# MS51p1 ADSL Router
# User Manual

SINGLE-PORT ADSL2+ MODEM ROUTER w/Broadcom 6332 chipset



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# Introduction

The MS51P1 is a single port ADSL2+ access device that supports multiple line modes. The device provides high-speed ADSL2+ broadband connection to the Internet or Intranet for high-end users. downlink up to 24 Mbps and uplink up to 1 Mbps.

## Packing List

- 1 x MS51p1
- 1 x external splitter
- 1 x power adapter
- 1 x telephone cables (RJ11)
- 1 x Ethernet cable (RJ45)

## Safety Precautions

Follow the following instructions to prevent the device from risks and damage caused by fire or electric power:
- Use the power adapter packed within the device package.
- Pay attention to the power load of the outlet or prolonged lines. An overburden power outlet or damaged lines and plugs may cause electric shock or fire accident. Check the power cords regularly. If you find any damage, replace it at once.
- Proper space left for heat dissipation is necessary to avoid damage caused by overheating to the device. The long and thin holes on the device are designed for heat dissipation to ensure that the device works normally. Do not cover these heat dissipation holes.
- Do not put this device close to a place where a heat source exists or high temperature occurs. Avoid the device from direct sunshine.
- Do not put this device close to a place where it is over damp or watery. Do not spill any fluid on this device.
- Do not connect this device to any external power source because any wrong connection may cause power or fire risk.
- Do not place this device on an unstable surface or support.

## System Requirements

Recommended system requirements are as follows:
- A 10/100 base-T Ethernet card is installed on your PC
- A hub or Switch. (connected to several PCs through one of Ethernet interfaces on the device)
- Operating system: Windows 98SE, Windows 2000, Windows ME, Windows XP
- Internet Explorer V8.0 or higher or Netscape / Firefox equivalent
- Subscription for ADSL service. Your ADSL service provider should provide you with at least one valid IP address (static assignment or dynamic).
- One or more computers, each containing an Ethernet 10/100M Base-T network interface card (NIC).
- A hub or switch, if you are connecting the device to more than one (1) computer.

# Features

## Broadcom 6332

The device supports the following features:
- ANSI T1.413 issue 2
- VLAN tagging
- Downstream: Up to 24Mbps
- Max upstream speed: 1Mbps.
- 1483Briged/1483Routed/MER/IPoA access
- Multiple PVCs (up to eight) and these PVCs can be isolated from each other
- A   single PVC with multiple sessions
- Multiple PVCs with multiple sessions
- 802.1Q and 802.1P protocol
- DHCP server
- Rate Adaptive at 32 Kbps steps
- Interoperable with all major DSLAM equipment
- TR-069 compliant with ACS
- ITU G.994.1 G.992.1(G.DMT) G.992.2(G.LITE)
- ITU G.992.3(G.DMT.BIS)
- ITU G.992.5
- T1.413
- PPPoE
- PPPoA
- IPoA
- MER
- BRIDGE mode

Operating Systems
- All versions of Windows, Mac and Linux

ATM Capabilities

- All ATM Connection
- VPI Range: 0-255
- VCI Range: 32-65535
- AESA (E.164, DCC, ICD)
- PVC Support, UNI 3.0 & 3.1 Signaling
- Support AAL 5

Management Support
- Web Based GUI 192.168.1.1
- Upgrade or update via FTP/HTTP
- Command Line Interface via Telnet
- Diagnostic Test
- Firmware upgradeable

Factory Defaults
- IP Address: 192.168.1.1
- Subnet Mask: 255.255.255.0
- Encapsulation: RFC 1483 LLC
- VPI/VCI: 0/35 MER Bridge mode

Environmental
- Operating humidity: 10%-90% non-condensing
- Non-operating storage humidity: 5%-95% non-condensing

