C HAPTER 14
Logs

This chapter contains information about configuring general log settings and viewing the Prestige's logs. Refer to the appendices for example log message explanations.

14.1 View Log

The web configurator allows you to look at all of the Prestige's logs in one location.

Click the **Logs** link under **Maintenance** to open the **View Log** screen.

Log entries in red indicate system error logs. The log wraps around and deletes the old entries after it fills. Click a column heading to sort the entries. A triangle indicates ascending or descending sort order.

Figure 89   View Log

The following table describes the labels in this screen.

Table 59 View Log

LABEL	DESCRIPTION
WAN Type	This shows the encapsulation method (and service type) the Prestige is using and the firmware version.
Display Time	This displays the time this screen was refreshed.
Email Log Now	Click **Email Log Now** to send the log screen to the e-mail address specified in the **Log Settings** page (make sure that you have first filled in the **E-mail Log Settings** fields in **Log Settings**).
Refresh	Click **Refresh** to renew the log screen.
Clear Logs	Click **Clear Logs** to delete all the logs.
Time	This field displays the time the log was recorded. See the chapter on time setting to configure the Prestige's time and date.
Message	This field states the reason for the log.

14.2 Log Settings

You can configure the Prestige's general log settings in one location.

Click the **Logs** link under **Maintenance** in the navigation panel and the **Log Settings** tab to open the **Log Settings** screen.

Use the **Log Settings** screen to configure to where the Prestige is to send logs; the schedule for when the Prestige is to send the logs and which logs and/or immediate alerts the Prestige to send.

An alert is a type of log that warrants more serious attention. They include system errors, attacks (access control) and attempted access to blocked web sites or web sites with restricted web features such as cookies, active X and so on. Some categories such as **System Errors** consist of both logs and alerts. You may differentiate them by their color in the **View Log** screen. Alerts display in red and logs display in black.

Alerts are e-mailed as soon as they happen. Logs may be e-mailed as soon as the log is full. Selecting many alert and/or log categories (especially **Access Control**) may result in many e-mails being sent

Figure 90 Log Settings

The following table describes the labels in this screen.

Table 60 Log Settings

LABEL	DESCRIPTION
E-mail Log Settings	
Mail Server	Enter the server name or the IP address of the mail server for the e-mail addresses specified below. If this field is left blank, logs and alert messages will not be sent via E-mail.
Mail Subject	Type a title that you want to be in the subject line of the log e-mail message that the Prestige sends. Not all Prestige models have this field.
Send Log To	The Prestige sends logs to the e-mail address specified in this field. If this field is left blank, the Prestige does not send logs via e-mail.
SMTP Authentication	SMTP (Simple Mail Transfer Protocol) is the message-exchange standard for the Internet. SMTP enables you to move messages from one e-mail server to another.
	Select the check box to activate SMTP authentication. If mail server authentication is needed but this feature is disabled, you will not receive the e-mail logs.

Table 60 Log Settings (continued)

LABEL	DESCRIPTION
User Name	Enter the user name (up to 31 characters) (usually the user name of a mail account).
Password	Enter the password associated with the user name above.
Syslog Logging	The Prestige sends a log to an external syslog server.
Active	Click **Active** to enable syslog logging.
Syslog Server IP Address	Enter the server name or IP address of the syslog server that will log the selected categories of logs.
Log Facility	Select a location from the drop down list box. The log facility allows you to log the messages to different files in the syslog server. Refer to the syslog server manual for more information.
Active Log and Alert	
Log	Select the categories of logs that you want to record.
Send Immediate Alert	Select log categories for which you want the Prestige to send E-mail alerts immediately.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

CHAPTER 15
Tools

This chapter shows you how to upload a new firmware, upload or save backup configuration files and restart the Prestige.

15.1 Firmware Upload Screen

Find firmware at www.zyxel.com in a file that (usually) uses the system model name with a .bin extension, for example, "Prestige.bin". The upload process uses HTTP (Hypertext Transfer Protocol) and may take up to two minutes. After a successful upload, the system will reboot.

Click the **Tools** link under **Maintenance** in the navigation panel. Follow the instructions in this screen to upload firmware to your Prestige.

Figure 91   Maintenance Firmware Upload

The following table describes the labels in this screen.

Table 61   Maintenance Firmware Upload

LABEL	DESCRIPTION
File Path	Type in the location of the file you want to upload in this field or click **Browse ...** to find it.
Browse...	Click **Browse...** to find the .bin file you want to upload. Remember that you must decompress compressed (.zip) files before you can upload them.
Upgrade	Click **Upgrade** to begin the upload process. This process may take up to two minutes.

Note: Do not turn off the Prestige while firmware upload is in progress!
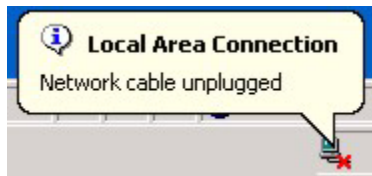
After you see the **Firmware Upload In Process** screen, wait two minutes before logging into the Prestige again.

Figure 92 Upload Warning

The Prestige automatically restarts in this time causing a temporary network disconnect. In some operating systems, you may see the following icon on your desktop.

Figure 93 Network Temporarily Disconnected

After two minutes, log in again and check your new firmware version in the **Status** screen.

If the upload was not successful, the following screen will appear. Click **Return** to go back to the **Firmware** screen.

Figure 94 Upload Error Message

15.2 Configuration Screen

See the Firmware and Configuration File Maintenance chapter for transferring configuration files using FTP/TFTP commands.

Click the **Tools** link under **Maintenance**, and the **Configuration** tab. Information related to factory defaults, backup configuration, and restoring configuration appears as shown next.

Figure 95   Configuration

15.2.1 Backup Configuration

Backup configuration allows you to back up (save) the Prestige's current configuration to a file on your computer. Once your Prestige is configured and functioning properly, it is highly recommended that you back up your configuration file before making configuration changes. The backup configuration file will be useful in case you need to return to your previous settings.

Click **Backup** to save the Prestige's current configuration to your computer

15.2.2 Restore Configuration

Restore configuration allows you to upload a new or previously saved configuration file from your computer to your Prestige.

Table 62   Maintenance: Restore Configuration

LABEL	DESCRIPTION
File Path	Type in the location of the file you want to upload in this field or click **Browse ...** to find it.
Browse...	Click **Browse...** to find the file you want to upload. Remember that you must decompress compressed (.ZIP) files before you can upload them.
Upgrade	Click **Upgrade** to begin the upload process.

Note: Do not turn off the Prestige while configuration file upload is in progress

After you see a "Upgrade Successful" screen, you must then wait one minute before logging into the Prestige again.

Figure 96 Configuration Restore Successful
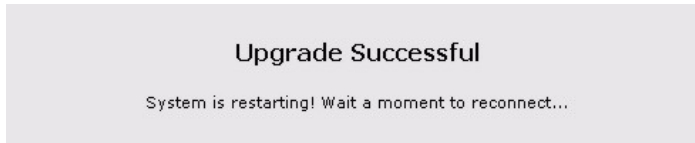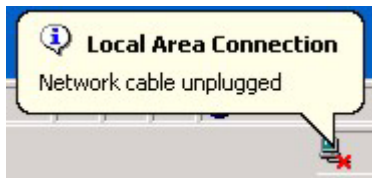
Upgrade Successful

System is restarting! Wait a moment to reconnect...

The Prestige automatically restarts in this time causing a temporary network disconnect. In some operating systems, you may see the following icon on your desktop.

Figure 97 Temporarily Disconnected

ⓘ Local Area Connection
Network cable unplugged

If you uploaded the default configuration file you may need to change the IP address of your computer to be in the same subnet as that of the default Prestige IP address (192.168.1.1). See the appendix for details on how to set up your computer's IP address.

