

Programmable operation terminal for MODBUS OPA2-MOD

General description

The OPA2-MOD is a programmable operation terminal with an isolated RS485 MODBUS communication. The operation terminal is communicating in slave mode. It may be used to control fan coil or VAV zones. Up to 5 zones may be controlled with one terminal.

Features

- RS485 2-wire MODBUS standard in accordance to EIA/TIA 485
- Slave type of communication
- Supports up to 127 nodes on one network
- Galvanic isolated bus connection
- Selectable transmission types:
- RTU with CRC16 checksum
- ASCII with LRC checksum
- Baud rates: 4800, 9600, 19200, 38400
- Parity: No parity, odd or even parity.
- Default: RTU with 8 data bits, 1 even parity bit, 1 stop bit. Baud rate 19200.
- LED indicators

Communication Specification

Communication standard	Modbus (www.modbus.org)
Default setting	19200 Baudrate, RTU 8 data bits, 1 even parity bit, 1 stop bit
Communication speed	4800, 9600, 19200, 38400
Protocol	RTU with CRC16 checksum ASCII with LRC checksum
Parity bit	no parity, even parity, odd parity

By default, RTU uses 8 data bits, 1 parity bit with even parity and 1 stop bit; ASCII mode uses 7 data bits, 1 parity bit with even parity, and 1 stop bit.

Both modes support "No Parity" mode, in these cases a 2nd stop bit is used to keep the byte length (11bit for RTU and 10 bit for ASCII, including the Start and Stop bits) unchanged in accordance with the Modbus specification.

Supported Modbus commands:

- 03 (0x03): Read multiple registers
- 06 (0x06): Write single register
- 16 (0x10): Write multiple registers

In commands 03 and 16 the allowed number of registers ranges from 1 to 32. Although Modbus specification would allow more registers to be read and written, a maximum of 32 Modbus registers are supported in one packet. One Modbus register is 16 bits wide. The Modbus slave transmits the values as signed 16 bit integers. The least significant digit of the transmitted number is always the first digit below the decimal point, and this results in the following range of numbers that the slave module is able to transmit: from -9999.9 to 9999.9

In an event of an out-of-range command addressing or an unsupported command, the Modbus slave responds with an exception message according to the Modbus specification.

Ordering Information

Model	Item#	Display	RT	DI	rH	Description
OPA2-MOD	40-50 0014	yes	1	2	-	Modbus communication module with one internal temperature and one external temperature input plus two binary inputs.
OPA2-MOD-H	40-50 0053	yes	1	2	1	As above with internal humidity sensor 3% accuracy.

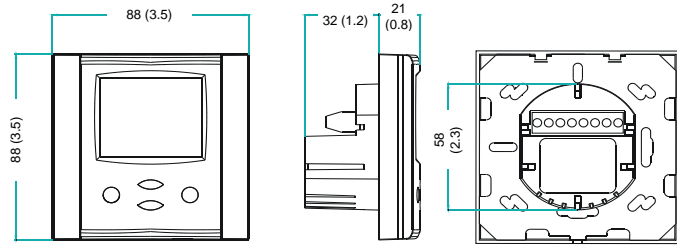
Technical Specification

Important notice and safety advice

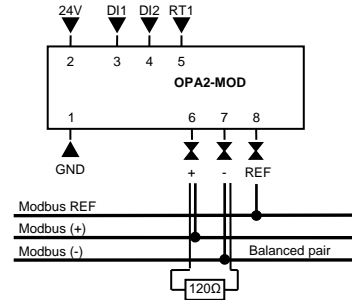
This device is for use as operating controls. It is not a safety device! Where a device failure endangers human life and/or property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent a system failure caused by such a device failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

