NetComm®

2 and 4-Wire Modem Router

SHDSL

User Guide

NB702 & NB704

Australia connects with NetComm®

Contents

Chapter 1 - Getting Started

I. Overview

This manual covers both the NetComm NB702 (2 wire SHDSL) and the NB704 (4 wire SHDSL) CPE products. The NB702 allows you to Transmit / Receive data over a single copper wire pair at rates up to 2.3Mbps. The NB704 allows you to Transmit / Receive data over two copper wire pairs at rates up to 4.6Mbps. Both models are designed to bring high speed data into your business network and are high performance, cost effective and easy to configure SHDSL devices which can operate in either Bridge or Router modes. The command structure and menu system for these products are almost identical.

Product naming conventions

This manual covers both the NB702 - 2 Wire SHDSL Modem Router and the NB704 - 4 Wire SHDSL Modem Router. Where features and functions are common to both models the product will be refered to as the NB702/NB704. Features and functions dedicated to the either model are shown separately.

II. Package Contents

This package consists of the following items:

- NetComm 2 wire SHDSL Router (NB702)

OR

- NetComm 4 wire SHDSL Router (NB704)

- RJ-45 Cable

- RJ-11 Cable

- AC Adapter

- This User Guide and a Package Contents Note contained on the CD

III. Features

- High-speed symmetrical data transmission on two pairs of twisted copper wire.
- ITU standard PAM16 Line Code complies with G.991.2 and G.994.1 standards.
- Supports Annex.A and Annex.B mode operation.
- Supports Wetting Current range from 0.3mA to 3mA.
- One Ethernet switch with four 10/100Mbps auto-sensing ports for PC or LAN connection.
- Provides a broad range of Symmetrical Multi-rate Data Transmission from 144 Kbps up to 2.3 Mbps.
- Supports PPPoE (RFC2516), PPP (RFC2364), and IP (RFC 2225/RFC1577) over ATM over SHDSL.
- RFC2684 (RFC1483) Bridged/Routed for both LLC/VC MUX.
- DHCP server supported for easy LAN IP address management.
- Allows LAN users to access the Internet through Network Address Translation (NAT, IP sharing) simultaneously.
- Local OAM&P through command line interface via RS-232 Craft port.
- Configuration and management by local Telnet, SNMP, and web-browser through the Ethernet interface, and remotely through SHDSL interface.
- Firmware upgradeable through TFTP.
- High performance, simple operation, and low power consumption

IV. Safety Guidelines

- In order to reduce the risk of fire, electric shock and injury, please adhere to the following safety guidelines.
- Carefully follow the instructions in this manual; also follow all instruction labels on this device.
- Except for the power adapter supplied, this device should not be connected to any other adapters.
- Do not spill liquid of any kind on this device.
- Do not place the unit on an unstable stand or table. This unit may drop and become damaged.
- Do not expose this unit to direct sunlight.
- Do not place any hot devices close to this unit, as it may degrade or cause damage to it.
- Do not place any heavy objects on top of this unit.
- Do not use liquid cleaners or aerosol cleaners. Use a soft dry cloth for cleaning.

V. Appearance

Front Panel for NB702 and NB704

Label	Status	Color	Description
PWR	ON	Green	Power supply is connected.
ACT	Blinking	Green	Transmitting or receiving packets over an Ethernet port.
LAN	ON	Green	An Ethernet port is connected to a LAN or PC.
WAN	Blinking	Green	Training with DSLAM.
	ON	Green	SHDSL link is ready.
ALM	Blinking	Red	Booting up.
	ON	Red	Error. Continuous ON indicates internal error.

Rear Panel

NB702 Rear View

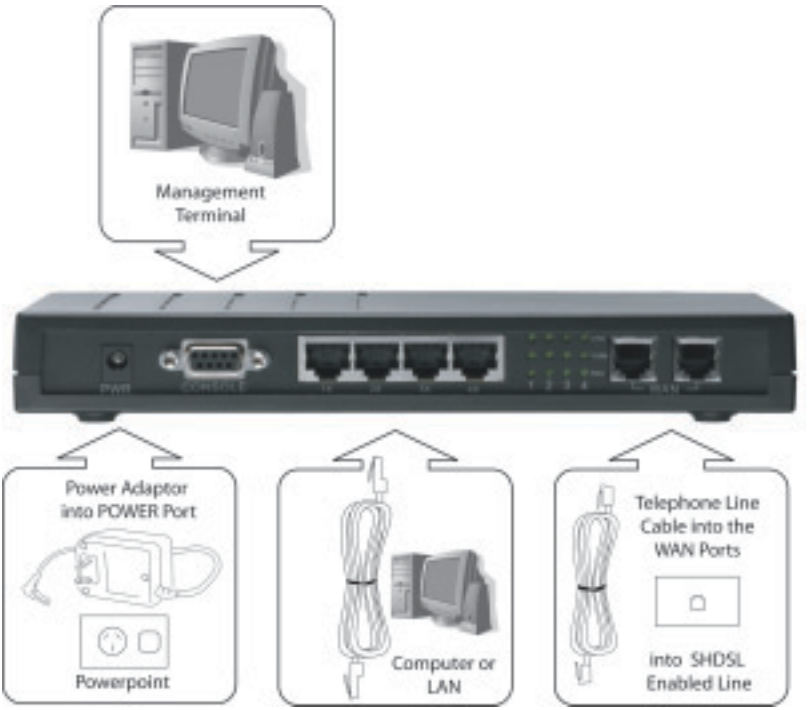
NB704 Rear View

Label	Description
PWR	DC-inlet for AC Adapter.
CONSOLE	Serial port; connect to an ASCII data terminal.
1X ~ 4X	Four RJ-45 ports; connect to a PC or LAN.
LINK	LINK LED indicates a specific port is connected.
100M	100M LED: ON indicates 100M data transferring, OFF indicates 10M data transferring.
FDX	FDX LED: ON indicates full-duplex, OFF indicates half-duplex
WAN	RJ-11 port; connect to the SHDSL outlet (**Note: The NB704 has two WAN ports**)

VI. Hardware Installation for the NB702/NB704

1. Connect one end of the RJ-11 cable into the WAN port of the NB702/NB704, and the other end into the SHDSL wall outlet.
2. Connect one end of the RJ-45 cable into one of the RJ-45 ports of the NB702/NB704, and the other end into your PC or LAN.
3. Plug in the AC adapter into the AC power socket, and connect the DC jack into the PWR inlet of the NB702/NB704.

Note: Use a 9-pin RS-232 cable (not supplied) to connect the Console port to the PC with data terminal emulation software (Hyper Terminal) installed. If you wish to manage the NB702/NB704 via a serial Interface.



Note: The above example displays the NB704.

VII. Management

Console Port (Serial)	Use a the RS-232 cable to connect the NB702/ NB704 to a serial console terminal or a PC running a terminal emulation program, such as Hyper Terminal. (For further details, See Chapter 3: Command Line Interface)
Local Ethernet Port	(Telnet) Connect the Ethernet port to your local area network or directly to a PC, “telnet” the NB702/NB704 from any workstation in the LAN. The default local Ethernet IP address is “192.168.1.1”.
Local Ethernet Port	(Web Browser) Connect the Ethernet port to your local area network or directly to a PC. Launch your web browser and enter default local Ethernet IP address “192.168.1.1” into the address bar.
ADSL Port from Remote Site	While the ADSL connection is in service, you may remotely “telnet” the NB702/NB704 from a workstation connected to the CO equipment.

Note: As operating an SHDSL device requires technical know-how and experience. It is recommended that only qualified technical staff manage the NB702/NB704. Therefore, password authentication is required when you enter the command line and web interface. See the Default Values section to obtain the password.

VIII. Default Values

The NB702/NB704 is pre-configured with the following parameters; you may also re-load the default parameters by typing Restore in the command line interface. (For further details, See Chapter 3: Command Line Interface)

Default mode:	Bridge
User Name:	N/A
Password:	admin

Bridge mode setting

Ethernet (local) IP:	192.168.1.1
Subnet mask:	255.255.255.0
Full Duplex:	Disable
Protocol:	RFC1483, Bridge Mode
VPI/VCI:	1/32
Class (QoS):	UBR
Spanning tree:	Disable
Packet filter:	Any

G.SHDSL setting

Terminal:	CPE
Rate mode:	Adaptive
Annex:	Annex A

Router mode setting

Ethernet (local) IP:	192.168.1.1
Subnet mask:	255.255.255.0
Full Duplex:	Disable
DHCP server:	Disable
DNS Relay:	Disable

Serial Port Properties

Bit per second:	9600
Data bits:	8
Stop bits:	1
Parity bits:	None
Flow Control:	None
Terminal Emulation:	VT100

IX. Software Upgrade

You may easily upgrade the NB702/NB704 embedded software by obtaining the compressed upgrade kit from the service provider then following the steps:

- Extract the ZIP file for updated firmware
- Connect the NB702/NB704 via the local Ethernet port or remote ADSL link, make sure that the NB702/NB704 Ethernet IP address and your terminal are properly configured so that you can successfully “ping” the NB704. The default local IP address is 192.168.1.1.
- Under the DOS prompt, execute the command “xupgrade <IP address of NB702/NB704>”, for instance “xupgrade 192.168.1.1”.
- This upgrading process may last as long as 60 seconds.
- Then reboot the NB702/NB704 with new software.

Chapter 2 - Web Management Interface

I. Overview

The Web management is provided in order to manage NB702/NB704 device as easily as possible. It provides a very user-friendly configuration and graphical interface through a web platform. You may configure a bridge or a router function to accommodate your device need. In the section below, each configuration item will be described in detail.

II. Preparation

1. Please refer the hardware installation procedure in Chapter 1 to install NB702/ NB704.
2. You should configure the PC to the same IP subnet as the NB702/NB704.

   Example:

   NB704: 192.168.1.1

   Your PC: 192.168.1.x
3. Connect your PC to NB702/NB704 via an Ethernet cable.
4. Launch the Web browser (IE or Netscape), and enter the default IP address 192.168.1.1 into the address bar to access the web management page.
5. The Enter Network Password dialog box will popup first.

Note1: ***Some commands or settings shown in this manual may not be available in the NB702 as it only supports 2 wire SHDSL .***

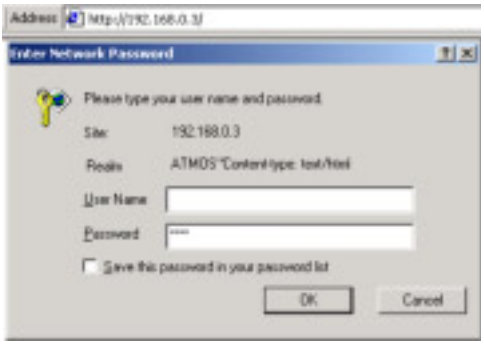
Commands not currently supported in the NB702 are: ipoa, pppoa, pppoe, rtable.

