



NVR Configuration Manual



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V1.0

NVR104/109/116

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This manual will provide assistance in setting up I-View Video Verification functionality based on sensor events configured in the Lilin NVR104/109/116. It is not a replacement for the excellent Lilin manuals for the NVR116 which can be downloaded from their hosted site at:

<http://www.meritlilin.com/webe/html/products/show.aspx?id=32&kid=54,66>

Introduction

The Lilin NVR104/109/116 supports up to 16 IP cameras and can easily accommodate monitoring a building, wide area or location, where multiple cameras and alarm inputs need to be integrated and reported upstream for central monitoring by a monitoring station like I-View. I-View's Video Verification adds value by enabling the customer to quickly focus on important events and review the conditions surrounding them both before and after.

Once the DVR has been set up it is ready to be tested with I-View. The following illustration shows the path of two message flows comprising a typical "Video Verification" scenario:

- 1-3 - An onsite alarm 'event' causes an SMTP message to be sent to the I-View Now system. The alarm event is usually the result of a simple contact closure wired into the back panel of the DVR.
- 4, 5 - The resulting message path I-View initiates upon receipt of the SMTP message to retrieve the 'pre' and 'post' alarm video associated with the alarm event. The number of pre and post seconds can vary but it's usually not less than 3 and normally about 10 on either side of the alarm condition that initiates the sequence.

The user can view one or more consecutive alarm event 'clips' as they arrive from the I-View Now portal via a cell phone, or a PC or tablet device's browser. With each clip is the ability to see one or more "Live Views" for various cameras associated with the DVR that generated the SMTP alarm.

Lilin NVR Series DVR Alarm Message to I-VIEW NOW

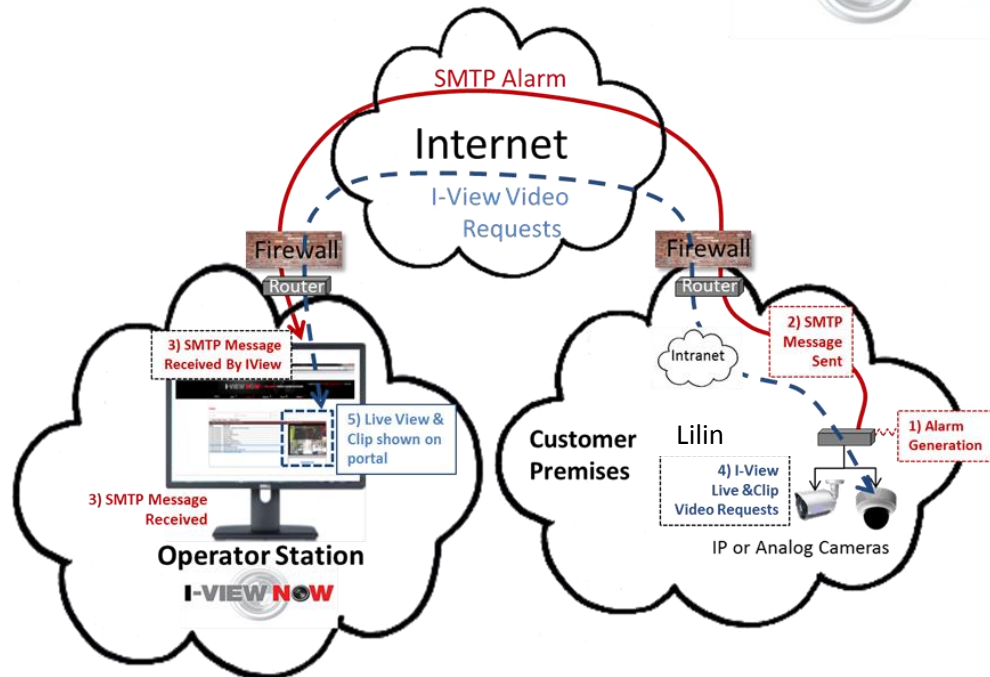


Figure 1

Workflow

This workflow describes the tasks to prepare the Lilin NVR104/109/116 Series to be ready to integrate with I-View Now.

1. User Setup

Change the default administrator password. I-View Now will be using the password on the “Installer Data worksheet” to log into the device. When a network request is delivered to the Lilin NVR104/109/116 from the I-View system this login and password will be used to programmatically authenticate before initiating Live View or retrieving Clips for Video Verification. If an alternate value is required this information must be put into the i-viewnow.com system.

2. Network Setup

I-View recommends using a static IP for the DVR onsite and enabling external access via port forwarding for specific service from the router/firewall facing the Internet for the site.

- a. **LAN Setup:** Static IP addresses are assigned by site IT staff
- b. **Port Setup:** The router for the site should be configured to forward messages intended for the Lilin NVR104/109/116 using the ports outlined below.

3. Configure SMTP email:

The SMTP information is used to initiate alerts and alarms to I-View Now. The SMTP server, SMTP ID provided and Port Id on the “Installer Data” Worksheet will be used here. Setting up these entries is critical for enabling the Lilin NVR104/109/116 to communicate an alarm event to I-View.

4. Recording Setup:

The DVR will be set to record by schedule or by events. Event recording will typically occur when an alarm event is detected; however, concurrent continuous recording is also possible.

5. Alarm Input Setup:

Here the technician will set up alarm inputs on the back of the DVR to perform two actions:

- a. Assert an alarm event and trigger recording
- b. Send SMTP (email) alerts to I-View Now upon detection of an alarm event. This causes the I-View system to retrieve the ‘pre’ and ‘post’ alarm video surrounding in time the condition that caused the alarm. This is a valuable feature as it benefits the user by providing a more complete context of the conditions leading up to the alarm event as well as what followed immediately thereafter.

