MIEN2016/2018/2024/2026

Rack Mount Industrial Ethernet Switch

User Manual

(Edition: V2.0)

Wuhan Maiwe Communication Co., Ltd.

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Clarification
The user manual is applicable to MIEN2016/MIEN2018/MIEN2024/MIEN2026 rack-mounted industrial ethernet switch.
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Revision history:

Version	Date	Reason
V1.0	2012.08	Document creation
V2.0	2014.06	Product upgrade

Safe Use Instruction

This product performance is excellent and reliable in the designed range of use, **but it's necessary to avoid man-made damage or destroy for the equipment**.

- Read the manual carefully and keep this manual for reference if need afterwards.
- Do not put the device close to the water sources or damp places.
- Do not put anything on the power cable, it should be placed out of reach.
- To avoid causing fire, do not knot or wrap the cable.
- Power connector and other device connectors should be firmly connected with each other, frequently inspection is needed.
- Please keep the fiber socket and plug clean. Do not look directly at the fiber section when the equipment is working.
- Please keep the equipment clean and wipe it with a soft cotton cloth if necessary.
- Please do not repair the equipment by yourself, unless there is clear instructions in the manual.

Under the following circumstances, please cut off power immediately and contact us.

- Equipment water damage.
- The equipment is broken or the casing is broken.
- The equipment works abnormally or the performance has completely changed.
- The equipment produces odor, smoke or noise.

Statement: Information requiring explanation in use of the managed software.
Attention: Matters requiring specific attention in the use of the managed software.

Catalogue

1. System Overview

1.1. Product Introduction

The unmanaged simple series products produced by Maiwe including MIEN2016, MIEN2024, MIEN2018-2S/M and MIEN2026-2S/M, are industrial Ethernet switches that are professionally designed and developed for industrial high-speed communication network applications. The switch is mainly used for simple plug-and-play applications. All electrical ports support auto-negotiation, 10/100Mbps full duplex and half duplex, Auto-MDI/MDI-X and other functions. Make industrial communication smoother, more reliable, and faster, and meet the continuous innovation needs of customers to increase value-added applications.

These unmanaged switches provide AC and DC 220V power supply support, while providing a wide range of DC and AC power input. In terms of structural installation, the switch uses rack installation.

This series of industrial Ethernet switches has a total of 26 100M ports at most, and its switching bandwidth is 8.8G. They all support 8K entries in the MAC address table.

1.2. Characteristic

1.2.1. Industrial network performance

- Broadcast storm suppression
- Optional 100Base-FX with different transmission distances and different types of optical fiber interfaces
- Store and forward mechanism
- 100M electrical port 10/100M adaptive, full/half duplex, MDI/MDIX adaptive mode
- Full-duplex flow control and half-duplex back pressure flow control
- AC and DC power input to meet the requirements of high availability
- Meet the requirements of trouble-free work under strong electromagnetic interference environment

1.2.2. Industrial application design

- Rack installation
- Quick recovery of port connection

1.2.3. Packing list

The packaging list of unmanaged products of Wuhan Maiwe Communication Co., Ltd. is shown in Table 1-1. If any of the listed items is lost or destroyed, please contact the agent or the customer service center for replace or make up.

Table 1-1 Product packing list

Item	Quantity
Switch	1
User manual	1
Product Certificate and Warranty Card	1

1.3. Performance specifications

Maiwe switches can complete Ethernet information exchange. Users must refer to the following data for reasonable selection and use in order to show good industrial characteristics and excellent network information exchange capabilities.

Technical index:

IEEE standard: 802.3, 802.3u, 802.3x

Exchange method: store and forward

Exchange bandwidth: 8.8G

Flow control: full-duplex flow control, half-duplex back pressure control

MAC address: 8K

Transmission distance: twisted pair cable 100m, fiber 100Mbps maximum 20, 40, 60, 80km

Broadcast storm: real-time broadcast storm suppression

EMC standard:

EN61000-4-2 anti-static (ESD): ±6kV contact discharge, ±8kV air discharge

EN61000-4-3 electromagnetic field: 10V/m (80-1000MHz)

EN61000-4-6 anti-conduction: 3V (10kHz~150 kHz), 10V (150kHz~80 MHz)

EN55022: EN55022 Class A

2. Application Description

2.1. Hardware structure

2.1.1. System structure

The system hardware is mainly composed of the following parts:

●The switching network controller uses high-performance ASIC chip technology to provide Layer 2 wire-speed forwarding of data packets.

●The fiber interface adopts an integrated optical transceiver module with stable performance.

