SW485

Splitter/extender of RS485

For up to 9 channels

SW485

Datasheet

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BASIC INFORMATION

Description

SW485 is a RS485 extender enabling to properly interconnect up to nine RS485 terminal blocks. All the lines are equal. When data are received by any line, they are sent to all the other lines.

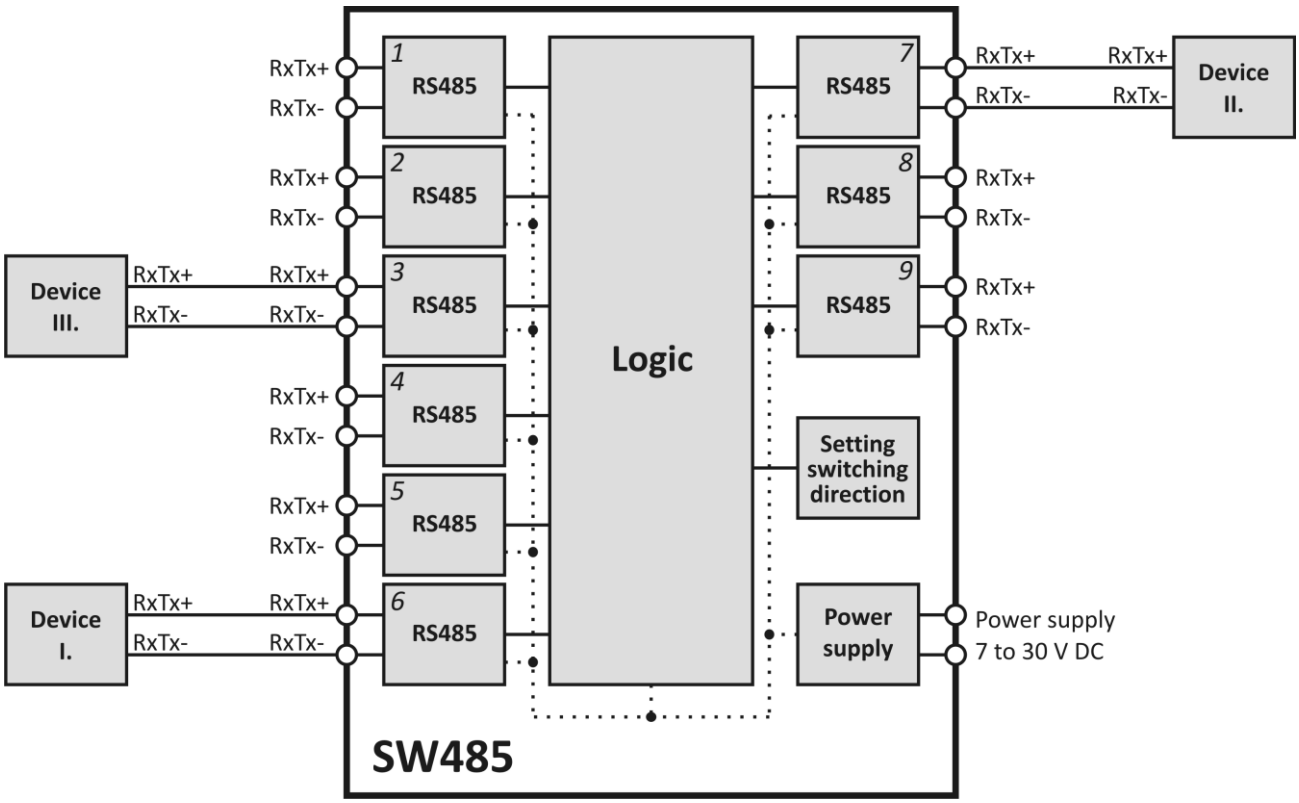

Fig. 1 – block diagram and connection of two devices

Application

- Connection of a number of devices communicating via RS485.
- Interconnection of RS485 networks.
- Signal edge enhancement for larger distances.

Operation

Data from individual lines are only processed by logical circuits. Data received by any of the lines are sent to all the other lines. Individual lines have no buffer for data receipt.

When data arrive almost simultaneously to two lines, the system receives the data whose beginning was first registered. The other lines switch to “Transmission” and start to transmit the data. After the data receipt has been completed the system waits for a period of time set by the configuration switch inside the SW485 (a so called “Switching Delay”). After this period has elapsed, all the lines switch to “Receipt” and wait for data to come.

CONNECTION

When putting the system in operation, follow the steps below:

1) If necessary, modify the period of time during which, after sending the last byte, the line drives remain switched to “Transmission” (a so called “Switching Delay”). The configuration of the switching delay is described on the next page.

2) Connect the RS485 communication lines. Individual signals are specified on the label found on the top side of SW485.

   All RS485 lines in the SW485 module are equal – they do not need to be connected successively starting from the first one.

   The RS485 wires connect to a connected device as follows: the RxTx+ of SW485 with RxTx+ of the device and RxTx- with RxTx-.[1]

3) Consider the connection of resistors defining the idle state of the RS485 line (BIAS). In case the SW485 module is located at the end of the line, connect terminating resistors using an IMP connector. The arrangement of connectors is shown on the label placed on the bottom side of the box lid (see Fig. 4).

