SD Card.

- **SD Card Information:** Displays the information of the installed SD card, including the **Total space** and **Free space**.

- **SD Card Setting**
  - **When Storage Full:** Select **Stop Recording** or **Recycle – Delete Oldest Folder** when the storage space on the SD card is full.
  - **Encode Format:** Select **MPEG4** or **H.264** as the encode format while recording.
  - **File Format:** Select **MP4** or **AVI** as the file format while recording.

4.11.2 SD Card >> File Manager

The **File Manager** menu allows you to download files from the SD card. Select the desire file and click the **Download** button to download the file.
4.12 Information

The Information menu displays the current configuration and events log of the camera.
4.12.1 System Information >> Device Information

Display the Basic, Video & Audio, and Network settings of the camera.

4.12.2 System Information >> Logs

The Logs table displays the events log recorded by the system.
CHAPTER 5

SECURVIEW™ PRO SOFTWARE

This chapter describes detailed instructions on using SecurView™ Pro, a customized software application with a user-friendly interface that allows you to access your cameras. The Software can monitor and record up to 36 cameras. It also let you change some basic settings of the camera, such as schedule profiles and motion detecting areas. The SecurView™ Pro also supports audio or Pan/Tilt function.

It is recommended to use a high performance computer if you want to connect multiple cameras simultaneously.

- **Platform:** Microsoft® Windows® 7/Vista/XP
- **Hard Disk:** 80GB or above
- **Resolution:** 1024x768 or above
- **Hardware Requirement**
  - 1 ~ 8 cameras: Intel Core 2 Duo; 2GB RAM
  - 9 ~ 32 cameras: Intel Core 2 Quad; 4GB RAM

* For Windows Vista users: please go to User Accounts and Family Safety > User Accounts > Turn User Account Control on or off, then uncheck the checkbox of “Use User Account Control (UAC) to help protect your computer”. Restart your computer to validate the setting. For additional information of User Account Control, please go to http://www.microsoft.com/windows/products/windowsvista/features/details/useraccountcontrol.mspx

* For Windows 7 users, please go to Control Panel > User Accounts > Change User Account Control Setting to lower your notify setting. For additional information of User Account Control, please go to http://windows.microsoft.com/en-us/windows7/products/features/user-account-control

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5.1 Installation

1. Insert the Installation CD-ROM into your computer’s CD-ROM drive to initiate the Auto-Run program.

2. Click the SecurView™ Pro from the Auto-Run menu screen.

**NOTE:** To use SecurView™ Pro, you must have Microsoft .NET Framework 2.0 installed in the computer. The setup wizard will detect it and, if the program is not installed yet, it will ask you to install it during the process of installing SecurView™ Pro.

**NOTE:** Microsoft® Windows® Installer 3.0 or above is a required component to install SecurView™ Pro. For more information of the required component during installation, please visit the Microsoft support Website.
3. Then **SecurView™ Pro** Setup Wizard will appear. Click “**Install**”.

4. Wait until the program finish the installation. By default, the destination location is C:\Program Files\TRENDnet\SecurView Pro.
5. Click “Finish” to finish the installation.

6. After installing the SecurView™ Pro, the application is automatically installed to your computer, and creates a folder in “Start \Program\TRENDnet\SecurView Pro”.
5.2 Using SecurView™ Pro

5.2.1 Launch the Program

To start SecurView™ Pro, click Start > All Programs > TRENDnet > SecurView™ Pro > SecurView™ Pro. You can also start the program by double-click the SecurView™ Pro icon on your desktop.

On the login window, enter the **User name/Password** and click **OK** to login. The default **User name/Password** is *admin/admin*. If you wish to save the login information, please select **Auto Login**.
5.2.2 Main Window and Features

When you start and login to SecurView™ Pro, the Main window will display as below:

The Main window provides you with the information on operating the system, as well as the control panel such as the Quick Launch buttons, and so on.

**NOTE** For best result, it is higher recommended to configure resolution setting to 1024 x 768 or higher; otherwise, it cannot be displayed on the screen when launching the program.

1. **Live View Window** displays the live video of the connected camera(s).
Quick Launch Buttons are located below the Live View Window, providing you with the following quick-launch functions:

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
</table>
| ![Logout](image) | **Logout**: To log out the SecurView™ Pro program  
**Close**: To close the SecurView™ Pro program |
| ![Restore Recording Type](image) | **Restore Recording Type**: Restore all recording type to current camera’s setting  
**All Continuous Recording**: Continuous recording on all cameras  
**Stop All Recording**: Stop recording on all cameras |
| ![View Setting](image) | **View Setting**: To configure eMap settings  
**eMap View**: To view current maps  
**Camera Status**: Display cameras status |
| ![Playback](image) | **Playback**: Playback recorded files |
| ![Schedule](image) | **Schedule**: Display Schedule Configuration window |
| ![Event Server](image) | **Event Server**: Setup a SMTP server  
**Address Book**: Add/Remove email address for event notification  
**Event Trigger**: Setup event trigger configuration |
| ![Device Setting](image) | **Device Setting**: Set up the camera  
**Recording Setting**: Set up the recording path |
| ![Account Information](image) | **Account information**: Setup administrator password  
**Version**: Display software version  
**System Setting**: Software settings |
3 **Camera View Mode** buttons in this area allow you to switch the camera view mode.

