Smart IP Extender

User Guide

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1. Welcome

The Smart IP Extender system is produced by Minicom Advanced Systems Limited.

Technical precautions

This equipment generates radio frequency energy and if not installed in accordance with the manufacturer's instructions, may cause radio frequency interference.

This equipment complies with Part 15, Subpart J of the FCC rules for a Class A computing device. This equipment also complies with the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications. These above rules are designed to provide reasonable protection against such interference when operating the equipment in a commercial environment. If operation of this equipment in a residential area causes radio frequency interference, the user, and not Minicom Advanced Systems Limited, will be responsible.

Changes or modifications made to this equipment not expressly approved by Minicom Advanced Systems Limited could void the user's authority to operate the equipment.

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2. Introduction

The Smart IP Extender (IP Extender) from Minicom Advanced Systems redirects local keyboard, mouse and video data to a remote computer. All data is transmitted via IP.

IP Extender features, remote KVM access and control via a LAN or Internet connection. IP Extender provides a non-intrusive solution for remote access and control. Remote access and control software runs on the IP Extender embedded processors only and not on the servers, so there is no interference with server operation or impact on network performance.

The IP Extender can also be used in a multi administrator and multi server environment. Combining one or several IP Extenders with a KVM switched matrix allows access to multiple remote servers over via single remote console. The IP Extender combines digital remote KVM access via IP networks with a comprehensive and integrated system management.

Figure 1 illustrates the connections of IP Extender to its host, to peripheral devices, to the power source and to the local area network.

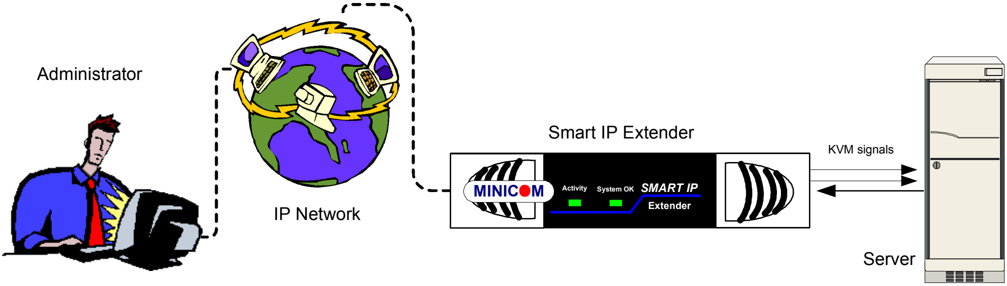


Figure 1 IP Extender usage scenario

IP Extender is multi user capable, i.e. up to 64 concurrent users may use IP Extender to administrate a remote site. Figure 2 illustrates a configuration with concurrent users on a number of servers connected by a KVM switching matrix using one or more IP Extenders. Using more than one IP Extender in a configuration prevents blocking administrators who use the switching matrix.

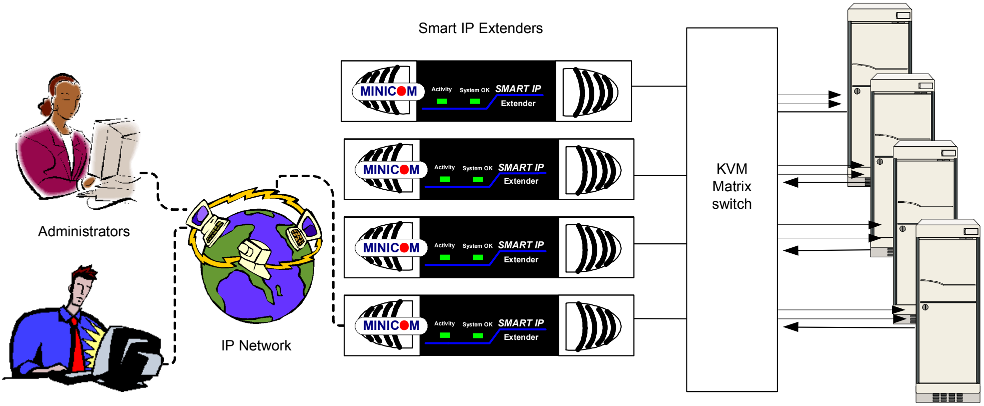


Figure 2 Multiple users/servers

3. Features of IP Extender

- KVM (keyboard, video, mouse) access over IP or analogous telephone line.
- Automatically senses video resolution for best possible screen capture
- High-performance mouse tracking and synchronization
- Connect a user console for direct access to KVM switch
- Local Mouse suppression (only when using SUN's Java Virtual Machine)

IP Extender supports PS/2 type keyboards and mice and HD 15 video output. See the pin assignments in Appendix C.

IP Extender automatically detects the current video mode of the console, however manual tuning is recommended to get the best video quality. IP Extender will accept video streams up to 110 MHz dot clock. This results in a screen resolution of 1280x1024 dots with a refresh rate of 75Hz.

4. Remote power management

There are 2 remote power management options:

- External scalable power switch box
- IPMI Version 1.5

The management system to use depends on the remote server interface.

External Power Switch Option - When there is neither a IPMI V1.5 option available or the ability to place a bracket in the remote system, an external power switch box can switch the power on and off.

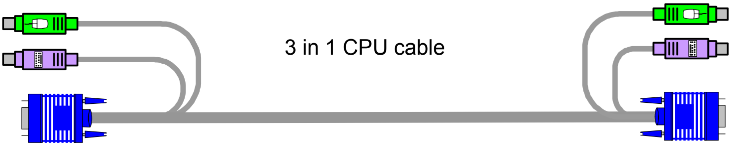
IPMI Version 1.5 - defines a serial connection to access certain system parameters and perform system actions like powering down or a hard reset. Modern server systems, supporting the IPMI V1.5 specification, provide a mode where the externally available COM2 serial connection can be configured as a system management port (sometimes called an emergency management port). IP Extender may use this port in order to enable remote system management operations.

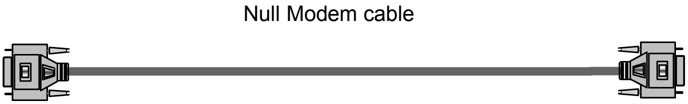
5. System components

- 1 IP Extender Extender box
- Cables (illustrated below)
- Power cord
- Marketing & Documentation CD
- Optional IPMI Option. This is a serial cable for connecting the IP Extender and an IPMI V1.5 compliant serial management port on the remote system.

6. The IP Extender cables

The IP Extender package contains the following cables.





7. IP Extender front panel

Figure 3 illustrates the IP Extender front panel.

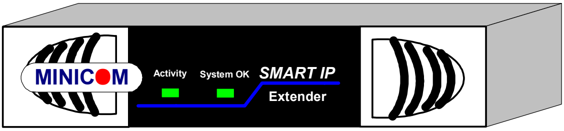


Figure 3 Front panel

The table below explains the functions of the front panel LEDs.

LED	Function
Activity	LED blinks when Network connection is functioning
System OK	LED solid when IP Link system connected and functioning

8. The IP Extender rear panel ports

The figure below illustrates the ports on the IP Extender.

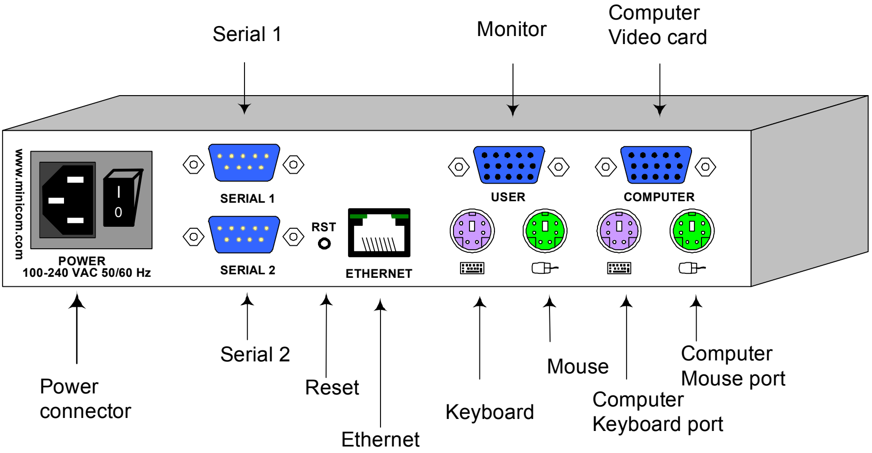


Figure 4 IP Extender ports

You can work locally on the host system by connecting a KVM console to IP Extender rear panel.

The Reset button resets the IP Extender.

Serial 1 port

Serial 1 port is used as follows:

- IPMI Version 1.5 connection to the remote system using the IPMI Option cable
- Serial output for modem dial in connection
- Serial pass-through via Telnet
- Initial configuration

Serial 2 port

The Serial 2 port supports the external power option.

Ethernet

Connects the IP Extender to an Ethernet network.

9. Pre-installation instructions

Place cables away from fluorescent lights, air conditioners and other machines that are likely to generate electrical noise.

Switch off the computer and disconnect the keyboard monitor and mouse.

10. Connecting the IP Extender to the host computer/KVM switch

Connect the host computer / KVM switch to the IP Extender as follows:

1. Connect the connectors of one end of the 3 in 1 CPU cable to the Computer/Switch KVM ports of the IP Extender.
2. Connect the connectors of other end of the 3 in 1 CPU cable to the KVM ports of the host computer / KVM switch.
3. Connect the power cord and Ethernet and/or modem connection.
4. You can connect a local KVM console to the IP Extender and work on the host computer. Figure 5 and Figure 6 illustrate the connections to a computer and KVM switch respectively.

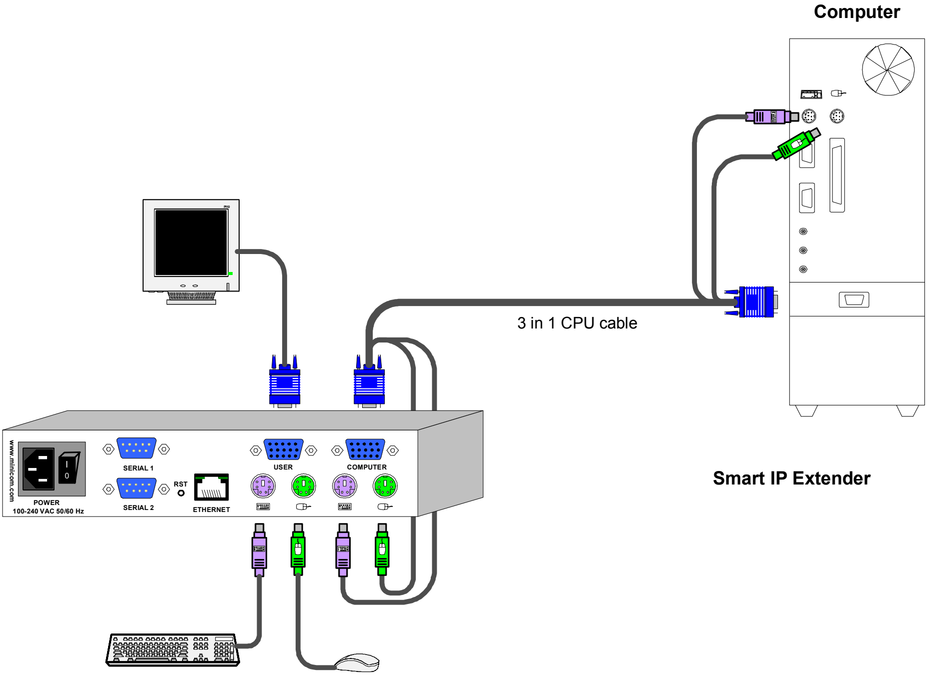


Figure 5 IP Extender connections to a computer

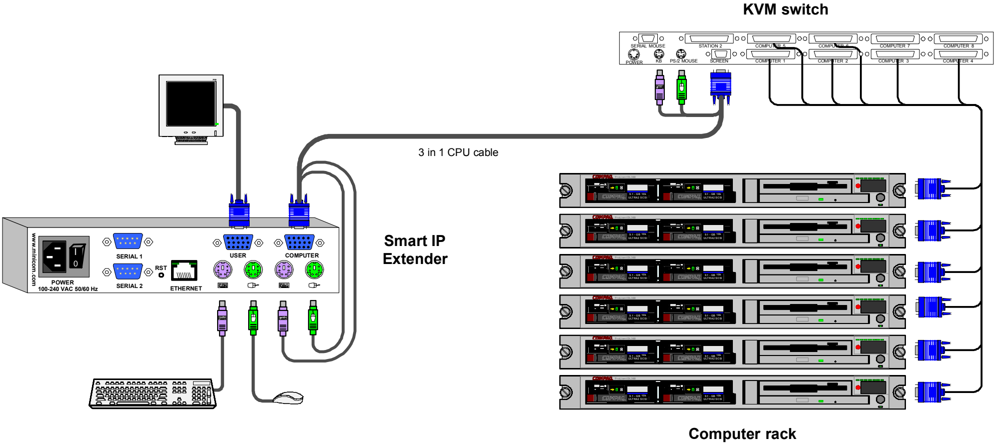


Figure 6 IP Extender connections to a KVM switch

11. Connecting the Power management options

Figure 7 gives an overview of the three Power management options.

