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Networking your world

NM-2000E

2x 10/100/1000 Base-T+1.25G/

2.5G SFP Media Converter

USER'S MANUAL

NM-2000E : 2 x10 / 100 / 1000Base-T+1.25G / 2.5G SFP Media Converter USER'S MANUAL Ver.A.6

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Foreword

The Netsys' NM-2000E is a media converter that's built for Fiber or XDSL data transmission via 10/100/1000BASE-T Ethernet cable (UTP) and 1.25G/2.5G SFP slot. With DIP switch on rear side of NM-2000E, it's easy for customer to configure SFP Mode for 100M/1.25G/2.5G and LFP(Link Fault Pass-through) as well as 10/100/1000 Base-T Ethernet ports isolation mode, etc. NM-2000E will automatically do auto-negotiation & auto-MDIX to set up the most stable & fastest connection between NM-2000E and the devices that connected to it.

NM-2000E supports conversion between 10/100/1000 Base-T Ethernet and 1.25G/2.5G network, and small form-factor pluggable transceiver is required. NM-2000E also supports 9K bytes jumbo frames pass-through which is perfect to utilize in AI, IoT, video streaming application, VOIP, etc.

With high performance of data transmission and easy installation, NM-2000E is suitable for ISP to build their FTTdp/FTTC/FTTB network and small office network environment in more cost-effective way.

Attention:

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

Caution:

The NM-2000E 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 used for North America and 230V AC used for 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 check list.

Package Contents:

				
1 x NM-2000E	1 x QR code for user's manual hyperlink.	Accessory: 4 x Rubber Feet , 1 x Ethernet Cable, 1 x DC12V Adapter 1 x SFP cover		

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. If the product has any issue, please contact your local vendor.
3. Do not use sub-standard power supply. Before connecting the power supply to the device, be sure to check compliance with the specifications. The NM-2000E uses a DC 12V/1A power supply.
4. The power supply included in the package is commercial-grade. Do not use in industrial-grade applications.
5. Please look for the QR code on the bottom of the product, the user can launch the QR code scanning program to scan and download the user's manual electronic format file. Above QR code icon is for reference.

Chapter 2. Hardware Description

This section describes the important parts of the converter. It features the front panel and rear panel.

1. Front Panel: The front panel provides SFP Connector, Ethernet Connector and LED indicators of the converter.
Front panel indicator: There are 10 LED indicators on Converter, the following Table shows the description.

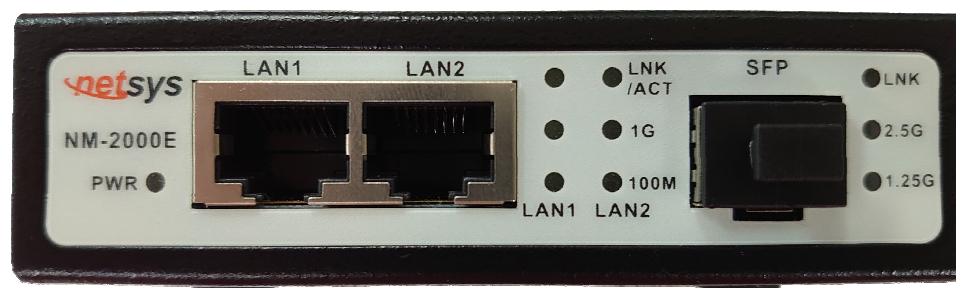


Figure 2.1 Front Panel

Tip: With only a glance of the front panel, the converter status will be fully aware.

Table 2-1 Description of the front interface

Connectors	Type	Description
LAN1 / LAN2	RJ-45	For connecting to an Networking device.
SFP	SFP slot	For small form-factor pluggable transceiver.

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2. Rear Panel: The rear panel provides Power DC Jack, mode-switching table and Dip Switch.

SFP Slot Mode Selection Table:

PIN 1	PIN 2	SFP Mode
OFF	OFF	1000X 1.25G
OFF	ON	HSGMII 2.5G
ON	OFF	SGMII 1.25G
ON	ON	SGMII 100M

Example:

To select 1000X 1.25G mode, please switch PIN 1 & PIN 2 Dip Switch to OFF.