Installation Worksheet

The I-View Now Portal Installation Worksheet is created after entering the DVR make and model into the system. A portion of an example worksheet is printed below. This sheet should be generated from the system before attempting to set up the site for integration with I-View as it enables setup of the DVR onsite login and password as well as the means to send SMTP messages back to the I-View Now server. There is a place on the form for recording the Location IP Address which is the external IP address used for the router at the site facing the Internet. In addition the ports on the external router that will be forwarded to the DVR should be noted on this form. This information needs to be input into the i-viewnow.com system so it will know the external IP address and ports used to communicate from the site through the router at the site and onto the DVR.

DVR/NVR #1: Honeywell HRDP			
SMTP Account ID:	example@iviewnow.com	DVR Username:	admin
SMTP Server ID:	iviewnow.com	DVR Password:	1111
SMTP Server Port:	3480		
Location IP Address:	24.234.157.232 (example)		
Device Port Number:	445 (example)		
Device Port Number:			
Pin 1	Camera 1	Event Type: <input checked="" type="checkbox"/> Alarm <input type="checkbox"/> Panic <input type="checkbox"/> Alert <input checked="" type="checkbox"/> Arm <input type="checkbox"/> Disarm <input type="checkbox"/> Unused	Zone Desc Front Door
Pin 2	Camera	Event Type: <input type="checkbox"/> Alarm <input type="checkbox"/> Panic <input type="checkbox"/> Alert <input type="checkbox"/> Arm <input type="checkbox"/> Disarm <input type="checkbox"/> Unused	Zone Desc

Figure 2

Retrieve the IP address by asking the Customer/IT department for the IP address, or visit <http://whatismyip.org> while on-site for a possible correct address; however, verify with the IT department that the IP address discovered is valid to use as a target from the I-View servers. The IT Site Administration must enable port forwarding from their router/firewalls to the Lilin NVR104/109/116 port address.

Changing the Default DVR Login

To start using the Lilin NVR104/109/116 first plug a monitor into the VGA output on the DVR and ensure power is provided to both. Note that the Lilin NVR104/109/116 does support touch screen monitors. Please see the Lilin website for specifications.

Also, plug the mouse provided with the DVR into the front side USB port of the DVR unit. The default password is “1111”. If this doesn’t work simply verify the correct login and password from the manual. Be aware that the Menu’s presented in this manual can vary slightly depending on the exact model and firmware version.

User Name: Admin

Password: 1111



USB Mouse



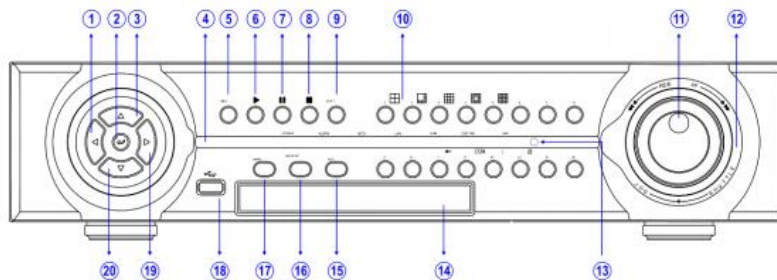
VGA Cable



VGA Port

After plugging in the power supply on the back of the unit and attaching a VGA monitor and a mouse on the right side as shown below, press the power button. The unit’s PWR and Hard Drive (HDD) LEDs should light and/or flash. The basic unit and its connections are shown below:

Lilin NVR116 Front Panel



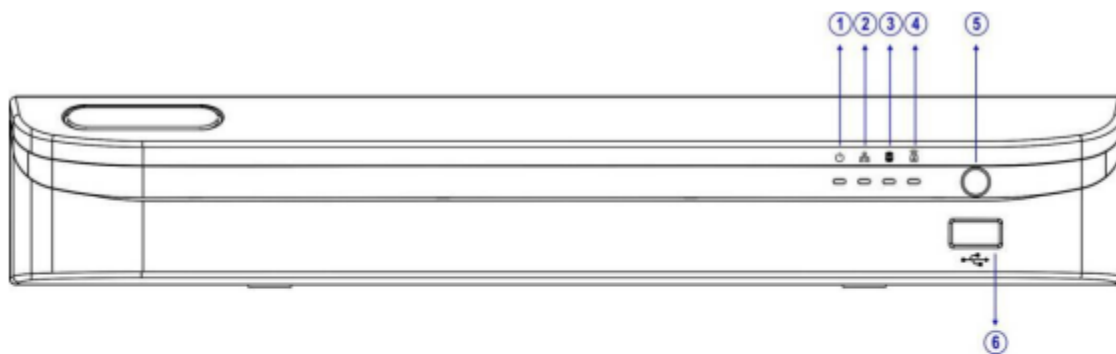
- | | |
|--|---|
| <ul style="list-style-type: none">1. Left
Move cursor left
Pan left
Decrease value2. Enter
Enter operation in menu setup
Instant PTZ camera selection at live mode
Camera active3. Up
Move cursor up
Tilt up4. LED status panel5. REC button
Start or stop recording6. Play button
Use this button to start playback7. Pause button8. Stop button9. Shift
Mode switch for split-display or camera selection10. Split-display/camera buttons
4, 8, 9, 13, 16 split-display
Camera selection mode | <ul style="list-style-type: none">11. Jog dial
Play recorded image frame by frame in playback
Perform zoom in and out12. Shuttle ring
Fast forward video in playback mode.13. IR receiver14. Built-in Slim DVD/RW drive
(DVD model only)15. ESC button16. Backup button17. Menu button18. USB 2.0 connector
USB flash disk
USB DVD/RW19. Right button
Move cursor right
Pan right
Increase value20. Down button
Move cursor down
Tilt down |
|--|---|

