VDSL2 LAN Extender

User Manual

Version: 0.01

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1 Introduction

VDSL2 LAN Extender is a Long Reach Ethernet media converter with one Ethernet port (RJ-45 connector) and one VDSL port (RJ-45 connector).

This model is a bridge mode modem, well accommodating VDSL2 (Very-high-data-rate Digital Subscribe Loop) technologies to extend Ethernet service over single-pair phone line. Supporting both symmetric and asymmetric transmission, it can reach up to 100/75 Mbps bandwidth (line rate) within 300M or 10/10 Mbps (line rate) for 1 Km long range connections. By providing ultrahigh speed, VDSL2 LAN Extender makes your telephone line achieve its best performance than before.

It has the advantage of minimum installation time (simply as plug-nplay) and minimum expense by allowing video streaming and data to share the same telephone pair without interference.

1.1 Features

- Cost effective bridge function to connect two Ethernet LANs
- Support flow control on Fast Ethernet port via PAUSE frame or Back Pressure
- IEEE 802.1Q VLAN tag transparent
- Easy installation via simple plug-and-play
- Selectable CPE and CO mode via DIP switch:

Two working modes are built in the same unit, which keep the flexibility of installation and easy provision of service but lower inventory of service provider.

- Selectable fast and interleaved mode:

  Fast mode guarantees a minimum end to end latency less than1 ms. Interleaved mode provides impulse noises protection for any impulse noise with a duration less than 250 us, Interleaved mode has a maximum end to end latency of 10 m sec. Interleaved mode is the default mode.

- Selectable target data rate and target SNR margin:

  User has the ability to select fixed SNR margin (9 dB) or fixed target data rate. When fixed SNR margin is selected, the systems will maintain the SNR margin at 9 dB across all usable loop length. When fixed target data rate is selected, the system will lock the data rate up to 50 Mbps/30 Mbps whenever the calculated SNR margin is higher than 9 dB. This gives best system stability and is the default mode.

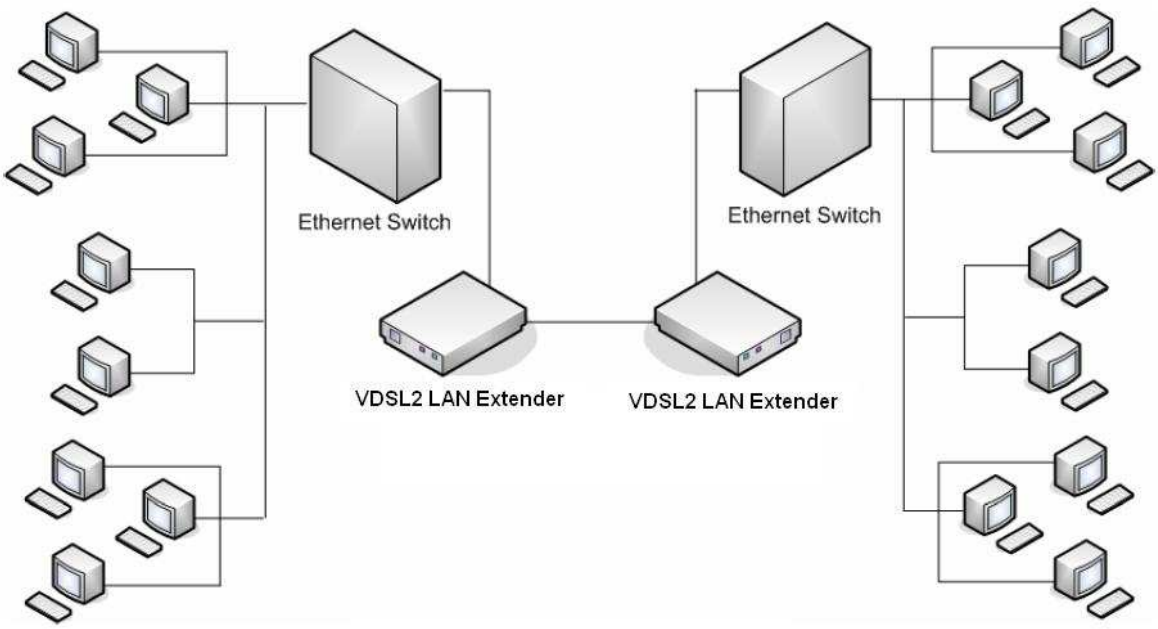
1.2 Specification

- LAN Interface:
  - RJ-45 connector
  - Complying with IEEE 802.3/802.3u/802.3x
  - 10/100 Base-T Auto-Negotiation, Auto-MDI/MDI-X.
- VDSL Interface:
  - RJ-45 connector
  - DMT Encoding

