

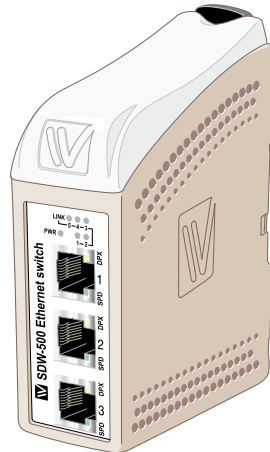
User Guide

6644-2212



# SDW-500

S E R I E S



## *Industrial Ethernet 5-port Switch*

[www.westermo.com](http://www.westermo.com)

## Safety



### General:

Before using this unit, read this manual completely and gather all information on the unit. Make sure that you understand it fully. Check that your application does not exceed the safe operating specifications for this unit.



### Before installation, maintenance or modification work:

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap).

Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supply and all other electrical connections.



### Installation:

This unit should only be installed by qualified personnel.

This unit should only be installed in a “restricted access area”, for example a lockable cabinet where access is restricted to service personnel only.

This unit is intended for permanent connection to the AC/DC mains supply.

The power supply wiring must be sufficiently fused, and if necessary it must be possible to disconnect manually from the AC/DC mains supply. Ensure compliance to national installation regulations.

Units with the rated voltage exceeding 42.4 V peak or 60 VDC, are defined as class I equipment with a protective earthing conductor terminal.

Units with the rated voltage up to 42.4 V peak or 60 VDC, are defined as class III equipment and shall be separated from hazardous voltage by double or reinforced isolation.

This unit uses convection cooling. To avoid obstructing the air flow around the unit, follow the spacing recommendations (see Installation section).

## Approvals

Conformity with the Directive 73/23/EEC Low Voltage Directive – LVD has been assessed by application of the standard EN 60 950.

Conformity with the Directive 89/336/EEC Electromagnetic Compatibility (EMC) has been assessed by application of standards EN 61000-6-2 (industrial immunity) and EN 61000-6-3 (residential emission) and EN61000-6-4 (Industrial emission).

## Description

The SDW-500 is a series of Industrial Ethernet 5-port switches.

Several variations are available ranging from a version with five RJ-45 TX (copper) ports to versions having two FX (fibre) and three TX ports.

All TX ports support auto-negotiation, but DIP-switches also allow speed and duplex configuration of any individual TX port. It is also possible to set up one port to monitor traffic to/from the switch.

The SDW-500 series has been designed to meet high industrial specifications, providing very high dependability in harsh environmental conditions.

### Features:

- ⌘ Flexible mix of TX (copper) and FX (fibre) interface
- ⌘ TX shields individually isolated
- ⌘ Wide DC power range 12–48 VDC (9.6 – 57.6 VDC operating voltage)
- ⌘ Wide temperature range
- ⌘ Redundant power
- ⌘ Automatic MDI/MDI-X crossover
- ⌘ LED indicators for Power, Speed, Duplex, Link and Traffic
- ⌘ Port monitoring
- ⌘ 35 mm DIN rail mounting
- ⌘ SC, ST and LC fibre interface
- ⌘ Multi (MM) and single mode (SM) fibre

### Example of applications are:

- ⌘ 5-port switch
- ⌘ Fibre to copper converter
- ⌘ Ethernet isolator, for STP network

# Declaration of Conformity



Westermo Teleindustri AB

## Declaration of conformity

The manufacturer Westermo Teleindustri AB  
SE-640 40 Stora Sundby, Sweden

Herewith declares that the product(s)

Type of product	Model	Art no
DIN rail mounted Ethernet switch family	SDW 500 series.	3644-0001/0005/0015/0019/0020/0021/0022/0023/0024/0025/0030/0031/0032/0033/0034/0035


is in conformity with the following EC directive(s).

No	Short name
2004/108/EC	Electromagnetic Compatibility (EMC)

References of standards applied for this EC declaration of conformity.

