

SPIROTECH – MODBUS RTU



Superior Modbus RTU

1. Addressing range

The Superior device can be addressed as a slave in the range of 1-247. By default, the Modbus address equals 1. In the Modbus configuration screen there is the option to change slave address.

2. Configuration

Address, baud rate and parity of the Modbus is changeable via the Modbus settings screen on the Superior brain. Configuration screen is available in the installer menu: Menu — Settings — Installer settings — Modbus settings.



Modbus settings screen

- Supported baud rates: 4800, 9600, 14400, 19200 (default: 19200)
- Supported parity settings: none, even and odd (default: none)
- Supported stop bit settings: one and two (default: one)
- Supported data bits: 8
- The device can be addressed as a slave in the range of 1-247 (default: 1)

3. Modbus functions

Supported function codes and their possible exception codes:

- 0x03 Read Holding Registers 16-bit data
- 0x04 Read Input Registers 16-bit data
- 0x06 Write Single Register 16-bit data

Exception codes:

- 0x02 – Illegal data address/size
- 0x03 – Illegal data value

4. Modbus register addresses

The Modbus RTU registers are grouped in the following register blocks:

Start address	Register block	Permissions	Description
100	Superior status	R	Register for reading status, errors, alarms, data, ...
200	Superior control	R/W	Registers for control and set parameters

• Superior status register block

Registers in this register block can be read by means of function codes 0x03 and/or 0x04. They are read-only.

Address	Register name	Description
100	Bit 0: Power status	Indicates the power state of the Superior 0: Off 1: On
	Bit 1: Error	Indicates if there is an error or not 0: No error 1: Error
	Bit 2: Warning	Indicates if there is a warning or not 0: No error 1: Warning
	Bit 3: Pump test	Indicates the pump test state 0: No pump test 1: Pump test in progress
	Bit 4: Degassing	Indicates the degassing state 0: No degassing 1: Degassing in progress
	Bit 5: Refilling	Indicates the refilling state 0: No refilling 1: Refilling in progress
	Bit 6: Low pressure refilling	Indicates the critical refilling state 0: No critical refilling 1: Low pressure refilling in progress
	Bit 7: Stopping procedure	Indicates the stopping state 0: No stopping procedure 1: Stopping procedure
	Bit 8: LAN connection	Indicates if the Superior is connected via LAN 0: No LAN connection 1: Superior connected via LAN
	Bit 9: WLAN connection	Indicates if the Superior is connected via WLAN 0: No WLAN connection 1: Superior connected via WLAN
101	System pressure	Indicates the actual system pressure, same as showed on the screen. The scale is 0.01 bar, the valid value range is from 0 to 1000 (10.00 bar). Common examples: 470: 4.70 bar 625: 6.25 bar.
102	Warning code	Warning number of the ongoing warning. See Superior warnings list to get meaning.
103	Error code	Error number of the ongoing error. See Superior errors list to get meaning.

Address	Register name	Description																				
104	Warning start date	<p>Date when warning occurs. Most significant word (16-bit) of 32-Bit Windows Date Format:</p> <table border="1"> <tr> <td>Bit position:</td> <td>31-25</td> <td>24-21</td> <td>20-16</td> </tr> <tr> <td>Length:</td> <td>7</td> <td>4</td> <td>5</td> </tr> <tr> <td>Contents:</td> <td>year</td> <td>month</td> <td>day</td> </tr> <tr> <td>Value Range:</td> <td>0-119</td> <td>1-12</td> <td>1-31</td> </tr> <tr> <td></td> <td>(relative to 1980)</td> <td></td> <td></td> </tr> </table> <p>If value equals 0 date & time do not exist.</p>	Bit position:	31-25	24-21	20-16	Length:	7	4	5	Contents:	year	month	day	Value Range:	0-119	1-12	1-31		(relative to 1980)		
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Length:	7	4	5																			
Contents:	year	month	day																			
Value Range:	0-119	1-12	1-31																			
	(relative to 1980)																					
105	Warning start time	<p>Time when warning occurs. Least significant word (16-bit) of 32-Bit Windows Time Format:</p> <table border="1"> <tr> <td>Bit position:</td> <td>15-11</td> <td>10-5</td> <td>4-0</td> </tr> <tr> <td>Length:</td> <td>5</td> <td>6</td> <td>5</td> </tr> <tr> <td>Contents:</td> <td>hours</td> <td>minutes</td> <td>2-second increments</td> </tr> <tr> <td>Value Range:</td> <td>0-23</td> <td>0-59</td> <td>0-29 in 2-second intervals</td> </tr> </table> <p>If value equals 0 date & time do not exist.</p>	Bit position:	15-11	10-5	4-0	Length:	5	6	5	Contents:	hours	minutes	2-second increments	Value Range:	0-23	0-59	0-29 in 2-second intervals				
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Contents:	hours	minutes	2-second increments																			
Value Range:	0-23	0-59	0-29 in 2-second intervals																			
106	Warning reset date	<p>Date when warning was reset manually. Most significant word (16-bit) of 32-Bit Windows Date Format. If value equals 0 date & time do not exist.</p>																				
107	Warning reset time	<p>Time when warning was reset manually. Least significant word (16-bit) of 32-Bit Windows Time Format. If value equals 0 date & time do not exist.</p>																				
108	Error start date	<p>Date when error occurs. Most significant word (16-bit) of 32-Bit Windows Date Format. If value equals 0 date & time do not exist.</p>																				
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112	Degassing start date	<p>Date when degassing started. Most significant word (16-bit) of 32-Bit Windows Date Format. If value equals 0 date & time do not exist.</p>																				
113	Degassing start time	<p>Time when degassing started. Least significant word (16-bit) of 32-Bit Windows Time Format. If value equals 0 date & time do not exist.</p>																				
114	Degassing stop date	<p>Date when degassing stopped. Most significant word (16-bit) of 32-Bit Windows Date Format. If value equals 0 date & time do not exist.</p>																				

