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Part Two: Network Camera User Manual

Network Connection

Before accessing a network camera (also known as IP Camera or IPC) from a PC, you need to connect the network camera to the PC directly with a network cable or via a switch or router.

Use a Shielded Twisted Pair (STP) cable to connect the network interfaces of the network camera and the PC.

Use Shielded Twisted Pair (STP) cables to connect the network interfaces of the camera and the switch or router.

Login

Preparation

After you have completed the installation in accordance with the quick guide, connect the camera to power to boot it. After the camera is booted, you can access the camera from a PC client using Internet Explorer or a Video Management System (VMS).

The following uses Internet Explorer 11 on a Microsoft Windows 10 operating system as an example.

Check before login

- The camera is powered on and connected to the network switch
- The camera’s IP address is located within the same subnet as the PC
- The PC is connected to the network switch
- The PC’s IP address is located within the same subnet as the camera
- The PC is installed with Internet Explorer 8.0 or higher (Internet Explorer 11 recommended)
- Use default video format setting or set the camera video format to 1080P30 or 1080P25 using RS485 keyboard (Refer to camera setting menu).
Logging in to the Web Interface

The default static IP address of the camera is 192.168.0.13, and the default subnet mask is 255.255.255.0

The following uses Internet Explorer as an example to describe the login procedure.
1. Browse to the login page by entering the correct IP address of your camera in the address bar.
2. If this is your first time logging in to the camera, follow system prompts and install the ActiveX. You need to close your browser and reopen it again to complete the installation.
3. Click Allow to proceed the login process.

NOTE:
- To manually load the ActiveX, type http://IP address/ActiveX/Setup.exe in the address bar and press Enter.

- You may be prompted to update your video player. Follow the “Download” and “Run” prompts to update. This will enable the user to see live video through the web interface.

- The default password is used for your first login. To ensure account security, please change the password after your first login. You are recommended to set a strong password (no less than eight characters).
- The camera protects itself from illegal access by limiting the number of failed login attempts. If login fails six times consecutively, the camera locks automatically for ten minutes.

4. Enter the username and password, and then click Login. For the first login, use the default username admin and password admin.

- If you log in with Live View selected, live video will be displayed when you are logged in. Otherwise, you need to start live video manually in the live view window.
- If you log in with Save Password selected, you do not need to enter the password each time when you log in. To ensure security, you are not advised to select Save Password.
- To clear the Username and Password text boxes and the Save Password check box, click Reset.

NOTE:
- Forgot Password?
  - A message will pop up, which reads: “Please contact support@bolintechnology.com to reset the password.”
  - When emailing Support@bolintechnology.com, please include the MAC address, as shown in the IP Finder tool.
  - A BOLIN Technology Support representative will provide a temporary password, which can be used to log in to the camera to create a new password.
Introduction to the Web Interface

1. IP Interface Menu
   - Used to navigate between Live View, Playback, and Setup menus, as well as Log Out

2. Live Stream Setup panel
   - Used to alter the way the live stream is viewed
   - Used to switch between Main, Sub, and Third streams
   - Contains shortcut to Image Settings interface, where image options can be configured

3. Live Stream
   - Where the live video will display

4. Video Controls
   - Used to start / stop the live stream
   - Used to control audio levels (input as well as output)
   - Snapshot, Record video, 2-way communication, and

5. Camera Control Panel
   - Used for PTZ control, as well as accessing / navigating SDI menu

Controlling the SDI interface from the Web GUI

Accessing the SDI Menu
The SDI menu can be accessed on the Control Panel via the Menu button
The menu is navigated by using the directional buttons on the Control Panel.
   - Up and Down arrows move between selection options
   - The Right arrow is used to confirm a selection
How to operate the SDI OSD menu, please refer to the section “Adjusting and Setting with Menus” in user guide part 1.

Preset tab
The Preset tab is used to access a list of presets that have been configured. A preset can be activated by clicking the arrow next to the preset listing.
For more information about creating presets, please see the section called “Preset”

Patrol tab
The Patrol tab is used for activating a patrol that has been configured.
For more information about creating patrols, please see the section called “Patrol”

Configuring the camera from the Setup Menu

The Setup menu can be accessed by clicking the Setup button along the top of the screen

The IP menu is divided into tabs. Under each tab is a collection of settings and parameters that the user can configure. Please refer to the list of tabs below

Common
The Common tab has some basic / common information about the camera

Local Settings

- **Recording:**
  - **Subsection by Size** – Recordings will be catalogued according to size
  - **Subsection by Date** – Recordings will be catalogued according to the date captured

