KVM over IP Module

IPK-M03

User Manual

V1.2

2009.04.23

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1. Product Overview

1.1 Introduction

The KVM-over-IP (IP-KVM) redirects local keyboard, mouse and video data to a remote administration console. It allows you to control one or many computers locally at the server site or remotely via the Internet using a standard browser. You can securely gain BIOS level access to systems for maintenance, support, or failure recovery over the Internet. Communication is secure via SSL authentication and encryption. Use in conjunction with a KVM switch for multiple-server access.

The IP-KVM provides convenient, remote KVM access and control via LAN or Internet. It captures, digitizes, and compresses video signal and transmits it with keyboard and mouse signals to and from a remote computer. IP-KVM provides a non-intrusive solution for remote access and control. Remote access and control software runs on its embedded processors only but not on mission-critical servers, so that there is no interference with server operation or impact on network performance.

1.2 Main Feature

- Manage servers around the world
- Remote KVM (keyboard, video, and mouse) access over IP or analogous telephone line (modem needed)
- Full control under any OS, in BIOS level, during boot, or at Blue Screens
- No additional software necessary on client console side
- Remote mass storage control and redirection
- Remote control over Java-enabled Browsers
- SSL Secure access through certificate authentication and data encryption
- SSL 256-bit encryption of all transmitted data
- RSA 1024-bit encryption
- Auto-optimize the frame rate and video quality according to the bandwidth availability
- Automatically senses video resolution for best possible screen capture
- High-performance mouse tracking and synchronization
- Interwork with most of KVM switches
- Firmware update via web interface

2. Installation and Start up

2.1 Package Checklist

The IP-KVM package consists of the followings items:

✓ The IP-KVM module

✓ CD-ROM (software utilities and user manual)

2.2 Product Views

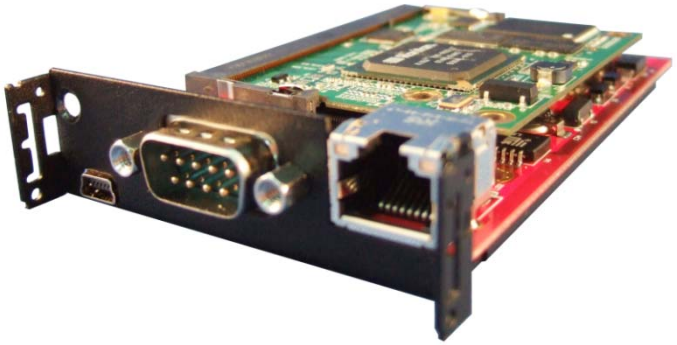


Figure 2-1 Product View

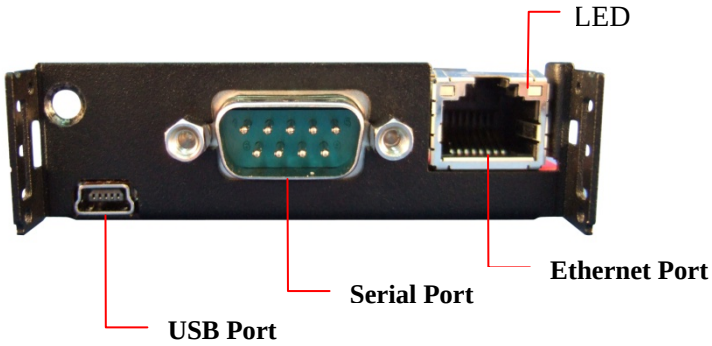


Figure 2-2 Front Panel View

LEDs on the Ethernet Connector:

- **Orange LED** -- 10BaseT Ethernet connection established
- **Green** LED -- 100BaseT Ethernet connection established
- ***Blinking****: data in activity*
- ***ON****: no data in activity and link connected*

2.3 System Requirements

Hardware

Item	Description
Local Host side	One Computer or Server or the console port of the KVM switch
Remote Console side	One Computer or Multiple Computers are linked into the network

Software

Item	Description
Local Host side	<No additional software necessary>
Remote Console side	(1) Java Runtime Environment : v 1.5 or above (2) Browser: Microsoft Internet Explorer (v6.0 or above), Netscape, Mozilla, Safari, Firefox, Avant, World, Opera, and others.

Notes:

1. In order to run this function, the system need support JRE(Java Runtime Environment) version 5.0 (v1.5) or above. You can get the Java Software from the website http://www.java.com/en/download/
2. It's recommended to install newer Java version (e.g., version 6 update 11 or above) for better performance.

2.4 Hardware Installation

Please follow the following steps:

1. Power down your KVM switch
2. Slide in the module into the module rack of the KVM switch, and make sure the module insert into backplane firmly, and then screw and secure the module on the KVM metal panel.
3. (Optional) Connect the USB connectors of USB A-mini cable to the host computer and the IP-KVM module while for remote mass storage control.
4. Connect Ethernet cable to Ethernet port.

The figure below depicts the cable connections.

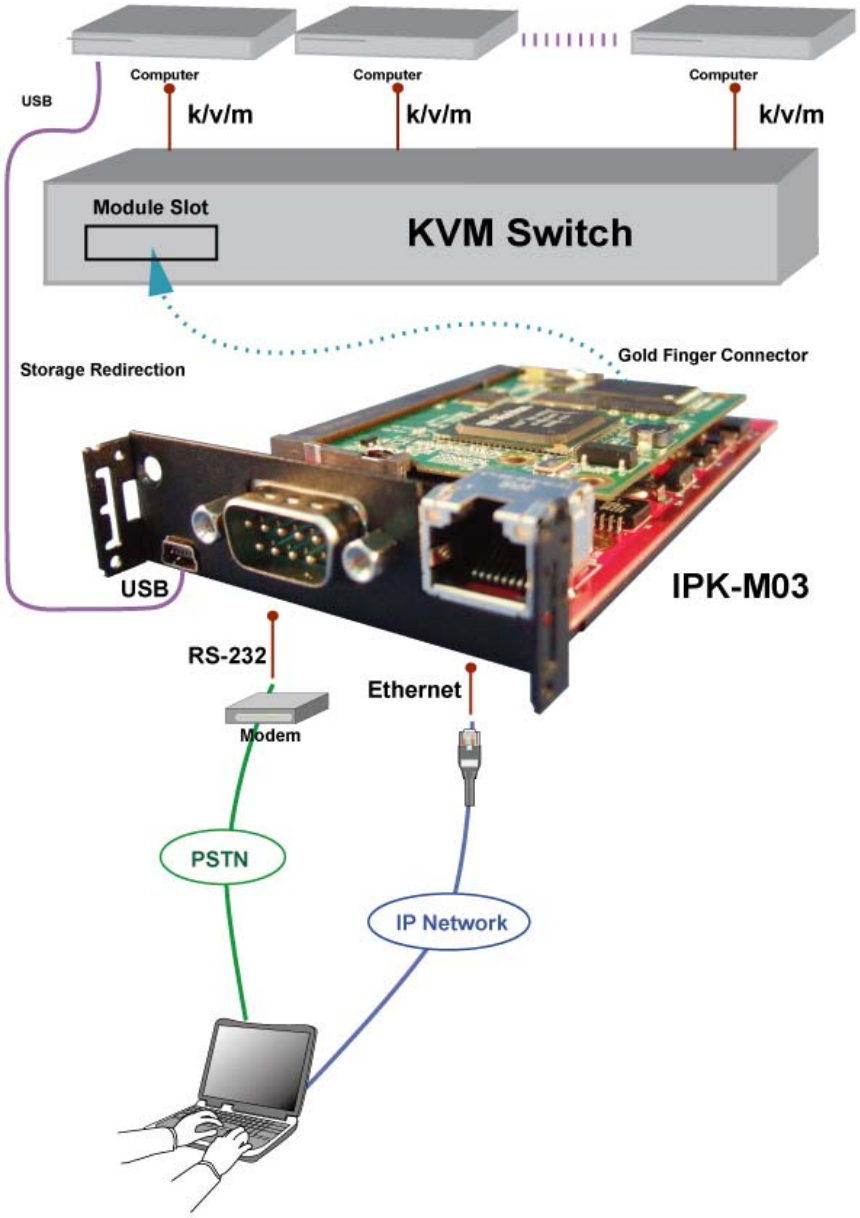


Figure 2-3 Cable Connections

Connect cables to the Host and Console devices as the figure depicts above. Leave the Serial interface open for now. After applying power to the unit, it'd take about 60 seconds to complete the startup processes, and then enter normal running state.

2.5 When the server is up and running

The IP-KVM gives you a full control over the remote server. The Management Console allows you to access the remote server's graphics, keyboard and mouse and to send special commands to the server. You can also perform periodic maintenance of the server. Using the Console Redirection Service, you are able to do the following:

I. Reboot the system
II. Watch the boot process.
III. Boot the system from a separate partition to load the diagnostic environment.
IV. Run special diagnostic programs

2.6 When the server is dead

Obviously, fixing hardware defects is not possible through a remote management device. Nevertheless IP-KVM gives the administrator valuable information about the type of a hardware failure. Serious hardware failures can be categorized into five different categories with different chances to happen:

I. Hard disk failure 50%
II. Power cable detached, power supply failure 28%
III. CPU, Controller, main board failure 10%
IV. CPU fan failure 8%
V. RAM failure 4%

Using IP-KVM, administrators can determine which kind of serious hardware failure has occurred

Type of failure	Detected by
Hard disk failure	Console screen, CMOS set-up information
Power cable detached, power supply failure	Server remains in power off state after power on command has been given.
CPU Controller, main board failure.	Power supply is on, but there is no video output.
CPU fan failure	By server specific management software
RAM failure	Boot-Sequence on boot console

3. Configuration

3.1 Initial IP Configuration via Network

The Factory default settings for the IP-KVM unit are as below:

DHCP: Disable
Default IP address: 192.168.0.70
Default Net Mask: 255.255.255.0

If DHCP mode is enabled (IP auto configuration = DHCP), the IP-KVM will try to contact a DHCP server in the subnet to which it is physically connected. If a DHCP server is found, it may provide a valid IP address, gateway address and net mask. Before you connect the device to your local subnet, be sure to complete the corresponding configuration of your DHCP server. It is recommended to configure a fixed IP assignment to the MAC address of the IP-KVM. You can find the MAC address labeled on the bottom side of the metal housing.

There is a Network Setup Software tool **(PSetup)** for setting up the network configuration (IP address, Subnet mask, DHCP, etc). It is useful when you want to change the network settings or you will not be able access to the unit due to not knowing the network settings of the unit. In this case, you can view or change the settings via this utility.

IP-KVM Setup Tool

If this initial configuration does not meet your local requirements, use the setup tool to change the configurations to your needs. The setup tool **PSetup** can be found on the CD-ROM delivered with this package. You can follow the procedures described below.

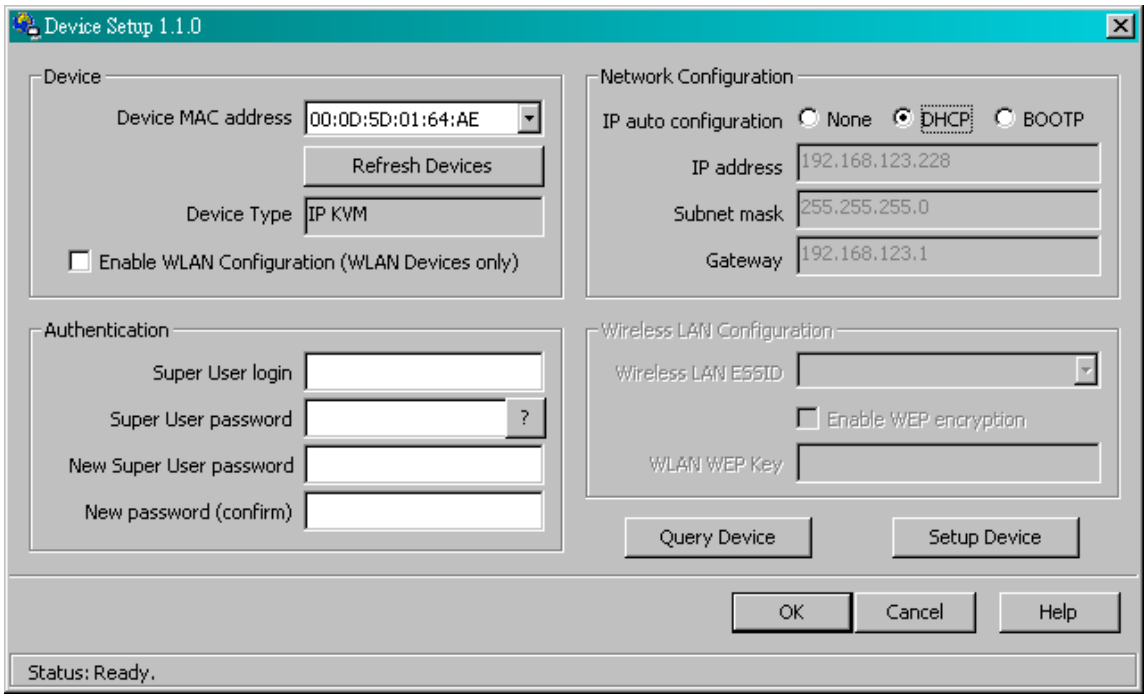
DHCP

If you have installed the IP-KVM on a network that enables DHCP, you can use the **PSetup** to find out the IP-KVM's IP.

(1) Plug Ethernet cable to IP-KVM. IP-KVM will get an IP via DHCP.
(2) Using **PSetup** to look for IP-KVM.
   a. Click **Refresh Devices** button to detect connected devices
   b. Select MAC address of the IP-KVM in "Device MAC address" box. You can find the MAC address labeled on the bottom side of the IP-KVM module. MAC address is detected as connection from computer and IP-KVM is valid through USB or network.
   c. Click **Query Device** to find the IP configuration on the right pane.

Notes:

- **BOOTP**, a static configuration protocol, uses a table that maps IP addresses to physical addresses.
- **DHCP**, an extension to BOOTP that dynamically assigns configuration information. DHCP is backward compatible with BOOTP.

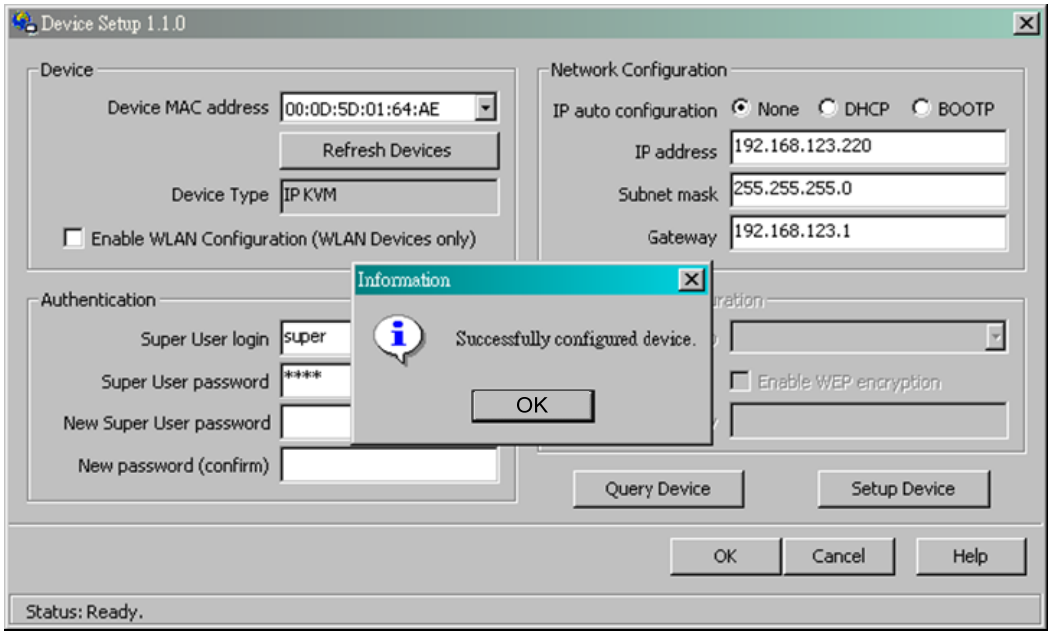


Set up a fixed IP

a. Setup “IP auto configuration” as “**None**” ; setup IP address and Subnet mask

b. Enter Super user login and password for Authentication (default : super/pass)

c. Click **Setup Device**. If super login was authenticated, it’ll show “Successfully configured device”. Otherwise it’ll show “Permission Denied”.



Authentication

To adjust the authentication settings, enter your login as a super user, and change your password.

Super user login

Enter the login name of the super user. The initial value is “super”. All characters are in lower case.

Super user password

Enter the current password for the super user. This initial value is “pass”. All characters are in lower case.

New super user password

Enter the new password for the super user.

New password (confirm)

Re-type the new password for the super user for confirmation.

To close the window and accept the changes, press the “OK” button; otherwise press the “Cancel” button.

3.2 Configuration Setup via Serial Console

For using serial terminal, the IP-KVM has a serial line interface (host side). This connector is compliant with the RS-232 serial line standard. The serial line has to be configured with the parameters given in Table below.

Parameter	Value
Bits/second	115200
Data bits	8
Parity	No
Stop bits	1
Flow Control	None

When configuring with a serial terminal, e.g., Hyper Terminal, reset the IP-KVM and immediately press the “ESC” key. You will see some device information, and a “=>” prompt. Enter “config”, press “Enter” key and wait for a few seconds for the configuration questions to appear.

As you proceed, the following questions will appear on the screen. To accept the default values shown in square brackets below, press “Enter” key.

IP auto configuration: None
IP address: [192.168.0.70]
Net mask: [255.255.255.0]
Gateway: [0.0.0.0] -- (0.0.0.0 for none)

IP auto-configuration

With this option, you can specify whether the IP-KVM should get its network settings from a DHCP or BOOTP server. For DHCP, enter “dhcp”, and for BOOTP enter “bootp”. If you do not specify any of these, the IP auto-configuration is disabled and subsequently you will be asked for the following network settings.

IP address

The IP address the IP-KVM. This option is only available if IP auto-configuration is disabled.

Net mask

The net mask of the connected IP subnet. This option is only available if IP auto-configuration is disabled.

Gateway address

The IP address of the default router for the connected IP subnet. If you do not have a default router, enter 0.0.0.0. This option is only available if IP auto-configuration is disabled.

3.3 Keyboard, Mouse, and Video configuration

Between the IP-KVM module and the KVM Switch, PS/2 interface is automatically selected for transmitting keyboard and mouse data. The correct operation of the remote mouse depends on several settings which will be discussed in the following subsections.

3.3.1 IP-KVM keyboard settings

The IP-KVM settings for the host's keyboard type have to be corrected in order to make the remote keyboard work properly. Check the settings in the IP-KVM Web front-end for details.

3.3.2 Remote Mouse Settings

A common seen problem with KVM devices is the synchronization between the local and remote mouse cursors. The IP-KVM addresses this situation with an intelligent synchronization algorithm. There are two mouse modes available on the IP-KVM:

Auto mouse speed

The automatic mouse speed mode tries to detect the speed and acceleration settings of the host system automatically. See the section below for a more detailed explanation.

Fixed mouse speed

This mode just translates the mouse movements from the Remote Console in a way that one pixel move will result in n-pixel moves on the remote system. This parameter n is adjustable with the scaling. Please note that this works only when mouse acceleration is turned off on the remote system.

3.3.3 Automatic mouse speed and mouse synchronization

The automatic mouse speed mode performs the speed detection during mouse synchronization. Whenever the local and remote mouse cursors move synchronously or not, there are two ways for re-synchronizing local and remote mouse cursors:

Fast Sync

The fast synchronization is used to correct a temporary, but fixed skew. Choose the option using the Remote Console options menu or press the mouse synchronization hotkey sequence in case you defined one.

Intelligent Sync

If the fast sync does not work or the mouse settings have been changed on the host system, use the intelligent resynchronization. This method takes more time than the fast one and can be accessed with the appropriate item in the Remote Console option menu. The intelligent synchronization requires a correctly adjusted picture. Use the auto adjustment function to setup the picture, and make sure that there are no window at the top left corner of the remote desktop that are able to change the mouse cursor shape from

the normal state. The Sync mouse button on top of the Remote Console can behave differently, depending on the current state of mouse synchronization. Usually pressing this button leads to a fast sync, except in situations where the KVM port or the video mode changed recently.

Note: At first start, if the local mouse pointer is not synchronized with the remote mouse pointer, press the Auto Adjust Button once.

3.3.4 Host system mouse settings

The host's operating system knows various settings from the mouse driver.

> **Note**: The following limitations do not apply in case of USB and Mouse Type "Windows >= 2000, MacOSX".

While the IP-KVM works with accelerated mice and is able to synchronize the local with the remote mouse pointer, there are the following limitations, which may prevent this synchronization from working properly:

Special Mouse Driver

There are mouse drivers that influence the synchronization process and lead to desynchronized mouse pointers. If this happens, make sure you do not use a special vendor-specific mouse driver on your host system.

Windows XP Mouse Settings

Windows XP knows a setting named "improve mouse acceleration", which has to be deactivated.

Active Desktop

If the Active Desktop feature of Microsoft Windows is enabled do not use a plain background. Instead, use some kind of wallpaper. As an alternative, you could also disable the Active Desktop completely.

Navigate your mouse pointer into the upper-left corner of the applet screen and move it slightly forth and back. Thus the mouse will be resynchronized. If re-synchronizing fails, disable the mouse acceleration and repeat the procedure.

3.3.5 Single and Double Mouse Mode

The information above applies to the Double Mouse Mode, where remote and local mouse pointers are visible and need to be synchronized. The IP-KVM also features another mode, the Single Mouse Mode, where only the remote mouse pointer is visible. Activate this mode in the open Remote Console and click into the window area. The local mouse pointer will be hidden and the remote one can be controlled directly. To leave this mode, it is necessary to

define a mouse hotkey in the Remote Console Settings Panel. Press this key to free the captured local mouse pointer.

3.3.6 Recommended Mouse Settings

For the different operating systems we give the following advices:

MS Windows

In general, we recommend the usage of a mouse via USB. Choose USB without Mouse Sync. For a PS/2 mouse choose Auto Mouse Speed. For XP disable the option “enhance pointer precision” in the Control Panel.

SUN Solaris

Adjust the mouse settings either via xset m 1 or use the CDE Control Panel to set the mouse to “1:1, no acceleration”. As an alternative you may also use the Single Mouse Mode.

MAC OS X

We recommend using the Single Mouse Mode.

3.3.7 Video Modes

The IP-KVM recognizes a limited number of common video modes. When running X11 on the host system, please do not use any custom mode lines with special video modes. If you do, the IP-KVM may not be able to detect them. We recommend using any of the standard VESA video modes, instead.

4. Usage

4.1 Prerequisites

The IP-KVM features an embedded operating system and applications offering a variety of standardized interfaces. This chapter will describe both these interfaces, and the way to use them in a more detailed manner. The interfaces are accessed using the TCP/IP protocol family, thus they can be accessed using the LAN port of the device.

The following interfaces are supported:

- **HTTP/HTTPS**
  Full access is provided by the embedded web server. The IP-KVM environment can be entirely managed using a standard web browser. You can access the IP-KVM using the insecure HTTP protocol, or using the encrypted HTTPS protocol. Whenever possible, use HTTPS.
- **Telnet**
  A standard Telnet client can be used to access an arbitrary device connected to the IP-KVM's serial port via a terminal mode.

The primary interface of the IP-KVM is the HTTP interface. This is covered extensively in this chapter. Other interfaces are addressed in subtopics.

In order to use the Remote Console window of your managed host system, the browser has to come with a Java Runtime Environment v1.5 or above. If the browser has no Java support (such as on a small handheld device), you are still able to maintain your IP-KVM using the administration forms displayed by the browser itself.

For secure connection to the IP-KVM, we recommend the following browsers versions:

- Microsoft Internet Explorer version 6.0 or higher
- Netscape Navigator 7.0 or Mozilla 1.6 or higher

In order to access the remote host system using a securely encrypted connection, you need a browser that supports the HTTPS protocol. Strong security is only assured by using a key length of 128 Bit. Some of the old browsers do not have a strong 128 Bit encryption algorithm.

Using the Internet Explorer, open the menu entry “?” and “Info” to read about the key length that is currently activated. The dialog box contains a link that leads you to information on how to upgrade your browser to a state of the art encryption scheme. Figure below shows the dialog box presented by the Internet Explorer 6.0.

Figure 4-1 The Internet Explorer displaying the encryption key length

Newer web browsers generally support strong encryption on default.

4.2 log in/out the IP-KVM

4.2.1 log in the IP-KVM

There are three levels of access privileges:

User Name	Default Password	Access Privileges
super (factory default)	pass (factory default)	Full access
administrator	(user define)	Has partial rights to change configuration of critical parts
user	(user define)	Has permission to access basic function of open Remote Console

The **super** user can add or remove a user easily via the web pages of **User Management > Users**. Please refer to Addendum C for detailed permission items for each user level.

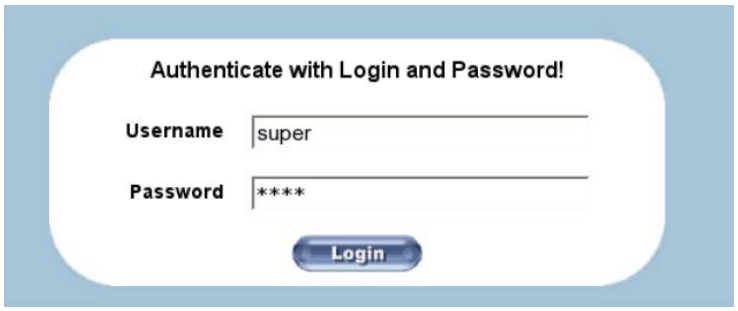
Launch your web browser. Direct it to the address of your IP-KVM, which you configured during the installation process. The address used might be an IP address or a domain name, in the case where you have given your IP-KVM a symbolic name in the DNS. For instance, type the following in the URL field of your browser when establishing an unsecured connection:

http://<IP address of IP-KVM>

When using a secure connection, type in:

https://<IP address of IP-KVM>

This will lead you to the IP-KVM login page as shown below



When connecting to the IPK-KVM unit, the IPK-KVM system (web server, Telnet server or SSH server) will prompt user to enter the user name and password in order to access to the system.
If this is the first time logging in, log in with the factory default username and password, you will be prompted to change the default password.

Warning

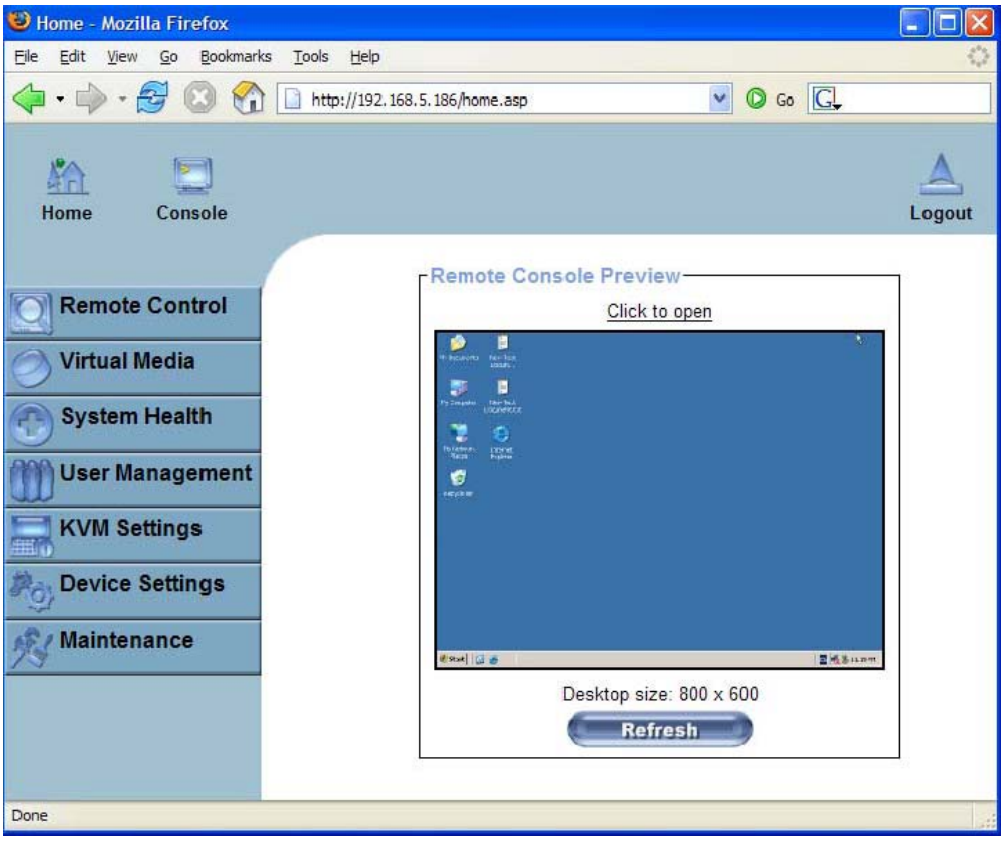
Please make sure to change the super user password immediately after you have **installed and accessed your IP-KVM for the first time. Unchanging of the password** for the super user is a severe security risk and might result in unauthorized access to the IP-KVM and to the host system including all possible consequences!

Warning

Your web browser has to accept cookies, or else login is not possible.

Navigation

Having logged into the IP-KVM successfully, the main page of the IP-KVM appears. This page consists of three parts; each of them contains specific information. The buttons on the upper side allow you to navigate within the front end. Within the right frame, task-specific information is displayed that depends on the section you have chosen before.



The Buttons of the front end:

Return to main page of IP-KVM access page

Open the IP-KVM remote console

Exit from the IP-KVM front end.

Warning

If there is no activity for 30 minutes, the IP-KVM will log you out, automatically. A click on one of the links will bring you back to the login screen.

Remote Console Preview

Click on **Click to open** to start the remote console redirection

Click on **Refresh** to refresh the picture.

4.2.2 Log out from the IP-KVM

This link logs out the current user and presents a new login screen. Please note that an automatic logout will be performed in case there is no activity for 30 minutes.

