

# **Ethernet over VDSL2 Bridge**

## **User's Manual**

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# 1. PRODUCT FEATURES

- Cost-effective VDSL2 CO/CPE bridge solution
- One box design, CO/CPE selectable via DIP Switch
- Defines profile 17a band plan for the long distance transmission of upstream and downstream signals
- Defines profile 30a band plan for the short distance transmission of upstream and downstream signals
- Complies with IEEE 802.3, IEEE 802.3u and IEEE 802.3x standards
- DMT (Discrete Multi-Tone) line coding
- Half-duplex back pressure and IEEE 802.3x full-duplex pause frame flow control
- Voice and data communication can be shared on the existing telephone wire simultaneously
- Supports up to 1536 bytes packet size, 802.1Q VLAN tag transparency
- VDSL2 stand-alone transceiver for simple bridge modem application
- Selectable target profile and target SNR margin
- Supports extensive LED indicators for network diagnostics

## 2. HARDWARE INTRODUCTION

### 2.1 Front Panel

The unit's front panels provide a simple interface monitoring the VDSL2 Bridge.

#### ■ Front Panel

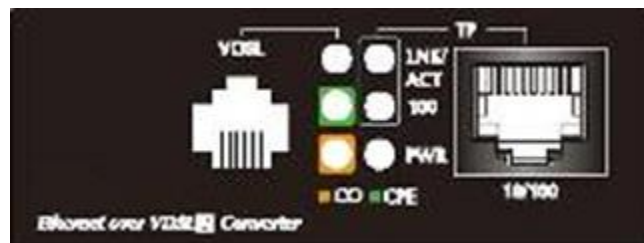


Figure 2-1: front panel

### 2.2 LED Indicators

The rich diagnostic LEDs on the front panel can provide the operating status of individual port and whole system.

#### ■ System

| LED | Color | Function                                                   |
|-----|-------|------------------------------------------------------------|
| PWR | Green | Lit<br>Lights to indicate that the VDSL2 Bridge has power. |
|     |       | Off<br>Indicate that the VDSL2 Bridge has no power.        |

#### ■ VDSL

| LED  | Color | Function   |                                                                        |
|------|-------|------------|------------------------------------------------------------------------|
| VDSL | Green | Lit        | Indicates that the VDSL link is established.                           |
|      |       | Fast Blink | Indicates that the VDSL link is in training status (about 10 seconds). |
|      |       | Slow Blink | Indicates that the VDSL link is in idle status.                        |
| CO   | Green | Lit        | Indicates the VDSL2 Bridge is running in <b>CO</b> mode.               |
| CPE  | Green | Lit        | Indicates the VDSL2 Bridge is running in <b>CPE</b> mode.              |

#### ■ 10/100BASE-TX Port

| LED         | Color | Function |                                                                                       |
|-------------|-------|----------|---------------------------------------------------------------------------------------|
| LNK/<br>ACT | Green | Lit      | Indicates that the port is linked up.                                                 |
|             |       | Blink    | Indicates that the VDSL2 Bridge is actively sending or receiving data over that port. |
|             |       | Off      | Indicates that the port is <b>linked down</b> .                                       |
| 100         | Green | Lit      | Indicates that the port is operating at <b>100Mbps</b> .                              |
|             |       | Off      | Indicate that the port is <b>linked down</b> or <b>10Mbps</b> .                       |

## 2.3 Rear Panel

The rear panel of the VDSL2 Bridge is shown below.

### ■ Rear Panel



Figure 2-2: rear panel

- ▶ DIP switch
- ▶ DC jack (DC input) for power adapter
- ▶

## 2.4 Mode DIP Switch

The Ethernet over VDSL2 Bridge provides 4 selective transmission modes. By switching the transmission modes, you can obtain a best transmission mode to suit with phone line quality or distance of connectivity. The following is the summary table of transmission setting, bandwidth and distance extensibility tested for AWG 24 (0.5mm) twisted-pair without noise and cross talk.

|              | DIP-1 | DIP-2      | DIP-3   | DIP-4 |
|--------------|-------|------------|---------|-------|
|              | Mode  | Channel    | Profile | SNR   |
| OFF          | CO    | Interleave | 17A     | 9dB   |
| ON (default) | CPE   | Fast       | 30A     | 6dB   |

■ **DIP-1: Mode (CO/CPE)**

|                                   |                                                                                                                                                                                                                                        |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO (Central Office)               | The Master device mode, usually the CO device will be located at the data center of ISP or enterprise to link to the backbone.                                                                                                         |
| CPE (Customer Premises Equipment) | The Slave device mode, usually the CPE device will be located at branch office, home or remote side as the long reach data receiver. The CPE can be connecting to the PC, IP Camera or Wireless Access Point or other network devices. |



When the Ethernet Over VDSL2 Bridge operates in CPE mode, DIP switch 2, 3, 4 have no function.

■ **DIP-2: Channel (Fast and Interleave mode)**

|                   |                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fast</b>       | Fast mode guarantees a minimum end-to-end latency less than 1 ms.                                                                                                         |
| <b>Interleave</b> | 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 10m sec. |

■ **DIP-3: Profile (17a/30a)**

User has the ability to select profile

|            |                                                                                              |
|------------|----------------------------------------------------------------------------------------------|
| <b>30A</b> | When 30a is selected that provides better downstream/upstream performance in short distance. |
| <b>17A</b> | When 17a is selected that provide longer distance                                            |

link capability.