- Complying with ITU-T G993.1/993.2
- On-board surge protection

- 4-position DIP Switch
- LED:
  - LAN: ACT/LNK, 10/100 Mbps, Half/Full Duplex
  - VDSL: Power On/Off, CO/CPE, Idle/Trained/Link
- Power supply:
  - DC single 12 Volt over 3.5mm DC jack
  - Power consumption: 4.2 Watt maximum.
- Dimensions:
  - 97mm x 73mm x 23mm

1.3 Applications



LAN Extender Application

2 Installation

2.1 Front Panel

This chapter shows the front panel and how to install the hardware.

Front panel can be separated into five parts from left to right:

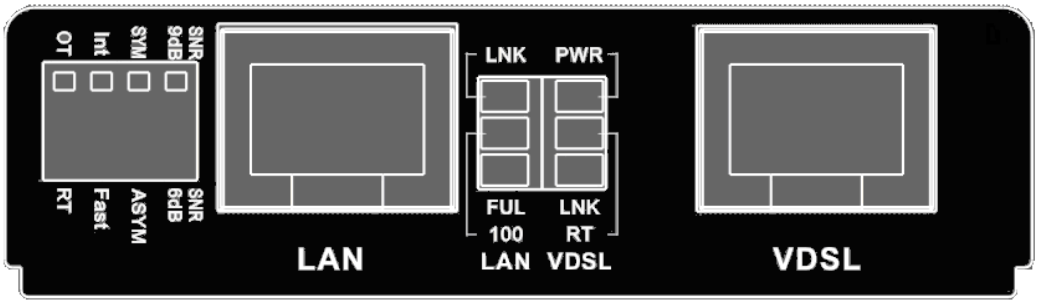
(1) DIP switch

(2) RJ-45 connector for Ethernet

(3) LEDs for Ethernet

(4) LED for VDSL

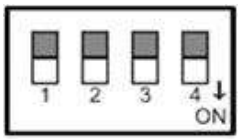
(5) RJ-45 connector for VDSL



The RJ-45 is designed to connect to the Local Network with the Unshielded Twisted Pair (UTP) cable.

2.1.1 Switches

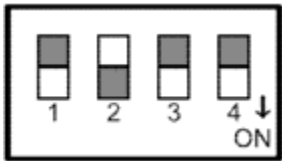
The following table describes the DIP Switches' setting:

	Pin 1	Pin 2	Pin 3	Pin 4
	Side	Channel	Rate Limit	SNR
Off	CO	Interleave	Symmetric	9dB
On	CPE	Fast	Asymmetric	6dB

Pin 1: CO, CPE switch

GO: LAN Extender acts as Central Office (CO) side.

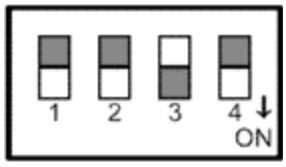
GPE: LAN Extender acts as Customer Premise Equipment (CPE) side.



Pin 2: Impulse noise protection

Interleave mode: Provides communication protection for up to 250ms impulse noise with latency less than 6 ms.

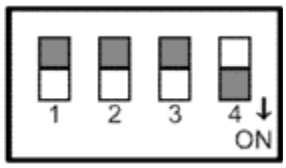
Fast mode: Direct data transmission with latency less than 1 ms.



Pin 3: Band Plan

Symmetric: Support the band plan G.997 and provide the symmetric transmission on both down stream and upstream.

Asymmetric: Provides highest line rate in short range in asymmetric mode.



