DARIM®
www.darim.com

PVE400
Portable Wireless IP Camera

Component of multichannel real-time digital video surveillance system

User's Guide

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Notice

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Table of Contents

1. GENERAL INFORMATION

1.1 Introduction

Developed for the most challenging environments, the Darim PVE400 Portable Video Encoder/Streamer is a robust, single channel video encoder for capturing, encoding and streaming high quality MPEG4 video and audio through a wireless interface. This compact and portable unit supports field-operational features such as Fischer Auto-Locking/Quick-release Interfaces, Aluminum rugged encasement, Waterproof Head-camera and Field-replaceable Lithium-ion battery, specifically designed to meet the needs of harsh operating conditions or critical/emergency response teams.

The PVE400 can be managed and monitored from either an Incident Response Command Post or from a Central Operations Control Centre – delivering real-time video and audio information from outdoor environments back to a centrally managed control location in order to communicate true "Point-of-View" situational awareness.

The PVE400 operates on IEEE802.11b/g wireless technology.

Access to the PVE400 and camera can be offered though a simple web browser, or for multiple units management is supported through the *Darim VideoSpider Console*. The *Video Spider* security management system offers connectivity to unlimited number of cameras, video servers, storage servers, and control rooms. Connections between system components are organized over IP LANs, WANs and the Internet, allowing the system to be distributed worldwide.

Figure 1. PVE400 with basic accessories

Features:

- Real-time hardware MPEG4 Video and G.711 Audio Compression
- Personal Wireless Router for locally attached Ethernet Devices
- Support of IEEE802.11b/g 2.4GHz
- Wireless communication with control center
- Integrated "Bullet head-camera" or Generic video camera cable options
- Individual WEB interface capability
- Rugged, watertight case and connectors
- DC 12V output for camera power feed
- Up to 4 hours operating time on single "Field-replaceable" battery
- Multi-device Enterprise management from Darim's VideoSpider Console

1.2 Requirements

The following are the requirements for a client PC to work with PVE400:

- CPU: Intel Pentium IV 1GHz or better
- RAM: 1024 MB or more
- OS: Microsoft® Windows® XP Home or Pro, Windows® Vista

The rest of this document contains important operating instructions for the PVE400 unit. Be sure to read all the applicable sections carefully before proceeding.

2. INSTALLATION STEPS

This chapter describes the installation procedure of the PVE400 accessories.
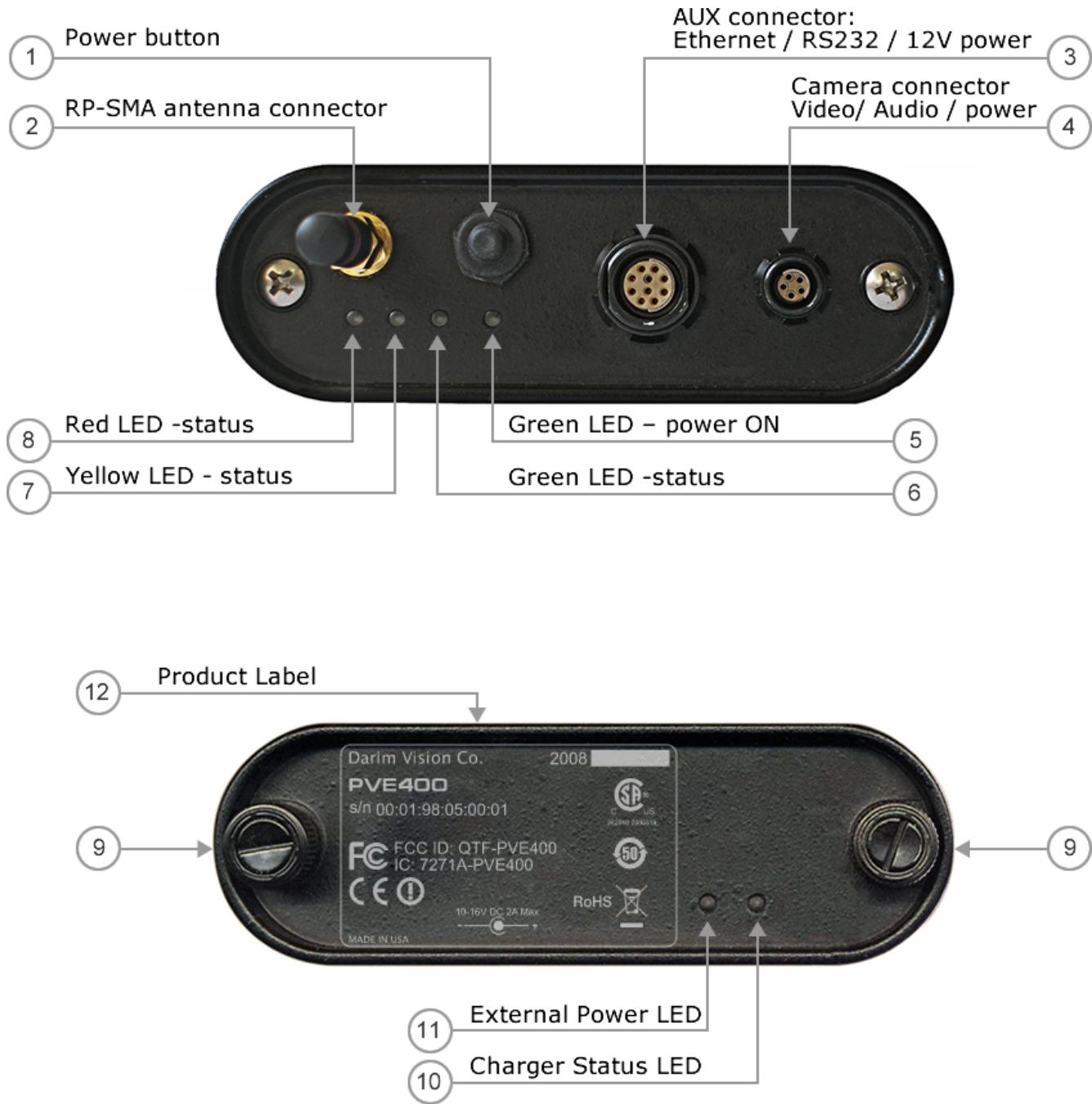
Figure 2. PVE400 interface

2.1 Installing antenna

Attach the supplied antenna to RP-SMA jack. To prevent from damaging RP-SMA connector, it is important to hold body of antenna and rotate only metal part of antenna. Do not rotate antenna itself.

Figure 3. Attaching the supplied antenna

⚠️ **Warning**:

The only supplied antenna with 2.0dBi gain is certified to use with PVE400 when the device is used as wearable.

2.2 Installing the camera

PVE400 is bundled with 1/3" Sony Ex-View HAD CCD, Hi-res weatherproof bullet camera. The camera comes with Fischer Automatic Latching, Self Aligned 5 pin connector. Gently plug and rotate the connector until it mates and push to lock. In this position the connector is securely locked and pulling the cable will not disconnect it. Fix the camera using a head strap or helmet mount (optional). The camera has a mark of a top position for easy orientation. In order to unplug the camera, pull the bottom sleeve of the connector.

2.3 Using other video/audio source

PVE400 can accept any standard video source. The optional PVE-AV split cable has a standard RCA female connector (Yellow) for video input. PVE400 can provide 12V/200mA power for an external camera using a standard power jack. This power source is protected by resettable fuse with 400mA limit, to secure PVE400 from accidental shortage.

The standard electret microphone can be connected to the audio jack. PVE400 will provide 1.1V DC bias for the microphone on the same connector.

See also the table in section *8.3* for the connector pin out, if the custom cable is needed.

