SDW-500
S E R I E S
6644-2212

WESTERMO

*Industrial Ethernet
5-port Switch*

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

Westermo
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	Installation manual
DIN-rail	SDW-550	3644-0010	6644-2212
DIN-rail	SDW-532-MM-SC2-SM-SC15	3644-0019	6644-2212
DIN-rail	SDW-541-MM-SC2	3644-0020	6644-2212
DIN-rail	SDW-541-MM-ST2	3644-0021	6644-2212
DIN-rail	SDW-541-SM-LC15	3644-0022	6644-2212
DIN-rail	SDW-541-MM-LC2	3644-0023	6644-2212
DIN-rail	SDW-541-SM-SC15	3644-0024	6644-2212
DIN-rail	SDW-541-SM-LC40	3644-0025	6644-2212
DIN-rail	SDW-532-2MM-SC2	3644-0030	6644-2212
DIN-rail	SDW-532-2MM-ST2	3644-0031	6644-2212
DIN-rail	SDW-532-2SM-LC15	3644-0032	6644-2212
DIN-rail	SDW-532-2MM-LC2	3644-0033	6644-2212
DIN-rail	SDW-532-2SM-SC15	3644-0034	6644-2212
DIN-rail	SDW-532-2SM-LC40	3644-0035	6644-2212

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

No	Short name
89/336/EEG	Electromagnetic Compatibility (EMC)

References of standards applied for this EC declaration of conformity.

No	Title	Issue
EN 61000-6-2	Immunity for industrial environments	2 (2001)
EN 61000-6-3	Emission standard for residential, commercial and light-industrial environments (3644-0010)	1 (2001)
EN 61000-6-4	Emission standard for industrial environments (3644-0020 and 3644-0030)	1 (2001)

The last two digits of the year in which the CE marking was affixed: 04

Hans Levin

Hans Levin
Technical Manager
15th December2004

Postadress/Postal address	Tel.	Telefax	Postgiro	Bankgiro	Org.nr/ Corp. identity number	Registered office
S-640 40 Stora Sundby	016-428000	016-428001	52 72 79-4	5671-5550	556361-2604	Eskilstuna
Sweden	Int+46 16428000	Int+46 16428001				

Specification

Power interface

	SDW-500 series	
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^2 (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	23dBm	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

10 mm *
(0.4 inches)

25 mm

25 mm
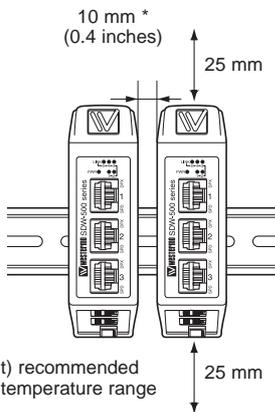
* Spacing (left/right) recommended
  for full operating temperature range
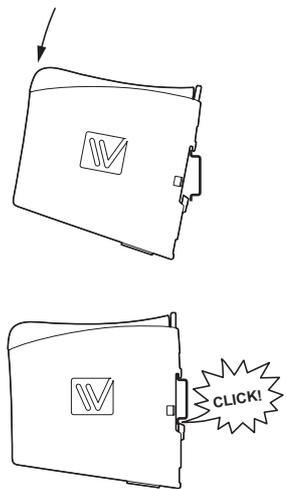
Removal

