# LNP-0500 series

## 5-port Industrial PoE+ Unmanaged Ethernet Switches

## 4*10/100Tx (30W/Port) + 1*10/100Tx




# User Manual

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# FCC Warning

This Equipment has been tested and found 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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# CE Mark Warning

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

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# Introduction

Antaira's LNP-0500 series switches are smart 5-port Industrial Unmanaged Ethernet Switches supporting IEEE-802.3at compliant (Power-over-Ethernet Plus) on ports 1 to 4. The switches are classified as power source equipment (PSE), and when used in this way, the LNP-0500 series switches enable centralization of the power supply and provide up to 30 watts of power per port. The switches can be used to power IEEE 802.3af or 802.3at compliant power devices (PD), eliminating the need for additional wiring, and support IEEE 802.3/802.3u/802.3x with 10/100BTx, full or half duplex, MDI/MDI-X auto sensing to provide an economical solution for the Industrial Ethernet Network.

In addition, the Network Broadcast Storm Protection and built-in relay warning function alerts network engineers when power failures or port breaks occur.

## Features

- System Interface/Performance
  - RJ-45 ports support Auto MDI/MDI-X Function
  - Embedded 4-port 10/100Tx w/PoE+ and 1-port 10/100Tx Fast Ethernet
  - Store-and-Forward Switching Architecture
  - Broadcast Storm Protection
  - 2K MAC Address Table

- Power Supply
  - DC 48 ~ 55V Redundant Power
- Operating Temperature
  - Standard Operating Temperature model: -10°C ~ 70°C
  - Extend Operating Temperature model with -T: -40°C ~ 75°C
- Case/Installation
  - IP-30 Protection
  - Installation in Pollution Degree 2 Environment
  - DIN Rail and Wall Mount Design
- Provides EFT protection 2,000 VDC for power line
- Supports 6,000 VDC Ethernet ESD protection

## Package Contents

Please refer to the package contents list below.

- LNP-0500 series - 5-Port Industrial PoE+ Unmanaged Ethernet Switch w/DIN Rail Bracket
- User Manual
- Removable Terminal Block
- Wall-mount Kit (2 Wall-mount Plates with Screws)

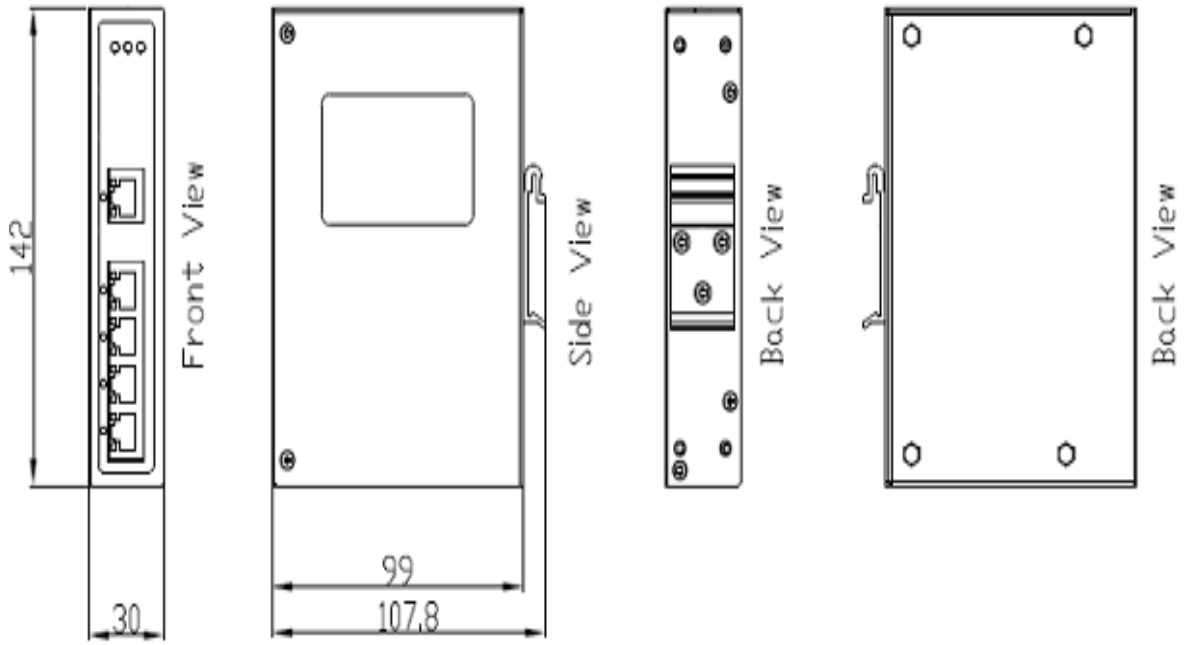
Compare the contents of the industrial switch with the checklist above. If any item is damaged or missing, please contact Antaira or Antaira's authorized channel partners for service.

