

**SV441HDIE**  
**SV841HDIE**  
**SV1641DHIE**

**Instruction Manual**

# IP KVM Switch

**4/8/16-Port Rackmount USB  
PS/2 Digital Remote Console IP  
KVM Switch**

**SERVER REMOTE CONTROL**

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

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

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# Table of Contents

<b>Introduction</b> .....	<b>1</b>
Packaging Contents.....	1
System Requirements .....	1
Required Cables and Hardware .....	2
<b>Installation</b> .....	<b>3</b>
Connecting to the Host Computers and Network.....	3
Connecting a Local Keyboard, Mouse, and Monitor.....	4
Disabling Mouse Acceleration on the Host Computer .....	5
<b>Configuring the SVxx41HDIE</b> .....	<b>6</b>
Web Configuration Using the On-Screen Display.....	6
Web Configuration Using DHCP .....	7
Web Configuration Using Static IP .....	9
Terminal Configuration Using a Serial Cable.....	10
<b>Using the Web Interface</b> .....	<b>11</b>
The Login Screen .....	11
Web Interface Introduction.....	12
Main Menu selections.....	13
Using the Terminal Interface via Serial Port.....	20
<b>Accessing the VNC Interface</b> .....	<b>21</b>
Web Interface .....	21
Native VNC Client.....	22
SSH Tunnel (with Native VNC client) .....	22
<b>Using the VNC Menu</b> .....	<b>23</b>

Bribar Feature.....	23
Main Menu.....	25
VirtKeys Menu .....	27
Video Tuning Menu .....	28
<b>Accessing KVM Features .....</b>	<b>32</b>
Cascade Configuration .....	32
OSD Operations .....	33
OSD Function Keys .....	34
Hot Key Commands.....	36
Connecting a Modem .....	39
Modem configuration.....	40
Configuring the Remote Connection .....	41
Accessing the Web Interface .....	42
Troubleshooting Guide.....	44
<b>Serial Remote Control operation .....</b>	<b>45</b>
Advanced Configuration Using the Integrated SSH Shell.....	47
About Security Certificate Warnings.....	49
<b>Troubleshooting.....</b>	<b>50</b>
<b>Supported Protocols.....</b>	<b>53</b>
<b>Specifications.....</b>	<b>54</b>
<b>Technical Support.....</b>	<b>55</b>
<b>Warranty Information .....</b>	<b>55</b>

# Introduction

## Packaging Contents

- 1 x SVxx41HDIE IP KVM unit
- 1 x Power Adapter
- 1 x Power Cord
- 1 x Set of rack mounting brackets
- 1 x DB9 serial cable
- 1 x Instruction Manual

## System Requirements

- PS/2 or USB enabled computer system or KVM switch  
**Note:** KVM switch must have a USB hub port
- Standard 104-key PS/2 wired keyboard
- Standard 3-button PS/2 wired mouse
- VGA enabled monitor/display
- 10/100Mbps compatible TCP/IP network

## Required Cables and Hardware

Depending on your needs, you may need one or more of the following cables:

### All applications

- 1 x Straight-through Ethernet patch cable (to connect the unit to your LAN)

StarTech.com part number: M45PATCHxx

- StarTech.com PS/2 3-in-1 KVM Cables (1 for each PS/2 computer)

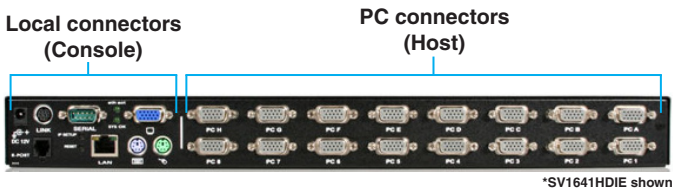
StarTech.com part number: SVECONxx

and/or

- StarTech.com USB 2-in-1 KVM Cables (1 for each USB computer)

StarTech.com part number: SVECONUSxx

# Installation



\*SV1641HDIE shown

## Connecting to the Host Computers and Network

1. Power down the computer to which the KVM Remote Control will be connected (Host computer).
2. If present, disconnect the existing monitor and keyboard/mouse from the Host computer.
3. Using a StarTech.com integrated KVM cable (sold separately), locate the male VGA (monitor) connector and connect it to the VGA-out connector on the back of the Host computer's video card.
4. If using a SVECONxx KVM cable, connect the PS/2 keyboard and mouse connectors on the host computer end of the KVM cable. If using a SVECONUSxx KVM cable, connect the single USB connector into the Host computer.
5. Insert the DE-15 connector on the opposite end of the integrated KVM cable into one of the PC connectors on the rear panel of the KVM switch.
6. Using a Category 5 Ethernet patch cable, connect the LAN connector on the rear panel of SVxx41HDIE to a network data jack (usually on a hub, switch, router, or pre-wired wall jack).

**IMPORTANT:** If you want to continue to use the host computer locally, skip step 7 and go directly to "Connecting a Local Keyboard, Mouse, and Monitor" after completing step 8. Otherwise, complete steps 7 and 8 now and continue to Configuration Methods Explained.

7. Connect the power cord (provided) to an available electrical outlet,

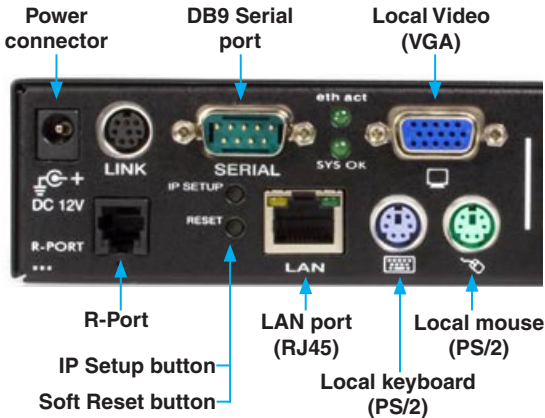
plug the opposite end of the power cord into the AC/DC adapter, and plug the power connector into the DC-in port on the rear panel of the unit.

8. Power on the Host computer.

**NOTE:** Only integrated KVM cables branded by StarTech.com will work on all SVxx41HDIE series KVM switches.

**IMPORTANT:** This KVM switch is convection-cooled. As such, please ensure the vents on both sides are unobstructed.

## Connecting a Local Keyboard, Mouse, and Monitor



SVxx41HDIE has the capability to connect a local keyboard, mouse, and monitor to the host computer for maintenance and monitoring, allowing users to physically use the host computer as though SVxx41HDIE were transparent. If needed, the unit can be run through a typical KVM switch like any other computer. Using a KVM cable, you can connect the Server Remote Control's host computer inputs to the "console" connectors on a KVM switch allowing you to control more than one computer remotely using a single Server Remote Control. If cascading, the SVxx41HDIE can only be the Master. Consult the



documentation that came with the other KVM switches for more details on how to make the necessary connections.

To connect console devices:

1. Connect a standard PS/2 keyboard to the Local Keyboard port on the rear panel of the KVM switch.
2. Connect a standard PS/2 mouse to the Local Mouse port on the rear panel of the KVM switch.
3. Connect a SVGA-compliant monitor to the Local Video port on the rear panel of the KVM switch.
4. Power on the KVM switch.

## Disabling Mouse Acceleration on the Host Computer

**NOTE:** If you are using USB to connect KVM switch to the host computer, you will not be required to adjust the mouse settings on the host computer, as this device uses “Absolute” mode, which eliminates any problems you may otherwise experience with mouse synchronization or host mouse acceleration.

Many operating systems offer a feature called mouse acceleration, allowing the user to adjust the responsiveness of the cursor on the screen in relation to physical movements of the mouse. While this is usually a beneficial interface enhancement, it can interfere with the operation of the KVM switch and should be disabled on the host computer before a remote session is attempted. Follow the instructions below to disable mouse acceleration for the operating system installed on the host computer.

### Windows 98

1. From the Control Panel, click on Mouse.
2. From Mouse Properties, click on the Motion tab.
3. Make sure the Pointer speed bar is centered and Acceleration is set to None.

### Windows 2000

1. From the Control Panel, Click on Mouse.

2. From Mouse properties, click on the Motion tab.
3. Make sure that the Pointer speed bar is centered and Acceleration is set to None.

### Windows XP and Windows Server 2003

1. Go to Pointer Options and turn off Enhance Pointer Precision and ensure that the pointer speed bar is centered.

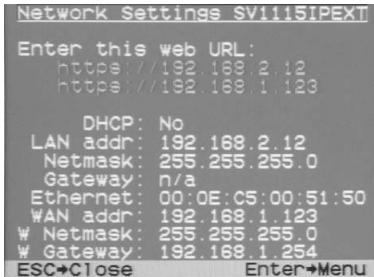
### Linux, Unix and X-Windows

1. Add this command to your xinitrc, xsession or other startup script:  
xset m 0/0 0 (For more information, please refer to Troubleshooting)

## Configuring the SVxx41HDIE

This IP KVM switch offers four distinct methods for configuring the unit for your network. Which method will work best will depend on your level of experience and your specific network configuration.

### Web Configuration Using the On-Screen Display



```
Network Settings SV1115IPEXT
Enter this web URL:
https://192.168.2.12
https://192.168.1.123

DHCP: No
LAN addr: 192.168.2.12
Netmask: 255.255.255.0
Gateway: n/a
Ethernet: 00:0E:C5:00:51:50
WAN addr: 192.168.1.123
W Netmask: 255.255.255.0
W Gateway: 192.168.1.254
ESC+Close      Enter+Menu
```

Upon boot-up, including following a reset, The IP KVM switch will display a window on the local video output, that will appear as follows:

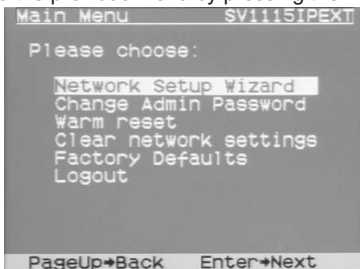
The initial screen will display the IP address assigned by your existing DHCP server (if present on your network). If no DHCP server is detected, a factory assigned IP address will be displayed in its place

(10.0.0.15 by default). Please make note of the assigned IP address, as you will need to enter it into your web browser to access the Web Interface.

