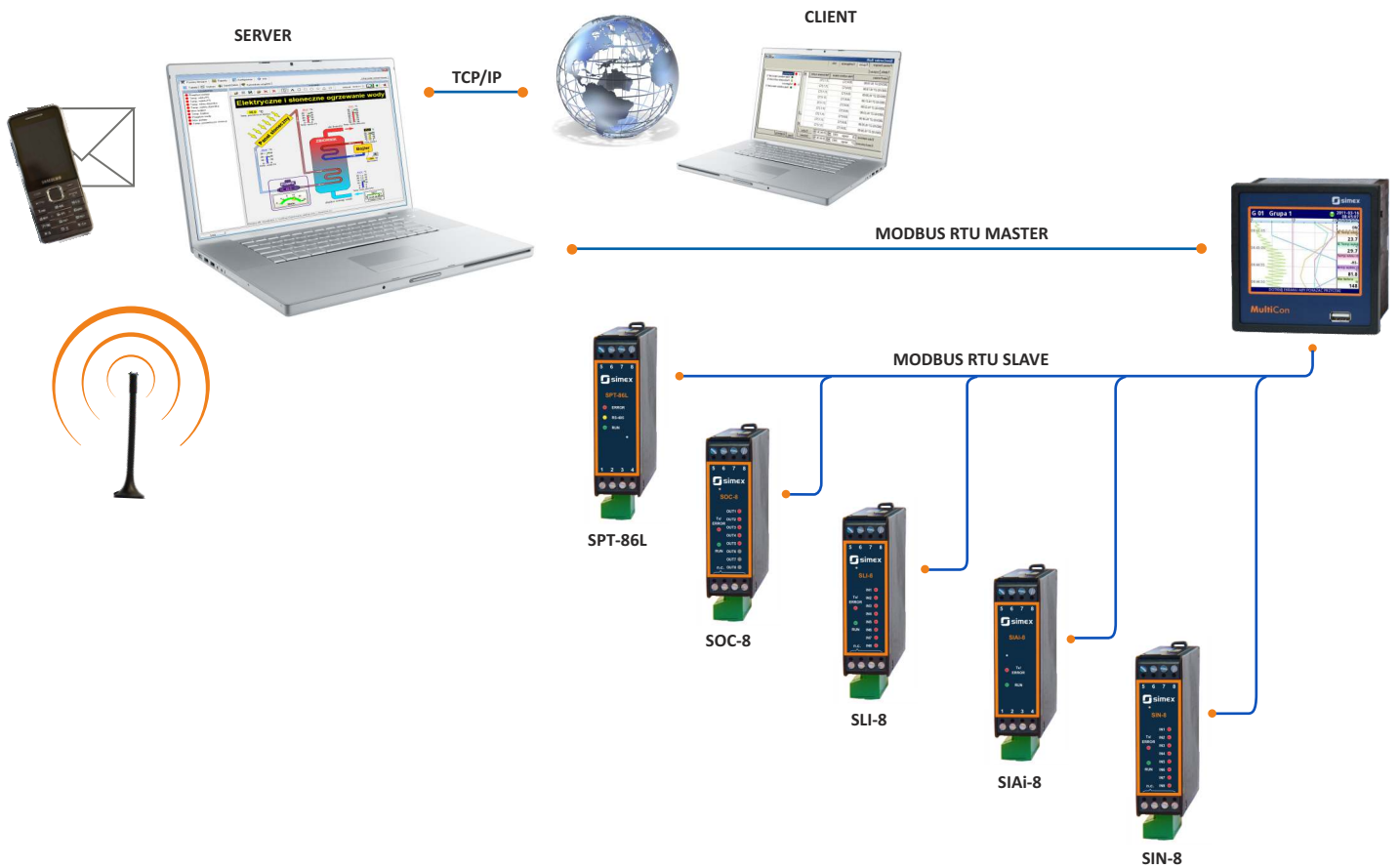**simex**

TRM

- Modbus RTU Slave
- DIN rail mount (TS-35 or TS-32)
- full equipment diagnostics
- multi-point inspection of process parameters
- galvanic separation of inputs/outputs from the voltage

The **TRM** DAQ system is based on multi-point communication modules. It uses the RS-485 network, Modbus RTU protocol, and enables inspecting process parameters. Thanks to a significant reduction of required wiring (usually one four-wire line) it is more and more widely used in the newly constructed and upgraded systems. The Modbus RTU communication makes it possible to inspect and diagnose an entire system, which is equal in priority to a measurement and process control themselves.