No	Title	Issue
EN 61000-6-2	Electromagnetic compatibility (EMC): Generic standards - Immunity for industrial environments	2005
EN 61000-6-3 <sup>1</sup>	Electromagnetic compatibility (EMC): Generic standards - Emission standard for residential, commercial and light-industrial environments	2007
EN 61000-6-4 <sup>2</sup>	Electromagnetic compatibility (EMC): Generic standards - Emission standard for industrial environments	2007

The last two digits of the year in which the CE marking was affixed: 10



Signature

Pierre Öberg  
R&D Manager  
3rd March 2010

<sup>1</sup> Applicable for 3644-000x and 3644-0015

<sup>2</sup> Applicable for 3644-0019, 3644-002x and 3644-003x

Postadress/Postal address  
S-640 40 Stora Sundby  
Sweden

Tel.  
016-428000  
Int+46 16428000

Telefax  
016-428001  
Int+46 16428001

Postgiro  
52 72 79-4

Bankgiro  
5671-5550

Org.nr/  
Corp. identity number  
556361-2604

Registered office  
Eskilstuna

## Specification

Power interface		
	<b>SDW-500 series</b>	
Rated voltage	12–48 VDC, polarity protected	
Operating voltage	9.6 – 57.6 VDC	
Rated current	@12 VDC power input	
	SDW-550	320mA
	SDW-541-MM-SC2	450mA
	SDW-541-SM-LC15	450mA
	SDW-541-SM-SC15	350mA
	SDW-541-SM-LC40	350mA
	SDW-541-MM-LC2	350mA
	SDW-532-2-MM-SC2	600mA
	SDW-532-2-MM-ST2	600mA
	SDW-532-2-SM-LC15	450mA
	SDW-532-2-SM-SC15	450mA
	SDW-532-2-SM-LC40	450mA
	SDW-532-2-MM-LC2	450mA
SDW-532-MM-SC2-SM-SC15	450mA	
Rated frequency	DC	
Connection	Detachable screw terminal	
Connector size	0.2 – 2.5 mm <sup>2</sup> (AWG 24-12)	

### Ethernet TX Interface

Electrical specification	IEEE std 802.3. 2000 edition
Data rate	10 Mbit/s or 100 Mbit/s, manual or auto
Duplex	Full or half, manual or auto
Connection	RJ-45, shielded
Circuit type	TNV-1
Transmission range	100 m

### Ethernet FX Interface

Fibre optic specification	IEEE std 802.3. 2000 edition, multi or single mode, 1300 nm
Data rate	100 Mbit/s
Duplex	Full
Connection	SC, ST, or LC
Transmission range	2, 15 or 40 km

Position	Direction*	Description	Product marking
Rx	In	Receive port	Rx
Tx	Out	Transmit port	Tx

\* Direction relative this unit

### Mechanical

Dimension (W x H x D)	35 x 121 x 119 mm
Weight	0.2 kg
Mounting	DIN-rail
Degree of protection	IP21

## Isolation between interfaces

Power Interface to all other	2.8 kV DC 2.0 kV RMS @ 50 Hz and 60 s duration
TX signal Interface to all other	2.1 kV DC 1.5 kV RMS @ 50 Hz and 60 s duration
TX shield Interface to all other	1.5 kV DC 1.0 kV RMS @ 50 Hz and 60 s duration

## Environmental

Temperature, operating	-25 to +70°C (SDW-550), -25 to +65°C (SDW-541), -25 to +60°C (SDW-532)
Temperature, storage and transportation	-25 to +70°C
Relative humidity, operating	5 to 95% (non-condensing)
Relative humidity, storage and transportation	5 to 95% (condensation allowed outside packaging)

## Configuration

Auto configured (auto-negotiation) or manually setting of speed and duplex of individual TX port, by DIP-switches.

Port mirror function is possible to set with DIP-switch. With the port mirror function active the switch will copy all outgoing traffic to port 1. This can be used to monitor all traffic going out from the switch. Packets may be discarded if the total throughput exceeds the port speed of port 1.

