

Unmanaged Fast Ethernet Switch BasicLine

IE-SW-BL05 Series (from product Rev. 3.0.0)

IE-SW-BL08 Series (from product Rev. 2.0.0)

Hardware Installation Guide

Sixth Edition, June 2024
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Weidmüller 

Overview

The IE-SW-BL05/08 series of industrial Ethernet switches are entry-level industrial 5 and 8-port Ethernet switches that support IEEE 802.3, IEEE 802.3u, and IEEE 802.3x with 10/100M, full/half-duplex, and MDI/MDIX auto-sensing.

The IE-SW-BL05/08 series provides 12/24/48 VDC (9.6 to 60 VDC) redundant power inputs. The switches are available with a standard operating temperature range from -10 to 60°C, or with a wide operating temperature range from -40 to 75°C, and 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-BL05/08 series also allow users to enable or disable broadcast storm protection (BSP) and quality of service (QoS) with DIP switches on the outer panel.

The IE-SW-BL05/08 switches can be easily installed with DIN-Rail mounting as well as distribution boxes. The DIN-rail mounting capability and IP30 metal housing with LED indicators make the plug-and-play IE-SW-BL05/08 switches reliable and easy to use.



ATTENTION

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.

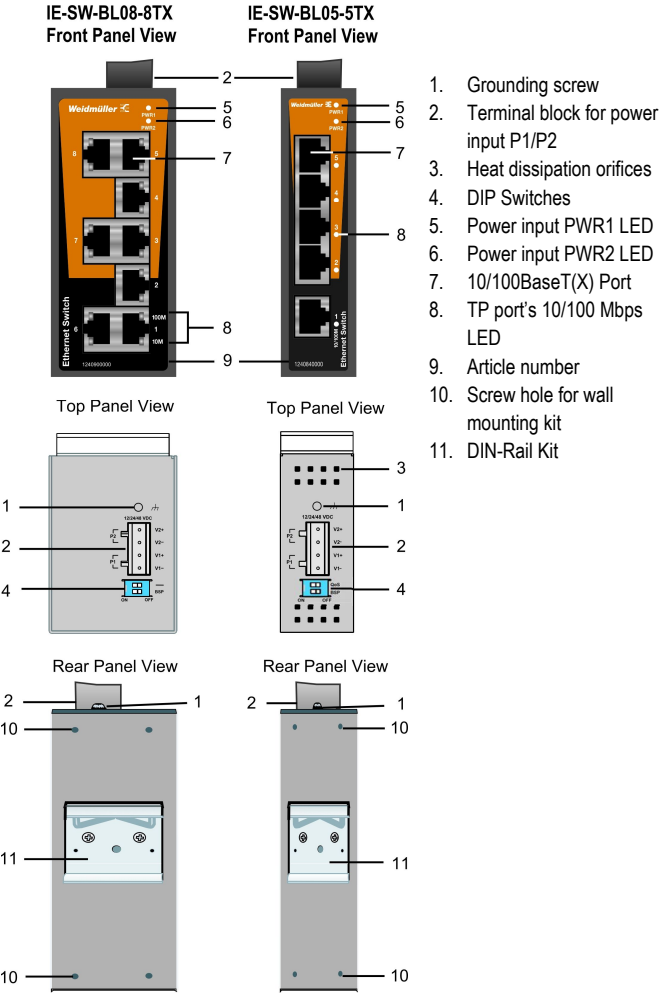
Package Checklist

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

- Ethernet Switch
- Hardware Installation Guide (printed)