If static IP addresses are assigned, you will likely need to change the Net Mask, IP Address and other details, prior to connecting via your Web browser. If this is the case, connect a local keyboard (USB or PS/2) and press the Enter key. In order to proceed, you will require an administrative username and password. By default, the username and password are admin. You will be given the opportunity to change the password (recommended) once the configuration is complete.

Alternatively, you may press the Setup button on the front panel, and you will not be asked to enter the admin password if you just press Enter.

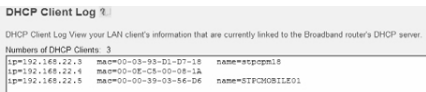
At the main OSD menu (pictured below), you will be given several basic setup options. To configure the IP KVM switch to your required network settings, use the Network Setup Wizard. To select from the menus provided, use the arrow keys on your keyboard. At any time, you can return to the previous menu by pressing the Page Up key.



## Web Configuration Using DHCP

This method requires that your network implement DHCP (Dynamic Host Configuration Protocol), usually on a server or network access device such as a router that dynamically allows devices to join the network without pre-configuration. It also assumes that you will have easy access to your network's DHCP log, since you will need to know

the IP address of the unit to complete the configuration over your Web browser. (If you are unsure of how to access your network's DHCP log, contact your System Administrator for details.) If the unit is powered on and connected to the network via LAN port on the rear panel, it will automatically attempt to lease an IP address using DHCP. Before you can begin the configuration process, you will need to access the DHCP log from your file server or other device that acts as the DHCP server on the network. A simple DHCP log looks similar to the following:



```
DHCP Client Log ?
DHCP Client Log View your LAN client's information that are currently linked to the Broadband router's DHCP server.
Numbers of DHCP Clients: 3
ip=192.168.22.3 mac=00-03-93-D1-D7-18 name=atcpml8
ip=192.168.22.4 mac=00-0E-C5-00-08-1A
ip=192.168.22.5 mac=00-00-39-03-56-D6 name=STPCHORILE01
```

The information displayed for your own network may vary significantly from the data displayed in the image, but should supply (at minimum) three essential details: IP address, MAC address, and device (or machine) name for the computers and other devices connected to your network. The values for the IP KVM switch tested above are as follows:

**IP Address:** 192.168.22.4

**MAC Address:** 00-0E-C5-00-08-1A

**Device Name:** (none)

The easiest way to identify your IP KVM switch on the network is by its MAC address, a unique hardware identifier that is specific to your unit. The MAC address of the unit can be found using the OSD setup screen. Write down this number and keep it for future reference. Once you locate the MAC address of your unit in the DHCP log, you can match it to its leased IP address and proceed with the Web configuration.

**NOTE:** Once you have located the IP address of the IP KVM switch and wish to proceed with the Web configuration, do not power off the unit or your DHCP server, since the Server Remote Control might lease a different IP address. Should this happen, reexamine the DHCP log to verify the IP address again.

## Web Configuration Using Static IP

Since some networks rely on static IP addresses (every device has a pre-configured IP address that does not change), the DHCP access method described above is not applicable in those situations.

To access the Web configuration for this product, you will need to configure the workstation you are using to the same subnet (255.255.255.0) and also assign it a valid IP address (i.e. 192.168.1.100). For details on how to change the IP address of your computer (if necessary), consult your documentation or System Administrator for assistance.

**NOTE:** It is advisable to verify whether another device on your network is using the same IP address as the IP KVM switch before connecting it to the network, to avoid a conflict. Should an IP address conflict occur with another device on the network, power off the conflicting device or assign it another IP address before continuing the installation.

**NOTE:** Not all IP addresses are valid for a given subnet. If you are required to change your subnet (and therefore IP address) to configure the unit, be sure the IP address you choose is within the allowable range for the 255.255.255.0 subnet.

Once your computer is configured to the same subnet as the IP KVM switch, you can use the IP address 192.168.1.123 to access the Web configuration system.

## Terminal Configuration Using a Serial Cable

Configuring the IP KVM switch using a serial cable is the best choice if you need to preconfigure the unit before attaching it to a network, (i.e. when sending to a branch office, customer site, etc). In general, the Web configuration is preferable because of its intuitive interface and the fact that you do not have to be within close physical proximity to perform the configuration. However, if you wish to use the serial cable method to configure the IP KVM switch, you can use any typical communication software package (UNIX: tip, cu, kermit, minicom; Windows: HyperTerminal, kermit).

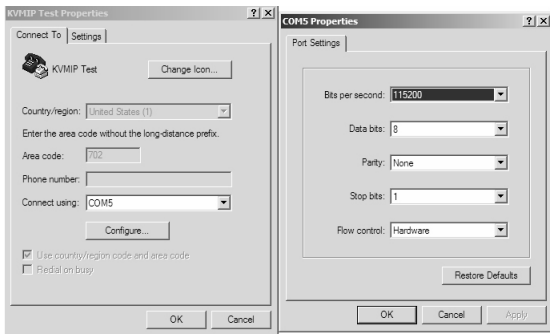
You can use the serial port on the SVxx41HDIE to access the terminal configuration tool; to do so, you will require a null modem serial cable. Connect a female end of a serial cable to the serial port used for serial access on the host computer. Connect the opposite end to the SVxx41HDIE. Configure the terminal software with “8N1” settings:

**Connection speed: 115200 bps**

**No. of bits: 8**

**Parity: None**

**Stop bits: 1**



\*sample HyperTerminal configuration

## Using the Web Interface

The Web interface is the most intuitive way to configure the IP KVM switch. Offering a Java-based VNC client that can be used to control the host computer from a remote location, as well as support for any industry-standard HTML Web browser. You can access the Web interface by opening your Web browser and entering the IP address of the IP KVM switch you wish to access/configure. The IP address will be either a) the address assigned by your DHCP server as identified in the previous section, or b) 192.168.1.123 if your network uses static IP addressing.

### The Login Screen



Before you can access the Web configuration interface, you must enter a user name and password. The default username and password as shipped from the factory is username admin, with a password of admin.

**NOTE:** Before the login screen appears, your Web browser may display a warning about an invalid security certificate. This does not affect the security of your data in any way. Whenever you are prompted about a certificate security problem by your browser or the Java VNC client, always choose the option to continue. For more information, please consult the section entitled About Security Certificate Warnings.

## Web Interface Introduction

After the initial login screen, the screen will be divided into several sections, four of which will remain on the screen at all times while viewing the Web Interface:

The screenshot shows the StarTech.com VNC web interface. At the top, the machine name is displayed as "cambridge (192.168.2.12/192.168.1.120)". Below this, there is a "Screen Timeout" section with a "Screen Timeout" button. A table titled "USB File Transfer" is visible, showing a file named "Cat\_Links\_Beta\_VSI" with a size of 0 bytes and a date of 09-14-2012 11:34. The interface includes a left-hand "Main Menu" with various options like "Home", "Preferences", "Screen Timeout", "File Transfer", "Login", "VNC", "Connect", "Disconnect", "Admin", "Network Config", "User Accounts", "System Ident", "Security", "Compatibility", "SNMP", "Hardware", "Modem", "Serial Ports", "Terminal", "Firmware", "Info", "Port Numbers", "Help", "VNC Help", and "VNC Upgrade". A right-hand "Help Area" provides additional information and a "Help" button.

**Name:** At the top of the screen, the name of the machine being controlled is displayed

**Tip Line:** The area directly below the Name indicates what function each selection from the Main Menu performs. Hover the mouse pointer over each individual listing in the Main Menu to update this message according to the function performed by each listing.

**Main Menu:** At the left-most side of each page, the Main Menu is displayed, allowing users to choose functions offered by the Web Interface.

**Help Area:** The right-most column offers an optional help summary for each page. If you don't wish to use this information, it can be closed by clicking the small [x] at the top right (within the Web Interface). If closed, click on the Help button near the top right of each page to re-display it.



**NOTE:** While these four sections remain stationary, depending on your selections, the center of the page will display the desired content.

## Main Menu selections

**NOTE:** Some of the following items may not be present, based on assigned user privileges (i.e. non-admin users will not see any items under the Admin category.).

### Home

The Home screen offers a Screen Thumbnail view of the controlled computer, as well as basic file transfer functions, Monitoring Information, System Identification and VNC Client options.

### Preferences

The Preferences screen offers several configuration options, pertaining to the functionality of the IP KVM switch. Here, you will be able to customize settings to optimize overall performance, (i.e. Encryption options, VNC options, display and bandwidth options etc.), according to each user's individual preferences. Please save your selections by clicking the Save Changes button.

### Snapshots

The Snapshots screen allows you to view and save a screenshot of the controlled computer in its current state. This screenshot will update periodically (automatically). Saved image files are stored in .PNG format.

### Logout

Clicking on **Logout** will terminate your Web Interface session. To re-initiate the Web Interface, you will be required to re-enter your username and password.

### VNC

Connect

Disconnect

To launch or disconnect a Virtual Network connection with the controlled computer, click on Connect or Disconnect as appropriate.

## Network Config

The **Admin** functions allow you to access all of the features you will need to perform an initial configuration of the IP KVM switch.

### Dynamic Host Configuration Protocol (DHCP)

#### Dynamic Host Configuration Protocol (DHCP)

Automatic network configuration using DHCP is:

**DHCP Disabled (use static address)** ▼

Automatic network configuration using DHCP is: Enabled/Disabled. This feature applies only to the LAN port on the rear panel, and is enabled by default. When enabled, the unit will automatically configure itself with an IP address when a DHCP server is present. When disabled, the LAN port will use the values assigned to it on the IP Addresses and Routing table below.