## Fibre optic power budget

Model	Multimode MM-xx2	Singlemode SM-SC15	Singlemode SM-LC15	Singlemode SM-LC40
Transmitted wavelength	1310 nm	1310 nm	1310 nm	1310 nm
Min. output power, transmitter	-19 dBm	-15 dBm	-15 dBm	-5 dBm
Max. output power, transmitter	-12 dBm	-8 dBm	-8 dBm	0 dBm
Input sensitivity, receiver	-31 dBm	-34 dBm	-31 dBm	-34 dBm
Min. power budget	12 dBm	19 dBm	16 dBm	29 dBm
Max. power budget	19 dBm	26 dBm	23 dBm	34 dBm
Recommended fibre cable and core / cladding diameter	50/125 62.5/125	9/125 10/125	9/125 10/125	9/125 10/125

Fibre type	Normal attenuation @ 1310 nm multimode	Normal attenuation @ 1310 nm singlemode
50/125	3.0 dBm/km	–
62.5/125	3.5 dBm/km	–
9/125	–	0.5 dBm/km
10/125	–	0.5 dBm/km

## Attenuation in connectors / splices

Type	Normal attenuation
Connector	0.2 - 0.4 dBm
Fusion splice	0.1 dBm
Mechanical splice	0.2 dBm

# Maintenance

No maintenance is required, as long as the unit is used as intended within the specified conditions.



## Installation

### Mounting / Removal

#### Before mounting or removing the unit:

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap).

Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supply and all other electrical connections.

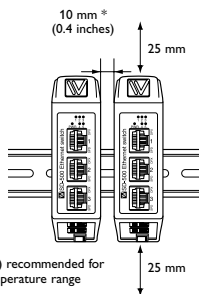
### Mounting

This unit should be mounted on 35 mm DIN-rail which is horizontally mounted on a wall or cabinet backplate.

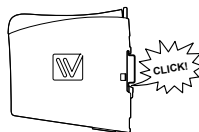
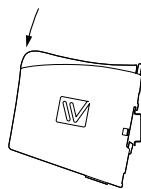
This unit uses convection cooling. To avoid obstructing the airflow around the unit, use the following spacing rules.

Recommended spacing 25 mm (1.0 inch) above/below and 10 mm (0.4 inches) left/right the unit.

Snap on mounting, see figure

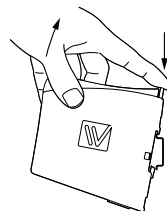


\* Spacing (left/right) recommended for full operating temperature range

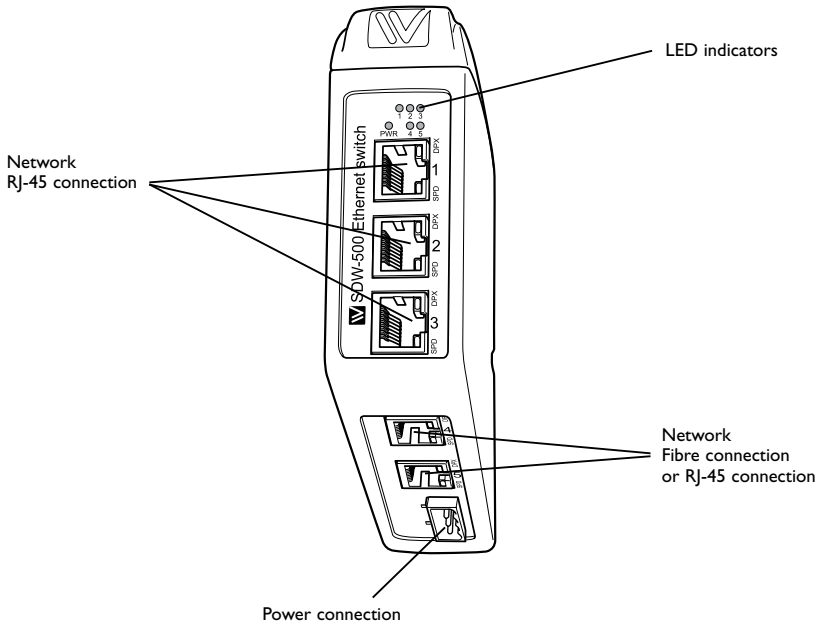


### Removal

Press down the black support at the back of the unit, see figure.



