

# INTELLIGENT CO / NO<sub>2</sub> ROOM SENSOR

## Modbus register map



## MODBUS REGISTER MAP

INPUT REGISTERS					
Register	Register Name	Data type	Description	Raw data range	Values
1	Temperature reading	signed integer	Actual temperature level	-300—700	500 = 50,0°C
2	Temperature output value	unsigned integer	Output value according to temperature	0—1.000	0 = 0 % 1.000 = 100 %
3	Temperature alert flag	unsigned integer	Flag indicates that measured Temperature is outside set alert values. Set to '1' when the measured value is outside the Temperature alert values defined by holding registers 13 and 14	0, 1	0 = Temperature measurement OK 1 = Temperature measurement too low / high
4	Temperature range limit flag	unsigned integer	Flag indicates that measured temperature is outside set range limit values. Set to '1' when the measured temperature is outside limit range values defined by holding registers 11 and 12	0, 1	0 = Temperature range OK 1 = Temperature range too low / high
5	Temperature sensor state	unsigned integer	Flag that shows if the communication with temperature sensor is lost	0, 1	0 = OK 1 = Fault
6—9			Reserved, return 0		
10	Actual relative humidity value	unsigned integer	Actual relative humidity level	0—1.000	1.000 = 100,0 % rH
11	Relative humidity output value	unsigned integer	Output value according to relative humidity	0—1.000	0 = 0 % 1000 = 100 %
12	Relative humidity alert flag	unsigned integer	Flag indicates that measured Relative humidity is outside set alert values. Set to '1' when the measured value is outside the Relative humidity alert values defined by holding registers 21 and 22	0, 1	0 = Relative humidity measurement OK 1 = Relative humidity measurement too low/high
13	Relative humidity range limit flag	unsigned integer	Flag indicates that measured Relative humidity is outside set range limit values. Set to '1' when the measured Relative humidity is outside limit range values defined by holding registers 19 and 20	0, 1	0 = Relative humidity range OK 1 = Relative humidity range too low/high
14	Humidity sensor state	unsigned integer	Flag that shows if the communication with humidity sensor is lost	0, 1	0 = OK 1 = Fault
15	Calculated dew point	signed integer	Calculated dew point	-700—700	200 = 20,0°C

INPUT REGISTERS					
		Data type	Description	Raw data range	Values
16–25			Reserved, return 0		
26	CO level	unsigned integer	Relevant CO level	0–1.000	100 = 100 ppm
27	CO Output value	unsigned integer	Output value according to CO	0–1.000	0 = 0 % 1.000 = 100 %
28	CO alert flag	unsigned integer	Flag indicates that measured CO level is outside set alert values. Set to '1' when the measured value is outside the CO values defined by holding registers 29 and 30	0, 1	0 = CO measurement OK 1 = CO measurement too low/high
29	CO range limit flag	unsigned integer	Flag indicates that measured CO is outside set range limit values. Set to '1' when the measured CO is outside limit range values set defined by holding registers 27 and 28	0, 1	0 = CO range OK 1 = CO range too low/high
30	CO sensor state	unsigned integer	Flag that shows if the communication with the CO sensor is lost	0, 1, 4	0 = OK 1 = Fault 4 = Preheating
31	NO <sub>2</sub> level	unsigned integer	Relevant NO <sub>2</sub> level	0–1.000	100 = 1 ppm
32	NO <sub>2</sub> output value	unsigned integer	Output value according to NO <sub>2</sub>	0–1.000	0 = 0 % 1.000 = 100 %
33	NO <sub>2</sub> alert flag	unsigned integer	Flag indicates that measured NO <sub>2</sub> level is outside set alert values. Set to '1' when the measured value is outside the NO <sub>2</sub> values defined by holding registers 33 and 34	0, 1	0 = NO <sub>2</sub> measurement OK 1 = NO <sub>2</sub> measurement too low/high
34	NO <sub>2</sub> range limit flag	unsigned integer	Flag indicates that measured NO <sub>2</sub> is outside set range limit values. Set to '1' when the measured NO <sub>2</sub> is outside limit range values set defined by holding registers 31 and 32	0, 1	0 = NO <sub>2</sub> range OK 1 = NO <sub>2</sub> range too low/high
35	NO <sub>2</sub> sensor state	unsigned integer	Flag that shows if the communication with the NO <sub>2</sub> sensor is lost	0, 1, 4	0 = OK 1 = Fault 4 = Preheating
36–38			Reserved, return 0		

