

Managed Ethernet Switches – Value Line

IE-SW-VL05/08M Series

Hardware Installation Guide

Fifth Edition, August 2016
1243340000/04/08.16

Important note:

This document, the detailed user manual, additional product information, configuration tool and latest firmware can be downloaded using following links:

<http://www.weidmueller.com>

► Select **Product Catalogue**

- ⇒ Select „Industrial Ethernet active“
- ⇒ Select „ValueLine managed Switches“
- ⇒ Select Product model
 - ⇒ Click and expand section „Downloads“
 - ⇒ Download needed software or documentation

Copyright Notice

Copyright © 2016 Weidmüller Interface GmbH & Co. KG
All rights reserved.

Reproduction without permission is prohibited.

Weidmüller 

Overview

The IE-SW-VL05/08M series are managed Fast Ethernet switches with 5-port or 8-ports in various copper and fiber variants. In addition, the built-in smart alarm function helps system maintainers monitor the health of your Ethernet network.

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.

- 1 Ethernet Switch IE-SW-VL05/08M Series
- Hardware Installation Guide
- RJ45 to DB9 console port cable
- Protective caps for unused ports

Regarding further documentation like the manual please download it from the Weidmüller Internet server as described on page 1.



Brief Information for quick access to the Web interface

The Web interface of the managed Switch can be accessed via IP address 192.168.1.110 and subnet mask 255.255.255.0 (Factory default value).

Connect the PC to any port of the managed Switch and set the PC's IP address to a free one of range 192.168.1.0 / 255.255.255.0

Start a web browser and enter the IP address of the connected Switch into the browser's address line.

<http://192.168.1.110>

After the appearance of the login prompt, please enter following login data (factory settings):

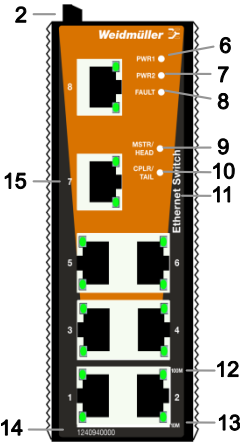
User name: **admin**
Password: **Detmold**

Note: The Web interface uses Java Runtime applets for displaying some Switch parameters. For this reason your PC must have installed the Java Runtime Engine to be able to configure the Switch without any limitations.

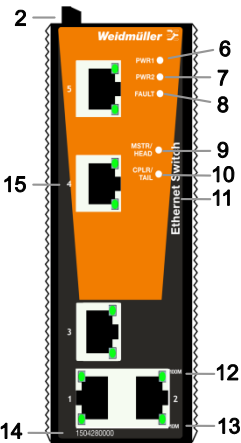
For general settings of the Switch parameters please refer to the manual.

Panel Layout of IE-SW-VL08MT-8TX and IE-SW-VL05M(T)-5TX

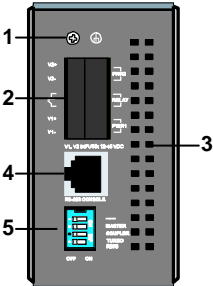
IE-SW-VL08MT-8TX
Front Panel View



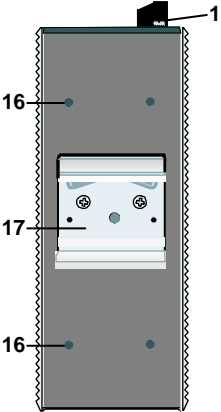
IE-SW-VL05M(T)-5TX
Front Panel View



Top Panel View



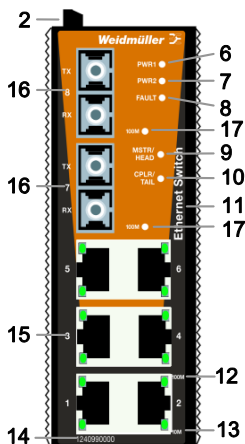
Rear Panel View



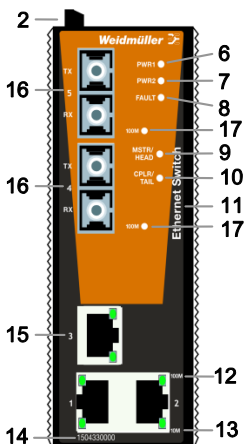
1. Grounding screw
2. Terminal block for power input PWR1/PWR2 and relay output
3. Heat dissipation orifices
4. Console port
5. DIP switches
6. Power input PWR1 LED
7. Power input PWR2 LED
8. Fault LED
9. MSTR/HEAD: LED indicator
10. CPLR/TAIL: LED indicator
11. Label
12. TP port's 100 Mbps LED
13. TP port's 10 Mbps LED
14. Article Number
15. 10/100BaseT(X) ports
16. Screw hole for wall mounting kit
17. DIN-Rail kit