## Connections



### Available models:

- ⌘ SDW-550 10/100Base-T/TX: 5 ports
- ⌘ SDW-541 10/100Base-T/TX: 4 ports 100Base-FX: 1 port
- ⌘ SDW-532 10/100Base-T/TX: 3 ports 100Base-FX: 2 ports

### NOTE! SDW-532-MM-SC2-SM-SC15

**Port 4:** SC Single mode 15 km connector

**Port 5:** SC Multi mode 2 km connector



## Power

The SDW-500 series supports redundant power connection.

The positive input are +VA and +VB, the negative input for both supplies are COM.

The power is drawn from the input with the highest voltage.



3-pos screw terminal	Description	Power
1	COM	0V
2	+VA	A: 9.6 – 57.6 VDC
3	+VB	B: 9.6 – 57.6 VDC

## TX

Ethernet TX connection (RJ-45 connector), automatic MDI/MDI-X crossover.

Contact	Signal Name	Direction	Description/Remark
1	TD+	In/Out	Transmitted/Received data
2	TD-	In/Out	Transmitted/Received data
3	RD+	In/Out	Transmitted/Received data
4			
5			
6	RD-	In/Out	Transmitted/Received data
7			
8			
Shield			HF-connected



CAT 5 cable is recommended.

Unshielded (UTP) or shielded (STP) connector might be used.

## FX SC Multi- or single mode (optional)

Ethernet FX connection.

1300 nm multi- or singlemode fibre transceiver with SC-connector.

The dust protection plug shall be mounted when no fibre is connected.



## FX ST Multi mode (optional)

Ethernet FX connection.

1300 nm multi mode fibre transceiver with ST-connector.

The dust protection plug shall be mounted when no fibre is connected.



## FX LC Multi- or single mode (optional)

Ethernet FX connection.

1300 nm singlemode fibre transceiver with LC-connector.

The dust protection plug shall be mounted when no fibre is connected.



## DIP switch settings SDW-550

DIP-switches are accessible under the lid on top of the unit. DIP-switches are used to configure the unit.



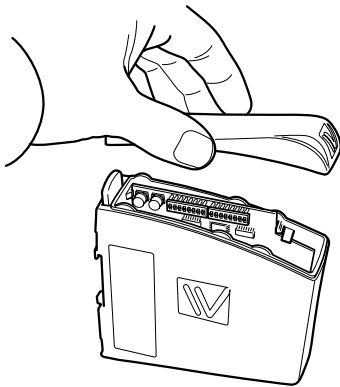
### Warning!

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap), before the lid on top/front of the unit is removed.



### Warning! Do not open connected equipment.

Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supply and all other electrical connections.









## NOTE

When configuration via DIP-switches, the settings of DIP-switches configure the unit only after a reboot (power off/on).







### To be observe when the DIP-switches will be configured

- ⌘ Speed and duplex setting only valid when auto-negotiation is disabled.
- ⌘ When monitoring selected all outgoing packets from the switch is also copied to the port 1.
- ⌘ If auto-negotiation and auto MDI/MDI-X disabled all TX ports support MDI-X configuration.







