ADB

DB 6520

**Installation
User Manual**
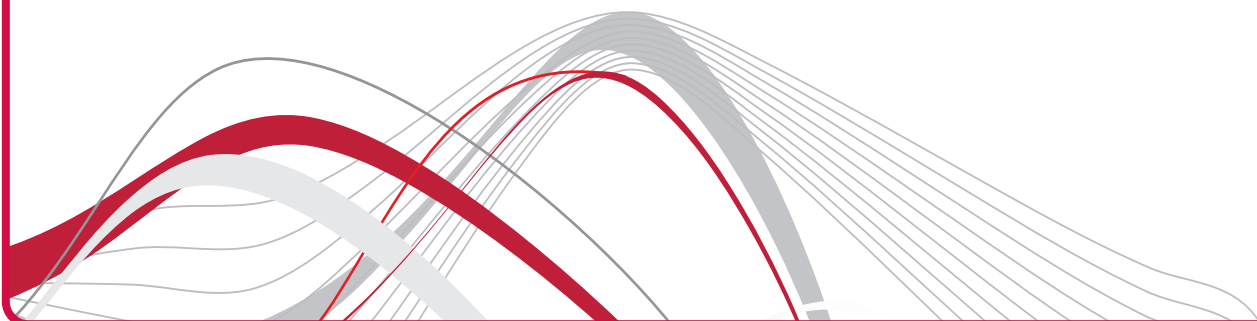
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CONTENTS

Welcome

ABOUT THIS GUIDE

This guide describes how to install and configure the **DB 6520** product. This guide is intended for use by those responsible for installing and setting up network equipment; consequently, it assumes a basic working knowledge of LANs (Local Area Networks) and Internet Routers. This guide can be used also for variants derived from this **DB 6520**, which are named respectively **DB 6220** (which do not provide dual-band radio) and **DV 6220** (which do not provide VDSL bonded functionality).

NAMING CONVENTION

Throughout this guide, the **DB 652** is referred to as the "ADSL Wi-Fi Router" or the "Router". Category 5 Ethernet Cable is referred to as Ethernet Cable throughout this guide.

CONVENTIONS

Table 1 and Table 2 list conventions that are used throughout this guide.

TABLE 1. **Notice Icons**

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions.
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device.
	Warning	Information that alerts you to potential personal injury.

TABLE 2. **Text Conventions**

Convention	Description
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press Return or Enter. Do not press Return or Enter when an instruction simply says "type."
Keyboard key names	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press Ctrl+Alt+Del
Words in italics	Italics are used to: • Emphasize a point. • Denote a new term at the place where it is defined in the text. • Identify menu names, menu commands, and software button names. Examples: "From the *Help* menu, select *Contents*. Click *OK*."

Introduction

INTRODUCTION

The **DB 6520** is designed to provide a bonded broadband Internet connection and provide several wired and wireless LAN connection. The Router also provides protection in the form of an electronic "firewall" preventing anyone outside of your network from seeing your files or damaging your computers.

The **DB 6520** is a VDSL/2/2+ Bonded router, targeted to residential environments and SOHO customers, that provides routed broadband services from a single and modular access point.

The **DB 6520** is the ideal solution for:

1. Connecting multiple PCs and Video game consoles;
2. Sharing broadband internet connections with all home computers;
3. Sharing printers and peripherals.

PACKAGE CONTENTS

Your new **DB 6520** Wireless Router kit contains the related hardware and software. You will find into packaging:

1. One **DB 6520** unit
2. One Power Supply adapter
3. One Phone cable RJ-11 plug (xDSL) (Gray)
4. One Ethernet CAT5 cable RJ-45 plug (Yellow)
5. A CD-ROM
6. A Safety Leaflet

TABLE 1.   Kit Material

	Quantity	DESCRIPTION
	1	*DB 6520*
	1	*Power Supplier Adapter*
	1	*Ethernet CAT5 cable RJ-45 plug (Yellow)*
	1	*Phone cable RJ-11 plug (DSL) (Gray)*
	1	*CD-ROM*
	1	*Safety leaflet*

If any of the items included in the package is damaged, please contact your Service Provider.

DB 6520 implements an "always-on" Very high asymmetric Digital Subscriber Line (VDSL) connection to the telephone line on the WAN side, as well as several local connectivity technologies on the LAN side:

- Five switched 10/100/1000 Base-TX Ethernet ports
- One HomePNA over Coax interface
- Two USB 2.0 Host port for external USB peripherals
- One IEEE 802.11b/g/n Wireless LAN access point 2x2 high power @2,4GHz
- One IEEE 802.11b/g/n Wireless LAN access point 3x3 high power @5GHz
- Two VDSL WAN interface with RJ-11 port

Figure 1 shows a sample network. Your Router becomes your connection to the Internet.

FIGURE 1.   Sample Home Network
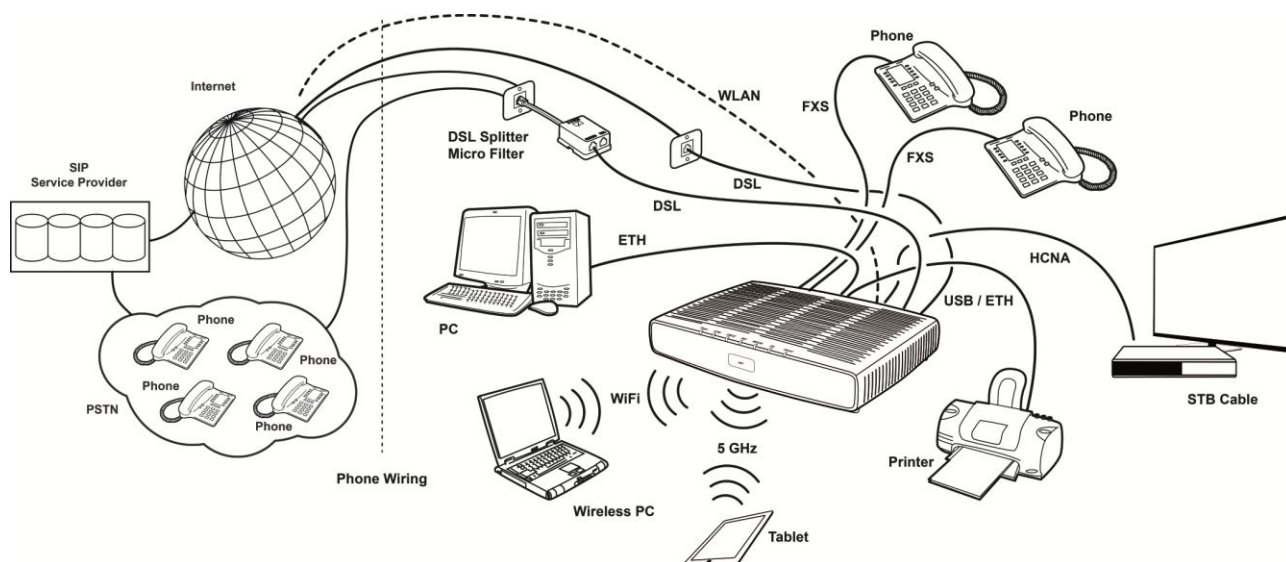
ROUTER ADVANTAGES

The advantages of the Router include:

- Shared Internet connection for both wired and wireless computers
- High speed 802.11b/g/n wireless networking with dual radio access
- No need for a dedicated, "always on" computer serving as your Internet connection
- Cross-platform operation for compatibility with Microsoft® Windows and Apple® MAC computers (see Technical description for supported platforms).
- Easy-to-use, Web-based setup and configuration
- Centralization of all network address settings (DHCP)
- a Virtual server to enable remote access to Web, FTP and other services on your network
- a Security - Firewall protection - against Internet hacker attacks and encryption to protect wireless network traffic
- A multi-language GUI.

