

VDSL2 Ethernet Extender

User Manual

Tupavco TEX-200



Version 1.1

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1 Introduction

TUPAVCO TEX-200 is an **Ultra-Speed Gigabit Ethernet Copper Extender** that supports a remarkable aggregated bandwidth up to **300Mbps** (Downstream: 150 Mbps/Upstream: 150 Mbps). It delivers fiber-optic like speeds on existing copper infrastructure, enabling a good alternative in place where fiber is not economical to deploy. The **TEX-200** is equipped with a **Gigabit Ethernet Port** (RJ-45 connector) and **one VDSL2 port** (RJ-45 connector). 8 different profile settings can be flexibly selected via dip switches to suit various applications and environments. Symmetric profile can be applied as a standard Ethernet connection while Asymmetric profile can be used for other services like Video streaming or IP surveillance services which require high traffic flow in an uni-direction configuration. The **TEX-200** supports transparent LAN bridging to extend Ethernet service over UTP, Cat 5+ or Coaxial cables. With **TUPAVCO TEX-200's** superior performance in its category, it is the best high throughput Long Reach Ethernet Extenders for service providers to deploy their IP-based networking services to meet various application scenarios.

1.1 Features

- High speed Ethernet extension over UTP, CAT 5e/6/7 or Coaxial cables.
- Support ITU-T G.993.5 G.vectoring and G.INP
- Selectable 8 different profile settings via Dip Switch (G.INP/Interleaved, Target SNR 6/8/12/24 dB, Symmetric/Asymmetric Modes)
- Configurable SNR profile for noisy environment
- Cost effective bridge function to connect two Ethernet LAN
- IEEE 802.1Q VLAN tag transparent
- Easy installation via simple plug-and-play

Specifications

VDSL2 Interface

- RJ-45 connector
- DMT Encoding
- Complying with ITU-T
G993.1/G993.2/G993.5/G.997.1/G.998
- G.INP
- On-board surge protection

LAN Interface

- 1 x RJ-45 connector
- 10/100/1000 Base-T; Auto-Negotiation, Auto-MDI/MDI-X.
- Complying with IEEE 802.3/802.3u/802.3z

4-position DIP Switch

- Selectable Master(OT) or Remote(RT) mode
- Selectable 8 different profile settings via Dip Switch (G.INP/Interleaved, Target SNR 6/8/12/24 dB, Symmetric/Asymmetric Modes)

LED

- Power: On/Off
- LAN: Fast Ethernet/Gigabit Ethernet
- VDSL2: Mode - CO (OT) / CPE (RT)
Sync - Idle / Training / Link

Power Supply

- 12-24 Vdc over 2.1mm DC Jack (Commercial Grade External Power Adaptor included)
- Power Consumption: 4.5 Watts (Max)

Physical Characteristics

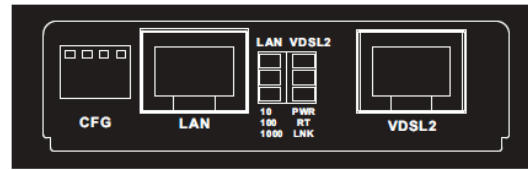
- Dimension (W x H x D): 96.2 x 22.8 x 73.4 mm
- Installation(Optional): Wall Mounting or Media Converter Chassis

Environment

- Operating Temperature: 0°C ~45°C
- Humidity: 0%~95%RH (non-condensing)

Regulatory Compliance

- CE Class A
- FCC Part 15B Class A
- EN60950



Front Panel

Performance

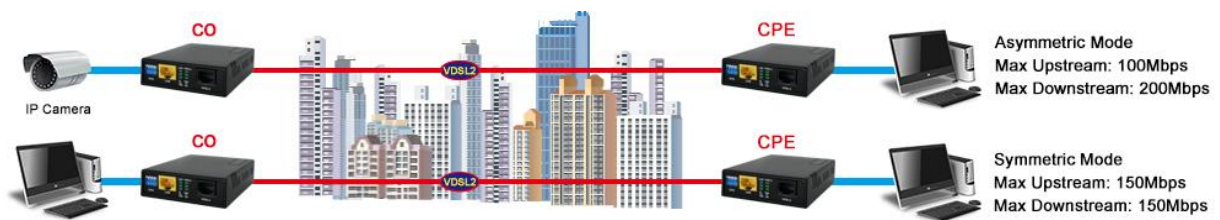
UTP, 26AWG		
Profile Setting 1: Symmetric, SNR 8dB, G.INP		
Distance (Feet)	Upstream Line Rate (Mbps)	Downstream Line Rate (Mbps)
500	155	158
1,000	122	126
1,500	75	80
2,000	48	56
2,500	28	38
3,000	23	28