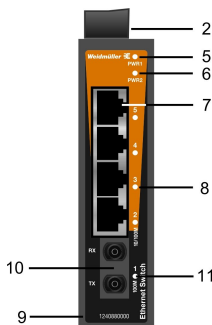
Panel Layout of

IE-SW-BL05(T)-5TX / IE-SW-BL08(T)-8TX

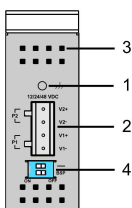


IE-SW-BL05(T)-4TX-1SC/1ST

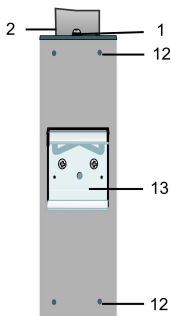
IE-SW-BL05-4TX-1ST
Front Panel View



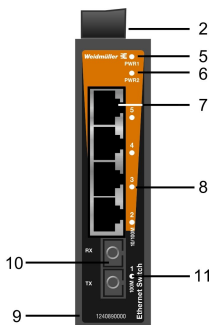
Top Panel View



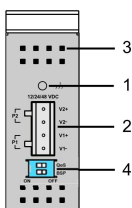
Rear Panel View



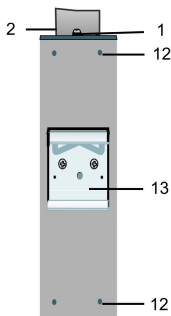
IE-SW-BL05-4TX-1SC
Front Panel View



Top Panel View



Rear Panel View



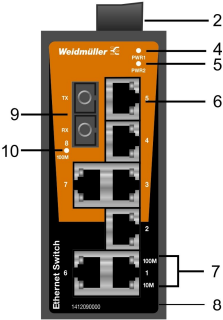
NOTE:

The appearance of
IE-SW-BL05(T)-4TX-1SC
is identical to
IE-SW-BL05(T)-4TX-1SCS.

1. Grounding screw
2. Terminal block for power input PWR1 / PWR2
3. Heat dissipation orifices
4. DIP Switches
5. Power input PWR1 LED
6. Power input PWR2 LED
7. 10/100BaseT(X) Port
8. TP port's 10/100 Mbps LED
9. Article number
10. 100BaseFX Port
11. FX port's 100 Mbps LED
12. Screw hole for wall mounting kit
13. DIN-Rail Kit

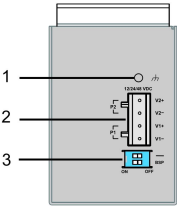
Panel Layout of IE-SW-BL08(T)-7TX-1SC

IE-SW-BL08-7TX-1SC
Front Panel View

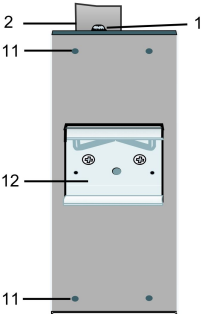


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2. Terminal block for power input PWR1 / PWR2
3. DIP Switches
4. Power input PWR1 LED
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Top Panel View



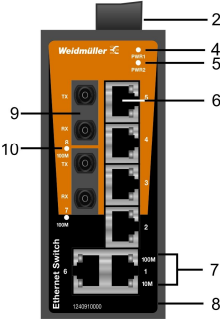
Rear Panel View



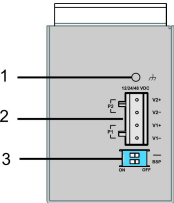
Panel Layout of

IE-SW-BL08(T)-6TX-2SC/2ST

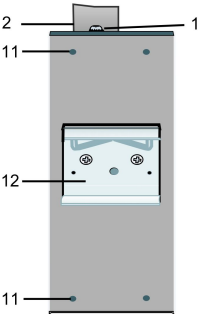
IE-SW-BL08-6TX-2SC
Front Panel View



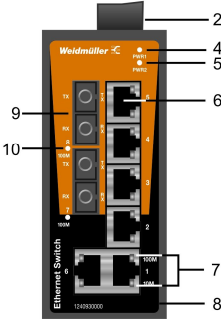
Top Panel View



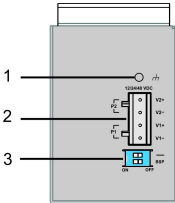
Rear Panel View



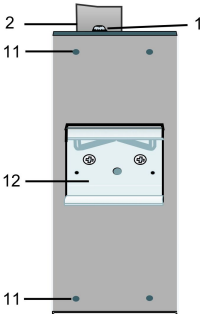
IE-SW-BL08-6TX-2ST
Front Panel View



Top Panel View



Rear Panel View



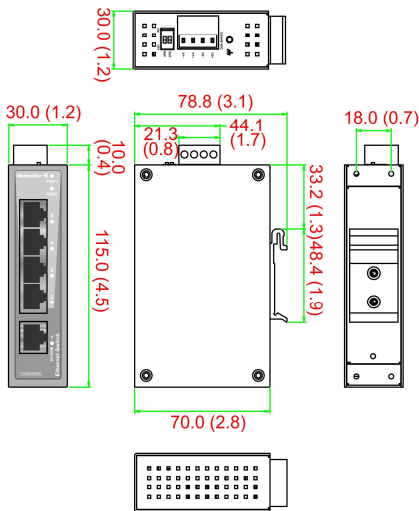
NOTE:
The appearance of
IE-SW-BL08(T)-6TX-2SC
is identical to
IE-SW-BL08(T)-6TX-2SCS.

