RMIO Modbus – 4 × AI (voltage, current, resistance), 2 × AO, 5 × relay outputs, 2 × SSR outputs

- **bit address = 16 * (word address -1) +1**
- **Supported Modbus functions – F01, F03, F15, F16**

name	**address**	**type (def)**	**description**	**note**
module ID	1 LSB 1 MSB	R	Module identification	Module ID: 8102hex
firmware MSB	2 LSB 2 MSB	R	Firmware version	FW version (in dec) corresponds with version of this document; for example: FW 13h (19 dec) = document V 01900 first three digits: FW version, remaining two digits: document revision
status LSB	3 LSB	R, W RAM	module status lower byte **bit 0** – enable EEPROM write **bit 1** – SW reset enable **bit 2** – central write disable (all RW registers) **bit 4** – enable EEPROM init **bit 5** – calibration offset **bit 6** – span calibation **bit 7** – calibration enable	**EEPROM init** is enabled when the INIT switch was ON at power-up, and switched OFF before bit 4 was set to 1 (indicated by bit 2 in status MSB) **SW reset** enables device restart (see register 1002) **Calibration** is enabled when the INIT switch was ON at power-up, and switched OFF before bit 7 was set to 1 (indicated by bit 3 in status MSB) **Calibration offset** is executed by writing a zero value in bit 7 (before that bit 7 must be set to 1) and by writing a 1 to bit 5 **Span calibration** is executed by writing a zero value in bit 7 (before that bit 7 must

				be set to 1) and by writing a 1 to bit 6
status MSB	3 MSB	R, RAM	module status upper byte **bit 0** - 0 normal mode - 1 init mode **bit 1** - 1 at the next write attempt received data will be written to **EEPROM** - 0 at the next write attempt received data will be written to **RAM only** **bit 2** – EEPROM init **bit 3** – 1-calibration enabled **bit 4** – central write disable indication **bit 5** – SW reset enable **bit 6** – failed to read data from EEPROM, during next calibration **all data** will be written in EEPROM **bit 7** –1	
address	4 LSB	R, W EEPROM (1)	module address	**!!!** The changes will become active only after module restart (the register is written immediately, but the new address is effective after restart)
baud rate (comm speed)	4 MSB	R, W EEPROM (13)	10dec … 1 200bps 11dec … 2 400bps 12dec … 4 800bps 13dec … 9 600bps 14dec … 19 200bps 15dec … 38 400bps 16dec … 57 600bps 17dec … 115 200bps	**!!!** The changes will become active only after module restart (the register is written immediately, but the new baud rate is effective after restart)
input range, channels 1, 2	5 LSB	R, W EEPROM (0x12)	**1 …Pt1000** (-50 to 150 °C) (-5000 to 15000), **divide by 100** to get the correct value **2 … voltage 0V … 10 V** (0 to 9999), **divide by 1000** to get the correct value **3 … resistance 0 … 1600**	bit 0 ... bit 3 … channel 1 bit 4 ... bit 7 … channel 2