4) Connect 7 to 30 V power supply to the POWER terminal. The input is protected against polarity reversal.

5) The POWER indicator lights up and the device is ready for operation.

Fig. 2 - all terminal blocks are removable

[1] The conductors are also sometimes referred to as “A” (for RxTx+; more positive conductor) and “B” (for RxTx-; more negative conductor).

SWITCHING DELAY

Switching delay is a period of time during which the drivers of the RS485 lines remain switched to “Transmission” after sending the last byte.

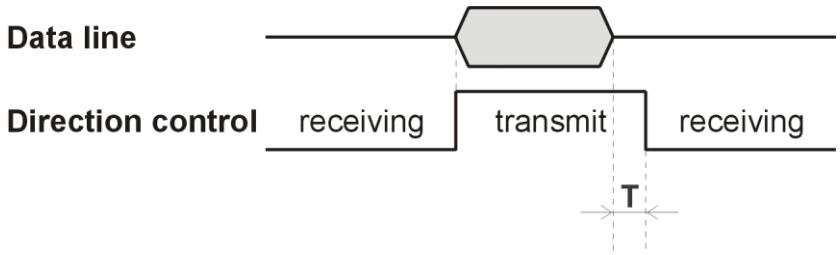

Fig. 3 – switching delay

The duration of the switching delay can be set using four pairs of connectors inside the box.

Fig. 4 – electronics board inside the box and information label on the bottom side of the lid

Configuration options are listed in the table below:

SW1	SW2	SW3	SW4	Delay	Recommended for speeds
OFF	OFF	OFF	OFF	1.9 ms	< 19 200 Bd
ON	OFF	OFF	OFF	460 µs	19 200 or 38 400 Bd *(default setup)*
OFF	ON	OFF	OFF	140 µs	57 600 or 115 200 Bd
OFF	OFF	ON	OFF	33 µs	
OFF	OFF	OFF	ON	9 µs	
OFF	OFF	ON	ON	7 µs	

Tab. 1 – delay duration configuration

RESISTORS TO MAINTAIN IDDLE STATE

When communicating via the RS485 line, there are sometimes moments when no device transmits any data over the line – all of them are switched to “Receipt”. During this time the status of the line is not defined and the line is extremely sensitive to induced voltage (failures), which appears to the line as incoming data. Therefore it is necessary to define the idle state of the line by connecting suitable resistors to one part of the line. In longer installations it is suitable to connect them to the termination modules on each side of the RS485.

In SW485 it is possible to use in-built resistors which can be connected via BIAS connectors individually for each RS485 line. The connectors are accessible after opening the box of the device. The label of the bottom side of the lid shows the arrangement of the connectors for individual lines (see Fig. 4).

INDICATION

Each communication line is equipped with its own **yellow light** indicating the receipt of data to that particular port. SW485 also contains a **green** POWER **light** indicating the connection of power supply.

TECHNICAL PARAMETERS

Communication

Type of lines	RS485
Number of lines	9
Transmitted signals	RxTx+ (A), RxTx- (B)
Maximum communication speed	1.5 Mbps
Signal delay	130 ns
Idle state maintenance	22 kΩ[2]
Termination	120 Ω (optional)

Other parameters

Supply voltage	7 to 30 V DC with protection against polarity reversal
Current consumption	typically 25 mA[3] at 12 V
Connection of signals	slip-on terminal block (bus bar)
Working temperature range	-40 to +70°C
Degree of protection	IP 20
Dimensions	121 × 55 × 24 mm
Weight	150 g

[2] 680 Ω resistors may be connected in parallel to the 22 kΩ ones via the connector inside the box.

[3] This value does not include the load of individual RS485 lines.

Available designs

Assembly:

- No mounting clip *(standard design)*
- With a clip for DIN rail

fig. 5 – box with a DIN rail clip

- With a wall mounting bracket

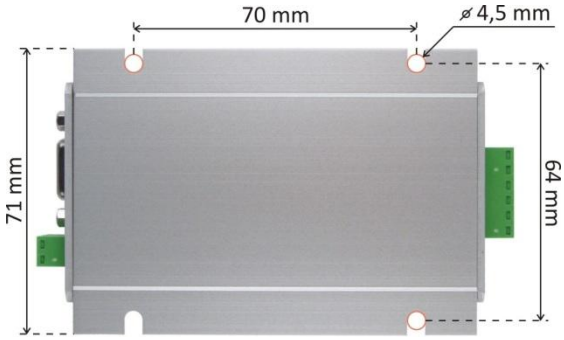

Fig. 6 – box with a wall mounting bracket

Do not hesitate to contact us in case of any other requirements concerning the design and functions of the SW485 module.

Papouch s.r.o.

Data transmission in industry, line and protocol conversions, RS232/485/422/USB/Ethernet/GPRS/ WiFi, measurement modules, intelligent temperature sensors, I/O modules, and custom-made electronic applications.

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