



## LNP-0800G-M12-67-24 Series

8-Port Industrial M12 IP67 Waterproof Gigabit PoE+ Ethernet Switch, w/8\*10/100/1000Tx (30W/Port) M12 Connector (X-Coded), 24~55VDC



Version 1.2

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## User Manual



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## FCC Notice

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.

**Caution:** Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

## 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.

## Industrial Ethernet Switches

User Manual

This manual supports the following models:

- LNP-0800G-M12-67-24
- LNP-0800G-M12-67-24-T

Please check our website ([www.antaira.com](http://www.antaira.com)) for any updated manual or contact us by e-mail ([support@antaira.com](mailto:support@antaira.com)).

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# 1. Overview

**Antaira Technologies' LNP-0800G-M12-67-24 Series** is an 8-port 10/100/1000Tx M12 IP67 PoE+ industrial Ethernet switch that meets the high-reliability requirements demanded by industrial applications. Its M12 connectors ensure a tight and robust connection and it guarantees reliable operation on applications that are subject to high vibration and shock in dust, liquid, or gas laden environments. Being able to operate under the standard temperature range from -10°C to 60°C or extended temperature range from -40°C to 70°C, the LNP-0800G-M12-67-24 Series can be installed in almost any harsh environment.

## 1.1 Key Features

- System Interface/Performance
  - All copper ports support auto MDI/MDI-X function
  - Embedded 8\*10/100/1000Tx with IEEE 802.3at compliant ports (30W/port)
  - Store-and-forward switching architecture
  - 8K MAC Address Table
  - Supports 12.2Kbytes Jumbo Frame
  - 448Kbits memory buffer
- Power Input
  - Redundant power DC 24-55V through M12 4-Pin T-Coded male connector
  - Max. current 8.8A
  - Max. PoE output: 200Watts
  - Relay Contact: 24VDC, 1A resistive, through M12 5-Pin A-Coded female connector
- Operating Temperature
  - Standard operating temperature model: -10°C ~ 60°C
  - Extended operating temperature model: -40°C ~ 70°C
- Case/Installation
  - Aluminum case
  - IP67 protection
  - Installation in a Pollution Degree 2 industrial environment
  - Wall mount design

## 1.2 Package Contents

- 1 – Quick Installation Guide
- 1 – LNP-0800G-M12-67-24(-T)
- 1 – Set of 10\*M12 protective caps

## 1.3 Safety Precaution

### **Attention**

If the DC voltage is supplied by an external circuit, please use a protection device on the power supply input. Supply by a UL listed industrial use power. The industrial Ethernet switch's hardware specs, ports, cabling information, and wiring installation will be described within this user manual.

**Warning Labels**

The caution label means that you should check the certain information in the user manual when working with the device. (Shown in *Figure 1*)



*Figure 1: Caution Label*

## 2. Hardware Description

### 2.1 Physical Dimensions

Figure 2.1, below, shows the physical dimensions of Antaira Technologies' LNP-0800G-M12-67-24(-T):