Power Supply	Power Requirements	24 VAC ±10%, 50/60 Hz, 24VDC ±10%
	Power Consumption	SELV to HD 384, Class II, 48VA max
	Terminal Connectors	For wire 0.34...2.5 mm2 (AWG 24...12)
Signal inputs	Passive Input Type & range:	DI1 to DI2, Passive Binary input RT1, Passive Temperature input NTC 10k
Network	Hardware interface	RS485 in accordance with EIA/TIA 485
	Max nodes per network	127
	Cabling	Twisted Shielded Pair (TSP) cable category 5 or 6.
	Impedance	balanced 120 ohm
	Nominal Capacitance	100 pF/m 16pF/ft or lower
	Nominal Velocity	65% or higher
Environment	Galvanic Isolation	The communication circuitry is galvanic isolated
	Line termination	A line termination resistance (120 ohm) shall be connected between the terminals + and - of the furthestmost node of the network
	Line polarization	The device needs polarization
	Network topology	Daisy chain according EIA/TIA 485 specifications
	Maximum length per chain	1200m (4000ft)
	Operation:	To IEC 721-3-3
Standards EU	Climatic Conditions	class 3 K5
	Temperature	0...50 °C (32...122 °F)
	Humidity	<95 % r.H. non-condensing
	Mechanical Conditions	class 2M2
	Transport & Storage:	To IEC 721-3-2 and IEC 721-3-1
	Climatic Conditions	class 3 K3 and class 1 K3
CE	Temperature	-25...70 °C (-13...158 °F)
	Humidity	<95 % r.H. non-condensing
	Mechanical Conditions	class 2M2
	conformity	2004/108/EC
	EMC Directive	2006/95/EC
	Low Voltage Directive	
Product standards	Automatic electrical controls for household and similar use	EN 60 730 –1
	Electromagnetic compatibility for industrial and domestic sector	Emissions: EN 60 730-1 Immunity: EN 60 730-1
	Degree of Protection	IP30 to EN 60 529 if mounted correctly
	Pollution Class	II (EN 60 730-1)
	Safety Class:	III (IEC 60536)
	Overvoltage Category	II (EN 60 730-1)
General	Material	Fire proof ABS plastic (UL94 class V-0)
	Dimensions (H x W x D)	Front part: 88 x 88 x 21 mm (3.5" x 3.5" x 0.8") Power case: ø 58 x 32 mm (ø 2.3" x 1.3")
	Weight (including package)	240g (8.47 oz)

Dimensions [mm](in)



Wiring



Line polarization:

The device needs line polarization. One pair of resistors may be connected on the RS-485 balanced pair:
- a Pull-Up Resistor to a 5V Voltage on D1 circuit.
- a Pull-Down Resistor to the common circuit on D0 circuit. This should be done only once at the master only. The value of those resistors must be between 450 Ohms and 650 Ohms. 650 Ohms resistors value may allow a higher number of devices on the serial line bus.

Note:

Power GND ≠ Modbus common!

On last node on either end of bus only connect 120Ω termination resistor between A and B (D0 and D1)

Description:

GND	Power supply:	0V; common for power supply
24V	Power supply:	24V AC or 24V DC
DI1	Passive input:	Binary input, keep open or switch to 0V
DI2	Passive input:	Binary input, keep open or switch to 0V
RT1	Passive input:	NTC 10kΩ @ 25°C (77°F) or open contact
(+)	RS485 :	Modbus +
(-)	RS485 :	Modbus -
REF	RS485 :	Modbus Reference

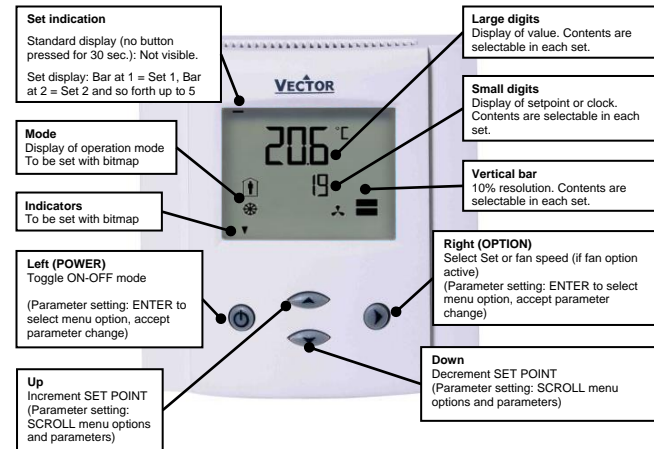
Mounting location

- On an easy accessible interior wall, approx. 1.5 m (4.5') above the floor in an area of average temperature.
- Avoid exposure to direct sunlight or other heat sources, e.g. the area above radiators and heat emitting electrical equipment.
- Avoid locations behind doors, outside walls and below or above air discharge grills and diffusers.
- Location of mounting is less critical if external temperature sensors are used

