

Unmanaged Gigabit PoE Switches Basic Line

IE-SW-BL05-4GTPoE Series

Hardware Installation Guide

Second Edition, May 2016
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Important note:

This document and additional product information can be downloaded using following link:

<http://www.weidmueller.com>

► **Select Product Catalogue**

- ⇒ Select „Industrial Ethernet active“
- ⇒ Select „PoE unmanaged Switches“
- ⇒ Select Product model
 - ⇒ Click and expand section „Downloads“
 - ⇒ Download needed documentation

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Overview

The IE-SW-BL05-4GTPoE series consists of rugged industrial 5-port Gigabit PoE switches for environments that fall under the pollution degree 2 category. The industrial Ethernet switches support IEEE 802.3, IEEE 802.3u, IEEE 802.3x with 10/100/1000M, full/half-duplex, MDI/MDIX auto-sensing, IEEE 802.3z with 1000M full-duplex (SFP model), and IEEE 802.3af/IEEE 802.3at PoE standards.

The IE-SW-BL05-4GTPoE series provides 12/24/48 VDC redundant power inputs that can be connected simultaneously to a live DC power source. The switches are available with a standard operating temperature range from 0 to 60°C, or with a wide operating temperature range from -40 to 75°C (T-models), and their IP30 metal housing makes them rugged enough for any harsh industrial environment.

To provide greater versatility for use with applications from different industries, the IE-SW-BL05-4GTPoE switches also allow users to enable or disable broadcast storm protection, 802.3az, Jumbo frame and PoE high power with DIP switches on the outer panel. The IE-SW-BL05-4GTPoE switches can be easily installed on a DIN-Rail or in distribution boxes. The DIN-Rail mounting capability and IP30 metal housing with LED indicators make the plug-and-play IE-SW-BL05-4GTPoE switches reliable and easy to use.

Package Checklist

Your Gigabit PoE Switch is shipped with the following items. If any of these items is missing or damaged, please contact your Weidmüller customer service for assistance.

- 1 Ethernet Switch of IE-SW-BL05-4GTPoE series
- Hardware Installation Guide

Features

High-watt Power-over-Ethernet

- Up to 30 watts output per PoE port (IEEE 802.3at)
- Supports PoE high power output up to 36 W
- Short circuit and over current protection
- Auto detection for IEEE 802.3af and IEEE 802.3at

High Performance Network Switching Technology

- 10/100BaseT(X), 1000BaseT and 1000BaseX (SFP)
- 10/100/1000M, Full/Half-Duplex, MDI/MDIX auto-sensing
- IEEE 802.3/802.3u/802.3x
- Store and Forward switching process type 8K MAC address entries
- Supports jumbo frames up to a length of 10 KBytes

Rugged Design

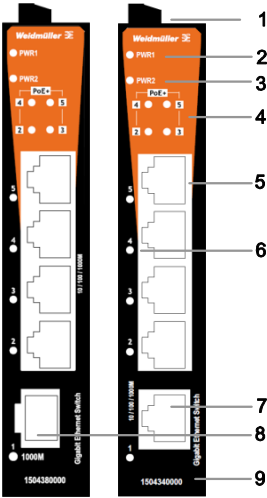
- Redundant dual 12/24/48 VDC power inputs
- Operating temperature range from 0 to 60°C, or extended operating temperature of -40 to 75°C for (T) models.
- IP30 metal housing
- DIN-rail or panel mounting ability

Panel Layout of IE-SW-BL05-4GTPoE series

IE-SW-BL05-1GS-4GTPoE IE-SW-BL05-1GT-4GTPoE

Front Panel View

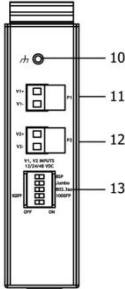
Front Panel View



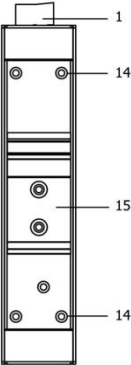
Device description:

1. Terminal blocks for P1/P2 power inputs
2. Power input P1 LED
3. Power input P2 LED
4. PoE status LED
5. 10/100/1000Base-T(X) PoE ports (port 2,3,4,5)
6. TP port speed LED
7. 10/100/1000BaseT(X) port (port 1)
8. 100/1000BaseX SFP slot
9. Article number
10. Grounding screw
11. P1 power input terminal block
12. P2 power input terminal block
13. DIP switches
14. Screw holes for panel mounting kit
15. DIN-Rail mounting kit

