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R24

DISPLAY MODULE WITH ACTIVE OUTPUT AND RELAY

Display module is designed for measuring the resistance, the signal from the RTDs, thermocouples, voltage 0-10V, current 0/4-20mA and other.
- input is isolated from supply voltage, switching elements and output.
- input parameters and their conversion (e.g. 4..20mA/0..100°C) you can set in RawetStudio
- auxiliary power supply in a wide range from 19 to 300VDC and from 90 to 250VAC or 12V DC
- active analog output according to design: 0/4..20mA, 0..10V , RS485 or without output
- relay switch according to design: without relay or to 4 relays, 2 switch on and 2 throw contacts
- display measuring signal at interval -1999…9999

The instrument is used to display the measured value of temperature, resistance, voltage drop on the shunt, DC voltage and current. Input configuration is performed on the mainboard by switching the jumper. The device may have an active output signal of 0-20mA, 4-20mA, 0-10V or RS485. The device can monitor setting of switching limits for up to 4 relays, 2 switching and 2 changeover relays or to inform about reaching the limit value. Using a PC, the program RawetStudio and adapter PD14-1 can change the input parameters, the displayed values, setting the relay limit values, the number of decimal places, the brightness and the time of rewriting the display. You can add a label of the unit which is located in the center below the display.

Variant R: Pt100, Pt1000, Ni100, Ni1000, odpor 320Ω a 2600Ω
Variant A: Current 0/4-20mA, voltage 0-10V , -10...20V
Variant I: supply 18V DC for powering and display a two-wire passive transducer
Variant T: Thermocoupler type J, K (other in table)
Variant P: Potentiometer to value 1kΩ – 20kΩ
Variant D: Special design – e.g. NTC, KTY, voltage ±30mV to 300V, current to ± 2A, resistor to 100kΩ

Electrical parameters of the device:

- display values	4-digit LED display 20 mm
- colour:	red or green (**G**)
- display range	-1999…9999
- input signal	see table 1
- outputs	see table 2
- output signal	activ 4..20mA, 0..20mA, 0..10V RS485 with auxiliary supply 10-30V on terminals 12, 13
- supply	standard: 19 - 300VDC and 90-250VAC, to order: 20 - 60VAC or 12V DC
- power consumption	max. 2VA
- max. resistance 3w connection RTD	< 10 Ω /1 wire
- input resistance for 10V input:	1MΩ
- input connections:	2 or 3 wire
- input resistance for current 20mA:	27Ω
- current through the sensor Pt100	< 0,5mA
- cold junction compensation	in range -30 ..70°C, accuracy ± 1°C
- output resolution	< 0,01%
- output limitation	2,5…22mA, 0…22mA, 0…12,5V
- damping	in range of 0,1..20s default settings: OV a Pot <0,2s, RTD, Tc 0,3s
- accuracy	basic ±(0,07% +0,1°C) drift: 0,03%/10K nonlinearity: 0,012%, Tc: K 0,1%, Tc J: 0,3°C
- output loop excitation	min.15V / (Rz <750 Ohm for 20mA)
- voltage output load	max. 10mA
- voltage drop on current input	0,54V for 20mA
- operating temperature	-30...+ 70°C
- storage temperatures	-40..80°C
- housing (display/ terminal board)	IP40 / IP20 or IP65 / IP20
- weight:	150g
- relay parameters	voltage 250VAC, max.6A,30VDC, min. switching load:10mA,5V number of operations - min.5x10^4
- signaling of relay switching	4x red LED
- working environment	pollution level 2, overvoltage category III
- electrical insulation strength:	4000Vef, 50Hz/1 min – power between output contacts and input 4000Vef, 50Hz/1 min – input between output and also output contacts
- panel cutout	92 × 45 (+0,6) mm
- dimensions	96 x 48 x 110 mm (with terminal boards)