2.4 Powering up

Press and hold the power button (Figure 2 -1) until the *green LED* is on (Figure 2 - 5). The unit will be ready for operation as soon as the *status LED* is lighted (Figure 2 - 6). To turn off, press and hold the power button again, until *all LEDs* are off. When the external power adapter is attached, the unit will turn on immediately. The power button works only for battery. Alternatively the unit can be powered via AUX connector (see the table in section *8.3*). This is useful if the unit operates with an external power source, for example inside a car, or while stationary mounted.

⚠ **Warning**:
Do not remove the battery, even if the unit is always working with the external power source.

2.5 Battery charging

The battery can be charged using an external charger (optionally supplied p/n PVE-ECx) or internally using bundled AC /12VDC power adapter (PVE-PS with AUX adapter). The charging time of a *fully discharged* battery is about 5 hours. During the charging process PVE400M will operate normally. On the bottom cap two additional LEDs will show status. If power source comes from AUX connector, *External Power LED* (Figure 2 - 11) will be solid green, *Charger Status LED* (Figure 2 – 10) will be solid *red* if battery is charging and change to solid *green(amber)* if battery is fully charged.

When AC/DC adapter is connected, the battery will always be in the charging state, but the internal circuit will prevent the unit from overcharging.

When the battery is internally charged, turn on the unit by pressing the battery power button first, then attach DC-AUX plug. This will insure calibration process of the battery monitor. When the unit is fully charged, the capacity monitor will work with 1% accuracy in this case.

It is also possible to charge from a car battery using an optional cable PVE-VPS (cigarette lighter plug to AUX), in the same way as using PVE-PS.

Aluminum case of PVE400M is electrically connected with internal ground signal (negative). The external power source must be positive. PVE400M has a built-in protection from reverse polarity of an external power source.

▭▷ **Note:** AC/DC adapter is designed to use only for indoor environment.

2.6 Battery replacement

If the capacity is below 10%, the *red LED* (Figure 2- 8) will start blinking. When the *status red LED* is solid, the battery capacity is below 5% and it must be recharged or replaced with a fully charged battery. More accurate battery status can be monitored using the web interface on the **BATTERY** tab (refer to section 3.5).

To replace the battery, turn off the unit by pressing and holding the power button until *all LEDs* are off and ensure that PVE-PS supply is disconnected.

Unscrew the thumb screws (Figure 2 - 10) on the bottom cap of the unit and pull out the battery. Insert the replacement battery positioning the contacts inside the unit. Put the cap back and thoroughly tighten the thumb screws to compress the rubber gasket. The battery has internal protection from overcharging and over discharging or short circuit. The battery life time is about 500 cycles (while maintaining about 70% of the initial capacity) depending on operational conditions. Do not charge the battery if the temperature is below 0°C (32°F) to prolong the battery life. Store the spare batteries in a dry place; preferably the temperature should not exceed 30°C (86°F).

⚠ **Warning**:
The battery used in this device may present a risk of fire or chemical burn hazard if mistreated.
Do not recharge, disassemble, heat above 60°C (140°F) or incinerate. Replace battery with Saft model 1S1P MP 176065 only. Use of another battery may present a risk of fire or explosion.

La batterie utilisée dans cet appareil peut présenter un risque d'incendie ou de brûlure chimique en cas de mauvais emploi. Ne pas recharger, démonter, chauffer à plus de 60C (140F) ni incinerer. Remplacer la batterie uniquement par le model Saft 1S1P MP 176065. Une autre batterie peut provoquer un incendie ou une explosion.

2.7 Using wired network connection

PVE400 has a standard 10/100Base-T Ethernet adapter accessible via AUX connector. Since AUX connector is also used for RS232 interface and external power, a special cable is required to use Ethernet function. PVE-AUX is 5 feet (1.5m) CAT5E grade cable with RJ45 plug (T568B) on one side and Automatic Latching, Self Aligned 10 pin connector on the other side. Gently plug and rotate AUX side of the connector until it mates, and push to lock. In this position the connector is securely locked and pulling cable will not disconnect it. To unplug, pull the bottom sleeve of the connector. If AUX connector is not used, make sure that the protection cap is always put.
Addendum 8.3 has AUX connector pin out and wiring diagram for PVE-AUX cable.

3. GETTING CONNECTED

PVE400 has a built-in web server. The whole configuration can be done using *Internet Browser*; no other special software is required. All parameters on the configuration pages are stored in Non-Volatile RAM (FLASH), so turning off the power will not reset them. New parameters will be stored by clicking the [**Apply**] button with verification that all parameters are valid. The grayed values are read only, can't be changed by user. Web interface is very generic and works with any operating system and browser, excepting video plug-in, which works only with *Microsoft Internet Explorer* version 6 or higher.

3.1 Accessing the device for the first time

The factory default configuration for Ethernet: IP 192.168.1.250 (static). To access PVE400 for the first time using the wired connection, PC must be on the same network subnet.
The network settings can be changed using the **NETWORK** tab (see section 3.2). Changing IP address may cause temporal disconnection. In this case reconnect to the device with a new IP address. The default configuration for wireless is *DHCP* client.

Once connection is established and verified (by ping command), launch *Internet Browser* with URL of a current IP address. For example: http://192.168.1.250. The standard authentication dialog will come out.
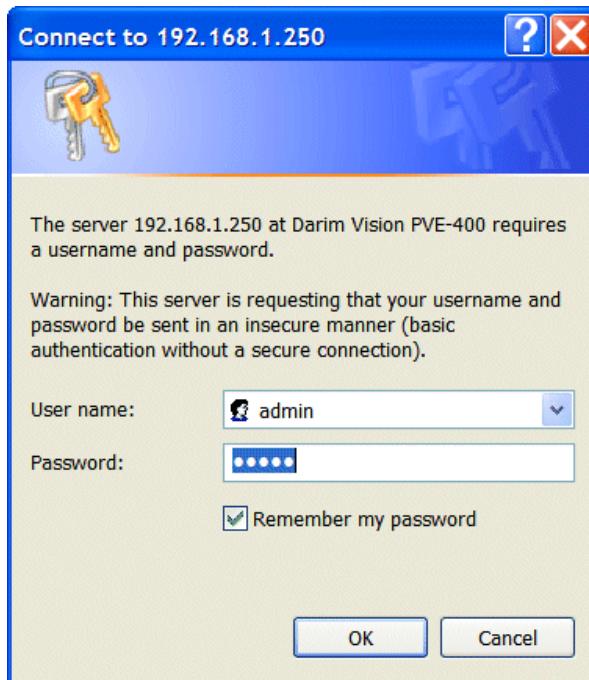
Figure 4. Authentication dialog