Installation

1. Connect the wires to the terminals of the power case according to wiring diagram
2. Install the mounting plate to the flush mounting box. Make sure that the nipple with the front holding screw is facing to the ground. Make sure the mounting screw heads do not stand out more than 5 mm (0.2") off the surface of the mounting plate.
3. Slide the two latches located on the top of the front part into the hooks at the upper side of the mounting plate.
4. Carefully lower the front part until the interconnector reaches the mounting-plate. Continue pressing in a gentle way until the front part is fully connected. While inserting the connectors, a slight resistance can be felt. This is normal. Do not use excessive force!
5. With a Philips-type screw driver of size #2, carefully tighten the front holding screw to secure the front part to the mounting plate. This screw is located on the front lower side of the unit. There is no need to tighten the screw too much.

Display and Operation



Operation mode symbols		Control symbols	
	Comfort (occupied)		Heating (reverse) active
	Standby (unoccupied):		Cooling (direct) active
OFF	Energy hold off		Manual override, delay on enable function
			Fan active

Standard display in OFF mode

- Active when UP/DOWN or OPTION have not been pressed for 30 seconds and unit is in OFF mode.
- Contents may be chosen.

Standard display in ON mode

- Active when Up/Down or OPTION have not been pressed for 30 seconds and unit is in ON mode.
- Contents may be chosen.

Set display

- Active when changing set points. Large digits show input value. Small digits show set point. Vertical bars show output value. All values and allowable set point ranges may be chosen.

Symbols

- Select which symbol to show. Active symbols in OFF mode are selected by bitmap.

Power failure

- All parameters and set points are memorized and do not need to be re-entered.

Error messages

- Err1:** A communication timeout occurred. The operation terminal did communicate successfully for the time period defined with CP18 (1022). Verify wiring or operation of Modbus master device.
To disable this error: set CP18 (1022) to 0.
- Err2:** The selected sensor is damaged or missing.
- NA:** The selected sensor is not enabled
- No:** The change of setpoint or operation mode is disabled or the remote disable function is active.

Configuration parameters for firmware version 1.2

The OPA2-MOD can be fine-tuned with a simple parameter setup routine. The parameters can be changed on the unit without the need of additional equipment.

Access to parameters

The parameters can be changed as follows:

- Press UP/DOWN buttons simultaneously for three seconds. Press the OPTION button to start login.
- CODE is shown on the upper digits.
- Select 009 using UP/DOWN buttons.
- Press OPTION after selecting the correct code. Now the Software Version and Revision is displayed. Acknowledge it by pressing the OPTION button again.
- Select the parameters by pressing the UP/DOWN buttons. Press the OPTION button to adjust the value with the UP/DOWN buttons. Press OPTION again to save the modified value.
- Press the POWER to leave the menu.

Setup parameters

Parameter	Description	Range	Default
CP 00	Communication address (must be unique in network)	1...255	1
CP 01	Baud rate: 0 = 19200 1 = 4800 2 = 9600 3 = 19200 4 = 38400	0...4	0
CP 02	Parity mode: 0 = No Parity, 1 = Even Parity , 2 = Odd Parity	0...1	1
CP 03	Mode of communication : 0 = RTU , 1 = ASCII	0...1	0
CP 04	Allow changing of communication address through broad cast command. 0 = Not allowed , 1 = Allowed	0...1	0
CP 05	Total number of groups 0 = one group with fan speed selection on right key 1 = one group 2 = two groups 3 = three groups 4 = four groups 5 = five groups	0...5	1
CP 06	Setpoint change enable 0 = disabled , 1 = enabled	0...1	1
CP 07	Operation mode change ON/OFF enabled 0 = disabled , 1 = enabled	0...1	1
CP 08	Operation mode change occupied / unoccupied enabled 0 = disabled , 1 = enabled	0...1	1
CP 09	24h / 12h: 0 = 24h , 1 = 12h (AM/PM)	0...1	0
CP 10	AM / PM flag (applies if CP 09 is 1 – 12h mode) 0 = AM , 1 = PM	0...1	0
CP 11	Celsius/Fahrenheit. 0 = Celsius , 1 = Fahrenheit	0...1	0
CP 12	Timeout in seconds to idle mode	1...255	30
CP 13	Idle mode, 0 = disabled , 1 = enabled If enabled shows a specific screen if no key is pressed for the time defined in CP12	0...1	0
CP 14	Maximum number of FAN speeds This setting applies for CP05 = 0 (one group with fan speed).	1...4	3
CP 15	Humidity sensor Offset	-12.7...12.7 %	0
CP 16	Internal NTC sensor Offset	-12.7...12.7 °C	0
CP 17	External NTC sensor Offset	-12.7...12.7 °C	0
CP 18	Modbus communication timeout: If there is no communication within the amount of seconds specified here, "Err1" is shown on the small digits. Setting the value to "0" disables this feature.	0...1000s	60s
CP 19	Delay for remote disable function. Useful for key card switches or window contacts connected to digital inputs. This function is activated in the setup for digital inputs.	0...255s	10s
CP 20	Delay for occupied/unoccupied changeover contact. Defines the timeout required to switch to unoccupied mode while there is no activity signaled by the motion detector connected to one of the digital inputs. This function is activated in the setup for digital inputs.	0...9999min	10min