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

Connections

LED indicators

Network
RJ-45 connection

Network
Fibre connection
or RJ-45 connection

Power connection
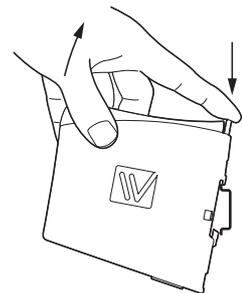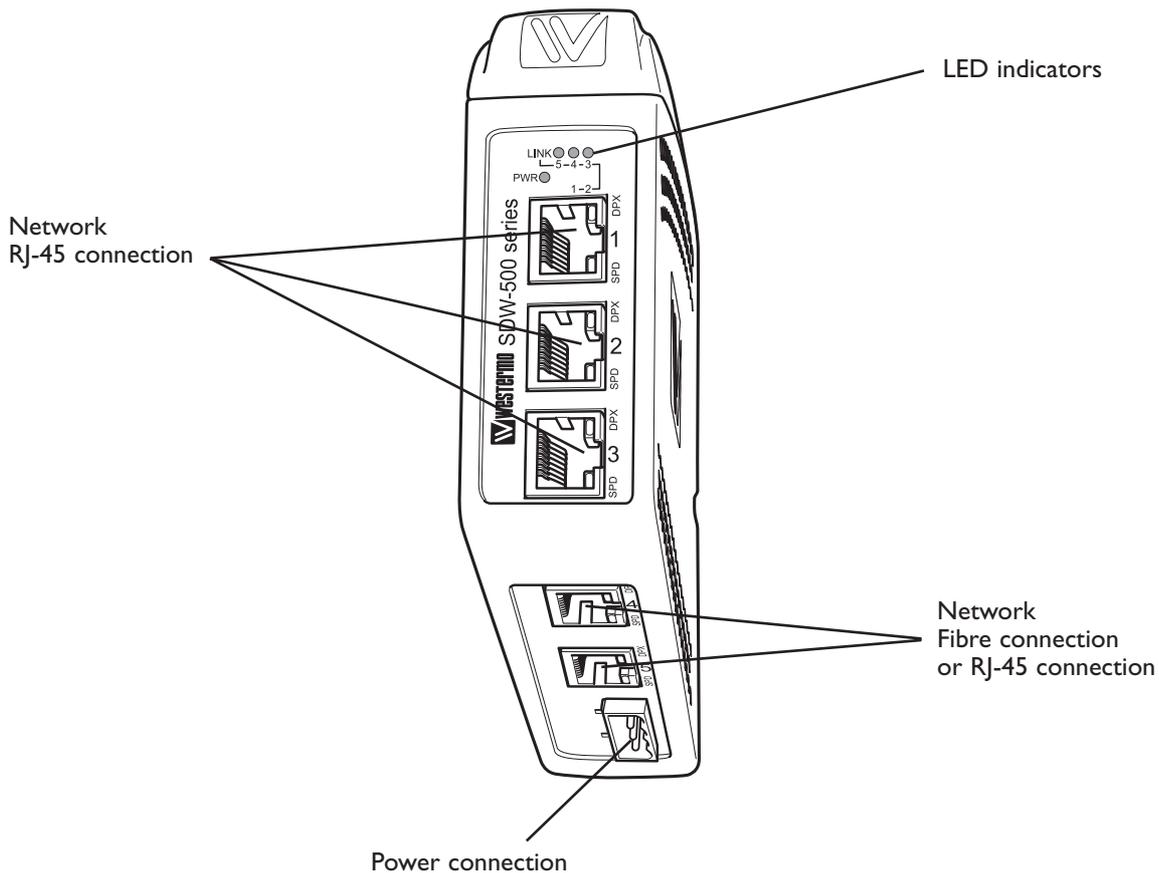
Available models:

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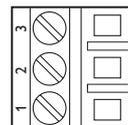
3-pos screw terminal	Description	Power
1	COM	0V
2	+VA	A: 9.6 – 57.6 VDC
3	+VB	B: 9.6 – 57.6 VDC

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
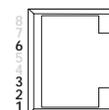
CAT 5 cable is recommended.
Unshielded (UTP) or shielded (STP) connector might be used.

FX SC Multi- or single mode (optional)

Ethernet FX connection.
1300 nm multi- or singlemode fibre tranceiver with SC-connector.
The dust protection plug shall be mounted when no fibre is connected.
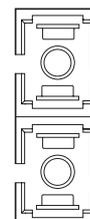
FX ST Multi mode (optional)

Ethernet FX connection.
1300 nm multi mode fibre tranceiver with ST-connector.
The dust protection plugs shall be mounted when no fibre is connected.
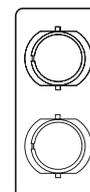
FX LC Multi- or single mode (optional)

Ethernet FX connection.
1300 nm singlemode fibre transceiver with LC-connector.
The dust protection plug shall be mounted when no fibre is connected.
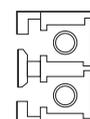
DIP switch settings SDW-550

