

# VersaCam® IC-360 User's Guide

\* This manual is for VersaCam IC-360 Firmware version 1.2.1. If you have later version of firmware, please download the last updated user's guide from Pentax's website (<http://www.pentaxtech.com>).

## **System Requirements**

### **■ Network Access For a VersaCam IC-360**

- Network: 10 Base-T LAN  
(Leased line, xDSL, Cable Modem, ISDN)

### **■ PC Access to a VersaCam IC-360 (this will result in frame rates of 2-to-15 fps - other system configurations will result in other frame rates)**

- Processor: Pentium II and above
- RAM: Minimum 64MB
- OS: Windows 95/98/NT/2000/XP/Mac, Linux
- Screen Resolution: 1024 X 768 pixels and above (standard VGA)

**Pentax Technologies Corp.**

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## FCC Compliance Statement

**Caution:** Any changes or modifications not expressly approved by the Pentax could void the user's authority to operate this equipment.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

## Warning

This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures



### **Important Notice**

1. The VersaCam IC-360 is for indoor use. Note that the CCD (charged coupled device) inside the product can be damaged permanently if the camera lens is exposed to direct sunlight. If your application demands prolonged exposure to sunlight, you should consider equipping it with a sun visor.
2. The VersaCam IC-360 is not weatherproof. You should consider the environmental specifications that are included in this manual. In case of outdoor use, you should equip the camera with a weatherproof case to protect from water, moisture, or extreme temperatures (higher or lower than specification). For VersaCam IC-360 cleaning, gently wipe with a clean dry cloth.
3. Be sure to use the DC adapter that is provided. Connecting a VersaCam IC-360 directly to AC current will cause damage to the camera.
4. Be cautious in handling the VersaCam IC-360. Physical shocks may harm the product.
5. The VersaCam IC-360 is made of aluminum case. When installing the camera, be sure it is attached tight and stable to avoid any injures. Be careful to locate the camera where children cannot reach it.
6. If the VersaCam IC-360 does not operate properly, please contact the closest local Pentax distributor for service. Do not disassemble the product or the service warranty may be voided.
7. Camera surveillance laws may differ for each country. Therefore, please contact local authorities first to avoid any surveillance law violations and to apply for authorized purposes only, if necessary.

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## I. Introduction

- **What is a VersaCam IC-360?**

The VersaCam IC cameras are Internet-based digital network cameras, which provide high-resolution imaging and use image compression via a network. They connect directly to an Ethernet network and provide live motion color pictures over the Internet or individual frames by E-mail or FTP.

The VersaCam IC is a microprocessor-based device that contains a digital color camera, web server functionality, optimized hardware for image compression, and a physical Ethernet connection. Therefore it does not require any extra software or hardware. Simply provide power and connect a LAN cable to the VersaCam IC.

The VersaCam IC Series generates pictures in Wavelet format, which compresses images more effectively than standard JPEG does. Moreover, Wavelet progressively generates pictures from low rates of resolution, so it reduces waiting time for users.

VersaCams fit in a wide range of applications to monitor places and objects. Common applications are: construction areas, important equipment, banks, hospitals, amusement parks, highways, and child care centers. Using a VersaCam IC-360, you can conveniently monitor any place thorough web browsers from remote sites.

- **Features and Benefits**

**Ease of Use** – VersaCam IC Series does not require the use of a PC frame grabber card nor interaction with any other server. The only software required is Netscape Navigator 4.x or Microsoft Internet Explorer 4.x or above. Since it has a complete plug-and-picture functionality, the only step one has to take is to assign a valid IP address.

**Open Standards Environment** - Supporting TCP/IP networking, SMTP E-mail, FTP, HTTP and other Internet-related protocols, the VersaCam IC Series can be used in mixed operating system environments, such as Windows, UNIX, Macintosh and OS/2. It integrates easily into other WWW/Intranet applications and CGI scripts.

**Simple Administration** - Using a standard Web browser, you can configure and manage a VersaCam IC-360 directly from its own Web pages. When a new firmware release becomes available, you can simply upgrade all of your VersaCam IC Series camera products remotely over the network.

**Wavelet Image Format** - As opposed to many inferior solutions that need to split image files prior to broadcast, VersaCam delivers complete high-quality and highly compressed pictures in Wavelet format. Wavelet has 30%~300% higher image compression rates than standard JPEG. Wavelet technology allows the integrity of your pictures to be higher than other web cameras and to be viewed with crystal clarity and high speed.

**External Device Connection** - Using an auxiliary Input/Output connector, you can connect your VersaCam IC Series to a variety of external devices, such as IR-sensors, switches, alarm relays, or CCTV analog video monitors (output). In combination with the programmable alarm facilities, you can quickly develop various security applications that are triggered on time-based or alarm-based events.

**User's Programmable Space** – VersaCam IC Series cameras contain user-programmable and user-configurable spaces that are about 6MB out of 8MB total Flash Memory. This means you can create your own web server, with your own homepage using your VersaCam.

**Embedded Linux Operating System** – VersaCam IC Series adopts cutting-edge technologies of digital image processing & networking. Since VersaCam IC Series consists of a high performance CPU (32-bit RISC), running embedded Linux, it allows up to 100 users to be connected to a VersaCam IC Series simultaneously.

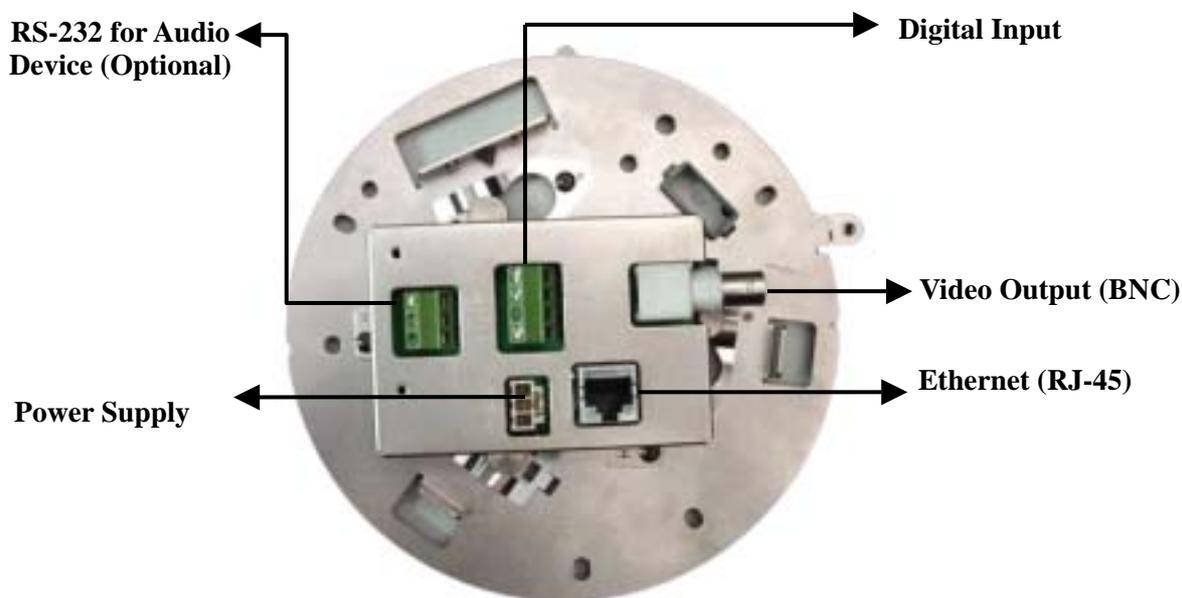
## II. Product Descriptions

### A. Camera Kit Contents

\* Unpack and check all the items below.

Item	Description	Remarks
VersaCam IC-360	Web Camera Server	
AC Adapter & Power cable	100-250VAC, 0.5A, 50/60 Hz 12VDC, 3.5A Output	
Lens	Optical 16x: 3.9mm ~ 62.4mm Digital 8x, Auto-iris & Auto-Focus	Included
Manual	VersaCam IC-360 User's Guide	On CD
Ethernet standard (straight-through) Cable	3-foot (1 m) cable, RJ45 connectors	White colored connectors
Ethernet Crossover Cable	3-foot (1 m) cable, RJ45 connectors	Red colored connectors
Bracket & Safety Wire	Ceiling Attachment Device	
Setup Disk (CD)	Setup Software, User's Manual, and Web Site Programmer's Guide	

### B. VersaCam IC-360 Overview and Description

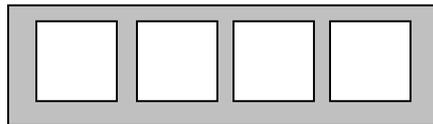


Connector Name	Description	Remarks
BNC connector	Output internal video signal through a coaxial cable.	
Power connector	To supply power from the provided power supply unit (12VDC, 1.5A)	
RS-232 Connector	To connect external devices such as a device for audio transmission.	
Digital Input Terminal	To connect external sensors.	
RJ-45 Ethernet port	To connect 10 Base-T Ethernet cable.	

### C. Descriptions of Ports (RS-232 and Digital Input)

**Digital Input:** To connect external devices such as infrared sensors. There are 2 pairs of isolated input ports. See Appendix 7 for details.

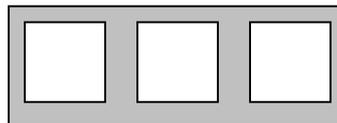
**S1+ S1- S2+ S2-**



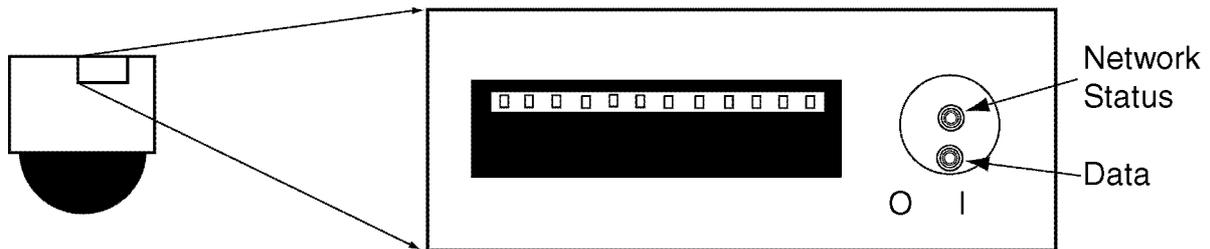
Pin Name	Description
S1+, S1- & S2+, S2-	<p>To connect external devices such as infrared sensors.</p> <p>Solid State Relay (Optically isolated)</p> <ul style="list-style-type: none"> <li>- Current <ul style="list-style-type: none"> <li>. Typical: 16mA</li> <li>. Maximum: 20mA (Maximum Rating: 60mA)</li> </ul> </li> <li>- Pulse time <ul style="list-style-type: none"> <li>. Minimum: 200msec</li> </ul> </li> <li>- Internal resistor: 330 ohm</li> </ul>

**RS-232:** To connect VersaCam IC Series to an Audio Device.

**RX TX GND**



## D. Description of LEDs



**Data LED:** This LED indicates the status of data transmission. After power is supplied, it is on for the first 4-5 seconds and then it goes off. It blinks continuously when a user accesses the VersaCam and is transmitting data.

**Network Status LED:** This LED indicates the status of the network. After power is supplied, it is on for the first 1-2 seconds, and then it blinks every two seconds as long as the network is connected.

### Malfunction Indications

#### 1. Network Malfunction

- Network Status LED blinks once every 4 seconds
- Check if the Ethernet cable is connected properly, if the right Ethernet cable is being used, or if the Network is working.

#### 2. Software Malfunction

- Both LEDs are on and they blink 6 times rapidly every 10 seconds.
  - ➔ Contact Customer Support for assistance.
- After being on for one second, both LEDs blink 6 times rapidly. Then the network status LED stays on and the Data LED stays off.
  - ➔ Re-installing the firmware can solve this problem. Contact Customer Support for assistance.

### III. VersaCam IC Series Installation Summary, Connection, & Placement

#### Summary

- Connect an Ethernet cable between the VersaCam IC-360 Ethernet Port and your local network.
- Connect the Power Supply to your VersaCam IC-360. Confirm that the Network Status LED blinks
- Install the setup program for the VersaCam IC-360 on a PC on your local network.
- Assign an IP address to the VersaCam IC-360 and configure the administrator's data.
- Configure the users' data.
- Disconnect the IC-360 from the local network and place it for your application\* then re-connect power and an Ethernet connection.
- Set the preset aiming positions as desired.

\* You must use a specialized bracket for ceiling attachment of VersaCam IC-360.

#### Caution

- Please note that exposing the camera lens to direct sunlight may cause permanent CCD (charged coupled device) damage.
- If your application demands prolonged or direct exposure to sunlight, you should consider a sunshade.

## IV. Assigning IP Address and Configuring the Administrator's Data

### \* Important \*

**To access a VersaCam, you first have to assign an appropriate IP address. When you assign an IP address to a VersaCam, make sure to use an unassigned IP address – do not use the default or example IP address.**

### Terminology

#### **IP Address**

An IP address is an identification code for computers and devices on a TCP/IP network. Networks using TCP/IP protocol route messages based upon the IP address of the destination. Within a closed network, IP addresses can be assigned at random as long as each one is unique. However, connecting a private network to the Internet requires using registered IP addresses to avoid duplicates. An IP address can be acquired from a network administrator or an Internet service provider.

#### **MAC Address (Media Access Control Address)**

A MAC address is a hardware identification code that uniquely identifies each node of a network. The MAC address of VersaCam is a 12-digit number. A unique MAC address can be found on the label at the bottom of each VersaCam.

#### **Crossover Cable**

The crossover cable (red) provided with the VersaCam is used to connect the VersaCam directly to a PC. A hub is not necessary to connect the VersaCam to a PC if a crossover cable is used.

#### **Direct Cable**

The direct cable (white) should be used if a hub is used as an intermediary between the VersaCam and a PC.

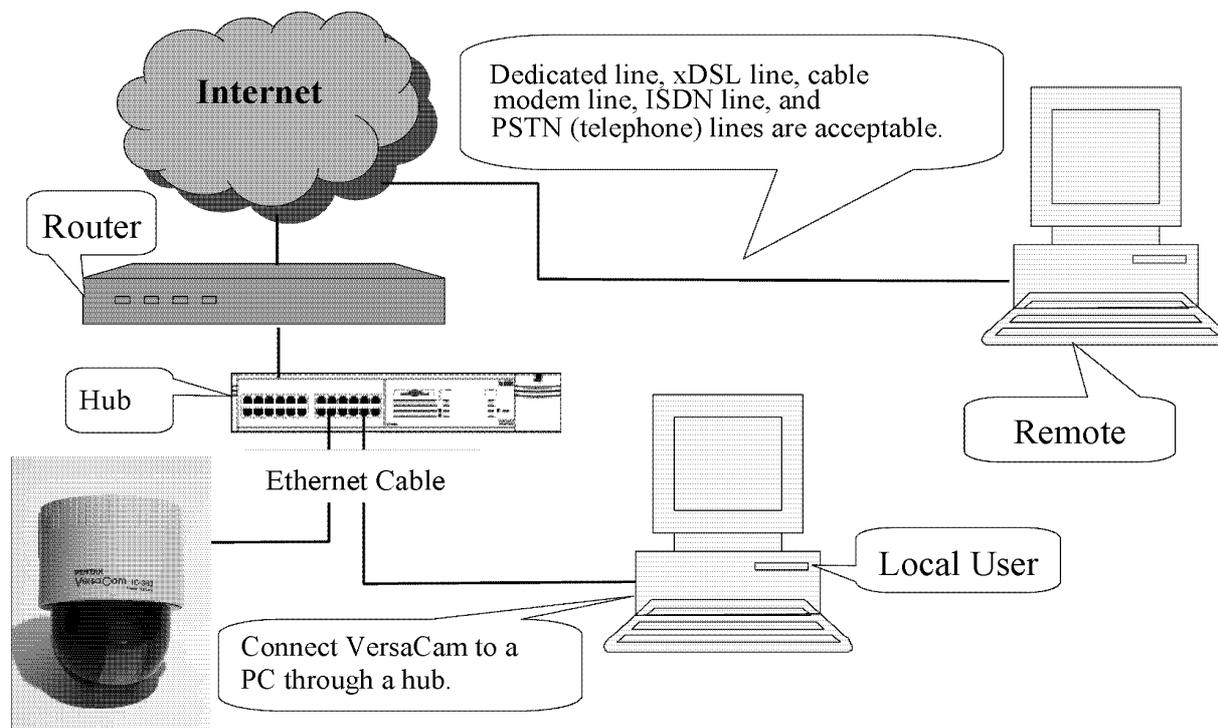
#### **10-Base T**

This describes the speed and cabling used to make 10-Megabit/second Ethernet connections. The camera cannot be directly connected to a network that allows only 100-Base T connections.