Address list

Terminal setup

Address	Type	R/W	Contents
1000	8bit	R	Hardware version / type
1001	8bit	R	Software version
1002	8bit	R	Software revision
1003	8bit	R/W	Communication address (must be unique in network)(factory default is "1")
1004	Selection	R/W	Baud rate: 0 = 19200 1 = 4800 2 = 9600 3 = 19200 4 = 38400
1005	bit	R/W	Parity mode: 0 = No Parity, 1 = Even Parity , 2 = Odd Parity
1006	bit	R/W	Mode of communication : 0 = RTU , 1 = ASCII
1007	bit	R/W	Allow changing of communication address through broad cast command. (will reset automatically after 30 seconds) 0 = Not allowed , 1 = Allowed
1008	selection	R/W	Total number of groups 0 = one group with fan speed selection on right key 1 = one group 2 = two groups 3 = three groups 4 = four groups 5 = five groups
1009	bit	R/W	Setpoint change enable 0 = disabled , 1 = enabled
1010	bit	R/W	Operation mode change ON/OFF enabled 0 = disabled , 1 = enabled
1011	bit	R/W	Operation mode change occupied / unoccupied enabled 0 = disabled , 1 = enabled
1012	BCD	R/W	Clock with hours and minutes in BCD format
1013	bit	R/W	24h / 12h Clock mode: 0 = 24h , 1 = 12h (AM/PM)
1014	bit	R/W	AM/PM flag: 0 = AM , 1 = PM
1015	bit	R/W	Celsius/Fahrenheit: 0 = Celsius , 1 = Fahrenheit
1016	byte	R/W	Timeout in seconds to idle mode. (1...255 seconds)
1017	bit	R/W	Idle mode, 0 = disabled , 1 = enabled If enabled shows a specific screen if no key is pressed for the time defined in 1016
1018	byte	R/W	Maximum number of FAN speeds (1...4) (3) This setting applies if number of groups is set to "one group with fan speed". (1008 = 0).
1019	byte signed	R/W	Humidity sensor user programmable offset (-12.7... 0 ...12.7 %)
1020	byte signed	R/W	Internal NTC user programmable offset (-12.7... 0 ...12.7 °C)
1021	byte signed	R/W	External NTC user programmable offset (-12.7... 0 ...12.7 °C)
1022	16bit	R/W	Modbus timeout for Err1 in seconds. (0... 60 ...1000 seconds) If there is no communication within the amount of seconds specified here, "Err1" is shown on the small digits. Setting the value to "0" disables this feature.
1023	byte	R/W	Remote disable delay for digital inputs (0... 10 ...255 seconds) Useful for key card switches or window contacts connected to digital inputs. This function is activated with address 10300 /or 10400.
1024	16bit	R/W	Occupied/unoccupied changeover delay for digital inputs (0... 10 ...9999 minutes) Defines the timeout required to switch to unoccupied mode while there is no activity signaled by the motion detector connected to one of the digital inputs. This function is activated with address 10300 /or 10400.