Enter the default **user name** as "*admin*" and initial **password** "*admin*" and click [**OK**] button. If the authentication process succeeds, PVE400 site will be opened at the **SYSTEM** page as default.
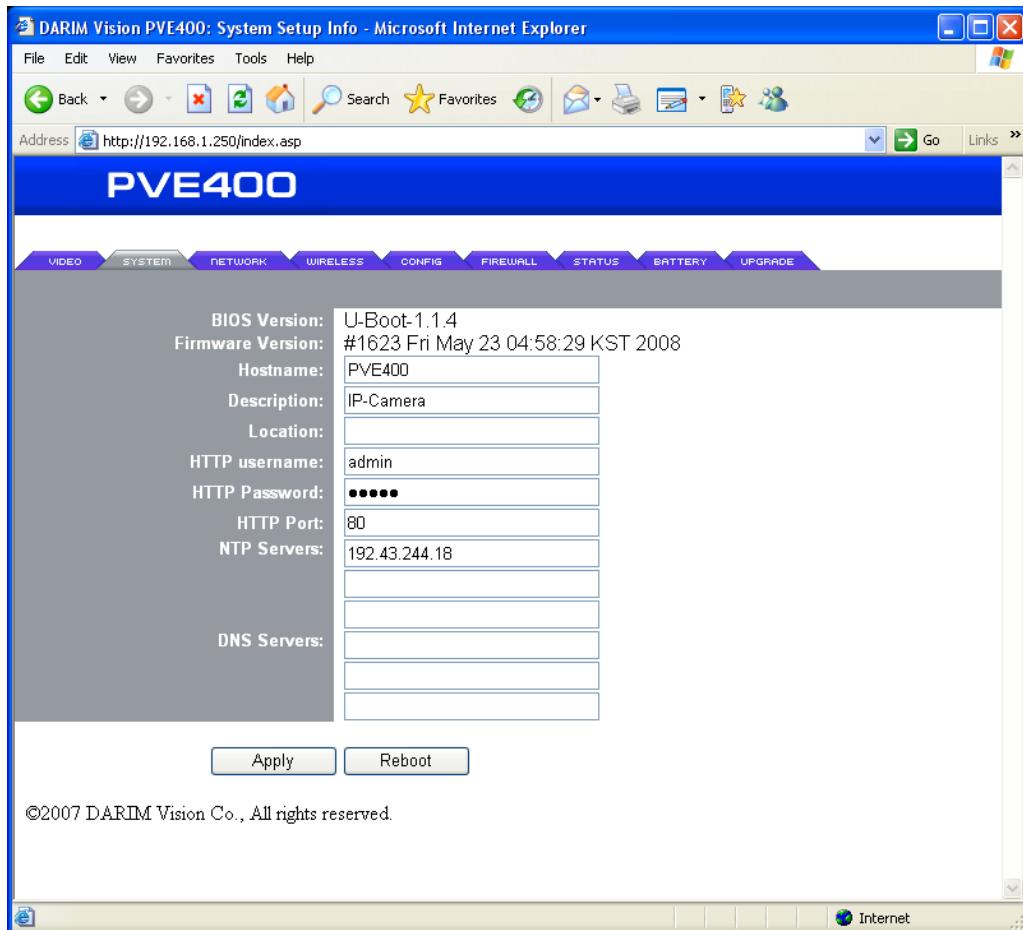
Figure 5. System setup page

Using this page you can change the default **user name** and **password**, if required. The **Hostname**, **Description**, The **Firmware Version** information is important when you contact the technical support team.
Location fields are simply for navigation purpose.
By default **HTTP port** is set to 80. If this port is changed, specify this port to access PVE400M web server. For example http://192.168.1.250:8080

The **NTP Servers** IP address is needed for time synchronization. Up to 3 different NTP servers can be listed. PVE400M has the internal clock with the backup battery (which can keep time for one-two weeks, if the unit is turned off). The internal time clock can be adjusted to reference time server using the standard NTP protocol during boot time. Most of Linux systems have NTP Daemon to synchronize time between machines. The best option here is to put IP address of MeshManager system, if it is based on Linux.
The internal clock is not used in any application for viewing video, but it is useful for logging purpose, as all messages are time stamped.
The **DNS** information is optional and not required for normal operation. It will be only useful for the firmware upgrading procedure (see section 3.6)

Clicking the [**Apply**] button will save all changes to Non-Volatile RAM and restart all services. Clicking the [**Reboot**] button will cause complete software and hardware reboot, during this time the communication will be lost for about 90 seconds.

3.2 Network configuration

3.2.1 Wired connection configuration

The **NETWORK** configuration tab allows to specify all related settings if the device is used with AUX Ethernet cable.
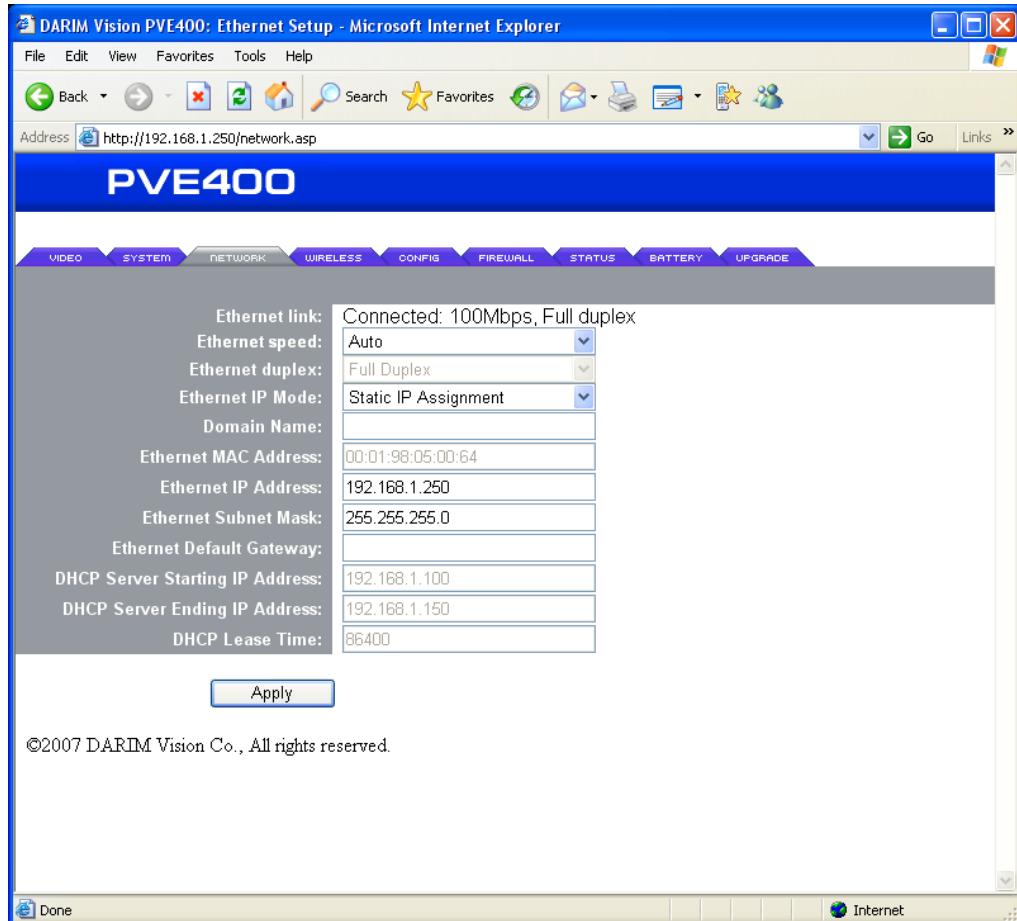
Figure 6. Ethernet configuration page

The **Internal Ethernet** adapter supports *10* and *100* Mbps speed and *Half* and *Full* **Duplex** mode.
When the **Ethernet speed** parameter is selected as *Auto*, it will be automatically set accordingly to the connection.
The **Ethernet IP mode** drop-down list allows you to select the IP configurations parameters:

- *DHCP Server* - PVE400 has an internal DHCP server and can provide IP address for other devices connected to PVE400.

   If this mode is selected, specify the address range in the **DHCP Server Starting IP Address** and **DHCP Server Ending IP Address** fields.
   Set **DHCP Lease Time** in seconds.
   The **Ethernet IP address** parameter must be assigned manually and should be in the same IP segment and DHCP range.

- *DHCP Client* – in this mode PVE400 will request IP address and all network configurations from the external DHCP server. If IP address has been successfully obtained, it will be shown in "Ethernet IP Address" line as read only (gray).

- *Static IP Assignment* – this is default mode, all configuration parameters will be taken from the corresponding lines on the Network configuration page.

- *Disabled* – Ethernet adapter is turned off.

The **Ethernet MAC address** parameter is a read-only one and shows unique MAC address of Ethernet adapter PVE400. All PVE400 devices have common address 00:01:98:05:xx:xx. This address is same as a serial number printed on the product label (Figure 2).

Clicking the [**Apply**] button will cause storing all parameters and restarting all network interfaces, running services and video encoder. If no changes required simply choose another tab.

