

M-200

DATA LOGGER

- 2 programmable analog inputs (RTD, TC, 0/4-20mA, voltage or resistance)
- PULS-type input (frequency or state)
- User linearization characteristic up to 50 points for every input
- Internal temperature sensor for cold junction compensation
- Recording data to internal 2GB memory
- Access to recorded data through USB port on front panel
- Alarm and control thresholds, 2 relay outputs
- Ethernet port (Modbus TCP, WWW server)
- RS485 port (Modbus RTU)



2 ANALOG INPUTS

Independent setup for input sensors:

- Type Pt100, Pt200, Pt500, Pt1000 RTD sensors (2-, 3- or 4-wire)
- Type J, K, T, E, B, N, R, S TC sensors
- Transducers with 4-20mA or 0-20mA current loop output
- Transducers with 0 ... 5k Ω linear resistance output
- Transducers with -10V ... +10V linear voltage output

For 3- or 4-wire connections, only one analog input is available.

PULS-TYPE INPUT

- Measurement of frequencies within the range of 0.001Hz ... 20 kHz or tracking the input state
- Control the operation of data recording

RECORDING MEASUREMENT RESULTS

- Recording data to internal 2GB memory.
- Local access to recorded data through USB port on front panel.
- Setting data recording rate between 1 s and 1 h.

2 RELAY OUTPUTS, ALARM AND CONTROL THRESHOLDS

- 2 x 60V / 0.1A solid state relays.
- 2 alarm and control thresholds for each channel.

COMMUNICATION WITH MASTER SYSTEM

- Galvanically separated **RS485 port** with Modbus RTU protocol.
- **Ethernet port**, Modbus TCP protocol and WWW server.

DISPLAYING THE RESULTS

- 5-digit, 3-colour (green, orange, red) LED display 14 mm high.
- 6 indicator LEDs.
- Dedicated software for visualisation of measurement results.

OTHER FUNCTIONS

- User linearization characteristic up to 50 points defined for each input channel.
- Software for configuration.
- Available version with RS-232/TTL port for thermal printer.

Device version: M-200 v1.07 / Datasheet version: 2012-07-31

TECHNICAL DATA

FRON PANEL	
Type of display:	7-segment, 3-colour (green, orange, red) LED display
Height of digits:	14,2 mm
Indication:	6 two-colour LEDs (red and green) "REC", "USB", "BATT", "1", "2", "3"
Keyboard:	2 buttons: "1-2-3", "USB REC"
USB port:	USB type A compliant
REAR PANEL	
Wire connection:	Screw-type terminal blocks, max wire section 1.5mm ² three 4-position terminal blocks two 2-position terminal blocks three 3-position terminal blocks
Ethernet port:	RJ-45
"REC" buttons:	Controlling the recording functions (START/STOP)
INPUTS	
Galvanic separation between inputs:	None
Galvanic separation from other circuits:	RS-485 port
ANALOG INPUTS	
Number of inputs:	2 (for 2-wire R/RTD connection) 1 (3- or 4- wire R/RTD connection)
Type of inputs:	RTD/R, TC/U, 0/4-20mA; set input type using jumpers inside device
RTD/R Input Configuration	
Sensor type:	Pt100, Pt200, Pt500, Pt1000, resistance-type
Sensor connection method:	4-, 3- or 2-wire
Sensor current:	200µA; 2-, 3-wire connection 400µA; 4- wire connection
Wire resistance compensation in 4- or 3-wire connection:	automatic + constant within the range of -100 ...+100Ω
Wire resistance compensation In 2-wire connection:	constant within the range of -100 ...+100Ω
Wire resistance:	max 50Ω
Resistance measurement range:	max 5kΩ
Conversion characteristic for R:	Linear, user programmable up to 50-point
TC/U Input Configuration	
Cold junction compensation:	Internal Pt1000 sensor
Cold junction compensation range:	-50.0 °C to +99.9 °C
Voltage measurement range:	- 10V to +10V
Maximum resistance of compensation wires (to	150 Ω