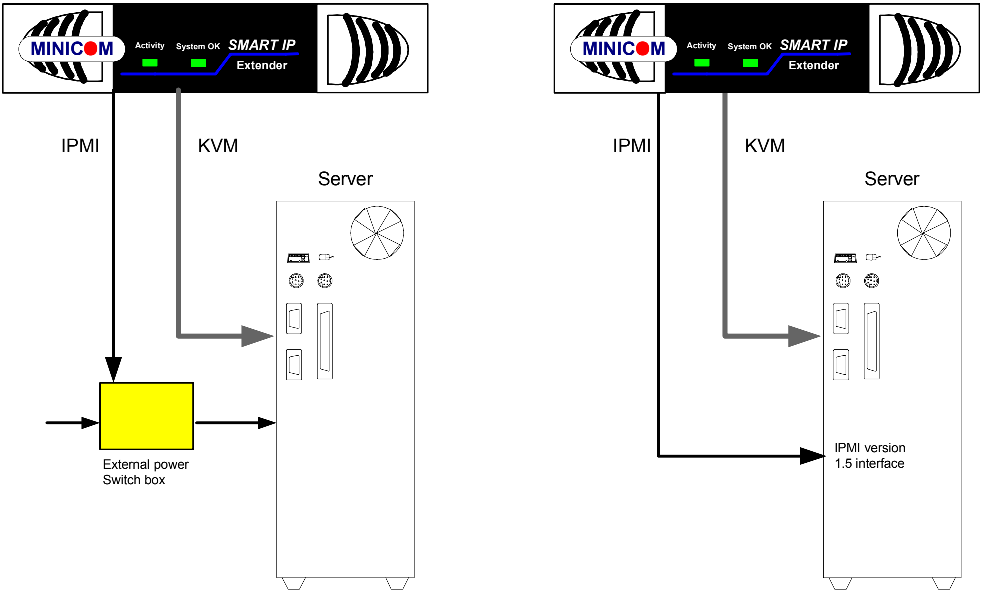


Figure 7 Power management options

12. Connecting the IPMI option

IPMI Version 1.5 defines a serial connection to access certain system parameters and to perform actions like switching off the system or performing a hard reset. Connect a Serial cable to a Serial port on the host computer and the Serial 1 or 2 port on the IP Extender.

For further information about IMPI 1.5, see
http://developer.intel.com/design/servers/ipmi/tools.htm

To use the IPMI over a serial interface enable it in the host computer. This is done using BIOS settings or special utilities provided by the server manufacturer. Refer to the server manufacturer's manual site.

Note! IPMI V1.5 is only supported by server systems manufactured in 2002 onwards.

13. Connecting the External Reset/Power Option

Refer to the Power Switch guide to connect this to one of the serial ports. To date supported options are:

- Minicom Power switch
- Avocent—SPC 1 800/1600
- Sentry In-Line Power Module

14. Connecting to Ethernet

The Ethernet connector on the IP Extender can be used either for a 100 Mbps 100BASE-TX connection or for a 10 Mbps 10BASE-T connection. The adapter adjusts to the appropriate operation mode automatically.

15. 10 Mbps Connection

For 10BASE-T Ethernet networks, the Fast Ethernet adapter uses Category 3, 4, or 5 UTP/FTP cable. To establish a 10 Mbps connection, the cable must be connected to a 10BASE-T hub. Ensure the cable is wired appropriately for a standard 10BASE-T adapter. Align the RJ-45 plug with the notch on the adapter's connector and insert it into the adapter's connector.

16. 100 Mbps Connection

For 100BASE-TX Fast Ethernet networks, the IP Extender supports Category 5 UTP cabling. To establish a 100 Mbps connection, the cable must be connected to a 100BASE-TX hub.

1. Make sure that the cable is wired appropriately for a standard 100BASE-TX adapter.

2. Align the RJ-45 plug with the notch on the adapter's connector and insert it into the adapter's connector.

Note! The UTP/FTP wire pairs and configuration for 100BASE-TX cable are identical to those for 10BASE-T cable when used with Category 5 UTP/FTP cable.

17. Switching on

After connecting IP Extender to the computer, switch on IP Extender first and then the computer.

18. Configuring the system

The IP Extender's communication interfaces are based on TCP/IP, and it comes configured with the values listed below.

- DHCP - active
- IP address - 192.168.0.220
- Net mask - 255.255.255.0
- Default Gateway - None

If the above values are unsuitable, change the IP configuration. This can be done in a number of ways:

19. Configuration via DHCP server

By default, IP Extender will try to contact a DHCP server in the subnet to which it is physically connected. If a DHCP server is found it may provide a valid IP address, gateway address and net mask. Before connecting the IP Extender to your local subnet complete the corresponding configuration of your DHCP server.

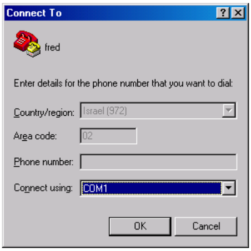
We recommended configuring a fixed IP assignment to the MAC address of IP Extender. You can find the MAC address on the outside of the shipping box and also labeled on IP Extender's underside. If the DHCP connection fails on boot up, IP Extender will boot with the last known IP configuration. So for the initial use this would be the pre-configured IP address as set out above.

20. Configuration via local console

There are two ways of doing this:

(A) Connect the NULL modem cable to the computer and to IP Extender’s Serial 1 port. Use any Terminal software to connect to IP Extender. The screen shots below use Windows Hyperterminal.

1. Choose Start/Programs/Accessories/Communications/Hyperterminal.
2. When prompted enter a name and click OK. The Connect To box appears. See Figure 8.
3. Fill in the connection details. Select COM 1 in the Connect using box and click OK. The COM 1 properties box appears. See Figure 9.

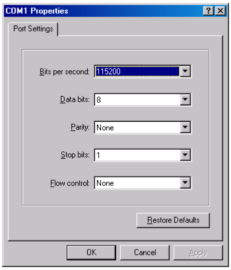


fred

Enter details for the phone number that you want to dial:

Country/region: Israel (972)
Area code: 02
Phone number:
Connect using: COM1

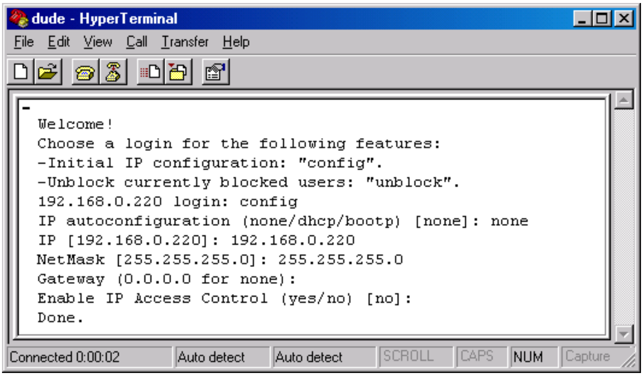
Figure 8 Connect To box



Bits per second: 115200
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None

Figure 9 COM 1 Properties box

4. Set the port settings to the following values:
   - Bits/second - 115200
   - Data bits - 8
   - Parity - None
   - Stop bits - 1
   - Flow Control - None
5. Click OK. The Hyperterminal appears. See Figure 10.



```
-
  Welcome!
  Choose a login for the following features:
  -Initial IP configuration: "config".
  -Unblock currently blocked users: "unblock".
  192.168.0.220 login: config
  IP autoconfiguration (none/dhcp/bootp) [none]: none
  IP [192.168.0.220]: 192.168.0.220
  NetMask [255.255.255.0]: 255.255.255.0
  Gateway (0.0.0.0 for none):
  Enable IP Access Control (yes/no) [no]:
  Done.
```

Figure 10 The Hyperterminal

6. Press **Enter**. Some device information and a prompt appear.
7. Type **config** and press **Enter**. Configuration questions appear. DHCP must be disabled. You can change the IP address, net mask and default gateway. Pressing **Enter** without entering values keeps the default values. To contact IP Extender from outside the LAN configure a gateway. To remove an already configured gateway, type 0.0.0.0.

   The last question – enable IP access control – concerns switching IP packet filtering on or off. This can re-enable access to IP Extender after an incorrect IP access configuration has been activated. Page 47 has more information on IP access control.
8. Confirm the settings, IP Extender resets the configuration.

(B) Use a crossover Ethernet cable to connect the IP Extender to the computer back-to-back.

Set the IP address of the computer to 192.168.0.1 and type 192.168.0.220 into the Address box of the web interface to carry out the IP configuration.

21. Mouse, Keyboard and Video configuration

The correct operation of the client mouse depends on the following two settings.

IP Extender mouse setting

To make the remote keyboard and mouse work properly the IP Extender settings for the host's mouse and keyboard types must be correct. Check the settings in the IP Extender front-end. See page 27.

Host system mouse settings

The host operating system has various settings for the mouse driver. IP Extender works with accelerated mice and is able to synchronize the host with the client mouse pointer. This is further discussed on page 23.

The following may prevent proper mouse synchronization.

Special vendor-specific Mouse drivers disrupt the synchronization process. Ensure these are not on the host system

Windows XP has a setting ' enhanced pointer precision’. Deactivate it.

Check the correct setting by moving the mouse of your administration system to the upper left corner of the Remote Console and moving it there slightly forth and back. This will force mouse synchronization in that corner of the screen. Once that is done you may observe the behavior of your client mouse in accordance to the host one. If both mice desynchronize quickly one of the above may be the reason.

22. IP Extender Video Modes

IP Extender recognizes a limited number of common video modes. When running X-Window on the host system, don't use any custom modelines with special video modes. If you do, IP Extender may not be able to detect these. Use any standard VESA video mode. Refer to Appendix A on page 60 for a list of all known modes.

You can adjust up to 4 Custom Video Modes if your video mode differs from the standard VESA video mode.

Set the Custom Video Modes in the Video settings section.

23. Operating the IP Extender system

Operate the IP Extender system through one of the following interfaces:

1. HTTP/HTTPS - Any standard Web browser. Depending on the Web browser, you can access the IP Extender card using the unsecured HTTP protocol or, in case the browser supports it, the encrypted HTTPS protocol. We recommend using HTTPS when possible.

2. SNMP (Simple Network Management Protocol) - Any standard SNMP client can use this protocol.

3. Telnet - Use a standard Telnet client to access an arbitrary device connected to one of the IP Extender's serial ports via a terminal mode.

All the above interfaces are accessed using the TCP/IP protocol. They can thus be used via the built-in Ethernet adapter or modem.

This chapter deals with the HTTP interface. The other two interfaces are explained on pages 42 and 57.

The Web browser must come with a Java Runtime Environment version 1.1 or higher. Without Java support, you can still maintain the remote host system using the administration forms displayed by the browser.

We recommend the following browsers for an unsecured connection:

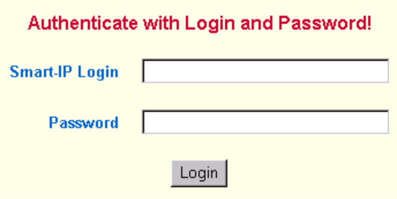
- Microsoft Internet Explorer version 5.0 or higher with Windows 98, ME, 2000 and XP
- Netscape Navigator 7.0 or Mozilla 1.0 with Windows 98, ME, 2000, and XP, Linux and other UNIX like operating systems

To access the remote host system using a securely encrypted connection you need a browser that supports the HTTPS protocol. Strong security is only assured by using key length of 128 Bit. We recommend the following browsers.

- Microsoft Internet Explorer version 5.5 or higher with Windows 98, ME, 2000 and XP
- Netscape Navigator 7.0 or Mozilla 1.0 with Windows 98, ME, 2000, and XP, Linux and other UNIX like operating systems

24. Logging in

Type the configured IP address into the Web browser. Either http://192.168.0.220 for an unsecured connection. Or https://192.168.0.220 for a secured connection. The Login screen appears. See Figure 11



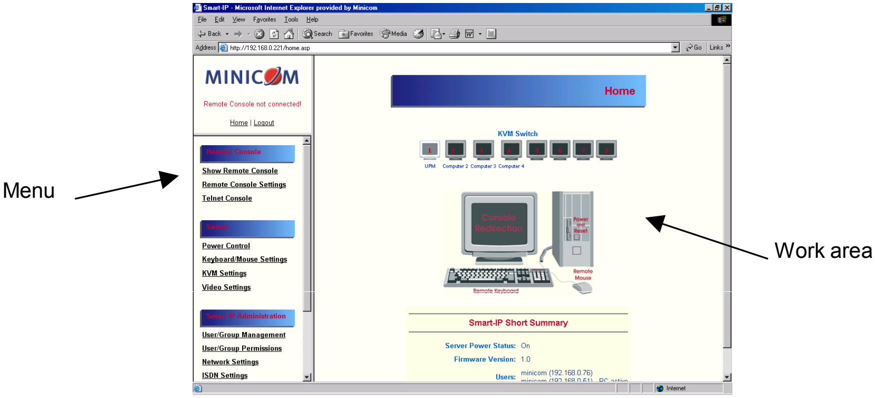
Authenticate with Login and Password!

