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

**VDSL Loop Extender
And Power Supply
(For VER- 1P)**

Installation Manual

Version 1.1

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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 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.

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General Description

VDSL loop extender (VER) can extend the coverage of VDSL lines. It will provide systems with higher performance-to-cost ratio, improve equipment utilization rate and optimize the network. This product will allow you to double the number of subscribers with the bit-rate you desire while offering more consistent high bandwidth services to your existing customers.

The VDSL Loop Extender is an active element installed in the outside loop plant. It operates as an amplifier and equalizes the signal.

VDSL loop extender box and the extender card are as below:

- VER-1P box: One box for 1 VER-1P embedded.
- VER-1P: One port VDSL loop extender for one VDSL subscriber can be inserted into the extender's box easily.

Benefits

- Comprehensive over-voltage protection.
- Low power consumption and more environmentally friendly

Technical Specifications

Table 1 –Technical specifications of VER-1P

Operating environment	Temperature	-35°C ~ +65°C
	Relative humidity	5%~95% (Non-condensing)
Input power	DC60V ~ DC155V	
Power consumption	Less than 0.4W(per port)	
Dimension(LWH)	VER-1P box	192mm×92mm×42mm
Number of supported subscriber	VER-1P	1 VDSL subscriber

Table 2 - Technical specifications of AEC-B1P

Operating environment	Temperature	-10C ~ +50C
	Relative humidity	5% ~ 95% (Non-condensing)
Input voltage	AEC-B1P	AC 220/110V(85V~265V) DC48V(36V~72V)
Output voltage	DC 116V	
Output current	less than 20mA	
Output port	AEC-B1P	1 port
Support the extender model and quantity	AEC-B1P	one VER-1P
Dimension(LWH)	AEC-B1P	110 mm×50 mm×30 mm

3. Application

3.1. The actual lines connecting of equipment

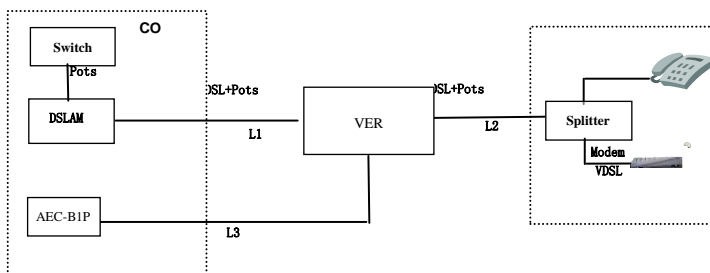


Figure 1 VDSL loop extender application diagram

L1: The signal twist pair connecting VER to DSLAM.

L2: The signal twist pair connecting VER to modem.

L3: The power twist pair connecting AEC to VER.

3.2. Resistance and distance demand

The recommended installation conditions are as follows.

(1) 26 AWG twist pair

Table 3 -The demand about resistance and distance:

Route	20°C loop resistance (Ω)	Distance demand	
		Kft	Km
L1	348 ~522	3.6 ~ 6.0	1.2 ~1.8
L2	87 ~ 435	1.0 ~5.0	0.3 ~ 1.5
L(L1+L2)	435 ~ 870	5.0 ~10.0	1.5 ~ 3.0

(2) 24 AWG twist pair

Table 4 -The demand about resistance and distance:

Route	20°C Loop Resistance (Ω)	Distance Demand	
		Kft	Km
L1	258 ~ 395	5.0~7.6	1.5~2.3
L2	60 ~ 326	1.2~6.3	0.35~1.9
L(L1+L2)	326 ~ 653	6.3~12.6	1.9~3.8

3.3. Switches setting

There are 2 switches, one is labeled “Up”, another is labeled “Down”. They are all two-bits switch, explained as fellows.

When L2 is longer, both bits of “Up” switch should be set to “high” position, and when L2 shorter, both bits be set to “low” position. The demarcation point is about 1.0 Km for AWG 26 cable, or about 1.2 Km for AWG 24 cable.

When L1 is longer, both bits of “Down” switch should be set to “high” position, and when L1 shorter, both bits be set to “low” position. The demarcation point is about 1.7 Km for AWG 26 cable, or about 2.1 Km for AWG 24 cable.

With real cable, considering the ageing, you can check which position (high or low) should be set, for the two switches (Up or Down), by reading the line bit-rate on VDSL Modem, or on DSLAM. High line bit-rate is available, by setting the “Up” switch and “Down” switch to their respective right positions, two bits of any one switch must be on same position.

