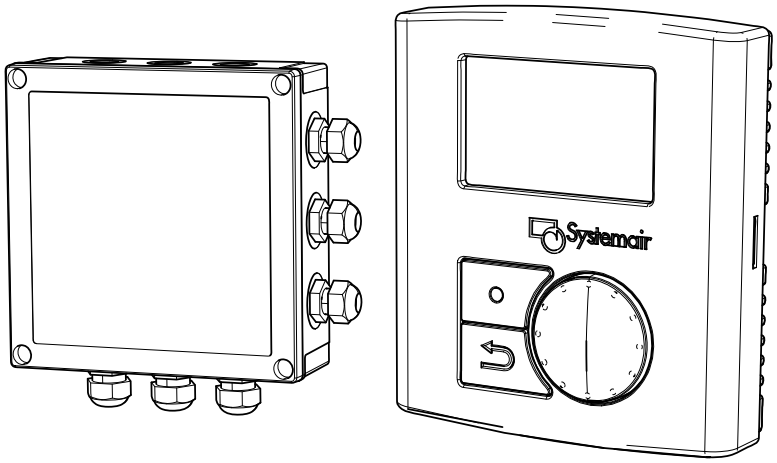
MODBUS for EC-Vent



GB User Manual

Document in original language

-EN_GB
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Contents

1 Introduction

The unit works as a Modbus slave and compiled with MODBUS over serial line specification and implementation guide V1.0 if nothing else is mentioned in this manual.

2 Transmission modes

These function codes are supported:

1. Read Coils
2. Read Discrete Input
3. Read Holding Registers
4. Read Input Register
5. Write Single Coil
6. Write Single Register
15. Write Multiple Coils
16. Write Multiple Regist

3 Pysical layer

The supported communication parameters are:

9600 Bd or 19200 Bd.

No parity, even parity or odd parity.

4 Address

Slave address 1 to 247.

The following exception codes are generated by the slave:

1: ILLEGAL FUNCTION: when using any of the functions code not listed above.

2: ILLEGAL DATA ADDRESS: when addressing any register, coil or digital input higher than the highest address or lower than the lowest address.

3: ILLEGAL DATA VALUE: when the format of the Modbus message is faulty (e.g. wrong message length).

5 Notes

Coils and digital inputs are always available as register as well. The address of the coil or digital input can be calculated as follows:

```
Address = (Register Adress*16) – 15
```

Reading any registers, inputs or coils that are not mentioned in the tables below will result in reading 0. Writing to any address that is not listed as writeable in the tables below, or is not listed at all, will have no effect.

Addressing any register, coil or digital input higher than the highest address will result in error 02, “Illegal Data Address” in the Modbus response.

The column “NVM” indicates if the value is stored in non-volatile memory (i.e. EEPROM) when writing to it.

6 Wiring

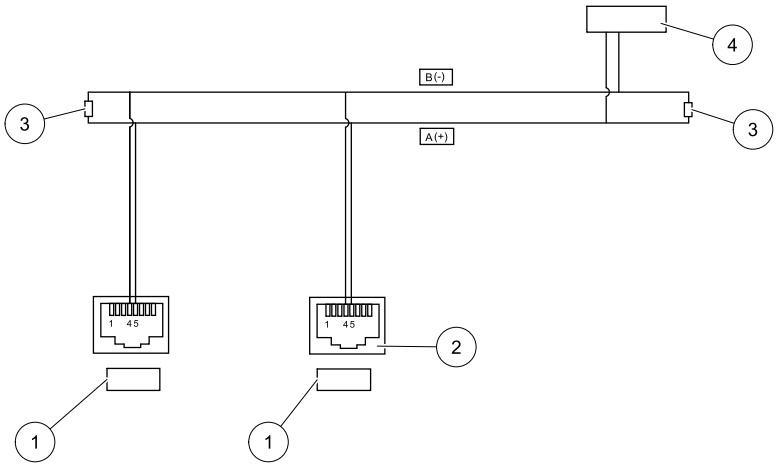

Fig. 1 Modbus wiring

Position	Description
1	EC-Vent control board
2	RJ45 on PCB, seen from the top
3	Termination resistor, close to the end of the line
4	Modbus master