Note2: ***You should change the default admin password of your router before you connect it to the internet or your network.***

Note3: ***When using NAT/PAT a 'Portforward' or 'Incoming Table' entry will be automatically generated for port 23 (Telnet). This will allow you to log-in from the WAN side of the NB702/4. If you do not want to allow Telnet service via the WAN port (Internet) you should delete the table entry for port 23.***

1. Login

The window Enter Network password will pop up while starting the configuration. With the window active, leave the User Name text box blank, and enter "admin" as the Password, and then click on the OK button.

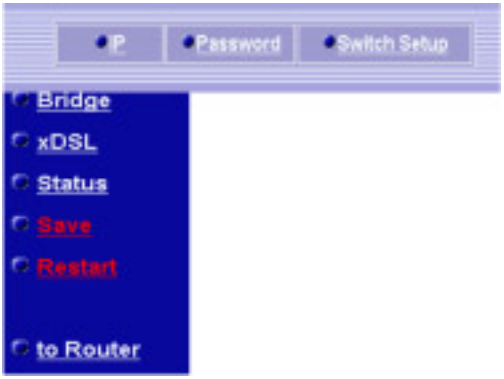


2. Bridge Mode Configuration

By default, the NB702/NB704 is configured in bridge mode. This section describes the steps involved in setting up the NB702/NB704 as a bridge. The links on the navigation bar are: Manage, Bridge, xDSL, Status, Save, and Restart. Each one is described in the next few sections.

2.1 Manage

Click on the Manage link in the navigation bar.



You will then see three options: IP, Password, and Switch Setup. Each one is described below.

2.1.1 IP Setup

Click on the IP link on the top of the page. You will then see the Device IP Setup table. On this page you can change the IP address and subnet mask of the NB702/ NB704.

Ethernet IP Address:	Enter the IP address of this device.
Ethernet Subnet Mask:	Enter the subnet mask for the IP address.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

2.1.2 Password Setup

Click on the Password link on the top of the page. You will then see the Change Password table. On this page you can change the password used to log into the NB702/NB704.

Old Password:	Enter the old password of the device.
New Password:	Enter the new password.
New Password Again:	Re-type the new password

Click on the Submit button to complete the configuration. You will then see a confirmation message.

2.1.3 Switch Setup

Click on the Switch Setup link on the top of the page. You will then see the Speed/ Duplex table. On this page you can change the speed and duplex on individual ports of the NB702/NB704.

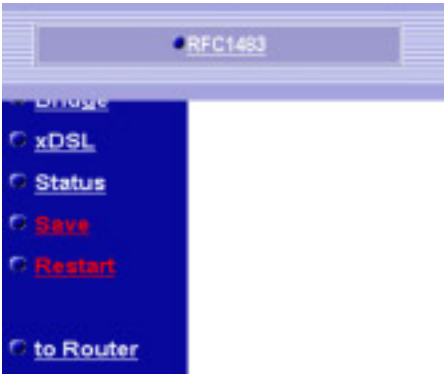
Select a port number.

From the drop down list select: Auto-nego, 100/Full, 100/Half, 10/Full, or 10/Half.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

2.2 Bridge

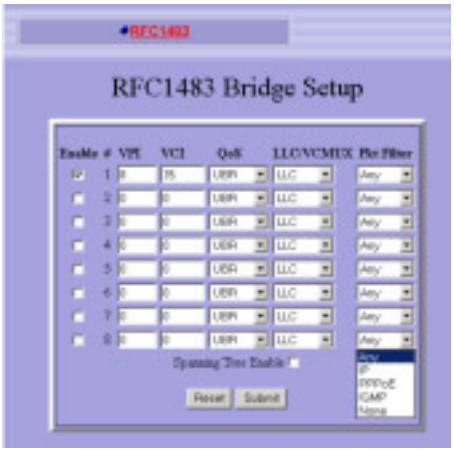
Click on the Bridge link in the navigation bar.



You will then see the RFC 1483 link, which is described below.

2.2.1 RFC 1483

Click on the RFC 1483 link on the top of the page. You will then see the RFC 1483



Bridge Setup table. On this page you can create up to 8 VPI/VCI channels and configure its QoS, encapsulation, packet filter, and spanning tree.

Enable: Place a check in this box if you would like to enable the settings in that row.

VPI:	Enter the VPI value that you received from your ISP.
VCI:	Enter the VCI value that you received from your ISP.
QoS:	Select a Quality of Service from the drop down list, options available are: UBR, CBR, VBR-nrt, VBR –rt.
LLC/VCMUX:	Select an encapsulation method from the drop down list, options available are: LLC and VCMUX.
Pkt Filter:	Select a packer filter from the drop down list, options available are: IP, PPPoE, IGMP, or None.
Spanning Tree Enable:	If you would like the connection to use spanning tree, place a check in this box.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

2.3 xDSL

Click on the xDSL link in the navigation bar.

You will then see the DSL Setup link, which is described below.

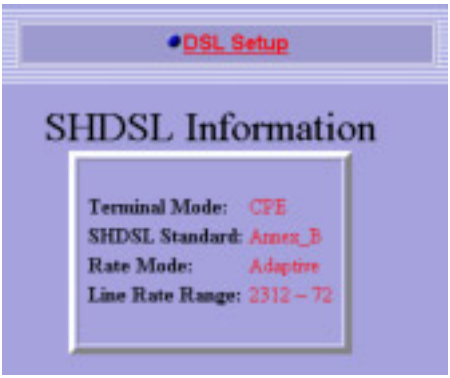
2.3.1 DSL Setup

Click on the DSL Setup link on the top of the page. You will then see the SHDSL Setup table. On this page you can modify the line rate, annex standard, and terminal type of the NB702/NB704.

Adapt: If you would like to use adaptive line rate, then select MaxRate and MinRate from the drop down list.

FixRate:	If you would like to use a fixed line rate, then select a FixRate from the drop down list.
Annex:	Select A or B from the drop down list.
Terminal:	Select a terminal type from the drop down list, CPE or COE.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.



2.4 Status

Click on the Status link in the navigation bar.

You will then see five options: Version, IP, Bridge, Interface, and SHDSL. Each one is described below.

2.4.1 Version

Click on the Version link on the top of the page. You will then see the Version table that displays the software version, firmware version, MAC address, and release date of the NB702/NB704.

2.4.2 IP

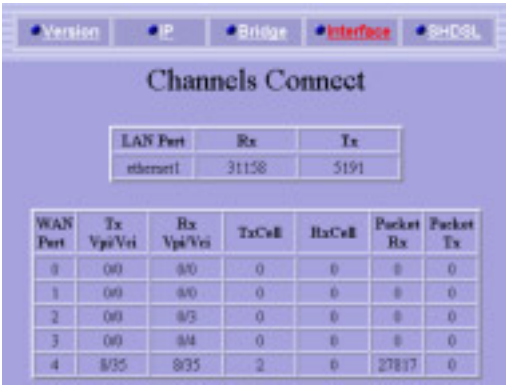
Click on the IP link on the top of the page. You will then see the Device IP Information table that displays the Ethernet IP address, subnet mask, and duplex of the NB702/NB704.

2.4.3 Bridge

Click on the Bridge link on the top of the page. You will then see the RFC 1483 Bridge table that displays the VPI/VCI values, QoS, encapsulation method, and packet filter of the NB702/NB704.

2.4.4 Interface

Click on the Interface link on the top of the page. You will then see the Channels Connect table that displays the transfer and receive values of the Ethernet and WAN ports of the NB702/NB704.

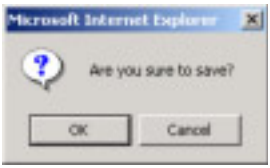


2.4.5 SHDSL

Click on the SHDSL link on the top of the page. You will then see the SHDSL Information table that displays the terminal mode, SHDSL standard, rate mode, and line rate range of the NB702/NB704.

2.5 Save

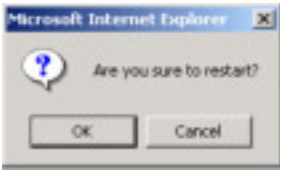
In order to save the changes to the NB702/NB704, you must click on the Save link on the navigation bar. You will then see the following message appear.



Click on the OK button to save the changes.

2.6 Restart

In order to restart the NB702/NB704, you must click on the Restart link on the navigation bar. You will then see the following message appear.



Click on the OK button to restart the NB702/NB704.

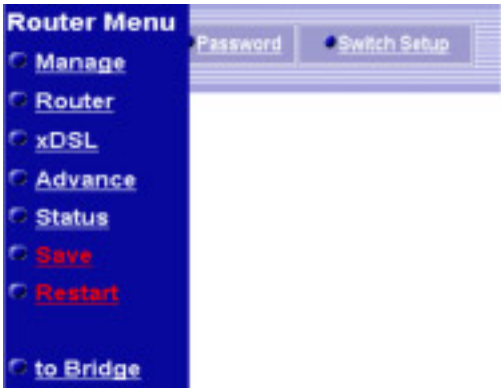
3. Router Mode Configuration

By default, the NB702/NB704 is configured in bridge mode. In order to switch to Router mode, click on the to Router link at the bottom of the navigation bar. You will then see the following screen.

This section describes the steps involved in setting up the NB702/NB704 as a router. The links on the navigation bar are: Manage, Router, xDSL, Advance, Status, Save, and Restart. Each one is described in the next few sections.

3.1 Manage

Click on the Manage link in the navigation bar.



You will then see three options: IP, Password, and Switch Setup. Each one is described below.

3.1.1 IP Setup

Click on the IP link on the top of the page. You will then see the Device IP Setup table. On this page you can change the IP address and subnet mask of the NB702/ NB704.

Ethernet IP Address: Enter the IP address of this device.

Ethernet Subnet Mask: Enter the subnet mask for the IP address.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

3.1.2 Password Setup

Click on the Password link on the top of the page. You will then see the Change Password table. On this page you can change the password used to log into the NB702/NB704.

Old Password: Enter the old password of the device.

New Password: Enter the new password.