<table>
<thead>
<tr>
<th>Buttons</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Single Camera View" /></td>
<td>Display the connected camera(s) in a single camera view mode.</td>
</tr>
<tr>
<td><img src="image" alt="Quad View" /></td>
<td>Display the connected camera(s) in a quad view mode.</td>
</tr>
<tr>
<td><img src="image" alt="3x3 Grid" /></td>
<td>Display the connected camera(s) in a 3 x 3 grid view mode.</td>
</tr>
<tr>
<td><img src="image" alt="13-Camera Split" /></td>
<td>Display the connected camera(s) in a 13-camera view mode using a split window. The first camera is displayed as the major view.</td>
</tr>
<tr>
<td><img src="image" alt="17-Camera Split" /></td>
<td>Display the connected camera(s) in a 17-camera view mode using a split window. The first camera is displayed as the major view.</td>
</tr>
<tr>
<td><img src="image" alt="N x N Grid" /></td>
<td>Display the connected camera(s) in a N x N grid view mode, supporting up to 36 cameras.</td>
</tr>
<tr>
<td><img src="image" alt="Full Screen" /></td>
<td>Display the live view of the selected camera in full screen mode. Click ESC on the keyboard to return to Main window.</td>
</tr>
</tbody>
</table>
| ![Auto Switch](image) | Automatically switch the live view of each connected cameras in single camera view mode by 30 seconds*. Click once to start and click again to stop.  
* The auto-switch time is set as 30 seconds by default, which can be changed by clicking the ➔ **System Setting** and then change the value from the pull-down list of the **Auto Switch time interval** option. |

4 **System Information** displays the system information, including the date and time, and the available storage space of the system.

5 **Live View Status** provides the status of live view mode, including **Camera List** and **eMap**.
• **Camera List** displays the status of the connected cameras. If multiple cameras are connected, you can switch to the live view of each camera by simply selecting the camera from the list.

• **eMap** allows you to select the desired camera to the view from the map easily. Please note that you have to set up the eMap for monitoring in advance.

6 **Camera Control Buttons** provides the control buttons that allow you to control the selected camera.

<table>
<thead>
<tr>
<th>Buttons</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Talk On/Off" /></td>
<td><strong>Talk On/Off</strong>. Click to enable/disable the speaker function of the connected camera. This option is available only in single camera view mode.</td>
</tr>
<tr>
<td><img src="image" alt="Listen On/Off" /></td>
<td><strong>Listen On/Off</strong>. Click to enable/disable the microphone function of the connected camera. This option is available only in single camera view mode.</td>
</tr>
<tr>
<td><img src="image" alt="Set/Preset/Go" /></td>
<td>For Pan/Tilt cameras, use this control panel to set the preset positions (up to 8 positions). Use Navigation buttons to adjust camera position, and then select the position number (1<del>8) from the Set button. To move to the preset position, simply select the position number (1</del>8) from the Go button.</td>
</tr>
<tr>
<td><img src="image" alt="Navigation Buttons" /></td>
<td>Navigation Buttons (Left/Right/Up/Down/Home). If the connected camera has pan/tilt functions, the Navigation buttons allow you to move the camera lens position. Clicking the Home (center) button will move the camera lens to the assigned home position.</td>
</tr>
<tr>
<td><img src="image" alt="Patrol/Stop" /></td>
<td>The <strong>Patrol/Stop</strong> buttons are used to enable/disable the patrol function of the camera. Click <strong>Patrol</strong> to start patrolling through the preset positions once. Click <strong>Stop</strong> to stop patrolling.</td>
</tr>
</tbody>
</table>
5.2.3 Manage the Cameras

Before adding the cameras, please setup the recording setting first.

- **Configure Recording Settings**

  1. Click the button and then select **Record Setting**.

  2. Default path is C:\, click **Browse** and select the desire directory then click **Save** to complete the configuration.

To change the time interval for recording, select time from the pull-down menu.

**NOTE:** The system will automatically delete the oldest files (10%) when the size of recorded files is up to 90% of the storage space.
Add a Camera

1. Click the button and select **Device Setting** to display the Device Setting window.

2. Click **New**.
3. Click on **Search**, all cameras that’s connected to your network would appear.

![Image of Device Setting window with a list of cameras and options to Search, Add, and Close.]

