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# RedHand VisionIP and SafeGuard Implementation and Installation Guide

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## RedHand Software

There are two software items.

1. The **Housekeeper** is responsible for communicating with the cameras via the network. It stores the picture images on the computer's Disk and maintains the database. The Housekeeper must be running all the time.
2. The **Viewer** allows viewing of the pictures in an intelligent of way.

There are two versions of software – Guardian and Enterprise. Guardian offers a single PC installation where the Housekeeper and the Viewer resides on the same PC. The Enterprise version allows any number of networked viewers across the LAN, it also allows the copying of Picture images across the Internet to a distant PC. SMS capability is available to send messages when a camera is triggered.

## Cameras

There are two types of camera family:

- Network cameras - these attach directly to the network via an RJ45 Cat5 connector. These are used internally.
- Standard Video Cameras – these can be covert, dome, external, infrared etc. The video lead from the camera plugs into a Video Server (but in practice may go via a pair of Video Over Cat5 Balans), which in turn attaches directly to the network via an RJ45 Cat5 connector.

RedHand is designed to work with Pixord Video servers and Cameras. These have been selected as they offer superior motion detection facilities, which when used in conjunction with the RedHand software will result in no network traffic unless there is movement.

Both the Network Camera and a video camera (via a server) will appear on the network as standard IP devices, and can be managed via a web browser. The video server and the internal Network Camera are similar as far as management is concerned. They require static IP Addresses.

## Network Requirements:

The cameras have built-in video motion detection. Hence they do not transmit network traffic if there is no movement. When movement is detected, a small semaphore is sent from the camera to the Housekeeper PC. This PC then sends back a request to the camera requesting it to send JPEG images at the rate of two per second. The size of each image is usually in the range 25 – 35kb. There is a picture quality adjustment on the camera and this is repeated within the Housekeeper program set-up. The file size is proportional to picture quality and can be fine tuned to suite local requirements. If you are



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using this control, ensure you do it from within Housekeeper as this value is then saved on the database. Adjusting the camera through the Web interface will result in it being reset by the RedHand software.

There must be TCPIP connectivity for HTTP traffic (port 80) between the camera IP Address and the Housekeeper PC. Video motion detection communication between the camera and the Housekeeper is based on port 10001 for Cam1, 10002 for Cam2 etc. Any network firewalls must be configured to ensure these requirements are met. The PC Firewall and any anti-virus, anti-spam software and automatic updates must be disabled on the PC.

The housekeeper can optionally notify viewers that new pictures have arrived. This is handled by a UDP broadcast message from the housekeeper to all viewer PCs on 255.255.255.255 port 999. Since UDP is a non-routable protocol this will not be transmitted through routers, but works fine with switches.

## Computer Requirements:

### CPU and RAM

There is no limit to the number of cameras that can be deployed. The specification of the PC is dependant on the number of cameras that are likely to be sending pictures at the same time. This is measured as Consecutive Camera Count or CCC. For CCC values below 5 then a standard Office PC with 512Mb RAM and 80Gb of disk is likely to be sufficient. RedHand is I/O intensive and therefore as CCC becomes larger, so does the importance of utilising high performance 7200rpm disks with 8Mb cache. Two separate spindles also offer better performance as any page file activity is kept away from picture file writing. As a guide, with a CCC value around 10 and above, we would recommend 1Gb. For large installations will a CCC value of 20 and above, we would recommend utilising a dedicated server, rather than a standard PC. Obviously we would recommend as fast a CPU as possible.

The RedHand software has been extensively tested on XP-Pro but should operate on Windows Server 2003 and Win2000 with no problems. It will not run on any of the Win98 derivatives.

### Disk Size

Disk size requirements are dependant on the number of cameras, the likely utilisation of them and the number of days that file retention is required. Use the following as a guide for each camera. (Pictures are approx 30Kb each):

H = Number of hours for which you estimate the camera will be taking pictures each day  
D = Number of days retention

Space needed for one camera =  $H \times 3600 \times 2 \times 30,000 \times D$  – measured in Bytes. Divide by 1000,000,000 to convert to Gb



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So for a 7 day retention and a camera taking 3 hours worth of pictures a day, the above equates to 4.5Gb. Some camera positions, such as a reception area, will be taking more pictures than say a Stock Room camera.

