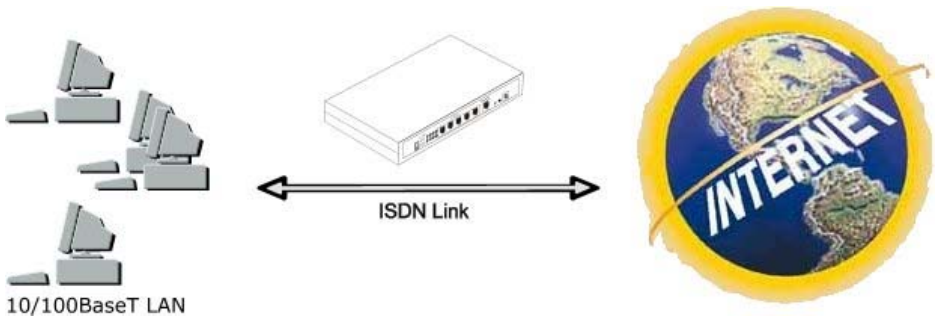


ISDN Internet Router



User's Guide

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Chapter 1

Your ISDN Internet Router



This Chapter covers the features and physical details of your ISDN Internet Router.

Features

The ISDN Internet Router incorporates many advanced features, carefully designed to provide sophisticated functions while being easy to use.

LAN Features

- **4 Port Switching Hub**
The ISDN Internet Router incorporates a 4 port Switching Hub. Both 10BaseT and 100BaseT connections can be used simultaneously.
- **DHCP Server Support.**
A DHCP (Dynamic Host Configuration Protocol) Server provides a dynamic IP address to PCs and other LAN devices upon request.
The ISDN Internet Router can act as a **DHCP Server**.
- **RIP and Multi Segment LAN Support.**
If you have a Router, PCs on other LAN segments can use the ISDN Internet Router to access the Internet. Both RIP 1 (Routing Information Protocol 1) and a static routing table are provided to support multiple-router LANs.

Internet Access Features

- **Shared Internet Account.**
All users on the LAN can share the same Internet Account.
- **Dial-On-Demand & Auto-Disconnect.**
A connection is established to the Internet as required, and automatically disconnected when no longer needed. This reduces on-line charges to the minimum possible level.
- **PPP Authentication.**
This is used to validate the log-on to your Internet Service Provider.
- **Advanced Internet Functions.**
 - **Virtual Servers.** This feature allows Internet users to access Internet servers on your LAN.
 - **VPN Support.** No configuration is required to access remote VPN (Virtual Private Network) Servers, using PPTP (Point to Point Tunneling Protocol). The *Virtual Server* feature allows access to a VPN Server on your LAN.
 - **Special Internet Applications.** Internet applications such as Internet Videoconferencing, Telephony, Games Servers, and other special-purpose Servers are supported.
 - **Exposed Computer.** One (1) PC on your local LAN can be exposed to the Internet. This allows unrestricted 2-way communication between this PC and servers or users on the Internet.

ISDN Features

- **Easy Configuration**
No complex technical data. You'll be finished in minutes!

- ***Intelligent B Channel Utilization***
Internet access can be configured to automatically switch between 1 or 2 B channels, depending on the volume of data.
- ***Outgoing Call ID***
The ISDN Internet Router supports Outgoing call ID for both MSN (Multiple Subscriber Numbering) and SAD (Sub Address).

Configuration & Management

- ***Easy Setup.***
Connect to the ISDN Internet Router with your WEB browser from anywhere on the LAN for configuration.
Alternatively, the provided Windows *Manager* utility can be used
- ***Remote Management and Monitoring.***
The ISDN Internet Router can be managed remotely, via the Internet. Either a Web browser or the provided Windows *Manager* utility can be used.

Advanced Functions

- ***Dial-in Remote Access.***
Remote users can dial in using their ISDN phone line, and use the ISDN Internet Router to connect to the LAN and access LAN resources.
- ***LAN-to-LAN Connectivity.***
Using 2 ISDN Internet Routers, 2 LANs can be connected via the ISDN link. The ISDN Internet Router will dial the remote LAN whenever required. Operation is completely automatic and transparent.

Security Features

- ***Configuration Data.***
Optional password protection is provided to prevent unauthorized users from modifying the configuration.
- ***Firewall Protection.***
All incoming data packets are monitored and all incoming server requests are filtered, thus protecting your network from malicious attacks from external sources.

Firewall Protection

The firewall protection provided by the ISDN Internet Router is an intrinsic side effect of IP sharing. All users on the LAN share a single external IP address. From the external viewpoint, there is no network, only a single device.

For internal users, the ISDN Internet Router acts as a "transparent proxy server", translating the multiple internal IP addresses into a single external IP address.

For external requests, any attempt to connect to local resources is blocked. The ISDN Internet Router will not "reverse translate" from a global IP address to a local IP address.

This type of "natural" firewall provides an impregnable barrier against malicious attacks.

Connectors and Components

LEDs - Front Panel

LAN (Hub)	<p>There are 3 LEDs for each Hub port.</p> <p>Full/Col</p> <p>ON - indicates the LAN connection is using Full Duplex.</p> <p>Off - indicates the LAN connection (if any) is using Half Duplex.</p> <p>Flashing - indicates packet collisions. It is normal to have occasional collisions in half-duplex mode.</p> <p>Link/Act</p> <p>On - The Router is successfully connected to a device through the corresponding port (1, 2, 3, or 4).</p> <p>Flashing - Transmitting or receiving data over the corresponding port.</p> <p>100</p> <p>On - LAN port connection is using a 100BaseT connection.</p> <p>Off - Port is unused or using a 10BaseT connection.</p>
Status (Orange)	<p>On - Error condition.</p> <p>Off - Normal operation.</p> <p>Blinking - This LED blinks during start up.</p>
LAN (Green)	<p>On - Normal start up/power on sequence, or idle.</p> <p>Flashing – Transmitting or receiving data over LAN ports.</p>
WAN	<p>There are 2 LEDs for the WAN connection:</p> <p>Data:</p> <p>Flashing - data is being transmitted or received via either or both of the ISDN "B" Channels.</p> <p>Off - the "B" Channel connections are idle.</p> <p>Link/Act:</p> <p>ON - the ISDN "D" channel connection is established. (The "D" channel is used for signaling and control, not for data.)</p> <p>Off - the "D" channel connection is idle.</p>

Rear Panel

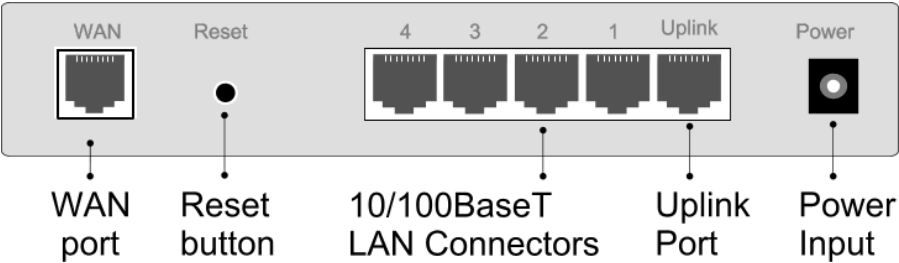


Figure 1: Rear Panel

WAN Port	This port is connected to the S/T connector on your ISDN NT1 (Network Terminator 1). A cable is supplied for this connection.
Reset button	When pressed and released, the ISDN Internet Router will reboot (restart).
10/100BaseT LAN Connectors	Use standard LAN cables (RJ45 connectors) to connect this port to your PCs. Both 10BaseT and 100BaseT connections can be used simultaneously.
	If Port 1 is used, the "Uplink" port can NOT be used.
Uplink Port	Use the "Uplink" port ONLY to connect to a normal port on another hub.
	If the "Uplink" port is used, Port 1 can NOT be used.
Power Input	Connect the supplied power adapter here.
DIP Switches (on base)	Refer to the following table.

DIP Switches

SW1	SW2	Description
OFF	OFF	Normal operation (default)
OFF	ON	DHCP Server disabled.
ON	OFF	Restore device IP and password (see below)
ON	ON	Normal Operation

Restore Device IP Address and Password

Use the following procedure to:

- Restore the device IP address to the factory default of 192.168.0.1
- Set the Network Mask to 255.255.255.0
- Set the *DHCP Server* to Enabled, allocating IP Addresses in the range 192.168.0.2 to 192.168.0.51
- Set the password to NULL (no password)

Procedure:

1. Power off the ISDN Internet Router.
2. Set DIP switch 1 to ON, and switch 2 to OFF.
3. Power on the ISDN Internet Router
4. Operate DIP switch 1 in the following sequence (you have 15 seconds to complete the sequence):
 - OFF
 - ON
 - OFF
5. If everything is OK, the *Status LED* should flash once after about 5 seconds.
The ISDN Internet Router is now ready for use with the default IP Address and password.

Specifications

Dimensions	195mm(W) * 130mm(D) * 33mm(H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocol:	TCP/IP
Ethernet Interface:	4 * 10/100BaseT (RJ45) auto sensing Switching hub ports 1 * 10/100BaseT (RJ45) "Uplink" port
ISDN Interface:	1 * RJ45 for S/T interface
LEDs	16 LEDs
External Power Adapter	12 V DC

FCC Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

CE Marking Warning

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Chapter 2

Setup & Operation

2

This Chapter covers the standard installation and configuration required to make your ISDN Internet Router operational.

Overview

For most situations, this chapter contains all the information required to provide shared Internet access via the ISDN Internet Router. The required steps are:

- Hardware Installation.
- Software Installation.
- ISDN Internet Router setup, using the supplied software.
- PC and/or LAN configuration.

Requirements

- 10BaseT or 100BaseT LAN cables.
- ISDN phone line, fitted with an NT-1 (Network Termination 1) termination and RJ45 sockets for S/T connection.
- Internet Access account with a local ISP (Internet Service Provider).
- The *Manager* utility program requires:
 - Windows 95/98, or Windows NT4.0, or later.
 - Internet Explorer (IE) V3.0 or later.

Hardware Installation

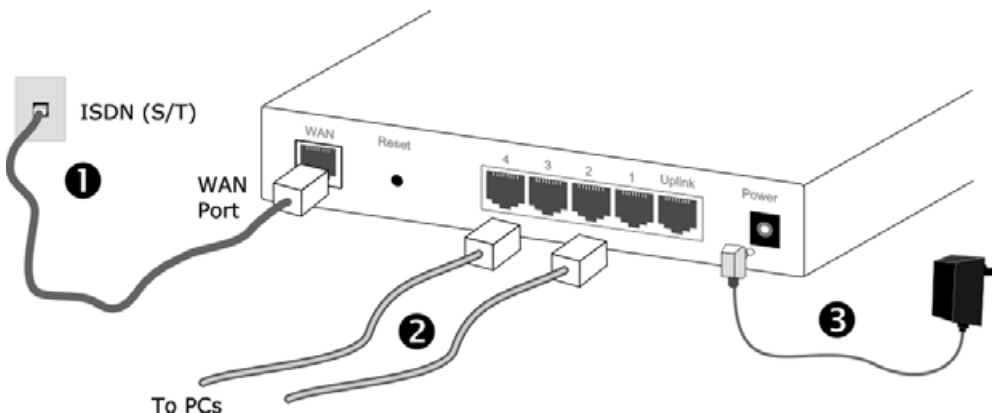


Figure 2: Physical Installation



Note!