Panel Layout of IE-SW-VL08MT-6TX-2SCS and IE-SW-VL05M(T)-3TX-2SC

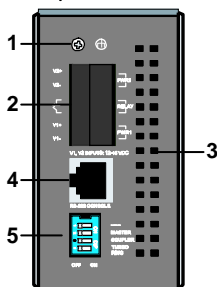
IE-SW-VL08MT-6TX-2SCS
Front Panel View



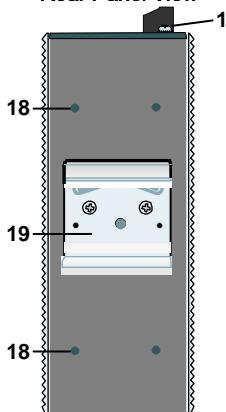
IE-SW-VL05M(T)-3TX-2SC
Front Panel View



Top Panel View



Rear Panel View



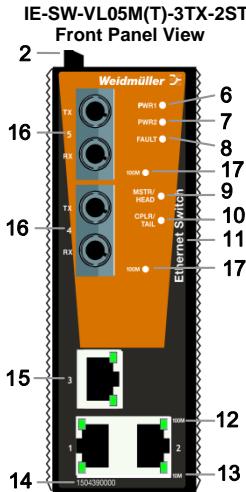
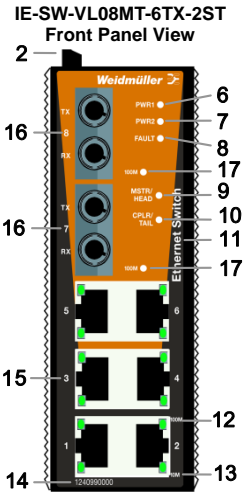
Note:

The appearance of the IE-SW-VL08MT-6TX-2SC is identical to that of the IE-SW-VL08MT-6TX-2SCS.

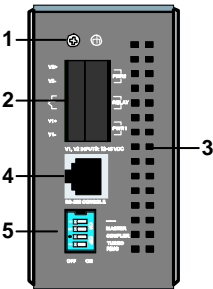
Device description:

1. Grounding screw
2. Terminal block for power input PWR1/PWR2 and relay output
3. Heat dissipation orifices
4. Console port
5. DIP switches
6. Power input PWR1 LED
7. Power input PWR2 LED
8. Fault LED
9. MSTR/HEAD: LED indicator
10. CPLR/TAIL: LED indicator
11. Label
12. TP port's 100 Mbps LED
13. TP port's 10 Mbps LED
14. Article number
15. 10/100BaseT(X) ports
16. 100BaseFX ports
17. FX port's 100 Mbps LEDs
18. Screw hole for wall mounting kit
19. DIN-Rail kit

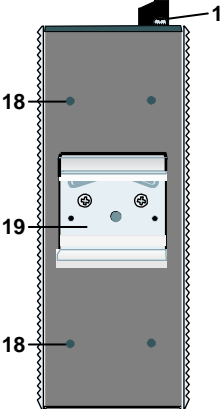
Panel Layout of IE-SW-VL08MT-6TX-2ST and IE-SW-VL05M(T)-3TX-2ST



Top Panel View



Rear Panel View

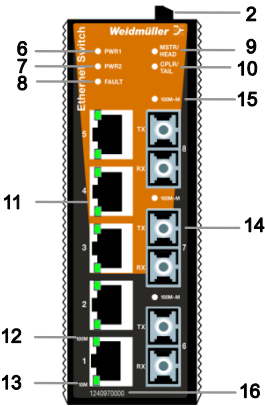


Device description:

1. Grounding screw
2. Terminal block for power input PWR1/PWR2 and relay output
3. Heat dissipation orifices
4. Console port
5. DIP switches
6. Power input PWR1 LED
7. Power input PWR2 LED
8. Fault LED
9. MSTR/HEAD: LED indicator
10. CPLR/TAIL: LED indicator
11. Label
12. TP port's 100 Mbps LED
13. TP port's 10 Mbps LED
14. Article Number
15. 10/100BaseT(X) ports
16. 100BaseFX ports
17. FX port's 100 Mbps LEDs
18. Screw hole for wall mounting kit
19. DIN-Rail kit

Panel Layout of IE-SW-VL08MT-5TX-3SC

IE-SW-VL08MT-5TX-3SC
Front Panel View



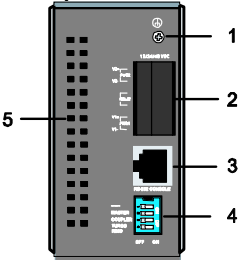
Note:

The appearance of the
IE-SW-VL08MT-5TX-1SC-2SCS
is identical to that of the
IE-SW-VL08MT-5TX-3SC

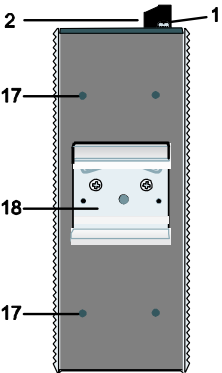
Device description:

1. Grounding screw
2. Terminal block for power input PWR1/PWR2 and relay output
3. Console port
4. DIP switches
5. Heat dissipation orifices
6. Power input PWR1 LED
7. Power input PWR2 LED
8. Fault LED
9. MSTR/HEAD: LED indicator
10. CPLR/TALE: LED indicator
11. 10/100BaseT(X) ports
12. TP port's 100 Mbps LED
13. TP port's 10 Mbps LED
14. 100BaseFX ports
15. 1 FX port's 100Mbps LEDs
16. Article Number
17. Screw hole for wall mounting kit
18. DIN-Rail kit

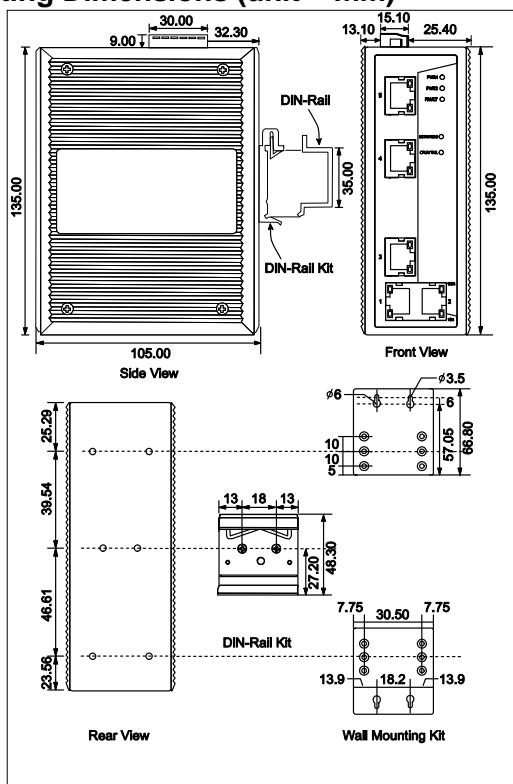
Top Panel View



Rear Panel View



Mounting Dimensions (unit = mm)

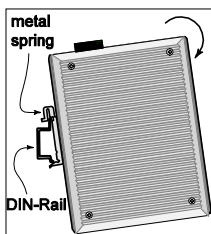


DIN-Rail Mounting

The aluminum DIN-Rail attachment plate should already be fixed to the back panel of the IE-SW-VL05/08M 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 following figures.

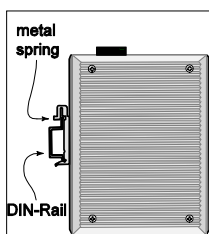
STEP 1:

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.



To remove the Ethernet Switch from the DIN-Rail, simply reverse Steps 1 and 2.

