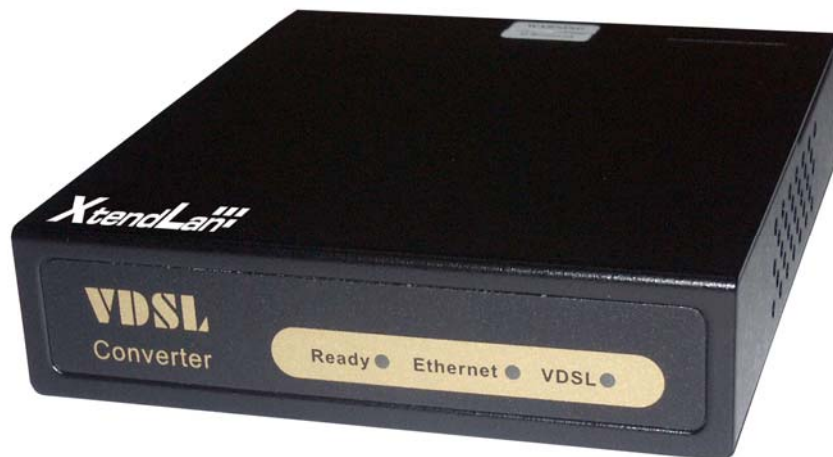




XL-VC102SD

VDSL CPE/Slave bridge

User's Guide



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1 VDSL Point to Point Solution

The VDSL (Very High Data Rate DSL) networking solution delivers cost-effective, high-performance broadband access to multiunit buildings (hotels, apartment, and multi-tenant unit office buildings) and enterprise campus environments such as manufacturing, educational campuses, and medical facilities. VDSL technology dramatically extends Ethernet over existing Category 1/2/3 wiring at speeds 10Mbps (full duplex) and distances up to 1200 meters. The VDSL technology delivers broadband service on the same lines as Plain Old Telephone Service (POTS), digital telephone, and ISDN system. In addition, VDSL supports modes compatible with asymmetric digital subscriber line (ADSL), allowing service providers to provision VDSL to buildings where broadband services already exist.

The VDSL solution includes VDSL Concentrator (VDSL switches), VDSL CO (Point to Point), and VDSL Modem for Customer Premise Equipment (CPE) device.

The VDSL solution delivers everything needed to quickly deploy an Ethernet-based network with the performance required to deliver high-speed Internet access at much greater distances and drive services like IP telephony and audio/video streaming. With this technology, a broad range of customers can benefit from lower operating costs and rapid deployment. This solution provides a RS-232C console port for monitoring VDSL status and to configure speed.

This device is a CPE side solution, and bridge between external Internet backbone through a router for IP sharing and the building 110D telephone rack or telephone box. It utilizes the available telephone wire to enable high-speed Internet access to building residents.

VDSL Modem uses the phone line networking technology endorsed by the VDSL, and utilizes the already existing telephone wire to deliver 4/1, 5/10/15 Mbps Internet access on each RJ-11 port.

This gives users a low-cost, end-to-end solution and eliminates the need to train installation teams on multiple systems.

Foreword

XL-VC102SD is an Ethernet to VDSL CPE side adapter that enables high speed internet access to building residents, campuses students and hotel guests by connecting Ethernet equipped computers, set-top box or any internet access device to the existing telephone wires.

The VDSL Modem uses the phoneline networking technology endorsed by the VDSL, an

association of industry-leading companies for in-networking focus on the existing telephone wire.

The Modem utilizes the already existing telephone wire to deliver 10Mbps internet access with no interference on the existing telephone service. It allows user to make calls while access the internet on the same wire simultaneously. It even allows staying connected 24 hours on internet connections, thus, eliminating dial up prior to internet access.

The Modem is simple to install and use. Two RJ-45 Ethernet ports connect to a Router, Ethernet Switch or to LAN card. The RJ11 ports available to connect to any existing modular phone jack.

There are two RJ-11 jacks on the Modem to provide phone extensions.

No software installation makes the Modem highly compatible with different operating system (Windows, Linux, Apple....etc).

Product Features & Specification

Model Name: XL-VC102SD

Description: VDSL Modem with C.P.E. side (Slave)

Features:

- Compliant with IEEE 802.3 & 802.3u Ethernet Standards
- Compliant with ETSI, ITU, ANSI VDSL standards
- Provides 2 x 10/100M auto-sensing RJ-45 Ethernet ports
- Supports Bandwidth setup with 4/1,5/10/15 Mbps VDSL RJ-11 ports
- POTS / ISDN Splitter port RJ-11 x 1 (Splitter on board)
- Ethernet transport with POTS / ISDN traffic over single copper wire pair
- Spectral compatibility with XDSL, ISDN (2B1Q/4B3T).
- Robust operation on severely distorted line
- Provides Ready LED.
- Provides LED indication Link/Active Status for Ethernet port.
- Provides LED indication Link for VDSL port.