If the upload was not successful, the following screen will appear.

Figure 98 Configuration Restore Error

Status: A file system error was detected: disk full
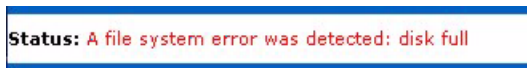
15.2.3 Back to Factory Defaults

Pressing the **Restart** button in this section clears all user-entered configuration information and returns the Prestige to its factory defaults.

You can also press the **RESET** button on the rear panel to reset the factory defaults of your Prestige. Refer to for more information on the **RESET** button.

15.3 Restart Screen

System restart allows you to reboot the Prestige without turning the power off.

Click the Tools link under **Maintenance**, and the **Restart** tab. Click **Restart** to have the Prestige reboot. This does not affect the Prestige's configuration.

Figure 99 System Restart
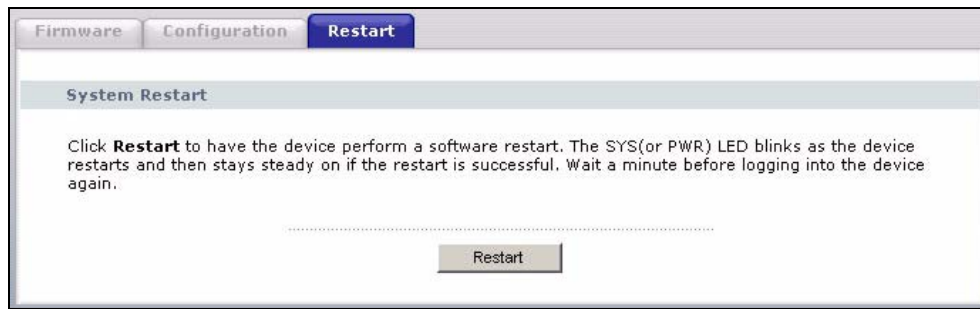
CHAPTER 16
Troubleshooting

This chapter covers potential problems and the corresponding remedies.

16.1 Problems Starting Up the Prestige

Table 63   Troubleshooting Starting Up Your Prestige

PROBLEM	CORRECTIVE ACTION
None of the LEDs turn on when I turn on the Prestige.	Make sure that the Prestige's power adaptor is connected to the Prestige and plugged in to an appropriate power source. Make sure that the Prestige and the power source are both turned on.
	Turn the Prestige off and on.
	If the error persists, you may have a hardware problem. In this case, you should contact your vendor.

16.2 Problems with the LAN

Table 64   Troubleshooting the LAN

PROBLEM	CORRECTIVE ACTION
The LAN LEDs do not turn on.	Check your Ethernet cable connections (refer to the Quick Start Guide for details). Check for faulty Ethernet cables.
	Make sure your computer's Ethernet Card is working properly.
I cannot access the Prestige from the LAN.	If **Any IP** is disabled, make sure that the IP address and the subnet mask of the Prestige and your computer(s) are on the same subnet.

16.3 Problems with the WAN

Table 65 Troubleshooting the WAN

PROBLEM	CORRECTIVE ACTION
The WAN LED is off.	Check the connections between the Prestige WAN port and the cable/DSL modem or ethernet jack.
	Check whether your cable/DSL device requires a crossover or straight-through cable.
I cannot get a WAN IP address from the ISP.	Click WAN to verify your settings.
	The username and password apply to PPPoE and PPPoA encapsulation only. Make sure that you have entered the correct **Service Type**, **User Name** and **Password** (be sure to use the correct casing). Refer to the WAN Setup chapter.
I cannot access the Internet.	Make sure the Prestige is turned on and connected to the network.
	Verify your WAN settings. Refer to the chapter on WAN setup.
	Make sure you entered the correct user name and password.
	If you use PPPoE pass through, make sure that bridge mode is turned on.
The Internet connection disconnects.	If you use PPPoE encapsulation, check the idle time-out setting. Refer to the Chapter 5 on page 81.

16.4 Problems with the Password

Table 66 Troubleshooting the Password

PROBLEM	CORRECTIVE ACTION
Cannot access the Prestige.	The password field is case sensitive. Make sure that you enter the correct password using the proper casing.
	Use the **RESET** button to restore the factory default configuration file. This will restore all of the factory defaults including the password; see Section 2.3 on page 37 for details.

16.5 Problems with Remote Management

Table 67   Troubleshooting Telnet

PROBLEM	CORRECTIVE ACTION
Cannot access the Prestige from the LAN or WAN.	Refer to Section 11.1.1 on page 119 for scenarios when remote management may not be possible.
	When NAT is enabled: • Use the Prestige's WAN IP address when configuring from the WAN. • Use the Prestige's LAN IP address when configuring from the LAN.

16.6 Problems Accessing the Prestige

Table 68   Troubleshooting Accessing the Prestige

PROBLEM	CORRECTIVE ACTION
I cannot access the Prestige.	The username is "admin". The default password is "1234". The **Password** and **Username** fields are case-sensitive. Make sure that you enter the correct password and username using the proper casing.
	If you have changed the password and have now forgotten it, you will need to upload the default configuration file. This restores all of the factory defaults including the password.
I cannot access the web configurator.	Use the Prestige's WAN IP address when configuring from the WAN. Refer to the instructions on checking your WAN connection.
	Use the Prestige's LAN IP address when configuring from the LAN. Refer to for instructions on checking your LAN connection.
	Check that you have enabled web service access. If you have configured a secured client IP address, your computer's IP address must match it. Refer to the chapter on remote management for details.
	Your computer's and the Prestige's IP addresses must be on the same subnet for LAN access.
	If you changed the Prestige's LAN IP address, then enter the new one as the URL.
	See the following section to check that pop-up windows, JavaScripts and Java permissions are allowed.
	You may also need to clear your Internet browser's cache. In Internet Explorer, click **Tools** and then **Internet Options** to open the **Internet Option**s screen.
	In the **General** tab, click **Delete Files**. In the pop-up window, select the **Delete all offline content** check box and click **OK**. Click **OK** in the **Internet Options** screen to close it.
	If you disconnect your computer from one device and connect it to another device that has the same IP address, your computer's ARP (Address Resolution Protocol) table may contain an entry that maps the management IP address to the previous device's MAC address).
	In Windows, use **arp -d** at the command prompt to delete all entries in your computer's ARP table.

16.6.1 Pop-up Windows, JavaScripts and Java Permissions

In order to use the web configurator you need to allow:

- Web browser pop-up windows from your device.
- JavaScripts (enabled by default).
- Java permissions (enabled by default).

Note: Internet Explorer 6 screens are used here. Screens for other Internet Explorer versions may vary.
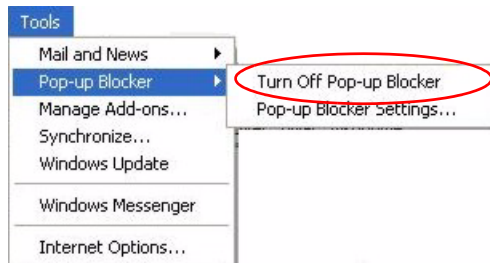
16.6.1.1 Internet Explorer Pop-up Blockers

You may have to disable pop-up blocking to log into your device.