MINIMUM SYSTEM AND COMPONENT REQUIREMENTS

Your Router requires the computer(s) and components in your network to be configured with at least the following:

- A computer with the Operating Systems that support TCP/IP networking protocols: Microsoft® Windows 98SE, Windows ME, Windows 2000, Windows XP 32bit, Windows Vista, Windows 7, or Apple® MAC 10.x
- An Ethernet 10Mbps or 10/100 Mbps NIC for each computer to be connected to one of the four Ethernet ports on the rear of the Router
- As optional, an 802.11b/g wireless NIC
- Supported Browsers: Internet Explorer, Netscape, Firefox, Chrome, Safari and Opera.

FRONT PANEL

The front panel of the Router contains indicator lights (LEDs) that help to describe the state of networking and connection operations.

FIGURE 2.   Front Panel LEDs
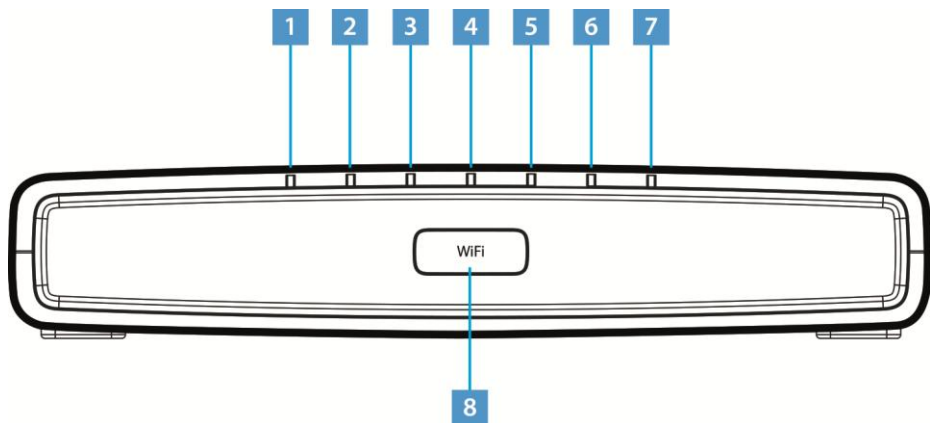
TABLE 2.   Front Panel LEDs explanation

LED Position	Color	Status	Description
Power	Green/Red	Solid Green	Power on
		Light off	Power off
		Solid red	Power on self-test /Device Malfunction (not bootable) and device malfunction
HCNA	Green	Solid Light	Device connected to LAN port
		Blinking	LAN Activity present
		Light off	No Activity
USB	Green	Solid Green	USB Link established
		Blinking Green	USB activity present (traffic in either direction)

		Light off	No USB Link established
Wi-Fi / WPS (button/LED)	Green / Red	Solid Green	Wi-Fi → Wireless is activated on modem. OR WPS → Successful PC synchronization: after the blinking phase it turns solid and keep this state for 10 sec.
		Solid Red	WPS → WPS failed
		Blinking	Wi-Fi → Wireless activity is present WPS → Attempting PC synchronization
		Light off	Wi-Fi → Wireless off or no device attached WPS → WPS not started
WAN Eth	Green	Solid Light	IP connected and no traffic detected
		Blinking	IP connected and Internet traffic detected
		Light off	Modem power off, modem in bridged mode or DSL connection not present
DSL	Green	Solid Light	DSL good sync.
		Blinking	DSL attempting sync.
		Light off	No carrier signal
Internet	Green/Red	Solid Green	IP connected and no traffic detected
		Solid Red	Authentication failed
		Blinking Green	IP connected and Internet traffic detected
ETH1-4	Green	Solid Light	Device connected to LAN port
		Blinking	LAN Activity present
		Light off	No Activity

REAR PANEL

The rear panel of the Router contains a reset button, a power adapter socket, five LAN ports, one HCNA port, two VDSL port, and two USB Host ports.

FIGURE 3.   Rear Panel Ports
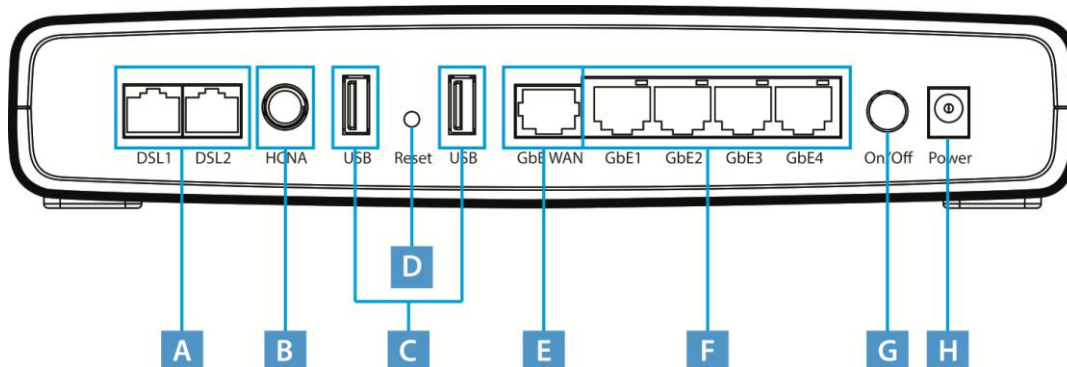
TABLE 3. Port Description

PORT	DESCRIPTION
A	2x Phone DSL connector (VDSL)
B	HCNA port
C	Two USB Host ports
D	Reset to factory
E	One Ethernet WAN port 10/100/1000 Mbps
F	Four Ethernet LAN ports 10/100/1000 Mbps
G	Power On/Off button
H	Power socket

Router Installation

INTRODUCTION

This chapter will guide you through a basic installation of the Router including:

1. Positioning the **DB 6520**
2. Installing Micro Filters
3. Connecting the Router to your network
4. Setting up your computer for networking with the Router

Please read carefully the Safety Information in Appendix "A"

POSITIONING THE ROUTER

You should place the Router in such a location to ensure that:

- It is located near an electrical outlet and a phone wall socket
- Water or moisture cannot enter the case of the unit
- It is out of direct sunlight and away from sources of heat
- The cabling is away from power lines, fluorescent lighting fixtures, and sources of electrical noise such as radios, transmitters and broadband amplifiers.
- It is centrally located with respect to the wireless devices that will be connected to the Router. A suitable location might be on top of a high shelf to ensure the maximum coverage for all connected devices.

INSTALLING MICRO FILTERS

Before beginning installation you must locate devices in your house requiring a DSL filter such as phones, fax machines, answering machines, dial-up modems, Satellite TV dialers or monitored security systems and attach a DSL filter to any one of them sharing the same phone line as your DSL modem.
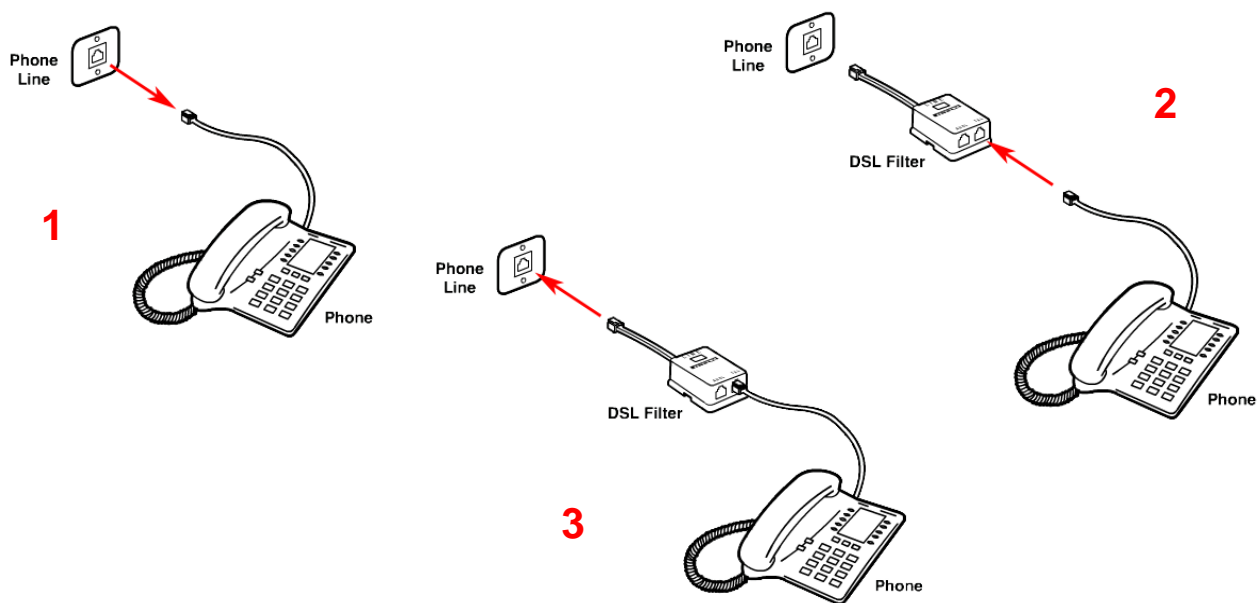
To install DSL filters please follow these steps:

1. Disconnect the phone cable from the telephone wall socket
2. Insert the phone cable into the DSL filter port identified with a phone symbol
3. Insert the DSL filter cable into the telephone wall socket

You do not need to attach a DSL filter to unused wall sockets.

FIGURE 1.   Micro Filter Installation

POWERING UP THE ROUTER

To power up the Router:

1. Plug the power adapter into the power adapter port located on the rear of the Router
2. Plug the power adapter into a standard electrical wall socket
3. Press the Power button located on the rear panel of the Router
4. Wait for the power LED to turn steady green

CONNECTING THE ROUTER

The first step to install the router is to physically connect it to the telephone socket and then connect it to a computer by means of an Ethernet connection.

To connect the phone cables (valid only for bonding models):

1. Connect one end of the first phone cable into the DSL filter port; the other end of the phone cable shall be inserted into the first DSL port on the rear of the Router.
2. Connect one end of the second phone cable into second phone line connector available on the wall; the other end of the cable shall be connected to the second DSL port on the rear panel of the router. (this is valid only for bonded models)

FIGURE 2.   Phone Cables Connection
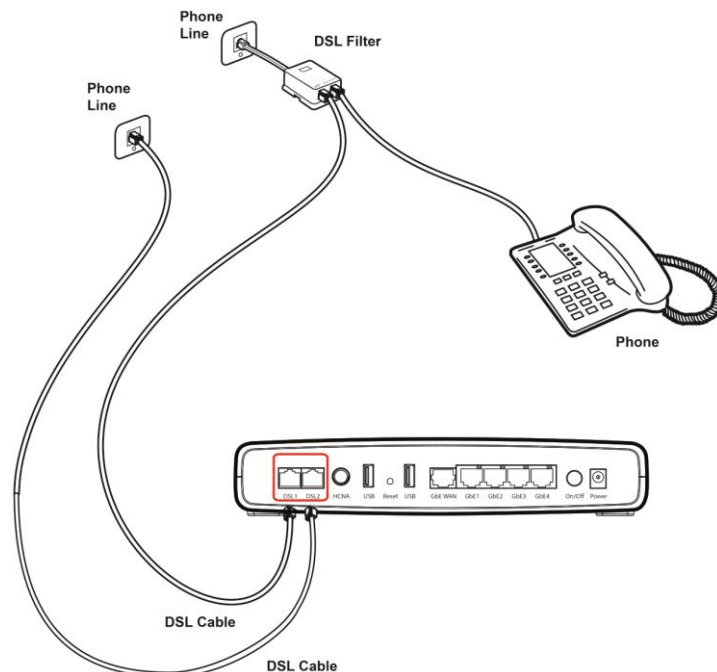
To connect the Ethernet cable:

1. Connect one end of the Ethernet cable into one of the four Ethernet ports on the rear of the Router

2. Connect the other end of the Ethernet cable into the Ethernet Network card of your computer

3. Verify if the Ethernet Network card is configured as DHCP client, otherwise configure it to remain in the same local network of the router interface (see chapter "Setting Up Your Computer")

FIGURE 3.   Ethernet Cable Connection
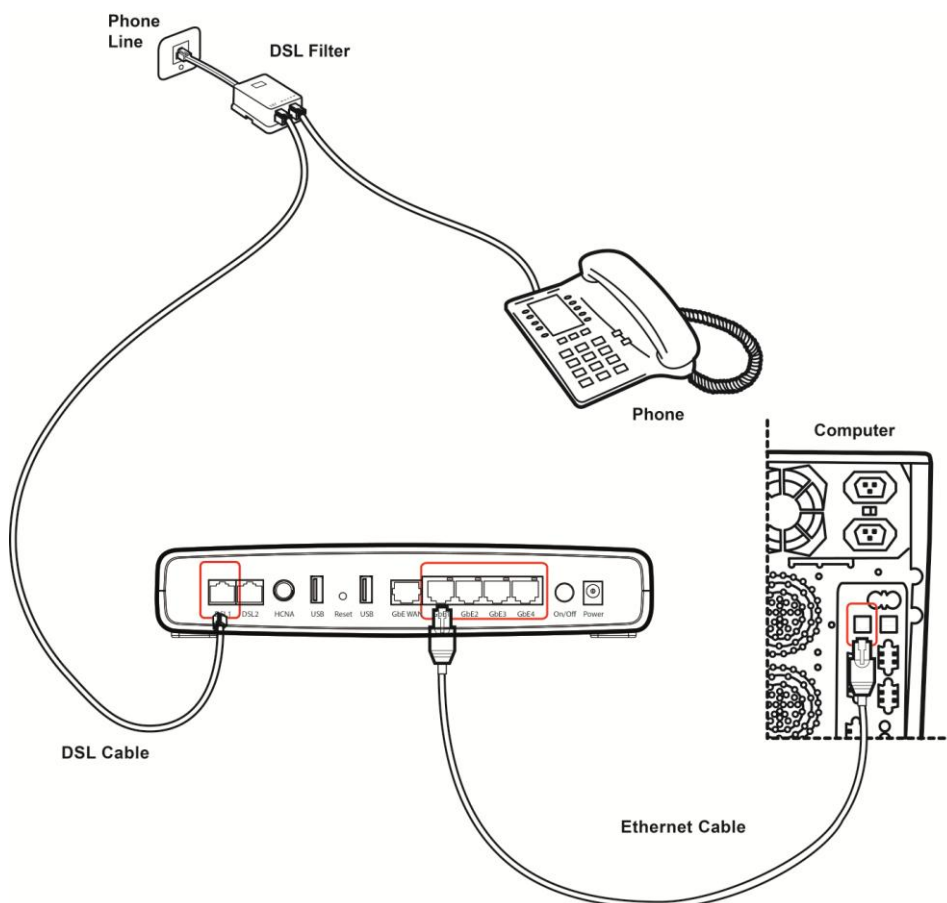
ETHERNET CONNECTION

You have to verify the existence of a TCP/IP protocol stack and, then, according to your Operating System, to establish an Ethernet connection to the Data Gateway. This connection will require you to enable your computer to receive

from the Data Gateway its own IP Address automatically: in such a case, the Data Gateway acts like the DHCP server in your local network.

TCP/IP CONFIGURATION

To access the Internet through the Data Gateway, you must configure the network settings of the computers on your LAN to use the same IP subnet as Data Gateway. The default IP settings for the Data Gateway are:

IP ADDRESS: 192.168.1.1

SUBNET MASK: 255.255.255.0

These settings can be changed to fit your network requirements, but you must first configure at least one computer to access the Data Gateway's web configuration interface in order to make the required changes.

ETHERNET CONNECTION >> TCP/IP PROTOCOL INSTALLATION

This procedure requires the TCP/IP protocol installed on your computer. Refer to the following paragraphs and to your Windows and MacOS operating systems manuals.