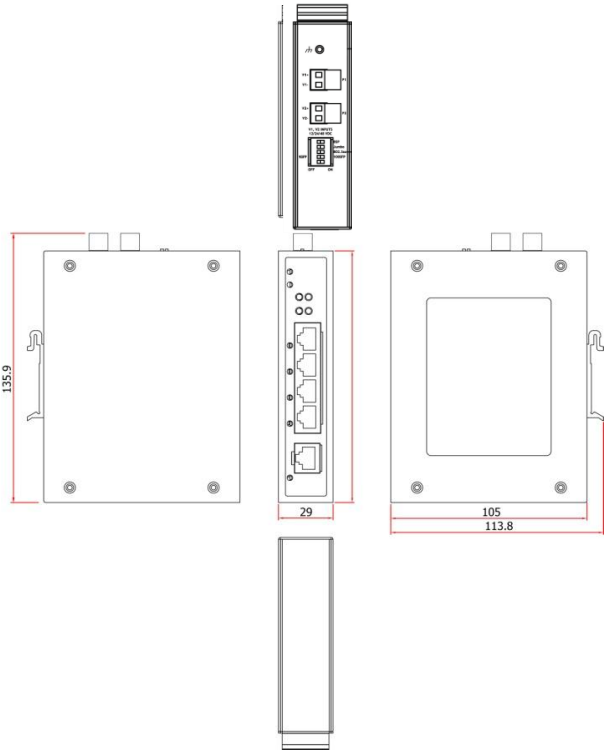
Top View



Rear View



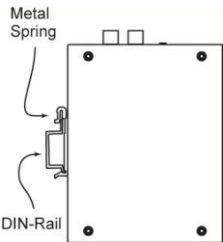
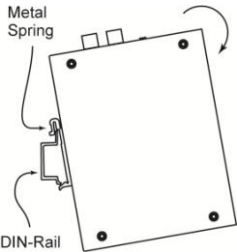
Mounting Dimensions (unit = mm)



DIN-Rail Mounting

The aluminum DIN-Rail attachment plate should already be fixed to the back panel of the switch when you take it out of the box. If you need to reattach the DIN-Rail attachment plate, make sure the stiff metal spring is situated towards the top, as shown in the figures below.

- STEP 1:** Insert the top of the DIN-Rail into the slot just below the stiff metal spring.
- STEP 2:** The DIN-Rail attachment unit will snap into place as shown below.

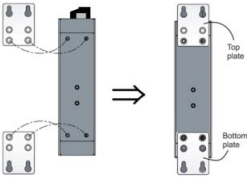


To remove the switch from the DIN-Rail, simply reverse Steps 1 and 2 above.

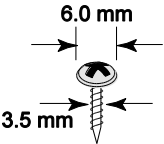
Wall Mounting (optional)

For some applications, you will find it convenient to mount the IE-SW-BL05 switch on the wall, as shown in the following figures.

STEP 1: Remove the aluminum DIN-Rail attachment plate from the switch's rear panel, and then attach the wall mount plates as shown in the diagram at the right.

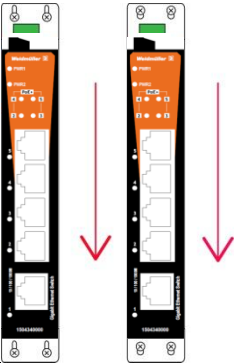


STEP 2: Mounting the switch on the wall requires 4 screws. Use the switch, with wall mount plates attached, as a guide to mark the correct locations of the 4 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure at the right.



NOTE Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the wall mounting plates. Do not screw the screws in completely—leave about 2 mm to allow room for sliding the wall mount panel between the wall and the screws

STEP 3: Once the screws are fixed on the wall, insert the four screw heads through the large parts of the keyhole-shaped apertures, and then slide the switch downwards, as indicated. Tighten the four screws for added stability.



Wiring Requirements



WARNING

Safety First

Turn the power off before disconnecting modules or wires. The correct power supply voltage is listed on the product label. Check the voltage of your power source to make sure that you are using the correct voltage. Do NOT use a voltage greater than what is specified on the product label

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

You should also pay attention to the following points:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
NOTE: Do not run signal or communications wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring to all devices in the system when necessary.

Grounding the Ethernet Switch

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.

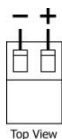


ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.