(W x H x D) is **253.6mm x 122mm x 116.1mm**

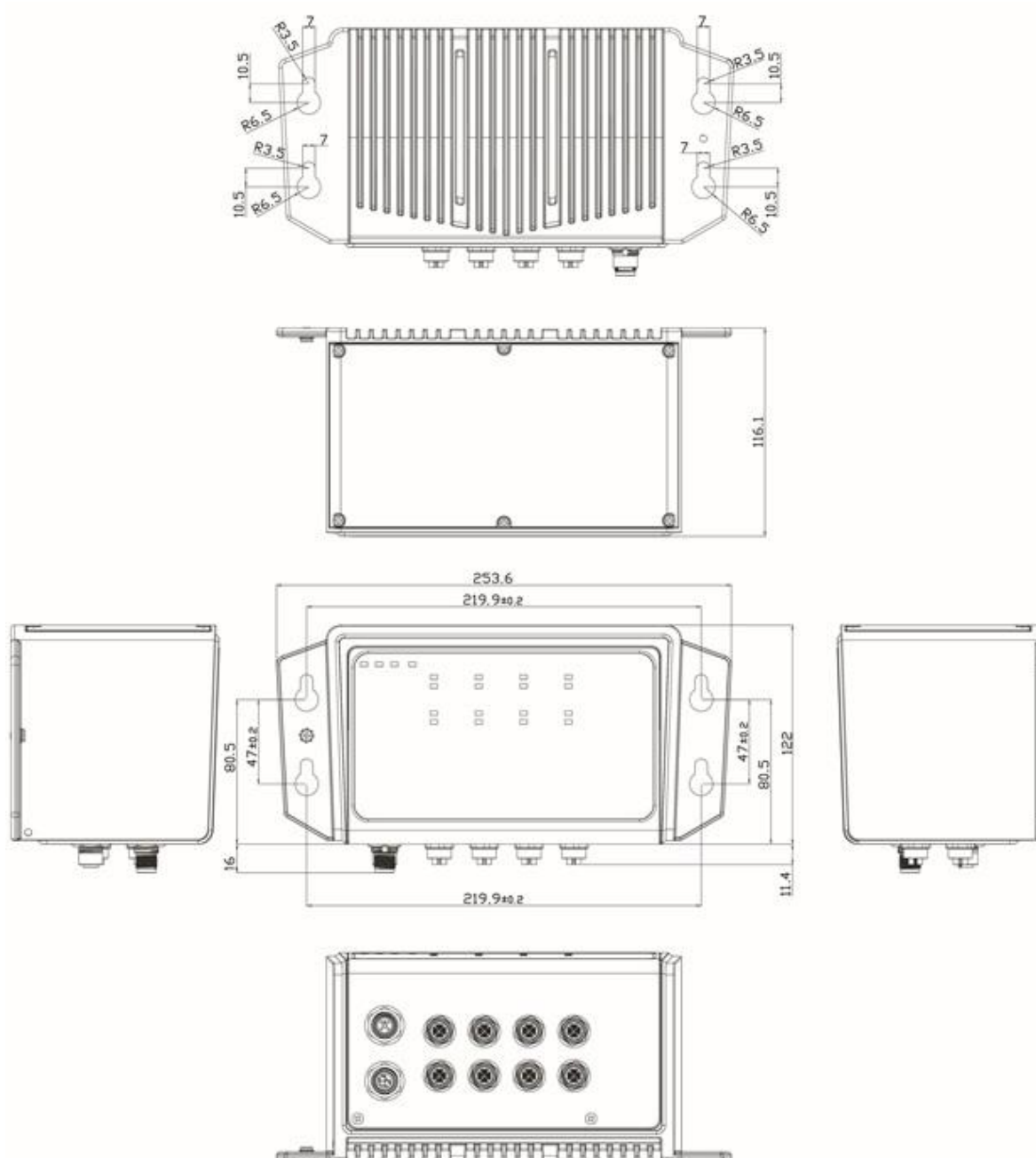
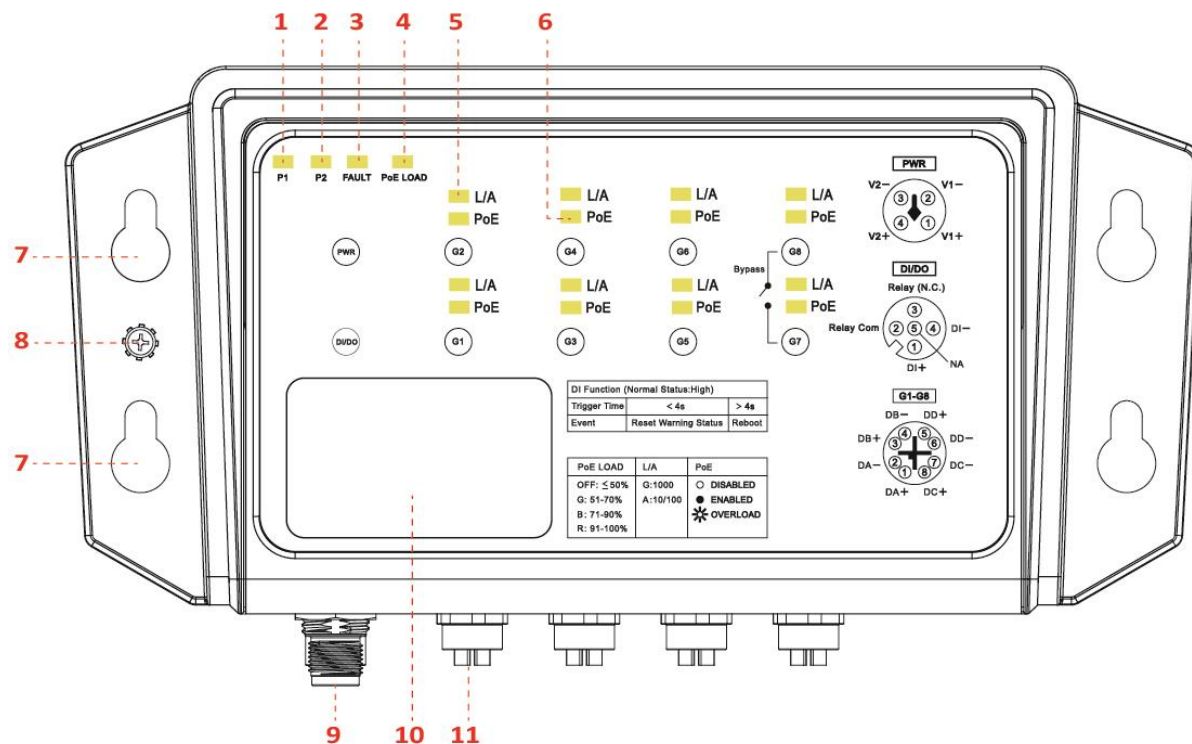