Microsoft Windows Vista / Windows 7

TCP/IP stack is considered a core component of the operating system, so it cannot be installed or uninstalled. You must check in this case that Internet Protocol (TCP/IP) is enabled. To do so, follow these steps:
1. Starting from *Start -> Control Panel -> Network & Internet -> Network Connections* depending on the configuration of your computer.
2. Select the Network Adapter icon and from the contextual menu, do select the *Properties* item.
3. In the General TAB panel, verify that *Internet Protocol v4 (TCP/IPv4)* item is checked; if not, do check it and click on the *OK* button.

Microsoft Windows XP

TCP/IP stack is considered a core component of the operating system, so it cannot be installed or uninstalled. You must check in this case that Internet Protocol (TCP/IP) is enabled. To do so, follow these steps:

1. Starting from *Start -> Settings -> Control Panel* or *Start -> Control Panel* depending on the configuration of your computer.
2. Make a double click on the *Network Connections* icon.
3. Select the Network Adapter icon and from the contextual menu, do select the *Properties* item.
4. In the General TAB panel, verify that *Internet Protocol (TCP/IP)* item is checked; if not, do check it and click on the *OK* button.

Microsoft Windows 98SE, ME, 2000

1. Insert your Windows installation CD-ROM into the CD-ROM drive.
2. Starting from Start -> Settings -> Control Panel or Start -> Control Panel depending on the configuration of your computer.
3. Make a double click on the Network and Dial-up Connections icon.
4. Select the interested Network Adapter icon and from the contextual menu, do select the Properties item.
5. If the Internet Protocol (TCP/IP) component is not checked you must enable it by checking the Internet Protocol (TCP/IP) item; otherwise, if it is not listed, you must install it by selecting the Install... button.
6. Choose the Protocol Network component and click on the add button.
7. In the Select Network Protocol panel, do choose Internet Protocol (TCP/IP) and the OK button.
8. After rebooting, you're ready to configure the TCP/IP setting, as described in the following paragraphs.

Apple MacOS 10.x

TCP/IP is installed on a MacOS system as part of Open Transport.

ETHERNET CONNECTION >> MS WINDOWS VISTA / WINDOWS 7

To configure TCP/IP on MS Windows Vista / Windows 7 Operating Systems follow these steps:

1. Select *Start -> Control Panel -> Network & Internet* and make a double click on the *Network Connections* icon.
2. Select the adapter card interested by TCP/IP configuration.
3. Select the *Properties* item from the contextual Adapter Card menu.
4. Select in the *General* TAB panel, the *Internet Protocol (TCP/IPv4)* item and then click on *Properties* button.
5. In the *General* TAB panel, check the *Obtain an IP address automatically* radio button and the *Obtain DNS server address automatically* radio button. Click on *OK* button.

ETHERNET CONNECTION >> MS WINDOWS XP

To configure TCP/IP on MS Windows XP Operating System follow these steps:

1. Select *Start -> Settings -> Control Panel* and make a double click on the *Network Connections* icon.
2. Select the adapter card interested by TCP/IP configuration.
3. Select the *Properties* item from the contextual Adapter Card menu.
4. Select in the *General* TAB panel, the *Internet Protocol (TCP/IP)* item and then click on *Properties* button.

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FIGURE 4.   Local Area Connection Properties

5. In the *General* TAB panel, check the *Obtain an IP address automatically* radio
button and the *Obtain DNS server address automatically* radio button. Click
on *OK* button.

FIGURE 5.   Internet Protocol (TCP/IP) Properties

**ETHERNET CONNECTION
>> MS WINDOWS 98SE, ME,
2000**

To configure TCP/IP on these Operating Systems follow these steps:

1. *Select Start -> Settings -> Control Panel* and make a double click on the *Network and Dial-up Connection* icon.
2. Select the adapter card interested by TCP/IP configuration and then select the Properties item from its contextual menu.
3. Select *Internet Protocol (TCP/IP)* item then click on *Properties* button.

FIGURE 6.   Local Area Connection Properties

1. Select the *General* TAB panel, then check the *Obtain an IP address automatically* and *Obtain DNS server address automatically* radio buttons. Click on *OK* button.

FIGURE 7. Internet Protocol (TCP/IP) Properties
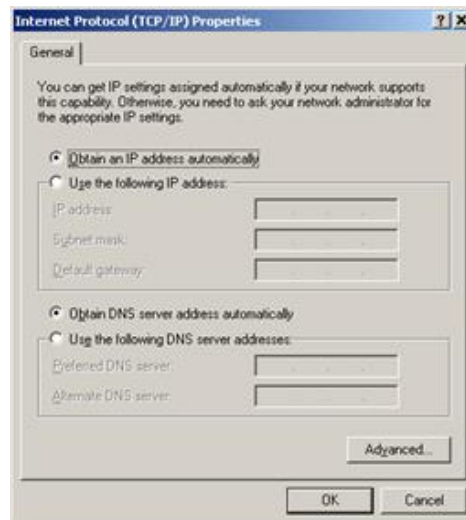
5. A system reboot will be required to make the changes real.

DISABLE HTTP PROXY

You need to verify that the "*HTTP proxy*" feature of your web browser is disabled. This is required in order that your browser can view the Gateway's HTML configuration pages.

OBTAIN IP SETTINGS FROM YOUR DATA GATEWAY >> MS WINDOWS XP / VISTA / 7

Now that you've configured your computer to connect to your Data Gateway, it needs to obtain new network settings. By releasing old DHCP IP settings and renewing them with settings from your Data Gateway, you can verify that you've configured your computer correctly.

2. On the Windows desktop, click *Start > Programs > Accessories > Command Prompt* menu item

3. In the Command prompt window, type "*ipconfig/release*" and press the *ENTER* key

4. Type "*ipconfig/renew*" and press the *ENTER* key. Verify that your IP Address is now 192.168.1.xxx, your Subnet Mask is 255.255.255.0 and your Default Gateway is 192.168.1.1. These values confirm that your xDSL Data Gateway is functioning

5. Close the Command Prompt window

**OBTAIN IP SETTINGS
FROM YOUR DATA
GATEWAY
>> MS WINDOWS 98SE, ME,
2000**

Now that you've configured your computer to connect to your Data Gateway, it needs to obtain new network settings. By releasing old DHCP IP settings and renewing them with settings from your Data Gateway, you can verify that you've configured your computer correctly.

6. On the Windows desktop, select the *Start > Programs > Accessories > Command Prompt* menu item

7. In the Command prompt window, type "*ipconfig/release*" and press the *ENTER* key

FIGURE 8.   Command Prompt (IPCONFIG command)
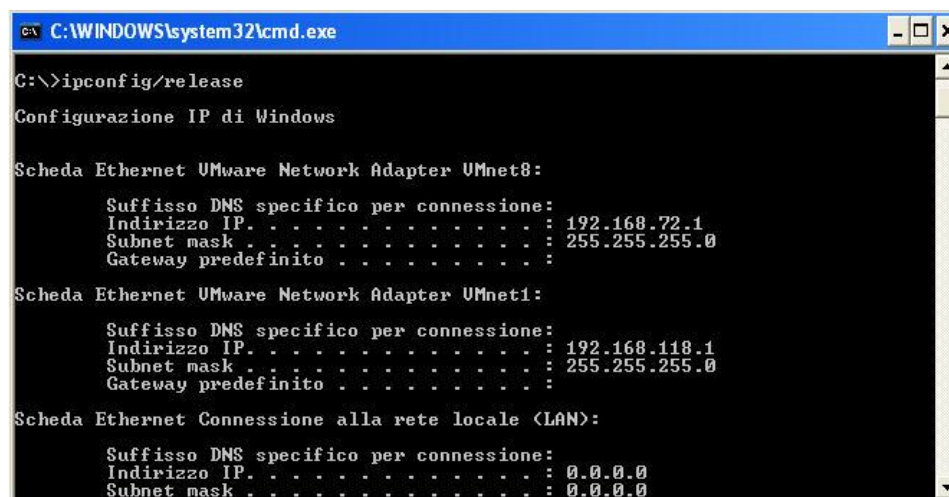
8. Type "*ipconfig/renew*" and press the *ENTER* key. Verify that your IP Address is now 192.168.1.xxx, your Subnet Mask is 255.255.255.0 and your Default Gateway is 192.168.1.1. These values confirm that your xDSL Data Gateway is functioning.