■ **DIP-4: SNR (9dB/6dB)Target SNR (Signal Noise Ratio) Margin**

- ◆ When SNR margin is selected, the system provides 9 dB/6 dB SNR margin for across all usable loop length.



1. By default, the four DIP switch at “**ON**” position that will operate as “**CPE**”. For operate as “**CO**”, please adjust the DIP 1 switch as “**OFF**” position. Then adjust other DIP switch accordingly to fulfill different network application demand.
2. Please power off the Ethernet over VDSL2 Bridge, before making any transmission mode adjustment.



## 3. Connecting and using the VDSL2

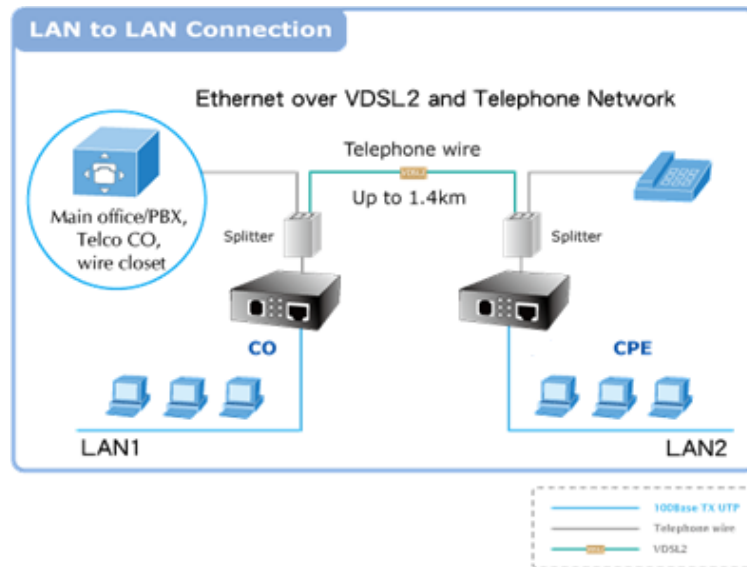
### Bridge

The Ethernet over VDSL2 Bridge does not require any software configuration. Users can immediately use any feature of this product simply by attaching the cables and plug power on. There is some key limitation on the Ethernet over VDSL2 Bridge. Please check the following items:

- The device is used for **Point-to-Point** connection only (Master device to Slave device) and allows data and voice work on the same telephone lines.
- The device provides one RJ11 connector for VDSL port and the port can build VDSL2 connection easily.
- Depending on the quality of telephone line, the maximum distance of one VDSL segment is 1.4km (4593ft) with AWG 24 telephone wires. The distance could vary on the quality of telephone wires.

### 3.1 Point-to-Point Application -- LAN to LAN Connection

Two sets of the Ethernet over VDSL2 Bridges could be used to link two local Area networks that are located in a different place. Through the normal telephone line, it could set up a 100/100Mbps symmetric backbone, but one Ethernet over VDSL2 Bridge must be Master (CO mode) and the other one is Slave (CPE mode).



Refer to the following procedures to set up the VDSL2 Bridge LAN to LAN connection.

1. **[LAN1]** Set the VDSL2 Bridge at LAN 1 to be **CO** mode from the DIP switch.
2. **[LAN2]** Set the VDSL2 Bridge at LAN 2 to be **CPE** mode from the DIP switch.
3. Power on the VDSL2 Bridge CO and CPE at both sides by connecting its power source.
4. Power LED will illuminate.
5. Connect VDSL line from another VDSL device to RJ11 **VDSL port** of the VDSL2 Bridge.
6. **VDSL LNK LED** will blink to illuminate at both VDSL2 bridges.

7. Connect telephone to the RJ11 **Phone port** of the VDSL2 Bridge.
8. Connect the VDSL2 Bridge Ethernet **LAN port** to other network device via regular Cat.5 UTP cable.

When deciding where to put the converter and/or prolong the operational life of the bridge, please also refer to the following points:

- It is accessible and cables can be connected easily.
- Cabling is away from sources of electrical noise such as radios, transmitters, motors, power lines and fluorescent lighting fixtures.
- Do not place objects on top of any unit or stack.
- Water or moisture cannot enter the VDSL2 Bridge.
- Air flow around the unit and through the vents in the side of the case is not restricted (we recommend that you provide a minimum of 25mm clearance).

## 3.2 Chassis Installation and Rack Mounting

To install the Ethernet over VDSL2 Bridge in a 10-inch or 19-inch Converter Chassis with standard rack, follow the instructions described below.

**Step 1:** Place your VDSL2 Bridge on a hard flat surface, with the front panel positioned towards your front side.

**Step 2:** Carefully slide in the module until it is fully and firmly fitted into the slot of the converter chassis.



**Figure 3-3:** Insert a VDSL2 Bridge into an available slot

**Step 3:** Attach a rack-mount bracket to each side of the Converter Chassis with supplied screws attached to the package.

**Step 4:** After the brackets are attached to the Converter Chassis, use suitable screws to securely attach the brackets to the rack.

**Step 5:** Connect one end of the power cable to the **10-inch** or **19-inch** Converter Chassis.

**Step 6:** Connect the power plug of the power cable to a standard wall outlet, and then power on the 10-inch or 19-inch Converter Chassis. The PWR LED should be lit.



Caution

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You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate your warranty.

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