## A. Connecting a VersaCam IC Series to a PC

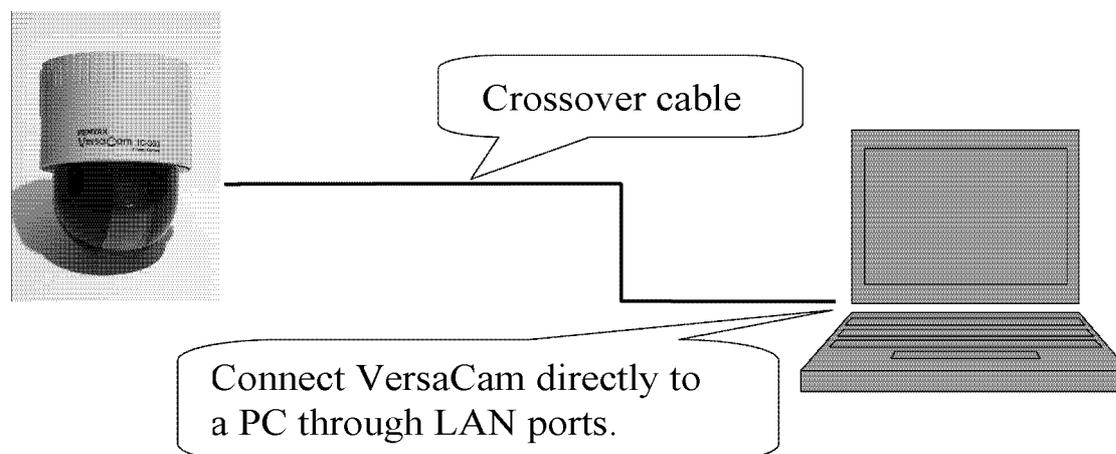
### 1) Connecting a VersaCam IC-360 to the Internet or a LAN.

- You may use a standard Ethernet cable (white colored connectors) to connect a VersaCam IC-360 to the Internet or a LAN. With this connection, a remote user may not access a VersaCam IC-360 before the local user configures their network settings.



### 2) Connecting a VersaCam IC Series to a PC.

- You may use a crossover cable (red colored connectors) to directly connect a VersaCam to a PC. This connection is only used to configure the VersaCam.



## IP Address Assigning Methods

- **With the setup program**

- Assemble and place the VersaCam.
- Assign an IP address to the VersaCam using the setup program on a local network.
- If it is impossible to assign an IP address with the setup program, try assigning it with the DOS ARP command.

- **With an ARP command**

- Assemble and place the VersaCam.
- Assign an IP address using the DOS ARP command on a local network.

## B. Assigning an IP address and configuring administrator's data with the setup program

### 1) Starting the VersaCam IC Series Setup Program

Click the file 'Setup.exe' on your PC. When the setup program is executed, the setup program detects and shows every VersaCam IC Series connected to the local network.

Among the VersaCams, choose the one to which you want to assign a new IP address. (The default address in the figure is 211.53.133.223). To choose a VersaCam, click on its MAC address or IP address.

When a VersaCam is selected, an IP address shows in the 'Selected IP Address' window. You must key in a password in the blank 'Admin's Password' window to assign (or change) the IP address to the VersaCam. The default password is 'admin'.

You can now change the IP address by clicking 'Change IP Addr' button or set up by clicking 'Start Configuration' button.



If the VersaCam has any problems, you can reboot without turning off the power supply. The 'Reboot' button works as a reset switch.

### 2) Assigning a VersaCam's IP Address

After keying in the administrator's password, click the 'Change IP Addr' button to change your VersaCam's IP address. Type in a new IP address that you are going to assign to your VersaCam. Then confirm it with the 'OK' button.



### 3) Configuring Administrator's Data

After assigning a new IP address to a user's VersaCam, you may configure the administrator's data for that camera. When you click 'Start Configuration' button, the Setup program automatically connects you to the Admin page of VersaCam Homepage. (For more detailed information, refer to Chapter VI 'Configuring Administrator's Data at the Homepage')

Start Configuration

## C. Assigning an IP Address with the ARP Command

### 1) Using ARP in Windows

When the PC's operating system is Windows 98, 2000, Me, XP, or NT, follow the steps below.

- Open a DOS window and type the following commands.

```
Arp -s <VersaCam IP address> <VersaCam MAC address>
Ping <VersaCam IP address>
```

- Example

```
Arp -s 192.168.1.3 00-40-8c-10-00-86
Ping 192.168.1.3
```

### 2) Using ARP in Windows 95

When the PC's operating system is Windows 95, follow these steps.

- Open a DOS window and type the following commands.

```
Arp -s <VersaCam IP add.> <VersaCam MAC add.> <my PC IP add.>
Ping <VersaCam IP address>
```

- Example

```
Arp -s 192.168.1.3 00-40-8c-10-00-86 192.168.1.2
Ping 192.168.1.3
```

### 3) Verifying Installation

After completing the tasks above successfully, the following messages or similar ones will appear on the screen:

```
Request timed out
:
Request timed out
Reply from 200.243.232.178: bytes=32 time=2ms TTL=255
Reply from 200.243.232.178: bytes=32 time=2ms TTL=255

Ping statistics for 200.243.232.178:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milliseconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms
```

If you don't receive the reply by using the 'ping' command, try pressing 'F3' and 'Enter' keys again. Normally 'Request timed out' messages appear 7 times before you receive a proper reply.

Data loss number may be from 0% to 99%. This is a normal reply. If the statistic shows '100% loss', you should check to see if the network lines and connection status are stable, if the IP address which is assigned to VersaCam is available, and whether the PC you are using has the same local network's IP address as the VersaCam. The same local IP address on a "C" grade network means that the first 3 sets of numbers are same but the fourth is different. For example, 192.168.1.2 and 192.168.1.3 are same local network IP addresses. (If there is a 'Network Mask' on the network, however, this can be a different case. For detailed information on IP, refer to Appendix 3)

## V. Accessing a VersaCam IC Series Homepage & Monitoring Real-Time Images

After assigning the VersaCam an IP address, you can configure the VersaCam from within its own web pages by using any standard Web browser on a local or remote network.

### A. Starting a Web Browser

Start your web browser by entering your VersaCam's IP address. Then you can see the built-in homepage of the VersaCam.

- Example

http://200.243.232.178/

VersaCam IC Series simultaneously supports up to 100 users. If a person tries to access VersaCam as the 101<sup>st</sup> user, they will not receive any image but will see a message on upper right side of the homepage: 'Running Video Channel: 101'.

### B. Login page

#### 1) ID and password

To connect to a VersaCam, you must follow the Login procedures. If you key in a user's ID and Password, you may access the viewer to monitor real-time images, and if you key in an administrator's ID and password, you may access the Admin page.

The default user's ID and password are set to 'guest', and the administrator may change them through the Admin page. Note that each ID and password may be composed of up to 9 letters.



#### 2) Behind A Firewall

If the PC is connected to a network where a firewall is installed, the real time image may not be displayed properly because the video TCP port of VersaCam is blocked. The default video TCP port of a VersaCam (8080) is often blocked under a firewall. In this case, the real time image may be viewed by using the VersaCam's Server Push Viewer that transmits video through a Web TCP port instead of the video TCP port.

To connect to the Server Push Viewer, click on the 'Behind Firewall' menu selection. Performance will likely be slower in this mode.

### **3) VersaCam IC Series Plug-in for Netscape Users**

To see the VersaCam image using a Netscape browser, the user should first install the VersaCam Plug-in by clicking the VersaCam Plug-in menu. When you connect the VersaCam for the first time or you have an old Plug-in version, you will have to download the current Plug-in by clicking 'Download VersaCam Plug In Now!' You then click the 'Grant' and 'Install' buttons respectively.

### **4) VersaCam IC Series Active-X for MS Explorer Users**

For an Internet Explorer User, Active-X Control is automatically installed when the user accesses the VersaCam. For Active-X installation on your PC, just click 'Yes' if you want to install the program. If you cannot see images, you should check if the Active-X Control file is installed properly. You may check the VersaCam Control (Active-X Control) file in the folder C:\Windows\Download Program Files. If the VersaCam Control file is not installed, try again to re-install it. If the Plug-in or Active-X program fails to be installed automatically, you may install it manually.

The installation will not take longer than 1 minute. Don't click any buttons until the installation is complete.

### **5) FAQ**

Questions and answers are provided In Appendix 2 for troubleshooting. If you have other questions that are not answered here, please contact your distributor or the Pentax Customer Service Department.

### C. Viewing With The VersaCam IC-360

There are 3 real-time viewers available on the VersaCam homepage: the “Default Viewer”, the “720×468 Viewer” and the “Server Push Viewer.” An administrator may set any viewer as a first user interface. A connected user may monitor real-time images through the administrator-selected main viewer or select another.

#### 1) Real-time monitoring through the default viewer

The viewer page is composed of three areas: 1) The real-time image screen, 2) The Java applet Pan/Tilt/Presets control panel, and 3) The video control section at the bottom of page.

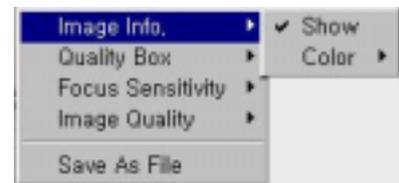


#### (1) Useful Pop-up Menu on the Real-time monitoring screen

A small window including 5 functions appears when a user clicks the right mouse button over the displayed image. Users who have the authority can access functions such as ‘Image Info’, ‘Quality Box’, ‘Focus Sensitivity’, and ‘Image Quality’.

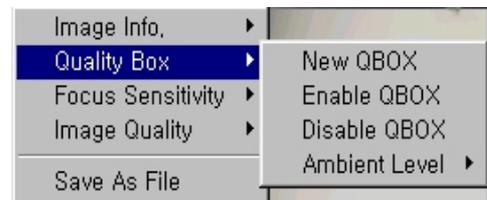
#### Video Information Setting

This page allows changing the color of the time shown on the left top of the image, or choosing not to show the time at all.



#### Configuration of the High Quality Image Area

You can overcome insufficient network bandwidth by using this function. Click the right mouse button on any place on the picture and drag to select a desired area. By selecting only a portion of the image for high contrast, the remaining portion of the image is sent at low contrast and is highly compressed.



If you want to set a new quality area, click on ‘New QBOX’. Place and click your cursor where you want to start and then drag the mouse and click again where you want the box to stop. You can also use the existing area to focus again by clicking ‘Enable QBOX.’ ‘Disable QBOX’ cancels the function. The image-activated high-quality area function is as below.

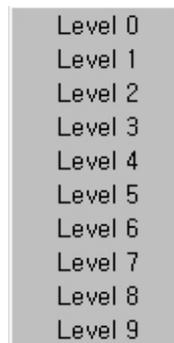


The user may set the quality of the “low contrast area” with ‘Ambient Level’. If you select ‘Level 1’, the quality

is similar to the high-quality area. If you select 'Level 5', the image outside of the high-quality area is created at a very low contrast.

### Focus sensitivity

Users may configure the zoom range with one click. The setting is from Level 0 to Level 9. By selecting 'Level 9', a user zooms in or out at the maximum range.



### Image quality

Users may select the compression level of the image. If the user chooses 'Level 9', VersaCam sends the best quality image. However, transmission speed may be reduced because of the larger data size of each image. If the user chooses 'Level 0', VersaCam sends the most compressed and least clear image but the download speed will be fast.

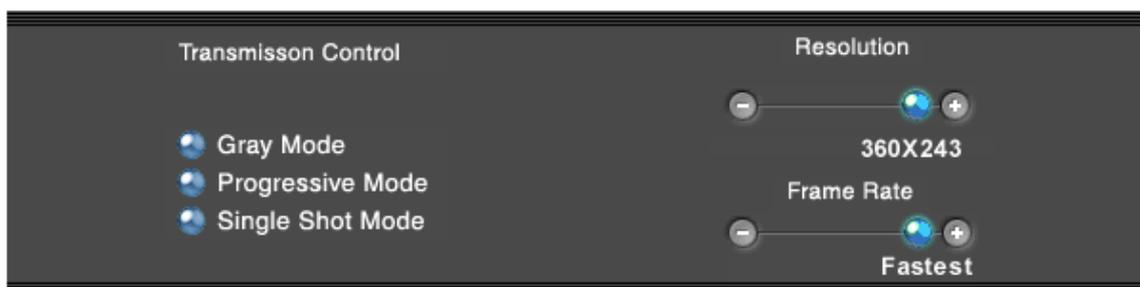
### Save File As

The User may save a still image from real time images. A still image can be saved as Wavelet files (\*.eye) or bitmap (\*.bmp) files. Wavelet compression files can be decompressed and displayed on Internet browsers such as Netscape or Internet Explorer providing the appropriate plug-in or Active-X module has been installed on your PC.



## (2) Real-time monitoring

Users monitor real-time images by clicking the video control menu at the bottom of the homepage after setting the channel, resolution, expansion, and frame rates.



### Transmission Control

- **Gray Mode:** If you choose this mode, the images are displayed in black and white. This may allow you to view the images faster since black and white images require much less data.
- **Progressive Mode:** In the case of 'Progressive Mode', the images are regenerated from low to high resolution. This function is more useful when you use a low speed network or dial-up connection, because it allows low-quality preview images to be rapidly seen.
- **Single Shot Mode:** If you choose this mode, only one frame of an image is transferred. Therefore, no other images may be viewed. To go back to the real-time images, just click the button again

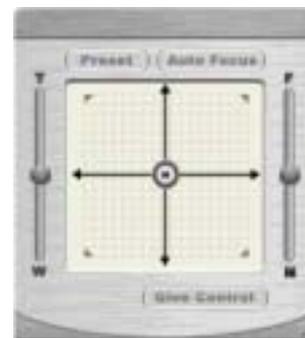
**Resolution:** The user may select among 5 levels of resolution (720x486, 720x243, 360x243, 180x121, 90x60 pixels). A high-resolution image is large, and will take longer to transmit.

**Frame Rate:** You can choose the transmission speed (1 fps, 3 fps, 5 fps, 10 fps, fastest). If you choose 'Fastest', you can get images at the fastest possible speed. The transmission speed also

depends on the network line's capacity, the user's PC's performance, and the number of users viewing the images.

### (3) Pan/Tilt/Preset Control

**Pan/Tilt:** You can adjust the position of the camera by locating your mouse cursor on the control panel and pressing the left mouse button. The nearer the center of the panel you click, the more slowly the VersaCam IC-360 moves, while the further from the center you click on the panel, the faster the VersaCam moves. Releasing your finger from the mouse button stops the camera movement.



**Zoom:** You can zoom the image in or out by dragging the ball on the left vertical bar 'T', 'W' (telephoto, wide angle) on control panel.

