Weidmüller

硬件安装手册

非网管快速以太网交换机

IE-SW-ELB-16-16TX（订货号.2828580000）

1. 介绍

魏德米勒非网管快速以太网交换机系列采用紧凑型设计，尺寸小巧，易于安装。配用坚固的金属外壳，确保恶劣工业现场设备的可靠稳定通讯，同时为了防止意外的安全风险，请仔细阅读操作说明提供的所有安全信息说明以及随产品提供的任何其他安全信息。

2. 安全警示

⚠	在移除电源连接之前，请确认关闭供电电源！
⚠	设备在运行过程中会发热，进行任何工作时，请让装置冷却后操作或使用防护手套。
⚠	设备只能连接到产品标签上显示的电源电压范围。高于规定的电压会损坏设备，设备必须由低压指令 2014/35/EU 中定义的电源供电。
	安装、调试和维护只能由合格的工程师进行。
	请遵守操作规范说明。
⚠	■ 室内使用污染程度为2级，必须用干布擦拭以清洁设备和标签。 ■ 如果设备未按制造商规定的方式使用，则设备提供的保护可能会受损。 ■ 应安装在工业控制柜内，工作环境温度不超过60℃。

FCC合规性此设备符合FCC规则第15部分的规定。操作受以下两个条件限制：（1）此设备可能不会造成有害干扰，以及（2）此设备必须接受接收到的任何干扰，包括可能导致不期望操作的干扰。

使用说明：
该设备旨在实现工业环境中的网络通讯，其设计用于受限区域。设备只能在规定的技术数据范围内使用。设备需安装在具备良好接地的安装面上，如金属控制柜。任何超出范围的使用都可能导致意外故障和设备损坏，请遵守使用规范。
环境要求：
本设备只用于限定区域。
在规划安装现场时，确保运行期间的环境温度不会超过技术数据中给出的温度。
同时确保气流不会受到其他设备的影响。
确保已安装和接线的设备不受任何机械应力的影响。

3. 包装清单

产品包装清单明细：

- 以太网交换机
- 本手册

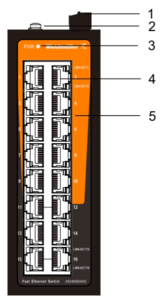
联系信息
魏德米勒电联接（上海）有限公司
上海市裕通路100号 宝矿洲际商务中心25楼
电话 +86 21-22195008 传真 +86 21-22195009
电子邮件 weidmueller@weidmueller.com 网站 www.weidmueller.com

V1.1 2025-04-14

4. 面板指示说明

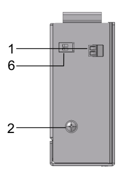
IE-SW-ELB-16-16TX

正面

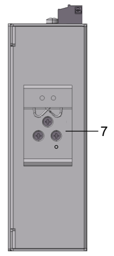


1. 电源输入接线端子
2. 接地螺钉
   注释：网口屏蔽线接地需要与接地螺钉建立电气连接
3. 电源状态指示灯
4. 16 x 10/100Base-T(X)网口
5. 端口连接状态指示灯
   备注：所有LAN端口LED均位于右侧端口，从上到下对应1至16端口LED。
6. 拨码开关
7. 卡轨

