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PVE400M

Portable Wireless IP Camera

Component of multichannel real-time digital video surveillance system

User's Guide

Rev. 1.1

October 17, 2007

Notice

The information in this document is subject to change without prior notice in order to improve reliability, design, or function and does not represent a commitment on the part of this company.

Throughout this manual, we make reference to product names that are trademarks of other companies. We are using these names for identification purposes only, with no intention of infringement of the trademarks.

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1. GENERAL INFORMATION

1.1 Introduction

Developed for the most challenging environments, the Darim PVE400M 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 crush-proof 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 PVE400M 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 PVE400M operates on Motorola's Mobility Enhanced Access (MEA®) wireless technology, supported in the MOTOMESH™ Solo and MOTOMESH™ Quattro product platforms.

Access to the PVE400M 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 an 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. PVE400M with camera

Features:

- Real-time hardware MPEG4 Video and G.711 Audio Compression
- Personal Wireless Router for locally attached Ethernet Devices
- Support of Motorola's Mobility Enhanced Access (MEA®) in 2.4GHz or 4.9GHz
- Wireless communication with control center
- Integrated "Bullet head-camera" or Generic video camera cable options
- Individual WEB interface capability
- Crushproof, 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 PVE400M:

- CPU: Intel Pentium 4 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 PVE400M unit. Be sure to read all the applicable sections carefully before proceeding.

2. INSTALLATION STEPS

This chapter describes the installation procedure of the PVE400M accessories.

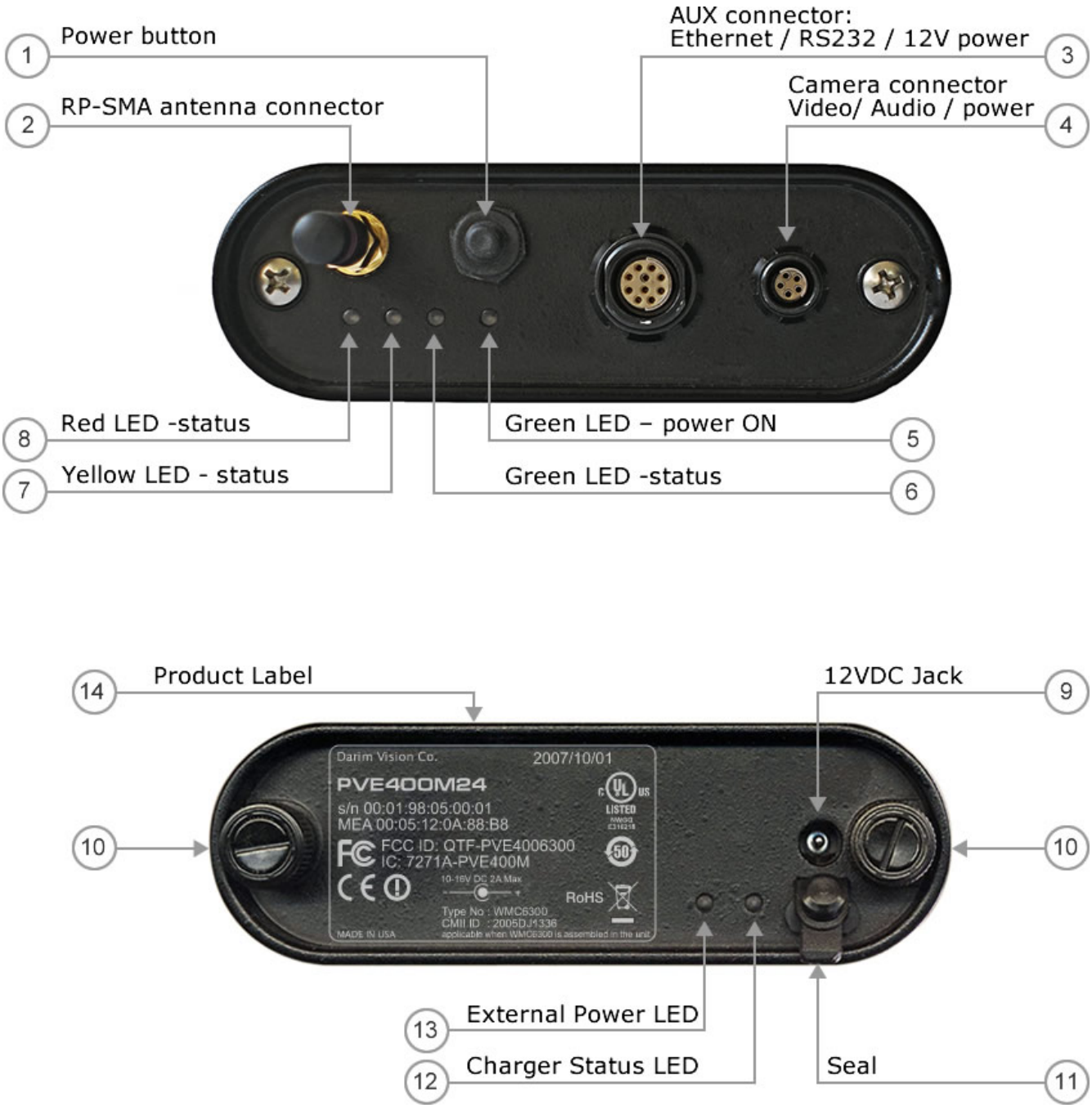


Figure 2. PVE400M interface

2.1 Installing antenna

Attach the supplied antenna to RP-SMA jack.