**Auto-Focus:** The VersaCam IC-360 has an auto-focus function. However, you can control and optimize the focus of the image manually by dragging the ball on the right vertical bar 'F'-'N' (farther, nearer) on the control panel.

**Preset:** The VersaCam IC-360 can be programmed with up to 64 preset position/zoom locations. If you preset a point, the preset Dialog Box will be activated. Your selection of a certain point on the list will make the camera move to the preset point.



**Take/Give Control:** By clicking this button, user gets operation of the pan/tilt/zoom/preset function (Take Control) or hands it over to another person (Give Control). If one user takes control, another user will have to wait until the first user finishes the PTZ operation. The Administrator may control how this function works or if it is even enabled.



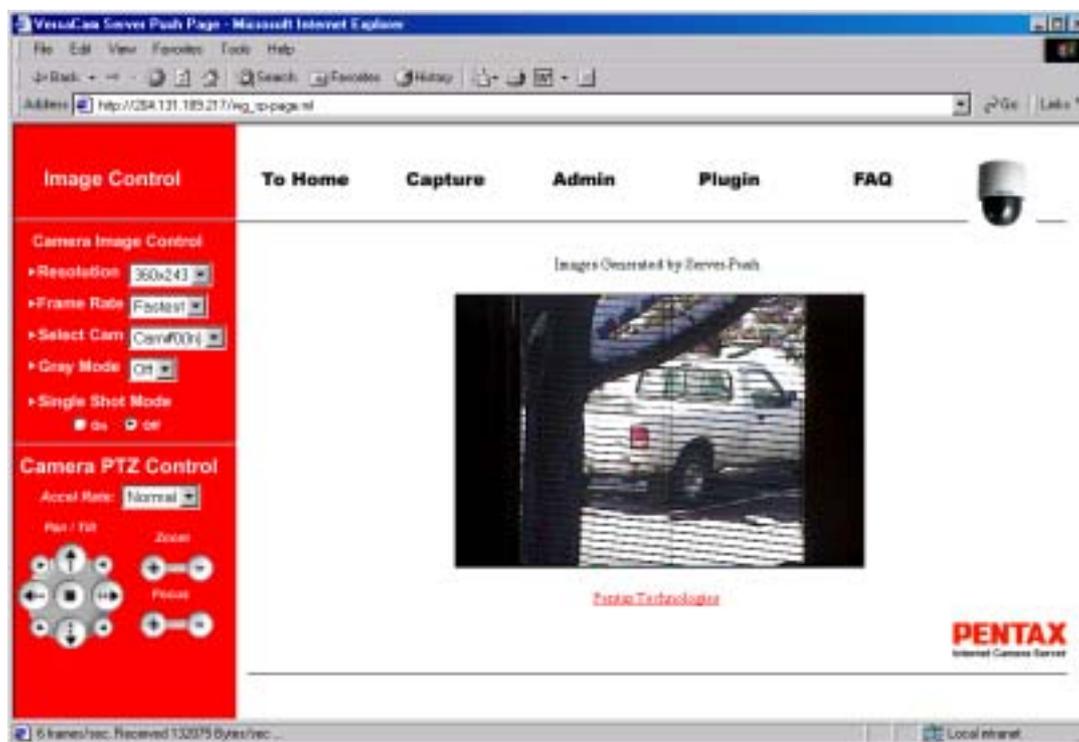
- These functions will be explained in detail in chapter VI.

### 2) 720x486 Viewer

By selecting this viewer, a user monitors images of 720 by 486 pixels. This viewer has the identical functions of the default viewer but the image panel will be 4 times bigger than that of the default viewer and the frame rate will be lower because of more data (4 times).

### 3) Server Push Viewer

If the VersaCam IC-360 is installed on a network where a firewall is located and which blocks certain ports, you may still access the camera through the server-push viewer to monitor real-time images. If you have information on the network as to which port is blocked with the firewall, you may access the camera with the default viewer by changing the camera's http (web) TCP port or video TCP port. To change these ports, please refer to Chapter VI 'Configuring Administrator's Data at the Homepage'.



Using the server-push viewer, some functions such as 'Progressive Mode' image transmission, 'Image Quality' control, and 'Quality Box' creation menus out of image control and 'Preset', and 'Focus Sensitivity' control out of PTZ control are not supported. Other functions are the same as that of the default viewer.

#### (1) Image Control

'Progressive Mode' image transmission menu is not supported.

##### **Resolution**

You may select a resolution level among five: 90x60, 180x121, 360x243, 720x243, and 720x486 pixels

##### **Frame Rate**

You may choose an image transmission speed: 1fps, 3fps, 5fps, 10fps, fastest

##### **Gray Mode**

If you choose this mode, images are displayed in black and white. These images may be transmitted faster than a color image. By clicking the button again, the function is cancelled and the images return to color.

##### **Single Shot Mode**

When this button is clicked, one frame of an image is displayed. To resume transmitting real-time

images, click the button again.

## **(2) PTZ mechanism control**

'Preset' is not supported.

### **Pan and Tilt**

If you click these buttons, you can move the direction of VersaCam.

### **Zoom**

You may use these buttons to zoom in and zoom out.

### **Focus**

You may control the camera manually to optimize the image's focus.

### **Acceleration Rate**

You may choose the speed of the Pan/Tilt/Zoom mechanism: fast, normal and slow.

## **(3) Pop-up Menu**

'Image Quality' control, 'Quality Box' creation, and 'Focus Sensitivity' controls are not supported.

### **Image Info**

You may select the color (black or white) of the information that is shown on the left top of the image or you may leave out the information.

### **Save File As**

This selection sets the file format of a saved still image file. A still image can be saved as bitmap (\*.bmp) file or a Wavelet file (\*.eye). Wavelet formatted image files can be displayed on Internet browsers such as Netscape Navigator or Internet Explorer as long as you have installed the necessary Active-X or Plug-in program. The image that is shown at the moment you click the menu is saved.

## **(4) To Home**

This is to go to main viewer. The main viewer is set in the administrator's page.

## **(5) Capture**

This is to capture an image and save it as a file. This menu has the same function as the 'Save File As' menu.

## **(6) Admin**

Clicking 'Admin' menu, you go to the administrator's login page. However, only a user who has authority as an administrator can access the page because an administrator's ID and password are required.

## **(7) Plug-in**

Because VersaCam compresses an image with the Wavelet algorithm, a user needs to install a Plug-in program to see the transmitted image through Netscape Navigator. By clicking on the 'Netscape Plug-in' menu, a user accesses a page where they can download the Plug-in program.

## **(8) FAQ**

A user may look up troubleshooting information regarding the installation or running of a VersaCam by clicking 'FAQ'.

## VI. Configuring Administrator's Data at Homepage

*This page allows the VersaCam Administrator to login and configure the camera remotely. This page may also be accessed by keying in the VersaCam's IP address and clicking the 'Start Configuration' button from the Setup program.*

### A. Administrator Login

#### 1) Accessing through the Setup Program

First, click on the MAC address to select the desired VersaCam. Then key in its administrator's password and click the 'Start Configuration' button. When you click the 'Start Configuration' button, the setup program automatically connects you to the Admin page of the VersaCam IC Series. (For more detailed information, refer to Chapter IV 'Assigning IP address and Configuring Administrator's Data')

#### 2) Accessing through Web Browser

Using a Web browser, an administrator can key in the IP address of the VersaCam IC-360 that they are going to configure. Then the administrator accesses the VersaCam IC-360 login page. At the login page, the administrator should key in the administrator's ID and password to access the Admin page.

The administrator may also access the VersaCam IC-360's real-time image viewer, and then access the Admin page by clicking the 'Goto Admin Page' button. The two login pages look a bit different, but the administrator can access the Admin page through both login pages.

The default administrator's ID and password are set to 'admin' and the administrator may change them at the Admin page. Note that each ID and password must be composed of up to 9 letters and numbers. Note that both are case sensitive.



## B. Configuring Administrator's Data at the Homepage

### 1) System Configuration

You can set the date & time, name, location, and description on your VersaCam. The model and serial number appear automatically.

**Date & Time:** There are three date & time menus. In the 'VersaCam Current Date & Time' panel, the current date and time of the VersaCam's clock is displayed. In 'System (PC) Current Date & Time' panel, the date and time of the clock in the administrator's PC is displayed. The administrator may reset the camera's clock with the PC's date and time by clicking the 'Time Synchronization' button. In 'Manual Date & Time' panel, the administrator may set the date and time to any desired value. The administrator then sets the camera date and time by clicking the 'Time Synchronization' button.

#### Administrator's E-mail Address:

In this panel, an administrator may set up an E-mail address. If an administrator puts a contact E-mail address link on the VersaCam homepage, the linked E-mail address is synchronized with it.

This is so the administrator can easily maintain E-mail addresses without modifying the HTML page.

**Initialize Flash Information:** The administrator can initialize almost all the information saved in flash memory by using 'Factory Setting'. However, 'Date & Time', 'Model', and 'Serial Number' in the 'System' menu, 'IP configuration' in the 'Network' menu, and all items in the 'Video' menu cannot be initialized. Also, Preset Position, which is configured in the Factory Setting, cannot be initialized.

**Rebooting:** If the VersaCam IC Series has any problem, the administrator can reboot it without manually disconnecting the power supply. This button works as a reset switch.



## 2) User Configuration

IDs and passwords can be established for an administrator and up to 5 classes of users. If you want to open your VersaCam to everyone, leave the default as “guest.” However, you should change the administrator’s ID and password to unique ones.

It is very important to compose any ID or password with no more than 9 letters and numbers. Note: Both are case sensitive.

It is possible to allow or not allow users to control pan/tilt/zoom and to control video data such as quality options, QBOX settings, etc. The administrator has full authority to give a certain user class a right to control these options or not.

User ID	User Account	Password	Re-Typed Password	Access Rights
Administrator	admin			All
User 1	guest			None
User 2	guest			None
User 3	guest			None
User 4	guest			None
User 5	guest			None

Apply Cancel Help

### 3) Network Configuration

This page defines network types and how to set network addresses for a VersaCam.

#### (1) Network Configuration

**DHCP Client Protocol:** DHCP (Dynamic Host Configuration Protocol) establishes IP addresses for network devices automatically. With this protocol, a device obtains its address from the network's DHCP server from a pool of addresses held on that server. This occurs when the device is turned on, and for some networks, at other times as well. As a result, it is not possible to predict in advance what addresses will be assigned, nor once an address is assigned, if the address will change.

Therefore, when a VersaCam is required to obtain its address from a DHCP server, it is normally impossible for anyone except the network administrator to determine the current IP address for the camera. Since the DHCP-assigned address can change from time to time, it is also impossible to point a registered domain name at the camera's IP address, as it is a "moving target."

Under the conditions of DHCP, however, it is always possible for the camera to E-mail and FTP images to any other accessible IP address or registered domain since no one in the "outside world" need to know the camera's address for these functions.

The above explanation notwithstanding, there are ways to determine the address of a DHCP-addressed camera under most circumstances. The explanation for these ways are too detailed for this guide, but require the use of a PC temporarily attached (instead of to the camera) to the DHCP connection in question, and the ability to run the program IPCONFIG (a DOS program available on all Windows machines, or the equivalent on other systems) to determine the currently assigned address, and then to immediately run the program TRACERT (again available on all Windows machines, or equivalent on other systems) using that address to find the name that is always associated with the connection. That name (which is assigned by the LAN's network administrator or the ISP and which may not be very "attractive") can be used (in almost all cases) instead of an IP address or domain name in the address line of a web browser or imbedded as a link in some other web page in order to access the camera.

**Select Network Interface:** This is used to select a proper network interface with which a VersaCam is connected.

If a VersaCam is connected with an Internet dedicated line, a cable modem line, or in a LAN environment, you should select 'Ethernet'.

If a VersaCam is connected to an xDSL line that needs PPPoE processes to connect to the Internet, the administrator should select 'xDSL (PPPoE)'. However if the xDSL line doesn't need a PPPoE process, the administrator should select 'Ethernet' even though the VersaCam is connected to an xDSL line.

Network Configuration	
Parameter Name	Parameter Value
DHCP Client Protocol	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Select Network Interface	<input checked="" type="radio"/> Ethernet <input type="radio"/> xDSL(PPPoE)

Ethernet Interface	
Parameter Name	Parameter Value
IP Address	211.53.133.249
Netmask	255.255.255.0
Broadcast Address	211.53.133.255 <input type="button" value="Get From Netmask"/>
Gateway IP Address	211.53.133.1
Select MTU Size	1500 Bytes
Ethernet(MAC) Address	00:30:A1:00:00:00
DNS1 Server IP Address	0.0.0.0
DNS2 Server IP Address	0.0.0.0
DNS3 Server IP Address	0.0.0.0

XDSL Interface	
Parameter Name	Parameter Value
User ID	
Password	
Assigned IP Address	Unassigned

**(2) Ethernet Interface:**

An administrator may configure the IP address, subnet mask, broadcast address, gateway address, and DNS addresses of a VersaCam. The administrator may set the broadcast address automatically by clicking the 'Get From Netmask' button after assigning an IP address and subnet mask. An administrator may also, depending on the network type, set the data packet size with 'Select MTU Size' to utilize the network more effectively.

When the addresses are not assigned properly, users cannot access a VersaCam from any local or remote network. Even on the local network, a user is not able to access the camera if the administrator does not assign a proper IP address to the VersaCam.

**(3) xDSL Interface**

If a VersaCam is connected on an xDSL line that requires a PPPoE process, the administrator should select 'xDSL (PPPoE)' and configure the ID and password for PPPoE. The ID and password may be acquired from the ISP that installed the line. The VersaCam may get an IP address when it is connected to the xDSL line.

#### 4) Security Configuration

This page allows you to control accessibility to the VersaCam with IP addresses.

If 'IP/Subnet Filtering Mode' is enabled, access can be granted or denied to users based upon their IP addresses. By specifying unique addresses (e.g., 204.131.189.217), access from those addresses may be controlled. If a user's IP address is not included specifically to "allow" access, even a correct user name and password will be insufficient to gain access. Likewise, even if in possession of a valid username/password, any user whose IP address is found to be specifically listed to "Deny," no access to images will be allowed for that user. "Unauthorized IP Address" will appear in the viewer window.

Parameter Name	Parameter Value
	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
IP/Subnet Client Address 0	0.0.0.0 Allow
IP/Subnet Client Address 1	0.0.0.0 Allow
IP/Subnet Client Address 2	0.0.0.0 Allow
IP/Subnet Client Address 3	0.0.0.0 Allow
IP/Subnet Client Address 4	0.0.0.0 Allow
IP/Subnet Client Address 5	0.0.0.0 Allow
IP/Subnet Client Address 6	0.0.0.0 Allow
IP/Subnet Client Address 7	0.0.0.0 Allow
IP/Subnet Client Address 8	0.0.0.0 Allow
IP/Subnet Client Address 9	0.0.0.0 Allow
Image Exception Mode	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
	Encryption PIN Number: <input type="text"/>
<input type="button" value="Apply"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/>	

The administrator may restrict users from receiving images from a VersaCam, even though they are able to access it. If 'Image Encryption Mode' is enabled, and a pin number is assigned, users must key in the assigned pin number to see the image after accessing VersaCam image viewers.

'Security Configuration' may be used as a second security layer to control accessibility in addition to utilizing 'User Account Configuration.'

## 5) Video Configuration

This page allows configuration of every channel with various conditions.

### (1) Video Channel State Control

The administrator decides whether to utilize the video signal from a particular video channel of the VersaCam. For the IC-360 model, there is only a single video channel available, so this button serves only to enable or shut down this channel.

