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Note:

This is a condensed version of the User Manual. The full version is installed with the *Windows Manager* utility.

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Your Level One ISDN Router

1

Connectors and Components

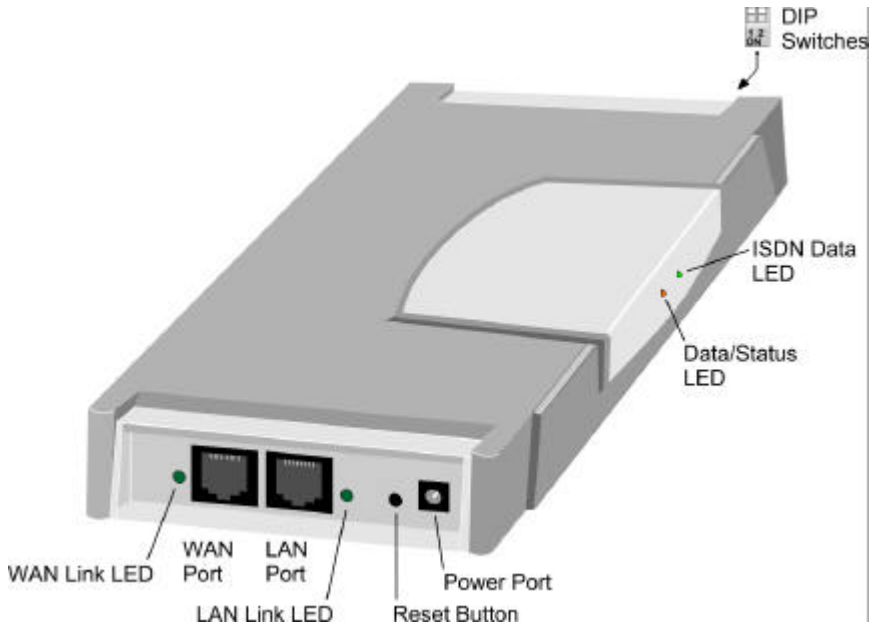


Figure 1: Connectors and Components

LEDs

LAN

LAN link LED (beside the LAN Port) is On when a LAN connection is established, and flashes when data is transmitted or received through the LAN.

ISDN LEDs

WAN Link LED (beside the WAN Port) is ON when an ISDN "D" channel connection is established.

ISDN Data LED (front) flashes when data is transmitted or received via the ISDN "B" Channel.

Data LEDs (Front)

Note: The Data/Status LED has 2 colors - Orange and Green.

Data/Status LED	ISDN Data LED	Description
OFF	OFF	No power.
ON (Orange, then Green)	ON, then OFF	Normal power ON (start up) sequence.
ON (Green)	OFF	Idle
Flashing (Green)	Flashing	Normal operation. Data is being received and transmitted.
Flashing Orange, Green (repeated)	-	Hardware error. Contact technical support.

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 password to NULL (no password)

Procedure:

1. Power off the Level One ISDN Router.
2. Set DIP switch 1 to ON, and switch 2 to OFF.
3. Power on the Level One ISDN 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 Level One ISDN Router is now ready for use with the default IP Address and password.

Specifications

Dimensions	120mm(W) * 93mm(D) * 30mm(H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocol:	TCP/IP
Ethernet Interface:	1 * 10/100BaseT (RJ45)
ISDN Interface:	1 * RJ45 for S/T interface.
LEDs	2 * RJ45 connection status 2 * Data Transfer
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 A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Setup & Operation



Overview

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

1. Hardware Installation
2. Software Installation
3. Level One ISDN Router setup, using the supplied software.
4. PC and or/LAN configuration.

Requirements

- 10BaseT or 100BaseT Ethernet network.
- ISDN phone line, fitted with a NT-1 (Network Termination 1) termination and RJ45 sockets for S/T connection.
- Internet Access account with a local ISP (Internet Service Provider).
- The Setup program requires Windows 95/98, or Windows NT4.0.



