NV-202M/S

Power over LAN extender

User's Manual

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Foreword

NV-202M system delivers power and IP connectivity at distances up to 2km (6,562ft) using existing or new copper twisted pair phone cable. These innovative transmission techniques result in power feeding and data over a single pair phone wire and are ideal for deploying extended Ethernet where there are no or limited electricity at one end. With automatic fault protection and power monitoring, these ensures reliable delivery of essential power and data / video to and from remote locations. Operators in diverse enterprises will now be able to deploy PoE devices in any service location. Install network security cameras, wireless access points, security / RFID scanners or access control systems in any place where you have basic wire connectivity.

The NV-202M / S provide extended-length power and Ethernet connections over one pair **Cat. 5 or above twisted pair** phone cable. The NV-202M / S works as Ethernet to / from VDSL subscriber site conversion NV-202M/S.
The front-panel provides LED indicators of power system and interface status. Full- or half-duplex mode of LAN operation is automatically sensed and configured. VDSL link rates are configured by NV-202M over the auto-speed . Therefore, NV-202M / S supports auto-speed operations on the subscriber-site and power protections as OVP(Over Voltage Protection), OCP(Over Current Protection), OTP(Over Temperature Protection), robust short-circuit protection and surge protection, as well as are part of an ideal solution for delivering cost-effective, high-performance broadband / multimedia services to point to point application.

Attention:

Be sure to read this manual carefully before using this product. Especially Legal Disclaimer, Statement of Conditions and Safty Warnings.

Caution:

The NV-202M/S is for **indoor** applications only. This product does not have waterproof protection. Do not use in harsh environments (Over temperature range: 0°C ~ 50°C (32°F ~ 122°F)).

Safety Warnings

For your safety, be sure to read and follow all warning notices and instructions before using the device.

◆ **DO NOT** open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel can service the device. Please contact your vendor for further information.

◆ **Use ONLY** the dedicated power supply for your device. Connect the power cord or power adapter to the right supply voltage (110V AC in North America or 230V AC in Europe).

◆ **DO NOT** use the device if the power supply is damaged as it might cause electrocution. If the power supply is damaged, remove it from the power outlet. DO NOT attempt to repair the power supply. Contact your local vendor to order a new power supply.

◆ **Place** connecting cables carefully so that no one will step on them or stumble over them. DO NOT allow anything to rest on the power cord and do not locate the product where anyone can work on the power cord.

◆ **DO NOT** install nor use your device during a thunderstorm. There may be a remote risk of electric shock from lightning.

◆ **DO NOT** expose your device to dampness, dust or corrosive liquids.

◆ **DO NOT** use this product near water, for example, in a wet basement or near a swimming pool.

◆ **Connect ONLY** suitable accessories to the device. Make sure to connect the cables to the correct ports.

◆ **DO NOT** obstruct the device ventilation slots, as insufficient airflow may harm your device.

◆ **DO NOT** place items on the device.

◆ **DO NOT** use the device for outdoor applications, and make sure all the connections are indoors. There may be a remote risk of electric shock from lightning.

◆ **Be careful** when unplugging the power, because the transformer may be very hot.

◆ **Keep** the device and all its parts and accessories out of children's reach.

◆ **Clean** the device using a soft and dry cloth rather than liquid or atomizers. Power off the equipment before cleansing it.

◆ This product is **recyclable**. Dispose of it properly.

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Chapter 1. Unpacking Information

1.1 Check List

Carefully unpack the package and check its contents against the checklist.

Package Contents:

1 x NV-202M 1 x NV-202S	1 x QR code for user's manual hyperlink.	Accessory: 1 x 48V / 1.875A Desktop Switching Power Adapter, 2 x RJ-45 Ethernet cable, 1 x Terminal Block, 8 x Rubber Feet ,

Notes:

1. Please inform your dealer immediately for any missing or damaged parts. If possible, retain the carton including the original packing materials. Use them to repack the unit in case there is a need to return for repair.
2. Power supply included in package is commercial-grade. Do not use in harsh environments.
3. Do not only use one of the Power Adapter, otherwise the performance will less than half.

Chapter 2. Installing the NV-202M/S

2.1 Hardware Installation

This chapter describes how to install the NV-202M/S and establishes network connections. You may install the NV-202M/S on any level surface (e.g. a table or shelf). However, please take note of the following minimum site requirements before you begin.

2.2 Pre-installation Requirements

Before you start the actual hardware installation, make sure you can provide the right operating environment including power requirements, sufficient physical space and proximity to other network devices that are to be connected.

Verify the following installation requirements:

- Power requirements: **1 x 48VDC / 1.875A or above**
- NV-202M/S should be located in a cool dry place with at least **10cm / 4in** of space at the front and back for ventilation.
- Place NV-202M/S away from direct sunlight, heat sources, or areas with a high amount of electromagnetic interference.
- Check if the network cables and connectors needed for installation are available.
- **Do Not** install phone lines strapped together with AC power lines, or telephone office line with voice signal.
- **Do Not** install phone lines with POTS/ISDN.
- Avoid installing this device with radio amplifying station nearby or transformer station nearby.
- Please connecting FG of NV-202M and NV-202S on rear panel to earth ground.

2.3 General Rules

Before making any connections to the NV-202M/S, please note the following rules:

- **Ethernet Port (RJ45)**

  All network connections to the NV-202M/S Ethernet port must be made using Category 5 UTP for 100Mbps, Category 3, 4 UTP for 10Mbps.

  No more than 100 meters of cabling may be used between the MUX or HUB and an end node.

- **Line Port (RJ-11 / Terminal block)**

  All Home network connections to the line port must use single pair **22~26** gauge with twisted pair phone wiring. RJ-11 and terminal block is shared and cannot be used together at the same time.

- We **do not** recommend using **28 gauge** or above phone line.

- Please note that the line port support reverse polarity protection, when user install the phone wire and reverse the two wires, it could be used.

2.4 Connecting the NV-202M and NV-202S

NV-202M power adapters must be connected first before switch can be powered on. NV-202M/S has one RJ-45 fast Ethernet port which support connection to Ethernet operation. The devices attached to these ports must support auto-MDIX and auto-negotiation or 10Base-T OR 100Base-TX unless they will always operate at half-duplex. NV-202S fast Ethernet port is used to connect to external power splitter(POE) or build in power splitter of networking devices such as IP CAM, VOIP, wireless AP, sensor scanner or other power splitter(PD side) at least 15W.