# Hardware Description

The Industrial switch's hardware spec, port, cabling information, and wiring installation will be described.

## Physical Dimension

The LNP-0500 series - 5-Port Industrial PoE+ Unmanaged Ethernet Switch dimension: (W x D x H) is **30mm x 99mm x 142mm**



## Front Panel

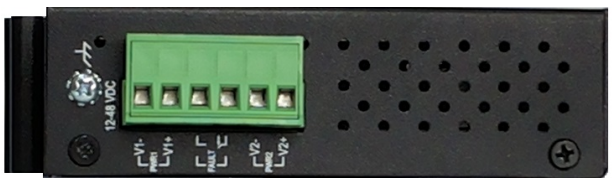
The Front Panel of the PoE Industrial Switch is shown below:




Front Panel of the PoE Industrial Switch

## Top View

The top view of the PoE Industrial Switch has one terminal block connector of two DC power inputs and relay circuit contact.




Top View of the PoE Industrial Switch

# LED Indicators

The diagnostic LEDs located on the front panel of the industrial switch provide real-time information of the system and optional status. The following table provides the description of the LED status.

| LED | Color | Description | |
|---|---|---|---|
| P1 | Green | On | Power input 1 is active |
| | | Off | Power input 1 is inactive |
| P2 | Green | On | Power input 2 is active |
| | | Off | Power input 2 is inactive |
| Fault | Red | On | Power input 1 or 2 has failed, port link is inactive |
| | | Off | Power input 1 and 2 are both functional, or no power inputs/port's link is active/port alarm is disabled |
| PoE Indicator (Port 1 ~ 4) | Green | On | The port is supplying power to the powered-device |
| | | Off | No powered-device attached or power supplying fails |
| LAN Port 1 ~ 5 (RJ-45) | Green  | On | Connected to network, 100Mbps |
| | | Flashing | Networking is active |
| | | Off | Not connected to network |
| | Green  | On | Connected to network, 10Mbps |
| | | Flashing | Networking is active |
| | | Off | Not connected to network |

# Ports

## ■ RJ-45 ports

The (RJ-45) Fast Ethernet ports will auto-sense for 10Base-T or 100Base-TX connections. Auto MDI/MDIX means that the switch can connect to another switch or workstation without changing straight through or crossover cabling. Please refer to the table below for RJ-45 pin assignment.

## ■ RJ-45 Pin Assignments

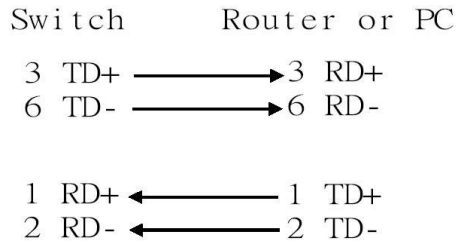
| Pin Number | Assignment |
|---|---|
| 1 | Rx+ |
| 2 | Rx- |
| 3 | Tx+ |
| 6 | Tx- |

***Note*** *"+" and "-" signs represent the polarity of the wires that make up each wire pair.*

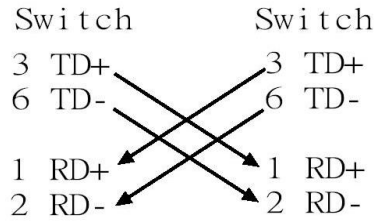
All ports on this industrial switch supports automatic MDI/MDI-X operation, users can use straight-through cables (See figure below) for all network connections to PCs or servers, or to other switches or hubs. With straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable. The table below shows the 10BASE-T/100BASE-TX MDI and MDI-X port pin outs.

| Pin MDI-X | Signal Name | MDI Signal Name |
|---|---|---|
| 1 | Receive Data plus (RD+) | Transmit Data plus (TD+) |
| 2 | Receive Data minus (RD-) | Transmit Data minus (TD-) |
| 3 | Transmit Data plus (TD+) | Receive Data plus (RD+) |
| 6 | Transmit Data minus (TD-) | Receive Data minus (RD-) |

The following figures show the cable schematic for both straight-through type and crossover type.