Isolation Selection Table:

	PIN 3	PIN 4(NC)
ON	RJ-45 port Isolation	LFP enable
OFF	RJ-45 port Unisolation	LFP disable

***PIN4 is for LFP function, please flip up to activate.**

Example:

To activate isolation function, please switch on Dip Switch.

Reminder: 1.Please select the SFP mode that your SFP transceiver is compatible to, otherwise, connection cannot set up.
2. If you are using NV-100SFP on NM-2000E, please switch SFP mode to 1000X 1.25G.



Figure 2.2 Rear Panel

2.1 LED Indicators

The NM-2000E Converter has 10 LED indicators. The following Table shows the description. (Table 2-1)

Table 2-1 LED Indicators Description and Operation

LEDs	Color	Status	Description
PWR	Green	ON	Power Good
		OFF	Power Failure
LAN1/LAN2 LNK/ACT	Green	ON (Steady)	Link Status
		Blinking Fastly	Active Status
		Blinking Slowly	Data transmission Status
		OFF	No connection
LNK(SFP)	Green	ON	Link Status
		OFF	No connection
SFP 1.25G	Green	ON	Config on 1.25G SFP mode
SFP 2.5G	Green	ON	Config on 2.5G SFP mode

Note: Except for Fiber SFP transceiver, LNK (SFP) indicator will light up right away when the SFP transceiver insert into SFP slot.

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2.2 Application Diagram

Even though Fiber optic is a well developed technology, it still can't reach some places due to cost & physical limit. NM-2000E is a media converter that supports data transmission between Fiber optic and xDSL on the end point, which give you a alternative way to extend the bandwidth to Maximum 2.5Gbps without further wiring renovation.