Figure 2.1

## 2.2 Front Panel

The front panel of the LNP-0800G-M12-67-24(-T) can be seen below (*Figure 2.2*).



*Figure 2.2*

1. Power 1 LED
2. Power 2 LED
3. Fault LED
4. PoE Load LED
5. 10/100/1000Mbps Link/Act LED
6. PoE Output LED
7. Screw Holes for Wall Mounting
8. Grounding Screw
9. Power Input Port: M12 4-Pin T-Coded Male Connector
10. Product Label
11. 10/100/1000Base-T(X) Ethernet Port: From Port G1 to G8 with M12 8-Pin X-Coded Female Connector

## 2.3 Top View

*Figure 2.3*, below, shows the bottom panel of the LNP-0800G-M12-67-24(-T) that is equipped with 8 x M12 X-Coded female connectors, 1 x M12 T-Coded male connector for dual DC power inputs (24-55VDC), and 1 x M12 A-Coded female connector for relay contact/digital input.

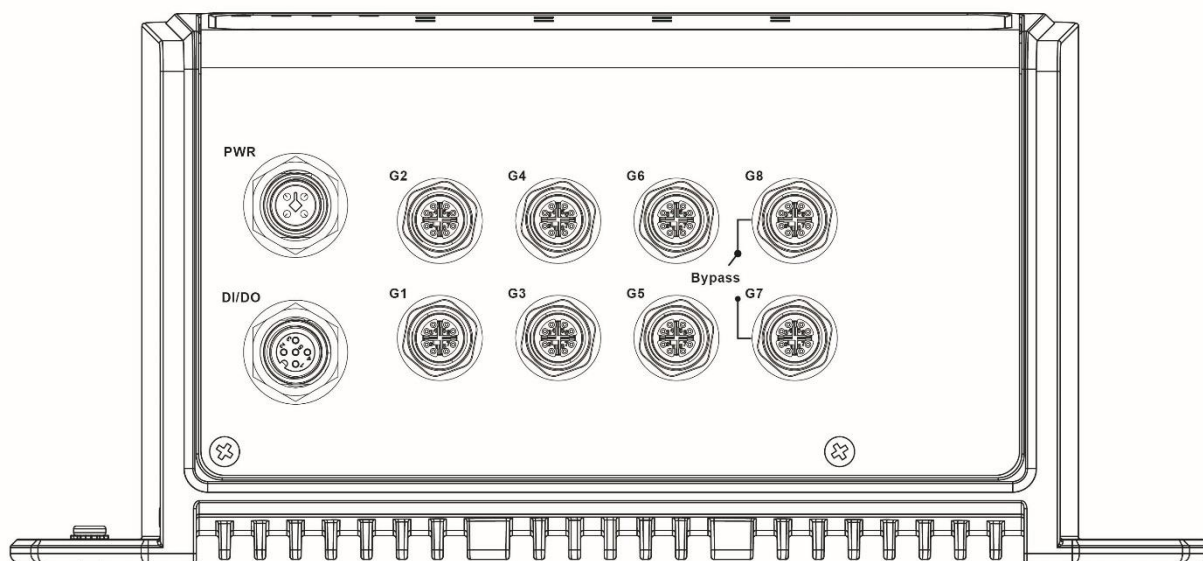


Figure 2.3

## 2.4 LED Indicators

There are LED light indicators located on the front panel of the industrial Ethernet switch that displays the power and network status. Each LED indicator has a different color and has its own specific meaning, see below in *Table 2.1*.