Physical structure

4.1 VER-1P

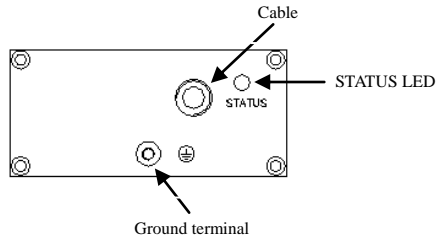


Figure 2 VER-1P

Table 5 - Twist-pair connection description of VER-1P

Twist-pair color	Connection
Blue/White	Remote PWR
Orange/White	to DSLAM
Green/White	to Modem
Brown/White	Unused

4.2 AEC-B1P



Figure 3 AEC-B1P

Attention: Two-core power cord without plug: used for DC48V power input, no polarity.

Three-core power cord with plug: used for AC 110V/220V power input.

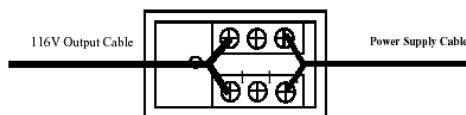


Figure 4 AEC-B1P connector wiring diagram

Installation Procedure

5.1 Unpack

Unpack equipment carefully, check for completeness against the purchase order. Notify the supplier if items are missing.

Note: Save packing material. All equipment returned must be packed in the original packing material.

Inspect equipment for shipping damage, including bent or loose hardware, and broken connectors. If equipment was damaged in transit, contact the supplier.

5.2 Install the remote power supply

- Generally, the Power Supply is installed at CO side. The type of power supply ordered should be right, either AC110V /AC220V or DC48V.
The Power supply also can be installed in the CPE or near the extender.
- One Spare copper pair is needed for deliver power to VER-1P.
- Before installation, the DC 48V or AC110V~AC220V power supply should be grounded reliably.
- DC 48V Power input is non-polarity.
- The output of DC116V is non-polarity.

Attention:

- 1. Ground terminal should be grounded reliably. Copper-core wire with no less than 2.5mm² section area is required as ground wire.**
- 2. Remote power supply should not be turned on until the extender installation is finished.**
- 3. When the power supply wire is active, do not touch both two wires of the twist pair simultaneously.**

5.3 Install the VER

- Fix the VER-1P box in the junction cabinet or near about at the supplied point. Ground the box through the grounding screw in the bottom outside the box.

Attention: Copper-core wire with no less than 2.5mm² section area 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 ground point.

➤ Connect the cable

VER-1P: Connect the power line with blue/white pair wire, CO signal line with orange/white, CPE signal line with green/white pair wire.

Attention: The power supply should not be turn on until the extender installation is finished.

➤ Power on

Power on after confirming that all the twist-pair cables are connected correctly and box is securely installed.

➤ Setting on DSLAM

Objective of VER's design is to get higher up-stream bit-rates within US0($f_1=276$ Hz). So it is important to set on DSLAM to get higher us bites by EU-64.

Troubleshooting

Table 6- VDSL loop extender power supply troubleshooting

Problem description	Problem reason	Suggested resolution
Power LED is not lit after equipment power-up	Power supply cable is not correctly connected	Check power supply cable connection
	The power switch is not set on	Set on the power switch
Output is ok but the extender does not work	Power output cable connection is wrong or line fault	Correct the power connection or check cable. Or check the cable length L1, L2 according to table 3 and table 4

Table 7 - VDSL loop extender troubleshooting

Problem description	Problem reason	Suggested resolution
STATUS LED is not lit on	Power supply cable(L3) is not connected properly	Correct the power connection or check cable
	No Power is supplied from power supply(AEC)	Correct the connection of the input cable of power supply(AEC)
		power on the power supply(AEC)
Phone not ok	CO cable (L1), or CPE cable (L2)is not properly connected	Correct the connection of cable L1 or cable L2
High noise on telephone	No splitter used at CPE side	Add splitter
	Cable is connected to ground or the insulation is not good caused by men during the construction process	Check the cables
	Cable is too near to some electric equipments with strong magnetic field, such as high power sounder, rectifier and high power motor	Make cable far from the strong magnetic field
VDSL is not ok, but the status LED is on, and telephone ok	Cable L1 and cable L2 are connected on wrong side	Correct the connection of cable L1 and cable L2
	splitter is connected on wrong terminal ports	Correct the connection of terminal ports: “Line” to cable L2; “Phone”to telephone set; “Modem”to VDSL modem
	Not suitable installation site	Correct the installation site according to table 3,table 4
	Too long parallel lines	Replace parallel lines with twist pair wires
	Affection of computer hardware failures, system failures and virus	Check computer or take with PC, testers and so on to deal with
	The parallel cable at CPE side is too long or the connector is oxidation	It is better to change the parallel cable to copper twist cable
	The cable to CPE side is connected with too many connectors	Avoid exposed connectors, use good quality cable instead scattered connectors

Attention: If all the resolution is not practicable, please contact with supplier.