The ISDN Internet Router incorporates a DHCP Server. If your LAN already has a DHCP Server, you can set DIP switch 2 ON to disable the DHCP Server in the ISDN Internet Router.

1. Use the supplied cable to connect the WAN port to the S/T connector on your ISDN NT1 (Network Terminator 1).
2. Use standard LAN cables (RJ45 connectors) to connect the ISDN Internet Router's LAN port to your PCs. Both 10BaseT and 100BaseT connections can be used simultaneously.
 - If required, the "Uplink" port can be connected to a normal port on another hub, to extend an existing LAN.
 - If the "Uplink" port is used, port 1 can NOT be used.
3. Connect the supplied power supply, and power up.
4. Check the LEDs
 - The *Status* LED should flash, then turn OFF. If it stays On, there is a hardware error.
 - For each PC connected and powered ON, the LAN *Link/Act* LED for the corresponding port should be ON.

Software Installation

1. Insert the supplied CD-ROM into your drive.
2. If the install program does not start automatically, run SETUP.EXE in the root directory.
3. Follow the prompts to complete the installation.
4. The *Manager* ISDN setup program will now run.
For future use, this program can be run from the Start menu. The default installation is *Start - Programs - ISDN Internet Router - Manager*.



Note!

If necessary, configuration may be performed using a Web browser instead of the supplied Windows utility. See "Appendix A - Web-based Setup" for details.

Setup using the "Manager" Utility

1. The first screen will list all compatible ISDN Internet Routers, as shown below. Select the desired unit, then click the *Setup* button.

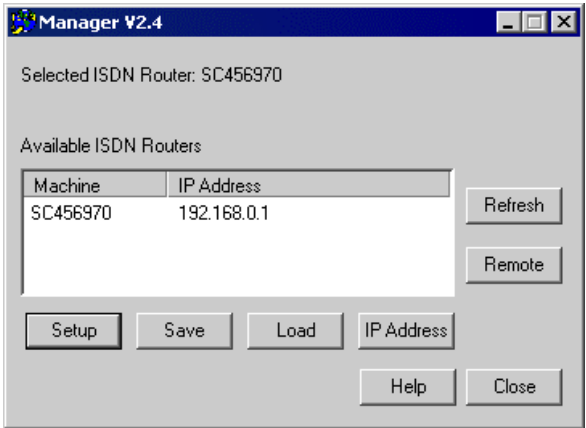


Figure 3: Manager Utility Main Screen

2. If the current IP Address is unworkable, the IP Address screen (below) will suggest new values.
 - Change the suggested IP Address if it is already in use by a device which is not powered on. Otherwise, use the suggested value.
 - Click "Change" to continue.
 - Clicking "Cancel" will leave the IP Address unchanged. Use this only if you intend to move the ISDN Internet Router to another LAN or LAN segment, where the current IP Address will be usable.

Note: If the current IP Address is OK, you will not see this screen.

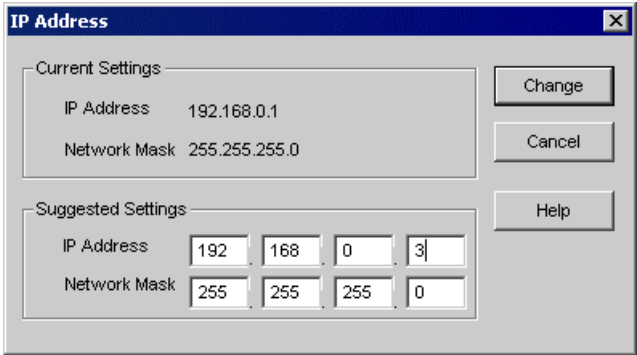


Figure 4: IP Address Screen

3. Enter the required data on the *Quick Setup* tab below.

SC456970

Access Control | Internet Application | LAN-to-LAN | ISDN

Quick Setup | Status | Option | LAN | Dial-in

Internet Access

☒ Enable Internet Access

Account Name

Account Password Verify

IP Address from ISP ☒ Dynamic ☐ Fixed

Idle Time-out second (0 = Unlimited)

DNS IP Address

Telephone (Required)

Telephone 2 (Optional)

Telephone 3 (Optional)

ISDN

Country

For USA, The following data is required:

SPID (1st B Channel)

SPID (2nd B Channel)

TCP/IP

Device IP Address 192.168.0.1

Network Mask 255.255.255.0

OK Cancel Help

Figure 5: Quick Setup Screen

Internet Access (from ISP)	
Account (User) Name	Account name provided by your ISP (Internet Service Provider).
Account Password Verify Password	Password for the above account.
IP Address from ISP	<i>Dynamic</i> IP addresses are the most common. If <i>Fixed</i> , enter the address provided by your ISP.
Idle Time-out	If a connection is idle for longer than this time period, it is terminated.
DNS IP Address	DNS IP address supplied or recommended by your ISP.
Telephone	ISP's telephone number; 2 nd and 3 rd numbers are optional.
ISDN Details (from Telephone Company)	
Country	Select your country. If in the USA, select the entry to match the "Switch Type" used by your telephone company.
SPID	If you live in the USA, enter the SPID (Service Profile Identifier) provided by your phone company.

LAN	
IP Address Network Mask	These are read-only.

Other Configuration

Normally, no other configuration is required, unless:

- Your LAN has a router
- You wish to change the IP Addresses allocated by the DHCP Server
- You wish to change the default ISDN settings.
- You wish to assign a password to protect the configuration data, or use the other options provided.

For details of these situations, refer to *Chapter 3 - Other Configuration*.

PC Setup (Required for every PC)

TCP/IP Setup



If your LAN already has a DHCP Server, or a Router, do NOT make any changes to TCP/IP settings on the PCs. See Chapter 3 for details of LAN configuration.

1. Use *Start - Settings - Control Panel - Network* to locate the screen below.

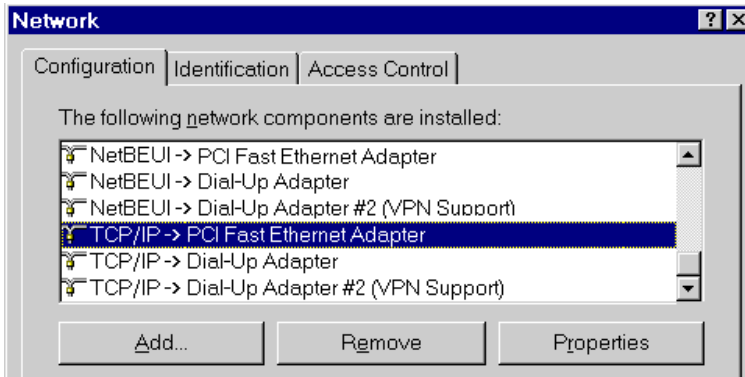


Figure 6: Network - TCP/IP

2. Select the "TCP/IP -> Network card" entry, as highlighted above, and click *Properties* to see the screen below.

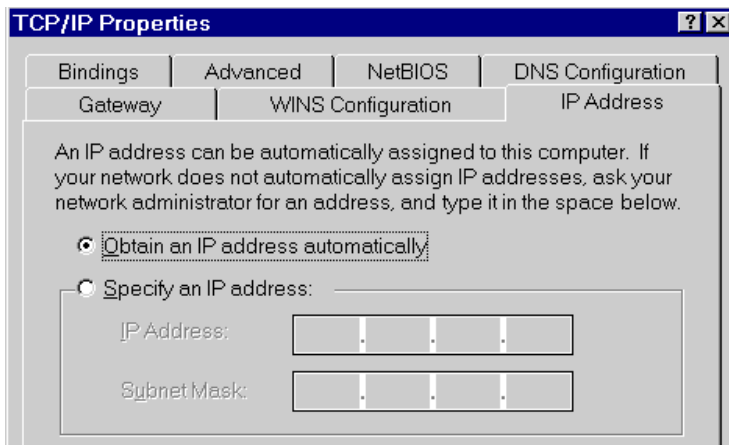


Figure 7: TCP/IP Properties

3. Use the appropriate settings for your situation:
 - Use "Obtain an IP address automatically", as shown above, if using the DHCP Server feature in the ISDN Internet Router, or an existing DHCP Server.
 - If using "Specify an IP Address":
 - Do not make any changes on the **IP Address** tab.
 - On the **Gateway** tab, set the *Default Gateway Address* to the ISDN Internet Router's *IP Address*.
 - On the **DNS Configuration** tab, enter the same value used when configuring the ISDN Internet Router.

Internet Settings

1. Run Start Menu-Settings-Control Panel-Internet Options.
2. On the *Connection* tab, click the *Setup* button.
3. Step through the Wizard, and ensure that Internet access is set to "via local area network (LAN)" and the other options are NOT selected.
4. Configuration is now complete.

Operation

Internet Access

Once configured, operation is automatic. You can use your Web Browser to access any Web Site. The ISDN Internet Router will connect and disconnect from your ISP as required.

Special Internet Applications

These server-based applications, such as Video-conferencing and on-line games, have special requirements, but many will work with the ISDN Internet Router. See *Chapter 4 - Advanced Features* for further details.

Status Tab

On the Windows *Manager* utility, the *Status* tab can be used to check the ISDN Internet Router.

- *Device* section provides details of the ISDN Internet Router.
- *ISDN* shows the current connection status.
- *Log* lists messages regarding the connection. Common messages are shown in the following table.

Message	Description
Dialing	Dialing the ISP
Try to establish physical connection.	The device is trying to connect with the ISP.
Busy error	The number dialed was busy.
Physical line is connected	Physical connection to ISP has been established.
Start PPP	A PPP connection is now being established.
PPP up fail	The PPP connection could not be established.
PPP up successfully	The PPP connection was established successfully.
Stop PPP	The PPP connection was terminated. This will occur at the end of a session, or an error condition.
Idle timer expires	The "Idle time-out" has been triggered. (There was no data sent or received for the duration of the "Idle time" period.)

Chapter 3

Other Configuration



This Chapter details other configuration possibilities and options which are not normally required.