### Port 1 settings

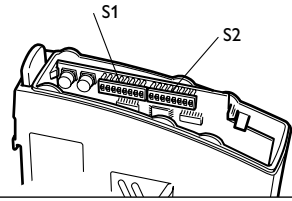
- S1  Auto-negotiation and auto MDI/MDI-X disabled
- S1  Auto-negotiation and auto MDI/MDI-X enabled
- S1  10 Mbit/s speed selected
- S1  100 Mbit/s speed selected
- S1  Half duplex selected
- S1  Full duplex selected

### Port 2 settings







- S1  Auto-negotiation and auto MDI/MDI-X disabled
- S1  Auto-negotiation and auto MDI/MDI-X enabled
- S1  10 Mbit/s speed selected
- S1  100 Mbit/s speed selected
- S1  Half duplex selected
- S1  Full duplex selected

### Port 3 settings







- S1  Auto-negotiation and auto MDI/MDI-X disabled
- S1  Auto-negotiation and auto MDI/MDI-X enabled
- S1  10 Mbit/s speed selected
- S1  100 Mbit/s speed selected
- S2  Half duplex selected
- S2  Full duplex selected





### Port 4 settings

- S2  Auto-negotiation and auto MDI/MDI-X disabled
- S2  Auto-negotiation and auto MDI/MDI-X enabled
- S2  10 Mbit/s speed selected
- S2  100 Mbit/s speed selected
- S2  Half duplex selected
- S2  Full duplex selected

### Port 5 settings

- S2  Auto-negotiation and auto MDI/MDI-X disabled
- S2  Auto-negotiation and auto MDI/MDI-X enabled
- S2  10 Mbit/s speed selected
- S2  100 Mbit/s speed selected
- S2  Half duplex selected
- S2  Full duplex selected

### Port mirroring settings

- S2  No monitoring selected
- S2  Monitoring selected

### Factory settings

- S1 
- S2 

## DIP switch settings SDW-541 and SDW-532

DIP-switches are accessible under the lid on top of the unit. DIP-switches are used to configure the unit.



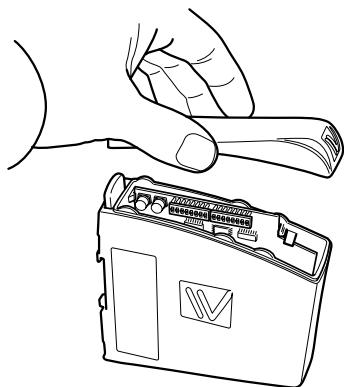
### Warning!

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap), before the lid on top/front of the unit is removed.



### Warning! Do not open connected equipment.

Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supply and all other electrical connections.









## NOTE

When configuration via DIP-switches, the settings of DIP-switches configure the unit only after a reboot (power off/on).







### To be observe when the DIP-switches will be configured

- ⌘ Speed and duplex setting only valid when auto-negotiation is disabled.
- ⌘ When monitoring selected all outgoing packets from the switch is also copied to the port 1.
- ⌘ Speed and duplex switch settings are ignored for FX ports.
- ⌘ If auto-negotiation and auto MDI/MDI-X disabled all TX ports support MDI-X configuration.







### Port 1 settings

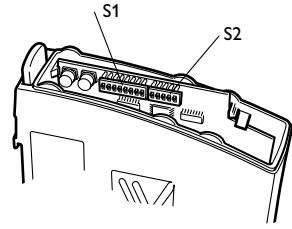
- S1  Auto-negotiation and auto MDI/MDI-X disabled
- S1  Auto-negotiation and auto MDI/MDI-X enabled
- S1  10 Mbit/s speed selected
- S1  100 Mbit/s speed selected
- S1  Half duplex selected
- S1  Full duplex selected

### Port 2 settings







- S1  Auto-negotiation and auto MDI/MDI-X disabled
- S1  Auto-negotiation and auto MDI/MDI-X enabled
- S1  10 Mbit/s speed selected
- S1  100 Mbit/s speed selected
- S1  Half duplex selected
- S1  Full duplex selected

### Port 3 settings

- S1  Auto-negotiation and auto MDI/MDI-X disabled
- S1  Auto-negotiation and auto MDI/MDI-X enabled
- S1  10 Mbit/s speed selected
- S1  100 Mbit/s speed selected
- S2  Half duplex selected
- S2  Full duplex selected





### Port 4 settings\*

- S2  Auto-negotiation and auto MDI/MDI-X disabled
- S2  Auto-negotiation and auto MDI/MDI-X enabled
- S2  10 Mbit/s speed selected
- S2  100 Mbit/s speed selected
- S2  Half duplex selected
- S2  Full duplex selected