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	There are three possible conditions that would make the LED light up: 1. If the current PoE outputs of all connected PDs were overloaded (>200 Watts) 2. If Power 1 or Power 2 was inactive 3. If the current PoE output of one or more PDs was overloaded (>30Watts)
		Off	Since the last reset of the fault LED, the PoE output of all connected PDs has not over 200W and no PD has been overloaded in this period and the power 1 & power 2 have not failed
PoE Load	Off	Off	The current PoE output of all connected PDs is $\leq 50\%$
	Green	On	The current PoE output of all connected PDs is 51% ~ 70%
	Blue	On	The current PoE output of all connected PDs is 71% ~ 90%
	Red	On	The current PoE output of all connected PDs is 91% ~ 100%
<b>Note:</b> The Max. PoE output of this switch is 200Watts.			

Port G1 to G8 L/A	Green	On	Connected to the network with 1000Mbps
		Flashing	Networking is active
		Off	Not connected to network
	Amber	On	Connected to network with 10/100Mbps
		Flashing	Networking is active
		Off	Not connected to network
Port G1 to G8 PoE	Green	On	The current PoE output is enabled
		Flashing	Overload occurred (>30 Watts) at the connected PD
		Off	The current PoE output is disabled

Table 2.1

**NOTE:** "P1/P2" is the abbreviation for "Power 1/Power 2", and "L/A" is for Link/Activity".

## 2.5 Grounding

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices. The grounding screw symbol is shown below in *Figure 2.4*.



Figure 2.4



**Caution:** Using a shielded cable achieves better electromagnetic compatibility.


## 2.6 Ethernet Ports

### M12 Interface (Auto MDI/MDIX)

- **Connection Format: M12 8-Pin X-Coded Female Connector**
- **Transmission Rate: 10/100/1000 Mbit/s**

Prepare the M12 8-Pin X-Coded Ethernet Port mating cable for Ethernet connection. The M12 X-Coded Ethernet ports are auto-sensing for 10Base-T, 100Base-TX, or 1000Base-T devices

connections. Auto MDI/MDIX means that you can connect to another switch or workstation without changing straight through or crossover cabling. See pin assignment shown in *Table 2.2*.

<b>M12 8-Pin X-Coded Female Connector</b>			
	<b>Pinouts</b>	<b>10/100Base-T(X) Signal</b>	<b>1000Base-T Signal</b>
	1	Transmit Data + (TX+)	BI_DA+
	2	Transmit Data – (TX-)	BI_DA-
	3	Transmit Data + (RX+)	BI_DB+
	4	Transmit Data – (RX-)	BI_DB-
	5		BI_DD+
	6		BI_DD-
	7		BI_DC+
	8		BI_DC-

*Table 2.2*

**NOTE:** “+” and “-” signs represent the polarity of the wires that make up each wire pair.

### Connection of Cables

Use the twisted-pair cable, category 5e, or the above cabling for M12 port connections. The cable between the Ethernet switch and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.

- Minimum Wire Gauge: 24AWG
- Maximum Transmission Length: 100m (328ft)



### Caution:

1. Please use with copper conductors only.
2. Use conductors with insulation rated for at least 60°C.
3. Base the conductor Ampacity on a maximum termination temperature of 60°C.

## 2.7 Power Inputs

This industrial Ethernet switch provides dual DC power inputs for redundancy through an M12 4-Pin T-Coded male connector. Prepare the M12 4-Pin T-Coded cable for power connection.

*Table 2.3* shows the pin assignment.

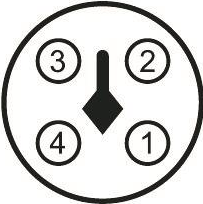
M12 4-Pin T-Coded Male Connector		
	Pinouts	Function
	1	V1+
	2	V1-
	3	V2-
	4	V2+

Table 2.3

### Connection of Cables

- Minimum Wire Gauge: 18AWG

Please follow the steps below to insert the power wire.