New Password Again: Re-type the new password

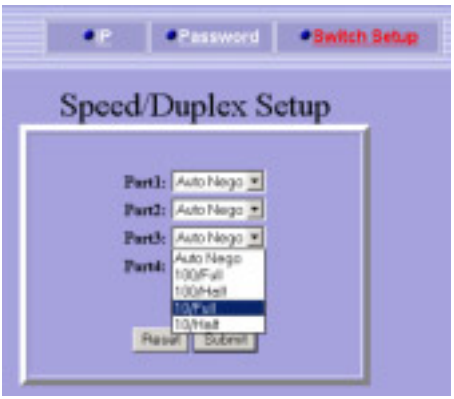
Click on the Submit button to complete the configuration. You will then see a confirmation message.

3.1.3 Switch Setup

Click on the Switch Setup link on the top of the page. You will then see the Speed/ Dublex table. On this page you can change the speed and duplex on individual ports of the NB702/NB704.

Select a port number.

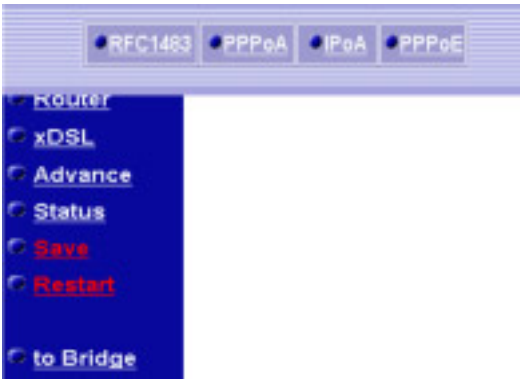
From the drop down list select: Auto-nego, 100/Full, 100/half, 10/Full, or 10/Half.



Click on the Submit button to complete the configuration. You will then see a confirmation screen.

3.2 Router

Click on the Router link in the navigation bar.



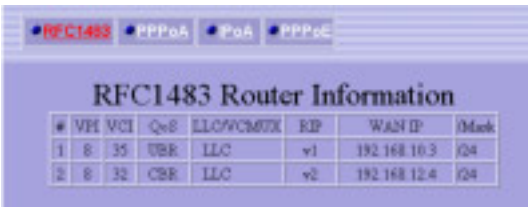
You will then see four options: RFC1483, PPPoA, IPoA, and PPPoE. You may configure each connection by first clicking on the link above. Each configuration is described in the next few sections.

3.2.1 RFC 1483

Click on the RFC 1483 link on the top of the page. You will then see the RFC 1483 Router Setup table. On this page you can create up to 6 VPI/VCI channels and configure its QoS, encapsulation, RIP, and WAN IP.

Enable:	Place a check in this box if you would like to enable the settings in that row.
VPI:	Enter the VPI value that you received from your ISP.
VCI:	Enter the VCI value that you received from your ISP.
QoS:	Select a Quality of Service from the drop down list, options available are: UBR, CBR, VBR-nrt, VBR –rt.
RIP:	Select an RIP version from the drop down list, options available are: none, V1, V2, or V1&V2.
WAN IP:	Enter the IP address of the WAN interface.
Mask:	Enter the subnet mask for the WAN IP.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

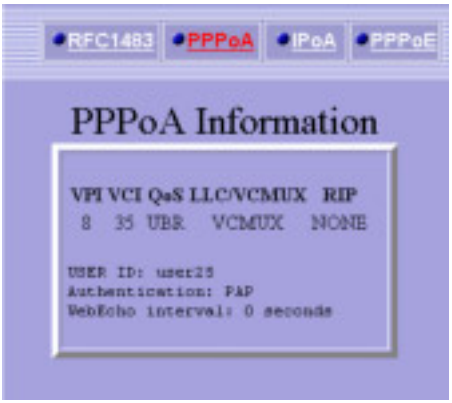


3.2.2 PPPoA (PPP over ATM)

Click on the PPPoA link on the top of the page. You will then see the PPPoA Setup table. On this page you can create your PPPoA connection based on your ISPs settings.

Enable:	Place a check in this box if you would like to enable the settings in that row.
VPI:	Enter the VPI value that you received from your ISP.
VCI:	Enter the VCI value that you received from your ISP.
QoS:	Select a Quality of Service from the drop down list, options available are: UBR, CBR, VBR-nrt, VBR –rt.
RIP:	Select an RIP version from the drop down list, options available are: none, V1, V2, or V1&V2.
Authentication:	Select None, PAP, or CHAP from the drop down list.
User ID:	Enter the username provided by your ISP.
Password:	Enter the password provided by your ISP.
Confirm:	Re-type the password provided by your ISP.
WebEchoInterval:	Leave this value set to 0, unless your ISP tells you otherwise.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.



3.2.3 IPoA (IP over Ethernet)

Click on the IPoA link on the top of the page. You will then see the IPoA Setup table. On this page you can create your IPoA connection based on your ISPs settings.

Enable:	Place a check in this box if you would like to enable the settings in that row.
VPI:	Enter the VPI value that you received from your ISP.
VCI:	Enter the VCI value that you received from your ISP.
QoS:	Select a Quality of Service from the drop down list, options available are: UBR, CBR, VBR-nrt, VBR –rt.

WAN IP:	Enter the IP address of the WAN interface.
Mask:	Enter the subnet mask for the WAN IP.
Gateway:	Enter the IP address of the gateway.
RIP:	Select an RIP version from the drop down list, options available are: none, V1, V2, or V1&V2.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

3.2.4 PPPoE (PPP over Ethernet)

Click on the PPPoE link on the top of the page. You will then see the PPPoE Setup table. On this page you can create your PPPoE connection based on your ISPs settings.

Enable:	Place a check in this box if you would like to enable the settings in that row.
VPI:	Enter the VPI value that you received from your ISP.
VCI:	Enter the VCI value that you received from your ISP.
QoS:	Select a Quality of Service from the drop down list, options available are: UBR, CBR, VBR-nrt, VBR –rt.
Authentication:	Select None, PAP, or CHAP from the drop down list.
User ID:	Enter the username provided by your ISP.
Password:	Enter the password provided by your ISP.
Confirm:	Re-type the password provided by your ISP.
WebEchoInterval:	Leave this value set to 0, unless your ISP tells you otherwise.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

3.3 xDSL

Click on the xDSL link in the navigation bar.

You will then see the DSL Setup link, which is described below.

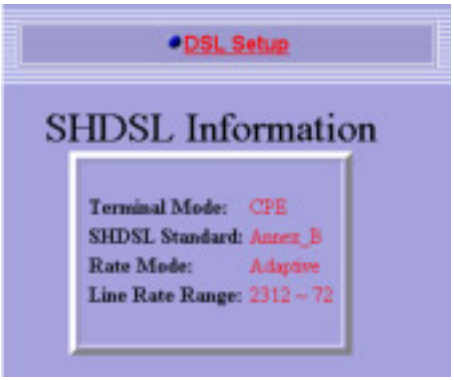
3.3.1 DSL Setup

Click on the DSL Setup link on the top of the page. You will then see the SHDSL Setup table. On this page you can modify the line rate, annex standard, and terminal type of NB702/NB704.

Adapt: If you would like to use adaptive line rate, then select MaxRate and MinRate from the drop down list.

FixRate:	If you would like to used a fixed line rate, then select a FixRate from the drop down list.
Annex:	Select A or B from the drop down list.
Terminal:	Select a terminal type from the drop down list, CPE or COE.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.



3.4 Advance

Click on the Advance link in the navigation bar.

You will then see four options: DHCP, NAT, Routing Table, and DNS Relay. You may configure each connection by first clicking on the link above. Each configuration is described in the next few sections.

3.4.1 DHCP

Click on the DHCP link on the top of the page. You will then see the DHCP Server Setup table. On this page you can modify the DHCP Server settings of NB704.

Enable: Place a check in this box if you would like to enable the DHCP Server.

Range 1 Start IP Address: Enter the IP address from which the NB702/NB704 can start assigning IP address.

Range 1 End IP Address: Enter the IP address that is the last one that the NB702/NB704 will assign.

Range 2 Start IP Address: Enter a second range if required.

Range 2 End IP Address: Enter a second range if required.

Primary DNS Address: Enter the IP address of the primary DNS server.

Secondary DNS Address: Enter the IP address of the secondary DNS server (not required).

Default Lease Time: Enter the max number of seconds you would like the IP addresses assigned.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

3.4.2 NAT (Network Address Translation)

Click on the NAT (Network Address Translation) link on the top of the page. You will then see the NAT Setup table.

You may enable NAT one any existing interface by placing a check in the box next to the interface name. Then click on the Submit button to confirm the configuration.

You can also set up PAT (Port Address Translation) by clicking on the PAT link next to the interface name. Refer to the next section if you would like to configure PAT.

Note: ***When using NAT/PAT a 'Portforward' or 'Incoming Table' entry will be automatically generated for port 23 (Telnet). This will allow you to log-in from the WAN side of the NB702/4. If you do not want to allow Telnet service via the WAN port (Internet) you should delete the table entry for port 23.***

3.4.2.1 PAT (Port Address Translation)

To set up PAT (Port Address Translation) click on the PAT link next to the interface

name on the NAT Setup table. You will then see the PAT Incoming Table.

Port:	Enter the port number that you would like to filter.
Protocol:	Select a protocol from the drop down list (TCP or UDP).
Server IP:	Enter the IP address of the server that will receive the packets.

Click on the Submit button to complete the configuration. You will then notice that your configuration has been added to the list.

3.4.3 Routing Table

Click on the Routing Table link on the top of the page. You will then see the Routing Table Setup page. On this page you can add or remove routing table entries.

Destination IP: Enter the IP address of the destination router.

Subnet Mask: Enter the subnet mask of that IP address.

Gateway IP: Select a gateway IP from the drop down list.

Click on the Submit button to complete the configuration. You will then notice that your configuration has been added to the list.

3.4.4 DNS Relay

Click on the DNS Relay link on the top of the page. You will then see the DNS Relay Setup page. On this page, you add the DNS Server's IP address.

DNS Server IP Address: Enter the IP address of the DNS Server.

Retry Time: Enter the number of times that you would like the NB702/NB704 to try to connect to the DNS Server if the connection fails.

Click on the Submit button to complete the configuration. You will then see a confirmation screen.

3.5 Status

Click on the Status link in the navigation bar.

You will then see five options:

- Version,
- IP,
- Router,
- Advance,
- Interface, and
- SHDSL.

Refer to the following descriptions.

3.5.1 Version

Click on the Version link on the top of the page. You will then see the Version table that displays the software version, firmware version, MAC address, and release date of the NB702/NB704.