LAN - DHCP

- A DHCP (Dynamic Host Configuration Protocol) **Server** provides an IP address and related data to a DHCP **Client** (PC or device) upon request.
- The ISDN Internet Router can act as a DHCP Server, and is configured to do so by default.
 - By default, Windows 9x systems act as DHCP Clients.

Existing DHCP Server

- If using an existing DHCP Server, rather than the DHCP Server in the ISDN Internet Router, the following changes are required:
- The existing DHCP Server must be re-configured to provide the ISDN Internet Router's IP Address as the *Default Gateway*.
 - The DHCP Server in the ISDN Internet Router should be disabled. This setting is on the *LAN* tab.

ISDN Internet Router's DHCP Server

- Normally, the default values do not need to be changed. However, if your LAN already has some devices using fixed IP Addresses, you need to set the IP Address range used by the DHCP Server to be compatible.
- The ISDN Internet Router's IP Address must be within the address range you wish to use. This should have been set during initial configuration.
 - DHCP Server settings are on the *LAN* tab of the *Manager* utility.

Enable/Disable	Enable/Disable the DHCP Server.
Start IP Address Finish IP Address	Sets the addresses allocated to DHCP clients by the DHCP server. This also sets the number of DHCP clients - maximum is 253.
DNS IP Address	If multiple entries are provided, the first available DNS will be used.



Devices having fixed (static) IP Addresses must NOT use an IP Address within the range used by the DHCP Server.

LAN - Routing

The Routing feature (on the *LAN* tab) can be completely ignored if you do not have a router in your LAN.

If you DO have a router, it is necessary to configure BOTH the Router and the Routing table in the ISDN Internet Router correctly.

See *Chapter 4 - Routing* for further details.

ISDN

The *ISDN* tab on the *Manager* program is shown below.

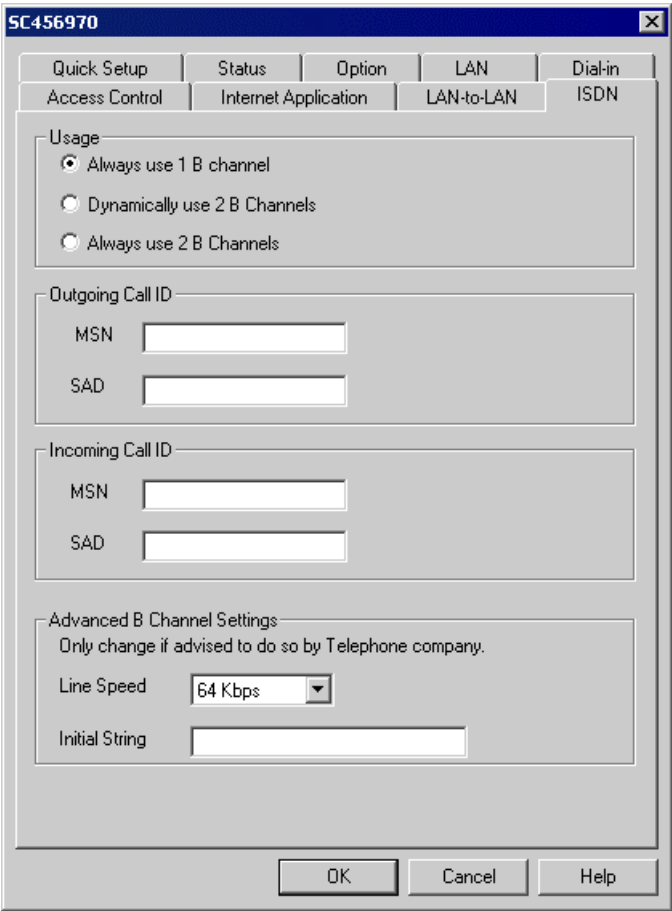


Figure 8: ISDN Tab

In most situations, there is no need to change these settings.

Usage	<p>These settings determine how the 2 ISDN "B" channels are used for Internet access:</p> <ul style="list-style-type: none">• Always use 1 B Channel. This is the default setting, and leaves 1 B channel available for Dial-in.• Dynamically use 2 B Channels. This setting uses 1 or 2 B Channels for Internet access, depending on the traffic volume. Also, if the Dial-in feature is used, one B channel will be dropped if necessary to allow the Dial-in call to be accepted.• Always use 2 B Channels. Both B channels are either open or closed. This provides better performance, but Dial-in connections can only be accepted if Internet access is not being used, and the ISDN phone line is idle.
Outgoing Call ID Incoming Call ID	<p>Use these to set the outgoing call MSN or SAD. MSN and SAD allow you to have multiple phone numbers.</p> <p>Enter the require telephone numbers, selected from the phone numbers allocated to you by your phone company.</p>
Advanced B Channel Settings	<p>These settings should only be changed if advised to do so by your phone company.</p> <p>Use the settings advised by your phone company.</p>

Options Screen

An example Options screen is shown below.

SC456970

Access Control

Internet Application

LAN-to-LAN

ISDN

Quick Setup

Status

Option

LAN

Dial-in

Administrator Password

Password

xxxxx

Verify

xxxxx

This password will be required in order to change the configuration

Remote Management

☒ Enable Remote Management (manage from Internet)

Port Number (Web Browser)

8080

Port Number (Windows utility)

161

ICMP

☐ Respond to ICMP request (Ping) via WAN port

OK

Cancel

Help

Figure 9: Option Tab

Administrator Password

Once a password is entered, it is required in order to change the device configuration. Passwords are case sensitive and can be up to 9 alphanumeric characters (no spaces or punctuation). To create or change the password, enter the required password in both the *New Password* and *Verify Password* input fields.



When connecting, and prompted for the password, leave the "User Name" blank.

Remote Management

This feature allows you to manage the ISDN Internet Router via the Internet. If using this feature, it is strongly recommended to assign a password, as described above, to prevent unauthorized access.

The following settings are available.

Enable Remote Management	Enable to allow management via the Internet. If Disabled, this device will ignore management connection attempts from the WAN port.
Port Number (Web Browser)	<p>Enter a port number between 1024 and 65535. The default value is 8080 is recommended. This port number must be specified when you connect with your Web browser, as described below.</p> <p>Note: The default port number for HTTP (Web) connections is port 80, but using port 80 here will prevent the use of a Web "Virtual Server" on your LAN. (See <i>Chapter 7 - Internet Application - Virtual Servers</i> for further details of <i>Virtual Servers</i>.)</p>
Port Number (Windows utility)	<p>Enter a port number between 1024 and 65535. The default is 161. Change this number if desired. This port number must be specified when you connect (see below).</p> <p>Note: The port number you select must NOT be used by any <i>Virtual Server</i> or <i>Special Application</i>. (See <i>Chapter 7 - Internet Application</i> for further details of <i>Special Applications</i> and <i>Virtual Servers</i>).</p>

To connect using a Web Browser

1. Ensure your Internet connection is established, and start your Web Browser.
2. In the "Address" bar, enter "HTTP://" followed by the WAN IP Address of the ISDN Internet Router. If the *Port number (Web Browser)* value is not 80, the port number is also required. (After the IP Address, enter ":" followed by the port number.)
e.g.

HTTP://123.123.123.123:8080

This example assumes the WAN IP Address is 123.123.123.123, and the port number is 8080.

3. If prompted for a username and password, leave the username blank, and enter the device password assigned to this ISDN Router.

To connect using the Windows "Manager" Utility

1. Start the Windows *Manager* program.
2. On the main screen, click the "Remote" button. A screen like the following will be displayed.

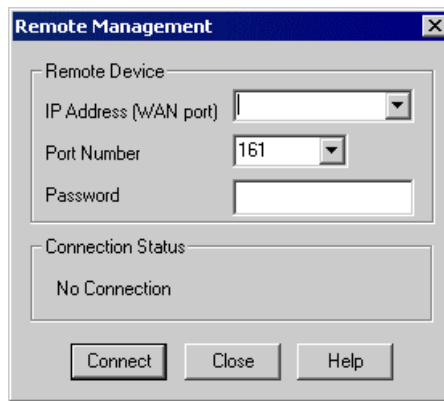


Figure 10: Remote Management Dialog

3. Enter the required data:
 - **IP Address (WAN Port)** - Enter the IP address of the ISDN Router you wish to connect to. Note that this IP Address is the WAN port IP Address, and is assigned by your ISP. If your ISP did not assign you a fixed IP Address, this IP Address may change every time a connection is established.
 - **Port Number** - Enter the number assigned to the *Remote Management - Port Number (Windows utility)* field for this ISDN Router. The default value is 161.
 - **Password** - Enter the device password assigned to this ISDN Router.
4. Click the *Connect* button, and check the *Connection Status* area:
 - *Error - No connection* indicates that no response was received to the connection request. This could be caused by a network problem, incorrect IP address, incompatible device, the remote ISDN Router not connected to the Internet, the *Remote Management* feature not enabled on the remote ISDN Internet Router, or an incorrect password.
 - *OK* indicates that the remote ISDN Router is available for Remote Management. It will now be listed in the main window.
5. On the main window, double-click the remote ISDN Router to configure it.

ICMP

Internet Control Message Protocol (ICMP) is used by devices such as routers, to report and acquire a wide range of network-related information.

The "ping" and "tracert" programs also use ICMP.

To provide additional security, this setting is disabled by default. It should be enabled only if you need the ISDN Router to respond to requests from ping, tracert and related programs.

Chapter 4

Routing



Routing configuration is required only if your LAN has existing Routers or Gateways. Otherwise, this Chapter can be ignored.

Overview

While the ISDN Internet Router includes both RIP 1 (Routing Information Protocol 1) and a standard static routing table, these feature can be completely ignored if you do not have a router in your LAN.

Also, if the ISDN Internet Router is only acting as an Internet Gateway for the local LAN segment, you can ignore the "Routing" screen even if your LAN has other Routers.

Generally, you should use either RIP (Routing Information Protocol) OR the Static Routing Table, although it is possible to use both methods simultaneously.

RIP

RIP (Routing Information Protocol) is used by Routers to exchange routing information, and build routing tables in each Router dynamically.

By default, RIP is disabled. Use the following as a guide to determine whether you should enable RIP.

- If your LAN has a standard Router (e.g. Cisco) on your LAN, and the ISDN Internet Router is to act as a Gateway for all LAN segments, enable RIP (Routing Information Protocol) and ignore the Static Routing table.
- If your LAN has other Gateways and Routers, and you wish to control which LAN segments use each Gateway, do NOT enable RIP (Routing Information Protocol). Configure the Static Routing table instead. (You also need to configure the other Routers.)
- If using Windows 2000 Datacenter Server as a software Router, enable RIP on the ISDN Internet Router, and ensure the following Windows 2000 settings are correct:
 - Open *Routing and Remote Access*
 - In the console tree, select *Routing and Remote Access* , [server name], *IP Routing*, *RIP*
 - In the "Details" pane, right-click the interface you want to configure for RIP version 2, and then click "Properties".
 - On the "General" tab, set Outgoing packet protocol to "RIP version 2 broadcast", and Incoming packet protocol to "RIP version 1 and 2".