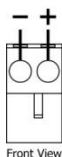
Wiring the Redundant Power Inputs

The two 2-contact terminal block connectors on the switch's top panel are used for the switch's two DC power inputs. Top and front views of the terminal block connectors are shown here.



STEP 1: Insert the negative/positive DC wires into the V-/V+ terminals.

STEP 2: To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.



STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on Switch's top panel.



ATTENTION

Before connecting the Ethernet Switch to the DC power inputs, make sure the DC power source voltage is stable.

Communication Connections

The IE-SW-BL05-4GTPoE switches have 4x 10/100/1000BaseT(X) PoE Ethernet ports for connecting PoE devices, and 1x 10/100/1000BaseT port or 1 100/1000BaseX SFP slot for uplink connection. For fiber connections, a field installed optical transceiver must be UL Recognized, in the Class I category, and contain the following CDRH Certification Marking: 'Complies with 21CFR 1040.10 and 1040.11'.

10/100/1000BaseT(X) Ethernet Port Connection

10/100/1000BaseT(X) ports located on the 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, and also show cable wiring diagrams for straight-through and cross-over Ethernet cables.

10/100BaseT(x) RJ45 Pinouts

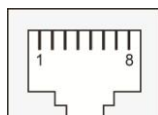
MDI Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

MDI-X Port Pinouts

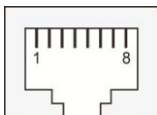
Pin	Signal
1	Rx+
2	Rx-
3	Tx+
6	Tx-

8-pin RJ45



1000BaseT RJ45 Pinouts

Pin	MDI	MDI-X
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-



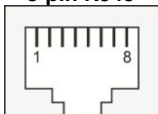
PoE Ethernet Port Connection

PoE ports located on the switch's front panel are used to connect to PoE-enabled devices. The pinout follows the "Alternative A, MDI mode" of 802.3af/802.3at standards. Please see the details in the following table.

PoE Port Pinouts

Pin	Power
1	V+
2	V+
3	V-
6	V-

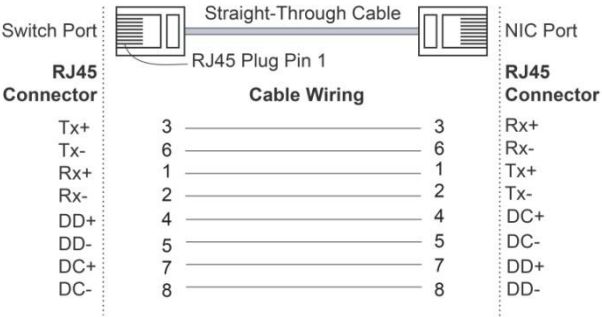
8-pin RJ45



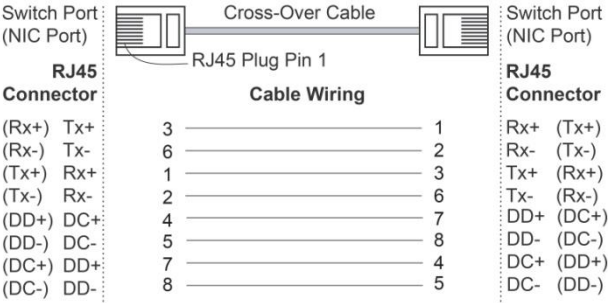
NOTE According to IEEE 802.3af/at standards, the PD shall be implemented to be insensitive to the polarity of the power supply and shall be able to operate per MDI mode and MDI-X mode. However, some PDs only support MDI mode or MDI-X mode only. The following figure shows how to select the correct cable between the PD and IE-SW-BL05-4GTPoE switch.

RJ45 (8-pin) to RJ45 (8-pin) Cable Wiring

RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring



RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring



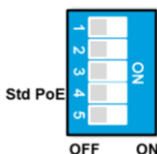
NOTE If the PD only supports PoE MDI mode (V+, V+, V-, V- for pins 1, 2, 3, 6), choose a cross-over Ethernet cable to connect the PD and the switch. If the PD only supports PoE MDI-X mode (V-, V-, V+, V+ for pins 1, 2, 3, 6), choose a straight-through Ethernet cable between the PD and the Switch.

Redundant Power Inputs

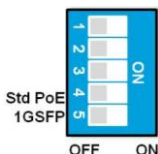
Both power inputs can be connected simultaneously to live DC power sources. If one power source fails, the other live source acts as a backup, and automatically supplies all of the switch's power needs.