## Housekeeper and Viewers

It is highly desirable for the Housekeeper PC to be solely dedicated to the purposes of RedHand. If it is used for other functions, the risk increases of the operator rebooting it. It is also useful for the PC to be arranged so that it will automatically boot on power up, and log in and run the Housekeeper software with no user intervention. This will allow full operational recovery after a power failure. We would also recommend an Uninterruptible Power Supply (UPS). This should feed the power to the cameras and any network equipment such as hubs and switches.

The Viewer software can be on the same PC as the Housekeeper. With the Enterprise version, it can also be on a number of other network connected PCs as well. The specification of a viewer PC is not so important. Again XP-Pro/Win2000 normal office PC spec will perform very adequately.

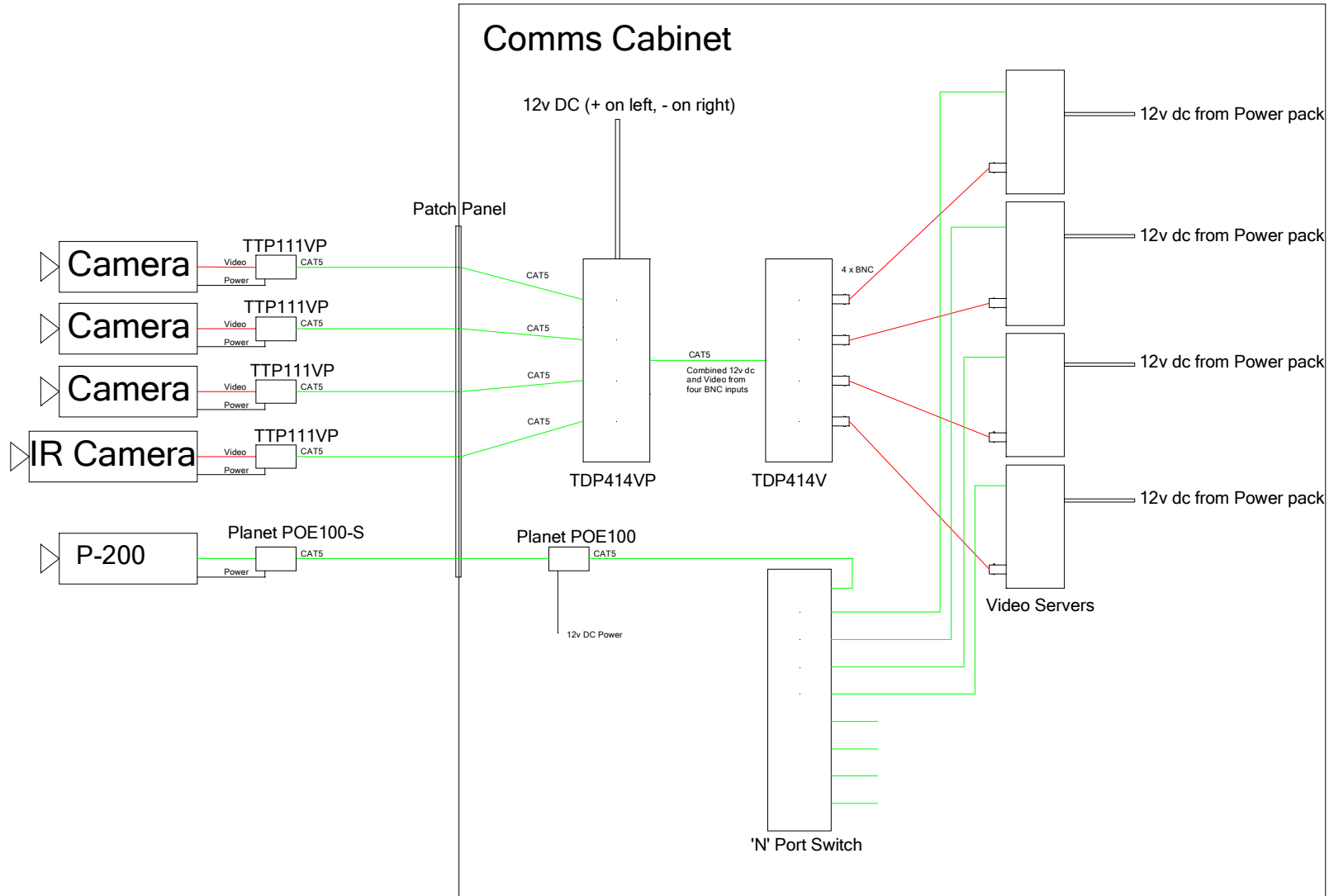
## Camera Installation

RedHand supports two camera types

1. Pixord P-200 Network Camera. This plugs directly into a Network Wall Port. It is an internal only camera and screws to the wall via the supplied bracket.
2. RedHand also supports any standard Video Camera with co-axial cable terminating in a BNC connector. This will connect to a P-1000 Video Server, which in turn connects into the network.

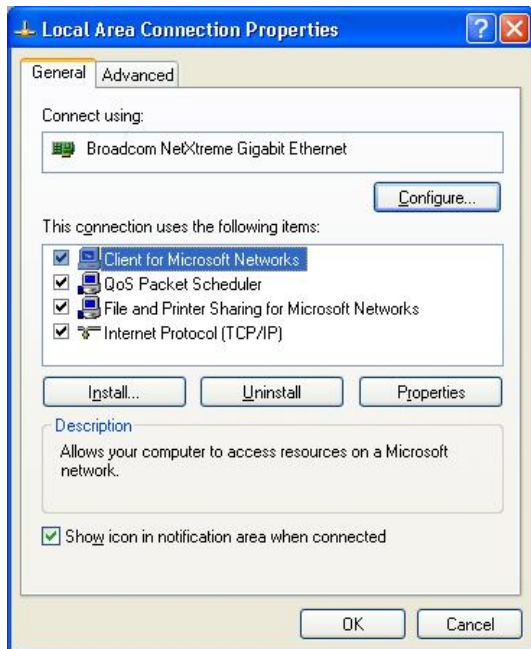
Fig 1 shows how the components are connected. The non-IR Camera is any type of internal or external camera that does not have Infrared capability (such as internal dome). The camera's co-axial cable is plugged into the BNC socket on the VPoE connector. The power