### IP Addresses and Routing

IP Addresses and Routing

Port	IP Address	Subnet mask	Gateway (or 0.0.0.0 for none)	Broadcast (or leave blank)
LAN	192.168.2.12	255.255.255.0	0.0.0.0	192.168.2.255

This table allows you to assign IP information for the LAN port. If you are using DHCP, the values for the LAN port will be filled in automatically and any changes made will not affect the setup.

### Domain Name Server (optional)

#### Domain Name Server

DNS Servers (example: 10.0.0.123,10.2.3.34):

Default DNS domain suffix (example: startech.com):

This section allows you to specify DNS servers and the default DNS domain suffix in use on the network. If DHCP is enabled, some of these values may be supplied automatically.

#### Commit Network Changes

[Click here to save your changes \(they will be applied on next reboot\).](#)

[Click here to reconfigure network settings immediately.](#)

Clicking the Commit button applies any changes made on this page, but leaves the old settings active until the next time the unit restarts. Clicking Make changes effective now applies the changes and restarts

the IP KVM switch so the new settings take effect immediately.

### **Ethernet Address (MAC Address)**

Ethernet Address (MAC Address)

LAN: 00:0e:c5:00:51:50

This is the Ethernet hardware address of this unit's LAN port. It is set at the factory and cannot be changed. You may need this number to configure your DHCP server.

### **User Accounts**

This menu will allow you to add accounts other than admin to the system. These accounts will not have the authority to change settings, but can access the Web interface and log into the VNC console. Selecting Delete permanently removes the user from the system. If you enter values for a user that does not already exist under Edit User Details, the system will create that user for you when you click Record changes. If the user already exists, you will change the password for that user.

### **Machine Name**

System Ident

This is a name that is used to uniquely identify this machine. You might want to create a DNS entry that matches this name. The name is provided as the Client Name for the DHCP server. It is also shown at the top of each page in the web browser interface and is the “desktop name” for VNC clients.

### **Other identification details**

These values are for information purposes. They are visible from the VNC client and via SNMP (if enabled).

### **Location**

This string is sent as the system.sysLocation value over SNMP. It should describe the location of this system.

### **Contact Name**

This string is sent as the system.sysContact value over SNMP. It should describe who to contact regarding this machine. Typically it includes an email address.

## Network Address

This value is not used in our configuration, but is meant to store a user-defined value that identifies the controlled machine on the network. The official DNS name of the controlled machine is a obvious value to put here, but you may use it for any purpose.

## Description

A user-defined description for the controlled machine.

### Security

This menu allows you to configure a number of settings, including changing the default password for admin (recommended). Read and consider the comments and instructions on this menu before making any changes, as changing these features could make the unit inaccessible through Web configuration (i.e. due to firewall filtering). Note that any password changes you make will have to be entered in duplicate to prevent the chance for error.

### Compatibility

The Compatibility menu offers features that may offer enhanced functionality with certain KVM and power products, such as StarTech.com's Remote Power Switch (PCM8155HNA). These can be left at their default values if you are not connecting the unit to a KVM or power management device.

### SNMP

The SNMP menu allows you to configure the IP KVM switch so it can be recognized and managed using industry-standard Simple Network Management Protocol software.

### RADIUS

The RADIUS server requires the IP address, the UDP port number (1812 - default or 1645) and the shared secret. The shared secret is used to encrypt communications and corresponds to a shared password for the RADIUS server and the client machine. Two additional servers may be defined for backup purposes. Each server will be tried in order, using the indicated number of retries and timeout period, which are configurable on the same page.

Remember to enable RADIUS after configuring it. While RADIUS authentication is enabled, the locally defined accounts on the Server Remote Control unit will not be used, except for the SSH login.

**RADIUS Configuration**

Use RADIUS for login:

**Servers**

Priority	Server IP Address	Port	Shared Secret	New Secret (twice)
#1	<input type="text" value="0.0.0.0"/>	<input type="text" value="1812"/>	<input type="text"/>	<input type="text"/> <input type="text"/>
#2	<input type="text" value="0.0.0.0"/>	<input type="text" value="1812"/>	<input type="text"/>	<input type="text"/> <input type="text"/>
#3	<input type="text" value="0.0.0.0"/>	<input type="text" value="1812"/>	<input type="text"/>	<input type="text"/> <input type="text"/>

Request timeout period (seconds):

Number of retries (per server):

Click here to save your RADIUS changes and apply them:

However, if a user name of the form “name.local” is given at the RADIUS prompt, the system will use “name”; check the password locally, and skip RADIUS authentication. Delete all local accounts to avoid this behavior. When connecting via VNC, a login screen is generated that asks for a RADIUS username and password.

Enable this to allow the modem to answer the phone and start a PPP connection.

### Modem

Enable modem connections (PPP) via serial port/modem.

### Serial Ports

The Serial Ports menu allows you to manage and connect to devices connected to the unit using the R-Port on the IP KVM switch.

### Time/Date

Date and time are stored without consideration for time zone. If you are controlling multiple sites in different time zones, we recommend you use UTC (Universal Coordinated Time, also sometimes called GMT or Zulu) for all machines. If the computer you are using to view this page knows the correct time, just press the button to set the time and date to the same time as your browser.

## Firmware

The firmware on the Server Remote Control is field upgradable. To upgrade to another version, login as admin.

### Auto Self Upgrade

The IP KVM switch includes an innovative feature allowing it to upgrade itself over the Internet. Simply click on the button labeled Upgrade to Latest and the unit will go out to the Internet and download the latest version of the system firmware and then install it. If it cannot access the Internet directly (perhaps due to a web proxy or other firewalls), then a page will be shown that causes your browser to download the required file. Save this file to disk and then upload it as described in the next section, Manual Upload.

### Manual Upload

Enter the name of the firmware file that you downloaded from StarTech.com into the field provided (or use the Browse... button). Press Start Upload and wait until a successful upload message is shown.

**NOTE:** Remember the following during the firmware upgrade:

- Do NOT turn off power to the unit before this operation completes successfully.
- The unit will sometimes reboot as part of the upgrade procedure, depending on which system component is upgraded. You will have to reconnect and re-login in those cases.
- Wait at least two minutes after pressing Start. Do not assume the upload did not work, the upload could simply be slow.
- Each distributed file upgrades a different component of the system. Be sure to apply all files provided as part of an upgrade. The system knows what to do with each file you give it, and they are checked for validity before being applied.

### Auto Self Upgrade

Clicking the Upgrade to latest button will automatically download and install necessary revisions. To download upgrades for manual installation, please click on Get latest version.

## Purchase Options

Certain firmware features may be offered separately from the base unit, in order to reduce the initial cost for the Server Remote Control unit.

**NOTE:** If you wish to upgrade after the system is in operation, go to the Manage Firmware page and scroll down to the section entitled Purchase Options. Look for a unique code, such as: 4-C80C-B960-1-0. If you provide this code to the technical support department, they can give you an unlock code that will open any feature you request. Type in the code provided, exactly, into the area provided and click Submit. The new features opened by the code will be enabled immediately, but you may need to reboot the unit to begin using certain features.

<b>Info</b>
Status
Port Numbers
Help
Site Map
Copyright

The Status screen displays a system security log, various system settings, and the ability to generate a copy of the system configuration in plain text format.

**Port Numbers** provides a table allowing you to change TCP port values for services available on the IP KVM switch. By default, they are factory-set to common Internet values. You may wish to enhance security by disabling services that you will not use with the unit. To disable a service, change its port number to 0. For flexibility, both the LAN and WAN ports can be configured separately. When you have made any necessary changes, click Commit Changes to use the settings the next time the IP KVM switch restarts. To force the unit to restart immediately, click Restart Servers.

## Help Menu

Provides an FAQ (Frequently Asked Questions) listing to assist you with the features and operation of the IP KVM switch.

## Site map Menu

This menu provides a hyperlinked directory of each setting available on the Web configurator.

## Copyright Menu

Provides the Terms of Use and other information related to the firmware and software on the IP KVM switch.

## Using the Terminal Interface via Serial Port

The terminal interface you can access via the serial port permits the configuration of the basic settings of the IP KVM switch. While not intended to be a substitute for the Web interface, it does allow you to configure some of the same functions. The menu list below describes the options that can be modified through the terminal interface.

Note that you must use the 'W' option to confirm and apply any changes made before you exit the terminal session.

If you changed the status of the Ethernet Bridging feature, you will also need to power the IP KVM switch on and off again to enable your changes.

```
Server Remote Control Network Setup
-----

NOTE: This interface is used to set network parameters and perform
certain recovery procedures, but the majority of setup and
configuration can only be done using the web interface.

Primary Ethernet Port (LAN) (00:0e:c5:00:08:1a)

DHCP is enabled. Current lease information:

IP Address: 192.168.22.4
Netmask: 255.255.255.0
Gateway: 192.168.22.1
Broadcast: 192.168.22.255

Secondary Ethernet Port (WAN) (00:0e:c5:00:08:1b)

IP Address: 192.168.1.123
Netmask: 255.255.255.0
Gateway: 192.168.1.254
Broadcast: 192.168.1.255

Ethernet bridge: Disabled

Machine name: moname

Commands (press one key, then Enter):

D - Disable DHCP, and use fixed IP address.
* I - Set IP address.
* N - Set netmask.
* C - Set default gateway.
* B - Set broadcast address (optional).
II - Set IP address (WAN).
NI - Set netmask (WAN).
OI - Set default gateway (WAN).
BI - Set broadcast address (WAN, optional).
E - Ethernet bridging (enable or disable).
M - Change machine name (DHCP client name).
W - Reset/disable firewall, TCP ports, SNMP, RADIUS.
F - Reset everything to factory defaults.
S - Change system admin password.
P - Send ICMP ping packets (testing purposes).
? - Show TCP/IP ports and servers enabled.
R - Revert to current settings (undo changes).
W - Commit changes to configuration.

* -> These values ignored due to DHCP.

Choice:
```



## Accessing the VNC Interface

There are three ways to communicate with the Server Remote Control unit in order to control the host computer:

- **Web interface:** The integrated Web server includes a Java-based VNC client. This allows easy browser-based remote control.
- **Native VNC client:** There are several third-party software programs that use the standard VNC protocol, available in open source and commercial VNC clients.
- **SSH access:** By default, there is a standard SSH server running on port 22 (the standard SSH port). Once connected via SSH, the VNC traffic is tunneled through the SSH connection and encrypts the VNC session. Each method will be discussed briefly in the following section. The type of encryption method or client used is not critical.