Static Routing

If RIP is not used, an entry in the routing table is required for each LAN segment on your Network, other than the segment to which this device is attached.

The other Routers must also be configured. It is essential that all IP packets for devices not on the local LAN be passed to the ISDN Internet Router, so that they can be forwarded to the Internet. To achieve this, the Routers must be configured to use the ISDN Internet Router as the *Default Route* or *Default Gateway*.

Local Router

The local router is the Router installed on the same LAN segment as the ISDN Internet Router. This router requires that the *Default Route* is the ISDN Internet Router itself. Typically, routers have a special entry for the *Default Route*. It should be configured as follows.

Destination IP Address	Normally 0.0.0.0, but check your router documentation.
Network Mask	Normally 0.0.0.0, but check your router documentation.
Gateway IP Address	The IP Address of the ISDN Internet Router.
Metric	1

Other Routers

Other routers must use the ISDN Internet Router's *Local Router* as the *Default Route*. The entries will be the same as the ISDN Internet Router's local router, with the exception of the *Gateway IP Address*.

- For a router with a direct connection to the ISDN Internet Router's local Router, the *Gateway IP Address* is the address of the ISDN Internet Router's local router.
- For routers which must forward packets to another router before reaching the ISDN Internet Router's local router, the *Gateway IP Address* is the address of the intermediate router.

Static Routing Example

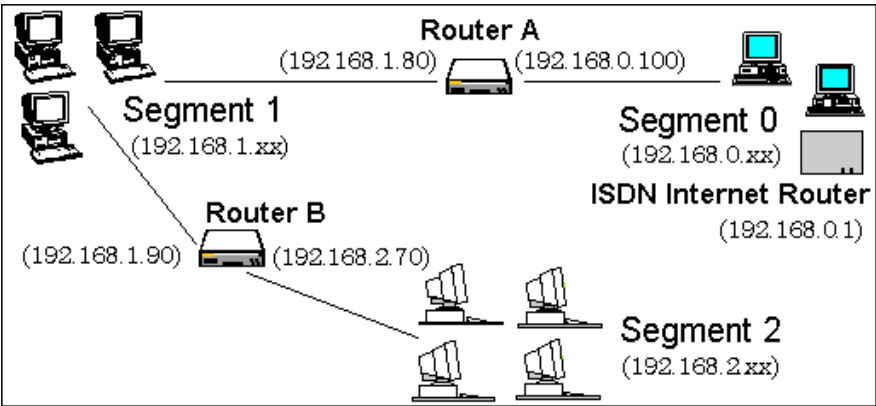


Figure 11: Routing Example

For the LAN shown above, with 2 routers and 3 LAN segments, the required entries would be as follows.

For the ISDN Internet Router's Routing Table

The ISDN Internet Router requires 2 entries as follows.

Entry 1 (Segment 1)	
Destination IP Address	192.168.1.0
Network Mask	255.255.255.0 (Standard Class C)
Gateway IP Address	192.168.0.100 (ISDN Internet Router's local Router)
Interface	LAN
Metric	1
Entry 2 (Segment 2)	
Destination IP Address	192.168.2.0
Network Mask	255.255.255.0 (Standard Class C)
Gateway IP Address	192.168.0.100
Interface	LAN
Metric	2

For Router A's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.0.1 (ISDN Internet Router's IP Address)

For Router B's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.1.80 (ISDN Internet Router's local router)

Static Routing Table

On the LAN tab, static routing table entries will appear as in the example screen below.

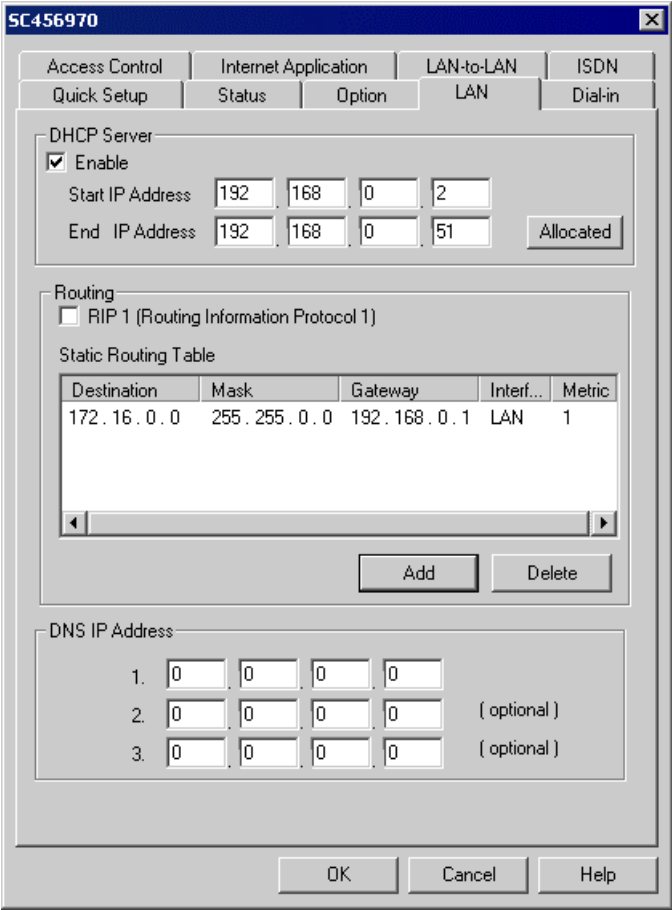


Figure 12: LAN Tab

Operations

To delete an existing entry:

- Select the desired name from the list.
- Click the *Delete* button.

To create a new entry:

- Click the *Add* button.
- Enter data as shown below.
- Click OK to save.

Routing Data

An entry in the routing table is required for each LAN segment on your Network, other than the segment to which this device is attached. The data for each entry is as follows.

RIP	
Enable RIP	<p>Check this to enable the RIP (Routing Information Protocol) feature of the ISDN Internet Router.</p> <p>The ISDN Internet Router supports RIP 1 only.</p>
Static Routing Table	
Select Entry	<p>This drop-down list shows all entries in the Routing Table.</p> <ul style="list-style-type: none">• To view or change an entry, select it, then click the <i>Get Data</i> button.• After making any required changes, click the <i>Update</i> button to save your changes.
Destination IP Address	<p>The network address of the remote LAN segment.</p> <p>For standard class "C" LANs, the network address is the first 3 fields of this <i>Destination IP Address</i>. The 4th (last) field can be left at 0.</p>
Network Mask	<p>The Network Mask used on the remote LAN segment. For class "C" networks, the standard Network Mask is 255.255.255.0</p>
Gateway IP Address	<p>The IP Address of the Router on the LAN segment to which this device is attached. (NOT the router on the remote LAN segment.)</p>
Interface	<p>Select the appropriate interface - LAN (Internal LAN) or WAN (External LAN or WAN) from the drop-down list.</p>
Metric	<p>The number of routers which must be traversed to reach the remote LAN segment. The default value is 1.</p>

Chapter 5

Dial-In



This Chapter explains the setup required to enable and use the ISDN Internet Router's Dial-in feature.

Overview

The ISDN Internet Router's dial-in feature allows remote users to:

- Use an ISDN TA to connect to the ISDN Internet Router, using the same PPP communication software (e.g. *Dial-up Networking*) that they use for dial-in Internet access.
- Have their user name and password verified by the ISDN Internet Router. (**Note:** If dial-in PPP link security is set to "None", no verification is performed.)
- Access the LAN resources as if they were a local user. To other users on the LAN, the remote users appears to be a local PC, using the IP Address allocated by the ISDN Internet Router.

For additional security, the dial-back function can be used. In this situation, the ISDN Internet Router will hang-up the user's incoming connection, and then call them back.

To use the Dial-in Feature:

1. Dial-in must be **Enabled** on the Dial-in Tab. (Default is *Disabled*.)
2. User access data is required. The options are as follows:
 - **Allow access by anyone and everyone** (not recommended) - If *Authentication* on the Dial-in screen is set to *None*, then the user name and password is not checked, so anyone who dials in can gain access.
 - **All users use the same log-in** - Create a single user (on the *Dial-in* screen) with dial-in access, and all users use this log-in.
 - **Enter data for each user** - Each person requiring dial-in access has their data entered on the *Users* screen.
3. The *Usage* setting on the **ISDN** tab should be checked:
 - If set to *Always use 2 B Channels* (for Internet Access), then Dial-in is only possible if the ISDN Internet Router is idle.
 - If set to *Dynamically use 2 B Channels* (for Internet Access), then 1 B Channel will be dropped if necessary to allow a dial-in call.
 - If set to *Use 1 B Channel* (for Internet Access), then the 2nd B Channel is always available for Dial-in.
4. The remote user can use the same dial-up software they use for Internet access. Once connected, the remote user can access LAN resources as they normally would. They will appear to other LAN devices as a normal PC on the LAN, using the IP Address allocated by the ISDN Internet Router.

Dial-in Screen

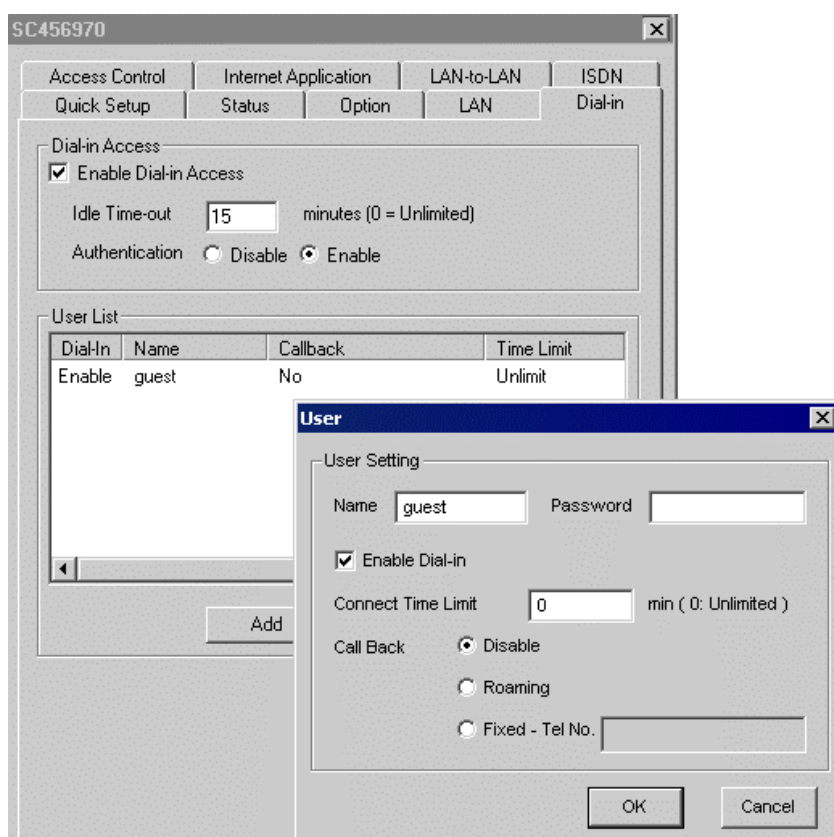


Figure 13: Dial-in

Data - Dial-in Tab

Data - Dial-in Access	
Enable Dial-in Access	If checked, dial-in will be allowed. Otherwise, any attempt to dial-in will be blocked. The default is <i>Disabled</i> .
Idle Time-out	If a dial-in connection remains inactive, it is terminated after this time period. Allowable range is 0-99 minutes; 0 means no limit.
Authentication	<p>Select the desired security option for log-in:</p> <p>Disable means no user name/password check is performed. Anyone can connect. It is not necessary to enter each user's details if this option is chosen.</p> <p>Warning! This is a major security risk.</p> <p>Enable uses the industry-standard PAP system.</p>

User List

Entering of user data is required only to provide secure dial-in access.