The line port has 1 connector: RJ-45 and terminal block. It is used to connect from NV-202M using single pair phone cable to NV-202S side(point to point solution). Take note that NV-202M/S line port cannot be used at the same time.

Either RJ-45 port is connected or terminal block is connected using straight connection (Figure2.1)

Figure2.1: NV-202M/S line ports straight connection
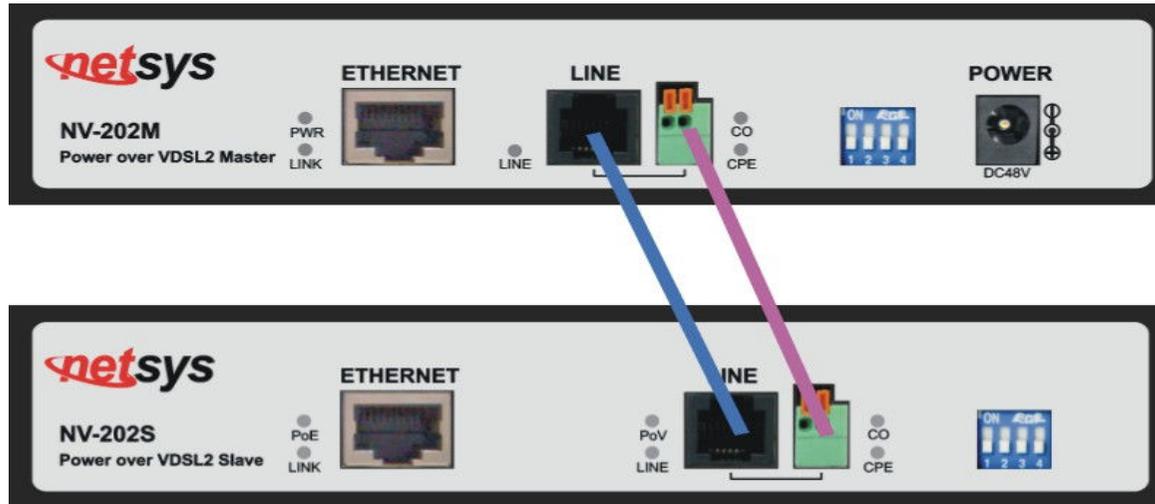
Blue Line : Valid
Red Line : Valid
Blue + Red : Invalid

2.5 Connecting the Line / Ethernet Ports

1. The NV-202M/S' line port supports max distance of 2km for data service across existing phone wiring. It is easy-to-use which do not require installation of additional wiring. Every modular phone jack in the home can

become a port on the LAN. (Figure 2.2)

VDSL2 with Remote Power Application
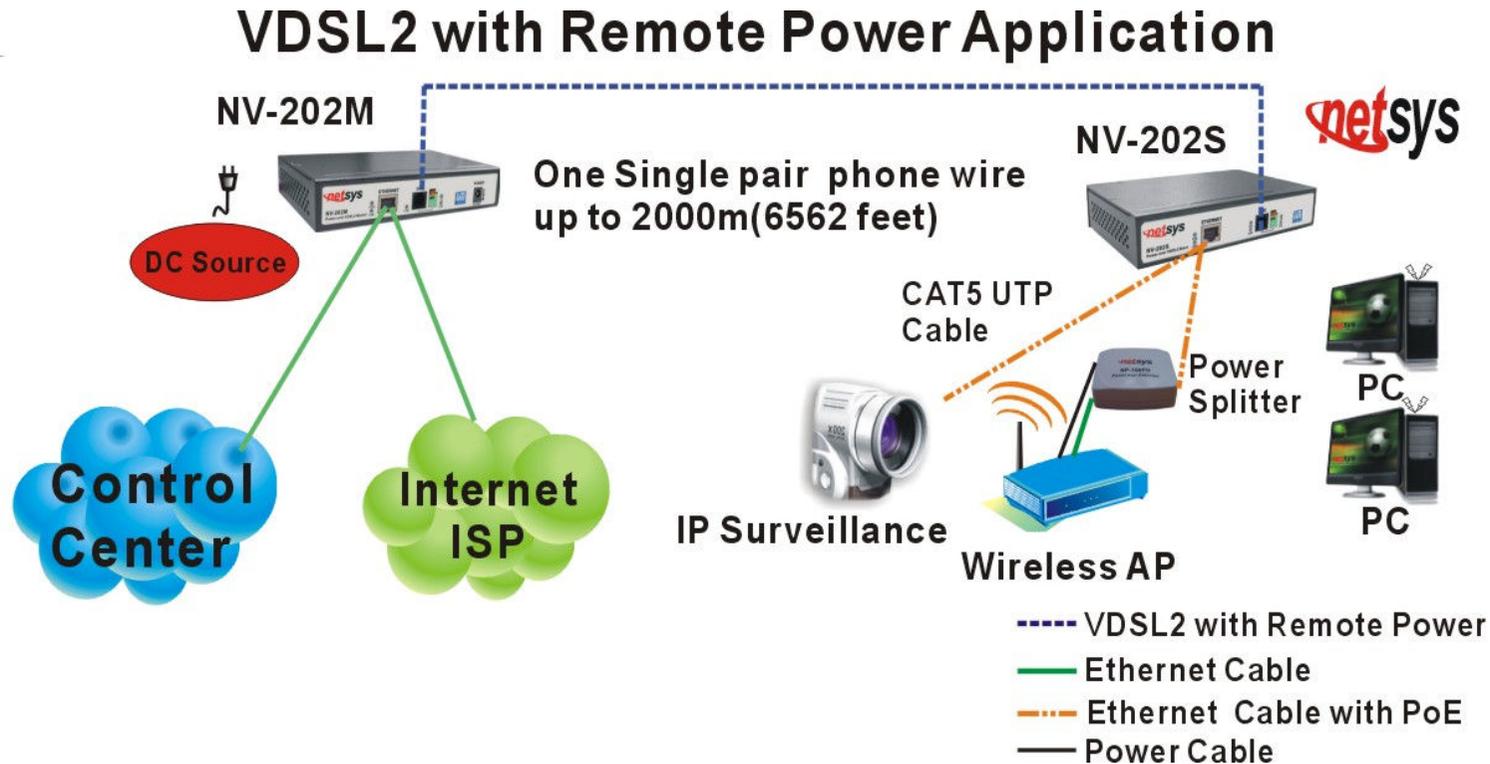
Figure 2.2: Master / Slave Ethernet extender with remote power point-to-point application

2. Use only twisted pair cable with RJ-45 connectors that conform to Ethernet standard. When inserting a RJ-45 plug, be sure the tab on the plug clicks into position to ensure that it is properly seated.