### Web Interface

Using IP KVM switch's web interface requires a browser, with cookies and JavaScript enabled. To start the Java VNC client, login to the Web configuration interface and click on the thumbnail of the desktop on the Home menu, or click on the Connect button, located in the Main Menu.

You may need to upgrade Java support in your browser; however, most modern browsers come with a version of Java that is compatible with this application. The Java VNC client makes a connection back to the Server Remote Control unit over port 5900 (by default) or 15900, if encrypted. The encrypted connection is a standard SSL (Secure Socket Layer) encrypted link that encrypts all data from the session, including the actual video pictures.

Because Java is considered a "safe" programming language, the Java VNC client has some limitations. Certain special keystrokes cannot be sent, such as "Scroll Lock" on the keyboard.

This client software requires the use of Java 2 (JRE 1.4) to enable features like wheel mouse support. Sun Microsystems' Java site, [www.java.com](http://www.java.com), is an excellent resource to ensure your browser and operating system are updated accordingly.

## Native VNC Client

This system implements the VNC protocol, so any off the shelf VNC client can be used. There are over 17 different VNC clients available and they should all work with this system. This system automatically detects and makes use of certain extensions to the basic RFB protocol that is provided by the leading VNC clients. Depending on your needs, there are several popular freeware, shareware, and commercial VNC clients available. Contact your system administrator or local software vendor for assistance.

**NOTE:** Some native VNC clients may require a flag or setting indicating they should use BGR233 encoding by default. If this flag is not set, you may see a garbled picture and the client will fail. The Unix versions of VNC require the flag `-bgr233`. For examples on using this flag, review the commands in the following section.

### SSH Tunnel (with Native VNC client)

If you are using OpenSSH, here is the appropriate Unix command to use, based on the default settings on a machine at 10.0.0.34:

```
ssh -f -l admin -L 15900:127.0.0.1:5900 10.0.0.34 sleep 60  
vncviewer -bgr233 127.0.0.1::15900
```

Same command, but using the WAN port:

```
ssh -f -l admin -L 15900:127.0.0.1:5900 10.0.0.98 sleep 60  
vncviewer -bgr233 127.0.0.1::15900
```

#### Notes:

- A copy of these commands, with appropriate values filled in for your current system setting, is provided in the on-line help page. This allows you to “cut-and-paste” the required commands accordingly.
- You have 60 seconds to type the second command before the SSH connection will be terminated.
- The port number “15900” is arbitrary in the above example and can be any number (1025...65535). It is the port number used on your client machine to connect your local SSH instance with the VNC

client. If you want to tunnel two or more systems, you will need to use a unique number for each instance on the same SSH client machine.

- Some Unix versions of the VNC client have integrated SSH tunneling support. Some clients require your local user ID to be the same as the user ID on the system.

Use a command like this: `vncviewer -bgr233 -tunnel 10.0.0.34:22`

## Using the VNC Menu

One of the unique features of this product is the VNC menu system. Whenever you see a window with a dark blue background and grey edges, this window has been inserted into the VNC data stream so that it is effectively laid over the existing video. These menus allow you to control the many features of the IP KVM switch without using the web interface or a custom client.

### Welcome Window

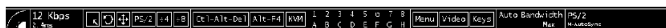


When you initially connect to the system, a Welcome Window will appear, indicating which system you are controlling, what encryption algorithm was used and what key strength is currently in effect. Click anywhere inside the window to clear it, or wait ten seconds.

### Bribar Feature

Along the bottom of the VNC screen is a dark blue bar with various buttons known as the bribar. Its purpose is to show a number of

critical status values and to provide shortcuts to commonly used features. Here is a snapshot of what it may look like. There will be slight differences based on optional features and system configuration. Starting from the left side of the Bribar, each feature and its function is outlined below.



**Bandwidth:** Indicates current average bandwidth coming out of the Server Remote Control unit. The second number measures round trip time (RTT) of the connection when it was first established.

**Resync:** Re-aligns the remote and local mouse points so they are on top of each other.

**Redraw:** Redraws the entire screen contents; occurs immediately.

**PS/2:** Resets the PS/2 keyboard and mouse emulation. Useful to recover failed mouse and/or keyboard connections in PS/2 mode.

**USB:** Resets the USB connection by simulating an unplug and replug. Forces operating system to recognize the USB keyboard, mouse and emulated disk drive.

**÷4, ÷8:** Switches to thumbnail mode, at indicated size (i.e. 1/8th, 1/4)

**Ctrl-Alt-Del:** Sends this key sequence to the host. Works immediately.

**Alt-F4:** Sends the key sequence to host (closes windows).

**KVM:** Sends the KVM “hotkey” sequence. This function is only enabled when you have configured the unit to expect a particular brand of KVM downstream. It sends the key sequence to launch the KVM’s on-screen display (OSD) menu. This button is only present when a KVM model is selected in the Web interface.

**1~8/A~H:** Corresponds to the ports on the KVM switch. Allows for direct port access by pressing the port ID you wish to control.

**Menu:** Shows the main menu.

**Video:** Shows the video-tuning menu where the picture quality can be adjusted.

**Keys:** Shows the VirtKeys menu, which allows you to simulate pressing special keys such as the Windows key or complex multi-key sequences.

**PS/2:** This area will show either PS/2 (as in this example) or USB to indicate if keyboard and mouse are being emulated via USB connection or PS/2 signals. If Autosync appears beneath this indicator, the mouse pointers on the local mouse and the VNC session will be synchronized automatically.

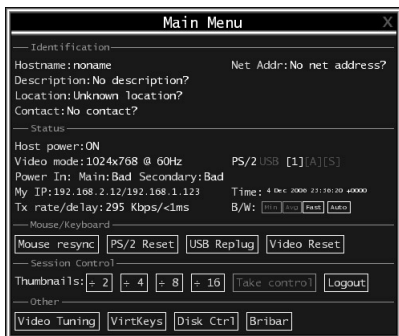
**[1][A][S]:** These flags show the state of the keyboard lights, NumLock, ShiftLock and ScrollLock respectively.

**X:** Click this button to close the Bribar and hide it. This can be very useful on a client machine that has a screen size the same as the remote machine. No vertical screen space is wasted with the Bribar. Use double-F7 to start the main menu, then click on the Bribar to restore the feature.

**Other items:** If the server's screen is larger than 1024x768, additional buttons will be shown to the right of the above listed items. These are all keyboard shortcuts and are duplicated in the Keys menu.

## Main Menu

To access the main menu, quickly press F7 twice quickly. You must press the key twice within one second. If you press it once or too slowly, then the F7 key(s) are sent to the host, just like any other key. This is the only way to get into the menu system, if the Bribar is disabled. Here is the main menu for a typical system:

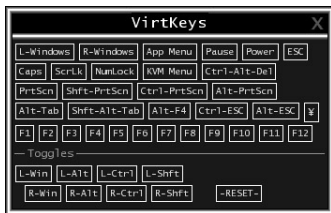


The main menu window may be moved by clicking and dragging on the title bar. It can be closed by pressing Escape, or by clicking on the red X in the top right corner. Here is a guide outlining various fields from the Main Menu. Most of the functions operate immediately. Other functions require a response to a confirmation prompt first before performing the requested function.

- **Identification:** Fixed text label that is defined by the user in the Web interface. This does not affect the operation of the system and is intended to assist with administration.
- **Status:** Current status of the attached system and the status of the unit.
- **B/W Min/Avg/Max/Auto:** Bandwidth control. Current operation will be indicated with white highlighting. If you choose Min/Avg/Max then you will override the default, Auto. As the automatic mode measures actual network performance, you may see the current mode switch from Min up to Avg or Max. The different modes indicate more time spent on compression versus more bandwidth. There is no visual difference between the modes, but there can be a noticeable difference in speed and smoothness.
- **Mouse Resync:** Resynchronizes the mouse pointer so that the local and remote mouse pointers are on top of each other.
- **PS/2 Reset:** Resets the PS/2 emulation going to the host and to the attached PS/2 devices. This can be used if the mouse stops responding or the PS/2 keyboard isn't working.
- **USB Replug:** Simulates unplugging the USB connector and then plugging it back in. If the host is not recognizing USB input devices, this button may be used to restore functionality.
- **Take Control:** When multiple users are connected to the same system, use this button to take control away from another user. Only one user may control the keyboard and mouse at any time. All users see the same picture. Please note: It is important that multiple users not be connected to the same physical network.
- **Thumbnails:** Switch to smaller thumbnail size screen images (click anywhere on thumbnail to restore it). Each button corresponds to a

- different sized image, from half size to one-sixteenth.
- **Logout:** End the VNC login session and disconnect.
- **Video Tuning:** Sub-menu with video adjustments, to be used when automatic picture adjustment does not provide a good quality picture.
- **VirtKeys:** Virtual keyboard provides a menu with special keys that are often hard to generate but needed by the remote system. The most common key sequence is the [Ctrl] – [Alt] – [Del].
- **KVM Menu:** Generates the key sequence used to access the on-screen menu for an enterprise-class KVM switch. When these conventional KVM switches are combined with the IP KVM switch, this key makes accessing their built-in menu easier, especially from the Java client. This button will only be shown when an external KVM has been enabled via the web interface.
- **Bribar:** Closes or reopens the Bribar window along the bottom of the screen.

