nLink-Modbus RTU / RS485
Configuration Software nCom485

Important:

Power Supply 5 - 18 VDC!

Bus connector is a M12 screw connection. Cables with open wires are available as option.

Adapter configuration either through ModbusRTU directly or use configuration software and USB cable «nCom485» (PC Software with M12/USB cable)

Scope of use:

This user guide applies to the nLink-ModbusRTU adapter from firmware version V1.0 and nSoft-ACT-M V0.0

1. Installation nSoft-ACT-M

Install software first before connecting the USB cable.

Start Installer by double clicking the .exe fil, follow the instructions. Choose «Full Installation».

Supported operating systems:

- Windows XP from Service Pack 3 on and higher Windows releases (32+64bit)

Hardware requirements:

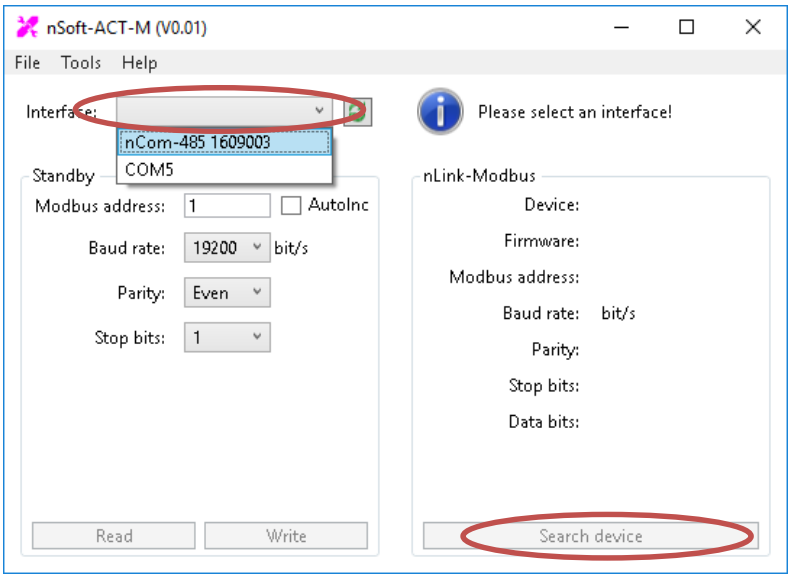
- Processor speed: at least 1 GHz
- USB or network connection: RJ45
- at least 512 MB of operating memory
- at least 4 GB of free disc space
- Software Adobe Acrobat Reader
- Admin rights on the PC

"nSoft-ACT-M_Installer_Net_Vx.exe"
Version incl. Net Framework 4. (will be installed automatically if not already installed)

“nSoft-ACT-M_Installer_Vx.exe”
Version without .Net Framework (free download on microsoft website)

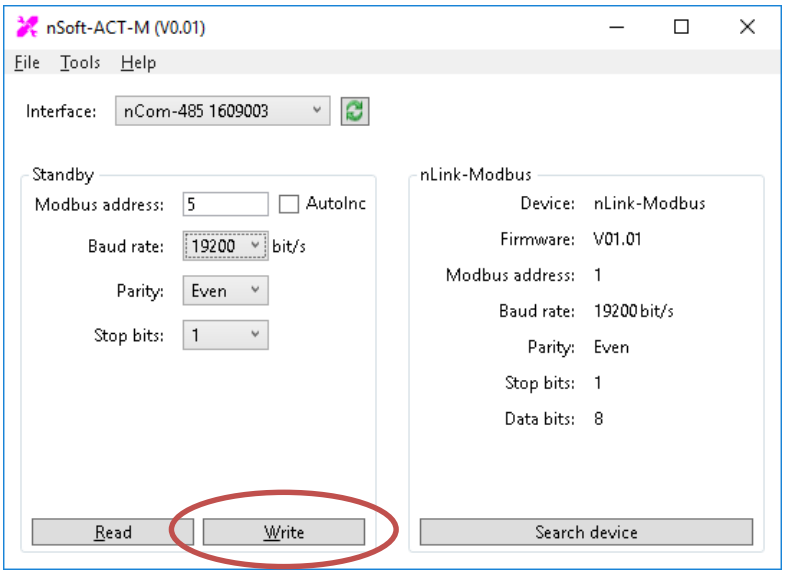
2. Configuration with nSoft-ACT-M

Connect USB Cable to your PC and nLink-Modbus adapter



Interface: Click on the arrow and choose the nCOM-485 connection.

Click on „Search Device“ to find connected adapter and indicate the settings.