Notes:

1. Be sure each twisted-pair cable (RJ-45) does not exceed 100 meters (328 feet).
2. Line port must use 22 ~ 26 gauge phone wiring, we do not recommend 28 gauge or above.

3. We advise using Category 3, 4, 5 cables for cable NV-202M/S or router connections to avoid any confusion or inconvenience in the future when you attached to high bandwidth devices.
4. Be sure phone wiring has been installed before NV-202M and NV-202S powered on.

Chapter 3. Hardware Description

This section describes the important parts of the NV-202M/S. It features the front panel and rear connectors.

3.1 NV-202M / NV-202S Detailed View

1. LED Indicators
2. Ethernet Port
3. Line Port
4. Terminal Block
5. Dip Switch
6. Power Jack(DC 48V)
7. Frame Ground

Figure 3.1: NV-202M detailed view

1. LED Indicators
2. Ethernet Port
3. Line Port
4. Terminal Block
5. Dip Switch
6. Frame Ground

Figure 3.2: NV-202S detailed view
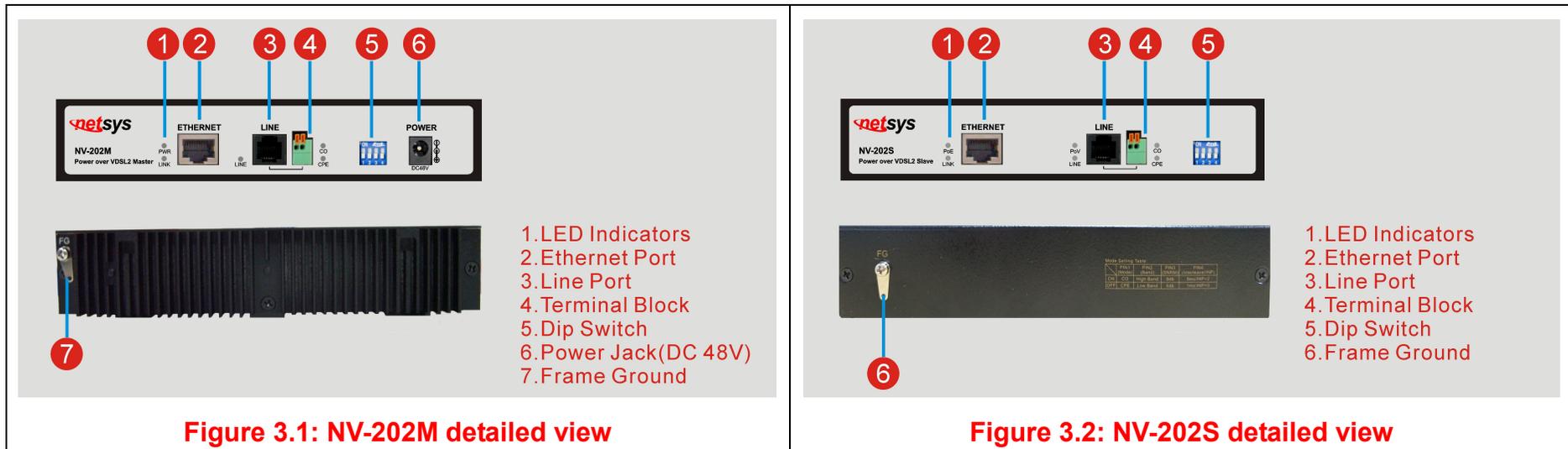
3.2 Front Panel

The figure shows the front panel of both NV-202M and NV-202S. (Figure 3.3)

Figure 3.3: Front Panel of NV-202M/S

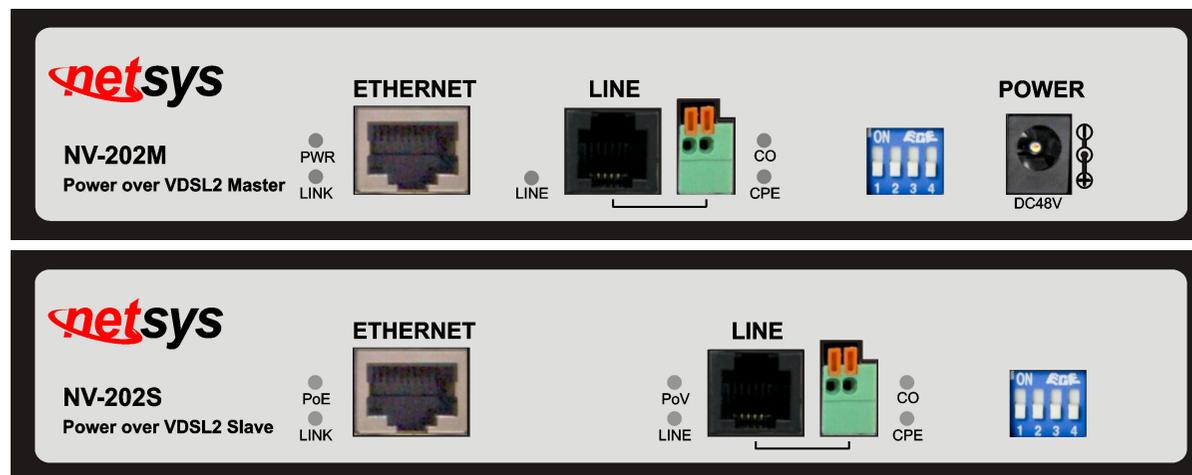At a quick glance of the front panel, it is easy to tell if NV-202M/S has power, if it has signal from its Ethernet RJ-45 port, if it is either providing or receiving power and if there is line signal on the line port. (Table 3-1)

Table 3-1: Description of NV-202M/S front interface

Interface	Connector Type	Description
Line	RJ-11 / Terminal Block	For connecting to NV-202M/S both line port over phone wire.
Ethernet	RJ-45	For connecting to the networking device for NV-202M. For connecting to the networking device with power splitter or connecting to external power splitter for NV-202S.