# Hardware Installation

## Front Panel



**Step 1**

Connect the **DSL** interface of the device and the **Modem** interface of the splitter through a telephone cable. Connect the phone to the **Phone** interface of the splitter through a cable. Connect the incoming line to the **Line** interface of the splitter

| LED | Color | Function |
|-----|-------|----------|
| PWR | Green | On: Power<br>Off: No power or system boot failed |
| DSL | Green | On: ADSL link established and active<br>Blinking: ADSL is trying to establish a connection<br>Off: No ADSL link |
| ACT | Green | Blinking: ADSL data activity occurs.<br>Off: No ADSL data is being sent or received. |
| LAN | Green | On: LAN link established and active<br>Blinking: ADSL data activity occurs.<br>Off: No LAN link. |

The splitter has three interfaces:
- **Line**: Connect to a wall phone jack (RJ-11 jack).
- **Modem**: Connect to the ADSL jack of the device.
- **Phone**: Connect to a telephone set.

**Step 2**    Connect the **LAN** interface of the device to the network card of the PC through an Ethernet cable (MDI/MDIX).

📖 **Note:**

Use twisted-pair cables to connect with the hub or switch.



**Step 3**    Plug one end of the power adapter to the wall outlet and connect the other end to the **Power** interface of the device.

Installing a telephone directly before the splitter may lead to failure of connection between the device and the central office, or failure of Internet access, or slow connection speed. If you really need to add a telephone set before the splitter, you must add a microfilter before a telephone set. Do not connect several telephones before the splitter or connect several telephones with the microfilter.

| Port | Function |
|------|----------|
| DSL | Connects the device to an ADSL telephone jack or splitter using a RJ-11 telephone cable |
| LAN | Connects the device to your PC's Ethernet port, or to the uplink port on your hub/switch, using a RJ-45 cable |
| Reset | System reset or reset to factory defaults. |
| POWER | Connects to the supplied power adapter |
| ⏻ | Switches the unit on and off |
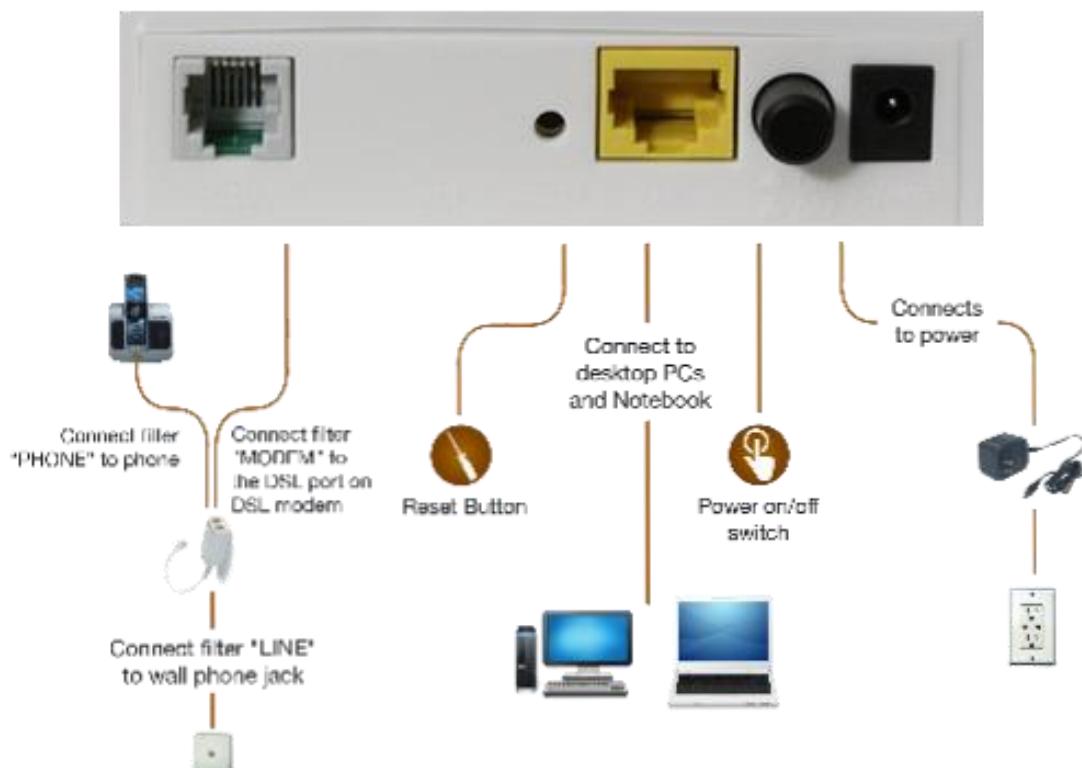
**Note: Without the splitter, transient noise from the telephone can interfere with the operation of the ADSL router. As a result, the ADSL router may introduce noise to the telephone line. To prevent this from happening, a small external splitter must be connected to each telephone.**