7 Units

Temperature	°C:	0.1
Temperature	F:	0.1
Pressure	Pa:	1
Pressure	In wg:	0.01
Flow	l/s:	1
Flow	m^3/s	0.1
Flow	cfm:	1
Flow	m^3/h:	1

8 System parameters

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_SYST_PROG_APPL_VER_HIGH	1	R		Reg	Application program version, high number
REG_SYST_PROG_APPL _VER_MEDIUM	2	R		Reg	Application program version, medium number
REG_SYST_PROG_APPL _VER_LOW	3	R		Reg	Application program version, low number
REG_SYST_PROG_BOOT_VER_HIGH	4	R		Reg	Boot loader program version, high number

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_SYST_PROG_BOOT _VER_MEDIUM	5	R		Reg	Boot loader program version, medium number
REG_SYST_PROG_BOOT _VER_LOW	6	R		Reg	Boot loader program version, low number
REG_SYST_FUSE_1	7	R		Reg	Program fuses, value 1
REG_SYST_FUSE_2	8	R		Reg	Program fuses, value 2
REG_SYST_FUSE_3	9	R		Reg	Program fuses, value 3
Reserved	10-20				
REG_SYST_ID_1	21	R		Reg	Reads as 0.
REG_SYST_ID_2	22	R		Reg	Reads as 0.
REG_SYST_ID_3	23	R		Reg	Reads as 0.
REG_SYST_ID_4	24	R		Reg	Reads as 3115.
Reserved					
REG_SYST_LANGUAGE	31	R/W	Y	Reg	0: Swedish 1: English 2: Norwegian 3: Danish 4: Finnish 5: Russian 6: German 7: French 8: Dutch 9: Polish 10: Czech 11: Slovak 12: Lithuanian 13: Latvian 14: Estonian 15: Romanian 16: Turkish 17: Hungarian
Reserved					
REG_STORE_NVM	100	W	N	Reg	165: stores the following parameters in NVM: • REG_CTR1_SP • REG_CTR2_SP • REG_CTR3_SP • REG_CTR4_SP • REG_CTR5_SP • REG_HC_SP All other values: no functionality. **Can only be activated by addressing with Function Code 6 (“Write single register”).**

8.1 Registers for controller 1

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_CTRL1_SP	101	R/W	Y1[1]	Reg	Set point.
REG_CTRL1_TYPE	102	R/W	Y	Reg	Controller type: 0: Disabled 1: Temperature 2: CO2 3: Humidity 4: Pressure 5: Flow 6: Slave
REG_CTRL1_SENSOR_BRD	103	R/W	Y	Reg	Board: 0: CB 1-10: RU 1-10 11: Modbus
REG_CTRL1_SENSOR_CH	104	R/W	Y	Reg	Sensor channel. The function of this field depends on the board type. Therefore, the board type shall be configured prior to setting the sensor channel. Board of type CB: 0: None 1: Channel 1 2: Channel 2 3: Channel 3 Board of type RU: 0: None 1: Channel 1 2: Channel 2 3: Do not use 4: RU Internal (humidity or temperature) Board of type Modbus: 0: Do not use. 1: Modbus channel A 2: Modbus channel B 3: Modbus channel C 4: Modbus channel D 5: Modbus channel E 6: Modbus channel F
REG_CTRL1_SENSOR_ADDRESS	105	R/W	Y	Reg	Address of sensor in case board type is modbus.
REG_CTRL1_SENSOR_RANGE_MIN	106	R/W	Y	Reg	Sensor range, minimum value.
REG_CTRL1_SENSOR_RANGE_MAX	107	R/W	Y	Reg	Sensor range, maximum value.