●The power supply adopts industrial-grade power supply, with over-current, over-voltage and EMC protection.

●All copper ports and serial ports have EMC protection.

2.1.2. Whole machine structure

The chassis is a 19-inch 1U rack structure, as shown in Figure 2-1, the whole machine adopts a six-sided fully enclosed structure. Abandon the traditional flow fan heat dissipation form, reduce the power consumption of the whole machine, but also improve the stability of the system.

The dimensions are: 482.6*44*210mm.

Figure 2-1 Product appearance

The front panel indicators are shown in Figure 2-2

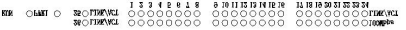

Figure 2-2 Schematic diagram of front panel indicators

The indicator description is shown in Table 2-1.

Function	**LED**	**LED** color	Condition	Status
Power state	PWR1	Red	On	Power connection
			Off	Power is not connected
System status	RUN	Green	Flashing	System is working fine

Panel status	100Mbps	Green	On	The port has established a 100M network connection
			Off	No port connection or 10M access
	LINK/ACT	Green	On	Port has established a valid network connection
			Flashing	Port has network activity
			Off	The port has not established a valid network connection

100M fiber interface

MIEN2018-2S/M and MIEN2026-2S/M have 2 100Base-FX full-duplex single-mode or multi-mode fiber interfaces, and the connectors can be SC, ST or FC. Optical fiber interfaces need to be used in pairs (TX and RX are a pair), TX port is the optical transmitting end, connected to the optical receiving end RX of the optical interface of another remote switch; RX port is the optical receiving end, connected to the same optical interface of the same remote switch The optical transmitter TX.

The 100M fiber interfaces mainly include: SC, ST, FC. As shown in Figure 2-3.

Figure 2-3 Appearance of SC /ST /FC interface optical module

Ethernet RJ45 port

This series of products has 16 or 24 10Base-T/100Base-TX Ethernet RJ45 ports. Each RJ45 port has an adaptive function and supports automatic MDI/MDI-X connection. The switch can be connected to terminal devices,

servers, hubs or other switches using straight-through network cables/crossover network cables. Each port supports IEEE802.3x adaptive, so the most suitable transmission mode (half-duplex or full-duplex) and data rate (10Mbps or 100Mbps) can be automatically selected (the connected device must also support this feature). If the devices connected to these ports do not support auto-negotiation, the ports will send at the correct speed, but the transmission mode will default to half-duplex.

The power input terminals are shown in Figure 2-4.

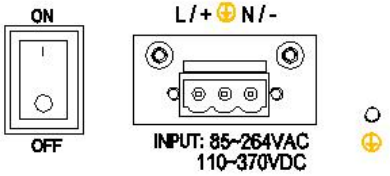

Figure 2-4 Schematic diagram of power input terminal

The power requirements of this series of switches are shown in Table 2-2.

Table 2-2 Switch power requirements

Voltage	voltage range	Operating temperature	Storage temperature	Humidity
220VAC/DC	85~265 VAC 47-63Hz or 110~370 VDC	-40°C~85°C	-40°C~85°C	5~95%

2.2. Hardware installation

2.2.1. Installation requirements

The industrial Ethernet switch is a single structure, which can be directly installed on a 19-inch rack. Before installation, first confirm that there is a suitable working environment, including power requirements, sufficient space, whether it is close to other network equipment to be connected, and whether other equipment is in place. Please confirm the following installation requirements:

- Power requirements: standard products use AC220V power supply. For

other power supply methods, please refer to the product label, the power supply label on the housing and the relevant manual

●Environmental requirements: temperature -40°C~85°C, relative humidity 5~95% (no condensation)

●Grounding resistance requirements: <5

●According to the contract configuration requirements, check whether the optical cable is laid in place and whether the optical fiber connector is suitable

●Avoid direct sunlight, keep away from heat sources or areas with strong electromagnetic interference

●The standard product is installed on a 19-inch rack. Check if there are cables and connectors required for installation

Note:

Be sure to disconnect the power cord before installing or connecting the Ethernet switch. Calculate the maximum possible current in each power line and common line, and observe all electrical information to know the maximum current allowed by lines of different widths. If the current exceeds the maximum rated current, the wire will overheat and cause serious damage to the equipment.

At the same time, you must also pay attention to the following:

Separate the paths of power lines and equipment lines. If the two paths must cross, make sure that these lines are perpendicular at the intersection. It is not allowed to lay signal wires or communication wires and power wires in the same pipe. To avoid interference, wires with different signal characteristics should be separated. We can use the type of signal transmitted in a line to determine which lines should be separated. It is strongly recommended to label all equipment lines in the system when necessary.