## PC Configuration

**Windows**

1. In the Windows task bar, click the "Start" button, point to "Settings", and then click "Control Panel".

2. Double-click the "Network" icon.

3. On the "Configuration" tab, select the TCP/IP network associated with your network card and then click "Properties".

4. In the "TCP/IP Properties" dialog box, click the "IP Address" tab. Set the IP address as 192.168.1.2 and the subnet mask as 255.255.255.0.

5. On the "Gateway" tab, set a new gateway as 192.168.1.1, and then click "Add".

6. Configure the "DNS" tab if necessary to 192.168.1.1, usually NOT needed.

7. Click "OK" twice to confirm and save your changes.

8. You will be prompted to restart Windows. Click "Yes".

## Access the Unit

After configuring the IP Address of you computer, power on the ADSL Router, and launch a web browser and navigate to http://192.168.1.1 to log on to the setting pages.



**Attention: the username admin and password adslroot are both lowercase.**

# Quick Setup

If there are no pre-configured PVCs in the router, you can find the **Quick Setup** option on the left of router configuration page. The user can also delete the PVCs pre-configured to find the option.

1. From home page, choose **Quick Setup**.

**Quick Setup**

This Quick Setup will guide you through the steps necessary to configure your DSL Router.

**ATM PVC Configuration**

Select the check box below to enable DSL Auto-connect process.

☑  DSL Auto-connect

2. Deselect the check box to disable the DSL Auto-connect process. Set the VPI/VCI value provided by your ISP.

**Quick Setup**

This Quick Setup will guide you through the steps necessary to configure your DSL Router.

**ATM PVC Configuration**

Select the check box below to enable DSL Auto-connect process.

☐  DSL Auto-connect

The Port Identifier (PORT) Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) are needed for setting up the ATM PVC. Do not change VPI and VCI numbers unless your ISP instructs you otherwise.

PORT: [0-3]     `0`

VPI: [0-255]    `0`

VCI: [32-65535] `35`

**Enable Quality Of Service**

Enabling QoS for a PVC improves performance for selected classes of applications. However, since QoS also consumes system resources, the number of PVCs will be reduced consequently. Use **Advanced Setup/Quality of Service** to assign priorities for the applications.

Enable Quality Of Service  ☐

**a. PPP over Ethernet (PPPoE)**

1. Select **PPP over Ethernet (PPPoE)** as connection type, and select **LLC/SNAP-BRIDGING** as encapsulation mode.



○ PPP over ATM (PPPoA)

○ PPP over Ethernet (PPPoE)

◉ MAC Encapsulation Routing (MER)

○ IP over ATM (IPoA)

○ Bridging

**Encapsulation Mode**
LLC/SNAP-BRIDGING ∨

3. Input the **PPP Username** & **PPP Password** and then click **Next**. The user interface allows a maximum of 256 characters in the user name and a maximum of 32 characters in the password. Just remember to enable **NAT** and **Firewall** as shown below.