顶面

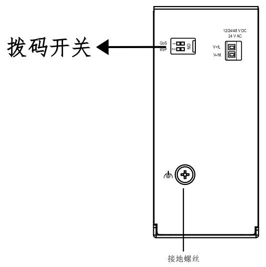


背面



5. 拨码开关

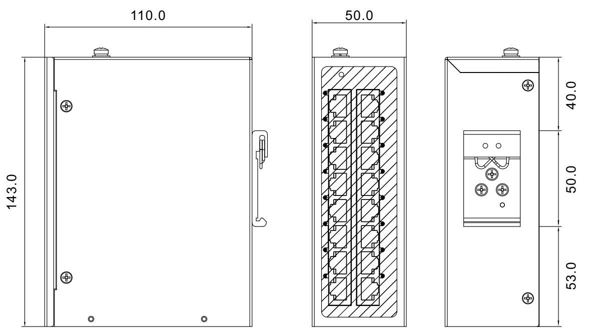
IE-SW-ELB-16-16TX



<table>
<tr><th>拨码开关定义</th><th>设定</th><th>描述</th></tr>
<tr><td rowspan="2">Quality of Service（QoS）</td><td>ON（默认）</td><td>开启 QoS 功能转发不同优先级数据包，交换机支持 4 个 WRR 优先级队列，映射如下表：
<table>
<tr><td>QoS（cos）值</td><td>7、6</td><td>5、4</td><td>3、2</td><td>1、0</td></tr>
<tr><td>队列</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td>WRR 比例</td><td>8</td><td>4</td><td>2</td><td>1</td></tr>
</table></td></tr>
<tr><td>OFF</td><td>关闭 QoS 优先级功能</td></tr>
<tr><td rowspan="2">Broadcast Storm Protection（BSP）</td><td>ON</td><td>开启广播包过滤功能，每个网口每秒最多支持 2000 个广播包</td></tr>
<tr><td>OFF（默认）</td><td>关闭广播包过滤功能</td></tr>
</table>

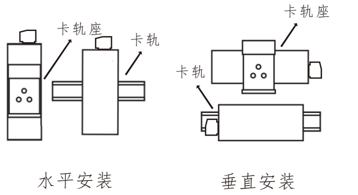
6. 安装尺寸

IE-SW-ELB-16-16TX （单位= mm）



7. 设备安装和卸载

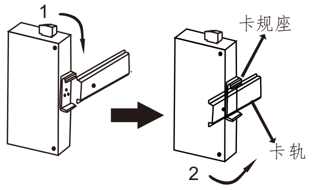
交换机支持水平和垂直安装，可以根据实际应用调整卡轨座的安装方向，满足不同的安装要求。



水平安装 垂直安装

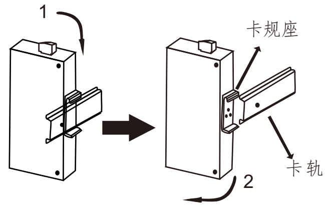
安装步骤

第 1 步：选定设备的安装位置，确保安装空间足够且散热通畅。
第 2 步：将卡轨座的上部卡在 DIN 轨上，按箭头 1 方向将设备的上部稍微往下压，按箭头 2 方向将设备的前部朝安装面推，直到听到咔嗒声到位。



拆卸步骤

第 1 步：按箭头 1 方向下压设备，至设备下端脱离 DIN 轨。
第 2 步：按箭头 2 方向转动设备，至设备脱离 DIN 轨完成拆卸。



8. 交换机接地

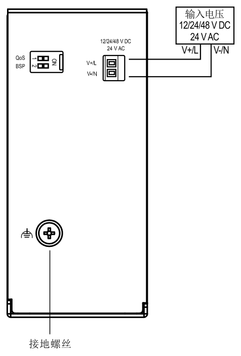
⚠	**警告：** ■ 接地有助于降低设备电磁干扰（EMI）造成的影响。 ■ 连接设备之前，接地螺钉和机柜接地处建立连接。 ■ 本产品建议安装在具有良好接地的安装面上，如金属控制柜。 ■ RJ45网口屏蔽线接地需要与接地螺钉建立电气连接。 ■ 接地线的截面积≥0.82mm²，接地电阻<5Ω。

9. 供电电源接线

交换机电源通过 2 芯端子连接器连接。请依照设备上指示说明，正确连接电源线。

⚠	**警告：** ■ 在连接电源线之前，请参阅以下指南。 ■ 可插拔电源输入接线端子适用于0.20-3.31mm²截面积导线，扭矩值为0.508Nm。 ■ 电源线的额定工作温度应高于105°C。 ■ 推荐使用符合UL 61010-1或61010-2-201 的 SELV 电源供电。