Either disable pop-up blocking (enabled by default in Windows XP SP (Service Pack) 2) or allow pop-up blocking and create an exception for your device's IP address.
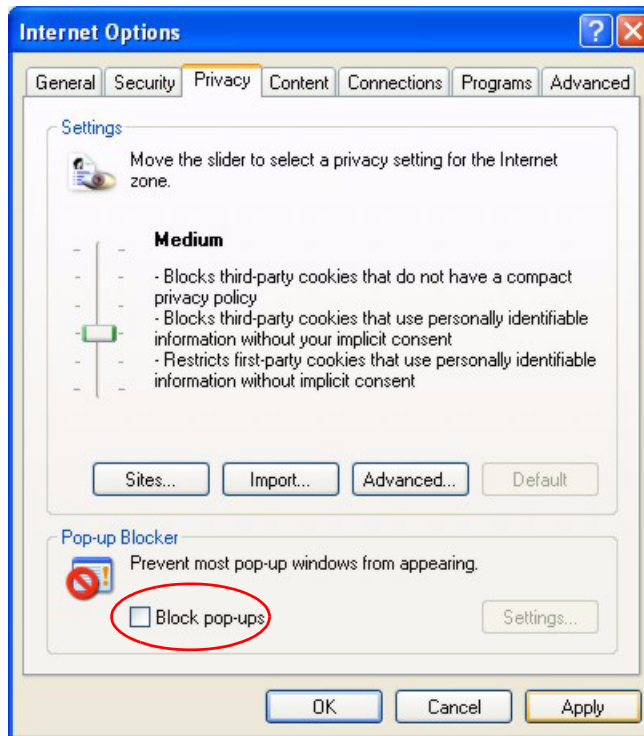
16.6.1.1.1 Disable pop-up Blockers

1 In Internet Explorer, select **Tools**, **Pop-up Blocker** and then select **Turn Off Pop-up Blocker**.

Figure 100   Pop-up Blocker

You can also check if pop-up blocking is disabled in the **Pop-up Blocker** section in the **Privacy** tab.

1 In Internet Explorer, select **Tools**, **Internet Options**, **Privacy**.

2 Clear the **Block pop-ups** check box in the **Pop-up Blocker** section of the screen. This disables any web pop-up blockers you may have enabled.

**Figure 101**   Internet Options

3 Click **Apply** to save this setting.

16.6.1.1.2 Enable pop-up Blockers with Exceptions

Alternatively, if you only want to allow pop-up windows from your device, see the following steps.

1 In Internet Explorer, select **Tools**, **Internet Options** and then the **Privacy** tab.

2 Select **Settings…**to open the **Pop-up Blocker Settings** screen.

Figure 102 Internet Options
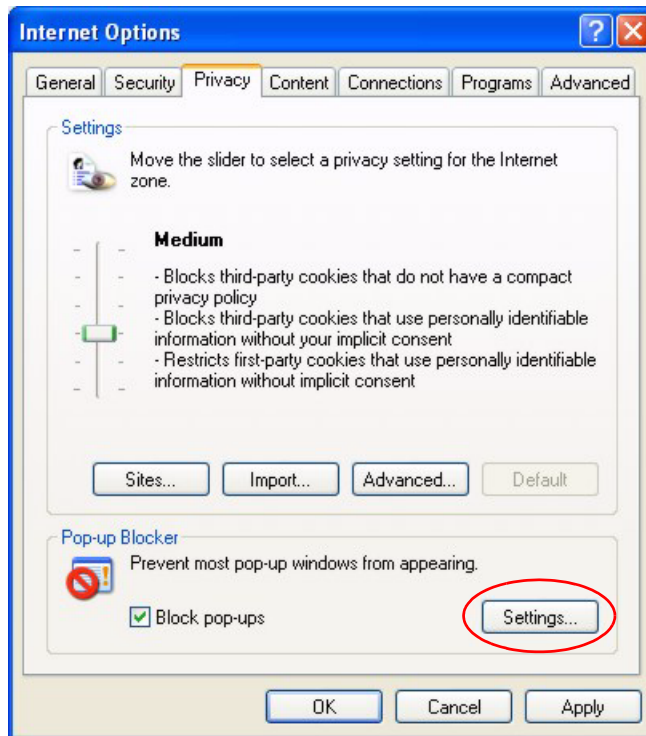
3 Type the IP address of your device (the web page that you do not want to have blocked) with the prefix "http://". For example, http://192.168.1.1.

4 Click **Add** to move the IP address to the list of **Allowed sites**.

Note: If you change the IP address of your device, make sure that the new address matches the address you type in the **Pop-up Blocker Settings** screen.

Figure 103 Pop-up Blocker Settings
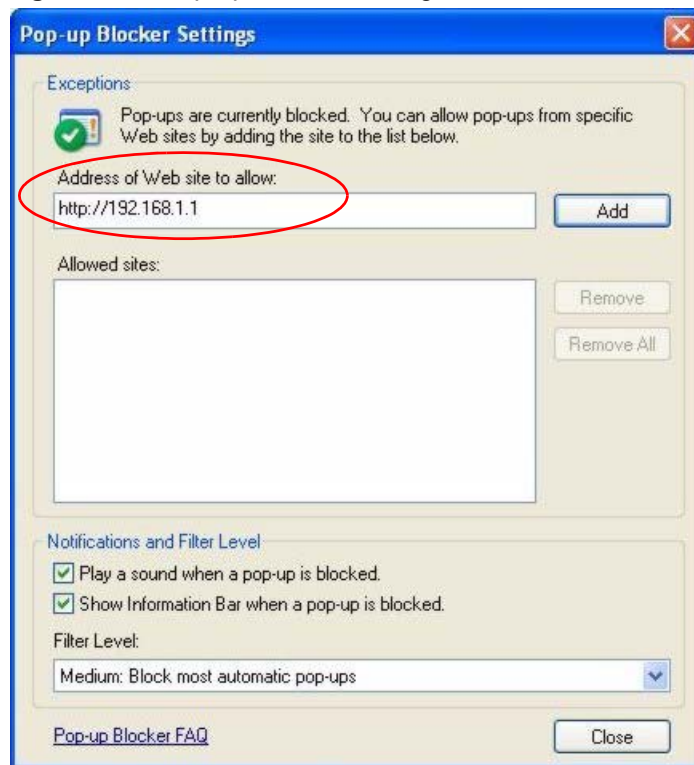
5 Click **Close** to return to the **Privacy** screen.

6 Click **Apply** to save this setting.

16.6.1.2 JavaScripts

If pages of the web configurator do not display properly in Internet Explorer, check that JavaScripts are allowed.

1 In Internet Explorer, click **Tools**, **Internet Options** and then the **Security** tab.

Figure 104   Internet Options
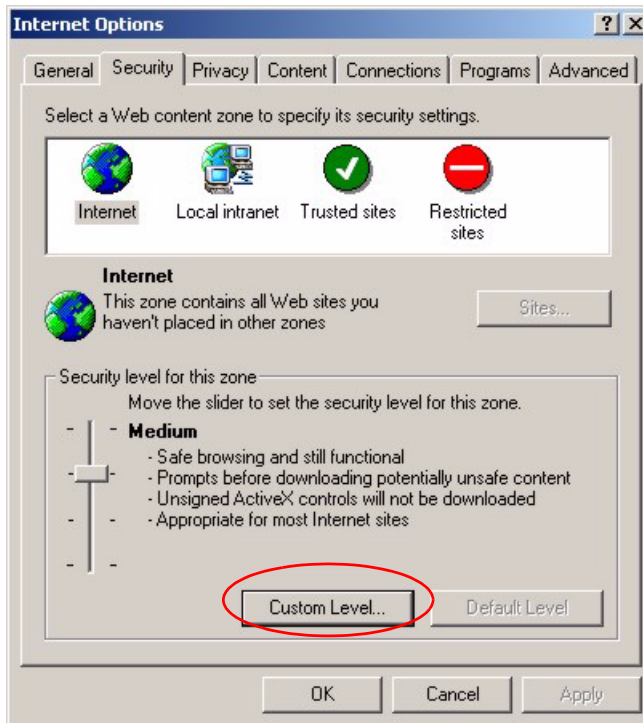
2   Click the **Custom Level...** button.