Figure 3. Attaching the supplied antenna

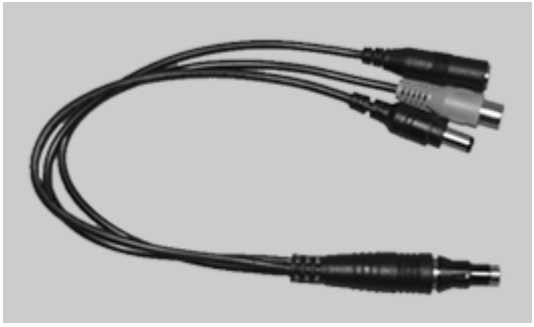
Warning:

The only supplied antenna with 2.0dBi gain is certified to use with PVE400M when the device is used as wearable.

2.2 Installing the camera

PVE400M 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



PVE400M can accept any standard video source. The optional PVE-AV split cable has a standard RCA female connector (Yellow) for video input. PVE400M can provide 12V/200mA power for an external camera using a standard power jack. This power source protected by resettable fuse with 400mA limit, to protect PVE400M from accidental shortage..

The standard electret microphone can be connected to the audio jack. PVE400M 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). The charging time of a *fully discharged* battery is about 5 hours. To plug AC/DC adapter, open the protective rubber seal (Figure 2 - 11) on the bottom side of PVE400M. During the charging process PVE400M will operate normally. The *status LED* will be changed in sequence *green* → *yellow* → *red* → *green* … As soon as the battery is fully charged, only the *green status LED* will be solid.

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 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.

When AC/DC adapter is not connected, always put into place the rubber seal, to protect the unit from outdoor environment. It is also possible to charge from a car battery using an optional cable PVE-VPS (cigarette lighter plug to DC jack), same way as using PVE-PS. AUX connector also can be used for powering/charging, using custom cable, if rigid connection required.

Aluminum case of PVE400M 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

2.6 *Note: AC/DC adapter designed to use only for indoor environment.* Battery replacement

If the battery capacity is below 50%, the *yellow status LED* will be on. If the capacity is bellow 20%, the *red LED* will be highlighted. When the *status red LED* is blinking, the battery capacity is bellow 10% 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 0).

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 or AUX 12V 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 to prolong the battery life. Store the spare batteries in a dry place; preferably the temperature should not exceed 30°C.

2.7 Using wired network connection

PVE400M 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

PVE400M 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 PVE400M 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 *MEA* card is *DHCP* client. Use *MeshManager* to properly setup and test connection.

Important Notes:
MEA card should be associated with IAP first, using the *MeshManager* software, before it will able to get IP address from DHCP server. You will need to reboot the PVE device as soon as IAP association is completed.

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, PVE400M site will be opened at the **SYSTEM** page as default.