4.3 The Remote Console

The Remote Console is the redirected screen, keyboard and mouse of the remote host system that IP-KVM controls.

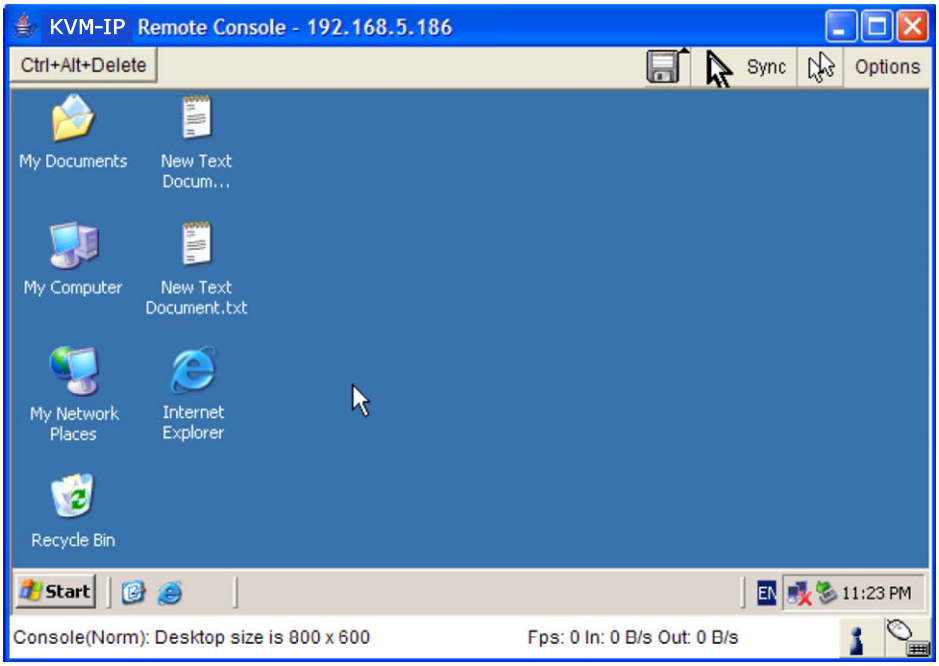
The Remote Console window is a Java Applet that tries to establish its own TCP connection to the IP-KVM. The protocol that is running over this connection is neither HTTP nor HTTPS, but RFB (Remote Frame Buffer Protocol). As default, RFB tries to establish a connection to TCP port number 443. Your local network environment has to allow this connection to be made, i.e. your firewall and, in case you have a private internal network, your NAT (Network Address Translation) settings have to be configured accordingly.

In case the IP-KVM is connected to your local network environment and your connection to the Internet is available using a proxy server only without NAT being configured, the Remote Console is very unlikely to be able to establish the desired connection. This is because today's web proxies are not capable of relaying the RFB protocol.

In case of problems, please consult your network administrator in order to provide an appropriate networking environment.

4.3.1 Main Window of Remote Console

To open the KVM console either click on the icon **Console** or **Remote Control > KVM Console** of the menu entry on the left or **Click to open** of the console picture on the right.



Starting the Remote Console opens an additional window. It displays the screen content of your host system. The Remote Console will behave exactly in the same way as if you were sitting locally in front of the screen of your remote system. That means keyboard and mouse can be used in the usual way. However, be aware of the fact that the remote system will react to keyboard and mouse actions with a slight delay. The delay depends on the bandwidth of the link to which you use to connect to the IP-KVM.

With respect to the keyboard, the very exact remote representation might lead to some confusion as your local keyboard changes its keyboard layout according to the remote host system. If you use a German administration system, and your host system uses a US English keyboard layout, for instance, special keys on the German keyboard will not work as expected. Instead, the keys will result in their US English counterpart. You can circumvent such problems by adjusting the keyboard of your remote system to the same mapping as your local one.

The Remote Console window always tries to show the remote screen with its optimal size. That means it will adapt its size to the size of the remote screen initially and after the screen resolution of the remote screen has been changed. However, you can always resize the Remote Console window in your local window system as usual.

Warning

In difference to the remote host system, the Remote Console window on your local window system is just one window among others. In order to make keyboard and mouse work, your Remote Console window must have the local input focus.

4.3.2 Control Bar of Remote Console

The upper part of the Remote Console window contains a control bar. Using its elements you can see the state of the Remote Console and adjust the local Remote Console settings. A description for each control follows.

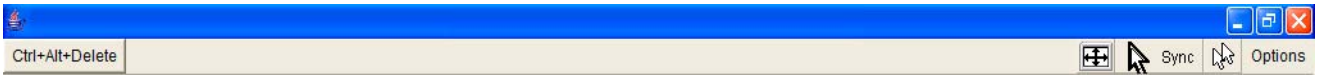
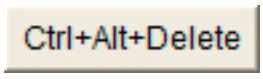


Figure 4-2 Remote Console Control Bar

Ctrl+Alt+Delete 

Special button key to send the “Control Alt Delete” key combination to the remote system (see also section 5.4.1 for defining new button keys).

Auto Adjust button 

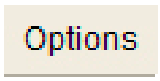
If the video display is of bad quality or distorted in some way, press this button and wait a few seconds while the IP-KVM tries to detect the video mode of VGA port to the controlled host and adjust itself for the best possible video quality.

Sync mouse 

Activates the mouse synchronization process. Choose this option in order to synchronize the local with the remote mouse cursor. This is especially necessary when using accelerated mouse settings on the host system. In general, there is no need to change mouse settings on the host.

Single/Double mouse mode 

Switches between the Single Mouse Mode (where only the remote mouse pointer is visible) and the Double Mouse Mode (where remote and local mouse pointers are visible and need to be synchronized). Single mouse mode is only available if using SUN JVM v1.5 or higher.

Options 

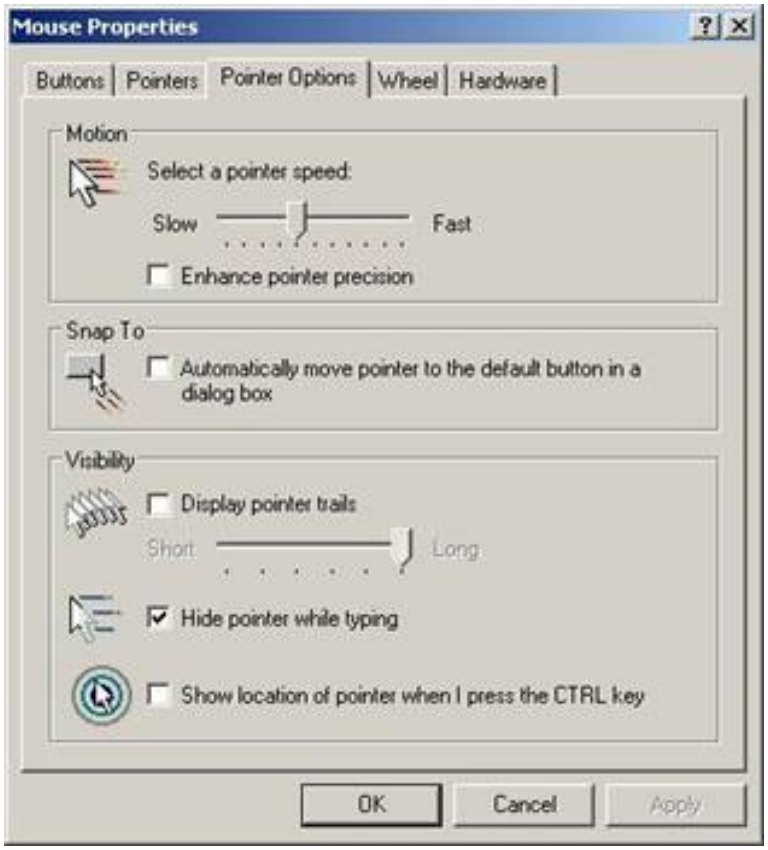
To open the Options menu, click on the button “Options”.

Figure 4-3 Remote Console Options Menu

Notice:

If your IP-KVM connects to PS/2 target computer and enable Double Mouse mode, in order to keep remote and local mouse pointers in sync, please take the following actions:

1. **Disable** the "Enhance pointer precision" and "Automatically move mouse pointer to the default button in a dialog box" in the mouse settings of host (target) computer OS.



2. If mouse pointers not in sync, please click on **Sync** button or **Options > Mouse Handling > Intelligent Sync.**

A short description of the options as follows.

- **Monitor Only**

  Toggles the Monitor only filter on or off. If the filter is switched on no remote console interaction is possible, and monitoring is possible.

- **Exclusive Access**

  If a user has the appropriate permission, he or she can force the Remote Consoles of all other users to close. No one can open the Remote Console at the same time again until this user disables the exclusive access, or logs off.

  A change in the access mode is also visible in the status line.

Figure 4-4 Remote Console Exclusive Mode

- **Scaling**

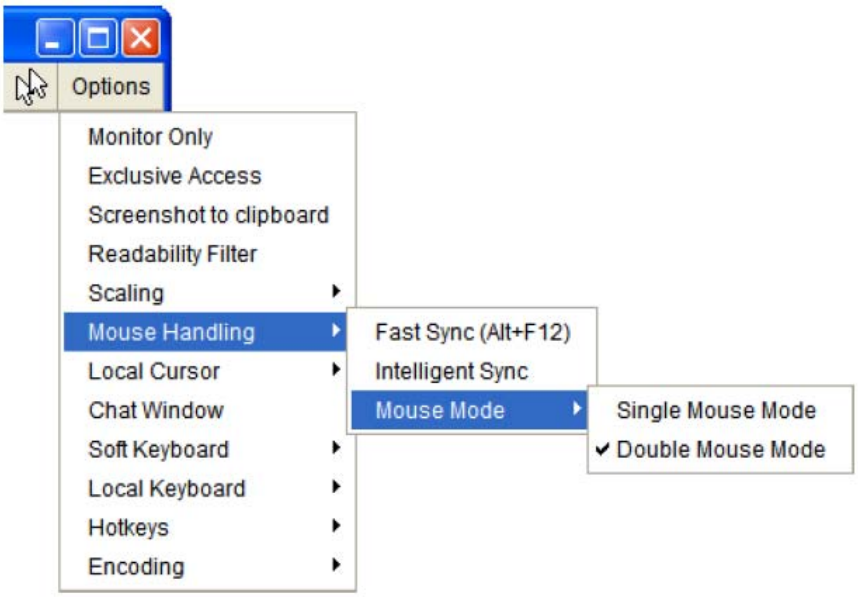
  Allow you to scale down the Remote Console. You can still use both mouse and keyboard, however the scaling algorithm will not preserve all display details.

  When you designate 25%, 50%, or100% scaling, the size of Remote Console window is calculated according to the remote host video setting with scaling algorithm execution. When you designate “Scale to fit”, the remote video displaying is scaled to fit the size of Remote Console window.

Figure 4-5 Remote Console Options Menu:Scaling

- **Mouse Handling**

  The submenu for mouse handling offers two options for synchronizing the local and the remote mouse cursors.



Fast Sync --

The fast synchronization is used to correct a temporary, but fixed skew.

Intelligent Sync --

Use this option if the fast sync does not work or the mouse settings have been changed on the host system.

Warning
This method takes more time than the fast one and requires a correctly adjusted picture. Use the auto adjustment function to setup the picture.

- **Local Cursor**

  Offers a list of different cursor shapes to choose from for the local mouse pointer. The selected shape will be saved for the current user and activated the next time this user opens the Remote Console. The number of available shapes depends on the Java Virtual Machine; a version of 1.5 or above offers the full list.

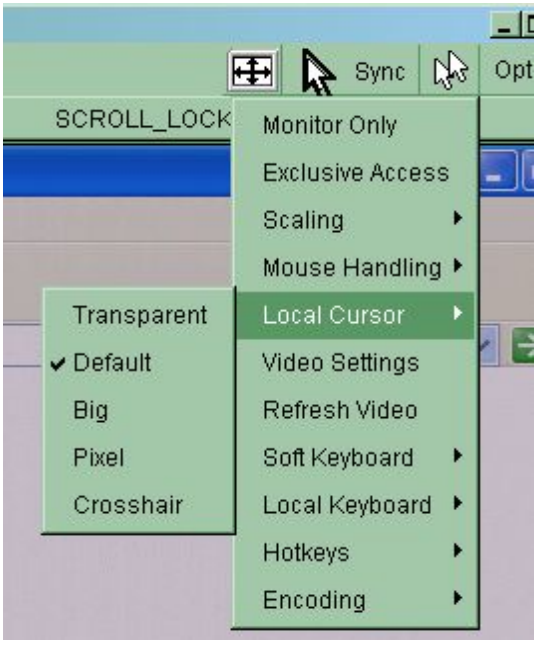


Figure 4-6 Remote Console Options Menu:Cursor

- **Video Settings**

  Opens a panel for changing the IP-KVM video settings. IP-KVM features two different dialogs, which for adjusting the video settings.

  Video Settings through the HTML-Frontend

  To enable local video port, select this option. This option decides if the local video output of IP-KVM is active and passing through the incoming signal from the host system.

  The option Noise Filter defines how IP-KVM reacts to small changes in the video input signal. Turning on the noise filter can help reduce video flickering that is often caused by distortions, as well as lowering unnecessary bandwidth consumption. A large filter setting needs less network traffic and leads to a faster video display, but small changes in some display regions may not be recognized immediately. A small filter displays all changes instantly but may lead to a constant amount of network traffic even if display content is not really changing (depending on the quality of the video input signal). All in all the default setting should be suitable for most situations.

Video Settings through the remote console

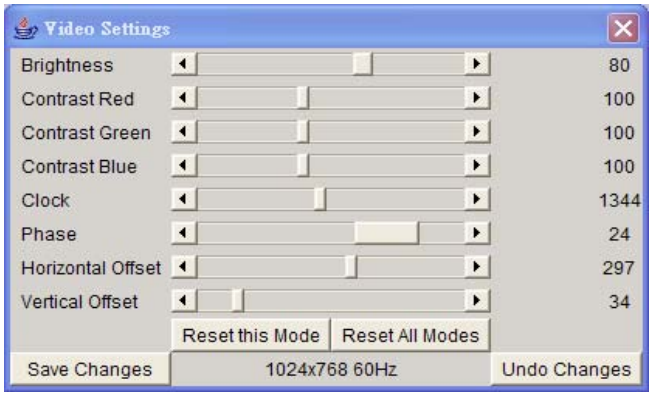


Figure 4-7 Video Settings Panel

Brightness Controls the brightness of the picture

Contrast Controls the contrast of the picture

Clock Defines the horizontal frequency for a video line and depends on the video mode. Different video card types may require different values here. The default settings in conjuction with the auto adjustment procedure should be adequate for all common configurations. If the picture quality is still bad after auto adjustment you may try to change this setting together with the sampling phase to achieve a better quality.

Phase Defines the phase for video sampling, used to control the display quality together with the setting for sampling clock.

Horizontal Position Use the left and right buttons to move the picture in horizontal direction while this option is selected.

Vertical Position Use the left and right buttons to move the picture in vertical direction while this option is selected.

Reset this Mode Reset mode specific settings (Clock , Phase and Position) to the factory-made defaults.

Reset all Modes Reset all settings to the factory-made defaults.

Save changes Save changes permanently

Undo Changes Restore last settings

- **Refresh Video**

Click to run this menu item for retrieving the whole video again from the controlled host and displayed on Remote Console. In normal situation, only changed parts of video will

be packed and sent from IP-KVM, for saving network bandwidth. This function is mainly used for troubleshooting purpose where some old video fragments are displayed as not updated in time for some reason; for example, noise filter for VGA is setting too large.

- **Soft Keyboard**

Figure 4-8 Soft Keyboard

Opens up the Menu for the Soft-Keyboard.

Show

Pops up the Soft-Keyboard. The Soft-Keyboard is necessary in case your host system runs a completely different language and country mapping than your administration machine.

Mapping

Used for choosing the specific language and country mapping of the Soft-Keyboard.

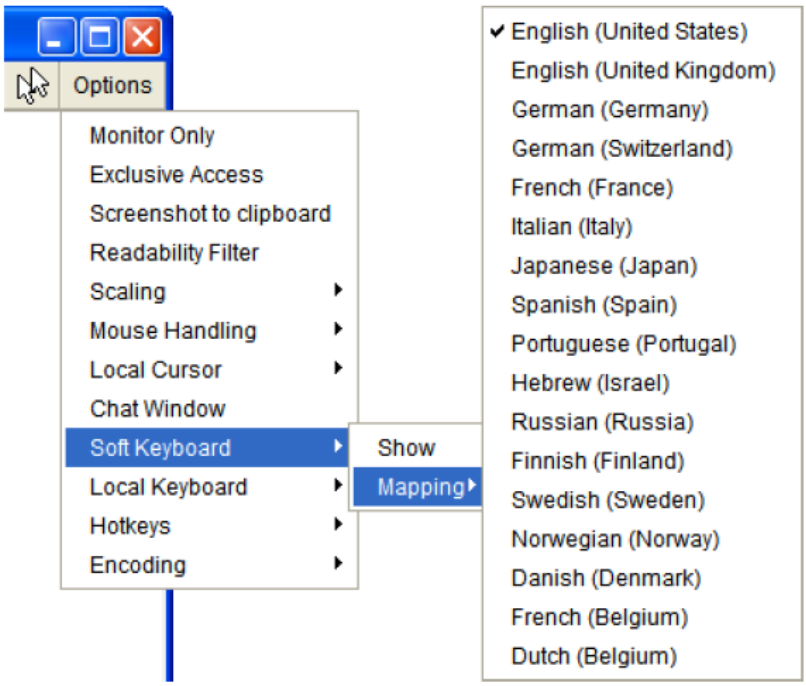


Figure 4-9 Soft Keyboard Mapping

- **Local Keyboard**

  Used to change the language mapping of your browser machine running the Remote Console Applet. Normally, the applet determines the correct value automatically. However, depending on your particular JVM and your browser settings this is not always possible. A typical example is a German localized system that uses an US-English keyboard mapping. In this case you have to change the Local Keyboard setting to the right language, manually.

- **Hotkeys**

  Opens a list of hotkeys defined before. Choose one entry, the command will be sent to the host system.

  A confirmation dialog can be added that will be displayed before sending the selected command to the remote host. Select “OK” to execute the command on the remote host.

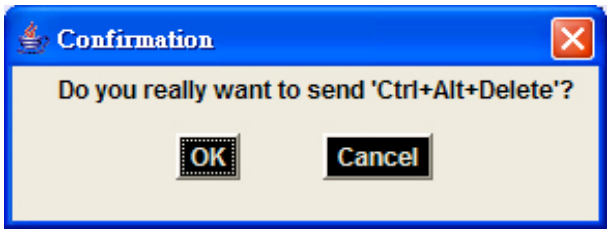
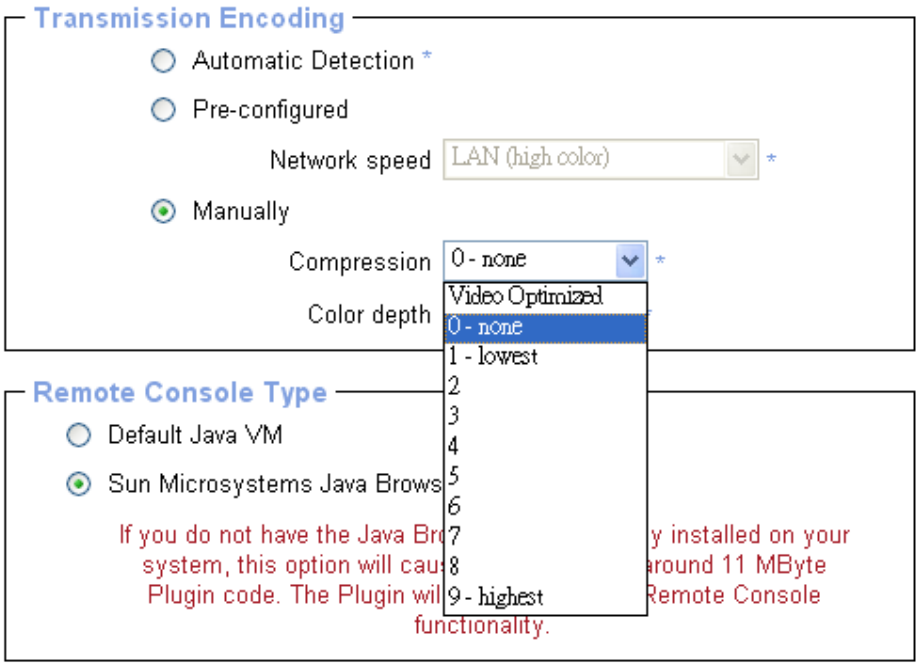


Figure 4-10 Remote Console Confirmation Dialog

- **Encoding**

  These options are used to adjust the encoding level in terms of compression and color depth. They are available only when "Transmission Encoding" is determined manually (select **Manually** in **KVM Settings > User Console > Transmission Encoding** of web page).



Compression Level

You may select a value between 1 and 9 for the desired compression level with level 1 enabling the fastest compression and level 9 the best compression. The most suitable compression level should always be seen as a compromise between the network bandwidth that is available, on your video picture to be transferred, and on the number of changes between two single video pictures. We recommend to use a higher compression level if the network bandwidth is low. The higher the compression level the more time is needed to pack and unpack the video data on either side of the connection. The compression quality depends on the video picture itself, e.g. the number of the colors or the diversity of pixels. The lower the compression quality, the more data have to be sent and the longer it may take to transfer the whole video picture.

If level 0 is chosen the video compression is disabled, completely.

The option "Video Optimized" has its advantages if transferring high-quality motion pictures. In this case the video compression is disabled, completely and all video data is transferred via network as full-quality video snippets. Therefore, a high amount of bandwidth is required to ensure the quality of the video picture.

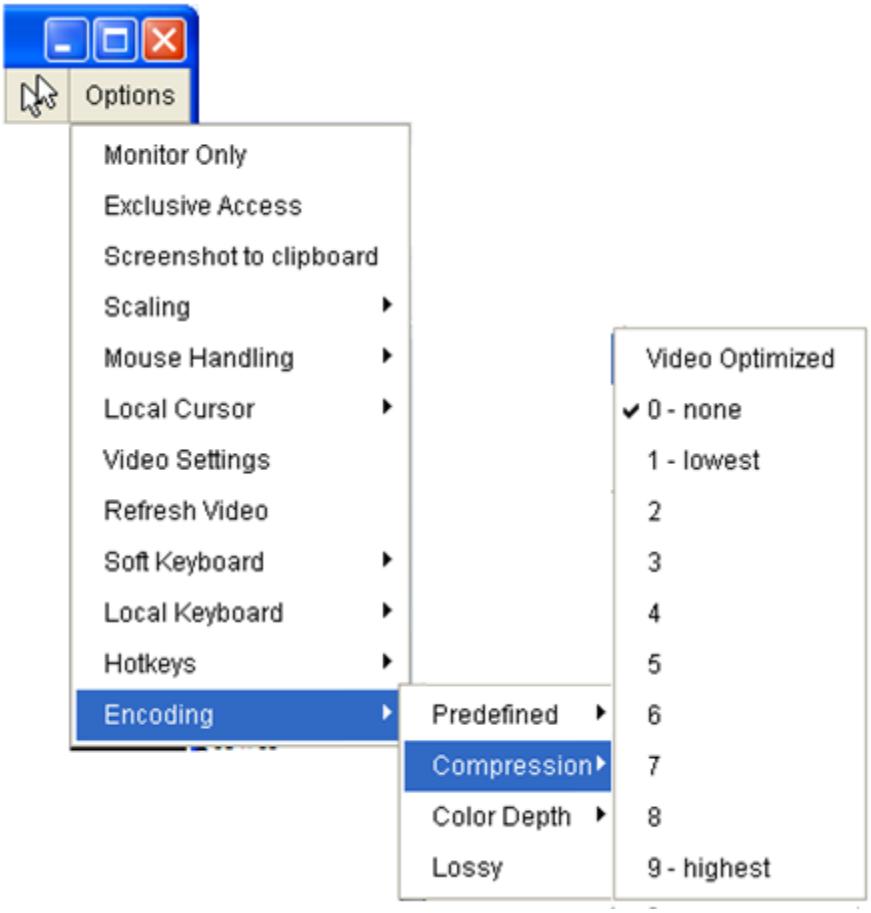


Figure 4-11 Encoding Compression

The next two options allow you to set the compression level to a predefined level OR to

set a level for "lossy" compression. This compresses well, but leads to degradation in image quality.

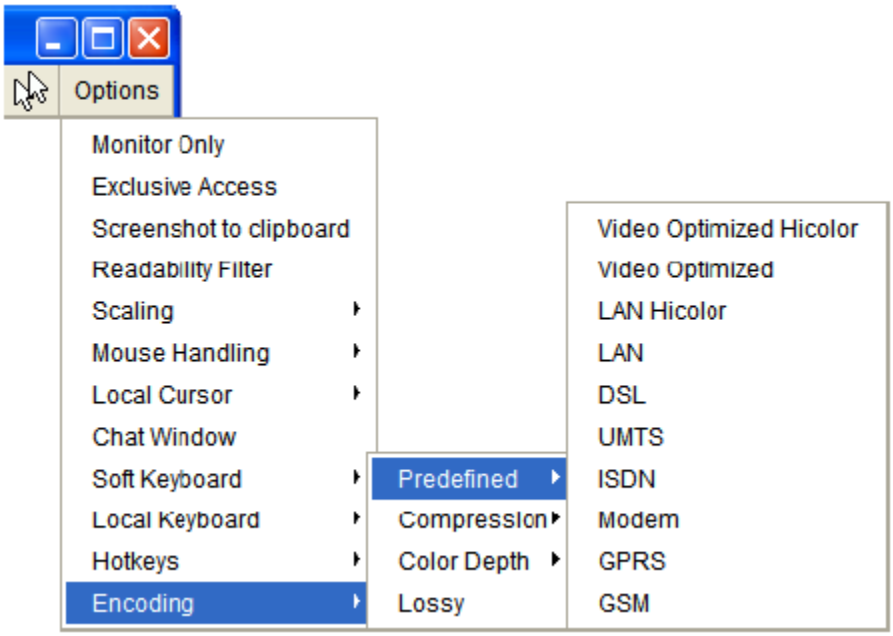


Figure 4-12 Predefined Compression

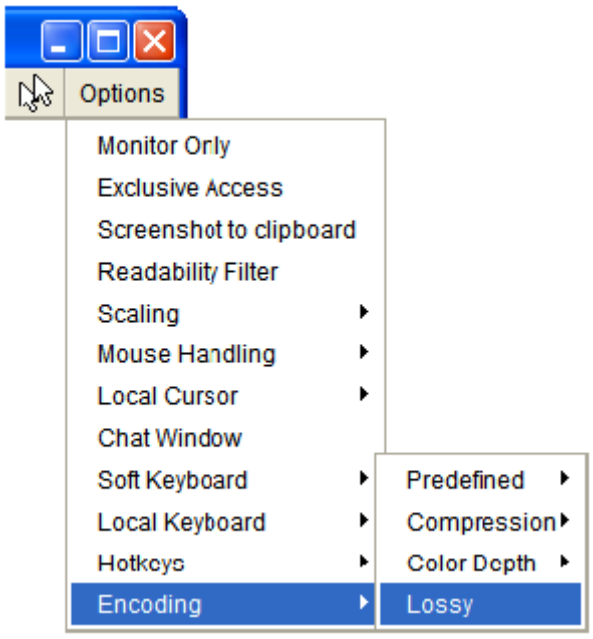


Figure 4-13 Lossy Compression

Color Depth

Set the desired color depth. You may select between 8 or 16 bit for Video Optimized/compression level 0, or between 1 and 8 bit for compression level 1 to 9. The higher the color depth, the more video information has to be captured and to be

transferred.

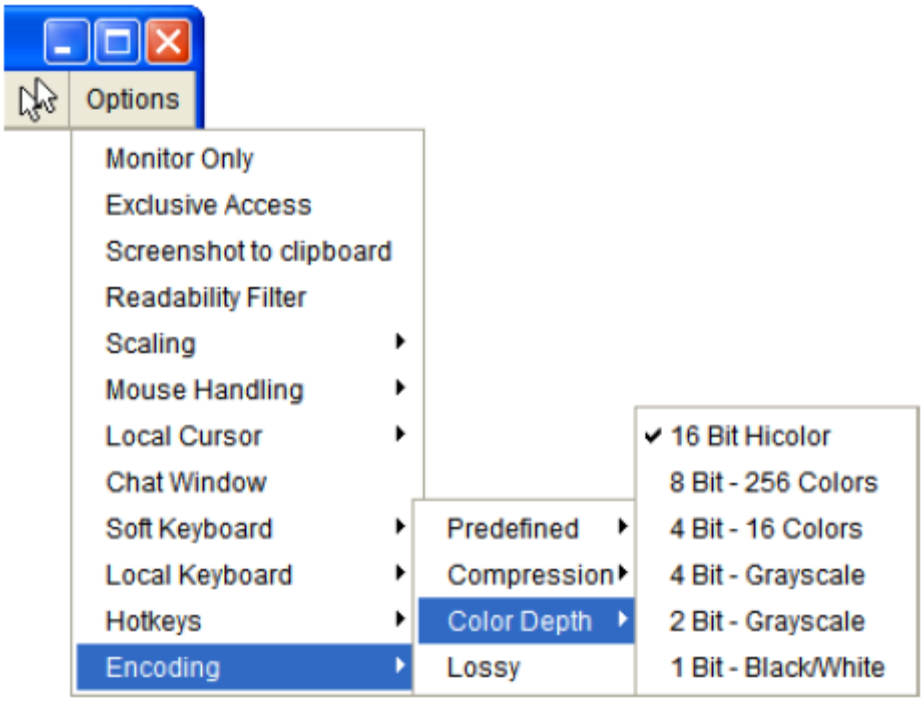


Figure 4-14 Encoding Color depth

Note:
If displaying motion pictures on a connection with low speed you may achieve an improvement regarding the video transfer rate by lowering the color depth and disabling the option "Video Optimized". As a general result, the data rate is reduced (less bits per color). Furthermore, the IP-KVM will not have to do any video compression. In total, this will lead to less transfer time of the motion picture.