In most applications, data monitoring is performed by means of programmable PLC controllers, operator panels, measurement concentrators, or other measurement systems. Wherever local readings of current or collected data need to be performed, SIMEX proposes using the multi-channel meter of the MultiCon series.

The basic element of any remote data acquisition system are measurement modules. Particular modules differ in the construction of input circuits, therefore they are used to measure different electrical quantities. Among the wide range of measurement modules, the most commonly used ones are current and voltage measurement modules, as well as binary input and counter modules (modules offered by SIMEX are described in detail in further catalog cards). As a result of applying the RS-485 interface, measurement data can be sent even at a distance of 1 km.
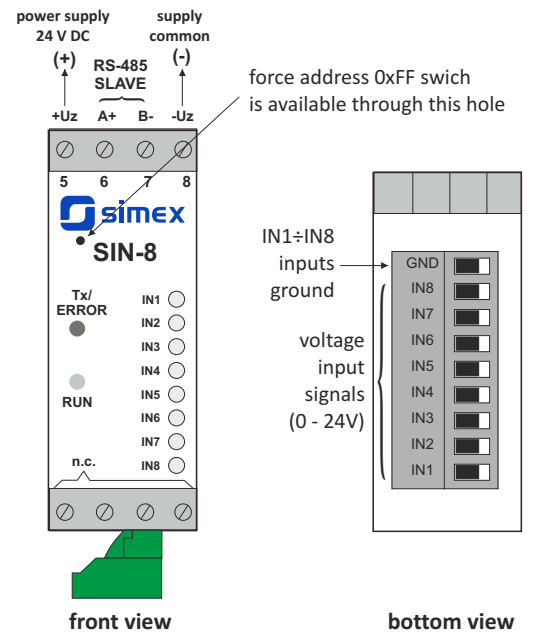
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TRM.1

SIN-8

- **binary inputs module**
- **8 independent voltage inputs**
- **RS-485 / Modbus RTU**
- **galvanic separation of the digital inputs from the module supply voltages**
- **internal digital filter**
- **signalling of inputs logic status and RS-485**
- **LEDs for module operation and Modbus transmission signalling**
- **input signals connected by means of the socket-plug connectors**

Module type **SIN-8** allows to monitor 8 binary voltage inputs via the RS-485 connection. It finds application in distributed control and visualization systems. Standard Modbus protocol transmission functions make device registers (address, state of inputs, device ID). All **SIN-8** operating functions, available via the RS-485, can be implemented with any typical visualization software or, for instance, with a suitably **MultiCon** controller. Registers state actualisation occurs only if input signal have fulfil some time restrictions. These restrictions depend on settings of internal digital filter implemented in firmware. Filter allows to eliminate signal oscillations corresponding to contacts bouncing (of mechanical sensors). Filter is factory switched off.

TECHNICAL DATA

Power supply / **Current consumption**	16V ÷ 30V DC (24V DC typical); external fuse (required): T - type, max. 1 A 20 mA typical
Inputs	8 independent voltage inputs
Input levels	low state: 0V (0 ÷ 3V); high state: 24V (15 ÷ 24V)
Galvanic separation	all 8 inputs are galvanically isolated from module supply and RS-485 interface
Communication interface	RS-485, 1200 ÷ 115200 bit/s, 8N1, Modbus RTU
Number of modules	max. 128 in a single network
Data memory	non-volatile memory, EEPROM type
Operating temperature	0°C ÷ +50°C (standard), -20°C ÷ +50°C (option)
Storage temperature	-10°C ÷ +70°C (standard), -20°C ÷ +70°C (with option **08**)
Humidity	max. 90%, non-condensing
Protection class	IP 20 (housing and connection clips)
Case	on the 35 mm strip; material: ABS
Dimensions	101 x 22,5 x 80 mm
Weight	120 g max.

TERMINALS CONNECTION

front view **bottom view**

CONNECTION AND PRINCIPLE OF OPERATION

Connect the supply voltage to the module (+Uz, -Uz, typically 24V DC) and two wires RS-485 (A+, B-) communication interface. Voltage Inputs are placed on bottom side of the module (look: bottom view).

Directly after power on the device is signalling its normal operation flashing green LED, marked „RUN" (about 2 times/sec.). Short flashes of LED marked "TX/ERROR" signalize activity of RS-485 interface (data flow between module and Master device) and permanent light of this LED means malfunction of the device.