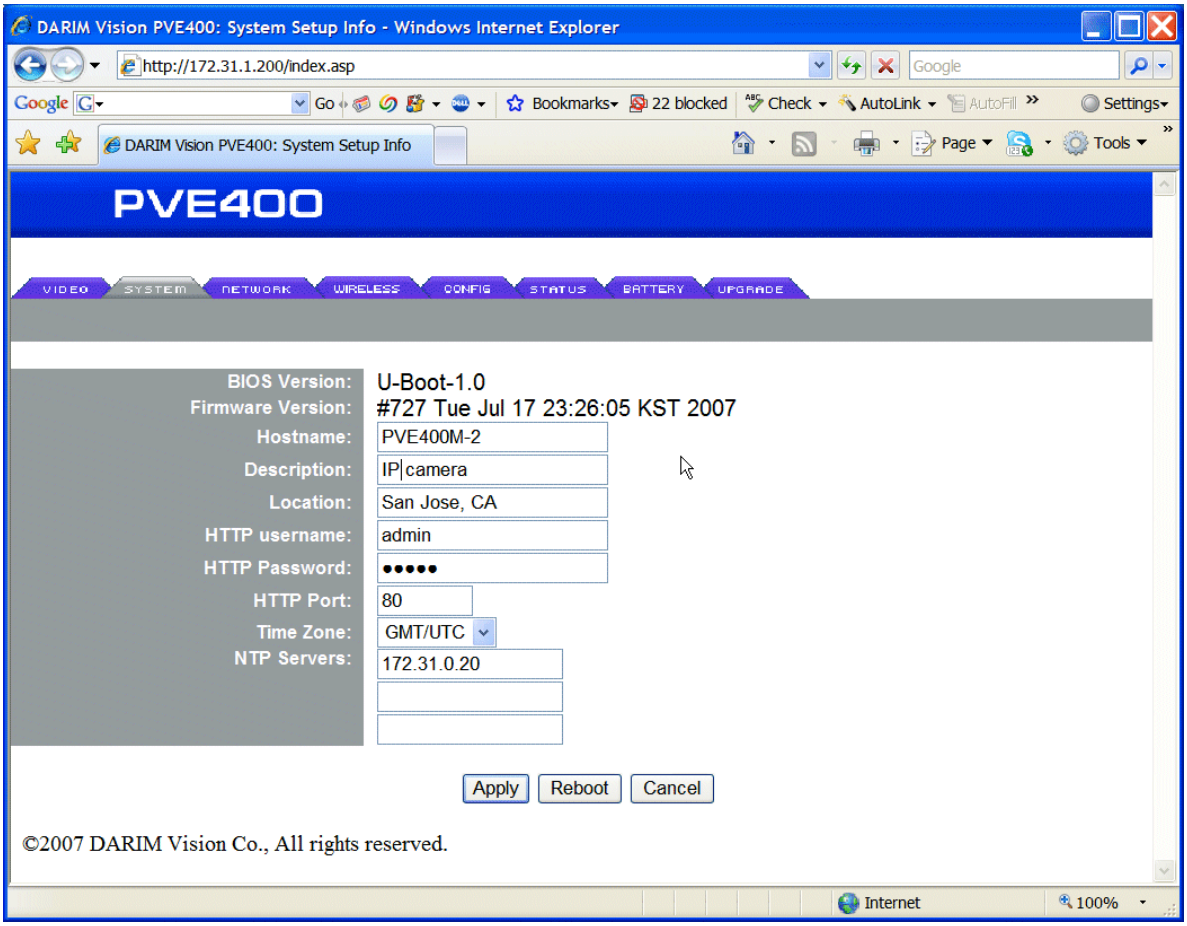


Figure 5. System setup page

Using this page you can change the default **user name** and **password**, if required. The **Hostname**, **Description**, **Location** fields are simply for navigation purpose.

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.
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

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.

The **Firmware Version** information is important when you contact the technical support team.

3.2 Network configuration

3.2.1 Wired connection configuration

Using the **NETWORK** configuration tab allows to specify all related settings if the device is used with AUX Ethernet cable.
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* - PVE400M has an internal DHCP server and can provide IP address for other devices connected to PVE400M.

  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 PVE400M 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 PVE400M. All PVE400M 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)

The **DNS** information is optional and not required for normal operation. It will be only useful for the firmware upgrading procedure (see section 3.5)

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.