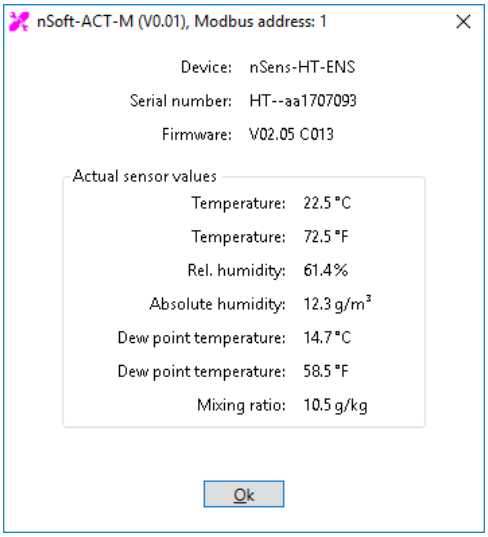


Configuration (Standby)
Set parameters according customers requirement.

Apply „Write“ to store the configuration on the adapter.

Selecting „AutoInc“ increases the Modbus Adress automatically for the next adapter.

After applying «Write» you can remove the nLink-Modbus and connect another adapter for configuration.



Sensor Information
Select Menu „Tools“ - Show Sensor Info to indicate sensor information in a new window.

A calibration is NOT possible, use nSoft-Cal

Update nLink-Modbus Firmware

Select Menu «Tools», Option "Firmware-Update" and follow the instructions. The firmware file can only be obtained by email (climate@novasina.ch).

Remark:

An interrupted Update can be restartet anytime, it does not damage the adapter.

3. nLink Modbus RTU

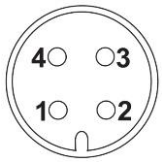
Technical Data

Name	nLink-ModbusRTU (Art-Nr 2601096)
Power supply	**10V DC** Permissible voltage range : 5 to 12VDC
Power consumption	<0.5W
Display	none
Outputs	ModbusRTU (all climate values and diagnostic information as described in the Modbusregister)
Housing material	PVDF black
Protection class	IP67
Soldering material	lead free (RoHS compliant)
Working temp.	-20 to 80°C
Storage temperature	-10 to 60°C (non-condensing)
CE-/EMC	Safety: IEC 61010-1:2010 EMC: IEC 61000-6-2:2005, EN 61000-6-2:2005 IEC 61000-6-3:2006+A1:2010, EN 61000-6-3:2007+A1:2011

RS485 Interface

Refer to implementation guidelines on Modbus.org.

Pin Assignment as follows, use M12 screw connector. Connecting cables can be obtained at Novasina. The following color code refers to these cables.



1: +5..12V_{DC} (brown)
2: RS485 (D-) (white)
3: RS485 (D+) (blue)
4: GND (black)

- Failsave: Open Bus, Idle Bus
- Bias Resistors: for nLink-Modbus not necessarily needed.
  As soon as a Bus-participant unit requires a Bias Resistors, it must be added one-time, normally on the Master.
  Therefore, even in disturbed environments the transmission quality can be improved.
- Terminating resistors: with < 100m Bus length it is not necessarily needed, above and depending on the baud rate at both Bus ends 2 x 150Ω 0.5W is recommended.
  Note:
  "MODBUS over Serial LineSpecification and Implementation Guide V1.02" (www.modbus.org) is only met with terminating resistors.
- Unit Load: < 1/6 (more than 200 nodes possible)
- GND (Pin 4) has must imperatively wired between all Bus-participants.

Modbus - Map

Register Address	Parameter	Datentyp	RW
Climate data			
30026 40026	Temperature [°C]	Float 32 (CDAB)	R
30028 40028	Temperature [°F]	Float 32 (CDAB)	R
30030 40030	Rel humidity [%RH]	Float 32 (CDAB)	R*[1]
30032 40032	Abs. humidity [g/m^3]	Float 32 (CDAB)	R*[1]
30034 40034	Dewpoint [°C]	Float 32 (CDAB)	R*[1]
30036 40036	Dewpoint [°F]	Float 32 (CDAB)	R*[1]
30038 40038	Mixing ratio [g/kg]	Float 32 (CDAB)	R*[1]
30040 40040	Temperature [°C] *100.0	Signed integer 16 (AB)	R
30041 40041	Temperature [°F] *100.0	Signed integer 16 (AB)	R
30042 40042	Rel humidity [%RH] *100.0	Signed integer 16 (AB)	R*[1]
30043 40043	Abs. humidity [g/m^3] *100.0	Signed integer 16 (AB)	R*[1]
30044 40044	Dewpoint [°C] *100.0	Signed integer 16 (AB)	R*[1]
30045 40045	Dewpoint [°F] *100.0	Signed integer 16 (AB)	R*[1]
30046 40046	Mixing ratio [g/kg], *100.0 limited to 327,67 g/kg	Signed integer 16 (AB)	R*[1]