UTP, 26AWG		
Profile Setting 1: Asymmetric, SNR 8dB, G.INP		
Distance (Feet)	Upstream Line Rate (Mbps)	Downstream Line Rate (Mbps)
500	100	200
1,000	77	170
1,500	38	105
2,000	22	64
2,500	10	43
3,000	9	42
4,000	6	34

**The above performance data is for reference only, the actual data rate may vary depending on the quality of the coaxial cable and environmental factors.

1.2 Applications

The solution works in pairs for point to point connectivity. One unit must be configured as Master (OT) while the other unit must be configured as Remote (RT) by using Dip Switch.



1.3 Reference Performance Data

26AWG Copper Wire

UTP, 26AWG		
Profile Setting 1: Symmetric, SNR 8dB, G.INP		
Distance (Feet)	Upstream Line Rate (Mbps)	Downstream Line Rate (Mbps)
500	155	158
1,000	122	126
1,500	75	80
2,000	48	56
2,500	28	38
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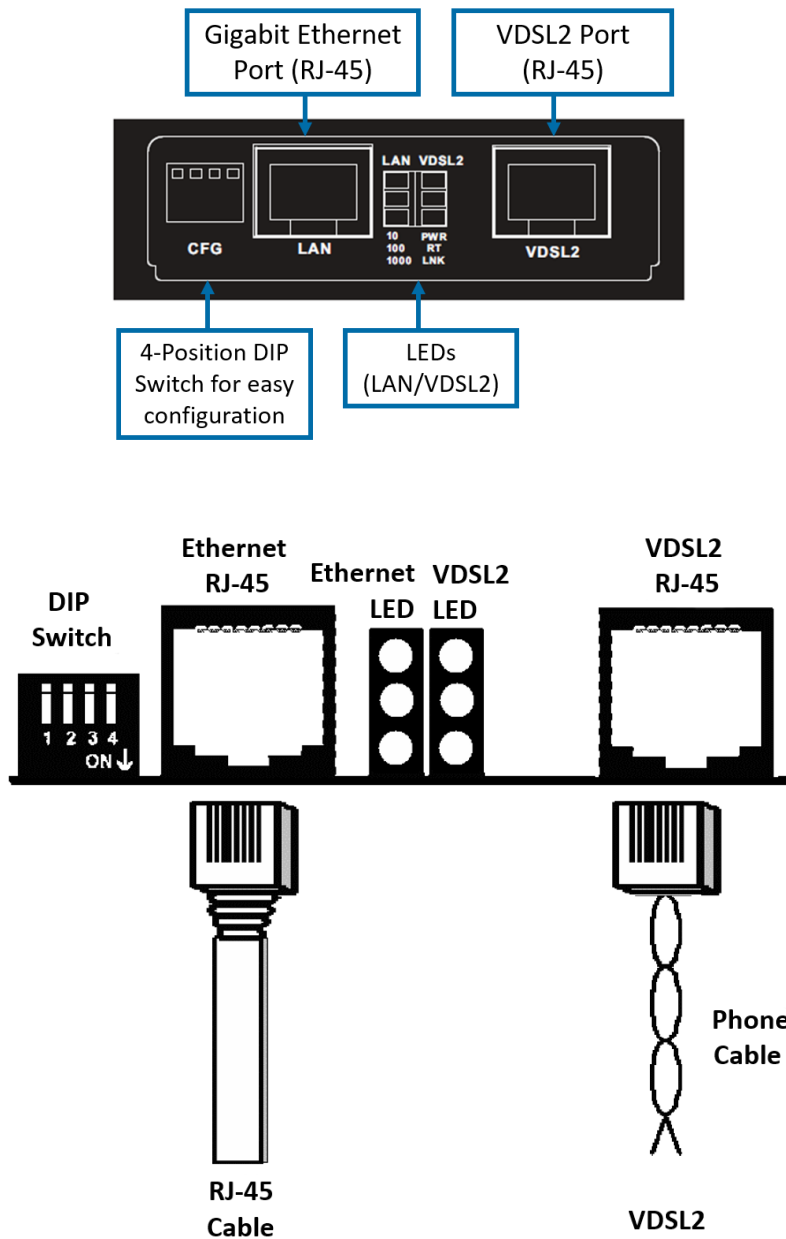
* The above performance data is for reference only, the actual data rate may vary depending on the quality of the copper wire and environmental factors.