3.2.2 Wireless connection configuration

The **WIRELESS** configuration tab is related to *Wi-Fi 802.11b/g* setup.
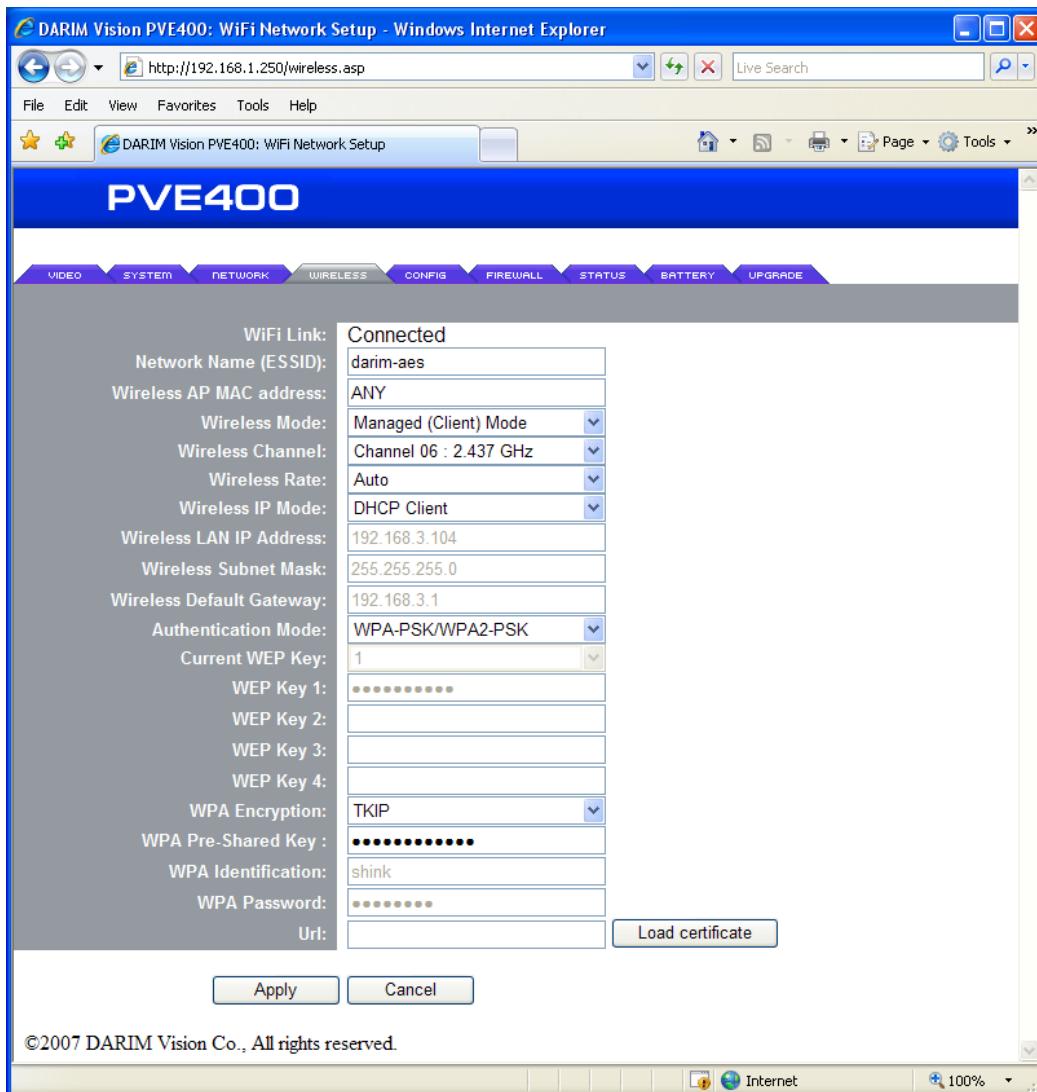
Figure 7. Wireless configuration page

The **Wireless IP mode** field allows you to select *DHCP Client*, *Static IP Assignment* or *Disabled* mode. For *Statically Provisioned* mode, use *DHCP Client* selection.

For the *Static IP Assignment mode*, enter the proper information for **IP address**, **Subnet Mask** and **Default Gateway** (if required).

The **Network Name** (**ESSID**) filed allows specifying the *Network Name* or *Extended Service Set Identification* (*ESSID*) of the wireless interface. During the operation in the *AD-Hoc* or *Client* mode, ESSID is the name of the *Wireless Access Point* for the device to be associated with. Additionally, in the ad-hoc mode, one must provide the **Wireless AP MAC** Address.

The **Wireless AP MAC address** field serves for specifying the *Access Point MAC address* to associate with when operating in *Ad-Hoc* or *Managed* mode. To associate with any access point, set the **ANY** value in this field. You may also use the **OFF** value to re-enable automatic mode without changing the current Access Point, or you may use **ANY** or **AUTO** to force the card to re-associate with the best current *Access Point*.

Using the **Wireless Channel** drop-down list specify the required value for wireless channel of the Wireless Interface. In case of *Auto* option, the channel will be automatically selected by auto scanning.

Specify the wireless data rate using the **Wireless Rate** drop-down list. Set the *Auto* value for providing all clients with the best speed.

Using the **Authentication Mode** drop-down list set one of the wireless security modes: *Open System, WEP Open mode, WEP Restricted mode, WPA-PSK/WPA2-PSK, WPA Enterprise, WPA2 Enterprise*. The default authentication mode is *Open System*.

Select the required WEP key parameter using the **Current WEP key** list and other WEP Key (1-4) editing fields.

If WEP security mode is selected, use the **WEP Key (1-4)** field for entering 5 ASCII characters or 10 hexadecimal digits for a 64-bit key. Enter 13 ASCII characters or 26 hexadecimal digits for a 128-bit key, identical as set on *Access Point*.

Choose either TKIP or AES value using the **WPA Encryption** drop-down list. Selecting TKIP sets encryption cipher for WPA-PSK, while the AES selection sets encryption cipher for WPA2-PSK.

Using the **WPA Pre-Shared Key** editing field specify the required key for WPA-PSK/WPA2-PSK security mode. Enter here from 8 to 63 characters or digits, identical as set on Access Point.

If the security mode WPA/WPA2 Enterprise is selected, use the **WPA Identification** editing field for entering User ID to get access to RADIUS server. The default User ID is a serial number of the device.

If the security mode WPA/WPA2 Enterprise is selected, use the **WPA Password** editing field for entering password to get access to RADIUS server. The default password is a serial number of the device.

The **Certificate URL** editing field serves for specifying the required URL certificate parameter. The authentication mechanism is EAP-PEAP/MSCHAPv2 in the *Enterprise* security mode. RADIUS server must have x.509 digital certificate (also known as public key). This certificate should be downloaded to PVE prior to wireless authentication. Use LAN connection to download it. The certificate must be placed to available ftp site on local network. Type in the full URL in the field, for example ftp://192.168.1.253/client.cer. Press the [**Load Certificate**] button to complete the load operation.

If any changes have been made on this page, click the [**Apply**] button; otherwise simply select the other tab.