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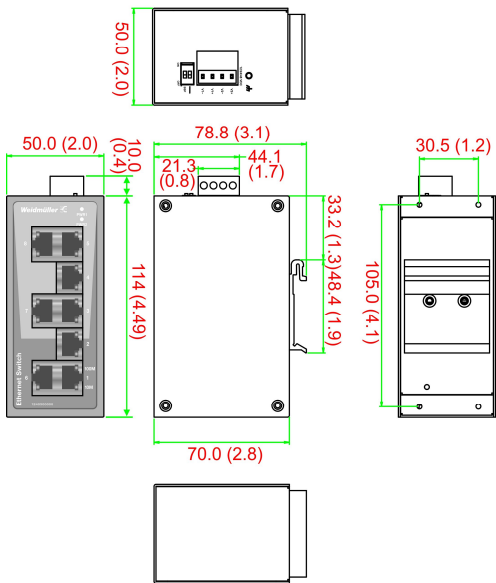
Mounting Dimensions

IE-SW-BL05 series

Unit = mm (inch)

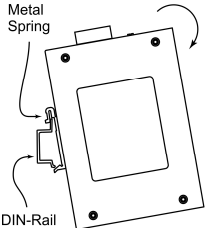
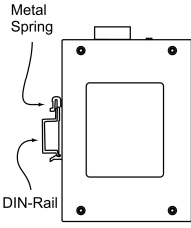


IE-SW-BL08 series



DIN-Rail Mounting

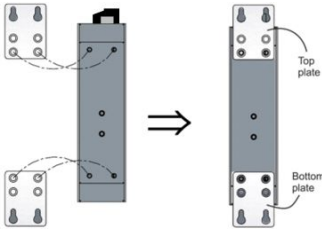
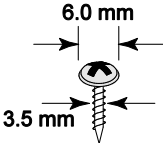
The aluminum DIN-rail attachment plate should already be fixed to the back panel of the Ethernet Switch when you take it out of the box. If you need to reattach the DIN-rail attachment plate, make sure the stiff metal spring is situated towards the top, as shown in the figures below.

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 DIN-rail from the Ethernet Switch, simply reverse Steps 1 and 2.

Wall Mounting (optional) for IE-SW-BL05 series only

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

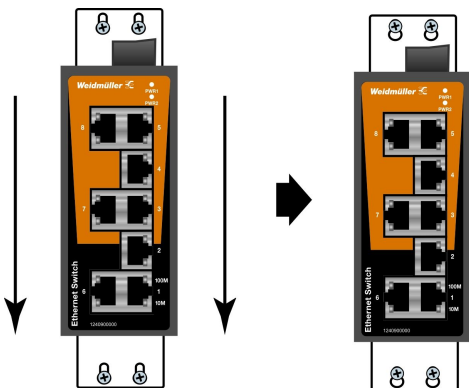
STEP 1: Remove the aluminum DIN-Rail attachment plate from the switch rear panel, and then attach the wall mount plates as shown in the diagram at the right.		
STEP 2: Mounting the switch on the wall requires 4 screws. Use the switch, with wall mount plates attached, as a guide to mark the correct locations 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 you are using the correct voltage. Do NOT use a voltage greater than what is specified on the product label.

These devices must be supplied by a SELV source as defined in the Low Voltage Directive 2014/35/EU and 2014/30/EU or compliant with UL 61010-1, UL 61010-2-201.



WARNING

Safety First!

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 items:

- 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 with similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring for all devices in the system when necessary.

Grounding 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.



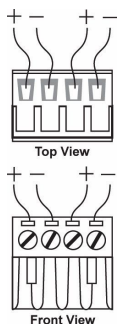
ATTENTION

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

NOTE 4 mm² conductor wire must be used when connecting the device's external grounding screw to ground.