- All users who have been created will be listed here.
- The *Dial-in* column indicates whether or not each user currently has Dial-in access. Click any entry in this column to Enable/Disable dial-in access.
- The user "Guest" is pre-defined, with no password or Dial-in access. This name will initially appear in the list.
- Note the limitations on user names:
 - Multiple words are NOT allowed.
 - Punctuation and special characters must NOT be used.
 - User names are case insensitive (case is ignored).

Data - User List	
User Name	Name of this user.
Password	The password for the current user. Passwords are case sensitive. When creating or changing a password, enter it in the <i>Verify</i> field also.
Enable Dial-in	Check this to enable dial-in; uncheck to suspend dial-in access.
Time limit	After this time period, the user is disconnected. Allowable values are 0 (default) to 999 minutes. Zero means no time limit.
Call Back	Options are: <ul style="list-style-type: none">• Disabled:- User can simply dial-in; the device will not hang-up and call back.• Roaming:- After providing their name and password, the user is prompted for the call-back number.• Fixed:- The number entered in the Telephone No. field is always used as the call-back number.

Remote Users

Remote users can use the same dial-up software they use for Internet access. They should check the following:

- Their ISDN TA must dial the telephone number of the ISDN Internet Router.
- Their software should be set to obtain an IP Address from the dial-in host. (This is the standard configuration; no changes should be required.)
Upon connection, the ISDN Internet Router will allocate a suitable unused IP Address.
- When prompted for user name and password, they must enter the *Name* and *Password* stored in the ISDN Internet Router.

Once connected, the remote user can access LAN resources as they normally would. They will appear to other LAN devices as a normal PC on the LAN, using the IP Address allocated by the ISDN Internet Router.

Chapter 6

Access Control



The Access Control feature allows the administrator to control Internet access by individual workstations (PCs)

Overview

The Access Control feature allows administrators to restrict Internet Access by individual workstations. The process uses "Packet Filtering" to block or discard data packets. You can apply the pre-defined filters, and optionally define your own filters. By default, filtering is disabled; no packets are blocked or discarded.

Selecting the *Access Control* tab will reveal a screen like the example below.

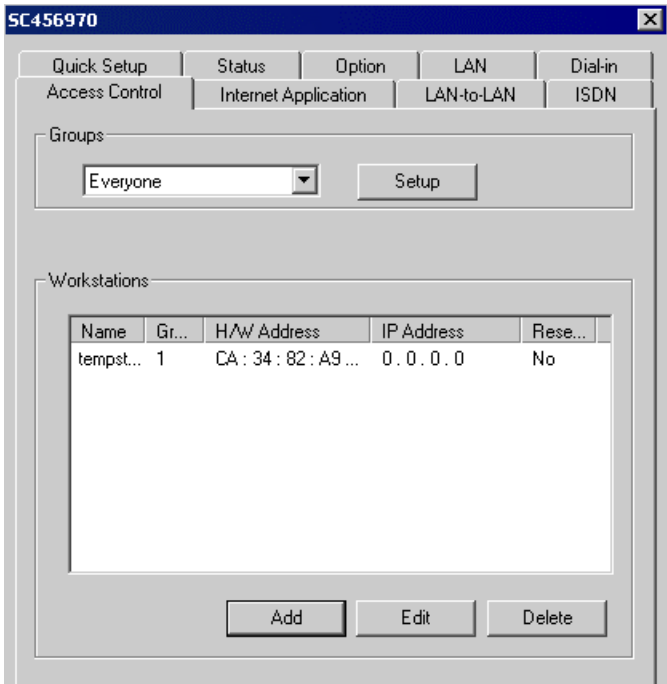


Figure 14: Access Control Tab

To use the Access Control feature:

1. Set the desired restrictions on the "Everyone" group, by selecting this group and clicking "Setup". By default, all PCs are in the "Everyone" group unless explicitly moved to another group.
2. Set the desired restrictions on the other groups ("Group 1", "Group 2", etc) as needed.
3. For each Workstation you wish to move from the "Everyone" group, enter their data and assign them to the desired group.



You can limit Internet access for ALL PCs without entering ANY workstation data, by applying restrictions to the "Everyone" group.

Security Groups

To Set or Change restrictions for a Security Group:

- 1. Select the group from the drop-down list. Note that the Security groups are pre-named "Everyone", "Group 1", "Group 2", "Group 3", and "Group 4". These names cannot be changed.
- 2. Click the *Setup* button to define restrictions for the selected group. An example screen is shown below.

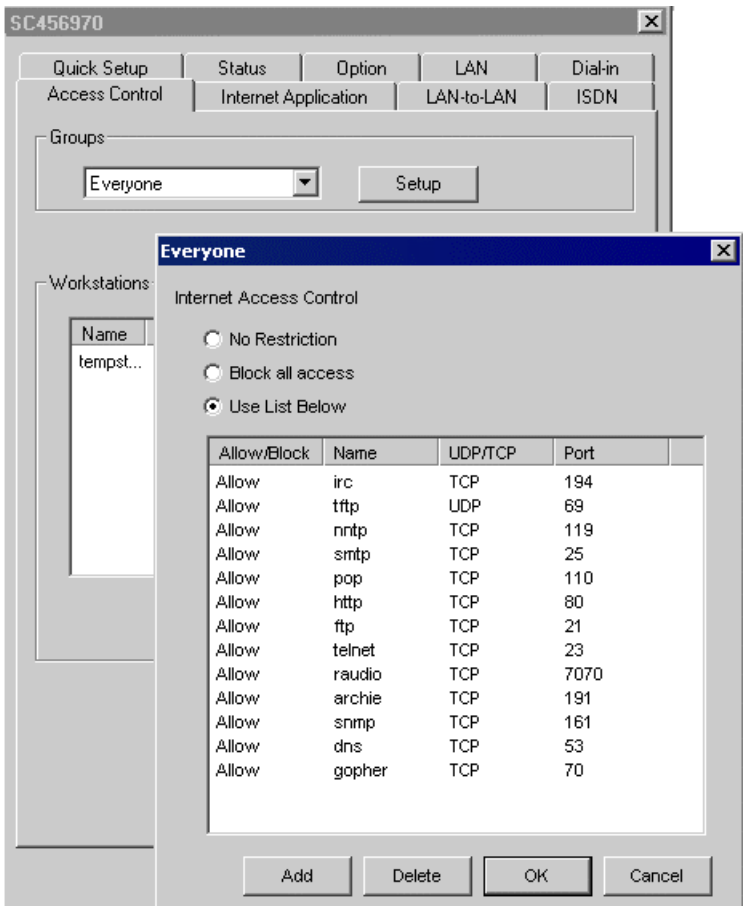


Figure 15: Access Control

- 3. Enter data on this screen as explained below. Click OK when finished.

Data for each Group

No Restriction	No packets are blocked. Use this to create an "Unlimited Access" group, or to temporarily remove restrictions from a group.
Block all access	Groups members cannot access the Internet at all. Use this to create the most restrictive group.

Use List Below	Enable or disable individual items as required. If set to <i>Block</i> , the item will be blocked, and the group will NOT have access. This table is ignored unless the <i>Use List Below</i> radio button is selected.
----------------	--

Workstations

This list shows all workstations (PCs) which have been defined. It is only necessary to define workstations in the following situations:

- To assign the workstation to a particular security group.
- To reserve an IP Address for this PC (or device), so that the DHCP Server function in the ISDN Internet Router will always allocate the same IP Address to this device, and never assign the reserved IP Address to any other device.
- Use the *Add*, *Edit*, and *Delete* buttons to modify the list as required; as in this example.

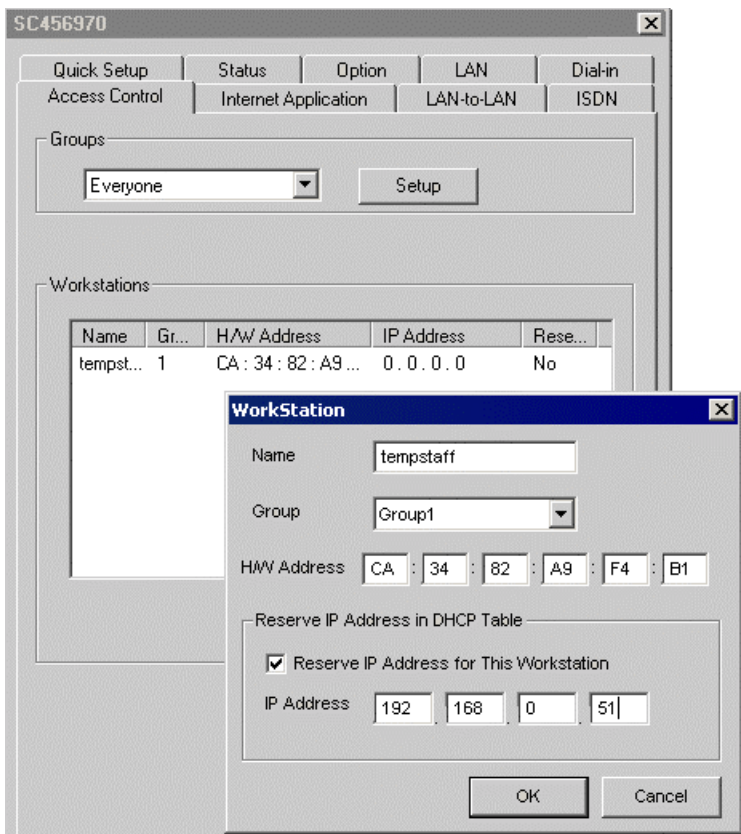


Figure 16: Workstation Screen

Workstation Data

Name	Enter an identifier for this workstation. The name is case insensitive (case is ignored).
Group	Select the security group for this workstation. If you only wish to reserve an IP Address, and are not using the Access Control features, simply leave this at "Everyone".