PPP Username: [ ]
PPP Password: [ ]
PPPoE Service Name: [ ]
Authentication Method: AUTO

☐ Enable Fullcone NAT

☑ NAT

☑ Firewall

☐ Dial on demand (with idle timeout timer)

☐ PPP IP extension
☐ Use Static IP Address

☐ Retry PPP password on authentication error
☐ Enable PPP Debug Mode
4. ☑ Bridge PPPoE Frames Between WAN and Local Ports (Default Enabled)

**PPPoE service name** can be blank unless your Internet Service Provider gives you a value to enter.

**Authentication method** is default to **Automatic**. It is recommended that you leave the **Authentication method** in **Automatic**, however, you may select **PAP** or **CHAP** if necessary. The default value for MTU (Maximum Transmission Unit) is **1500** for PPPoA and **1492** for PPPoE. Do not change these values unless your ISP asks you to.

The gateway can be configured to disconnect if there is no activity for a specific period of time by selecting the **Dial on demand** check box and entering the **Inactivity timeout**. The entered value must be between 1 minute and 4320 minutes.

The **PPP IP Extension** is a special feature deployed by some service providers. Unless your service provider specifically requires this setup, do not select it. If you need to select it, the PPP IP Extension supports the following conditions:

▪ It allows only one computer on the LAN.

▪ The public IP address assigned by the remote using the PPP/IPCP protocol is actually not used on the WAN PPP interface. Instead, it is forwarded to the computer's LAN interface through DHCP. Only one system on the LAN can be

connected to the remote, since the DHCP server within the ADSL gateway only has a single IP address to assign to a LAN device.

- NAPT and firewall are disabled when this option is selected.

- The gateway becomes the default gateway and DNS server to the computer through DHCP using the LAN interface IP address.

- The gateway extends the IP subnet at the remote service provider to the LAN computer. That is, the PC becomes a host belonging to the same IP subnet.

- The ADSL gateway bridges the IP packets between WAN and LAN ports, unless the packet is addressed to the gateway's LAN IP address.

3. Deselect **Enable IGMP Multicast**, and select **Enable WAN Service** and then click **Next.**

**Enable IGMP Multicast, and WAN Service**

| | |
|---|---|
| Enable IGMP Multicast | ☐ |
| Enable WAN Service | ☑ |
| Service Name | pppoe_0_0_35_1 |

5. Configure the DSL Router's IP Address and Subnet Mask for LAN interface. In this page, you can use DHCP (Dynamic Host Configuration Protocol) to control the assignment of IP addresses on your local network (LAN only).

**Device Setup**

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

| | |
|---|---|
| IP Address: | 192.168.1.1 |
| Subnet Mask: | 255.255.255.0 |

○ Disable DHCP Server
⦿ Enable DHCP Server

| | |
|---|---|
| Start IP Address: | 192.168.1.2 |
| End IP Address: | 192.168.1.254 |
| Subnet Mask: | 255.255.255.0 |
| Leased Time (hour): | 24 |

☑ Configure the second IP Address and Subnet Mask for LAN interface

| | |
|---|---|
| IP Address: | 10.0.0.1 |
| Subnet Mask: | 255.0.0.0 |

6.

| Item | Description |
|------|-------------|
| **IP address** | This is the IP address that other devices on your local network will use to connect to the modem. |
| **Subnet mask** | This defines the size of your network. The default is **255.255.255.0**. |
| **Disable / Enable DHCP server** | The DHCP server assigns an IP addresses from a pre-set pool of addresses upon request from DHCP client (e.g. your computer). Do not disable the DHCP server unless you wish to let another device handle IP address issuance on the local network. |
| **Start / end IP address** | This is the beginning and ending range for the DHCP server addresses. |
| **Lease time** | The amount of time before the IP address is refreshed by the DHCP server. |
| **Configure the second IP address and...** | Use this feature to create a public network on your local LAN, which is accessible from the Internet. By assigning an address to this interface and setting LAN clients to the same network, LAN clients are accessible from the public network (e.g. FTP or HTTP servers). |