\* Setting of port 4 is only possible when using SDW-541. These settings are ignored when using SDW-532

### Port mirroring settings

- S2  No monitoring selected
- S2  Monitoring selected

### Factory settings

- S1  S2 

## LED indicators

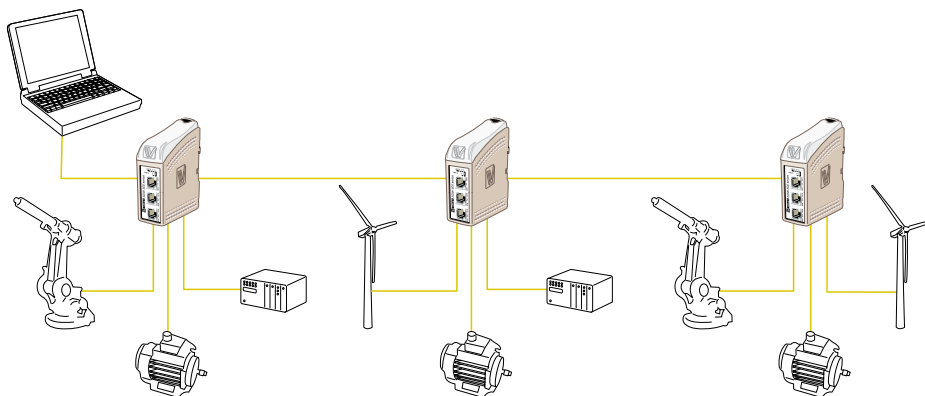
At power on the PWR flashes during initialising.

**Indicators (LED)**      Power (PWR)  
                                  Link (LINK) of every port  
                                  Speed (SPD) and duplex (DPX) of TX ports

LED	Status	Indication of
PWR	ON	Internal power, initialising OK
	Slow flash	Initialisation progressing
	Fast flash	Initialisation error
LINK	OFF	No Ethernet link
	ON	Good Ethernet link
	Flash	Ethernet data is transmitted or received, traffic indication
SPD (TX only)	OFF	10 Mbit/s
	ON	100 Mbit/s
DPX (TX only)	OFF	Half duplex
	ON	Full duplex



## Application example



Westermo Teleindustri AB • SE-640 40 Stora Sundby, Sweden

Phone +46 16 42 80 00 Fax +46 16 42 80 01

E-mail: [info@westermo.se](mailto:info@westermo.se)

Westermo Web site: [www.westermo.com](http://www.westermo.com)

### Subsidiaries

Westermo Data Communications AB

Svalgängen 1

SE-724 81 Västerås

Phone: +46 (0)21 548 08 00 • Fax: +46 (0)21 35 18 50

info.sverige@westermo.se

Westermo Data Communications Ltd

Talisman Business Centre • Duncan Road

Park Gate, Southampton • SO31 7GA

Phone: +44(0)1489 580-585 • Fax: +44(0)1489 580586

E-Mail: [sales@westermo.co.uk](mailto:sales@westermo.co.uk)

Westermo Data Communications GmbH

Goethestraße 67, 68753 Waghäusel

Tel.: +49(0)7254-95400-0 • Fax: +49(0)7254-95400-9

E-Mail: [info@westermo.de](mailto:info@westermo.de)

Westermo Data Communications S.A.R.L.

9 Chemin de Chilly 91160 CHAMPLAN

Tél : +33 1 69 10 21 00 • Fax : +33 1 69 10 21 01

E-mail : [infos@westermo.fr](mailto:infos@westermo.fr)

Westermo Data Communications Pte Ltd

2 Soon Wing Road #08-05

Soon Wing Industrial Building

Singapore 347893

Phone +65 6743 9801 • Fax +65 6745 0670

E-Mail: [sales@westermo.com.sg](mailto:sales@westermo.com.sg)

Westermo Teleindustri AB have distributors in several countries, contact us for further information.