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_CTRL1_LIN_EXP	108	R/W	Y	Reg	Sensor type: 0: Linear 1: Exponential
REG_CTRL1_TEMP_FUNCTION	109	R/W	Y	Reg	Function in case of temperature controller: 0: Cooling: higher temperature gives higher fan speed 1: Heating: higher temperature gives lower fan speed
REG_CTRL1_MIN_SPEED	110	R/W	Y	Reg	Minimum fan speed for this controller.
REG_CTRL1_MAX_SPEED	111	R/W	Y	Reg	Maximum fan speed for this controller.
REG_CTRL1_PBAND	112	R/W	Y	Reg	P band.
REG_CTRL1_ITIME	113	R/W	Y	Reg	I time
REG_CTRL1_SP_RANGE_MIN	114	R/W	Y	Reg	Minimum set point.
REG_CTRL1_SP_RANGE_MAX	115	R/W	Y	Reg	Maximum set point.
REG_CTRL1_SP_RANGE_FIXED	116	R/W	Y	Reg	Set point range/fixed: 0: Fixed. 1: Range.
REG_CTRL1_DISPL_BRD	117	R/W	Y	Reg	Board for displacement sensor: 0: CB 1-10: Do not use 11: Modbus sensor
REG_CTRL1_DISPL_CH	118	R/W	Y	Reg	Channel for displacement. Depends on type of displacement sensor board: CB: 0: None 1: Channel 1 2: Channel 2 3: Channel 3 Modbus: 0: Do not use 1: Modbus channel A 2: Modbus channel B 3: Modbus channel C 4: Modbus channel D 5: Modbus channel E 6: Modbus channel F
REG_CTRL1_SENSOR_ADDRESS	119	R/W	Y	Reg	Address of displacement sensor in case board type is modbus.
REG_CTRL1_DISPL_START	120	R/W	Y	Reg	Start value for displacement.
REG_CTRL1_DISPL_STOP	121	R/W	Y	Reg	Stop value for displacement.
REG_CTRL1_DISPL_DISPLACEMENT	122	R/W	Y	Reg	Displacement value.
REG_CTRL1_OUTPUT	123	R	-	Reg	Fan speed according to this controller.
REG_CTRL1_INT_SP	124	R	-	Reg	Actual set point (compensated for schedule and displacement)

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_CTRL1_INT_FB	125	R	-	Reg	Feedback (from sensor)
REG_CTRL1_INT_E	126	R	-	Reg	Error
REG_CTRL1_INT_I_L	127	R	-	Reg	Integral, low 16 bits
REG_CTRL1_INT_I_H	128	R	-	Reg	Integral, high 16 bits
REG_CTRL1_INT_DISPLACEMENT	129	R	-	Reg	Actual displacement

1. Stored by writing to register 100 (REG_STORE_NVM).

8.2 Registers for controller 2

As for controller 1, but from address 151.

8.3 Registers for controller 3

As for controller 1, but from address 201.

8.4 Registers for controller 4

As for controller 1, but from address 251.

8.5 Registers for controller 5

As for controller 1, but from address 301.

8.6 Registers for heater/cooler

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_HC_SET_POINT	351	R/W	Y[1]	Reg	Set point.
REG_HC_SENSOR_BRD	352	R/W	Y	Reg	Board: 0: CB 1-10: RU 1-10 11: Modbus

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_HC_ SENSOR_CH	353	R/W	Y	Reg	Sensor channel. The function of this field depends on the board type. Therefore, the board type shall be configured prior to setting the sensor channel. Board of type CB: 0: None 1: Channel 1 2: Channel 2 3: Channel 3 Board of type RU: 0: None 1: Channel 1 2: Do not use 3: Do not use 4: RU Internal temperature Board of type Modbus: 0: None 1: Modbus channel A 2: Modbus channel B 3: Modbus channel C 4: Modbus channel D 5: Modbus channel E 6: Modbus channel F
REG_HC_ SENSOR_ADDRESS	354	R/W	Y	Reg	Address of sensor in case of modbus sensor.
REG_HC_OUTPUT_CHANNEL	355	R/W	Y	Reg	Output channel: 0: CB Channel 1 1: CB Channel 2 2: CB Channel 3 3: None
REG_HC_FUNCTION	356	R/W	Y	Reg	Function: 0: heating 1: Cooling
REG_HC_PBAND	357	R/W	Y	Reg	P band.
REG_HC_ITIM E	358	R/W	Y	Reg	I time
REG_HC_SP_RANGE_MIN	359	R/W	Y	Reg	Minimum set point.
REG_HC_SP_RANGE_MAX	360	R/W	Y	Reg	Maximum set point.
REG_HC_SP_RANGE_FIXED	361	R/W	Y	Reg	Set point range/fixed: 0: Fixed. 1: Range.