4. Select the camera you would like to add and then click **Add**.

![Image of Device Search window with a list of cameras including IP addresses, ports, device names, and MAC addresses, with a highlight on a specific row.]
5. The information of the camera will display on the screen. It will auto detect the IP address/port number and display the stream type of the camera. Please type in the correct user name and password, then select **Preview** to view live image.

![Device Setting window](image)

6. To setup recording style, select **Yes** on **Record** option. These four recording types will appear. Select one of the recording type, configure it then click **Save**.

   ![Recording options](image)

   **Continuously:**
   Record the stream video continuously

   **Schedule:**
Records stream video by schedule. You can setup the schedule by click **Add Schedule** here.

Click on **New** to create a new schedule and select the time to record. Click on **Save** when finish.

![Schedule Configuration](image)

**Motion:**
Record video by Motion Detection. Motion detection recording required to setup a motion detection area. If you are adding a new camera, you must preview the camera first in order to setup the motion detection area.
Click on **Motion detection area** to setup

Enable motion detection windows, set up the sensitivity and click on **Save**.
Motion by Schedule:
same requirement as Motion & Schedule recording.

Digital Input:
Recording triggered when there I/O port is triggered. After all recording methods are configured, click **Save** to apply the settings.
7. Camera list will appear with recording type notification.

8. Once you added all the cameras, click the close button “x” on the Device Setting windows to return to the main windows. The cameras will display here.
NOTE  Divx/Xvid codec is required for viewing the image of camera. If the image cannot be displayed in the Live View/Preview window normally, click the following path to download and install the required component: http://download.divx.com/divx/DivXInstaller.exe

- Edit / Delete a Camera

1. **To edit a camera:** From the Device Setting window, highlight the camera you would like to edit then click on **Modify** button.
2. **To delete a camera:** select the desired one and then click **Remove**. Click **Yes** to confirm.

- **View Camera Image**

Since you have added camera(s) to the system, the image of the selected camera(s) will be displayed on the Live View Window automatically. You can view a maximum of 36 cameras simultaneously. Additionally, you can select one-camera or other view mode to display the video from the Camera View Mode buttons.

For example, if you use only one camera, select single camera view mode (□), and the Live View Window will display the view as below. You can select the other modes according to your need.
The **Information icon** (_information icon_ ) on the top-right corner of the window provides you with the options to connect/disconnect the camera, select a camera to be displayed in the window, capture a still image of the camera live video, or switch to eMap mode. Click the Information icon to pop up the shortcut menu and select the desired option.
Playback the Recorded Files

1. Click the button to display the Playback window.

2. On the Playback window, select the camera and setup the begin/end date and begin/end time, then click Search. The search result will be displayed in the Record File list.
3. To playback the video clip, select the desired file and click Play.

![Image of video playback interface]

**5.2.4 eMap Setup & Camera Status**

- **Manage eMap**

  Click the button and select **View Setting** to manage eMap.

![Image of eMap settings menu]

eMap refers to the geography and device scope in the SecurView™ Pro, which visually presents the devices in your security system. It uses a background of the area (e.g. a picture or a map) as the interface for monitoring.
To add an eMap

1. On the View Setting window, click New.

2. Enter an eMap name.
3. Click **Browse** to select a **Picture File** from your computer. Picture will display in the Preview window.

4. Click **Save** and click **OK** to apply the settings.
5. Click **Camera Location** to assign the camera location.

6. The following screen appears.
7. Select the camera from the list and then click the position on the map. The camera icon 📷 will be displayed on map.

8. Click **Save** when complete.
To modify/remove an eMap

1. **To edit the eMap:** In the eMap List, select the map name from eMap list, and click **Modify**.

2. The map’s information will display on the preview windows. After changes the setting information, click **Save** to save the setting.
3. **To delete the eMap**: In the eMap List, select the desired one and click **Remove**. The selected map will be removed from the list.
**View eMap**

a. Click the button and select **eMap View**.

b. Select the map from the eMap Name list.
Camera Status  Click the camera icon , the camera Live Monitor window will display live image on that camera.

5.2.5 System Info

Account

Click the System button and select Account to change the administrator password of the system.
Enter the **Current password**, and then enter the new password twice (in the **Type new password** and **Retype password** boxes). Then click **Save**.

- **Version**

  Click the **System** button and select **Version** to view the current firmware version of the system.
- System Setting -

Click the **System** button and select **System Setting**. **Auto Scan** period can be set from 30 seconds to 100 seconds.

![System Setting](image)

- 5.2.6 Event Settings -

- Setting up Event Server -

Click the **Event Server** button to configure the SMTP settings for email notification use.
Select the **Enable SMTP** option and configure the following information correctly to start the email feature.

- **SMTP Server Address**: Enter the mail server address. For example, mymail.com or smtp.gmail.com or smtp.live.com
- **Sender Email Address**: Enter the email address of the user who will send the email. For example, John@mailserver.com.
- **Authentication Mode**: Select **None** or **SMTP** according to the mail server configuration.
- **Sender User Name**: Enter the user name to login the mail server.
- **Sender Password**: Enter the password to login the mail server.
- **Port Number:** Enter the port number used for the email server.