Table 1

Inputs and range display module R24						
	R24-R – RTD	**R24-T - Tc**	**R24-A - UI**	**R24-P - Potentiometer**	**R24-X**	**R24-D**
0	Pt100 2W, -99..530°C	Tc K -210 .. 400°C	0-20mA	1-20kΩ	external converter	60mV
1	Pt100 3W, -99..530°C	Tc K -270 .. 1372°C	4-20mA			±60mV
2	Pt1000 2W, -99..400°C	Tc K -60 .. 1372°C	0-10V			NTC
3	Pt1000 3W, -99..500°C	Tc J -210 .. 1050°C	-10...20V			KTY
4	Ni100/5000 2w, -60..180°C	Tc J -210 .. 1200°C				other
5	Ni100/5000 3w, -60..180°C	Tc J -210 .. 300°C				
6	Ni1000/5000 2w, -60..250°C	Tc T -270 .. 400°C				
7	Ni1000/5000 3w, -60..250°C	Tc S -50 .. 1768°C				
8	Ni100/6180 2w, -60..180°C	Tc L 0 .. 900°C				
9	Ni100 /6180 3w, -60..180°C	Tc B 0 .. 1820°C				
A	Ni1000/6180 2w, -60..180°C					
b	Ni1000/6180 3w, -60..240°C					
C	resistor 2w, 0..320Ω					
d	resistor 3w, 0..320Ω					
E	resistor 2w, 0..2500Ω					
F	resistor 3w, 0..2800Ω					

Table 2

Outputs of R24					
Value	**Relay 1 switching**	**Relay 2 switching**	**Relay 3 changeover**	**Relay 4 changeover**	**Output**
0	-	-	-	-	-
1	Yes	-	-	-	-
2	Yes	-	-	-	Yes
3	Yes	Yes	-	-	-
4	Yes	Yes	-	-	Yes
5	-	-	Yes	-	-
6	-	-	Yes	-	Yes
7	-	-	Yes	Yes	-
8	-	-	Yes	Yes	Yes
9	Yes	-	Yes	-	-
A	Yes	-	Yes	-	Yes
B	Yes	Yes	Yes	-	-
C	Yes	Yes	Yes	-	Yes
D	Yes	Yes	Yes	Yes	-
E	Yes	Yes	Yes	Yes	Yes
F	-	-	-	--	Yes

Table 3

Analog output / RS485				
Value	**4-20mA**	**0-10V**	**0-20mA**	**RS485**
A	Yes	-	-	-
B	-	Yes	-	-
C	-	-	-	-
D	-	-	Yes	-
E	-	-	-	Yes

Table 4

Code	**Unit**	**Code**	**Unit**
00	NO	28	mm
01	°C	29	cm
02	°F	30	m
03	mA	31	km
04	A	32	l
05	kA	33	l/s
06	mV	34	l/h
07	V	35	ms
08	kV	36	s
09	uA	37	h
10	uV	38	pH
11	Ω	39	%RH
12	kΩ	40	turns
13	Hz	41	rps
14	kHz	42	rpm
15	W	43	rph
16	kW	44	m/h
17	MW	45	km/h
18	Var	46	N
19	kVAr	47	kN
20	MVAr	48	Pa
21	VA	49	hPa
22	kVA	50	kPa
23	MVA	51	Mpa
24	%	52	bar
25	°	53	Psi
26	rad	54	K
27	um	99	jiná

Table 5

Housing display		
Value	**IP40**	**IP65**
-	Yes	-
65	-	Yes

Table 6

signaling limits				
Value	**1**	**2**	**3**	**4**
H1	Yes	-	-	-
H2	-	Yes		-
H3	-		Yes	-
H4	-	-	-	Yes

Table 7

Colour of display		
Value	**RED**	**GREEN**
-	Yes	-
G	-	Yes

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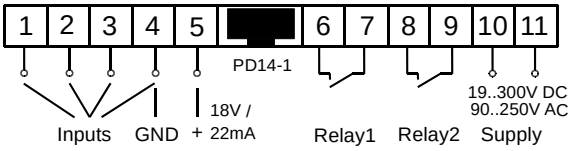
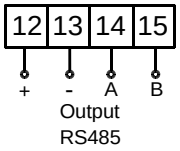
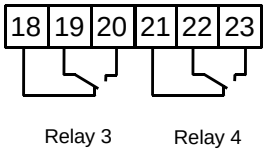
Terminal connection:

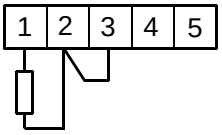
1, 2+3	Input RTD
1(+), 2(-)	Input Tc (1A, mV)
3(+), 4(-)	Input 0-20mA
2(+), 3(-)	Input 0..10V
10, 11	Supply 19 – 300VDC and 90 – 250 VAC
4, 5(+)	Supplying an external 2-wire transmitter