- **Subsection Size (MB)** – Determines the size of each video clip subsection

- **When Storage Full:**
  - **Overwrite Recording** – Will begin overwriting oldest footage once all space is filled
  - **Stop Recording** – Will cease recording to avoid overwriting recorded footage

- **Total Capacity (GB):**
  - The total capacity you would like to allocate for this directory to hold

- **Local Recording**—Determines the video file format (Automatically configured to store AVI files)

- **Recording Folder**—This is the directory on the computer where recordings will be saved

- **Snapshot Folder**—This is the directory on the computer where snapshots will be saved

A/V Streams
The A/V Streams tab is used to configure settings for the compression, format, and data rates for all video and audio streams produced by the camera

Definitions:

- **Codec:** The encoding standards that are available for use (H.264 / H.265)

- **Resolution:** (WxH) The number of Pixels that make up the width of the image (W) by the number of horizontal lines that make up the height of the image (H)

<table>
<thead>
<tr>
<th>Rate Control Options:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBR – Constant Bit Rate</td>
</tr>
<tr>
<td>CVBR – Constrained Variable Bit Rate</td>
</tr>
</tbody>
</table>
- **Frame Rate**: Rate at which image frames are captured
- **GOP Length**: Interval at which a key frame is captured within a group of successive pictures within a coded video stream
- **Bit Rate**: The amount of data transmitted per second. Measured in Kilobits Per Second (Kbps). 1000 kbps = 1Mbps

### Video Configuration

<table>
<thead>
<tr>
<th>Stream</th>
<th>Codec</th>
<th>Resolution Options</th>
<th>Rate Control Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Stream</strong></td>
<td>4264</td>
<td>1920x1080, 1280x720</td>
<td>CBR, CVBR</td>
</tr>
<tr>
<td><strong>Secondary Stream</strong></td>
<td>H.264</td>
<td>1280x720, 720x576, 720x480, 640x360, 352x288, 320x240</td>
<td>CBR, CVBR</td>
</tr>
<tr>
<td><strong>Third Stream</strong></td>
<td>MJPEG</td>
<td>640x360, 352x288, 320x240</td>
<td>CBR, CVBR</td>
</tr>
</tbody>
</table>

- **Codec**:
  - **Primary Stream** – The main stream, viewed by default on the Live screen
    - **Codec Options**:
      - H.264
      - H.265
      - MJPEG
    - **Resolution Options**:
      - 1920x1080
      - 1280x720
    - **Rate Control Options**:
      - CBR – Constant Bit Rate
      - CVBR – Constrained Variable Bit Rate.
  - **Secondary Stream** – The second video stream produced by the camera, this can be disabled by unchecking the box at the top of this stream’s settings
    - **Codec Options**:
      - H.264
      - H.265
      - MJPEG
    - **Resolution Options**:
      - 1280x720
      - 720x576
      - 720x480
      - 640x360
      - 352x288
      - 320x240
    - **Rate Control Options**:
      - CBR – Constant Bit Rate
      - CVBR – Constrained Variable Bit Rate.
  - **Third Stream** – The third video stream produced by the camera, this can be disabled by unchecking the box at the top of this stream’s settings
    - **Codec Options**:
      - H.264
      - H.265
      - MJPEG
Resolution Options:
- 640x360
- 352x288

Quality Options:
- High, Medium, Low

Frame Rate: Rate at which image frames are captured

Audio Configuration
This section contains the ability to select the audio compression parameters for both the Audio In (microphone) and the Audio Out

- Audio Compression Options:
  - **G.711A** – Pulse Code Modulation (PCM), often used to decode voice frequencies with regard to Telephony
  - **G.711U** – Standard for speech compression and decompression within digital transmission systems
  - **G.722.1** – A high quality, moderate bit rate wideband audio coding standard
  - **G.726** – A speech codec standard covering the transmission of voice at rates of 16, 24, 32, and 40 Kbit/s
  - **MP2L2** – A type of compression which removes some voice frequency ranges which are not detectable to the human ear
  - **AAC-LC** – Advanced Audio Coding

- Noise Suppression:
  - Suppression of background noise

Audio In
- The ability for the camera to accept audio in via the Audio In jack

Audio Out
- The ability for the camera to encode and transmit audio out through the Audio Out jack

PTZ - Basic Settings
This section contains the section where the Address code and Baud rate can be configured.

**Address code**: The ID by which the camera is controlled. Often the index position of the camera within a daisy chain

**Baud Rate**: The rate at which command data is transmitted to the camera. The Baud rate of the camera needs to match the Baud Rate of the source of the command (Keyboard controller, Control software, etc.)
**Home Position**
The first position where the camera will aim upon boot.