3   Scroll down to **Scripting**.

4   Under **Active scripting** make sure that **Enable** is selected (the default).

5   Under **Scripting of Java applets** make sure that **Enable** is selected (the default).

6   Click **OK** to close the window.

Figure 105 Security Settings - Java Scripting
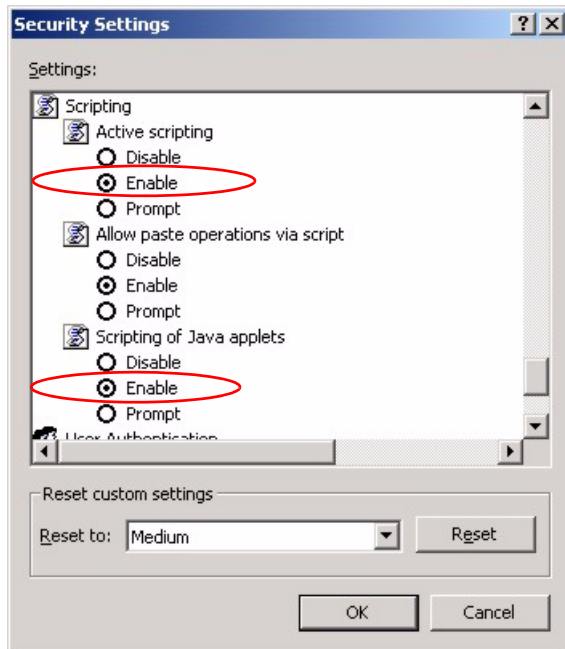
16.6.1.3 Java Permissions

1 From Internet Explorer, click **Tools**, **Internet Options** and then the **Security** tab.

2 Click the **Custom Level...** button.

3 Scroll down to **Microsoft VM**.

4 Under **Java permissions** make sure that a safety level is selected.

5 Click **OK** to close the window.

Figure 106 Security Settings - Java
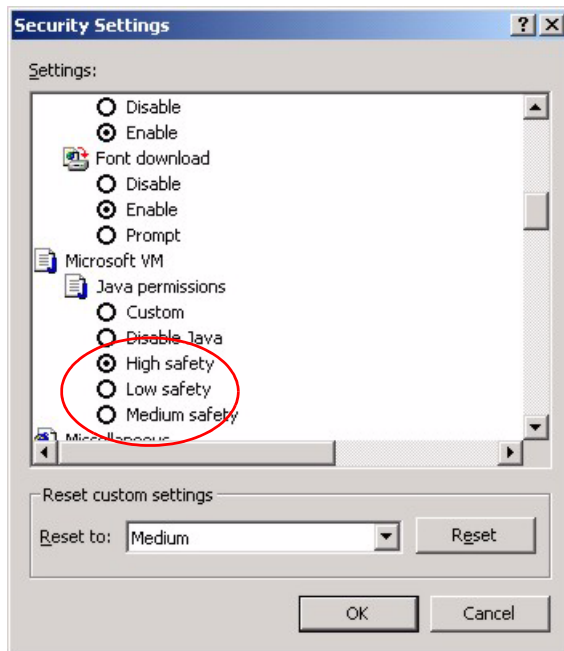
16.6.1.3.1 JAVA (Sun)

1 From Internet Explorer, click **Tools**, **Internet Options** and then the **Advanced** tab.

2 Make sure that **Use Java 2 for <applet>** under **Java (Sun)** is selected.

3 Click **OK** to close the window.

Figure 107 Java (Sun)
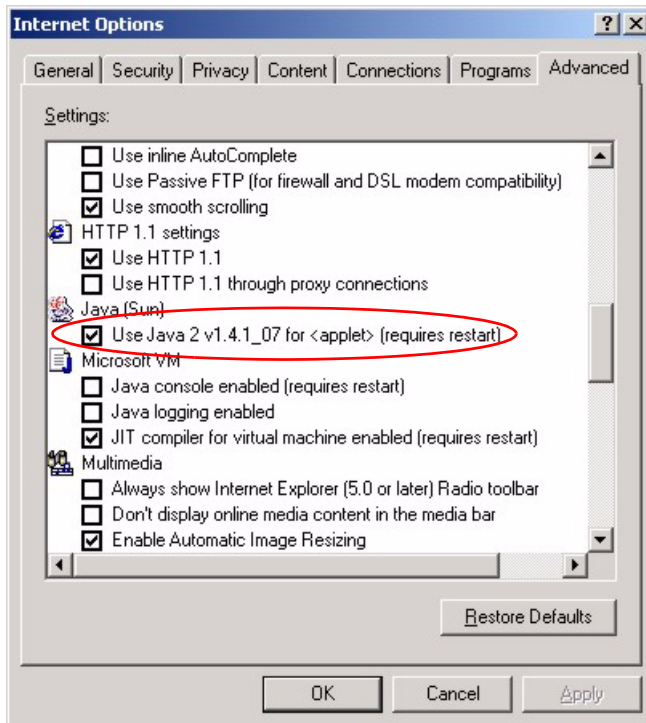
16.6.2 ActiveX Controls in Internet Explorer

If ActiveX is disabled, you will not be able to download ActiveX controls or to use Trend Micro Security Serivces. Make sure that ActiveX controls are allowed in Internet Explorer.

Screen shots for Internet Explorer 6 are shown. Steps may vary depending on your version of Internet Explorer.

1 In Internet Explorer, click **Tools**, **Internet Options** and then the **Security** tab.

2 In the **Internet Options** window, click **Custom Level**.

Figure 108   Internet Options Security
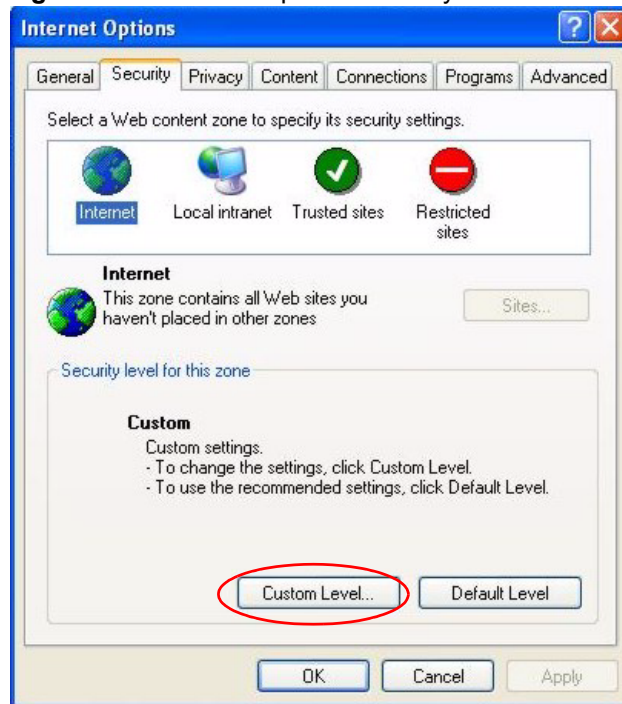
3 Scroll down to **ActiveX controls and plug-ins**.

4 Under **Download signed ActiveX controls** select the **Prompt** radio button.

5 Under **Run ActiveX controls and plug-ins** make sure the **Enable** radio button is selected.

6 Then click the **OK** button.

Figure 109 Security Setting ActiveX Controls
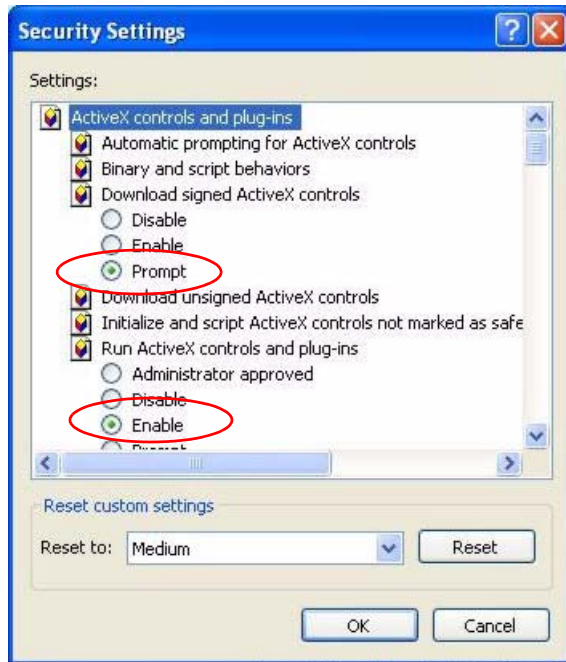
APPENDIX A

Product Specifications

See also the Introduction chapter for a general overview of the key features.