Straight Through Cable Schematic




Cross Over Cable Schematic

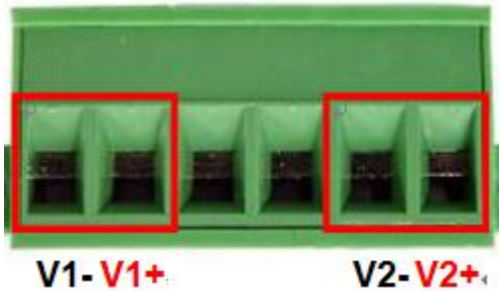
## Cabling

- Twisted-pair segments can be connected with an unshielded twisted pair (UTP) or shielded twisted pair (STP) cable. The cable must comply with the IEEE 802.3u 100Base TX standard (e.g. Category 5, 5e, or 6). The cable between the equipment and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.

## Wiring the Power Inputs

Please follow the steps below to insert the power wire.

Insert the positive and negative wires into the PWR1 (V1+, V1-) and PWR2 (V2+,V2-) contacts on the terminal block connector.




Tighten the wire-clamp screws to prevent the wires from loosening.

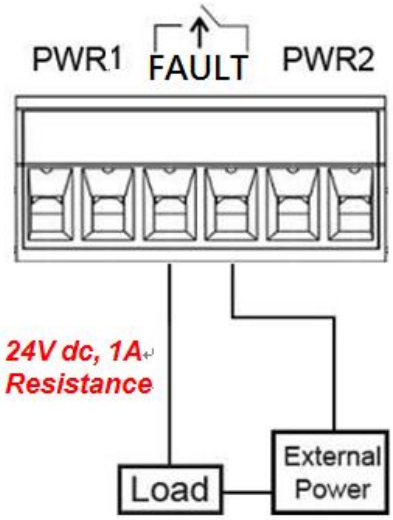


***Note***

- *Use Copper Conductors Only, **60/75°C**, Tighten to **5 lb** in*
- *The wire gauge for the terminal block should range between **12 ~ 18 AWG**.*

## Wiring the Fault Alarm Contact

The fault alarm contact is in the middle of the terminal block connector as the picture shows below. By inserting the wires, it will detect the fault status including power failure or port link failure (managed industrial switch only) and form a normally open circuit. An application example for the fault alarm contact is shown as below:





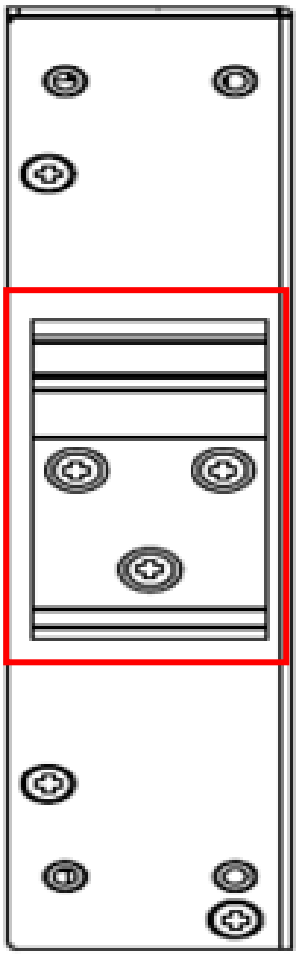

***Note***

- *Use Copper Conductors Only, **60/75°C**, Tighten to **5 lb** in*
- *The wire gauge for the terminal block should range between **12 ~ 24 AWG**.*

# Mounting Installation

## DIN-Rail Mounting

The DIN-Rail is screwed on the industrial switch from the factory. If the DIN-Rail is not screwed on the industrial switch, please see the following pictures to screw the DIN-Rail on the switch. Follow the steps below to hang the industrial switch.