Green LEDs marked "IN1" - "IN8" signalize active state on particular binary inputs (logic HIGH state). When particular input is in active state then corresponding register value is 01h, otherwise its value is 00h.

ORDERING

SIN-8-XX1

options:
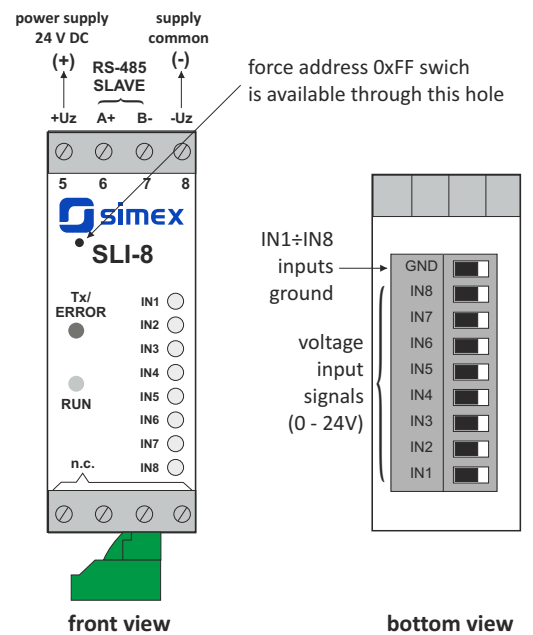**00** : no options
08 : operating temp. -20°C ÷ +50°C

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TRM.2

SLI-8

- **multi counters module**
- **8 independent voltage inputs**
- **RS-485 / Modbus RTU**
- **galvanic separation of the digital inputs from the module supply voltages**
- **internal digital filter**
- **signalling of input states and RS-485**
- **LEDs for module operation and Modbus transmission signalling**
- **input signals connected by means of the socket-plug connectors**

Multi counters module **SLI-8** allows to counting of pulses delivered to 8 isolated binary inputs independently. All counters are 32 bit long and can be read and cleared by user at any time. Occurrence of HIGH state on particular input is signalled by green LEDs marked IN1 to IN8. Incrementation of counter occurs after falling edge on particular input (input state changes from HIGH to LOW). It is essential that pulses have fulfill some time restrictions. These restrictions depend on settings of implemented internal digital filter, which allows to eliminate signal oscillations corresponding to contacts bouncing (of mechanical sensors).

Standard functions of MODBUS RTU protocol make internal registers (like: address, device ID, counters content etc.) accessible via RS-485 interface. All **SLI-8** operating functions, available via the RS-485, can be implemented from any typical visualization software or, for instance, with a suitably **MultiCon** controller.

TECHNICAL DATA

Power supply	16V ÷ 30V DC (24V DC typical); external fuse (required): T - type, max. 1 A
Current consumption	20 mA typical
Inputs	8 independent binary inputs; counters capacity: 4 294 967 295 (32 bits)
Input levels	low state: 0V; high state: 24V (min. 8V); min. duration: 50 µs
Galvanic separation	all 8 inputs are galvanically isolated from module supply and RS-485 interface
Communication interface	RS-485, 1200 ÷ 115200 bit/s, 8N1, Modbus RTU
Number of modules	max. 128 in a single network
Data memory	non-volatile memory, EEPROM type
Operating temperature	0°C ÷ +50°C (standard), -20°C ÷ +50°C (option)
Storage temperature	-10°C ÷ +70°C (standard), -20°C ÷ +70°C (with option **08**)
Humidity	max. 90%, non-condensing
Protection class	IP 20 (housing and connection clips)
Case	on the 35 mm strip; material: ABS
Dimensions	101 x 22,5 x 80 mm
Weight	120 g max.

TERMINALS CONNECTION

front view **bottom view**

CONNECTION AND PRINCIPLE OF OPERATION

Connect the supply voltage to the module (+Uz, -Uz, typically 24V DC) and two wires RS-485 (A+, B-) communication interface. Module voltage inputs are located on the lower edge of the case (look: bottom view). Directly after power on the device is signalling its normal operation flashing green LED, marked „RUN" (about 2 times/sec.). Short flashes of LED marked "TX/ERROR" signalize activity of RS-485 interface (data flow between module and Master device) and permanent light of this LED means malfunction of the device. Module makes the measurements from eight inputs in cycles. While power off, current states of counters, filter state and device address are stored into EEPROM memory. After power on these values are restored and counters continue count from value stored while power off.