DIP Switch Settings

The default setting for each DIP Switch is OFF. The following table explains the effect of setting the DIP Switches to the ON positions.



BSP
Jumbo
802.3az
Hi PWR



BSP
Jumbo
802.3az
Hi PWR
100SFP

**IE-SW-BL05-1GT-4GTPOE
(Copper Model)**

**IE-SW-BL05-1GS-4GTPOE
(SFP Model)**

DIP Switch	Setting	Description
BSP	ON	Enable broadcast storm protection
	OFF	Disable broadcast storm protection
Jumbo Frame	ON	Enable jumbo frame function
	OFF	Disable jumbo frame function
802.3az	ON	Enable the energy-efficient Ethernet function
	OFF	Disable the energy-efficient Ethernet function
PoE High Power	ON	Supports PoE high power output up to 36 W. PoE high power is activated when an 802.3af or 802.3at connection is detected.
	OFF	Supports standard PoE power output up to 30 W
100/1G SFP (For SFP model only)	ON	Supports 100M SFP module
	OFF	Supports 1000M SFP module
---	—	Serves no function (reserved for future use)
(For copper model only)		



ATTENTION

To actively update DIP switch settings, power off and then power on the switch.

LED Indicators

The front panel of the Switches contain several LED indicators. The function of each LED is described in the following table.

LED	Color	State	Description
PWR1	AMBER	On	Power is being supplied to power input P1.
		Off	Power is not being supplied to power input P1.
PWR2	AMBER	On	Power is being supplied to power input P2.
		Off	Power is not being supplied to power input P2.
10/100/1000M	AMBER	On	TP port's 10/100 Mbps or SFP port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 10/100 Mbps.
		Off	TP port's 10/100 Mbps or SFP port's 100 Mbps link is inactive.
	GREEN	On	TP/SFP port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps.
		Off	TP/SFP port's 1000 Mbps link is inactive.
PoE+	AMBER	On	The PoE device is connected by the IEEE 802.3af standard
		Blinking (1 time/s)	The PoE power has been shut off because the power budget is too low.
		Off	No PoE power output or no PoE connected PoE devices
	Green	On	The PoE device is connected by IEEE 802.3at standard or PoE High Power
		Off	No PoE power output or no PoE connected PoE devices
	Red	Blinking	PoE failure: - 1 time/s: PoE standard detection failure - 2 times/s: PoE current overload
		Off	No PoE failure

Auto MDI/MDI-X Connection

The Auto MDI/MDI-X function allows users to connect the Switch's 10/100/1000BaseT(X) ports to any kind of Ethernet device, without needing to pay attention to the type of Ethernet cable being used for the connection. This means that you can use either a straight-through cable or cross-over cable to connect the Ethernet Switch to Ethernet devices.

Triple Speed Functionality and Switching

The Ethernet Switch's 10/100/1000 Mbps switched RJ45 port auto negotiates with the connected device for the fastest data transmission rate supported by both devices. All models of IE-SW-BL05-4GTPoE series are plug-and-play devices, so that software configuration is not required at installation, or during maintenance. The half/full duplex mode for the switched RJ45 ports is user dependent and changes (by auto-negotiation) to full or half duplex, depending on which transmission speed is supported by the attached device.

Note about possible lost 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 has to be set to half-duplex mode (speed either 10,100 or 1000 Mbit/s).

Jumbo Frames

The IE-SW-BL05-4GTPoE series supports Ethernet jumbo frames up to 10 KByte, which is with more than 1500 bytes of payload. This function is by default disabled and can be enabled by turning on the DIP switch labeled “Jumbo” on the top cover. This is commonly used for large packet size applications such as video surveillance.

Broadcast Storm Protection

The switch has built-in algorithm for limiting the amount of broadcast packets through the switch. This function is by default disabled and can be enabled by turning on the DIP switch labeled “BSP” on the top cover. If the broadcast storm protection algorithm detects more than 2k broadcast frames per second, then the switch will be suppressed from receiving broadcast frames for a period of 2 ms to prevent any further flooding.

Total Power Budget

For the total power budget, the switch will provide 62 W at 12 to 17 VDC input, 120 W at 18 to 35 VDC input, and 144 W at 36 to 57 VDC input. The total power budget is the total amount of reserved PoE power based on the PoE class of the PoE device. If a newly connected PoE device causes the total reserved power to exceed the total power budget, the newly connected PoE device will be denied power.