IE-SW-ELB-16-16TX



10. 网络连接

IE-SW-ELB-16-16TX 网口定义：16x10/100Base-T(X)

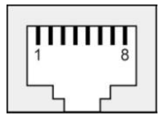
注释： 请选择符合标准要求的线缆和水晶头，并避免信号受到其它信号的干扰。

10.1 10/100Base-T(X) RJ45 网口

每个 RJ45 网口独立支持端口传输速率自动协商，根据 IEEE802.3 标准自动识别连接设备端口传输速率。这意味着一些连接的以太网设备可以以 10 Mbps 的传输速率运行，而其他节点则以 100 Mbps 的传输速率同时运行。

同时以太网交换机支持 MDI 和 MDI-X 自动翻转功能，支持两种接线方案，参照下表接线定义：

10/100Base-T(X) RJ45 针脚定义

<table>
<tr><th colspan="2">MDI 针脚定义</th><th colspan="2">MDI-X 针脚定义</th><th>8 针 RJ45</th></tr>
<tr><td>针脚</td><td>定义</td><td>针脚</td><td>定义</td><td rowspan="5"> </td></tr>
<tr><td>1</td><td>Tx+</td><td>1</td><td>Rx+</td></tr>
<tr><td>2</td><td>Tx-</td><td>2</td><td>Rx-</td></tr>
<tr><td>3</td><td>Rx+</td><td>3</td><td>Tx+</td></tr>
<tr><td>6</td><td>Rx-</td><td>6</td><td>Tx-</td></tr>
</table>

⚠	关于“双工不匹配”情况下可能导致丢失数据包的说明 如果交换机自动协商端口连接到非自动协商设备，交换机将其端口传输速率设置为与连接设备相同，但无法确定双方双工模式是否一致。 为了正确传输，必须将非自动协商端口双工模式和自动协商端口保持一致。

11. LED 指示灯

面板指示灯定义：

LED	颜色	状态	描述
PWR	绿色	亮	设备供电工作正常
		灭	设备供电异常，或者未供电
LNK/ACT	绿色:100Mbps	亮	端口连接正常
		灭	端口未正确建立连接
		闪烁	端口有数据传输

12. 产品规格

技术	
以太网通讯标准	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3x Flow Control IEEE 802.1p Class of Service
处理方式	存储转发
MAC 地址表	8K
数据包缓存	4Mbit
接口说明	
RJ45 端口	10/100M自适应，全双工/半双工，MDI/MDI-X 自动翻转
LED 指示灯	PWR,LNK/ACT
电源	
工作电压	9.6～60VDC或18～30VAC
工作电流（24VDC）	0.17A
电源连接器	2芯可插拔端子，电源线截面积：0.2-3.31mm²
过载保护	支持
反向保护	支持
机械特性	
外壳	金属外壳，IP40防护等级
尺寸 (宽 x 高 x 深)	50x143x110mm
重量	521g
安装方式	导轨式
工作环境	
工作温度	-10～60℃
存储温度	-40～85℃
工作湿度	5%～95%（无凝露）
工作海拔	≤2000m
污染度	2
安规认证	
安全标准	UL 61010-1；UL 61010-2-201
EMC	EN 55032, EN 55035, Class A, IEC 61000-4-2 ESD:接触放电:4kV;空气放电:8kV, IEC 61000-4-3 RS:80MHz～1GHz:3V/m, IEC 61000-4-4 EFT:电源:0.5kV;网口:0.5kV, IEC 61000-4-5 Surge:电源:0.5kV;网口:1kV, IEC 61000-4-6 CS:3 Vrms
冲击	IEC 60068-2-27
跌落	IEC 60068-2-32
振动	IEC 60068-2-6
平均无故障时间	
平均无故障时间	412,528小时
依据标准	Telcordia SR332
保修期	
保修期	5年

请遵守注意事项正确使用产品，您可以在这里查看说明：
www.weidmueller.com/disposal

Weidmüller

Hardware Installation Guide

Unmanaged Fast Ethernet Switches

IE-SW-ELB-16-16TX（Part No.2828580000）

1. Introduction

Ethernet Switches from Weidmüller are designed with a very compact housing size and are fitted with a robust housing.To ensure reliable,error-free operation. And to prevent damage or injury, please read the operating instructions, all safety information provided in this document and any other safety information that were supplied with the product.