3.5.2 IP

Click on the IP link on the top of the page. You will then see the Device IP Information table that displays the Ethernet IP address, subnet mask, and duplex of the NB702/NB704.

3.5.3 Router

Click on the Router link on the top of the page. You will then see the Router Protocol Status Options. Click on the appropriate protocol to view its status, or click on the Router link in the navigation bar for configuration.

3.5.4 Advance

Click on the Advance link on the top of the page. You will then see the Advanced Status Options. Click on the appropriate option to view its status, or click on the

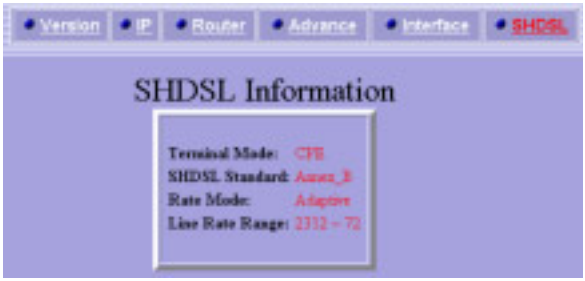
Advance link in the navigation bar for configuration.

3.5.5 Interface

Click on the Interface link on the top of the page. You will then see the Channels Connect table that displays the transfer and receive values of the Ethernet and WAN ports of the NB702/NB704.

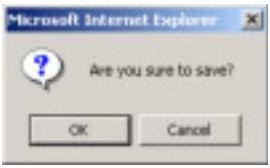
3.5.6 SHDSL

Click on the SHDSL link on the top of the page. You will then see the SHDSL Information table that displays the terminal mode, SHDSL standard, rate mode, and line rate range of the NB702/NB704.



3.6 Save

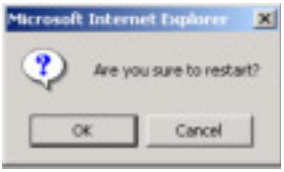
In order to save the changes to the NB704, you must click on the Save link on the navigation bar. You will then see the following message appear.



Click on the OK button to save the changes.

3.7 Restart

In order to restart the NB702/NB704, you must click on the Restart link on the navigation bar. You will then see the following message appear.



Click on the OK button to restart the NB702/NB704.

Chapter 3 - Command Line Interface

I. CLI Commands

The next few sections in this chapter will describe the commands required to configure the NB702/NB704 in bridge and router mode. The chapter is divided into three sections.

1. **Main Menu Commands**: this section lists all the commands available and describes the commands that are common in both bridge and router mode.
2. **Bridge Mode Configuration**: this section lists and describes all the commands that are used for configuring the NB702/NB704 as a bridge.
3. **Router Mode Configuration**: this section lists and describes all the commands that are used for configuring the NB702/NB704 as a router.

Note1: ***Some commands or settings shown in this manual may not be available in the NB702 as it only supports 2 wire SHDSL .***

Commands not currently supported in the NB702 are; ipoa, pppoa, pppoe, rtable.

Note2: ***You should change the default admin password of your router before you connect it to the internet or your network.***

Note3: ***When using NAT/PAT a 'Portforward' or 'Incoming Table' entry will be automatically generated for port 23 (Telnet). This will allow you to log-in from the WAN side of the NB702/4. If you do not want to allow Telnet service via the WAN port (Internet) you should delete the table entry for port 23.***

II. Console Setup

Connect the RS-232 console port to an ASCII data terminal or a PC with Widows serial Terminal mode of VT-100 (Hyper Terminal). To Start the Hyper-terminal, follow the steps below.

1. Start "Hyper-terminal" program:

   On Windows 98 or Windows NT:

   Click on the Start button -> Programs -> Accessories -> Hyper Terminal Group -> Double Click “Hypertrm.exe” -> Enter Connection Name -> Select Icon -> Click OK

2. Select a COM port to communicate with the NB704:

   Choose direct to COM1 or COM2 and click on OK

3. Set Port Properties:

   Port Setting:

   Bit per second: 9600

   Data bits: 8

   Stop bits: 1

   Parity bits: None

   Flow Control: None

   Settings:

   Function, arrow, and ctrl keys act as: Windows keys

   Emulation: Auto-detect

   Back-scroll buffer lines: 500

   ASCII Setup: Echo typed characters locally

   Line delay: 0 milliseconds

   Character line feeds incoming line ends: enable

1. Main Menu Commands

Type "?" followed by ">>" is used retrieve the list of commands to begin the configuration. Type "home" to return to the main menu.

Command	Syntax	Description / Parameters
?	>> ?	Lists the commands available under the main menu
Default	>> default	Set all configuration to factory setting
Dnsrelay	>> dnsrelay	Entry to DNS Relay menu (See DNS Relay Menu Commands for more details)
Ipoa	>> ipoa	Entry to IPoA menu [Router Mode Only] (See IPoA Menu Commands for more details)
Lan	>> lan	Entry to Ethernet Menu (See LAN Menu Commands for more details)
List	>> list	List status for enabled PVC
Manage	>> manage	Entry to Management menu (See Manage Menu Commands for more details)
Mode	>> mode	Exit this menu and change modem mode
Pat	>> pat	Entry to PAT menu (See PAT Menu Commands for more details)
Ping	>> ping	Ping IP for testing purpose
Pppoa	>> pppoa	Entry to PPPoA menu [Router Mode Only] (See PPPoA Menu Commands for more details)
Pppoe	>> pppoe	Entry to PPPoE menu [Router Mode only] (See PPPoE Menu Commands for more details)
Quick	>> quick	Quick setup
R1483	>> r1483	Training with DSLAM.
		Entry to RFC1483 menu (See RFC1483 Menu Commands for more details)
Restart	>> restart	Reboot modem
Rtable	>> rtable	Entry to Routing Table Menu [Router Mode Only] (See Routing Table Menu Commands for more details)
Save	>> save	Save and restart modem
Shdsl	>> shdsl	Entry to SHDSL menu (See SHDSL Menu Commands for more details)
Ver	>> ver	displays software version

Note: ***Commands not currently supported in the NB702 are: ipoa, pppoa, pppoe, rtable***

DEFAULT

Set all configurations back to factory settings.

Syntax: default

```
>> default
The data set to default successfully.
>>
```

LIST

Lists the status for enabled PVCs. Includes the port, transfer, and receive packet information.

Syntax: list

```
>> list
Port ethernet1    0: edd           TxPkts:       1/0
RxPkts:      10/0
Port  shdsl
   0: oamloop    TxPkts:    0/0      RxPkts:    0/0      TxVPI/VCI:
0/0      RxVPI/VCI:    0/0
   1: oamloop    TxPkts:    0/0      RxPkts:    0/0      TxVPI/VCI:
0/0      RxVPI/VCI:    0/0
   2: oamloop     TxPkts:   0/0      RxPkts:    0/0      TxVPI/VCI:
0/0      RxVPI/VCI:    0/3
   3: oamloop     TxPkts:   0/0      RxPkts:    0/0      TxVPI/VCI:
0/0      RxVPI/VCI:    0/4
   4: bridge         TxPkts:   7/0     RxPkts:    0/0     TxVPI/
VCI:    8/35    RxVPI/VCI:    8/35
```

MODE

Switch between bridge and router mode.

Syntax: mode

You will be prompted to choose between a bridge or router mode. Type “b” for bridge or “r” for router. The default mode is: bridge

```
>> mode
Please select bridge or router:(b/r,b)  b
Current mode is bridge
>>
>> mode
Please select bridge or router:(b/r,b)  r
Current mode is router
```

PING

Allows you to PING an IP address for testing purposes.

Syntax: ping <ipaddress>

Example: ping 192.168.0.2

```
>> ping 192.168.0.2
Press 'ESC' to break
ip: ping - reply received from 192.168.0.2
ip: ping - reply received from 192.168.0.2
ip: ping - reply received from 192.168.0.2
```

RESTART

Reboots the modem.

Syntax: restart

```
>> restart
NBfs0ZSDRAM size = 0x800000
Booting...
System start...
password:
>>
```

SAVE

Saves the current configuration and reboots the modem.

Syntax: save

```
>> save
Saving configuration...
Configuration saved.
Updating flash filing system ...
done
NBfs0ZSDRAM size = 0x800000
Booting...
System start...
password:
```

SHOW (Bridge Mode)

Displays the configuration of PVCs, Ethernet IP, Subnet mask, and Full Duplex.

Syntax: show

The configuration information will then be displayed. This includes the following: Ethernet IP address, subnet mask, auto-negotiation of full duplex: (enable, disable), type of function, VPI/VCI values, Class (UBR, CBR, VBR) LLC or VCMUX, Spanning tree (enable, disable), and the type of packet filtering used (Any, IP, PPPoE).

```
>> show
Ethernet ip: 192.168.0.3
Subnet mask: 255.255.255.0

FUNCTION    VPI/VCI      CLASS    LLC/VCMUX   Spanning   Pkt
Filter
Rfc1483       8/35        ubr        LLC       Disable    ANY
```

SHOW (Router Mode)

Displays the configuration of Ethernet IP, Subnet mask, DHCP, and Routing Table.

Syntax: show

The configuration information will then be displayed. This includes the following: Ethernet IP address, subnet mask, DHCP current/ineffective setting, and routing table setting.

```
>> show
Ethernet ip: 192.168.0.3
Subnet mask: 255.255.255.0

DHCP current setting : disable.
DHCP ineffective setting : disable.


effective routing table:
Routing table is empty
```

1.1 DNS Relay Menu Commands

The following commands are available in both bridge and router mode. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
?	> dnsrelay> ?	Lists the commands available under the current menu
Setdnsip	> dnsrelay> setdnsip	Set the DNS Server IP
Show	> dnsrelay> show	Show DNS Relay Configuration

SETDNSIP

Sets the IP address for the DNS server.

Syntax: setdnsip <dnsip> [<retry times>]

Example: setdnsip 192.168.10.5

SHOW

Sets the IP address for the DNS server.

Syntax: setdnsip <dnsip> [<retry times>]

```
> dnsrelay> show
Primary DNS Server: 192.168.10.5
```

***Note**: Strictly maintain stable power to the NB702/NB704while upgrading its software. If the power fails during the upgrading process, contents in the memory could be destroyed, and the system may hang. In such as case, you must call the dealer or system integrator for repairs.*

1.2 LAN Menu Commands

The following commands are available in both bridge and router mode. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
?	> dnsrelay> ?	Lists the commands available under the current menu
Dhcpserver	> lan> dhcpserver	Set dhcp server configuration
Setdhcp	> lan> setdhcp	Set dhcp operation
Setip	> lan> setip	Setup the IP address, and subnet mask for Ethernet connection
Setswitch	> lan> setswitch	Set SwitchHub link speed & duplex
Show	> lan> show	Show LAN configuration
Switchlist	> lan> switchlist	Show SwitchHub configuration

DHCPSERVER

Set the IP ranges for the DHCP Server, primary and secondary DNS server IP address.