Wiring the Redundant Power Inputs

The top two contacts and the bottom two contacts of the 4-contact terminal block connector on the Ethernet Switch's top panel are used for the Ethernet Switch's two DC inputs. Top and front views of the terminal block connector 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 Ethernet Switch's top panel.

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 Ethernet Switch's power needs.



ATTENTION

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

NOTE For use in Pollution Degree 2 Environment or similar environment.
Field Wiring Terminal Markings - Wiring terminals shall be marked to indicate the proper connections for power supply and load, or a wiring diagram coded to the terminal marking shall be securely attached to the device, and "Use Copper Conductors Only, Tighten to 4.5 pound-inches" or equivalent. This marking should be located adjacent to the terminal or on the wiring diagram.

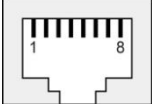
Communication Connections

The 5-Port models have 4 or 5 10/100BaseT(X) Ethernet ports, and 1 or 0 (zero) 100 BaseFX multi/single-mode (SC/ST-type connector) fiber ports. The 8-Port models have 6, 7 or 8 10/100BaseT(X) Ethernet ports, and 2, 1 or 0 (zero) 100 BaseFX multi/single-mode (SC/ST-type connector) fiber ports.

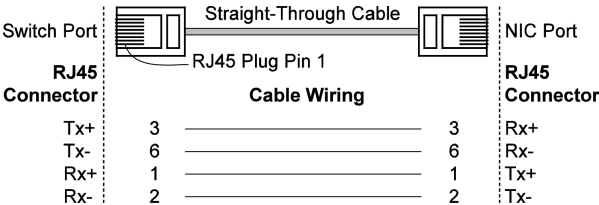
10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(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, and also show cable wiring diagrams for straight-through and cross-over Ethernet cables.

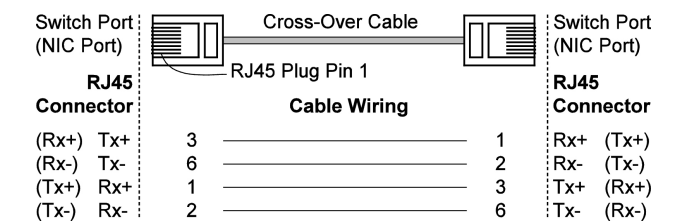
10/100Base T(x) RJ45 Pinouts

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

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



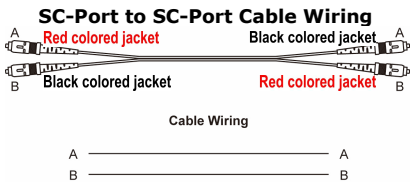
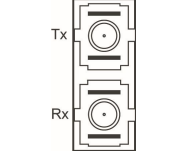
RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring



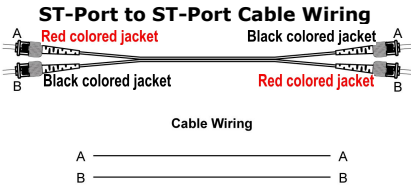
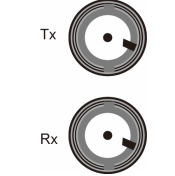
100BaseFX Ethernet Port Connection (Fiber)

Remember to connect the Tx (transmit) port of device 1 to the Rx (receive) port of device 2, and the Rx (receive) port of device 1 to the Tx (transmit) port of device 2. Fiber optic connections generally are using the full-duplex transmission mode.

SC-Port Pinouts



ST-Port Pinouts



ATTENTION

This is a Class 1 Laser/LED product. To avoid causing serious damage to your eyes, do not stare directly into the Laser Beam.

