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[ENG] NetPing NP-SM4, User guide

[SM4] Copyright and Disclaimer

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Developer and manufacturer:

NetPing global Ltd

[SM4] Introduction

This User Guide helps to know the peculiarities of a device operation as well as to get an idea about its functionality and technical specifications, and prepare a device for operation. A User Guide describes a model NP-SM4 of switches (hereinafter a switch or a device).

A User Guide is designed for network administrators and users, who set up or operate a device. To work with a device properly, a user must have an idea about the principles of building and functioning of local networks as well as possess the next knowledge and skills:

- Basic knowledge in the area of local and global networks;
- Basic knowledge in the area of architecture and principles of work of TCP/IP networks;
- Basic knowledge in the area of architecture and principles of work of Ethernet networks.

[SM4] NP-SM4 Switch Overview

In this section a using area of a device is described as well as its appearance, sockets and indication elements.

A Purpose of a Device

NP-SM4 – is an uncontrollable switch with 4 ports. A peculiarity of this switch is its power supply feeding from PoE (IEEE 802.3.at or IEEE 802.3.af) with a possibility to further transmit a PoE power supply. This helps to connect NP-SM4 switches in a circuit, using only an Ethernet cable.

NP-SM4 allows connecting a necessary amount of workplaces, VoIP phones, video cameras to the Ethernet with a minimal expense on a cable infrastructure.

A switch is made in a body of a wall computer socket, which makes it convenient to assemble on a horizontal or a vertical surface.

Appearance

An appearance of a switch is represented on a picture below:



Sockets and LEDs

A switch has 4 Ethernet ports 10/100BASE-TX. Two of them are on a front panel of a device, and the rest two ones are on left and right side panels. There is a socket for connecting an external power supply unit (not included into a shipping kit) on a back panel. There is a LED indicating a power supply availability on a top panel of a device.

Front Panel	Back Panel
Left Panel	Right Panel

Power Supply Unit

A device is shipped without a power supply unit included. A device can be fed from a POE Ethernet network or it is possible to plug an external power supply unit to a device with a voltage from 12V to 48V and a capacity not less than 5Watts (to feed a switch itself nonmetering POE consumers!).

If a device should operate as a POE injector for other devices in a network supporting an IEEE 802.3af/at standard, it is necessary to use a power supply unit with a voltage 48V! A capacity of a power supply unit must be enough to provide a total consumed capacity of a switch itself and all connected POE consumers.

To plug an external power supply unit, a socket DJK-02A with a 2.1 mm dowel is used.

It is recommended to use [Power Supply Unit 48V 1.5A](#) as an external power supply unit of a switch.



A shipping kit includes:

- a NP-SM4 switch;
- 6 mini jumpers for PoE switching;
- a ZIP pack.

A power supply unit is not included into a shipping kit!

[SM4] Installation and Connection

Installation and Connection

For a successful installation of a switch, there is a need to fulfill the following:

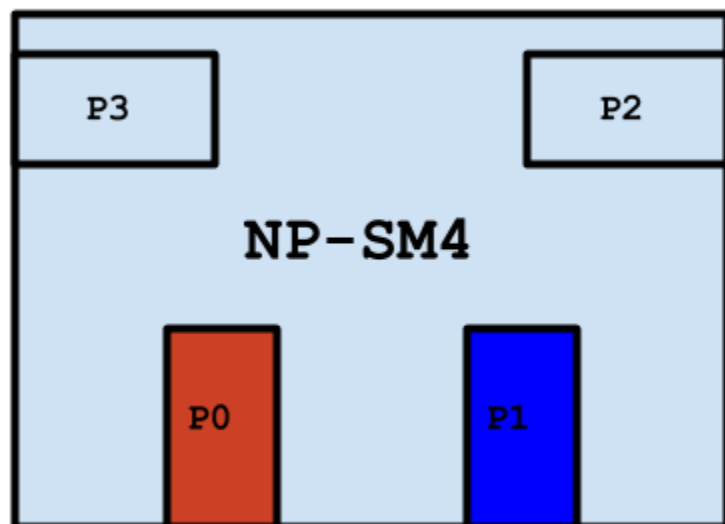
- Define, how the switch will be supplied: from an power supply unit or by PoE;
- Define, which ports of the switch will provide a power supply by PoE technology to other devices;

Important! A board of a switch is under 48 V voltage, which is dangerous for your life. To avoid an electric shock, always turn off a power supply of a switch before removing its lid. A switch operation with an opened lid is not allowed.