Syntax:	dhcpserver range1 startIP> <range1 endIP> [<range2 startIP> <range2 endIP>] [<max-lease-time>]
Syntax:	dhcpserver dns <dns ip1> [<dns ip2>]
Example:	dhcpserver dns 192.168.3.2 192.168.3.20

SETDHCP

Set an option for DHCP: server or disable.

Syntax:	setdhcp <server>|<disable>
Example:	setdhcp server

SETIP

Set the LAN IP address and subnet mask.

Syntax:	setip <etherip[/<masknum>] [subnet mask]>|<dhcp>
Example:	setip 192.168.0.1 255.255.255.0

SETSWITCH

Allows you to set the speed of each port on the switch (10 or 100Mpbs) ,(Half(h) or Full(f)), or auto-negotiation.

Syntax:	setswitch <1~4> <100F|100H|10F|10H|AUTO>
Select between	10fF(10Mbs Full dublex),
	10H (10Mbs Half dublex),
	100F (100Mbs Full dublex),
	100H (10Mbs Half dublex),
	AUTO (auto-negotiation)
	By default, the speed and duplex of each port is set to auto.
Example:	setswitch 2 100F

SHOW

Displays the LAN connection. This includes IP address, Subnet mask, and DHCP setting.

Syntax: show

```
> lan> show
Ethernet ip: 192.168.0.3
Subnet mask: 255.255.255.0
DHCP current setting : disable.
DHCP ineffective setting : disable.
```

SWITCHLIST

Displays the speed/duplex setting of each port on the switch.

Syntax: switchlist

```
> lan> switchlist
        SwitchHub configuration
            Port 1: Auto
            Port 2: 100F
            Port 3: Auto
            Port 4: Auto
```

1.3 Manage Menu Commands

The following commands are available in both bridge and router mode. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
?	> dnsrelay> ?	Lists the commands available under the current menu
Setpass	> manage> setpass	Change/disable password

SETPASS

Allows you to change the password.

Syntax:	setpass
New Password:	type in the new password here, or press Enter to disable the password.
Confirm password again:	re-enter the new password.
	The password will then be changed and the configuration will be saved.

```
> manage> setpass
Old Password:****
New Password(press ENTER to disable):****
Confirm password again:****
Password has been changed
Saving configuration...
Configuration saved.
```

1.4 SHDSL Menu Commands

The following commands are available in both bridge and router mode. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
Adapt	shdsl> adapt	Adaptive mode
Annex	shdsl> annex	SHDSL Standard
default	shdsl> default	Set SHDSL configuration back to factory setting
Enable	shdsl> enable	Activate the last updated SHDSL parameters
Fix	shdsl> fix	Fixed mode
Status	shdsl> status	Display the configuration and status of SHDSL setting
Terminal	shdsl> terminal	Configure modem to COE or CPE mode

ADAPT

Sets the rate mode.

Syntax: adapt <maxrate> | <minrate>

Example: adapt 74 (sets adaptive rate to 74. Range is between 74 and 2312)

ANNEX

Sets annex standard.

Syntax: annex <a>|<b>|<ab>

Example: annex ab (this will set annex to ab, to verify the annex value, use the “status” command)

DEFAULT

Sets the SHDSL configurations back to the factory settings.

Syntax: default

ENABLE

Activates the last updated SHDSL parameters.

Syntax: enable

FIX

Activates fixed mode.

Syntax: fix <rate>

Example: fix 72 (range must be between 72 and 2320)

STATUS

Displays the configuration and status of the SHDSL settings.

Syntax: status

This includes information such as: terminal type, line rate range, line code, last failed, attenuation, average quality, transmit power, current rate, rate mode, firmware version, SHDSL standard, start progress, line quality, receiver gain, framer status, and line status.

```
Last Failed    : No failure
switchlist
Start Progress: PRE ACTIVATIONon
Attenuation    : 0dBType 'help' or 'hel
SNR  Margin    : 0dBe details
Receiver Gain  : 0dB
XMIT Power     : 0.0dBm
Framer Status  : LOS
Ethernet ip: 19
Current Rate   : 0
Line Status    : Handshake
Utopia Address: 0x0000: disable.
Config :
terminal          - cpe
Rate Mode         - adaptive
Line Rate Range - MAX:2312    MIN:72
4 Wire Mode       - byte
```

TERMINAL

Sets the terminal type as: COE (Central Office Equipment) or CPE (Customer Premises Equipment).

Syntax: terminal <coe>|<cpe>

Example: annex cpe (this will set the terminal to CPE mode, to verify the terminal setting, use the “status” command)

2. Bridge Mode Configuration

This section lists and describes all the commands that are used for configuring the NB702/NB704 as a bridge. By default, the NB702/NB704 is configured as a bridge.

To switch between Bridge and Router mode, use the “mode” command under the main menu.

MODE

Switch between bridge and router mode.

Syntax: mode

You will be prompted to choose between a bridge or router mode. Type “b” for bridge or “r” for router. The default mode is: bridge

```
>> mode
Please select bridge or router:(b/r,b) b
Current mode is bridge
>>
>> mode
Please select bridge or router:(b/r,b) r
Current mode is router
```

2.1 Quick Command (RFC 1483 Bridge)

QUICK

This command lets you configure a protocol quickly and easily.

Syntax:	quick
	There are a total of 8 PVCs. In the example below 1 PVC are being used, while 7 are still available. The prompts from there on are as follows:
VPI (0-4095):	type in a VPI value that is between 0 and 4095.
VCI (0-65535):	type in a VCI value that is between 1 and 65535.
Packet Filter:	(Any/IP/PPPoE) Type in the packet filter you would like to use.
	Add another PVC? If you would like to add another PVC, type “y”, if not, type “n” and press “Enter”.
Enable Spanning Tree:	If you would like to enable the Spanning Tree function, type “y”, if not, type “n” and press “Enter”.
	You will then see a summary of your configuration. Preserve the configuration: type “y” to preserve this configuration, or “n” to ignore it.

Please remember to save and restart the NB702/NB704 in order for the settings to take affect.

```
>> quick
1 PVC existed, 7 PVCs available.
VPI(0-4095): 8
VCI(1-65535): 35
Packet Filter ( Any/Ip/Pppoe ): IP
Add another PVC ? (y/n): n
Enable Spanning tree? (y/n) : n
            Configuration
          MODE: Bridge
          FUNCTION: R1483
          Spanning Tree: Disable
      #   VPI     VCI     Package filter
     1:    8       35       IP
Preserve the configuration (y/n) : y
Configuration will have no effect until after save and
restart.
```

2.2 PAT Menu Commands

The following commands are available in Bridge Mode only. To switch between Bridge and Router mode, use the "mode" command under the main menu.

Command	Syntax	Description / Parameters
Addpatin	Pat> addpatin	Add incoming PAT table
Delpatin	Pat> delpatin	Delete incoming PAT table
Show	Pat> show	Show PAT configuration

ADDPATIN

Add an incoming PAT interface to the PAT table.

Syntax: addpatin bridge <port>[-<port2>]/<udp|tcp|both> <serverip>

Example: addpatin bridge 80/both 192.168.10.5

DELPATIN

Add an incoming PAT interface to the PAT table.

Syntax: delpatin <all>|<number>

Example: delpatin 4

The "4" is the fourth interface in the PAT table. To view the PAT configuration/table use the "show" command.

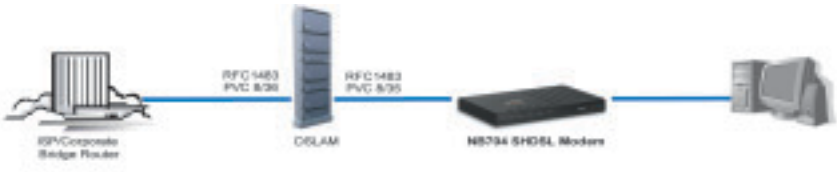
SHOW

Displays the PAT interface table.

Syntax: show

```
PAT enabled interface:
 Interface        IP address
No setting
PAT incoming table:
 No. i/f name|WanIP              Port/Protocal     Server IP
No setting
```

2.3 R1483 Menu Commands



The following commands are available in Bridge Mode only. To switch between Bridge and Router mode, use the "mode" command under the main menu.

Command	Syntax	Description / Parameters
Delpvc	r1483> delpvc	Delete VPI and VCI
Pfilter	r1483> pfilter	Set packet filter type
Setpatip	r1483> setpatip	Set PAT IP
Setpvc	r1483> setpvc	Set VPI and VCI for bridge mode
Setqos	r1483> setqos	Set quality of service (QoS)
Setspan	r1483> setspan	<Enable>|<Disable> spanning tree
Show	r1483> show	Show RFC1483 configuration

DELPVC

Deletes PVC from the table.

Syntax: delpvc <all>|[<vpi>/]<vci>

Example 1: delpvc all (deletes all the PVCs)

Example 2: delpvc 8/35 (delete record of VPI/VCI 8/35)

PFILTER

Sets the packet filter type.

Syntax: pfilter [<vpi>/]<vci> <any|ip|pppoe|igmp|none>

Select between: Any, IP, PPPoE, IGMP, or None

Example: pfilter 8/35 IP

SETPATIP

Set and IP address, subnet mask, and gateway IP for PAT.

Syntax: setpatip <patip[/<masknum>]> [<gatewayip>]

Example: setpatip 192.168.10.2/24 192.168.10.5

SETPVC

Sets the VPI and VCI values for R1483 bridge mode.

Syntax: setpvc [<vpi>/]<vci> [llc/vcmux]

Enter the VPI/VCI value, and choose between LLC or VC

Example: setpvc 8/35 llc

SETQOS

Sets the Quality of Service (QoS) value for VPI and VCI.

Syntax: setqos [<vpi>/]<vci> <ubr|cbr|vbr|vbr-rt>

Select between: UBR, CBR, VBR, or VBR-rt

Example: setqos 8/35 ubr

SETSPAN

Settings for enabling or disabling spanning tree.

Syntax: setspan <Enable>|<Disable>

Example: setspan enable

SHOW

Displays the R1483 Bridge configuration. Included is the function name, VPI/VCI settings, QoS, LLC/VC MUX, Spanning Tree and Packet Filtering.