connector to the camera connects to the power connector on the VPoE device. The VpoE device also has an RJ45 connector, which connects to a standard Cat5 cable, which is routed back to the server area. For neatness, it is usually convenient to mount the servers in a comms cabinet, possibly via a patch panel. This cabinet can also hold a USP. An identical VPoE device is connected to the end of the Cat5 Cable, and its BNC connection is plugged directly into the P-1000 server, or can be routed via a length of BNC cable as shown. A 12v power pack connects to this VpoE device.

The P-200 camera is a fully functional Network Camera with a built-in server. Therefore the Cat5 cable is connected directly to the camera or via PoE device., which carries data, rather than video. Standard Power over Ethernet devices are connected as shown in Fig 1.



**Fig1. Various Connection Options**

## PC IP Address



To check that the PC has been given a Static IP Address, click on Start/Settings/Control Panel/Network Connections. Select the Local area connection, right click it and select 'properties'. You should see a screen as on the left.

Select Internet Protocol (TCP/IP) and click 'properties'. Ensure that the PC has a static IP Address. Note that this housekeeper PC should not obtain its IP Address Automatically, as this implies a DHCP server and the actual IP Address could change which is not desirable. If there are no other PC's on the network then set the IP Address to 192.168.0.2 (which leaves 192.168.0.1 for a possible Router/Gateway) and the subnet mask to 255.255.255.0. The default gateway can be left blank.