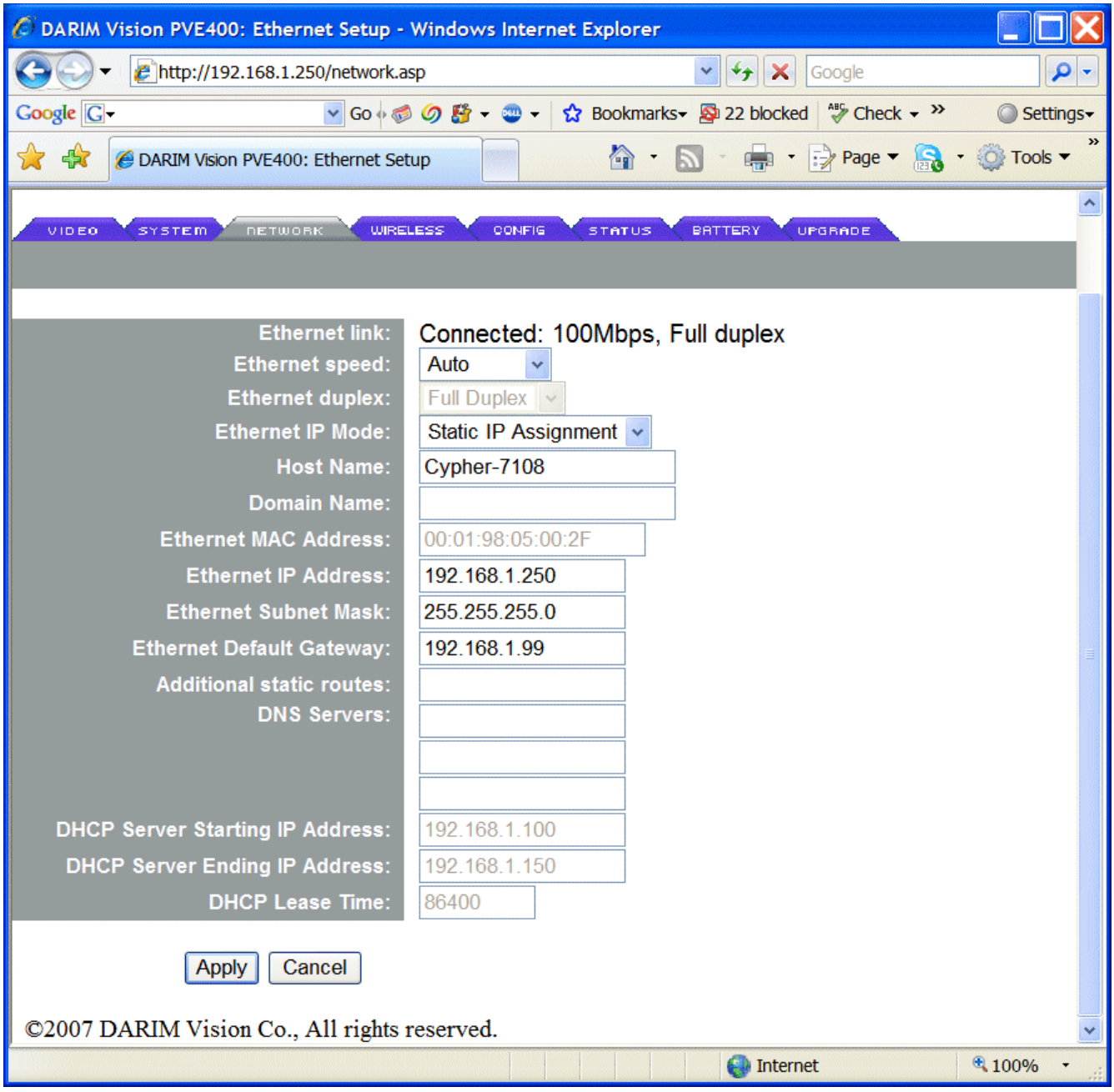


Figure 6. Ethernet configuration page

3.2.2 Wireless connection configuration

The **WIRELESS** configuration tab is related to *WMC6300/7300* setup

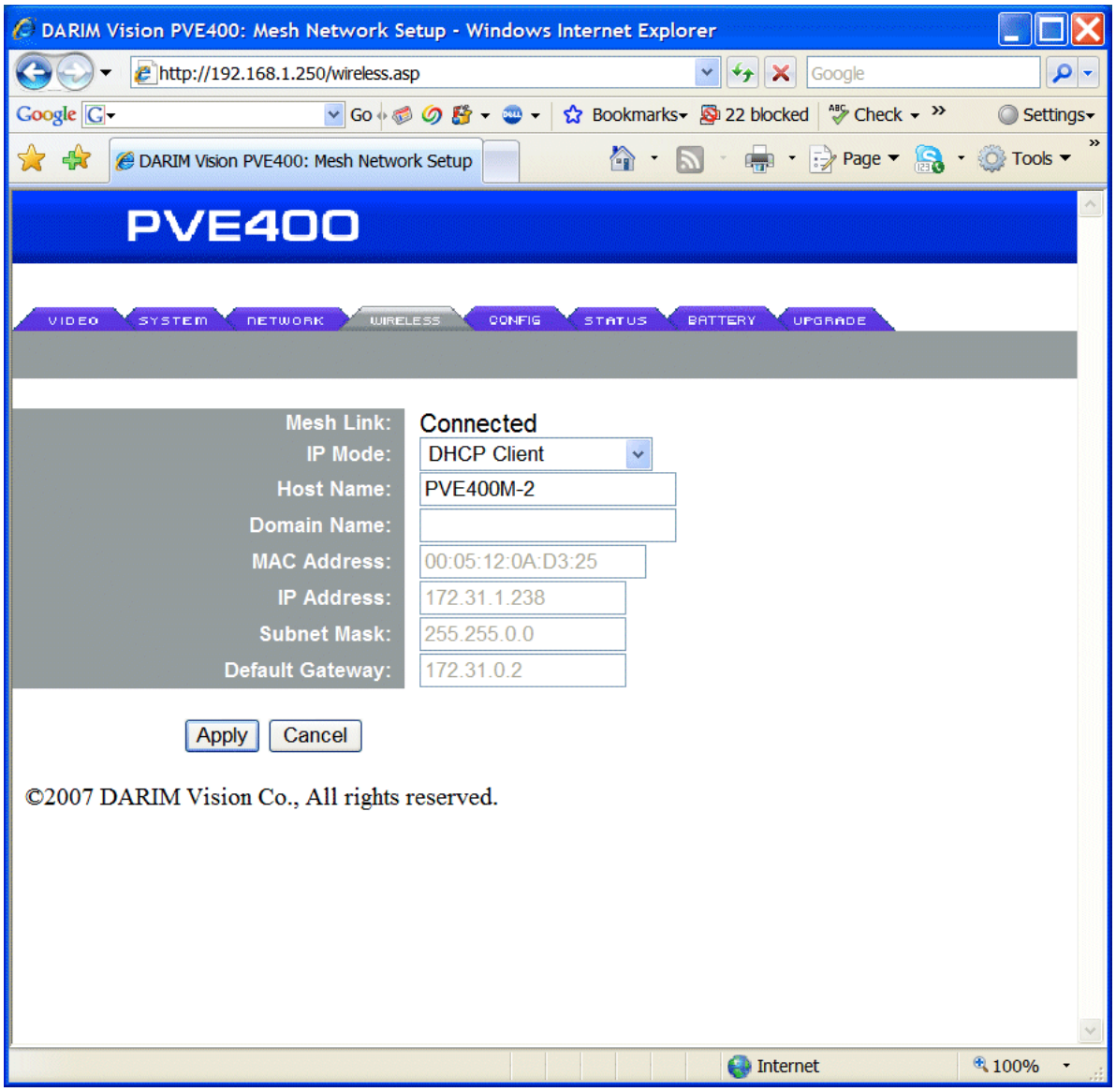


Figure 7. Wireless configuration page

The **IP mode** field allows you to select either *DHCP Client*, *Static IP Assignment* or *Disabled* mode. For *Statically Provisioned* mode, use *DHCP Client* selection.
The **MAC Address** field is a read-only parameter and serves for verification purpose. The same information can be found on the sticker on the bottom of PVE400M.
For the *Static IP Assignment mode*, enter the proper information for **IP address**, **Subnet Mask** and **Default Gateway** (if required).
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.