the sensor):	
Input resistance:	>10k Ω
Conversion characteristic (for U):	Linear, user programmable up to 50-point
Configuration of 0/4-20mA Input	
Measurement range:	0-24mA
Input resistance:	92 Ω +/-5%
Transducer powered from device:	Yes (24VDC)
Maximum input voltage:	\pm 30VDC between I+ and I- terminals
Conversion characteristic:	Linear, user programmable up to 50-point
Measurement Error	
Measurement accuracy (at ambient temp. of 25 °C):	As specified in the table for the given sensor type
Temperature drift (between 0 °C and 50 °C):	0.025% of the range /10 °C
PULS-TYPE INPUT	
Maximum input voltage:	30VDC or 30V _{p-p}
Measurement range:	From 0.001Hz to 20kHz (from 0.001Hz to 1kHz if filtrating condenser is connected)
Minimum pulse width:	20 μ s (0.5ms if filtrating condenser is connected)
Voltage (OC):	3.3V
Current (input shorted / contact closed):	3.3mA
Switch on / off threshold:	2.7V / 2.4V
BINARY OUTPUTS	
Number of outputs:	2
Type of outputs:	Solid State Relay
Maximum load current:	100 mA (AC/DC)
Maximum voltage:	60 V (AC/DC)
RS485 SERIAL PORT	
Signals output on terminal block:	A(+), B(-), GND
Galvanic separation:	Yes, 500V AC/DC
Maximum load:	32 receivers / transmitters
Transmission protocol:	Modbus RTU
Maximum length of line:	1,200 m
Transmission rate:	1.2, 2.4, 9.6, 19.2, 115.2, 230.4kbps – programmable
Parity control:	Even, Odd, None – programmable
Frame:	1 start bit, 8 data bits, 1 stop bit (1 or 2 stop bits for None)
Minimum timeout:	0 ÷ 7,000ms – programmable
Maximum differential voltage A(+) – B(-):	\pm 14V

Maximum total voltage A(+) – "ground" or B(-) – "ground"	-7 .. +12V
Minimum output signal of transmitter:	1.5V (at $R_0=27\Omega$)
Minimum sensitivity of receiver:	200mV / $R_{WE}=12k\Omega$
Minimum impedance of data transmission line:	27 Ω
Short-circuit / thermal protection:	Yes
ETHERNET PORT	
Transmission protocol:	Modbus TCP, ICMP (ping), DHCP server, WWW server
Interface:	100BaseT Ethernet
Number of connections opened simultaneously:	4
Connection:	RJ-45
Indication LEDs:	2, in RJ45 socket
USB Port	
Port:	Type A, USB compliant
Version:	USB 1.1
Recording indication:	Green and red LED on the front panel
INTERNAL DATA MEMORY	
Capacity:	2GB (Flash)
Recording indication:	Green and red LED on the face plate
POWER SUPPLY	
Supply voltage:	24VAC (+5% / -10%) 20 ... 30VDC (any polarity)
Power consumption:	Max 5W
WORKING CONDITIONS	
Working temperature:	-20 °C ÷ +50 °C
Storage temperature:	-30 °C ÷ +70 °C
Relative humidity during operation	5 ... 90% without condensation
MECHANICAL DIMENSIONS - CASE	
Type of case:	For mounting in panels, PPO
Dimensions:	96mm x 48mm x 100mm
Dimensions of panel cut-out:	92 ^{+0.8} mm x 45 ^{+0.6} mm
Maximum panel thickness:	5mm
Weight:	ca. 0.3kg

Sensor range and accuracy table:

INPUT CATEGORY	RANGE	ACCURACY	CHARACTERISTIC
Pt100 / Pt200 / Pt500 / Pt1000	-200 to +600 °C	+/-0.5 °C	IEC751
Pt100 / Pt200 / Pt500 / Pt1000	-200 to +850 °C	+/-1 °C	IEC751
Pt100+ / Pt200+ / Pt500+ / Pt1000+	-50 to +250 °C	+/-0.3 °C	IEC751
J (Fe – CuNi)	-210 to +1,200 °C	+/-0.5 °C *	IEC584
K (NiCr – Ni)	-270 to +1,370 °C	+/-0.5 °C *	IEC584
T (Cu – CuNi)	-270 to +400 °C	+/-0.5 °C *	IEC584
E (NiCr – CuNi)	-270 to +1,000 °C	+/-0.5 °C *	IEC584
N (NiCrSi – NiSi)	-270 to +1,300 °C	+/-0.5 °C *	IEC584
B (Pt30Rh – Pt6Rh)	0 to +1,820 °C	+/-0.5 °C *	IEC584
R (Pt13Rh – Pt)	-50 to +1,760 °C	+/-0.5 °C *	IEC584
S (Pt10Rh – Pt)	-50 to +1,760 °C	+/-0.5 °C *	IEC584
R	0 to 5,000Ω	+/-0.2 %	linear
U	-1 to +1V	+/-0.5%	linear
0/4-20mA	0-20mA or 4-20mA	+/-0.2%	linear

* Accuracy does not include cold junction temperature measurement error (+/- 2 °C)

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