**FIGURE 9.   Command Prompt (IPCONFIG command)**
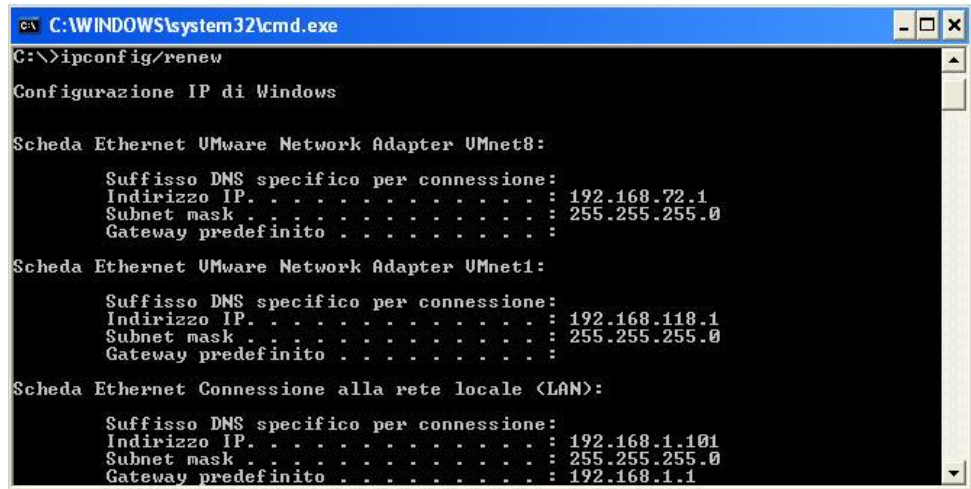
9. Close the Command Prompt window

**ETHERNET CONNECTION
>> MAC OS 10.X**

To configure TCP/IP on MAC OS 10.x follow these steps:

10. Open the *Apple Menu > System Preferences* and select *Network*.

11. From the *Show* drop down list, according to the type of connection used, select *Built-in Ethernet*.

12. Select the *TCP/IP* tab.

13. Select *DHCP* from the *Configure* pop-up menu to have a dynamic IP address. Click Apply Now.

14. Click on the *Register* button to save the changes in the Control Panel.

15. Enter *http://192.168.1.1/* in the address bar of your browser to open the **DB 6520** Home Page.

FIGURE 10. Network panel on MAC OS 10.x
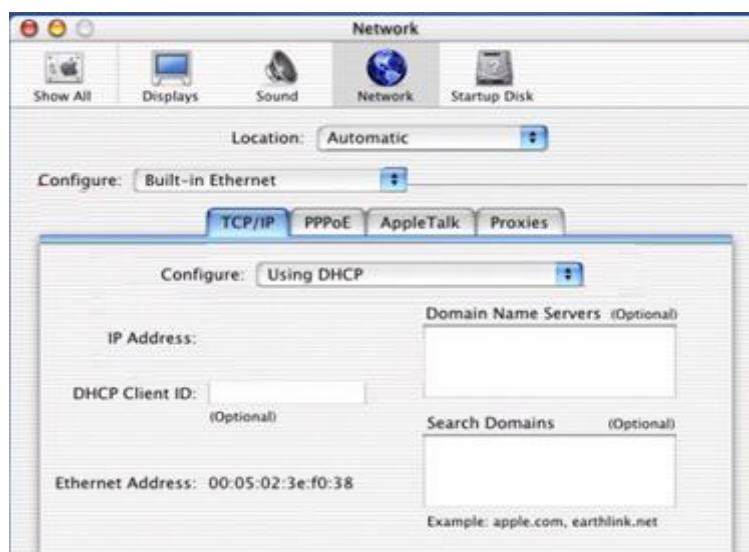
WI-FI CONNECTION

*It requires a computer with 802.11b/g/n (Wi-Fi Certified) wireless adapter installed.*

1. Install your wireless adapter according to the manufacturer's instructions and verify that your computer is set to obtain an IP address automatically (DHCP mode).

2. Upon wireless adapter installation and driver setup, please check in the *Network Connections* panel – accessible through your OS *Control Panel* – that the Wireless Network Connection is **enabled**. If not, enable it by right clicking on the Wireless Network Connection item and by selecting "**Enable**".

3. In case of an hardware wireless switch, please check that it is set to ON. Usually a steady lighted or flashing led will notify you the wireless connection up. Please consult your PC or notebook manual to get information on proper hardware switching and related led behavior.

*You will need to properly configure your adapter to communicate with the **DB 6520** according to the configuration rules.*
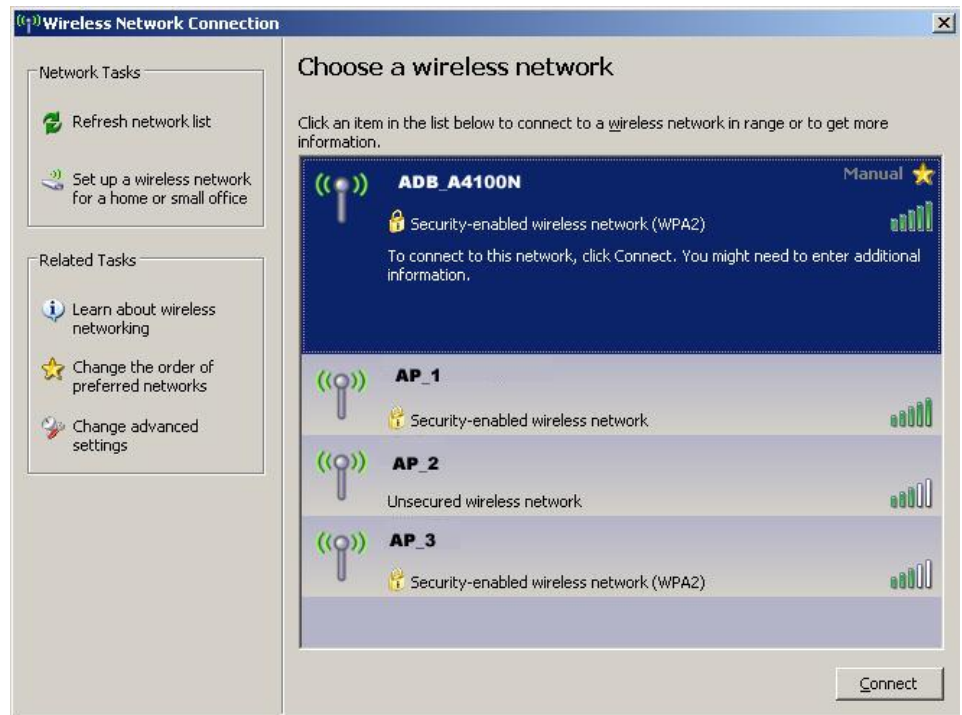
4. An icon will be shown in the quick tray icon bar at the bottom of your screen to notify you the current wireless connection state (see Figure 12)

FIGURE 11. Wireless connection icon (Windows XP)
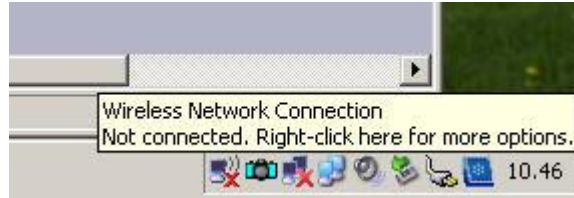
5. By double clicking on the wireless icon, a panel will appear showing you all available wireless network

FIGURE 12. Wireless network connection panel (Windows XP)

6. Double click on the SSID of the **DB 6520** in the Access Points list

7. A panel will appear asking you to insert the wireless key as defined in Chapter 7 ("Wireless Section").

Technical Specifications A

This section lists the technical specifications for the **DB 6520**.