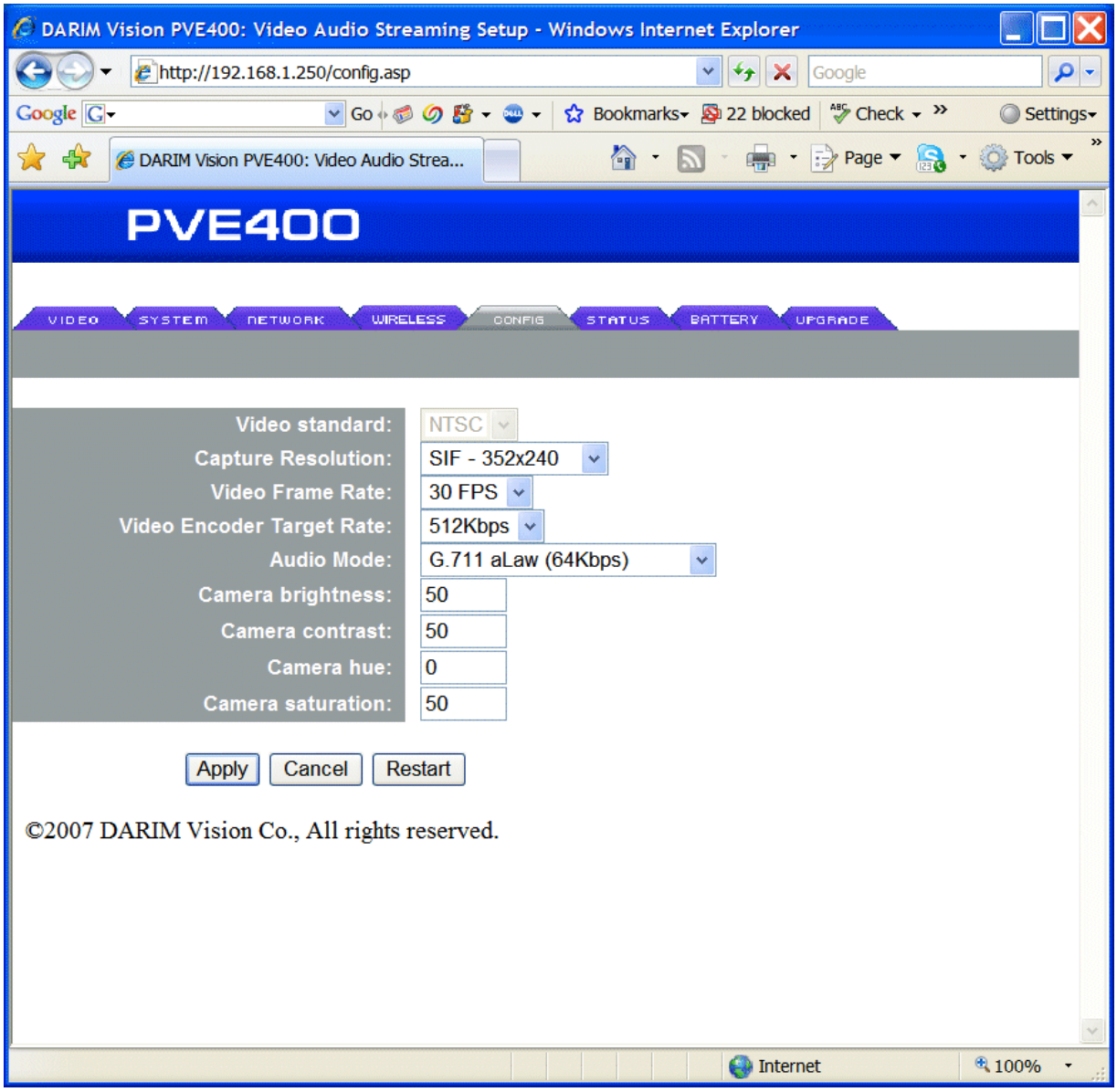


Figure 8. Video and Audio configuration page

PVE400M can operate in *PAL* or *NTSC* mode. The **Video Standard** field represents the video standard parameter assigned on the factory and depends on the standard of a bundled camera.
Using the **Capture Resolution** drop-down list you can select 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.

PVE400M 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 PVE400M unit.
For *Microsoft Internet Explorer* PVE400M 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.