Once presets have been set up, one of the presets can be selected as the **Home Position**.

The “Return to Home After” setting determines how long the camera will wait before returning to the home position after another preset has been called. This setting is measured in seconds.

**Preset**
Presets are predetermined positions that the user can command the camera to recall quickly.

**To add a new preset:**

1. Use the control panel and image viewer to pan to the desired Pan, Tilt, Zoom, and Focus position.
2. Click the **Add Preset** button.
3. Enter a number for the **Preset ID**.
4. Enter a name for the preset under the **Preset**.
5. The table will populate with all of the created presets. These will also appear on the Main page, within the control panel, under the **Preset** tab.

**Patrol**
A Patrol is a series of presets, recalled in a given order. This causes the camera to iterate through the series, moving to each preset in the selected order.

**To create a new Patrol**

1. Click the **Add Patrol** button.
2. Enter a name for the **Route Name**.
3. Click the **Add/ Delete** buttons to add or delete patrol positions.
4. Use the dropdown for each patrol position, and select a preset from the list of presets.
Click the **Submit** button to save. The patrol will appear in the Patrol table. Activate a patrol by clicking the **Play** button.

### Image

Image parameters can be adjusted to control the way the image is captured and displayed.

### Privacy Zone

The Privacy Zone setting is for adding up to 5 “Masks” of pixels where the image will not be captured.

Each area can be set up by performing the following:

1. Check the box next to the “Mask” selectin
2. Draw the mask area on the provided image window
3. Click the “Set Area” button

Any Privacy Zone can be deleted by clicking the “Del Area” button next to the given Mask.
OSD

There are On Screen display (OSD) sections within the image.

Each OSD section can be individually configured to display configurable data.

Any of the 4 areas can be configured to contain one of the following:

- **Nothing (OFF)** – The area will not be used, and will not display anything.

- **Date/Time** – The internal Date and Time settings will be used to fill the area.

- **Camera Name** – The user will define a name for the camera.

- **Logo** – An image, such as a company logo can be uploaded to be displayed within the image.

  - When selecting a file, make sure that it is a .BMP format.
  - The width is a multiple of 32, and the height is a multiple of 4.
  - The total pixels should be less than 256.
  - Click the **Upload** button, and then **Save**. The live view will now show the uploaded image in the selected area.
• **Custom Text** – The user will enter the text that they wish to be displayed.

**Network**

**Basic**

The Basic network settings tab is where the user is able to configure the following:

- DHCP options
  - DHCP – An IP address will be dynamically assigned to the camera from the gateway (router)
  - Static IP – The user will enter/define the IP address
  - PPPoE—Point-to-Point Protocol over Ethernet

- IP Address
- Subnet Mask
- Gateway
- IPv6 settings
- DNS Configurations

- RTMP settings
  - Check the RTMP checkbox
  - Copy and paste the stream URL from the online platform
  - Copy and paste the Stream Key (Also known as the Stream ID) from the online platform.
  - Example below shows where to copy the information from YouTube
Click Save
Allow a few minutes for the stream to connect. The status on your streaming platform (such as YouTube) will change to Live. When this happens, the camera is streaming video Live to

NOTE: Similar steps can be followed to stream to any platform that supports RTMP, such as YouTube, Facebook, Twitter, Twitch, etc.

Port
This section allows the user to specify which ports the camera will use to communicate using the following protocols:

- **HTTP**: Default 80
  - HTTP is the protocol used to access the web interface.
  - Changing this port number will require the user to specify the port number when entering the IP address to the web browser.
  - For example, if it is changed to 85, the IP address will need to be entered as follows in order to access the web interface: http://192.168.0.13:85

- **HTTPS**: Default 443
  - HTTPS is the protocol used for making a secure connection to the camera
  - Changing this port number will require the user to specify the port number when attempting to make a secure connection to the camera
  - For example, if it is changed to 425, the IP address will need to be entered as follows in order to make a secure connection: https://192.168.0.13:425

- **RTSP**: Default 554
  - RTSP is the protocol used to pull real-time video over the network (using VLC Player or other network video-compatible software)
  - Changing this port number will change the way the RTSP video can be viewed. Most RTSP streaming software uses port 554 by default, therefore it is not recommended that this port number be changed.
  - Please see the section of this manual titled RTSP for more information
**FTP**

The camera has the ability to behave as an FTP server.

A user can connect to the camera to access internal files via FTP

To allow this camera to act as an FTP server:

- Check the “Enable” checkbox
- Create a password, and enter it into the **Password** field
- Re-type the password into the **Re-Type Password** field

Once this has been enabled, a user can use FileZilla (or some other such FTP client software) to access the camera’s files.