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_HC_MM_SENSOR_BRD	362	R/W	Y	Reg	Minimum/maximum sensor board: 0: CB 1-10: RU 1-10 11: Modbus
REG_HC_MM_SENSOR_CH	363	R/W	Y	Reg	Minimum/maximum sensor channel. The function of this field depends on the board type. Therefore, the board type shall be configured prior to setting the sensor channel. Board of type CB: 0: None 1: Channel 1 2: Channel 2 3: Channel 3 Board of type RU: 0: None 1: Channel 1 2: Channel 2 3: Do not use 4: RU Internal temperature Board of type Modbus: 0: None 1: Modbus channel A 2: Modbus channel B 3: Modbus channel C 4: Modbus channel D 5: Modbus channel E 6: Modbus channel F
REG_HC_MM_SENSOR_ADDRESS	364	R/W	Y	Reg	Address of Minimum/maximum sensor in case of modbus sensor.
REG_HC_MM_SENSOR_MIN	365	R/W	Y	Reg	Minimum/maximum sensor range, minimum value.
REG_HC_MM_SENSOR_MAX	366	R/W	Y	Reg	Minimum/maximum sensor range, maximum value.
REG_HC_ENABLED	367	R/W	Y	Reg	Heater/cooler enabled.
REG_HC_OUTPUT_VALUE	368	R		Reg	Output value of Heater/Cooler module. Unit: %.
REG_HC_INT_FB	369	R	-	Reg	Value of main sensor.
Reserved	370-379				
REG_HC_FG_MM_SENSOR_BRD	380	R/W	Y	Reg	
REG_HC_FG_MM_SENSOR_CH	381	R/W	Y	Reg	
REG_HC_FG_MM_SENSOR_ADDRESS	382	R/W	Y	Reg	
REG_HC_FG_FB	383	R	-	Reg	Value of Frost Guard/Stand-by sensor.
REG_HC_FG_ENABLE	384	R/W	Y	Reg	
REG_HC_STB_ENABLE	385	R/W	Y	Reg	

8.7 Registers for the schedule

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_SCH_ANY_ACTIVE	401	R		Reg	0: No schedules active 1: One or more schedules active
REG_SCH_LATEST_ACTIVE	402	R		Reg	Index of the latest activated schedule. 1-14 correspond to schedule 1 to 14. 0 indicates that no schedule is active.
REG_SCH_ACTIVE_TYPE	403	R/W	Y	Reg	0: Active schedule requests fixed speed 1: Active schedule requests new set point
REG_SCH_ACTIVE_VALUE	404	R/W	Y	Reg	Active schedule's speed or set point value
REG_SCH_ANY_DEFINED	405	R		Reg	0: No schedule defined. 1: One or more schedules defined.
Reserved	406-409				
REG_SCH1_START_DAY	410	R/W	Y	Reg	Start day of schedule 1. 0: Monday 1: Tuesday 2: Wednesday 3: Thursday 4: Friday 5: Saturday 6: Sunday 7: Daily 8: Saturday and Sunday 9: Monday to Friday
REG_SCH1_START_HOUR	411	R/W	Y	Reg	Start hour of schedule 1
REG_SCH1_START_MINUTE	412	R/W	Y	Reg	Start minute of schedule 1
REG_SCH1_END_DAY	413	R/W	Y	Reg	End day of schedule 1.
REG_SCH1_END_HOUR	414	R/W	Y	Reg	End hour of schedule 1
REG_SCH1_END_MINUTE	415	R/W	Y	Reg	End minute of schedule 1
REG_SCH1_EVENT	416	R/W	Y	Reg	0: Fixed speed 1: New set point
REG_SCH1_EVENT_PARAM	417	R/W	Y	Reg	Value for set point or fan speed
Reserved	418-419				
REG_SCH2_xxx	420-429				As for schedule 1.
REG_SCH3_xxx	430-439				As for schedule 1.
REG_SCH4_xxx	440-449				As for schedule 1.
REG_SCH5_xxx	450-459				As for schedule 1.
REG_SCH6_xxx	460-469				As for schedule 1.
REG_SCH7_xxx	470-479				As for schedule 1.
REG_SCH8_xxx	480-489				As for schedule 1.
REG_SCH9_xxx	490-499				As for schedule 1.
REG_SCH10_xxx	500-509				As for schedule 1.

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_SCH11_xxx	510-519				As for schedule 1.
REG_SCH12_xxx	520-529				As for schedule 1.
REG_SCH13_xxx	530-539				As for schedule 1.
REG_SCH14_xxx	540-549				As for schedule 1.