- **SSL:** If the mail server requires an encrypted connection, you should check the **SSL** option. For example, gmail users, please select this option.

When completed, click **Save** and then select **OK**. The system will automatically start the Event Service.

**TIP** The status of Event Service is indicated by the ![icon] in the system bar.
Sending Notification to the User

Click the button and select Address Book to assign the user to the Address Book of the camera. The user will receive a real-time notification from the system while triggering out.

1. On the Address Book window, click New.
2. In the Address Book Information field, enter the Name and Email of the user.
3. When completed, click Save. The user will be displayed in the Address Book List.
4. To edit the user: In the Address Book List, select the desired user and click Modify. The user’s information will
be displayed, where you can change the user’s information and then click **Save** when completed.

5. **To delete the user:** In the Address Book List, select the desired user and click **Remove**. The selected user will be removed from the list.

### Configuring Event Trigger

Click the **button and select **Event Trigger** to configure the trigger out function of the camera.

1. On the Event Trigger window, select the desired camera from the Camera List.
2. Do one of the following:

- **SMTP**: Select this option and enter the Subject and Message, the system will send an email message to the selected user(s) in the Address Book List.

- **Play Sound**: Select this option select a sound file from the computer, so that the system will alarm by the sound while triggering out.

- **eMap Popup**: Select this option and select the eMap profile from the pull-down menu. The camera view of the eMap will be displayed while triggering out.

5.2.7 Close Program

When you have finished operating, click the button and select **Logout** to logout the system or **Close** to exit the program.
CHAPTER 6

How to access the camera behind a Router

You can either setup the Dynamic DNS connection via camera itself or your home router. An account from any of the listed DDNS providers is required prior to this operation.

Configure DDNS on your Camera

1. Go to Camera’s DDNS Setting page, click Enable to activate the feature. Then select a DDNS provider from the list.

   ![DDNS Setting Page]

2. Enter your DDNS’s the Host Name, User Name and Password.

   ![DDNS Configuration]

   - Host Name: trendnet.dyndns.org
   - User Name: trendnet
   - Password: ************
   - HTTP Port: 9000 (default 80)
3. In the **Port Number** section, assign an HTTP port of the camera. The default HTTP Port on the camera is 80. The example shows above is using port number 9000.

4. Open another web browser and go to your Router’s Web Configuration page. (In the example, TRENDnet’s TEW-651BR Wireless N router is used)

![TRENDnet Router Configuration](image)

5. Go to **Virtual Server** section and create a new entry.
   - **Enable**: Click **Enable**
   - **Name**: Enter the application name (eg. CameraName)
   - **Protocol**: Select **TCP**
**Private Port:** The HTTP port that you assign on your Camera.

**Public Port:** The port used on remote side to access to your Camera.

**LAN Server:** The local IP address of your Camera.

Then click **Add** to add the application.

* Please refer to your router’s user’s manual for detail **Virtual Server** setting. Some router might use **Port Forwarding** or **Special applications** for this function. The setup steps should be very similar.
6. Open another web browser and enter your DDNS domain and camera’s port number.
   http://yourDomainName:PortNumber

7. Camera’s login page will appear.

**Configure DDNS on your router**

1. Go to Camera’s DDNS ➔ Ports Number section, assign a HTTP port for your camera and click **Apply**.

2. Login to your router’s web configuration page.
3. Find the **Dynamic DNS** configuration section.

4. Enable DDNS, fill out the following information and then click **Apply**.
5. Go to Virtual Server* section and create a new entry. 
   **Enable**: Click Enable  
   **Name**: Enter the application name (eg. Camera Name)  
   **Protocol**: Select TCP  
   **Private Port**: The HTTP port that you assign on your Camera.  
   **Public Port**: The port used on remote side to access to your Camera.  
   **LAN Server**: The local IP address of your Camera.

![Virtual Server Image](image)

Click **Add** to add the application.

* Please refer to your router’s user’s manual for detail Virtual Server setting. Some router might use Port Forwarding or Special applications for this function. The setup steps should be very similar.