Video Configuration	
Parameter Name	Parameter Value
Video Channel State Control	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Camera Color Type	<input checked="" type="radio"/> Color <input type="radio"/> Black/White
Video Signal Type	<input checked="" type="radio"/> NTSC <input type="radio"/> PAL
Camera Installation Angle	Normal
Advanced Configuration	
<input type="button" value="Apply"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/>	

### (2) Camera Color Type

This button is used to define whether the camera internal to the IC-360 is a color or black & white camera. At this time, ALL IC-360 units employ color cameras. Therefore, this setting must be left in the “Color” position.

### (3) Video Signal Type

This button is used to define the type of internal CCD module and external CCD cameras (not available on the IC-360) as either ‘NTSC’ or ‘PAL’ format. As the VersaCam IC-360 cameras are built as either one or the other, this setting should not be changed.

### (4) Camera Installation Angle

This feature allows for automatic image rotation for cameras that are not installed “right side up.” The IC-360 model can be installed base up on a ceiling (where this option is set to “Normal”) or with the base down on a table or other surface with the dome pointing up (where this option is set to “180 deg”).

### (5) Advanced Configuration

By Clicking ‘Advanced Configuration,’ you may access the page where advanced configuration details can be set.

#### Calibration Parameters

The administrator may manipulate the image by adjusting brightness, contrast, hue, saturation, horizontal line shift, and vertical line shift from this menu. The default setting for all controls is “0.” Immediate feedback of the results of each change is available in the image viewing area after confirming that the administrator wishes to make the change by clicking the “Apply” button at the bottom of the page.

#### Caption Display Options

The administrator can set the default captioning information to be displayed, if any, on the transmitted image.

Advanced Video Configuration	
Parameter Name	Parameter Value
Calibration Parameters	Video Gain : <input type="text" value="0"/> (-100 .. 100) Brightness : <input type="text" value="0"/> (-100 .. 100) Contrast : <input type="text" value="0"/> (-100 .. 100) Hue : <input type="text" value="0"/> (-100 .. 100) Saturation : <input type="text" value="0"/> (-100 .. 100) Horizontal Line Shift : <input type="text" value="0"/> (-20 .. 20) Vertical Line Shift : <input type="text" value="0"/> (-20 .. 20)
Caption Display Options	<input checked="" type="radio"/> Black <input type="radio"/> White <input checked="" type="checkbox"/> Time Information <input type="checkbox"/> Channel Information <input type="checkbox"/> User Defined String <input type="text"/>
Visual Setting Parameters	<b>Image Viewer for CH# 0 (Reload Page)</b> Click the mouse right-button for pop-up menu. 
<input type="button" value="Apply"/> <input type="button" value="Cancel"/> <input type="button" value="Back"/>	

Black and White selection sets, respectively, black print on a white background, or white print on a black background.

If “Time Information” is enabled, the currently stored VersaCam date and time (to within 1/100 second) are transmitted with each image in the form MM/DD/YY HH:MM:SS:ss.

If “Channel Information” is enabled, the date/time stamp will be preceded by “CH#n” where ‘n’ is the currently selected video channel. For the IC-360 model, there is only one video channel available, so this has no real use.

If the “User Defined String” is enabled, the string specified will follow the date/time stamp. The maximum string length is somewhat variable as it is limited by the physical space available and the fact that a proportional font is used wherein each character takes can occupy a different amount of lateral space.

**QBOX View Control:** If the administrator or user wants to see only a particular area of interest within the whole image, the QBOX (Quality Box) feature may be enabled. With a certain area of the image defined as the current QBOX, the image outside this high-quality area is set to reduced contrast. Because such low-contrast areas are highly compressible (more so if the quality of this low-contrast perimeter area is set closer to “1” by the “Ambient Level” control – see below) the QBOX feature can improve image transmission speeds substantially. **This and all other subsequent controls listed below are accessed by pressing the right mouse button with the cursor placed over the image viewing area of the screen. These are default settings and may be modified by users with the consent of the administrator.**

**QBOX Parameters:** The administrator sets up the QBOX area with a mouse using ‘click and drag’ (clicking one corner, holding down the left mouse button, and dragging the cursor until the desired rectangle is defined). The selected area coordinates are then shown as the ‘Left Top Placement’ and ‘Right Bottom Placement’ panels in the menu. Using the ‘Ambient Level’ menu, the administrator may set the quality level of the low-contrast area (outside the QBOX) in the image. There are 5 levels. The administrator may set the level to 5 (lowest contrast), which may increase image transmission speed, or to level 1 (highest contrast), which may slow down transmission speed.

**Focus Sensitivity:** The administrator selects a default sensitivity for auto-focus of the IC-360 system. If the user enables “auto-focus” from the Pan/Tilt/Zoom menu, the VersaCam will attempt to focus the image automatically in response to a zoom change or change in distance to the object when the camera position is moved. The level of focal sharpness (0 is least, 9 is most) desired can be adjusted here.

**Image Quality Level:** The administrator selects a default image quality level from 0 to 9. If level 9 is chosen, the VersaCam will send the highest quality image by employing a lesser degree of image compression to the transmitted file. However, transmission speed will be reduced because of larger file size. The image level inside the QBOX is the same level as is selected in this menu.

## 6) Application Configuration

This page allows configuration of the E-mail and FTP functions.

### (1) Recipient E-mail Address

This page allows you to designate a person to receive E-mail with the images attached.

### (2) Sender's E-mail Address

This page allows you to enter the E-mail address of the sender.

The E-mail sender's address is nothing more than a reference as to the identity of the sender, or the administrator, since the camera cannot receive E-mail in return.

Another important function of this menu item is to avoid a potential problem where the E-mail may be blocked by an E-mail server. Some E-mail servers don't allow reception of E-mail that does not have a valid return domain name such as abc@abcdefg.com. This is because so much "spam" is sent using fictional domain names. Therefore, VersaCam and other devices that do not have a valid return domain name or only have their IP addresses may be prevented from sending E-mails. To avoid this problem, VersaCam allows entering a valid sender's E-mail address. The default value is invalid, so the administrator should change the address to a valid one. The administrator may enter only one sender's E-mail address.

### (3) Check E-mail Options

**Relay Mail Server:** Considering the same problem of E-mail blocking, VersaCam has a function to relay its E-mail through an available E-mail server so that an E-mail can have the relay server's domain name. After activating 'User Relay Mail Server' menu, you enter a server's domain name such as '@abcdefg.com'. The initial E-mail server's default value is invalid, so don't use the default value when you have to use the relay mail server function. Test first with this function disabled to see if it will be necessary.

**Content-Transfer-Type:** This is to define E-mail format. E-mail servers and clients usually support 'Base64' format, but some servers do not. In this case, you may select the format as 'Quoted Printable' (UUCP).

### (4) E-mail Event Configuration

**Event source:** An administrator may specify which event(s) cause(s) images to be sent as E-mail attachments. The options include 'Motion Detection,' the two external sensors, and a timer ('Periodic Sending'). In the latter case, the administrator must also specify the frequency (in minutes) of capture and transmission. This may be from 5 minutes to 525,600 minutes (once per

The screenshot shows the 'Application Configuration' window with a table of parameters and their values. The table has two columns: 'Parameter Name' and 'Parameter Value'. Below the table are several sections for configuration options.

Parameter Name	Parameter Value
Recipient Email Address	
Sender Email Address	yours@your.org.domain
Check Email Options	<input type="checkbox"/> Use Relay Mail Server: invalidwebgateinc.com Content-Transfer-Type: Base64
Email Event Configuration	<input type="checkbox"/> Motion Detection <input type="checkbox"/> Sensor Input Detection for Input Port 1 <input type="checkbox"/> Sensor Input Detection for Input Port 2 <input type="checkbox"/> Periodic Sending per 60 minutes Naming Method for the attached image file: <input checked="" type="radio"/> DATETIME suffix <input type="radio"/> SEQNUM suffix <input type="radio"/> Manually assigned filename Image Filename: IMAGE.EYE Select Image Resolution: 360x240
FTP Server Address	
FTP User Account	
FTP User Password	
FTP Event Configuration	<input type="checkbox"/> Motion Detection <input type="checkbox"/> Sensor Input Detection for Input Port 1 <input type="checkbox"/> Sensor Input Detection for Input Port 2 <input type="checkbox"/> Periodic Sending per 3600 secs Naming Method for the transferred image file: <input checked="" type="radio"/> DATETIME suffix <input type="radio"/> SEQNUM suffix <input type="radio"/> Manually assigned filename Image Filename: IMAGE.EYE Select Image Resolution: 360x240

Buttons: Apply, Cancel, Help

year). Note that any or none of these event types can be specified. If none are specified, no E-mail messages will be sent by the camera. When more than one event type is specified, E-mail will be sent whenever any of the selected events occurs.

**File name:** If E-mail event handling is enabled as noted above, the administrator must decide how to name the resulting image files. There are three naming conventions that may be employed.

The 'DATETIME' method creates files in the format:

**IMG-CHnn-yyyyddd-hhmmss.eye**, where

'nn' = the channel number (for cameras with multiple video inputs)

'yyyy' = year (e.g., 2002)

'ddd' = day of the year (e.g., 001 to 365)

'hh' = hour (e.g., 00 to 23)

'mm' = minute (e.g., 01 to 59)

'ss' = second (e.g., 01 to 59)

If the administrator selects the 'SEQNUM' option, each file will have appended a numerical sequence number. The file-naming format will be:

**IMG-CHnn-SNx.eye**, where

'x' = the sequence number beginning with 1

The administrator may also elect to provide a fixed name to the file such that the same name is sent every time, for example, **Image.eye**.

In addition, the fixed file name field may contain abbreviations for date, time, and sequence numbers as described above as suffixes to the file name. The abbreviations that are allowed include:

&D = Date

&T = Time

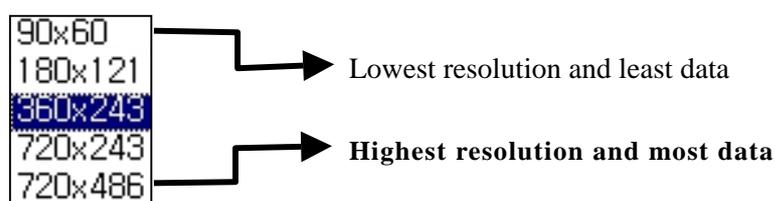
&C = Channel Number

&S = Sequence Number

So, for example, if the administrator keys in 'MYIMAGES\_&D.eye,' all of the resulting images will be stamped with the name 'MYFILES' appended with a date stamp in the format described above (e.g., MYFILES\_2002062.eye). If 'SOMEIMAGE\_&D-&T.eye were keyed in, the resulting filename would include both date and time (e.g., SOMEIMAGE\_2002062-070015.eye which would indicate the 62<sup>nd</sup> day of 2002 at 07:00:15 in the morning).

The extension for image files is usually defined as '.eye' so that it will be recognized by the Wavelet viewer plug-in supplied by Pentax. When the browser sees the '.eye' file, it automatically knows which plug-in is associated with this image file type and will call up that plug-in automatically for image viewing. If the administrator chooses either the DATETIME or SEQNUM format, the VersaCam will automatically use the .eye filename extension.

**Image quality:** The administrator sets the resolution of the image that will be delivered by E-mail.



## (5) FTP Configuration

**FTP Directory Configuration:** In order to make use of the FTP transmission method, the administrator must define the FTP server address, FTP user account name, the FTP user password, and the FTP file path.

The 'FTP server address' is the address of the target FTP server that will hold the transferred images. This needs to be an IP address in the form xxx.xxx.xxx.xxx. Note that if the requested server is NOT on your local net, you must be sure you have properly identified the correct gateway address in the Network Configuration or the camera will be unable to move images outside of your local net to the target server.

The 'FTP user account name' must be used unless the FTP server permits anonymous logins. You should obtain this account name from the server's administrator. This also applies for the 'FTP user password.'

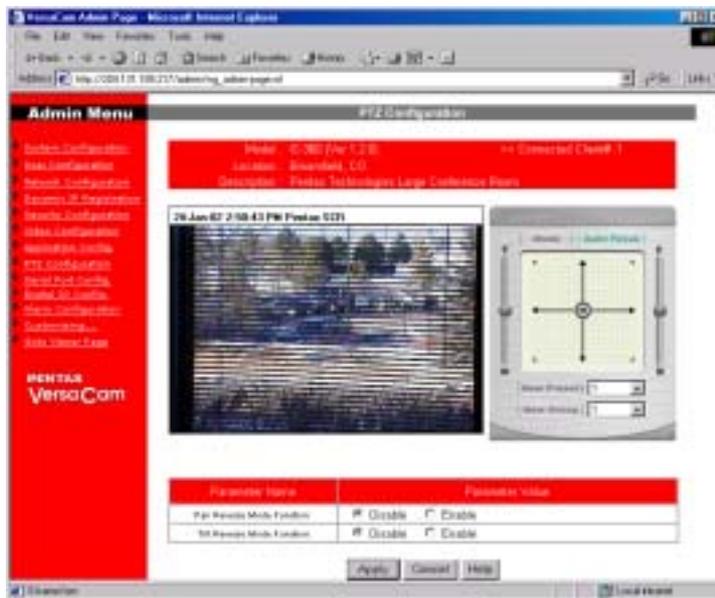
The 'FTP file path' may be required if you wish to store images on the FTP server at some level below the root or home directory where the camera logs into the server. For example, if you wish to store images in a subdirectory called 'IMAGES,' you should specify this name by keying in '/IMAGES.'" The forward slash is important.

An administrator assigns an FTP server address, FTP user accounts, FTP user passwords, and FTP user paths to receive files when events occur.

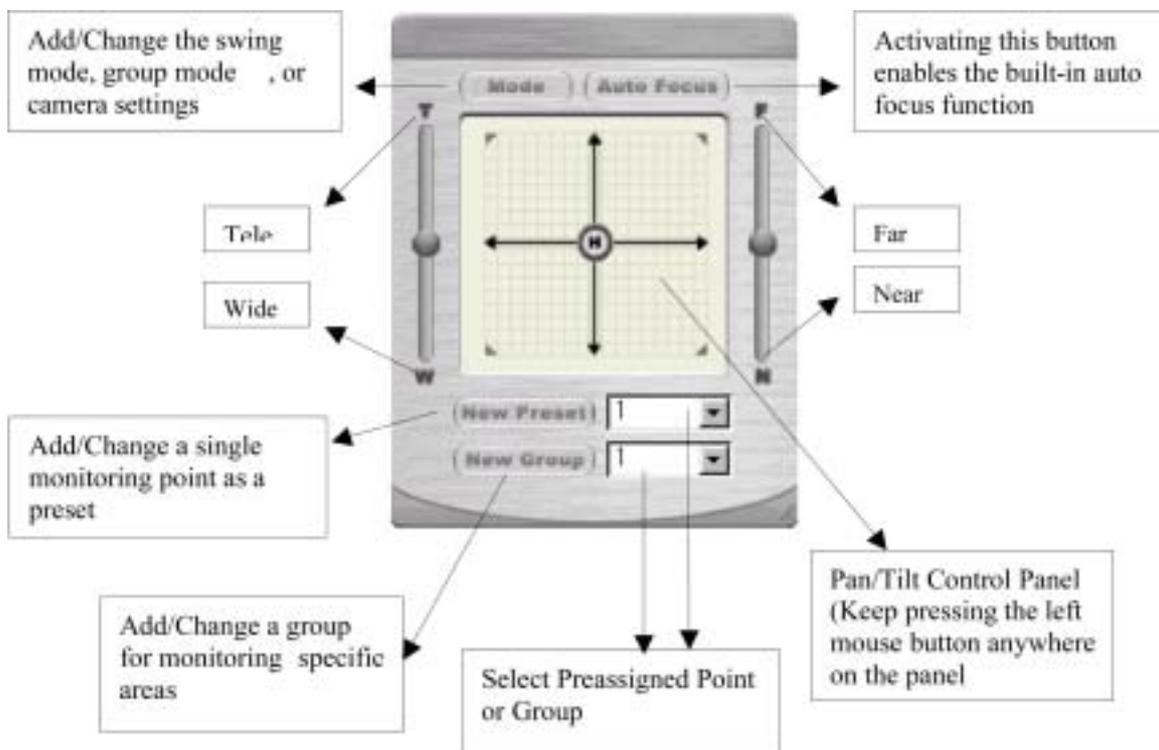
**FTP Event Configuration:** The administrator may set sending conditions, image resolution, and filename in the same fashion as described above for E-mail events. The exception is that the frequency of scheduled transmissions, if any, is specified in seconds rather than minutes.