The status of each LED is described in the following table:

POWER	ALARM	HDD	LAN	USB	DVD-RW	REC
●	●	●	●	●	●	●

LED	Description	Colour
POWER	NVR power on/off indicator	Yellow
ALARM	External alarm switches indicate motion or alarm triggers	Red (flashing)
HDD	HDD recording indicator	Green (flashing)
LAN	LAN access light	Green
USB	USB device access light	Green
DVD-RW	Backup LED indicator	Yellow (flashing)
REC	Recording indicator	Yellow

Lilin NVR109/NVR104 Front Panel



- | | |
|--|--|
| <p>1. POWER LED (Yellow)
NVR power on/off indicator</p> <p>2. LAN LED (Green)
LAN access light</p> <p>3. HDD LED (Green blinking)
HDD recording indicator</p> | <p>4. Alarm LED (Red blinking)
Indicates motion or alarm triggers</p> <p>5. IR receiver</p> <p>6. USB 2.0 connector
USB flash disk / USB DVD/RW</p> |
|--|--|

Figure 3

Once the system initializes, it will show a group of rectangles icons in the upper left corner of the screen. The first step in starting to configure the system is to click on “Gear Icon” in the upper left corner of the screen

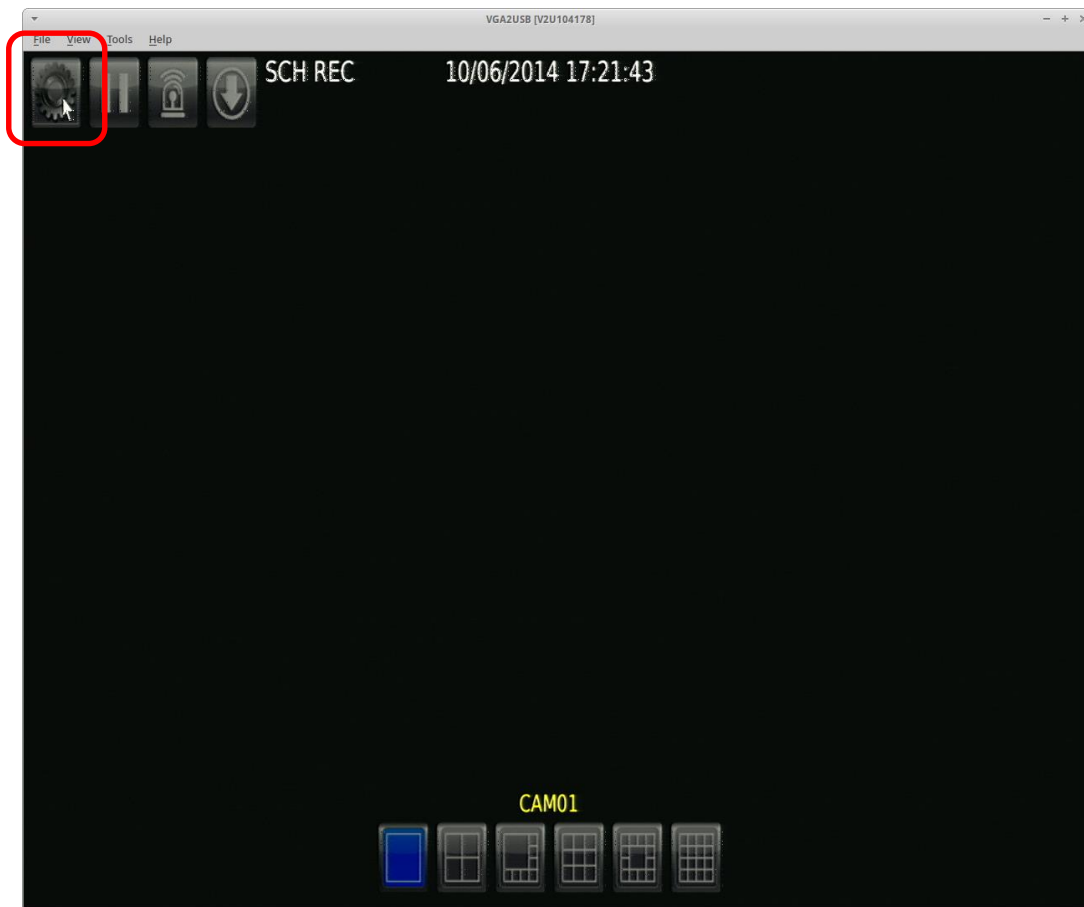
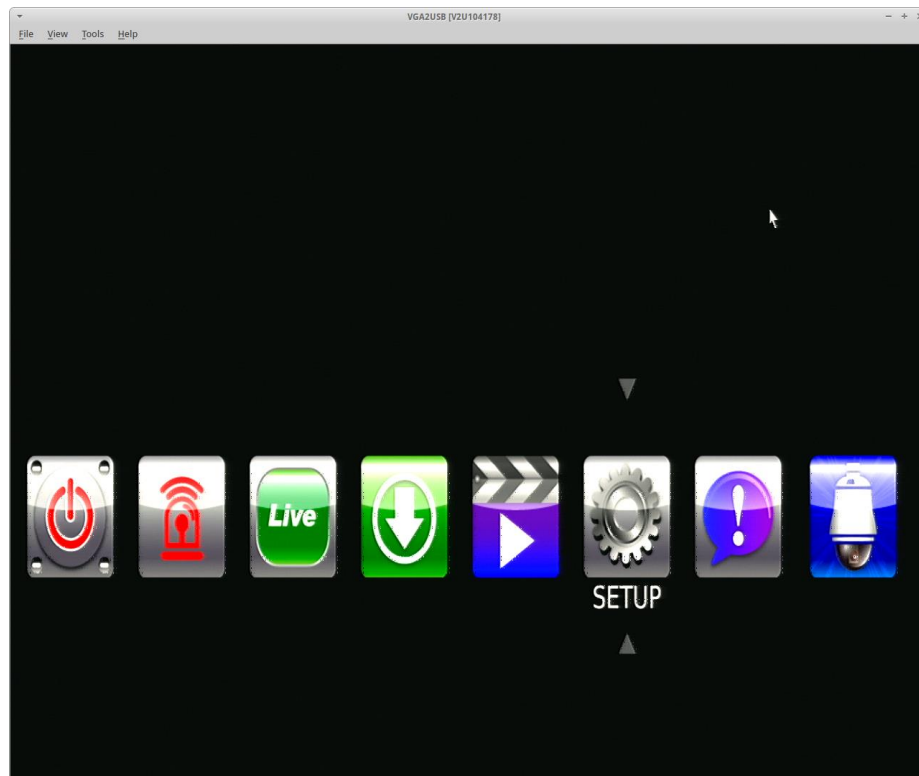