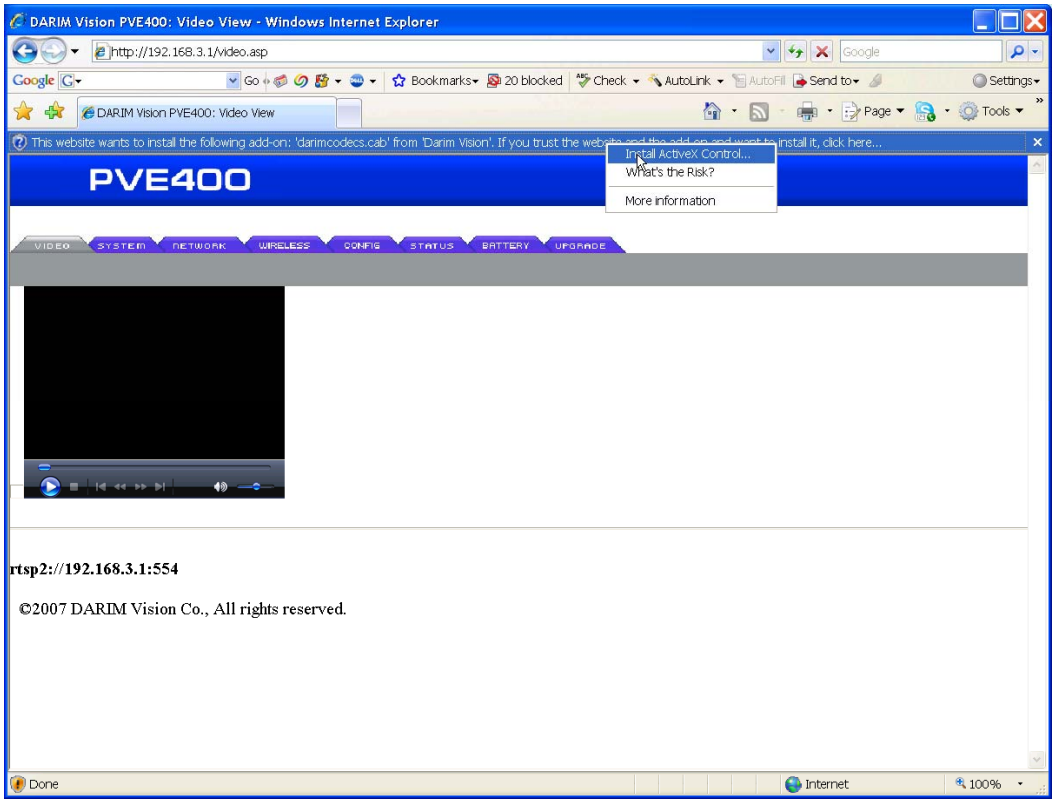


Figure 9. Video page

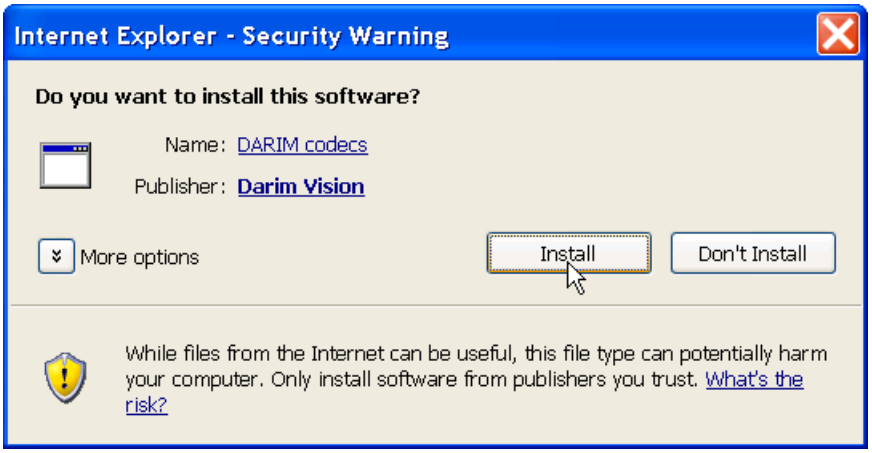


Figure 10. Security warning dialog

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 PVE400M)
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 you allow to monitor and record data from multiple PVE400M 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 PVE400M in the field.
More information about VideoSpider software can be found at http://www.darimcctv.com/products/spider.php

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.