## Software Installation and Licencing

A single executable file contains the full installation for both Housekeeper and Viewer. After unpacking you will be presented with the following screen:



You will only install Housekeeper once on the network, but may also install a copy of the viewer on the same PC. With Enterprise you can install a viewer on any number of PCs.

When Housekeeper is run for the first time, you will be asked to obtain a licence key. A RedHand licence allows you to run on a single PC. Contact the RedHand office (+44 (0)870 8870256 or E-Mail: [licence@redhand.co.uk](mailto:licence@redhand.co.uk)) and provide the PC

checksum that is presented to you by the software. Once the licence has been filled in, then the main screen will boot up and configuration can start.

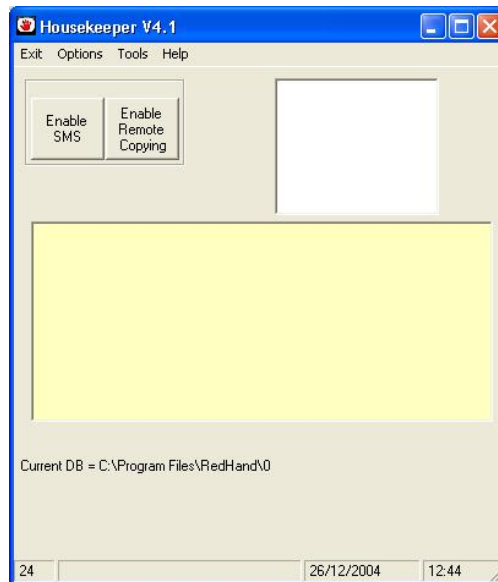
The viewer on the Housekeeper PC will share the same licence key. For each installation of viewer on a different PC, you will require a separate licence key.

## Enterprise Viewer Access Rights

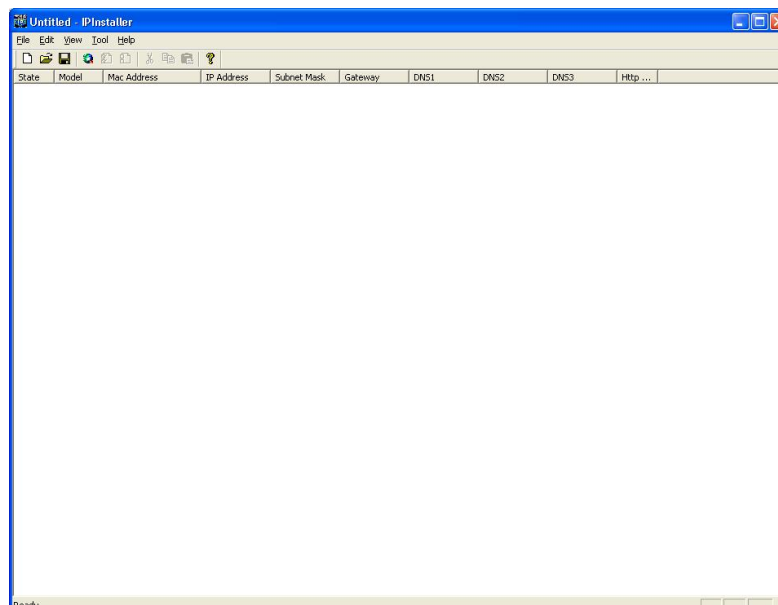
If you have an Enterprise licence and are installing Viewer on a different PC to the Housekeeper, you will be asked for the location of the database file. You must ensure that the directory, and all subdirectories, on the housekeeper PC is shared and that read/write access is allowed into this directory by all users who need to. The default directory is C:\Program Files\RedHand and the database file is EDDS.mdb. It is useful to carry out this task before Housekeeper starts to save pictures. Pictures created afterwards will then inherit the security rights of the main folder.