3.3 Video and audio configuration

The **CONFIG** page contains all *Video/Audio* related parameters.
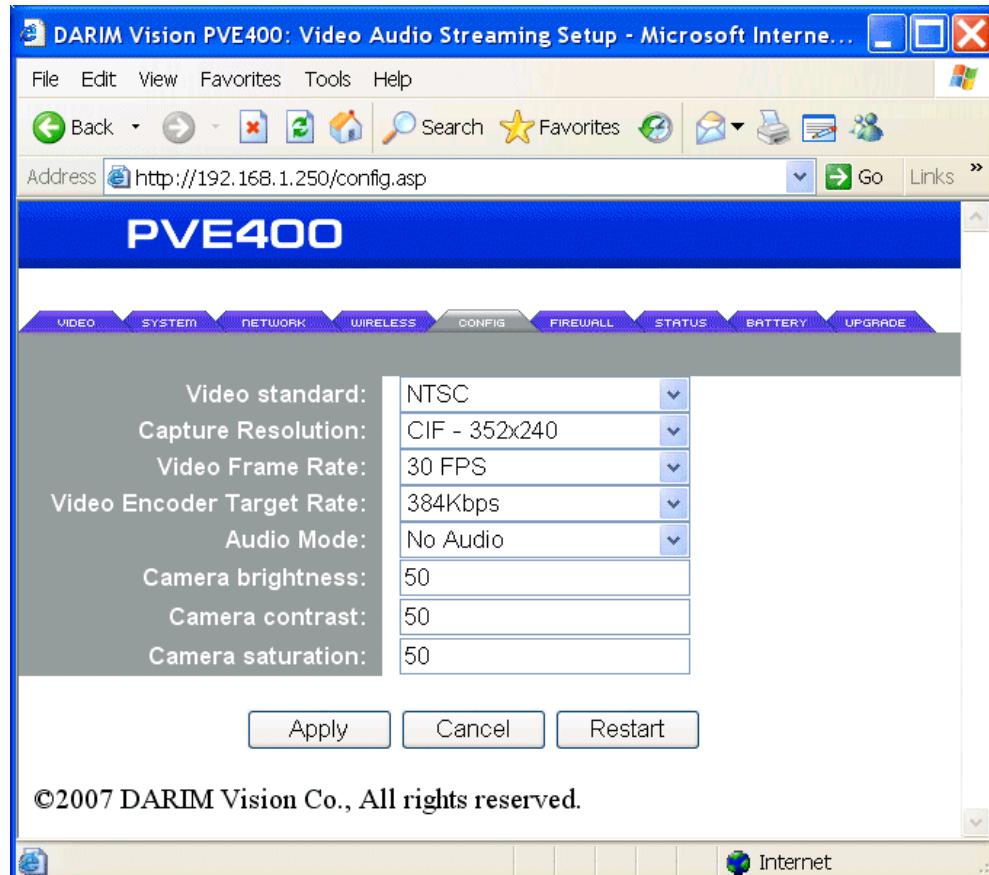

Figure 8. Video and Audio configuration page

PVE400 can operate in *PAL* or *NTSC* mode. The **Video Standard** field represents the current selection of the video standard.
Using the **Capture Resolution** drop-down list you can choose a required resolution. Currently four different resolutions are supported.

The **Video Frame Rate** drop-down list allows selecting the target frame rate (in frames per second). It depends on the link quality and the actual frame rate can vary, but it will not exceed the specified value in this field.

The **Video Encoder Target Rate** parameter field serves for specifying maximum allowed bit rate for video compression. It depends on the link quality, and the actual bit rate can vary, but it will not exceed the set value of this field. Make sure you have selected the adequate bit rate for existing network condition.

The **Audio mode** field allows selecting a required audio format. If the external microphone connected to PVE-AV cable, choose a desired compression format from the list. Use the *No audio* option if the microphone is not used.

The **Camera brightest/contrast/hue/saturation** parameters will adjust picture quality, similar to regular settings of TV set.

PVE400 uses *MPEG4* compression for video. When the wireless connection is used, the video bit rate is limited by the throughput of the wireless network, which is about 1Mbps in case of using *WMC6300/7300* cards. This bandwidth will be shared by all users in the network.

Video streaming uses *RTSP/RTCP/RTP* protocols, bit rate and frame rate will be automatically adjusted depending on the link quality, but will not exceed the selected values in the **Video Frame Rate** and **Video Encoder Target Rate** selection fields.

If any changes have been made on this page, click the [**Apply**] button, otherwise simply select other tab. The [**Restart**] button will restart the streaming engine and video driver without complete reboot.

3.4 Viewing video

There are several ways to get a video feed from the PVE400 unit.
For Microsoft Internet Explorer PVE400 has a built-in plug-in which will be automatically installed the first time you access the **VIDEO** tab. You will be required to confirm the security warnings about the ActiveX installation, as shown in the figures below.
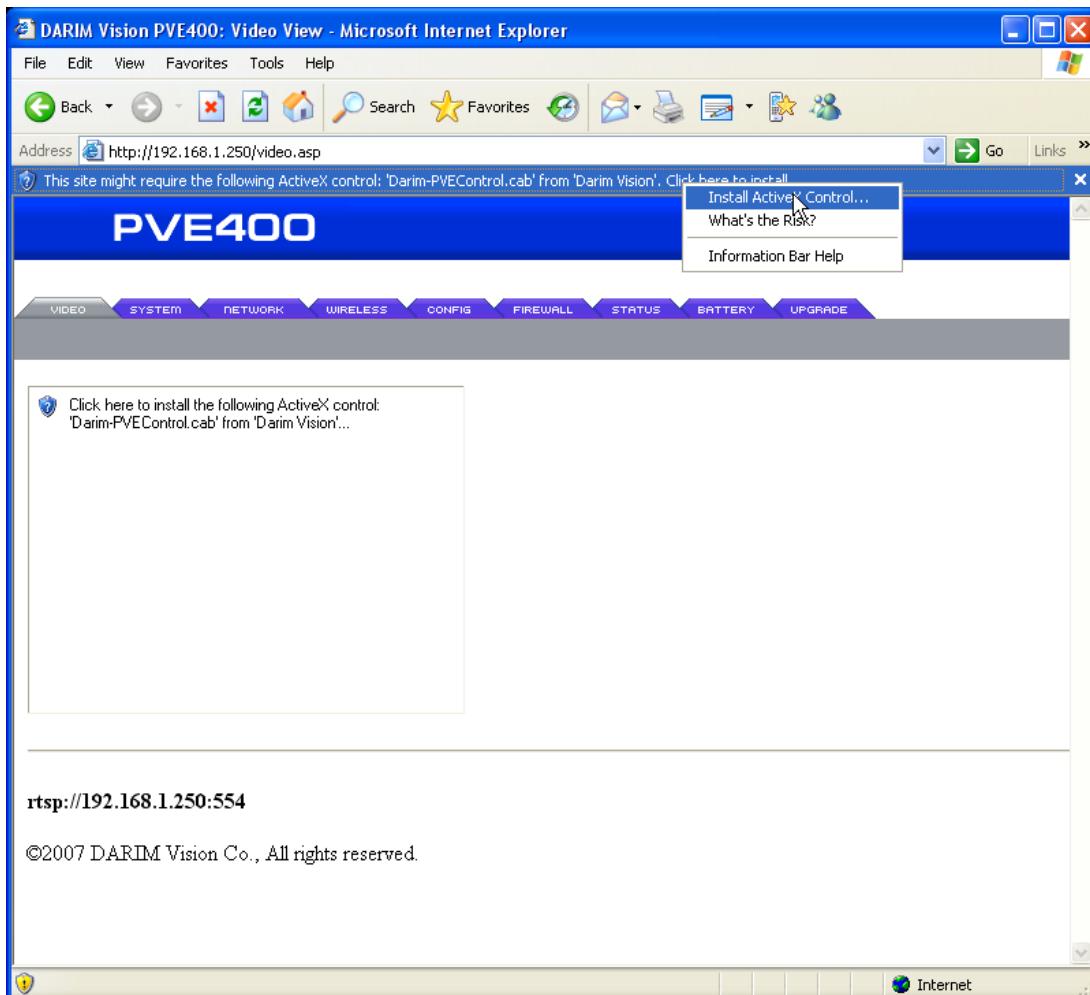
Figure 9. Video page

Figure 10. Security warning dialog

If the plug-in has been correctly installed, video can be also viewed directly in the *Windows Media Player*, without the need to open IE. In this case, select **Open URL** command from the File menu in the *Windows Media player*.
URL will be "rtsp2://192.168.1.250" (IP address of PVE400)
If *Windows XP Firewall* is enabled, you may need to unblock the *Windows Media Player Application*.