ATEX Information



II 3G



1. Certificate number DEMKO 11 ATEX 150189X
2. Ambient range ($-40^{\circ}\text{C} \leq T_{\text{amb}} \leq 75^{\circ}\text{C}$)
3. Certification string
IE-SW-VL08M-Series: Ex nA nC IIC T4 Gc
4. Standards covered (EN60079-0:2012+A11:2013, EN60079-15:2010)
5. The conditions of safe usage:
 - These products must be mounted in an IP54 enclosure.
 - Install in an area of pollution degree 2 or less.
 - Use a conductor wire of size 0.2 mm² or greater.
 - PROVISIONS SHOULD BE MADE, EXTERNAL TO THE APPARATUS, TO PREVENT THE RATED VOLTAGE FROM BEING EXCEEDED BY TRANSIENT DISTURBANCES OF MORE THAN 40 %.

Wiring Requirements



WARNING

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your Ethernet Switch.

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.

Be sure to read and follow these important guidelines:

- 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 through the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- 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 separate.
- 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.



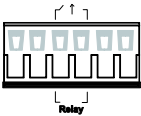
ATTENTION

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

Wiring the Relay Contact

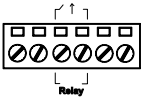
The Relay Contact consists of the two middle contacts of the terminal block on the IE-SW-VL05/08M series top panel. Refer to the next section for detailed instructions on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor.

In this section, we explain the meaning of the two contacts used to connect the Alarm Contact.



FAULT: The two middle contacts of the 6-contact terminal block connector are used to detect both power faults and port faults. The two wires attached to the fault contacts form an open circuit when:

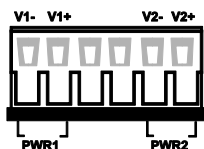
- 1. A relay warning event is triggered.
OR
- 2. The IE-SW-VL05/08M series is the Master of this Turbo Ring, and the Turbo Ring is broken.
OR
- 3. Start-up failure.



If none of these three conditions is satisfied, the fault circuit will remain closed

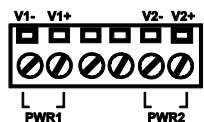
Wiring the Redundant Power Inputs

The top two contacts and the bottom two contacts of the 6-contact terminal block connector on the IE-SW-VL05/08M series top panel are used for the two DC inputs. Top and front views of one of the terminal block connectors are shown in the following figures:



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

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 the IE-SW-VL05/08M series top panel.



ATTENTION

Before connecting the IE-SW-VL05/08M series to the DC power inputs, make sure the DC power source voltage is stable.

Communication Connections

IE-SW-VL05/08M models have 8, 6, 5 or 3 10/100BaseT(X) Ethernet ports, and 0 (zero), 2, or 3 100BaseFX (SC/ST-type connector) fiber ports.

10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on the Ethernet Switches front panel are used to connect to Ethernet-enabled devices.

Next, 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.

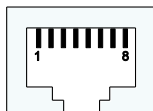
MDI Port Pinouts

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

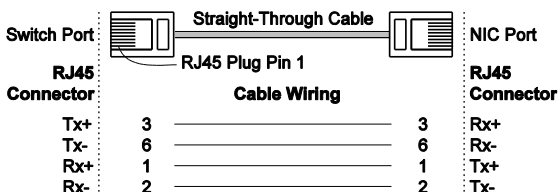
MDI-X Port Pinouts

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

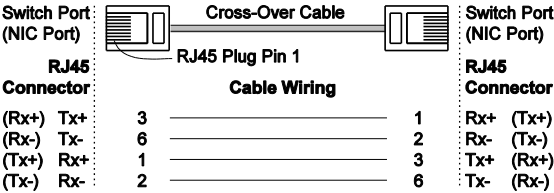
8-pin RJ45



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



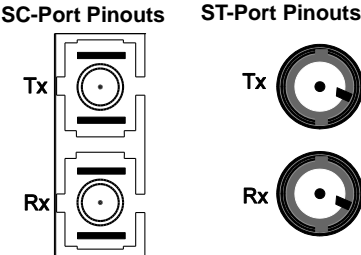
RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring



100BaseFX Ethernet Port Connection

The concept behind the SC/ST port and cable is quite straightforward. Suppose you are connecting devices I and II; contrary to electrical signals, optical signals do not require a circuit in order to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used transmit data from device II to device I, for full-duplex transmission.

Remember to connect the **Tx (transmit)** port of device I to the **Rx (receive)** port of device II, and the **Rx (receive)** port of device I to the **Tx (transmit)** port of device II.