4.3.3 Status Line of Remote Console

Status line

Shows both console and the connection state. The size of the remote screen is displayed. Figure belowwas taken from a Remote Console with a resolution of 800x600 pixels. The value in brackets describes the connection to the Remote Console. “Norm” means a standard connection without encryption, “SSL” means a secure connection.

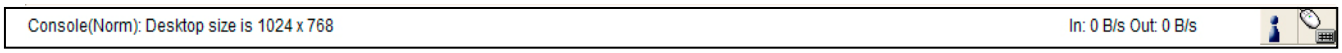


Figure 4-15 Status line

Furthermore, both the incoming (“In:”) and the outgoing (“Out:”) network traffic are visible (in kb/s). If compressed encoding is enabled, a value in brackets displays the compressed transfer rate.

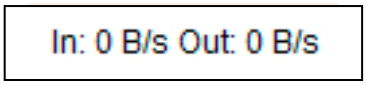
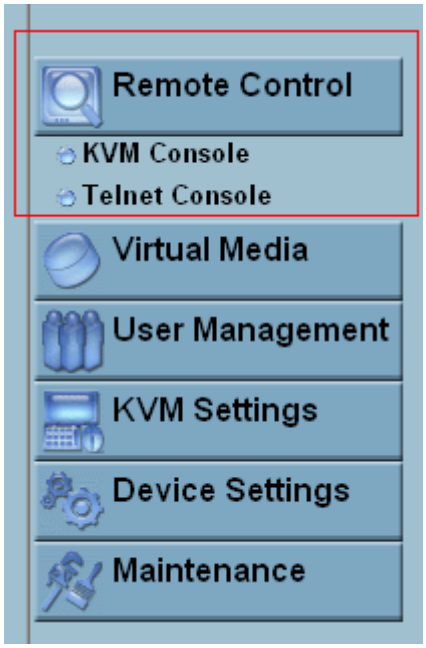


Figure 4-16 Status line transfer rate

For more information about Monitor Only and Exclusive Access settings, see related sections

5. Menu Options

5.1 Remote Control



The Remote Console is the redirected screen, keyboard and mouse of the remote host system that IP-KVM controls. The Remote Console window is a Java Applet that tries to establish its own TCP connection to the IP-KVM.

Starting the Remote Console opens a new window displays screen movement of host system, with its size automatically adjusted to optimum. Keyboard and mouse are redirected to control the host system simultaneously. A slight delay may present depending on the bandwidth of network.

5.1.1 KVM Console

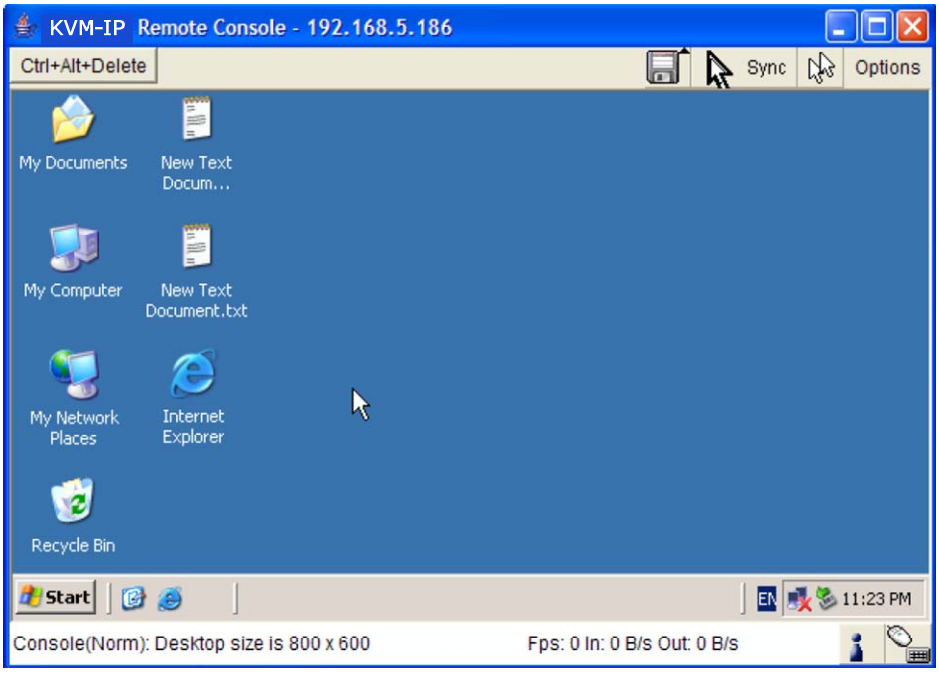


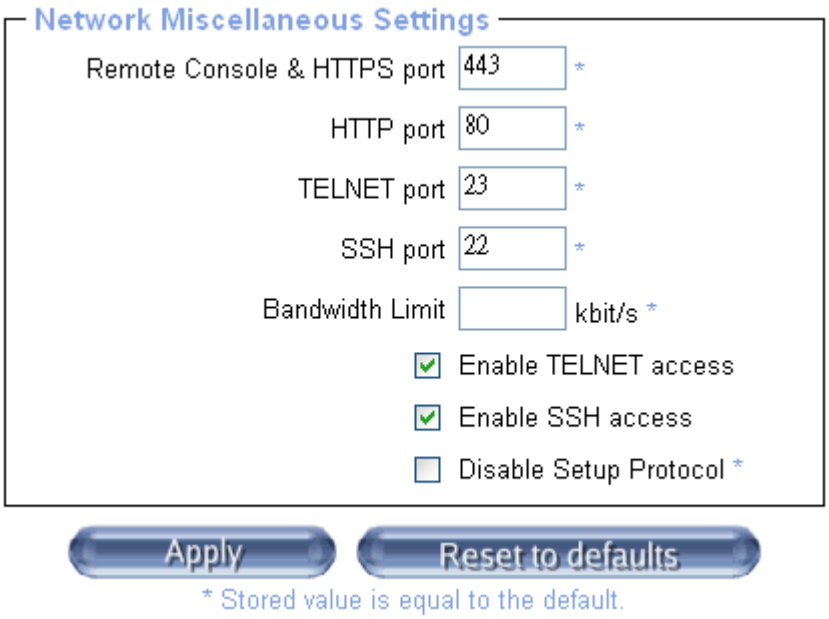
Figure 5-1 KVM Console

To open the KVM console either click on the icon **Console** or **Remote Control > KVM Console** of the menu entry on the left or **Click to open** of the console picture on the right.

5.1.2 Telnet/SSHConsole

In general, the Telnet or SSH interface supports two operation modes: the **command** line mode and the **terminal** mode. The command line mode is used to control or display some parameters. In terminal mode the pass-through access to serial port is activated (if the serial settings were configured accordingly). All inputs are redirected to the device on serial port and its answers are displayed on the Telnet interface.

In order to log in with Telnet or SSH, you have to enable the access settings from **Device Settings > Network.**

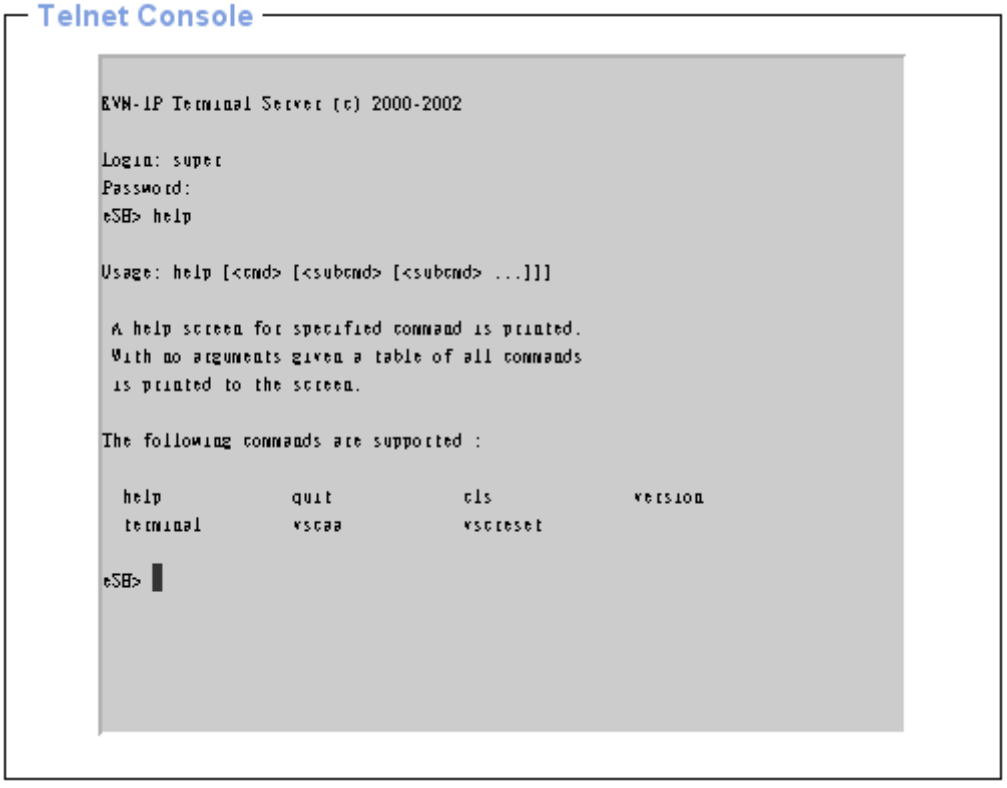


Telnet Console

The IP-KVM firmware features a Telnet server that enables a user to connect via a standard Telnet client. In case the Telnet program is using a VT 100, VT 102 or VT 220 terminal or an according emulation, it is even possible to perform a console redirection as long as the IP-KVM host machine is using a text mode screen resolution.

To log in Telnet Console by one of the following way:

1. clicking **Remote Control > telnet Console**



2. or telnet command as required by the Telnet client, for instance in a UNIX shell:

telnet 192.168.0.70

3. or run the SSH-supported terminal emulation program (such as **PuTTY**).

Replace the IP address by the one that is actually assigned to the IP-KVM. This will prompt for username and password in order to log into the device. The credentials that need to be entered for authentication are identical to those of the web interface. That means, the user management of the Telnet interface is entirely controlled with the according functions of the web interface.

Once you have successfully logged into the IP-KVM a command line will be presented and you can enter according management commands.

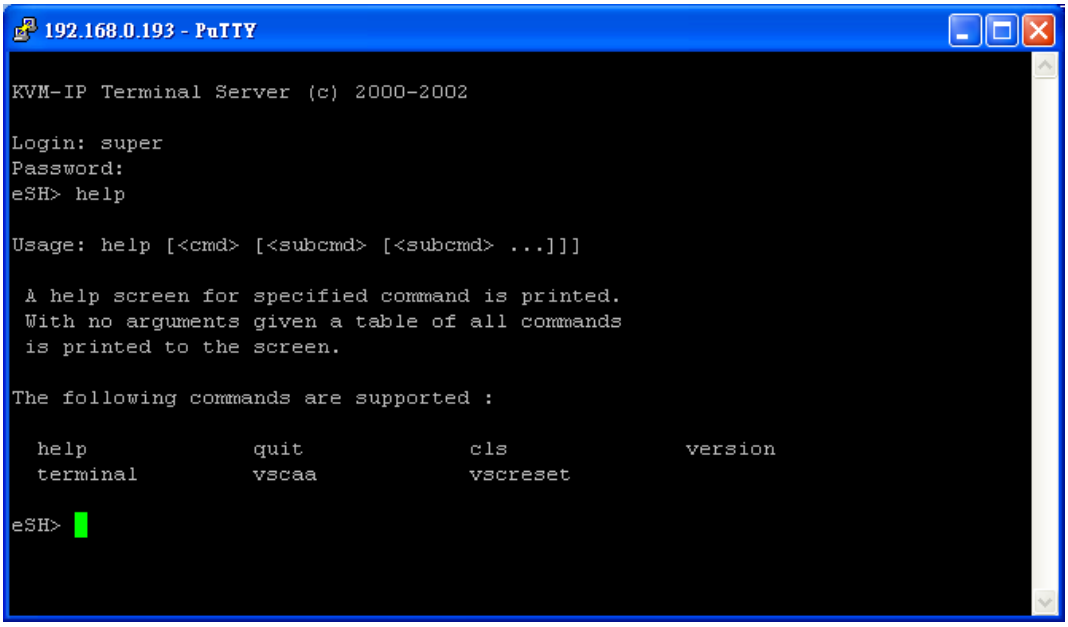


Figure 5-2 Telnet Console

Key in **help** to list all available commands.

The following list shows the according command mode command syntax and their usage.

help

Displays the list of possible commands

cls

Clears the screen

quit

Exits the current session and disconnects from the client

version

Displays the release information

terminal

Starts the terminal **passthrough** mode for RS-232 serial port. This mode provides **Serial over IP** functin. The key sequence *ESC + exit* switches back to the command mode.

vscaa

Auto adjustment of the Remote Console.

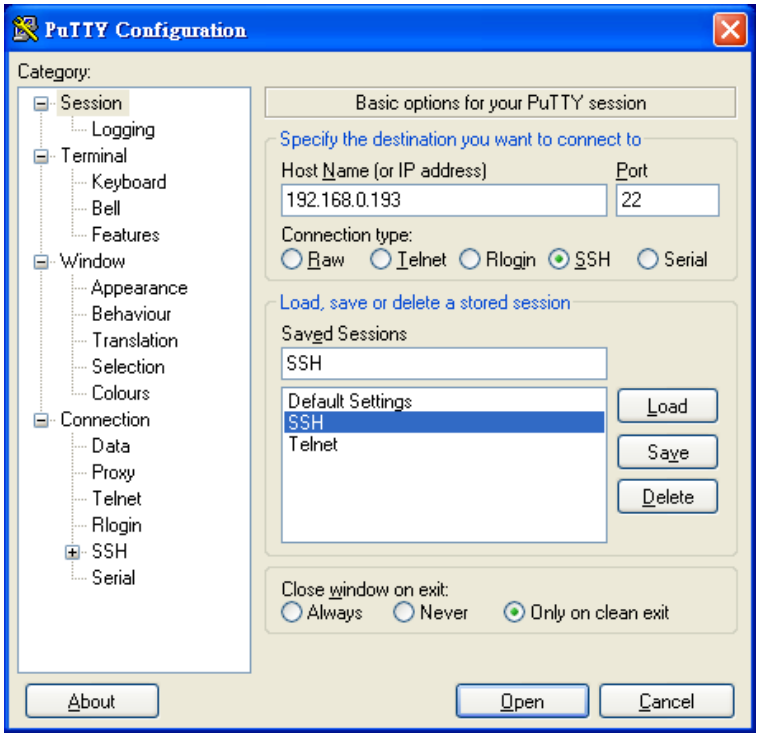
vscreset [modes/allmodes/all]

Reset the video modes like in the remote console under option “Video Settings”. *vscreset modes*: reset settings for the current video mode *vscreset allmodes*: reset settings for all video modes *vscreset all*: reset all video modes and global settings (Brightness and Contrast)

SSH Console

The IP-KVM supports SSH security protocol. The SSHv2 will encryption the transferred data so as to keep the data communication secured. Basically, the SSH’s configuration interface is the same as Telnet console’s, except that SSH is data encrypted and secured.

Please run the SSH-supported terminal emulation program (such as **PuTTY**).



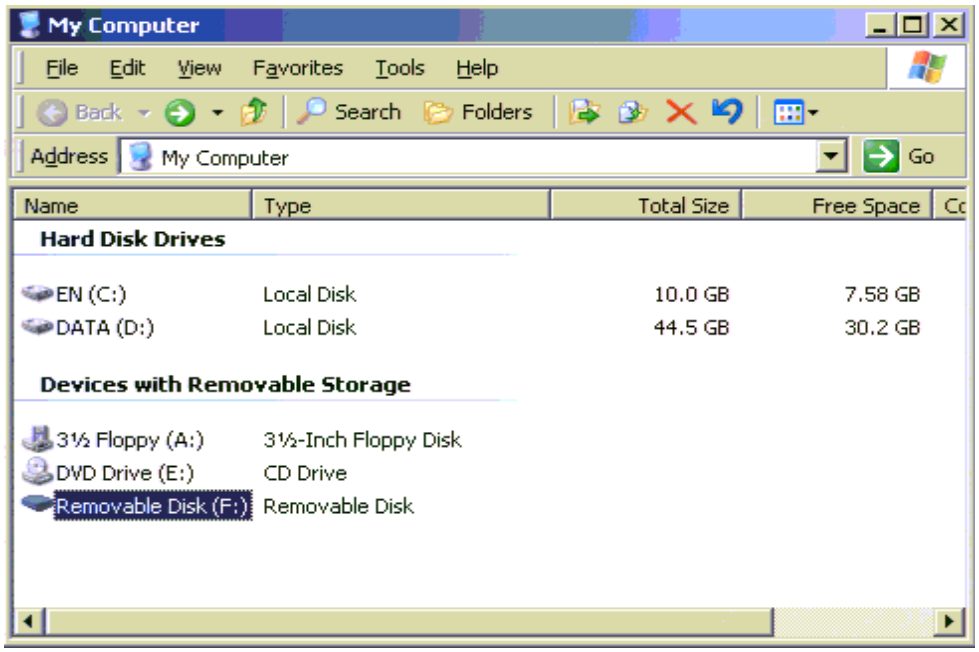
5.2 Virtual Media

The IP-KVM provides a powerful capability called Virtual Media (or Virtual Disk). Using the USB port, the IP-KVM can present either a local floppy disk image or a redirected remote CD/DVD-ROM image to the target computer. This can allow system recovery in conditions as bad as having local disks down and no primary network connection. With Floppy Disk Image, the user can upload an image to the IP-KVM's memory, which then emulates a locally attached floppy drive. With CD/DVD-ROM Image, a Windows or other SAMBA share can emulate a locally attached CD/DVD-ROM, for instance to update software.

Drive Redirection allows you to share (redirect) your local drive (floppy drives, hard disks, CD ROMs and other removable devices like USB sticks) with the remote system over a TCP network connection. Thus, with Drive Redirection, you can use a virtual disk drive on the remote computer instead of an image file. It is also possible to enable a remote machine to write data to your local disc.

Before go ahead with this setup, both remote user computer and local computer (the one connected with the IP-KVM unit) would have to have Operating System Win2000, XP or above. This function would not work on other platforms at this moment.

Before using Virtual Media, please connect the USB cable from IP-KVM to host computer. After connecting the USB cable, you can see a "Removable Disk" on the host computer. Below is the host computer screen (the computer which connected with IPKVM).



5.2.1 Drive Redirection

The Drive Redirection is another possibility to use a virtual disc drive on the remote computer. With Drive Redirection you do not have to use an image file but may work with a drive from your local computer on the remote machine. The drive is hereby shared over a TCP network connection. Devices such as floppy drives, hard discs, CD-ROMs and other removable devices like USB sticks can be redirected. It is even possible to enable a write support so that for the remote machine it is possible to write data to your local disc.

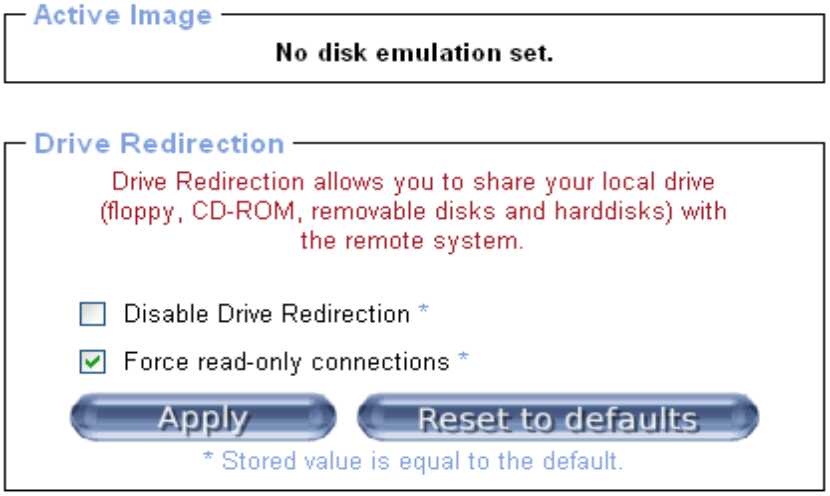


Figure 5-3 Options of Drive Redirection

Please note that Drive Redirection works on a level which is far below the operating system. That

means that neither the local nor the remote operating system is aware that the drive is currently redirected, actually. This may lead to inconsistent data as soon as one of the operating systems (either from the local machine, or from the remote host) is writing data on the device. If write support is enabled the remote computer might damage the data and the file system on the redirected device. On the other hand, if the local operating system writes data to the redirected device the drive cache of the operating system of the remote host might contain older data. This may confuse the remote host's operating system. We recommend to use the Drive Redirection with care, especially the write support.

Disable Drive Redirection

To disable the function of Drive Redirection.

Force read-only connections

If enabled the Write Support for the Drive Redirection is switched off. It is not possible to write on a redirected device.

Click **Apply** to submit your changes.

5.2.2 Virtual Drive

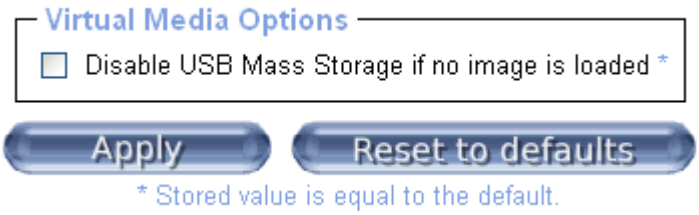


Figure 5-4 USB mass storage option

Set this option to disable the mass storage emulation (and hide the virtual drive) if not mounting a image file or drive to the host system. To set this option, press the button "Apply".

Note: If unset, and no file image will be found it may happen that the host system will hang on boot due to changes in the boot order, or the boot manager (LILO, GRUB). This case was reported for some Windows versions (2000, XP), other OS might not be fully excluded. This behavior depends on the BIOS version used in that machine.

5.2.3 CD/DVD Image

Use Image on Windows Share (via SAMBA)

To include an image from a Windows share, select “CD/DVD Image” from the submenu.

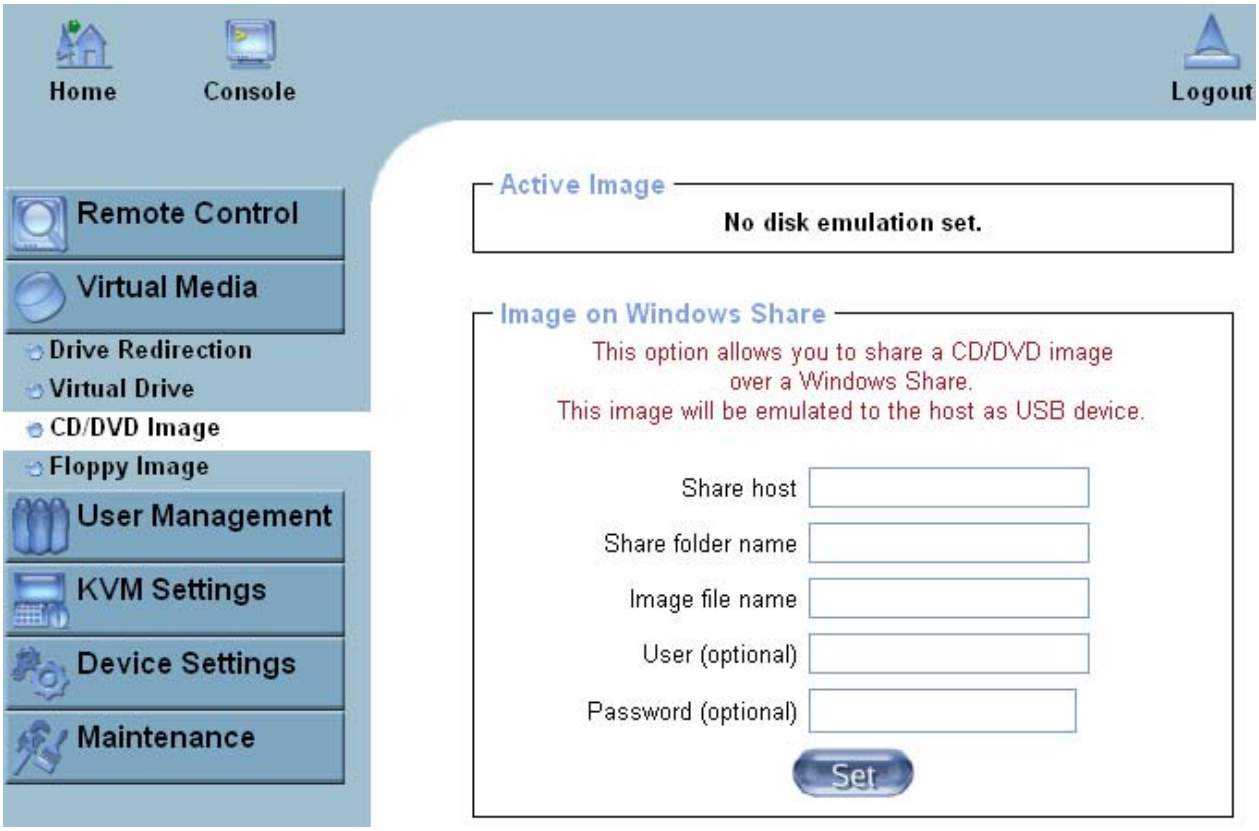


Figure 5-5 Virtual Media - CD-ROM Image

Share host

The server name or its IP address (the PC that shares out the image file). On Windows 95, 98 and Windows ME do not specify the IP address but the server name ("NetBIOS Name").

Share folder name

The name of the share to be used.

Image file name

The image file name on the share folder.

User (optional)

If necessary, specify the user name for the share named before. If unspecified and a guest account is activated, this guest account information will be used as your login.

Password (optional)

If necessary, specify the password for the given user name.

Notes:

1. The output image extension file name has to be ‘iso’, e.g. CD-Rom_vir.iso.
2. You may create an ISO image size up to 650Mb (for CD-ROM). This drive would be in read-only mode and would not allow you to write any information on this drive but copying only. This drive would be bootable under DOS mode if the motherboard/BIOS on the host computer supports USB BOOTABLE function. For emulating DVD Drive, please use **Drive Redirection** function.
3. The above information has to be given from the point of view of IP-KVM with correct IP address and device name. Administrative permission is required as regular user may not have the right to access. Please login as a system administrator (or as “root” on UNIX systems).
4. The specified image file is supposed to be accessible from the IP-KVM. The information above has to be given from the point of view of the IP-KVM. It is important to specify correct IP addresses, and device names. Otherwise, IP-KVM may not be able to access the referenced image file properly, leave the given file unmounted and will display an according error message, instead. So, we recommend to state correct values and repeat this step if necessary.
5. Furthermore, the specified share has to be configured correctly. Therefore, administrative permissions are required. As a regular user you may not have these permissions. You should either login as a system administrator (or as “root” on UNIX systems), or ask your system administrator for help to complete this task.

Operation Procedures:

1. Please run Nero or any CD/DVD imaging tool to create CD/DVD ISO image.
2. Please create a folder and share this folder **in the PC that shares out the image file**. Copy the CD/DVD ISO image file to this sharing folder. (Please make sure password has to be setup with the authorized user during Sharing => Permission settings)

MS Windows

Open the Explorer, navigate to the directory (or share) and press the right mouse button to open the context menu. Select **Sharing** to open the configuration dialog

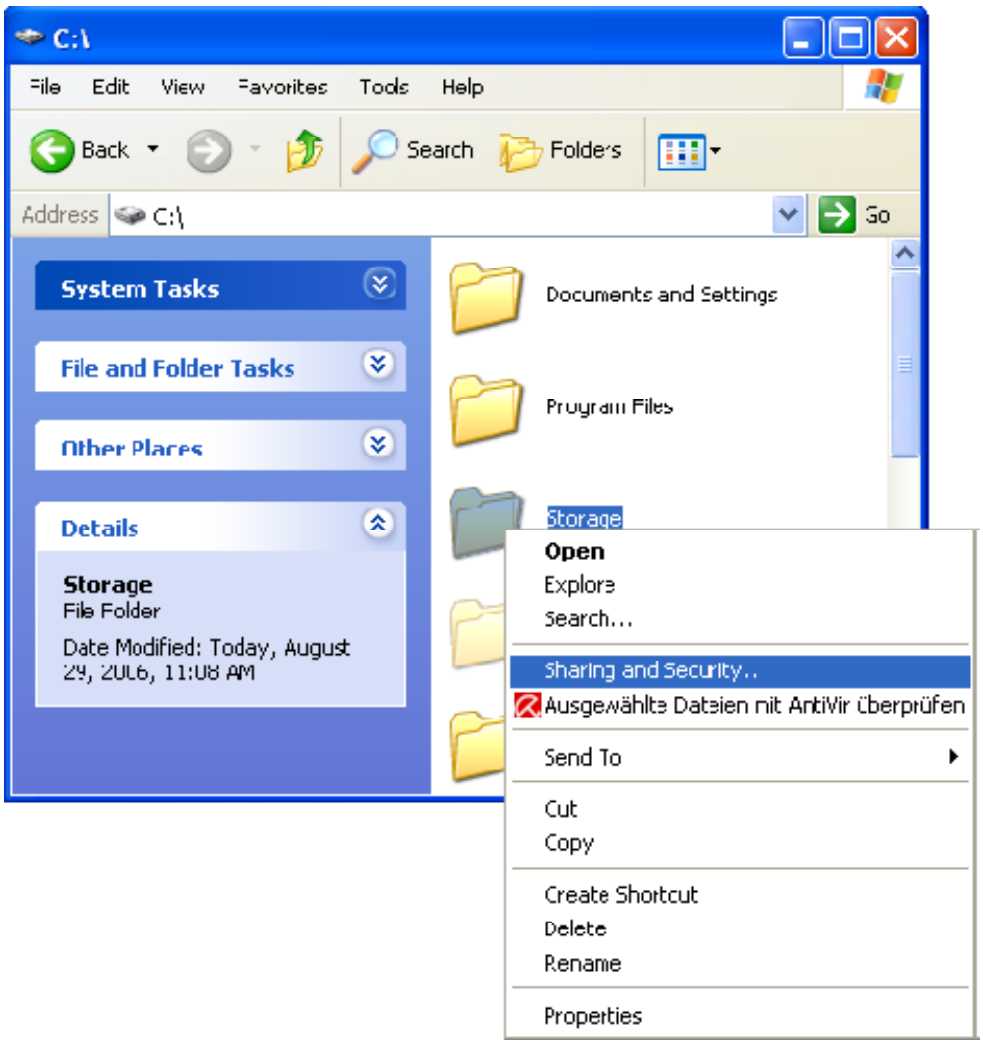


Figure 5-6 Explorer Context Menu

Figure 5-7 Share Configuration Dialog

Adjust the settings for the selected directory.