2 Hardware Description

Tupavco TEX-200 is a Long Reach Ethernet Extender. This chapter shows the product outlook and hardware interfaces.

2.1 Mechanical Dimensions

Front Panel



2.2 Connector Architecture

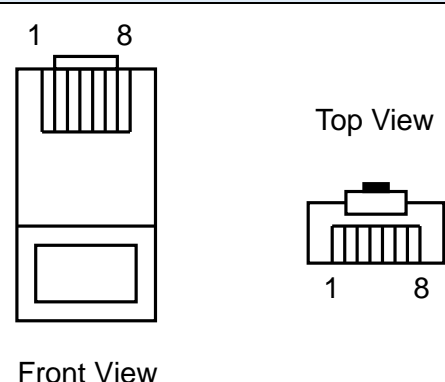
Ethernet Port Connector (RJ-45)

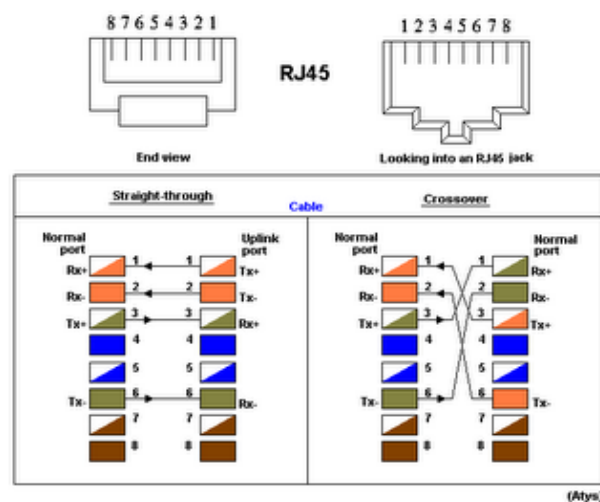
The Ethernet Port interface is an 8-position Modular Jack. The table below displays the pin out assignments.

Pin Number	Name	Description
1	BI_DA+	Bi-directional pair A +
2	BI_DA-	Bi-directional pair A -
3	BI_DB+	Bi-directional pair B +
4	BI_DC+	Bi-directional pair C +
5	BI_DC-	Bi-directional pair C -
6	BI_DB-	Bi-directional pair B -
7	BI_DD+	Bi-directional pair D +
8	BI_DD-	Bi-directional pair D -

VDSL2 Interface Pin Assignments (RJ-45)

The VDSL2 interface is standard eight-pin 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	



3 LED Definition

3.1 LED Indicators

The LED indicators could provide instant feedback to users; the behaviors of the LED are given in below table.

(1) LEDs for VDSL2

LED	Blinking	On	Off
PWR		Device Power On	Device Power Off
RT		CPE (Remote)	CO (Master)
LNK	Slow: Idle Fast: Training / Data Transmitting	Link UP	Link Down

(2) LEDs for Ethernet Port

LED	Blinking	On	Off
10	Data Transmitting	Reception of data occurring at speed of 10Mbps	Link Down
100	Data Transmitting	Reception of data occurring at speed of 100Mbps	Link Down
1000	Data Transmitting	Reception of data occurring at speed of 1,000Mbps	Link Down

4 Power Connection

1. 12-24 Vdc over 2.1mm DC Jack (Commercial Grade External Power Adaptor included)
2. Power Consumption: 4.5 Watts maximum