Specification Tables

Table 69   Device

Default IP Address	192.168.1.1
Default Subnet Mask	255.255.255.0 (24 bits)
Default Password	1234
DHCP Pool	192.168.1.32 to 192.168.1.64
Dimensions	(181 W) x (128 D) x (36 H) mm
Weight	424g
Power Specification	12VAC
Built-in Switch	Four auto-negotiating, auto MDI/MDI-X 10/100/1000 Mbps RJ-45 Ethernet ports
Operation Temperature	0º C ~ 65º C
Storage Temperature	-20º ~ 60º C
Operation Humidity	15% ~ 90% RH
Storage Humidity	10% ~ 90% RH

Table 70   Firmware

Standards	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet TCP, UDP, ICMP, ARP, RIP - 1/RIP - 2 IP Routing (RFC 791) PPP over Ethernet (RFC 2516) MAC encapsulated routing (ENET encapsulation)
Other Protocol Support	PPP (Point-to-Point Protocol) link layer protocol. DHCP Server (RFC 2131, 2132) RIP I/RIP II ICMP SNMP v1 and v2c with MIB II support (RFC 1213) UPnP
Management	Embedded Web Configurator Remote Management via Web SNMP manageable Configuration backup and restoration. Built-in Diagnostic Tools for FLASH memory, RAM and LAN port Syslog

Table 70 Firmware (continued)

Wireless	IEEE 802.11g Compliance
	Frequency Range: 2.4 GHz
	Advanced Orthogonal Frequency Division Multiplexing (OFDM)
	Data Rates: 54Mbps and Auto Fallback
	Wired Equivalent Privacy (WEP) Data Encryption 64/128/256 bit.
	WLAN bridge to LAN
	Up to 32 MAC Address filters
	WPA, WPA-PSK
	OTIST (One Touch Intelligent Security Technology)
	IEEE 802.1x
	External Radius server using EAP-MD5, TLS, TTLS
Firewall	Stateful Packet Inspection.
	Prevent Denial of Service attacks such as Fraggle, SYN Flood, Land attack, Smurf etc.
	Real time E-mail alerts
	Reports and logs
NAT/SUA	Port Forwarding
	4096 NAT sessions
	Multimedia application
	PPTP under NAT/SUA
	IPSec passthrough
	SIP ALG passthrough
	Cone NAT (Port-restricted NAT)
Static Routes	8 IP
Other Features	Traffic Redirect
	Dynamic DNS
	SMTP Authentication

APPENDIX B
IP Subnetting

IP Addressing

Routers "route" based on the network number. The router that delivers the data packet to the correct destination host uses the host ID.

IP Classes

An IP address is made up of four octets (eight bits), written in dotted decimal notation, for example, 192.168.1.1. IP addresses are categorized into different classes. The class of an address depends on the value of its first octet.

- Class "A" addresses have a 0 in the left most bit. In a class "A" address the first octet is the network number and the remaining three octets make up the host ID.
- Class "B" addresses have a 1 in the left most bit and a 0 in the next left most bit. In a class "B" address the first two octets make up the network number and the two remaining octets make up the host ID.
- Class "C" addresses begin (starting from the left) with 1 1 0. In a class "C" address the first three octets make up the network number and the last octet is the host ID.
- Class "D" addresses begin with 1 1 1 0. Class "D" addresses are used for multicasting. (There is also a class "E" address. It is reserved for future use.)

Table 71   Classes of IP Addresses

			OCTET 2	OCTET 3	OCTET 4
Class A	0	Network number	Host ID	Host ID	Host ID
Class B	10	Network number	Network number	Host ID	Host ID
Class C	110	Network number	Network number	Network number	Host ID

Note: Host IDs of all zeros or all ones are not allowed.

Therefore:

A class "C" network (8 host bits) can have 2^8 –2 or 254 hosts.

A class "B" address (16 host bits) can have 2^{16} –2 or 65534 hosts.

A class "A" address (24 host bits) can have 2^{24} –2 hosts (approximately 16 million hosts).

Since the first octet of a class "A" IP address must contain a "0", the first octet of a class "A" address can have a value of 0 to 127.

Similarly the first octet of a class "B" must begin with "10", therefore the first octet of a class "B" address has a valid range of 128 to 191. The first octet of a class "C" address begins with "110", and therefore has a range of 192 to 223.

Table 72   Allowed IP Address Range By Class

	ALLOWED RANGE OF FIRST OCTET (BINARY)	ALLOWED RANGE OF FIRST OCTET (DECIMAL)
Class A	**0**0000000 to **0**1111111	0 to 127
Class B	**10**000000 to **10**111111	128 to 191
Class C	**110**00000 to **110**11111	192 to 223
Class D	**1110**0000 to **1110**1111	224 to 239

Subnet Masks

A subnet mask is used to determine which bits are part of the network number, and which bits are part of the host ID (using a logical AND operation). A subnet mask has 32 is a "1" then the corresponding bit in the IP address is part of the network number. If a bit in the subnet mask is "0" then the corresponding bit in the IP address is part of the host ID.

Subnet masks are expressed in dotted decimal notation just as IP addresses are. The "natural" masks for class A, B and C IP addresses are as follows.

Table 73   "Natural" Masks

	NATURAL MASK
A	255.0.0.0
B	255.255.0.0
C	255.255.255.0

Subnetting

With subnetting, the class arrangement of an IP address is ignored. For example, a class C address no longer has to have 24 bits of network number and 8 bits of host ID. With subnetting, some of the host ID bits are converted into network number bits. By convention, subnet masks always consist of a continuous sequence of ones beginning from the left most bit of the mask, followed by a continuous sequence of zeros, for a total number of 32 bits.

Since the mask is always a continuous number of ones beginning from the left, followed by a continuous number of zeros for the remainder of the 32 bit mask, you can simply specify the number of ones instead of writing the value of each octet. This is usually specified by writing a "/" followed by the number of bits in the mask after the address.

For example, 192.1.1.0 /25 is equivalent to saying 192.1.1.0 with mask 255.255.255.128.

The following table shows all possible subnet masks for a class "C" address using both notations.

Table 74   Alternative Subnet Mask Notation

	SUBNET MASK "1" BITS	LAST OCTET BIT VALUE
255.255.255.0	/24	0000 0000
255.255.255.128	/25	1000 0000
255.255.255.192	/26	1100 0000
255.255.255.224	/27	1110 0000
255.255.255.240	/28	1111 0000
255.255.255.248	/29	1111 1000
255.255.255.252	/30	1111 1100

The first mask shown is the class "C" natural mask. Normally if no mask is specified it is understood that the natural mask is being used.

Example: Two Subnets

As an example, you have a class "C" address 192.168.1.0 with subnet mask of 255.255.255.0.

Table 75   Two Subnets Example

		HOST ID
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	00000000
Subnet Mask	255.255.255.	0
Subnet Mask (Binary)	11111111.11111111.11111111.	00000000

The first three octets of the address make up the network number (class "C"). You want to have two separate networks.