- Install jumpers to transmit a power supply (Look at the Section “PoE Technology in NP-SM4 Switches”);
- Put a switch in a place of planned installation;
- Apply power to a switch. A LED will light up on a case of a device;
- Connect patch cords to a switch.

[SM4] PoE Technology in NP-SM4 Switches

A switch Netping NP-SM4 has four ports: P0, P1, P2, P3. Their location and numeration are shown at the picture 6.



Picture 6. Ports Location

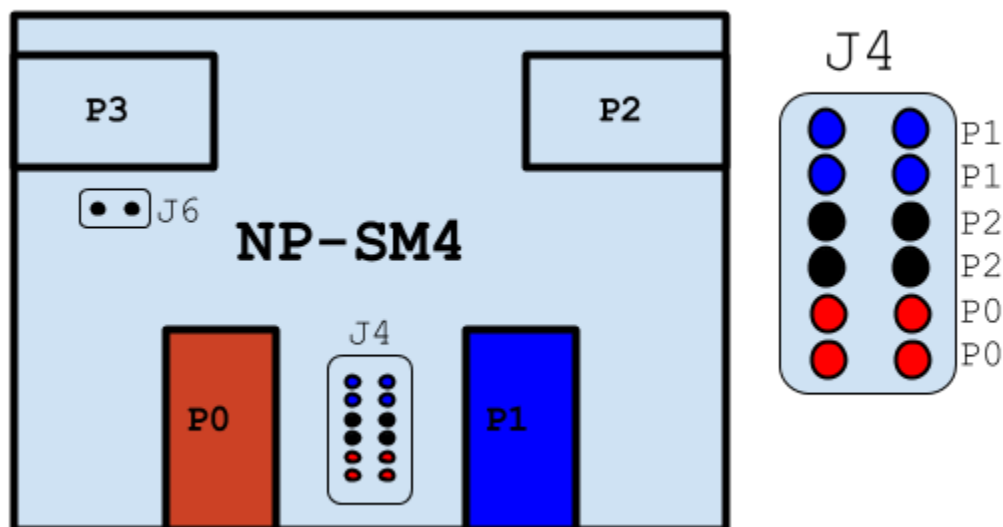
A port P3 is designed to feed a power supply to a switch NP-SM4 with the help of PoE-injector or any other PSE device. A power supply voltage range at a port P3 is 42 – 60V. A compatibility determination scheme works at a port P3 with PoE devices of af/at standard. Jumper J6 disables a work of PoE determination scheme and decreases a lower limit of a voltage range to 5 V (more detailed information about J6 is given below).

A switch can be fed with the help of external power supply unit. An input voltage range for a supply unit is 11 – 60 V. A priority is given to a power supply unit. When a voltage on input of a power supply unit exceeds 10 V, PoE input is disabled.

NP-SM4 switch can transmit power supply received from PoE-injector or a power supply unit on ports P0, P1, P2.

Important! A partner PoE determination scheme doesn't work on ports P0, P1, P2. When jumpers are installed, power supply is always fed without determining if a partner supports PoE. Power supply is always fed on both pairs for transmitting data and on unused pairs. (A and B variants of PoE standard). It's impossible to choose either one of the variants.

By default, NP-SM4 switch does not feed the ports P0, P1, P2. There is a need to install jumpers on a board of a switch to feed one or several ports. Two jumpers are responsible for each port. A location of jumpers is shown at the picture 7.

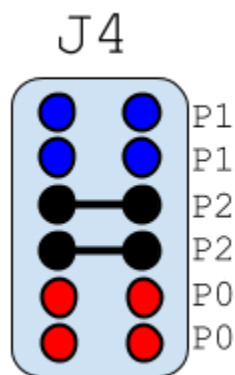


Picture 7. Location of Jumpers on a Board of a Switch

J4 jumpers block is responsible for feeding. Two upper jumpers (when installed) enable P1 port feeding, two middle ones enable P2 port feeding, and two lower ones enable P0 port feeding.