**RTSP**

The camera is capable of providing an RTSP stream

The stream can be accessed with or without the need for Authentication credentials. This is toggled by ticking / unticking the checkbox for **Authentication**

Each stream can be accessed using the **Path**. The URL format is as follows:

```
rtsp://{ip address}/{path}
```

Example:

```
rtsp://192.168.0.13/stream1
```

**DDNS**

Dynamic DNS is the ability to create a domain name that can be synced to the WAN IP, and then used to access the camera remotely (from outside the LAN where the camera exists)

This assumes that all necessary port-forwarding has been performed on the router(s) and firewall(s) that may exist between the camera and the WAN (Internet).

This is accomplished by:

1. Enabling DDNS by ticking the checkbox
2. Enter a hostname (Must be unique)
3. Select a DDNS server from the drop-down list
4. Create a username and Password

**NOTE:**

This Username and Password are for the **account** that is being created at the selected DDNS server. These are **NOT** the credentials used to log in to the interface of the camera. The credentials used to authenticate into the camera are configured within the **User Management** section.
System

Date/Time
This interface allows the user to configure the date / time settings of the camera

- **Time Settings**
  - Display Format – allows the user to configure the date time format
  - Synchronize with Computer Time – Causes the camera to pull the current date and time information from the computer and apply it as the current date and time for the camera
  - Manual – Allows the user to manually enter the date and time

- **NTP Server**
  - DHCP or Manual are options that will cause the camera to access an NTP server (automatically, or via the user’s configuration)

Daylight Saving
To configure the camera to automatically adjust for daylight saving:

- Select the Daylight Saving tab along the top of the Date/Time interface
- Set the proper time zone
- Check the Daylight Saving time checkbox, and then enter the dates and times when Daylight Saving time should be activated / deactivated in the Start Time / End Time sections respectively

Maintenance / System Information
The following general information can be found under the System Information tab within the Maintenance section of the web GUI:

Model Name: The specific model of this camera
Firmware Version: The current firmware version running on this device
Serial Number: The serial number of the image module within the camera
MAC Address: The MAC address of the camera’s Network Interface Card (NIC)
**Maintenance / Maintenance**

The Maintenance tab under the Maintenance section within the web GUI can be used to perform the following functions:

- **Update firmware**
  - A firmware file can be obtained from BOLIN Technology
  - Click the **Browse** button, and navigate to the file (.bin)
  - Click **Upload**, and allow the camera to load the new firmware
  - It takes a few minutes for the camera to come back online

- **Reboot camera**
  - This button performs a soft reboot (camera will restart without needing to disconnect power)

- **Reset to Default**
  - Will reset the camera’s settings to factory defaults, except the IP address will not be affected

- **Reset to Factory Default**
  - Will reset all settings (including the IP address) to factory default

- **Download Log File**
  - Should the need arise, the Log File can be downloaded and provided to Technical Support personnel for analysis when troubleshooting

- **Download Config File**
  - A configuration file can be downloaded, which stores all of the camera’s settings
  - This file acts as a backup for the camera settings

- **Upload a config file**
  - A configuration file can be downloaded from a camera containing all the IP settings, which acts as a backup
  - This configuration file can be uploaded through this portion of the interface

- **Update MCU file**
  - MCU firmware can be obtained from BOLIN Technical Support
  - MCU firmware can be updated by uploading here

**User Management**

This interface allows the administrator to create / manage user accounts and passwords
To add a new user:
1. Click the **Add** button
2. Enter the username
3. Enter the new password in the **Password** field
4. Re-enter the password in the **Re-type Password** field

**Log**

The Log is where the camera stores all actions that are performed by the camera. The log shows the following data points for each event:

<table>
<thead>
<tr>
<th>ID</th>
<th>Level</th>
<th>Category</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INFO</td>
<td>System</td>
<td>Setting pako ptc/move pan, tilt -0.905.</td>
</tr>
<tr>
<td>2</td>
<td>INFO</td>
<td>System</td>
<td>Setting pako ptc/move pan, tilt -0.905.</td>
</tr>
<tr>
<td>3</td>
<td>INFO</td>
<td>System</td>
<td>Setting pako ptc/move pan, tilt -0.905.</td>
</tr>
<tr>
<td>4</td>
<td>INFO</td>
<td>System</td>
<td>Setting pako ptc/move pan, tilt -0.905.</td>
</tr>
</tbody>
</table>