8.8 Registers DI Control

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_DIC1_SENSOR_BRD	551	R/W	Y	Reg	As for REG_CTRL1_SENSOR_BRD
REG_DIC1_SENSOR_CH	552	R/W	Y	Reg	As for REG_CTRL1_SENSOR_CH
REG_DIC1_FUNCTION	553	R/W	Y	Reg	0: Fixed speed 1: New set point
REG_DIC1_PARAM	554	R/W	Y	Reg	Value for set point or fan speed
REG_DIC1_NONC	555	R/W	Y	Reg	0: open contact activates input. 1: closed contact activates input.
REG_DIC1_ACTIVE_DELAY_HOURS	556	R/W	Y	Reg	
REG_DIC1_ ACTIVE_DELAY_MINUTES	557	R/W	Y	Reg	
REG_DIC1_ ACTIVE_DELAY_SECONDS	558	R/W	Y	Reg	
REG_DIC1_INACTIVE_DELAY_HOURS	559	R/W	Y	Reg	
REG_DIC1_ INACTIVE_DELAY_MINUTES	560	R/W	Y	Reg	
REG_DIC1_IN ACTIVE_DELAY_SECONDS	561	R/W	Y	Reg	
REG_DIC1_ENABLED	562	R/W	Y	Reg	
REG_DIC1_ENABLED	563	R/W	Y	Reg	
Reserved	564-570				
REG_DIC2_xxx	571-583		Y		As for REG_DIC1_SENSOR_BRD to REG_DIC1_ENABLED
Reserved	584-590				
REG_DIC3_xxx	591-603		Y		As for REG_DIC1_SENSOR_BRD to REG_DIC1_ENABLED

8.9 Registers for units

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_UNITS_TEMPERATURE	651	R/W	Y	Reg	0: Celsius 1: Fahrenheit
REG_UNITS_PRESSURE	652	R/W	Y	Reg	0: Pa 1: Inches water gauge
REG_UNITS_FLOW	653	R/W	Y	Reg	0: l/s 1: m3/s 2: m3/h

8.10 Registers for operating mode

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_OPMODE_MODE	701	R/W	Y	Reg	Remark: prior to changing the operating mode, the parameters for that operating mode shall be configured. For example, first write the boost time, in a next Modbus telegram select the boost mode. Operating mode: 1: Auto 2: Away 3: Extended 4: Boost mode 5: Manual mode
Reserved	702-709				
REG_OPMODE_BOOST_HOURS	710	R/W	Y	Reg	
REG_OPMODE_BOOST_MINUTES	711	R/W	Y	Reg	
REG_OPMODE_BOOST_REM_HOURS	712	R		Reg	
REG_OPMODE_BOOST_REM_MINUTES	713	R		Reg	
REG_OPMODE_BOOST_REM_SECONDS	714	R		Reg	
Reserved	715-719				
REG_OPMODE_AWAY_ENABLED	720	R/W	Y	Reg	
REG_OPMODE_AWAY_SPEED	721	R/W	Y	Reg	
Reserved	722-729				
REG_OPMODE_EXT_HOURS	730	R/W	Y	Reg	
REG_OPMODE_EXT_MINUTES	731	R/W	Y	Reg	
REG_OPMODE_EXT_ REM_HOURS	732	R			
REG_OPMODE_EXT_ REM_MINUTES	733	R			
REG_OPMODE_EXT_REM_SECONDS	734	R			
Reserved	735-739				
REG_OPMODE_MANUAL_SPEED1	740	R/W	Y	Reg	
REG_OPMODE_MANUAL_SPEED2	741	R/W	Y	Reg	
REG_OPMODE_MANUAL_SPEED3	742	R/W	Y	Reg	
REG_OPMODE_MANUAL_SPEED4	743	R/W	Y	Reg	
REG_OPMODE_MANUAL_SPEED5	744	R/W	Y	Reg	
REG_OPMODE_MANUAL_STEPS	745	R/W	Y	Reg	
REG_OPMODE_MANUAL_MIN_SPEED	746	R/W	Y	Reg	
REG_OPMODE_MANUAL_MAX_SPEED	747	R/W	Y	Reg	
REG_OPMODE_MANUAL_MODE	748	R/W	Y	Reg	Manual mode: 0: Disabled 1: Step mode 2: Stepless mode
REG_OPMODE_MANUAL_LEVEL	749	R/W	N	Reg	Level for step or stepless fan speed.
REG_OPMODE_MANUAL_OVERRIDE	750	R/W	Y	Reg	