3.3 Front Indicators

The NV-202M has **FIVE** LED indicators. The following table shows the description. (Table 3-2)

Table 3-2: LED Indicators Description and Operation

LEDs	Color	Status	Descriptions
PWR (Power LED)	Green	On	The system power is normal and functioning properly.
		Off	The system power is not ready or has malfunctioned.
LINK	Green	On	The device has a good Ethernet connection.(Link)
		Blinking	The device is transmitting / receiving data.(Activity)
		Off	The LAN is not connected.
LINE(VDSL LINK LED)	Green	On	The Internet or network connection is up.
		Blinking fastly	1.The CO device has detected a CPE device and ready to connect. 2.The device is sending or receiving data.
		Off	The system power is not ready or has malfunctioned.
CO (Local Side)	Green	On(Steady)	Indicate the VDSL2 NV-202M is running at **CO(Master)** mode.

(CO LED)			
CPE (Remote Side) (CPE LED)	Green	On(Steady)	Indicate the VDSL2 NV-202M is running at **CPE(Slave)** mode.

The NV-202S has **SIX** LED indicators. The following table shows the description. (Table 3-3)

Table 3-3: LED Indicators Description and Operation

LEDs	Color	Status	Descriptions
PoE (Power over Ethernet LED)	Green	On	The power injector had detected the power splitter (IEEE802.3at).
		Blinking	The power injector had detected a non standard POE.
		Off	The power injector has not detected the power splitter.
LINK	Green	On	The device has a good Ethernet connection.(Link)
		Blinking	The device is transmitting / receiving data.(Activity)
		Off	The LAN is not connected.
PoV (Power over VDSL LED)	Green	On	For NV-202S the device is remote power link good.
		Off	The device is not ready or has malfunctioned.
LINE(VDSL LINK LED)	Green	On	The Internet or network connection is up.

		Blinking fastly	1.The CO device has detected a CPE device and ready to connect. 2.The device is sending or receiving data.
		Off	The system power is not ready or has malfunctioned.
CO (Local Side) (CO LED)	Green	On(Steady)	Indicate the VDSL2 NV-202S is running at **CO(Master)** mode.
CPE (Remote Side) (CPE LED)	Green	On(Steady)	Indicate the VDSL2 NV-202S is running at **CPE(Slave)** mode.

3.4 Rear Panel

The following figure shows the rear connectors. (Figure 3.4)

Figure 3.4: Rear connectors of NV-202M/S respectively

The following figure shows the DIP switch connection. By switching the transmission modes, you can obtain a best transmission mode to suit with phone line quality or distance or connectivity. (Figure 3.5).
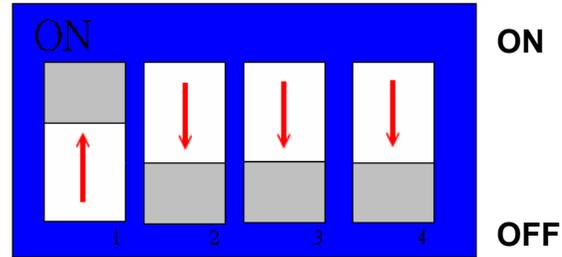
Figure 3.5: DIP switch setting

The following is table of DIP Switch configuration. (Table 3-6)

Table 3-6 DIP Switch Configuration

On/OFF	Pin 1	Pin 2	Pin 3	Pin 4
	CO/CPE Mode	**Band**	**SNRM**	**Interleave / INP**
On	CO Mode	High Band	9db	8ms / INP=2
Off	CPE Mode	Low band	6db	1ms / INP=0

Note:

1. The DIP switch default values are OFF.
2. Please power off NV-202M, before making any transmission mode configuration.

TIP(Reference Only):

Interleave delay function is used in digital data transmission technology to protect the transmission against noise issue and data error.

If during transit more than a certain amount of data has been lost then the data cannot be correctly decoded. Short bursts of noise on the line can cause these data packets to become corrupt and the NV-202M/S has to re-request data which in turn can slow down the overall rate at which data is transmitted.

Interleaving is a method of taking data packets, chopping them up into smaller bits and then rearranging them so that once contiguous data is now spaced further apart into a non continuous stream. Data packets are re-assembled by your NV-202M/S.

The diagram below is an example of how interleaved traffic is transmitted.
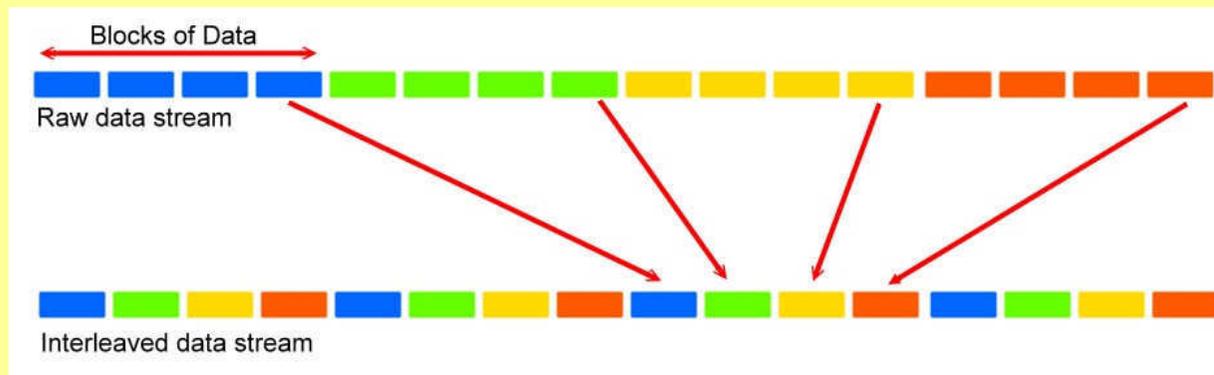
If your line is particularly susceptible to bursts of noise then interleaving should improve your VDSL2 experience simply because if you lose a whole batch of data then this could cause your NV-202M/S to loose sync with the exchange.
Using Interleaving, the NV-202M/S is able to re-assemble the data or if necessary just re-request the part of the data that it is unable to recover. By increasing the interleave depth of each ports that are susceptible to noise, this will improve error performance and stability of marginal lines.