Specifications:

- Compliant with IEEE 802.3 & 802.3u Ethernet Standards
- Compliant with ETSI, ITU, ANSI VDSL standards
- 10/100M auto-sensing RJ-45 Ethernet ports x 2
- 4/1, 5/10/15 Mbps VDSL RJ-11 port x 1
- POTS / ISDN Splitter port RJ-11 x 1
- Surge Protection
- Switch method : store and forward
- Flow control Full duplex : IEEE 802.3x Half duplex : Backpressure
- Driver capable :
 - 4/1Mbps: 1.9km
 - 5Mbps :1.5km
 - 10Mbps : 1.2km (**Default**)
 - 15Mbps : 1km
- Indication LED x 3: Ready LED x1, Ethernet Link/Active LED x 1, VDSL Link LED x 1
- VDSL Frequency Spectrum :
 - Transmitter : 0.9 ~ 3MHz
 - Receiver : 4.5 ~ 7.9 MHz
 - Splitter : 0 ~ 620k

- Power consumption : 2.5 Watt
- Weight : 345 g
- Dimensions: 95 x 110 x 24 mm
- External switching power adapter Input :AC 100-240 volts/50-60Hz Output :DC 5V/1A or above
- Operating Temperature : 0°C ~ 50 °C (41F ~ 122F)
- Storage Temperature : - 20 °C ~ 65 °C (-4F ~ 149F)
- Humidity : 10%~90% non-condensing

Certifications : FCC, CE Mark class A, EN60950

2 Unpacking Information

Carefully unpack the package and check its contents against the checklist.

Package Contents:

- VDSL CPE x 1
- Four plastic feet x 4
- AC To DC Power Adapter x 1
- RJ-45 cable x 1
- RJ-11 cable x 1



Please inform your dealer immediately for any missing items, or damaged parts. If possible, retain the carton, including the original packing materials. Use them to repack the unit in case there is a need to return for repairing.

3 Installing the Modem

Hardware Installation

This chapter describes how to install the Modem and establishes network connections. You may install the Modem on any level surface (e.g, a table or shelf). However, please take note of the following minimum site requirements before you begin. Stick the 4 plastic feet at the bottom to avoid scratches.

Pre-installation Requirements

Before you start the actual hardware installation, make sure you can provide the right operating environment, including power requirements, sufficient physical space, and proximity to other network devices that are to be connected.

Verify the following installation requirements:

Power requirements: DC 5V/1A or above

The Modem should be located in a cool dry place, with at least 10cm/4in of space at the front and back for ventilation.

Place the Modem out of direct sunlight, and away from heat sources or areas with a high amount of electromagnetic interference.

Check if network cables and connectors needed for installation are available

Connecting the Modem

The Modem has one Ethernet port which support connection to Ethernet operation. The devices attached to these ports must support auto-negotiation or 10Base-T OR 100Base-TX unless they will always operate at half duplex.

Use any of the Ethernet ports to connect to devices such as NIC, Switch, bridge or router. You can also connect to another compatible Modem to an RJ-45 port on the other device.

The RJ11 Line port is used to connect to the wall RJ-11 modular socket which is connect to VDSL CPE Modem side (Point to point solution)

The RJ11 Phone port of the Modem can connected to a telephone and a computer sharing one telephone wire for making calls and accessing the internet at the same time

Connecting the RJ-11/RJ-45 Ports

The Modem's RJ-11 ports support the transmission of data up to 4/1, 5/10/15Mbps across existing phone wiring, without interfering with standard voice transmissions, easy-to-use does not require the installation of any additional wiring. Every RJ-11 modular phone jack in the home can become a port on the LAN. Networking devices can be installed on a single telephone wire that can span within 1.9/1.5/1.2/1km (depend on speed) between the two farthest points.

VDSL CPE Modem has embedded Splitter between every VDSL side (Line) and POTS (Phone) side. It permit you can delivers broadband service on the same lines as Plain Old Telephone Service (POTS), PBX, ISDN traffic and VDSL Signal.

The RJ-11 port support 4/1,5/10/15 Mbps connections. When inserting a RJ-11 plug, be sure the tab on the plug clicks into position to ensure that it is properly seated.

Do not plug a RJ-11 phone jack connector into the Ethernet port (RJ-45 port). This may damage the Modem Instead; use only twisted-pair cables with RJ-45 connectors that conform to Ethernet standard.

Notes:

Be sure each twisted-pair cable (RJ-45) does not exceed 100 meters (333 feet).

RJ-11 port use 24 ~ 26 gauge phone wiring, we do not recommend 28 gauge or above.