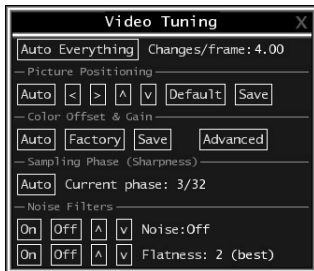
## VirtKeys Menu



Clicking any button in the top half of the window simulates pressing and releasing the indicated key. In the bottom area of the screen, clicking will simulate the indicated Meta key being pressed. You may then click in the top part to send another key and release the Meta key at the same time. Alternatively, you may move the mouse outside this window, press the regular key, and then choose -RESET- to release all depressed keys. The VirtKeys menu can be left open while using the host system. You can then click the required button at the suitable time, and still interact with the host in a normal fashion.

**Examples:**

- **[Ctrl]-[Alt]-[F4]:** Use L-Ctrl then L-Alt in the Toggles area. Then click F4.
- To bring up the Start menu under Windows: Click the L-Windows button at the top left of the above window.

**Video Tuning Menu**

Use the **Auto Everything** button to automatically fine-tune all three adjustments. If the test pattern for Color Offset calibration is not present on the screen, then the Color Offset adjustment is skipped.

**Changes/frame** indicates the number of 16x16 blocks of video that are being sent, on average, for every frame of video. With a static image being displayed by the server, this number will be zero (shown as -nil-). Moving the mouse, for example, will cause the number to jump to about 2 or 3. You may use this number to judge the picture quality as you adjust the controls on this menu.

**Picture Positioning** affects the image position on your screen. If you see a black line on either side of your screen, or at the top or bottom, you can use the arrow buttons to shift the image in that direction. Pressing Auto does the same thing for you automatically. Use Save to save the changes you have made manually. Since this adjustment depends on the video mode, separate values are stored for each video mode.

**Color Offset** is a fine tuning adjustment that requires the use of a test pattern. There is a copy of the test pattern available on the Help!



menu of the integrated web server. You must arrange for that image to be shown on the host computer. Do not allow scaling, cropping or any other changes to that image. Press the Auto button and the system will calibrate color for the best possible picture in approximately one minute. If the system cannot find the test pattern on the screen, it will say so. Check that the pattern isn't scaled or covered up. It's important to perform this operation in 24-bit or 32-bit color video mode (i.e. True Color). Although the algorithm may work in 16-bit or 8-bit color video modes, the results will not be optimum and usually it won't be able to recognize the test pattern.

Pressing the **Advanced** button will open the **Advanced Video Tuning** menu. While the vast majority of users will not need to adjust these settings, it offers added control of the video settings of your VNC sessions.

**Sampling Phase** does not normally need to be used since the IP KVM switch tunes the sampling phase whenever the video mode changes. This button does not require a test pattern, but will perform optimally when used with our standard test pattern. For your reference, the sampling phase number is shown to the right of the Filtering button.

**Noise Filter** controls the advanced video filtering of our system. Unlike other filtering algorithms, our noise filter will only remove noise. It does not degrade the signal quality or readability of small text. You may turn it on and off using the indicated button, or set it to other values using the arrows. Higher numbers cause more filtering and may cause artifacts when moving windows. The most common visual artifact is a vertical line dropping when moving windows horizontally. You may use the Redraw button to correct these, or use a lower filter number. At minimum, these values must be greater than two.

## Getting Peak Performance

### Choose the best video mode

- We recommend using 60Hz refresh rate and 1024x768 resolution. Using a smaller resolution like this allows you to fit multiple windows on your remote desktop. Higher refresh rates stress the video card's quality and do not provide any additional information or benefit.

## Noisy video cards

- A digital KVM works by converting the analog video signals emitted by your video card into digital data. If there is noise on that signal, then it must also be digitized and sent over the network. Quality video cards, in our experience, offer better performance simply because they don't add analog noise.
- Some external KVM switches generate video noise as well. Try to keep cables short, in order to reduce this effect.
- Enable the Noise Filter option (on the Video Tuning menu) to mitigate noise issues.

## Network performance

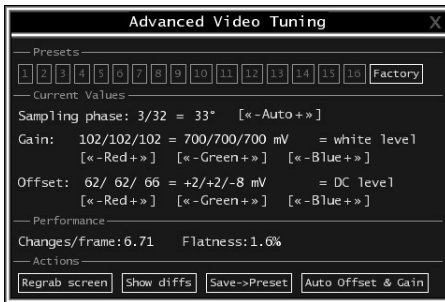
The IP KVM switch will always send as much data as it can, given what's happening on the screen and the actual network performance. When nothing is changing on the video screen, zero bytes are sent over the network. If the whole screen is changing, then the unit will send as much data as your network connection and VNC client allow.

Network latency, which is the total time it takes for a packet to get to the IP KVM switch and come back, has the biggest impact on perceived performance and usability. Network bandwidth has a lesser effect, particularly when just moving the mouse around. Only a few bytes need to be sent when the mouse is moving (and nothing else is changing on the screen), but the round-trip-time limits the hand-eye coordination of the user if it is too great. Both actual bandwidth and measured network latency are shown in the Main Menu.

## Using the Advanced Video Tuning Feature

The Advanced Video Tuning menu allows you to adjust the qualities of the video in your VNC sessions, and can be accessed by clicking the Advanced button on the Video Tuning VNC menu. While many users will probably allow the IP KVM switch to automatically configure the video properties, you can use this menu to exercise a great deal of control over the settings if you wish.

The Presets section contains up to sixteen different settings, plus the factory setting. If a number is highlighted, then that preset has been programmed with valid settings and may be used. Note that the Factory



preset is always available. Simply click on the appropriate button and those settings will be restored. To save settings to a preset, click on the Save->Preset button in the Actions pane. The preset buttons will highlight. Click the desired preset button to save the values. Note that any previous settings assigned to that button will be lost. If you do not wish to save the presets after clicking the Save->Preset button, click the Save->Preset button a second time and the save function will be cancelled.

The section of the screen marked **Current Values** indicates the various video parameters that can be adjusted. For each parameter, there are a series of buttons: [ , <<, -, **Auto**, +, >> ]. The '[' and ']' buttons set the parameter to its smallest or largest values, respectively. The '<<' and '>>' buttons decrease or increase the parameter by a large amount. In the case of phase, this is 4 units. For all the others, this is 10 units. The '-' and '+' buttons decrease or increase the parameter by one unit. The middle button sets the parameter to the middle value. The text of the middle button also indicates which parameter is being controlled. Note that in the case of phase, the middle button invokes the auto-phase algorithm.

The **Performance** section of the screen gives an indication of the quality of the video. Changes/frame is the average number of tiles that change for each frame sampled by the hardware. Flatness is an indication of what percentage of the screen contains tiles that are comprised of only one color.

The **Regrab Screen** button in the Actions section causes the screen to be re-captured. When making small changes to the video parameters, sometimes these changes are not reflected in the displayed screen immediately, particularly if the noise filter is enabled. Press this button to see the immediate effect of the changes.

Use the **Show Diffs** button to learn which parts of the screen are being sent over the Internet. When you click this button, the screen is cleared to a medium grey color. All blocks that are sent from that point on will show up on the screen as they are sent. Click the button again to reset the screen to grey. To return to normal operation, click the Regrab button. It is very easy to visually identify the effect noise has on signal processing, using this feature.

The Auto Offset & Gain button in the Actions section invokes the automatic algorithm for setting the video parameters. The algorithm requires the factory calibration test pattern to be correctly displayed on the screen.

## Accessing KVM Features

Once you can access and configure the networking component of the Server Remote Control, you can use it to select and control the managed computers connected to it. This section describes how to add additional KVM switches to the master unit for greater flexibility, and how to use the on-screen display (OSD) system to manage your computers. Once you have established a VNC session with the SVx41HDI, you can access the KVM features as though you were at a local console.

### Cascade Configuration

You can connect a second level of KVMs to one or more of your Master Server Remote Control's PC x ports. The KVM switches connected to the Server Remote Control (the "Master switch") are known as Slaves. Once connected, the units will automatically configure themselves as either Masters or Slaves. You can only connect an equal or "smaller" KVM to the Master: a 16-port master Server Remote Control switch

can have both 16-port and 8-port KVM slaves, an 8 port Master Sever Remote Control switch can have 8-port and 4-port Slaves, and so on.

For example, the 16-port unit can support 136 computers, with 8 16-port Slave KVMs, each connected to 16 computers. The Slave KVMs must be connected to the PC 1~8 ports, not the A~H ports.

To cascade your KVMs, use a 3-in-1 PS/2 KVM cable to connect one of your Master switch's PC ports to the Slave switch's Local Console. When turning on your cascaded switches, turn on the Slave switches prior to turning on the Master switch.

## OSD Operations

By hitting the left <CTRL> key twice within two seconds, you may see the 'Hotkey Menu' if it is enabled (an OSD option). Or, by hitting the left <CTRL> key three times within two seconds, you will see a KVM MENU screen (below) showing a list of the computers with corresponding channel addresses, names and status.

- The port number (or channel address) of the currently selected computer is displayed in red in the top right of the screen.
- The device name is green if the device has power and is ready for selection or white if it has no power. The OSD menu automatically updates the color when it is activated.
- Use the <UP> and <DOWN> arrow keys to highlight a computer and the <ENTER> key to select it.
- Press <ESCAPE> to exit the OSD menu and remove the OSD menu from the screen.
- A triangle mark on the right side of the screen indicates the port is cascaded to a Slave KVM; the number at the left of the triangle mark shows the number of ports the Slave has. With that port highlighted, press <ENTER> to brings up a screen listing the computers connected to that Slave. The name of the Slave KVM will be shown at the upper right corner of the OSD menu.
- An eye mark on the right side of the screen indicates that the computer has been selected to be monitored in Scan mode. You can switch this mark on and off using function key <F2>.