ORDERING

SLI-8-XX1

options:
00 : no options
08 : operating temp. -20°C ÷ +50°C

SIAi-8

- ■ **analogue inputs module**
- ■ **8 independent analogue inputs (voltage or current)**
- ■ **RS-485 / Modbus RTU**
- ■ **galvanic separation of the inputs from the module supply voltages**
- ■ **LEDs for module operation and Modbus transmission signalling**
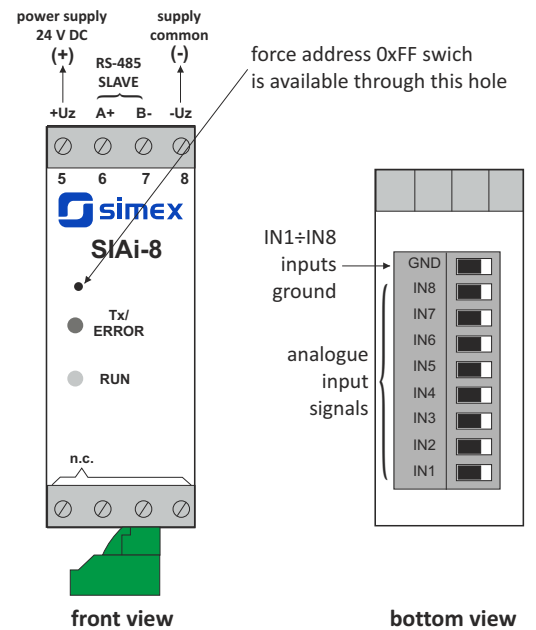- ■ **input signals connected by means of the socket-plug connectors**

Module **SIAi-8** allows to measure analog values from 8 current (or voltage) inputs via the RS-485 connection, with speed rate about 10 Hz (every channel). Measurement results can be internally recalculated due to one of available characteristics: linear, square or user definable multipoint (max. 20 points length). It finds application in distributed control and visualization systems.

Standard functions of Modbus transmission allow to changing of device address or detect its type. All **SIAi-8** operating functions, available via the RS-485, can be implemented from any typical visualization software or, for instance, with a suitably **MultiCon** controller.

TECHNICAL DATA

Power supply	16V ÷ 30V DC (24V DC typical); external fuse (required): T - type, max. 1 A
Current consumption	55 mA typical
Inputs	8 independent analogue inputs: current 0-20 mA; 4-20 mA or voltage 0-10 V; 2-10 V; 0-5 V; 1-5 V
Measurement accuracy	± 0.25% ± one digit
Galvanic separation	all 8 inputs are galvanically isolated from module supply and RS-485 interface
Communication interface	RS-485, 1200 ÷ 115200 bit/s, 8N1, Modbus RTU
Number of modules	max. 128 in a single network
Data memory	non-volatile memory, EEPROM type
Operating temperature	0°C ÷ +50°C (standard), -20°C ÷ +50°C (option)
Storage temperature	-10°C ÷ +70°C (standard), -20°C ÷ +70°C (with option **08**)
Humidity	max. 90%, non-condensing
Protection class	IP 20 (housing and connection clips)
Case	on the 35 mm strip; material: ABS
Dimensions	101 x 22,5 x 80 mm
Weight	120 g max.

TERMINALS CONNECTION

front view

bottom view

CONNECTION AND PRINCIPLE OF OPERATION

Connect the supply voltage to the module (+Uz, -Uz, typically 24V DC) and two wires RS-485 (A+, B-) communication interface. Module inputs are located on the lower edge of the case (look: bottom view).

Directly after power on the device is signalling its normal operation flashing green LED, marked „RUN" (about 2 times/sec.). Short flashes of LED marked "TX/ERROR" signalize activity of RS-485 interface, and permanent light of this LED means malfunction of the device.

Module makes the measurements from eight inputs in cycles.

