**Please read this
document carefully
before installation!**

Line Power

VDSL2 Loop Extender

Installation Manual

Version: 1.0

Preface

This manual provides information on how to best use this product. Please read this manual thoroughly before installation and use. Additionally, please keep this manual handy for ease of reference during installation and troubleshooting.

● The contents of this document may be updated in the future, without prior notice.

● This booklet was created with thorough attention to the content. If, however, you have a question, spot an error, or find a description lacking, please refer to the end of this booklet for information on how to contact us.

● All brand names and trademarks are the property of their respective owners.

Contents

Abbreviations

CO   Center Office

CPE   Customer Point Equipment

DSLAM   Digital Subscriber Line Access Multiplexer

1.General Description

In order to supply much higher bandwidth to users, telecom operators have already upgraded the ADSL2 + network to VDSL2 network step by step. But the VDSL2 bit-rate decreased rapidly with the increase of distance.

The VDSL2 loop extender is installed on the loop between the VDSL2 DSLAM and the user's modem, amplifying VDSL2 signal, extending the coverage of VDSL2 effective bandwidth, improving the downstream bit-rate and bring more stable and reliable VDSL2 broadband service to those longer users.

Feature:

➢   Fully compatible with ITU-T G.993.2, G994.1

➢   Fully compatible with all the VDSL2 equipments which comply with these above standards

➢   Fully compatible with VDSL2 band profile：8a，12a，17a,30a；PSD mask：EU32，EU64

➢   At 2.0 Km ~ 2.7 Km (24AWG) distance range, downstream bit-rate has increased significantly with the highest increase of 60%

➢   Powered by PBX, no remote power supply required

➢   POTS is unavailable

➢   IP66 Rated enclosures

➢   High grade protection from lightening.

➢   Low power consumption and more environmentally friendly

➢   Easy to install, deploy, and maintain. no switch to config

➢   This solution is a cost-effective, quick-to-market solution

2. Technical Specifications

Table 1 –Technical Specifications of AER800-1PVL , AER800-4PVL box,

AER800-8PVL box,

Operating Environment	Temperature	-40℃～+65℃
	Relative Humidity	5%～95% (Non-condensing)
Input Power Voltage	DC36V~DC72V	
Power Consumption	Less than 0.3W(per port)	
Lightning-proof grade	4000V(10/700μS)	
Number of supported subscribers	AER800-1PVL	1 ADSL subscriber
	AER800-4PVL	5 ADSL subscribers
	AER800-8PVL	9 ADSL subscribers
Dimension(LWH)	AER800-1PVL Box	160mm×70mm×48mm
	AER800-4PVL Box	215mm×290mm×82mm
	AER800-8PVL Box	315mm×290mm×82mm

3. Application
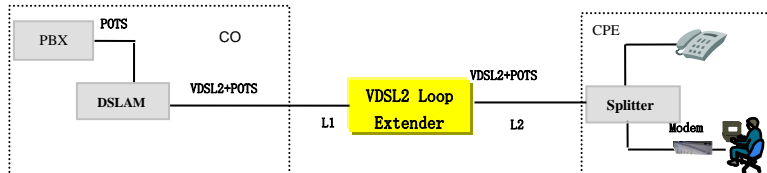
3.1 Equipment connection diagram:

Figure 1、 Line Power VDSL2 Loop Extender Connection Diagram

L1: The twist pair connecting extender to DSLAM.

L2: The twist pair connecting extender to Modem.

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3.2、The installation range of distance for 24AWG

DSLAM to Extender：	0.9Km ～ 1.8Km；（3Kft ～ 6Kft）
Extender to CPE：	0.6Km ～ 1.8Km；（3Kft ～ 6Kft）
DSLAM – CPE：	1.5Km ～ 2.7Km；（5Kft ～ 9Kft）

4. Physical Structure

➢ AER800-1PVL: Stand-alone 1 port unit.

➢ AER800-4PVL Box: A Box for up to 5 AER800-C1PVL cards.