INP (Impulse Noise Protection): Impulse noise in multicarrier communication systems behaves effectively as a modulating signal that controls the first moment of the background Gaussian noise. The composite noise, which is the aggregate of the Gaussian noise and impulse noise, has a probability density function that is conditionally Gaussian with non-zero average, hence referred to as biased-Gaussian. The BER-equivalent power of the composite noise source is defined as the power of a pure Gaussian noise source that yields the same bit-error rate (BER). The BER-equivalent noise for a biased-Gaussian noise is simply the amplified version of the underlying Gaussian noise source. The amplification factor is derived from the characteristics of the impulse interference. Any bit-loading algorithm designed for Gaussian noise sources is also applicable to biased-Gaussian noise sources provided that the BER-equivalent SNR is used in place of the measured SNR.

SNRM (Signal to Noise Ratio Margin): It's very similar to a conversation at a party and it's dealt with in the same way; we naturally account for both distance from the other person and the amount of background noise. When we do we don't just talk loud enough to be heard, we speak a bit louder waiting for the idiot with the stupid, loud laugh to start up again. We add a bit extra on to make sure we're louder than the average change in background noise.

That ratio is a major factor in determining the connection speed, as the higher the ratio the higher the possible speed. The SNRM is a margin which by which the noise level can rise before connection is lost.

Chapter 4. Performance

4.1 Performance and power budget Descriptions:

NV-202M/S support long reach mode up to 2000m(6,562ft) / 7W power budget shown as Table 4-1

Cable Length(Meter)	DS(Mps)	US(Mps)	PoE Output
300m	100	100	15.0W
400m	87	81	13.5W
600m	53	48	13.0W
800m	34	31	12.5W
1000m	20	20	11.5W
1200m	14	10	11.0W
1400m	13	2.7	10.0W
1600m	10	1.2	9.0W
1800m	9.5	1.1	8.0W
2000m	7.2	0.5	7.0W

Table 4-1 : (US: Up Stream / DS: Down Stream)

Note:

1. We recommend phone cable that must meet Cat. 5 standard or above and without clustering.
2. The performance data above is for reference only, the actual distance will vary on the quality of the copper wire and environment factors. We recommend using 22~26 gauge and Cat. 5 standard or above phone wiring, otherwise the above guarantee will be void.

Appendix A: Cable Requirements

A.1 Ethernet Cable

A CAT. 3, 4 or 5 twisted pair cable is typically used to connect the Ethernet device to the NV-202M/S. A 10Base-T cable often consists of four pairs of wires, two of which are used for data transmission and the other two pairs are used for power transmission. The connector at the end of the 10Base-T cable is referred to as RJ-45 connector and it consists of eight pins. The Ethernet standard uses pins 1, 2, 3 and 6 for data transmission purposes, power supply uses pins 4, 5 and ground uses pins 7, 8. (Table A-1)

Table A-1 RJ-45 Ethernet Connector Pin Assignments

| PIN #	MDI		MDI-X	
	Signal	Media Dependant interface	**Signal**	Media Dependant interface-cross
1	TX+	Transmit Data +	RX+	Receive Data +
2	TX-	Transmit Data -	RX-	Receive Data -
3	RX+	Receive Data +	TX+	Transmit Data +
4	48V	NV-202S only	48V	NV-202S only
5	48V	NV-202S only	48V	NV-202S only
6	RX-	Receive Data -	TX-	Transmit Data -
7	Ground	NV-202S only	Ground	NV-202S only
8	Ground	NV-202S only	Ground	NV-202S only
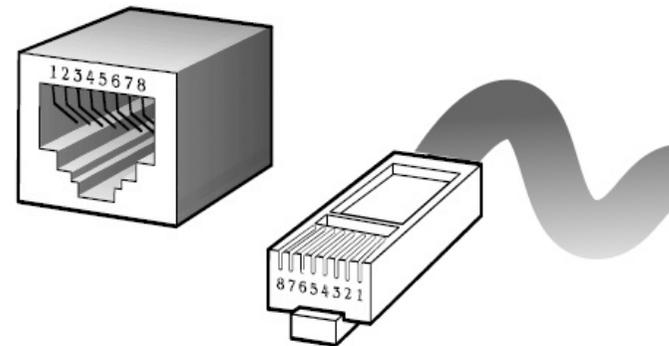
Figure A-1 Standard RJ-45 repectacle/connector

Note:

Please make sure your connected cables are with same pin assignment as above table before deploying the cables into your network.

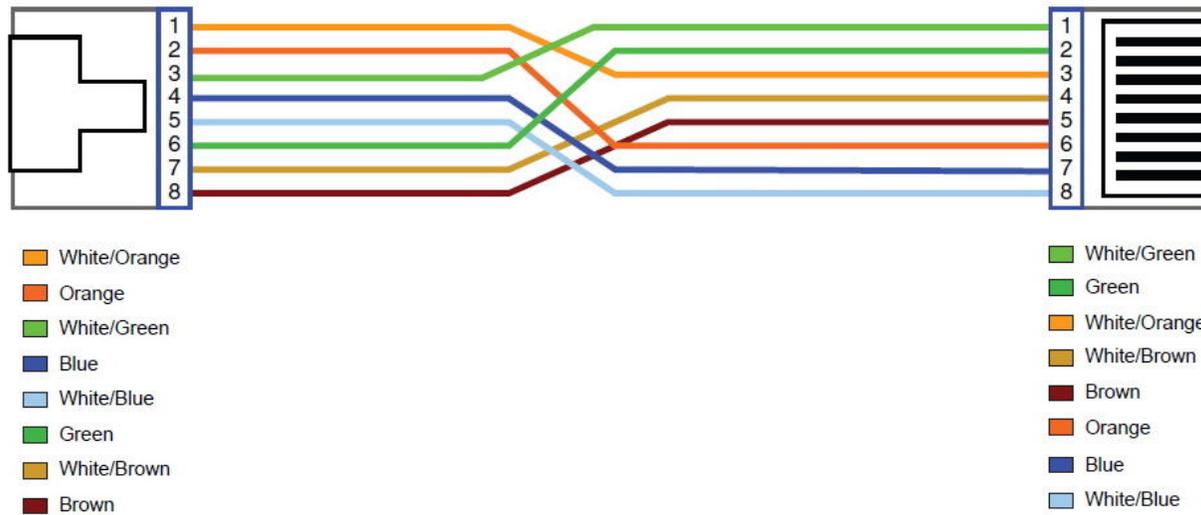**Figure A-2 Pin Assignments and Wiring for an RJ-45 Straight-Through Cable**