Syntax: show

```
> r1483> show
FUNCTION  VPI/VCI  CLASS  LLC/VCMUX   Spanning   Pkt  Filter
Rfc1483        8/35        ubr             LLC
Disable         ANY
```

3. Router Mode Configuration

This section lists and describes all the commands that are used for configuring NB702/NB704 as a router. By default, NB702/NB704 is configured as a bridge.

To switch between Bridge and Router mode, use the “mode” command under the main menu.

MODE

Switch between bridge and router mode.

Syntax: mode

You will be prompted to choose between a bridge or router mode. Type “b” for bridge or “r” for router. The default mode is: bridge

```
>> mode
Please select bridge or router:(b/r,b) b
Current mode is bridge
>>
>> mode
Please select bridge or router:(b/r,b) r
Current mode is router
```

3.1 Quick Command (RFC 1483 Bridge)

The Quick command allows you to configure four protocols quickly and easily. Each one is described below.

- R1483 (Routing)
- IPoA
- PPPoA
- PPPoE

3.1.1 R 1483 (Routing) Quick Setup

QUICK

This command lets you configure a protocol quickly and easily.

Syntax:	quick
R1483(r)/ IPoA(i)/ PPPoA(p)/ PPPoE(pe):	Enter “r” for R1483.

There are a total of 6 PVCs. In the example below 0 PVCs are being used, while 6 are still available. The prompts from there on are as follows:

Ethernet IP:	Enter the Ethernet IP address.
Subnet mask:	type in the subnet mask for the IP address.
VPI (0-4095):	Enter a VPI value that is between 0 and 4095.
VCI (0-65535):	Enter a VCI value that is between 1 and 65535.
WAN IP:	Enter the IP address of the WAN interface.
Add another PVC?	If you would like to add another PVC, type “y”, if not, type “n” and press “Enter”. You will then see a summary of your configuration. Preserve the configuration: type “y” to preserve this configuration, or “n” to ignore it.
Continue Quick?	Enter “y” if you would like to run another quick session, or type “n” to continue and save the changes.

Please remember to save and restart the NB702/NB704 in order for the settings to take affect.

```
>> quick
R1483(r)/ IPoA(i)/ PPPoA(p)/ PPPoE(pe): r

   0 PVC existed, 6 PVCs available.
Ethernet IP (192.168.0.3) : 192.168.1.1
Subnet mask (255.255.255.0) : 255.255.255.0
VPI(0-4095): 8
VCI(1-65535): 36
WAN IP : 210.62.8.1
Add another PVC ? (y/n): n
            Configuration
          MODE: Router
          FUNCTION: R1483
           Ethernet IP: 192.168.1.1
           Subnet Mask: 255.255.255.0
          #  VPI     VCI     WAN IP
          1: 8       36      210.62.8.1
Preserve the configuration (y/n) : y
Continue quick (y/n) : n
Configuration will have no effect until after save and
restart
```

3.1.2 IPoA Quick Setup

QUICK

This command lets you configure a protocol quickly and easily.

Syntax: quick

R1483(r)/ IPoA(i)/

PPPoA(p)/ PPPoE(pe): Enter “i” for IPoA.

There are a total of 6 PVCs. In the example below 0 PVCs are being used, while 6 are still available. The prompts from there on are as follows:

Ethernet IP:	Enter the Ethernet IP address.
Subnet mask:	type in the subnet mask for the IP address.
VPI (0-4095):	Enter a VPI value that is between 0 and 4095.
VCI (0-65535):	Enter a VCI value that is between 1 and 65535.
WAN IP:	Enter the IP address of the WAN interface.
Gateway:	Enter the IP address of the gateway.
Add another PVC?	If you would like to add another PVC, type “y”, if not, type “n” and press “Enter”. You will then see a summary of your configuration. Preserve the configuration: type “y” to preserve this configuration, or “n” to ignore it.
Continue Quick?	Enter “y” if you would like to run another quick session, or type “n” to continue and save the changes.

Please remember to save and restart the NB702/NB704 in order for the settings to take affect.

3.1.3 PPPoA Quick Setup

QUICK

This command lets you configure a protocol quickly and easily.

Syntax: quick

R1483(r)/ IPoA(i)/

PPPoA(p)/ PPPoE(pe): Enter “p” for IPoA.

There are a total of 6 PVCs. In the example below 0 PVCs are being used, while 1 is still available. The prompts from there on are as follows:

Ethernet IP:	Enter the Ethernet IP address.
Subnet mask:	type in the subnet mask for the IP address.
VPI (0-4095):	Enter a VPI value that is between 0 and 4095.
VCI (0-65535):	Enter a VCI value that is between 1 and 65535.
Authentication:	Enter PAP, CHAP, or none.
Username:	Enter the username received from your ISP.
Password:	Enter the password for the username.
Retype Password:	Retype the password to confirm the settings.
Add another PVC?	If you would like to add another PVC, type “y”, if not, type “n” and press “Enter”. You will then see a summary of your configuration. Preserve the configuration: type “y” to preserve this configuration, or “n” to ignore it.
Continue Quick?	Enter “y” if you would like to run another quick session, or type “n” to continue and save the changes.

Please remember to save and restart the NB702/NB704 in order for the settings to take affect.

```
>> quick
R1483(r)/ IPoA(i)/ PPPoA(p)/ PPPoE(pe): p

   0 PVC existed, 1 PVC available.
Ethernet IP (192.168.1.1) : 192.168.1.1
Subnet mask (255.255.255.0) : 255.255.255.0
VPI(0-4095): 8
VCI(1-65535): 36
Authentication( PAP(p)/CHAP(c)/None(n) ): p
User name: user25
Password: *****
Retype password: *****

          Setup Configuration
     FUNCTION: PPPOA
     Ethernet IP: 192.168.1.1
     Subnet Mask: 255.255.255.0
 #  VPI     VCI     AUTH    USERID
 1: 8       36      PAP     user25
Preserve the configuration (y/n) : y
Continue quick (y/n) : n
Configuration will have no effect until after save and
restart
```

3.1.4 PPPoE Quick Setup

QUICK

This command lets you configure a protocol quickly and easily.

Syntax:	quick
R1483(r)/ IPoA(i)/	
PPPoA(p)/ PPPoE(pe):	Enter “pe” for PPPoE.

There are a total of 6 PVCs. In the example below 0 PVCs are being used, while 1 is still available. The prompts from there on are as follows:

Ethernet IP:	Enter the Ethernet IP address.
Subnet mask:	type in the subnet mask for the IP address.
VPI (0-4095):	Enter a VPI value that is between 0 and 4095.
VCI (0-65535):	Enter a VCI value that is between 1 and 65535.
Authentication:	Enter PAP, CHAP, or none.
Username:	Enter the username received from your ISP.
Password:	Enter the password for the username.
Retype Password:	Retype the password to confirm the settings.
Add another PVC?	If you would like to add another PVC, type “y”, if not, type “n” and press “Enter”. You will then see a summary of your configuration. Preserve the configuration: type “y” to preserve this configuration, or “n” to ignore it.
Continue Quick?	Enter “y” if you would like to run another quick session, or type “n” to continue and save the changes.

Please remember to save and restart the NB702/NB704 in order for the settings to take affect.

```
>> quick
R1483(r)/ IPoA(i)/ PPPoA(p)/ PPPoE(pe): p

   0 PVC existed, 1 PVC available.
Ethernet IP (192.168.1.1) : 192.168.1.1
Subnet mask (255.255.255.0) : 255.255.255.0
VPI(0-4095): 8
VCI(1-65535): 36
Authentication( PAP(p)/CHAP(c)/None(n) ): p
User name: user25
Password: *****
Retype password: *****

       Setup Configuration
     FUNCTION: PPPOE
     Ethernet IP: 192.168.1.1
     Subnet Mask: 255.255.255.0
 #  VPI     VCI     AUTH    USERID
 1: 8       36      PAP     user25

Preserve the configuration (y/n) : y
Continue quick (y/n) : n
Configuration will have no effect until after save and
restart
```

3.2 IPoA Menu Commands

The following commands are available in both bridge and router mode. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
Delwanip	>ipoa> delwanip	Delete IPoA PVC
Setqos	>ipoa> setqos	Set quality of service (QoS)
Setrip	>ipoa> setrip	Set RIP configuration
Setwanip	>ipoa> setwanip	Set IPoA PVC
Show	>ipoa> show	Show IPoA configuration

DELWANIP

Delete a WAN IP address from the IPoA table

Syntax: delwanip <all>|[<vpi>/]<vci>

Example: delwanip all

Example: delwanip 8/35

SETQOS

Set the Quality of Service (QoS) for IPOA

Syntax: setqos [<vpi>/]<vci> <ubr|cbr|vbr|vbr-rt>

Example: setqos 8/35 ubr

SETRIP

Set the Routing Information Protocol (RIP) for IPOA

Syntax: setrip [<vpi>/]<vci> <1|2|1&2|0>

Example: setrip 8/35 2

SETWANIP

Set the WAN IP address for IPOA

Syntax: setwanip [<vpi>/]<vci> [unnumber | <wanip[/<masknum>]> <gateway>

Example: setwanip 8/45 unnumber 192.168.2.5

SHOW

Displays the IPoA settings: this includes: function, VPI/VCI, class of service, WAN IP address, gateway IP address, and RIP IP address.

Syntax: show

```
> ipoa> show
IPoA setting:
FUNCTION   VPI/VCI      CLASS   Wan  IP/MaskNum        GatewayIP
RIP
IPoA               0/35             ubr         192.168.10.2/24
192.168.10.3       0
```

3.3 PAT Menu Commands

The following commands are available in router mode only. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
addpatin	Pat> addpatin	Add incoming PAT table
delpatin	Pat> delpatin	Delete incoming PAT table
setpat	Pat> setpat	Enable or disable PAT function
show	Pat> show	Show PAT configuration

ADDPATIN

Add an incoming PAT interface to the PAT table.

Syntax: addpatin <pppoa|pppoe|wanip> <port>/<udp|tcp> <serverip>

Example: addpatin pppoa 80/tcp 192.168.2.5

This will add the PPPoA interface to port 80 using the TCP protocol to the server 192.168.2.5

DELPATIN

Add an incoming PAT interface to the PAT table.

Syntax: delpatin <all>|<number>

Example: delpatin 4

The “4” is the fourth interface in the PAT table. To view the PAT configuration/table use the “show” command.

SETPAT

Enable or Disable the PAT function.