- Press <ESCAPE> to exit the OSD and to return to using the selected computer. The computer name is shown on the screen.

## OSD Function Keys

You can use the function keys when the OSD menu is active.

### Function key <F1>

Edits the name of a managed computer or a Slave KVM. First, use the <UP> and <DOWN> arrow keys to highlight a channel then press <F1> followed by name entry. Your name can be up to 14 characters long. Valid characters are A to Z, 0 to 9, and the dash character. Lowercase letters are converted to uppercase. Press <BACKSPACE> to delete a letter one at a time. Nonvolatile memory stores all name entries until you change, even if the unit is powered down.

### Function key <F2>

Marks a computer to be scanned by switching the eye mark on or off. First, use the <UP> and <DOWN> arrow keys to highlight the device, then press <F2> to switch its eye mark on or off. If Scan Type is Ready PC + Eye (see Function key <F4>), only the powered and eye-marked computers will be displayed in Scan mode.

### Function key <F3>

Locks a device (a computer or a Slave) from unauthorized access. To lock a device, use the <UP> and <DOWN> arrow keys to highlight it, then press <F3>. Now, enter up to 4 characters (A to Z, 0 to 9, dash) followed by <ENTER> as new password. A Security enabled device is marked with a lock beside its channel number. To permanently disable the security function from a locked device, highlight it, press <F3> then enter the password. If you want to access the locked device temporarily, simply highlight it and press <ENTER>. Enter the password and you can access the device. The device is automatically re-locked once you switch to another device. During Scan mode, OSD skips the security-enabled device.

### Function key <F4>

More functions are available by hitting <F4>. A new screen pops up displaying the functions described below. Most of them are marked with

a triangle indicating there are options to choose from. Using the <UP> and <DOWN> arrow keys, select the function and press <ENTER>.

Available options will be shown in the middle of the screen. To select an option, use the <UP> and <DOWN> arrow keys then press <ENTER> to select the options. You can press <ESCAPE> to exit at any time.

### **Auto Scan**

In this mode, the KVM automatically switches from one powered computer to the next sequentially in a fixed interval. During Auto Scan mode, the OSD displays the name of the selected computer. When Auto Scan detects any keyboard or mouse activity, it suspends the scanning until activity stops; it then resumes with the next computer in sequence. To abort Auto Scan mode, press the left <CTRL> twice. Scan Type and Scan Rate set the scan pattern. Scan Type (<F4>: More\Scan Type) determines if scanned computers must also be eye mark selected. Scan Rate (<F4>: More\Scan Rate) sets the display interval when a computer is selected before selecting the next one.

### **Manual Scan**

Scans through powered computers using keyboard control. Scan Type (<F4>: More\Scan Type) determines if scanned computers must also be eye mark selected. Press the up arrow key to select the previous computer and the down arrow key to select the next computer. Press any other key to abort the Manual Scan mode.

### **Scan Type**

Ready PC + Eye: In Scan mode, scans through only powered computers that are eyemarked selected.

Ready PC: In Scan mode, scans through all powered computers. The non-volatile memory stores the Scan Type setting.

### **Scan Rate**

Sets the duration of a computer displayed in Auto Scan mode. The options are 3 seconds, 8 seconds, 15 seconds and 30 seconds. The Scan Rate setting is stored in non-volatile memory.

### **Keyboard Speed**

The KVM offers a keyboard typematic setting that overrides the

typematic settings in the BIOS and Windows operating system. Available speed options are Low, Middle, Fast and Faster as 10, 15, 20 and 30 characters/sec respectively. The Keyboard Speed setting is retained in non-volatile memory.

## Hotkey Menu

When you hit the left <CTRL> key twice within two seconds, the Hotkey Menu appears displaying a list of hot-key commands if the option is On. The Hotkey Menu can be turned Off if you prefer not to see it when the left <CTRL> key is hit twice. The nonvolatile memory stores the Hotkey Menu setting.

## CH Display

Auto Off: After you select a computer, the channel address and name of the computer will appear on the screen for 3 seconds then disappear automatically. Always On: The channel address and name of a selected computer and/or OSD status displayed on the screen all the time. The non-volatile memory stores the CH Display setting.

## Position

You can choose where the selected computer name and/or OSD status is displayed on your screen during operation. The actual display position shifts due to different VGA resolutions: the higher the resolution the higher the display position. The non-volatile memory stores the Position setting.

UL as Upper Left UR as Upper Right

LL as Lower Left LR as Lower Right

MI as Middle

**ESC:** To exit the OSD, press the <ESCAPE> key

## Hot Key Commands

A hot key command is a short keyboard sequence to select a computer, activate a computer scan, etc. A hot-key sequence starts with two Left Control keystrokes followed by one or two more keystrokes.

The short form hot-key menu can be turned on as an OSD function



(<F4>: **More\Hotkey Menu**) every time the left <CTRL> key is pressed twice.

Left Ctrl refers to the <CTRL> key located at the left side of the keyboard.

1~8/A~H refer to the number keys 1 to 8 at the upper row of the keyboard (Do not use the keypad at the right of the keyboard) and character keys A to H (case insensitive).

### **Selecting a Computer**

To select a computer by hot-key command you need to know the device's channel address, which is determined by the KVM connection. For a computer connected to the Master switch, the address is represented by the PC port number (1~8 or A~H). For example, to access the PC plugged into port 7 of the Master KVM switch, type:

Left <CTRL> + Left <CTRL> + 7.

For a computer connected to a Slave KVM, you need to know the channel address of the Slave unit (1~8) and then the channel address of the device (1~8 or A~H). (Please note that only Master's PC 1 to PC 8 ports can be connected to a Slave.) For example, to access the computer plugged into port C of a Slave KVM Switch that is plugged into Port 6 of the Master switch, type:

Left <CTRL> + Left <CTRL> + 6 + C

### **Auto Scan**

Auto Scan automatically scans through powered computers at a fixed interval:

Left <CTRL> + Left <CTRL> + <F1.>

When Auto Scan detects any keyboard or mouse activity, it suspends the scanning until activity stops; it then resumes with the next computer in sequence. The length of the Auto Scan interval (Scan Rate) is adjustable (see Scan Rate on the following page). To abort the Auto Scan mode, press the left <CTRL> key twice.

### **Manual Scan**

Manual Scan enables you to manually switch back and forth between powered computers:

Left <CTRL> + Left <CTRL> + <F2>

Press the up or down arrow to select the previous or next computer in sequence. Press any other key to abort the Manual Scan.

**NOTE:** The Scan Type setting will determine whether computers must be eye-marked to be included in the scan. See page 25 for details.

### Scan Rate

Scan Rate sets the duration between switching to the next computer in Auto Scan mode:

Left <CTRL> + Left <CTRL> + <F3>

The unit switches between scan intervals of 3, 8, 15 and 30 seconds.

### Keyboard Typematic Rate

You can adjust the keyboard typematic rate (given in characters/sec). This setting overrides the keyboard typematic rate of your BIOS and any operating system.

Left <CTRL> + Left <CTRL> + <F4>

The unit switches between rates of 10, 15, 20 and 30 characters/sec.

### Changing Your Configuration

After the initial power up, any device (either a KVM or a PC) can be added or removed from any PC x port on the KVM without having to power down the Master KVM Switch. Make sure that devices are turned off before connecting them to the Master KVM switch. Note: After changing your configuration, the OSD will automatically update to reflect the new configuration.

## Using the Modem Feature

### Background

The modem feature allows the IP KVM switch to act as an Internet connection server for increased security and flexibility in connecting with the host computer. Unlike the TCP/IP connection used with the standard Web configuration and VNC clients, the modem creates a one-to-one connection between the IP KVM switch and the computer



you are using to manage the host computer that is essentially private, as it bypasses the public Internet completely. Note: this feature requires both an external modem (most standard connection protocols are supported) and a dedicated phone line that can be connected to the modem for external access. While it is possible to use the modem feature through some PBX systems, this increases the complexity and reduces the performance of the connection. For clarity, the instructions presented here assume that the modem is connected to a typical POTS (plain old telephone system) line that is not routed through a phone management system or shared with other devices. If you wish to use this feature through a PBX system, it may require some experimentation and additional support from your telecom services provider, and is not supported by StarTech.com.

## Connecting a Modem

The IP KVM switch will work with virtually any Hayes-compatible modem that recognizes the standard AT command set. Some modem manufacturers offer “enterprise” grade modem products (at a premium price) that include technology to improve the stability of connections; whether this type of product would be beneficial to your application depends on whether you consider the modem connection to be mission-critical, the quality of your telecom infrastructure, and your budget for implementing this solution. The model of modem attached is essentially transparent to the IP KVM switch.

It is important to note that modems that offer “56K” (or 56,000 bps) connections often achieve connection speeds that are far lower than their maximum capabilities. Given the limitations of telecom infrastructure (many locations have yet to implement fully digital

switching technology, and still rely on older analog technology for some segments), the maximum “upstream” transfer rate is limited to a maximum of 33,600 bps between two modems; the “downstream” rate is often within a similar range for a typical connection. Therefore, speeds below 56,000 bps do not indicate a problem with the modem or the IP KVM switch, but simply reflect the line conditions at the time the connection is made.

Place the modem near the IP KVM switch and an available telephone jack. Connect the modem to the telephone jack, data cable, and power source according to the instructions in its documentation. The opposite end of the modem’s data cable should be a DB9 female serial connection. Connect that end of the cable to the Serial connection on the rear panel of the IP KVM switch.

## Modem configuration

Although most connections will work appropriately with the default settings on the IP KVM switch, manual changes can be made. To do so:

Login to the Web interface as Admin. Click Modem, listed on the left side of the main page. You will then be presented with the Modem Option menu (see above). Make the following changes to enable and configure the modem connection.

- Enable modem connections (PPP) via serial port/modem: select Enabled.
- Baud rate to use (affects connection between us and the modem only): select 115200.
- Init string: leave as ATE0S0=1&K3 (see below).