*If necessary, configuration may be performed using a Web browser instead of the supplied Windows utility. See **Websetup**, in the **Manual** folder on the CD-ROM, for details.*

Hardware Installation

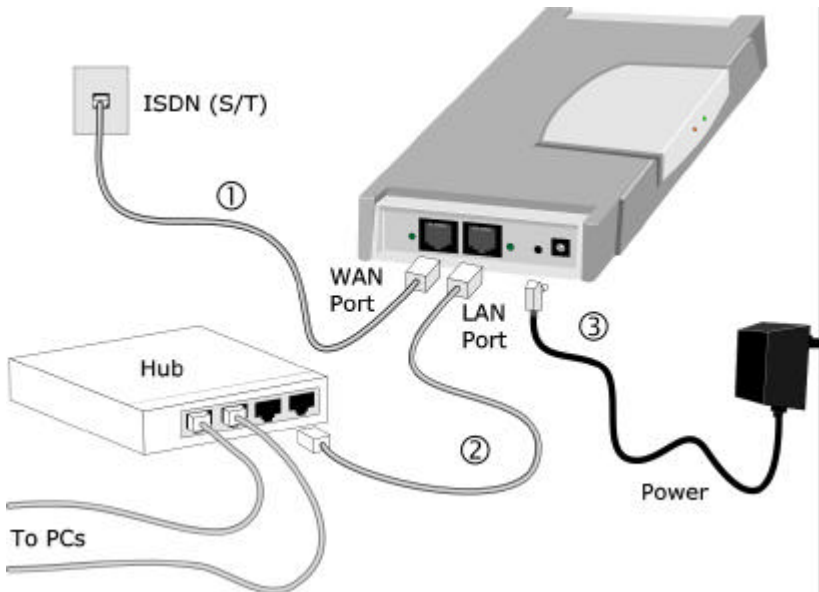


Figure 2: Installation



The ISDN Router incorporates a DHCP Server. If you already have a DHCP Server, and wish to continue using it, set DIP switch 2 ON to disable the DHCP Server in the ISDN Router.

1. Use the supplied cable to connect the WAN port to the S/T connector on your ISDN NT1 (Network Terminator 1).
2. Connect the LAN port to your 10BaseT or 100BaseT hub.
3. Connect the supplied power supply.

Software Installation

1. Insert the supplied CD-ROM into your drive.
2. If the install program does not start, run SETUP.EXE in the root directory.
3. Follow the prompts to complete the installation.
4. The setup program will now run.

ISDN Router Setup

1. On the first screen, select the Level One ISDN Router, and click "Setup".

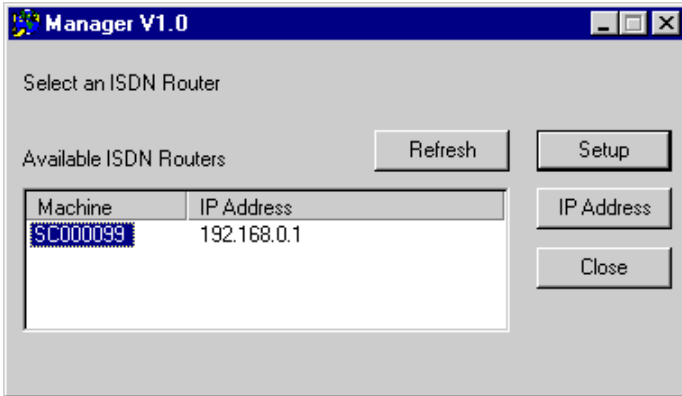


Figure 3: Manager - first screen

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.
 - Click "Change" to continue.

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

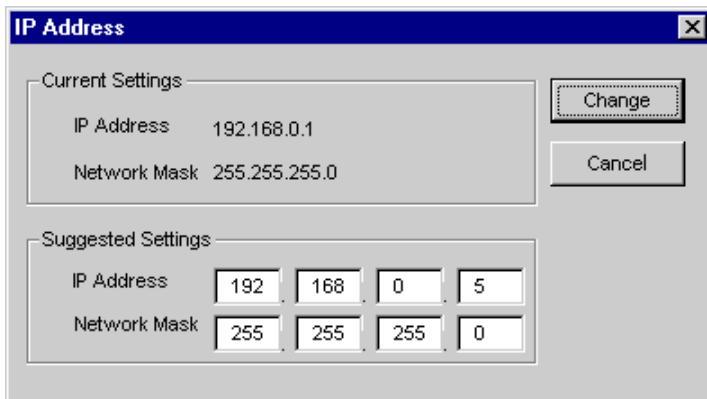


Figure 4: IP Address Screen

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

SC000099

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

Internet Access

Enable Internet Access

Account Name

Account Password Verify

IP Address from ISP Dynamic
 Fixed

Idle Time-out minutes (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

Figure 5: Quick Setup Tab

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> , use the address provided by your ISP.
Idle Time-out	If a connection is idle for longer than this time period, it is dropped.
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.