The switch must be connected to the protective ground:

Grounding and wiring can effectively suppress the noise impact caused by electromagnetic interference. The ground connection should be made before connecting the equipment, from the ground screw to the ground surface.

2.2.2. Host installation

The installation dimensions of MIEN2016 and MIEN2024 are shown in Figure 2-5.

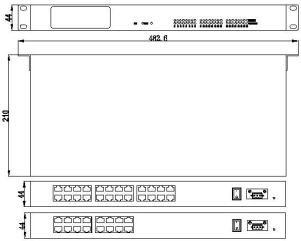

Figure 2-5 Schematic diagram of the installation dimensions of MIEN2016 and MIEN2024

The installation dimensions of MIEN2018-2S/M and MIEN2026-2S/M are shown in Figure 2-6.

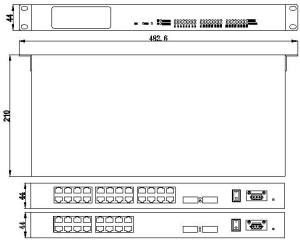

Figure 2-6 Installation dimensions of MIEN2018-2S/M and MIEN2026-2S/M

For most industrial applications, 19-inch rack installation is very convenient. The installation situation of the rack should be checked before installation. It mainly includes the following two contents:

- Is there enough space for installing this product
- Is there a power supply suitable for the work of this product

When installing, first determine the installation position of the product, align the mounting holes of the switch with the holes on the rack, and fix it with 4 screws. The recommended specification is M5*14.

2.2.3. Cable connection

After the correct installation, the cables can be installed and connected, mainly including the cable connections of the following interfaces.

- Working interface

The terminal device interface provided by this product is a 10Base-T/100Base-TX Ethernet RJ45 interface, which uses a straight-through network cable to connect to the terminal device and a crossover network cable to connect to the network device.

●Connect to power

When all other cables are connected, you can connect to the power supply of the product identification specification.

2.2.4. Fiber optic connection

Both MIEN2018-2S/M and MIEN2026-2S/M products provide two 100Base-TX single-mode or multi-mode optical fiber interfaces. The type of fiber interface can be selected as SC, ST or FC according to requirements.

Note:

This switch uses lasers to transmit signals on fiber optic cables. The laser meets the requirements of Class 1 laser products, and normal operation is harmless to eyes. However, when the equipment is powered on, do not look directly at the optical transmission port and the end face of the optical fiber terminator.

For modules with a transmission distance greater than 60km, do not use short optical fibers (below 20km) to connect, so as not to cause the optical saturation and overpower at the receiving end of the module to burn.

The steps to connect the pluggable fiber optic module are as follows:

●Remove and keep the rubber sleeve of the LC, SC or FC port. When not in use, put on a rubber sleeve to protect the fiber terminator.

●Check whether the fiber terminator is clean. Slightly moisten a clean paper towel or cotton ball, and gently wipe the cable plug. Dirty fiber optic terminator will reduce the quality of optical transmission and affect port performance.

●Connect one end of the optical cable to the optical fiber interface of the switch, and the other end to the optical fiber interface of another device.

●After the connection is completed, please check the corresponding LINK/ACT indicator of the optical port on the front panel of the switch. If the indicator is on, the connection is valid.

2.2.5. Laying cables

The cable layout must meet the following conditions:

●Check whether the specifications, models and quantities of all cables are in accordance with the construction drawing design and contract requirements before laying out the cables

●Before laying the cable, check whether the cable is damaged, whether there are factory records and quality assurance certificates that prove its quality

●The specifications, quantity, routing direction, and location of the cables to be laid should meet the design requirements of the construction drawing, and the wiring length of each cable should be determined according to the actual location

●User cables and power cords are laid separately

●There must be no broken wires or joints in the middle of the laid cables

●The cables should be laid out neatly in the aisle, and the bends should be even, smooth and straight

●The cable should be straight in the channel, and should not go out of the channel and block other cable entry and exit holes. The cable should be tied and fixed at the location of the cable exit from the channel or the cable bend.

●When the cables, power cords, and ground wires are laid in the same slot, the cables, power cords and ground wires cannot be overlapped or mixed. When the cable is too long, the cable must be neatly placed in the middle of the cable rack, and cannot be pressed on other cables

●When laying pigtails, prevent the optical cable from knotting and minimize the turning points, and the turning radius should not be too small. The lashing should be moderately tight and not too tight. When laying on the cable rack, it should be placed separately from other cables

●Both ends of the cable should have corresponding marks, and the content of the marks is concise and easy to maintain

Note:

When laying pigtails, prevent the optical cable from kinking and minimize the turning point, and the turning radius should not be too small. If the turning radius is too small, it will cause serious loss of the link optical signal. Affect the quality of communication.