- Activate the selected directory as a share. Select **Share this folder**.
- Choose an appropriate name for the share. You may also add a short description for this folder (input field **Comment**).
- If necessary, adjust the permissions (**Permissions** button).
- Click **OK** to set the options for this share.

UNIX and UNIX-like OS (UNIX, Solaris, Linux)

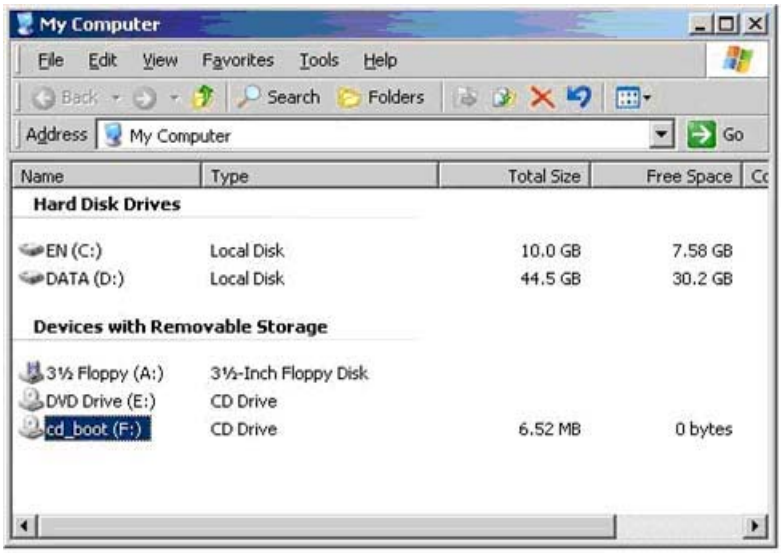
If you like to access the share via SAMBA, SAMBA has to be set up properly. You may either edit the SAMBA configuration file /etc/samba/smb.conf or use the Samba Web Administration Tool (SWAT) or WebMin to set the correct parameters.

Also looking at the **man**-entry of **smb.conf** is very helpful.

3. Fill in the sharing information on **Image on Windows Share,** click on the **Set** button.

4. If the Image file set successfully.

5. Open the remote console and you can see the virtual CD as below picture.



5.2.4 Floppy Disk

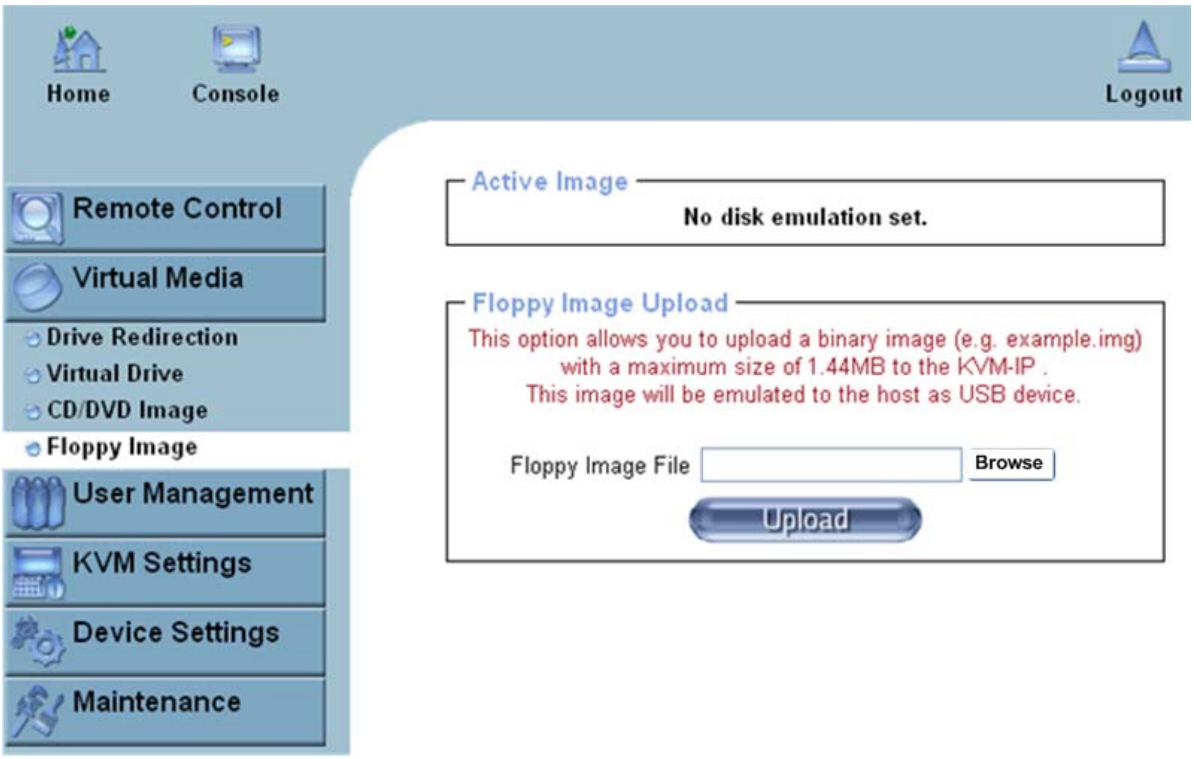
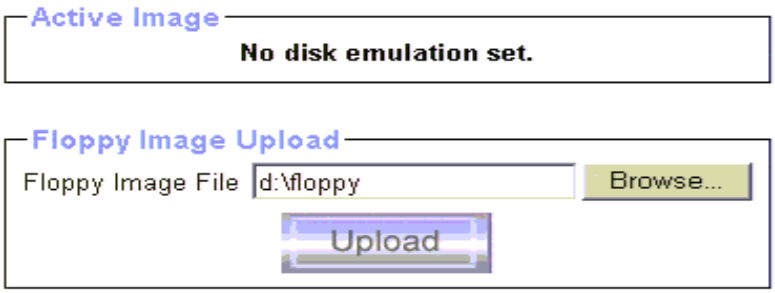


Figure 5-8 Virtual Media - Floppy Disk

The maximum image size is limited to 1.44MB. To use a larger image mount this image via Windows Share (or SAMBA) (see the Section called Use Image on Windows Share (via SAMBA) for details).

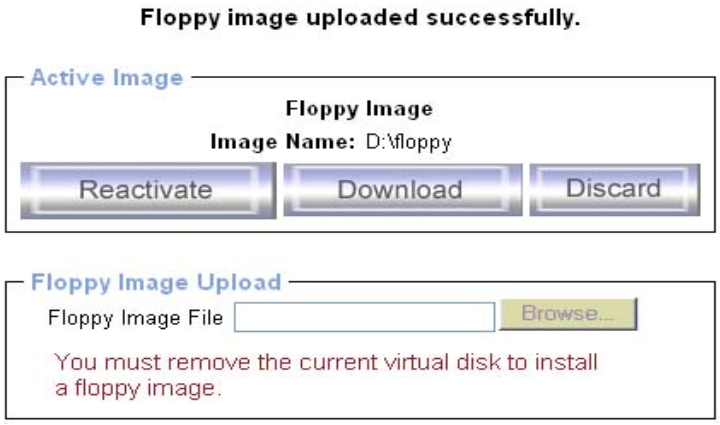
Operation Procedures:

1. You need to create the floppy image file first (Please refer to the section "Creating a floppy image"). For this example, we use RawWrite software (or any other image-creator software) to create floppy image. Please use licensed software for this purpose.
2. You can find an image file saved at desire destination after you created it with RawWrite.
3. Open the browser to log into the IP-KVM. Click **Virtual Media > Floppy Disk.** Click the Browse button to choose the image file.

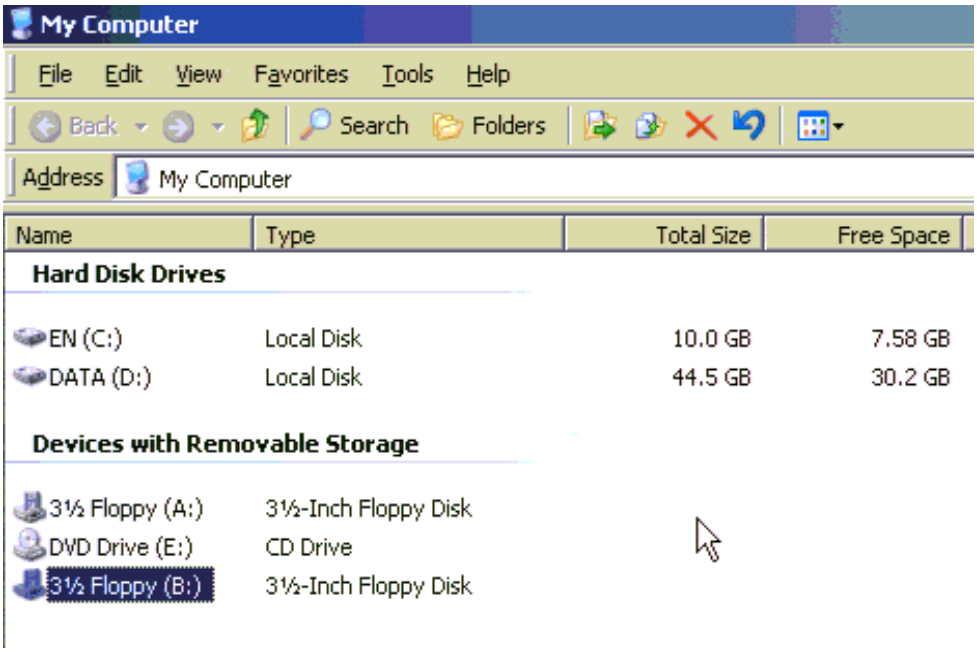


Click on the button **Upload** to initiate the transfer of the chosen image file into the IP-KVM module's on-board memory.

4. After you uploading the image file, you will see the information below.



5. Open the remote console and you will see a virtual Floppy drive is created on the host computer that connect to IP-KVM



You may create a floppy image size up to 1.44Mb. This drive would be in read-only mode and would not allow you to write any information on this drive but copying only. This drive would be bootable under DOS mode if the motherboard/BIOS on the host computer supporting USB BOOTABLE function.

Notes:

1. If using other image-creator software, the output image extension file name has to be ‘img’, e.g. floppy_vir.img.
2. The uploaded image file will be kept in the onboard memory of the IP-KVM until the end of the current session, as you logged out, or initiated a reboot of the IP-KVM.

5.2.5 Creating an Image

5.2.5.1 Creating a Floppy Image

MS Windows

You can use the tool “Raw Write for Windows”. You can get the RawWrite software from the website http://www.chrysocome.net/rawwrite.

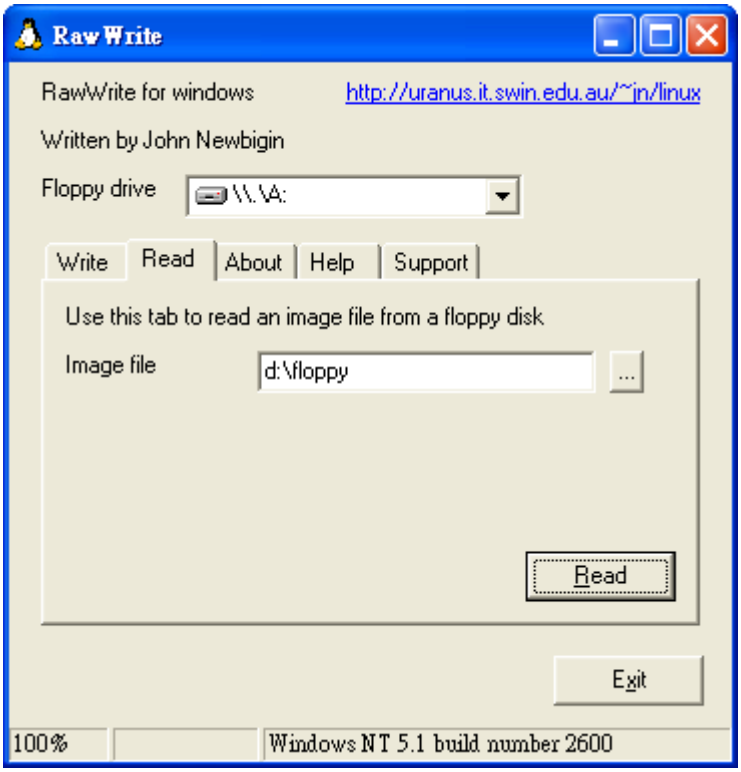


Figure 5-9 RawWrite for Windows selection dialog

From the menu, select the tab “Read”. Enter (or choose) the name of the file in which you would like to save the floppy content. Click on the button “Copy” to initiate the image creation process.

UNIX and UNIX-like OS

To create an image file, make use of “dd”. This is one of the original UNIX utilities and is included in every UNIX-like OS (UNIX, Sun Solaris, and Linux).

To create a floppy image file, copy the contents of a floppy to a file. You can use the following command:

dd [*if=/dev/fd0*] [*of=/tmp/floppy.image*]

dd reads the entire disc from the device /dev/fd0, and saves the output in the specified output file /tmp/floppy.image. Adjust both parameters exactly to your needs (input device etc.)

5.2.5.2 Creating a CD/DVD ISO Image

MS Windows

To create the image file, use your favorite CD imaging tool. Copy the whole contents of the disc into one single image file on your hard disk.

For example, with “Nero” you choose “Copy and Backup”. Then, navigate to the “Copy Disc” section. Select the CD-ROM or DVD drive you would like to create an image from. Specify the filename of the image, and save the CD-ROM content in that file.

Figure 5-10 Nero selection dialog

UNIX and UNIX-like OS

To create an image file, make use of “dd”. This is one of the original UNIX utilities and is included in every UNIX-like OS (UNIX, Sun Solaris, and Linux).

To create a CD-ROM image file, copy the contents of the CD-ROM to a file. You can use the following command:

dd [*if=/dev/cdrom*] [*of=/tmp/cdrom.image*]

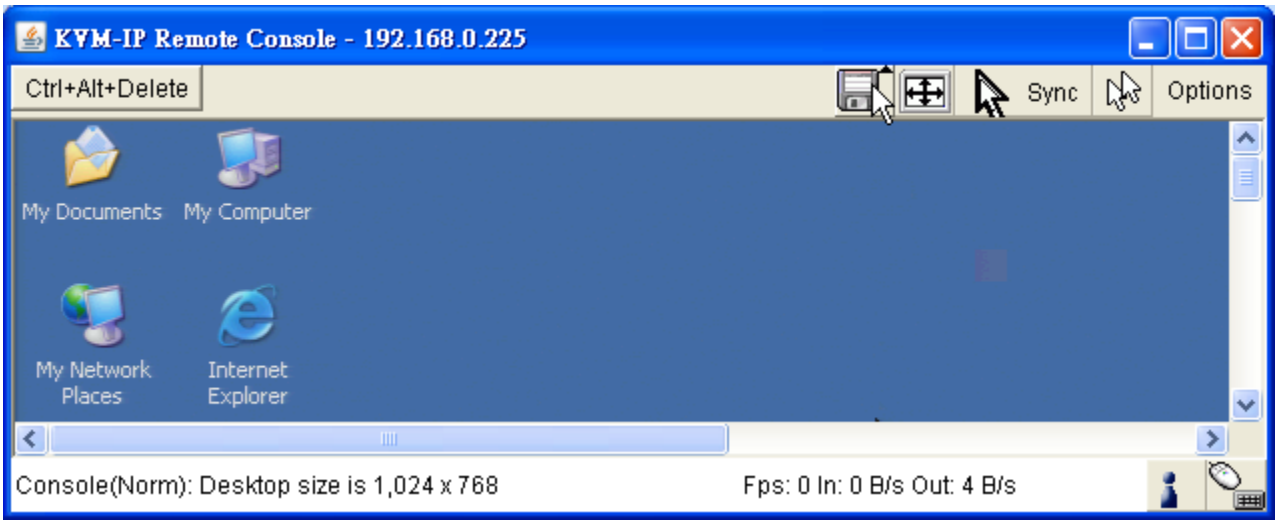
dd reads the entire disc from the device /dev/cdrom, and saves the output in the specified output file /tmp/cdrom.image. Adjust both parameters exactly to your needs (input device etc.).

5.2.6 Making a Drive Redirection

The operation procedures to make a drive redirection are as follows.

1. Run **Remote Control > KVM Console**.

2. Click on the “Floppy” icon 



You will see the Driver Redirection window as below.

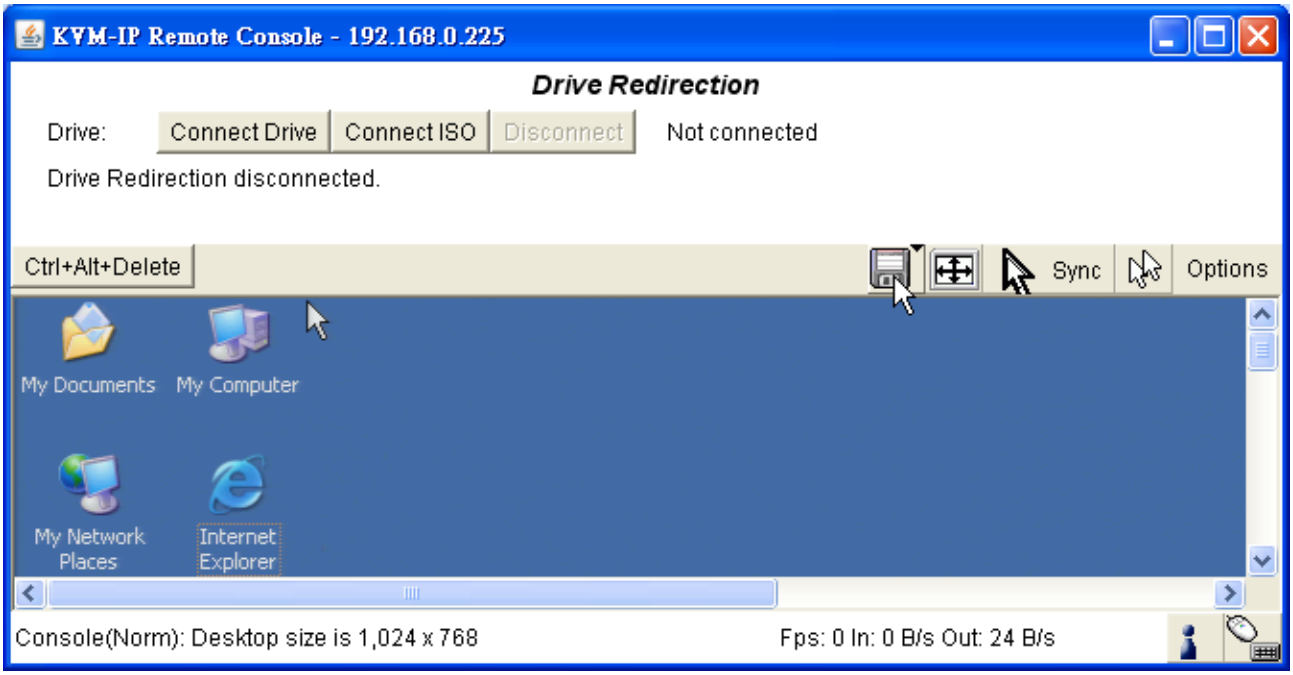
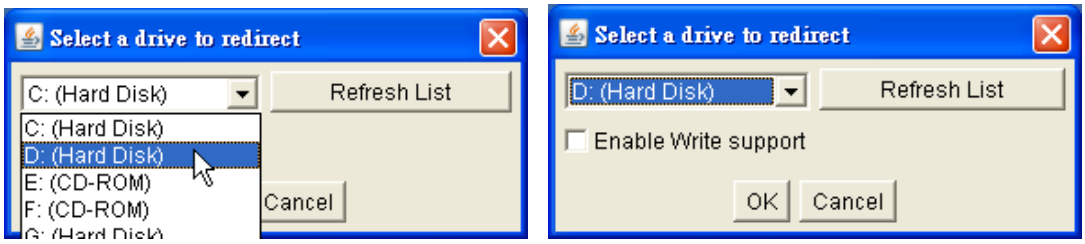


Figure 5-11 Built-in Java Drive Redirection

3. You can either redirect a local drive (only available under Windows) or redirect an ISO CD/DVD image.

3a. If click on **Connect Drive**



Select the drive to be redirected and click **OK**.

Select the drive you would like to redirect. All available devices (drive letters) are shown here. Please note that the whole drive is shared with the remote computer, not only one partition. If you have a hard disc with more than one partition all drive letters that belong to this disc will be redirected. The Refresh button may be used to regenerate the list of drive letters, especially for an USB stick.

> **Warning**
> Please be cautious that if "Allow Write Support" is selected, all data on the shred media might be destroyed.

Write Support

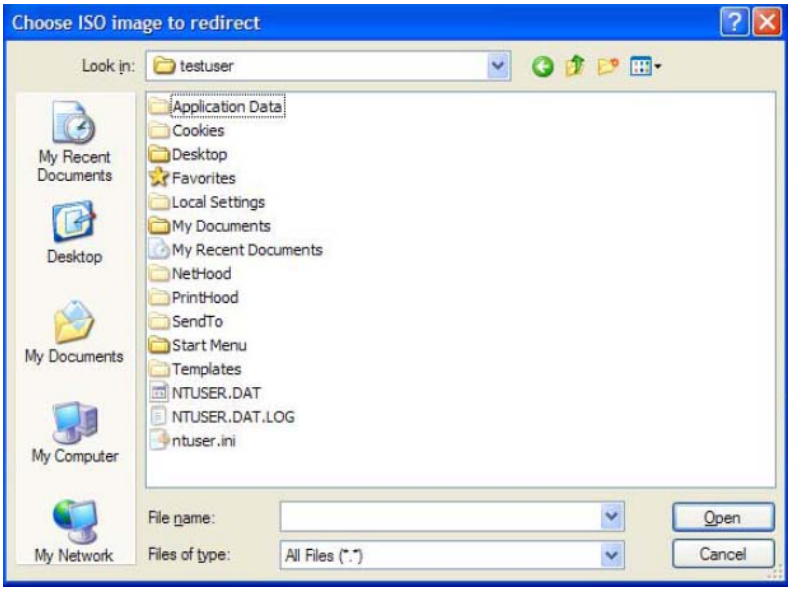
This feature may be enabled here. Write support means that the remote computer is allowed to write on your local drive. As you can imagine, this is very dangerous. If both the remote and the local system try to write data on the same device, this will certainly destroy the file system on the drive. Please use this only when you exactly know what you are doing.

Device Authentication

The factory default Username is "super" and the default Password is "pass".
Click **Connect** to redirect drive

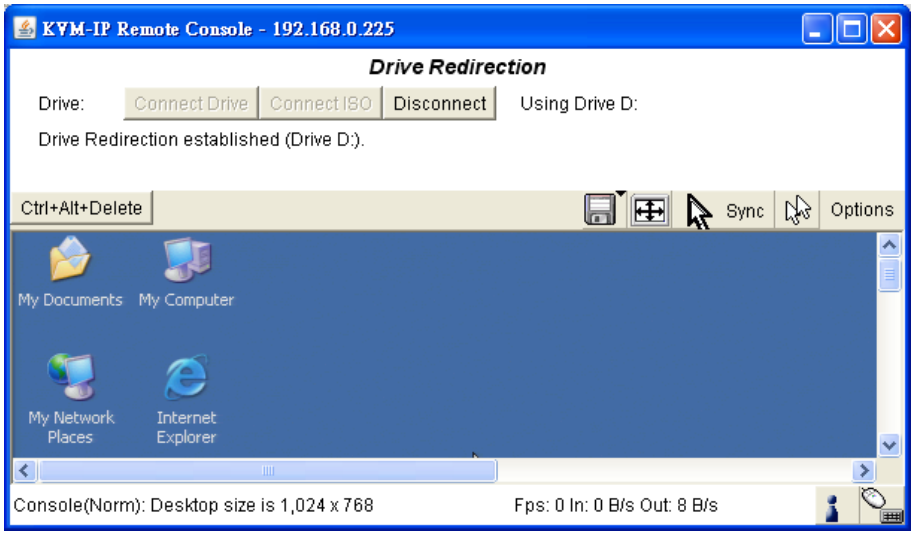
> **Warning**
> 1. Drive Redirection is only possible with Windows 2000 or later versions.
> 2. The Drive Redirection works on a low SCSI level and the SCSI protocol cannot recognize partitions; therefore the whole drive selected will be shared instead of any particular partition.
> 3. While connecting to a legacy KVM switch, please select PS/2 mouse for **Keyboard/Mouse setting** from webpage. Otherwise you will not be able to

3b. If click on **Connect ISO**

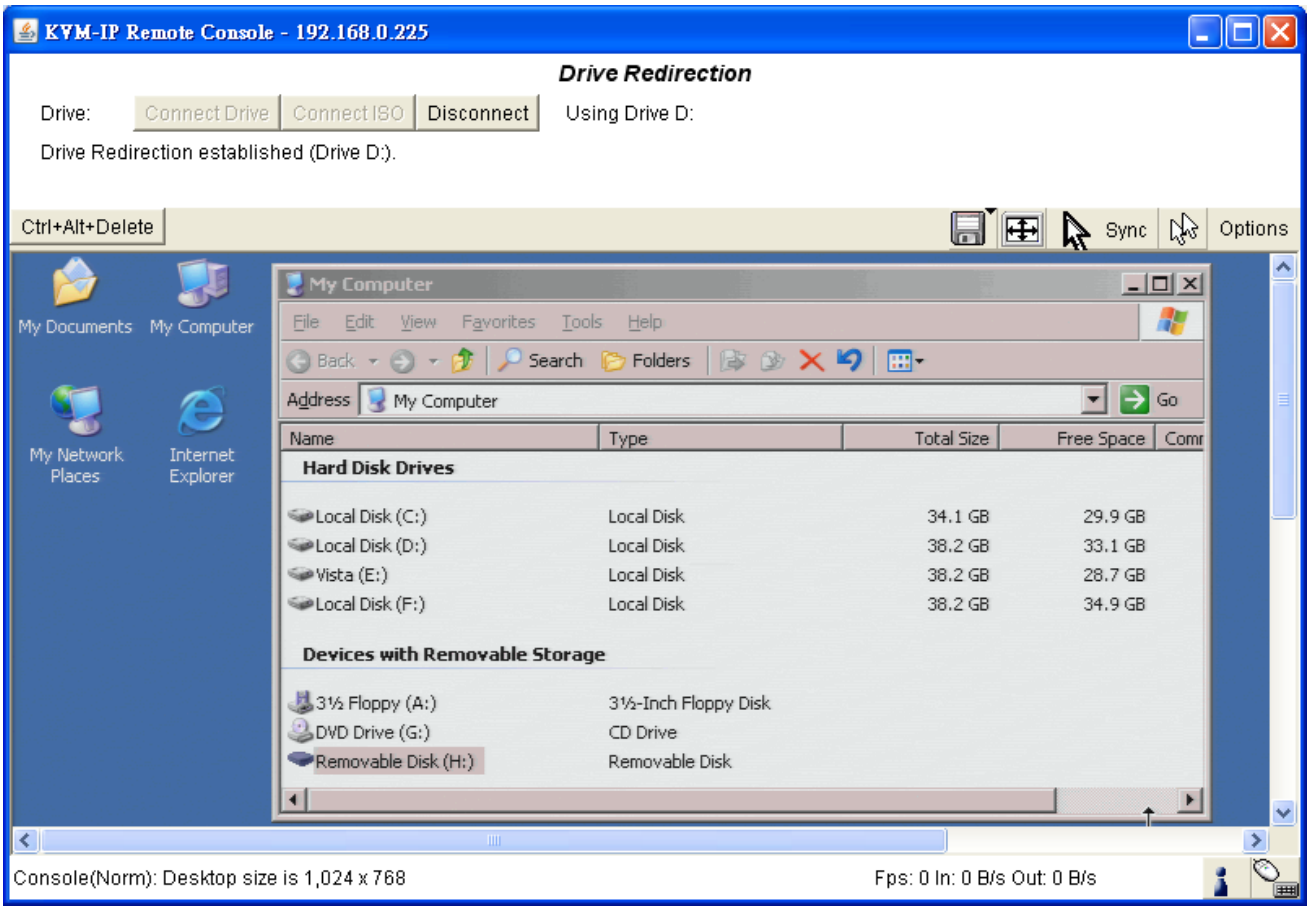


Select the ISO image file and click **Open**.

4. Finally the established Drive Redirection connection will be displayed



Open **My Computer y**ou will see the virtual drive appears on the remote host PC window.



The drive redirection software tries to lock the local drive before it is redirected. That means that it tries to prevent the local operating system from accessing the drive as long as it is redirected. This may also fail, especially if a file on the drive is currently open. In the case of a locking failure, you will be prompted if you want to establish the connection anyhow. This should not be a serious problem when the note above is respected. If the write support is enabled, a drive which is not locked might be damaged by the Drive Redirection.

Clicking on the **Disconnect** button will disconnect the Drive Redirection connection.

Please note that Virtual Drive creation is by Device manner not by Partition. Which means it looks for I/O in BIOS and sends the corresponding signal to host computer. This way, you are sending the entire hard drive (may consist of 'X' numbers of partitions) and emulate whatever number of partitions on host computer. You may also emulate a DVD-Drive with the same procedure. However, this DVD-Drive **Does NOT** support Bootable function like Floppy and CD-ROM emulation.