ORDERING

SIAi-8X-XX1

options:
00 : no options
08 : operating temp. -20°C ÷ +50°C

type of inputs:
N : voltage inputs
P : current inputs

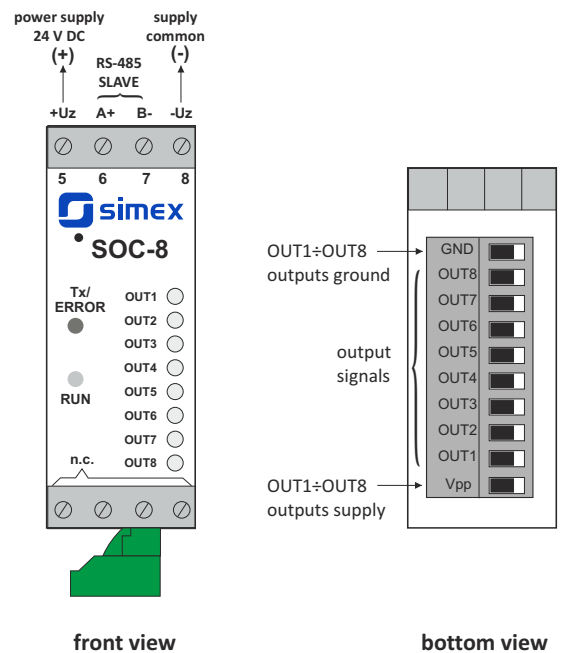KKATAEN_v1.20.111

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TRM.4

SOC-8

- **binary outputs module**
- **8 independent OC outputs**
- **RS-485 / Modbus RTU**
- **galvanic separation of the outputs from the module supply voltages**
- **signalling of output state**
- **LEDs for module operation and Modbus transmission signalling**
- **output lines connected by means of the socket-plug connectors**

The **SOC-8** binary outputs module is used to control the low-power output devices via the RS-485 connection. It finds application in distributed control and visualization systems. It can directly control, for example, contactors, relays, light bulbs and other DC loads with the 24V control (supply) voltage and the 0,5A current (maximum). Galvanic separation of all outputs ensures safe operation of the master system, without the risk of damage caused by dangerous overvoltage. All **SOC-8** operating functions, available via the RS-485, can be implemented from any typical visualization software or, for instance, with a suitably **MultiCon** controller.

TECHNICAL DATA

Power supply	16V ÷ 30V DC (24V DC typical); external fuse (required): T - type, max. 1 A
Current consumption	20 mA typical
Outputs	8 independent OC outputs
Max output current:	0.5A / single output, max. 2 active outputs; 0.2A / single output, all outputs active
Galvanic separation	all 8 outputs are galvanically isolated from module supply and RS-485 interface
Communication interface	RS-485, 1200 ÷ 115200 bit/s, 8N1, Modbus RTU
Number of modules	max. 128 in a single network
Data memory	non-volatile memory, EEPROM type
Operating temperature	0°C ÷ +50°C (standard), -20°C ÷ +50°C (option)
Storage temperature	-10°C ÷ +70°C (standard), -20°C ÷ +70°C (with option **08**)
Humidity	max. 90%, non-condensing
Protection class	IP 20 (housing and connection clips)
Case	on the 35 mm strip; material: ABS
Dimensions	101 x 22,5 x 80 mm
Weight	120 g max.

TERMINALS CONNECTION

front view   **bottom view**

CONNECTION AND PRINCIPLE OF OPERATION

Connect the supply voltage to the module (+Uz, -Uz, typically 24V DC) and two wires RS-485 (A+, B-) communication interface. Outputs are placed on bottom side of the module. Connect the common signal and the polarization voltage (GND and Vpp) on the outputs' side. It is recommended that those signals be separated from the module supply voltage (i.e. by using the PS-series separate power supply adapters manufactured by SIMEX). The load control is effected by closing the common signal (GND) contact which is connected to the **SOC-8**.

Directly after power on the device is signalling its normal operation flashing green LED, marked „RUN" (about 2 times/sec.). Short flashes of LED marked "TX/ERROR" signalize activity of RS-485 interface, and permanent light of this LED means malfunction of the device.

Red LEDs marked "OUT1" ÷ "OUT8" signalize active state of outputs. Pay special attention for permissible currents of outputs, and the sum of all currents.

ORDERING

SOC-8-XX1

options:
00 : no options
08 : operating temp. -20°C ÷ +50°C

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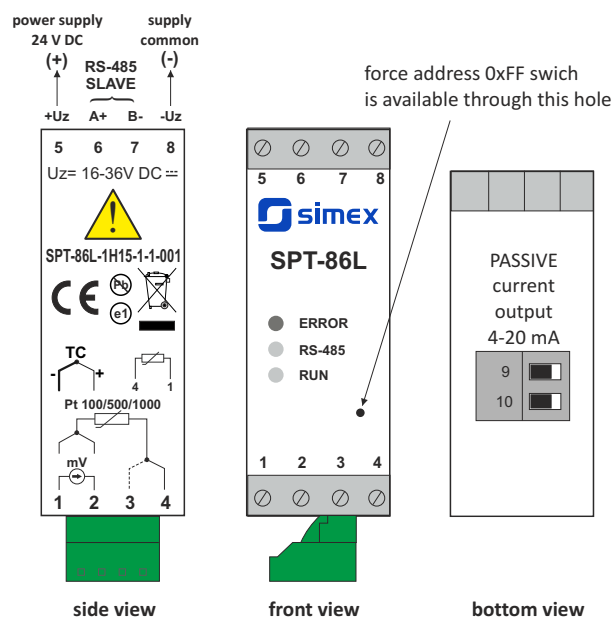
TRM.5