6. Open another web browser and enter your DDNS domain and camera’s port number. 
   ![New Tab - Windows Internet Explorer](image)

   **http://yourDomainName:PortNumber**

7. The camera login page will appear.
Appendix

A.1 Specification

<table>
<thead>
<tr>
<th>Camera</th>
<th>Specification</th>
</tr>
</thead>
</table>
| General | Sensor: 1/3” Megapixels color CMOS sensor  
Resolution: 1280 x 1024 pixels  
Board Lens  
Focal Length: 12mm  
Aperture (F/No): F1.8  
Minimum illumination: 0 Lux (Night vision)  
Diagonal viewing angle: 28.5 degree |
| Image & Video | Compression: H.264, MPEG-4, and MJPEG  
Exposure/white balance/gain control : automatic  
Built-in ICR |
| Audio | External microphone in  
Sensitivity: -48dB +/- 3dB  
Frequency: 50~16000Hz  
S/N: >60dB  
Format: PCM/AMR |
| GPIO | Ground, GPIO in/out, RS485, 12V DC, 24V AC |
| SD Slot | Supports SD/SDHC (up to 32GB) |
| Hardware | |
| Network | IEEE 802.3u 10/100Mbps Fast Ethernet  
IEEE 802.3af PoE |
| LED | Power, Link |
| Reset Button | Reboot or restore to factory default |
| Power Consumption | 9.5 Watts max. |
| Power | 12 V DC, 1.5 A external power adapter  
(for non-PoE installations) |
| Dimension | 235 x 110 x 89 mm (9.3 x 4.3 x 3.5 in.) |
| Weight | 1.5 kg (3.2 lb) |
| **Operating Condition** | Temperature: -20°C ~ 60°C (-4°F ~ 140°F)  
Wind Velocity: 130km/hr  
Humidity: Max. 90% (non-condensing) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Certifications</strong></td>
<td>CE, FCC, IP66</td>
</tr>
<tr>
<td><strong>Management Interface</strong></td>
<td>Internet Explorer 6.0 or above</td>
</tr>
<tr>
<td><strong>To Run SecurView Pro</strong></td>
<td>Windows 7 (32/64-bit), Vista (32/64-bit), XP (32/64-bit)</td>
</tr>
</tbody>
</table>
| **SecurView Pro**       | Channel: supports up to 32 cameras  
Record/Playback/Motion Detection |
| **Network Protocols**   | TCP/IP, IPv4, IPv6, UDP, ICMP, DHCP, NTP, DNS, DDNS, SMTP, FTP, HTTP, HTTPs, Samba, PPPoE, UPnP, Bonjour, RTP, RTSP, and RTCP |
| **Management**          |                                                                                  |
| **Remote**              | Remote management supported                                                      |
| **Backup / Restore**    | Save/retrieve configuration files                                                |
| **Settings**            |                                                                                  |
| **Image**               | Brightness, saturation, sharpness, and mirror (horizontal/vertical)              |
| **Video**               | Encoding type: H.264, MPEG-4, MJPEG  
Compression: 5 levels  
Resolution/Frame Rate:  
SXGA (1280 x 1024) up to 15fps  
VGA (640x480) up to 30fps  
QVGA (320x240) up to 30fps  
QQVGA (160x120) up to 30fps  
Multi-Stream  
H.264: SXGA, VGA, QVGA, QQVGA  
MPEG4: VGA, QVGA, QQVGA  
MJPEG: SXGA, VGA, QVGA, QQVGA |
| **Recording**           | Recording type: continuous, schedule, or motion detection with software          |
| Event Management                  | Event trigger: motion, GPIO, schedule  
|                                 | Store video file to SD card  
|                                 | Send Instant message to Jabber client via Jabber server  
| QoS                              | DSCP  
| Port Settings                    | HTTP port: 80 (default)  
| Digital Zoom                     | 3x  
| Dynamic DNS                      | Yes  
| Time                             | Synchronize with NTP server or set time/date manually  
| SMTP                             | SMTP mail supported up to 2 destination accounts  
| System Log                       | 100 entries (max.)  

A.2 GPIO Terminal Application

Typically used in association with programming scripts for developing applications for motion detection, event triggering, alarm notification via e-mail, and a variety of external control functions. The 8-pin I/O Terminal Block is located on the rear panel and provides the interface to: a photo-coupled switch output, a photo-coupled input, and RS-485 interface. The RS-485 is typically used for pan/tilt control.

Connector Pin Assignment

<table>
<thead>
<tr>
<th>PIN</th>
<th>FUNCTION</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground (common)</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>IN1</td>
<td>Photo-Relay INPUT (+)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active High voltage 9~40VDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dropout voltage 0 VDC.</td>
</tr>
<tr>
<td>3</td>
<td>IN2</td>
<td>Photo-Relay OUTPUT (Normal Open)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Close circuit current maximum 70mA AC or 100mA DC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output resistance 30 Ohm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open circuit voltage maximum 240V AC or 350V DC.</td>
</tr>
<tr>
<td>4</td>
<td>OUT+</td>
<td>Photo-Relay OUTPUT (Normal Open)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Close circuit current maximum 70mA AC or 100mA DC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output resistance 30 Ohm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open circuit voltage maximum 240V AC or 350V DC.</td>
</tr>
<tr>
<td>5</td>
<td>Ground (common)</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>DC 12V</td>
<td>DC +12V output</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power distribution: 250mA max.</td>
</tr>
<tr>
<td>7</td>
<td>TX+</td>
<td>RS-485 (+) or (A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compliant to RS-485.</td>
</tr>
<tr>
<td>8</td>
<td>TX-</td>
<td>RS-485 (-) or (B)</td>
</tr>
</tbody>
</table>