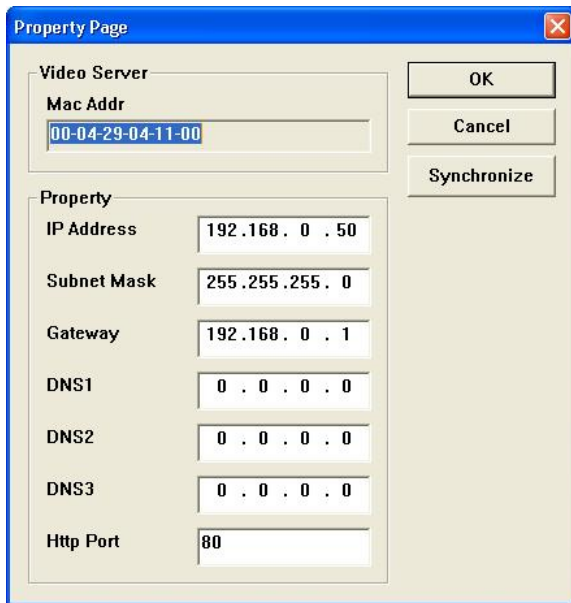
## Housekeeper Camera Configuration

Boot up Housekeeper:



The Cameras need to be given IP Addresses. Select Tools/IP Installer and you will be presented with the following screen:



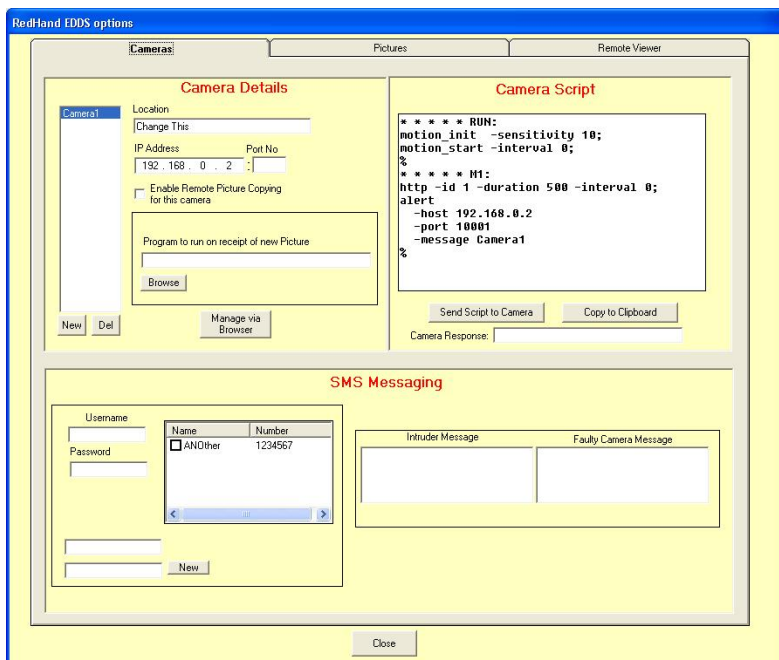


Select Tool/Search Network Device and you should see all the cameras/Servers that can be seen on the Network. Double click each in turn and select the IP Address and Subnet mask that is appropriate for your installation. If the PC has an IP Address of 192.168.0.1 then it is useful to start the cameras at 192.168.0.11 (Cam1), 192.168.0.2 (Cam2) etc. After you have set each one, click on Synchronize and this will set the IP Address in the Camera/Server and reboot it.

When all the cameras have been assigned an IP address, exit from the IP Installer. There is no need to save any settings when asked.

Cameras can now be configured as follows. Follow this procedure carefully for the first camera.

On the main Housekeeper screen, select Options/Edit Options and select the Camera Tab.