The third option is using *Darim's Video Spider* software, it can be purchased separately.
The *Video Spider* software will allow to monitor and record data from multiple PVE400 units. The *Video Spider* software has *Client-Server* architecture, allowing multiple client computers to connect to the server (or multiple servers). This will you give the advantage of using local network between clients and server, while wireless network is used only between single server and PVE400 in the field.

More information about VideoSpider software can be found at http://www.darimcctv.com/products/spider.php.

3.5 Monitoring the battery status

The **BATTERY** tab provides the useful information about the battery status. The negative current value is shown for discharging (normal operation) and positive during battery charging. The normal value is 1~2A, depending on the transmitter power and streaming video status. When streaming video is not active, the power for the camera is not supplied; so the overall power consumption will be reduced.
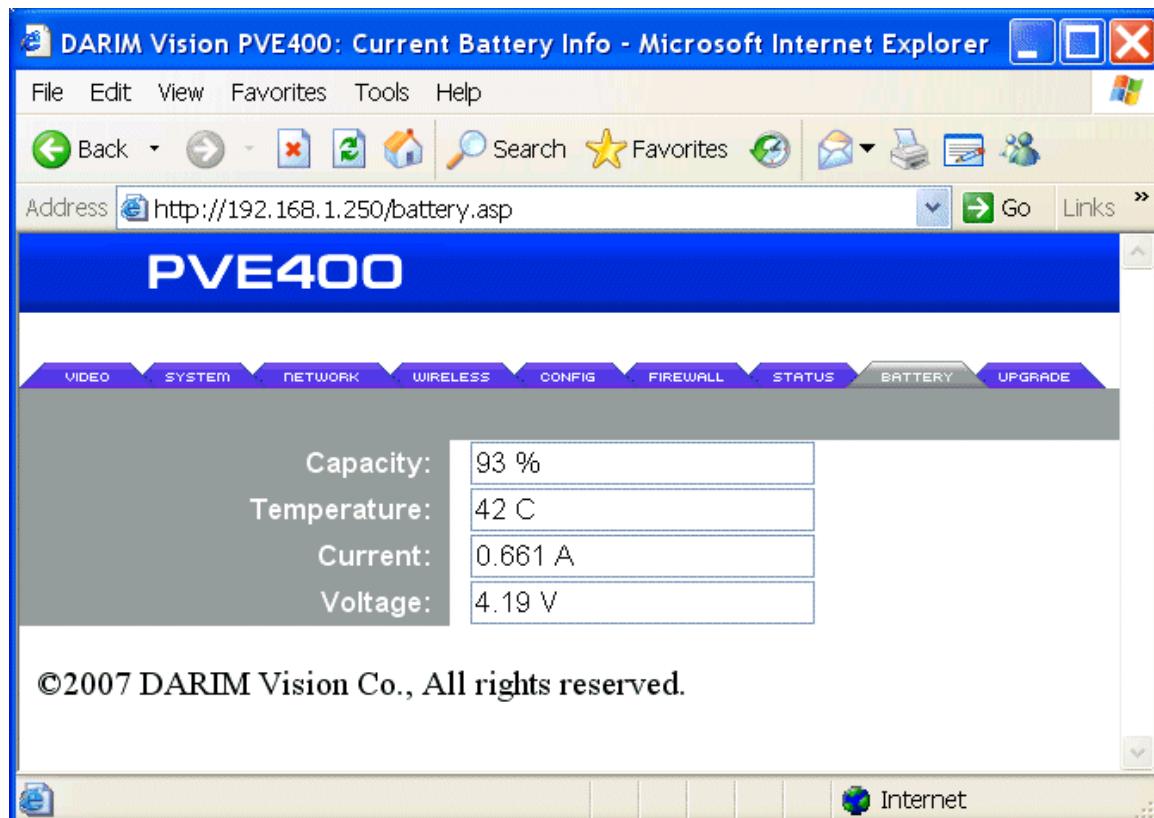
Figure 11. Battery status page

During the charging process, the start current will be positive 1.7A and slowly reduced till it becomes nearly 0, when the battery is fully charged. The voltage of the fully charged battery will be 4.2V maximum. The device will normally operate until the battery is discharged down to 3.0V and then shutdown.

The rechargeable Lithium-Ion battery rated with capacity 6.8Ah if discharged till 2.5V. It means that the useful capacity is slightly less. The capacity counter will show an accurate value only if the battery has been fully charged inside the PVE400 unit. If a new battery is installed, the capacity calculation will be done only based on the voltage information (with 20% accuracy)

To update the information on this page, press the [**Refresh**] button or simply click the tab again.

⚠ **Warning**:

> Li-ion battery has operating temperature range up to +60° C. When internal temperature reached this limit, wireless transmitter will shut down, to prevent overheat. All three status LEDs will start blinking until temperature drops to +55° C.

3.6 Upgrading firmware

The PVE400 firmware can be upgraded using the **UPGRADE** tab.
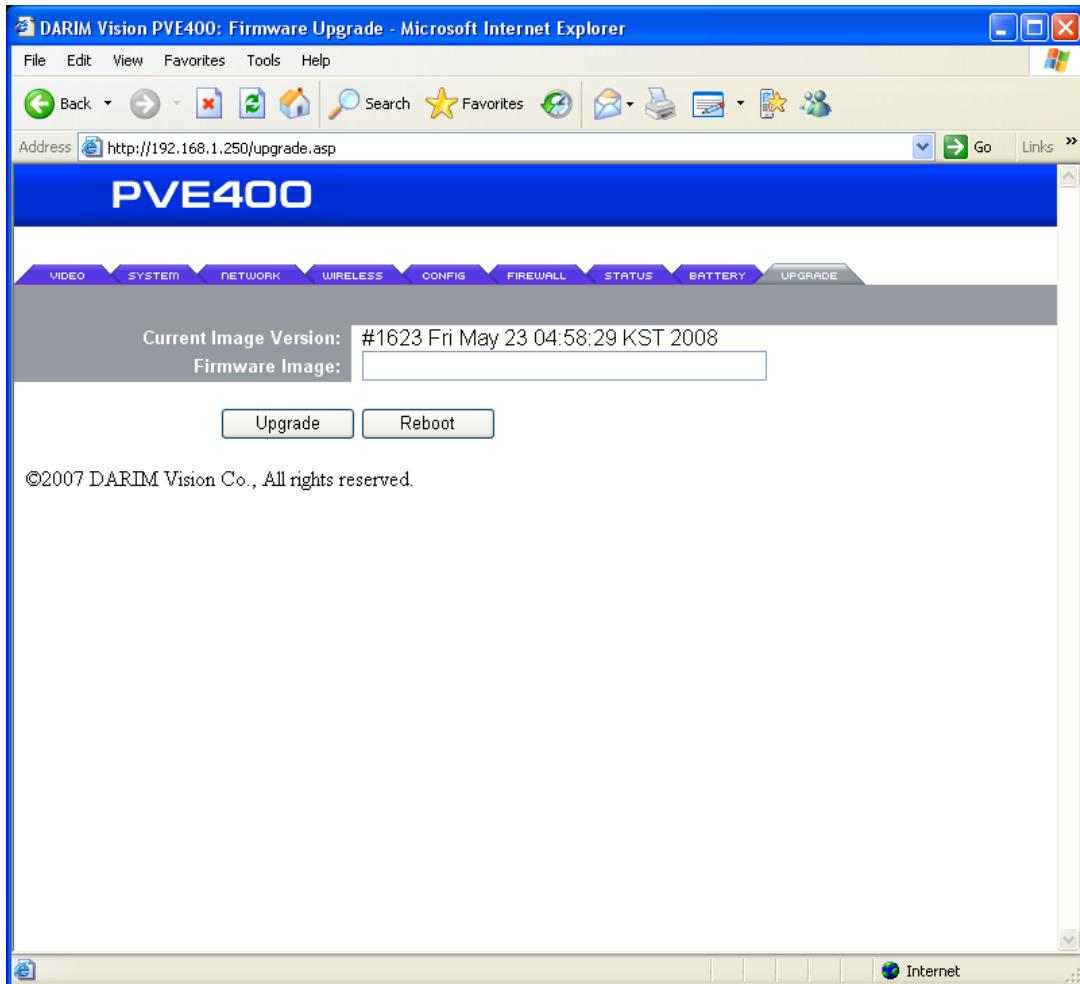
Figure 12. Firmware upgrade page