Pin 4: General protection

9dB: Better channel noise protection with SNR up to 9 dB

6dB: Original channel noise protection with 6 dB SNR

2.1.2 Ethernet LED

The Ethernet LEDs show the status as below:

LED for **Ethernet**	✹ Blinking	● On	○ Off
○	Activity	Link UP	Link Down
○		100Mbps	10Mbps
○		Full Duplex	Half Duplex

2.1.3 VDSL LED

The VDSL LEDs show the status as below:

LED for **VDSL**	✸ **blinking**	● **On**	○ **Off**
○		Power **ON**	Power **OFF**
○		**CPE**-mode	**CO**-mode
○	**Slow: Idle** **Fast: Training**	**Linked**	**Off line**

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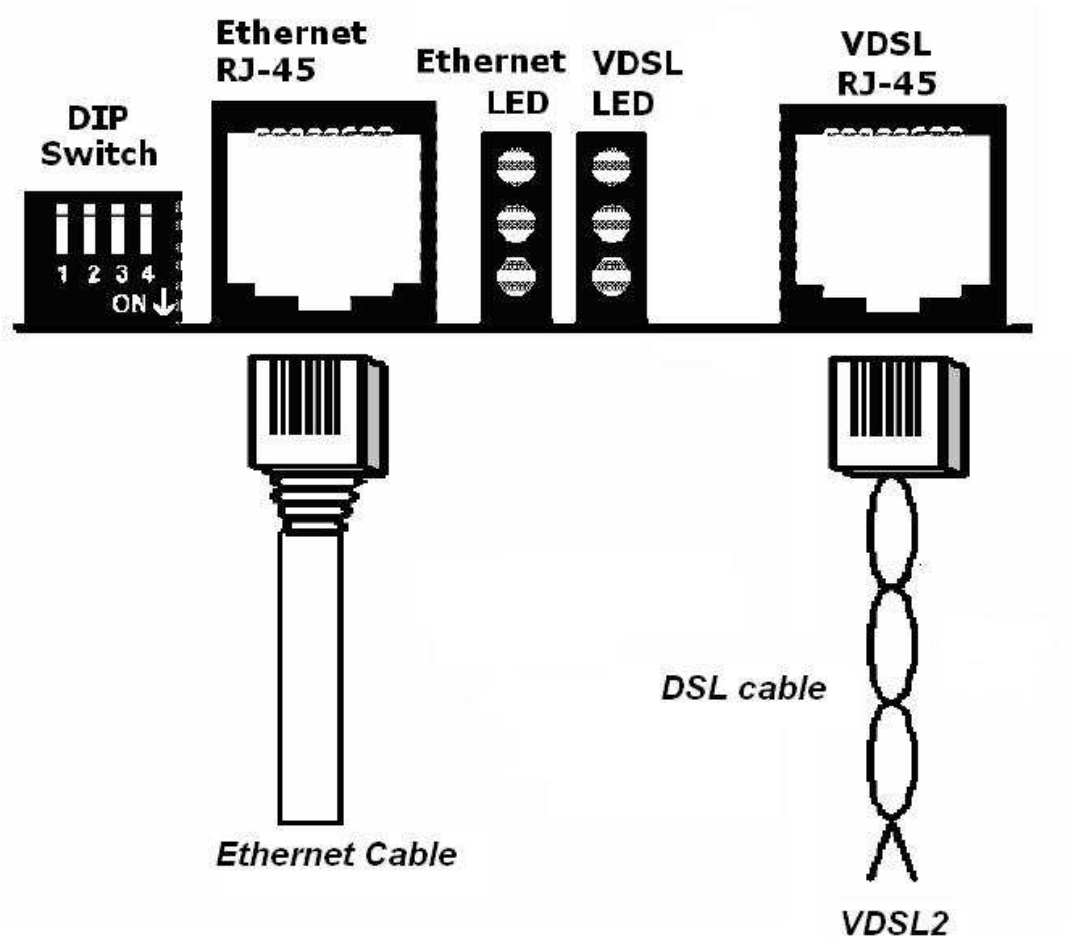
2.2 Real Panel

The DC Jack on the rear panel can be connected to power supply adaptor with the DC input.