Name	Number
<input type="checkbox"/> ANOther	1234567

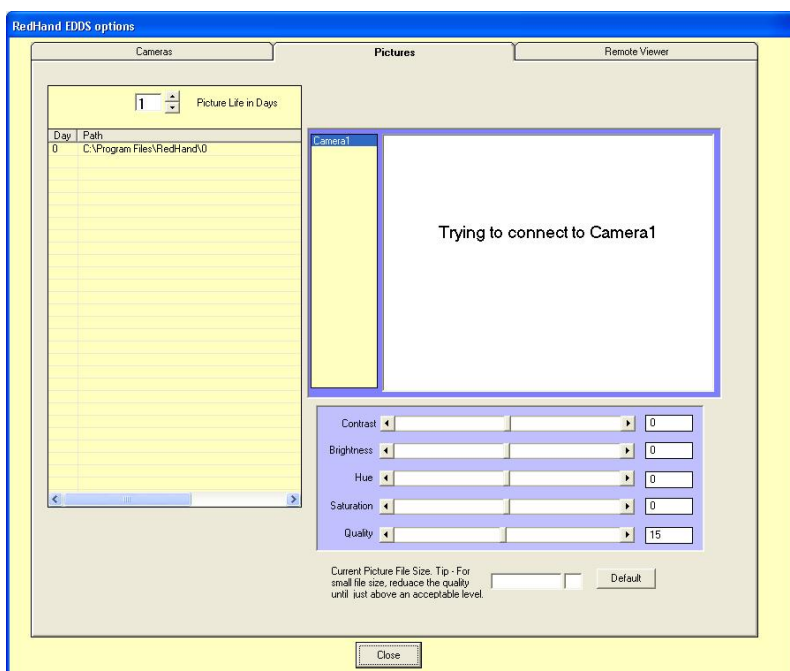
Fill in the IP Address of the first camera/server (a dummy has been provided). It may well be that you won't know which IP Address you have given to which camera, but as soon as you have filled in a valid IP Address, you can switch to the Pictures Tab and you should see a live video picture.

Fill in the Location as a name you will understand such as Reception, Back Entrance etc. Leave the 'Enable Remote Picture Copying' and 'Program to run on receipt of a new picture' blank.

## Camera Script:

The Camera Script is essential for the operation of the RedHand software. Click the 'Send to Camera' button, and if all is well, you will see a very brief 'OK' and then a single figure 1 in the Camera Response box. If you see anything such as <!DOCTYPE HTML etc, then there is no IP connectivity to the camera.

Before configuring the other cameras, you should set up the Picture retention Days as this builds the directory structure, which is important to do before adding any other



cameras onto the system. Select the Pictures Tab and Move the up/down control to get to the correct number of days that you wish file retention to be. Make sure you understand the disk space implications of this. See Computer Requirements earlier.

You can spread the directories for the pictures across various disks. Make sure you do not use a Network Drive on another PC as performance will not be good. So for example, you could have days 1,2,3 on the C: Drive and days 4,5,6,7

on the D Drive. To do this, once you have selected the picture retention days, double click the path for one of the days and the drive selection box will appear. Select the path for this day and all the days below the selected one will be automatically configured.

**Important:** If you will be configuring other networked PCs with a copy of Viewer, ensure that you specify the full UNC path as follows:

\\MyPcName\Cdrive\Program Files\RedHand\0

To do this, when the "Browse for a Folder" screen is visible, select the drive via the "My Network Places" and this will ensure that the correct UNC path is inserted into the database.

At this stage, it is wise to close down Housekeeper Options after agreeing to the changes. This will create correct directory structure on the disk.



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## Managing the Camera via a Browser

Select Options/Edit Options and select the Camera Tab again. Click on 'Manage via browser' and you will be taken into a web Browser session and if all is well, you should see a live picture.

### Possible Issues:

You may be asked to install a Pixord Active-X Component. This is essential to view live images. At some stage you may be asked to look at your security requirements to allow Java components to run. These problems may well be short circuited by running the file C:\Program Files\RedHand\msjavx86.exe. This will install the Microsoft Virtual Machine. A reboot of the PC after this is essential.

### Checking the Camera Script

From the main screen in the Web Browser, select the Configure Option and then select Script Edit (last one in the list). The script that you sent to the camera should be visible. Ensure that 'Start Now' is displayed and the 'Automatically start event when camera is turned on' should be checked.