1. Use the screws to screw the DIN-Rail bracket on the rear side of the industrial switch.
2. To remove the DIN-Rail bracket, reverse the step 1.
3. After the DIN-Rail bracket is screwed on the rear side of the switch, insert the top of

DIN-Rail on to the track.



4. Then, lightly pull down the bracket on to the rail.

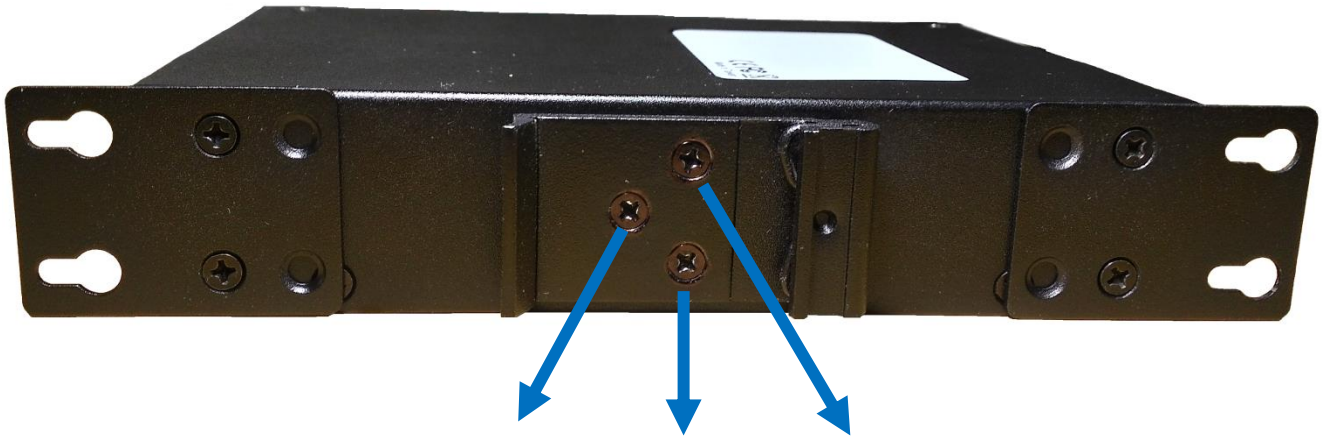


5. Check if the bracket is mounted tight on the rail.
6. To remove the industrial switch from the rail, reverse steps above.

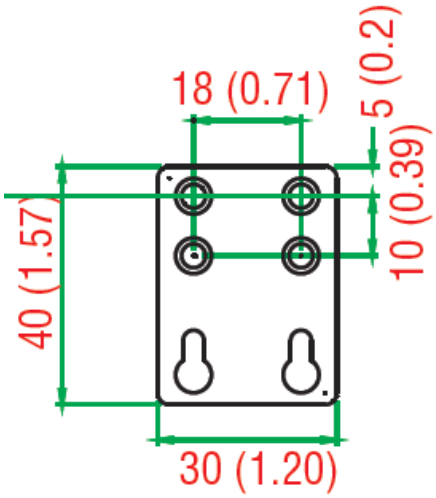
## Wall Mounting

Follow the steps below to mount the industrial switch using the wall mount bracket.

1. Remove the DIN-Rail bracket from the industrial switch; loosen the screws to remove the DIN-Rail.
2. Place the wall mount bracket on the top and bottom of the industrial switch.
3. Use the screws to screw the wall mount bracket on the industrial switch.
4. Use the hook holes at the corners of the wall mount bracket to hang the industrial switch on the wall.
5. To remove the wall mount bracket, reverse steps above.



Below is the dimension of the wall mount bracket.



# Hardware Installation

This section is to explain how to install the LNP-0500 series Industrial PoE+ Unmanaged Ethernet Switch.

## Installation Steps

1. Unpack the Industrial switch packing.
2. Check if the DIN-Rail bracket is screwed on the Industrial switch. If the DIN-Rail is not screwed on the Industrial switch, please refer to the **DIN-Rail Mounting** section for DIN-Rail installation. If users want to wall mount the Industrial switch, then please refer to the **Wall Mounting** section for wall mount installation.
3. To hang the Industrial switch on a DIN-Rail or wall, please refer to the **Mounting Installation** section.
4. Power on the Industrial switch. Please refer to the **Wiring the Power Inputs** section for information about how to wire power. The power LED on the Industrial switch will turn on. Please refer to the **LED Indicators** section for indication of LED lights.
5. Prepare the twisted-pair, straight through Category 5/above cable for Ethernet connection.
6. Insert one side of the RJ-45 cable into the Industrial switch Ethernet port and on the other side to the network device's Ethernet port, e.g. Switch PC or Server. The Ethernet port (RJ-45) LED on the Industrial switch will turn on when the cable is connected to the network device. Please refer to the **LED Indicators** section for LED light indication.
7. When all connections are set and the LED lights all show normal, the installation is complete.