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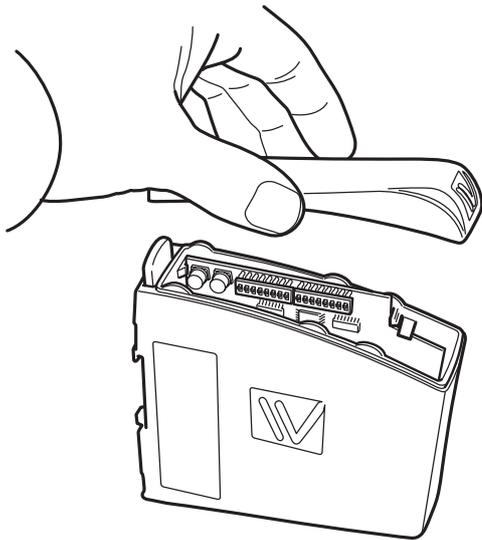
⚠️ **Warning!**

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 — ON `1● 2 3 4 5 6 7 8` — Auto-negotiation and auto MDI/MDI-X disabled

S1 — ON `1 2● 3 4 5 6 7 8` — Auto-negotiation and auto MDI/MDI-X enabled

S1 — ON `1 2 3● 4 5 6 7 8` — 10 Mbit/s speed selected

S1 — ON `1 2 3● 4 5 6 7 8` — 100 Mbit/s speed selected

S1 — ON `1 2 3 4● 5 6 7 8` — Half duplex selected

S1 — ON `1 2 3 4● 5 6 7 8` — Full duplex selected

Port 2 settings

S1 — ON `1 2 3 4 5● 6 7 8` — Auto-negotiation and auto MDI/MDI-X disabled

S1 — ON `1 2 3 4 5● 6 7 8` — Auto-negotiation and auto MDI/MDI-X enabled

S1 — ON `1 2 3 4 5 6● 7 8` — 10 Mbit/s speed selected

S1 — ON `1 2 3 4 5● 6 7 8` — 100 Mbit/s speed selected

S1 — ON `1 2 3 4 5 6 7● 8` — Half duplex selected

S1 — ON `1 2 3 4 5● 6 7 8` — Full duplex selected

Port 3 settings

S1 — ON `1 2 3 4 5 6 7● 8` — Auto-negotiation and auto MDI/MDI-X disabled

S1 — ON `1 2 3 4 5 6 7● 8` — Auto-negotiation and auto MDI/MDI-X enabled

S1 — ON `1 2 3 4 5 6 7 8●` — 10 Mbit/s speed selected

S1 — ON `1 2 3 4 5 6 7 8●` — 100 Mbit/s speed selected

S2 — ON `1● 2 3 4 5 6 7 8` — Half duplex selected

S2 — ON `1● 2 3 4 5 6 7 8` — Full duplex selected

Port 4 settings

S2 — ON `1● 2 3 4 5 6 7 8` — Auto-negotiation and auto MDI/MDI-X disabled

S2 — ON `1 2● 3 4 5 6 7 8` — Auto-negotiation and auto MDI/MDI-X enabled