J6 jumper (when installed) decreases a lower limit of a voltage range of P3 port to 5 V (when J6 is not installed, a voltage on P3 should be in a range 42 – 60 V). This helps to feed a device even with a long cable with a big voltage drop. Installing of a jumper J6 disables a function of auto determination, which is used by PSE devices to determine a presence of PoE consumers (PD devices). Thus PSE devices will feed NP-SM4, which has a jumper J6 installed. J6 jumper is not included into a shipping kit.

Jumpers are installed horizontally. Improper installation of jumpers can damage a switch. An example of a proper installation of jumpers for feeding P2 port is shown at the picture 8.



Picture 8. Proper Installation of Jumpers

Important! A board of switch is under 48 V voltage, which is dangerous for a life. To avoid an electric shock, always turn off a power supply of a switch before removing its lid. A switch operation with an opened lid is not allowed.

Important! Do not turn on feeding of ports, where an equipment, which does not support PoE, can be connected.

To feed a certain port of a switch, it is a necessary to fulfill the following:

- Turn off power supply of NP-SM4 switch;
- Remove a lid of a switch, using an end screwdriver. To do this, there are grooves near P3 and P2 ports;
- Install/remove jumpers;
- Close a lid of a switch;
- Turn on power supply of a switch.

A maximum capacity of a NP-SM4 switch (and all PoE consumers, connected to it), should not exceed 30 watts according to the 802.3at standard. Consumers can be connected to different ports of NP-SM4 switch or to one port, there is no limit to a total power. A maximum power consumption of NP-SM4 switch itself is 2.5 watts, which gives an opportunity to join up to 10 NP-SM4 switches in a circuit, using short patch cords. However, it is not recommended to join more than four switches in a circuit.

There is a need to take into account a voltage drop on long lines, as for 100 meter cable segment of class 5 a voltage drop can make up to 10 V on a device. Thus it is possible to join only two devices in a circuit.

[SM4] QoS Technology in NP-SM4 Switches

QoS technology in NP-SM4 switches is programmed to provide a good result for the most scenarios with default settings.

Amount of queues in the interface:4

Queues servicing mechanism:WRR (Weighted Round Robin)

Traffic classification: by six high-order IP TOS and IPv6 TC bits

Classification table:

Queue number	Beginning of the Range	End of the Range
0	0x00	0x0f
1	0x10	0x1f
2	0x20	0x2f
3	0x30	0x3f

Queue 3 has the biggest weight, queue 0 – the least one.

Make sure that IP-phones mark voice traffic with DSCP values, which correspond to queues 2 or 3 to ensure a prioritization of a voice traffic.

[SM4] Warranty

The manufacturer guarantees normal operating of the product within 24 months from the date specified on the warranty sticker if a buyer follows operating and storage conditions. Manufacturer warranty applies only to failure of a device, which occurred because of defects in manufacturing process of products and components used. If during a warranty period, the manufacturer receives a notice of such defects, it will repair or exchange a product (by its own discretion). If the manufacturer is unable to repair or replace a flawed item during a period of time determined by the current legislation, the manufacturer according to a customer's wish can return the amount paid for the product at the time of purchase. The manufacturer provides a limited warranty on firmware and device configuration software. In case of detecting any errors in software, which became known to the manufacturer on its own or from a customer, the manufacturer will fix these errors within a reasonable time and provide an update for the customer. Only the errors that block normal use of the device at conditions and for performing functions, described in this User Guide, are subject to mandatory fix. This warranty does not apply to cases, when defects appear because of: a misuse of a device, any modifications of a device without a written permission of the manufacturer, opening up a device, except cases, foreseen by this description, repairing by unauthorized personnel, using or storing a device out of the range of allowable temperature and humidity, pressure, a software modification, and the reasons, listed below:

- A device failed because of the problems in a public electric network, plugging a device into power supply networks with invalid parameters, absence of grounding, etc. (power fluctuations and surges, overloading, etc.);
- A device failed because of a liquid inside;
- A device failed as a result of extreme temperatures;
- A device failed because of mechanical damage;
- A device failed because of connecting a power supply unit with invalid output voltage or a defective power supply unit;
- There are foreign objects, insects, etc inside the enclosure;
- During operation, a voltage bigger than an allowable voltage range by the Ethernet standard has been supplied to the ports of a device.