Operation state, symbols & alarms

Address	Type	R/W	Contents
100	8bit	R	"Something Changed" flag. Gets the group ID value whenever a setpoint gets changed in a group. Is always written to "0" on any write.
2000	bit	R/W	Operation state ON / OFF 0 = OFF 1 = ON
2001	bit	R/W	Operation state occupied / unoccupied 0 = Unoccupied 1 = Occupied
2002	bit	R/W	Maximum number of fan speeds (1...4) (3)
2003	8bit	R/W	Actual fan speed (0-4)
2004	bit	R/W	Show fan (0)
2005	bit	R/W	Show alarm symbol (0)
2006	bit	R/W	Show alarm string (0)
2007	bit	R/W	Show heat (0)
2008	bit	R/W	Show cool (0)
2009	bit	R/W	Show occupied (0)
2010	bit	R/W	Show unoccupied (0)
2011	16 bit	R/W	Show arrow 0-10 LSB = Arrow 1 on the left (0)
2012	8bit (ASCII)	R/W	text string alarm letter 1:
2013	8bit (ASCII)	R/W	text string alarm letter 2:
2014	8bit (ASCII)	R/W	text string alarm letter 3:
2015	8bit (ASCII)	R/W	text string alarm letter 4:
2016	bit	R/W	A flag to define where the alarm text shall be displayed 0 = nowhere 1 = large digits 2 = small digits
2017	bit	R/W	Show time symbol (0)
2018	bit	R/W	Show override symbol (0)

Display in OFF mode

Address	Type	R/W	Contents
3000	Selection	R/W	Contents of large digits: 0 = empty 1 = text string OFF 2 = value group 1 (5001) 3 = setpoint group 1 (5004 or 5005 depending on occupied/unoccupied state) 4 = value group 2 (6001) 5 = setpoint group 2 (6004 or 6005 depending on occupied/unoccupied state) 6 = value group 3 (7001) 7 = setpoint group 3 (7004 or 7005 depending on occupied/unoccupied state) 8 = value group 4 (8001) 9 = setpoint group 4 (8004 or 8005 depending on occupied/unoccupied state) 10 = value group 5 (9001) 11 = setpoint group 5 (9004 or 9005 depending on occupied/unoccupied state) 12 = Clock 13 = Alarm text 14 = internal NTC 15 = external NTC 16 = humidity value 17 = digital input 1. 18 = digital input 2.
3001	Selection	R/W	Contents of small digits: 0 = empty 1 = text string OFF 2 = value group 1 (5001) 3 = setpoint group 1 (5004 or 5005 depending on occupied/unoccupied state) 4 = value group 2 (6001) 5 = setpoint group 2 (6004 or 6005 depending on occupied/unoccupied state) 6 = value group 3 (7001) 7 = setpoint group 3 (7004 or 7005 depending on occupied/unoccupied state) 8 = value group 4 (8001) 9 = setpoint group 4 (8004 or 8005 depending on occupied/unoccupied state) 10 = value group 5 (9001) 11 = setpoint group 5 (9004 or 9005 depending on occupied/unoccupied state) 12 = Clock 13 = Alarm text 14 = internal NTC 15 = external NTC 16 = humidity value 17 = digital input 1. 18 = digital input 2.
3002	Selection	R/W	Contents of vertical bar: 0 = empty 1 = bar of group 1 2 = bar of group 2 3 = bar of group 3 4 = bar of group 4 5 = bar of group 5
3003	Selection	R/W	Show state of following symbols in OFF mode: bit select for symbols: bit 0 = fan bit 1 = alarm bit 2 = heating/cooling bit 3 = occupied/unoccupied bit 4 = arrows
3004	8bit (ASCII)	R/W	text string OFF letter 1:
3005	8bit (ASCII)	R/W	text string OFF letter 2:
3006	8bit (ASCII)	R/W	text string OFF letter 3:
3007	8bit (ASCII)	R/W	text string OFF letter 4:

Display in idle mode

If enabled with address 1017(CP13), this screen is shown if no key is pressed for the time defined in 1016(CP12).
Pressing the RIGHT or UP/DOWN key while in this screen will move to the Group 1 display.