Interfaces/Standard

WAN Interface

(*) Nr.2 Line port (RJ-11 plug) supporting the following standards:
- ADSL (G.992.1, G992.2, T1.413, G994.1, G.997.1)
- ADSL2 (G.992.3)
- ADSL2+ (G992.5)
- VDSL2 (G993.2)
- (*) For model DV 6220 there is N.1 Line port

Nr.1 Gigabit WAN Ethernet 10/100/1000 BASE-T/TX (RJ-45 plug), compliant IEEE 802.3, with auto MDIX and auto-negotiation

LAN Interface

- Nr. 4 10/100/1000 BASE-T/TX Ethernet ports (RJ-45 plug), compliant IEEE 802.3, with auto MDIX and auto-negotiation
- Nr. 1 HomePNA over Coax v.3.1
- Nr. 2 USB Host v. 2.0

Wireless Interface

Wi-Fi access point solution is compliant with:
- IEEE 802.11b/g/n @2.4 GHz High Power
- (*) IEEE 802.11 b/g/n @5GHz High power
- WPA/WPA2 (IEEE 802.11i)
- WMM (IEEE 802.11e)
- Internal antennas
- (*) For models DB 6220 and DV 6220 the Wi-Fi is Single radio only.

DSL (ATM) Features

- AAL5 (ITU-T I.363.5)
- UBR, VBR-nrt, VBR-rt, CBR traffic classes
- ATM support for ADSL
- Multiple VC/PPP connections
- Multi-protocol encapsulation over AAL5, RFCs 2684
- Up to 8 PVC
- Pre-emptive SAR
- Possibility of multiple physical queues (up to 8) per traffic class, with priority-based scheduling support
- OAM (ITU-T I.610)
  - F4, F5
  - Loop-back
- Encapsulation modes in ATM stack: LLC SNAP and VC-Mux

WAN Protocol Encapsulation	- Bridged/Routed Ethernet over ATM (RFC 2684 / RFC 1483) - PPP over Ethernet (RFC 2516) - PPP over ATM (RFC 2364) - IP over ATM (RFC 1577)
Routing / Bridging	- IPv4/IPv6 - NAT/NAPT, RFCs 3022, Static NAT/NAPT - DHCP Server/Client/Relay - DNS relay - VPN pass-through - Application Level Gateway (ALGs) modules - Spanning tree protocol - IP Multicasting – IGMP v1, v2, v3 - Transparent Bridging (IEEE802.1d)
QoS	- IP QoS - Traffic shaping (ATM layer) - Priority-based scheduling (up to 8* queues, max 4 per PVC) - Diffserv (RFC2474, RFC2475) marking and queuing according to connection type, network interface, MAC, IP - Port based QoS
File sharing and Printer Server	- File Sharing - Printer Server with SMB protocol
Security	- Programmable firewall, Stateful Packet Inspection (SPI) Firewall - IP protocol filtering

Management	- Broadband Forum TR-069 CPE Management Protocol:
	  - Auto- configuration and dynamic service provisioning
	  - Software/firmware image management
	  - Status and performance monitoring
	- Diagnostics and LOGs
	- Telnet with CLI
	- WEB server with Admin/User configuration Pages

Environmental Specifications	Temperature (ETS 300-019-1-3):
	  - Operating: +5° to 40° C
	  - Non Operating: -20° to 70°C
	Relative Humidity (ETS 300-019-1-3):
	  - Operating: 10% to 90% non-condensing
	  - Non Operating: 5% to 95% non-condensing

Power Adapter	- INPUT: 100/240Vac 50/60 Hz - OUTPUT: 12Vdc 3A (For models DB 6220 and DV 6220 it is 12Vdc 2.5A)

Glossary

802.11b

The IEEE specification for wireless Ethernet which allows speeds of up to 11 Mbps. The standard provides for 1, 2, 5.5 and 11 Mbps data rates. The rates will switch automatically depending on range and environment.

802.11g

The IEEE specification for wireless Ethernet which allows speeds of up to 54 Mbps. The standard provides for 6, 9, 12, 18, 24, 36, 48 and 54 Mbps data rates. The rates will switch automatically depending on range and environment.

802.11n

The IEEE specification for wireless Ethernet which allows speeds of up to 300 Mbps. The standard provides for 7,2 up to 300 Mbps data rates. The rates will switch automatically depending on range and environment.

10BASE-T

The IEEE specification for 10 Mbps Ethernet over Category 3, 4 or 5 twisted pair cable.

100BASE-TX

The IEEE specification for 100 Mbps Fast Ethernet over Category 5 twisted-pair cable.

1000BASE-TX

The IEEE specification for 1 Gbps Gigabit Ethernet over Category 5 twisted-pair cable.

Access Point

An Access Point is a device through which wireless clients connect to other wireless clients and which acts as a bridge between wireless clients and a wired network, such as Ethernet. Wireless clients can be moved anywhere within the coverage area of the access point and still connect with each other. If connected to an Ethernet network, the access point monitors Ethernet traffic and forwards appropriate Ethernet messages to the wireless network, while also monitoring wireless client radio traffic and forwarding wireless client messages to the Ethernet LAN.

Ad Hoc mode

Ad Hoc mode is a configuration supported by most wireless clients. It is used to connect a peer to peer network together without the use of an access point. It offers lower performance than infrastructure mode, which is the mode the router uses. (see also Infrastructure mode.

Auto-negotiation

Some devices in the range support auto-negotiation. Auto-negotiation is where two devices sharing a link, automatically configure to use the best common speed. The order of preference (best first) is: 100BASE-TX full duplex, 100BASE-TX half duplex, 10BASE-T full duplex, and 10BASE-T half duplex. Auto-negotiation is defined in the IEEE 802.3 standard for Ethernet and is an operation that takes place in a few milliseconds.

Bandwidth

The information capacity, measured in bits per second, that a channel can transmit. The bandwidth of Ethernet is 10 Mbps, the bandwidth of Fast Ethernet is 100 Mbps. The bandwidth for 802.11b wireless is 11Mbps.

Category 5 Cables

One of five grades of Twisted Pair (TP) cabling defined by the EIA/TIA-586 standard. Category 5 can be used in Ethernet (10BASE-T) and Fast Ethernet networks (100BASE-TX) and can transmit data up to speeds of 100 Mbps. Category 5 cabling is better to use for network cabling than Category 3, because it supports both Ethernet (10 Mbps) and Fast Ethernet (100 Mbps) speeds.

Channel

Similar to any radio device, the Wireless Cable/DSL router allows you to choose different radio channels in the wireless spectrum. A channel is a particular frequency within the 2.4GHz spectrum within which the Router operates.

Client

The term used to described the desktop PC that is connected to your network.

DHCP

Dynamic Host Configuration Protocol. This protocol automatically assigns an IP address for every computer on your network. Windows 95, Windows 98 and Windows NT 4.0 contain software that assigns IP addresses to workstations on a network. These assignments are made by the DHCP server software that runs on Windows NT Server, and Windows 95 and Windows 98 will call the server to obtain the address. Windows 98 will allocate itself an address if no DHCP server can be found.

DMZ

DMZ (Demilitarized Zone) is an area outside the firewall, to let remote users to have access to items on your network (Web site, FTP download and upload area, etc.).

DNS Server Address

DNS stands for Domain Name System, which allows Internet host computers to have a domain name (such as pirelli.com) and one or more IP addresses (such as 192.168.10.8). A DNS server keeps a database of host computers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing "pirelli.com" into your Internet browser), the user is sent to the proper IP address. The DNS server address used by the computers on your home network is the location of the DNS server your ISP has assigned.

DSL

Short for digital subscriber line, but is commonly used in reference to the asymmetric version of this technology (ADSL) that allows data to be sent over existing copper telephone lines at data rates of from 1.5 to 9 Mbps when receiving data (known as the downstream rate) and from 16 to 640 Kbps when sending data (known as the upstream rate). ADSL requires a special ADSL modem. ADSL is growing in popularity as more areas around the world gain access.