➢ AER800-8PVL Box: A Box for up to 9 AER800-C1PVL cards.

➢ AER800-C1PVL: A one port line power VDSL2 loop extender , used to be

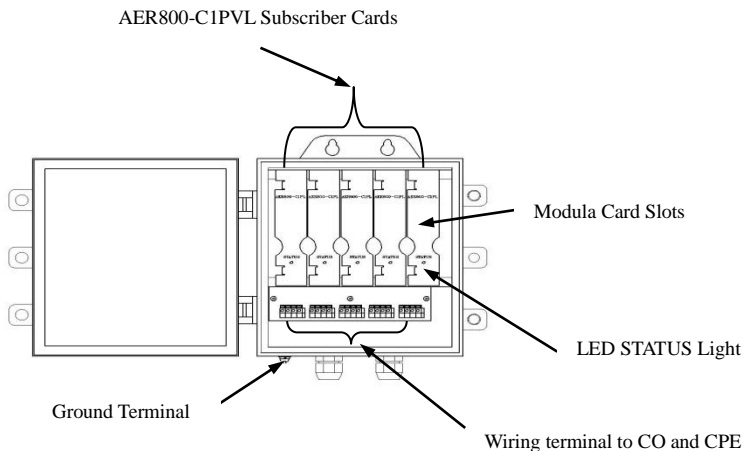inserted into the backplane of any AER800-xPVL enclosure.

4.1 AER800-1PVL Box

Figure 2 AER800-1PVL Box

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Table 4 - Twist-pair Connection Description of AER800-1PVL

Color	Connection
Orange/White (A/B)	to DSLAM
Green/White (A/B)	to Modem

4.2 AER800-4PVL Box

AER800-C1PVL Subscriber Cards

Modula Card Slots

LED STATUS Light

Ground Terminal

Wiring terminal to CO and CPE

Figure 3 AER800-4PVL Box

4.3 AER800-8PVL Box

AER800-C1PVL Subscriber Card

Modular Card Slots

LED STATUS Light

Ground Terminal

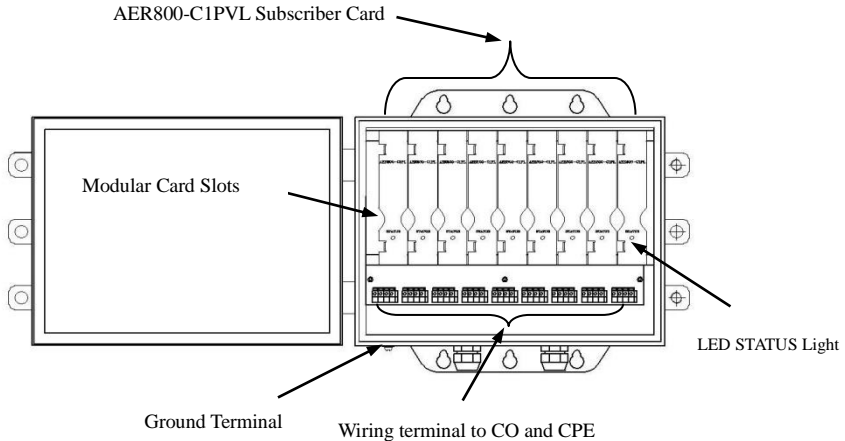Wiring terminal to CO and CPE

Figure 4 AER800-8PVL Box

4.4.The AER800-C1PVL card

The AER800-C1PVL card is plug and play.

The backplane of the AER800-xPVL series enclosures contain wiring terminals for connecting the extender to the existing loop plant. "CO" connects the line from the DSLAM to AER800-C1PVL, "CPE" connects the line to the customer modem.

5. Installation Procedure

5.1 Unpack

When unpacking the equipment, be sure to check the contents of the packaging for completeness against your purchase order. Notify your supplier immediately if any items are missing.

Note: Please save packing material. All equipment returned must be packed in

the original packing material.

