

2-CHANNEL MODULE OF ANALOG INPUTS SM1 TYPE



1. APPLICATION

the SM1 2-channel module of analog inputs is destined to convert standard signals, resistance or temperature signals into numerical data accessible through the RS-485 or RS-232 port by means of the MODBUS protocol.

The measurement is carried out independently on two channels.

RS-485 and RS-232 output ports are galvanically insulated from input signals and supply. The programming of the module is possible by means of the RS-485 or RS-232 port. In the set of SM1 module there is the connecting lead, to connect with the PC computer (RS-232).

The SM1 module realises following functions:

- mathematical operations on channels and between measuring channels,
- conversion of measured or calculated quantities on the base of individual linear characteristics,
- storage of maximal and minimal values for each channel,
- programming of the measurement averaging time,
- servicing of RS-485 and RS-232 interfaces in MODBUS protocol, both in ASCII and RTU mode.

2. TECHNICAL DATA

INPUTS:

Depending on the execution code for individual channels:

- voltage measurement 0...10 V input resistance > 1 MΩ
- current measurement 0...20 mA input resistance < 10 Ω
- resistance measurement 0... 400 Ω
- Pt100 (- 200... + 850)°C

Current flowing through the Pt100 sensor < 250 μA

Resistance of leads connecting the resistance thermometer with the module max 20 Ω/wire

Pt100 characteristic acc. to EN 60751+A2

OUTPUTS:

- digital

a) RS-485 interface

transmission protocol	MODBUS
ASCII	8N1, 7E1, 7O1
RTU	8N2, 8E1, 8O1, 8N1
baud rate	2400, 4800, 9600, 19200 bauds

b) RS-232 interface

transmission protocol	MODBUS
RTU	8N1
baud rate	9600 bauds
address	1

maximal response time to the query frame 300 ms.

Basic error ± 0.2% of measuring range

Additional error from ambient temperature changes ± (0.1% of range /10K)

Measurement averaging time:

- when one input is switched on min 100 ms (programmable)
 - when two inputs are switched on min 200 ms (programmable)
- the sampling frequency of the input is 5 kHz. Total measurement averaging time is the sum of measurement times of both inputs.

Rated operation conditions:

- supply voltage depending on the execution code 85... 253 V a.c./d.c.
20... 50 V a.c./d.c.
- supply voltage frequency 40... 440 Hz
- ambient temperature -10...23...55°C
- storage temperature -25...+85°C
- relative humidity < 95% (no condensation)
- preheating time 10 min

Sustained overload:

- resistance thermometers 1%
- measurement of voltage, current and resistance 10%

Short-duration overload (3 s):

- voltage input 10 Un
- current input 10 In

Ensured protection grade

acc. to EN 60529:

- through the housing IP 40
- electrical connections IP 20

Dimensions

22.5 × 120 × 100 mm

Weight

< 0.3 kg

Fixing

on a 35 mm rail

Power consumption

< 4 VA

Resistance against decays

acc. to EN 61000-6-2

Electromagnetic compatibility:

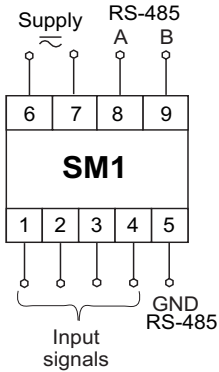
- immunity acc. to EN 61000-6-2
- emission acc. to EN 61000-6-4
- additional error from electromagnetic hazard < 0.2%

Safety requirements acc. to EN 61010-1 standard:

- installation category III
- pollution grade 2
- phase-to-earth working voltage:
 - supply 300 V
 - input 50 V
 - output 50 V

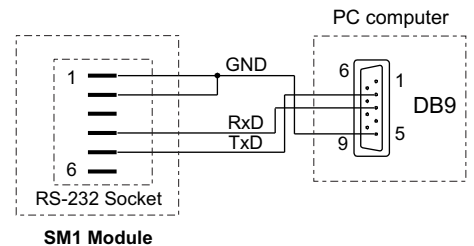
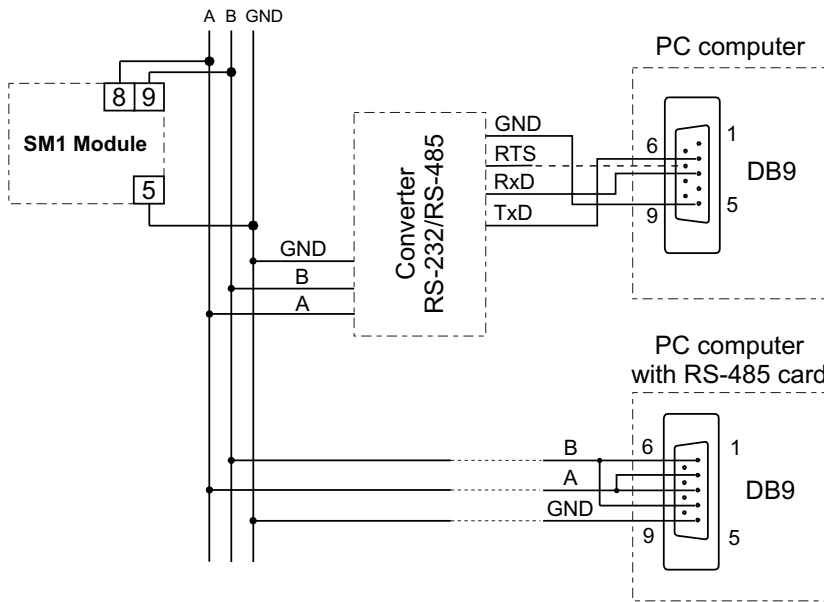
3. EXTERNAL CONNECTION DIAGRAMS

Connection way of external signals



Connection way of input signals

connection way	Measured signal			
	2 voltage inputs	2 current inputs	1 voltage input + 1 current input	2 Pt100 inputs or resistance measurement up to 400 Ω



4. ORDERING CODES

SM1 Module	XX	X	X
Input signal*:			
2 voltage inputs	0...10 V	00	
2 current inputs	0/4...20 mA	01	
1 voltage input + 1 current input	0...10V + 0/4...20 mA	02	
2 resistance or Pt100 inputs	Pt100 or resistance < 400 Ω	03	
on order**		XX	
Supply:			
85... 253 V a.c./d.c.		1	
20... 50 V a.c./d.c.		2	
on order **		X	
Acceptance tests:			
without additional requirements		0	
with an extra quality inspection certificate		1	
acc. to customer's agreement**		X	

EXAMPLE OF ORDER

When ordering, please respect successive code numbers.

Code: **SM1 01 1 1** means:

- SM1**- 2-channel module of analog inputs,
- 01** - module with 2 current inputs 0/4... 20 mA,
- 1** - supply voltage: 85... 253 V a.c./d.c.
- 1** - with an extra quality inspection certificate