The baud rate dictates the connection speed between the IP KVM switch’s serial port and the modem, and does not affect the connection speed between the local and remote modems, as they will negotiate their own connection speed when a connection is made. It is highly recommended that this setting be left at the default for best performance.

The initialization (“init”) string is the command (using the standardized

Hayes AT command set) that the IP KVM switch will send to the modem to activate it. The string included should work with the majority of modems and configures the following connection properties: answer incoming calls on the first ring, enable hardware flow control, and lock the connection speed. Your modem's documentation will describe other potential init strings that you can use to alter the connection properties. For instance, you could commit the settings to the modem's non-volatile memory (NVRAM) or allow the modem to adjust the connection speed for greater stability (and so on). You may wish to test the connection with the default init string first, before making changes specific to your modem model or situation, to simplify the troubleshooting process.

Click the Commit button to save your changes and activate the modem feature with the specified settings.

## Configuring the Remote Connection

This section describes how to configure a typical Windows dial-up session to access the modem connection on the IP KVM switch. The instructions here relate to a Windows XP configuration; other versions of Windows are similar.

1. Open My Network Places from the desktop or the Start menu.
2. Click View network connections.
3. Click Create a new connection under Network Tasks.
4. The New Connection Wizard window will open. Click Next.
5. Select Connect to the Internet and click Next.
6. Select Set up my connection manually and click Next.
7. Select Connect using a dial-up modem and click Next.
8. In the space provided under ISP Name, type an appropriate name of your choosing for the connection. Click Next.
9. In the space provided under Phone Number enter the phone number for the line to which the IP KVM switch's modem is connected. You may need to add the area code, country code, or other digits needed to access the outside line as appropriate. When finished, click Next.

10. Make your choice from Anyone's use or My use only and click Next.
  11. Beside User name enter the user name of any valid user created using the Web interface of the IP KVM switch. Beside Password and Confirm password enter the password that the user you entered above uses to access the Web interface.
  12. This screen also includes 3 checkboxes. Uncheck all 3 checkboxes.
  13. Click Next.
  14. You may select to add a shortcut to the desktop for this connection. Click Finish.
- PPP (Point-to-Point Protocol) must be used; no other authentication methods are supported.
  - TCP/IP must be installed/enabled on the computer making the connection, and must be used for the dial-up connection.
  - The connection must be configured to obtain a dynamic IP address.
  - The user name/password must match a user currently configured on the IP KVM switch.
  - For best performance and to simplify the troubleshooting process, firewall software should not be used with the dial-up connection.

## Accessing the Web Interface

Once a dial-up connection has been established, you can access the Web interface or start a VNC session using the following IP address:

`https://99.99.99.99`

You can now login to the Web interface (and/or VNC session) normally. Note that the remote machine (the one you dialed from) is automatically assigned the IP address 99.99.99.100 for the PPP session. This, and the IP address of the IP KVM switch, cannot be modified. The following TCP/IP port numbers are assigned for a PPP connection, regardless of the settings configured in the Web interface for the LAN ports:

**HTTPS:** 443

**VNC (clear-text):** 5900

**VNC (SSL secured):** 15900

**SSH:** 22

## Performance Notes

- All images over the PPP connection will be gray scale to conserve bandwidth. If other users are connected while a PPP session is active, their screens will be in gray scale as well. When PPP is inactive, color is automatically re-enabled.
- Some areas of the screen may not be updated as frequently as others, and animations or other auto-updating areas of the screen may appear out-of-focus or “blocky” as a result. Since the area around the mouse pointer is refreshed most frequently, hold the pointer over an area to improve its clarity.
- It may be beneficial to minimize any unnecessary icons, backgrounds, or other clutter on the host computer’s desktop to make the dial-up connection as efficient as possible.
- When the modem feature is enabled, you can use a “line modem” connection on the serial port using a serial cable to begin a PPP session. If you are using the DTE Serial port on the front panel, use a null modem serial cable. If you have disconnected the modem and are using the DCE Serial port on the rear panel for the PPP connection, use a straight through serial cable. When the modem is not actively connected, you can begin a PPP session at up to 460 kbps. To hang up and re-connect the modem, end the PPP session.
- If you need to configure the device over a serial connection while the modem option is enabled, connect a serial cable (see immediately above for instructions on what type of cable to use for the port you are accessing on the IP KVM switch) and begin a terminal session following the instructions under Terminal Configuration Using a Serial Cable in this manual. Once connected, you will see the following message:

Expecting a modem, if human, type admin password (Or start PPP)

Type the password for user admin and press Enter. The password will not appear on the screen. The configuration menu will appear. Make the changes you wish or press 'q' and Enter to exit and leave the modem connection active.

## Troubleshooting Guide

The following messages will appear in the system log on the Status screen in the Web interface and may help to diagnose problems with the modem configuration.

### **Starting PPP (for auth) on port...**

Modem is connecting and the PPP login process is starting.

### **Modem hang up. Resetting**

The connection has been closed or terminated unexpectedly.

### **Timeout during login process. Giving up**

The PPP client connecting over the modem has waited too long to complete the authentication process or supplied an invalid user name and/or password.

### **Modem init chat script failed**

The modem did not respond to the initialization string from the IP KVM switch. You may need to change the init string or verify the cabling and modem status.

### **Modem init okay**

The modem has responded appropriately to the init string.

### **Saw PPP startup from client**

A PPP authentication has occurred and a session has started.

### **Phone line rings**

An incoming call has been detected by the modem.

### **Modem answers: xxxxxxxxx**

The connection speed and protocol used for a connection, as reported by the modem. The exact contents of the message will vary depending on the modem make and model. Using Optional Serial Remote Control



(R-Port) Modules.

## Serial Remote Control operation

### Background

The IP KVM switch offers a unique way to expand the functionality of the base product. Using the integrated R-Port on the rear panel, you can manage up to 8 serial devices using a specialized daisy-chain technology. The IP KVM switch includes integrated control functionality that allows you to monitor and configure serial devices using the interactive Web interface. To minimize space and infrastructure requirements, the R-Port modules use a single cable to carry both power and the data signal. All configuration settings are stored separately in each attached device in non-volatile memory so that they will not be lost in the event of a power outage or disconnection.

### Connecting Serial Remote Control Modules to the IP KVM switch

The cable for each serial device is similar to a phone cable and uses an RJ-14 connector. For the first module, connect the cable (provided) to the R-Port on the rear panel of the IP KVM switch. Connect the opposite end to the DATA OUT (or similar) port on the Serial Remote Control unit. Note that some devices may use an integrated cable, so you will not need to make a separate connection on the serial device. Once you have added the first serial device to the IP KVM switch, you can connect additional modules to the DATA IN (or similar) port on the previous module in the chain. Once the cabling is attached, the module becomes active after a 15 second initialization period. For specific information regarding cabling and status indicators for a specific serial console, refer to the instructions that came with the product.

### Configuring/Viewing Serial Remote Control Modules through the Web Interface

Once you have one or more R-Port serial devices connected, you will be able to configure and manage them through the Web interface. You may need to modify the default settings on IP KVM switch to match your various R-Port modules' default configuration. Consult the documentation that came with your R-Port module to determine if you need to modify the default settings to complete the installation. To

be able to configure your R-Port modules, you must be logged in as admin. Other users will be able to view which modules are active but cannot configure them.

Once you are logged in, choose the Admin/Setup option from the menu at the top of the Home screen in the Web interface. Click External Serial consoles setup and control. You will be presented with the Serial Consoles Attached menu, and a table with the following headings:

**#:** You can assign a value (1 ~ 99) to each attached serial remote control module. This does not affect the configuration or operation of the device in any way, but is simply a means to sort this list for ease of management.

**Name/Description:** An identifier for the R-Port module. Like the number assignment, it is for ease of administration only.

**Baud (bps):** This is the communication speed for the device, and the setting here must match the setting on the module itself. All common baud rates between 300 and 115,200 bps are supported.

**Mode:** Sets the character framing scheme that the IP KVM switch will use with the R-Port module. You can choose from the following selections:

**8N1:** Eight bits, no parity, one stop bit (default and most common).

**7N1/7O1/7E1/7M1/7S1:** Seven bits, (none/odd/even/mark/space) parity, one stop bit.

**8N1/8O1/8E1/8M1/8S1:** Eight bits, (none/odd/even/mark/space) parity, one stop bit.

**8N2:** Eight bits, no parity, two stop bits.

**Force DCD:** Forces the Carrier Detect signal to be active at all times. Normally, DCD becomes active when a new user connects and is dropped when the last user disconnects (a response that is similar to many modems). When active, the device will logout and reset itself if the carrier signal is lost, increasing security. Note that this may not work with all devices and could impair proper operation in some circumstances. The default setting is off.

**Console Log:** Clicking this link will open a separate Web page that

will display the last 200 characters committed to that device's console log. Note that existing data is overwritten automatically when the 200 character limit is reached.

Once you are satisfied with the changes you have made, click Commit changes to apply the new settings. Click Refresh at any time to see an updated list of attached R-Port modules.

## Advanced Configuration Using the Integrated SSH Shell

In most cases, configuring the IP KVM switch to the same settings as the R-Port devices you are connecting should allow the devices to work with a minimum amount of configuration. However, you can also change the default settings on each R-Port device to fit your preferences and the needs of your application.