Smart-IP Login

Password

Figure 11 The Login screen

Initially there is only one user configured who has unrestricted access to all IP Extender features. Type the default Login name ‘super’ and Password ‘smart’ and click **Login**. The IP Extender Home page appears. See Figure 12.



Remote Console not connected!

Smart-IP Short Summary

Server Power Status: On

Firmware Version: 1.0

Users: minicom (192.168.0.76)

Figure 12 The IP Extender Home page

25. Timeout

After half an hour of non-activity the system automatically logs out. Clicking anywhere on the screen will lead back to the Login screen.

26. The Work area

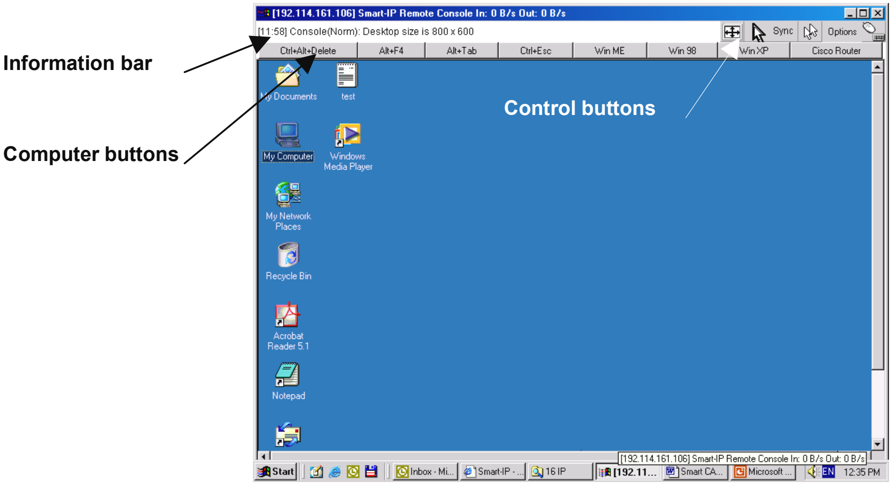
The Work area has a short summary about your IP Extender.

- Server Power Status - On or Off
- Firmware Version - installed on your IP Extender
- Device management – self managed or connected to a management device
- Users - all currently logged in users and IP addresses. (Note: when connected through a proxy server the IP address will be that of the proxy server).

  RC – Remote Control open. **Exclusive** – Exclusive mode. **Idle** – time since last activity.

27. Remote Console

From the menu click **Show Remote Console**. The remote console appears. See Figure 13.



[192.114.161.106] Smart-IP Remote Console In: 0 B/s Out: 0 B/s

[11:58] Console(Norm): Desktop size is 800 x 600

Figure 13 The remote console

You can work on it with the keyboard and mouse. The delay with keyboard and mouse reactions - if any - depends on the line connection bandwidth.

28. Keyboard layout

Your host keyboard changes its layout to match the remote host system. So for example if the host system uses a US English keyboard layout, special keys on a German keyboard won't work but will function as US English keys.

To solve this problem, adjust the remote system keyboard to the same mapping as your host one. Alternatively, use the Soft-Keyboard that is part of the Remote Console applet.

The Remote Console window is a Java Applet that tries to establish its own TCP connection to IP Extender. The protocol that is run over this connection is not HTTP or HTTPS but a protocol called RFB (Remote Frame Buffer Protocol). Currently RFB tries to establish a connection to port number 443. Your local network environment must allow this connection to be made, i.e. your firewall and, in case you have a private internal network, your NAT (Network Address Translation) settings must be configured accordingly.

In case IP Extender is connected to your local network environment and your connection to the Internet is available using a proxy server only without NAT being configured, the Remote Console is very unlikely to be able to establish the according connection. This is because today's Web proxies are not capable of relaying the RFB protocol. In case of problems, please consult your network administrator in order to provide an appropriate network environment.

The Remote Console window shows the remote screen at its optimal size. However, you can always resize the Remote Console window in your host window system.

Hint: The Remote Console window on your local window system is just one window among others. To make the keyboard and mouse work, your Remote Console window must have the local input focus.

29. The Control buttons /toolbar icons

The control buttons/toolbar icons have the following functions:

Ctrl+Alt+Delete - Sends the `Control Alt Delete' key combination to the remote system.

Auto adjust - Adjusts the screen to the best visual quality

Sync **Sync mouse** - Synchronizes the host and remote mice. Necessary when using accelerated mouse settings on the host system. There is generally no need to change mouse settings on the host.

- Discussed on page 24.

Click the Options button to get the following options:

Monitor Only - When turned on, the Remote Console does not accept keyboard / mouse input. The top right hand icon appears like this .

Exclusive access - If a user has the appropriate permission, he can force the Remote Consoles of all other users to close. No one can open the Remote Console until this user disables the Exclusive access or logs off.

Scaling - Scale down the Remote Console. Not all display details will be preserved.

Readability Filter - Turn the filter on in scaling mode to preserve most of the screen details. Only available with a Java Virtual Machine version number of 1.3 or higher

Mouse handling - The submenu for mouse handling offers two options for synchronizing the host and the client mouse pointer - explained on page 23. The option for 'Fast Sync' shows the hotkey if you defined one using the Remote Console Settings.

Local cursor - Choose a cursor shape for the host mouse. The number of available shapes depends on the Java Virtual Machine, only version 1.2 or higher offers the full list.

Chat Window - Opens the Chat window

Video Settings – To adjust the video settings.

Refresh video - Refreshes the video

Soft Keyboard - Opens the soft-keyboard menu:

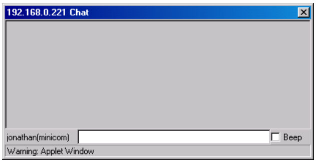
- Click Show. The soft-keyboard appears.
- Click Layout. Choose layout
- Click Mapping. Choose the desired language and country

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

Information bar - Shows the console and connection state and remote screen size. The value in round brackets describes the connection to the remote system: Norm stands for a standard connection without encryption; SSL stands for a secured connection. Double click the bar to see a history of all the status information.

30. The Chat window

Use the Chat window to chat with others logged into the system. Figure 14 illustrates the Chat window.



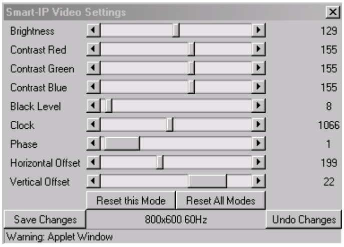
Warning: Applet Window

Figure 14 Chat window

All messages are broadcast to ALL connected users. There is no option to direct a message to a particular user only. There is no message history, so messages can only be received after opening the Remote Console.

31. The Video settings

From the Options menu choose Video Settings. The Video Settings box appears. See Figure 15.



Brightness	129
Contrast Red	155
Contrast Green	155
Contrast Blue	155
Black Level	8
Clock	1066
Phase	1
Horizontal Offset	199
Vertical Offset	22

Figure 15 The Video settings

The parameters have the following functions:

Brightness - Brightness control.

Contrast Red/Green/Blue- RGB contrast control.

Black level - Sets the intensity of the color black.

Clock - Sets the horizontal frequency for a video line, this depends on the video mode. Different video cards may require different values. The default settings and auto adjustment procedure should be adequate for all common configurations. If not change this setting together with the sampling phase.

Phase - Sets **t**he phase for video sampling.

Horizontal Offset - Moves the picture in a horizontal direction.

Vertical Offset - Moves the picture in a vertical direction.

Brightness, Black level and contrast affect all modes and KVM ports globally; the other settings are changed specifically for each mode on each KVM port.

Reset this Mode - Resets mode to factory defaults.

Reset All Modes - Resets all modes to factory defaults.

Save Changes - Saves changes.

Undo Changes - Undoes changes that have not yet been saved.

32. Video Settings access

In the User/Group Permissions section on page 36, it explains how to set access levels for all parameters including Video Settings access. A Remote Console user can always change Brightness, Contrast, Black level and picture positions, whatever his Video Settings access rights. A user who has permission to change the Video Settings can also change the Clock and Phase parameters and use the reset buttons.

33. Mouse synchronization

There are two ways to synchronize the host and remote mice:

(a) Choose **Options** / **Mouse Handling** / **Fast Sync**. This corrects a temporary, but fixed skew.

(b) Intelligent Sync If the fast sync doesn't work or the mouse settings have been changed on the host system use the Intelligent Sync option.

To do so:

1. Ensure the picture is correctly adjusted, Click Auto Adjust or manually correct the picture using the Video Settings.
2. Choose **Options** / **Mouse Handling** / **Intelligent Sync**.

Pressing the Sync button usually leads to a fast sync, except when the KVM port or the video mode recently changed.

34. Mouse synchronization limitations

Synchronization may not work properly in the following cases:

1. For the intelligent sync to work, the picture MUST be correctly adjusted. Use the auto adjustment function or the manual correction in the Video Settings panel to adjust the picture. The video must also be of sufficiently good quality.
2. Special vendor-specific Mouse drivers disrupt the synchronization process. Ensure these are not on the host system
3. Windows XP has a setting 'enhanced pointer precision'. Deactivate it.

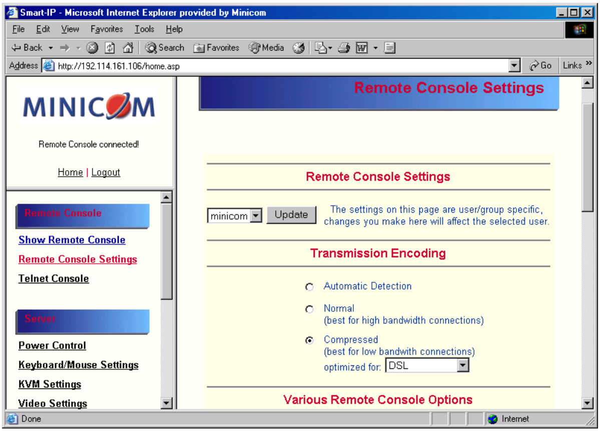
4. Active Desktop. Disable it. Or do not use a plain background, use a wallpaper.

35. Single mouse mode

The information above applies to the Double Mouse Mode, where remote and host mouse pointers are visible and need to be synchronized. There is also the Single Mouse mode. In this mode only the client mouse pointer is visible. Single Mouse mode needs a Sun Java Virtual Machine 1.3 or later.
Select the mode in the Remote console - see Figure 13.
From the Options menu choose Mouse Handling/Mouse Mode/ Single Mouse Mode. Or press from the Control Buttons toolbar. The client mouse pointer can be controlled directly.
To leave this mode, you must define a mouse hotkey in the Remote Console Settings Panel – see section 36 below. Press this key to free the captured host mouse pointer.

36. Remote Console Settings

From the IP Extender Menu click Remote Console Settings. The Remote Console Settings window appears. See Figure 16.



http://192.114.161.106/home.asp

MINICOM

Remote Console connected!

Home | Logout

Remote Console

Show Remote Console

Remote Console Settings

Telnet Console

Server

Power Control

Keyboard/Mouse Settings

KVM Settings

Video Settings

Remote Console Settings

Remote Console Settings

minicom ▾ Update The settings on this page are user/group specific, changes you make here will affect the selected user.

Transmission Encoding

○ Automatic Detection

○ Normal
(best for high bandwidth connections)

● Compressed
(best for low bandwith connections)
optimized for: DSL ▾

Various Remote Console Options

Figure 16 The Remote Console Settings

The settings and their functions are now described. All settings are user specific. Choose a user from the Drop-down menu.

Transmission Encoding - Optimizes the speed of the remote screen depending on the number of parallel users and the bandwidth of the connection line.

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

Normal - Best suited for many parallel users in a LAN environment.

Compressed - For low bandwidth Modem connections. 1 is the lowest and 9 the highest compression rate. The IP Extender takes time to compress the data. This option shouldn't be used when many users want access simultaneously

Various Remote Console Options

Start in Monitor Mode - Check this option to open the Remote Console window in read only mode.

Exclusive Access- Enables the Exclusive Access mode at Remote Console startup. This forces the Remote Consoles of all other users to close. No one can open the Remote Console until this user disables the Exclusive Access or logs off.

Remote Console Type

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

Sun Microsystems Java Browser Plugin - Uses Sun Microsystems Java Browser Plugin - Sets the administration system's Web browser to use the JVM (Java Virtual Machine) of Sun Microsystems. The JVM is used to run the code for the Remote Console window, which is actually a Java Applet. If the Java plug-in is not installed on your system, it will be downloaded and installed automatically. The download is about 11 Mbytes. The JVM provides a stable and identical Java Virtual Machine across different platforms. The Remote Console software is optimized for this JVM version and offers wider range of functionality when run in SUN's JVM.