1. Insert the positive and negative power wires into the power connector on the industrial Ethernet switch with Power 1 (V+,V-), and Power 2 (V2+,V2-).
2. Tighten the screw nut to prevent the connector from loosening.



**Caution:** The power input specification is complied with the requirements of SELV (Safety Extra Low Voltage), and the power supply should be complied with UL 61010-1 & UL 61010-2-201.

## 2.8 Relay Contact and Digital Input

The Ethernet switch is equipped with an M12 5-Pin A-Coded female connector with a normally closed relay contact for fault alarm and a digital input (DI) for resetting relay and rebooting unit. The pin assignment of this connector is shown in *Table 2.8*.

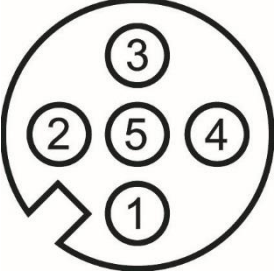
M12 5-Pin A-Coded Female Connector			
	Pinouts	Function	Description
	1	DI+	Digital Input +
	2	Relay Com	Common
	3	Relay (N.C.)	Normally Closed
	4	DI-	Digital Input -
	5	NA	Not Assigned

Table 2.8

### Connection of Cables

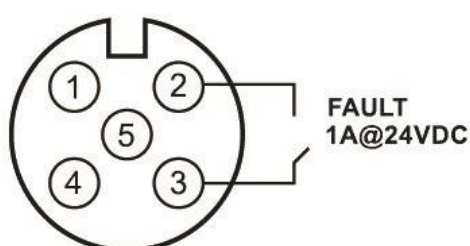
- Minimum Wire Gauge: 24AWG

### Relay Contact

By using an M12 5-Pin A-Coded cable to connect the normally closed relay contact, it will detect the fault status and form an open circuit when any of the following abnormal conditions occurs:

1. If the current PoE outputs of all connected PDs were overloaded (>200 Watts)
2. If the current PoE output of one or more PDs was overloaded (>30 Watts)
3. If Power 1 or Power 2 was inactive

A connection of relay contact for fault alarm is shown below in *Figure 2.5*.



*Figure 2.5*

When the Ethernet switch is operating normally, the relay contact is a closed circuit. When the switch has any fault status (PoE overload or power failure), the relay contact circuit is opened and the FAULT LED lights up. In addition, even after the abnormal situation has been removed, the relay contact is still open and FAULT LED remains active, unless using the digital input to reset that. See the next section for information on Digital Input.

**Note:** If only using one power source, jumper Pin 1 to Pin 4 and Pin 2 to Pin 3 on the M12 4-Pin T-Coded power cable to eliminate power fault alarm.

### Digital Input (DI)

The digital input is used for monitoring two external events via an external voltage source. When the voltage level on digital input pins changes from high voltage to low voltage, the DI function will be triggered. *Table 2.9* shows a detail specification of the digital input.

Specification		Description
Level 0 (Low)	-30~8VDC	Will trigger DI function (active trigger states)
Level 1 (High)	10~30VDC	Normal Status (inactive trigger states)
Nominal Input Voltage	24VDC	
Max. Input Voltage	30VDC	

Nominal Input Current	5mA (typical)	
Max. Input Current	8mA	

Table 2.9

As described in Relay Contact section, if the fault status (total output power over device's PoE power budget, or any one of PoE ports over 30Watts) happens, you have to use DI function to reset the Fault LED; there are two DI functions this unit supports for manually resetting or rebooting the device, which is shown as follows.

1. When the trigger time is < 4 seconds, the relay contact will be reset and the Fault LED light turned off.
2. When the trigger time is > 4 seconds, the Ethernet switch will be rebooted.

## 2.9 Prioritization of PoE Ports

The prioritization of PoE is the priority class of power. There is a decreasing rule in prioritization from port G1 to G8, which means the Ethernet switch assigns a lower numbered port to a higher priority. Therefore, port G1 uses the highest priority and port G8 uses the lowest to determine which ports will provide the connected powered device (PD) power.