5.3 User Management

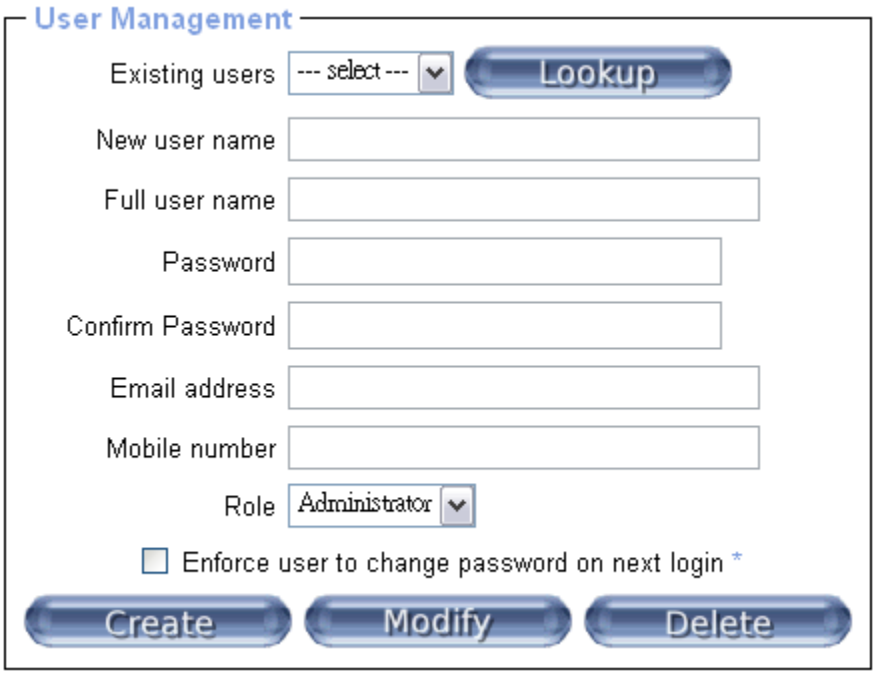
On an IP-KVM, each user name has settings and permissions associated with it. Settings affect how the user interfaces with the Remote Console. Permissions allow or forbid the user from performing various actions on the IP-KVM's web pages. A newly assigned user has permissions inherited from an assigned group, if any, or individual permissions if no group is assigned.

5.3.1 Change Password

Figure 5-12 Setting Password

Change password of currently logged in user:
Old Password: type in current password
New Password: type in new password
Confirm New Password: re-type new password for verification
Click "Apply" to submit your changes.

5.3.2 Users and Groups



There are three kinds of levels of user accounts:

- **Super** -- Has all possible rights to configure the device
- **Administrator** -- Has partial rights to change configuration apart from critical settings
- **User** -- Has permission to access basic function of open Remote Console

You can choose the desired level from the selection box **role**.

The IP-KVM comes with 1 pre-configured user account that has fixed permissions. The account “super” has all possible rights to configure the device and to use all functions IP-KVM offers.

Upon delivery, the account “super” has the password “pass”. Make sure to change password immediately after you have installed and on initial access of your IP-KVM.

Existing users

Select an existing user for modification. Once a user has been selected, click the lookup button to see the user information.

New User name

The new user name for the selected account.

Password

The password for the login name. It must be at least three characters long.

Confirm password

Confirmation of the password above.

Email address

This is optional.

Mobile number

This information may be optionally provided.

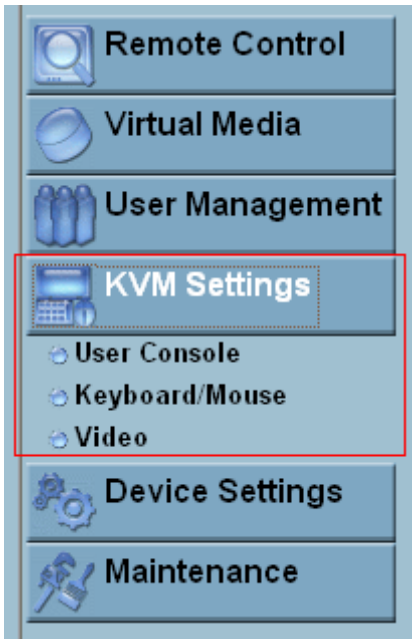
Role

Each user can be a member of a group (named a “role”) – there kinds can be shose from: super, administrator, or an regular user.

To create an user press the button **Create**. The **Modify** button changes the displayed user settings. To delete an user press the button **Delete**.

Note:The IP-KVM is equipped with an host-independent processor and memory unit which both have a limitation in terms of the processing instructions and memory space. To guarantee an acceptable response time we recommend not to exceed the number of 15 users connected to the IP-KVM at the same time. The memory space that is available onto the IP-KVM mainly depends on the configuration and the usage of the IP-KVM (log file entries etc.). That’s why we recommend not to store more than 150 user profiles.

5.4 KVM Settings



5.4.1 User Console

The following settings are user specific. That means, the super user can customize these settings for every users separately. Changing the settings for one user does not affect the settings for the other users.

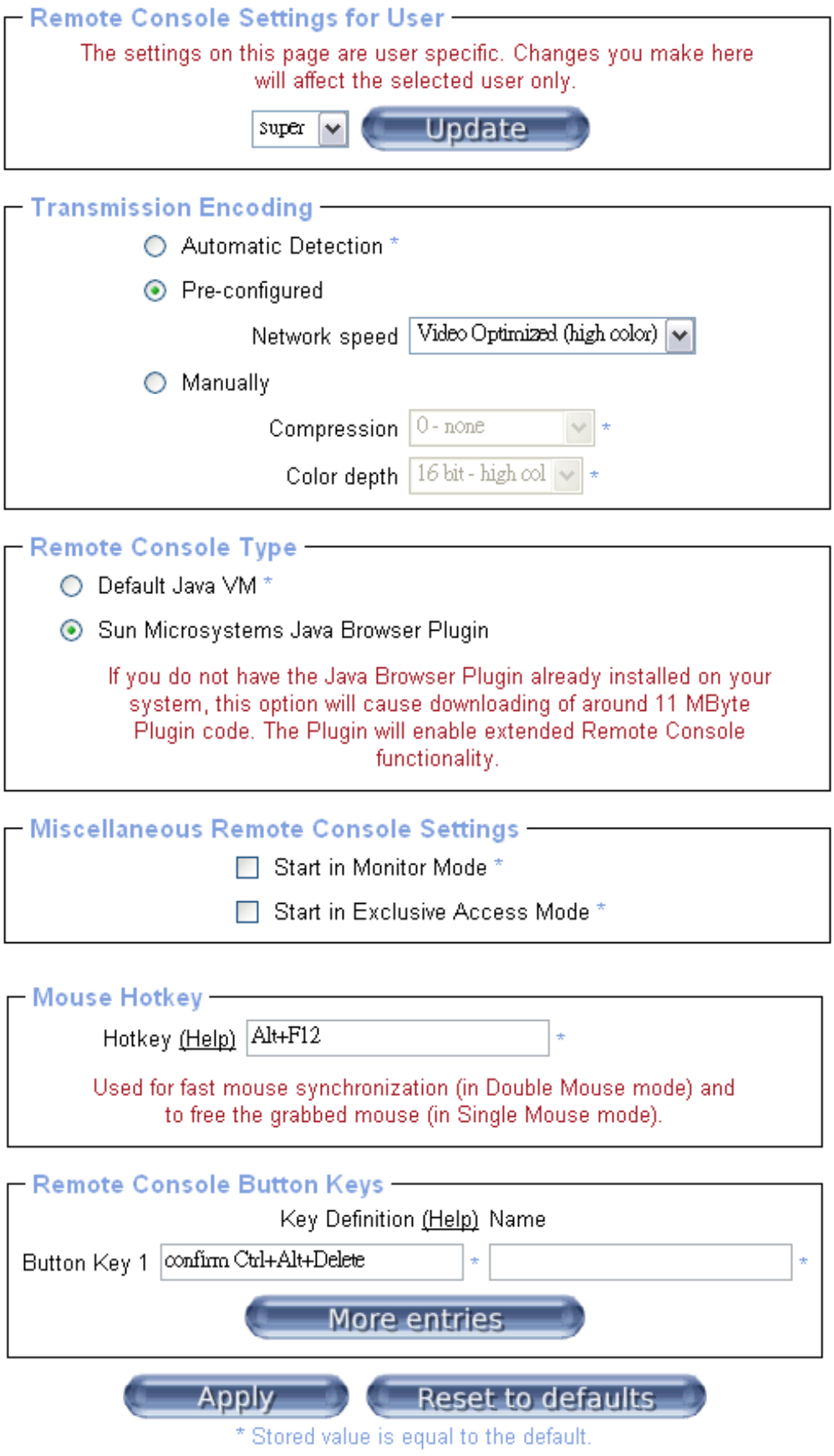


Figure 5-13 User Console Setting

User select box

This selection box displays the user ID for which the values are shown and for which the changes will take effect. You may change the settings of other users if you have the required privileges.

Transmission Encoding

The Transmission Encoding setting allows changing the image-encoding algorithm that is used to transmit the video data to the Remote Console window. It is possible to optimize the speed of the remote screen processing depending on the number of users working at the same time and the network bandwidth of the connection line (Modem, ISDN, DSL, LAN, etc.).

Automatic detection

The encoding and the compression level is determined automatically from the available bandwidth and the current content of the video image.

Pre-configured

The pre-configured settings deliver the best result because of optimized adjustment of compression and colour depth for the indicated network speed.

Manually

Allows to adjust both compression rate and the colour depth individually. Depending on the selected compression rate the data stream between the IP-KVM and the Remote Console will be compressed in order to save bandwidth. Since high compression rates consum more computing power of IP-KVM, they should not be used while several users are accessing the IP-KVM simultaneously.

The standard color depth is 16 Bit (65536 colors). The other color depths are intended for slower network connections in order to allow a faster transmission of data. Therefore compression level 0 (no compression) uses only 16 Bit color depth. At lower bandwidths only 4 Bit (16 colors) and 2 Bit (4 gray scales) are recommended for typical desktop interfaces. Photo-like pictures have best results with 4 Bit (16 gray scales). 1 Bit color depth (black/white) should only be used for extremely slow network connections.

Remote Console Type

Specifies, which Remote Console Viewer to use.

Default Java-VM

Uses the default Java Virtual Machine of your Browser. This may be the Microsoft JVM for the Internet Explorer, or the Sun JVM if it is configured this way. Use of the Sun JVM may also be forced (see below).

Sun Microsystems Java Browser Plugin

Instructs the web browser of your administration system to use the JVM of Sun Microsystems. The JVM in the browser is used to run the code for the Remote Console window, which is actually a Java Applet. If you check this box for the first time on your administration system and the appropriate Java plug-in is not already installed on your system, it will be downloaded and installed automatically. However, in order to make the installation possible, you still need to answer the according dialogs with “yes” . The download volume is around 11 Mbytes. The advantage of downloading Sun's JVM lays in providing a stable and identical Java Virtual Machine across different platforms. The Remote Console software is optimized for this JVM versions and offers wider range of functionality when run in SUN's JVM. Please make sure that you are installing Sun JVM v1.5 or above to your client system.

Miscellaneous Remote Console Settings

Start in Monitor Mode

Sets the initial value for the monitor mode. By default the monitor mode is off. In case you switch it on, the Remote Console window will be started in a read only mode.

Start in Exclusive Access Mode

Enables the exclusive access mode immediately at Remote Console startup. This forces the Remote Consoles of all other users to close. No one can open the Remote Console at the same time again until this user disables the exclusive access or logs off.

Mouse hotkey

Allows to specify a hotkey combination which starts either the mouse synchronization process if pressed in the Remote Console, or is used to leave the single mouse mode.

Remote Console Button Keys

Button Keys allow simulating keystrokes on the remote system that cannot be generated locally. The reason for this might be a missing key or the fact, that the local operating system of the Remote Console is unconditionally catching this keystroke already. Typical examples are “Control+Alt+Delete” on Windows and DOS, what is always caught, or “Control+Backspace” on Unix or Unix-like OS for terminating the X-Server. The syntax to define a new Button Key is as follows:

[confirm] <keycode>[+|-[*]<keycode>]*

“confirm” requests confirmation by a dialog box before the key strokes will be sent to the remote host.

“keycode” is the key to be sent. Multiple key codes can be concatenated with a plus, or a minus sign. The plus sign builds key combinations, all keys will be pressed until a minus sign or the end of the combination is encountered. In this case all pressed keys should be

released in reversed sequence. The minus sign builds single, separate key presses and releases. The star inserts a pause with duration of 100 milliseconds.

5.4.2 Keyboard/Mouse

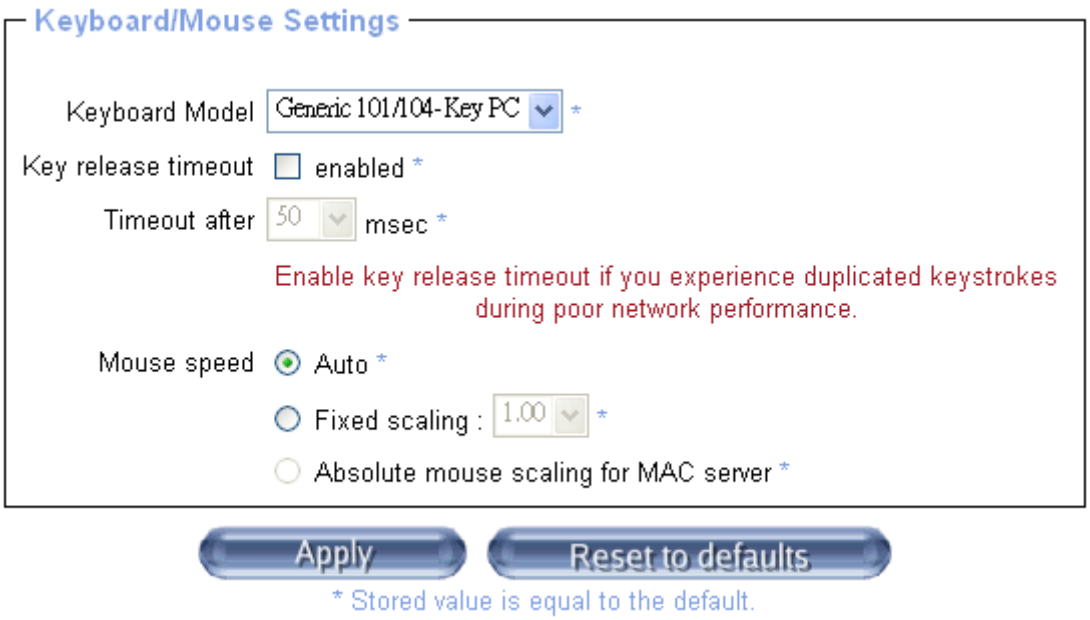


Figure 5-14 Keyboard and Mouse Settings

PS/2 Keyboard Model

Enables a certain keyboard layout. You can choose between “Generic 101-Key PC” for a standard keyboard layout, “Generic 104-Key PC” for a standard keyboard layout extendend by three additional windows keys, “Generic 106-Key PC” for a japanese keyboard, and “Apple Macintosh” for the Apple Macintosh.

Keyboard timeout

Recommanded as “enable” for keyboard timeout when host is UNIX or UNIX-like OS.

Mouse Speed

- Auto mouse speed

  Use this option if the mouse settings on host use an additional acceleration setting. The IP-KVM tries to detect the acceleration and speed of the mouse during the mouse sync process.

- Fixed mouse speed

  Use a direct translation of mouse movements between the local and the remote pointer.

You may also set a fixed scaling which determines the pixel-amount of the remote mouse pointer movement when the local mouse pointer is moved by one pixel. This option is used to manually control the remote mouse speed and only works when the mouse settings on the host are linear. This means mouse acceleration of OS should be disabled, and the intelligent mouse synchronization of IP-KVM is not functioning under this setting.

- Absolute mouse scaling for MAC server

  Use this option for MAC server.

To set the options, click on the button **Apply**.

5.4.3 Video

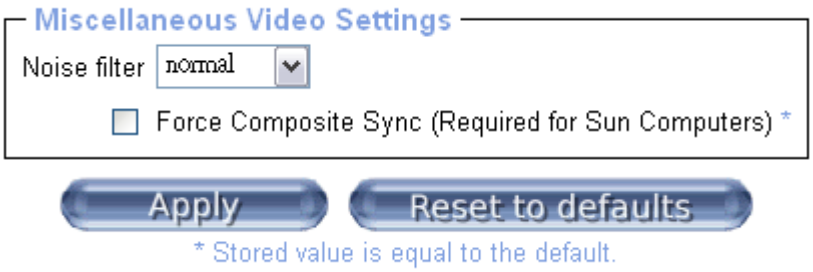


Figure 5-15 Video Settings

Miscellaneous Video Settings

- **Noise filter**

  This option defines how the IP-KVM reacts to small changes in the video input signal. Turning on the noise filter can help reduce video flickering that is often caused by distortions, as well as lowering unnecessary bandwidth consumption. A large filter setting needs less network traffic and leads to a faster video display, but small changes in some display regions may not be recognized immediately. A small filter displays all changes instantly but may lead to a constant amount of network traffic even if the display content is not really changing (depending on the quality of the video input signal). All in all the default setting should be suitable for most situations.

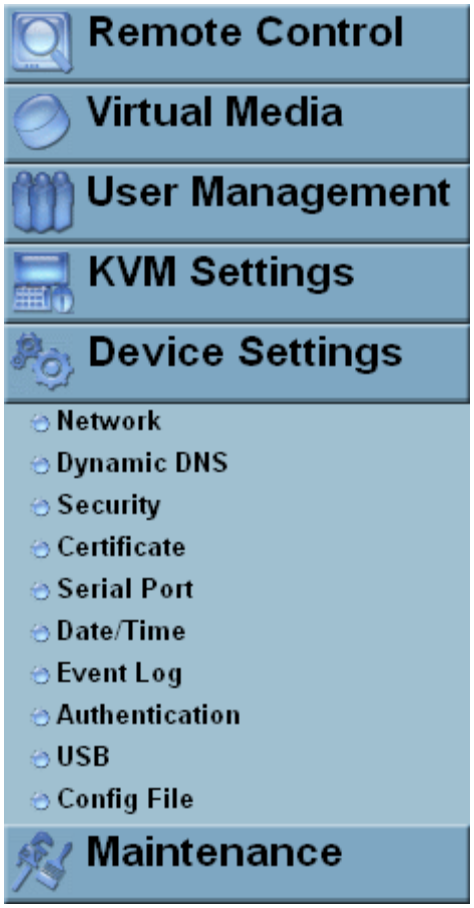
- **Force Composite Sync (Required for Sun Computers)**

  When connecting the device directly to legacy Sun computer (with composite sync as the video output, it may be possible that IP-KVM don’t recognize the composite sync

automatically. To support signal transmission from a Sun machine, enable this option. If not enabled the picture of the remote console will not be visible.

To set the options, click on the button **Apply**.

5.5 Device Settings



5.5.1 Network

The Network Settings panel allows changing network related parameters. Each parameter will be explained below. Once applied the new network settings will immediately come into effect.

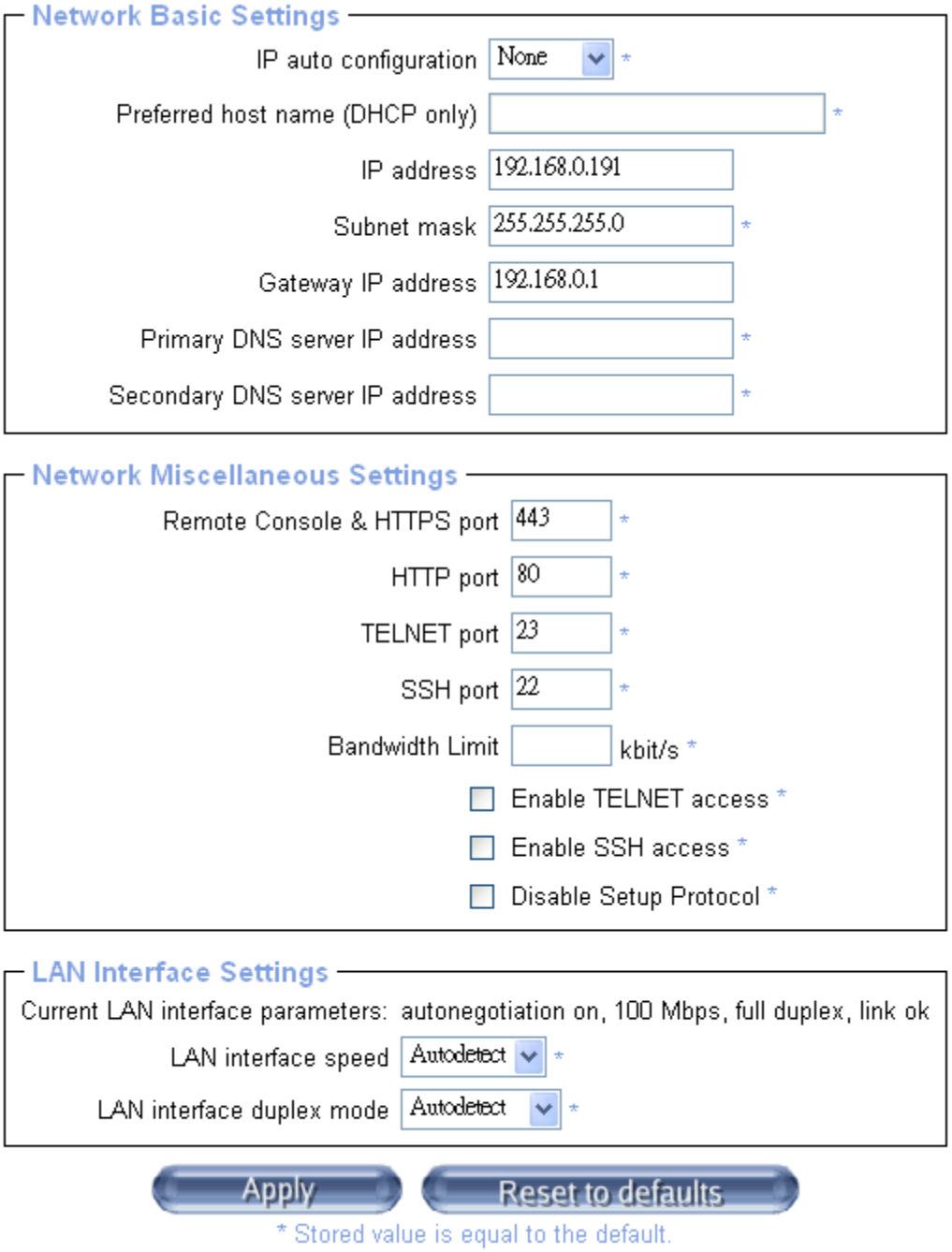


Figure 5-16 Network Settings

Warning

Changing the network settings of the IP-KVM might result in losing connection to it. In case you change the settings remotely make sure that all the values are correct and you still have an option to access the IP-KVM.

IP auto configuration

With this option you can control if the IP-KVM should fetch its network settings from a DHCP or BOOTP server. For DHCP, select “dhcp” , and for BOOTP select “bootp” accordingly. If you choose “none” then IP auto configuration is disabled.

Preferred host name

Preferred host name to request from DHCP server. Whether the DHCP server takes the IP-KVM suggestion into account or not depends on the server configuration.

IP address

IP address in the usual dot notation.

Subnet Mask

The net mask of the local network.

Gateway IP address

In case the IP-KVM should be accessible from networks other than the local one, this IP address must be set to the local network router's IP address.

Primary DNS Server IP Address

IP address of the primary Domain Name Server in dot notation. This option may be left empty, however the IP-KVM will not be able to perform name resolution.

Secondary DNS Server IP Address

IP address of the secondary Domain Name Server in dot notation. It will be used in case the Primary DNS Server cannot be contacted.

Remote Console And HTTPS port

Port number at which the IP-KVM's Remote Console server and HTTPS server are listening. If left empty the default value will be used.

HTTP port

Port number at which the IP-KVM's HTTP server is listening. If left empty the default value will be used.

Telnet port

Port number at which the IP-KVM's Telnet server is listening. If left empty the default value will be used.

SSH port

Port number at which the IP-KVM SSH (Secure SHell) server is listening to. If left empty the default value (port 22) will be used.

Bandwidth limitation

The maximum network traffic generated through the IP-KVM ethernet device. Value in Kbit/s.

Enable Telnet access

This enables the Telnet function.

Enable SSH access

This enables the SSH (Secure SHell) function.

Disable Setup Protocol

Enable this option to exclude the IP-KVM from the setup protocol. Setup protocol is a proprietary layer-2 MAC-based protocol to allow some configuration software to detect IP-KVM devices in the network, even without IP address, and then config network related settings to IP-KVM..

LAN Interface Settings

The “Autodetect” will set the ethernet speed to the fastest possible value supported by both endpoints of the link. For example, if you use a 10M/half duplex HUB, this speed will be auto-selected. If this option does not work with some network device (HUB, switches, and routers), you can set the Ethernet interface speed of IP-KVM manually to the values as supported by the network device.

5.5.2 Dynamic DNS

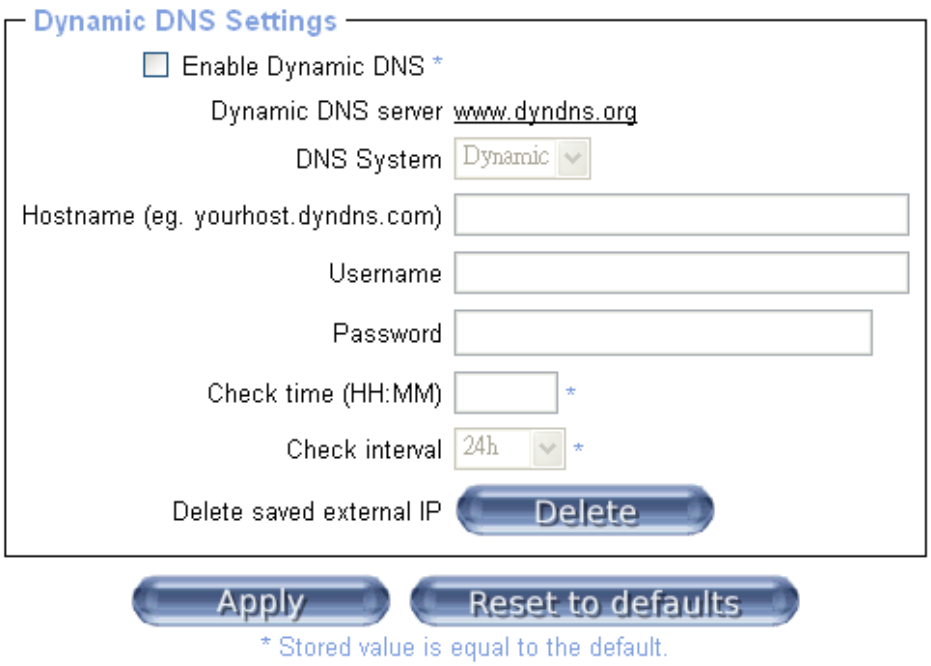


Figure 5-17 Dynamic DNS

A freely available Dynamic DNS service (www.dyndns.org) can be used in the following scenario.

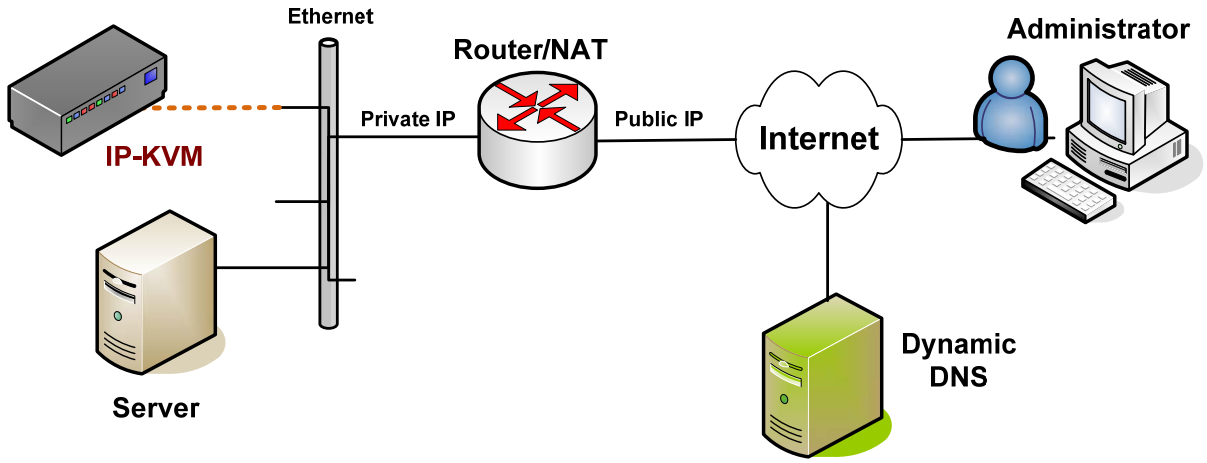


Figure 5-18 Dynamic DNS Scenario

The IP-KVM is reachable via the IP address of the DSL router, which is dynamically assigned by the provider. Since the administrator does not know the IP address assigned by the provider, the IP-KVM connects to a special dynamic DNS server in regular intervals and registers its IP address there. The administrator may contact this server as well and pick up the same IP address relating to his IP-KVM unit.

The administrator has to register an IP-KVM that is supposed to take part in the service with the Dynamic DNS Server and assign a certain hostname to it. He will get a nickname and a password in return to the registration process. This account information together with the hostname is needed in order to determine the IP address of the registered IP-KVM.

You have to perform the following steps in order to enable Dynamic DNS:

- Make sure that the LAN interface of the IP-KVM is properly configured.
- Enter the Dynamic DNS Settings configuration dialog as shown in Figure.
- Enable Dynamic DNS and change the settings according to your needs (see below).

Enable Dynamic DNS

This enables the Dynamic DNS service. This requires a configured DNS server IP address.

Dynamic DNS server

This is the server name where IP-KVM registers itself in regular intervals. Currently, this is a fixed setting since only dyndns.org is supported for now.