Figure 4

At the time of writing this manual, the Lilin default USER is “Admin” and the PASSWORD is “1111”. The Mouse can be used to input characters or a keyboard can be attached to the other USB port for character input. First change the USER and PASSWORD to the settings on the form you should’ve received from I-View. As stated above, the information on the form will be expected to be set when the I-View system attempts to interface with the Lilin NVR104/109/116 Series, so ensure you change the password to that on the form before proceeding.

Firmware Version

The version of the firmware on the DVR tested with I-View Now is 1.0.49a. The DVR should have this version set to ensure proper interoperability with I-View Now.



On the Lilin NVR104/109/116 menu click the SETUP icon  which take you to the next screen. Click on MANAGEMENT and then SYSTEM INFO. A Screen similar to the one below will be presented showing the Firmware version 1.10N. Note, the SOFTWARE VERSION of the firmware must match this configuration as this is the specific Lilin firmware that has been integration tested with I-View. Other versions have not been certified. If you need to download and update the firmware please refer to the Lilin manual and their site to obtain this specific firmware software package and install it into the machine. Depending on how new the firmware release is you may need to contact the manufacturer directly.

Network Setup

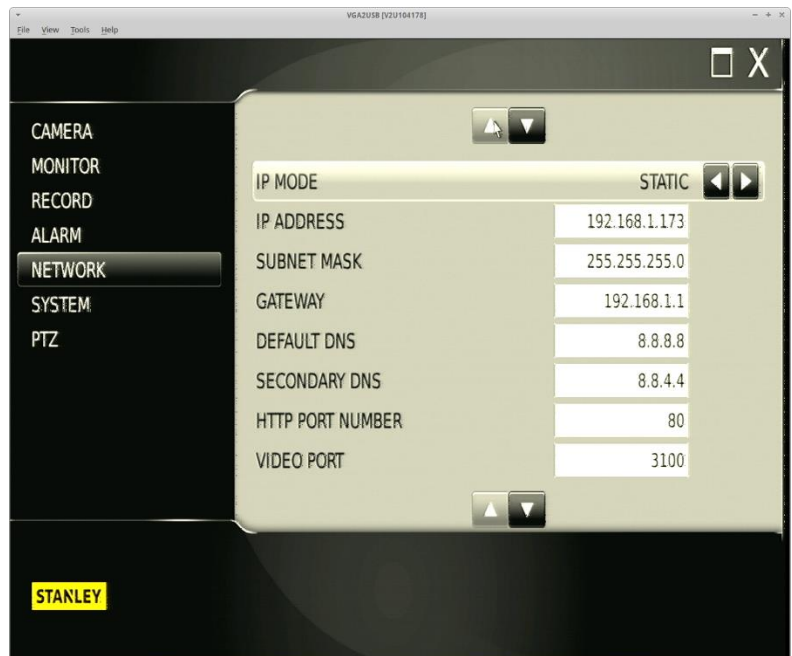
After logging into the device for the first time and setting the proper login and password, the first setting that should be changed is the IP address. The DVR requires a static internal IP address at the site behind the router/firewalls. In addition, one or more communication ports will have to be forwarded to it from the firewall/router on site.

Be sure to write on the installation note on the external IP address representing the Internet facing location where the Lilin NVR104/109/116 is installed (Location IP Address). This value is typically the IP address of the router facing the Internet for the site. In addition, the Device Port Number is vital to enable the router to 'port forward' incoming I-View requests to the Lilin NVR104/109/116 machine. The IT staff responsible for the site needs to assist you in ensuring these prerequisites are in effect in their network facilities.

After changing the login and password the next setting changed should be the IP address. The DVR requires a static internal IP address. Its communication ports will be forwarded from the firewall/router on site to this static IP along with specific ports for video or control communication. The IP address is set on the NETWORK panel. This menu is on the left hand side of the screen.