Each of the eight Ethernet ports of this switch can provide up to 30W and the maximum total PoE output is 200Watts. If the switch can provide power for all connected PD, it doesn't use the prioritization rule to allocate power. Only if the current PoE provisioning on all connected PD oversubscribes the available power (above 200W), one or more lower priority ports will be removed from power in order of priority until the switch can meet the total power consumption for other, higher priority ports.

## 2.10 Bypass Function

This Ethernet switch supports bypass function by two Ethernet ports (G7 and G8). When one of the Ethernet switches loses power, Ethernet ports (G7 and G8) will bypass the power lost from the Ethernet switch to prevent the network from disconnecting.

Take *Figure 2.6*, for example, if Switch B has a power failure, the bypass function will be activated automatically, and it will bypass Switch B and bridge G7 to G8 of Switch B, so that the data transmission path (from Switch A to C) can remain connected and unaffected.

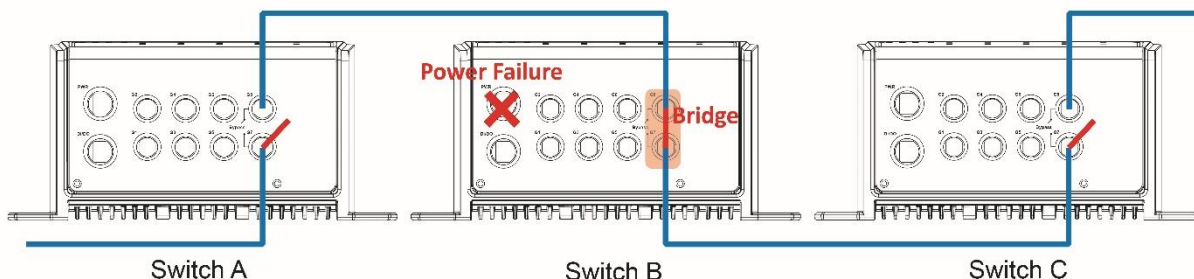


Figure 2.6

## 2.11 Prioritization of Packets

This Ethernet switch provides QoS based IEEE 802.1p class of service (CoS) values that range from 0 to 7. These CoS values are mapped to 4 priority queues that go from high to low priority. Traffic can be forwarded sequentially according to the priorities set. The highest priority packet is transmitted first by the switch. Quality of Service (QoS) is used to ensure the priority of network traffic receiving correct treatments, so it eliminates the unpredictability issue of network traffic.

A priority queue is a data type which identifies an item with the highest priority in a system. To map each CoS value to a QoS priority queue is to prioritize the type of traffic at congestion points of the network. The *Table 2.10* below is the priority queue mapping.

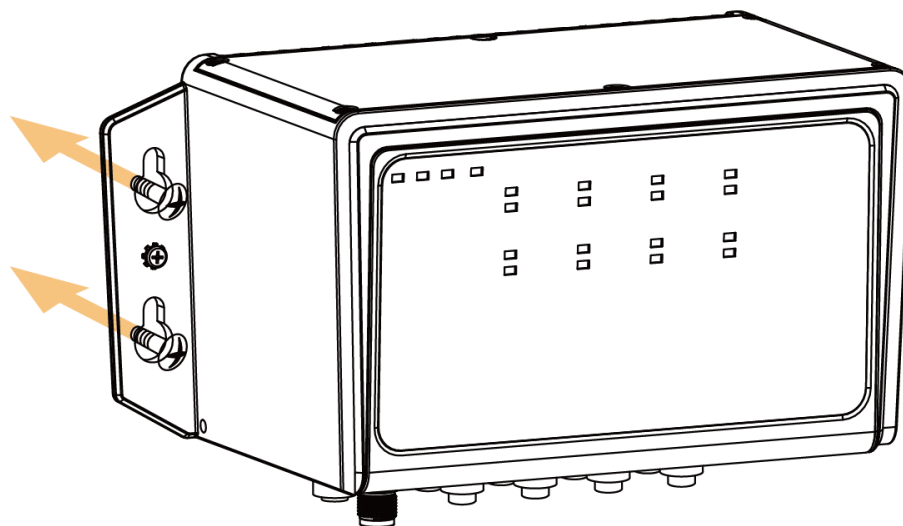
CoS Value	0	1	2	3	4	5	6	7
QoS Priority Queue	Low	Low	Normal	Normal	Medium	Medium	High	High

*Table 2.10*

## 3. Mounting Installation

### 3.1 Wall Mounting

Follow the steps below to mount the industrial Ethernet switch to a wall using the screw holes as shown below in *Figure 3.1*.