Tip! The software is on the Marketing & Documentation CD. So, if you have a slow Internet connection, pre-install the JVM on your administration machine.

ActiveX control - Use an ActiveX control instead of a Java applet - This is the ActiveX-Control of the KVM Vision Viewer - an application available separately. You must install the viewer on your local system. See the Viewer Guide for further information. This option only works with Microsoft Internet Explorer on Win32 Systems.

Mouse hotkey - Used for fast mouse synchronization in Double Mouse mode and to free the grabbed mouse when in single mouse mode.

Remote Console Button Keys - Button Keys simulate keystrokes on the remote system that cannot be generated locally. For example `Control + Alt + Delete' on Windows and DOS or `Control + Backspace' on Linux.

Define a new Button Key as follows:

Type the required keys e.g. Ctrl+Alt+Delete. The + sign means that the keys are pressed together. The – sign means the keys are pressed sequentially.

The * sign inserts a pause with a definable duration. See page 30.

To require a confirmation request before keystrokes are sent, write **confirm** at the start. E.g. confirm Ctrl+Alt+Delete.

For a list of key codes and aliases IP Extender recognizes, refer to Appendix B on page 15.

Press **Apply** for the changes to take effect.

37. Telnet Console

The Telnet Console offers a Java applet for the Telnet protocol to open a connection to IP Extender. Its main use is the pass through option for the Serial port 1 see page 43. The Telnet access has to be enabled in the security settings as well, see page 47. It is also possible to connect with a standard Telnet client.

For details regarding the Telnet interface please refer to page 57.

38. Status via IPMI

The Status via IPMI function shows the current values and the min/max-thresholds of all fans, temperatures and voltages existing in the host system. Change the thresholds by editing the values and pressing Apply.

The first time you call this page, it can take up to two minutes until the sensor data appears.

Note: If IPMI is disabled, Status via IPMI and System Log via IPMI are not available (the menu options are not visible).

39. Event Log via IPMI

The Event Log via IPMI accesses the SEL (System Event Log) repository and reads every entry sequentially. The first time you use this function after starting Smart 16 IP the complete repository has to be read, what may take 1 or 2 minutes.

After reading all entries, Smart 16 IP displays them with their time, sensor and description in accordance with the filter settings. You have the choice between several pre-settings (i.e. last day, last week) or an exact declaration of the start and the end date.

Once you change the filter settings, click `Update' to update the shown entries. If the Get sensor names box is checked, all sensor IDs are shown with their respective names.

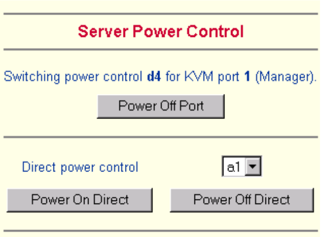
The time shown in the log entries is the SEL time, meaning it is independent of the system time. The SEL time is shown at the top of the log table. Click Clear Event Log to delete all entries in the SEL repository.

40. Power Control

The appearance of the power control window depends on the power control option connected to IP Extender and on the currently activated setting (discussed on page 44). There are 2 options available: Power control disabled and external power.

External power

If the external power option is enabled it will look like Figure 17.



Server Power Control

Switching power control **d4** for KVM port **1** (Manager).

Direct power control: a1

Figure 17 External power control

The upper half is used to switch the power for the KVM port currently active. Use the KVM settings – see page 30 - to assign a port of the external power control to a KVM port. If no assignment exists, the option is disabled.

The lower half offers controls for switching each port of the external power control directly. Select the appropriate port and decide whether to power it off or on.

The Remote reset and power button effects are as follows:

Reset - This is similar to pressing the reset button directly on the remote system. Pressing the reset button will result in a cold start of the system. This might damage open files and the file system itself.

Power (short press) - A short press on the ATX button is normally caught by the running operating system that tries to initiate a controlled shut down. Do this to switch off the system. If this does not work try the long press button.

After pressing, the power state displayed in the administration panel won't immediately reflect the requested change. A controlled shut down of the system may take some minutes. Observe the action caused by your button press using the Remote Console window or by reloading the Server Power Control panel.

Power (long press) - This will unconditionally power off the system. Even if you have submitted a short press before, this will shut down the power supply of the host system. The effect of the long button press can be immediately observed on the panel that is loaded into the browser because of the button press. The power state will be off.

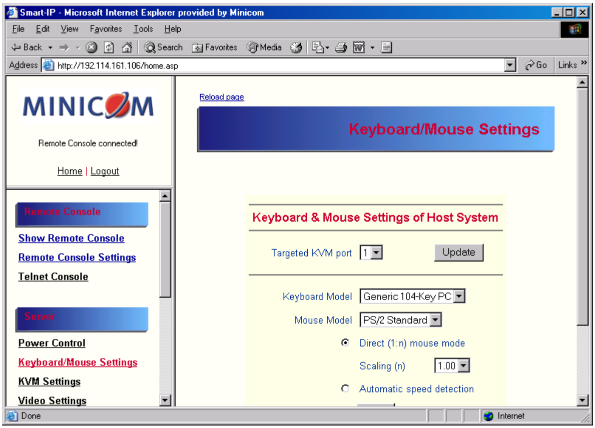
If IPMI is enabled, the power control functions are performed over IPMI requests. This may take a few seconds.

If IPMI is disabled, the power control functions are performed through the external power control options.

41. Keyboard & Mouse Settings

IP Extender supports different keyboard and mouse types.

Click Keyboard & Mouse Settings. The settings appear as in Figure 18.



Address: http://192.114.161.106/home.asp

Remote Console connected!

Home | Logout

Show Remote Console

Remote Console Settings

Telnet Console

Power Control

Keyboard/Mouse Settings

KVM Settings

Video Settings

Reload page

Keyboard/Mouse Settings

Keyboard & Mouse Settings of Host System

Targeted KVM port: 1 Update

Keyboard Model: Generic 104-Key PC

Mouse Model: PS/2 Standard

● Direct (1:n) mouse mode

Scaling (n): 1.00

○ Automatic speed detection

Figure 18 Keyboard & Mouse Settings

The elements of the Keyboard & Mouse Settings are explained below.

Targeted KVM port

1. Choose the port to which a KVM switch is connected.
2. Press Update to display the current values for the selected KVM port. Without pressing Update alterations will **NOT** be made to the chosen port.

Keyboard Model - Choose the keyboard model

Mouse Model - Choose the mouse model

Direct (1:n) mouse mode

Use a direct translation of mouse movements between the host and the remote pointer. Fix a scale, which determines the amount the client mouse pointer moves when the host mouse pointer moves by one pixel. This only works when Mouse Acceleration on the local computer is disabled.

Automatic speed detection

When Mouse Acceleration on the local computer is enabled, check Automatic speed detection. We highly recommend disabling the Mouse Acceleration.

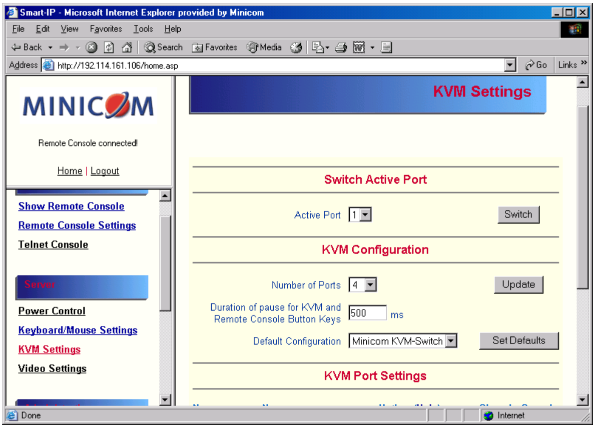
G&D Equalizer – **G&D Equalizer** – This supports to the mouse synchronization for Guntermann & Drunck KVM switches. These switches perform an internal rescaling of the mouse movements, which cause the existing algorithm to break if IP Extender is connected behind such a switch. This option detects the rescaling and compensates for it, so that the mouse synchronization works. Choose auto or a number from the drop down menu.

Apply - Click to apply changes

Reset - If the keyboard or mouse seems to react irrationally click to reset the keyboard and mouse emulation. It is like disconnecting and reconnecting the keyboard and mouse connectors.

42. KVM Settings

Adjust the settings for the KVM switches connecting the IP Extender to the host computers. From the IP Extender menu choose KVM Settings. The IP Extender KVM settings appear. See Figure 19.



Switch Active Port

Active Port: 1

KVM Configuration

Number of Ports: 4

Duration of pause for KVM and Remote Console Button Keys: 500 ms

Default Configuration: Minicom KVM-Switch

KVM Port Settings

Figure 19 KVM Settings

The elements of the KVM Settings are explained below.

Active Port

To switch to a computer:

1. Choose a number in the Active port Drop-down list.
2. Press Switch. The computer screen appears in the Remote Console.

Number of Ports

To set the number of ports the KVM uses:

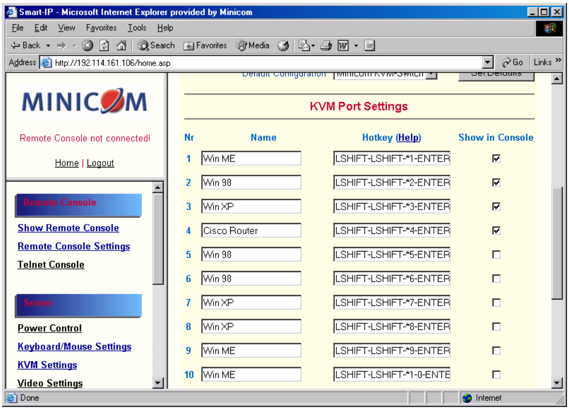
1. Choose a number in the Number of Ports Drop-down list.
2. Press Update. The number of rows chosen appears in the KVM Port Settings list. See Figure 20.

Duration of Pause

Define the pause time for KVM and Remote Console Button Keys in milli-seconds , represented by the * symbol in all hotkeys and button keys.

Default configuration

This is explained in the section below.



KVM Port Settings

Nr	Name	Hotkey (Help)	Show in Console
1	Win ME	LSHIFT-LSHIFT-*1-ENTER	☑
2	Win 98	LSHIFT-LSHIFT-*2-ENTER	☑
3	Win XP	LSHIFT-LSHIFT-*3-ENTER	☑
4	Cisco Router	LSHIFT-LSHIFT-*4-ENTER	☑
5	Win 98	LSHIFT-LSHIFT-*5-ENTER	□
6	Win 98	LSHIFT-LSHIFT-*6-ENTER	□
7	Win XP	LSHIFT-LSHIFT-*7-ENTER	□
8	Win XP	LSHIFT-LSHIFT-*8-ENTER	□
9	Win ME	LSHIFT-LSHIFT-*9-ENTER	□
10	Win ME	LSHIFT-LSHIFT-*1-0-ENTE	□

Figure 20 KVM Port Settings

43. KVM Port Settings

1. Assign names for each port.
2. Define hotkeys to switch to each port.

Choose either Minicom default hotkeys by selecting Minicom KVM-Switch in the Default configuration box, and then click the Set Defaults button.

Or choose your own hotkeys. The syntax to define a new hotkey is as follows: <keycode> [+ | - | *] <keycode>.

For example LShift-LShift-*1-Enter. A + sign means that the keys are pressed together. The – sign means the keys are pressed sequentially. Lshift means the left Shift key.

The * sign inserts a pause with a definable duration. Add more than one pause if necessary. See Appendix B on page 15 for a list of key codes.

3. Press **Apply** at the bottom of the page. The settings are saved.

IP Extender uses separate mouse synchronization settings - see page 23 - and video-settings - see page 22 - for each port.

Note:

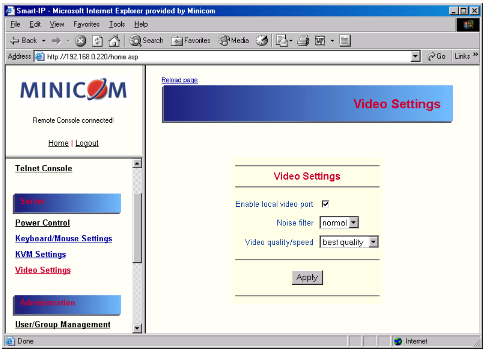
It is still possible to apply KVM key combinations through the Remote Console for switching the KVM port. However, video and mouse synchronization settings will be shared among the ports and may be unintentionally changed for one of those ports.

If an external power option is enabled it is possible to assign a port of this control for power switching to each KVM port, see page 27.

Show in console – check this option to have a button appear on the top of the Remote console. Click the button to switch to that computer.

44. Video Settings

From the IP Extender Menu choose Video Settings. The Video settings appear. See Figure 21



Address http://192.168.0.220/home.asp

Video Settings

Enable local video port ☑

Noise filter: normal

Video quality/speed: best quality

Figure 21 Video Settings

45. Enable local video port

This option decides if the video output on the front panel of IP Extender is active and passing through the incoming signal from the host system.