2. Safety notice

⚠	Switch off the electrical power before removing the power connection!
⚠	The device heats up during operation. Allow the unit to cool down or use protection gloves when carrying out any work.
⚠	The device may only be connected to the supply voltage shown on the product label. Higher voltage than specified will destroy the device. The device must be supplied by a SELV source as defined in the Low Voltage Directive 2014/35/EU.
	Installation, commissioning and maintenance may only be performed by qualified electricians.
	Observe the operating instructions.
⚠	■ Indoor use and pollution degree 2, it must be wiped with a dry cloth for clean up the device and label. ■ If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. ■ Shall be mounted in the Industrial Control Panel and ambient temperature is not exceed 60℃.

FCC compliance this device complies with part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Intended use

The device is intended for the realization of communication networks within an industrial environment, it is intended to be used in a restricted access location. The device may only be used within the scope of the specified technical data. The device is intended to be mounted to a well-grounded mounting surface, such as a metal panel. Any other use may result in unintentional malfunction and damage. Observing the documentation is part of the intended use.

Environmental conditions

This equipment is intended to be used in a restricted access location.When planning the installation site make sure that the ambient temperature during operation will not exceed the temperature given in the technical data.
Also make sure that the air flow will not be compromised by other devices.
Ensure that the mounted and wired device is not exposed to any mechanical stress.

3. Package Checklist

Your Ethernet Switch is shipped with the following items:

- Ethernet Switch
- Hardware Installation Guide (printed)

Contact Information

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Klingenbergstraβe26,32758 Detmold/Germany
Phone +49(0)5231 14-0, Fax +49(0)5231 14-292083
E-Mail weidmueller@weidmueller.com, Internet www.weidmueller.com

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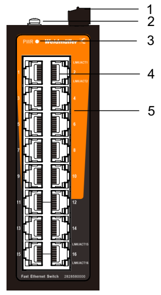
4. Panel Layouts

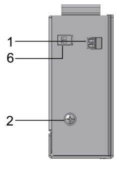
IE-SW-ELB-16-16TX

Front Panel

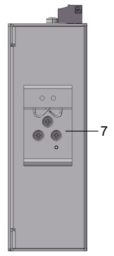


1.Terminal block for power input PWR
2.Grounding screw
Note: The shielding ground of the LAN port is electrically connected to the grounding screw.
3.Power input LEDs
4.16 x 10/100Base－T(X)
5.LAN port Link/Activity LED
Note: All the LAN port LEDs are on the right side, indicate status of port 1 to 16 from top to bottom.
6.DIP Switch
7.DIN Rail