Input Voltage	Total Power Budget
12 VDC (12 to 17 VDC)	62 W
24 VDC (18 to 35 VDC)	120 W
48 VDC (36 to 57 VDC)	144 W

PoE Class	Reserved Power
0	15.4 W
1	4.0 W
2	7.0 W
3	15.4 W
4	30 W

PoE High Power Application

PoE High Power can be enabled by DIP switch, and supply up to 36 W of PoE power when the PSE detects an 802.3af or 802.3at connection. Refer to the table below for the power budget at different input voltages, and for the number of PoE High Power Ports supported.

Input Voltage	Total Power Budget	Number of PoE High Power Ports
12 VDC (12 to 17 VDC)	62 W	Up to 1 PoE high power port (36 W)
24 VDC (18 to 35 VDC)	120 W	Up to 3 PoE high power port (36 W)
48 VDC (36 to 57 VDC)	144 W	Up to 4 PoE high power port (36 W)

Specifications

Technology	
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3ab for 1000BaseT IEEE 802.3z for 1000BaseX IEEE 802.3x for Flow Control IEEE 802.3af for PoE IEEE 802.3at for PoE+ IEEE 802.3az for Energy-Efficient Ethernet
Processing Type	Store and Forward
Interface	
RJ45 Ports	10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Port	100/1000 BaseX (SFP Slot)

LED Indicators	Power: PWR1, PWR2 TP Port: 10/100/1000M Fiber Port: 100/1000M PoE Ports: PoE+ for Port 2,3,4,5
DIP Switches	Broadcast storm protection, Jumbo Frame, 802.3az, Standard PoE/PoE High Power, 100/1G SFP
PoE	
Total Power Budget	62 W @ 12 VDC (12 to 17 VDC) 120 W @ 24 VDC (18 to 35 VDC) 144 W @ 48 VDC (36 to 57 VDC)
PoE Output Voltage	53 VDC @ 12/24/48 VDC power input
PoE Output Power	15.4 W in 802.3af, 30 W in 802.3at, 36 W in high power mode
PoE Output Current	350 mA in 802.3af, 600 mA in 802.3at, 720 mA in high power mode
Overload Current Protection at Port	Present
PoE Pinout	Mode A: Pair 1, 2 (V+); Pair 3, 6 (V-)
Power	
Input Voltage	12/24/48 VDC, redundant dual inputs
Operating Voltage	12 to 57 VDC
Rated Current	5.92 A @ 12 VDC ; 5.65 A @ 24 VDC ; 3.21 A @ 48 VDC
Power Consumption	11.73 W without PDs' consumption
Inrush Current	17.4 A @ 24 VDC (0.1 to 1 ms)
Electrical Isolation	2250 VDC to chassis for 60 s
Heat Dissipation	36.4 BTU/h
Overload Current Protection at Input	Present
Reverse Polarity Protection	Present
Connection	2 removable 2-contact terminal block
Physical Characteristics	
Housing	Aluminum, IP30 protection
Dimensions (WxHxD)	29 x 135 x 105 mm
Weight	300 g
Installation	DIN-Rail mounting, Wall mounting (with optional kit)
Environmental Limits	
Operating Temperature	Standard models: 0 to 60°C (32 to 140°F) Wide temp. models: -40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)

EMC	
EMI	CISPR 22, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8
Standards and Certifications	
Safety	UL 508
EMC	EN 55022/24, EN 61000-6-2/6-4
Vibration	IEC 60068-2-6
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
MTBF	
Time	1.257.910 hrs
Database	Telcordia (Bellcore), GB
WARRANTY	
Time Period	5 years

Weidmüller gives a 5 year warranty on this product in accordance with the warranty terms as described in the general conditions of sale of the Weidmüller company which has sold the products to you. Weidmüller warrants to you that such products the defects of which have already existed at the time when the risk passed will be repaired by Weidmüller free of charge or that Weidmüller will provide a new, functionally equivalent product to replace the defective one. Safe where expressly described otherwise in writing in this catalogue/product description, Weidmüller gives no warranty or guarantee as to the interoperability in specific systems or as to the fitness for any particular purpose. To the extent permitted by law, any claims for damages and reimbursement of expenses, based on whatever legal reason, including contract or tort, shall be excluded. Where not expressly stated otherwise in this warranty, the general conditions of purchase and the expressive liability commitments therein of the respective Weidmüller company which has sold the products to you shall be applicable.

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