46. Noise filter

Define how IP Extender reacts to small changes in the video input signal. A large tolerance needs less network traffic and leads to a faster video display, but small changes in some display regions may not be recognized immediately. A small tolerance displays all changes instantly but may lead to a constant amount of network traffic even if display content is not really changing (depending on the quality of the video input signal). The default setting should be suitable for most situations.

47. Video quality/speed

Choose the Video quality/speed, the faster the speed the lower the video quality.

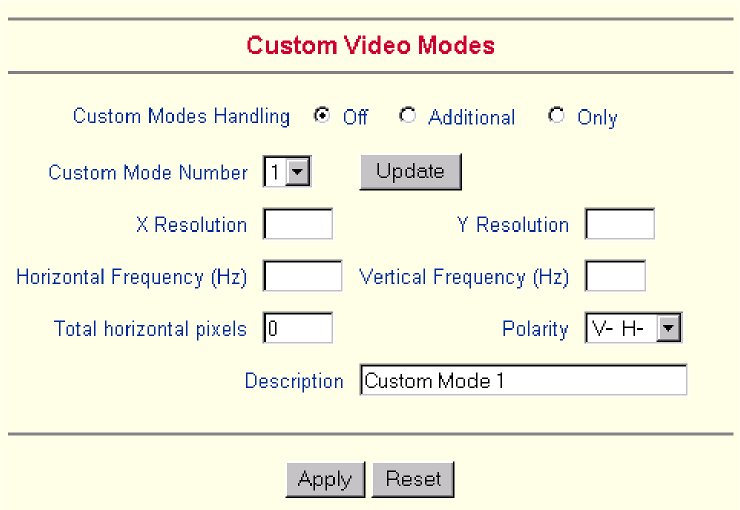
48. Custom Video Modes

Add video modes to IP Extender, which are not recognized using the factory settings, when for example using special modelines in an X-Window configuration on the host or with uncommon hosts or operating systems.

Click Add Custom Video Modes. The Custom Video Modes window appears, see Figure 22.

Note! This option may affect the correct video transmission and is for advanced users only.

The maximum number of custom video resolutions is 4.



Custom Video Modes

Custom Modes Handling ● Off ○ Additional ○ Only

Custom Mode Number 1

X Resolution

Y Resolution

Horizontal Frequency (Hz)

Vertical Frequency (Hz)

Total horizontal pixels 0

Polarity V- H-

Description Custom Mode 1

Figure 22 Custom Video Modes window

Custom Modes Handling – switch custom modes off, or use in addition to the standard video resolutions, or use exclusively - **Only**. With **Only** you can force a special video mode for IP Extender.

To change the parameters for a mode, choose the number and press **Update**.

X Resolution - Visible number of horizontal pixels.

Y Resolution - Visible number of vertical pixels.

Horizontal Frequency (Hz) - Horizontal (line) frequency.

Vertical Frequency (Hz) - The vertical (refresh) frequency.

Total horizontal pixels - The total amount of pixels per line, including non-visible and blank areas.

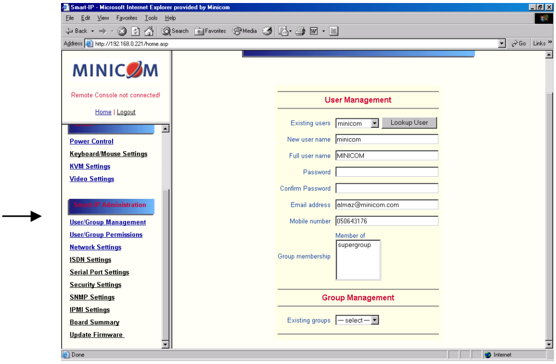
Polarity - The polarity (positive/negative) of the synchronization signals. V means vertical, H means horizontal.

Description Give the mode a name. The name appears in the Remote Console when the custom mode is activated.

49. User/Group Management

From the IP Extender Menu choose User/Group Management. The User/Group Management settings appear. See Figure 23. The user and group management of IP Extender is based on configurable users and groups. Each user or group can have different access capabilities.

The IP Extender is factory set with a supervisor user called `super' with the password ‘smart’. Change the super user password immediately after accessing the IP Extender.



User Management

Existing users: minicom [Lookup User]

New user name: minicom

Full user name: MINICOM

Password:

Confirm Password:

Email address: almaz@minicom.com

Mobile number: 050643176

Group membership: Member of: supergroup

Group Management

Existing groups: — select —

Figure 23 The User/Group Management settings

50. Existing user

Select an existing user for modification or deletion. Once selected, click Lookup User to see the user information.

51. New user name

Enter a login name for a new user here. Ensure that it is not the same as a current user or group.

52. Full user name

Write the full name of the new user.

53. Password / Confirm password

The password must be at least four characters. Confirm password.

54. Email address /Mobile number

These are optional.

55. Group membership/Member of/Not Member of

Each user can be a member of one or more groups and inherit the rights of that group. Use the arrows to add or remove a user from a group.

56. Existing groups

Select an existing group for copying, modification or deletion.

57. New group name

To create a new group, enter a new group name.

58. Create User button

Once the required fields are filled in, click the Create User button to create a new user.

59. Delete User button

To delete a user:

1. Select a user in the Existing users Drop-down list.
2. Click the Lookup button. The complete user information appears.
3. Click the Delete User button.

Note: The factory set supervisor user `super' cannot be deleted, but it can be renamed.

60. Modify User button

To modify a user:

1. Select a user in the Existing users Drop-down list.
2. Click the lookup button to get all the user's information.
3. All fields can be modified as required. The old password is not displayed, but can be modified.
4. Click the Modify User button.

61. Copy User

To copy an existing user's properties to a new user:

1. Select a user in the Existing user Drop-down list.
2. Enter a new user name in the New user name box.
3. Click the Copy User button. All properties of the selected user will be copied to the new one, except user specific permissions.

62. Group Management

The following headings appear under Group Management.

63. Create group button

To create a group:

1. Type a name into the New group name box
2. Click the Create group button.

64. Delete Group button

To delete a group:

1. Select a group in the Existing groups Drop-down list.
2. Click the Delete group button.

65. Modify Group

To modify an existing group select the group in the Existing group control. The group's name field can be modified. Finally click the Modify group button.

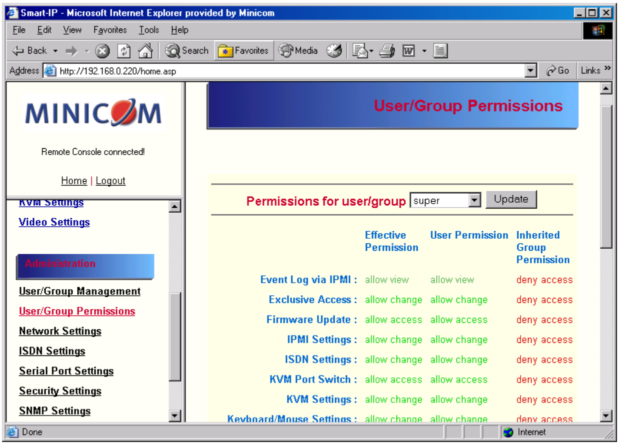
66. Copy Group

To create a group with the properties of an existing group:

1. Select a group in the Existing group Drop-down list.
2. Type a name into the New group name box.
3. Click the Copy Group button.

67. User/Group Permissions

From the IP Extender Menu choose User/Group Permissions. The User/Group Permissions settings appear. See Figure 24.



User/Group Permissions

Permissions for user/group super Update

	Effective Permission	User Permission	Inherited Group Permission
Event Log via IPMI :	allow view	allow view	deny access
Exclusive Access :	allow change	allow change	deny access
Firmware Update :	allow access	allow access	deny access
IPMI Settings :	allow change	allow change	deny access
ISDN Settings :	allow change	allow change	deny access
KVM Port Switch :	allow access	allow access	deny access
KVM Settings :	allow change	allow change	deny access
Keyboard/Mouse Settings :	allow change	allow change	deny access

Figure 24 User/Group Permissions

Each user or group has a set of access rights to the IP Extender functions. The user 'super' always has unalterable full access rights. A newly created user has the access rights of all groups he belongs to.

You can change the access rights in the User/Group Permissions panel. The panel shows the changes to the access rights inherited by the user's ancestors only. This means an empty user permission list has exactly the same access rights as the groups he belongs to.

When one user creates a new user, he can alter his access rights. A user can change another user or group's access rights if he stands higher in hierarchy. The 'super' user stands at the top of the hierarchy, and can change everybody's access rights.

A user can never give more access rights than he himself has but he can always reduce the access rights.

To change access rights:

1. From the Drop down list select a user/group. The selection list shows only users and groups, which you have the right to change.
2. Click the Update button. The access rights of the user appear. The meaning of the Permissions is as follows:

Viewing a field. allow view means you can view it. deny access means you cannot view it.

Changing a field setting. Allow change means you can change it. (This doesn’t give an automatic right to view the value, the allow view value must also be set). Deny change means you cannot change it.

Using a function. allow access means you can use it. deny access means you cannot use it.

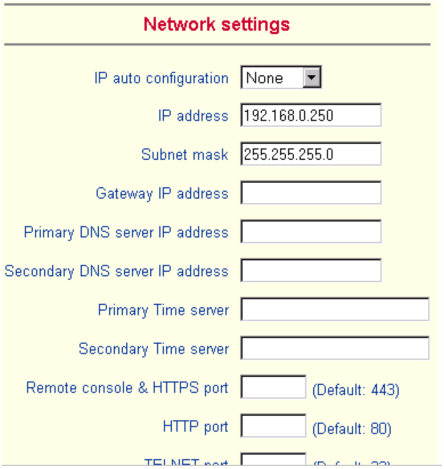
Group setting – Use the access rights inherited from the group(s), the user belongs to.

3. Select the desired permission.
4. To add the right, click **Add**.

   To remove the right, check the Delete Entry box.
5. Click **Apply**.

68. Network Settings

From the IP Extender Menu choose Network Settings. The Network Settings appear. See Figure 25.



Network settings

IP auto configuration	None ▾	
IP address	192.168.0.250	
Subnet mask	255.255.255.0	
Gateway IP address		
Primary DNS server IP address		
Secondary DNS server IP address		
Primary Time server		
Secondary Time server		
Remote console & HTTPS port		(Default: 443)
HTTP port		(Default: 80)
TELNET port		(Default: 23)

Figure 25 The Network Settings

In the Network Settings panel you can change the network parameters.

The initial IP configuration is usually done directly at the host system. However you can also connect to the IP Extender using its pre-configured IP settings.

Warning! Changing the network settings of IP Extender may result in losing the connection. If you remotely change the settings ensure that all values will give you access to the IP Extender.

IP auto configuration

Choose between the 3 options.

None – no IP auto configuration. In this case type a static IP address in the appropriate settings below.

DHCP - When selected, IP Extender will contact a DHCP (Dynamic Host Configuration Protocol) server in the local sub-net to obtain a valid IP address, gateway address and net mask. Before you connect IP Extender to your local sub-net, complete the corresponding configuration of your DHCP server.

BOOTP - When selected, IP Extender will contact a BOOTP (Bootstrap Protocol) server in the local sub-net to obtain a valid IP address, gateway address and net mask.

IP address

Static IP address in the usual dot notation.

Subnet mask

The net mask of the local network.

Gateway IP address

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

Primary DNS Server IP address

IP address of the primary Domain Name Server. This may be left empty, however IP Extender won't be able to perform name resolution.

Secondary DNS Server IP address

This address will be used in case the Primary DNS Server can't be contacted.

Primary Time Server

IP address of the primary NTP (Network Time Protocol) compliant timeserver. IP Extender will synchronize its own absolute time with the timeserver's one. This is important for writing log entries and for the Dynamic DNS Service.

Secondary Time Server

This address will be used in case the Primary Time Server can't be contacted.

Remote Console & HTTPS port

Port number at which IP Extender's Remote Console server and HTTPS server are listening. If empty the default value is used.

HTTP port

Port number at which IP Extender's HTTP server is listening. If empty the default value is used.

Telnet port

Port number at which IP Extender's Telnet server is listening. If empty the default value is used.

Bandwidth limitation

The maximum network traffic generated through the IP Extender Ethernet device.

Disable Setup Protocol

Exclude the IP Extender from the setup protocol.

69. Dynamic DNS

Minicom provides a Dynamic DNS service. See Figure 26.