- Normally, no other configuration is required, but if your LAN has a router, or you wish to change the IP Addresses allocated by the DHCP Server, refer to Chapter 3.

PC Setup (Required for every PC)

TCP/IP Setup



If your LAN has a DHCP Server, or a Router, do NOT change the TCP/IP settings on the PCs. See Chapter 3 for further details.

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

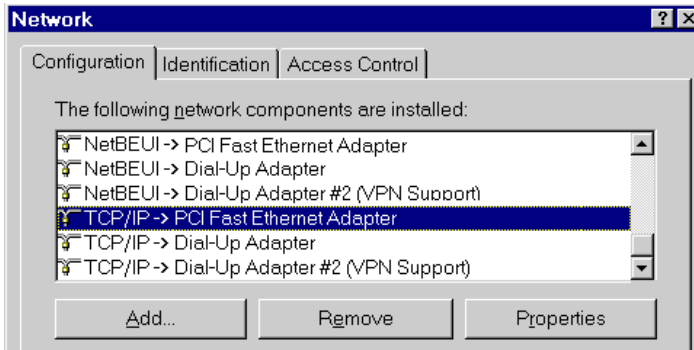


Figure 6: Network - Windows 95/98

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

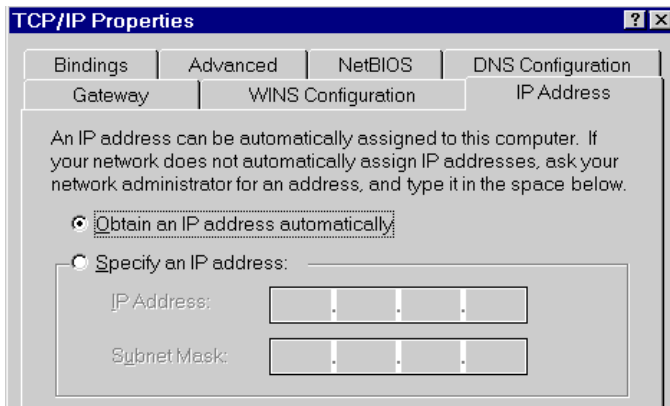


Figure 7: TCP/IP Properties

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 Level One ISDN 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 Level One ISDN Router's *IP Address*.
 - On the **DNS Configuration** tab, enter the same value used when configuring the Level One ISDN 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.
 - You can now use your Browser to access the Internet.
 - To access the E-Mail account provided by your ISP, your E-Mail program must be configured as detailed by your ISP.

Operation

Internet Access

Once configured, operation is automatic. You can use your Web Browser to access any Web Site. The Level One ISDN 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 Level One ISDN 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 Level One ISDN Router.

- *Device* section provides details of the Level One ISDN 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.)

Other Configuration

Overview

In most cases, the configuration covered in this chapter is not necessary. If required, chapter 2 will direct you to this chapter.

DHCP

A DHCP (Dynamic Host Configuration Protocol) server provides an IP address and related data to a DHCP client (PC or device) upon request.

Existing DHCP Server

If using an existing DHCP Server:

- Configure it to provide the ISDN Router's IP Address as the *Default Gateway*.
- The DHCP Server in the Level One ISDN Router should be disabled. This setting is on the *LAN* tab.

ISDN 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 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 (below) 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.



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

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 Level One ISDN Router correctly. See the On-line manual, installed with the *Manager* utility, for further details.

ISDN

The *ISDN* tab on the *Manager* program allows you to:

- Temporarily switch the ISDN link OFF.
- Use 2 B Channels for Internet access, rather than 1.
This will provide greater bandwidth, and therefore faster file transfers, but at increased telephone costs.
- Set the outgoing call MSN and SAD. (MSN and SAD allow you to have multiple phone numbers).
- Set the B Channel line speed, or enter an "Initial Sting" (Only if advised to do so by your phone company.)