Hardware (MAC) Address	Hardware or physical address. On a PC, this is often called the <i>Network Adapter Address</i> . You can use the Windows "Winipcfg" program or your LAN management program to find this address. (By default, there is no Start Menu item for <i>Winipcfg</i> so you must use the "Run" command or create your own shortcut.)
Reserve IP Address for this workstation	Check this if you wish to reserve an IP address for this workstation. This is useful if you have to provide the IP Address for other programs or users. If this is left unchecked, the following entry can be ignored.
Reserved IP Address	This relates to the entry above. Enter the reserved address here. This MUST be within the range used by the DHCP server (set on the <i>LAN</i> screen).

Chapter 7

Internet Application



These features provides additional capabilities relating to the use of Internet software, including using Servers on your LAN.

Overview

The Internet Application screen provides access to some advanced features of the ISDN Internet Router. Selecting the **Internet Application** tab will display a screen like the example below.

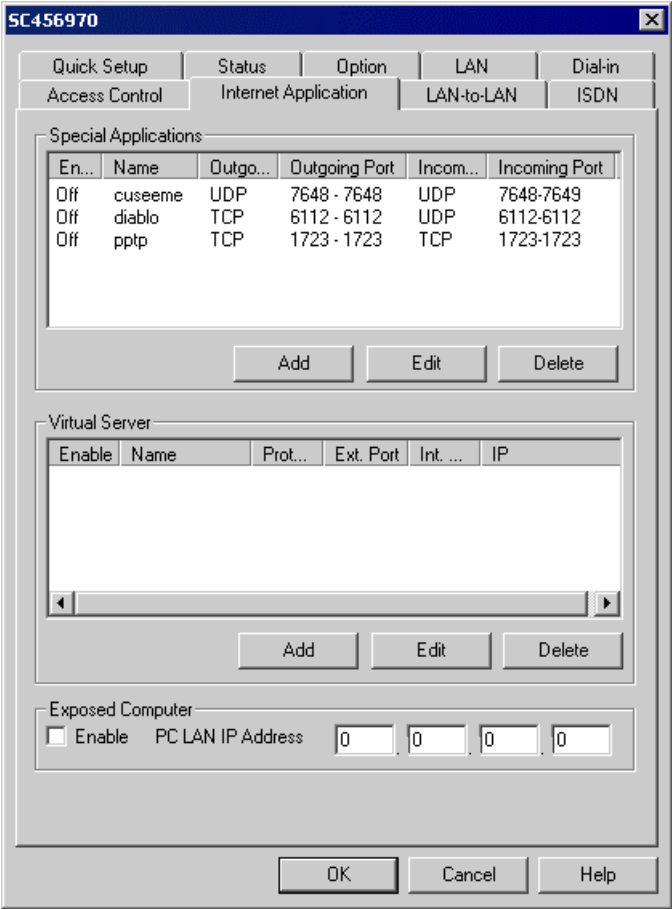


Figure 17: Internet Tab

Special Applications

This feature is only required if you wish to use Internet applications which require 2-way communication, multiple connections, or combined TCP/UDP connections.

- Examples of such applications are Internet Videoconferencing, Telephony, Games Servers, and other special-purpose Servers. A number of the more common applications have been pre-defined, and will appear in the list.
- Generally, you will become aware of the need for this feature when an Internet application is unable to function correctly.
- At any time, only one (1) PC can use each Special Application.

Operation

To use an existing entry:

- Select an entry by clicking in the first column.
- Toggle the **Enable/Disable** state by double-clicking the first column for the entry.
- The *Edit* and *Delete* buttons apply to the selected entry.

To create a new entry:

1. Click the **Add** button. A screen like the following will be shown.

Figure 18: Special Application

2. Enter data as described below.
3. Click OK when finished. The new entry will appear in the list, and can be enabled and disabled like the pre-defined entries.

Data - Special Applications

Enable	Use this to Enable or Disable support for this application, as required.
Name	Enter a descriptive name to identify this application entry.
Outgoing Data	
Protocol	The protocol (TCP or UDP) used when you connect to the special application service.
Port Range: Start	The beginning of the range of port numbers used by the application server, for data you send to it. If the application uses a single port number, enter it in both the "Start" and "Finish" fields.
Port Range: End	The end of the range of port numbers used by the application server, for data you send.
Incoming Data	
Protocol	The protocol (TCP or UDP) used when the application or service sends data to you.
Port Range: Start	The beginning of the range of port numbers used by the application server when data is sent to you. If the application uses a single port number, enter it in both the "Start" and "Finish" fields.
Port Range: End	The end of the range of port numbers used by the application server, when data is sent to you.

Virtual Servers

Overview - Virtual Servers

The **Virtual Servers** feature allows Internet users to access Servers on your LAN, via the ISDN Internet Router. This feature is available only if you are using the ISDN Internet Router for shared Internet access, rather than for LAN-to-LAN connection.

Normally, Internet users would not be able to access a server on your LAN because:

- Your Server does not have a valid external IP Address.
- Attempts to connect to devices on your LAN are blocked by the firewall in this device.

The "Virtual Server" feature solves these problems and allows Internet users to connect to your servers. However, your LAN must have an existing connection to the Internet. Internet users cannot open a connection.

Virtual Server operation is illustrated below.

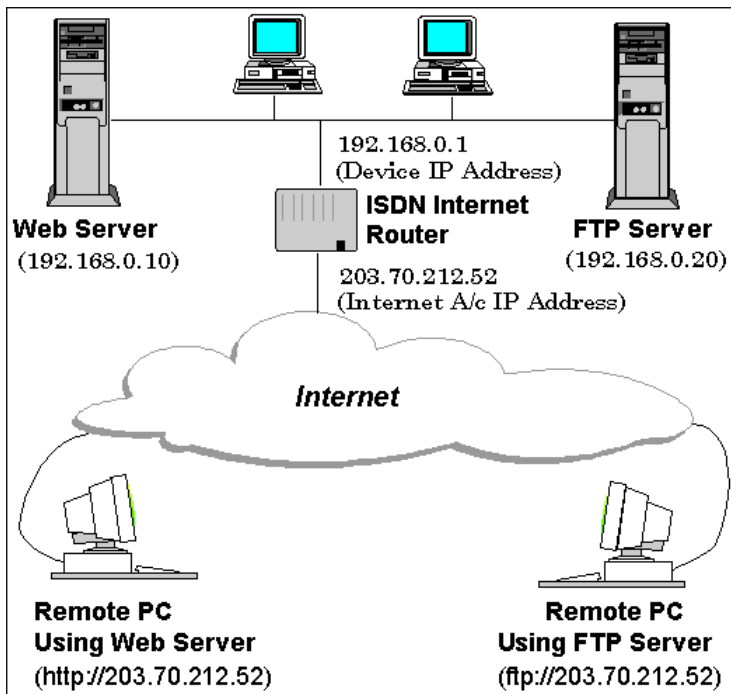


Figure 19: Virtual Server Operation

IP Address seen by Internet Users

Note that, in this illustration, both Internet users are connecting to the same IP Address, but using different protocols.

To Internet users, all virtual Servers on your LAN have the same IP Address.

This IP Address is the *IP Address from ISP* on the *Quick Setup* screen. This address should be static (fixed), rather than dynamic, to make it easier for Internet users to connect to your Servers.

Using Virtual Servers

- 1. Enable the Server type or types you wish to use.
This can be done by double-clicking within the "Enable" column, to toggle the value On or Off.
If creating or editing an entry, an *Enable* checkbox is available.
- 2. Enter the IP Address of each server on your LAN.
- 3. Click *OK* when finished.
- 4. Advise Internet users of the IP Address to use. (The IP Address allocated by the ISP, not the address on your LAN.) Note that because all Servers have the same IP Address, the appropriate client software (e.g. Browser, FTP client, Mail Client) must be used so that Internet users will be connected to the correct server.
- 5. Ensure that the connection to the Internet is established. Internet users cannot open a connection.

Defining Virtual Servers

If the type of Server you wish to use is not listed, you can define it by clicking the *Add* button. You will see a screen like the example below.

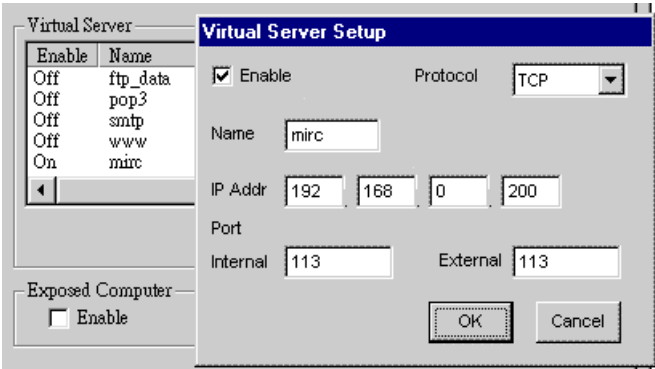


Figure 20: Virtual Server Setup

Data - Virtual Servers

Enable	Use this to Enable or Disable support for this Server, as required.
Protocol	Select the protocol (TCP or UDP) used by the Server.
Name	Names are case insensitive (case is ignored).
IP Address	The IP Address of the PC on your LAN which is running the Server software.
Internal Port Number	Enter the port number used by the Server to connect to clients.
External Port Number	The port number used by clients when connecting to the Server. This is normally the same as the <i>Internal Port Number</i> . If it is different, this device will perform a "mapping" or "translation" function, allowing you to configure the server to use one port address, while clients use a different port address

VPN (Virtual Private Networking) Servers

The ISDN Internet Router supports VPN, using PPTP (Peer-to-peer Tunneling Protocol).

- If accessing remote VPN Servers, no configuration is required. Just use your VPN Client software normally.
- To allow remote users to access a VPN Server on your LAN, you must create a *Virtual Server* entry for the VPN Server, using the procedure described above.
 - Select the TCP protocol
 - Enter a suitable name
 - Enter the IP Address of your VPN Server
 - Enter the port numbers used by your VPN software - normally 1723 for both the internal and external port.

Once this is done, the ISDN Internet Router is transparent. Simply configure and use your VPN software as described in the software documentation.

Exposed Computer

This feature, if enabled, allows one (1) computer on your LAN to be exposed to all users on the Internet, allowing unrestricted 2-way communication between the "Exposed Computer" and other Internet users or Servers.

This allows connection to special-purpose servers which require proprietary client software, or 2-way user connections such as Video-conferencing, which requires both users to run special software.