2.3. Simple test

2.3.1. System self-check

All the service port indicators on the front panel will flash once when the device is powered on, indicating that the port is working normally. After that, the corresponding Power will always be on, and the Run light (system running status indicator) will flash at intervals of 1s.

2.3.2. Copper port test

As shown in Figure 2-7, power up the device, connect any two electrical ports to the network ports of two test computers through a direct-connected network cable, and send Ping commands to each other. Both parties can correctly ping each other without packet loss. It means that the hardware of the tested two copper ports is working normally.

Figure 2-7 Schematic diagram of electrical port test

2.3.3. Fiber port test

Combine the two devices into an optical fiber chain network as shown in Figure 2-8. Any electrical port of each device is connected to the test computer through a direct-connected network cable, and PING commands are sent to each other, and both parties can correctly PING to each other without packet loss. At the same time, the LINK/ACT light corresponding to the optical port should be on. It means that the hardware of the two fiber ports under test is working normally, and the other optical ports are tested in the same way.

Figure 2-8 Schematic diagram of optical port test

PING command example:

The IP address of test computer 1 is 192.168.0.10, and the IP address of test computer 2 is 192.168.0.11. First, make sure that the first item "Allow incoming echo requests" in the local connection ICMP settings of the firewall of the two machines is checked. The operation method is to open the advanced page in the windows firewall settings and set the ICMP protocol, as shown in

Figure 2-9.

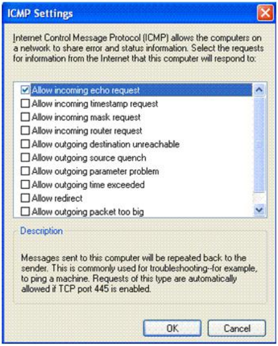

Figure 2-9 ICMP setting interface diagram

Then click Start→Run of test computer 1, enter cmd or command (cmd for Win2000/XP system, command for WIN98/95 system), a console window will pop up, and send ping 192.168.0.11 –l 1000 –t, (–l It refers to the number of bytes to send data packets, -t refers to continuously sending data), run ping 192.168.0.10 -l 1000 -t in test computer 2 in the same way. If test computer 1 returns Reply from 192.168.0.11: bytes=1000 time<10ms TTL=128, test computer 2 returns Reply from 192.168.0.10: bytes=1000 time<10ms TTL=128, use CTL+ after running for more than 10 minutes The C command statistics packet loss rate is 0, indicating that the device is working normally. As shown in Figure 2-10.

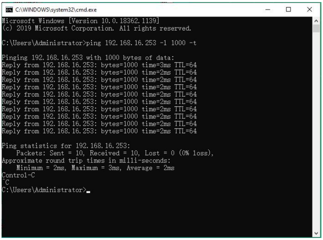

Figure 2-10 The result of inputting the ping test computer in CMD

3. Maintenance and Service

From the date of product shipment, Wuhan provides a five-year product warranty. According to the product specifications of Wuhan Maiwe Communication Co., Ltd., during the warranty period, if the product has any malfunction or functional operation failure, Maiwe will repair or replace the product for the user free of charge. However, the above commitment does not cover damage caused by improper use, accidents, natural disasters, incorrect operation or incorrect installation.

To ensure that consumers benefit from the products of Maiwe, help and problem solving can be obtained through the following methods:

- Internet Service
- Call the technical support office
- Product repair or replacement

3.1. INTERNET service

Through the technical support section of Maiwe website, you can get more useful information and usage skills.

3.2. Technical support telephone service

Users who use the products of Wuhan Maiwe Communication Co., Ltd. can call the technical support office of Maiwe. Maiwe has professional technical engineers to answer your questions and help you in the first time to solve the product or usage problems you encountered.

3.3. Product repair or replacement

For product maintenance, replacement or return, in accordance with the processing procedures of Wuhan Maiwe Communication Co., Ltd., you should first confirm with the technicians of Maiwe and then negotiate with the sales staff to complete the repair, replacement or return of the product.

Appendix

Selection guide

100M fiber port single-mode/ multi-mode optional, connector SC/ST/FC optional

Model	100M fiber port	10/100M copper port
MIEN2016	0	16
MIEN2024	0	24
MIEN2018-2S/M	2	16
MIEN2026-2S/M	2	24

Description

Our company has the right to change the product model without notifying the user. For the latest information, please consult our company's market or technical support staff.

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