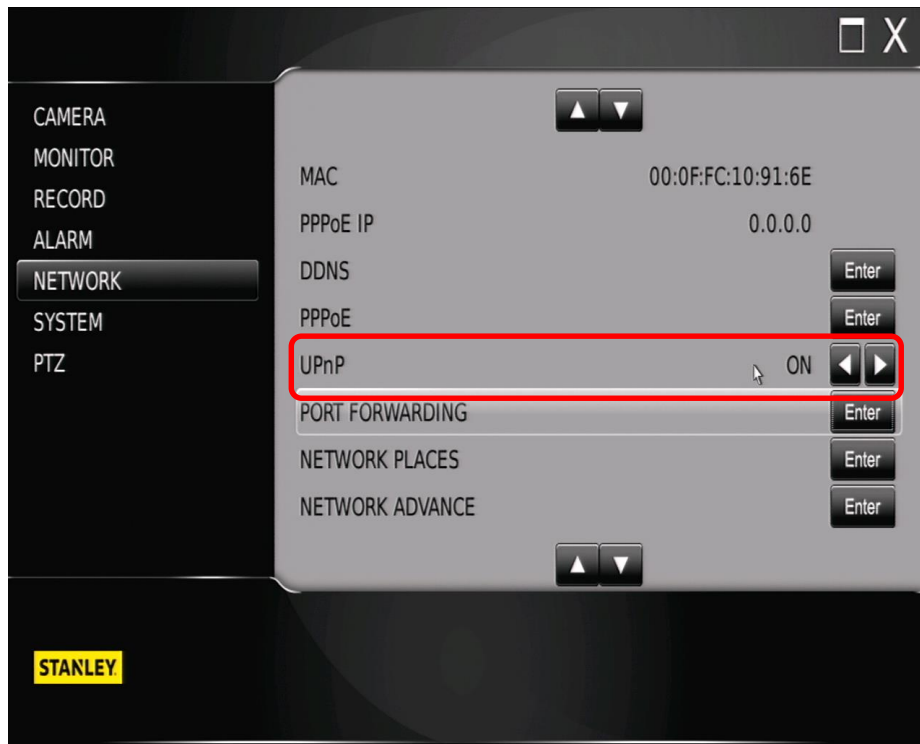
This is what the screen should look like clicking the network tab. Each field has an explanation intending to describe how to configure the various settings to prepare the system for integration with I-View Now:

- Set the "IP MODE" to "STATIC"
- Set the static "IP" address and gateway to the value provided by your site administrator
- Enter the "SUBNET MASK" which is usually "255.255.255.0" since the far right number is the only one changing, but this can vary
- Ask the Site's IT staff for a preferred DNS server or use the Google public DNS (PRIMARY) server at 8.8.8.8 and (SECONDARY) at 8.8.4.4
- The HTTP PORT NUMBER is the WEB port – typically it is "80"
- Set the VIDEO PORT to 3100

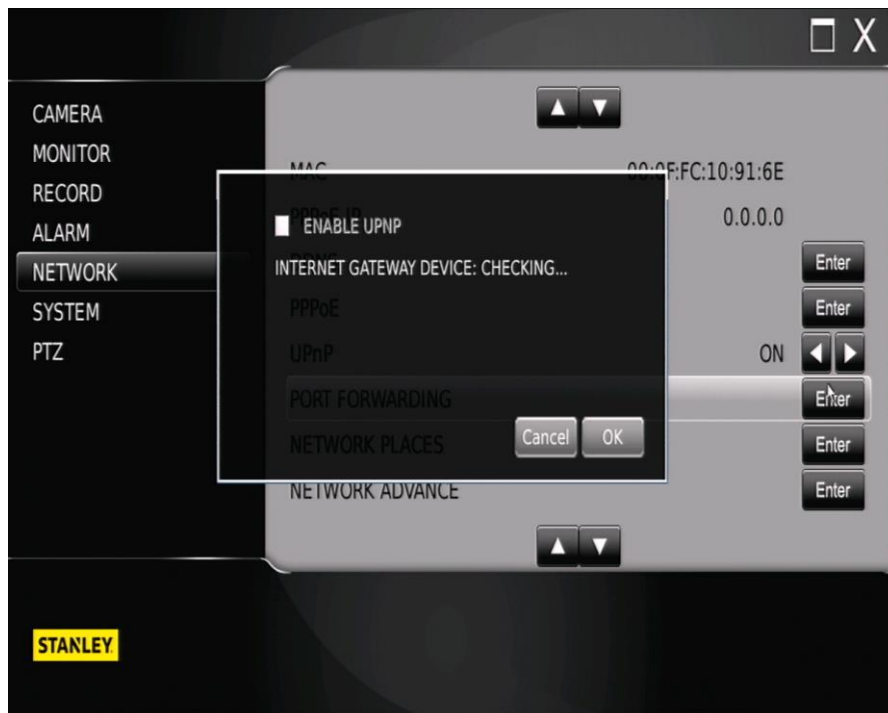


IF THE NETWORK IS UPnP ENABLED

If the customer's network router is UPnP enabled – an alternative to Port Forwarding is available. As you can continue to scroll down in the "NETWORK" section you will see an Option called UPnP. By default it is turned off. To Enable it, click the arrow till the Option is set to "ON".