Syntax: setpat <wanip><(e)nable><(d)isable>

Example: setpat 192.168.2.5 e

This will enable the PAT function on IP address 192.168.2.5

SHOW

Displays the PAT configuration. Included is the PAT interface name, IP address, Interface number, port, protocol, and server IP address.

Syntax: show

```
> pat> show
PAT enabled interface:
 Interface        IP address
 PPPoE            8.218.23.0
PAT incoming table:
 No. i/f name|WanIP       Port/Protocal      Server IP
  1  pppoe                   80/tcp          192.168.2.3
```

3.4 PPPoA Menu Commands

The following commands are available in router mode only. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
Adduser	Pppoa> adduser	Add user ID and password
Chpass	Pppoa> chpass	Change user password
Connect	Pppoa> connect	Pppoa connect
Deluser	Pppoa> deluser	Delete user
Disconn	Pppoa> disconn	PPPoA disconnect
Echo	Pppoa> echo	Set echo interval time
Setllc	Pppoa> setllc	Add LLC header on the packets
Setqos	Pppoa> seqos	Set class
Setrip	Pppoa> setrip	Set RIP configuration
Show	Pppoa> show	Show PPPoA configuration

ADDUSER

Add a user for the PPPoA interface.

Syntax: adduser [<vpi>/]<vci> <userid> [<chap|pap>]

Example: adduser 8/25 john pap

This will add the user john to the 8/25 VPI/VCI setting with the PAP security setting.

CHPASS

Change the password of the PPPoA interface.

Syntax: chpass

You will be prompted to enter the old password. Then enter the new password, and type it again to re-confirm it.

CONNECT

Enable the PPPoA connection.

Syntax: connect

DELUSER

Delete the user of the PPPoA interface.

Syntax: deluser

DISCONN

Disable the PPPoA connection.

Syntax: disconn

ECHO

Set the inerval time of the PPPoA interface.

Syntax: echo <intervaltme>

Example: echo 5

SETLLC

Adds the LLC header to the PPPoA packets.

Syntax: setllc <(e)nable>|<(d)isable>

Example: setllc enable

SETQOS

Set the Quality of Service (QoS) for PPPoA packets.

Syntax: setqos <ubr|cbr|vbr|vbr-rt>

Example: setqos vbr

This will set Quality of Service to Variable Bit Rate

SETRIP

Configure the Routing Information Protocol setting.

Syntax: setrip <1|2|1&2|0>

Choose between RIP 1, RIP2, RIP 1&2, or 0 (none)

Example: setrip 1

This will set the Routing Information Protocol to RIP1

SHOW

Displays the PPPoA configuration. Included is the function name, VPI/VCI settings, QoS class, RIP level, User Id, authentication, LLC enabled or disabled, interval time, and idle time.

Syntax: show

```
> pppoa> show
PPPoA setting:
Function   VPI/VCI       CLASS   RIP  UserID/Authentication
PPPoA        8/45         ubr     0      john/PAP
            LLC=Enabled    Echo interval time: 5 s

IdleTime     0/200   Type:numbered
```

3.5 R1483 Menu Commands

The following commands are available in router mode only. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
Delwanip	R1483> delwanip	Delete R1483 PVC
Setqos	R1483> setqos	Set class
Setrip	R1483> setrip	Set RIP configuration
Setwanip	R1483> setwanip	Set PVC and Wan IP for routing mode
Show	R1483> show	Show RFC1483 configuration

DELWANIP

Delete a WAN IP address from the R1483 table.

Syntax:	delwanip <all>|[<vpi>/]<vci>
Example:	delwanip all
Example:	delwanip 8/35

SETQOS

Sets the Quality of Service (QoS) value for VPI and VCI.

Syntax:	setqos [<vpi>/]<vci> <ubr|cbr|vbr|vbr-rt>
Select between:	UBR, CBR, VBR, or VBR-rt
Example:	setqos 8/35 ubr

SETRIP

Configure the Routing Information Protocol setting.

Syntax:	setrip <1|2|1&2|0>
	Choose between RIP 1, RIP2, RIP 1&2, or 0 (none)
Example:	setrip 1
	This will set the Routing Information Protocol to RIP1

SETWANIP

Set the WAN IP address for R1483.

Syntax: setwanip [<vpi>/]<vci> [unnumber | <wanip[/<masknum>]> <gateway>

Example: setwanip 8/45 unnumber 192.168.2.5

SHOW

Displays the R1483 configuration. Included is the function name, VPI/VCI settings, QoS, LLC/VC MUX, WAN IP, and RIP stetting.

Syntax: show

```
> r1483> show
RFC1483 setting:
FUNCTION   VPI/VCI      CLASS   LLC/VCMUX       Wan IP/MaskNum
RIP
Rfc1483         8/35            ubr            LLC
192.168.2.10/24      0
```

3.6 Rtable Menu Commands

The following commands are available in router mode only. To switch between Bridge and Router mode, use the “mode” command under the main menu.

Type “?” followed by “>>” is used retrieve the list of commands to begin the configuration. Type “home” to return to the main menu.

Command	Syntax	Description / Parameters
Addiproute	Rtable> addiproute	Add routing table
Deliproute	Rtable> deliproute	Delete routing table
Show	Rtable> show	Show routing table

ADDIPROUTE

Add an IP route to the Routing Table.

Syntax: addiproute <destip[/<masknum>]> [<submask>] <gatewayip>

Example: addiproute 192.168.2.5 255.255.255.0 192.168.25.5

DELIPROUTE

Delete an IP route to the Routing Table.

Syntax: deliproute <all>|<number>

Example: deliproute 4

The “4” is the fourth entry in the routing table. To view the routing tables use the “show” command.

SHOW

Displays Routing table. Included are the entry number, destination IP address, subnet mask, and gateway IP address.

Syntax: show

```
> rtable> show
Routing Table:
 No. Destination IP   SubMask            Gateway IP
  1   0.0.0.0          0.0.0.0            192.168.10.3
  2   192.168.0.0      255.255.255.0      192.168.0.32
effective routing table:
```

3.7 SNMP (example)

NB702> console

NB702> snmp

NB702 snmp> help

Commands are:

Command	Syntax	Description / Parameters
?	access	config help
trap	version	
'.'	repeats the last command	

Type "snmp help all" or "snmp help <command>" for more details

Use "home" to return to "NB702" prompt.

```
NB702 snmp> access
access read public
access write xdsl00
NB702 snmp> help access     (show the help for the command
access)
```

access syntax:

```
   snmp access [read | write] <community> [<IP addr>]
                      - allow read-only or read-write access
   snmp access delete <community> [<IP addr>]
                     - revoke specified access
   snmp access flush
                     - revoke all access
   snmp access list - list allowed access

NB702 snmp> access delete public   (to delete a group)
NB702 snmp> access read public     (to add a group for read)
NB702 snmp> access write test      (to add a group for write)
```

Appendix A – NB704 Specifications

A1. Hardware Specifications

Local Interface

Four-10/100BaseT Ethernet switch, IEEE 802.3, RJ-45 connectors

10 Half, 10Full, 100Half, 100Full, Auto Negotiation configurable for each port

Supports port-based VLAN

WAN SHDSL Line Interface

Data Rate:	144 Kbps up to 4.6Mbps rate adaptive
Line Code:	PAM16
Line Impedance:	135 Omhs
Connection Loops:	Two Pairs (4-wire)
Connector:	RJ-11

Indicators

PWR – Green LED, indicates power status

ACT – Green LED, indicates data Transmitting / Receiving

LINK – Green LED, indicates local interface link status

WAN – Green LED, indicates SHDSL data link status

ALM – Red LED, indicates data error and operation status

OAM&P

Local:	RS-232 Craft Port or Telnet, Web browser via Ethernet
Remote:	Telnet or web-browser

Environment

Operation Temperature:	0?C ~ 45?C
Operation Humidity:	5% ~ 95%
Storage Temperature:	-20 ~ +85?C
Storage Humidity:	5%~95%

Physical Dimensions

(W x D x H)	220mm x 169mm x 40mm

Power

AC Adapter :	Input 110 or 230 or 240 VAC, 50/60Hz; Output 12VDC 1A
Power Consumption:	Less than 10 Watts

Certificates

EMC:	CE EN300386 & FCC Part 15 class B
Safety:	EN60950 & CB

A2. Software Specifications

ATM

ATM Cell over SHDSL, AAL5

Support UBR, CBR, VBR-nrt & VBR-rt

VPI Range (0-4095) and VCI range (1-65535)

Supports up to 8 PVCs for Bridge and 5 PVCs for Router

Support OAM F4/F5 loopback

Payload Encapsulation --

RFC2684 (RFC1483), multi-protocol over ATM

RFC2225 (RFC1577), IPoA

RFC2364, PPP over ATM (CHAP and PAP supported)

RFC2516, PPPoE (PPP over Ethernet) over ATM

Bridging

Transparent Bridging (IEEE 802.1D)

RFC2684 (RFC1483) Bridged

Spanning Tree Protocol (IEEE 802.1D)

Supporting IP and PPPoE packets filter function

Routing

TCP/IP with RIP1, RIP2, or static IP routing

NAT/PAT – RFC1631 (basic Firewall support)

RFC2684 (RFC1483) Routed

DNS Relay

Configuration and Network Management

DHCP server for IP management

Local console configuration and management through RS-232 port

Telnet for local or remote management

TFTP for firmware upgrade and configuration

Web configuration

Appendix B – NB702 Specifications

A1. Hardware Specifications

Local Interface

Four 10/100BaseTX Ethernet switch, IEEE 802.3u, RJ-45 connectors.

10 Half, 10Full, 100Half, 100Full, Auto Negotiation configurable for each port.

Supports port based VLAN.

WAN SHDSL Line Interface

Data Rate:	72 Kbps up to 2.3Mbps rate adaptive
Line Code:	PAM16
Line Impedance:	135 Omhs
Connection Loops:	One Pair
Connector:	RJ-11

Indicators

PWR – Green LED, indicates power and operation.
ACT – Green LED, indicates LAN data transmitting / receiving.
LINK – Green LED, indicates LAN data link status.
WAN – Green LED, indicates SHDSL data link status.
ALM – Red LED, indicates data error and operation fault.

OAM&P

Local:	RS-232 Craft Port or Telnet, Web browser via Ethernet.
Remote:	SNMP, Telnet, or Web-browser.

Environment

Operation Temperature:	0?C ~ 45?C
Operation Humidity:	5% ~ 95%
Storage Temperature:	-20 ~ +85?C
Storage Humidity:	5%~95%

Physical Dimensions

(W x D x H) 224mm x 162mm x 33mm

Power

AC Adapter :	Input 110VAC/60Hz or 220VAC/50Hz; Output 12VDC 1A
Power Consumption:	Less than 10 Watts

Certificates

EMC:	CE, FCC Part 15 class B, CB

A2. Software Specifications

ATM

ATM Cell over SHDSL, AAL5.