## INPUT REGISTERS

		Data type	Description	Raw data range	Values
39	Actual output value	unsigned integer	The actual output value	0–1.000	0 = 0 % 1.000 = 100 %
40	Output control mode	unsigned integer	The source of the output value	1, 2, 5, 6, 99	1 = Temperature 2 = rH 5 = CO 6 = NO <sub>2</sub> 99 = all OFF
41	Ambient light intensity	unsigned integer	Measured ambient light intensity	0–32.000	1.000 = 1.000 lux
42	Active / Standby	unsigned integer	Active or Standby indication according the Active / Standby light level defined by holding registers 35 and 36. If the measured light level is between the two levels the indication is 0 (Low intensity)	0–2	0 = Low light intensity 1 = Active 2 = Standby
43	Ambient light sensor state	unsigned integer	Flag that shows if the communication with the ambient light sensor is lost	0, 1	0 = OK 1 = Fault
44–50			Reserved, return 0		

**Note:** The input registers can be read via the Modbus command: "Read input registers".

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
1	Device slave address	unsigned integer	Modbus device address	1–247		1
2	Modbus baud rate	unsigned integer	Modbus communication baud rate	0–6	0 = 4.800 1 = 9.600 2 = 19.200 3 = 38.400 4 = 57.600 5 = 115.200 6 = 230.400	2
3	Modbus parity	unsigned integer	Parity check mode	0–2	0 = 8N1 1 = 8E1 2 = 8O1	1
4	Device type	unsigned integer	Device type, read only	1.624	RCCOM-R = 1.624	
5	HW version	unsigned integer	Hardware version of the device, read only	XXXX	0x0200 = HW version 2.0	
6	FW version	unsigned integer	Firmware version of the device, read only	XXXX	0x0100 = FW version 1.0	
7–8			Reserved, returns 0			
9	Modbus network Bus termination (NBT)	unsigned integer	Set device as end device of the line / or not by connecting NBT	0, 1	0 = NBT disconnected 1 = NBT connected	0
10	Modbus registers reset	unsigned integer	Resets Modbus Holding registers (8 and above 10) to default values. When finished this register is automatically reset to '0'	0, 1	0 = Idle 1 = Reset Modbus Registers	0
11	Minimum temperature range	unsigned integer	Minimum value of temperature range, cannot be set higher than maximum temperature range minus 5°C	-0—(Max. range - 50)	100 = 10,0°C	0
12	Maximum temperature range	unsigned integer	Maximum value of temperature range, cannot be set less than minimum temperature range plus 5°C	(Min. range + 50) - 500	500 = 50,0°C	500
13	Minimum temperature alert	unsigned integer	Minimum temperature alarm value	Min. temperature range—Max. temperature alarm	100 = 10,0°C	0