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.

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 the IE-SW-VL05/08M series with power.

Relay Contact

The Ethernet switch has one Relay Contact located on the top panel. For detailed instructions on how to connect the Relay Contact power wires to the two middle contacts of the 6-contact terminal block connector, see the **Wiring the Relay Contact** section. A typical scenario would be to connect the fault circuit to a warning light located in the control room. The light can be set up to switch on when a fault is detected.

The Relay Contact has two terminals that form a fault circuit for connecting to an alarm system. The two wires attached to the fault contacts form an open circuit when (1) a relay warning event is triggered, (2) the switch is the Master of this Turbo Ring, and the Turbo Ring is broken, or (3) start-up failure. If none of these three conditions occur, the fault circuit will be closed.

Turbo Ring DIP Switch Settings

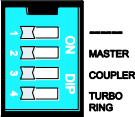
IE-SW-VL05/08M models are managed Ethernet switches that offer redundancy. The proprietary Turbo Ring protocol provides better network reliability and faster recovery time. Turbo Ring’s recovery time is less than 300 ms (**Turbo Ring**) or 20 ms (**Turbo Ring V2**) - compared to a 3- to 5-minute recovery time for commercial switches - decreasing the possible loss caused by network failures in an industrial setting.

There are 4 Hardware DIP Switches for Turbo Ring on the top panel of IE-SW-VL05/08M series that can help setup the Turbo Ring easily within seconds. If you do not want to use a hardware DIP switch to setup the Turbo Ring, you can use a web browser, telnet, or console to disable this function.

NOTE

Please refer to the **Turbo Ring DIP Switch** section and **Using Communication Redundancy** section in User’s Manual for more detailed information about the settings and usage of **Turbo Ring** and **Turbo Ring V2**.

IE-SW-VL05/08M Series DIP Switches



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

“Turbo Ring” DIP Switch Settings			
DIP 1	DIP 2	DIP 3	DIP 4
Reserved for future use.	ON: Enables this Ethernet Switch as the Ring Master.	ON: Enables the default “Ring Coupling” ports.	ON: Activates DIP switches 1, 2, 3 to configure “Turbo Ring” settings.

	<u>OFF</u> : This Ethernet Switch will not be the Ring Master.	<u>OFF</u> : Do not use this Ethernet Switch as the ring coupler.	<u>OFF</u> : DIP switches 1, 2, 3 will be disabled.
“Turbo Ring V2” DIP Switch Settings			
DIP 1	DIP 2	DIP 3	DIP 4
<u>ON</u> : Enables the default “Ring Coupling (backup)” port.	<u>ON</u> : Enables this Ethernet Switch as the Ring Master.	<u>ON</u> : Enables the default “Ring Coupling” port.	<u>ON</u> : Activates DIP switches 1, 2, 3 to configure “Turbo Ring V2” settings.
<u>OFF</u> : Enables the default “Ring Coupling (primary)” port.	<u>OFF</u> : This Ethernet Switch will not be the Ring Master.	<u>OFF</u> : Do not use this Ethernet Switch as a ring coupler.	<u>OFF</u> : DIP switches 1, 2, 3 will be disabled.

NOTE If you do not enable any of the IE-SW-VL05/08M switches to be the Ring Master, the Turbo Ring protocol will automatically choose the switch with the smallest MAC address range to be the Ring Master. If you accidentally enable more than one IE-SW-VL05/08M switch to be the Ring Master, these switches will auto-negotiate to determine which one will be the Ring Master.

NOTE To switch on the Master or Coupler functions of the DIP switch, you have to enable the Turbo Ring Pole first.

LED Indicators

There are several LEDs on the Ethernet Switches front panel. 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 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.
FAULT	RED	On	When (1) a relay warning event is triggered, (2) the switch is the Master of this Turbo Ring, and the Turbo Ring is broken, or (3) start-up failure.