AC Power

| AC24V Power Input |

- 120 -
### A.3 Bandwidth Reference Guide

#### H.264

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Frame rate (fps)</th>
<th>Bit rate (Kbit/s)</th>
<th>Lowest</th>
<th>Low</th>
<th>Normal</th>
<th>High</th>
<th>Highest</th>
</tr>
</thead>
<tbody>
<tr>
<td>QQVGA</td>
<td>30</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>QVGA</td>
<td>30</td>
<td>128</td>
<td>128</td>
<td>256</td>
<td>512</td>
<td>1024</td>
<td></td>
</tr>
<tr>
<td>VGA</td>
<td>30</td>
<td>128</td>
<td>128</td>
<td>512</td>
<td>1024</td>
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<td></td>
</tr>
<tr>
<td>SXGA</td>
<td>15</td>
<td>192</td>
<td>192</td>
<td>768</td>
<td>1536</td>
<td>3072</td>
<td></td>
</tr>
</tbody>
</table>

#### MPEG4

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Frame rate (fps)</th>
<th>Bit rate (Kbit/s)</th>
<th>Lowest</th>
<th>Low</th>
<th>Normal</th>
<th>High</th>
<th>Highest</th>
</tr>
</thead>
<tbody>
<tr>
<td>QQVGA</td>
<td>30</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>QVGA</td>
<td>30</td>
<td>128</td>
<td>128</td>
<td>256</td>
<td>512</td>
<td>1024</td>
<td></td>
</tr>
<tr>
<td>VGA</td>
<td>30</td>
<td>128</td>
<td>256</td>
<td>512</td>
<td>1024</td>
<td>2048</td>
<td></td>
</tr>
</tbody>
</table>

#### MJPEG

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Image size (KB)</th>
<th></th>
<th>Lowest</th>
<th>Low</th>
<th>Normal</th>
<th>High</th>
<th>highest</th>
</tr>
</thead>
<tbody>
<tr>
<td>QQVGA</td>
<td>1.5</td>
<td>1.9</td>
<td>2.4</td>
<td>2.7</td>
<td>4.1</td>
<td></td>
<td></td>
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<tr>
<td>QVGA</td>
<td>3.2</td>
<td>4.2</td>
<td>5.4</td>
<td>6.3</td>
<td>9.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VGA</td>
<td>8.8</td>
<td>11.2</td>
<td>14</td>
<td>16</td>
<td>24.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A.4 Glossary of Terms

**NUMBERS**

10BASE-T  
10BASE-T is Ethernet over UTP Category III, IV, or V unshielded twisted-pair media.

100BASE-TX  
The two-pair twisted-media implementation of 100BASE-T is called 100BASE-TX.

**A**

ADPCM  
Adaptive Differential Pulse Code Modulation, a new technology improved from PCM, which encodes analog sounds to digital form.

AMR  
AMR (Adaptive Multi-Rate) is an audio data compression scheme optimized for speech coding, which is adopted as the standard speech codec by 3GPP.

Applet  
Applets are small Java programs that can be embedded in an HTML page. The rule at the moment is that an applet can only make an Internet connection to the computer form that the applet was sent.

ASCII  
American Standard Code For Information Interchange, it is the standard method for encoding characters as 8-bit sequences of binary numbers, allowing a maximum of 256 characters.

ARP  
Address Resolution Protocol. ARP is a protocol that resides at the TCP/IP Internet layer that delivers data on the same network by translating an IP address to a physical address.

AVI  
Audio Video Interleave, it is a Windows platform audio and video file type, a common format for small movies and videos.

**B**

BOOTP  
Bootstrap Protocol is an Internet protocol that can automatically configure a network device in a diskless workstation to give its own IP address.

**C**
Communication

Communication has four components: sender, receiver, message, and medium. In networks, devices and application tasks and processes communicate messages to each other over media. They represent the sender and receivers. The data they send is the message. The cabling or transmission method they use is the medium.

Connection

In networking, two devices establish a connection to communicate with each other.

D

DHCP

Developed by Microsoft, DHCP (Dynamic Host Configuration Protocol) is a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the device's IP address can even change while it is still connected. It also supports a mix of static and dynamic IP addresses. This simplifies the task for network administrators because the software keeps track of IP addresses rather than requiring an administrator to manage the task. A new computer can be added to a network without the hassle of manually assigning it a unique IP address. DHCP allows the specification for the service provided by a router, gateway, or other network device that automatically assigns an IP address to any device that requests one.