Address	Register name	Description
115	Degassing stop time	Time when degassing stopped. Least significant word (16-bit) of 32-Bit Windows Time Format. If value equals 0 date & time do not exist.
116	Degassing time	Time of last degassing process in minutes
117	Refilling start date	Date when refilling started. Most significant word (16-bit) of 32-Bit Windows Date Format. If value equals 0 date & time do not exist.
118	Refilling start time	Time when refilling started. Least significant word (16-bit) of 32-Bit Windows Time Format. If value equals 0 date & time do not exist.
119	Refilling stop date	Date when refilling stopped. Most significant word (16-bit) of 32-Bit Windows Date Format. If value equals 0 date & time do not exist.
120	Refilling stop time	Time when refilling stopped. Least significant word (16-bit) of 32-Bit Windows Time Format. If value equals 0 date & time do not exist.
121	Refilling time	Time of last refill process in minutes
122	Refilling quantity Hi	Refilling quantity of the last refill process in liters, most significant word (16-bit)
123	Refilling quantity Lo	Refilling quantity of the last refill process in liters, least significant word (16-bit)
124	Firmware version	Firmware version of the Brain unit, MSB as version major, LSB as version minor
125	HV firmware version	Firmware version of the HV unit, MSB as version major, LSB as version minor

• Superior control register block

Registers in this register block can be read by means of function codes 0x03 and/or 0x04.

They can be written as holding register with function code 0x06.

Address	Register name	Description
200 (register always read as 0)	Bit 0: Power ON	Control bit that switches ON Superior 0: No request 1: Turn ON request You can read actual power state from register 100, bit 0
	Bit 1: Power OFF	Control bit that switches OFF Superior 0: No request 1: Turn OFF request You can read actual power state from register 100, bit 0
	Bit 2: Error reset	Control bit that resets errors 0: No resetting 1: Reset errors
	Bit 3: Warning reset	Control bit that resets warnings 0: No resetting 1: Reset warnings
	Bit 4: Degass start	Control bit that starts degassing 0: No action 1: Start degassing You can read actual degass state from reg. 100, bits 4

Address	Register name	Description
	Bit 5: Degass stop	Control bit that stops degassing 0: No action 1: Stop degassing You can read actual degass state from reg. 100, bits 4
	Bit 6: Refill start	Control bit that starts refilling 0: No action 1: Start refilling You can read actual refill state from reg. 100, bit 5
	Bit 7: Refill stop	Control bit that stops refilling 0: No action 1: Stop refilling You can read actual refill state from reg. 100, bit 5
	Bit 8: Low pressure refill start	Control bit that starts low pressure refilling (proper conditions must be met) 0: No action 1: Start low pressure refilling You can read actual refill state from reg. 100, bit 6
201	Boiler interlock enable	Enable/Disable the boiler interlock 0: Disabled 1: Enabled
202	Boiler interlock low	Sets the low pressure threshold of the boiler interlock. The scale is 0.01 bar, the valid value range is from 0 to 1000 (10.00 bar). Example: 210: 2.10 bar
203	Boiler interlock high	Sets the high pressure threshold of the boiler interlock. The scale is 0.01 bar, the valid value range is from 0 to 1000 (10.00 bar).
204	Max. system pressure	Sets the maximum system pressure. The scale is 0.01 bar, the valid value range is from 0 to 1000 (10.00 bar).
205	Desired system pressure	Sets the desired system pressure. The scale is 0.01 bar, the valid value range is from 0 to 1000 (10.00 bar).
206	Refill system pressure	Sets the refill system pressure. The scale is 0.01 bar, the valid value range is from 0 to 1000 (10.00 bar).
207	Common fault mode	Sets the common fault relay mode. 0: Normally open 1: Normally closed