		Off	When a relay warning event is not triggered.
MSTR/ HEAD	GREEN	On	When the switch is set as the Master of the Turbo Ring, or as the Head of the Turbo Chain.
		Blinking	The switch has become the Ring Master of the Turbo Ring, or the Head of the Turbo Chain, after the Turbo Ring or the Turbo Chain is down.
		Off	When the switch is not the Master of this Turbo Ring or is set as the Member of the Turbo Chain.
CPLR/ TAIL	GREEN	On	When the switch coupling function is enabled to form a back-up path, or when it's set as the Tail of the Turbo Chain.
		Blinking	When the Turbo Chain is down.
		Off	When the switch disables the coupling function, or is set as the Member of the Turbo Chain.
10M (TP)	GREEN	On	TP port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	TP Port's 10 Mbps link is inactive.
100M (TP)	GREEN	On	TP port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	TP Port's 100 Mbps link is inactive.
100M (FX)	GREEN	On	FX port's 100 Mbps is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	FX port's 100 Mbps is inactive.

Auto MDI/MDI-X Connection

The Auto MDI/MDI-X function allows users to connect the 10/100BaseTX 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 IE-SW-VL05/08M switches to Ethernet devices.

Specifications

Technology	
Standards	IEEE802.3, 802.3u, 802.3x, 802.1D-2004, 802.1Q, 802.1w, 802.1p
Protocols	IGMP V1/V2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, TFTP, SNMP, SMTP, RARP, RMON, HTTP, Telnet,

	Syslog, DHCP Option 66/67/82, BootP, LLDP, Modbus TCP, Ethernet/IP, PROFINET RT, IPv6
MIB	MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, RMON MIB Group 1, 2, 3, 9, Bridge MIB, RSTP MIB
Forwarding and Filtering Rate	148.810 pps
Processing Type	Store and Forward
Flow Control	IEEE802.3x flow control, back pressure flow control
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)
Console	RS-232 (RJ45)

LED Indicators	PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber Port), CPLR/TAIL and MSTR/HEAD
Relay Contact	One relay output with current carrying capacity of 1A @ 24 VDC
DIP Switches	Master, Coupler, Turbo Ring, Reserve

Optical Fiber		
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. Tx	-10 dBm	0 dBm
Min. Tx	-20 dBm	-5 dBm
Rx Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km ^a , 4 km ^b	40 km ^c
Saturation	-6 dBm	-3 dBm

^a using [50/125μm, 800 MHz*km] cable

^b using [62.5/125μm, 500 MHz*km] cable

^c using [9/125μm, 3.5 PS/(nm *km)] cable

Power	
Input Voltage	12 to 45 VDC, redundant inputs
Input Current (@24V)	IE-SW-VL05M(T)-5TX: Max. 0.24 A IE-SW-VL08M-8TX: Max. 0.21 A IE-SW-VL05M(T)-3TX-2SC/ST: Max.0.32 A IE-SW-VL08MT-6TX-2SC/ST/SCS: Max. 0.35 A IE-SW-VL08MT-5TX-3SC: Max. 0.32 A IE-SW-VL08MT-5TX-2SCS-1SC: Max. 0.32 A
Connection	One removable 6-pin terminal block
Overload Current Protection	Present
Reverse Polarity Protection	Present

Mechanical	
Housing	Metal, IP30 protected
Dimensions	53.6 × 135 × 105 mm (W × H × D)
Weight	0.65 kg (IE-SW-VL05M models) 0.89 kg (IE-SW-VL08M models)
Installation	DIN-Rail, Wall Mounting (optional kit)
Environment	
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)
Regulatory Approvals	
Safety	UL60950-1, UL 508, CSA C22.2 No. 60950-1, EN60950-1
Hazardous Location	UL/cUL Class I, Division 2, Groups A, B, C, and D ATEX Zone 2: IE-SW-VL08M-Series: Ex nA nC IIC T4 Gc
EMI	FCC Part 15, CISPR (EN55022) class A
EMS	EN61000-4-2 (ESD), Level 3 EN61000-4-3 (RS), Level 3 EN61000-4-4 (EFT), Level 3 EN61000-4-5 (Surge), Level 3 EN61000-4-6 (CS), Level 3
Shock	IEC60068-2-27
Freefall	IEC60068-2-32
Vibration	IEC60068-2-6
MTBF (mean time between failures)	
Time	392,000 hrs (IE-SW-VL05M models) 1,102,850 hrs (IE-SW-VL08M models)
Database	Telcordia (Bellcore), GB 25°C
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.

Contact Information

Weidmüller Interface GmbH & Co. KG
Postfach 3030
32760 Detmold
Klingenbergstraße 16
32758 Detmold
Germany

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