Divide the network 192.168.1.0 into two separate subnets by converting one of the host ID bits of the IP address to a network number bit. The "borrowed" host ID bit can be either "0" or "1" thus giving two subnets; 192.168.1.0 with mask 255.255.255.128 and 192.168.1.128 with mask 255.255.255.128.

Note: In the following charts, shaded/bolded last octet bit values indicate host ID bits "borrowed" to form network ID bits. The number of "borrowed" host ID bits determines the number of subnets you can have. The remaining number of host ID bits (after "borrowing") determines the number of hosts you can have on each subnet.

Table 76   Subnet 1

		LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	**0**0000000
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	**1**0000000
Subnet Address: 192.168.1.0	Lowest Host ID: 192.168.1.1	
Broadcast Address: 192.168.1.127	Highest Host ID: 192.168.1.126	

Table 77   Subnet 2

		LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	**1**0000000
Subnet Mask	255.255.255.	128
Subnet Mask (Binary)	11111111.11111111.11111111.	**1**0000000
Subnet Address: 192.168.1.128	Lowest Host ID: 192.168.1.129	
Broadcast Address: 192.168.1.255	Highest Host ID: 192.168.1.254	

The remaining 7 bits determine the number of hosts each subnet can have. Host IDs of all zeros represent the subnet itself and host IDs of all ones are the broadcast address for that subnet, so the actual number of hosts available on each subnet in the example above is $2^7 - 2$ or 126 hosts for each subnet.

192.168.1.0 with mask 255.255.255.128 is the subnet itself, and 192.168.1.127 with mask 255.255.255.128 is the directed broadcast address for the first subnet. Therefore, the lowest IP address that can be assigned to an actual host for the first subnet is 192.168.1.1 and the highest is 192.168.1.126. Similarly the host ID range for the second subnet is 192.168.1.129 to 192.168.1.254.

Example: Four Subnets

The above example illustrated using a 25-bit subnet mask to divide a class "C" address space into two subnets. Similarly to divide a class "C" address into four subnets, you need to "borrow" two host ID bits to give four possible combinations of 00, 01, 10 and 11. The subnet mask is 26 bits (11111111.11111111.11111111.**11**000000) or 255.255.255.192. Each subnet contains 6 host ID bits, giving 2^6-2 or 62 hosts for each subnet (all 0's is the subnet itself, all 1's is the broadcast address on the subnet).

Table 78   Subnet 1

		LAST OCTET BIT VALUE
IP Address	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	**00**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.0	Lowest Host ID: 192.168.1.1	
Broadcast Address: 192.168.1.63	Highest Host ID: 192.168.1.62	

Table 79   Subnet 2

		LAST OCTET BIT VALUE
IP Address	192.168.1.	64
IP Address (Binary)	11000000.10101000.00000001.	**01**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.64	Lowest Host ID: 192.168.1.65	
Broadcast Address: 192.168.1.127	Highest Host ID: 192.168.1.126	

Table 80   Subnet 3

		LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	**10**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.128	Lowest Host ID: 192.168.1.129	
Broadcast Address: 192.168.1.191	Highest Host ID: 192.168.1.190	

Table 81   Subnet 4

		LAST OCTET BIT VALUE
IP Address	192.168.1.	192
IP Address (Binary)	11000000.10101000.00000001.	**11**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.192	Lowest Host ID: 192.168.1.193	
Broadcast Address: 192.168.1.255	Highest Host ID: 192.168.1.254	

Example Eight Subnets

Similarly use a 27-bit mask to create 8 subnets (001, 010, 011, 100, 101, 110).

The following table shows class C IP address last octet values for each subnet.

Table 82   Eight Subnets

	SUBNET ADDRESS	FIRST ADDRESS	LAST ADDRESS	BROADCAST ADDRESS
1	0	1	30	31
2	32	33	62	63
3	64	65	94	95
4	96	97	126	127
5	128	129	158	159
6	160	161	190	191
7	192	193	222	223
8	224	225	254	255

The following table is a summary for class "C" subnet planning.

Table 83   Class C Subnet Planning

	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
1	255.255.255.128 (/25)	2	126
2	255.255.255.192 (/26)	4	62
3	255.255.255.224 (/27)	8	30
4	255.255.255.240 (/28)	16	14
5	255.255.255.248 (/29)	32	6
6	255.255.255.252 (/30)	64	2
7	255.255.255.254 (/31)	128	1

Subnetting With Class A and Class B Networks.

For class "A" and class "B" addresses the subnet mask also determines which bits are part of the network number and which are part of the host ID.

A class "B" address has two host ID octets available for subnetting and a class "A" address has three host ID octets (see Table 71 on page 165) available for subnetting.

The following table is a summary for class "B" subnet planning.

Table 84 Class B Subnet Planning

	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
1	255.255.128.0 (/17)	2	32766
2	255.255.192.0 (/18)	4	16382
3	255.255.224.0 (/19)	8	8190
4	255.255.240.0 (/20)	16	4094
5	255.255.248.0 (/21)	32	2046
6	255.255.252.0 (/22)	64	1022
7	255.255.254.0 (/23)	128	510
8	255.255.255.0 (/24)	256	254
9	255.255.255.128 (/25)	512	126
10	255.255.255.192 (/26)	1024	62
11	255.255.255.224 (/27)	2048	30
12	255.255.255.240 (/28)	4096	14
13	255.255.255.248 (/29)	8192	6
14	255.255.255.252 (/30)	16384	2
15	255.255.255.254 (/31)	32768	1

APPENDIX C

Setting up Your Computer's IP Address

All computers must have a 10M or 100M Ethernet adapter card and TCP/IP installed.

Windows 95/98/Me/NT/2000/XP, Macintosh OS 7 and later operating systems and all versions of UNIX/LINUX include the software components you need to install and use TCP/IP on your computer. Windows 3.1 requires the purchase of a third-party TCP/IP application package.

TCP/IP should already be installed on computers using Windows NT/2000/XP, Macintosh OS 7 and later operating systems.

After the appropriate TCP/IP components are installed, configure the TCP/IP settings in order to "communicate" with your network.

If you manually assign IP information instead of using dynamic assignment, make sure that your computers have IP addresses that place them in the same subnet as the Prestige's LAN port.

Windows 95/98/Me

Click **Start**, **Settings**, **Control Panel** and double-click the **Network** icon to open the **Network** window.

Figure 110 WIndows 95/98/Me: Network: Configuration
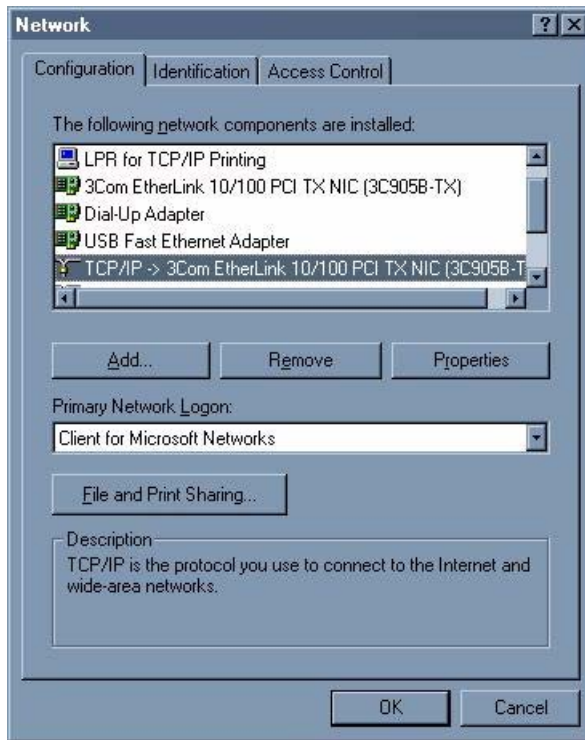
Installing Components

The **Network** window **Configuration** tab displays a list of installed components. You need a network adapter, the TCP/IP protocol and Client for Microsoft Networks.