NM-2000E Application Diagram

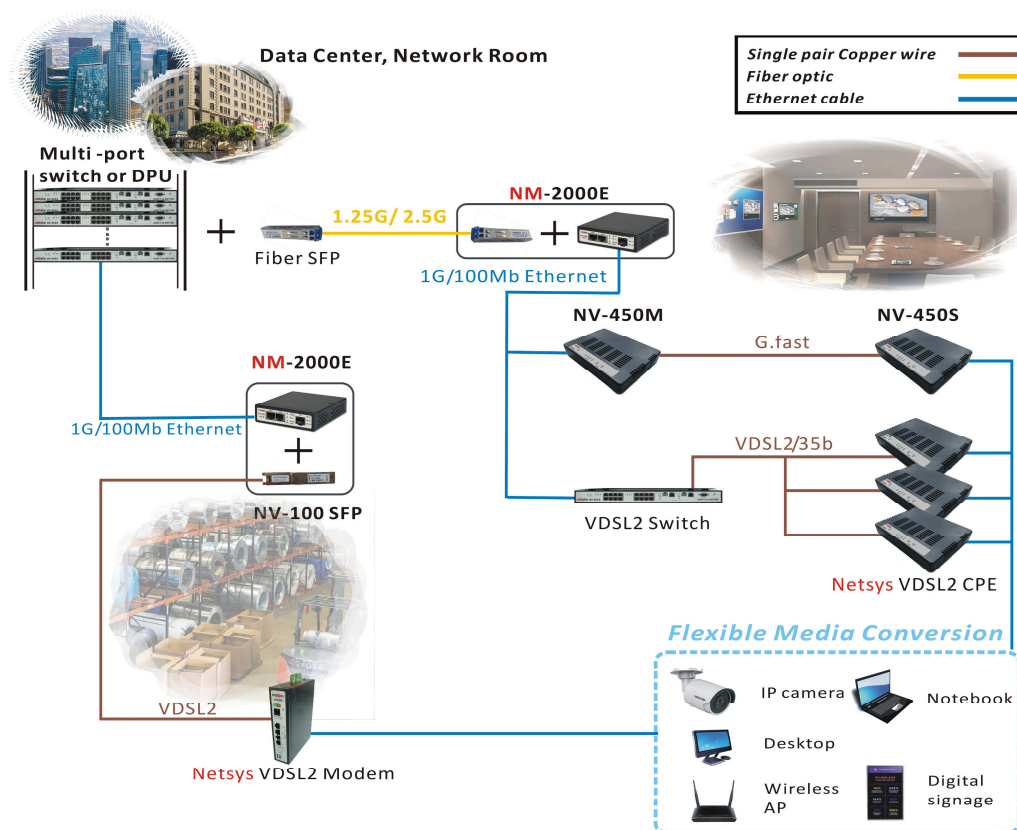


Figure 2.2 Application Diagram

Appendix A: Cable Requirements

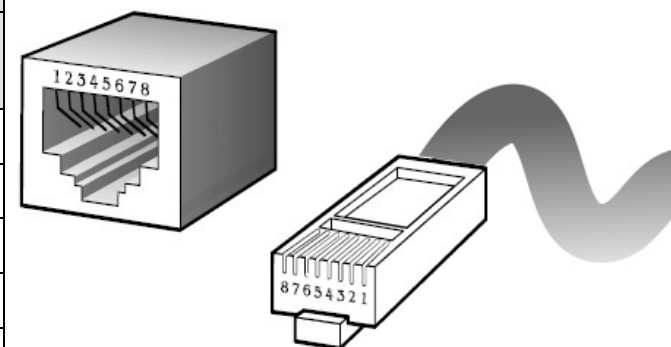
A.1 Ethernet Cable

A CAT 5~7 UTP (unshielded twisted pair) cable is typically used to connect the Ethernet device to the Modem. A: 10/100TX cable often consists of four pairs of wires, two of which are used for transmission. The connector at the end of the 10/100TX cable is referred to as a RJ-45 connector and it consists of eight pins. The Ethernet standard uses pins 1, 2, 3 and 6 for data transmission purposes. (Table A-1 10/100TX)

B: 1000TX cable often consists of four pairs of wires, all of which are used for transmission. The connector at the end of the 1000TX cable is referred to as a RJ-45 connector and it consists of eight pins. The Ethernet standard uses pins 1, 2, 3, 4, 5 and 6 for data transmission purposes. (Table A-1 1000TX)

Table A-1 RJ-45 Ethernet Connector Pin Assignments

PIN #	10/100TX		1000TX	
	Signal	Media Dependant interface	Signal	Media Dependant interface-cross
1	TX+	Transmit Data+	BI_DA+	Bi-directional pair A+
2	TX-	Transmit Data-	BI_DA-	Bi-directional pair A-
3	RX+	Receive Data+	BI_DB+	Bi-directional pair B+
4	NC	Unused	BI_DC+	Bi-directional pair C+
5	NC	Unused-	BI_DC-	Bi-directional pair C-
6	RX-	Receive Data-	BI_DB-	Bi-directional pair B-
7	NC	Unused	BI_DD+	Bi-directional pair D+
8	NC	Unused	BI_DD-	Bi-directional pair D-



**Figure A-1 Standard RJ-45
repectacle/connector**



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

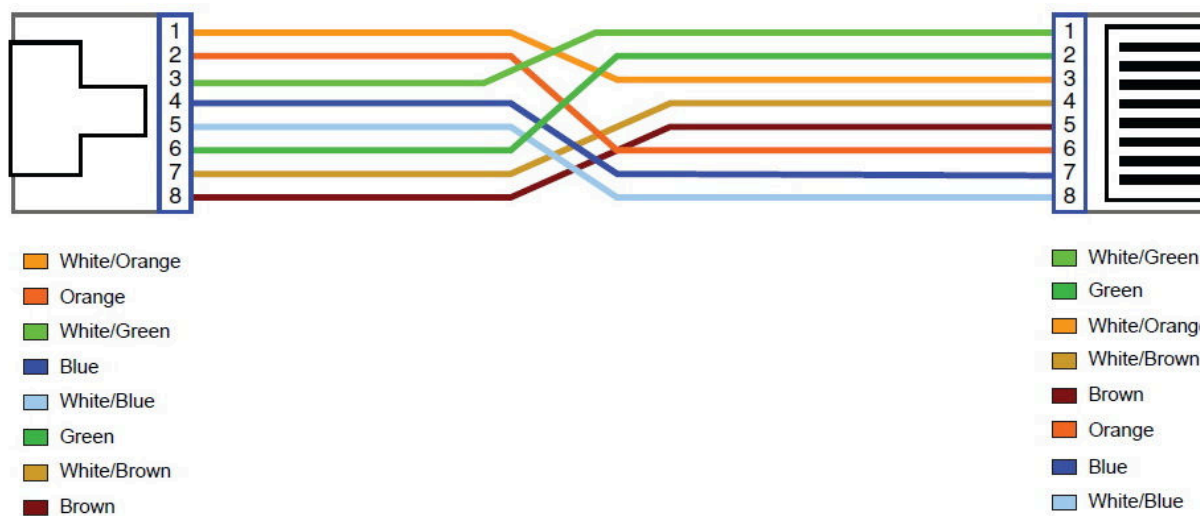


Figure A-3 Pin Assignments and Wiring for an RJ-45 Crossover Cable

Appendix B: Product Specification

Key Features and Benefits:

- ◆ Supports 2 x 10/100/1000Base-T & auto –MDIX for RJ-45 port
- ◆ Supports 1 x 1.25G / 2.5G SFP slot
- ◆ Supports up to 9K jumbo frames
- ◆ Supports DIP switch for selecting 1000X/SerDes 1.25G, HSGMII 2.5G, SGMII 1.25G, SGMII 100M SFP slot mode & RJ-45 isolation mode
- ◆ Supports DIN-Rail (Optional) installation
- ◆ Compact in size , easy installation
- ◆ Plug & Play
- ◆ Flexible application & installation
- ◆ Supports LFP(Link Fault Passthrough) function

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Specification:

Item	Description
Protocol and Standards :	IEEE 802.3u / IEEE802.3ab / IEEE802.3z
Cabling requirements:	Ethernet: 10/100/1000Base-T Cat.5 or above UTP Cable Fiber Optic: Flexible (Depending on Fiber Transceiver)
SFP Modes :	1000X/SerDes, HSGMII 2.5G, SGMII 1.25G, SGMII 100M
Interface :	2 x RJ-45 10/100/1000Mbps auto-negotiation Ethernet port 、 1 x SFP slot 、 1 x DIP switch 、 1 x DC power jack
Jumbo Frame :	9K bytes
LED Indication :	PWR LAN1/LAN2: Link/ACT, 1Gbps, 100Mbps SFP slot: Link, 2.5G, 1.25G
Certification :	CE, FCC, RoHS Compliant
Temperature :	0°C ~ 50°C (32°F ~ 122°F) (Operating) -20°C ~ 70°C (-4°F ~ 158°F) (Storage)
Optional accessories :	Din Rail mounting plate
Humidity :	10 - 90% (non-condensing)
Weight :	0.3Kg
Dimensions :	95mm x 110mm x 27mm (3.74" x 4.33"x 1.06")
Power Consumption :	0.5W
Power Adapter :	Input : AC 100~240 volts/50~60Hz Output : DC 12V/1A

Appendix C: Troubleshooting

Diagnosing Giga Media Converter Indicators

The Giga Media Converter can be easily monitored through its comprehensive panel indicators. These indicators assist in identifying problems the Media Converter 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.
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:	<ul style="list-style-type: none">◆ Verify if both of the Media Converter (all devices) and attached device are powered on.◆ Be sure the Ethernet cable and fiber optics are plugged into both the switch and corresponding device.◆ Verify that the proper cable type is used and its length does not exceed specified limits.◆ Check the Adapter on the attached device and cable connections for possible defects.◆ Replace the defective Adapter or cable if necessary.◆ Verify SFP Mode setting is correctly and repower after DIP switch setting

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. 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. 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 of transmission mode for RJ-45 ports is 10/100/1000 Mbps ETHERNET, for SFP port are 1.25Gbps/2.5Gbps SFP mode. 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 re-establish connection with the attached device via auto-negotiation

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 D: 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 class B rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generate, 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

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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 **12VDC 1A** or above.
IN Europe, use only with CE certified power supply, rated **12VDC 1A** 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.

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FCC Warning



This equipment has been tested to comply with the limits for a Class B 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

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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.

ErP Power Usage

This device complies with Energy Related Product (ErP) regulations and is not classified as a High Network Availability (HiNA) product. If it is not needed during certain periods of time, it can be unplugged to save energy.

Network Standby: 0.4 watts.

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.**

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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)	邻苯二甲 酸二(2- 乙基己 基)酯 (DEHP)	邻苯二甲 酸丁酯苯 甲酯 (BBP)	邻苯二甲 酸二丁酯 (DBP)	邻苯二甲 酸二异丁 酯 (DIBP)
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 39560 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 39560 标准规定的限量要求。										

上述规范仅适用于中国法律