6, 7	relay 1
8, 9	relay 2
18, 19, 20	relay 3
21, 22, 23	relay 4
12, 13	analog output (0-20mA, 4-20mA, 0-10V)
14(A),15(B)	digital output RS485
12,13	supply RS485 10-30V DC

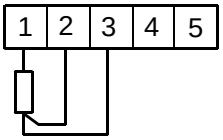




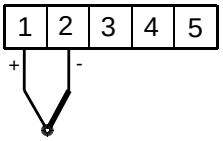




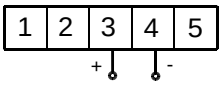
RTD 2-wire



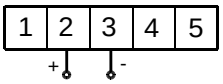
RTD 3-wire



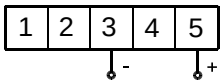
Termocoupler



Curent output 0/4-20mA



Voltage output 0-10V



External passive converter

Type tests:

Standard type test:	according to ČSN EN 60770-1 ed.2
EMC:	according to ČSN EN 61326-1 ed.2
Safety:	according to ČSN EN 61010-1 ed.2

Ordering instructions:

Your purchase order should include:

- number of pieces
- input signal type and range
- display range e.g. 0 to 100 or 0,0 to 100,0
- adjust the brightness of the display
- relay outputs: number and type (switching, changeover)
- limits relay setting
- analog output (e.g. 0-10V)
- unit (if you can e.g. A)
- other then standard supply
- other then standard covering (IP65)

Order Example:

Order Code	Display colour	Input	Output	Analog output	Unit	Setting	Down limit	Upper limit	Calibration	Supply	IP
R24-R1 0C 00	x	Pt100/3w	x	x	x	No	x	x	x	standard	40
R24G-T1 3C 01	x	Tc "K"	2 x relay	x	°C	No	x	x	x	standard	40
R24G-A1 4A 00 N65/0...100	G	4-20mA	2 x relay	4-20mA	x	Yes	4=0	20=100	x	standard	65
R24-A2 AD 04 N K/0,0...300,0	G	0-10V	1 x relay	RS485	A	Yes	0=0	10,0=300,0	Yes	standard	40
R24-A1 4A 00 N AC65/0...150	x	4-20mA	2 x relay	4-20mA	x	Yes	4=0	20=150	x	20-60V AC	65
R24-A2 40 00 N DC/0...20,00	x	0-10V	2 x relay	x	V	Yes	0=0,00	10=20,00	x	12V DC	40
R24G-A2 AD 04 N K AC/-10...500	G	0-10V	1 x relay	RS485	kV	Yes	0=-10	10=500	Yes	20-60V AC	40
R24-R1 0C 01 DC65	x	Pt100/3w	x	x	°C	x	x	x	Yes	12V DC	65

For 12V DC power, output limitations apply. It can not be supplied with a different output than 2x switching relay and power to the external converter is not possible. The ordered specification of the input can be changed in the range of recorded linearizations, eg: for R24-R Table 1, first column. The ordered output specifications of the instrument are factory set and can not be changed, must be selected when ordering. Unit is a label which is located in the center below the display.

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Special requirements need to be discussed in advance. You can order by configurator R24 on our web pages.

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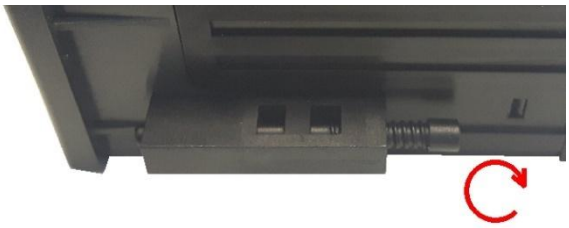
Mechanical installation:

The terminal block used allows connecting conductors to a 3.5 mm2 cross section. The recommended cable with a core cross section of 0.5 mm2 on the desired line resistance. At the input terminal block there are the M2.5 screws , so only **a reasonable clamping force is required**. The display is inserted into the hole in the panel. Push the brackets to the hole on the sides and move them towards the terminal block. The locking screws are inserted into these holders. Tighten the screws to firmly anchor the display in the panel.



Notice:

In the case of RS485 output, download the MODBUS-RTU communication protocol ver.4 on our website.

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