Top Panel

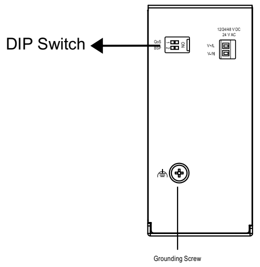


Rear Panel



5. DIP Switch

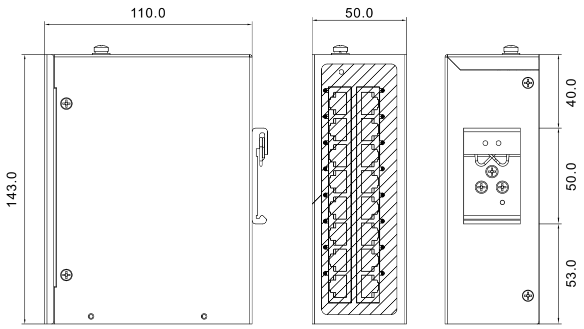
IE-SW-ELB-16-16TX



<table>
<tr><th>DIP Switch</th><th>Setting</th><th>Description</th></tr>
<tr><td rowspan="2">Quality of Service (QoS)</td><td>ON
（Default）</td><td>Enable the Quality of Service to handle packet priorities in four WRR queues.
QoS and ToS/DSCP priority mapping matrix in each queue
<table>
<tr><td>QoS 3bit priority</td><td>7.6</td><td>5.4</td><td>3.2</td><td>1.0</td></tr>
<tr><td>Queues</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td>WRR</td><td>8</td><td>4</td><td>2</td><td>1</td></tr>
</table></td></tr>
<tr><td>OFF</td><td>Disable the Quality of Service</td></tr>
<tr><td rowspan="2">Broadcast Storm Protection（BSP）</td><td>ON</td><td>Enables broadcast storm protection (only allow maximum of 2000 broadcast packets per second）for each Ethernet port</td></tr>
<tr><td>OFF
（Default）</td><td>Disables the Broadcast Storm Protection</td></tr>
</table>

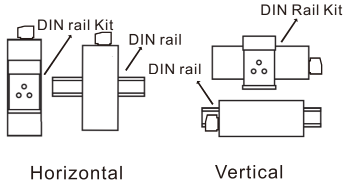
6. Mounting Dimensions

IE-SW-ELB-16-16TX **(units = mm)**



7. DIN-Rail Mounting

The switch supports horizontal and vertical installation.The DIN rail kit can be adjusted according to the actual application to meet different installation requirements.

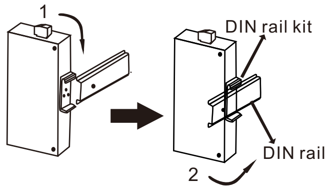


Horizontal Installation　Vertical Installation

Installation

Step 1: Select the mounting position for the device and guarantee adequate space and heat dissipation.

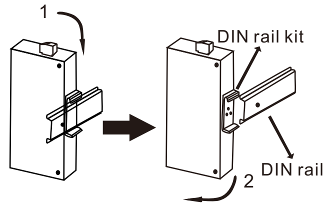
Step 2: Clip the upper part of the rail holder to the DIN rail, push the the upper part of the device down slightly in the direction of arrow 1, push the front of the module toward the mounting surface until it audibly snaps into place in the direction of arrow 2.



Uninstallation

Step 1: As shown in the following figure, press the device downward in the direction of arrow 1 until the bottom of the device is detached from the DIN rail.

Step 2: Rotate the device in the direction of arrow 2 until the device is removed from the DIN rail.



8. Grounding Ethernet Switch

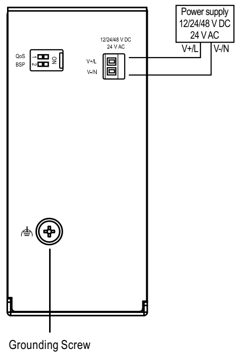
⚠	**ATTENTION** ■ Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). ■ The ground connection from the ground screw to the grounding surface prior to connecting devices. ■ This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel. ■ The shielding ground of the RJ45 ports are electrically connected to the ground connection (screw). ■ Cross-sectional area of the grounding cable≥0.82mm²(AWG 18); Grounding resistance<5 Ω.

9. Wiring the Power Inputs

The switch power supply inputs which are located on the 2-pin terminal block. Refer to illustration below for correct wiring.

⚠	**WARNING** ■ Take into consideration the following guidelines before wiring the device. ■ Terminal block is mating with Plug and suitable for 0.20-3.31mm². Torque value 0.508Nm. ■ The temperature rating of the input connection cable should higher than 105℃. ■ Supplied by SELV source evaluated by UL 61010-1or 61010-2-201 power supply only.