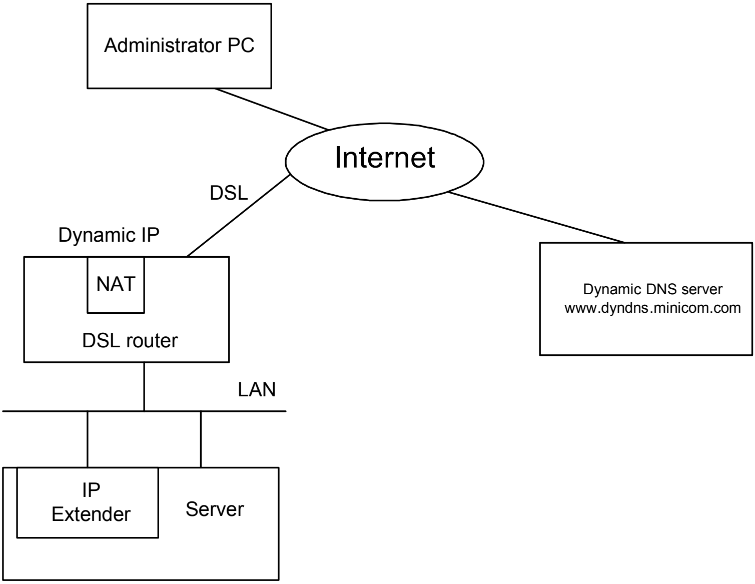


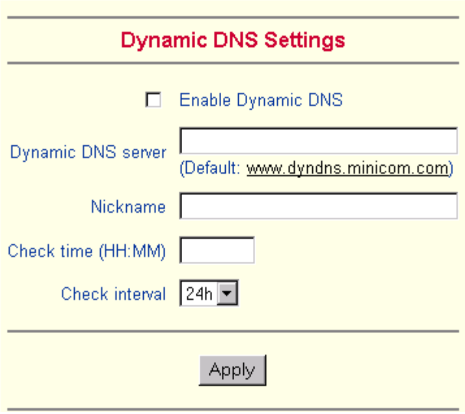
Figure 26 Dynamic DNS scenario

IP Extender is reachable via the IP address of the DSL router, which is dynamically assigned by the provider. Since the administrator doesn't know the IP address assigned by the provider, IP Extender connects to a special dynamic DNS server in regular intervals and registers its IP address there. The administrator can contact this server as well and pick up the same IP address belonging to his card.

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

To enable the Dynamic DNS:

1. Ensure the IP Extender LAN interface is properly configured.
2. From the IP Extender menu choose Network Settings / Dynamic DNS. The Dynamic DNS Settings appear. See Figure 27.



Dynamic DNS Settings

□ Enable Dynamic DNS

Dynamic DNS server
(Default: www.dyndns.minicom.com)

Nickname

Check time (HH:MM)

Check interval 24h

Figure 27 Dynamic DNS Settings

3. Check the Enable Dynamic DNS box.
4. Change the settings as desired.

Dynamic DNS server - Enter the server name where IP Extender registers itself in regular intervals. If left blank the default will be used.

Nickname - The nickname registered during manual registration with the Dynamic DNS Server. Spaces are not allowed in the Nickname.

Check time - IP Extender card registers itself in the Dynamic DNS server at this time.

Check interval - Interval for reporting again to the Dynamic DNS server by IP Extender.

IP Extender has its own independent real time clock. Ensure the time setting is correct by configuring a timeserver see page 30.

IP Extender registers itself to the Dynamic DNS server slightly different from the time configured. To reduce load peaks on the server we add a random time (0-10 min) to the absolute time value.

70. Modem Settings

IP Extender has the option of remote access using a telephone line. Connect the modem to IP Extender’s serial interface. Using a telephone line means building up a dedicated point to point connection from your console computer to the IP Extender. The IP Extender acts as an Internet Service Provider (ISP) to which you can dial in. The connection is established using the Point-to-Point Protocol (PPP).

Before connecting to IP Extender, configure your console computer accordingly. For instance on Windows based operating systems you can configure a dial-up network connection, which defaults to the right settings like PPP. The modem settings are part of serial settings panel (see the section above).

Enable modem on RS 232

Enable or disable the modem on the serial interface adapter of IP Extender. When enabled, IP Extender tries to initialize the modem using an initial string of AT commands and waits for incoming connections.

Serial line speed

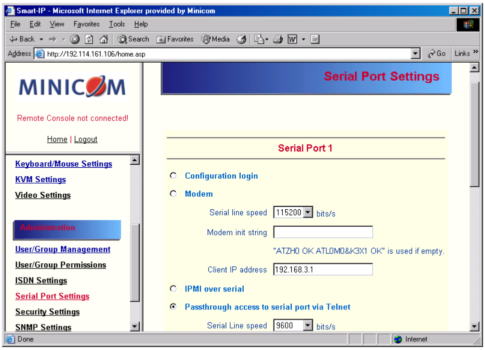
The speed IP Extender communicates with the modem. Most modems today support the default value of 115200 bps. Try lowering the speed of old modem if you are having problems.

Modem Init String

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

71. Serial Port Settings

From the IP Extender Menu choose Serial Port Settings. The Serial Port Settings appear. See Figure 28.



Smart-IP - Microsoft Internet Explorer provided by Minicom
File Edit View Favorites Tools Help
Back Search Favorites Media
Address
Go Links
MINICOM
Done
Internet

http://192.114.161.106/home.asp

Remote Console not connected!

Home | Logout

Keyboard/Mouse Settings
KVM Settings
Video Settings

Administration

User/Group Management
User/Group Permissions
ISDN Settings
Serial Port Settings
Security Settings
SNMP Settings

Serial Port Settings

Serial Port 1

○ Configuration login

○ Modem

Serial line speed 115200 bits/s

Modem init string

"ATZH0 OK ATL0M0&K3X1 OK" is used if empty.

Client IP address 192.168.3.1

○ IPMI over serial

● Passthrough access to serial port via Telnet

Serial Line speed 9600 bits/s

Figure 28 Serial Port Settings

In the IP Extender Serial Settings specify the devices connected to the two Serial ports.

Serial Port 1

The port options are listed below

Configuration login –If this option is checked you can only use the port for the initial configuration and no other function.

Modem - Connect a modem to Serial 1 port. See section 70 below

Serial line speed - Most modems today will support the default value of 115200 bps. For older modems lower the speed.

Modem Init String - Initialization string. The default value works with all modern standard modems connected to a telephone line. For special modems or if connected to a local telephone switch that requires a special dial sequence to connect to the public telephone network, change this setting by giving a new string. See the modem's manual about the AT command syntax.

Modem Server IP address – This address is used only when connecting to IP Extender via a modem. When you dial into the IP Extender the client computer will receive a Client IP address from the IP Extender. Open the Web browser and type modem server IP address to login to the IP Extender.

The Client IP (see paragraph below) must be in the same class C subnet as the server IP. This subnet should not conflict with the Ethernet subnet on the client side and with the Ethernet subnet on IP Extender Network side.

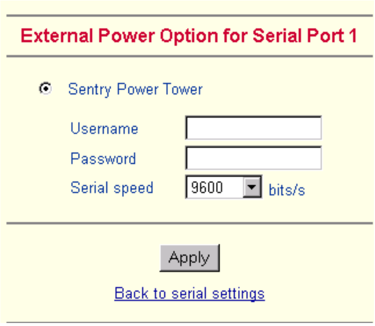
Modem Client IP address - This address is assigned to your console computer during the PPP handshake. Since it is a point-to-point IP connection virtually every IP address is possible but ensure, it is not interfering with the IP settings of IP Extender and your console computer. The default value will work in most cases.

IPMI over Serial - Check to use this serial port for IPMI 1.5 over serial. See page 51 for more information.

Passthrough… - Connect an arbitrary device to the serial port and access it (assuming it provides terminal support) via telnet. Select the appropriate options for the serial port and use the Telnet Console (see page 46) or a standard telnet client to connect to IP Extender. For more information, see page 57.

External Power Option – When the **External Power Option** is the Sentry Power Tower connected to Serial port 1, configure it by clicking **change external power switch option**. The External Power Option for Serial port 1 window appears.

Fill in the Username and password as defined by the Sentry Power Tower.



External Power Option for Serial Port 1

● Sentry Power Tower

Username	
Password	
Serial speed	9600 bits/s

Figure 29 External Power Option for Serial port 1 window

Serial Port 2

This port provides the power control options, see page 27. Choose a suitable setting and fill in additional required options. IP Extender supports the following:

External Power Option

To configure the External Power Option connected to Serial port 2, click **change external power switch option.**

SPC 800/1600 - Using the Avocent™ SPC, switch power for more than one system connected to IP Extender through a KVM switch. To use this device enter a username and password, which exist on the SPC and have the privileges to switch power for each port.

Intelligent Power Module - External module option to switch power of a single system by putting it in the power supply line of the controlled system.

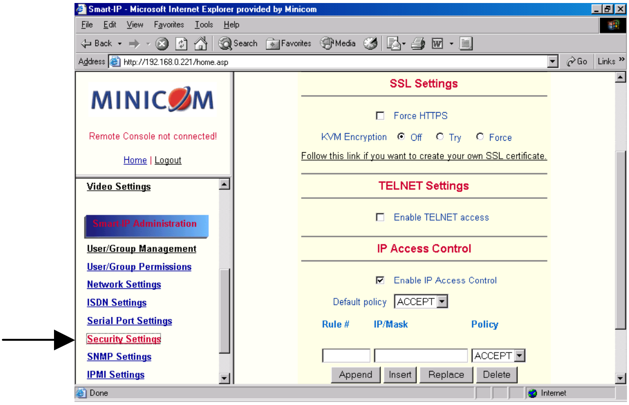
ePowerSwitch 4 port- Using this switch, switch power for more than one system connected to IP Extender through a KVM switch.

ePowerSwitch-Slave – This switch is cascadable to up to 4 power sockets with 8 ports. IP Extender must be connected to the first socket of the cascade via a serial connection.

Spectrum Control Inc. - Smart Start Jr. – Check the box if this option is connected.

72. Security Settings

From the IP Extender Menu choose Security Settings. The Security Settings appears. See Figure 30.



Remote Console not connected!

SSL Settings

☐ Force HTTPS

KVM Encryption ● Off ○ Try ○ Force

Follow this link if you want to create your own SSL certificate.

TELNET Settings

☐ Enable TELNET access

IP Access Control

☑ Enable IP Access Control

Default policy ACCEPT

Rule # IP/Mask Policy

ACCEPT

Figure 30 Security Settings

SSL settings

Force HTTPS - Access the Web front-end only using an HTTPS connection. IP Extender won't listen on the HTTP port for incoming connections.

Disable SSLv2 ciphers – disables SSLv2 ciphers. Only version 3 or higher is enabled.

KVM encryption - Controls the encrypting of the RFB protocol, used by the Remote Console to transmit the screen data to the administrator machine and keyboard and mouse data back to the host.

Off - No encrypting used.

Try - Tries to make an encrypted connection. If unsuccessful, an unencrypted connection is used.

Force - Tries to make an encrypted connection.

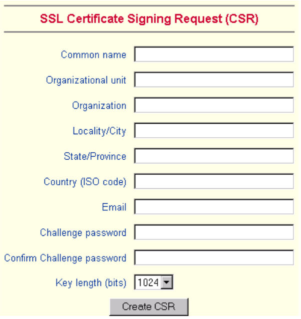
SSL Certificate Management

IP Extender uses the SSL (Secure Socket Layer) protocol for any encrypted network traffic between itself and a connected client. When connecting, IP Extender reveals its identity to a client using a cryptographic certificate. This is the same for all IP Extenders and won't match the network configurations applied to the card by its user. The certificate's underlying secret key is also used for securing the SSL handshake. Hence, this is a security risk (but better than no encryption at all).

You can generate and install a new certificate unique to a particular card. IP Extender can generate a new cryptographic key and the associated Certificate Signing Request that needs to be certified by a certification authority (CA). A CA verifies you are who you claim to be and signs and issues a SSL certificate to you.

To create and install a IP Extender SSL certificate:

1. From the Security Settings page choose **Create your own SSL certificate**. The window appears as in Figure 31.



SSL Certificate Signing Request (CSR)

Common name	
Organizational unit	
Organization	
Locality/City	
State/Province	
Country (ISO code)	
Email	
Challenge password	
Confirm Challenge password	
Key length (bits)	1024

Figure 31 CSR

2. Fill in the fields:

Common name - Network name of IP Extender once installed in the user's network. It is identical to the name that is used to access the card with a Web browser. In case the name given here and the actual network name differ, the browser will pop up a security warning when the card is accessed over HTTPS.

Organizational unit - Specifies which department within an organization IP Extender belongs.

Organization/Locality/City/State/Province - Organization to which IP Extender belongs + location.

Country - Use the 2 letter ISO code, e.g. DE for Germany.

Challenge Password/Confirm- Some certification authorities require a challenge password to authorize later changes on the certificate. The minimum is 4 characters.

Email - Of a security contact person that is responsible for IP Extender.

Key length - Length of the generated key in bits. 1024 Bits are supposed be sufficient for most cases. Larger keys may result in slower response time during the connection.

3. Click .

4. Press **Download CSR** to download the CSR to your administration machine.
5. Send the CSR to a CA for certification. They will send a new certificate
6. Press **Upload** to upload the certificate to IP Extender. The certificate uploads.