We advise using Category 3,4,5 cable for Cable Modem or Router connections to avoid any confusion or inconvenience in the future when you upgrade attached to high bandwidth devices.

4 Hardware Description

This section describes the important parts of the Modem. It features the front indicators and rear connectors.

Front Indicators

The following figure shows the front panel:



At a quick glance of the front panel, it is easy to tell if the CPE Modem XL-VC102SD has power, if it has signal from its Ethernet RJ-45 port and if there is phone line signal on RJ-11port

LED Description and Operation:

LEDs	Status	Descriptions
Ready (Ready LED)	Steady Green	It will light up (ON) to show that the product is power good, and system reset OK.
Ethernet (Ethernet LED)	Steady Green Flashing (LINK/ACT)	Each RJ45 station port on the Ethernet is assigned an LED light for monitoring port “Good Linkage”. LED is normally OFF after the power on operation, but will light up steadily to show good linkage and flashing to show data transmission.
VDSL (VDSL LED)	Steady Green	RJ11 station port on the VDSL is assigned an LED light for monitoring port “Good Linkage”. LED is normally OFF after the power on operation, but will light up steadily to show good linkage.

Rear Panel

The following figure shows the rear connectors



Table Modem Rear Connectors

Connectors	Description	Type
Line	For connecting to the VDSL Modem Using a RJ-11 cable	RJ-11
Phone	For connecting to the telephone or Fax / ISDN modem	RJ-11
Ethernet	For connecting to a Ethernet equipped device	RJ-45

Power On

1. Check the adapter is properly connected.
2. Verify the power LED is steadily on.

5 Cable Requirements

A CAT 3,4 or 5 UTP (unshielded twisted pair) cable is typically used To connect the Ethernet device to the Modem. A 10Base-T cable often consists of four pairs of wires, two of which are used for transmission. The connector at the end of the10Base-T cable is referred to as an RJ-45 connector and it consists of eight pins. The Ethernet standard uses pins 1,2,3 and 6 for data transmission purposes.

RJ-45 Ethernet Connector Pin out assignments

PIN	MNEMONIC	FUNCTION
1	TX+	Ethernet differential Transmit signal(+)
2	TX-	Ethernet differential Transmit signal(-)
3	RX+	Ethernet differential receive signal(+)
4	NC	Unused
5	NC	Unused
6	RX-	Ethernet differential receive signal(-)
7	NC	Unused
8	NC	Unused

Standard telephone wire of any gauge or type-flat, twisted or quad is used to connect the Modem to the telephone network. A telephone cable typically consists of three pairs of wires, one of which is used for transmission. The connector at the end of the telephone cable is called an RJ-11 connector and it consists of six pins. POTS (plain old telephone services) use pins 3 and 4 for voice transmission.

The RJ-11 connectors have six positions, two of which are wired .The Modem uses the center two pins. The pin out assignment for these connectors is presented below.

RJ-11 Pin out assignments

PIN	MNEMONIC	FUNCTION
1	NC	Unused
2	NC	Unused
3	TIP	POTS
4	RING	POTS
5	NC	Unused
6	NC	Unused

6 Troubleshooting

Diagnosing the Modem's Indicators

The Modem can be easily monitored through its comprehensive panel indicators.

These indicators assist the network manager in identifying problems the hub may encounter.

This section describes common problems you may encounter and possible solutions:

Symptom: Ready indicator does not light up (green) after power on.

Cause: Defective External power supply

Solution: Check the power plug by plugging in another that is functioning properly. Check the power cord with another device. If these measures fail to resolve the problem, have the unit power supply replaced by a qualified distributor.

Symptom: Link indicator does not light up (green) after making a connection.

Cause: Network interface (e.g, a network adapter card on the attached device), network cable, or switch port is defective.

Solution:

1. Power off and re- power on the VDSL Modem.
2. Verify that the switch and attached device are powered on.
3. Be sure the cable is plugged into both the switch and corresponding device.
4. Verify that the proper cable type is used and its length does not exceed specified limits.
5. Check the Modem on the attached device and cable connections for possible defects.
6. Replace the defective Modem or cable if necessary
7. Verify the VDSL switch and VDSL Modem during the same speed mode. You can select VDSL Speed mode by 10 Mbps. Only same speed mode can link and work. VDSL default transmission mode is 10 Mbps

Symptom: VDSL Link can not be established.