# Network Application

This segment provides an example of an industrial switch application.



# Troubleshooting

- Verify the right power cord/adapter, never use power supply/adapter with non-compliant DC output voltage, or it will burn the equipment.
- Select the proper UTP/STP cable to construct the network with using the right cable. Use unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable for RJ-45 connections: 100Ω Category 5e/above cable for 10M/100Mbps. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).
- **Diagnosing LED Indicators:** To assist in identifying problems, the Switch can be easily monitored through LED indicators, which describe common problems a user may encounter and where the user can find possible solutions.
- If the power indicator LED does not turn on when the power cord is plugged in, the user may have a problem with the power cord. Check for loose power connections, power losses or surges at the power outlet. Please contact Antaira or Antaira's authorized channel partners for technical support service, if the problem still cannot be resolved.
- If the Industrial switch LED indicators are normal and the connected cables are correct but the packets still cannot transmit. Please check the system's Ethernet devices' configuration or status.

# Technical Specification

The LNP-0500 series - 5-Port Industrial PoE+ Unmanaged Ethernet Switch technical specifications is shown below.

| | |
|---|---|
| **Standard** | IEEE 802.3 10Base-T Ethernet<br>IEEE 802.3u 100Base-TX Fast Ethernet<br>IEEE802.3x Flow Control and Back Pressure<br>IEEE802.3at Power over Ethernet |
| **Protocol** | CSMA/CD |
| **Transfer Rate** | 14,880 pps for 10Base-T Ethernet port<br>148,800 pps for 100Base-TX Fast Ethernet port |
| **MAC Address** | 2K Table size |
| **RJ45 Port** | 4*10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection |
| **PoE Pin Assignment** | RJ-45 port #1 ~ # 4 support IEEE 802.3at End-point, Alternative A mode.<br>Positive (VCC+): RJ-45 pin 1, 2.<br>Negative (VCC-): RJ-45 pin 3, 6.<br>Data (1,2,3,6 ) |
| **LED** | **Per unit**: Power 1 (Green), Power 2 (Green), Fault (Red)<br>**Per port**: Link/Activity (Green)<br>**PoE**: Feeding Power (Green) |
| **Network Cable** | 10Base-T: 2-pair UTP/STP Cat. 3, 4, 5, 5e cable<br>EIA/TIA-568 100-ohm (100m)<br>100Base-TX: 2-pair UTP/STP Cat. 5/5e, 6 cable<br>EIA/TIA-568 100-ohm (100m) |
| **Over Current Protection** | Single-Blown Fuse |
| **Power Input** | Redundant Power DC 48 ~ 55V with Connective<br>1*6-Pin Removable Terminal Block |

| | |
|---|---|
| **Max Power Consumption** | 110 Watts @ 48V, 130 Watts @ 51-55V<br>Full Load with PoE Function |
| **Installation** | DIN Rail Mounting, Wall Mounting |
| **Operating Temp.** | Standard Operating Temperature: -10$^{o}$C to 70$^{o}$C<br>Wide Temperature model: -40$^{o}$C to 75$^{o}$C |
| **Operating Humidity** | 5% to 95% (Non-Condensing) |
| **Storage Temperature** | -40$^{o}$C to 85$^{o}$C |
| **Case Dimension** | IP-30, 30mm (W) x 99mm (D) x 142mm (H) |
| **EMI** | FCC Class A<br>CE EN61000-4-2/3/4/5/6/8<br>CE EN61000-6-2<br>CE EN61000-6-4 |
| **Safety** | UL 508 (Pending - Please check with Antaira or authorized channel partner for update status) |
| **Stability testing** | IEC60068-2-32 (Free fall)<br>IEC60068-2-27 (Shock)<br>IEC60068-2-6 (Vibration) |