Figure A-3 Pin Assignments and Wiring for an RJ-45 Crossover Cable

A.2 Telephone wire

Standard telephone wire of any gauge or type-flat, twisted or quad is used to connect the NV-202M/S to the telephone network. A telephone cable typically consists of three pairs of wires, one of which is used for transmission. The connector at the end of the telephone cable is called RJ-11 connector and it consists of eight pins. VDSL signal use pins 4 and 5 for data transmission. A telephone cable is shown below. (Figure A-4)
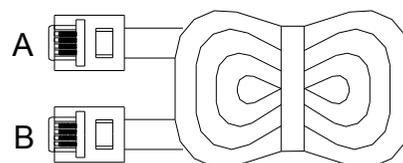
Figure A-4: Telephone cable

The A and B connectors on the rear of the NV-202M/S are RJ-11 connectors. These connectors are wired identically. The RJ-11 connectors have eight positions, two of which are wired. The NV-202M/S uses the center two pins. The pin out assignment for these connectors is presented below. (Table A-2)

Table A-2: RJ-11 Line connector Pin out Assignments

Pin#	MNEMONIC	FUNCTION
1	NC	Unused
2	**DSL**	**Used**
3	**DSL**	**Used**
4	NC	Unused

Appendix B: POE vs. POE+ parameters

Table B-1: POE vs. POE+ parameters

Property	802.3af (802.3at Type1) POE	802.3at Type 2 POE+
Power available at PD	12.95W	25.50W
Maximum power delivered by PSE	15.40W	30.0W
Voltage range (at PSE)	44.0-57.0V	50.0-57.0V
Voltage range (at PD)	37.0-57.0V	42.5-57.0V
Maximum current	350 mA	600 Ma per mode
Maximum cable resistance	20Ω(Category3)	12.5Ω(Category5)
Power management	Three power class levels negotiated at initial connection	Four power class levels negotiated at initial connection or 0.1W steps negotiated continuously
Derating of maximum cable ambient operating temperature	None	5℃ (9℉) with one mode (two pairs) active
Supported cabling	Category 3 and Category 5	Category 5
Supported modes	Mode A (endspan), Mode B (midspan)	Mode A, Mode B

Note:

1. Most switched power supplies within the powered device will lose another 10 to 25% of the available power.

2. More stringent cable specification allows assumption of more current carrying capacity and lower resistance(20.0Ω for Category 3 Versus 12.5Ω Category 5)

Appendix C: Product Specification

Key Features & Benefits

- Compliant with ETSI, ITU and ANSI VDSL2 standards
- Compliant with IEEE802.3 10BASE-T, IEEE802.3u, 100BASE-TX and IEEE802.3at Ethernet PD class 0
- Supports auto speed for Line port
- Support long reach mode up to 2km(6,562ft) / 7w power budget
- Supports Surge protection for line port
- Support OVP / OCP / OTP power protection and revise polarity auto adjustment
- Supports Robust short circuit protection
- Supports polarity detection and auto adjustment for line port
- Supports RJ-11/Terminal Block combo for Line port
- Supports 1 x RJ-11/Terminal block for VDSL line port using single pair phone cable
- Supports 1 x RJ-45 for fast Ethernet port with power injector (NV-202S only)
- Supports 1 x DIP switch for line speed and interleave delay setting (NV-202M/S)
- Supports long packet size up to 1536 bytes
- Data and Remote Power work on the single pair phone line
- Spectral compatibility with xDSL (2B1Q/4B3T)
- DIP switch with CO and CPE mode selectable
- Support High band(500khz-30Mhz) / Low band (25khz – 30Mhz) working frequency selection
- Support INP / Interleave delay time setting over DIP switch
- Supports SNRM(Noise level) selection
- Removes the 100m-distance limitation of Ethernet – for both PoV power and data
- Provide LED indicators for Power, Link/Active Status for Ethernet port and Link for VDSL port
- Supports DIN-Rail mount installation
- Supports wall mounting

- Supports wide range operating temperature(0°C ~ 55°C)

Product Specifications

Standard Compliant:	IEEE802.3 IEEE802.3u IEEE 802.3at PoE standard ITU-G993.2 VDSL2 standard
EMC Compliant:	CE,FCC,VCCI
Environmental Protection Compliant:	RoHS
Interface:	NV-202M 1 x RJ-45, 10/100Mbps auto-sensing port 1 x RJ-11 1 x Terminal Block 1 x DIP Switch 1 x DC Jack for AC I/P 100~240V / DC O/P 48V/1.875A power adapter NV-202S 1 x RJ-45, 10/100Mbps auto-sensing with PoE 1 x RJ-11 1 x Terminal Block 1 x DIP Switch
Power Protection:	Thermal overload protection OTP(Over Temperature Protection) OVP(Over Voltage Protection) OCP(Over Current Protection) Robust short circuit protection

	Surge protection
System Management:	DIP Switch for setting CO/CPE, Band, SNRM, Interleave/INP mode
Cable Connection:	RJ-45 (Ethernet): Cat. 5 or above UTP/STP RJ-11 (VDSL2): Cat.5 24AWG with twisted Pair phone wire

LED Indication:	Power/Remote Power for system Link/Active for Ethernet port Link for VDSL port Remote Power Link good for POV Power link good for POE
Power Injector mode:	Mid-span mode support connecting to Class 0,1,2,3 of PD side(power splitter)
Operating Temperature:	0°C ~ 50°C (32°F ~ 122°F)
Storage Temperature:	-20°C ~ 70°C (-4°F ~ 158°F)

Humidity:	10% to 90% (non-condensing)
Dimensions:	NV-202M: 169mm x 122mm x 35mm (6.65" x 4.8" x 1.38") NV-202S: 169mm x 115mm x 35mm (6.65" x 4.53" x 1.38")

Appendix D: DIN-Rail mount installation

This appendix describes how to install the DIN-Rail to the bridged. The accessory is optional.