Important! If you destroy the CSR on IP Extender there is no way to get it back! If you deleted it, repeat the above steps.

Telnet Settings

Enable Telnet access - Access over Telnet client. For better security disable Telnet access.

IP Access Control

This is used to limit access to a specific number of clients only. These clients are identified by their IP addresses.

The IP access control settings apply to the LAN interface only!

Enable IP Access Control - Enables access control based on IP source addresses.

Default policy - Controls arriving IP packets that don't match any of the configured rules. They can be accepted or dropped.

ATTENTION: If you set this to DROP and you have no ACCEPT rules configured, access to the Web front-end over LAN is disabled! To enable access, change the security settings via modem dial in or by temporarily disabling IP access control with the initial configuration procedure (see page 13).

Rule # - Type the rule number for which the following commands will apply. This is ignored, when adding a new rule.

IP/Mask - Specifies the IP address or IP address range for which the rule applies.

Numbers attached to an IP address with a `/' is the number of valid bits that are used for the given IP address. Examples:

192.168.0.22 or 192.168.0.22/32 matches the IP Address 192.168.0.22

192.168.0.0/24 matches all IP packets with source addresses from 192.168.0.0 to 192.168.0.255

0.0.0.0/0 matches any IP packet

Policy - Determines what to do with matching packets. They are accepted or dropped.

NOTE: The order of the rules is important. The rules are checked in ascending order until a rule matches. Rules below the matching one are ignored. The default policy applies if no match has been found.

Append a rule - Enter the IP/Mask and set the policy. Then press Append.

Insert a rule - Enter the rule number, IP/Mask and set the policy. Then press Insert.

Replace a rule - Enter the rule number, IP/Mask and set the policy. Then press Replace.

Delete a rule - Enter the rule number and press Delete.

Anti Brute Force Settings

Anti Brute Force Settings lets you block access to a specific user, for a fixed amount of time if a predefined number of unsuccessful login attempts by this user occurred.

Max. number of failed logins – insert a maximum number or leave it blank.

Block time - Block time in minutes - insert a number or leave it blank.

73. SNMP Settings

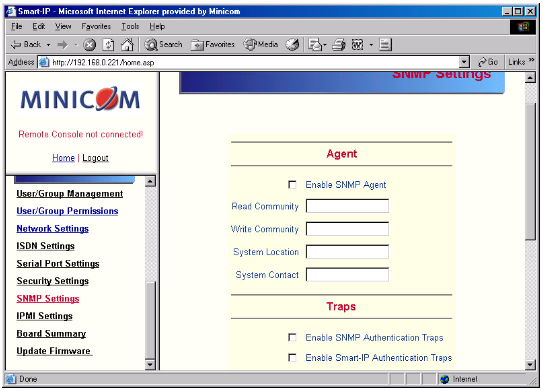
The following information is available via SNMP:

- Serial number
- Firmware version
- MAC address / IP address / Netmask / Gateway of LAN interface
- Configured users
- Currently active users with login time (login time is only valid if time is synchronized on IP Extender)
- Server's power state
- The following actions can be initiated via SNMP:
- Reset server
- Power on/off server
- Reset IP Extender

The following events are reported by IP Extender via SNMP:

- Login trial at IP Extender failed
- Login trial at IP Extender succeeded
- Denying access to a particular action.
- Server was reset.
- Server was powered on/off

From the IP Extender Menu choose SNMP settings. The SNMP Settings appear. See Figure 32.



SNMP Settings

Agent

□ Enable SNMP Agent

Read Community

Write Community

System Location

System Contact

Traps

□ Enable SNMP Authentication Traps

□ Enable Smart-IP Authentication Traps

Figure 32 SNMP settings

You can change the following parameters:

Enable SNMP Agent - When checked, IP Extender will answer to SNMP requests. If a community is blank, you cannot perform the request. E.g. if you want to disable the possibility to reset IP Extender via SNMP, don't set a write community.

Read Community - This is the SNMP community, which allows you to retrieve information via SNMP.

Write Community - This community allows you to set options and reset IP Extender or the host via SNMP.

System Location - Type a description of the physical location of the host. This will be used in reply to the SNMP request "sysLocation.0".

System Contact - Type a contact person for the host. This will be used in reply to the SNMP request "sysContact.0".

Enable SNMP Authentication Traps -When checked, an SNMP trap will be sent in case somebody has tried to access IP Extender via SNMP using a wrong SNMP community.

Enable IP Extender Authentication Traps - When checked, an SNMP trap will be sent if somebody tries to login via the Web front-end. Both successful and failed logins trials will be indicated. Furthermore, there will be notification about other security violations like trying to perform an action via Web front-end for which a user has no permission.

Enable Host Traps -When checked, IP Extender will send SNMP traps whenever the host is reset, powered down or powered up.

Trap destinations Enter IP addresses, to which the traps will be sent. For every IP address, set an according community so that your management client can identify the SNMP traps.

After making the entries click Apply.

74. The IP Extender SNMP MIB

Click the link to access the IP Extender SNMP MIB file. With it, an SNMP client can communicate with IP Extender.

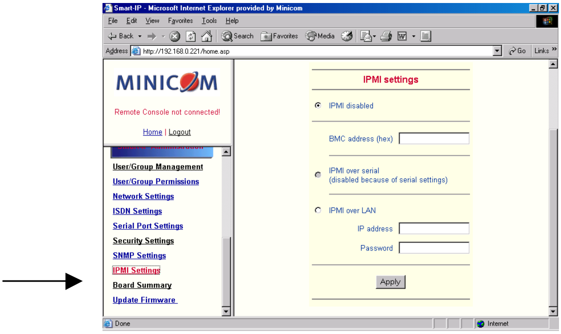
75. IPMI Settings

The IP Extender IPMI (Intelligent Platform Management Interface) is an additional way to power on or off the system or to perform a hard reset. You can also show an event log of the host system and the status of some system sensors (i.e. temperature). If your host system supports IPMI, you can access it in one of the following ways:

- IPMI over Serial
- IPMI over LAN

Both require IPMI V1.5.

From the IP Extender Menu choose IPMI Settings. The IPMI Settings appears. See Figure 33.



IPMI settings

● IPMI disabled

BMC address (hex)

○ IPMI over serial
(disabled because of serial settings)

○ IPMI over LAN

IP address

Password

Apply

Figure 33 IPMI Settings

IPMI disabled - Disables IPMI. Status via IPMI and Event Log via IPMI are not available and the power on/off and reset functions won't use IPMI.

BMC address - Hexadecimal Baseboard Management Controller address. Needed for all types of communication to the IPMI-interface. Usually you can find this address in the BIOS of the host system. The default and common value is 20.

IPMI over Serial - If your host system supports IPMI V1.5 and has an Intel EMP (Emergency Management Port, usually COM2) connector, you can connect IPMI through serial port 1 on IP Extender. Please note:

- Set the EMP port to Always enable and switch off the Restricted Mode.
- The BMC should accept a null username and a non-null password account as login.
- Passwords are 4 -16 characters long.
- Use a null modem cable for connection

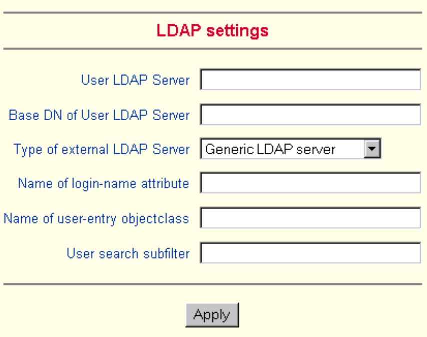
IPMI over LAN - You can connect the IPMI over a LAN connection. You need a host system with IPMI V1.5 and a network adapter with a sideband connection to the BMC (mostly on board). In the IPMI Settings, enter the IP-address of this host system and the correct password for the LAN connection.

You can also access other IPMI systems when you enter their IP address.

76. LDAP Settings

You can keep authentication information in a central LDAP directory.

From the IP Extender Menu choose LDAP Settings. The LDAP Settings appears. See Figure 34.



LDAP settings

User LDAP Server	
Base DN of User LDAP Server	
Type of external LDAP Server	Generic LDAP server
Name of login-name attribute	
Name of user-entry objectclass	
User search subfilter	

Figure 34 LDAP Settings

User LDAP Server - Enter the name or IP address of the LDAP server containing all the user entries. If you use a name, configure a DNS server in the network settings.

Base DN of User LDAP Server - Specify the distinguished name (DN) where the directory tree starts in the user LDAP server.

Type of external LDAP Server - Set the type of the external LDAP server. This is necessary since some server types require special handling. Also the default values for the LDAP schema are set appropriately. Choose between Generic LDAP Server, Novell Directory Service and Microsoft Active Directory. If you don't have Novell Directory Service or Microsoft Active Directory then choose Generic LDAP Server and edit the LDAP schema used (see below).

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

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

User search subfilter - Refine the search for users that should be known to the IP Extender.

77. Maintenance

From the IP Extender Menu choose Maintenance. The IP Extender Maintenance window appears.

Board Summary - This contains information about the IP Extender and its current firmware.

78. Updating firmware

You can receive firmware updates by email or download them from the Minicom Web site. Save the firmware file on the client computer.

To update the firmware:

1. Scroll down the Maintenance window. Under Maintenance features click Update Firmware. The Update Firmware window appears. See Figure 35.

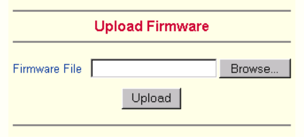


Figure 35 Update Firmware window

2. Ensure that the host computer is connected to IP Link and switched on during the firmware update.
3. Locate and upload the firmware file from your client system. In case of any errors the upload will be aborted.

After a smooth upload the Update Firmware panel appears showing the current firmware version number and the uploaded firmware version number.

4. Press the Update button. The firmware updates. Warning! This process is irreversible; ensure the IP Extender's power supply won't be interrupted during the update process, as this may cause damage.
5. When prompted reset IP Extender manually by pressing the Reset Smart-IP button. When pressed all connections to the administration or Remote console close. 30 seconds later, IP Extender runs with the new firmware. You must login again.

Attention: Only experienced staff members or administrators should perform a firmware update.

79. Direct SmartIP Links

You can set up direct links to any Minicom IP hardware over a LAN or WAN. Use the links to directly connect to these IP units without having to remember their IP addresses. You can also see the status of the remote IP units as explained below.

All the IP units must have firmware that supports direct connection functionality. Ensure that firmware of all units is updated to the latest version. See the User Guide of each IP unit to update the firmware.

To set up the direct connections:

1. Scroll down the Maintenance window to Maintenance Features. See Figure 36.

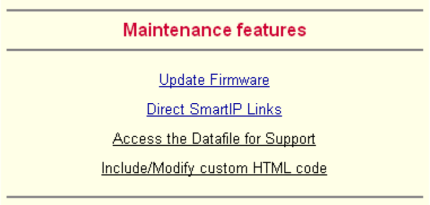
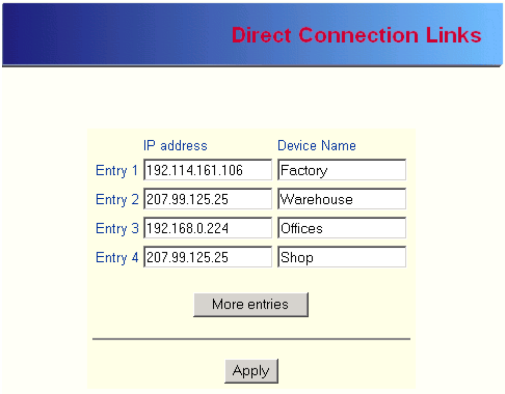

Maintenance features
Update Firmware
Direct SmartIP Links
Access the Datafile for Support
Include/Modify custom HTML code

Figure 36 The Maintenance Features

2. Click Direct SmartIP Links. The Direct Connection Links page opens.
See Figure 37.



Direct Connection Links

	IP address	Device Name
Entry 1	192.114.161.106	Factory
Entry 2	207.99.125.25	Warehouse
Entry 3	192.168.0.224	Offices
Entry 4	207.99.125.25	Shop

Figure 37 The Direct Connections Links page

3. In the IP address column, type IP addresses of the other Minicom IP units. For up to 16 entries press More entries.
4. In the Device Name column type a description.
5. Click Apply. On the Home page Monitor icons representing the direct connection IP units appear. See Figure 38.

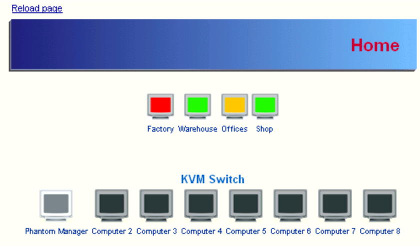


Figure 38 The Monitor icons

The icons are color coded as follows:

Icon	Meaning
⬜ Gray	Powered off or disconnected from the network
🟩 Green	Powered on but no user is logged in
🟧 Orange	A user is logged in
🟥 Red	User is working with the remote console

Note! If the state of one device changes, there may be a delay of some seconds until icon colors reflect the true situation especially where the network link of this device is going down.