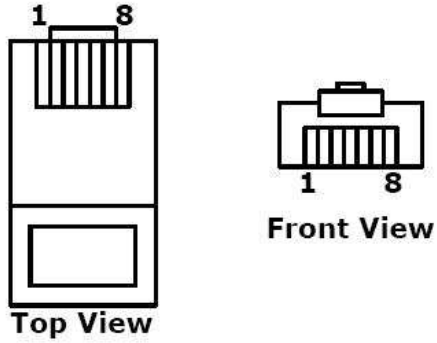
3 Installation



4 Connector Architecture

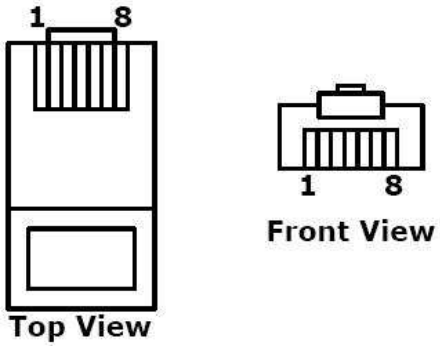
4.1 Ethernet Port

The Ethernet Port interface is a 8 position Modular Jack. The table below displays the pin out assignments.

Pin Number	Assignment (MDI-X)	Figure
1	RX+; Receive data +	
2	RX-; Receive data -	
3	TX+; Transmit data +	
4	Not used	
5	Not used	
6	TX-; Transmit Data -	
7	Not used	
8	Not used	

4.2 VDSL Port

The VDSL interface is standard 8 position modular jack. The table below displays the pin out assignments.

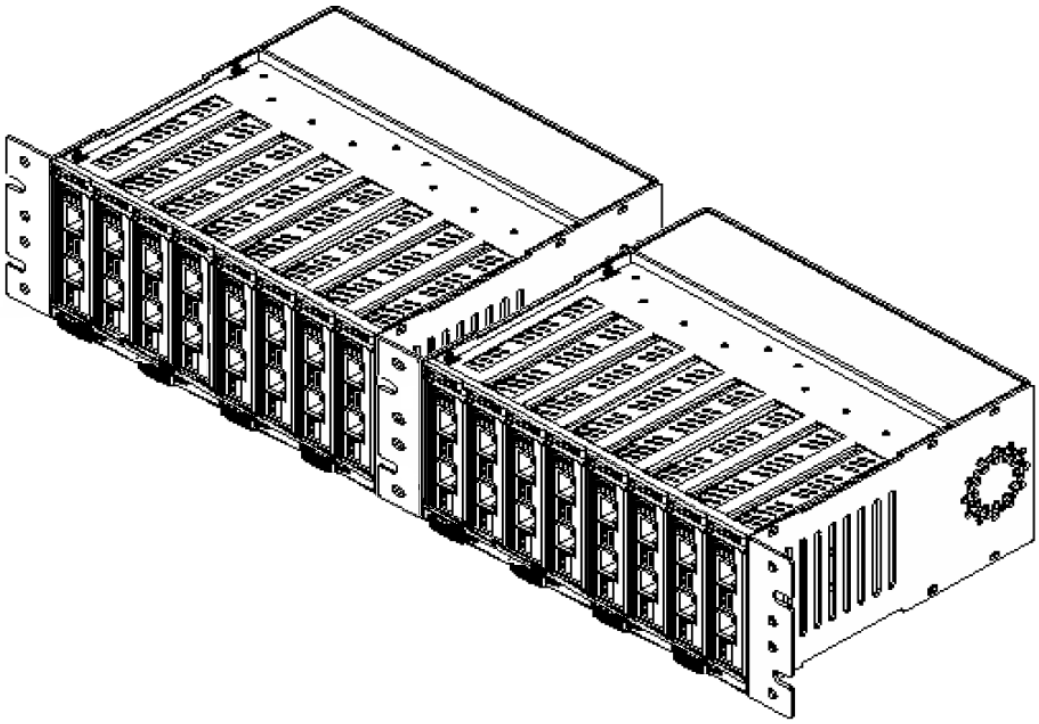
Pin Number	Description	Figure
1	Not used	
2	Not used	
3	Not used	
4	ANALOG Input/Output	
5	ANALOG Input/Output	
6	Not used	
7	Not used	
8	Not used	

5 Chassis Accessory

Also provide the Mini-Chassis solution for application on the rack in CO side.

The major factor of Chassis is listed below:

- 2 U high
- Support 8-slot in one unit
- Two units of mini-chassis are able to fit into the 19-inch standard rack to support 16-slot in 2U height., as the illustration below
- Power Input: 90-230V AC, 47~63Hz
- Embedded 10A/230V fuse.



Two units of mini-chassis fit into the 19-inch standard rack