◆ Please refer to install the DIN-RAIL as following step:

1. Install the DIN-Rail mounting plate to the NV-202M/S. (Figure C-1)
2. Please use the suitable DIN-Rail to install, please refer to the dimensions of the DIN-Rail.(Figure C-2)
3. Insert the top of the DIN-Rail into the top slots on the DIN-Rail mounting plate and the DIN-Rail mounting plate will snap into place. (Figure C-3、C-4)
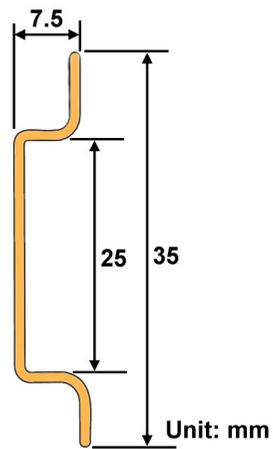
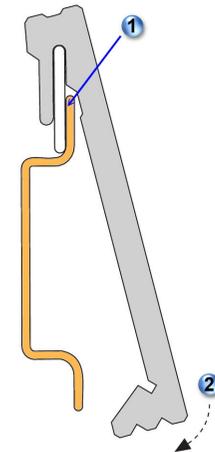| **Figure C-1** | **Figure C-2** | **Figure C-3** | **Figure C-4** |

Appendix E: Troubleshooting

Diagnosing the NV-202M/S' Indicators

The NV-202M/S can be easily monitored through its comprehensive panel indicators. These indicators assist the network manager in identifying problems that hub may encounter. This section describes common problems you may encounter and possible solutions.

1. Symptom:	POWER indicator does not light up (green) after power on.
Cause:	Defective External power supply
Solution:	Check the power plug by plugging in another that is functioning properly. Check the power cord with another device. If these measures fail to resolve the problem, have the unit power supply replaced by a qualified distributor.
Note:	Don't use other AC to DC power adapter

| 2. Symptom:	Link indicator does not light up (green) after making a connection.
Cause:	Network interface (ex. a network adapter card on the attached device), network cable, or switch port is defective.
Solution:	2.1 Power off and re-power on the VDSL NV-202M/S. 2.2 Verify that the switch and attached device are power on. 2.3 Be sure the cable is plugged into both the switch and corresponding device. 2.4 Check if the proper cable type is used and its length exceed specified limits. 2.5 Check the NV-202M/S on the attached device and cable connections for possible defects. 2.6 Make sure that the phone wire must be connected between NV-202M and NV-202S first, when both are to be power on. 2.7 Replace the defective NV-202M/S or cable if necessary.

3. Symptom:	NV-202M/S speed link cannot be established.
Cause:	NV-202M/S speed mode setting failure or phone cable length is over the specification limit of the speed mode.
Solution:	3.1 Please make sure that the phone cable must be connected between NV-202M and NV-202S when both are power on. NV-202M will link depending on the speed mode setting and phone wire length. Therefore, if NV-202M can't detect NV-202S over phone cable while both power on, this will cause the link to fail. 3.2 Please check phone cable must be Cat5 22~26 gauge with twisted pair and without rust, and the length is not over 1km. 3.3 Please check the right DIP switch setting that must follow up phone cable length limitation.
Note:	Phone cable must meet CAT 5 standard or above and without clustering, otherwise will cause more cross talk issue to reduce VDSL power driver.

4. Symptom:	NV-202S PoE LED does not light up.
Cause:	The networking device connecting to the NV-202S does not follow IEEE802.3at PoE standards.
Solution:	Make sure that the networking device must conform to IEEE802.3at PoE standards. Also, Make sure that the networking device has embedded power splitter. If not, use an external power splitter for connecting to NV-202S.

5. Symptom:	Power splitter cannot power feeding to networking device.
Cause:	NV-202S built-in power injector output is limited by phone cable length.
Solution:	Make sure to follow the product specification of NV-202S power injector output by differential cable length.

6. Question:	We using NV-202M/S kits and the end point device (NV-202S)when touch gives them a shock.
Answer:	NV-202M will supply DC high voltage for feeding NV-202S at long length phone cable. Regarding this issue, please connecting FG of NV-202M/S on rear panel to earth ground.

7. Question:	How can I establish the NV-202M/S connection.
Answer:	When the equipment you want connect to NV-202S, please make sure the networking device has built-in power splitter(PD) function, if yes, please connect it directly, if not, please connect between NV-202S and networking device through a power splitter(PD side). our PD provides 12VDC and how to choose PD model, which depend on networking device DC input requirement.

VDSL2 with Remote Power Application
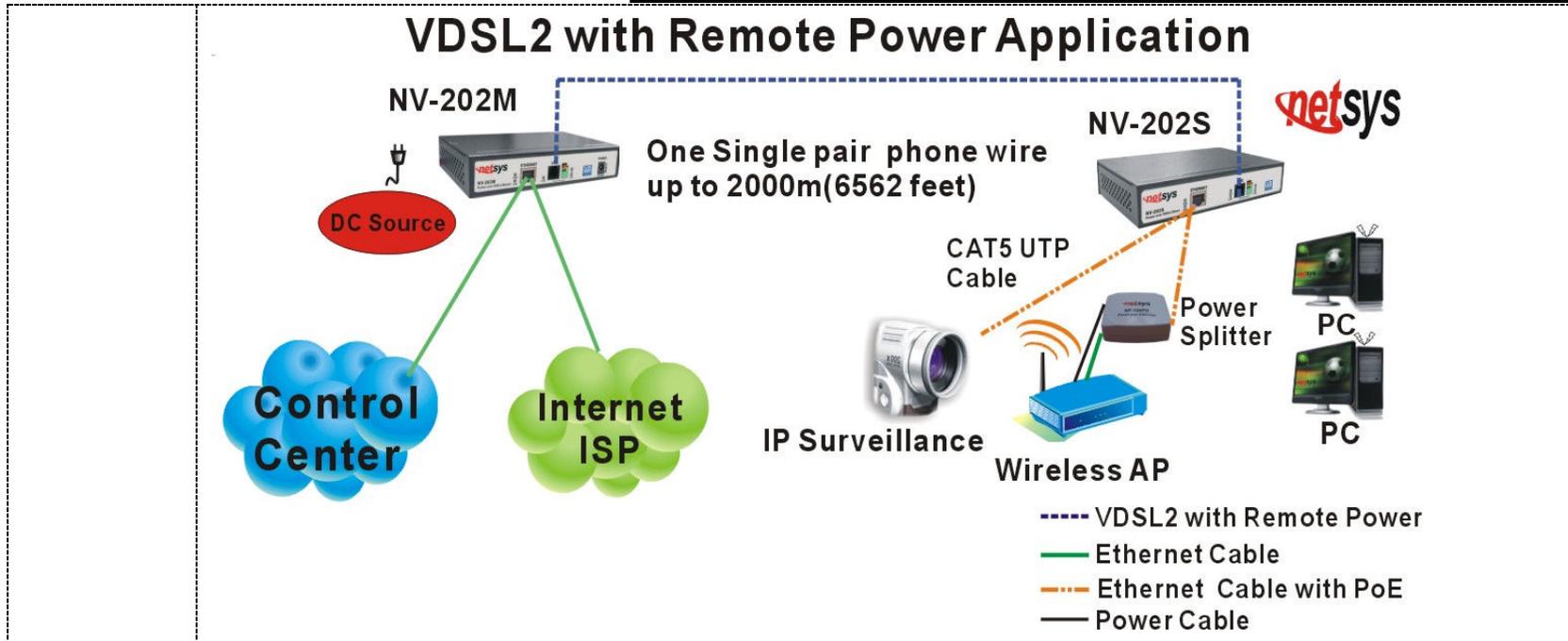
System Diagnostics