If you need the adapter:

1 In the **Network** window, click **Add**.

2 Select **Adapter** and then click **Add**.

3 Select the manufacturer and model of your network adapter and then click **OK**.

If you need TCP/IP:

1 In the **Network** window, click **Add**.

2 Select **Protocol** and then click **Add**.

3 Select **Microsoft** from the list of **manufacturers**.

4 Select **TCP/IP** from the list of network protocols and then click **OK**.

If you need Client for Microsoft Networks:

1 Click **Add**.

2 Select **Client** and then click **Add**.

3 Select **Microsoft** from the list of manufacturers.

4 Select **Client for Microsoft Networks** from the list of network clients and then click **OK**.

**5** Restart your computer so the changes you made take effect.

Configuring

1 In the **Network** window **Configuration** tab, select your network adapter's TCP/IP entry and click **Properties**

2 Click the **IP Address** tab.

- If your IP address is dynamic, select **Obtain an IP address automatically**.
- If you have a static IP address, select **Specify an IP address** and type your information into the **IP Address** and **Subnet Mask** fields.

Figure 111 Windows 95/98/Me: TCP/IP Properties: IP Address
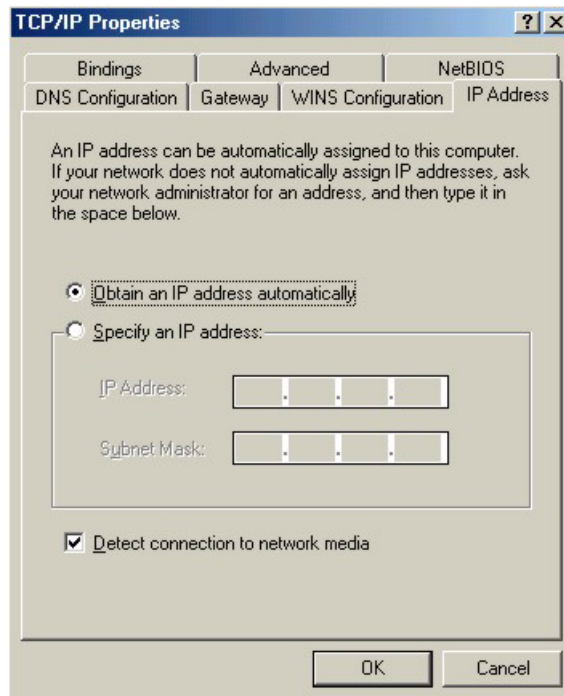
3 Click the **DNS** Configuration tab.

- If you do not know your DNS information, select **Disable DNS**.
- If you know your DNS information, select **Enable DNS** and type the information in the fields below (you may not need to fill them all in).

Figure 112 Windows 95/98/Me: TCP/IP Properties: DNS Configuration
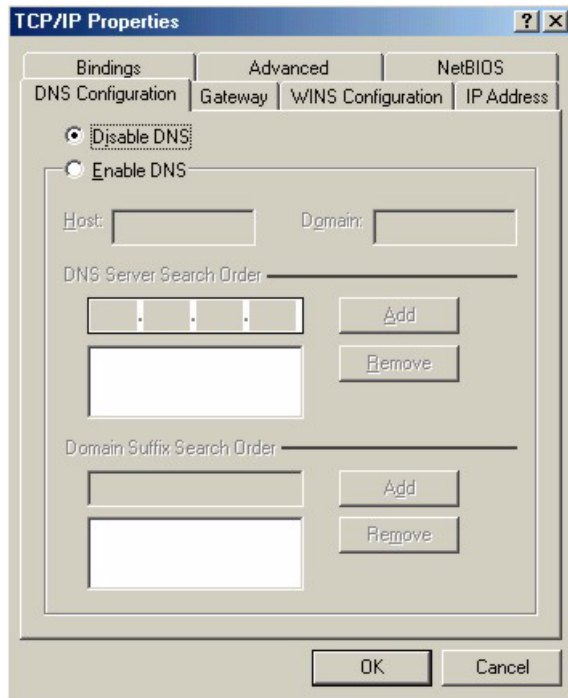
4 Click the **Gateway** tab.

- If you do not know your gateway's IP address, remove previously installed gateways.
- If you have a gateway IP address, type it in the **New gateway field** and click **Add**.

5 Click **OK** to save and close the **TCP/IP Properties** window.

6 Click **OK** to close the **Network** window. Insert the Windows CD if prompted.

7 Turn on your Prestige and restart your computer when prompted.

Verifying Settings

1 Click **Start** and then **Run**.

2 In the **Run** window, type "winipcfg" and then click **OK** to open the **IP Configuration** window.

**3** Select your network adapter. You should see your computer's IP address, subnet mask and default gateway.

Windows 2000/NT/XP

The following example figures use the default Windows XP GUI theme.

1 Click **start** (**Start** in Windows 2000/NT), **Settings**, **Control Panel**.

**Figure 113** Windows XP: Start Menu
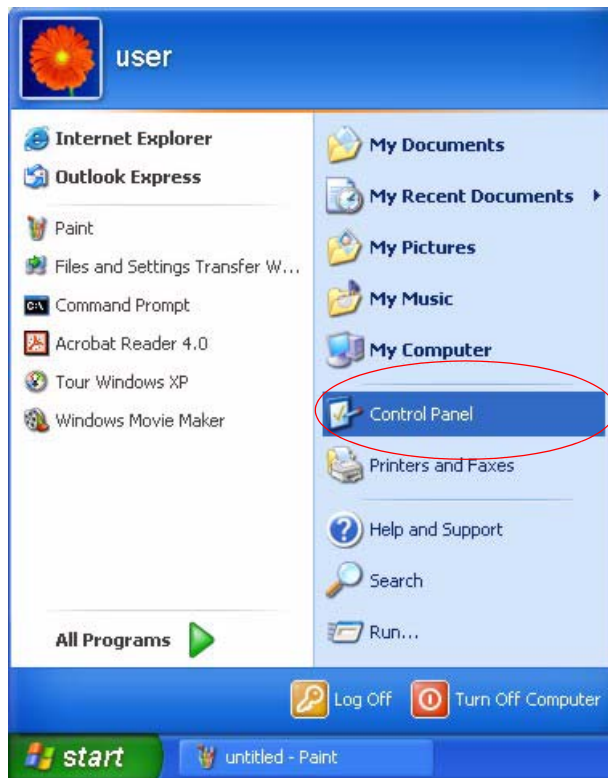
2 In the **Control Panel**, double-click **Network Connections** (**Network and Dial-up Connections** in Windows 2000/NT).

Figure 114 Windows XP: Control Panel
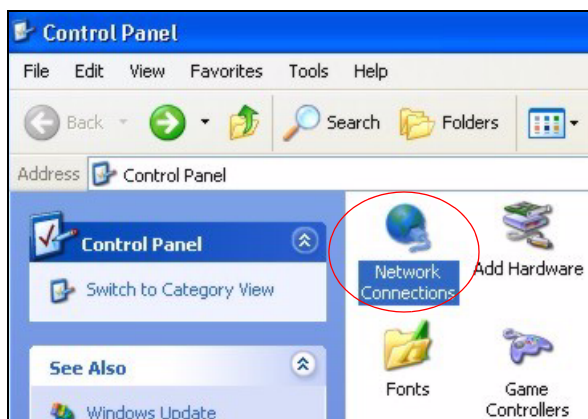
3 Right-click **Local Area Connection** and then click **Properties**.