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

Advanced Features

Overview

This Chapter is provided to help you decide whether or not you need to use a particular feature.

For configuration and implementation details, refer to the on-line User Manual installed with the *Manager* utility.

Access Control

The Access Control feature allows administrators to restrict Internet Access by individual workstations (PCs). The process uses "Packet Filtering" to block or discard data packets. You can apply the pre-defined filters, and optionally define your own filters.

- For convenience, restrictions are applied to a "Group" (of workstations), rather than to individual workstations.
- To block access by an individual workstation, its details must be entered in the Workstation database.
- Restrictions can be applied to ALL PCs without entering ANY workstation data, by applying restrictions to the "Everyone" group.
- By default, filtering is disabled, and no packets are blocked or discarded.

Internet Applications

These features, on the *Internet Application* tab, are not available if you use the ISDN Router for *LAN-to-LAN* connection.

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.
- If a new Internet application is unable to function correctly, you can add it to the list.
- At any time, each Special Application can be used by only 1 PC.

Virtual Servers

The *Virtual Servers* feature allows Internet users to access standard Servers on your LAN, via the Level One ISDN Router.

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 the Level One ISDN Router.

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.

To Internet users, all virtual Servers on your LAN have the same IP Address (*IP Address from ISP*, on the *Quick Setup* screen). This address should be fixed (static) to make it easier for Internet users to connect to your Servers.

Exposed PC

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.

- Internet users will see the PC as having the *IP Address from 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.
- Using this feature is a security risk. You should use this feature only if the "Special Applications" feature is insufficient to allow the desired application to function.

Dial-in

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

- Dial the ISDN Router using an ISDN TA and the same software that they use for dial-in Internet access. (e.g. *Dial-up Networking*).
- Have their user name and password verified by the Level One ISDN Router. (If dial-in authentication is set to "None", no User name/password verification is performed.)
- Access the LAN resources as if they were a local user. To other devices on the LAN, the dial-in user will appear to be a local PC having an IP Address allocated by the ISDN Router.

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

The Dial-in feature is unavailable when the ISDN Router is used for **LAN-to-LAN** connection.

LAN-to-LAN

The LAN-to-LAN feature allows the Level One ISDN Router to connect to a remote LAN, via the ISDN link.

- The remote LAN must also have a Level One ISDN Router or compatible device; each device must be configured.
- NAT (Network Address Translation) - the feature that allows all PCs on the LAN to share 1 external IP Address, and also provides firewall protection - is disabled when using the LAN-to-LAN function.



Note!

If LAN-to-LAN is used, neither Internet Access nor Dial-in are available.

Troubleshooting

5

Overview

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

Internet Access

Problem 1	ISDN Router is not listed in the Windows utility.
Solution 1	<p>Check the following:</p> <ul style="list-style-type: none">• The ISDN Router is properly installed, LAN connections are OK, and it is powered ON.• Ensure that your PC and the ISDN Router are on the same network segment. (If you don't have a router, this must be the case.)
Problem 2	When I enter a 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 Router. Use the "Run" command to enter the following command: <pre>Ping xxx.xxx.xxx.xxx</pre>where xxx.xxx.xxx.xxx is the ISDN Router's IP address.3. If the ping command fails, check that the ISDN 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 11.

6. Check the "Proxy Server" settings on your PCs.
 - The ISDN 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 Router.

Solution 3

The ISDN Router processes the data passing through it, so it is not transparent.

The following applications and protocols are transparently supported by firmware V5.0 or later:

- Telnet, FTP, HTTP, ping
- POP/SMTP, Archie, NNTP
- TFTP, IRC, Gopher
- DNS, SNMP, Real Audio

For applications which are not transparently supported, 2 features can be used:

- **Special Applications**
(*Internet Application* 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**
(*Internet Application* tab). If an Internet Application cannot be made to work using the *Special Application* 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 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	<p>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 Router is idle.</p> <p>If set to "Dynamically use 2 B Channels", then dial-in access will be provided by dropping 1 B channel if necessary.</p>
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 Router.</p> <p>The ISDN 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 it in the <i>Start IP Address</i> field.3. Disable the <i>DHCP Server</i> function.4. Click <i>OK</i> to save.