Register Address	Parameter	Datentyp	RW
Communication parameter			
60001	Slave ID (1..247), Factory setting: 247	Signed integer 16 (AB) **Warning**: "It is of great importance to ensure at the time of the procedure of devices addressing, that there is not two devices with the same address. In such a case, an abnormal behavior of the whole serial bus can occur, the Master being then in the impossibility to communicate with all present slaves on the bus."	W *2
40001			R
60002	Communication settings: factory settings: - 19200 Bit/s - Parity even - 1 Stop Bit - 8 Data Bits (nicht änderbar)	High Byte: Must be set to 0x01 Low Byte: b7: Reserve, set to 0 b6: Reserve, set to 0 b5: 0 ≙ 1 Stop Bit 1 ≙ 2 Stop Bits b4...b3: 01 ≙ Parity none 10 ≙ Parity odd 11 ≙ Parity even b2..b0 000 ≙ 4800 Bit/s 001 ≙ 9600 Bit/s 010 ≙ 19200 Bit/s 011 ≙ 38400 Bit/s	W *2
40002			R
Gateway description (Modbus Adapter)			
332769 432769	Gateway device detection (must never be changed) Novax 0x0001/00	ASCII String 0 terminated, 11 Registers The identification is *ModbusAdapter*	R
332780 432780	Gateway Software Version Novax 0x0001/01	ASCII String 0 terminated, 11 Registers	R
332791 432791	Gateway profile GUID Device detection (All 0x00 if not available) U8[0] = leftmost byte Novax 0x0001/02	GUID U8[16], 8 Registers The identification is *8E 4C 99 56 05 F4 49 F9 92 1B B5 F4 E5 4C 9C 97*	R
332799 432799	Gateway Modbus Capability level Communication profile	Unsigned integer 16 (AB)	R
332800 432800	Gateway Modbus Required Capability level Master Communication profile	Unsigned integer 16 (AB)	
332801 432801	Gateway Marketing name Novax 0x0001/03	ASCII String 0 terminated, 11 Registers The identification is *nLink-Modbus*	
332812 432812	Reserved		

Register Address	Parameter	Datentyp	RW
Sensor description			
336865 436865	Sensor device detection (is never changed) Novax 0x0001/00	ASCII String 0 terminated, 11 Registers The identification is *ModbusAdapter*	R
336876 436876	Sensor Software Version Novax 0x0001/01	ASCII String 0 terminated, 11 Registers	R
336887 436887	Sensor profile GUID Device detection (All 0x00 if not available) U8[0] = leftmost byte Novax 0x0001/02	GUID U8[16], 8 Registers	R
336895 436895	Sensor NBus Capability level Communication profile	Unsigned integer 16 (AB)	R
336896 436896	Sensor NBus Required Capability level Master Communication profile	Unsigned integer 16 (AB)	R
36897 436897	Sensor Marketing name Novax 0x0001/03	ASCII String 0 terminated, 11 Registers	R
336908 436908	Sensor serial no.	ASCII String 0 terminated, 11 Registers	R
*1	Not available with sensor type nSens-T-Nxx		
*2	After setting the communication parameter it can take up to 1s before the nLink-Modbus can answer on queries.		

Slave ID

- Using the ID 247 the device can be always addressed to independently of the effective ID which is set. This ID should therefore not be used by any other device in the Bus!
- The ID 247 is used by our configuration software.

Note regarding Register Address

- A Register Address for example 30026 means - according to the Modbus Notation - the access with function code 0x03 (Read Holding Registers) on register 26.
  With 40026 the access with function code 0x04 (Read Input Registers) on register 26.
  All climatic data can be read both, with "Read Holding Registers" and "Read Input Registers".
- According to the Modbus specification the register counting begins with 1.
  In a Modbus telegram (PDU) however the counting of the "Communications Address" begins with 0.
  Example:
  The Register Address 30026 effectuates an access with function code 3 on the "Communications Address" 25.

Timeout

- Although the answer is sent after less than 60ms, we recommend a minimum timeout time of 200mS.

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4. Connecting and configuration cable

nSens cable **extensions**	**M12/4 Modbus cable**	**nCom-485 USB**
Extension cable between nLink Modbus and nSens. .	M12 connection cable with 4 open cables for RS485 wiring	Configuration cable for nLink-Modbus to USB / Windows PC Software available for download
		
260 1136 nSens Extension 5m **260 1201 nSens Extension 2m**	**260 1135 Bus cable length 2m** **260 1349 Bus cable length 10m**	**260 1125 nCOM485**