DSL modem

DSL stands for digital subscriber line. A DSL modem uses your existing phone lines to send and receive data at high speeds.

Encryption

A method for providing a level of security to wireless data transmissions. The Router uses two levels of encryption; 40/64 bit and 128 bit. 128 bit is a more powerful level of encryption than 40/64 bit.

Ethernet

A LAN specification developed jointly by Xerox, Intel and Digital Equipment Corporation. Ethernet networks use CSMA/CD to transmit packets at a rate of 10 Mbps over a variety of cables.

Ethernet Address

See MAC address.

Fast Ethernet

An Ethernet system that is designed to operate at 100 Mbps.

Firewall

Electronic protection that prevents anyone outside of your network from seeing your files or damaging your computers.

Full Duplex

A system that allows packets to be transmitted and received at the same time and, in effect, doubles the potential throughput of a link.

IEEE

Institute of Electrical and Electronics Engineers. This American organization was founded in 1963 and sets standards for computers and communications.

IETF

Internet Engineering Task Force. An organization responsible for providing engineering solutions for TCP/IP networks. In the network management area, this group is responsible for the development of the SNMP protocol.

IGMP

The Internet Group Management Protocol (IGMP) is an Internet protocol that provides a way for an Internet computer to report its multicast group membership to adjacent routers. Multicasting allows one computer on the Internet to send content to multiple other computers that have identified themselves as interested in receiving the originating computer's content. Multicasting can be used for such applications as updating the address books of mobile computer users in the field, sending out company newsletters to a distribution list, and
"broadcasting" high-bandwidth programs of streaming media to an audience that has "tuned in" by setting up a multicast group membership.

Infrastructure mode

Infrastructure mode is the wireless configuration supported by the Router. You will need to ensure all of your clients are set up to use infrastructure mode in order for them to communicate with the Access Point built into your Router. (see also Ad Hoc mode)

IP

Internet Protocol. IP is a layer 3 network protocol that is the standard for sending data through a network. IP is part of the TCP/IP set of protocols that describe the routing of packets to addressed devices. An IP address consists of 32 bits divided into two or three fields: a network number and a host number or a network number, a subnet number, and a host number.

IP Address

Internet Protocol Address. A unique identifier for a device attached to a network using TCP/IP. The address is written as four octets separated with periods (full-stops), and is made up of a network section, an optional subnet section and a host section.

ISP

Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

LAN

Local Area Network. A network of end stations (such as PCs, printers, servers) and network devices (hubs and switches) that cover a relatively small geographic area (usually not larger than a floor or building). LANs are characterized by high transmission speeds over short distances (up to 1000 metres).

MAC

Media Access Control. A protocol specified by the IEEE for determining which devices have access to a network at any one time.

MAC Address

Media Access Control Address. Also called the hardware or physical address. A layer 2 address associated with a particular network device. Most devices that connect to a LAN have a MAC address assigned to them as they are used to identify other devices in a network. MAC addresses are 6 bytes long.

Mbps

Megabits per second.

MDI/MDIX

In cable wiring, the concept of transmit and receive are from the perspective of the PC, which is wired as a Media Dependant Interface (MDI). In MDI wiring, a PC transmits on pins 1 and 2. At the hub, switch, router, or access point, the perspective is reversed, and the hub receives on pins 1 and 2. This wiring is referred to as Media Dependant Interface - Crossover (MDI-X).

NAT

Network Address Translation. NAT enables all the computers on your network to share one IP address. The NAT capability of the Router allows you to access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP.

Network

A Network is a collection of computers and other computer equipment that are connected for the purpose of exchanging information or sharing resources. Networks vary in size, some are within a single room, others span continents.

Network Interface Card (NIC)

A circuit board installed into a piece of computing equipment, for example, a computer, that enables you to connect it to the network. A NIC is also known as an adapter or adapter card.

Protocol

A set of rules for communication between devices on a network. The rules dictate format, timing, sequencing and error control.

PSTN

Public Switched Telephone Network.

PPPoA

Point-to-Point Protocol over ATM. PPP over ATM is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

PPPoE

Point-to-Point Protocol over Ethernet. Point-to-Point Protocol is a method of data transmission originally created for dial-up connections; PPPoE is for Ethernet connections.

RJ-45

A standard connector used to connect Ethernet networks. The "RJ" stands for "registered jack".

Router

A device that acts as a central hub by connecting to each computer's network interface card and managing the data traffic between the local network and the Internet.

Server

A computer in a network that is shared by multiple end stations. Servers provide end stations with access to shared network services such as computer files and printer queues.

SSID

Service Set Identifier. Some vendors of wireless products use SSID interchangeably with ESSID.

Subnet Address

An extension of the IP addressing scheme that allows a site to use a single IP network address for multiple physical networks.

Subnet mask

A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet, which must assigned by InterNIC).

Subnets

A network that is a component of a larger network.

Switch

A device that interconnects several LANs to form a single logical LAN that comprises of several LAN segments. Switches are similar to bridges, in that they connect LANs of a different type; however they connect more LANs than a bridge and are generally more sophisticated.

TCP/IP

Transmission Control Protocol/Internet Protocol. This is the name for two of the most well-known protocols developed for the interconnection of networks. Originally a UNIX standard, TCP/IP is now supported on almost all platforms, and is the protocol of the Internet.

TCP

It relates to the content of the data travelling through a network — ensuring that the information sent arrives in one piece when it reaches its destination. IP relates to the address of the end station to which data is being sent, as well as the address of the destination network.

Traffic

The movement of data packets on a network.

Universal plug and play

Universal plug and play is a system which allows compatible applications to read some of their settings from the Router. This allows them to automatically configure some, or all, of their settings and need less user configuration.

URL Filter

A URL Filter is a feature of a firewall that allows it to stop its clients form browsing inappropriate Web sites.

USB

Universal Serial Bus is a specification to establish communication between devices and a host controller (usually personal computers).

UTP

Unshielded twisted pair is the cable used by 10BASE-T and 100BASE-Tx Ethernet networks.

VCI

VCI - Virtual Channel Identifier. The identifier in the ATM (Asynchronous Transfer Mode) cell header that identifies to which virtual channel the cell belongs.

VPI

VPI - Virtual Path Identifier. The field in the ATM (Asynchronous Transfer Mode) cell header that identifies to which VP (Virtual Path) the cell belongs.

WAN

Wide Area Network. A network that connects computers located in geographically separate areas (for example, different buildings, cities, or countries). The Internet is an example of a wide area network.

WEP

Wired Equivalent Privacy. A shared key encryption mechanism for wireless networking. Encryption strength is 40/64 bit or 128 bit.

Wi-Fi

Wireless Fidelity. This is the certification granted by WECA to products that meet their inter operability criteria. (see also 802.11b, WECA)

Wi-Fi Alliance

The Wi-Fi Alliance is a trade group, owning the trademark to Wi-Fi, aiming at performing the testing, certifying interoperability of products and promoting the technology.

Wireless Client

The term used to describe a desktop or mobile PC that is wirelessly connected to your wireless network

Wireless LAN Service Area

Another term for ESSID (Extended Service Set Identifier)

Wizard

A Windows application that automates a procedure such as installation or configuration.

WLAN

Wireless Local Area Network. A WLAN is a group of computers and devices connected together by wireless in a relatively small area (such as a house or office).