DNS System

Choose Dynamic for free DNS service. Custom for your own domain.

Hostname

This is the hostname of the IP-KVM that is provided by the Dynamic DNS Server. (use the whole name including the domain, e.g. testserver.dyndns.org , not just the actual hostname).

Username

You have registered this username during your manual registration with the Dynamic DNS Server. Spaces are not allowed in the Nickname.

Password

You have used this password during your manual registration with the Dynamic DNS Server.

Check time

The IP-KVM registers itself for initiating the IP address of IP-KVM stored in the Dynamic DNS server at this time.

Check interval

This is the interval for reporting again to the Dynamic DNS server for updating the IP address associated with the Domain Name of the IP-KVM.

Warning

The IP-KVM has its own independent real time clock. Make sure the time setting of the IP-KVM is correct. (see the Section *Date And Time*)

5.5.3 Security

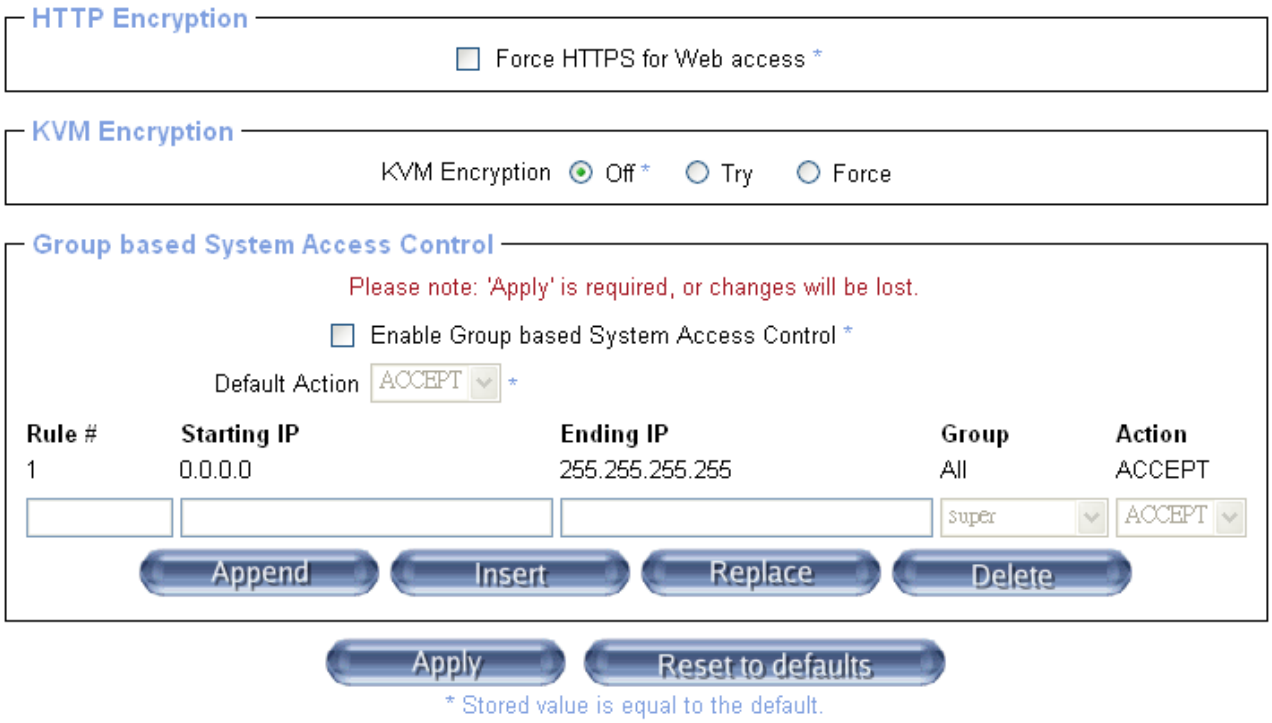


Figure 5-19 Device Security

Force HTTPS

If this option is enabled access to the web front-end is only possible using an HTTPS connection. The IP-KVM will not listen on the HTTP port for incoming connections.

In case you want to create your own SSL certificate that is used to identify the IP-KVM refer to the Section called *Certificate*.

KVM encryption

This option controls the encryption of the RFB protocol. RFB is used by the Remote Console to transmit both the screen data to the administrator machine and keyboard and mouse data back to the host. If set to “Off” no encryption will be used. If set to ”Try” the applet tries to make an encrypted connection. In case connection establishment fails for any reason an unencrypted connection will be used.

If set to “Force” the applet tries to make an encrypted connection with certificate. An error will be reported in case connection establishment fails.

Group-based System Access Control

This is the IP filtering function, it keeps unauthorized hosts from accessing to the IP-KVM by specifying IP filtering rules. It is important to fully understand what an IP filter is. If you don't fully understand this, you will get unexpected results against your original plan.

Chain rule

The **Chain rule** determines whether the access from the hosts is allowed or not. It can be one of these two values:

- ACCEPT : access allowed
- DROP : access not allowed

The rule can be configured to apply to a particular Group level (All, User, Super, Administrator).

When the IP-KVM receives a TCP packet, it will process the packet with the chain rule depicted below. The process ordering is important; The packet will enter the chain rule 1 first, if meet the rule then take action directly, otherwise go to chain rule 2.

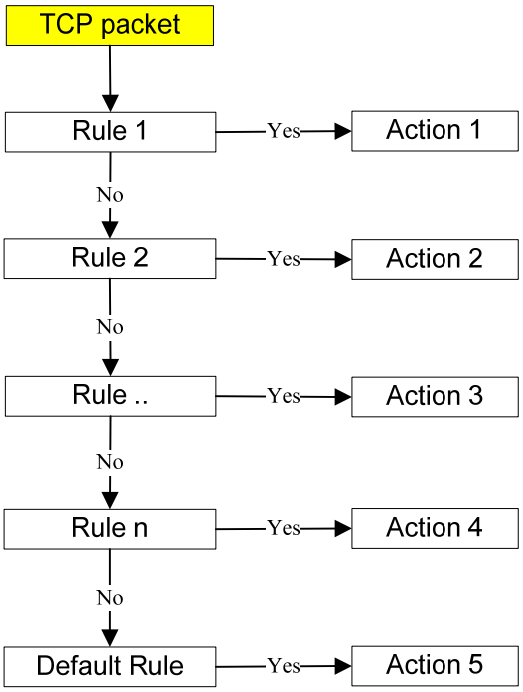
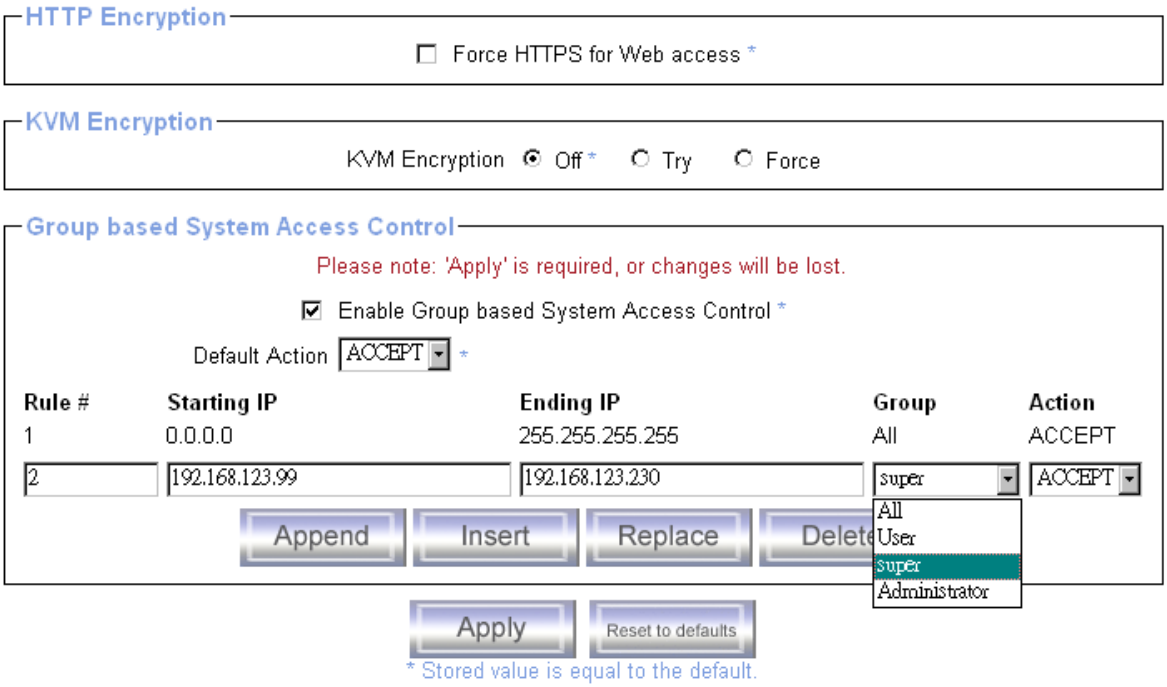


Figure 5-20 Chain Rules of IP Filtering

Check the “Enable Group based System Access Control” to edit the rules

Users can add a new IP filtering rule by setting the properties at adding line by **Append** or **Insert**. User can remove a rule by **Remove** or **Delete**.



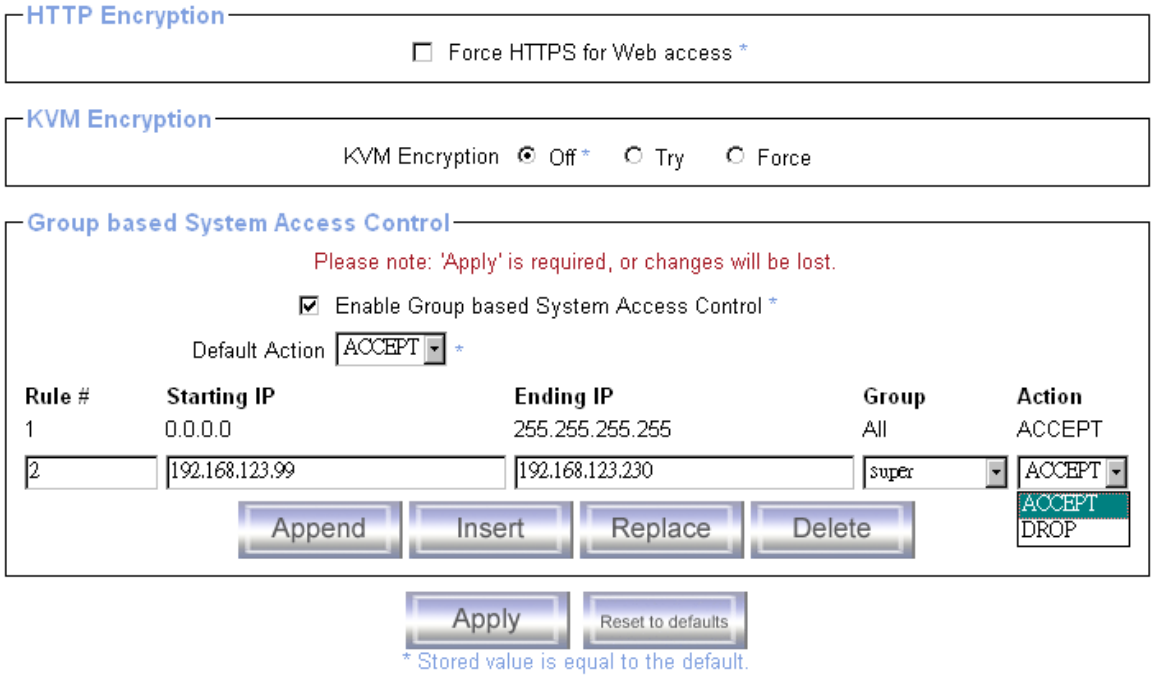


Figure 5-21 IP Filter Settings

5.5.4 Certificate

Figure 5-22 Certificate Settings

The IP-KVM uses the Secure Socket Layer (SSL) protocol for any encrypted network traffic between itself and a connected client. During the connection establishment the IP-KVM has to expose its identity to a client using a cryptographic certificate. The default certificate comes with IP-KVM device upon delivery is for testing purpose only. System administrator should not rely on this default certificate as the secured global access mechanism through Internet.

However, it is possible to generate and install a new base64 X.509 certificate that is unique for a particular IP-KVM. In order to do that, the IP-KVM is able to generate a new cryptographic key and the associated Certificate Signing Request (CSR) that needs to be certified by a certification authority (CA). A certification authority verifies that you are the person who you claim you are, and signs and issues a SSL certificate to you.

The following steps are necessary to create and install a SSL certificate for the IP-KVM:

- Create a SSL Certificate Signing Request using the panel shown in Figure. You need to fill out a number of fields that are explained below. Once this is done, click on the button “Create” which will initiate the Certificate Signing Request generation. The CSR can be downloaded to your administration machine with the “Download CSR” button.

- Send the saved CSR string to a CA for certification. You will get the new certificate from the CA after a more or less complicated traditional authentication process (depending on the CA).
- Upload the certificate to the IP-KVM using the “Upload” button as shown in Figure below.

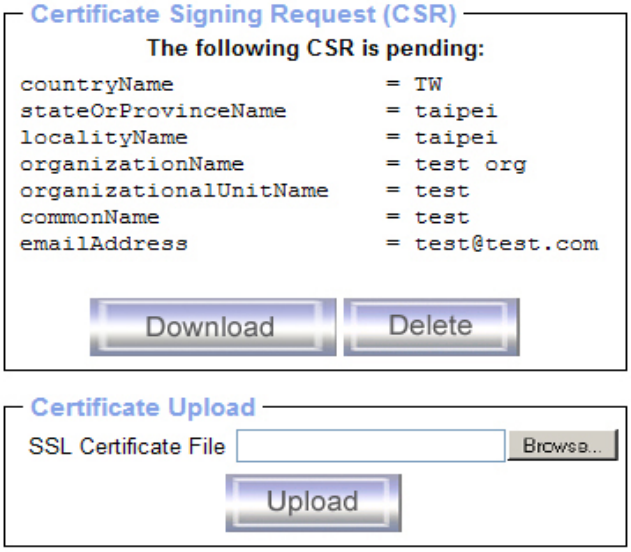


Figure 5-23 SSL Certificate Upload

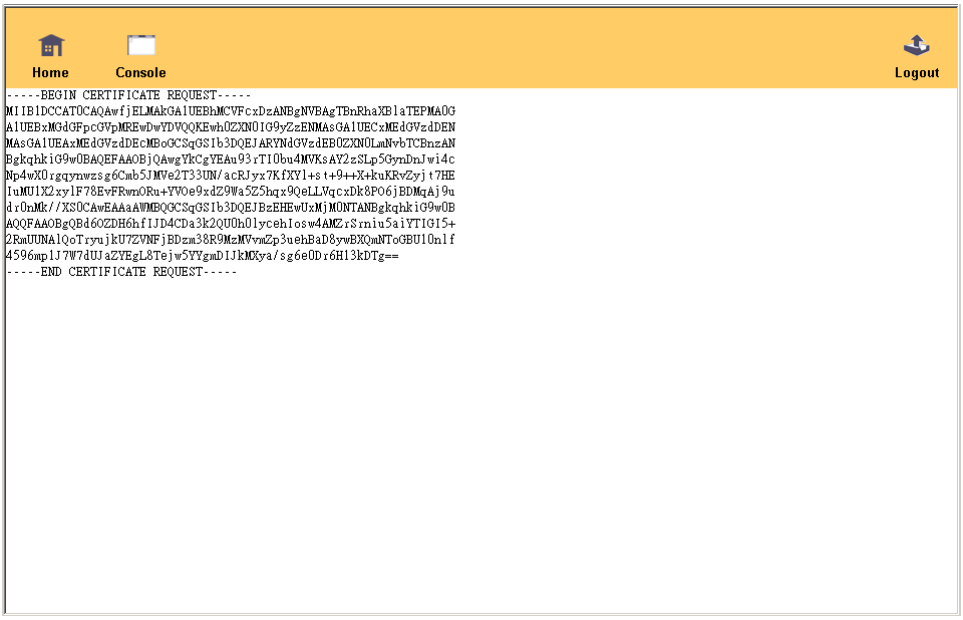


Figure 5-24 CSR string

After completing these three steps, the IP-KVM has its own certificate that is used for identifying the IP-KVM to its clients.

> **Warning**
>
> If you destroy the CSR on the IP-KVM there is no way to get it back! In case you deleted it by mistake, you have to repeat the three steps as described above.

Common name

This is the network name of the IP-KVM once it is installed in the user's network (usually the fully qualified domain name). It is identical to the name that is used to access the IP-KVM with a web browser (without the “http://” prefix). In case the name given here and the actual network name differ, the browser will pop up a security warning when the IP-KVM is accessed using HTTPS.

Organizational unit

This field is used for specifying to which department within an organization the IP-KVM belongs.

Organization

The name of the organization to which the IP-KVM belongs.

Locality/City

The city where the organization is located.

State/Province

The state or province where the organization is located.

Country (ISO code)

The country where the organization is located. This is the two-letter ISO code, e.g. DE for Germany, or US for the USA. (Note: the country code has to be entered in CAPITAL LETTERS.)

Challenge Password

Some certification authorities require a challenge password to authorize later changes on the certificate (e.g. revocation of the certificate). The minimal length of this password is 4 characters.

Confirm Challenge Password

Confirmation of the Challenge Password

Email

The email address of a contact person that is responsible for the IP-KVM and its security.

Key length

This is the length of the generated key in bits. 1024 Bits are supposed to be sufficient for most cases. Longer keys may result in slower response time of the IP-KVM during connection establishment.

5.5.5 Serial Port

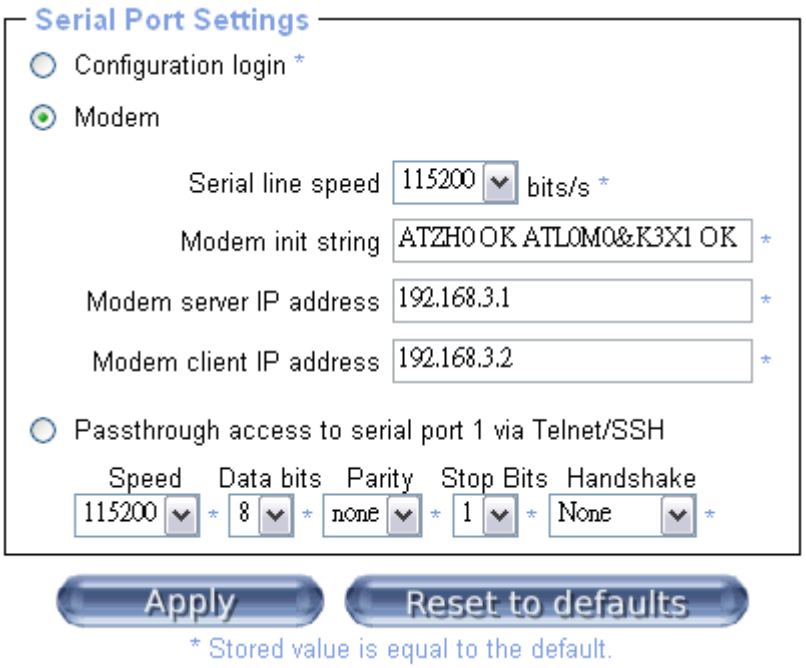


Figure 5-25 Serial Port

The IP-KVM Serial Settings allows you to specify what device is connected to the serial port and how to use it.

Configuration or console login

Do not use the serial port for any special function, use it only for the initial configuration.

Modem

The IP-KVM offers remote access using a telephone line in addition to the standard access over the built-in Ethernet adapter. The modem needs to be connected to the serial interface of the IP-KVM .

Logically, connecting to the IP-KVM using a telephone line means nothing else than building up a dedicated point-to-point connection from your console computer to the IP-KVM. In other words, the IP-KVM acts as an Internet Service Provider (ISP) to which you can dial in. The connection is established using the Point-to-Point Protocol (PPP). Before you connect to the IP-KVM, make sure to configure your console computer accordingly. For instance, on Windows based operating systems you can configure a dial-up network connection, which defaults to the right settings like PPP.

The Modem Settings panel allows you to configure the remote access to the IP-KVM using a modem. The meaning of each parameter will be described below. The modem settings are part of the serial settings panel.

Serial line speed

The speed the IP-KVM is communicating with the modem. Most of all modems available today will support the default value of 115200 bps. In case you are using an old modem and discovering problems try to lower this speed.

Modem Init String

The initialization string used by the IP-KVM to initialize the modem. The default value will work with all modern standard modems directly connected to a telephone line. In case you have a special modem or the modem is connected to a local telephone switch that requires a special dial sequence in order to establish a connection to the public telephone network, you can change this setting by giving a new string. Refer to the modem's manual about the AT command syntax.

Modem server IP address

This IP address will be assigned to the IP-KVM itself during the PPP handshake. Since it is a point-to-point IP connection virtually every IP address is possible but you must make sure, it is not interfering with the IP settings of the IP-KVM and your console computer. The default value will work in most cases.

Modem client IP address

This IP address will be assigned to your console computer during the PPP handshake. Since it is a point-to-point IP connection virtually every IP address is possible but you must make sure, it is not interfering with the IP settings of the IP-KVM and your console computer. The default value will work in most cases.

Passthrough access to serial port via Telnet

Using this option, it is possible to connect an arbitrary device to the serial port and access it (assuming it provides terminal support) via Telnet. Select the appropriate options for the serial port and use the Telnet Console, or a standard Telnet client to connect to the IP-KVM.

5.5.6 Date / Time

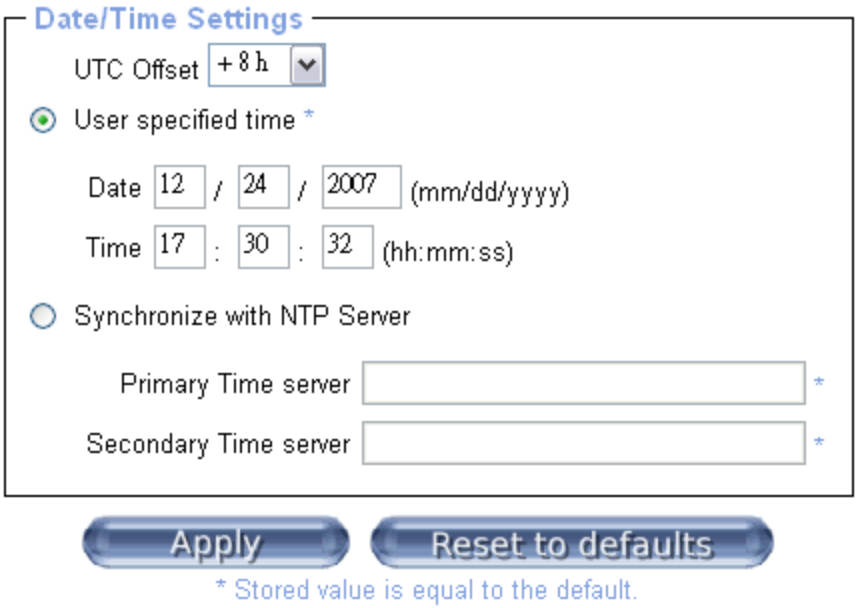


Figure 5-26 Date / Time

This link refers to a page, where the internal real-time clock of the IP-KVM can be set up. You have the possibility to adjust the clock manually, or to use a NTP timeserver. Without a timeserver, your time setting will not be persistent, so you have to adjust it again, after IP-KVM loses power for more than a few minutes. To avoid this, you can use a NTP timeserver, which sets up the internal clock automatically to the current UTC time. Because NTP server time is always UTC, there is a setting that allows you to set up a static offset to get your local time.

Warning

There is currently no way to adjust the daylight saving time automatically. So you have to set up the UTC offset twice a year properly to the local rules of your country.

5.5.7 Event Log

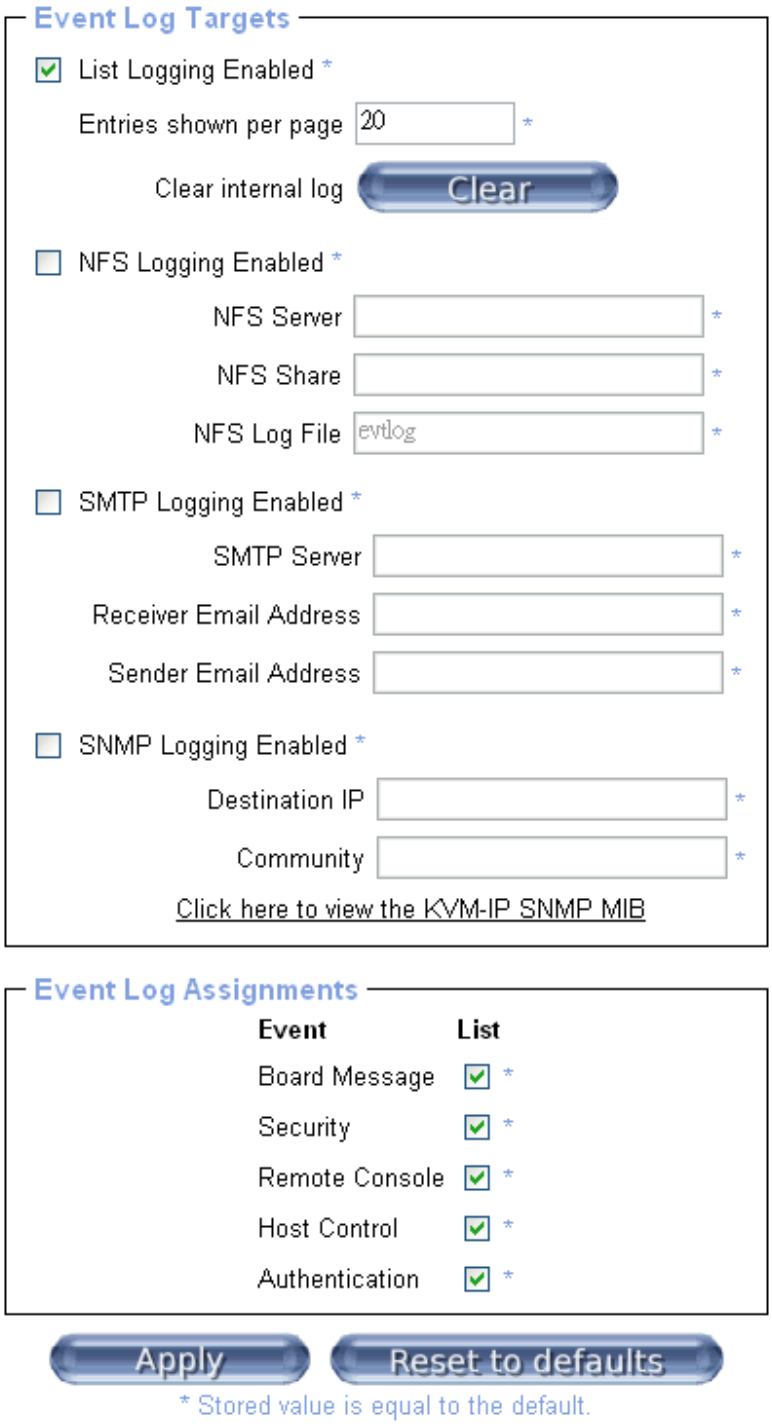


Figure 5-27 Event Log

Important events like a login failure or a firmware update are logged to a selection of logging destinations. Each of those events belongs to an event group, which can be activated separately.

The common way to log events is to use the internal log list of the IP-KVM. To show the log list, click on “Event Log” on the “Maintenance” page. In the Event Log Settings you can

choose how many log entries are shown on each page. Furthermore, you can clear the log file here.

List logging enabled

The common way to log events is to use the internal log list of the IP-KVM . To show the log list, click on “Event Log” on the “Maintenance” page.

Since the IP-KVM's system memory is used to save all the information, the maximum number of possible log list entries is restricted to 1.000 events. Every entry that exceeds this limit overrides the oldest one, automatically.

> **Warning**
>
> If the reset button on the HTML frontend is used to restart the IP-KVM, all logging information is saved permanently and is available after the IP-KVM has been started. If the IP-KVM loses power or a hard reset is performed, all logging data will be lost. To avoid this, use one of the following log methods.

NFS Logging enabled

Define a NFS server, where a directory or a static link have to be exported, to write all logging data to a file that is located there. To write logging data from more than one IP-KVM devices to only one NFS share, you have to define a file name that is unique for each device. When you change the NFS settings and press the button “Apply” , the NFS share will be mounted immediately. That means, the NFS share and the NFS server must be filled with valid sources or you will get an error message.

SMTP Logging enabled

With this option, the IP-KVM is able to send Emails to an address given by the Email address text field in the Event Log Settings. These mails contain the same description strings as the internal log file and the mail subject is filled with the event group of the occurred log event. In order to use this log destination you have to specify a SMTP server, that has to be reachable from the IP-KVM device and that needs no authentication at all (<serverip>:<port>).

SNMP Logging enabled

If this is activated, the IP-KVM sends a SNMP trap to a specified destination IP address, every time a log event occurs. If the receiver requires a community string, you can set it in the appropriate text field. Most of the event traps only contain one descriptive string with all information about the log event. Only authentication and host power events have an own trap class that consists of several fields with detailed information about the occurred event. To receive this SNMP traps, any SNMP trap listener may be used.