Address	Type	Contents
4000	Selection	Contents of large digits: 0 = empty 1 = text string ON 2 = value group 1 (5001) 3 = setpoint group 1 (5004 or 5005 depending on occupied/unoccupied state) 4 = value group 2 (6001) 5 = setpoint group 2 (6004 or 6005 depending on occupied/unoccupied state) 6 = value group 3 (7001) 7 = setpoint group 3 (7004 or 7005 depending on occupied/unoccupied state) 8 = value group 4 (8001) 9 = setpoint group 4 (8004 or 8005 depending on occupied/unoccupied state) 10 = value group 5 (9001) 11 = setpoint group 5 (9004 or 9005 depending on occupied/unoccupied state) 12 = Clock 13 = Alarm text 14 = internal NTC 15 = external NTC 16 = humidity value 17 = digital input 1. 18 = digital input 2.
4001	Selection	Contents of small digits: 0 = empty 1 = text string ON 2 = value group 1 (5001) 3 = setpoint group 1 (5004 or 5005 depending on occupied/unoccupied state) 4 = value group 2 (6001) 5 = setpoint group 2 (6004 or 6005 depending on occupied/unoccupied state) 6 = value group 3 (7001) 7 = setpoint group 3 (7004 or 7005 depending on occupied/unoccupied state) 8 = value group 4 (8001) 9 = setpoint group 4 (8004 or 8005 depending on occupied/unoccupied state) 10 = value group 5 (9001) 11 = setpoint group 5 (9004 or 9005 depending on occupied/unoccupied state) 12 = Clock 13 = Alarm text 14 = internal NTC 15 = external NTC 16 = humidity value 17 = digital input 1. 18 = digital input 2.
4002	Selection	Contents of vertical bar: 0 = empty 1 = bar 1 2 = bar 2 3 = bar 3 4 = bar 4 5 = bar 5
4003	8bit (ASCII)	text string ON letter 1:
4004	8bit (ASCII)	text string ON letter 2: O
4005	8bit (ASCII)	text string ON letter 3: N
4006	8bit (ASCII)	text string ON letter 4:

Display group 1

Address	Type	R/W	Contents
5000	Selection	R/W	Contents of large digits: 0 = empty 1 = text string group 1 2 = value 3 = setpoint (Comfort/Standby depending on operation mode) 4 = Alarm text 5 = internal NTC 6 = external NTC 7 = humidity value 8 = digital input 1. 9 = digital input 2.
5001	16 bit signed	R/W	Value of large digits
5002	Selection	R/W	Unit of digits 0 = no unit 1 = % 2 = °C 3 = Pa
5003	Selection	R/W	Contents of small digits: 0 = empty 1 = text string group 1 2 = value 3 = setpoint (Comfort/standby depending on operation mode) 4 = Alarm text 5 = internal NTC 6 = external NTC 7 = humidity value 8 = digital input 1. 9 = digital input 2.
5004	16 bit signed	R/W	Comfort setpoint x 10 Modbus value: 200 Display value: 20.0
5005	16 bit signed	R/W	Standby setpoint x 10 Modbus value: 200 Display value: 20.0
5006	16 bit signed	R/W	Setpoint step x10 Modbus value: 1, 5, 10, 20, 50 Display value: 0.1, 0.5, 1, 2, 5
5007	16 bit signed	R/W	Low setpoint limit x 10 Modbus value: 160 Display value: 16.0
5008	16 bit signed	R/W	High setpoint limit x10 Modbus value: 320 Display value: 32.0
5009	8 bit	R/W	Vertical bar 0-100 in steps of 10 Modbus value: 10 Vertical bars: 1
5010	8bit (ASCII)	R/W	Text string letter 1
5011	8bit (ASCII)	R/W	Text string letter 2 L
5012	8bit (ASCII)	R/W	Text string letter 3 P
5013	8bit (ASCII)	R/W	Text string letter 4 1

Display group 2 – 5

As above with following addresses:
Group 2 = 6000 – 6013
Group 3 = 7000 – 7013
Group 4 = 8000 – 8013
Group 5 = 9000 – 9013