WPA

Wi-Fi Protected Access. A dynamically changing encryption mechanism for wireless networking. Encryption strength is 256 bit.
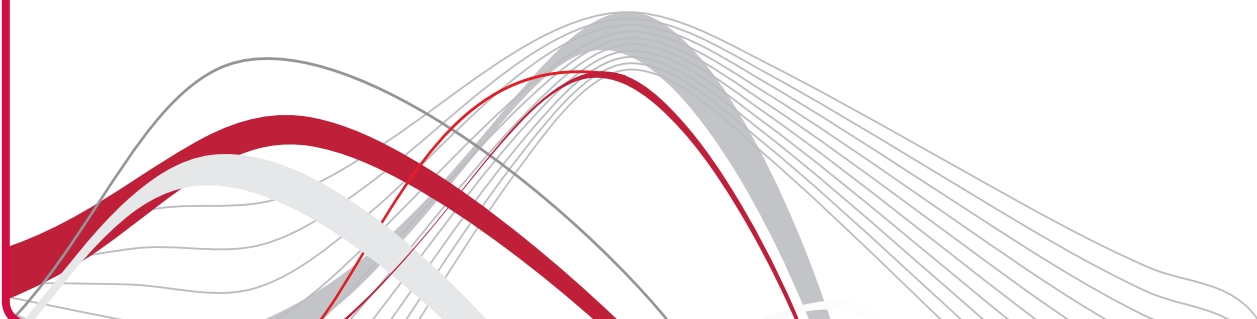
If trouble is experienced with this VDSL/GbE WiFi Data Router for repair or warranty information, please contact:

Company Name:	**COSTAR**
Address:	**518 VALLEY WAY MILPITAS CA 95035 USA**
Tel. No:	**408-946-9339**

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

WHEN PROGRAMMING EMERGENCY NUMBERS AND(OR) MAKING TEST CALLS TO EMERGENCY NUMBERS:

1) Remain on the line and briefly explain to the dispatcher the reason for the call.
2) Perform such activities in the off-peak hours, such as early morning or late evenings.

End of life disposal

	The crossed-out wheeled bin symbol on the Product or on its packaging indicates that this Product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment, or to return it to the dealer when purchasing a new appliance. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment and supports the reuse and/or recycling of materials the equipment is made of. For more information about where you can drop off your waste equipment for recycling, please contact your local city office or your household waste disposal service. **The unlawful disposal of the product by the user may entail a fine.**
(i)	Waste packaging should be separated and delivered at the collection points in accordance with the local waste collection rules.

FINAL REMARKS

This Product must be installed and used in strict accordance with the manufacturer's instructions as described in the enclosed user documentation.

In some cases the use of wireless devices could be limited by the proprietary or representative of the building. In case of doubts about the disposals and rules regarding the use of wireless devices in specific environment (ex. airports and hospitals), it is recommended to ask the authorization before using the Product.

ADB Broadband S.p.A. is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution or attachment of connecting cables and equipment other than specified by ADB Broadband S.p.A. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user. ADB Broadband S.p.A. and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from the user failing to comply with these guidelines.

Manufactured by ADB Broadband S.p.A.
P.IVA: 04566350965
Viale Sarca, 222 – 20126 Milano
For further information http://adbglobal.com

REGULATORY COMPLIANCE AND SAFETY INFORMATION

(symbol)	Before any operation is performed, please read the operation instructions and precautions carefully in order to minimize the possibility of accidents.

When you use this Product you shall always respect basic safety measures in order to reduce risk of fire, electric shock or injury, following below instructions.

Environmental conditions for Product installation and use

⚠	The Product shall be installed and configured in accordance with the user guide. The Product shall be used and installed indoor with a maximum ambient temperature of 45 °C and a minimu temperature of -5 °C. The Product shall be installed in a place with a grade 2 of environmental pollution (a place without conducting polluting agents). The Product shall not be placed near any source of heat or direct sunlight. The Product shall be placed in a well-ventilated area in order to prevent overheating. Do not cover or block the air vents on the Product. These are necessary for proper ventilation. Do not use this Product near water or in close proximity to bath tub, wash bowl, kitchen sink, or laundry basin, in a wet basement, or near a swimming pool. The Product Shall not get in contact with water and moisture. Moving the Product from a cold environment to a hot one may cause moisture on some internal parts of the device. Wait until the Product is totally dry before turning it on. In case of fire, do not use water for fire-extinguishing.
⚠	The Product shall not be used during a lightning storm. There is a remote risk of electric shock from lightning.

Interface classification

The external interfaces of the Product are classified as:

(i)	**xDSL**: TNV-3 circuit subject to overvoltages. xDSL port is classified as TNV-3 circuit. This means that although the cables to be used for the normal connection in accordance with the installation procedures are subject to overvoltages, the safety standard are respected. The other telecommunication ports (**Ethernet, HCNA** and **USB** Host) and the **low voltage power supply port**: SELV circuit.
⚠	External xDSL cables must be connected only to xDSL port. Where these cables were connected to other ports of the Product does not comply with safety standards, there may be overvoltages problems. Ethernet ports must be connected only to devices that support the same kind of interface, and the cable used must not leave the building where the Product is installed.

Wireless LAN

(i)	The Product is provided with a Wi-Fi interface based on DSSS (Direct Sequence Spread Spectrum) and OFDM (Orthogonal Frequency Division Modulation) radio technologies. The Product complies with the IEEE 802.11a/b/g/n standard and is Wi-Fi Certified[TM] according to Wi-Fi Alliance.

USB

⚠	The equipment has to be connected to a standard USB device compliant with limited current circuit (as per UL 60950-1/CSA C22.2 No. 60950-1).

xDSL line cord

To reduce the risk of fire, use only NO. 26 AWG or larger（e.g.. 24 AWG) UL Listed or CSA certified Telecommunication Line cord.

Follow the guidelines to plug the cords to the device in the same order as indicated in the user guide.

Do not plug in any case the telecommunication line cord to other ports of the device (for example Ethernet ports).

Power source

Use only the Class II power adapter provided with the Product. The Product should be operated only with power source of the same kind as indicated on the power adapter rating plate.

It is a limited power source as per UL 60950-1/ CSA C22.2 No. 60950-1 and it is compliant to national standards of the specific country where the Product is installed. It is strictly forbidden to use different type of power source.

The plug-socket serves as the main disconnecting device. Be sure that the used power outlet is easily accessible and located as close to the user as possible.

In order to reduce the risk of fire or electric shock, do not overload the electrical outlet, power strip, or extension power cable.

Cleaning instructions

Unplug the Product from the power outlet (or socket) and any other telecommunication interfaces before cleaning.

Use a damp cloth for cleaning. Do not use liquid or aerosol cleansers.

Maintenance

Do not open the case in order to avoid electric shock or exposition to overvoltages.

Improper mounting can cause electric shock during further use of the Product.

There are no parts inside the Product that can be substituted by the user.

Damage requiring service/replacement

In case the Product requires service unplug the Product from the electrical outlet and contact your service provider.

Typical conditions which may require service:
– Liquid has been spilled into the Product.
– The Product does not operate normally when you follow the operating instructions.
– The Product has been dropped or damaged.
– There are noticeable signs of overheating.
– The power cord, extension cord, or plug is damaged.
– A burning smell or smoke is perceived from the device.

FCC Statement

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

(1) This device may not cause harmful interference

(2) This device must accept any interference received, including interference that may cause undesired operation.

This Product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna
– Increase the separation between the equipment or devices
– Connect the equipment to an outlet other than the receiver's one
– Consult a dealer or an experienced radio/TV technician for assistance.

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. In that event, user's right to use the equipment may be limited by FCC regulations, and he may be required to correct any interference to radio or television communications at his own expense.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operation within 5.15 ~ 5.25 GHz / 5.47 ~5.725 GHz frequency range is restricted to indoor environment. The band 5600-5650 MHz will be disabled by the software during the manufacturing and cannot be changed by the end user. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

FCC Radiation Exposure Caution

This Product complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm (8 inches) between the radiator and your body.

FCC Part 68 Statement

This Product complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the bottom is a label that contains, among other information, a product identifier in the format US:6CTDL01BDB6520. If requested, this number must be provided to the telephone company. Applicable connector jack Universal Service Order Codes ("USOC") for the Equipment is RJ11C.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this Product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:6CTDL01BDB6520. The digits represented by 01 are the REN without a decimal point (e.g., 01 is a REN of 0.1).

If this VDSL/GbE WiFi Data Router causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.