## 7) Pan/Tilt/Zoom Configuration

The IC-360 has various special functions including 64 PTZ Presets, auto-pan between two different monitoring areas, or group mode swing between eight different positions. Using these functions, users can obtain the effect of a multi-camera system with only one VersaCam installation. To use the VersaCam efficiently, users should have a good understanding of these functions.



### Pan/Tilt/Zoom Control Panel



**New Preset:** Users can select up to 64 preset points whereby one click will send the camera to the predefined position.

First, move the camera to the desired preset location. Then, click “New Preset” button. The preset configuration pop-up window will be activated.



In this window, select the number that you wish to assign to this preset position, or change the existing preset, and type the nickname you prefer for this point. Last, click the “Add/Change” button and close this window using the “Close” button at the bottom of the window.



**New Group:** This function is designed for sequential group monitoring of several designated preset points. The VersaCam will automatically patrol the preset points within a group.

Users can easily make a monitoring group by gathering the above preset points. First, click the “New Group” button and the new Group configuration pop-up window will be activated. In this window, select the number that you wish to assign to this new group, or change the existing group. Type the nickname for the group at “Name.” “Time,” the third item, determines how long, in seconds, that the camera will rest at each preset point within a group. Select each preset as a monitoring group member up to 9. Last, click the “Add/Change” button and close the window using the “Close” button.”

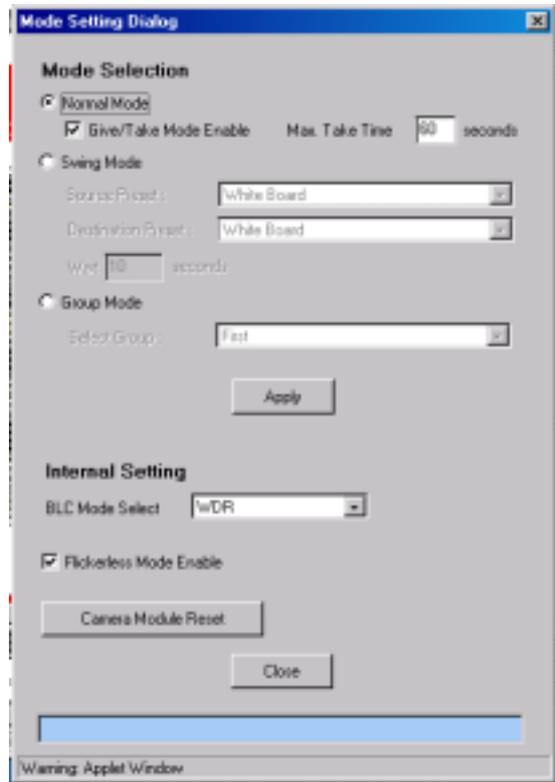


**Mode:** The Main purpose of this menu is to utilize the above preset and grouping functions. When you click the “Mode” button, the “Mode Setting Dialog” will be activated.



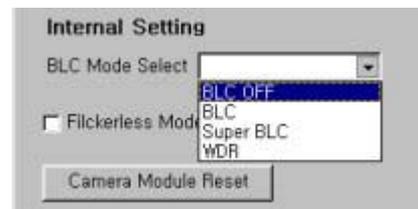
**Mode Selection**

- **Normal Mode:** When a user is using PTZ control, another user would normally wait indefinitely until the first user relinquished control. To prevent this, the administrator can select the “Give/Take Mode Enable” and set the time limit for control by each user by checking the left checkbox.
- **Swing Mode:** This mode is for automatic patrolling between two preset points that are set up in the “New Preset” menu. The VersaCam will move back and forth between the two selected points, resting for the designated number of seconds at each monitoring point.
- **Group Mode:** By selecting a preset group at the “New Group” menu, a user can select a group he would like to have the VersaCam patrol automatically. There is no resting time setting on the group mode because the preset group has already had this time established through the “New Group” registration.



**Internal Settings**

**BLC Mode Select:** This setting controls the backlight compensations (Back Light Control) of the camera. Options include “BLC Off” for no backlight compensation, “BLC” for normal compensation, “Super BLC” for extreme backlight compensation, and “WDR” for Wide Dynamic Range.” Each of these settings is designed to have an effect on how the camera handles very high contrast images. Often this is the result of the subject area including a window with incoming sunlight.



**Flickerless Mode Enable:** This function prevents the auto-brightness control of the camera from responding to such light sources as fluorescent lamps. Fluorescent lamps are not actually illuminated all the time – they switch on and off at a rate of 60 times per second. This flicker can fool the camera, making the Flickerless Mode necessary to avoid constant changes in image brightness.

**Pan/Tilt Reverse Mode Function**

This page allows you to reverse Pan/Tilt control functions. This function is useful when a VersaCam 360 is installed upside down.

Parameter Name	Parameter Value
Pan Reverse Mode Function	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Tilt Reverse Mode Function	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

## 8) Serial Port Configuration

The VersaCam IC-360 has an RS232C interface port for an audio device.

Note: As of the date of printing of this manual, this audio device was not available. when it is available, the following instructions will apply.

The VersaCam IC-360 supports a specialized Audio Device for the VersaCam series called “Sound Messenger.” This is physically connected to the Audio Device port and enabled using this menu.

To configure this Sound Messenger, select the “Audio Device” from “Select Attached Device” pull-down menu.

- **AGC Control Enable:** When this function is enabled, the VersaCam IC-360 will automatically control the input audio volume and adjust it up or down for any given noise ambient condition.

- **Microphone Volume Level:** This is a 10-level control for microphone volume.

Serial Port Configuration	
Parameter Name	Parameter Value
Port Device Name	1: RS232
Select Attached Device	None
<input type="button" value="Apply"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/>	

Serial Port Configuration	
Parameter Name	Parameter Value
Port Device Name	1: RS232
Select Attached Device	Audio Device
AGC Control Enable	<input checked="" type="radio"/> Off <input type="radio"/> On
Microphone Volume Level	Level 0
<input type="button" value="Apply"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/>	

## 9) Digital I/O Configuration

This feature allows users to control the effect of the state of any sensors that may be attached to the VersaCam. The camera may then be programmed (See Application Configuration and Alarm Configuration) to send E-mails and/or to transfer files by FTP in response to these external triggers.

### Device Type for Input Port 1 and Port 2:

The administrator may define the active state of two optional input devices connected to two camera input ports. These can be switches, infrared sensors, or any other device that meets the electrical requirements specified in the manual for your particular VersaCam model. The active states of sensing devices may be either “normally closed” or “normally open” depending on the design of the sensor. For example, a

door switch might be normally closed but open in response to an opened door, or it might be normally open but close in response to an opened door. This menu allows the administrator to specify which state matches the actuated or triggered position of the sensor. See details in Appendix 7 for specific wiring requirements for your sensor and detailed information about using these settings.

Digital IO Configuration	
Parameter Name	Parameter Value
Device Type for Input Port 1	<input type="radio"/> NO(Normal Open) <input checked="" type="radio"/> NC(Normal Close)
Current State for Input Port 1	Active State
Device Type for Input Port 2	<input checked="" type="radio"/> NO(Normal Open) <input type="radio"/> NC(Normal Close)
Current State for Input Port 2	De-Active State
<input type="button" value="Apply"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/>	

**Current State for Input Port 1 and Port 2:** This status area shows the current states of any digital devices connected to the two available input ports. In the status area, an “Active State” or “De-active State” message indicates the current input port status. The “De-Active State” means that either a normally-open sensor is connected, or the sensor was not detecting an ‘event’ when the ‘Apply’ button was clicked. Though this message is not updated until you confirm the ‘OK’ response from the camera after clicking the ‘Apply’ button, the VersaCam IC-360 is still receiving updated sensor readings from the input port.

## 10) Alarm Configuration

This feature allows the administrator to set parameters that affect the manner in which the triggers (both internal and external) will cause the VersaCam to respond.

### Motion Detection Threshold:

This value is used to set the threshold for the motion detection function. During operation with this feature enabled (See Application Configuration) changes in the video image are perceived by the camera as motion and cause E-mail or FTP files to be sent. The administrator can determine the level of motion (amount of variation occurring in the video image) that will be required to cause this trigger to occur.

Threshold “0” is the most sensitive state and “900” is the least sensitive state.

The administrator should gain some experience with motion in the desired frame of reference before settling on a particular value for this threshold. Note that the motion of leaves on trees, cars on distant roads, and other transient events must sometimes be taken into account when setting up this feature.

Parameter Name	Parameter Value		
Motion Detection Threshold	300 (0 - 900)		
Alarm Parameters for Email/FTP Application	MD Event	before	Saving [0] Image(s) during [1] sec(s)
		after	Saving [0] Image(s) during [1] sec(s)
	SID1 Event	before	Saving [0] Image(s) during [1] sec(s)
		after	Saving [0] Image(s) during [1] sec(s)
	SID2 Event	before	Saving [0] Image(s) during [1] sec(s)
		after	Saving [0] Image(s) during [1] sec(s)
Alarm Preset	SID1 Event	<input checked="" type="checkbox"/> Disable <input type="checkbox"/> Enable Preset Number [86:45-13]	
	SID2 Event	<input checked="" type="checkbox"/> Disable <input type="checkbox"/> Enable Preset Number [87:Z.O.T.]	

### Alarm Parameters for E-mail / FTP Application:

Here, the administrator defines image-recording conditions that will occur in the event of a trigger of the three possible sensors. These include motion detection (MD) or external sensors (SID1 and SID2 Events).

The VersaCam 360 can record between 0 and 2 frames for 1 or 2 seconds before the event and/or between 0 and 2 frames for 1 or 2 seconds after an event. The maximum recording rate is 1 frame per second. These are the image frames that will be E-mailed or transferred by FTP depending on the Application Configuration setup. If the trigger event lasts longer than 2 seconds, the camera will continue to send non-duplicate images regardless of any overlap in the time setting.

### Alarm Preset

If an external trigger is sensed by the camera, the camera can be forced to move to one of the preset monitoring points by enabling this feature for one or both of the external inputs. Such preset positions are configured in the PTZ Configuration menu. The two external triggers can be associated with different preset locations if desired.

Alarm Preset	SID1 Event	<input checked="" type="checkbox"/> Disable <input type="checkbox"/> Enable Preset Number [02:WebEye 1]
	SID2 Event	<input checked="" type="checkbox"/> Disable <input type="checkbox"/> Enable Preset Number [03:Z.O.T.]

## 11) Custom Configuration

### Web Server TCP Port:

The TCP ports used by a VersaCam IC-360 are assignable by the administrator. It is through this “Web Server” port that users can access a VersaCam IC-360 and through which the camera will send its web page and configuration data. Normally, the 80 port is assigned by the network administrator as a Web Server TCP port like other ordinary Web Servers on a network.

Parameter Name	Parameter Value
Web Server TCP Port	80
Video Server TCP Port	8080
Select Main Page	Default Viewer
Main Title	NERD CAM
LOGO Image Source URL	/images/logo.gif
LOGO Image Link URL	http://www.versacam.com
Background Color	#FFFFFF
Foreground Color	#000000

### Video Server TCP Port:

The “Video Server” port identifies the port number through which a VersaCam will transmit its images. Normally the 8080 port is assigned as a server TCP port.

Both the port for Web and Video data should be opened and available to the network to which the VersaCam is attached. Where a network firewall is installed, one or the other of these ports may be closed. In this case, the installer should either request that the network administrator make both ports available, or request that the network administrator make available alternative port numbers for use. If alternative port(s) must be used for either the Web or Video, the administrator must enter the port number(s) on this configuration page.

### Select Main Page:

The administrator may assign the viewer page desired as the default page that appears when a user first accesses the VersaCam. The administrator can choose from among 3 different html viewer pages. There are, at present, called “Default Viewer,” “720x486 Viewer,” and “Server Push Viewer.” The 720x486 Viewer creates the largest browser screen and the largest image page possible. The Server Push Viewer may be used when the user is behind a firewall and cannot directly access the camera otherwise.

Default Viewer  
Default Viewer  
720x486 Viewer  
Server-Push Viewer

### Viewer Editing:

Certain presentation aspects of the default viewer are designed for the administrator to edit easily. The editable features of these pages are:

- **Main Title:** This string changes the main title that is displayed at the bottom of the default viewer.
- **Logo Image Source URL:** The administrator may assign a URL pointing to a particular site from which a default viewer gets the logo that appears in the upper left corner of the viewer window
- **Logo Image Link URL:** The administrator may link the logo to a particular web page. By clicking on the logo, users will be transferred to the selected web page.

- **Background Color and Foreground Color:** The background and foreground colors of the default viewer cannot be changed with this revision of software.

## 12) Goto Viewer Page

Users can return to the “Default Viewer Page” by clicking on this menu item.



**\* Caution: To save the changes, you have to click the ‘Apply’ button on every page.**

**Appendix 1 - Detailed Specifications of VersaCam IC-360****1. General**

<b>CPU</b>	32bit RISC Embedded processor
<b>Flash memory</b>	8Mbyte
<b>RAM</b>	16Mbyte
<b>OS</b>	Embedded Linux
<b>Video Channel</b>	NTSC or PAL video formats are supported 1 Channel of External Video Output
<b>Image Resolution Control</b>	720x486, 720x243, 360x243, 180x121, 90x60 pixels
<b>Image Compression</b>	Wavelet
<b>Compression Rate</b>	10:1 ~200:1
<b>Transfer Rate</b>	Max 120 fps ([4.7KB image] up to 30 fps, 1 - 4 clients)
<b>Decoding Rate</b>	2 ~ 30fps (depends on client system)
<b>Compression rate</b>	Max 30 fps
<b>Security</b>	Password-Based User Authentication IP-filtering (Secure Mode) Image Encryption
<b>Alarms and I/O</b>	Motion detection Software-controlled dual (2) alarm inputs Sending E-mail automatically Sending image files through FTP automatically
<b>Misc. functions</b>	High quality image area setting Image compression control (10 Levels) Periodic sending of images through E-mail, FTP Gray/Progressive/Single-Shot Mode User-customized home page publishing supported by FTP
<b>Power Supply</b>	DC 12V, 3.5A via external power supply supplied
<b>Sensor input</b>	2 auxiliary inputs are supported

**2. CCD Camera**

<b>Image Sensor</b>	1/4-inch color interline-transfer CCD
<b>Total Pixels</b>	410,000 pixels NTSC-811(H) x 508(V), PAL-795(H) x 596(V)
<b>Active Pixels</b>	380,000 pixels 768(H) x 494(V), PAL-752(H) x 582(V)
<b>Scanning Frequency</b>	15.734kHz (H) 59.94Hz(V)
<b>Synchronization</b>	Internal/External (AC Line Lock)
<b>Video Output</b>	1.0 Vp-p/75 ohm
<b>Interface</b>	RS232, BNC (Video)
<b>Resolution</b>	480/440 TV Lines (Slow Shutter Mode)
<b>S/N Ratio</b>	More than 50dB
<b>White Balance</b>	Automatic Tracing White Balance (ATW)/AWC
<b>Back Light Compensation</b>	Super BLC/BLC/ Wide Dynamic Range/Off
<b>Focus</b>	Auto/Manual
<b>Electronic Shutter</b>	Auto/Manual (1/60 to 1/10,000 12 steps)
<b>Slow Shutter</b>	Auto (1/30 to 1/2)/OFF
<b>Flickerless</b>	Auto/Manual (Fixed 1/100)
<b>Iris</b>	Automatic
<b>Gain Control</b>	Automatic