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
14	Maximum temperature alert	unsigned integer	Maximum temperature alarm value	Min. temperature alarm—Max. temperature range	500 = 50,0°C	500
15–18			Reserved, return 0			
19	Minimum relative humidity range	unsigned integer	Minimum value of relative humidity range, cannot be set higher than maximum relative humidity range minus 5%	0—(Max. range-50)	200 = 20,0 % rH	0
20	Maximum relative humidity range	unsigned integer	Maximum value of relative humidity range, cannot be set less than minimum relative humidity range plus 5%	(Min. range + 50)—1.000	1.000 = 100 % rH	1.000
21	Minimum relative humidity alert	unsigned integer	Minimum relative humidity alarm value	Min. relative humidity range—Max. relative humidity alarm	200 = 20,0 % rH	0
22	Maximum relative humidity alert	unsigned integer	Maximum relative humidity alarm value	Min. relative humidity alarm—Max. relative humidity range	1.000 = 100 % rH	1.000
23–26			Reserved, return 0			
27	Minimum CO range	unsigned integer	Minimum CO range, cannot be set higher than maximum CO range minus 10 ppm	0—(Max. range - 10)	100 = 100 ppm	0
28	Maximum CO range	unsigned integer	Maximum CO range, cannot be set less than minimum CO range plus 10 ppm	(Min. range +10)—1.000	1.000 = 1.000 ppm	1.000
29	Minimum CO alert	unsigned integer	Minimum CO alarm value	Min. CO range—Max. CO alarm	0 = 0 ppm	0
30	Maximum CO alert	unsigned integer	Maximum CO alarm value	Min. CO alarm—Max. CO range	200 = 200 ppm	100
31	Minimum NO <sub>2</sub> range	unsigned integer	Minimum NO <sub>2</sub> range, cannot be set higher than maximum NO <sub>2</sub> range minus 0,1 ppm	0—(Max. range-10)	0 = 0 ppm	0
32	Maximum NO <sub>2</sub> range	unsigned integer	Maximum NO <sub>2</sub> range, cannot be set less than minimum NO <sub>2</sub> range plus 0,1 ppm	(Min. range + 10)—1.000	100 = 1 ppm	1.000

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
33	Minimum NO <sub>2</sub> alert	unsigned integer	Minimum NO <sub>2</sub> alarm value	Min. NO <sub>2</sub> range— Max. NO <sub>2</sub> alarm	0 = 0 ppm	0
34	Maximum NO <sub>2</sub> alert	unsigned integer	Maximum NO <sub>2</sub> alarm value	Min. NO <sub>2</sub> alarm – Max. NO <sub>2</sub> range	1.000 = 10 ppm	100
35	Active level	unsigned integer	The ambient light level above which 'Active' is indicated in input register 42	0—32.000	100 = 100 lux	100
36	Standby level	unsigned integer	The ambient light level below which 'Standby' is indicated in input register 42	0—32.000	10 = 10 lux	10
37—44			Reserved, return 0			
45	Output 1 min value	unsigned integer	Set minimum value of output 1 signal in percentage	0—400	200 = 20 %	0
46	Output 1 max value	unsigned integer	Set maximum value of output 1 signal in percentage	600—1.000	1.000 = 100 %	1.000
47	Temperature sensor selection (On/Off)	unsigned integer	Turn ON or OFF the temperature sensor (related to output 1 or digital output value)	0, 1	0 = OFF 1 = ON	1
48—56			Reserved, return 0			
57	Relative humidity sensor selection (On/Off)	unsigned integer	Turn ON or OFF the rH sensor (related to output 1 or digital output value)	0, 1	0 = OFF 1 = ON	1
58—66			Reserved, return 0			
67	CO / NO <sub>2</sub> sensor selection	unsigned integer	Turn ON or OFF the CO / NO <sub>2</sub> sensor (related to output 1 or digital output value)	0—2	0 = OFF 1 = CO 2 = NO <sub>2</sub>	1
68—78			Reserved, return 0			

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
79	LED indication	unsigned integer	Select sensor to be related to LED indication	1, 2, 5, 6	1 = Temperature 2 = rH 5 = CO 6 = NO <sub>2</sub>	5
80	LED intensity / brightness	unsigned integer	LED intensity (incrementing with step of 10 %)	0—10	0 = LEDs OFF 1 = 10 % 10 = 100 %	5

**Note:** The holding registers can be managed via the following Modbus commands: "Read Holding Registers", "Write Single Register" or "Write Multiple Registers".

The free Sentera configuration and monitoring software 3SModbus can be downloaded via: <https://www.sentera.eu/en/3SMCenter>