Input configuration			
Address	Type	R/W	Contents
10000	bit	R/W	Enable temperature input 0 = sensor disabled 1 = Sensor enabled
10001	bit	R	Error state of input 0 = ok 1 = error
10002	16 bit signed	R	Measured temperature input value
10003	16 bit signed	R/W	Internal temperature sensor programmable offset (-12,7...0...12,7 °C)
10100	bit	R/W	Humidity input enabled (for –H type only) 0 = sensor disabled 1 = Sensor enabled
10101	bit	R	Error state of input (for –H type only) 0 = ok 1 = error
10102	16 bit signed	R	Measured humidity input value (for –H type only)
10103	16 bit signed	R/W	Internal humidity sensor programmable offset (-12,7...0...12,7 %)
10200	selection	R/W	Enable external temperature sensor 0 = sensor disabled 1 = Sensor enabled
10201	bit	R/W	Error state of input 0 = ok 1 = error
10202	16 bit signed	R	Value of external temperature input
10203	16 bit signed	R/W	External temperature sensor programmable offset (-12,7...0...12,7 °C)
10300	bit	R/W	Digital input "1" function: 0: Input in normal digital mode 1: Remote disable: Key card or Window contact 2: Occupied / Unoccupied changeover: Motion detector
10301	bit	R	Digital input 1 value
10302	byte	R/W	Digital input 1 open character 01
10303	byte	R/W	Digital input 1 open character 02
10304	byte	R/W	Digital input 1 open character 03
10305	byte	R/W	Digital input 1 open character 04
10306	byte	R/W	Digital input 1 grounded character 01
10307	byte	R/W	Digital input 1 grounded character 02
10308	byte	R/W	Digital input 1 grounded character 03
10309	byte	R/W	Digital input 1 grounded character 04
10400	bit	R/W	Digital input 2 function: 0: Input in normal digital mode 1: Remote disable: Key card or Window contact 2: Occupied / Unoccupied changeover: Motion detector
10401	bit	R	Digital input 2 value
10402	byte	R/W	Digital input 2 open character 01
10403	byte	R/W	Digital input 2 open character 02
10404	byte	R/W	Digital input 2 open character 03
10405	byte	R/W	Digital input 2 open character 04
10406	byte	R/W	Digital input 2 grounded character 01
10407	byte	R/W	Digital input 2 grounded character 02
10408	byte	R/W	Digital input 2 grounded character 03
10409	byte	R/W	Digital input 2 grounded character 04

- ➔ Use Remote disable for key cards or window contacts. If the digital input is opened the device will switch to OFF mode after the delay defined with address 1023 (CP19) has expired. Closing the contact will switch the device back on immediately. The delay is defined in seconds.
- ➔ Use occupied/unoccupied changeover with key card switches and occupancy sensors. The device will be in occupied mode as long as the digital input is connected to signal ground. Once the input is opened it will switch to unoccupied mode after the delay defined with address 1024 (CP20) has expired. The delay is defined in minutes.

Fan strings

Address	Type	R/W	Contents
11000	byte	R/W	FAN string 0 character 1 ("A")
11001	byte	R/W	FAN string 0 character 2 ("u")
11002	byte	R/W	FAN string 0 character 3 ("t")
11003	byte	R/W	FAN string 0 character 4 ("o")
11004	byte	R/W	FAN string 1 character 1 ("F")
11005	byte	R/W	FAN string 1 character 2 ("A")
11006	byte	R/W	FAN string 1 character 3 ("N")
11007	byte	R/W	FAN string 1 character 4 ("1")
11008	byte	R/W	FAN string 2 character 1 ("F")
11009	byte	R/W	FAN string 2 character 2 ("A")
11010	byte	R/W	FAN string 2 character 3 ("N")
11011	byte	R/W	FAN string 2 character 4 ("2")
11012	byte	R/W	FAN string 3 character 1 ("F")
11013	byte	R/W	FAN string 3 character 2 ("A")
11014	byte	R/W	FAN string 3 character 3 ("N")
11015	byte	R/W	FAN string 3 character 4 ("3")
11016	byte	R/W	FAN string 4 character 1 (" ")
11017	byte	R/W	FAN string 4 character 2 ("O")
11018	byte	R/W	FAN string 4 character 3 ("F")
11019	byte	R/W	FAN string 4 character 4 ("F")

Reduced ASCII table for display of characters

ASCII	Item
32	(space)
45	-
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9

ASCII	Item
65	A
66	B
67	C
69	E
70	F
72	H
73	I
76	L
78	N
79	O
80	P
83	S
85	U
95	

ASCII	Item
98	b
99	c
100	d
103	g
104	h
108	l
110	n
111	o
112	p
113	q
114	r
116	t
117	u
121	y