### **3. Lens Specification**

<b>Focal Length</b>	F3.9mm to 62.4mm 16x Optical Lens
<b>Digital Zoom</b>	8x (Total 128x possible)
<b>Max. Relative Aperture</b>	Wide 1:1.4, Tele 1:2.7
<b>Min. Focus Distance</b>	40" (1,000 mm) (Tele End)
<b>Min. Illumination</b>	3.0/0.5 Lux (Slow Shutter Mode)

### **4. Pan/Tilt Specification**

<b>Pan Rotation</b>	360° continuous
<b>Pan Speed Manual</b>	0.8 to 120 /sec. (adjustable in 64 steps)
<b>Preset</b>	0.8 to 240 /sec. (adjustable in 64 steps)
<b>Tilt Rotation</b>	0 to 90°
<b>Tilt Speed Manual</b>	0.8 to 120 /sec. (adjustable in 64 steps)
<b>Preset</b>	0.8 to 180 /sec. (adjustable in 64 steps)
<b>Preset Positions</b>	Up to 64 positions

### **5. Network**

<b>Browser</b>	MS Internet Explorer V. 4.0 or later Netscape V. 4.5 or later, up to V. 4.7 JAVA Applet for non PC User (Mac or Unix)
<b>Connector</b>	10 Base-T Ethernet (RJ-45)
<b>Installation</b>	Assign IP address using setup program or ARP, RARP protocol
<b>Protocols supported</b>	TCP/IP, HTTP, ARP, RARP, ICMP, DHCP, FTP and SMTP
<b>S/W Update</b>	Flash memory allows remote software updates over the network using FTP or proprietary 'upgrade.exe' software
<b>Management</b>	Configuration is achieved using a proprietary setup program and the Web server built-in Admin. Page

### **6. Mechanical**

<b>Dimensions</b>	H x W x L = 1.8" (45mm) x 3.3" (92mm) x 5.8" (146mm)
<b>Weight</b>	4.1 lb. (1855g), without Power supply
<b>Dimensions</b>	160 x 201 mm (Dome 132 mm) 6.40 x 8.04 inch (Dome 5.28 inch)
<b>Weight</b>	approx. 4.6 lb (2.1kg)

### **7. Environmental**

(\*) This data is a target specification.

<b>Operating Temperature</b>	32° to 104° F (0° to 40° C)
<b>Storage Temperature</b>	-4° to 104° F (-20° to 60° C)
<b>Relative Humidity</b>	10 to 75% (No condensation)
<b>Storage Humidity</b>	10 to 95% (No condensation)
<b>Typical</b>	1.5A, Peak 3A
<b>Environment</b>	Indoor*

\*Always use the attached Dome to prevent dust or other contamination.

## Appendix 2 - Frequently Asked Questions

This is the FAQ document for VersaCam IC Series products. This document provides answers to questions that often arise in the process of installing and operating the VersaCam Internet camera.

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  - 1.3. [Control and Utility Programs](#)
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## 1. Frequently Asked Questions

### 1.1. VersaCam Features

- **Q: What are VersaCam IC Series cameras?**

**A:** VersaCam IC-Series cameras are integrated web cameras and servers with additional abilities to transmit images using FTP and e-mail. Each camera contains a CCD module, web server, FTP and e-mail clients, and networking hardware. VersaCam captures, processes, and transmits digital images through a network connection. As the VersaCam can be configured to operate as a Web server, it does not require a separate dedicated server in most cases (depending upon number of simultaneous users). After installing the VersaCam at the desired site, you may monitor images from your choice of remote sites.

- **Q: What preparation is needed for installation?**

**A:** A VersaCam requires only AC power and a 10BaseT type network connection.

- **Q: Which algorithm is used to compress digital images?**

**A:** The VersaCam IC Series uses a wavelet algorithm to compress digital images. Wavelet is a still-image based compression algorithm. This means that each frame is captured individually, and can be viewed individually (unlike MPEG images), making it ideal for security applications. The VersaCam compresses and transmits these still images at very high speed to provide high speed streaming video.

- **Q: What is the difference between Wavelet algorithm and JPEG in compressing digital images?**

**A:** Wavelet is more efficient than JPEG by 30-300%. The higher efficiency of Wavelet comes from its encoding method. The Wavelet algorithm uses DWT (Discrete Wavelet Transform) while JPEG uses DCT (Discrete Cosine Transform). Due to its efficiency, Wavelet has also been adopted for JPEG 2000 digital image compression.

Since Wavelet is not yet fully standardized, it requires the installation of a browser plug-in or Active-X control to view VersaCam images through such standard web browsers as Netscape and Explorer. The size of a typical Plug-in or Active-X control for Wavelet images is often as large as 3 megabytes, requiring a long download time. However, Pentax provides Plug-in and

Active-X controls of only 300KB, requiring a much shorter download time, especially over a dial-up connection.

- **Q: Can VersaCam IC Series support multiple users with different resolutions at the same time?**

**A:** The VersaCam IC Series can support up to 100 users with different resolutions at the same time. Moreover, VersaCam has progressive mode (image quality builds slowly over time) and gray mode. As these modes require much less bandwidth than full color images, these can be accessed by dial-up connections with reasonable results. One user can monitor full resolution (720 X 486) color images while another user views half resolution (360 X 243) B/W images.

- **Q: What is the maximum transmission speed?**

**A:** The VersaCam IC Series compress and transmit up to 30 frames per second, and operates on a 10BaseT network. However this speed is not necessarily available to every user. Actual transmission speed may depend on the performance of the user's PC and available network bandwidth. A few things must be remembered when attempting to calculate transmission speed:

The maximum transmission speed is 30 frames per second to any individual user. However, this does not necessarily mean that any number of users can simultaneously receive 30 frames per second. Although the VersaCam can keep track of transmission of images for up to 100 users simultaneously, it is limited by available network bandwidth. For example, if 5 users are receiving 10 frames per second, the total frame count that the VersaCam will need to transmit is 50 frames per second. The total bandwidth required to transmit 50 frames per second (of 10KB images) is within the full bandwidth capacity of a 10BaseT network. Such networks can typically handle 123 frames of 10KB images per second, assuming no other devices are also trying to consume that available bandwidth. Listed below are the sizes of a very complex image (highly detailed and difficult to compress) and a fairly simple image (less detail) at various resolutions and image quality (compression level) settings:

Image Resolution	Quality	Complex File Size	Simple File Size
720 x 486	9	77KB	24KB
720 x 486	5	49KB	16KB
720 x 486	2	33KB	12KB
360 x 243	9	29KB	10KB
360 x 243	5	22KB	8KB
360 x 243	2	17KB	6KB
180 x 121	9	17KB	7KB
180 x 121	5	12KB	5KB
180 x 121	2	8KB	4KB

- **Q: Does the VersaCam IC Series support Pan/Tilt/Zoom functions?**

**A:** The VersaCam IC-360 model, being a dome camera, has its own pan/tilt/zoom mechanism. The other cameras in the VersaCam IC Series family support stand-alone pan/tilt/zoom mechanisms that respond to ASCII motion commands over an RS-232 or RS-485 serial connection using the DB-15 connector on the rear of the camera. Such devices can be controlled remotely by sending commands over the network to the VersaCam that are in turn sent to the PTZ mechanism.

- **Q: Is there any limitation to login name and password length?**

**A:** Login names and passwords must be comprised of 9 or less bytes both for user and administrator accounts.

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## 1.2. VersaCam IC Series Installation

- **Q: What network connection may be used?**

**A:** Any normal IP based 10BaseT connection can be used. If you must use an xDSL, cable modem or ISDN connection that requires a dynamic IP address (DHCP), the process of installing and accessing the VersaCam is a bit different than if a fixed IP address is available. For many reasons, a fixed IP address is preferable.

- **Q: What is maximum acceptable length of network cable?**

**A:** UTP cable that is used on a LAN can be extended up to 325 feet (100 meters) without bridging.

- **Q: Can the ordinary telephone lines (POTS) be used to connect the VersaCam to the network?**

**A:** Telephone lines can be used to connect the VersaCam, but it is necessary to equip your system with a telephone modem router. Pentax will provide information on such devices upon request. However, it is not efficient to use telephone lines to transmit images because the speed is very low. At best, a V.90 connection will supply 33,600bps uplink speed for transmission. Compare this to a 10,000,000bps LAN connection and you can quickly understand the difference.

- **Q: Is a special housing needed when a VersaCam is installed outdoors?**

**A:** The VersaCam cameras are not weatherproof. Therefore, it is necessary to install the camera into a weatherproof housing for outdoor installations.

- **Q: When the network to which the VersaCam is installed is made up of one public IP address and several private IP addresses (virtual private network), can the VersaCam be connected to the network with a private IP address?**

**A:** If the VersaCam IC Series is to be used as a Web server, it cannot be assigned a private IP address unless it will be viewed only from within the virtual private network, or pointed to as a server by the network's router. Private addresses cannot be directly "seen" from the outside world.

A virtual private network that presents a single static IP address is normally equipped with such a router and is comprised of a local network with various private IP addresses. In this case, all the devices connected on the local network are assigned private IP addresses by the network administrator. However, all of the devices communicate with remote devices (those outside the local virtual private network) using a single "real world" IP address. The router converts the private IP addresses into the single real IP address, and allows local devices access to devices outside the network. This function is called NAT (Network Address Translation), and can be used to connect the VersaCam to a virtual network as a server for its images.

When you configure a router, you can designate a local device as a local server among all the connected devices. You have to supply the VersaCam's IP address to the router as a local server address.

- **Q: When a network is made up of only private IP addresses, can a VersaCam be connected to the network?**

**A:** The VersaCam can be connected to LAN having only private IP addresses as long as only local users on that network expect to access the VersaCam.

- **Q: Can the VersaCam be installed on a network that employs a firewall?**

**A:** If there is a firewall on the network, Port 80 is normally open for ordinary data communication. However, since the VersaCam transmits image data, the default Port 8080 is used by VersaCam. It is normally necessary to open Port 8080 of the network for users outside of the firewall who are expected to access the VersaCam.

However, typical firewall installations often open only Port 80 to enhance network security. In this case, either the firewall must be reprogrammed to enable access to Port 8080, or remote users must access the VersaCam with the "Server Push Viewer" that can be found in the 'Image Viewers' - 'Other' menu in the 'Default Viewer' list. Server Push Viewer enables the VersaCam to communicate through Port 80. "Server Push" is, however, a slower means for transmitting images, and will noticeably slow the reception of images for the user.

Another method that may be used to resolve this problem is to move the camera's transmissions from Port 8080 to any port granted by the firewall. The VersaCam port usage may be reconfigured using the setting at the 'User Custom Configuration' page in the VersaCam's Admin page.

- **Q: How can a user view VersaCam IC Series images when using Netscape?**

**A:** If a user wants to see the real-time VersaCam images using the Netscape browser, it is first necessary to install the VersaCam plug-in program. The procedure for the plug-in setup follows:

- Access VersaCam using Netscape by addressing the
1. camera's assigned IP address (e.g., http://168.192.1.1/)
  2. Set up the VersaCam Plug-in using the Netscape Smart Update

The VersaCam plug-in for Netscape is stored and downloaded from the VersaCam itself. Accessing the camera, Netscape can download and install the plug-in quickly and easily. When a user connects to the VersaCam for the first time or has an older version of the VersaCam plug-in, the user must download the current plug-in by selecting "Download VersaCam Plug In Now!" from the Login menu. Then the user must click "Grant" to accept the VersaCam certificate and then select the "Install" button.

- **Q: How can a user view VersaCam images when using Internet Explorer?**

**A:** If a user wants to see the real-time VersaCam images using the IE (Explorer) browser, it is first necessary to install the VersaCam plug-in and to have installed a current version of the Active-X control for the Explorer Browser. The plug-in is used only for server-push mode, and the Active-X control is for the live image viewer.

If the Active-X control is not installed in your system, or is an old version, the installation of the Active-X control will occur automatically when an attempt is made to run it by the application. All the user needs to do is click on "Yes" when the PC asks whether it is to install it. If Explorer is to be used, we recommend version 4.0/5.0 or above.

When you access a VersaCam for the first time, or you access another VersaCam that is running on a higher level of internal software, your PC will note this and ask if you wish to install the Active-X control.

- **Q: What is to be done when the Active-X Control does not install properly?**

**A:** Occasionally, the VersaCam IC Series Active-X control program is installed improperly due to the configuration of some computers. In this case, the user may not see the VersaCam image on the screen or will see the message "No Video Input" in the image area. To solve this problem, the user should remove and attempt to reinstall the VersaCam Active-X control program as follows:

Remove the VersaCam control program by clicking the right mouse button and selecting the 'Remove' menu. For a PC that uses Windows 98, the program is installed in the directory C:\windows\Downloaded Program Files. For a PC running Windows NT or 2000, it is in the directory C:\winnt\Downloaded Program Files. Then, access the VersaCam again by its IP address and install the Active-X control program.

If you do not see video even though you have performed the above-mentioned process, first assure that the camera can be viewed from another PC or browser before attempting to further troubleshoot the problem.

- **Q: The viewer loads correctly, and no message occurs indicating that a problem has occurred, but no video is visible for the VersaCam's own built-in CCD camera. What could the problem be?**

- **A:** (For VersaCam IC-4 and IC-R20 models with external camera input)

Since no error or "loading" message is visible, it is likely that the video from the VersaCam's internal CCD module is not being transmitted, but rather, that of an unused external video input. Therefore, one possibility (for multi-input VersaCam models) is that you have selected the external video source for Channel 0 to which no camera is attached. Note that Channel 0 can be used either for the 1st BNC input or the internal CCD on models so equipped. In the VersaCam setup program or administrator's page, you can access "System Configuration". At the bottom of the page, there is a menu item "Attached CAM#1" by means of which you can select either the video source "Ch0(Internal)" for the internal CCD or "Ch1(External)" for an external CCTV camera. To see video from the VersaCam's internal CCD module, you should select "Ch0(Internal)". "Ch1(External)" should be selected only to see video from an external CCD camera that is connected to the first external BNC video port on the rear of the VersaCam BNC, depending upon the camera model.

A second possibility is that you have not activated the internal CCD module. To activate the internal CCD module, in the VersaCam setup program or VersaCam administrator's page, access "Video Configuration". At the top of the page, there is a menu of "Select Video Channel". At the menu you select "Ch#0(Internal)", and at the next menu of "Video Input Control" you select "Enable". This process determines whether to permit video from the internal CCD or not.

The last possibility is that you have enabled external channels to which no external cameras are connected. To use external cameras, you should connect external RS170 type CCTV cameras to BNC ports (or DB-15 port) in the rear of VersaCam, and activate them from the VersaCam setup program or administrator's page. If you do not activate channels that are connected to external ports, their video will not be seen. If you activate channels for external cameras without connecting them to their ports, all video signals on the browser page may be influenced due to the lack of proper termination of the port. The video may be seen dimly or in B/W mode.

- **A:** (For all VersaCam IC Series models)

In the event that the video from external cameras is not seen, one cause may be that you have not activated the channel(s) for external CCD cameras. In VersaCam IC Series setup program or administrator's page, access the configuration page for "Video". At the top of the page, there is a menu "Select Video Channel". At this menu, you may select the channel(s) for which you plan to connect external CCTV cameras. In the next menu, "Video Input Control", you must select "Enable". This process is to determine whether to enable transmission of video for the external camera(s).

(For VersaCam IC Series models with external camera input)

It is also possible that a BNC cable is not connected properly between the external CCTV camera and the VersaCam. Though the cable is connected physically, there still is a possibility of a broken or unstable connection between the VersaCam and an external CCTV camera. In this event, the user may see poor quality video or no video

at all. If you encounter this condition, check if the BNC cable is defective or improperly connected. Often, the user will neglect to fully twist the BNC connector after installation to lock it into place.