### Setting Motion Detection

Click the Set Motion Detection Area button. You will see a live image. Click the 'Select All' button. This will place a number of red squares over the image. Whenever movement takes place in one of these red squares, then the movement detection mechanism will be activated and pictures will be taken. It is essential to mask out any moving trees, or other non-essential parts by clicking on a red square to make it disappear. You can re-select it by clicking on it again. Once the correct motion detection area has been established, close that screen down.

### Setting the Time Stamp

You can imbed the time and Camera number as part of the picture image. Click on the 'Time Stamp' button on the left. Click the 'Display Time' and 'Display Text' box. Fill in any appropriate legend that you wish to be displayed. Note that the actual time is set by the clock on the PC via Housekeeper (ensure that the PC time is correct)

## Saving Settings

Make sure you save all the changes before leaving the browser session. To do this, select 'System' on the left and 'Save Changes'. This will ensure that everything will be restored when the camera/server is rebooted.

Close the Web Browser session.

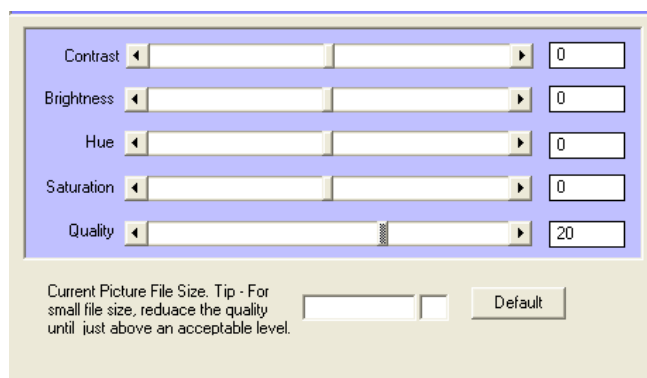
## Adding More Cameras

The other cameras can be set in the same way. As a reminder, here is the procedure described in full above:

1. Click the 'New' button on the Camera Tab
2. Set the IP Address
3. Give the Location a Name (Check the picture on the 'Pictures' Tab to see where the camera is)
4. Send the Camera Script
5. Manage via Browser
6. In Browser:
  - a. Check Event Script
  - b. Set Motion Detection Area
  - c. Set Time Stamp
  - d. Save Settings

## Video Quality Settings

On the Picture Tab, there are 4 slide bars, which adjust various aspects of video quality. For normal use the top three can be left. However the bottom slider is worth adjusting. Picture quality is proportional to file size. If you move the quality slider far left, you will see that the resulting file size can get up to 200Kb each. This is clearly not desirable. If you move the slider far right, the picture quality will have degraded a considerable amount. There is an optimum point at which the eye no longer sees the improvement in quality, unless the picture is magnified. This optimum will be found with a quality value of about 20.





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## Testing:

Close down Housekeeper Options and save your changes. Watch the Housekeeper screen and carry out a test walk in front of each camera. When pictures are received they will be displayed on the small monitor screen on Housekeeper. You will also notice a message, which indicates which camera pictures are is being received. If you go into Redhand viewer and select each camera in turn, you will see the pictures that have been received.

See on-line Help file for further assistance in operating the Viewer and Housekeeper.

## System Administration Issues

### Directory (Folder) Configuration

You will notice on the front screen of Housekeeper, there is an indication of which database is currently in operation. The storage of pictures works briefly as follows:

- Day one is assumed to be 1<sup>st</sup> January 2000.
- When Housekeeper boots up, it finds today's date and calculates the number of days back to 1<sup>st</sup> Jan 2000
- Dividing this value by the picture retention days will result in the current day.

Examples of the default folder structure on C:

C:\program Files\RedHand	Main directory structure
C:\program Files\RedHand\0	Holds the database for day 0
C:\program Files\RedHand\0\Pictures\Camera1	Holds the pictures for Camera1 for day 0

## Purge Routine

Every 30 seconds, Housekeeper launches a Purge program which performs the following functions:

- Removes pictures files from each camera folder that are older than the picture retention date
- Sets the time of each camera to be the same as the PC time.
- Carries out a network Ping of each camera/server and displays and errors on the message screen of Housekeeper.
- Ensures Database integrity