DNS

Domain Name System is an Internet service that translates domain names into IP addresses. Since domain names are alphabetic, they’re easier to remember. The Internet however, is really based on IP addresses every time you use a domain name the DNS will translate the name into the corresponding IP address. For example, the domain name www.network_camera.com might translate to 192.167.222.8.

E

Enterprise network

An enterprise network consists of collections of networks connected to each other over a geographically dispersed area. The enterprise network serves the needs of a widely
distributed company and operates the company’s mission-critical applications.

**Ethernet**
The most popular LAN communication technology. There are a variety of types of Ethernet, including 10Mbps (traditional Ethernet), 100Mbps (Fast Ethernet), and 1,000Mbps (Gigabit Ethernet). Most Ethernet networks use Category 5 cabling to carry information, in the form of electrical signals, between devices. Ethernet is an implementation of CSMA/CD that operates in a bus or star topology.

**F**

**Fast Ethernet**
Fast Ethernet, also called 100BASE-T, operates at 10 or 100Mbps per second over UTP, STP, or fiber-optic media.

**Firewall**
Firewall is considered the first line of defense in protecting private information. For better security, data can be encrypted. A system designed to prevent unauthorized access to or from a private network. Firewalls are frequently used to prevent unauthorized Internet users from accessing private networks connected to the Internet, especially Intranets all messages entering or leaving the intranet pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

**G**

**Gateway**
A gateway links computers that use different data formats together.

**Group**
Groups consist of several user machines that have similar characteristics such as being in the same department.

**H**

**HEX**
Short for hexadecimal refers to the base-16 number system, which consists of 16 unique symbols: the numbers 0 to 9 and the letters A to F. For example, the decimal number 15 is represented as F in the hexadecimal numbering system. The hexadecimal system is useful because it can represent every byte (8 bits) as two consecutive hexadecimal digits. It
is easier for humans to read hexadecimal numbers than binary numbers.

**Intranet**
This is a private network, inside an organization or company that uses the same software you will find on the public Internet. The only difference is that an Intranet is used for internal usage only.

**Internet**
The Internet is a globally linked system of computers that are logically connected based on the Internet Protocol (IP). The Internet provides different ways to access private and public information worldwide.

**Internet address**
To participate in Internet communications and on Internet Protocol-based networks, a node must have an Internet address that identifies it to the other nodes. All Internet addresses are IP addresses.

**IP**
Internet Protocol is the standard that describes the layout of the basic unit of information on the Internet (the *packet*) and also details the numerical addressing format used to route the information. Your Internet service provider controls the IP address of any device it connects to the Internet. The IP addresses in your network must conform to IP addressing rules. In smaller LANs, most people will allow the DHCP function of a router or gateway to assign the IP addresses on internal networks.

**IP address**
IP address is a 32-binary digit number that identifies each sender or receiver of information that is sent in packets across the Internet. For example 80.80.80.69 is an IP address. When you “call” that number, using any connection methods, you get connected to the computer that “owns” that IP address.

**ISP**
ISP (Internet Service Provider) is a company that maintains a network that is linked to the Internet by way of a dedicated communication line. An ISP offers the use of its dedicated communication lines to companies or individuals who can’t afford the high monthly cost for a direct connection.
Java

Java is a programming language that is specially designed for writing programs that can be safely downloaded to your computer through the Internet without the fear of viruses. It is an object-oriented multi-thread programming best for creating applets and applications for the Internet, Intranet and other complex, distributed network.

LAN

Local Area Network a computer network that spans a relatively small area sharing common resources. Most LANs are confined to a single building or group of buildings.

MJPEG

MJPEG (Motion JPEG) composes a moving image by storing each frame of a moving picture sequence in JPEG compression, and then decompressing and displaying each frame at rapid speed to show the moving picture.

MPEG4

MPEG4 is designed to enable transmission and reception of high-quality audio and video over the Internet and next-generation mobile telephones.

NAT

Network Address Translator generally applied by a router that makes many different IP addresses on an internal network appear to the Internet as a single address. For routing messages properly within your network, each device requires a unique IP address. But the addresses may not be valid outside your network. NAT solves the problem. When devices within your network request information from the Internet, the requests are forwarded to the Internet under the router's IP address. NAT distributes the responses to the proper IP addresses within your network.

Network

A network consists of a collection of two or more devices, people, or components that communicate with each other over physical or virtual media. The most common types of
Network are:

**LAN** – (local area network): Computers are in close distance to one another. They are usually in the same office space, room, or building.

**WAN** – (wide area network): The computers are in different geographic locations and are connected by telephone lines or radio waves.

**NWay Protocol**
A network protocol that can automatically negotiate the highest possible transmission speed between two devices.

**PCM**
PCM (Pulse Code Modulation) is a technique for converting analog audio signals into digital form for transmission.

**PING**
Packet Internet Groper, a utility used to determine whether a specific IP address is accessible. It functions by sending a packet to the specified address and waits for a reply. It is primarily used to troubleshoot Internet connections.