Power and Cooling Problems

If the POWER indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply as explained in the previous section. However, if the unit power is off after running for a while, check for loose power connections, power losses or surges at the power outlet, and verify that the fan on back of the unit is unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, please contact your local dealer.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (e.g. the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

Transmission Mode

The default method of selecting the transmission mode for RJ-45 ports is 10/100 Mbps ETHERNET, for RJ-11 port are auto-negotiation VDSL. Therefore, if the Link signal is disrupted (e.g. by unplugging the network cable and plugging it back in again, or by resetting the power), the port will try to reestablish communications with the attached device via auto-negotiation. If auto-negotiation fails, then communications are set to half duplex by default. Based on this type of industry-standard connection policy, if you are using a full-duplex device that does not support auto-negotiation, communications can be easily lost (i.e. reset to the wrong mode) whenever the attached device is reset or experiences a power fluctuation. The best way to resolve this problem is to upgrade these devices to a version that support Ethernet and VDSL.

Physical Configuration

If problems occur after altering the network configuration, restore the original connections, and try to track the problem down by implementing the new changes, one step at a time. Ensure that cable distances and other physical aspects of the installation do not exceed recommendations.

System Integrity

As a last resort verify the switch integrity with a power-on reset. Turn the power to the switch off and then on several times. If the problem still persists and you have completed all the preceding diagnoses, then contact your dealer.

Appendix F: Compliance and Safety Information

FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a computing device, pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. The equipment and the receiver should be connected to outlets on separate circuits.
4. Consult the dealer or an experienced radio/television technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

If this telephone equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance in order for you to make necessary

modifications to maintain uninterrupted service.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Important Safety Instructions

◆ **Caution:** The direct plug-in wall transformer serves as the main product for disconnecting. The socket outlet shall be installed near the product and be readily accessible.

◆ **Caution:** Use only the power supply included with this product. In the event the power supply is lost or damaged:In the United States, use only with CSA certified or UL listed Class 2 power supply, rated **1 x 48Vdc 1.875A** or above.
IN Europe, use only with CE certified power supply, rated **1 x 48Vdc 1.875A** or above.

◆ **Do not** use this equipment near water, for example in a wet basement.

◆ **Avoid** using a telephone during an electrical storm. There may be a remote risk of electrical shock from lightning.

◆ **Do not** use the telephone to report a gas leak in the vicinity of the leaking area.

◆ If you experience trouble with this unit, please contact customer service of your dealer immediately.

◆ **DO NOT DISASSEMBLE THIS EQUIPMENT**. It does not contain any user serviceable components.

FCC Warning

This equipment has been tested to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment can generate, use, and radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at owner's expense.

CE Mark Warning

This is a class B product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

RoHS Mark Warning

RoHS stands for Restriction of Hazardous Substances, and impacts the entire electronics industry and many electrical products as well. The original RoHS, also known as Directive 2002/95/EC, originated in the European Union in 2002 and restricts the use of six hazardous materials found in electrical and electronic products. All applicable products in the EU market since July 1, 2006 must pass RoHS compliance. Directive 2011/65/EU was published in 2011 by the EU, which is known as RoHS-Recast or RoHS 2. RoHS 2 includes a **CE-marking directive**, with RoHS compliance now being required for CE marking of products. RoHS 2 also added Categories 8 and 9, and has additional compliance recordkeeping requirements. Directive 2015/863 was published in 2015 by the EU, which is known as RoHS 3. RoHS 3 adds four additional restricted substances (phthalates) to the list of six.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Warranty

The original owner that the product delivered in this package will be free from defects in material and workmanship for one year parts after purchase.

There will be a minimal charge to replace consumable components, such as fuses, power transformers, and mechanical cooling devices. The warranty will not apply to any products which have been subjected to any misuse, neglect or accidental damage, or which contain defects which are in any way attributable to improper installation or to alteration or repairs made or performed by any person not under control of the original owner.

The above warranty is in lieu of any other warranty, whether express, implied, or statutory, including but not limited to any warranty of merchantability, fitness for a particular purpose or any warranty arising out of any proposal, specification or sample. We shall not be liable for incidental or consequential damages. We neither assume nor authorize any person to assume for it any other liability.

WARNING
Warranty Void
If Removed

WARNING:
1.DO NOT TEAR OFF OR REMOVE THE WARRANTY STICKER AS SHOWN, OR THE WARRANTY IS VOID.
2. WARRANTY VOID IF USE COMMERCIAL-GRADE POWER SUPPLY IS USED AT HARSH ENVIRONMENTS.

Chinese SJ/T 11364-2014

部件名称	有 毒 有 害 物 质 或 元 素					
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬[Cr(VI)]	多溴联苯(PBB)	多溴二苯醚(PBDE)
结构壳体	○	○	○	○	○	○
电路组	○	○	○	○	○	○
电源供应器	○	○	○	○	○	○
线材	○	○	○	○	○	○
包装及配件	○	○	○	○	○	○
○：表示该有毒物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。						
✕：表示该有毒物质至少在该部件的某依均质材料中的含量超出 GB/T 26572 标准规定的限量要求。						

上述规范仅适用於中国法律