- Internet users will see the PC as having the *IP Address allocated by ISP* shown on the *Quick Setup* screen of this device. (This is the same IP Address used by the Virtual Servers.)
- Any Internet user who knows this address can connect to the *Exposed Computer*. (What happens after connection depends on what software both computers are using).
- **To allow unrestricted access, the Firewall in this device is disabled, creating a security risk.**
- **You should use this feature only if the "Special Applications" feature is insufficient to allow an application to function correctly.**
- **This feature should be enabled only when required.**

Operation

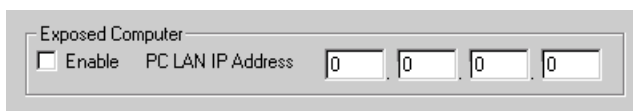


Figure 21: Exposed Computer

- Enter the IP Address of the PC on your LAN which you wish to be the *Exposed Computer*.
- Enable this feature as and when required.

Chapter 8

LAN-to-LAN



This Chapter describes the setup and operation of the LAN-to-LAN feature, which allows automatic connection to a remote LAN.

Overview

- The LAN-to-LAN feature allows the ISDN Internet Router to connect to a remote LAN, via the ISDN link.
- If the LAN-to-LAN feature is used, both Internet Access and the Dial-in feature are unavailable.
- The remote LAN must also have an ISDN Internet Router or compatible device; each device must be configured to connect to the other. One Server can be configured to initiate the connection, or both can dial-up as necessary. (In the latter case, there is a possibility that neither can connect because each is dialing the other.)

LAN-to-LAN Screen

Selecting the **LAN-to-LAN** tab will reveal a screen like the following example.

SC456970

Quick Setup | Status | Password | LAN | Dial-in
Access Control | Internet Application | LAN-to-LAN | ISDN

☒ Enable LAN to LAN / Disable Internet Access & Dial-in

Remote Site
IP Address: 192 . 168 . 1 . 203
Network Mask: 255 . 255 . 255 . 0

Act as a Receiver
☒ Enable
Authentication: ☐ Disable ☒ Enable
Login Name: WesternBranch
Password: [masked] Verify: [masked]

Initiate Connection to Remote Site
☐ Enable
Phone Number to Dial: [empty]
Login Using:
Name: [empty]
Password: [empty] Verify: [empty]
LAN to LAN time_out: 120 second (0 = Unlimited)

OK Cancel

Figure 22: LAN to LAN Tab

Data - LAN-to-LAN

Enable LAN-to-LAN	Use this to Enable and Disable the LAN-to-LAN feature. Note that enabling LAN-to-LAN will disable both Internet access and the <i>Dial-in</i> feature.
Remote Site	
Device IP Address	IP Address of the ISDN Internet Router at the remote LAN.
Network Mask	Network Mask (Subnet mask) of the ISDN Internet Router at the remote LAN.
Act as Receiver	
Enable	In <i>Act as Receiver</i> mode, this device will accept a connection from the remote device. Use this to Enable/Disable this mode.
Authentication	Select the desired security option: Disable means no name/password checking is performed. No login name or password is required if this option is chosen. Warning! Anyone can connect, this is a major security risk. Enable uses the industry-standard "PAP" security method.
Login Name	When another ISDN Internet Router attempts to connect to this one, a log-in name and password will be requested. Enter the name and password (below) which permit access to this ISDN Internet Router.
Password	The password associated with the log-in name above. Enter the password in the <i>Verify</i> field also.
Initiate Connection to Remote Site	
Enable	In this mode, the ISDN Internet Router will connect to the remote site as required. Use this checkbox to Enable/Disable this mode.
Telephone	Telephone number to dial to connect to the remote LAN. The remote site must have another ISDN Internet Router or compatible device.
Login using:	The remote ISDN Internet Router will request a Log-in name and password. Enter the name and password required to gain access to the remote ISDN Internet Router.
LAN-to LAN time-out	If the connection is not be used, it will be terminated after this time interval. Enter a suitable time for your situation. 0 means the connection will never be terminated.

Chapter 9

Troubleshooting



This Chapter explains the most common problems, and the solution to them.

Overview

This section covers some common problems that may be encountered while using the ISDN Internet Router. If you follow the suggested steps and the ISDN Internet Router still does not function properly, contact your dealer for further advice.

Internet Access

Problem 1	ISDN Internet Router is not listed in the Windows utility.
Solution 1	<p>Check the following:</p> <ul style="list-style-type: none">• The ISDN Internet Router is properly installed, LAN connections are OK, and it is powered ON.• Ensure that your PC and the ISDN Internet Router are on the same network segment. (If you don't have a router, this must be the case.)
Problem 2	When I enter an URL or IP address I get a time out error.
Solution 2	<p>Try the following troubleshooting steps.</p> <ol style="list-style-type: none">1. If using static IP Addresses, ensure that your workstations IP settings are correct, including IP address, default gateway and DNS.2. Ping the ISDN Internet Router. Use the "Run" command to enter the following command: <code>Ping xxx.xxx.xxx.xxx</code> where xxx.xxx.xxx.xxx is the ISDN Internet Router's IP address.3. If the ping command fails, check that the ISDN Internet Router is connected and ON. If it is connected and on, there is a problem with your LAN.4. On the <i>Quick Setup</i> screen, check that <i>Enable Internet Access</i> is checked.5. Check the <i>ISDN Status</i> screen, and examine the Connection Log. For details of the Log messages, refer to page 12.6. Check your "Proxy Server" settings on your PCs.<ul style="list-style-type: none">• The ISDN Internet Router is NOT a Proxy Server; PCs do not require "Proxy Server" settings to use it.• If you have Proxy Server on your local LAN, you should turn it Off, and disable the "Proxy Server" settings in your PC applications.• If your ISP has a Proxy Server, follow the instructions provided by the ISP.

Problem 3	Some applications do not run properly when using the ISDN Internet Router.
Solution 3	<p>The ISDN Internet Router processes the data passing through it, so it is not transparent.</p> <p>The following applications and protocols are transparently supported:</p> <p>Telnet, FTP, HTTP, ping</p> <p>POP/SMTP, Archie, NNTP</p> <p>TFTP, IRC, Gopher</p> <p>DNS, SNMP, Real Audio</p> <p>For applications which are not transparently supported, 2 features can be used:</p> <ul style="list-style-type: none">• Special Applications (<i>Internet Application</i> tab). If possible, you should use this feature. You can add additional applications to those already listed, using the data provided by the service provider. Note: At any time, only 1 PC can use a particular Special Application.• Exposed Computer (<i>Internet Application</i> tab). If an Internet Application cannot be made to work using the <i>Special Application</i> feature, you can use this method. However, this is a security risk, so should only be used when essential.

Dial-in

Problem 1	My modem can't establish a connection to the ISDN Internet Router.
Solution 1	You can NOT use a modem. You must use an ISDN TA, and establish an ISDN link.
Problem 2	I always get a busy tone when I try to dial-in.
Solution 2	Check the <i>Usage</i> setting on the <i>ISDN</i> tab. If set to "Always use 2 B channels", then dial-in is only possible when the ISDN Internet Router is idle. If set to "Dynamically use 2 B Channels", then dial-in access will be provided by dropping 1 B channel if necessary.
Problem 3	When using Dial-in, I get an IP Address conflict involving the dial-in PC.
Solution 3	<p>This can happen if you are not using the DHCP Server feature of the ISDN Internet Router.</p> <p>The ISDN Internet Router must allocate an IP Address to the dial-in PC, even if the DHCP Server is disabled. It allocates the IP Address shown in the <i>Start IP Address</i> field for the DHCP Server (on the LAN tab of the Manager utility).</p> <p>If this causes an IP Address conflict, you can change this value as follows:</p> <ol style="list-style-type: none">1. On the LAN tab, enable the <i>DHCP Server</i> function.2. Select an unused IP Address from the address range used on your PC, and enter in the <i>Start IP Address</i> field.3. Disable the <i>DHCP Server</i> function.4. Click <i>OK</i> to save.

Appendix A

Web-based Setup



For those unable to use the Window setup program, this Chapter explains the Web-based configuration system.

Overview

The ISDN Internet Router incorporates a Web-based setup facility, providing a cross-platform method of configuration. Any Web browser on any operating system using the TCP/IP network protocol can be used.

However, use of the ISDN Internet Router's advanced features requires use of the Windows utility.

Connecting to the ISDN Internet Router

1. Check the LAN:

- Since configuration uses the LAN connection, the ISDN Internet Router must be installed on your LAN first, and powered ON.
- If the ISDN Internet Router's default IP Address (192.168.0.1) is already used by another device, the other device must be turned OFF until the ISDN Internet Router is allocated a new IP Address during configuration.
- If your LAN has an existing DHCP Server, set DIP switch 2 ON to disable the DHCP Server in the ISDN Internet Router.

2. Check your TCP/IP settings (Windows 95):

The default settings for Windows 98 or later are correct.

For Windows 95, check your TCP/IP settings as follows:

1. Use *Start - Settings - Control Panel - Network* to view a screen like the following:

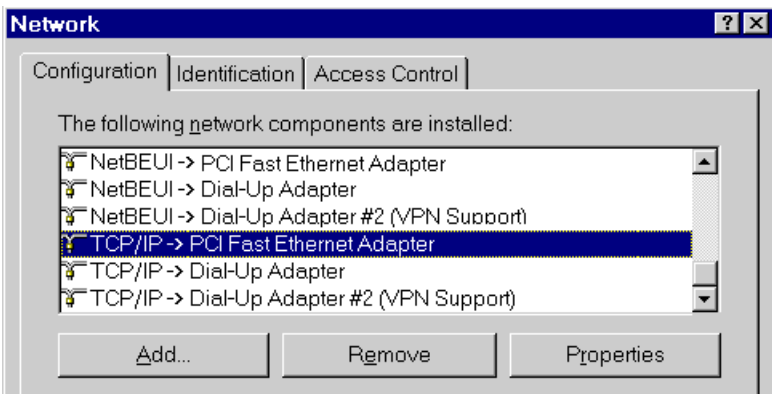


Figure 23: Network Configuration tab

2. If a line like the one highlighted ("TCP/IP -> Network Card") is not listed, select *Add - Protocol - Microsoft - TCP/IP - OK* to add it.