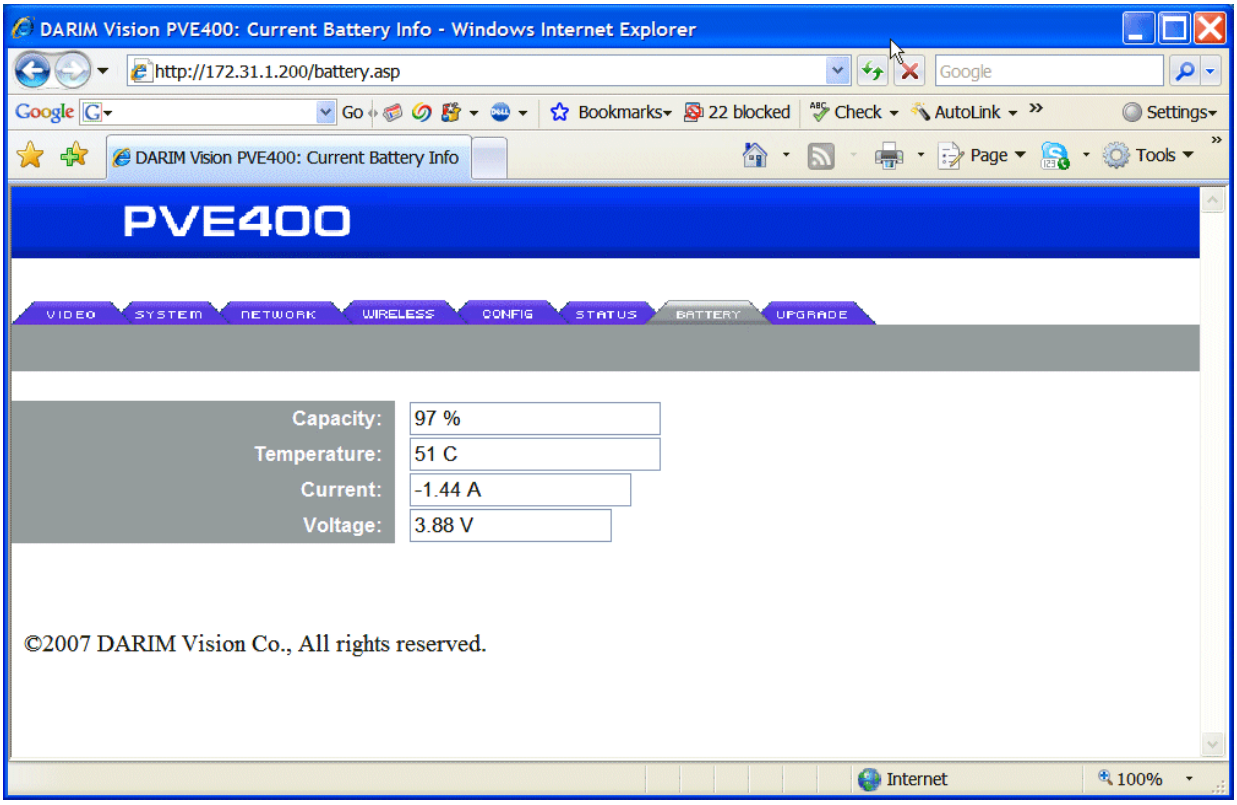


Figure 11. Battery status page

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 PVE400M 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.

3.5 Upgrading firmware

The PVE400M firmware can be upgraded using the **UPGRADE** tab.