1. **ID** – The data point which identifies each individual event
2. **Level** – The urgency level which is used to classify the event. Each event falls into one of the following levels:
   a. System Information (Info) – General operations
   b. Warning – Something is operating in an abnormal (though non-critical) manner
   c. Error – An error has occurred
   d. Critical – A critical error has occurred
3. **Category** – The descriptor for the data that is affected by the event. This can be classified into the following categories:
   a. System
   b. Network
   c. Event
   d. Setting
   e. Other
4. **Source** – The IP address that originated the command that generated the recorded event
5. **Time** – The date and time when the event occurred
6. **Message** – Text-based data describing the action that was taken

Log events can be filtered by level of entry, as well as by Category:
Storage

SD Record

Please note: on FEX model cameras, the Micro SD card cannot be installed after it has been shipped. A custom order is required to purchase FEX cameras with a Micro SD card installed.

The camera has an SD card slot on the back panel, allowing for an SD card to be inserted and used to record footage. With the camera powered off, insert a supported Micro SD card into the SD Card slot on the back of the camera, and then power the camera on.

If the card has been properly detected, the “SD Information” section will show data about the SD card, indicating that the card is being detected, and is available to be written to.

To clear all data from the Micro SD card, the user has the option to click the Format SD Card button. This will delete all data from the Micro SD card, and make space on the space on the card available for recording.

Currently, the following Micro SD cards are supported:

<table>
<thead>
<tr>
<th>Brand</th>
<th>Size</th>
<th>Format</th>
<th>Type</th>
<th>Class</th>
<th>Transfer Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingston</td>
<td>16GB</td>
<td>exFAT</td>
<td>SDHC</td>
<td>10</td>
<td>IU1</td>
</tr>
<tr>
<td>Kingston</td>
<td>32GB</td>
<td>FAT32</td>
<td>SDHC</td>
<td>10</td>
<td>IU1</td>
</tr>
<tr>
<td>Kingston</td>
<td>32GB</td>
<td>exFAT</td>
<td>SDHC</td>
<td>10</td>
<td>IU1</td>
</tr>
<tr>
<td>Kingston</td>
<td>64GB</td>
<td>exFAT</td>
<td>SDHC</td>
<td>10</td>
<td>IU1</td>
</tr>
<tr>
<td>Kingston</td>
<td>128GB</td>
<td>exFAT</td>
<td>SDXC</td>
<td>10</td>
<td>IU1</td>
</tr>
<tr>
<td>Samsung</td>
<td>32GB</td>
<td>FAT32</td>
<td>SDHC</td>
<td>10</td>
<td>UHS-I (1)</td>
</tr>
<tr>
<td>Samsung</td>
<td>32GB</td>
<td>exFAT</td>
<td>SDHC</td>
<td>10</td>
<td>UHS-I (1)</td>
</tr>
<tr>
<td>Samsung</td>
<td>32GB</td>
<td>FAT32</td>
<td>SDHC</td>
<td>10</td>
<td>UHS-I (1)</td>
</tr>
<tr>
<td>Samsung</td>
<td>32GB</td>
<td>exFAT</td>
<td>SDHC</td>
<td>10</td>
<td>UHS-I (1)</td>
</tr>
<tr>
<td>Samsung</td>
<td>64GB</td>
<td>exFAT</td>
<td>SDXC</td>
<td>10</td>
<td>UHS-I (3)</td>
</tr>
<tr>
<td>Toshiba</td>
<td>32</td>
<td>FAT32</td>
<td>NA</td>
<td>10</td>
<td>U1</td>
</tr>
<tr>
<td>Toshiba</td>
<td>32</td>
<td>exFAT</td>
<td>NA</td>
<td>10</td>
<td>U1</td>
</tr>
</tbody>
</table>

Once the card has been properly installed, follow these steps to record video to the Micro SD card:

1. From the SD Record Handler section, tick the “enable” checkbox.
2. Select the “Trigger Scheduled” radio button.
3. For best results, set the schedule so that the camera is set to record all day for each day. This will result in the camera recording every time the camera is powered on.
4. The FileName Prefix and Server Path values will change the name of the video file, and the location where the file is saved on the SD Card, respectively.
Recording Download

When an SD card is installed and configured to record, the web interface offers the option for the recording to be accessed and downloaded.

This is accomplished by following these steps:
1. Click on the Recording Download tab
2. Select a beginning date, and an end date using the two date selection boxes
3. Click the Search button
4. Select the recording by ticking the checkbox next to the entry
5. Click the Download link

A notification will appear at the bottom of the Internet Explorer window, prompting the user to save the file.

Click Save to automatically save the file to your computer’s default Downloads folder, where it can be accessed and played.