3. Select *Properties* for the "TCP/IP -> Network card" entry. You will then see the *IP Address* screen like the following example:

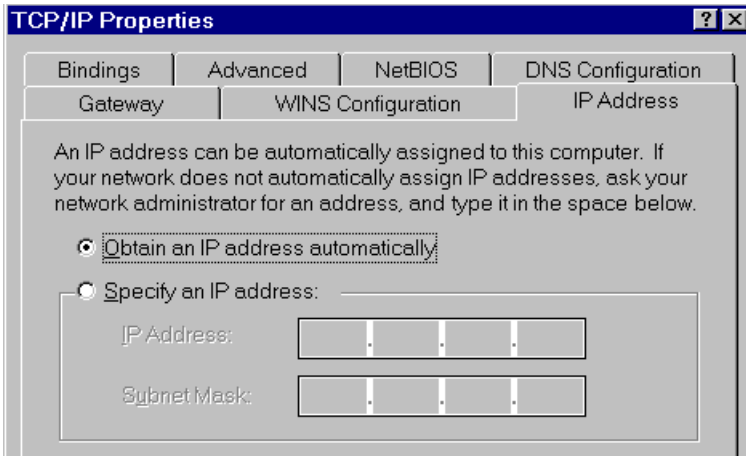


Figure 24: TCP/IP Properties – IP Address Tab

4. Either
 - Select "Obtain an IP address automatically" (your PC will act as a DHCP client, and obtain an IP address from the ISDN Internet Router)
 - OR
 - Select the radio button "Specify an IP Address"
 - Set *IP Address* to an unused value in the range 192.168.0.2 to 192.168.0.254
 - Set *Network Mask* to 255.255.255.0

These values are compatible with the ISDN Internet Router's default *IP Address* of 192.168.0.1 and *Network Mask* (Subnet mask) of 255.255.255.0

5. Restart (reboot) your PC.

3. Connect to the ISDN Internet Router

1. Start your Web Browser.
2. In the *Address* field, enter the following:
http://192.168.0.1
3. If a password has been set for the ISDN Internet Router, you will be prompted for the password, as shown below. (If no password has been set, you will not see this dialog box.)

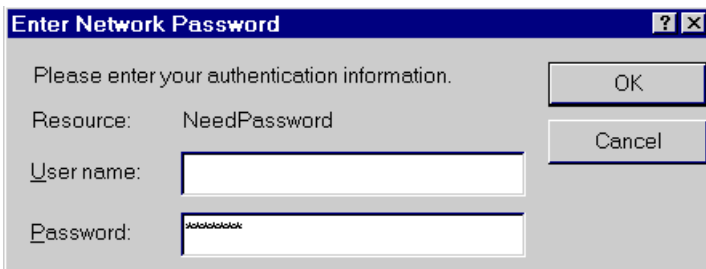


Figure 25: Password Dialog

Leave the "User Name" blank, and enter the password you assigned to the ISDN Internet Router.

4. You should then see the *Internet* screen.

5. The **Internet**, **ISDN**, and **LAN** screens must all be configured, as explained in the following sections.
6. Once setup is complete:
 - Restart the ISDN Internet Router by disconnecting and reconnecting the power.
 - Configure each PC, including the one used for this setup procedure.
 - You can then use the Status screen to check on the ISDN Internet Router and ISDN connection status.

If you can't connect, check the following:

- The ISDN Internet Router is properly installed, LAN connections are OK, and it is powered ON.
- Ensure that your PC and the ISDN Internet Router are on the same network segment. (If you don't have a router, this must be the case.)
- Check your TCP/IP settings, as described for Windows 95. For other versions of Windows, the screens may look different, but the settings are identical.

Internet Screen

Internet

ISDN

LAN

Status

Account (User) Name

guest

Account Password:

Verify:

IP Address from ISP

☒ Dynamic

☐ Fixed

0

0

0

0

DNS IP Address

0

0

0

0

Telephone

555123456

Disconnect after Idle Time of

120

seconds

Save your data before changing tabs.

Save

Cancel

Figure 26: Internet Screen

Data - Internet Screen

Account (User) Name	Enter the account name provided by your ISP (Internet Service Provider). This name will be used to log in to the ISP. s server.
Account Password	Enter the current password for the above account.
Verify	Re-enter the password to ensure it is correct.
IP Address from ISP	<i>Dynamic</i> is the most common; an IP Address is assigned when you connect. If <i>Fixed</i> , enter the IP address assigned by your ISP.
DNS IP Address	The DNS (Domain Name Server) translates names (e.g. micro-soft.com) to IP Addresses. Use the DNS IP address supplied or recommended by your ISP.
Telephone	The telephone number to connect to your ISP.
Disconnect after Idle Time	After this time period, idle connections will be terminated.

ISDN Screen

Figure 27: ISDN Screen

Data - ISDN Screen

Country	<p>Select your country from the drop-down list.</p> <p>Note that there are 5 entries for the USA. If in the USA, select the entry to match the "Switch Type" used by your telephone company.</p>
SPID (1st B Channel)	<p>If you live in the USA, enter the SPID (Service Profile Identifier) provided by your phone company.</p> <p>The most common format for the SPID is 10 digits (area code + local number) for the phone number, followed by 4 digits for the device ID.</p> <p>e.g. 555-555-1234-0101</p> <p>Where 555-555-1234 is the phone number, and 0101 is the device ID.</p> <p>However, there is wide variation in SPID formats, and you must use the method advised by your phone company.</p> <p>If your telephone company did not provide this information, leave this blank.</p>
SPID (2nd B Channel)	Enter the SPID for the 2 nd B Channel. (See above)
Usage	Select the desired option.

LAN Screen

Internet

ISDN

LAN

Status

Device IP Address

192

168

0

1

Network Mask

255

255

255

0

DHCP Server

☒ Enable

Start IP Address:

192

168

0

2

Finish IP Address:

192

168

0

51

DNS IP Address

1.

172

68

2

254

2.

0

0

0

0

(optional)

3.

0

0

0

0

(optional)

Save your data before changing tabs.

Save

Cancel

Figure 28: LAN Screen

Data - LAN Screen

<div>IP Address</div> <div>Network Mask</div>	<div>These settings depend on your LAN environment:</div> <div>If you use the built-in DHCP server (recommended):</div> <div><ul style="list-style-type: none">Usually, no changes are required on this screen.However, all devices on your LAN must either be a DHCP Client OR use a compatible IP Address and Network mask.</div> <div>If your LAN already has a DHCP server:</div> <div><ul style="list-style-type: none">If not already done, set DIP switch 2 ON to disable the DHCP server in the ISDN Internet Router.Assign the ISDN Internet Router an unused <i>IP Address</i> within the address range used on your LAN. (Do not use an IP Address allocated by the DHCP Server; doing so will cause an IP Address conflict.)The <i>Network Mask</i> must be the same as the value used by the DHCP server.</div> <div>If your LAN uses static (fixed) IP Addresses:</div> <div><ul style="list-style-type: none">Give the ISDN Internet Router a unique <i>IP Address</i> chosen from the address range used by PCs on your LAN.The ISDN Internet Router's <i>Network Mask</i> must be the same value as PCs on your LAN.</div>
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DHCP Server	<p>If Enabled (default), the ISDN Internet Router will provide the IP Address and related data when requested by <i>DHCP Clients</i>. (See PC Setup for details on configuring your PCs as DHCP clients.)</p> <p>If necessary, change the <i>Start IP Address</i> and <i>Finish IP Address</i> to suit your LAN.</p> <p>These settings also determine how many DHCP clients can be handled.</p>
DNS IP Address	<p>The first entry will match the value entered on the Internet tab. The other entries are optional.</p> <p>If desired, provide additional DNS entries. If multiple entries are provided, the first available DNS Server will be used.</p>

Status Screen

The **Status** screen can be used to review the connection status of the ISDN Internet Router. An example screen is shown below.

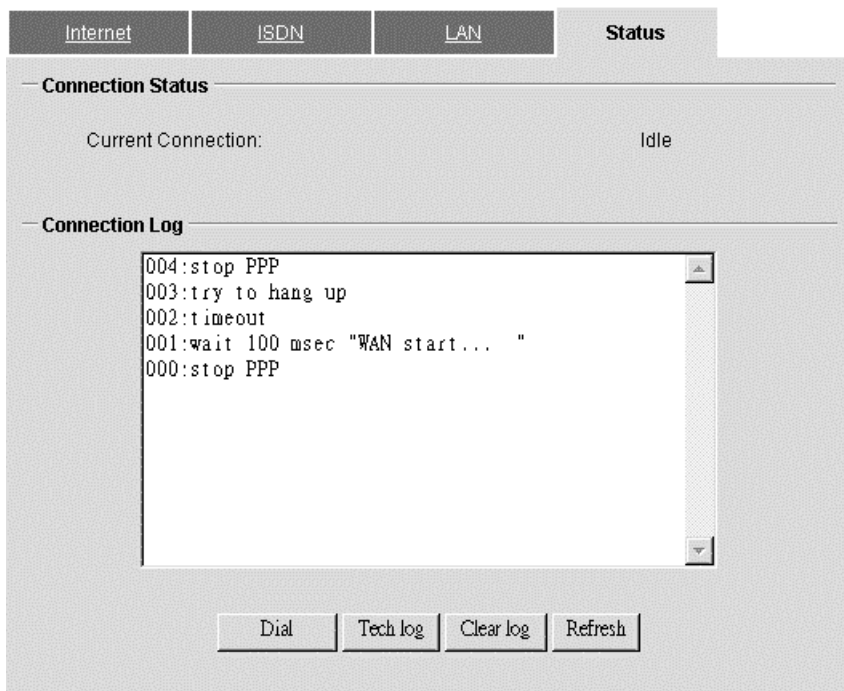


Figure 29: Status Screen

Connection Status

Current Connection	<p>This indicates whether the ISDN Internet Router is Idle, or being used for Internet Access, LAN-to-LAN connection, or Dial-in.</p> <p>If a connection exists, the following data is shown:</p> <ul style="list-style-type: none">• Name: For Internet access, the account name is displayed. For Dial-in, the name of the dial-in user is displayed. For LAN-to-LAN, the name of the remote device is displayed.• IP Address The IP Address used by this device, allocated by the remote device. This address is provided by the ISP on connection. (Or by the remote ISDN Internet Router, if using LAN-to-LAN.)
---------------------------	---

Connection Log

This shows status to the PPP link over the ISDN line.
Common messages are shown in the following table.

Message	Description
Dialing	Dialing the ISP
Try to establish physical connection	The device is trying to connect with the ISP.
Busy error	The number dialed was busy.
Physical line is connected	Physical connection to ISP has been established.
Start PPP	A PPP connection is now being established.
PPP up fail	The PPP connection could not be established.
PPP up successfully	The PPP connection was established successfully.
Stop PPP	The PPP connection was terminated. This will occur at the end of a session, or an error condition.
Idle timer expires	The "Idle time-out" has been triggered. (There was no data sent or received for the duration of the "Idle time" period.)

Buttons

- **Dial/Hang Up**- Dial your ISP or hang up, depending on whether or not a connection exists.
- **Tech Log** - Display ISDN messages, instead of connection messages. This is only to assist technical support staff.
- **Clear Log** - Delete existing data in the log. This makes new data easier to read.
- **Refresh** - Update the Log.