To connect to an IP unit:

Click the desired icon on the Home page. The Login page of that IP unit appears.

Figure 39 below illustrates a direct connections link scenario.

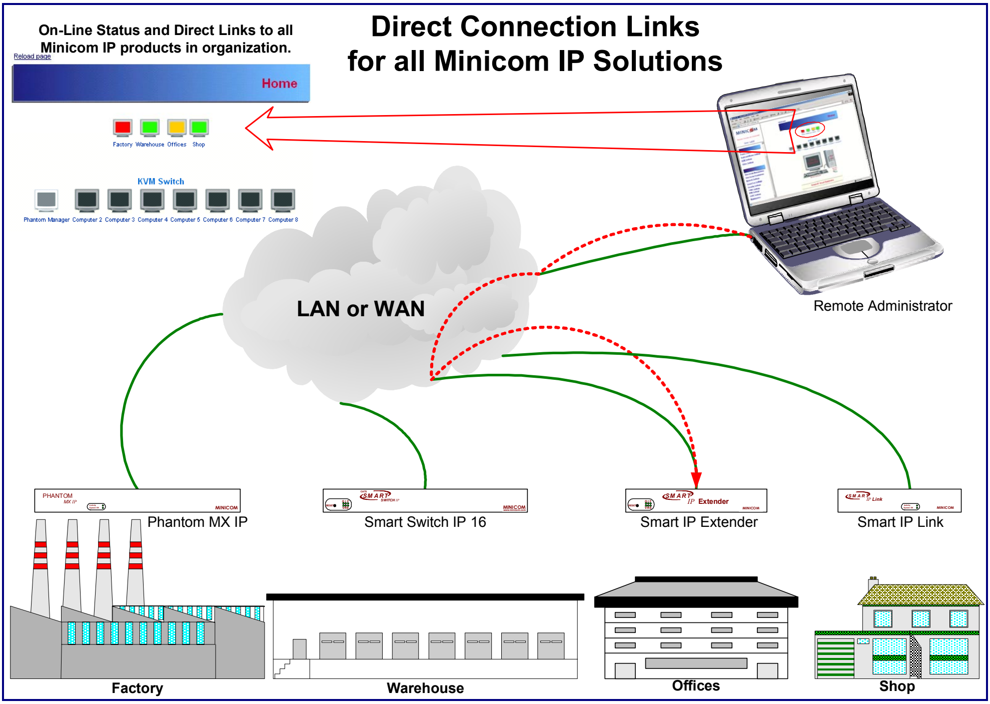


Figure 39 Direct connections link scenario

80. Data file for support

Click the link to access the IP Extender data file. The file contains support information, which will help us to troubleshoot your problem.

81. Include/modify custom HTML code

You can modify the HTML code of the Home page to include customized graphics and text. You can't save graphics on the IP Extender therefore the graphics should be accessible on the Network. Define Primary and secondary DNS in the Network settings if needed.

82. Access via Telnet

Connect via a standard Telnet client using IP Extender's Telnet server. Use it for passthrough access to a device connected to serial port 1. Connect any serial device, which offers terminal access via its serial port and access it using the Telnet interface. Set the serial settings - see page 42 - according to the requirements of the device.

Connect to IP Extender in the usual way required by the Telnet client, e.g. in a UNIX shell: `telnet 192.168.0.220` – (The IP address has been replaced by the one that is actually assigned to IP Extender).

Type a username and password when prompted. These are identical to those of the Web interface. The user management of the Telnet interface is controlled just like the Web interface.

Once logged in, the command line appears to type management commands.

The interface supports both the command line and terminal modes. The command line mode is used to control or display some parameters. In terminal mode the passthrough access to serial port 1 is activated (if the serial settings were made accordingly). All inputs are redirected to the device on serial port 1 and the answers appear on the Telnet interface.

83. Telnet server commands

Click **help** to list the following commands:

cls - Clears screen

quit - Logs out current user and disconnects from the client.

version - Shows all available version numbers

terminal - Starts the terminal passthrough mode for serial port 1. The key sequence `<esc> exit' switches back to command modus.

Frequently Asked Questions

Q 1: The client mouse doesn't work or is not synchronized.

A: Ensure the IP Extender mouse settings match the mouse model. Also see page 23

Q 2: Bad video quality or grainy picture

A: Use the brightness and contrast settings - see page 22. Use the auto adjustment feature to correct a flickering video.

Q 3: Login fails.

A: Was the correct user and password given? On delivery, the user "super" has the password "smart". Configure your browser to accept cookies.

Q 4: I use the Mozilla Browser 0.9.x., Netscape 6.x and https (secure http). When I try to open the Remote Console applet loading fails with Bad Magic Number Exception.

A: This is a bug in some older versions of Mozilla. Don't use https, or upgrade your Browser.

Q 5: The Remote Console window can't connect to IP Extender.

A: Maybe a firewall prevents access to the Remote Console. Ensure the TCP port numbers 443 or 80 are open for incoming TCP connections.

Q 6: Cannot connect to IP Extender.

A: Check if the network connection is working (ping the IP address of IP Extender). If not, check network hardware. Is IP Extender powered on? Check if the IP address of IP Extender and all other IP related settings are correct. Also verify that all the IP infrastructure of your LAN, like routers are correctly configured. Without a ping functioning, IP Extender can't work.

Q 7: Special key combinations, e.g. ALT+F2, ALT+F3 are intercepted by the console system and not transmitted to the host.

A: Define a so-called 'Button Key'. This can be done in the Remote Console settings.

Q 8: In the browser the IP Extender pages are inconsistent or chaotic.

A: Ensure your browser cache settings are feasible, and are not set to something like "never check for newer pages". Otherwise IP Extender pages may be loaded from your browser cache and not from the card.

Q 9: Windows XP doesn't awake from standby mode

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

Glossary of terms

ACPI - A specification that enables the operating system to implement power management and system configuration.

ATX - Advanced Technology Extended: A particular specification of a motherboard introduced by Intel in 1995.

BMC - Board Management Controller: implements the IPMI based main board management functions.

DHCP - Dynamic Host Configuration Protocol: protocol for dynamically assigning IP configurations in local networks.

DNS - Domain Name System: protocol used to locate computers on the Internet by their name.

EMP - Emergency Management Port: provides remote emergency access and control of server resources. EMP offers operating system independent, fundamental remote management access regardless of the server's current state or network availability.

HTTP - Hypertext Transfer Protocol: the protocol used between web browsers and servers.

HTTPS - Hyper Text Transfer Protocol Secure: secure version of HTTP.

IPMI - Intelligent Platform Management Interface

MIB - Management Information Base: describes the structure of the management information that can be accessed via SNMP.

SNMP - Simple Network Management Protocol: a widely used network monitoring and control protocol.

SSL - Secure Socket Layer: encryption technology for the Internet used to provide secured data transmissions.

SVGA - Super VGA: A refinement of Video Graphics Array (VGA) that provides increased pitch and resolution performance.

Appendix A: IP Extender Video modes

The IP Extender supports the following video modes. Do not use other custom video settings.

Resolution	Refresh rates (Hz)
640x350	70, 85
640x400	56, 70, 85
640x480	60, 67, 72, 75, 85, 90, 100, 120
720x400	70, 85
800x600	56, 60, 70, 72, 75, 85, 90, 100
832x624	75
1024x768	60, 70, 72, 75, 85, 90, 100
1152x864	75
1152x870	75
1152x900	66, 76
1280x960	60
1280x1024	60
1280x1024	75
1600x1200	60

Appendix B: Key codes

Figure 40 illustrates the keys on a standard 104 key PC keyboard with a US English language mapping. These keys are used to define keystrokes or hotkeys for several IP Extender functions. The keys may not represent keys used on international keyboards. Most modifier keys and other alphanumeric keys are in identical positions, whichever language mapping you are using.

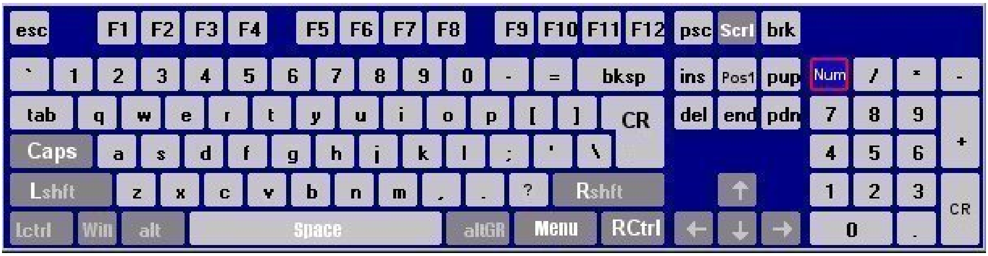


Figure 40 US English keyboard layout

The table below lists keys that that have 2 ways of being written (Alternative) and also keys that are written in a different way to that which appears on the actual keyboard key (Key code).

Key	Key code	Alternative
~	~	TILDE
-	-	MINUS
=	=	EQUALS
<	<	LESS
/	/	SLASH
Bksp	BACK_SPACE	
Tab	TAB	
CR	ENTER	
Caps	CAPS_LOCK	
\	\	BACK_SLASH
Lshft	LSHIFT	SHIFT
Lctrl	LCTRL	CTRL
Win	WINDOWS	
Alt	LALT	ALT
AltGR	ATGR	
Esc	ESCAPE	ESC

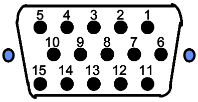
Key	**Key code**	**Alternative**
Psc	PRINTSCREEN	
Scrl	SCROLL_LOCK	
Brk	BREAK	
Ins	INSERT	
Pos1	HOME	
Pup	PAGE_UP	
Del	DELETE	
Pdn	PAGE_DOWN	
↑	UP	
←	LEFT	
↓	DOWN	
→	RIGHT	

The numerical keypad codes

Key	**Key code**	**Alternative**
num	NUM_LOCK	
0	NUMPAD0	
1	NUMPAD1	
2	NUMPAD2	
3	NUMPAD3	
4	NUMPAD4	
5	NUMPAD5	
6	NUMPAD6	
7	NUMPAD7	
8	NUMPAD8	
9	NUMPAD9	
+	NUMPADPLUS	NUMPAD_PLUS
/	NUMPAD/	
*	NUMPADMUL	NUMPAD_MUL
-	NUMPADMINUS	NUMPAD_MINUS
CR	NUMPADENTER	

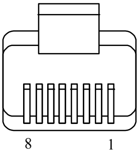
Appendix C: Pin assignments

VGA HD-15



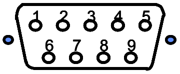
Pin	Assignment	Pin	Assignment
1	Red	9	5 V
2	Green	10	GND sync
3	Blue	11	Not connected
4	Not connected	12	SDA, DCC, ...
5	GND	13	HSYNC
6	GND red	14	VSYNC
7	GND green	15	DATA CLOCK
8	GND blue		

RJ 45 Connector Ethernet



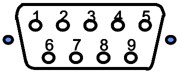
Pin	Assignment	Pin	Assignment
1	TX +	5	Not connected
2	TX -	6	RX -
3	RX +	7	Not connected
4	Not connected	8	Not connected

Serial SUB-D 9 Connector 1



Pin	Assignment	Pin	Assignment
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Serial SUB-D 9 Connector 2



Pin	Assignment	Pin	Assignment
1	DCD	6	DSR, Reset2
2	RX	7	RTS, Power1
3	TX	8	DTS, Power2
4	DTR, Reset1	9	Not connected
5	GND		

Pins 1 and 6 are bridged

Appendix D: Technical specifications

Host computer - Operating systems	Novel, Linux, Windows 98, ME, 2000, XP and later
Client computer - Operating systems	Windows 98, ME, 2000, XP and later, Linux. Internet browser with full Java support
Host computer - resolution	Up to 1600x1200 @60Hz
Client computer - resolution	Recommended resolution should be higher than host computer resolution
Host mouse driver	Microsoft Driver or Operating System default mouse driver.
IP Extender to local KVM connection	Screen – HDD15; Keyboard/Mouse – MiniDIN6
IP Extender to computer /switch connection	3 in 1 CPU cable 1.8m: HD15-MiniDIN6-MiniDIN6 (Supplied with system)
Line connection	RJ45 – LAN, Autosensing 10/100 Mbit/s
Serial connection	2 x DB9: COM1 for initial configuration and external modem, COM2 for power management only
Product weight	1.8 Kg / 3.97 lb
Shipping weight	2.3 Kg / 5.07 lb
Dimensions	21.6 x 27 x 4 cm / 8.5 x 11 x 1.6 inches
Power supply	100 – 240 VAC 50 / 60 Hz
Operating temperature	0°C to 40°C / 32° to 104°F
Storage temperature	-40°C to 70°C / -40° to 158°F
Operating humidity	10% to 90% (non-condensing)
Storage humidity	5% to 95% (non-condensing)
Warranty:	3 years

MINICOM

ADVANCED SYSTEMS