The update image can be accessed using *FTP* protocol. Type *URL* for the firmware image and press the [**Upgrade**] button. In case of successful connection, the upgrade process will take 5-10 minutes. Do not interrupt the power supply within this period. Once the update process is finished, PVE400 will automatically reboot. Check the *LED* status, as soon as the device is booted up, and reconnect the browser. Power off/on cycle is recommended after the upgrade procedure.

If the status after the upgrade reports an error, check the network connection to upgrade site, if it can be accessed from the network segment of the working PVE400. The firmware image can be downloaded from the *Internet* and placed to a *local FTP* site, to make easy access from PVE400.

In order to upgrade directly from the *external FTP* site, make sure that *Gateway* setting is properly assigned. If *DNS* settings are not provided, use *IP* address for *URL*
Default location for updates from Darim Vision FTP site will be ftp://ftp.darim.com/pub/PVE/uImage.xxxx or ftp://216.55.162.11/pub/PVE/uImage.xxxxx   where xxxx – build number

3.7 Status LEDs

Three color indicators one the top cap (Figure 2 - 6,7,8) will show status of operation.
Green LED will turn on as soon PVE400 is ready for operation. If remote client connected to PVE and receiving video stream, LED will start blinking.
Yellow LED will start blinking, if quality of connection degraded.
Red LED will start blinking if battery capacity below 10% and will be solid red, when less than 5% remains.

If internal temperature rose above 60°C (140°F)*,* all three LEDs will start flashing simultaneously. During this time wireless connection will be shutdown until unit cools down.

4. Advanced configuration

4.1 Firewall

To provide the additional layer of security, the PVE400 unit supports IP and MAC address filtering on the Wireless interface in order to prevent unauthorized subscribers from accessing the device. The **Trusted IP Filter** or the **White List** dialog box (see Figure 13) represents the devices which are allowed to access the PVE400 unit, either for configuring or requesting a video stream.

By default, the list is empty. Any device can be connected to the PVE400 unit. However, once an address is added to the list, all other devices are automatically prevented from accessing with the exception of those devices from the list. To add a new *trusted* address, click the [**Add**] button. Using the [**Delete**] button you can remove the selected addresses from the list. Clicking the [**Clear**] button will remove all addresses from the list and return the PVE400 unit to its initial state.

> **Note**:
> The System configuration addresses such as *DNS*, *NTP* and *Gateway IP* addresses are automatically added to the **Trusted** list though they are not visible in the **Trusted IP Filter** dialog box. If required, these addresses can be removed from the **SYSTEM** (Figure 5) and **NETWORK** (Figure 6) pages.
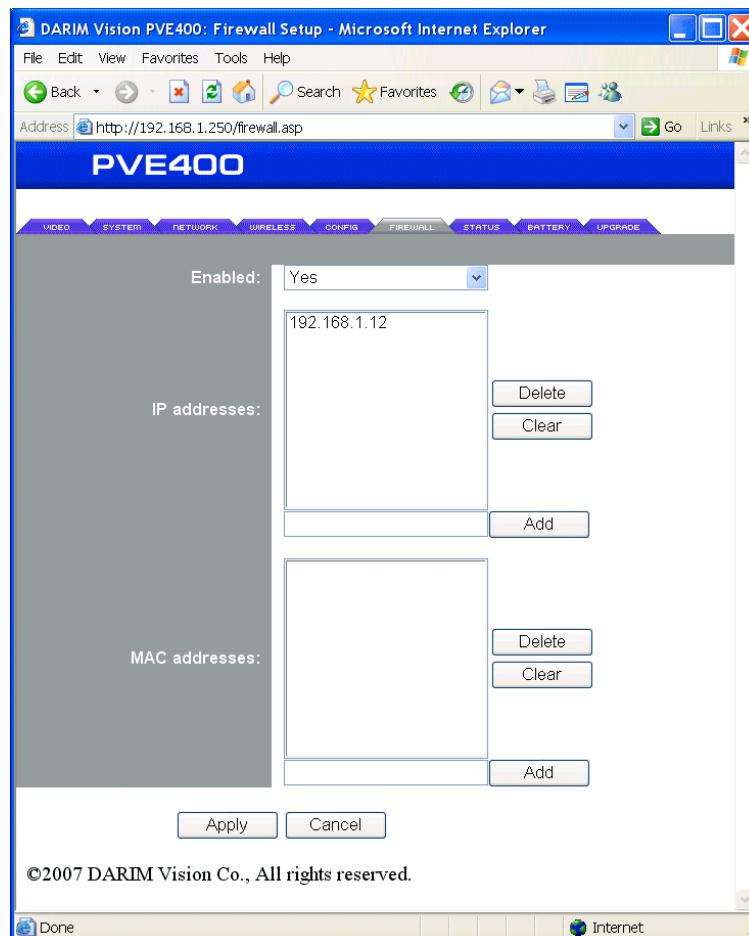
Figure 13. Firewall page

4.2 IP router

As the PVE400 unit has two network interfaces, it can act as a wireless router. By default IP forwarding is enabled. All you need is to configure IP settings of the external devices, so that they will be in the same IP segment as PVE400 Ethernet, and PVE400 will be as the default gateway for them.

Example:

Ext device #1   PVE400 Ethernet side   PVE400 Wireless side

IP 192.168.1.2   IP 192.168.1.250   IP 172.31.1.200
MASK 255.255.255.0   MASK 255.255.255.0   MASK 255.255.0.0
GW 192.168.1.250   GW - none   GW 172.31.0.20

Test connection using "`ping 172.31.0.20`"

In order to access "Ext device #1" from wireless network, make static routing table with gateway 172.31.1.200 as default gateway for 192.168.1.000 segment. Test connection using "`ping 192.168.1.2`"

5. Customer Service Information

If the product fails to perform either during the warranty period or after, contact Darim's designated regional representative for troubleshooting and potential RMA information.

The nearest Darim's Regional Representative can be found at http://www.darimcctv.com/support/pve_rep.php . Or send an e-mail to usasales@darim.com. The Regional Representative will be the first line of support for the product.

The latest version of the PVE400 User's Guide is available at www.darimcctv.com/ftp/PVE/PVE400-UG.pdf.

6. Product Warranty Information

Limited Warranty

Our company warrants this product against defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, products determined by us to be defective in form or function will be repaired or replaced at our option, at no charge.

This warranty does not apply if subjected to any of the following: abuse, improper use – negligence, accident, fire, modification, failure of the end-user to follow the operating procedures outlined in the user's manual, failure of the end-user to follow the maintenance procedures in the service manual for the Product where a schedule is specified for regular replacement or maintenance or cleaning of certain parts (based on usage); operation of the Product outside of the published environmental and electrical parameters. We may disclaim warranty for the Products in use with any combination of Non-Darim Products that Purchase may choose to connect to the Product

This warranty is in lieu of any other warranty expressed or implied. In no event shall we be held liable for incidental or consequential damages, such as lost revenue or lost business opportunities arising from the purchase of this product.