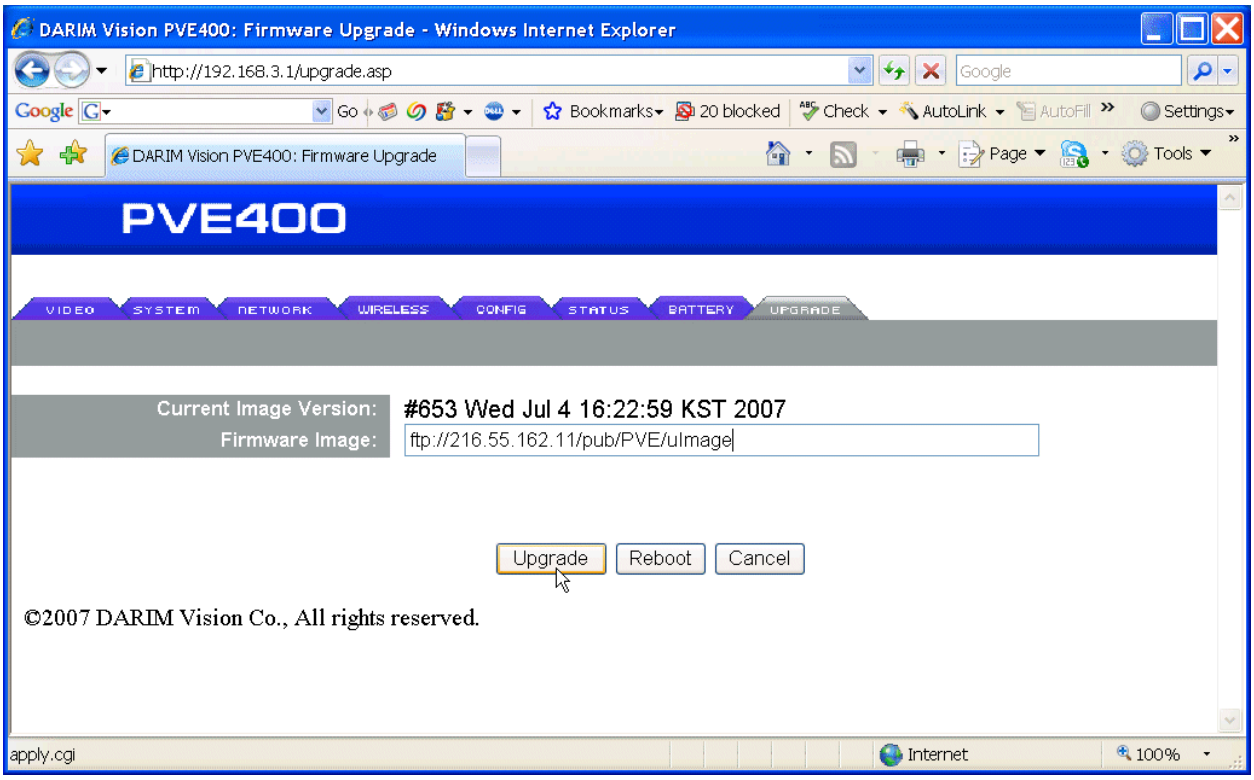


Figure 12. Firmware upgrade page

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, PVE400M 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 PVE400M. The firmware image can be downloaded from the *Internet* and placed to a *local FTP* site, within the *MeshManager* infrastructure, to make easy access from PVE400M.

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.dat
or ftp://216.55.162.11/pub/PVE/uImage.dat

4. Advanced configuration

4.1 IP router

As the PVE400M 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 PVE400M Ethernet, and PVE400M will be as the default gateway for them.

Example:

Ext device #1	PVE400M Ethernet side	PVE400M 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 MESH 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 www.darimcctv.com/pve/rep. 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 PVE400M User's Guide is available at www.darimcctv.com/ftp/PVE/PVE400M-UG.pdf.

For all issues related to **WMC6300/WMC7300** card, wireless network configuration, see corresponded *Motorola MOTOMESH* product and system documentation and contact your Motorola regional support contacts or authorized distributor.

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 PV400M and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the supplier of PVE400M 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-PVE4006300 **(**applicable when WMC6300 is assembled in the unit)
FCC ID: QTF-PVE4007300 **(**applicable when WMC7300 is assembled in the unit)
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 PVE400M 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.

PVE400M is covered under the product certification Europe:

EN 300 328
EN 301 489-17 - Specific conditions for 2.4 GHz wideband transmission systems and 5GHz high performance RLAN equipment
EN 60950 - Safety of information technology equipment (IT Equipment)
EN50360 – 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:

The alert symbol indicates that PVE400M 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 (PVE400M49 model)

7.4 RoHS

The PVE400M complies with the European RoHS directive, 200/95/EC, and Chinese RoHS regulations, EFUP-50 (see bundled sheet TTT table - CMM hazardous table content).

7.5 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 PVE400M 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:	Motorola Mea WMC6300 or WMC7300 PC cards.
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, 2A
Dimensions:	134x113x37mm
Weight:	0.75kG (without caring case)
Operating temperature:	-20- +40C
Humidity:	0-95%
Rating:	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 (mm):	21(D) x 72(L)
Weight:	220g
Cable length:	4' (1.2M)

8.3 Connectors pin out

AUX connector

Pin #	Designation
1	Ethernet Rx Data-
2	Ethernet Tx Data+
3	+12V input
4	reserved
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).

DC power jack

Center pin - +10-16V 2A Max
Standard 5mm with center pin 2.1 mm DC power connector
Mating plug – Kobiconn P/N 1710-2111 www.mouser.com

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 PVE400M)
PVE-PS	AC to DC Power Supply to power PVE400M 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 PVE400M 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