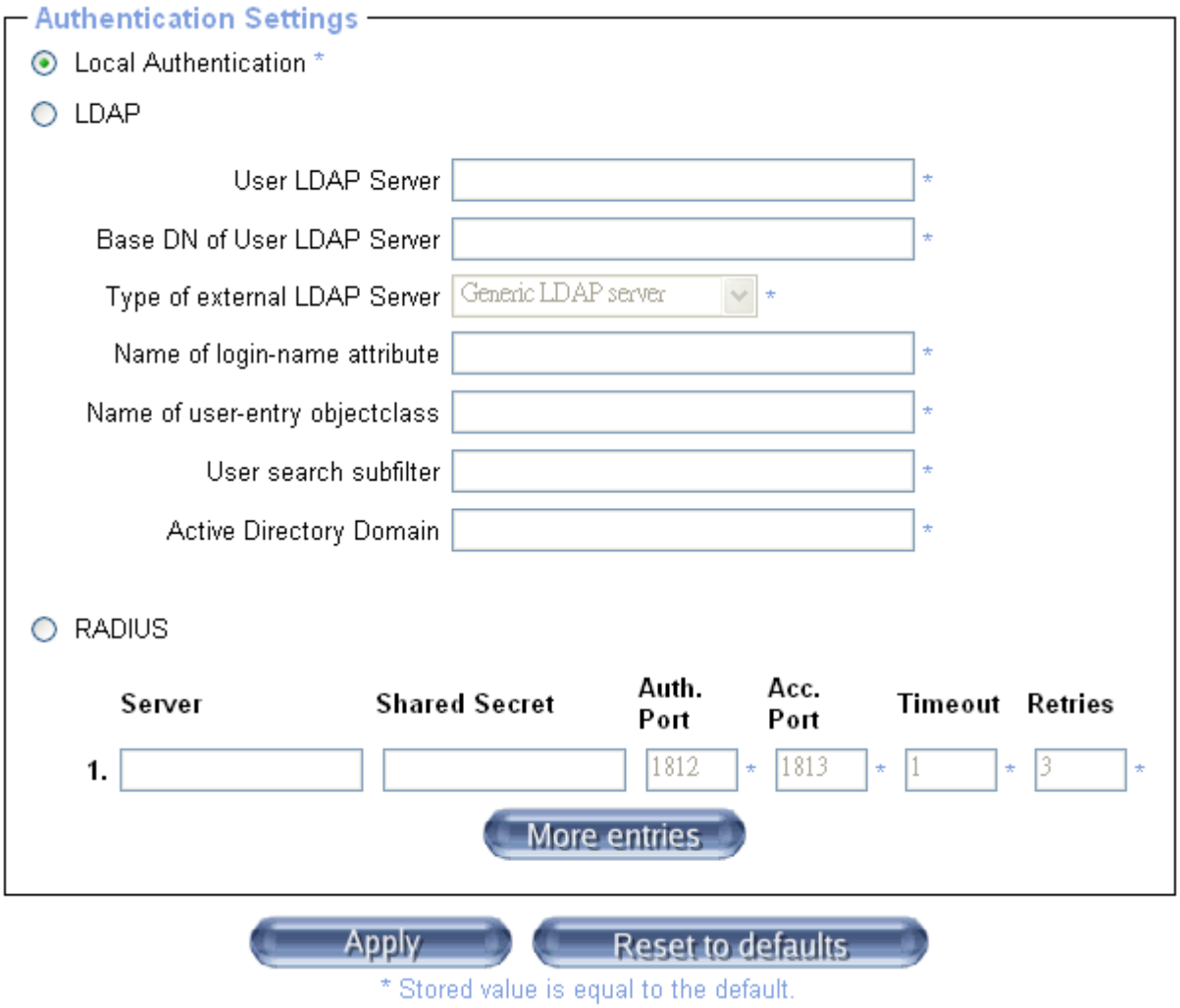
Here is a example of all gerenated event and its event group.

Device succesfully started	device
Board Reset performed by user...	device
Firmware upload failed.	device
No firmware file uploaded.	device
Uploaded firmware file discarded.	device
Firmware validation failed.	device
Firmware file uploaded by user...	device
Firmware updated by user...	device
Internal log file cleared by user...	device
Security Violation	security
Host Power	host
Host Reset	host
Connection to Remote Console failed: reason.	console (several)
Connection to client ... established.	console
Connection to client ... closed.	console
Login failed.	auth
Login succeed.	auth

Warning

In contrast to the internal log file on the IP-KVM, the size of the NFS log file is not limited. Every log event will be appended to the end of the file so it grows continuously and you may have to delete it or move it away from time to time.

5.5.8 Authentication



On this screen you can specify where the IP-KVM will look in order to authenticate the users. You can use "Local Authentication", this means you need to have created the user account on the IP-KVM and the user/group information residing on the IP-KVM for authentication.
The other options allow you to specify an LDAP or a RADIUS Server to use for the login authentication. These methods are very useful when you want to map users into specific groups which have certain privileges. It is usually far easier and simpler to refer to already existing groups, rather than having to re-enter everything into the IP-KVM.

Note: *Whatever you configure, you can always login over the network as the superuser "super". The superuser is always authenticated and authorized locally, so you always have a "back door" to the IP-KVM.*

LDAP Access

The IP-KVM uses LDAP only for authentication (password verification). User privileges and private settings are still stored locally at the IP-KVM. That's why a user account has to be created on the IP-KVM before this user can login via LDAP. Also, all privilege configurations have to be done within the IP-KVM user management.

In order to configure the LDAP access, you can set the following options:

User LDAP Server

Here you enter the name or IP address of the LDAP server containing all the user entries. If you choose a name instead of an IP address you need to configure a DNS server in the network settings. E.g.: 192.168.1.250

Base DN of User LDAP Server

Here you specify the distinguished name (DN) where the directory tree starts in the user LDAP server. E.g.: dc=test,dc=domain,dc=com

Type of external LDAP Server

With this option you set the type of the external LDAP server. This is necessary since some server types require special handling. Additionally, the default values for the LDAP scheme are set appropriately. You can choose between a Generic LDAP Server, a Novell Directory Service and a Microsoft Active Directory. If you have neither a Novell Directory Service nor a Microsoft Active Directory then choose a Generic LDAP Server and edit the LDAP scheme used (see below).

Name of login-name attribute

This is the name of the attribute containing the unique login name of a user. To use the default leave this field empty. The default depends on the selected LDAP server type.

Name of user-entry object class

This is the object class that identifies a user in the LDAP directory. To use the default leave this field empty. The default depends on the selected LDAP server type.

User search subfilter

Here you can refine the search for users that should be known to the IP-KVM.

Active Directory Domain

This option represents the active directory domain that is configured in the Microsoft Active Directory server. This option is only valid if you have chosen a Microsoft Active Directory as the LDAP server type. E.g.: test.domain.com

Using the RADIUS Server

RADIUS (Remote Authentication Dial In User Service) is a protocol specified by the Internet Engineering Task Force (IETF) working group. There are two specifications that make up the

RADIUS protocol suite: Authentication and Accounting. These specifications aim to centralize authentication, configuration and accounting for dial-in services to an independent server. The RADIUS protocol exists in several implementations such as freeRADIUS, openRADIUS or RADIUS on UNIX systems. The RADIUS protocol itself is well specified and tested. We can give a recommendation for all products listed above, especially for the freeRADIUS implementation.

Note: *Currently, we do not support challenge/response. An Access Challenge response is seen and evaluated as an Access Reject.*

To access a remote device using the RADIUS protocol you have to login, first. You are asked to specify your user name and password, then. The RADIUS server reads your input data (Authentication) and the IP-KVM looks for your profile (Authorization). The profile defines (or limits) your actions and may differ depending on your specific situation. If there is no such profile your access via RADIUS will be refused. In terms of the remote activity mechanism the login via RADIUS works similar to the Remote Console. If there is no activity for half an hour your connection to the IP-KVM will be aborted and closed.

Server

Enter either the IP address or the hostname of the RADIUS Server to connect to. For the hostname DNS has to be configured and enabled.

Shared Secret

A shared secret is a text string that serves as a password between the RADIUS client and RADIUS server. In this case the IP-KVM serves as a RADIUS client. A shared secret is used to verify that RADIUS messages are sent by a RADIUS-enabled device that is configured with the same shared secret and to verify that the RADIUS message has not been modified in transit (message integrity). For the shared secret you can use any standard alphanumeric and special characters. A shared secret may consist of up to 128 characters in length and may contain both lowercase and uppercase letters (A-Z,a-z), numerals (0-9) and other symbols (all characters not defined as letters or numerals) such as an exclamation mark (!) or an asterisk (*).

Authentication Port

The port the RADIUS server listens for authentication requests. The default value is #1812.

Accounting Port

The port the RADIUS server listens for accounting requests. The default value is #1813.

Timeout

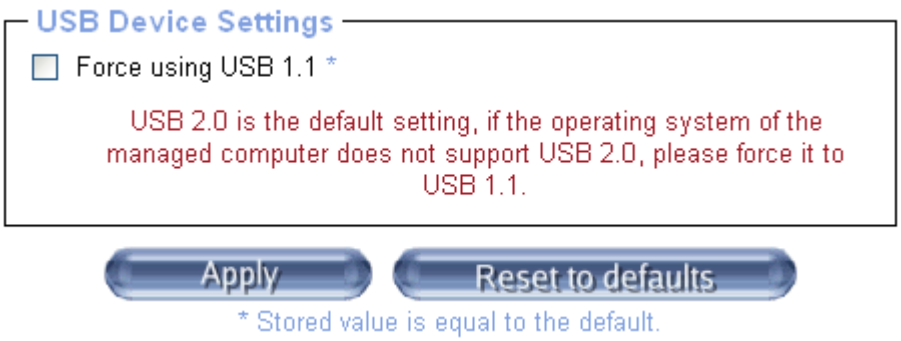
Sets the request time-to-live in seconds. The time-to-live is the time to wait for the completion of the request. If the request job is not completed within this interval of time it is cancelled.

The default value is 1 second.

Retries

Sets the number of retries if a request could not be completed. The default value is 3 times.

5.5.9 USB



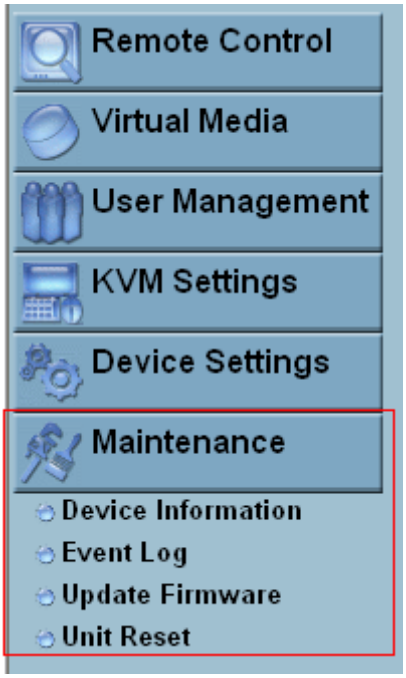
USB 2.0 is the default setting, if the operating system of the managed computer does not support USB 2.0, please force it to USB 1.1.

5.5.10 Config File

With this function, the configuration settings can be saved (Backup) in a file (config.gz), or reloaded (Restore) from a previously saved configuration file.

5.6 Maintenance

The administrator performs various maintenance activities on the IP-KVM. These include viewing its status, update firmware, view the event log and reset the unit.



5.6.1 Device Information

The Device Status page contains a table with information about the IP-KVM's hardware and firmware. This information is useful if technical support is required.

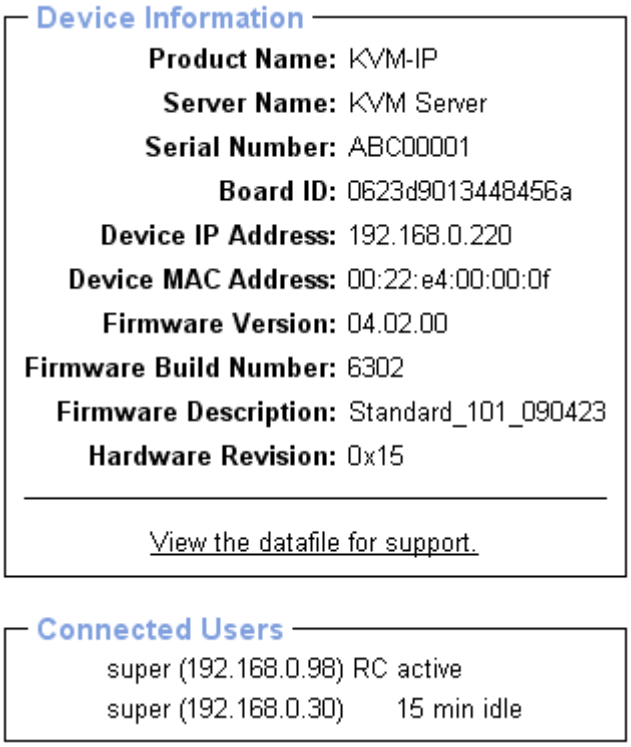


Figure 5-28 Device Information

The Data file for support allows you to download the IP-KVM data file with specific support information. This is an XML file with certain customized support information like the serial number etc. You may send us this information together with a support request. It will help us to locate and solve your reported problem.

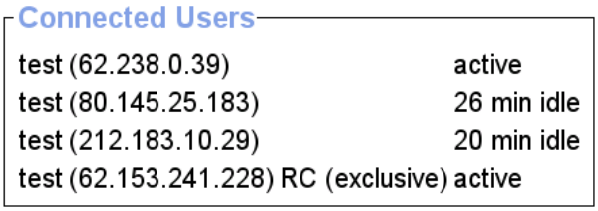


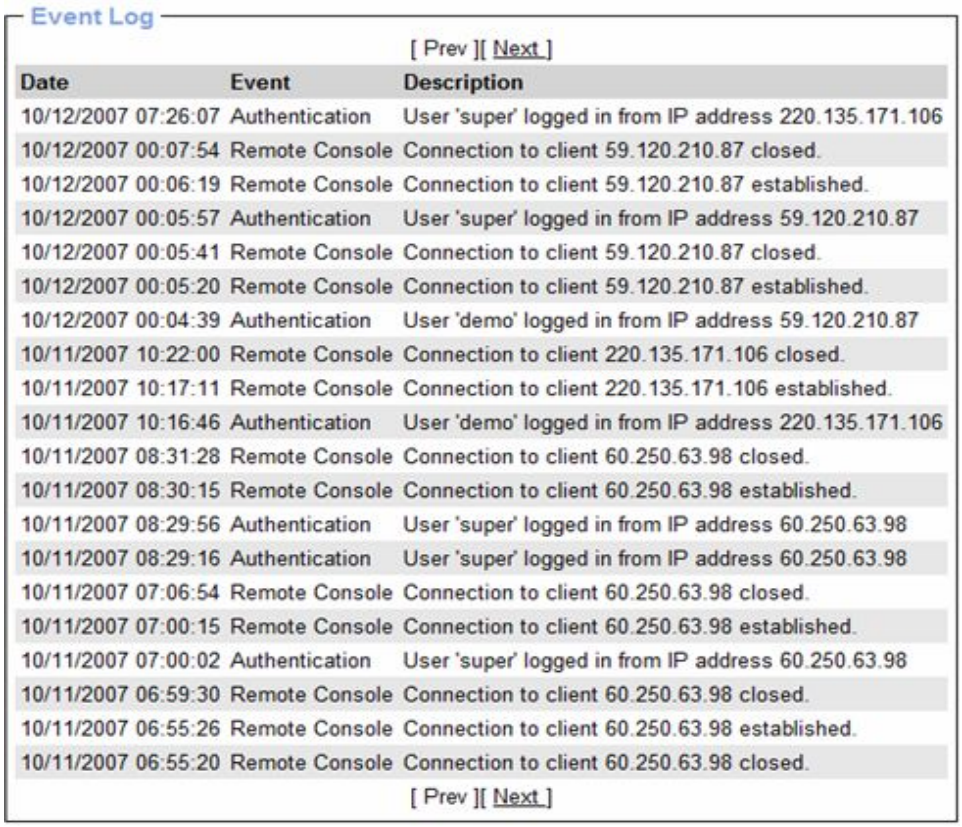
Figure 5-29 Connected Users

Figure above displays the IP-KVM activity. From left to right the connected user(s), its IP address (from which host the user comes from) and its activity status is displayed. RC means that the Remote Console is open. If the Remote Console is opened in exclusive mode the term (exclusive mode) is added. For more information about this option see the Section called Remote Console Control Bar.

To display the user activity the last column contains either the term active for an active user or 30 min idle for a user who is inactive for a certain amount of time.

5.6.2 Even log

The figure below displays the log list including the events that are logged by the IP-KVM



Event Log

[Prev][Next]

Date	Event	Description
10/12/2007 07:26:07	Authentication	User 'super' logged in from IP address 220.135.171.106
10/12/2007 00:07:54	Remote Console	Connection to client 59.120.210.87 closed.
10/12/2007 00:06:19	Remote Console	Connection to client 59.120.210.87 established.
10/12/2007 00:05:57	Authentication	User 'super' logged in from IP address 59.120.210.87
10/12/2007 00:05:41	Remote Console	Connection to client 59.120.210.87 closed.
10/12/2007 00:05:20	Remote Console	Connection to client 59.120.210.87 established.
10/12/2007 00:04:39	Authentication	User 'demo' logged in from IP address 59.120.210.87
10/11/2007 10:22:00	Remote Console	Connection to client 220.135.171.106 closed.
10/11/2007 10:17:11	Remote Console	Connection to client 220.135.171.106 established.
10/11/2007 10:16:46	Authentication	User 'demo' logged in from IP address 220.135.171.106
10/11/2007 08:31:28	Remote Console	Connection to client 60.250.63.98 closed.
10/11/2007 08:30:15	Remote Console	Connection to client 60.250.63.98 established.
10/11/2007 08:29:56	Authentication	User 'super' logged in from IP address 60.250.63.98
10/11/2007 08:29:16	Authentication	User 'super' logged in from IP address 60.250.63.98
10/11/2007 07:06:54	Remote Console	Connection to client 60.250.63.98 closed.
10/11/2007 07:00:15	Remote Console	Connection to client 60.250.63.98 established.
10/11/2007 07:00:02	Authentication	User 'super' logged in from IP address 60.250.63.98
10/11/2007 06:59:30	Remote Console	Connection to client 60.250.63.98 closed.
10/11/2007 06:55:26	Remote Console	Connection to client 60.250.63.98 established.
10/11/2007 06:55:20	Remote Console	Connection to client 60.250.63.98 closed.

[Prev][Next]

Figure 5-30 Event Log List

5.6.3 Update Firmware

Firmware can be easily upgraded via web page. This section describes the upgrade procedures.

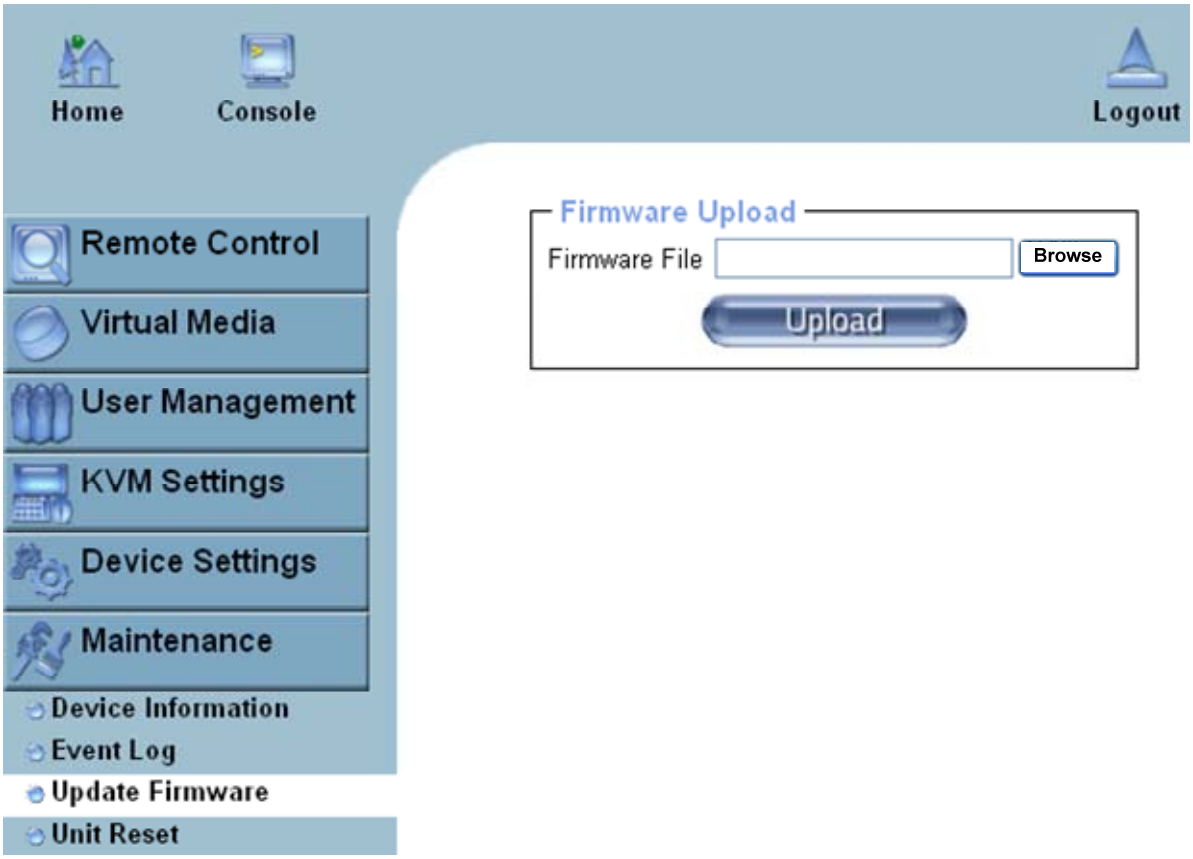


Figure 5-31 Update Firmware

The IP-KVM is a complete standalone computer. The software it runs is called firmware. The firmware of the IP-KVM can be updated remotely in order to install new functionality or special features.

A new firmware update is a binary file which will be sent to you by email or which you can download from the supplier web site. If the firmware file is compressed (file suffix .zip) then you must unzip it before you can proceed. Under the Windows operating system you may use WinZip from http://www.winzip.com/ for decompression. Other operating systems might provide a program called unzip.

Before you can start updating the firmware of your IP-KVM the new uncompressed firmware file has to be accessible on the system that you use for connecting to the IP-KVM.

Warning !!!

This process is not reversible and might take few minutes. During this upgrading process, we should not disconnect the power or the Ethernet cable, since it may causes upgrade failure and destroy the image in Flash memory.

The IP-KVM will automatically initiate a self-reboot upon completion of upgrade process to make newly upgraded firmware effective. At the end of countdown counter expires, the browser will redirect user to the login homepage. Users shall refer to **Maintenance > Device Information** page to check the firmware version and confirm the operation.

Warning !!!

IP-KVM will verify firmware checksum before proceed upgrade procedure. The mechanism help to prevent false firmware file to damage IP-KVM. It is crucial to keep a steady power supply during the procedure otherwise the power-off event may damage the permanent storage and disable IP-KVM.

Updating the firmware is a three-stage process:

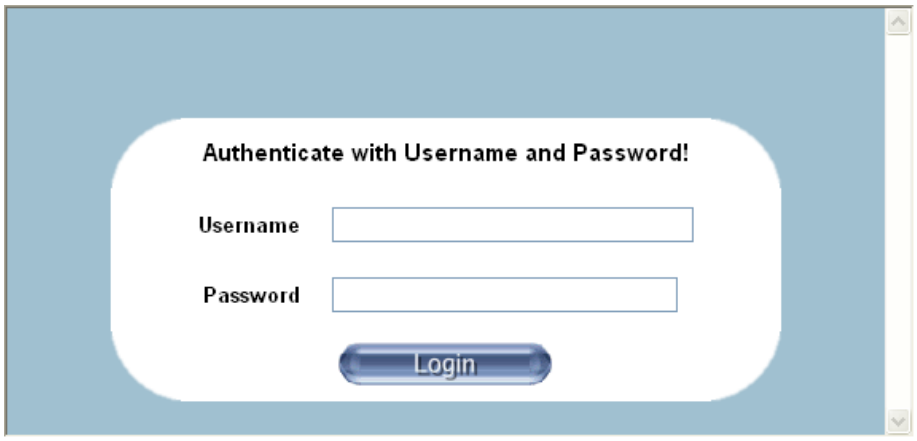
1. Upload the new firmware file onto the IP-KVM unit.

   In order to do that you need to select the file on your local system using the button "**Browse**" of the Upload Firmware panel. Click **Upload**. Once the firmware file has been uploaded, it is checked whether it is a valid firmware file and whether there were any transmission errors. In case of any error the Upload Firmware function will be aborted.

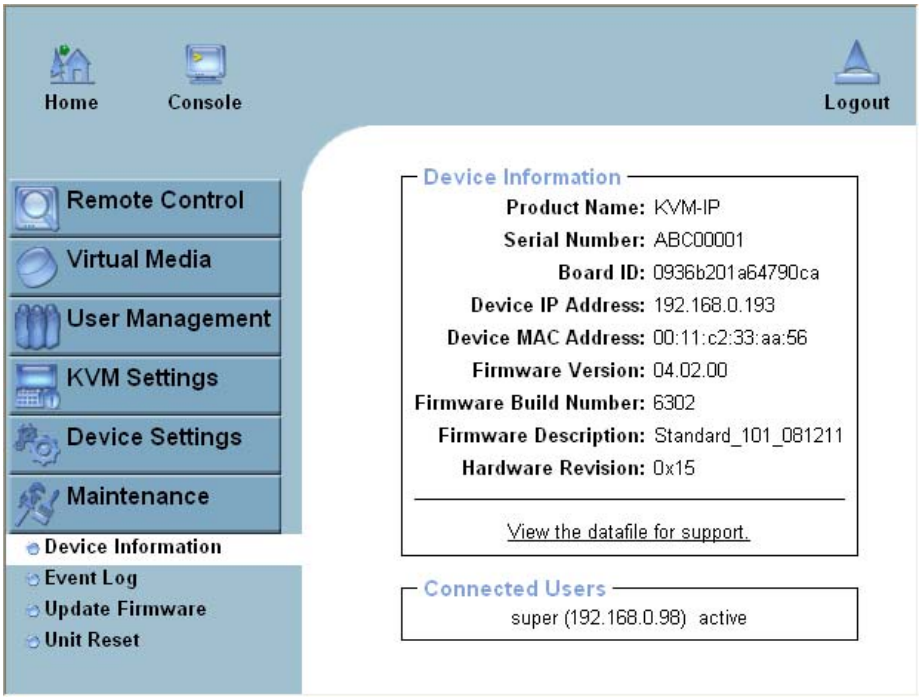
2. If everything went well, you see the Update Firmware panel.

   The panel shows you the version number of the currently running firmware and the version number of the uploaded firmware. Pressing **Update** will store the new version and substitute the old one completely.

3. After the firmware updated successfully, the device will be rebooted and redirected to the login web page automatically.



Check out the device information to see the updated firmware is running.



5.6.4 Unit Reset

This section allows you to reset specific parts of the device. This involves resetting keyboard/mouse, USB, video engine, or the IP-KVM device itself.

In general, the IP-KVM requires a reset when implementing a firmware update. In the event of an abnormal operation, a number of subsystems may be reset without resetting the entire IP-KVM.

Click **Maintenance > Unit Reset**, the following window displays.

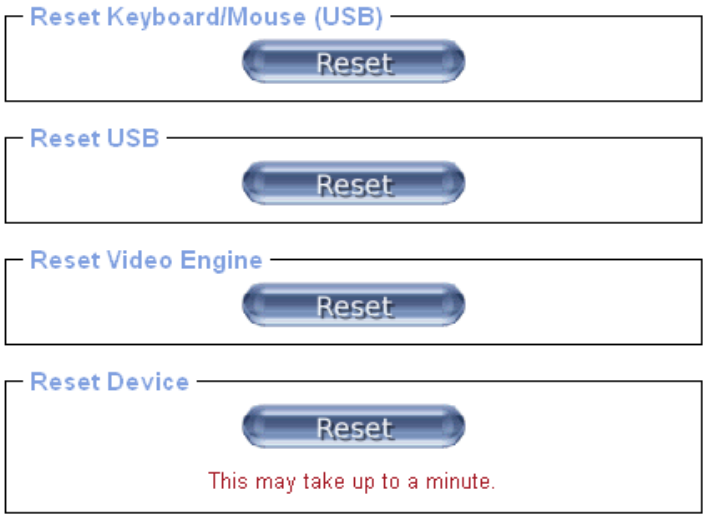


Figure 5-32 Unit Reset

To reset a certain IP-KVM functionality click on the **Reset** button as displayed in figure below.

Clicking on **Reset** of **Reset Device** will reboot the IP-KVM system. It will close all current connections to the administration console and to the Remote Console. The whole process will take about one minute. Resetting subdevices (e.g. video engine) will take few seconds only and does not result in closing connections.

Note: Only the **super** user is allowed to reset the IP-KVM.

5.6.5 Reset to Factory Defaults

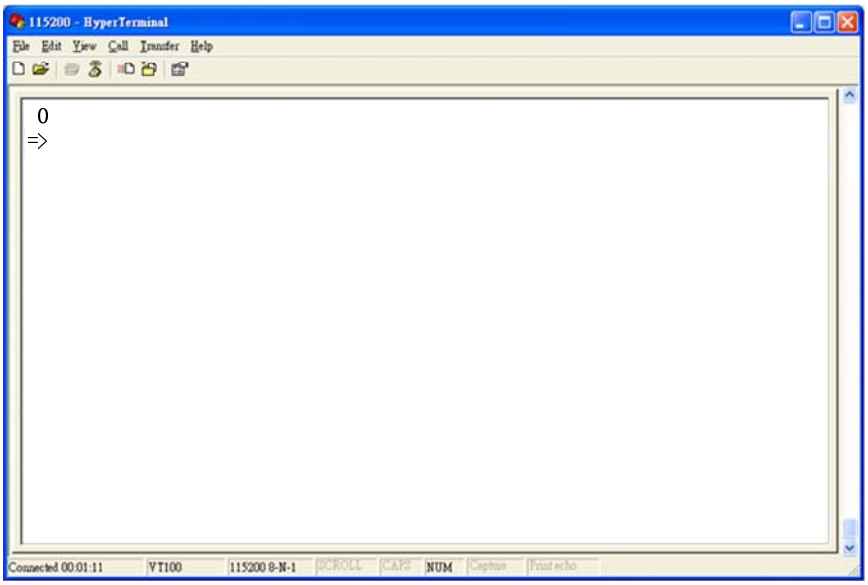
This function may be used when you forgot the password to log in the IP-KVM.

Note: The unit will reboot after this command. All current settings will be lost.

