

NICO Modbus RTU

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Serial interface

The serial port configuration for the RS485 interface is (9600,8N1):

- Baud rate: 9600 bps
- Data bits: 8
- Stop bits: 1
- Parity: none

Data types

Name	Register Count	Format
Bool	1	false: 0x0000, true: 0xFF00
Uint8	1	unsigned 8 bit integer. Value range: 0x0000 - 0x00FF
Uint16	1	unsigned 16 bit integer. Value range: 0x0000 - 0xFFFF
Uint32	2	unsigned 32 bit integer. Value range: 0x00000000 - 0xFFFFFFFF
Float	2	IEEE 754 32 bit floating point value.
Char[n]	$\left\lfloor \frac{n}{2} \right\rfloor$	ASCII string of n characters.

Functions

These Modbus function codes are supported by the sensor:

Name	Code	Description / Application
Read multiple registers	0x03	Read the serial number and firmware version and of course measurement data.
Write single register	0x06	Trigger a measurement process.
Report slave ID	0x11	Read serial number and firmware version.

Default slave address

The factory default setting of the slave address is **1 (0x01)**.

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Read / Write multiple registers (0x03 / 0x10)

The following table describes the Modbus register mapping:

Name	R/W	Address	Datatype
Description			
Modbus slave address	RW	0	Uint16
The Modbus slave address of the sensor. Valid IDs: 1...247			
Device serial number	R	10	Char[10]
The serial number of the sensor.			
Firmware version	R	15	Char[10]
The installed firmware version.			
Self-trigger activated	RW	102	Bool
Enables or disables the self-trigger. For external trigger: deactivate the self-trigger. Hint: If used with a control unit it is recommended to disable the self-trigger.			
Self-trigger interval	RW	103	Uin32
The interval in [s] for self-triggered measurements. Value range: 1s – 86400s. Hint: If used with a control unit it is recommended to disable the self-trigger.			
N-NO₃ / scaled	R	1000 / 1500	Float
NO₃ / scaled	R	1002 / 1502	Float
SQI / scaled	R	1004 / 1504	Float
RefA / scaled	R	1006 / 1506	Float
RefB / scaled	R	1008 / 1508	Float
RefC / scaled	R	1010 / 1510	Float
RefD / scaled	R	1012 / 1512	Float
N-NO_x / scaled	R	1014 / 1514	Float
NO_x / scaled	R	1016 / 1516	Float

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Name	R/W	Address	Datatype
Description			

Write single register (0x06)

A special case of the “write single register” function is writing to the following register. Instead of changing configuration values, special actions are performed.

Name	Address
Description	
Trigger measurement	1
<p>A single measurement is triggered. Depending on the value written, a different type of measurement is performed:</p> <p>0x0101: Standard measurement</p> <p>Other values are reserved for future purpose and may result in undefined behavior, yet. Meanwhile the measurement process the sensor may not reply to Modbus requests.</p>	

Report slave ID (0x11)

The sensor name, serial number and firmware version is replied each as null terminated ASCII string.

Example:

N	I	C	0	0x00	F	0	2	0	0x00	1	.	1	0x00
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