FCCOX-R | INTELLIGENT MULTIFUNCTIONAL SENSOR

Modbus register map

MODBUS REGISTER MAP

INPUT REGISTERS

		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	Relative humidity level	unsigned integer	Actual relative humidity level	0—1.000	1.000 = 100 % rH
11	Relative humidity output value	unsigned integer	Output value according to relative humidity	0—1.000	0 = 0 % 1.000 = 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	Dew point level	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	Actual CO level	0—1.000	1.000 = 1.000 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 25 and 26	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 23 and 24	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 and 4	0 = OK 1 = Fault 4 = Warming up
31	NO_2 level	unsigned integer	NO_2 level	0—1.000	100 = 1 ppm
32	NO_2 output value	unsigned integer	Output value according to NO_2	0—1.000	0 = 0 % 1.000 = 100 %
33	NO_2 alert flag	unsigned integer	Flag indicates that measured NO_2 level is outside set alert values. Set to ‘1’ when the measured value is outside the NO_2 values defined by holding registers 33 and 34	0, 1	0 = NO_2 measurement OK 1 = NO_2 measurement too low/high
34	NO_2 range limit flag	unsigned integer	Flag indicates that measured NO_2 is outside set range limit values. Set to ‘1’ when the measured NO_2 is outside limit range values set defined by holding registers 31 and 32	0, 1	0 = NO_2 measurement OK 1 = NO_2 measurement too low/high
35	NO_2 sensor state	unsigned integer	Flag that shows if the communication with the NO_2 sensor is lost	0,1 and 4	0 = OK 1 = Fault 4 = Warming up
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	0—4	0 = Overwrite 1 = Temperature 2 = rH 3 = CO 4 = 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 light 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	1656—1658	1656 = FCCOG-R 1657 = FCCOF-R 1658 = FCCO8-R	
5	HW version	unsigned integer	Hardware version of the device. Read only	XXXX	0x0100 = HW version 1.0	
6	FW version	unsigned integer	Firmware version of the device. Read only	XXXX	0x0100 = FW version 1.0	
7			Reserved, returns 0			
8	Modbus safety timeout	unsigned integer	Timeout setting for no Modbus communication. After time runs out, output(s) is/are set to 0	0—60	0 = no timeout 60 = 60 minutes	0
9	Modbus network resistor 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 10 above) 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 - 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 + 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 - 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 + 50)—1000	850 = 85 % 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	850 = 85 % 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 - 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 + 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	100 = 100 ppm	0
30	Maximum CO alert	unsigned integer	Maximum CO alarm value	Min. CO alarm—Max. CO range	100 = 100 ppm	100
31	Minimum NO_2 range	unsigned integer	Minimum NO_2 range, cannot be set higher than maximum NO_2 range minus 0,1 ppm	0—(Max-10)	100 = 1 ppm	0
32	Maximum NO_2 range	unsigned integer	Maximum NO_2 range, cannot be set less than minimum NO_2 range plus 0,1 ppm	(Min + 10)—1.000	1.000 = 10 ppm	1.000

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
33	Minimum NO_2 alert	unsigned integer	Minimum NO_2 alarm value	Min. NO_2 range—Max. NO_2 alarm	100 = 1 ppm	0
34	Maximum NO_2 alert	unsigned integer	Maximum NO_2 alarm value	Min. NO_2 alarm —Max. NO_2 range	1.000 = 10 ppm	100
35	Active light 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 light level	unsigned integer	The ambient light level below which 'Standby' is indicated in input register 42	0—32.000	10 = 10 lux	10
37—40			Reserved, return 0			
41	Output 1 mode	unsigned integer	Select analogue / modulating output 1 type	1—3	1 = 0—10 VDC 2 = 0—20 mA 3 = PWM	1
42	Output 1 enable / disable	unsigned integer	Enables the direct control over the temperature output 1	0, 1	0 = Disabled 1 = Enabled	0
43	Output 1 overwrite value	unsigned integer	Overwrite value for output 1. Active only if Holding register 42 is set to 1	0—1.000	0 = 0 % 1.000 = 100 %	0
44	Internal voltage source selection Output 1	unsigned integer	Selection of internal voltage source for PWM output 1	0, 1	0 = 3,3 VDC 1 = 12 VDC	0
45	Minimum output 1 value	unsigned integer	Set minimum value of output signal in percentage	0—40	20 = 20 %	0
46	Maximum output 1 value	unsigned integer	Set maximum value of output signal in percentage	60—100	60 = 60 %	100
47	Temperature sensor selection (ON / OFF)	unsigned integer	Turn ON or OFF the temperature sensor (related to output 1)	0, 1	0 = OFF 1 = ON	1

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
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)	0, 1	0 = OFF 1 = ON	1
58—66			Reserved, return 0			
67	CO sensor selection (ON / OFF)	unsigned integer	Turn ON or OFF the CO sensor (related to output 1)	0, 1	0 = OFF 1 = ON	1
68—78			Reserved, return 0			
79	LED indication	unsigned integer	LED indication related to one of the parameters	1—4	1 = Temperature 2 = rH 3 = CO 4 = NO_2	1
80	LED intensity / brightness	unsigned integer	LED intensity setting	0—10	0 = OFF 1 = 10 % 5 = 50 % 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/eu/3SMCenter***