5. Make sure that the settings below match the settings provided by your ISP.

| | |
|------|------|
| **PORT / VPI / VCI:** | 0 / 0 / 35 |
| **Connection Type:** | PPPoE |
| **Service Name:** | pppoe_0_0_35_1 |
| **Service Category:** | UBR |
| **IP Address:** | Automatically Assigned |
| **Service State:** | Enabled |
| **NAT:** | Enabled |
| **Firewall:** | Enabled |
| **IGMP Multicast:** | Disabled |
| **Quality Of Service:** | Disabled |

6. Click on the **Save/Reboot** button to save your configurations.

**b.  PPP over ATM (PPPoA)**

1. Select **PPP over ATM (PPPoA)** as connection type, and select **VC/MUX** as encapsulation mode.

- ⊙ PPP over ATM (PPPoA)
- ○ PPP over Ethernet (PPPoE)
- ○ MAC Encapsulation Routing (MER)
- ○ IP over ATM (IPoA)
- ○ Bridging
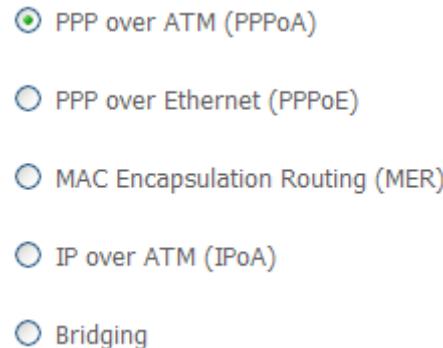
2. Input **PPP Username** & **PPP Password** and then click **Next**. The user interface allows a maximum of 256 characters in the user name and a maximum of 32 characters in the password. Just remember to enable **NAT** and **Firewall** as below.

PPP Username:
PPP Password:
Authentication Method: AUTO

☐ Enable Fullcone NAT

☑ NAT

☑ Firewall

☐ Dial on demand (with idle timeout timer)

☐ PPP IP extension
☐ Use Static IP Address

☐ Retry PPP password on authentication error
☐ Enable PPP Debug Mode

**PPPoA service name** can be blank unless your Internet Service Provider gives you a value to enter.

The **Authentication method** is default to the **Automatic** setting. It is recommended that you leave the **Authentication method** in **Automatic**, however, you may select **PAP** or **CHAP** if necessary. The default value for MTU (Maximum Transmission Unit) is **1500** for PPPoA and **1492** for PPPoE. Do not change these values unless your ISP requests you to.

The gateway can be configured to disconnect if there is no activity for a specific period of time by selecting the **Dial on demand** check box and entering the **Inactivity timeout**. The entered value must be between 1 minute and 4320 minutes.

The **PPP IP Extension** is a special feature deployed by some service providers. Unless your service provider specifically requires this setup, do not select it. If you need to select it, the PPP IP Extension supports the following conditions:

- It allows only one computer on the LAN.

- The public IP address assigned by the remote using the PPP/IPCP protocol is actually not used on the WAN PPP interface. Instead, it is forwarded to the computer's LAN interface through DHCP. Only one system on the LAN can be connected to the remote, since the DHCP server within the ADSL gateway has only a single IP address to assign to a LAN device.

- NAPT and firewall are disabled when this option is selected.

- The gateway becomes the default gateway and DNS server to the computer through DHCP using the LAN interface IP address.

- The gateway extends the IP subnet at the remote service provider to the LAN computer. That is, the PC becomes a host belonging to the same IP subnet.

- The ADSL gateway bridges the IP packets between WAN and LAN ports, unless the packet is addressed to the gateway's LAN IP address.