**PPPoE**
Point-to-Point Protocol over Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as DSL or cable modem. All the users over the Ethernet share a common connection.

**Protocol**
Communication on the network is governed by sets of rules called protocols. Protocols provide the guidelines devices use to communicate with each other, and thus they have different functions. Some protocols are responsible for formatting and presenting data that will be transferred from file server memory to the file server’s network adapter. Others are responsible for filtering information between networks and forwarding data to its destination. Still other protocols dictate how data is transferred across the medium, and how servers respond to workstation requests and vice versa. Common network protocols responsible for the presentation and formatting of data for a network operating system are the Internetwork Packet Exchange (IPX) protocol or the Internet Protocol (IP).
Protocols that dictate the format of data for transferors the medium include token-passing and Carrier Sense Multiple Access with Collision Detection (CSMA/CD), implemented as token-ring, ARCNET, FDDI, or Ethernet. The Router Information Protocol (RIP), a part of the Transmission Control Protocol/Internet Protocol (TCP/IP) suite, forwards packets from one network to another using the same network protocol.

<table>
<thead>
<tr>
<th>R</th>
<th>RJ-45</th>
<th>RJ-45 connector is used for Ethernet cable connections.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Router</td>
<td>A router is the network software or hardware entity charged with routing packets between networks.</td>
</tr>
<tr>
<td></td>
<td>RTP</td>
<td>RTP (Real-time Transport Protocol) is a data transfer protocol defined to deliver live media to the clients at the same time, which defines the transmission of video and audio files in real time for Internet applications.</td>
</tr>
<tr>
<td></td>
<td>RTSP</td>
<td>RTSP (Real-time Streaming Protocol) is the standard used to transmit stored media to the client(s) at the same time, which provides client controls for random access to the content stream.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S</th>
<th>Server</th>
<th>It is a simple computer that provides resources, such as files or other information.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SIP</td>
<td>SIP (Session Initiated Protocol) is a standard protocol that delivers the real-time communication for Voice over IP (VoIP), which establishes sessions for features such as audio and video conferencing.</td>
</tr>
<tr>
<td></td>
<td>SMTP</td>
<td>The Simple Mail Transfer Protocol is used for Internet mail.</td>
</tr>
<tr>
<td></td>
<td>SNMP</td>
<td>Simple Network Management Protocol. SNMP was designed to provide a common foundation for managing network devices.</td>
</tr>
<tr>
<td></td>
<td>Station</td>
<td>In LANs, a station consists of a device that can communicate data on the network. In FDDI, a station includes both physical nodes and addressable logical devices.</td>
</tr>
</tbody>
</table>
Workstations, single-attach stations, dual-attach stations, and concentrators are FDDI stations.

**Subnet mask**

In TCP/IP, the bits used to create the subnet are called the subnet mask.

**T (TCP/IP)**

Transmission Control Protocol/Internet Protocol is a widely used transport protocol that connects diverse computers of various transmission methods. It was developed by the Department of Defense to connect different computer types and led to the development of the Internet.

**Transceiver**

A transceiver joins two network segments together. Transceivers can also be used to join a segment that uses one medium to a segment that uses a different medium. On a 10BASE-5 network, the transceiver connects the network adapter or other network device to the medium. Transceivers also can be used on 10BASE-2 or 10BASE-T networks to attach devices with AUI ports.

**U**

**UDP**

The User Datagram Protocol is a connectionless protocol that resides above IP in the TCP/IP suite.

**User Name**

The USERNAME is the unique name assigned to each person who has access to the LAN.

**Utility**

It is a program that performs a specific task.

**UTP**

Unshielded twisted-pair. UTP is a form of cable used by all access methods. It consists of several pairs of wires enclosed in an unshielded sheath.

**W**

**WAN**

Wide-Area Network. A wide-area network consists of groups of interconnected computers that are separated by a wide distance and communicate with each other via common carrier telecommunication techniques.
<table>
<thead>
<tr>
<th><strong>WEP</strong></th>
<th>WEP is widely used as the basic security protocol in Wi-Fi networks, which secures data transmissions using 64-bit or 128-bit encryption.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Windows</strong></td>
<td>Windows is a graphical user interface for workstations that use DOS.</td>
</tr>
<tr>
<td><strong>WPA</strong></td>
<td>WPA (Wi-Fi Protected Access) is used to improve the security of Wi-Fi networks, replacing the current WEP standard. It uses its own encryption, Temporal Key Integrity Protocol (TKIP), to secure data during transmission.</td>
</tr>
<tr>
<td><strong>WPA2</strong></td>
<td>Wi-Fi Protected Access 2, the latest security specification that provides greater data protection and network access control for Wi-Fi networks. WPA2 uses the government-grade AES encryption algorithm and IEEE 802.1X-based authentication, which are required to secure large corporate networks.</td>
</tr>
</tbody>
</table>
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