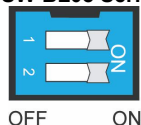
DIP Switch Settings

IE-SW-BL05 Series DIP Switches



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

IE-SW-BL08 Series DIP Switches



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



ATTENTION

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

DIP Switch	Setting	Description															
QoS (IE-SW-BL05 series only)	ON	Enables Quality of Service which handles packet priorities using four WRR queues.															
		QoS 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>	QoS 3bit priority	7, 6	5, 4	3, 2	1, 0	Queues	3	2	1	0	WRR	8	4	2	1
		QoS 3bit priority	7, 6	5, 4	3, 2	1, 0											
	Queues	3	2	1	0												
WRR	8	4	2	1													
Note: Enabling the QoS DIP switch will also enable Multicast Filtering which will block LLDP & PROFINET PTCP-Delay traffic by filtering frames with a destination MAC address within the range of 01-80-C2-00-00-02 to 01-80-C2-00-00-0F.																	
OFF	Disables Quality of Service.																
BSP	ON	Enables broadcast storm protection and limits broadcast packets to a rate of 1Mbps for each Ethernet port. The switch will discard any further incoming broadcast packet if the limit is exceeded.															
	OFF	Disables broadcast storm protection.															

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	State	Description
PWR1	AMBER	On	Power is being supplied to power input PWR1.
		Off	Power is not being supplied to power input PWR1.
PWR2	AMBER	On	Power is being supplied to power input PWR2.
		Off	Power is not being supplied to power input PWR2.
10M	YELLOW	On	Port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	Port's 10 Mbps link is inactive
100M	GREEN	On	Port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	Port's 100Mbps link is inactive.

Auto MDI/MDI-X Connection

The Auto MDI/MDI-X function allows connecting devices to an Ethernet Switch's 10/100BaseT(X) port without paying 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 devices to the Ethernet Switch.

Auto-Negotiation and Speed Sensing

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. Auto-negotiation takes place each time when a RJ45 cable connection is made and a link will be established. The Ethernet Switch advertises its capability for using 10 or 100 Mbps transmission speed to the connected device and expects this also from the connected device. This procedure results in an agreement to operate at a speed of either 10 or 100 Mbps.

Auto-Negotiation and Transmission Mode

Besides the transmission speed, each RJ45 port auto-negotiates the transmission mode (half duplex or full duplex). Typically, if both devices are set to "auto-negotiation", the full duplex transmission will be set.

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 either 10 Mbps or 100 Mbps).

Specifications

Technology				
Standards	IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X) and 100Base FX, IEEE 802.3x for Flow Control			
Flow Control	IEEE 802.3x flow control, back pressure flow control			
Processing Type	Store and Forward			
Interface				
RJ45 Ports	10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection			
Fiber Ports	100BaseFX ports (SC/ST connector, multi/single-mode)			
LED Indicators	PWR1, PWR2 (Power), 10/100M (TP-Port) and 100M (Fiber port)			
DIP Switches	Enable/disable broadcast storm protection Enable/disable Quality of Service (IE-SW-BL05 series only)			
Optical Fiber				
		100Base FX		
		Multi-mode		
Fiber Cable Type		OM1	OM2	OM3 OM4
Typical Distance		4 km	2 km	2 km
Wavelength	Typical (nm)	1300		
	TX Range (nm)	1260 to 1360		
	RX Range (nm)	1100 to 1600		
Optical Power	TX Range (dBm)	-10 to -20		
	RX Range (dBm)	-3 to -32		
	Link Budget (dB)	12		
	Dispersion Penalty (dB)	3	2	2 2
		100Base FX		
		Multi-mode		Single-mode
Fiber Cable Type		50/125 μm 800 MHz*Km		G.652
Typical Distance		5 km		40 km
Wavelength	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1
Note: When connecting 40 km single-mode fiber over a short distance, we recommend putting an attenuator to prevent the transceiver from being damaged by excessive optical power.				
Typical Distance: To reach the typical distance of a specified fiber transceiver, please refer to the following formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).				