3.  Unselect **Enable IGMP Multicast**, and select **Enable WAN Service** and then click **Next**

**Enable IGMP Multicast, and WAN Service**

| | |
|---|---|
| Enable IGMP Multicast | ☐ |
| Enable WAN Service | ☑ |
| Service Name | pppoa_0_0_35_1 |

4.  Configure the DSL Router's IP Address and Subnet Mask for LAN interface. On this page, you can use DHCP (Dynamic Host Configuration Protocol) to control the assignment of IP addresses on your local network (LAN only).

**Device Setup**

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address: 192.168.1.1
Subnet Mask: 255.255.255.0

○ Disable DHCP Server
◉ Enable DHCP Server
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
Subnet Mask: 255.255.255.0
Leased Time (hour): 24

☑ Configure the second IP Address and Subnet Mask for LAN interface
IP Address: 10.0.0.1
Subnet Mask: 255.0.0.0

| Item | Description |
|---|---|
| **IP address** | This is the IP address that other devices on your local network will use to connect to the modem. |
| **Subnet mask** | This defines the size of your network. The default is **255.255.255.0**. |
| **Disable / Enable DHCP server** | The DHCP server assigns an IP addresses from a pre-set pool of addresses upon request from DHCP client (e.g. your computer). Do not disable the DHCP server unless you wish to let another device handle IP address issuance on the local network. |
| **Start / end IP address** | This is the beginning and ending range for the DHCP server addresses. |
| **Lease time** | The amount of time before the IP address is refreshed by the DHCP server. |
| **Configure the second IP address and...** | Use this feature to create a public network on your local LAN, accessible from the Internet. By assigning an address to this interface and then statically setting your LAN clients to the same network, the LAN clients are accessible from the public network (e.g. FTP or HTTP servers). |

5. Make sure that the settings below match the settings provided by your ISP.

| | |
|---|---|
| **PORT / VPI / VCI:** | 0 / 0 / 35 |
| **Connection Type:** | PPPoA |
| **Service Name:** | pppoa_0_0_35_1 |
| **Service Category:** | UBR |
| **IP Address:** | Automatically Assigned |
| **Service State:** | Enabled |
| **NAT:** | Enabled |
| **Firewall:** | Enabled |
| **IGMP Multicast:** | Disabled |
| **Quality Of Service:** | Disabled |

6. Click on the **Save/Reboot** button to save your configurations.

c. **Bridging (RFC 2684)**

Select the bridge operation mode at the suggestion of your ADSL service provider. To configure the bridging option, instructions are as follows:

1. Select **Bridging (RFC 2684)** as the connection type.

- ○ PPP over ATM (PPPoA)

- ○ PPP over Ethernet (PPPoE)

- ○ MAC Encapsulation Routing (MER)

- ○ IP over ATM (IPoA)

- ● Bridging

**Encapsulation Mode**
LLC/SNAP-BRIDGING ▾

2. Select the appropriate **Encapsulation mode** and click **Next**. The following screen appears:

Unselect the check box below to disable this WAN service

Enable Bridge Service: ☑

Service Name:     br_0_0_35

3. Enable or disable bridge service and enter a bridge service name. Click **Next** and configure your LAN.

**Device Setup**

Configure the DSL Router IP Address and Subnet Mask for your Local Area Network (LAN).

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

4. The summary page presents the entire configuration summary. Click **Save** if the settings are correct or **Back** to change any of the settings.

| | |
|---|---|
| **PORT / VPI / VCI:** | 0 / 0 / 35 |
| **Connection Type:** | Bridge |
| **Service Name:** | br_0_0_35 |
| **Service Category:** | UBR |
| **IP Address:** | Not Applicable |
| **Service State:** | Enabled |
| **NAT:** | Disabled |
| **Firewall:** | Disabled |
| **IGMP Multicast:** | Not Applicable |
| **Quality Of Service:** | Disabled |

**Note: If you would like to cancel all modification that you make on the router, please select "Management⇨Setting⇨Restore Default Settings" to restore the router to its factory default settings.**