7. Regulatory Information

7.1 FCC Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:
This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Federal Communication Commission (FCC) statement:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the PV400 and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the supplier of PVE400 or an experienced radio/TV technician for help.

Changes or modifications not expressly approved in writing by Darim Vision Co. may void the user's authority to operate this equipment.

FCC ID: QTF-PVE400
Tested to Comply with FCC Standards
FOR HOME OR OFFICE USE

7.2 FCC RF Radiation Exposure Statement

In August 1996, the Federal Communications Commission (FCC) of the US adopted an updated safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC regulated transmitters. The design of PVE400 complies with the FCC guidelines and those standards.

To maintain compliance with FCC RF exposure guidelines, if you wear device on your body, use the supplied or approved carrying case, holster, or other body-worn accessory. If you do not use a body-worn accessory, ensure the antenna is at least 1.5 cm from your body when transmitting. Use of non-approved accessories may violate FCC RF exposure guidelines.

7.3 CE Mark Certification

The CE mark is the official marking required by the European Community for all Electric and Electronic equipment that will be sold, or put into service for the first time, anywhere in the European community. It proves to the buyer or user that this product fulfils all essential safety and environmental requirements as they are defined in the European Directives.

PVE400 is covered under the product certification Europe:

Radio Spectrum : EN 300 328 V1.7.1 (2006-10)
EMC: EN 301 489-17 V1.2.1 (2002-08)
Safety: EN 60950-1 2001 +A11: 2004
Health: EN50360: 2001 (Specific Absorption Test – SAR)

CE Marking on the product will grant access to the European Economic Area (EEA). Some countries may require a declaration of conformity, please check with your sales team for details.

The following is an example of the CE Marking on the product label: $C \in \mathbb{O}$

The alert symbol indicates that PVE400 is *not* certified to operate in France. Outdoor use in France is restricted to 10mW EIRP for band 2454 -2483.5 MHz

> **Note**:
> CE mark is not applicable if WMC7300 is assembled in the unit (PVE40049 model)

7.4 CSA Mark Certification

CSA Reference Number: 242519-2005519
The enclosure is evaluated to UL50 and CSA94 standard type 4 environment rating for outdoor use.
CAN/CSA-C22.2 No.60950-1-03 – Safety of Information Technology Equipment
ANSI/UL 60950-1-2002 – Safety of Information Technology Equipment

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

7.5 RoHS

The PVE400 complies with the European RoHS directive, 200/95/EC, and Chinese RoHS regulations, EFUP-50 (see bundled sheet TTT table - CMM hazardous table content).

7.6 WEEE Directive

The European Union has enacted a Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE Directive). This directive is applicable in the European Union member states.

The WEEE marking on this product indicates that the product must not be disposed of together with household waste. To prevent possible harm to human health and/or the environment, the product must be disposed of in an approved and environmentally safe recycling process. For further information on how to dispose of this product correctly, contact the product supplier, or the local authority responsible for waste disposal in your area.

8. Specifications

8.1 PVE400 Technical specification

Video input:	Composite, NTSC/PAL 1V 75 Ohm;
Audio input:	Microphone level, Mono 1.1V / 50uA DC bias.
Compression:	Video – MPEG4 SP/ASP
	Audio – G711 (8 kHz sample rate)
Resolution:	NTSC: 720x480, 320x240
	PAL: 720x576, 352x288;
Frame rate:	NTSC: 1- 30 fps, PAL: 1 – 25 fps
Bit rate:	64 Kbps - 3 Mbps;
Interfaces:	Ethernet 10/100, RS232,
Wireless interface:	Wi-Fi 802.11b/g 2.4Ghz
Communication protocols:	RTSP/RTCP, RTP, Telnet, DHCP, HTTP, NTP
Antenna:	RP-SMA jack; 2.0dBi Dual Band (2.4/4.9Ghz)
Indicators:	On/Off - green, Battery Life - Green/Yellow/Red
Battery:	Lithium Ion 3.6V, 6.8 Ah rechargeable, replaceable
Operation time:	3-5 hours (depends of network condition)
External power:	10-16V DC, 1.5A
Dimensions:	5.3"x4.45"x1.46" (134x113x37mm)
Weight:	1.65lb (0.75kG) without caring case
Operating temperature:	- 4˚ F~104˚ F (-20˚ C~ + 40˚ C)
Humidity:	0-95%
Rating:	NEMA 4R (IP66)

8.2 PVE-CAM technical specification

Image sensor:	1/3" Sony Ex-view HAD CCD
Effective pixels:	768(H) x 494(V)
Min. illumination:	0.1Lux at F2.0
Scanning system:	NTSC 525 Lines
Video output:	1.0Vp-p Composite. 75 Ohms
S/N ratio:	More then 50 dB (AGC Off)
Gain control:	4dB~30dB Auto
Gamma correction:	r=0.45
Shutter speed:	1/60～1/100,000 sec
White balance:	Automatic (AWB)
Smear Effect:	0.005%
MTBF:	80,000 hours
Lens standard	3.6mm (92˚ Angle of View)
Optional lenses	2.9mm, 4.3mm, 6mm, 8mm, 16mm
Power source:	12VDC
Operating current:	90mA
Operating temperature:	14˚ F~122˚ F (-10˚ C~ + 50˚ C)
Measurement:	0.83" x 2.84" (21mm x 72mm)
Weight:	0,485lb (220g)
Cable length:	4' (1.2M)

8.3 Connectors pin out

AUX connector

Pin #	Designation
1	Ethernet Rx Data-
2	Ethernet Tx Data+
3	reserved
4	+12V input
5	Common ground
6	Ethernet Rx Data+
7	Ethernet Tx Data-
8	RS232 ground
9	RS232 Rx
10	RS232 Tx

Mating male connector Fischer S1031 A010-140+

A/V connector

Pin #	Designation
1	Video in
2	Audio input
3	Audio ground
4	+12V out
5	Video ground/power ground

Mating male connector Fischer S102 A054-140+
www.fischerconnectors.com

PVE-AUX cable wiring table

AUX pin #	Wire color	RJ45 pin #	Purpose
1	green	6	Ethernet
2	white/orange	1	Ethernet
5	white/brown	7	reserved
6	white/green	3	Ethernet
7	orange	2	Ethernet
8	white/blue	5	RS232 common
9	brown	8	RS232 Rx
10	blue	4	RS232 Tx

Note:
Ethernet wired as straight through (T568B).

8.4   *List of accessories*

Ordering Part name	Description
PVE-AV	Audio-in/Video-in/DC-out inline cable with Fischer 5 pin connector
PVE-AUX	5 feet CAT5E cable with Ethernet RJ45 to Fischer 10pin connector
PVE-NCC	Nylon Carrying Case with strap an belt loop
PVE-BT	Spare battery (same as supplied with PVE400)
PVE-PS	AC to DC Power Supply to power PVE400 and charge internal battery
PVE-RPC (US)	US type Power cord for PVE-PS
PVE-RPC (EUR)	European type Power cord for PVE-PS
PVE-RPC (UK)	UK type Power cord for PVE-PS
PVE-RPC (AUS)	Australian type Power cord for PVE-PS
PVE-VPS	Vehicle DC Power adapter to power PVE400 and charge internal battery.
PVE-EC1 *(xyz)*	External Battery charger plus cradle , 1 port (xyz) – cord type: US, UK, EUR, AUS
PVE-EC2 *(xyz)*	External Battery charger plus cradle , 2 ports
PVE-EC6 *(xyz)*	External Battery charger plus cradle , 6 ports
PVE-CAM	Helmet mount bullet CCD camera with Fischer connector and head strap.
PVE-HS	Nylon head strap for camera.
PVE-HA	2.0dBi Dual Band 2.4/4.9 GHz antenna, 76mm
PVE-SS	VideoSpider software package