Once UPNP is set to “ON”, press “Enter” on Port Forwarding. Once “Enter” is pressed the Lilin will attempt to detect the network and port settings, so Port Forwarding will not have to be done. A Pop-Up will appear while it is interrogating the network and say “Checking...”. If it returns a successful message you can click on “Enable UPNP” in the pop up box. If it returns a message “NOT FOUND” traditional Port Forwarding will have to be used. You will then also have to revert the UPNP setting to “OFF”



SMTP Settings

The SMTP Settings enable the Lilin NVR104/109/116 to notify I-View when an alarm event occurs. These are configured from the “ALARM” tab. This form is long and there is an up/down arrow at the top of the screen to assist in navigating the form.

The figure displays two screenshots of the SMTP Settings configuration window in the I-View software. The window has a dark sidebar on the left with a menu containing: CAMERA, MONITOR, RECORD, ALARM (selected), NETWORK, SYSTEM, and PTZ. A yellow 'STANLEY' label is visible at the bottom left of the sidebar. The main content area is light gray and contains various settings. At the top of the main area are two up/down arrows. The settings are organized into sections, each with its own up/down arrows. The top screenshot shows the 'ENABLE' section, which includes a toggle for 'ENABLE' (set to ON), and input fields for 'MAIL SERVER' (ivnview.eu), 'MAIL FROM' (example@ivnview.c), 'MAIL TO' (example@ivnview.c), 'SMTP PORT' (3480), 'LOGIN AUTH' (OFF), 'USERNAME' (user), and 'PASSWORD' (masked with dots, with a 'Show' button). The bottom screenshot shows the 'LOGIN AUTH' section, which includes a toggle for 'LOGIN AUTH' (OFF), 'USERNAME' (user), 'PASSWORD' (masked with dots, with a 'Show' button), 'ATTACH JPEG' (OFF), 'SSL' (OFF), 'MOTION DETECTION' (OFF), 'SENSOR INPUT' (OFF), and 'HDD ERROR' (OFF). The window title bar at the top reads 'VGA2USB (V2U104178)'.

Figure 6

The mail server must match the I-View Now email SMTP server and the mail port as specified in the installation form. The "LOGIN AUTH" is OFF and the MAIL FROM and MAIL TO values will come from the installation form. When an alarm is tripped, the Lilin NVR104/109/116 will use these parameters to send an SMTP message to the I-View system with the identifying account and server values specified on the form forwarded to the email server's port 3480. Make sure the SENSOR INPUT is checked. Motion can be checked but it will send an email alert each time Motion is detected. The time of the event on the email message will be used to initiate a request back to the Lilin NVR104/109/116 for live view and to begin downloading a clip of pre and post alarm event video before and after the event of interest. These will be available for viewing on a standard web browser iPad or a smart phone. This is the heart of the functionality of I-View Video Verification and these parameters must be configured correctly for proper capture of the important pre and post event video.

Click on the X in the upper right to go back to the menu.

Setting up an Camera and an Alarm Event

From the menu choose “CAMERA”. In this menu configure each IP camera the will be used with the system. Be sure to uniquely identify each camera by name.

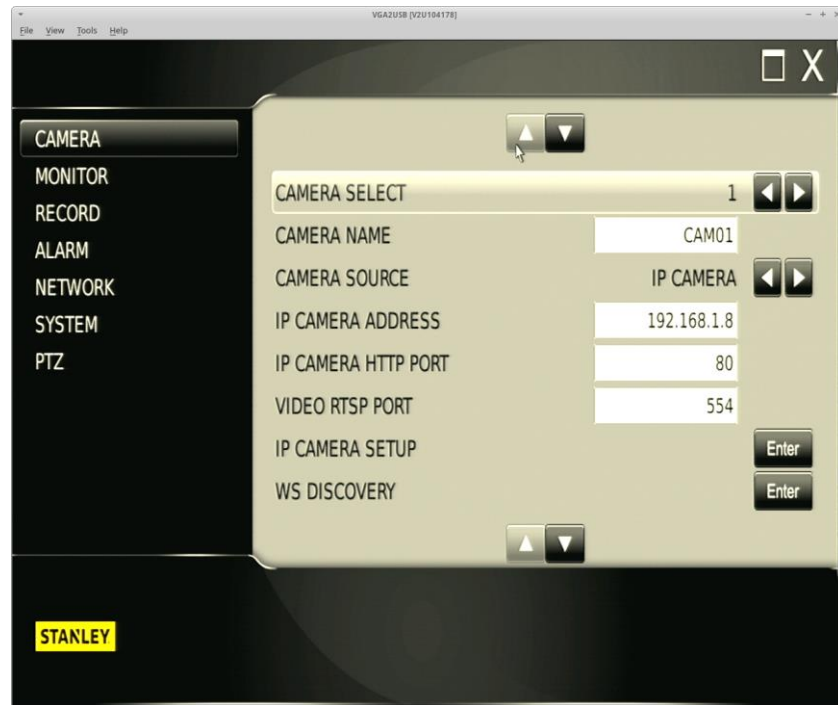


Figure 6

From the “RECORD” tab on the main menu you can set the camera schedule (refer to manufacturer’s guide). Set the “RESOLUTION” to “DUAL STREAM SD HD”. For I-View Now to function properly it must be able to pull a clips that contains pre and post alarm video. In this Menu set “POSTALARM” to 15 SEC and “PREALARM REC” to ON. See example below:

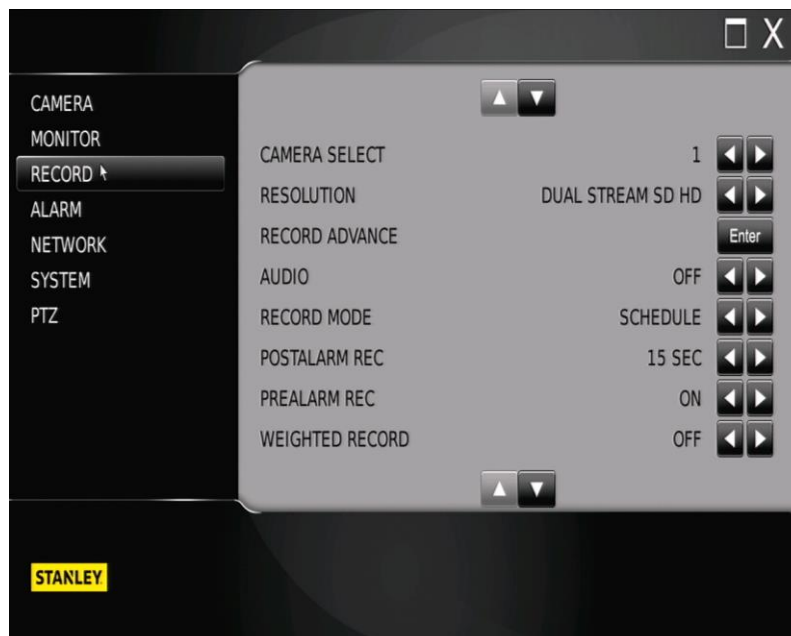
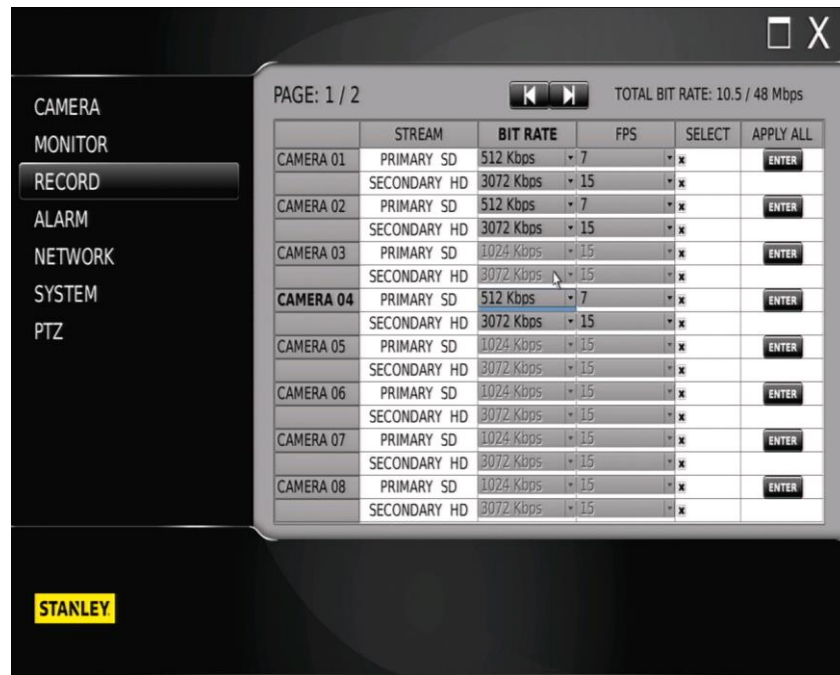


Figure 7

For each camera, you will select the desired resolution and recording options. Click on the “ENTER” button associated with RECORD ADVANCE. This is where the bit rate and FPS rate are set for each stream. I-View Now will use the SD stream and local recording will utilize the HD stream. To preserve bandwidth set the PRIMARY SD stream to 512 kbps and 7 FPS. The Secondary HD stream can be configured at 3072 Kbps and 15 FPS or higher.

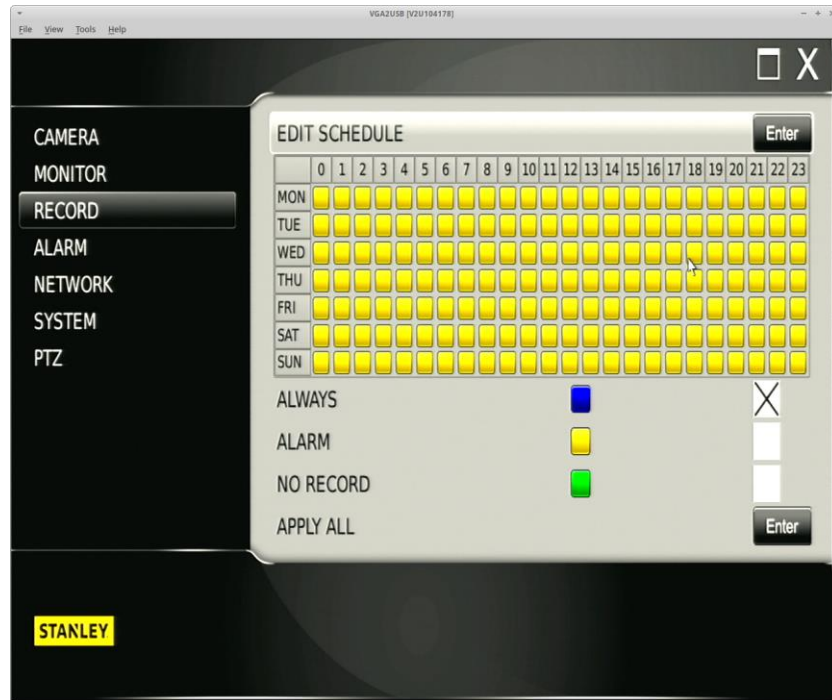


“RECORD MODE” should be set to “SCHEDULE” so recording is enabled.