*Figure 3.1*

1. Prepare 4 screws for mounting the switch to a wall.  
Note: Recommended use the M6 screws.
2. Based on the *Figure 3.2*, on the following page, which shows the positions of 4 screw holes on the left and right side of the switch, make 4 screw holes on a wall accordingly.
3. Insert the screws through the screw holes on the switch and screw the switch into the wall.  
Shown above in *Figure 3.1*.
4. To remove the switch from the wall, do the opposite from the steps above.  
Note: Make sure to disconnect all cables from the switch before removing the unit from the wall.

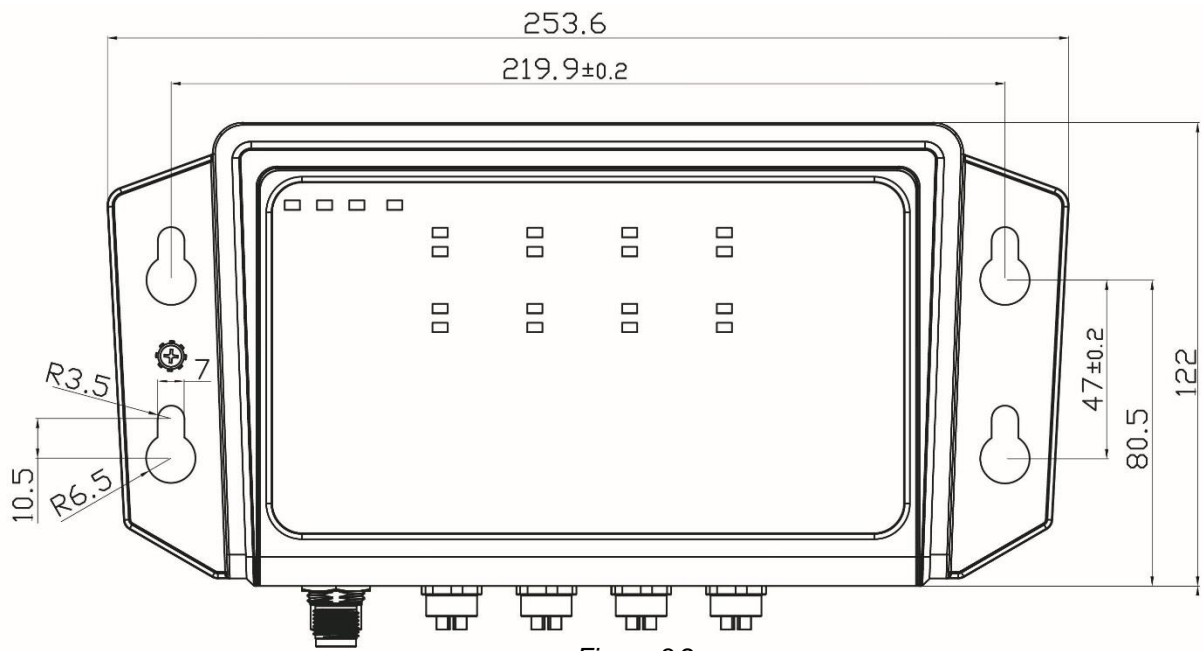


Figure 3.2



**Caution:** "Wall" means industrial control panel wall.

## 4. Hardware Installation

### 4.1 Installation Steps

This section will explain how to install LNP-0800G-M12-67-24(-T).



**Caution:**

1. This device is intended for indoor use and at altitudes up to 2000 meters. In addition, the environmental condition should be maximum relative humidity of 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
2. The device is intended to be installed in an industrial control enclosure and panel.
3. For use in a controlled environment, please refer to the manual for environmental conditions.