- **Q: Which pan/tilt/zoom mechanisms can be installed with the VersaCam?**

**A:** While the IC-360 contains its own pan/tilt/zoom mechanism, the other members of the VersaCam IC Series family also have the ability to control external pan/tilt/zoom devices on-line. Such PTZ devices are connected to the VersaCam through its DB-15 port or Terminal Block interface in the rear panel (the connection method depends on the VersaCam model). Consult the manual for your model of VersaCam to determine whether RS232 or RS-485 devices are appropriate, and which pins are to be used from the DB-15 connector for this purpose.

Using the RS-485 connection, you can install various models of Pelco and the PTZ devices of several other U.S. companies. The VersaCam can be programmed to send specific commands to control pan, tilt, zoom and focus functions in response to commands. You can also install pan/tilt/zoom devices that use an RS232 or RS-422 interface to the VersaCam's RS232 connections. Some VersaCam models are already programmed for support of Pelco's D and P protocols. When using Pelco products, it is necessary to employ a signal level converter to shift the RS232 output of the VersaCam to the RS-422 levels required by the Pelco device. These converters are sold at any outlet carrying Pelco products, or at many computer interface specialty companies such as Blackbox Co.

With RS232 connections, you can install the pan/tilt driver of Surveyor Co. and other vendors. For detailed descriptions of the interface connections, please refer to Appendix 7.

- **Q: It is impossible to assign an IP address to the VersaCam with the ARP command. What is the problem?**

**A:** The ARP command may only be used on a local network. With a PC or a notebook computer, you can assign an IP address to any VersaCam connected on a local network with the ARP command or with the VersaCam setup program. If you cannot assign an IP address to a VersaCam with the ARP command, you should check the following:

First, observe the green LED in the rear of VersaCam. Disconnect and then reconnect power to the camera. When you supply power to the camera, the green LED comes on for about two seconds then and then turns off. Afterwards it blinks once about every two seconds. If the green LED begins to repeat blinking on for four seconds and off for one second, there is a problem with the network connection. There are several possible reasons for this, including using the wrong (crossover vs.. straight through) network cable, no real network connection from the wall jack to the network, the use of a hub that supports ONLY 100BaseT connections (the VersaCam requires 10BaseT), and other conditions. If the network connection is faulty, you should check whether your network cable is of the correct type and works properly and that the host or hub can handle 10BaseT connections.

If the green LED blinks normally, check the IP address of the PC or notebook computer being used to ARP the camera. As explained before, the ARP command may only be used across a local network. To be connected across a local network means that every device on the network uses the same starting numbers of the local IP address (e.g. if your computer's address is 204.131.189.xxx, you should only be attempting to ARP assign a similar 204.131.189.xxx

address to the camera). If your PC or notebook has a "non-local" IP address (any of the first 3 sets of digits are different) compared to an IP address that you are attempting to assign to VersaCam, you will be unsuccessful. For example 204.131.189.213 and 204.131.189.214 are part of the same local Class C network. Addresses 203.131.189.213 and 204.131.189.214 are not. If the camera is being connected directly to a single computer for configuration, it is easy enough to temporarily modify the IP address of the computer to match the desired address block of the camera.

Another source of trouble occurs when two devices are assigned addresses in a "split" network. It is possible to subdivide a local network into multiple pieces that, while they share the same first 3 sets of digits in their addresses, are not local to one another. In this case, your network coordinator must identify for you the range of addresses that are local so that you can restrain your camera address programming to those ranges. For example, the range of 204.131.189.0 through 204.131.189.127 may comprise one local network, and 204.131.189.128 through 204.131.189.255 another. This is handled by means of "Network Mask" numbers, and must be handled through your network coordinator.

- **Q: Sometimes I can access the VersaCam and sometimes not. How can this problem be solved?**

**A:** This problem occurs most often on Cable Modem, ISDN, and xDSL lines that use modems or routers. Those lines connect the VersaCam to the ISP through their modems or routers, and the modems or routers are set to disconnect their connection during idle times while no data (in this case, our VersaCam images) is being sent. Generally, a modem or a router is set to disconnect the subscriber's computer from the network after 3-5 minutes of idle time. In that case, there is no way for users to access the VersaCam; the VersaCam does not require a modem or a router to connect a line nor send any image unless a user attempts to access it. Conversely, there is no way to restart camera activity if there is no way for the user to access the camera.

If you have such access time-out problems with xDSL, Cable Modem, and ISDN networks, you should set the 'Dynamic IP Registration Interval' from the administrator's page to once each 60 seconds, using an unused domain address, even if you have assigned a static IP address to the camera. With this setting, the VersaCam will attempt to connect to the unknown domain once per minute to register its IP address to a dynamic IP registration server. This data activity will assure that the modem maintains a connection to the VersaCam. Any interval shorter than the time-out established by the ISP will suffice.

---

### 1.3. Control and Utility Programs

- **Q: What should I do if runtime errors occur when running the Plug-in/Active-X control?**
  - **A:** If you see a box containing the message "Mismatched Version" or similar, do the following:
    1. Reinstall the Plug-in or Active-X control contained in the VersaCam.
  - **A:** If you see a box containing the message "VersaCam client initialization has failed" or similar, do the following:

1. The problem is that the user's PC does not contain the Winsock2 library. Download the Winsock2 library, which is available on numerous public sites.
2. Install it into your system, and then rerun your web browser.

- **Q: I can't see the images in the VersaCam Java Applet view page. I am using the Netscape browser on a Macintosh computer.**

**A:** You need to install MRJ (Macintosh Runtime for Java) and MRJ Plugin for your Netscape browser. Please take the following steps for installing them:

1. Go to <http://www.apple.com/java/> and download MRJ v2.2.4.
2. Delete the existing MRJ package's folder ("root/Apple Extras/Mac OS Runtime for Java") if it exists.  
Install the MRJ package downloaded from step 1.
3. (Refer to the Apple's Java site for detailed information.)
4. Go to <http://www.mozilla.org/oji/MRJPlugin.html> and download the Netscape MRJ Plugin.
5. Refer to the installation procedure at the Mozilla web site.  
Try again to see images in the VersaCam Java
6. Applet view page after installing Netscape's MRJ Plugin.

- **Q: I can't automatically download the Plug-in/ActiveX Control for the VersaCam. What's wrong?**

**A:** Basically, the Plug-in for Netscape browser and the ActiveX control for Internet Explorer are designed to be downloaded and installed automatically on the user's computer. But, for the Netscape Plug-in, if the Netscape browser can't support the SmartUpdate function, the automatic installation after downloading may fail. In case of ActiveX Control, if the IE browser's version is less than v4.0 or the registry information of system is corrupted, it may not automatically download and install on your computer. There are many situations that may prevent the control from to be installed automatically because the modern computer system is very complex in its configuration and applications. So, for getting around such problems with the installation of Active-X controls, we have prepared a manual installation program for VersaCam Plug-in/ActiveX control. Please try to use that program.

1. Download the manual installation program at <http://www.versacam.com>.
2. Set up the manual installation program.

- **Q: I can't run the setup program delivered with my VersaCam IC Series.**

**A:** The setup program is an MFC-based windows program. So, if MFC42.DLL is not installed or an incompatible version is installed in your computer, the setup program may fail to start. If the program shows a message like "...MFC42.DLL...not found...", you must install MFC42.DLL. The installation procedure is the following:

1. Download [MFC42.CAB](http://www.versacam.com/MFC42.CAB) from www.versacam.com
2. Unzip the .cab file into your temporary folder.
3. Execute the "mfc42.exe".

- **Q: When using the setup program, when I select one of the VersaCam cameras in the list box and press the "Change IP Address" button, the setup program returns the "No Response" message.**

**A:** If the "Obtain an IP address automatically" option is set in your (Win98) Windows Control Panel / Network / TCP/IP / IP setting or in (Win2000) My Network Places / Properties / Local Area Connection / Properties / TCP/IP setting, temporarily change it to "Use the following IP address" option as a static IP address. After install, change the IP address of your VersaCam to one within your site's IP subnet so that you can access it. If you fail to change the IP address of the camera using the setup program after doing that, please advise us of your computer's operating system and the version of VersaCam.

- **Q: When using the setup program, when I select one of the VersaCam cameras in the list box and press the "Start Configuration" or "Rebooting" button, the setup program returns the "No Response" message.**

**A:** If the IP address of the camera you selected is not in the subnet of your computer, you will receive the "No Response" message. Please be sure that the camera's IP address is in same subnet with your computer by using the "Change IP address" button.

---

#### 1.4. Inserting Images into HTML Pages

- **Q: How can I insert .eye images into my web site's home page?**

**A:** The following is sample code to make this insertion. If you want to use other file extensions, other than ".eye," the other file extension should be associated with the application/x-webeye MIME type in your web server for properly displaying the files as the camera's image.

```
<HTML><HEAD><TITLE> Show the eye file. </TITLE></HEAD>
<BODY>
<center><p><b><font size="4"> HTML file including the eye file.
  <br></font></b></center>
<hr><center>
```

```

<table width="500">
<tr>
<td><p>
<object id="webeye" codebase="http://204.131.189.217:80/wg_webeye.cab"

classid="clsid:A8739816-022C-11D6-A85D-00C04F9AEAFB"
align="center" width="486" height="720">
<param name="src" value="http://pentaxtech.com/client_pull/image2.eye">
<embed type="application/x-webeye" name="pulling"
src="http://www.pentaxtech.com/client_pull/image2.eye"
align="center" width=486 height=720
pluginspage="http://204.131.189.217:80/wg_webeye-install.html"></embed>

</object>
</td>
<tr>
<td><Br><Br><Br>
<object id="webeye" codebase="http://204.131.189.217:80/wg_webeye.cab"

classid="clsid:A8739816-022C-11D6-A85D-00C04F9AEAFB"
align="center" width="360" height="243">
<param name="src" value="http://pentaxtech.com/client_pull/image2.eye">
<embed type="application/x-webeye" name="pulling"
src="http://www.pentaxtech.com/client_pull/image2.eye"

align="center" width=360 height=243
pluginspage="http://204.131.189.217:80/wg_webeye-install.html"></embed>

</object>
</td>
</tr>
</table>
</center><hr>

<p align="center">
<font size="2">Copyright (C) 2000-2001 Pentax Technologies</font>
</p>
<p align="center"> </p>
</BODY>
</HTML>

```

In the source code, bold items are to be edited by the user. The <param> tag is used for OCX on IE, and the <embed> tag is used for Plug-ins on Netscape. Using this code requires a change to the IP address for your VersaCam and the URLs of the pages on your server where the .eye files to be displayed can be found.

The applet needed for users to view .eye images in your html pages is taken from one of your cameras – in the above example, a camera at 204.131.189.217.

**Caution** - In Netscape version 6.0 and 6.01, you cannot see the wavelet data and image data (eye file) because those Netscape versions have a basic set of live connect functions that are provide by Plug-ins. It is not clear that this problem is solved on the next version of Netscape. If you want more detailed information about this problem, then visit <http://home.netscape.com/eng/mozilla/ns6/relnotes/pv6-1.html#problems>.



## Appendix 3 - Utilizing IP Addresses on a Local Network

### 1. Introduction

A lot of business is done via the Internet. We share information by transmitting it through E-mails and searching the world of the Internet. IP addresses are what we utilize to access to the Internet.

Currently, IP addresses are limited. There are currently five classes of networks in the world and a given network contains many IP addresses. A network can only have a limited number of IP addresses. The numbers depends on the network class. Five classes of network are given letters A through E, and the most common one is the C-class network.

### 2. IP construction and Network class

#### 1) IP construction

xxx	xxx	xxx	xxx	(xxx: 0 – 255)
X1	X2	X3	X4	

#### 2) Network class

**A class:** A local network that contains IP addresses from 0 to 127 at 'X1'.

Network ID: X1

Host ID: X2, X3, X4

Total number of A-class networks is 128 in the world.

**B class:** A local network that contains IP addresses from 128 to 191 at 'X1'.

Network ID: X1, X2

Host ID: X3, X4

Total number of B-class networks is 65,534 in the world.

**C class:** An Internet network that contains IP addresses from 192 to 223 at 'X1'.

Network ID: X1, X2, X3

Host ID: X4

This is the most common network in the world and the total number of C-class networks is 2,097,152

**D class:** A network that contains IP addresses from 224 to 239 at 'X1'. A D-class network is for multicasting only and is not allowed for other uses.

**E class:** A network that contains IP addresses from 240 to 254 at 'X1'. The E-class network is reserved.

### 3. C-class Networks

#### 1) Features of Addresses

**IP address:** The three digits in 'X4' are for the Host ID and the numbers are allowed from 0 to 255. Among the numbers, 0 is used for the Network ID, 1 is used for Router IP (Gateway address) and 255 is used for a Broadcast address. Therefore, the numbers from 2 to 244 are IP addresses that can be assigned to VersaCam, PCs, etc.

**Network ID:** This is to identify a network. Generally the first number is assigned as a Network ID.

**Gateway address:** This is an IP address of the router that is connecting the Internet and a local network. Remote users can access a local network over the Internet through a gateway (router). Generally, the second number is assigned as the Gateway address.

**Broadcast address:** This is for broadcasting to all devices that are connected on a local network. The broadcast address is a destination for broadcasting. All devices connected on local network have the same Broadcast address.

**Subnet Mask address:** This is to divide a local network into remote networks. A Subnet Mask address serves as a border. The addresses that can be used as a Subnet Mask addresses are limited (0, 4, 8, 16, 32, 64, 128)

## 2) Network configuration

### (1) To use as a local network

Network ID: xxx.xxx.xxx.0  
Gateway Address: xxx.xxx.xxx.1  
Subnet Mask Address: 255.255.255.0  
Broadcast Address: xxx.xxx.xxx.255  
IP Addresses: xxx.xxx.xxx.2 – xxx.xxx.xxx.254

### (2) To use as two remote networks (1/2 + 1/2)

Sub-Network ID: xxx.xxx.xxx.0  
Gateway Address: xxx.xxx.xxx.1  
Subnet Mask Address: 255.255.255.128  
Broadcast Address: xxx.xxx.xxx.127  
IP Addresses: xxx.xxx.xxx.2 – xxx.xxx.xxx.126

Sub-Network ID: xxx.xxx.xxx.128  
Gateway Address: xxx.xxx.xxx.129  
Subnet Mask Address: 255.255.255.128  
Broadcast Address: xxx.xxx.xxx.255  
IP Addresses: xxx.xxx.xxx.130 – xxx.xxx.xxx.254

### (3) To use as three remote networks (1/2 + 1/4 + 1/4)

Sub-Network ID: xxx.xxx.xxx.0  
Gateway Address: xxx.xxx.xxx.1  
Subnet Mask Address: 255.255.255.128  
Broadcast Address: xxx.xxx.xxx.127  
IP Addresses: xxx.xxx.xxx.2 – xxx.xxx.xxx.126

Sub-Network ID: xxx.xxx.xxx.128  
Gateway Address: xxx.xxx.xxx.129  
Subnet Mask Address: 255.255.255.192  
Broadcast Address: xxx.xxx.xxx.191  
IP Addresses: xxx.xxx.xxx.130 – xxx.xxx.xxx.190

Sub-Network ID: xxx.xxx.xxx.192  
Gateway Address: xxx.xxx.xxx.193  
Subnet Mask Address: 255.255.255.192  
Broadcast Address: xxx.xxx.xxx.255  
IP Addresses: xxx.xxx.xxx.193 – xxx.xxx.xxx.254

## Appendix 4 - Updating VersaCam IC-360 Firmware

### Warning

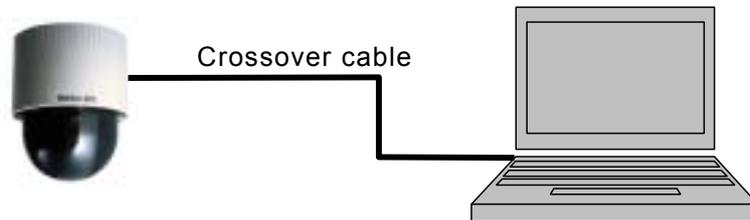
This process is for updating the current firmware that is already installed into your VersaCam 360 with new updated firmware.