Click on “SCHEDULE TABLE” from the “RECORD” Menu to program the recording schedule.



All time boxes should be set to yellow (Alarm) or blue (Always). The “APPLY ALL” button will copy this schedule configuration for all cameras.



In order to set up an alarm event to cause I-View to retrieve and store a clip one of the sensors accessible from the backplane must be configured. A typical configuration recommended is “NORMAL OPEN” which indicates there is normally no path from a sensor to ground. By closing this loop either by simple relay, transistor or some similar mechanical contact an alarm event is sensed within the DVR which then initiates the sending of an email to the I-View system using the parameters set up for SMTP email.

Thereafter, a message with the time, camera and date of the alarm relative to the Lilin will be sent to I-View Now using the SMTP settings setting, which will in turn cause processing within I-View to initiate Live View on the camera I-View receives in its SMTP message for the DVR IP address and port associated with the alarm. Thereafter I-View Now will initiate concurrent Live Views of the cameras a clip with pre and post alarm video based on the time of the clip. The clip can be viewed on a browser or smart phone as the clip is stored on a URL within the I-View system accessible by the customer.

By clicking on the “ALARM” tab the input type can be set for each camera. Select the appropriate camera with “CAMERA SELECT”. Choose the proper alarm input (N/O or N/C).

On the back panel of the Lilin there are sensors which accept physical wires. Please refer to the Lilin manual as to how to set them up to ‘trip’ an alarm and thus initiate a sensor SMTP message to I-View Now.

NOTE: THE NVR116 Support 8 digital inputs with a connector on the back of the unit. Cameras 1-8 can be “tripped” via PINS 1-8 (N/O or N/C). Cameras 9-16 are IP only and can be tripped by Motion.

Setting the Time

Make sure care is taken to set up the time on the Lilin appropriately. Please refer to the Manufacturer's guide.

Take care to set the time zone and determine if day light savings is in effect for part of the year where the DVR resides. If so, set it to the appropriate value, e.g. USA. Some adjustments can be made in retrieving clips depending on how these parameters are set when retrieving the clips.

In addition, the system should be set to synchronize with the Internet time site so events will closely correlate with other events. Set the PRIMARY SNTP SERVER to Pool.ntp.org, the SECONDARY to Time.nist.gov and set the appropriate time zone, e.g. GMT -8:00 (Los Angeles/Vancouver) if the DVR is on the West coast. There is also a connection verification time which is usually set to some early time in the morning such as 3:00 am or during periods of little activity.

Test Settings

Once the DVR has been properly configured and the necessary settings entered into the i-viewnow.com portal, it is a good idea to test each alarm input on the DVR by triggering the corresponding device on your alarm panel.

Once the Lilin has been added to the router at the site and port forwarding enabled, and the SMTP settings for communication of alarms back to I-View established, then the technician can enable alarm monitoring on one of the sensors set to a continuous open mode then manually close a sensor to ground. If the time has been set appropriately the I-View system should receive an appropriate SMTP alarm message and begin a Live View Session and download a clip associated with the alarm session.

The I-View Events panel should present a Live View display along with a download of the clip from the camera tied to the sensor in the set up. For more information on configuration of alarms and sensor tripping in the Lilin in general see the manual at <http://www.meritlilin.com/webe/html/products/show.aspx?id=32&kid=54,66>

Glossary

This section includes terminology used throughout the manual. For further information on any term, type the name in Google with “wiki” at the end to see a complete definition.

1. **DDNS - Dynamic DNS** is a method, protocol, or network service that provides the capability for a networked device, such as a router or computer system using the Internet Protocol Suite, to notify a domain name server to change, in real time (ad-hoc) the active DNS configuration of its configured hostnames, addresses or other information stored in DNS
2. **DHCP - Dynamic Host Configuration Protocol (DHCP)** is a network application protocol used by devices (DHCP clients) to obtain configuration information for operation in an Internet Protocol network.
3. **DVR - Digital Video Recorder.** This is typically an analog camera based recording system that provides a common interface into 4 to 16 cameras. In contrast, an NVR (Network Video Recorder) provides an IP based interface to cameras.
4. **IP - Internet Protocol address.** IP addresses are used to identify the I-View server, the site containing the DVR and the DVR itself. The site and I-View IP addresses are Internet routable which means they can be anywhere on the Internet. The DVR typically has an private address which is specific to the site. This is why the router/firewall at the site that faces the Internet must contain a port forwarding entry to allow for messages to be passed to the DVR from I-View as well as the DVR to communicate with the I-View via an SMTP email message or in response to a request for a clip or live view.
5. **MAC Address - A media access control address (MAC address)** is a unique identifier assigned to network interfaces for communications on the physical network segment. MAC addresses are used as a network address for most IEEE 802 network technologies, including Ethernet. Essentially, the MAC address can be thought of as one layer above the physical medium, e.g. wire or cable, and one level below the IP address. The MAC address is often assigned by the manufacturer.
6. **Private Network -** In the Internet addressing architecture, a private network is a network that uses private IP address space, following the standards set by RFC 1918 for IPv4 and RFC 4193 for IPv6. These addresses are commonly used for home, office, and enterprise local area networks (LANs), when globally routable addresses are not mandatory, or are not available for the intended network applications. Under Internet Protocol IPv4, private IP address spaces were originally defined in an effort to delay IPv4 address exhaustion, but they are also a feature of the next generation Internet Protocol, IPv6.
7. **SMTP - Simple Mail Transfer Protocol** is an Internet standard for electronic mail (e-mail) transmission across Internet Protocol (IP) networks.