Be sure to inspect the equipment for shipping damage, including bent or loose hardware, and broken connectors. If the equipment appears to have been damaged in transit, please contact your supplier.

5.2 Line Power ADSL Loop Extender Installation

(1) The AER800-1/4/8PVL Box can be installed in a junction cabinet, pedestal, or pole mounted via the supplied mounting brackets. Once mounted, ground the unit via the supplied grounding screw on the bottom outside of the box.

Attention: Copper-core wire with no less than 2.5mm^2 (13 AWG) diameter is required as ground wire. One end of the wire should connect to Loop Extender's ground terminal. The other end of the wire should connect to a good grounding point. Grounding reliability is the best way to protect the unit against lightning damage.

(2) Insert the AER800-C1PVL card into the AER800-4/8PVL box.

(3) Connect the line from the DSLAM to the "CO" terminal, and connect the line linked to the customer's modem to the "CPE" terminal. Once the "CO" pair is connected, the power LED will come on to indicated the AER800-C1PVL card is operational.

(4) After confirming that all the twist-pair cables are connected correctly, and the AER800-4/8PVL is securely installed, the extender will work 10 seconds after power is steadily applied.

Attention:

"A" and "B" represent tip and ring of the twisted-pair. No polarity.

6. Troubleshooting

Checks at the Central Office

➢ check that there are no leakage currents on the line (measured at the CO).   With no extender on the line, current should be essentially zero.   With a line powered loop extender, you will read about 15mA .

➢ check the VDSL2 DSLAM configur, is band profile 8a,12a,17a or 30a, is PSD mask EU32, EU64

Checks at the Pedestal

➢ The minimum distance (on 24AWG) from the Central Office for extender installation is 3Kft for line power extender.

➢ Is the LED on the extender on?

➢ Is the extender grounded? Bonded? The ground, cable sheath, and extender should all be bonded together at the extender and as frequently as possible elsewhere.   Lack of bonding will allow significant interference from AC power, AM radio, electric fences and similar problems.   Lack of bonding will also make you a prime target for lightning and other surges.   If you can't bond, don't ground the extender.   If you can't ground, you have to take steps to isolate the enclosure from ground too. Grounding & Bonding together is preferred.

➢ Does the loop distance match the installation condition? . If not, re-check distances, connections and eliminate loads.

➢ Does modem sync at the pedestal without the extender connected? The sync rate at this location is the maximum the extender can deliver down range. If you can't get sync, the extender will not work at this location.

Checks at the Customer Premise

➢ Customer premise should be at least 3Kft (on 24AWG) from the extender for optimal performance. It will work at shorter distances with sub-optimal performance.

➢ Does the modem run without errors?

Table 5 – Line power ADSL extender Troubleshooting

Problem Description		Possible Reason	Suggested Resolution
Equipment does not work after connected. Status LED is OFF.		CO side cable is not connected properly.	Check CO side cable.
No Sync.	AER800-C1PVL status LED is on.	Cables at DSLAM or Modem side are connected on wrong side.	Correct the cable connection.
		Line quality issues.	Diagnose cable for proper Ohms/Attenuation values.
		There is a telephone before the splitter on CPE side.	Discard the telephone before the splitter on CPE side.
		VDSL2 loop extender is not connected properly.	Correct the cable connection, or check whether the distance between the DSLAM, extender, and Modem is within recommended values.
		L1 or L2 is too short.	Check that loop extender placement meets engineering requirements.
		SNR Margin is too high.	Reduce SNR Margin setting on the DSLAM until a connection is made. We suggest using SNR Margin < 10.　Testing with SNR margin = 1 can provide useful hints during troubleshooting.
Internet is slow, frequent disconnects.		Possible PC issues, virus, hardware malfunction, etc.	Verify issue with test set or a known good piece of hardware. Check statistics on modem and DSLAM.
		Parallel open wire at CPE is too long or the connector is rusted.	Change the parallel cable to copper twisted-pair.
		The CPE side cable has too many connectors.	Avoid exposed connectors, use good quality cable.