Figure 115 Windows XP: Control Panel: Network Connections: Properties
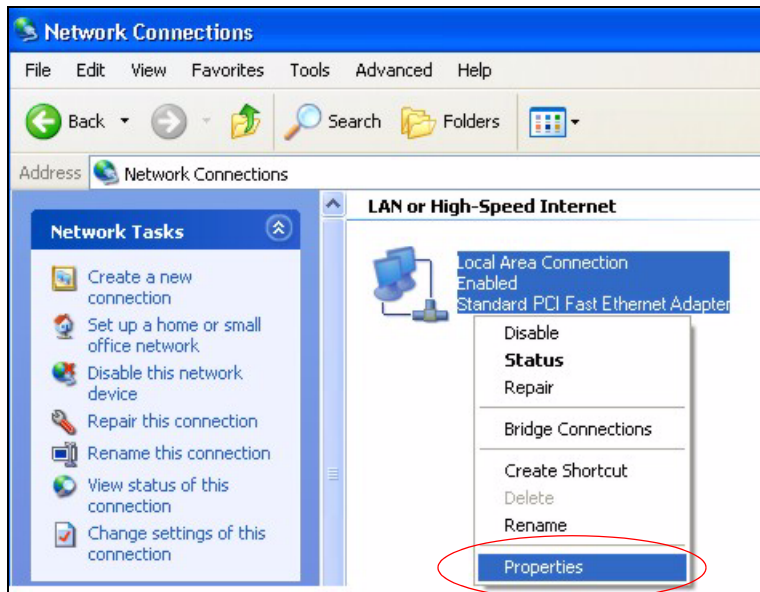
4 Select **Internet Protocol (TCP/IP)** (under the **General** tab in Win XP) and then click **Properties**.

Figure 116 Windows XP: Local Area Connection Properties
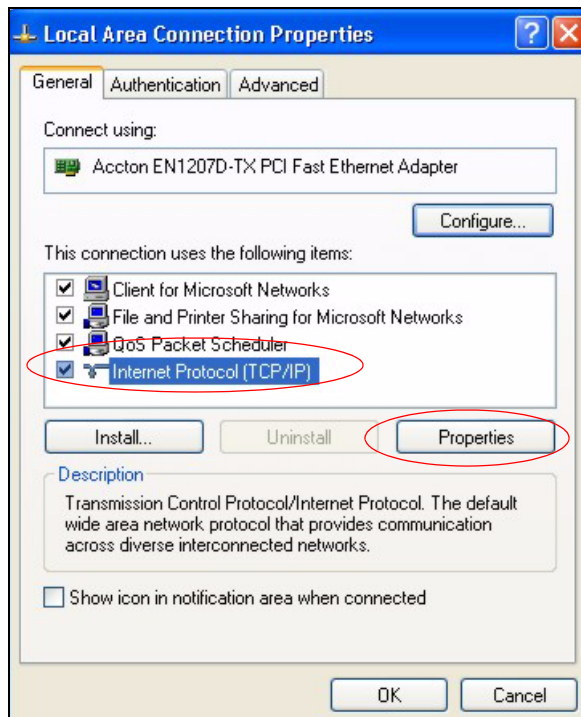
5 The **Internet Protocol TCP/IP Properties** window opens (the **General tab** in Windows XP).

• If you have a dynamic IP address click **Obtain an IP address automatically**.

> • If you have a static IP address click **Use the following IP Address** and fill in the **IP address**, **Subnet mask**, and **Default gateway** fields.
>
> • Click **Advanced**.

Figure 117   Windows XP: Internet Protocol (TCP/IP) Properties
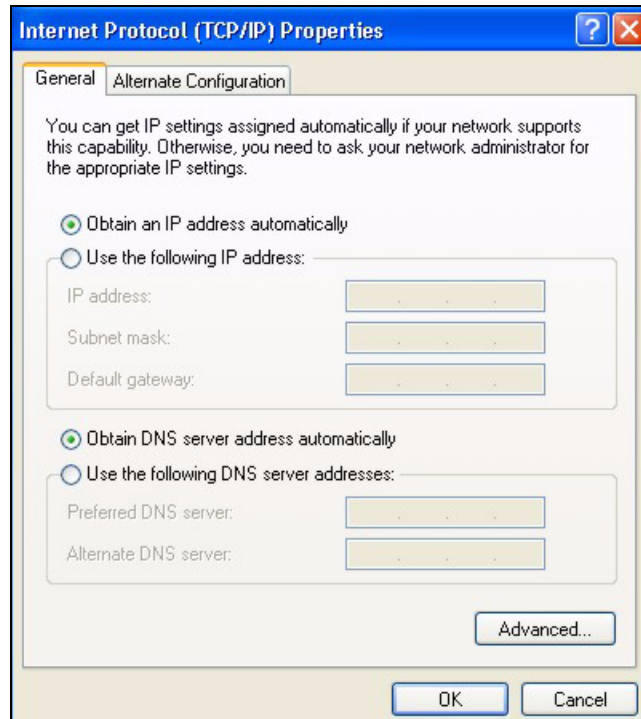
> **6** If you do not know your gateway's IP address, remove any previously installed gateways in the **IP Settings** tab and click **OK**.

Do one or more of the following if you want to configure additional IP addresses:

> • In the **IP Settings** tab, in IP addresses, click **Add**.
>
> • In **TCP/IP Address**, type an IP address in **IP address** and a subnet mask in **Subnet mask**, and then click **Add**.
>
> • Repeat the above two steps for each IP address you want to add.
>
> • Configure additional default gateways in the **IP Settings** tab by clicking **Add** in **Default gateways**.
>
> • In **TCP/IP Gateway Address**, type the IP address of the default gateway in **Gateway**. To manually configure a default metric (the number of transmission hops), clear the **Automatic metric** check box and type a metric in **Metric**.
>
> • Click **Add**.
>
> • Repeat the previous three steps for each default gateway you want to add.
>
> • Click **OK** when finished.

Figure 118 Windows XP: Advanced TCP/IP Properties
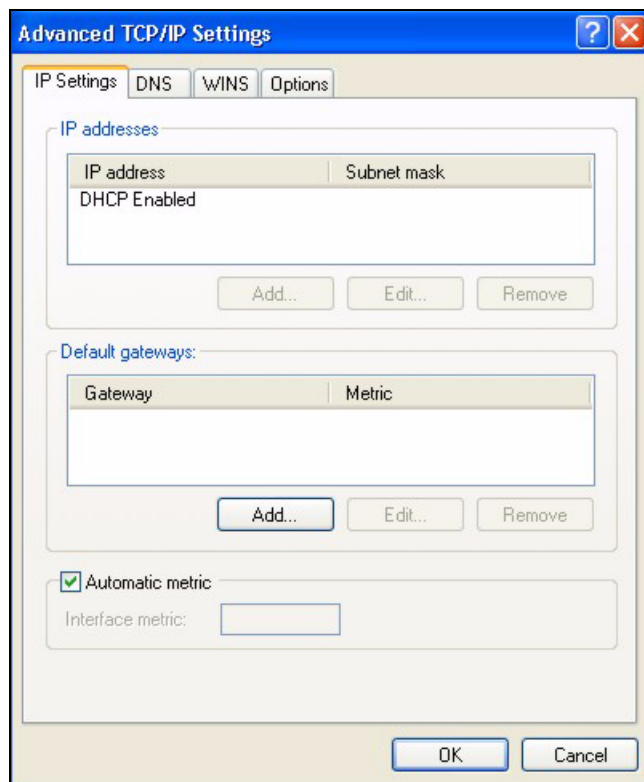
7 In the **Internet Protocol TCP/IP Properties** window (the **General** tab in Windows XP):

- Click **Obtain DNS server address automatically** if you do not know your DNS server IP address(es).

- If you know your DNS server IP address(es), click **Use the following DNS server addresses**, and type them in the **Preferred DNS server** and **Alternate DNS server** fields.

  If you have previously configured DNS servers, click **Advanced** and then the **DNS** tab to order them.