input range, channels 3, 4	5 MSB	R, W EEPROM (0x11)	**Ohm** (0 to 16000), **divide by 10** to get the correct value **4 ... current 0 ... 20 mA** (0 to 2000), **divide by 100** to get the correct value NB: an external resistor 125 Ohm is necessary **5 ... resistance 0 – 5000 Ohm** (0 to 50000), **divide by 10** to get the correct value	bit 0 ... bit 3 … channel 3 bit 4 ... bit 7 … channel 4
latched state	6 LSB	R, W EEPROM (0)	state to be catched **0** – log 1 **1** – log 0	bit 0 is input 1 … bit 3 is input 4
relay com	6 MSB	R, W EEPROM (0)	**0** – when no communication, relays stay in last state **1** – when no communication, relays are set to **relay state** values	bit 0 is relay 1 … bit 6 is relay 7
relay state	7 LSB	R, W EEPROM (0)	relays will be set on or off (according to corresponding bits) if there was no communication with module for a given time and in **relay com** the corresponding relay bit is set to 1	bit 0 is relay 1 … bit 6 is relay 7
relay time	7 MSB	R, W EEPROM (30)	time [in seconds] since no communication, after which relays will be set in the required state	if set to 0, the function is disabled
relay start enable	8 LSB	R, W EEPROM (0)	startup relay behaviour **0** – relays are not commanded **1** – the corresponding relay is set to its **relay start** value after module startup	bit 0 is relay 1 … bit 6 is relay 7
relay start	8 MSB	R, W EEPROM (0)	relays state on power-up	bit 0 is relay 1 … bit 6 is relay 7
relay	9 LSB	R, W RAM	relays outputs on/off	bit 0 is relay 1 … bit 6 is relay 7
latch enable	9 MSB	R, W RAM	latch function enable for each input – if **set to 1** the **latched value** bit goes to 0 and stays so until the latched value is detected; after RESET the register is set to 0	reset the **latched value** register bits to 0 by changing the value of **latch enable** bits from 0 to 1 (=disable and enable

				latching for individual bits) bit 0 is input 1 … bit 3 is input 4
channel value AO1	10 LSB 10 MSB	R, W RAM	the AO values are ranged 0000 hex–0FFF hex which is (0 dec – 4095 dec) 0000 hex is for 0 V 0FFF hex is for 10 V	analogue output channels
channel value AO2	11 LSB 11 MSB	R, W RAM		
inputs	12 LSB	R	readout of binary inputs	bit 0 is input 1 … bit 3 is input 4
latched value	12 MSB	R	catched values **0** –if since latch enable the latched state has **not been detected** at the input **1** -if since latch enable the latched state **has been detected** at the input	reset of individual bits: disable and enable the corresponding bits –see register **latch enable** bit 0 is input 1 … bit 3 is input 4
channel value AI1	13 LSB 13 MSB	R	Measured values at analogue inputs	Measured values on analogue input channels AI1 ... AI4
channel value AI2	14 LSB 14 MSB	R		
channel value AI3	15 LSB 15 MSB	R		
channel value AI4	16 LSB 16 MSB	R		
channels	17 LSB	R, W EEPROM (0x0F)	Measured channels **log. 0** on bit means that the respective channel **will not** be sampled **log. 1** … means that the respective channel **will be** sampled **bit 0** … input channel 1 (AI1) … **bit 3** … input channel 4 (AI4)	not implemented yet
reserved	17 MSB	R		
uptime	18 LSB 18 MSB 19 LSB 19 MSB	R	Time [in seconds] since module power-up or reset	LSB MSB

number EE values	20 LSB 20 MSB	R EEPROM	number of EEPROM writing cycles (address, baud rate, range, …), just for information	Counter 0 … FFFE h; no overflow, when FFFE h is reached, the counter stops
number EE cal 1	21 LSB 21 MSB	R EEPROM	number of EEPROM writing cycles - calibration	Counter 0 … FFFE h; no overflow, when FFFE h is reached, the counter stops.
uptime	1000 LSB 1000 MSB 1001 LSB 1001 MSB	R	Uptime [s]	
SW reset	1002 LSB 1002 MSB	R, W RAM	Writing of a non-zero value executes software restart (function must be enabled in Status LSB bit 1).	
serial number	1003 LSB 1003 MSB 1004 LSB 1004 MSB	R, W OTP EEPROM	Module serial number (one-time programmable only, at production)	
serial port settings	1005 LSB	R,W EEPROM (0)	Serial port settings **bits 0,1** – parity 0 none 1 even 2 odd **bit 2** – 0 one stopbit 1 two stopbits	**!!!** The changes will become active only after module restart (the register is written immediately, but the new settings are effective after restart)
reserved	1005 MSB	R		
dip switch	1006 LSB	R	Actual value of the addressing DIP switch	
reserved	1006 MSB	R		

Revision:

21.02.2018 ver. 100
14.01.2022 ver. 105 – stylistic adjustments, change logo
18.01.2023 ver. 105 – edited header