Power	
Rated Input Voltage and Current	IE-SW-BL05 series: 12/24/48 VDC, Max. 0.29 A, Class 2 IE-SW-BL08 series: 12/24/48 VDC, 0.3/0.15/0.08A, Class 2
Operating Voltage	9.6 to 60 VDC (2 redundant inputs)
Connection	One removable 4-pin terminal block
Inrush Current	IE-SW-BL05 series: Max. 6.24A @ 24VDC (0.1 - 1ms) IE-SW-BL08 series: Max. 8.81A @ 24VDC (0.1 - 1ms)
Overload Current Protection	Present
Reverse Polarity Protection	Present
Physical Characteristics	
Housing	IP30 protection (not UL certified), metal case
Dimension (W x H x D)	IE-SW-BL05 series: 30x 115 x 70 mm IE-SW-BL08 series: 50x 114 x 70 mm
Weight	IE-SW-BL05 series: 175 g IE-SW-BL08 series: 275 g
Installation	DIN-rail, Wall Mounting (with optional kit for IE-SW-BL05 series only)
Environmental	
Operating Temperature	-10 to 60°C (14 to 140°F) -40 to 75°C (-40 to 167°F) for -T models
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Operating altitude	Up to 2000 m
Regulatory Approvals	
Safety	IE-SW-BL05 series: UL 61010-1, UL 61010-2-201, UL 62368, EN 62368-1 IE-SW-BL08 series: UL 61010-1, UL 61010-2-201, EN 62368-1
EMC	EN 55032, EN 55035
EMI	FCC Part 15, CISPR (EN 55032) 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 PFMF
Hazardous Location	UL/cUL Class I, Division 2, Groups A, B, C, and D; ATEX Zone 2, Ex ec IIC T4 Gc EN IEC 60079-0:2018 EN IEC 60079-7:2015/A1:2018
Maritime	DNV
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-32
Vibration	IEC 60068-2-6
MTBF	
Time	IE-SW-BL05(T)-5TX: 3,969,664 hrs IE-SW-BL05(T)-4TX-1SC: 3,500,324 hrs IE-SW-BL05(T)-4TX-1ST: 3,293,423 hrs IE-SW-BL05(T)-4TX-1SCS: 2,797,013 hrs

	IE-SW-BL08(T)-8TX: 3,248,014 hrs IE-SW-BL08(T)-6TX-2SC/2ST/2SCS: 2,705,157 hrs IE-SW-BL08(T)-7TX-1SC: 2,943,335 hrs
Database	Telcordia (Bellcore), GB
Warranty	
Time Period	5 years

NOTE The device should be deployed at least 400 mm away from any compass.



WARNING

This equipment is intended to be used in a restricted access location.



WARNING: HOT SURFACE!! Before touching it, special attention or protection is required.



WARNING

- The PWR terminal block plug requires 24 to 12 AWG wiring size, (0.205 to 3.31 mm²) torque 4.5 in-lb, (0.509 N-m) min. 105 °C, copper conductors only.
- The recommended stripping length is 7 to 8 mm.
- Please use optional optical transceivers (SFP/Fixed Fiber) that comply with IEC 60825-1, 21 CFR 1040 Section 1040.10 and 1040.11, classified as Class 1 laser products.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Installation to ensure the safety of any system incorporating the equipment is the responsibility of the system assembler.
- These devices are open-type devices that are to be installed in an enclosure with tool-removable cover or door suitable for the environment at that location.

Hazardous Location

ATEX information	  II 3G Certification No.: ATEX: DEMKO 11 ATEX 150193X Certification String: ATEX: Ex ec IIC T4 Gc Ambient range: -10°C to 60°C (for models without -T suffix) -40°C to 75°C (for models with -T suffix) Standards covered: EN IEC 60079-0:2018 EN IEC 60079-7:2015/A1:2018 WARNING – DO NOT SEPARATE WHEN ENERGIZED
Safe Usage Conditions	<ul style="list-style-type: none"> • The equipment shall only be used in an area of at least pollution degree 2, as defined in EN IEC 60664-1. • The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with EN/IEC 60079-0 and accessible only with use of a tool. • Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.

NOTE Suitable for use in Class I, Division 2, Groups A, B, C and D hazardous locations, or nonhazardous locations only.



WARNING



EXPLOSION HAZARD - Substitution of any component may impair suitability for Class 1, Division 2



WARNING

EXPLOSION HAZARD - Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.

Disposal Information

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

- Installation of the equipment should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- This device should be used with a certified power supply with SELV output or certified power supply providing double insulation evaluated by UL61010-2-201 standards.

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.

Contact Information

Weidmüller Interface GmbH & Co. KG
32760 Detmold
Klingenbergstraße 26
32758 Detmold / Germany

Phone +49 (0) 5231 14-0
Fax +49 (0) 5231 14-292083
E-Mail info@weidmueller.com
Internet www.weidmueller.com