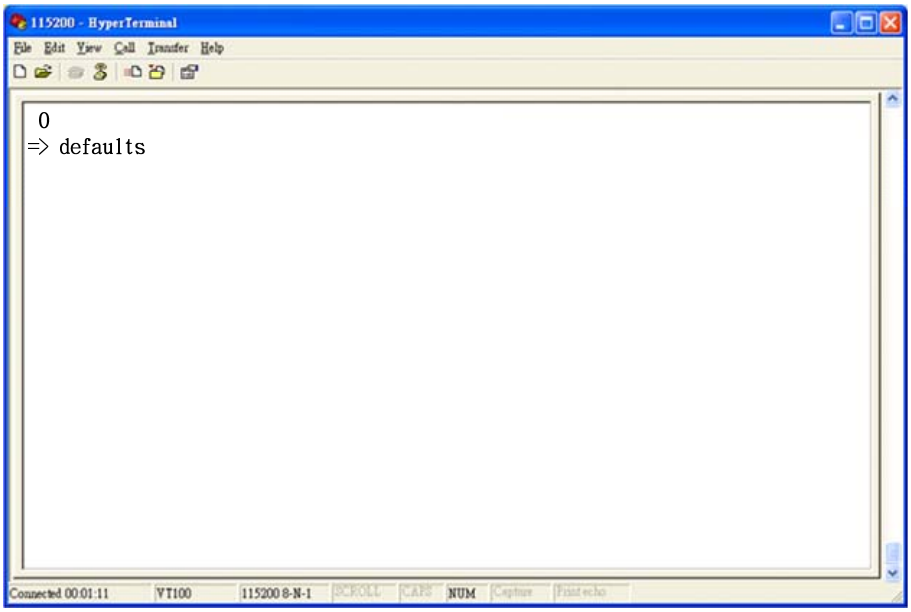
The following procedures will revert to factory default settings:

1. Connect a RS232 null modem cable from your local console PC to the IP-KVM Serial port. Configure your terminal emulation program (such as **HyperTerminal** or **PuTTY**) to the following settings: Baudrate **115200**, Data/stop bits **8-1**, Parity **none**, Flow control **none**.
2. Enter the debugging mode via reboot the IP-KVM system and hit the ESC key. There are two ways to enter the debugging mode:
   (a) Power cycle (reboot) the IP-KVM device. Within 2 seconds of booting the IP-KVM, enter the **Esc** key a few times to get a => prompt.
   (b) Press & hold **ESC** AND push and release **Reset** button, and then release **ESC** in 2 seconds.

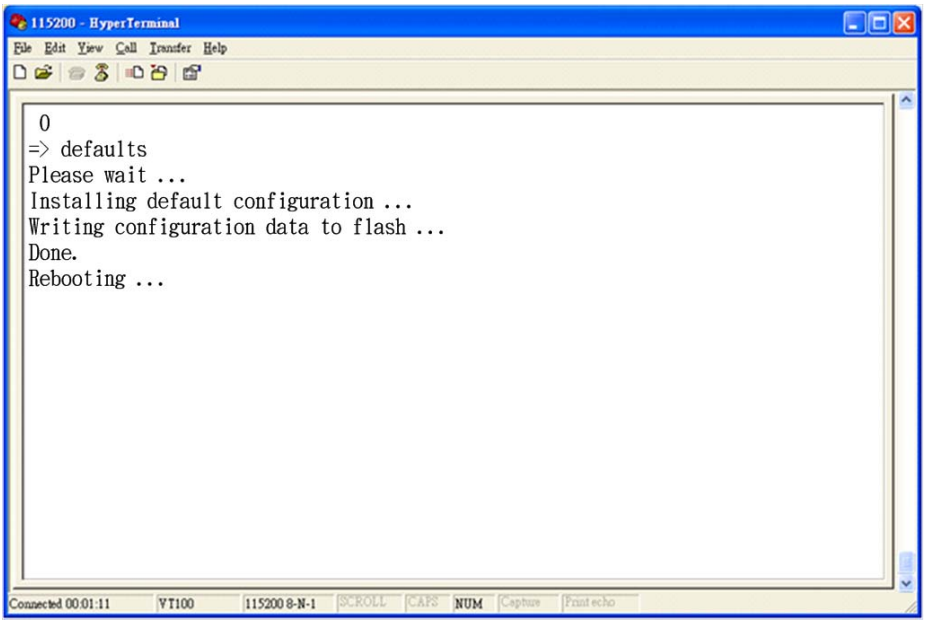
   The debugging mode window will display as below.



3. Key in **“defaults”** command and then **Enter**. The unit will automatically set to factory default settings and reboot the system.



4. The following window displays if reverting to factory default is complete.



6. Technical Specifications

Feature	Description
Target Server Side	1x on-board Gold finger connector
	1x USB mini receptacle
Remote Console Side	1x Standard RJ-45 Connectors (LAN port)
Video Resolution	up to 1600x1200@60Hz
Protocols	TCP, IP, ARP, ICMP, HTTP/HTTPS, SSL, Telnet, DHCP, PPP, SMTP, NTP, DDNS
Security	AES 256-bit encryption for all transmitted data
	RSA 1024-bit encryption for authentication
	SSHv2
Authentication	SSL / Certificate
Virtual Media	Floppy/CD/DVD/USB/HD drive redirection
	Floppy/CD/DVD/ISO Image redirection

7. FAQ

1. **Does any software require on servers which connect to the IP-KVM?**
   No, the IP-KVM is a 100% hardware solution. No extra software require on servers.

2. **What operating systems does IP-KVM support?**
   The IP-KVM supports Windows, Unix, Unix-like Operating System (Sun Solaris, Linux) and Mac OS.

3. **What web browsers does IP-KVM support?**
   The IP-KVM support Microsoft Internet Explorer version (v6.0 or above), Netscape, Mozilla, Safari, Firefox, Avant, World, Opera, and others.

4. **What Java version shall we install?**
   We need to install Java Runtime Environment (version 1.5 or above) on the remote console PC.

5. **Does the IP-KVM work with other brand's KVM switch?**
   Yes, the IP-KVM can work with most of standard KVM.

6. **How many letters the username and password can be set on IP-KVM?**
   The IP-KVM accepts 32 letters of username and password.

7. **How many concurrent user of IP-KVM?**
   The IP-KVM accepts 15 concurrent users.

8. **How many bits of data encryption provided by IP-KVM?**
   The IP-KVM provides RSA 1024-bit encryption for authentication, and AES 256 bits encryption for data.

8. Troubleshooting

1. **Can't bring up the login page of IP-KVM web server.**
   Is the IP-KVM powered on? Verify your network configuration (IP address, subnet mask, router, firewall, etc.) are correct. You may ping the IP address of the IP-KVM to find out whether the IP-KVM is reachable via network. Without a ping functioning, IP-KVM can't work either.

2. **I forgot my password. How can I reset the IP-KVM to factory defaults?**
   For a detailed description see the Section called **Reset to Factory Defaults** in Chapter 5 for detailed operation.

3. **Login to IP-KVM fails.**
   Was the correct combination of user and password given? On delivery, the user "super" has the password "pass". Moreover your browser must be configured to accept cookies.

4. **When a PC connects to the host USB (mini connector) and runs the PSetup utility, an error message occurred: "Exception processing message ..."**
   This problem may due to BIOS setting improperly. This problem will be disappeared after correcting the BIOS setting. If the PC does not equip with floppy diskette, please set BIOS to "**floppy not installed**", not "floppy 1.44MB".

5. **In the browser the web pages are inconsistent or chaotic.**
   Make sure your browser cache settings are feasible. Especially make sure the cache settings are not set to something like "never check for newer pages". Otherwise web pages may be loaded from your browser cache and not from the IP-KVM device itself.

6. **The Remote Console window of IP-KVM can not be opened.**
   (1) Please make sure the remote console PC has been installed with Java Runtime Environment (v1.5 or above). When trying to open the Remote Console, the  icon will appear on the upper-right corner if no Java Runtime Environment.

   Notes:
   1. In order to run this function, the system need support JRE (Java Runtime Environment) version 5.0 (v1.5) or above. You can get the Java Software from the website http://www.java.com/en/download/
   2. It's recommended to install newer Java version (e.g., version 6 update 11 or above) for better performance.

   (2) Possibly a firewall prevents access to the Remote Console. Make sure the TCP port **443** (for both HTTPS and RFB) and #80 (for HTTP) are open for incoming TCP connection establishments.

7. **The Remote Console (Java Applet) hanged.**

The reason may be hidden in the very details of the Windows memory management configuration. The issue was that Windows was allocating more memory to system cache than to applications. Solving the issue is trivial:

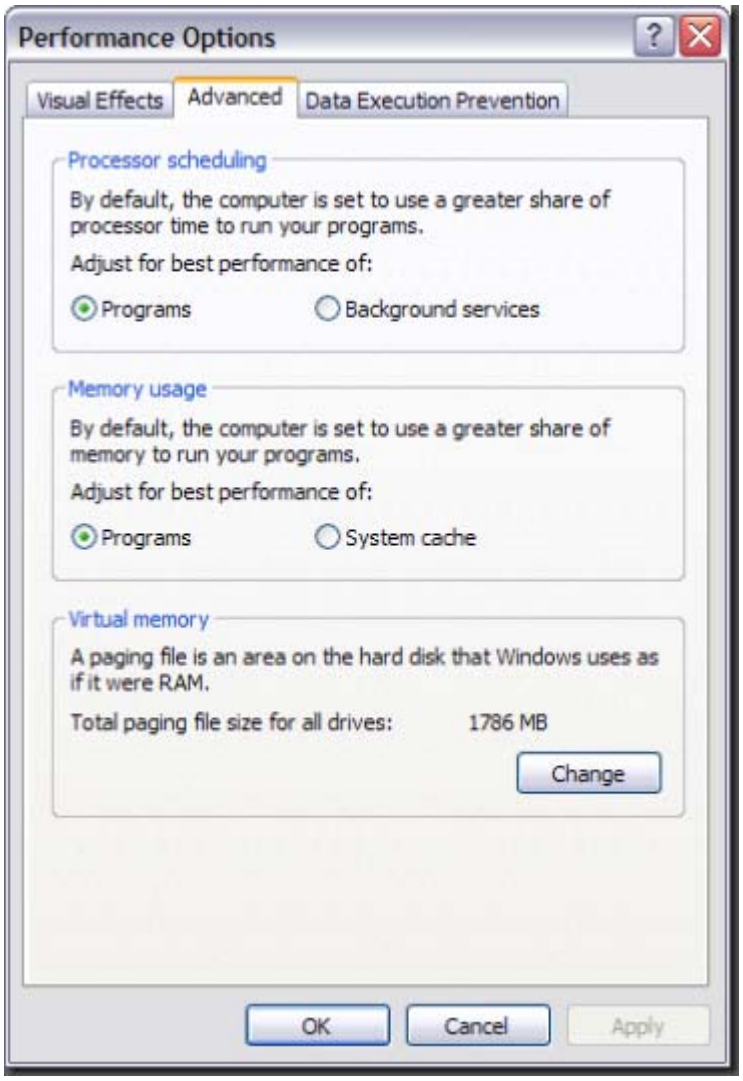
(a) Go to Control Panel - System.

(b) In the Advanced tab, click Performance Settings.

(c) Click the Advanced tab.

(d) Memory Usage is probably adjusted for Best performance of System cache, change it to Best performance of **Programs** (default value) and click OK.

(e) Restart computer. The problem should then disappear.



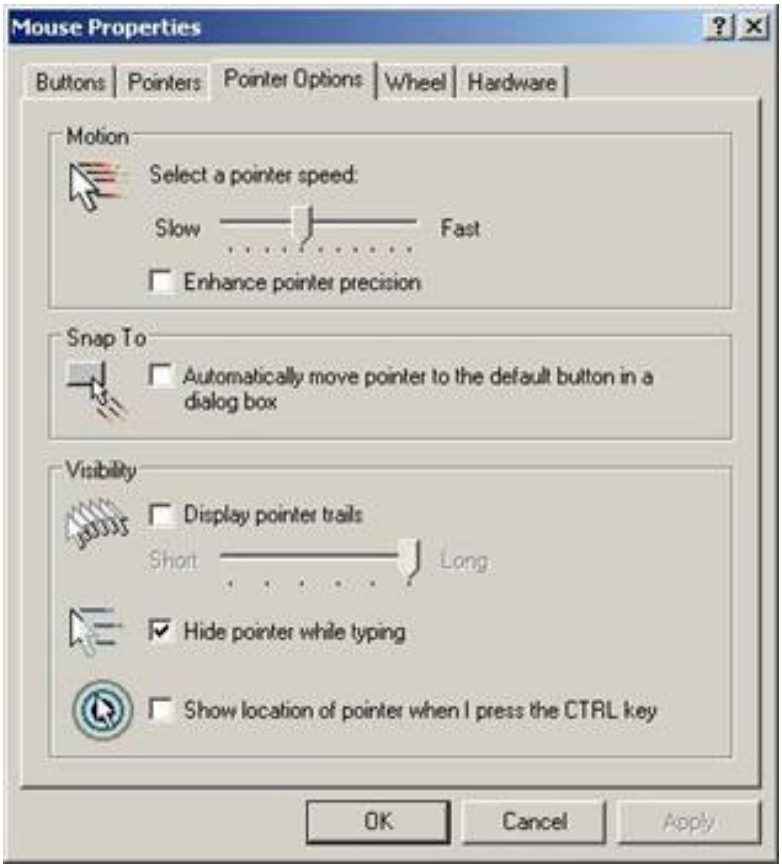
8. **The target computer has started up, but local PS/2 keyboard or mouse won't work.**
   Make sure your keyboard and mouse work fine if directly plugged into the target computer. Since PS/2 keyboard and mouse are not hot pluggable, so we should **follow the power up procedures**: power on monitor, power on IP-KVM, wait for IP-KVM startup complete (about 60 seconds), and then finally power on the Host (Target) computer.

9. **(for standalone IP-KVM only) The target computer has started up, but local USB keyboard or mouse won't work.**

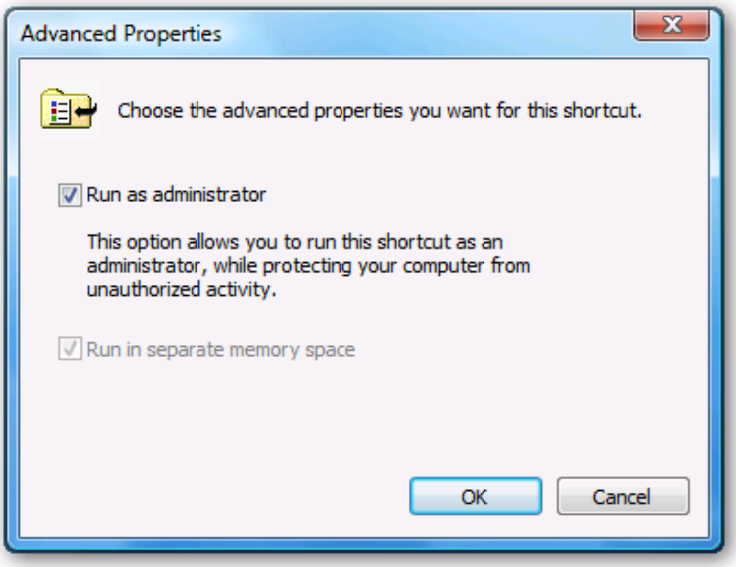
This problem may due to BIOS does not work well with Virtual Media (USB drive). In this case, it's recommended to use PS/2 keyboard and mouse, and force "KVM Settings > Keyboard/Mouse > Host Interface" to **PS/2**.

10. **Local mouse and remote mouse are not in sync after doing mouse Intelligent Sync.**
    Please don't place mouse on upper-left corner of remote console window. Intelligent Sync (Options > Mouse handling) will re-calculate the coordinate of mouse from upper-left corner of remote console window. If still not in sync, please check whether the "Enhance pointer precision" **is disable** in the mouse settings of host (target) computer OS (see the next item).

11. **In Double mouse mode the local and remote mouse pointers are not in sync even after clicking the Sync button.**
    If your IP-KVM connects to PS/2 host computer and select Double mouse mode, please **disable** the "Enhance pointer precision" and "Automatically move mouse pointer to the default button in a dialog box" in the mouse settings of host (target) computer OS.



12. **In Windows Vista, when Remote Console is opened, the mouse won't work in Remote Console window, and Drive Redirection won't work either.**
    You should run IE in Administrator mode;
    (a) right-click on IE shortcut, select "Run as administrator", or
    (b) right-click on IE shortcut, select properties, Shortcut-Advanced properties, select "Run as administrator". Note: this will always start IE in Administrator mode.



13. **Virtual Media (Drive Redirection) fails to connect to an USB drive**
    This problem may due to BIOS setting improperly. This problem will be disappeared after correcting the BIOS setting. If the PC does not equip with floppy diskette, please set BIOS to "**floppy not installed**", not "floppy 1.44MB".

14. **When connecting Local console, the computer VGA resolution does not match the monitor's resolution**.
    Make sure VGA resolution works fine if directly connect the monitor to the computer. Please turn off the computer, wait few seconds then turn on again. Notice that during computer startup, it will try to obtain the information of the connected monitor resolution from its VGA port. So before computer startup, the monitor and KVM switch should be already ON and running. Please follow the power up procedures: power on monitor, power on IP-KVM, wait for IP-KVM startup complete (about 60 seconds), and then power on the Host (Target) computer.

15. **The video quality is bad or the picture is grainy**
    Try to correct the brightness and contrast settings (in Options > Video Settings) until satisfaction, or simply click on the "Auto Adjust Video" button  to correct a flickering video.

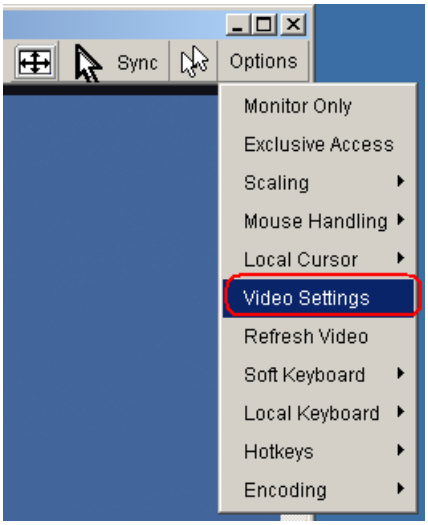
16. **The video data on the local monitor is surrounded by a black border.**
    This is not a failure. The local monitor is programmed to a fixed video mode that can be selected in the video settings of the IP-KVM. Refer to the Section called **Control Bar of Remote Console** in Chapter 4 for further explanation.

17. **The local monitor displays video data but the remote screen remains blank.**
    If the Remote Console is connected (look at the status line of the Remote Console) you should verify that the flat panel interface is not switched off by the video driver of your operating system.

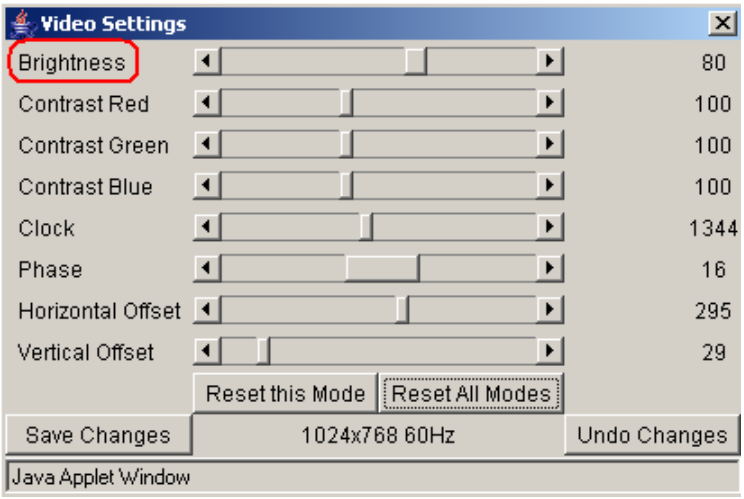
18. **The color of remote console displaying a pinkish tint.**

If you are experiencing the **remote control screen displaying a pinkish tint** with some graphic cards, please try adjusting the brightness of the remote console by following steps below.

(a) Click **Video Settings** in Options menu of the remote console.



(b) Adjust the **Brightness** setting until the pinkish tint is reduced or eliminated.



19. **Special key combinations, e.g. ALT+F2, ALT+F3 are intercepted by the console system and not transmitted to the host.**

You have to define a so-called “Button Key”. This can be done in the Remote Console settings.

20. **Windows XP doesn’t awake from standby mode**

This is possibly a Windows XP problem. Try not to move the mouse while XP goes in standby mode.

21. **Can’t upload the signed certificate in MacOS X**

If an “internal error” occurs while uploading the signed certificate either change the extension of the file to .txt or add a file helper using the Internet Explorer preferences for this type of file. Make sure that the encoding is plain text and the checkbox “use for outgoing” is checked. Another possibility is to use a Mozilla based browser (Mozilla, FireFox).

22. **The Remote Console does not open with Opera in Linux.**

    Some versions of Opera do not grant enough permissions if the signature of the applet cannot be verified. To solve the problem, add the lines

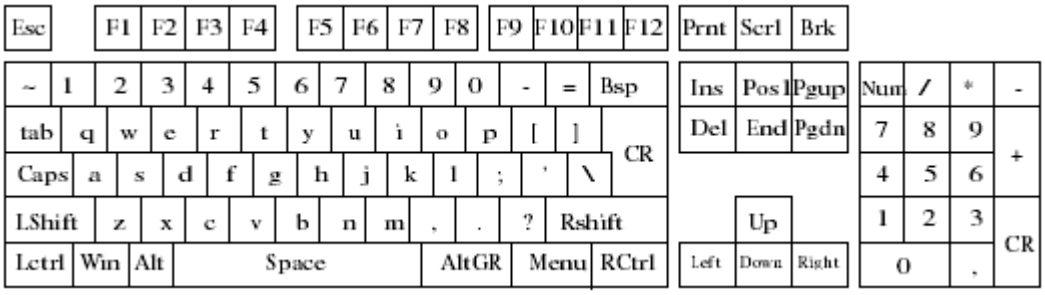
    ```
    grant codeBase "nn.pp.rc.RemoteConsoleApplet" {
    permission java.lang.RuntimePermission
    "accessClassInPackage.sun.*";
    ```

    to the java policy file of opera (e.g. `/usr/share/opera/java/opera.policy`).

9. Addendum

A. Key Codes

Table below shows the key codes used to defines keystrokes or hotkeys for several functions. Please note that these key codes do not represent necessarily key characters that are used on international keyboards. They name a key on a standard 104 key PC keyboard with an US English language mapping. The layout for this keyboard is shown in figure below. However, most modifier keys and other alphanumeric keys used for hotkey purposes in application programs are on an identical position, no matter what language mapping you are using. Some of the keys have aliases also, means they can be named by 2 key codes (separated by comma in the table).



Key (and aliases)		
0 - 9	SPACE	PAGE DOWN
A - Z	ALTGR	UP
, TILDE	ESCAPE, ESC	LEFT
-, MINUS	F1	DOWN
=, EQUALS	F2	RIGHT
;	F3	NUM LOCK
’	F4	NUMPAD0
<, LESS	F5	NUMPAD1
,	F6	NUMPAD2
.	F7	NUMPAD3
/, SLASH	F8	NUMPAD4
BACK SPACE	F9	NUMPAD5
TAB	F10	NUMPAD6
[	F11	NUMPAD7
]	F12	NUMPAD8
ENTER	PRINTSCREEN	NUMPAD9
CAPS LOCK	SCROLL LOCK	NUMPADPLUS,NUMPAD PLUS
\, BACK SLASH	BREAK	NUMPAD/
LSHIFT, SHIFT	INSERT	NUMPADMUL,NUMPAD MUL
RCTRL	HOME	NUMPADMINUS,NUMPAD MINUS
RSHIFT	PAGE UP	NUMPADENTER
LCTRL, CTRL	DELETE	WINDOWS
LALT, ALT	END	MENU

B. Video Modes

Table below lists the video modes IP-KVM supports. Please don't use other custom video settings besides of these, or the IP-KVM may not be able to detect them.

Resolution (x, y)	Refresh Rates (Hz)
640 x 350	70, 85
640 x 400	56, 85
640 x 480	60, 72, 75, 85, 90, 100, 120
640 x 480	66.6
720 x 400	70, 85
800 x 600	56, 60, 70, 72, 75, 85, 90, 100
832 x 624	75
1024 x 768	60, 70, 72, 75, 85, 90, 100
1152 x 864	75
1152 x 870	75
1152 x 900	66, 76
1280 x 960	60, 85
1280 x 1024	60, 75, 85
1600 x 1200	60
2048 x 1536 (local console)	85

C. User Role Permissions

Table below lists the user role permissions granted for three user role groups: "Super", "Administrator", and "User".

Function	User	Administrator	Super
Remote Control: KVM	x	x	x
Remote Control: Remote Power	-	x	x
Remote Control: Telnet Console	x	x	x
Virtual Media	x	x	x
User Management: Change Password	x	x	x
User Management: Users	-	-	x
KVM Settings: User Console	x (w/o Misc. Settings)	x	x
KVM Settings: Keyboard/Mouse	-	x	x
KVM Settings: Video	-	x	x
Device Settings	-	-	x
Maintenance: Device Information	x	x	x
Maintenance: Event Log	-	-	x
Maintenance: Update Firmware	-	-	x
Maintenance: Unit Reset	Keyboard/ Mouse, Video	Keyboard/ Mouse, Video	Keyboard/ Mouse, Video, Device

D. Bandwidth Consumption

The preconfigured network speed selection simply results in a different Compression and Color Depth configuration in order to match the different bandwidth limitations of the network type (UMTS, ISDN, etc.)

The following suggested network bandwidth planning table for IP-KVM installation is from the test results with 3D-Labyrinth screen saver at Resolution 800x600, the worst case consuming the highest network bandwidth.

	Compression	**Color Depth**	**Used Bandwidth**	**Comment**
Video Optimized	Video Optimized	8 bit	3.0 - 3.3 MB/s	uncompressed, synchronized video data, most bandwidth needed
Video Optimized (high color)	Video Optimized	16 bit	4.3 - 5.0 MB/s	uncompressed, synchronized video data, most bandwidth needed
LAN (high color)	0 (no compression)	16 bit	1.0 - 1.3 MB/s	uncompressed video data
LAN	0 (no compression)	8 bit	500 - 700 kb/s	uncompressed video data
DSL	2	8 bit	110 - 140 kb/s	slower video because of compression
UMTS	4	8 bit	80 - 100 kb/s	slower video because of compression
ISDN 128k	6	4 bit	20 - 30 kb/s	16 colors
ISDN/Modem V.90	7	2 bit	13 - 17 kb/s	gray scale
GPRS/HSCSD	8	2 bit	5 - 7 kb/s	gray scale
GSM Modem	9 (best compression)	1 bit	1 - 3 kb/s	black&white video

E. Well-Known TCP/UDP Port Numbers

Port numbers are divided into three ranges: Well Known Ports, Registered Ports, and Dynamic and/or Private Ports. Well Known Ports are those from 0 through 1023. Registered Ports are those from 1024 through 49151. Dynamic and/or Private Ports are those from 49152 through 65535.

Well Known Ports are assigned by IANA, and on most systems, can only be used by system processes or by programs executed by privileged users. Table below shows some of the well-known port numbers. For more details, please visit the IANA website: http://www.iana.org/assignments/port-numbers

Port Number	Protocol	TCP/UDP
21	FTP (File Transfer Protocol)	TCP
22	SSH (Secure Shell)	TCP
23	Telnet	TCP
25	SMTP (Simple Mail Transfer Protocol)	TCP
37	Time	TCP, UCP
39	RLP (Resource Location Protocol)	UDP
49	TACACS, TACACS+	UDP
53	DNS	UDP
67	BOOTP server	UDP
68	BOOTP client	UDP
69	TFTP	UDP
70	Gopher	TCP
79	Finger	TCP
80	HTTP	TCP
110	POP3	TCP
119	NNTP (Network News Transfer Protocol)	TCP
161/162	SNMP	UDP
443	HTTPS	TCP

F. Protocol Glossary

BOOTP (Bootstrap Protocol)
Similar to DHCP, but for smaller networks. Automatically assigns the IP address for a specific duration of time.

CHAP (Challenge Handshake Authentication Protocol)
A secure protocol for connecting to a system; it is more secure than the PAP.

DHCP (Dynamic Host Configuration Protocol)
Internet protocol for automating the configuration of computers that use TCP/IP.

DNS (Domain Name Servers): A system that allows a network name server to translate text host names into numeric IP addresses.

LDAP (Lightweight Directory Access Protocol)
A protocol for accessing directory information.

NAT (Network Address Translation)
An Internet standard that enables a LAN to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. This enables a company to shield internal addresses from the public Internet.

NFS (Network File System)
A protocol that allows file sharing across a network. Users can view, store, and update files on a remote computer. You can use NFS to mount all or a portion of a file system. Users can access the portion mounted with the same privileges as the user's access to each file.

NTP (Network Time Protocol)
A protocol used to synchronize time on networked computers and equipment.

PAP (Password Authentication Protocol)
A method of user authentication in which the username and password are transmitted over a network and compared to a table of name-password pairs.

PPP (Point-to-Point Protocol)
A protocol for creating and running IP and other network protocols over a serial link.

RADIUS (Remote Authentication Dial-In User Service)

An authentication and accounting protocol. Enables remote access servers to communicate with a central server to authenticate dial-in users and their access permissions. A company stores user profiles in a central database that all remote servers can share.

SNMP (Simple Network Management Protocol)
A protocol that system administrators use to monitor networks and connected devices and to respond to queries from other network hosts.

SMTP (Simple Mail Transfer Protocol)
TCP/IP protocol for sending email between servers.

SSL (Secure Sockets Layer)
A protocol that provides authentication and encryption services between a web server and a web browser.

SSH (Secure Shell)
A secure transport protocol based on public-key cryptography.

Telnet
A terminal protocol that provides an easy-to-use method of creating terminal connections to a network host.

G. Regulation Information

Regulation Information

CC

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 in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential environment may cause harmful interference.

CE

This equipment has been tested and found to comply with the CE regulations of Class A.

RoHS

All contents of this package, including products, packing materials and documentation comply with RoHS.