IE-SW-ELB-16-16TX



10. Communication Connections

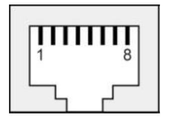
Switch **IE-SW-ELB-16-16TX** is equipped with following communication interfaces: 16x10/100Base-T(X) ports

10.1 10/100Base-T(X) RJ45 Ports

Each RJ45 Ethernet port independently supports auto-negotiation for recognizing the transmission speed 10 Mbps or 100 Mbps according to the IEEE802.3 standard. This means that some of connected Ethernet devices could operate at 10 Mbps, while at the same time other nodes are operating at 100 Mbps.

The 10/100Base-T(X) ports located on Ethernet Switch's front panel are used to connect to Ethernet-enabled devices. Below we show pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports. Auto MDI-X ensures that both wiring–schemes are supported.（Automatic cross over function）

10/100Base-T(X) RJ45 Pinouts

MDI Port Pinouts		MDI-X Port Pinouts		8-pin RJ45
Pin	Signal	Pin	Signal	
1	Tx+	1	Rx+	
2	Tx-	2	Rx-	
3	Rx+	3	Tx+	
6	Rx-	6	Tx-	

⚠	**Note about possible loss of data packages in case of "Duplex mismatching"** If the switch's auto–negotiation port is connected to a non-negotiating device, then the switch will set its port transmission speed same as the connected device but is unable to correctly detect the duplex mode. As result the port is set to the correct speed but is using always the half duplex mode as required by the IEEE 802.3u standard in such cases. For correct transmission, the non–negotiating port must be set to half–duplex mode (speed can be either 10 Mbps or 100 Mbps, it always will be recognized automatically by an Auto–Negotiation–Device).

11. LED Indicators

The front panel of the Ethernet Switch contains several LED indicators. The function of each LED is described in the table below.

LED	Color	Status	Description
PWR	Green	On	Power is being supplied to power input PWR
		Off	Power is not being supplied to power input PWR
LNK/ACT	Green:100Mbps	On	Port's link is active
		Off	Port's link is inactive
		Blinking	Transmitting data

12. Specifications

Technology	
Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX IEEE 802.3x for Flow Control IEEE 802.1p for Class of Service
Processing Type	Store and Forward
MAC Table size	8K
Packet buffer size	4Mbit
Interface	
RJ45 Ports	10/100Base-T(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection
LED Indicators	PWR , LNK/ACT
Power	
Input Voltage	9.6~60VDC or 18~30VAC
Input Current @24 VDC	0.17A
Connection	One removable 2-pin terminal block,Wiring cable 0.2-3.31mm²
Overload Current Protection	Present
Reverse Polarity Protection	Present
Physical Characteristics	
Housing	IP40 protection, metal
Dimension (W x H x D)	50x143x110mm
Weight	521g
Installation	DIN-rail
Environmental conditions	
Operating Temperature	-10 to 60℃
Storage Temperature	-40 to 85℃
Ambient Relative Humidity	5% to 95% (non-condensing)
Altitude	up to 2000 m
Pollution Degree	2
Regulatory Approvals	
Safety	UL 61010-1; UL 61010-2-201
EMC	EN 55032, EN 55035, Class A, IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV, IEC 61000-4-3 RS: 80 MHz~1 Ghz: 3 V/m, IEC 61000-4-4 EFT: Power:0.5 kV; Signal:0.5 kV, IEC 61000-4-5 Surge: Power:0 .5 kV; Signal:1 kV, IEC 61000-4-6 CS:3 Vrms
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-31
Vibration	IEC 60068-2-6
MTBF	
Time	412,528 hrs
Database	Telcordia SR332
Warranty	
Time Period	5 years

Observe the notes for proper disposal of the product.
You can find the notes here:
www.weidmueller.com/disposal.