#### **Installation Steps**

1. Unpack the industrial Ethernet switch from the original packing box.
2. To hang the industrial Ethernet switch on a wall or DIN-Rail, please refer to the **Mounting Installation** section.
3. Power on the industrial Ethernet switch, then the power LED light will turn on.
  - a. If you need help on how to wire power, please refer to the **Wiring the Power Inputs** section.
  - b. Please refer to the **LED Indicators** section for LED light indication.
4. Prepare the M12 cable for Ethernet connection.
5. Insert one side of the M12 cable into the switch's Ethernet port and on the other side into the networking device's Ethernet port. The Ethernet port's LED on the industrial Ethernet switch will turn on when the cable is connected to the networking device.
  - a. Please refer to the **LED Indicators** section for LED light indication.
6. When all connections are set and the LED lights all show normal, the installation is complete.

## **4.2 Maintenance and Service**

- If the device requires servicing of any kind, the user is required to disconnect and remove it from its mounting. The initial installation should be done in a way that makes this as convenient as possible.
- Voltage/power lines should be properly insulated as well as other cables. Be careful when handling them so as to not trip over.
- Do not under any circumstance insert foreign objects of any kind into the heat dissipation holes located in the different faces of the device. This may not only harm the internal layout, but might cause harm to user as well.
- Do not under any circumstance open the device for any reason. Please contact your dealer for any repair needed or follow the instructions within the manual.
- Clean the device with dry soft cloth.

## 5. Network Application

This segment provides an example of an industrial M12 Ethernet switch application (Figure 5.1).

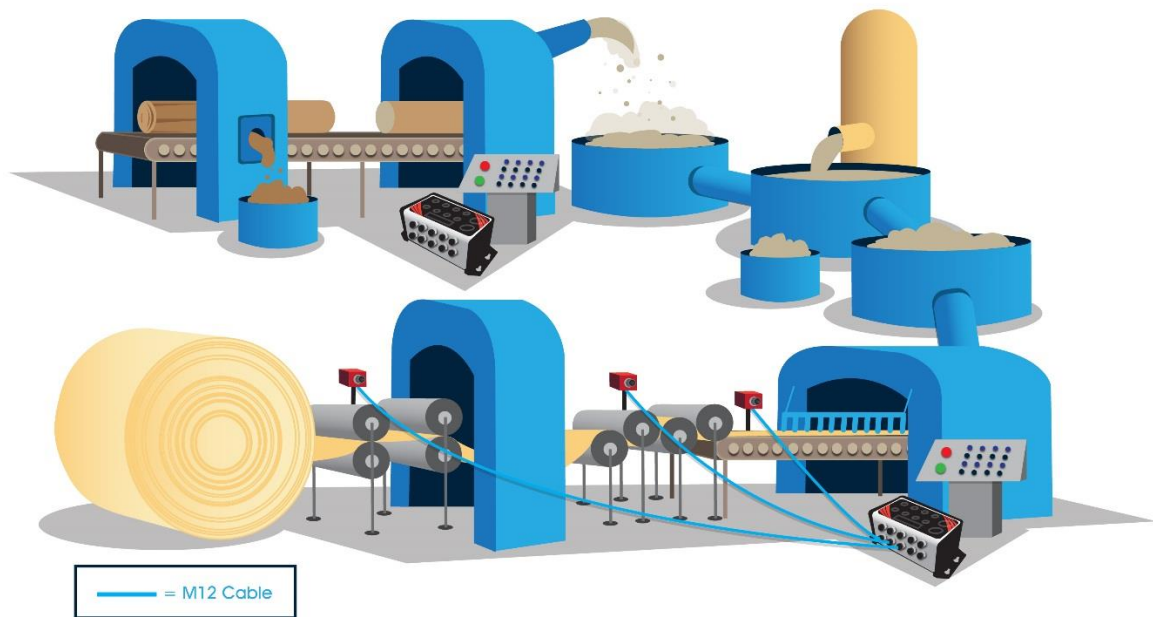


Figure 5.1  
Industrial M12 Ethernet Switch Application  
Example

## 6. Trouble Shooting

1. Verify you have the right power cord or adapter. Never use a power supply or adapter with a non-compliant DC output voltage or it will burn the equipment.
2. Select the proper cable to construct your network. Please check that you are using the right cable.
3. Diagnosing LED Indicators: To assist in identifying problems, the switch can be easily monitored with the LED indicators which help to identify if any problems exist.
  - a. Please refer to the **LED Indicators** section for LED light indication.
4. 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.
  - a. Please contact Antaira for technical support service if the problem still cannot be resolved.
5. If the industrial switch's 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.

**Antaira Customer Service and Support**

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