SPT-86L

- temperature and voltage transmitter
- RTD, thermocouple or milivotage input
- output signal 4-20 mA
- RS-485 / Modbus RTU
- peaks detection function
- free selection of characteristics
- free data reading and configuration software S-Config
- DIN rail mounting

SPT-86L module is the insulated temperature and voltage to current in the 4-20 mA standard transmitter, and has possibility of data reading via RS-485 interface. It has one input (Pt 100/500/1000, thermocouples K/S/J/T/N/R/B/E, 0-60 / 0-75 / 0-100 / 0-150 mV) and one passive current output 4-20 mA. During the measurement one type of input can be used at a time only. The measurement inputs have full linearization of characteristics and automatic compensation of the cold junction temperature in the thermocouple mode. Pt mode handles three methods of connection: 2-, 3- and 4-wire. For the milivoltage input user can choose between linear, square, square root or user defined characteristics. In the basic configuration the measurement, after being processed, is given to the current output, but current output can be also controlled directly thru serial interface. For configuring and data reading RS-485 (Modbus RTU) interface is used. The device parameters can be set by the S-Config software, directly from PC level. Every unit can be factory pre-configured on request.

TECHNICAL DATA

Power supply / Power consumption	24V DC (16 ÷ 30V DC), insulated typically 0.65 W
Input signal and ranges	milivoltage: 0-60 mV, 0-75 mV, 0-100 mV, 0-150 mV, input resistance > 1,5 MΩ; accepted prolonged input overload +20% RTD: Pt100, Pt500, Pt1000, measurement wires resistance: max. 20Ω (every wire); measurement range: -100°C ÷ 600°C thermocouple: K, S, J, T, N, R, B, E; input range: -200°C ÷ +1370°C (**K**); -50°C ÷ +1768°C (**S**); -210°C ÷ +1200°C (**J**); -200°C ÷ +400°C (**T**); -200°C ÷ +1300°C (**N**); -50°C ÷ +1768°C (**R**); +250°C ÷ +1820°C (**B**); -200°C ÷ +1000°C (**E**)
Indication range	-999 ÷ 9999 + decimal point
Accuracy	± 0.1%@25°C (for TC N: ± 0.2%@25°C; for TC S, T, R, B: ± 0.5%@25°C); accuracy of cold junction temperature compensation: ± 1°C
Temperature stability	50 ppm/°C
Output	passive current: range max. 2.8 ÷ 24 mA, load resistance 0... (Us - 9.5V) / 24 mA [kΩ], resolution: 12 bits
Communication interface	RS-485, 8N1 and 8N2, Modbus RTU, not isolated from power supply circuit
Data memory	non-volatile memory, EEPROM type
Software	S-Config 2 for configuration and data reading
Operating temp.	0°C ÷ +50°C (standard), -20°C ÷ +50°C (option)
Storage temp.	-10°C ÷ +70°C (standard), -20°C ÷ +70°C (depending on option)
Humidity	5 to 90% no condensation
Protection class	IP 20
Mounting	DIN rail (35 mm)
Dimensions	101 x 22.5 x 80 mm
Weight	ok. 110 g

WIRING

power supply 24 V DC
supply common
(+) RS-485 SLAVE (-)
+Uz A+ B- -Uz
5 6 7 8
Uz= 16-36V DC

SPT-86L-1H15-1-1-001

force address 0xFF swich is available through this hole

5 6 7 8
simex
SPT-86L
ERROR
RS-485
RUN
1 2 3 4

TC
Pt 100/500/1000
mV
1 2 3 4

PASSIVE current output 4-20 mA
9
10

side view **front view** **bottom view**

ORDERING

SPT-86L-1HXX-1-1-XX1

number of outputs:
0
1

type of outputs:
0 : no output
5 : passive current output

options:
00 : no options
08 : operating temp. -20°C ÷ +50°C

Note:
S-Config software can be downloaded from SIMEX website at **www.simex.pl**

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TRM.6