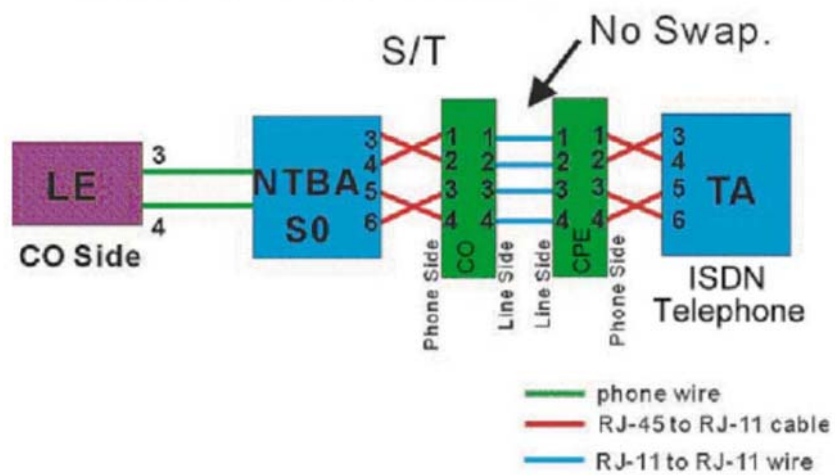
Cause: Rusted phone wire, not standard 24 gauge phone wire, not twisted-pair phone wire, wrong speed mode.

Solution: Check if speed of CO and CPE is in the same speed mode else please increase interleaver depth value to 8 or above.

Symptom: We tested with a regular S0 bus from an NTBA - data works, but ISDN telephone does not.

Solution: You have to connect as following chart if you want to connect VDSL CO Modem Smart and VDSL CPE Modem with NTBA.

S0 TO CPE PIN ASSIGNMENT



Power and Cooling Problems

If the POWER indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply as explained in the previous section. However, if the unit power is off after running for a while, check for loose power connections, power losses or surges at the power outlet, and verify that the fan on back of the unit is unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, contact your dealer.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (e.g., the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

Transmission Mode

The default method of selecting the transmission mode for RJ-45 ports is 10/100 Mbps ETHERNET, for RJ-11 port are 10Mbps VDSL. Therefore, if the Link signal is disrupted (e.g., by unplugging the network cable and plugging it back in again, or by resetting the power), the port will try to reestablish communications with the attached device via auto-negotiation.

If auto-negotiation fails, then communications are set to half duplex by default. Based on this type of industry-standard connection policy, if you are using a full-duplex device that does not support auto-negotiation, communications can be easily lost (i.e., reset to the wrong mode) whenever the attached device is reset or experiences a power fluctuation. The best way to resolve this problem is to upgrade these devices to a version that support Ethernet and VDSL.

Physical Configuration

If problems occur after altering the network configuration, restore the original connections, and try to track the problem down by implementing the new changes, one step at a time. Ensure that cable distances and other physical aspects of the installation do not exceed recommendations.

System Integrity

As a last resort verify the switch integrity with a power-on reset. Turn the power to the switch off and then on several times. If the problem still persists and you have completed all the preceding diagnoses, then contact your dealer.

7 Compliance and Safety Information

FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a computing device, pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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 :

- 1 Reorient or relocate the receiving antenna.
- 2 Increase the separation between the equipment and receiver.
- 3 The equipment and the receiver should be connected to outlets on separate circuits.
- 4 Consult the dealer or an experienced radio/television technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment. If this telephone equipment 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 proper functioning of your equipment. If they do, you will be notified in advance in order for you to make necessary modifications to maintain uninterrupted service. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Important Safety Instructions

Caution : The direct plug-in wall transformer serves as the main disconnect for the product. The socket outlet shall be installed near the product and be readily accessible.

Caution : Use only the power supply included with this product.

In the event the power supply is lost or damaged :

- In the United States, use only with CSA certified or UL listed Class 2 power supply, rated 5VDC 1A or above.
- In Europe, use only with CE certified power supply, rated 5Vdc 1A or above.

Do not use this equipment near water, for example in a wet basement.

Avoid using a telephone during an electrical storm. There may be a remote risk of electrical shock from lightning.

Do not use the telephone to report a gas leak in the vicinity of the leak.

If trouble is experienced with this unit, please contact customer service at the address and phone listed below. Do not disassemble this equipment. It does not contain any user serviceable components.

FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Mark Warning

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

Warranty

The original owner that the product delivered in this package will be free from defects in material and workmanship for one year parts after purchase. There will be a minimal charge to replace consumable components, such as fuses, power transformers, and mechanical cooling devices. The warranty will not apply to any products which have been subjected to any misuse, neglect or accidental damage, or which contain defects which are in any way attributable to improper installation or to alteration or repairs made or performed by any person not under control of the original owner.

The above warranty is in lieu of any other warranty, whether express, implied, or statutory, including but not limited to any warranty of merchantability, fitness for a particular purpose, or any warranty arising out of any proposal, specification, or sample. Shall not be liable for incidental or consequential damages. We neither assumes nor authorizes any person to assume for it any other liability.

Note: Please do not tear off or remove the warranty sticker as shown, otherwise the warranty will be

void. 