S2 — ON `1 2 3● 4 5 6 7 8` — 10 Mbit/s speed selected

S2 — ON `1 2 3● 4 5 6 7 8` — 100 Mbit/s speed selected

S2 — ON `1 2 3 4● 5 6 7 8` — Half duplex selected

S2 — ON `1 2 3 4● 5 6 7 8` — Full duplex selected

Port 5 settings

S2 — ON `1 2 3 4 5● 6 7 8` — Auto-negotiation and auto MDI/MDI-X disabled

S2 — ON `1 2 3 4 5● 6 7 8` — Auto-negotiation and auto MDI/MDI-X enabled

S2 — ON `1 2 3 4 5 6● 7 8` — 10 Mbit/s speed selected

S2 — ON `1 2 3 4 5● 6 7 8` — 100 Mbit/s speed selected

S2 — ON `1 2 3 4 5 6 7● 8` — Half duplex selected

S2 — ON `1 2 3 4 5 6● 7 8` — Full duplex selected

Port mirroring settings

S2 — ON `1 2 3 4 5 6 7● 8` — No monitoring selected

S2 — ON `1 2 3 4 5 6 7● 8` — Monitoring selected

Factory settings

S1 — ON `1 2 3 4 5 6 7 8`   S2 — ON `1 2 3 4 5 6 7 8`

DIP switch settings SDW-541 and SDW-532

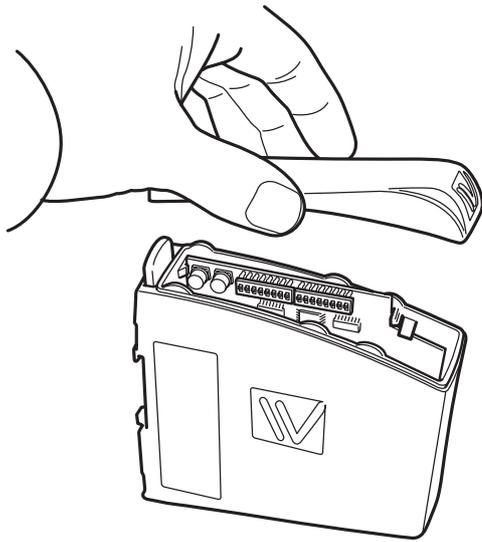DIP-switches are accessible under the lid on top of the unit. DIP-switches are used to configure the unit.

⚠️ **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
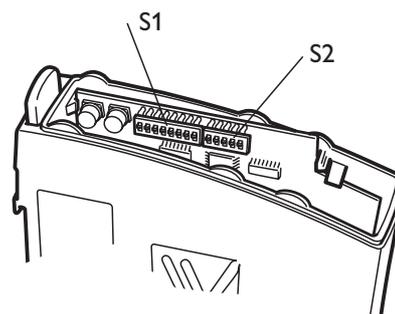
Port 2 settings

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
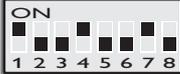
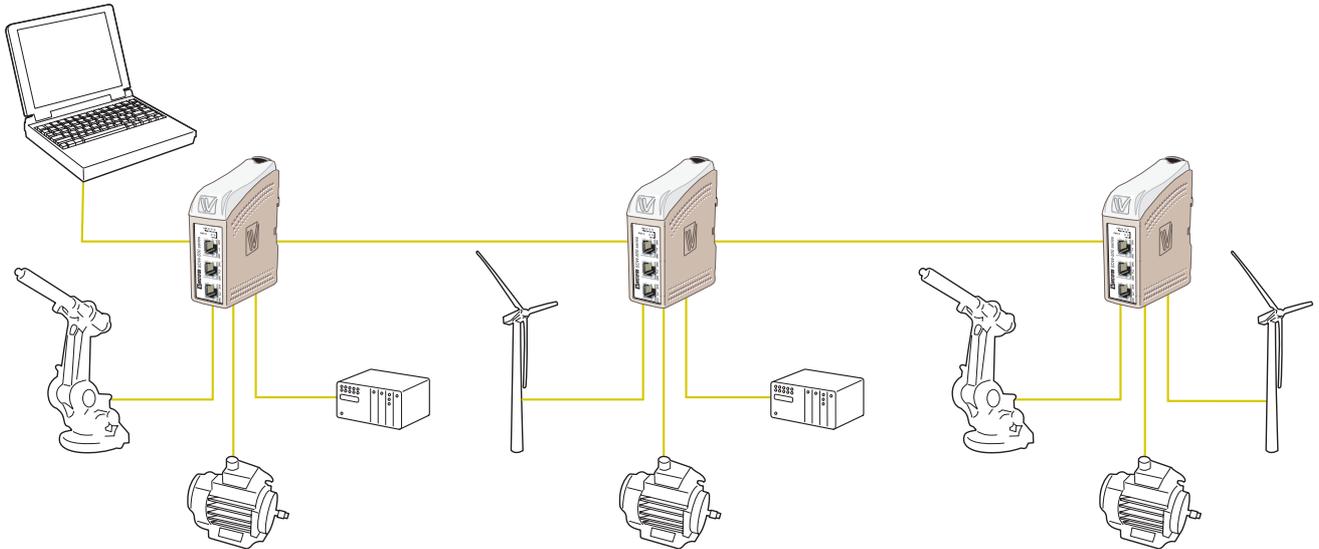| S1 | | S2 | |
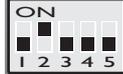
LED indicators

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	OFF	10 Mbit/s
(TX only)	ON	100 Mbit/s
DPX	OFF	Half duplex
(TX only)	ON	Full duplex

Application example