To begin the process, wait until the 'Loading complete' message appears. During the process, do not disturb the VersaCam or disconnect network lines or power. Otherwise, your VersaCam can be damaged, which may result in inappropriate operation or operational failure.

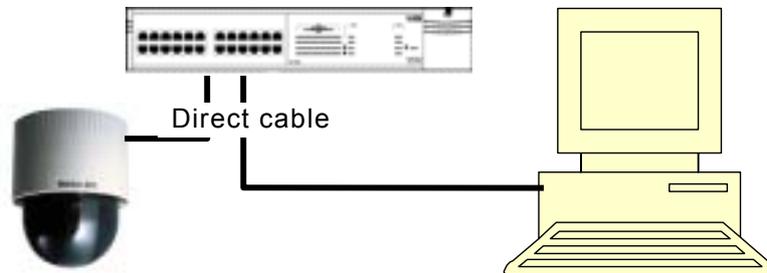
If you fail to completely update the VersaCam firmware or the VersaCam does not operate properly after the updating process, contact your distributor or Pentax Customer Service.

### 1. Connect VersaCam 360 to a PC.

When you update your firmware, it is strongly recommended that you connect your VersaCam to a PC directly\* using a crossover cable.



If a crossover cable is not available, you may perform the update with a direct cable connected a HUB (LAN). When you perform an update via a LAN, your VersaCam and PC should be connected on local network.



\* You may also update the firmware via a remote network.

## 2. Upgrading firmware with the upgrade program

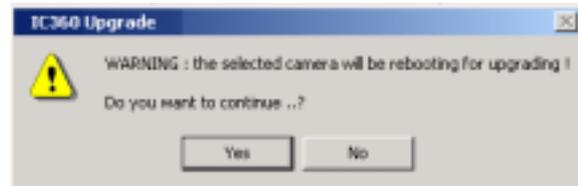
(1) Begin the upgrade program by selecting the VersaCam that you are going to update. Click on the IP address or MAC address in the list.

When an IP address appears in the box 'Selected IP address', key in the administrator's password in the box 'Administrator's password'.

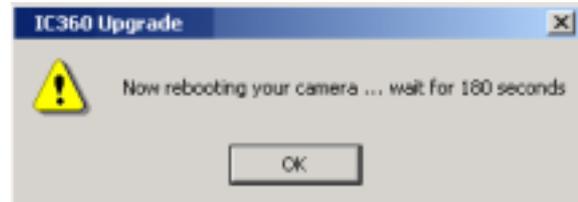
Then click the 'Start' button.



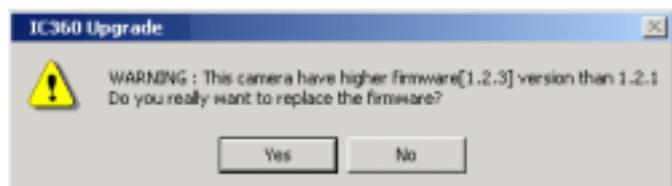
(2) Click the 'Yes' button to reboot the VersaCam.



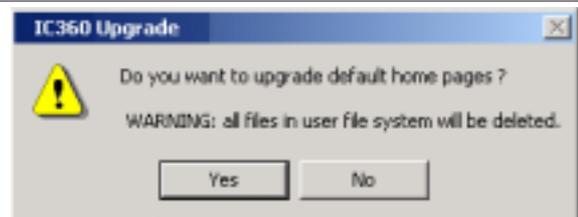
(3) Click 'OK' button to start the rebooting process.



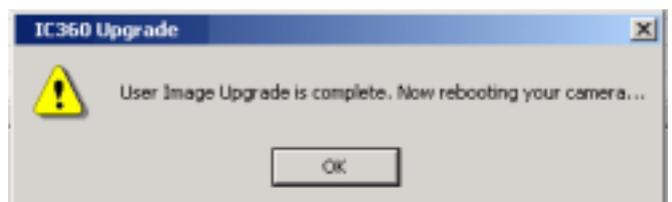
(4) If the VersaCam has a different firmware version, you are asked whether to replace it with a new one. Confirm by clicking 'Yes'.



(5) You will be asked if you want to format the user file system. If you want to maintain the current format of the VersaCam web pages, click 'No.' to use the default one, click 'Yes.'



(6) When the upgrade is completed, reboot the VersaCam by clicking the 'OK' button.



(7) If you have another VersaCam to upgrade, follow the same process from (1) to (6). If not, quit the program by clicking the 'Exit' button.

Appendix 5

## Appendix 5 - VersaCam IC-360 Physical Installation Guide

### 1. Contents

Item	QTY	Remarks
Ceiling Suspension Bracket	1	Connector Board attached
AC Adapter Mounting Plate (I)	1	
AC Adapter attachment screw M3	6	
Camera attachment screw M3 (M)	1	
Tapping screw M4 (F)	3	
Safety wire (A)	1	
Safety wire attachment bolt & nut	2	
Ceiling anchor screw	3	Use this item when necessary

### 2. VersaCam IC-360 physical installation procedure.

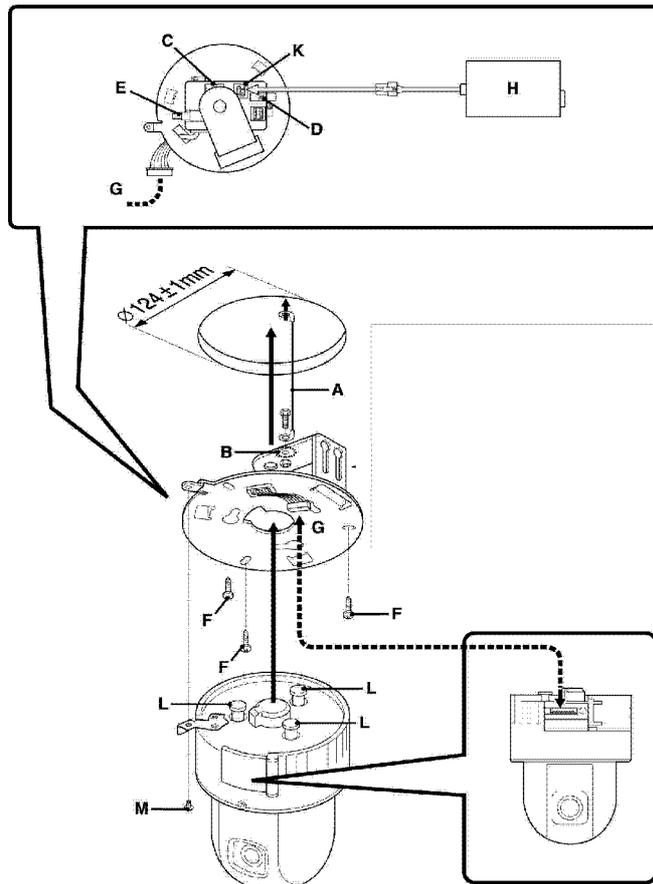
#### Caution:

You must install a VersaCam IC-360 with power disconnected. Otherwise, the dome may start turning when the camera data cable is connected and you may drop the camera.

- (1) Before installation, verify the strength\* of the location where the “Ceiling Suspension Bracket” is to be installed.
- (2) Make a 4-7/8” (124mm±1mm) diameter hole for bracket installation
- (3) Attach the bracket to the anchor with the “Safety Wire” (A). If the anchor point is located near the camera installation point, you can use it. Connect the safety wire (A) to bracket hole (B) with the included bolt and nut.

**Caution: The anchor bolt should be fastened strongly enough to hold no less than 22 lb (10kg).**

- (4) Connect the LAN cable to the Ethernet connector (C). If you want to see the video image through a CCTV monitor, connect a coaxial video cable to the Video Out connector (E).
- (5) Connect the 4” power adapter cable to the IC-360 power connector (K).
- (6) Put the bracket in the installation hole and attach it with three included M4 screws (F). Before



installation of the bracket, the camera data cable (G) must be connected to the camera body and pulled toward ceiling.

- (6) Power Adapter installation: The power adapter may be placed in a convenient spot near the camera. Make sure none of the cables (either the AC cable or the DC cable) are stretched tight. Do not connect the power adapter output cable to the 4” adapter cable at this time.
- (7) Connect the camera cable (G) to the camera body.
- (8) Connect the output connector of the AC adapter (H) to the 4” power adapter cable.
- (9) Insert the three camera body holders (L) to the holes of the suspension bracket and turn the body clock-wise to fasten. Attach it with the included M3 screw (M).

## Appendix 6 - VersaCam IC-360 Power Supply Installation Guide

### 1. 100-250VAC - 12VDC Supply For The VersaCam IC-360 (PW160)

#### 1) Checking the Package Contents

Check that the following items are included in the VersaCam package:  
 Power Supply (1), AC Power Cord (1), Attachment Hook (1) (not used), Camera Adapter Cable

#### 2) Installation

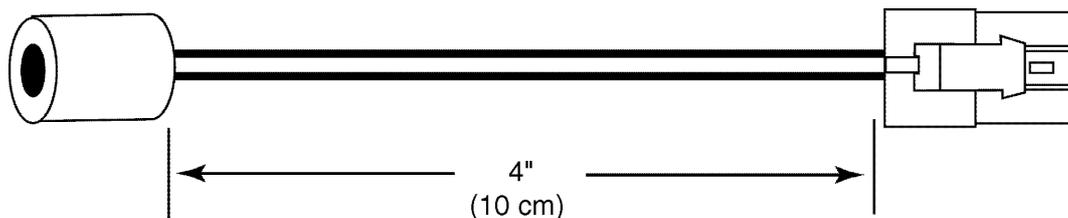
Place the power supply in a safe location (not likely to fall) near the IC-360 so that the cables easily reach the camera. Connect the adapter cable to the power cable, then to the camera into the appropriate connector. Make sure the camera is properly mounted before connecting the power supply cord to AC power because the dome may rotate automatically when power is applied.



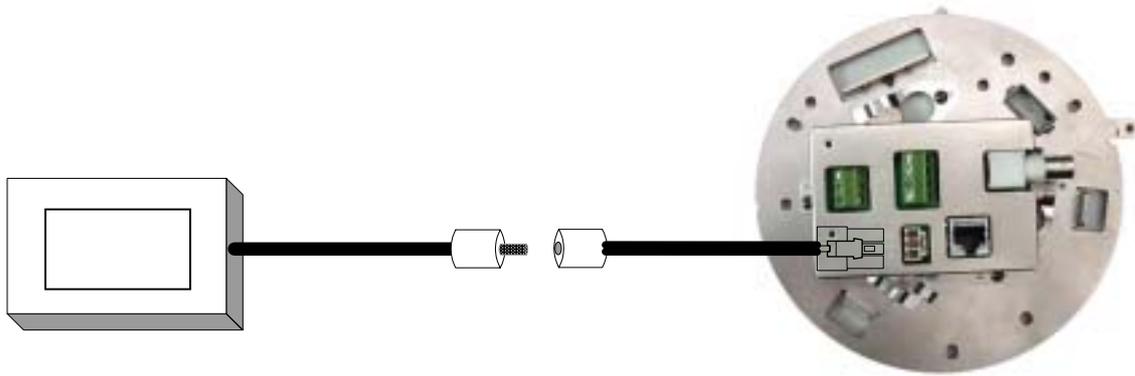
#### 3) Power Supply Specification

Model	PW-160
Input Voltage	100-250VAC±10%, 50/60Hz, 1.2A Max.
Power Out	12VDC ± 1%, 3.5A
Power Consumption	42 Watts max
Operating Environment	32-104° F (0 ~ 40° C), 5-95% RH (non-condensing)
Dimensions	1.46''H x 2.60''W x 4.20''D [37mm H x 66mm W x 107 mm D]
Weight	0.83 lb (285g) including power cord

#### 4) Adapter Cable View



#### 5) Connection Diagram



Power Supply

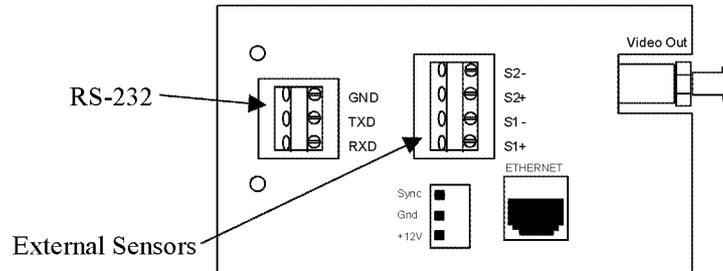
4" Adapter Cable

 <b>CAUTION</b>
Turn off or disconnect the power to the power supply before making any connections.

## Appendix 7 - VersaCam IC-360 External Device Connection Information

### 1. Connections and Connectors

The IC-360 makes use of two connectors on the top of the camera to make connections to external devices. The following illustration and text detail the function of these connectors.



### RS-232 Connector

Line Name

Line Description

RS232 Receive (RXD)

This input conforms to normal RS232C specifications for a “receive” line. At present, the IC-360 uses this connection only to receive audio from the optional audio module.

RS232 Transmit (TXD)

This output conforms to normal RS232C specifications for a “transmit” line. Baud rate and specific strings sent are configured in the camera’s administration page. While designed to control the optional audio module, this port can be configured for many other purposes by the user.

Ground (GND)

Ground reference for Pins 1 and 2.

### External Sensor Connectors

Line Name

Line Description

External Sensor 1 + Input (S1+)

This pin is connected through a 330 ohm series resistor to the anode of a Toshiba TPL504A or similar photo-coupler input diode.

In combination with Pin 2, which is connected to the cathode of the input diode, the signal here causes the Sensor

1 input of the camera to be triggered. In normal practice, power for this input can be taken from the 12VDC power input of the camera if an additional 680-ohm resistor is installed in series between the 12VDC and the sensor circuit. A sensor device may also supply its own switched voltage across Pins 1 and 2 providing the current is held to between 10 and 20 milliamps, remembering that the 300 ohm series resistor of the camera must be taken into account. For any sensor, a minimum of 200ms is required to assure trigger recognition.

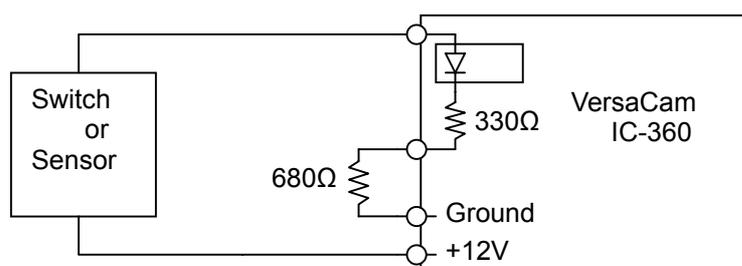
External Sensor 1 - InputSee Pin 1.  
(S1 -)

External Sensor 2 + Input (S2+)                      Electrically identical to Pins 1 and 2, Pins 2 and 3 represent the second external sensor input.

External Sensor 2 - InputSee Pin 3.  
(S2 -)

## Powering External Sensors

Because the IC-360 camera contains only an internal 330 ohm series resistor, an additional external series resistor is required to use the VersaCam IC-360's own 12V power to operate sensor circuits without damage to the opto-coupler.



Alternately, a device may supply its own voltage to activate the opto-couplers. For additional details on such circuits, please refer to the pin-out and interface information at the end of this document.