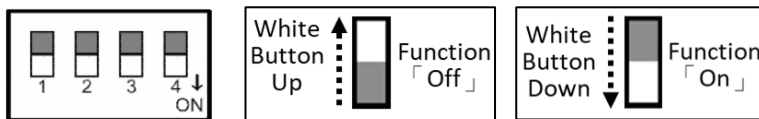


5 4-Position DIP Switch

The device is equipped with DIP Switch selection which allows users to select the parameters in order to meet the needs of different applications. Dip Switch 1 allows you to configure the unit as Master (OT) or Remote (RT). Usually, the Master unit is located at the central office site of Service Providers or Headquarter of Enterprise while the Remote unit is located at home, remote sites or branch offices. Please note the Remote Unit (RT) will always follow the setting of Master Unit (OT). When the unit operates in RT (CPE) Mode, Dip Switches 2,3,4 have no functions. When the unit operates in OT (Master) Mode, Dip Switches supports 8 different profile settings for different applications and environments.

Note:

There are four white buttons for DIP Switch. Moving the white button **up** position, its function is "Off". Moving the white button **down** position, its function is "On".



Role	DIP Switch				Symmetrical/ Asymmetrical	G.INP/ Interleaved Mode	Target SNR Margin (dB)	Max Data Rate DS/US (Mbps)
	1	2	3	4				
Master (OT)					Symmetrical	G.INP	8	160/160
					Asymmetrical	G.INP	8	220/110
					Symmetrical	Interleaved	6	160/160
					Asymmetrical	Interleaved	6	220/110
					Symmetrical	G.INP	12	150/150
					Asymmetrical	G.INP	12	220/100
					Symmetrical (Forcing 30a profile to link, and disable band 0 to 2.2MHz)	G.INP	24	20/20
					Asymmetrical (Standard profile Annex A 17a-eu32)	Interleaved	6	150/50
Remote (RT)					Remote Unit (RT) will always follow the setting of Master Unit (OT). When the unit operates in RT (CPE) Mode, DIP Switches 2,3,4 have no functions.			

6 Description of Setting

1. **Symmetrical profile** - Downstream and upstream rate are symmetrical.
2. **Asymmetrical profile** - Downstream and upstream rate are asymmetrical. Asymmetric profile can be used for services like Video streaming or IP surveillance services which require high traffic flow in an uni-direction configuration.
3. **GINP** - Retransmission mode that provides enhanced protection against impulse noise or to increase the efficiency of providing impulse noise protection (INP).
4. **Interleaved** - Interleaved mode has a slower transfer rate and increase latency in exchange for error correction. A general line setting mode that provides common impulse noise protection.
5. **Max Data Rate Downstream/ Upstream** - This parameter specifies the maximum net data rate for the bearer channel as desired by the operator of the system. The data rate is coded in steps of 1000 bit/s (G.997.1).
6. **Target SNR Margin Downstream/ Upstream setting** - This is the Noise Margin the xTU-R/C receiver shall achieve, relative to the BER requirement for each of the downstream bearer channels, or better, to successfully complete initialization. (G.997.1)
7. **Special Profile Setting (Dip2: Off, Dip3: On, Dip4: On)** is for application of near end distance or poor environment, Target SNR Margin is set to high value of 24dB and rate limit at 20Mbps to ensure channel stability. In addition, band 0 to 2.2MHz is disable to avoid possible effects by low frequency. Because this item is set to 30a profile, so its train up time is about 15sec to 20sec.
8. **Profile Setting (Dip2: On, Dip3: On, Dip4: On)** is standard profile Annex A 17a-eu32.



Precautions and Safety Warnings

- Disconnect all power from devices before attempting installation.
- This device is intended for installation only in **restricted access locations** as defined where both these conditions apply:
 - Access is through the use of a lock or tool and key, or other means of security, and is controlled by the authority responsible for the location.
 - Access can only be gained by service persons or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- All electric installations must be carried out in accordance with local and national regulations.
- Do not work on the system, connect or disconnect cables during periods of lightning activity.

Note:

- To reduce potential safety issues, only the AC Adapter provided with the product, a replacement AC Adapter provided by agency, or an AC adapter purchased as an accessory from agency should be used with the product.