Support UBR & CBR, VBR-nrt & VBR-rt.

VPI Range (0-4095) and VCI range (1-65535).

Supports up to 8 PVCs for Bridge mode and 5 PVCs for Router mode.

Supports OAM F4/F5 loopback.

Payload Encapsulation --

RFC2684 (RFC1483), multi-protocol over ATM.

RFC2225 (RFC1577), IPoA.

RFC2364, PPP over ATM (CHAP and PAP supported).

RFC2516, PPPoE (PPP over Ethernet) over ATM.

Bridging

Transparent Bridging (IEEE 802.1D).

RFC2684 (RFC1483) Bridged.

Spanning Tree Protocol (IEEE 802.1D).

Supports IP, IGMP, and PPPoE packets filter function.

Supports port-based VLAN.

Routing

TCP/IP with RIP1, RIP2, or static IP routing.

NAT/PAT – RFC1631 (basic Firewall support).

RFC2684 (RFC1483) Routed.

DNS Relay.

Configuration and Network Management

DHCP server for IP management.

Local console configuration and management through RS-232 port.

Telnet for local or remote management.

TFTP for firmware upgrade.

Web configuration.

Appendix C – Cable Connections

This cable information is provided for your reference only. Please ensure you only connect the appropriate cable into the correct socket on either this product or your computer.

If you are unsure about which cable to use or which socket to connect it to, please refer to the hardware installation section in this manual. If you are still not sure about cable connections, please contact a professional computer technician or NetComm for further advice.

RJ-45 Network ports

All of the ethernet ports on the NB702/NB704 are 10/100 Mbps capable auto-sensing Ethernet ports. Each port supports only unshielded twisted pair (UTP) cable using an 8-pin RJ-45 plug. The Auto-uplink feature senses the connection of uplink (MDI-II) wiring using a straight-through twisted pair cable to any of the ethernet ports on the NB702/NB704 switch to allow for connection to any port of an ethernet adapter, ethernet switch or hub.

RJ-45 Connector Pin Assignment	Normal Assignment
1	Input Receive Data +
2	Input Receive Data -
3	Output Transmit Data +
6	Output Transmit Data -
4,5,7,8	Not used

Figure 1

Twisted pair cables

Figures 1 and 2 illustrate the use of straight-through and crossover twisted pair cables along with the connector.

RJ-45 plug attached to cable

Figure 2

Straight and crossover cable configuration

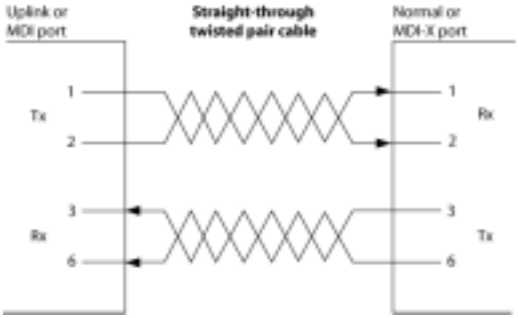


Figure 3

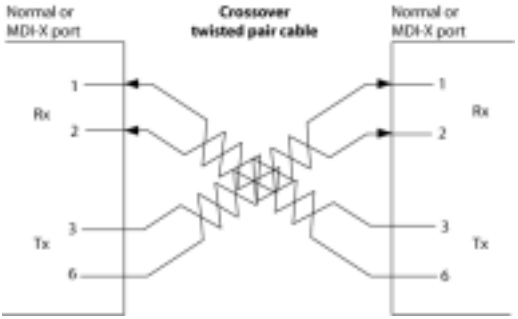


Figure 4

RJ11 connector and cable

An RJ-11 connector is the small, modular plug used for most analog telephones. It has six pin slots in the head, but usually only two or four of them are used.

RJ-11 Connector Pin Assignment	Normal Assignment
1	Signal Ground
2	CTS
3	RXD
4	TXD
5	+5 Volts In
6	Signal Ground

Figure 5

605 to RJ-11 adapter

The 605 to RJ-11adaptor is provided to comply with the older 610 Telstra wall socket. The 605 to RJ-11 adapter may be used to convert the supplied RJ-11 cable, if the older connection is required.

USB cable

A typical USB cord has an "A" connection (“upstream” to plug into the computer) and a “B” connection (“downstream” to plug into the device).

By using different connectors on the upstream and downstream ends, cable connection is simplified. The “B” connection will fit a into the “B” socket of any USB device. Similarly, any "A" connector can be plugged into any "A" socket, such as on a computer.

If it is a new device, the operating system auto-detects it and asks for the driver disk. If the device has already been installed, the computer activates it and starts talking to it. USB devices can be connected and disconnected at any time.

9 Pin (RS-232) Serial Cable

A 9 Pin (RS-232) Serial Cable may be used to connect the NB702/NB704 to a serial console terminal or a PC running a terminal emulation program, such as Hyper Terminal. (For further details, See Chapter 3: Command Line Interface.)

Male Connector

Pin No	Name	Notes/Description No.
1	DCD	Data Carrier Detect
2	RD	Receive Data (a.k.a RxD, Rx)
3	TD	Transmit Data (a.k.a TxD, Tx)
4	DTR	Data Terminal Ready
5	SGND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

Appendix D – Registering your NetComm Product

To ensure that the conditions of your warranty are complied with, please go to the NetComm web site for quick and easy registration of your product at

www.netcomm.com.au

Alternatively, you can complete the following copy of the Warranty Registration Form and mail it to NetComm Limited, PO Box 1200, Lane Cove NSW 2066.

Contact Information

If you have any technical difficulties with your product, please do not hesitate to contact NetComm's Customer Support Department.

Email: support@netcomm.com.au

Fax: (02) 9424-2010

Web: www.netcomm.com.au

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Please note that the images used in this document may vary slightly from those of the actual product. Specifications are accurate at the time of the preparation of this document but are subject to change without notice.

Legal & Regulatory Information Copyright Information

Customer Information

ACA (Australian Communications Authority) requires you to be aware of the following information and warnings:

(1) This unit shall be connected to the Telecommunication Network through a line cord which neets the requirements of the ACA TS008 Standard.

(2) This equipment has been tested and found to comply with the Standards for C-Tick and or A-Tick as set by the ACA . These standards are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio noise and, if not installed and used in accordance with the instructions detailed within this manual, may cause interference to radio communications. However, there is no guarantee that interference will not occur with the installation of this product in your home or office. If this equipment does cause some degree of interference to radio or television reception, which can be determined by turning the equipment off and on, we encourage the user to try to correct the interference by one or more of the following measures:

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

(3) The power supply that is provided with this unit is only intented for use with this product. Do not use this power supply with any other product or do not use any other power supply that is not approved for use with this product by NetComm. Failure to do so may cause damage to this product, fire or result in personal injury.

Cut along the line

Warranty Registration Form

Date of Purchase .....

Name .....

Company .....

Address .....

..... Post Code .....

Tel No ( ) ..... Fax No ( ) .....

E-mail .....

The following information is vital for your warranty

Please make sure it's correct and complete.

Serial No .....

Model .....

Product Type:

- ☐ PC Card
- ☐ External
- ☐ Internal
- ☐ Other

! Make sure you fill this section in!

I intend to use this product at:

- ☐ Home
- ☐ School/College/University
- ☐ Business
- ☐ Government Office

Dealer's Name .....

Dealer's Address .....

..... Post Code .....

Tel No ( ) ..... Fax No ( ) .....

How did you find out about our products?

.....

.....

Product Warranty

The warranty is granted on the following conditions:

1. This warranty extends to the original purchaser (you) and is not transferable;
2. This warranty shall not apply to software programs, batteries, power supplies, cables or other accessories supplied in or with the product;
3. The customer complies with all of the terms of any relevant agreement with NetComm and any other reasonable requirements of NetComm including producing such evidence of purchase as NetComm may require;
4. The cost of transporting product to and from NetComm's nominated premises is your responsibility; and,
5. NetComm does not have any liability or responsibility under this warranty where any cost, loss, injury or damage of any kind, whether direct, indirect, consequential, incidental or otherwise arises out of events beyond NetComm's reasonable control. This includes but is not limited to: acts of God, war, riot, embargoes, acts of civil or military authorities, fire, floods, electricity outages, lightning, power surges, or shortages of materials or labour.
6. The customer is responsible for the security of their computer and network at all times. Security features may be disabled within the factory default settings. NetComm recommends that you enable these features to enhance your security.

The warranty is automatically voided if:

1. You, or someone else, use the product, or attempts to use it, other than as specified by NetComm;
2. The fault or defect in your product is the result of a voltage surge subjected to the product either by the way of power supply or communication line, whether caused by thunderstorm activity or any other cause(s);
3. The fault is the result of accidental damage or damage in transit, including but not limited to liquid spillage;
4. Your product has been used for any purposes other than that for which it is sold, or in any way other than in strict accordance with the user manual supplied;
5. Your product has been repaired or modified or attempted to be repaired or modified, other than by a qualified person at a service centre authorised by NetComm; and,
6. The serial number has been defaced or altered in any way or if the serial number plate has been removed.

Limitations of Warranty

The Trade Practices Act 1974 and corresponding State and Territory Fair Trading Acts or legalisation of another Government ("the relevant acts") in certain circumstances imply mandatory conditions and warranties which cannot be excluded. This warranty is in addition to and not in replacement for such conditions and warranties.

To the extent permitted by the Relevant Acts, in relation to your product and any other materials provided with the product ("the Goods") the liability of NetComm under the Relevant Acts is limited at the option of NetComm to:

- Replacement of the Goods; or
- Repair of the Goods; or
- Payment of the cost of replacing the Goods; or
- Payment of the cost of having the Goods repaired.

All NetComm ACN 002 490 486 products have a standard 12 months warranty from date of purchase. However some products have an extended warranty option (refer to packaging). To be eligible for the extended warranty you must supply the requested warranty information to NetComm within 30 days of the original purchase by registering on-line via the NetComm web site at www.netcomm.com.au.

NetComm reserves the right to request proof of purchase upon any warranty claim.

NetComm®

SHDSL

3 YEAR WARRANTY*

1 year warranty out of the box. Extra 2 years **FREE** with online registration at **www.netcomm.com.au** - Conditional upon registration online.

AUSTRALIA CONNECTS WITH NetComm®

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