If you click the Connect... button next to the device you want to configure, two new windows will appear. The smaller of the two is a login screen; the other is a SSH terminal window. Click the login window and sign in as admin (using the same password as the Web interface) to activate the terminal window. You will see a welcome banner similar to the following:

**Baud rate:** 115200 bps, 8N1

**Connected to #1:** (none)... (Press Ctrl-Shift-\_ for menu)

You are now connected to the R-Port module in a live terminal session. Commands you type will be echoed on the terminal screen. The module also offers a simple menu system that allows you to change its configuration settings (similar to the function of the menus in a terminal software package). Press [Ctrl] - [Shift] - [\_] (underscore) on the keyboard to access the menu. It will be similar to the following:

**RS-232 Menu (#1: (none), 115200 bps, 8N1)**

**Q – Disconnect**

**# - Send break**

**H – Hangup line (drop DCD)**

**E – Send Ctrl-Shift-\_**

**L – Low log entries (line buffer)**

## 1 – Show last 10 log entries

**other** – Return to connection

**Press key** ->

To execute the desired command, simply press the corresponding key on the keyboard. You can also execute the command and avoid the menu by pressing the [Ctrl] – [Shift] – [ ] key combination quickly and pressing the letter of the command. To quit the menu, press [Q] on the keyboard when the menu is active. These commands are not sent to the device you are managing and relate to the R-PORT module itself.

## Remote Login via SSH

You can also use a standard SSH client to access the R-Port options if you wish to avoid using the Java-based SSH client in the Web interface. Simply use your SSH client (several freeware packages are available for download, along with commercial applications) and connect to the IP address of the IP KVM switch using port 22 (default).

Log in to the SSH session as admin using the same password as the Web interface. At the command prompt type connect x (where x is the number of the R-Port devices you wish to manage). Alternatively, you can enter the command connect -l to see a list of active devices.

## Operating Notes

- If the power supply to the R-Port modules you have connected becomes faulty (short, overload) then the R-Port LED on the front panel of the IP KVM switch will show red. Under normal operations, this light should remain green. The R-Port connector on the rear panel also has an LED that mirrors the status of the light on the front panel. (**Note:** The rear LED status was reversed on some early units, where red=normal and green=fault. This does not affect operation in any way, but a green LED on the front panel and a red LED on the rear panel indicates that you have one of these units.)
- Hardware handshaking (CTS/RTS) is required for speeds exceeding 9600 bps. It is enabled by default on the IP KVM switch, but may need to be enabled on the other end of the connection. For Unix systems, the command is:

```
stty -crtcts < /dev/[serial port]
```

- A maximum of four users may simultaneously login to the same module. All users may type commands at any time, and all users will see the same output. Note the following:
  - All users have equal access to all channels.
  - A maximum of 16 R-Port modules may be connected at any one time.
  - You plug-in and unplug any R-Port module at any time. When reconnected, it will automatically become available after a 15 second initialization period. Any log entries will be retained by the R-Port module while deactivated, but will not be available to users until it is re-initialized.

## About Security Certificate Warnings

### What is a security certificate?

Sites that employ secure TCP/IP (Internet) connections include a certificate that confirms that users are connecting to a legitimate site and are not being redirected without their knowledge. Certificates are issued by trusted third parties called Certificate Authorities (CAs) and contain essential details about a site that must match the information supplied to your Web browser.

### Why do I receive a warning when I access the login screen on the IP KVM switch?

As it redirects you to a secure (SSL) session by default, the login screen may generate a warning from your Web browser or the VNC Java client for two different reasons. First, the CA that has issued the certificate on StarTech.com's behalf may not yet be recognized as a trusted source by the computer you are using to access the IP KVM switch. Second, since the unit could be configured in a number different ways, it is impossible to supply a generic certificate that will match your exact network settings.

### Is my data safe?

Yes. The security certificate does not affect encryption effectiveness in any way, nor does it make the IP KVM switch any more vulnerable to outside attacks.

## Can I prevent the warning from occurring?

Yes. You have two options that may prevent the warning from occurring. First, if the Web browser you are using offers the option to ignore the warning for future visits, the browser will no longer generate a warning if that option is selected. Second, if you install the certificate from the IP KVM switch onto the host computer (see below) and if the unit is configured with a domain name ending in .com, .net, .org, .gov, .edu, .us, .ca, .uk, .jp, or .tw (i.e. remotecontrol.mydomain.net) then the warning should no longer occur.

### Installing the new certificate...

The following instructions detail how to install the certificate from the IP KVM switch onto your local computer (in this case, when using Internet Explorer with Windows XP).

1. Open your Web browser and go to the IP KVM switch login screen. Click the Update security certificate link.
2. When prompted, choose Open.
3. A Window will appear that offers information about the certificate. Click Install Certificate.
4. The Certificate Import Wizard will appear. Select Automatically select the certificate store... (default) and click Next. When the next window appears, click Finish.
5. A confirmation dialog will appear asking you if you wish to install the certificate. Click Yes.
6. A message should appear saying the import was successful. Click OK.

## Troubleshooting

### Forgotten master password.

You can reset the master password using the serial interface on the unit. Use the 'S' command, and type a new password. The old password is not required for this procedure.

**Remote mouse and local mouse don't line up.**

Use the Mouse resync command in the main menu or press the Resync button on the Bribar. If the mouse pointers still don't line up, verify that mouse acceleration has been disabled.

**NOTE:** The Windows login screen does not accept the "mouse acceleration" configuration, and always has the mouse accelerated regardless of your configuration. Therefore, on this screen it is best to avoid using the mouse.

**After resync, the mouse pointers are still not aligned.**

Use the video adjust menu to position your video image exactly where it should be. Normally a slight video positioning error is perceived as a mouse sync issue. A video positioning error is visible as a black line along the top or bottom (and right or left) edges of the remote screen. Remember to save your position changes!

**Cannot login via SSH**

Remember to use either admin or a username created in the system as the user name you give your SSH client.

If you see a warning about identity of host cannot be verified, and a question about saving the host's fingerprint, this is normal for the first time you connect to any machine running SSH. You should answer yes so that your SSH client saves the public key of this host and doesn't re-issue this warning.

**Certificate warning shown when connecting via HTTPS.**

It is normal for a warning dialog to be shown when connecting via HTTPS. The SSL certificate the IP KVM switch uses is created when the unit is first produced. It does not contain the correct hostname (subject name) because you can change the hostname as required. Also, it is not signed by a recognized certificate authority (CA) but is signed by our own signing authority.

**Mouse performance is erratic when using the GNOME or KDE desktop in a Linux X-Window environment.**

The mouse controls in GNOME and KDE environments offer both an acceleration and sensitivity setting. The following directions correct this issue, and apply to Red Hat Fedora Core 2, but should be similar for other distributions that use GNOME or KDE:

1. Click the Launch menu icon.
2. Choose Preferences > Mouse.
3. Click the Motion tab.
4. Set the Acceleration bar to the setting immediately left of center.
5. Set the Sensitivity bar to the left most settings (lowest possible).



## Supported Protocols

Service	Description	Benefit
SSH	Secure Shell	May be used to securely "tunnel" VNC and HTTP protocols.
HTTP	Web redirector (to HTTPS)	Convenience server to redirect all web traffic to encrypted port. Clear-text HTTP is not supported
SNMP	SNMP agent (UDP)	Allows integration with existing SNMP network management systems.
HTTPS	SSLTLS Encrypted web control	Secure control and management of the device and attached system. Screen snapshots may be downloaded. Integrated Java VNC client (with or without encryption) allows control from any Java enabled browser. Password protected.
VNC	VNC/RFB Protocol Server	Standardized real-time KVM network protocol. Compatible with existing VNC client software.
VNCS	SSL-tunneled VNC	VNC protocol tunneled via SSLTLS encryption. For secure real-time control of the server over public networks.
DHCP		Eases network setup by fetching IP address and other network settings from a centralized server.
RADIUS		Allows integration with existing RADIUS servers, so that user management can be centralized. Supports challenge response authentication using hardware tokens (like SecurID) and conventional passwords.
SYSLOG	System event logging to another system	MIT-LCS UDP protocol. Must be configured via DHCP option.
DNS	Domain Name Service	Converts text name into IP Address Only used in the URL specification needed to emulate a CD-ROM. Use is optional.

# Specifications

	SV441HDIE	SV841HDIE	SV1641HDIE
<b>Number of Ports</b>	4	8	16
<b>Console Connectors (Local)</b>	2 x PS/2 female 1 x DE-15 VGA female 1 x RJ45 1 x DB9 serial male 1 x DC power connector 1 x R-Port		
<b>Host Connectors (Per Port)</b>	1 x DE-15 female		
<b>LEDs</b>	Sys OK, R-Port, LAN		
<b>Maximum Number of Simultaneous Users</b>	1 active plus 3 viewing		
<b>Maximum Video Resolution</b>	1600x1200 @ 85Hz (Remote) 1920x1440 (Local)		
<b>Security</b>	128-bit SSL		
<b>Ethernet</b>	10/100 BaseTX		
<b>Cascadable</b>	Yes (Master only)		
<b>Rack Mountable</b>	Yes		
<b>Supported Interfaces</b>	PS/2, USB (Host) / PS/2 (Console)		
<b>Power Adapter</b>	12VDC, 3A, center positive		
<b>Dimension (LxWxH)</b>	185.5mm x 224.5mm x 43.2mm	404.0mm x 224.5mm x 43.2mm	404.0mm x 224.5mm x 43.2mm
<b>Weight</b>	2520g	3950g	4150g

- Source code for the unit operating system is available upon request. Please contact us by phone, live chat, or email to make your request. This offer is valid for three years from the date of purchase and/or for as long as parts or customer support is offered for this product. Charges for the reasonable cost of copying and/or conveying may apply

## Technical Support

StarTech.com's lifetime technical support is an integral part of our commitment to provide industry-leading solutions. If you ever need help with your product, visit [www.startech.com/support](http://www.startech.com/support) and access our comprehensive selection of online tools, documentation, and downloads.

## Warranty Information

This product is backed by a one year warranty.

In addition, StarTech.com warrants its products against defects in materials and workmanship for the periods noted, following the initial date of purchase. During this period, the products may be returned for repair, or replacement with equivalent products at our discretion. The warranty covers parts and labor costs only. StarTech.com does not warrant its products from defects or damages arising from misuse, abuse, alteration, or normal wear and tear.

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