8.11 Registers for Outputs

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_OUTPUT1_TYPE	751	R/W	Y	Reg	0: Analogue 1: Digital
REG_OUTPUT1_ENABLED	752	R/W	Y	Reg	
REG_OUTPUT1_POLARITY	753	R/W	Y	Reg	0: Digital output active if fan speed under threshold 1: Digital output active if fan speed over threshold
REG_OUTPUT1_OFFSET	754	R/W	Y	Reg	
REG_OUTPUT1_THRESHOLD	755	R/W	Y	Reg	
Reserved	756-760				
REG_OUTPUTx_xxx	761-765		Y		As for output 1.
Reserved	766-770				
REG_OUTPUTx_xxx	771-780		Y		As for output 1.

8.12 Registers for alarms

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
Reserved	801-804				
REG_ALARM_FAN_SPEED	805	R/W	Y	Reg	
Reserved	806				
Reserved	807				
REG_ALARM_ANALOG1_SENSOR_BRD	811	R/W	Y	Reg	As for REG_CTRL1_SENSOR_BRD
REG_ALARM_ANALOG1_SENSOR_CH	812	R/W	Y	Reg	As for REG_CTRL1_SENSOR_CH
REG_ALARM_ANALOG1_MINIMUM	813	R/W	Y	Reg	
REG_ALARM_ANALOG1_MAXIMUM	814	R/W	Y	Reg	
Reserved	815				
REG_ALARM_ANALOG2_xxx	816-819				
Reserved	820				
REG_ALARM_ANALOG3_xxx	821-824				
Reserved	825				
REG_ALARM_DIGITAL_SENSOR_BRD	826	R/W	Y	Reg	As for REG_CTRL1_SENSOR_BRD
REG_ALARM_ DIGITAL_SENSOR_CH	827	R/W	Y	Reg	As for REG_CTRL1_SENSOR_CH
REG_ALARM_DIGITAL_POLARITY	828	R/W	Y	Reg	0: Alarm if low 1: Alarm if high
Reserved	829-830				
REG_ALARM_BATTERY_ENABLED	831	R/W	Y	Reg	
REG_ALARM_BATTERY_VOLTAGE	832	R		Reg	
Reserved	833-840				
REG_ALARM_FAN_WEEKDAY	841	R		Reg	
REG_ALARM_FAN_HOUR	842	R		Reg	
REG_ALARM_FAN_MINUTE	843	R		Reg	

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_ALARM_FAN_SECOND	844	R		Reg	
REG_ALARM_FAN_ACTIVE	845	R		Reg	
REG_ALARM_FAN_ACKNOWLEDGE	846	W	N	Reg	Writing 1 to this tag resets or blocks this alarm. Writing 0 does not affect the alarm state.
REG_ALARM_FAN_STATE	847	R	-	Reg	0: None 1: Alarm condition active, waiting 1 minute 2: Alarm active 3: Alarm is being blocked 4: Alarm blocked; waiting for inactive alarm condition
Reserved	848				
REG_ALARM_ANALOG1_WEEKDAY	849	R		Reg	
REG_ALARM_ANALOG1_HOUR	850	R		Reg	
REG_ALARM_ANALOG1_MINUTE	851	R		Reg	
REG_ALARM_ANALOG1_SECOND	852	R		Reg	
REG_ALARM_ANALOG1_ACTIVE	853	R		Reg	
REG_ALARM_ANALOG1_ACKNOWLEDGE	854	W	N	Reg	As for REG_ALARM_FAN_ACKNOWLEDGE
REG_ALARM_ANALOG1_STATE	855	R		Reg	As for REG_ALARM_FAN_STATE
Reserved	856				
REG_ALARM_ANALOG2_WEEKDAY	857	R		Reg	
REG_ALARM_ANALOG2_HOUR	858	R		Reg	
REG_ALARM_ANALOG2_MINUTE	859	R		Reg	
REG_ALARM_ANALOG2_SECOND	860	R		Reg	
REG_ALARM_ANALOG2_ACTIVE	861	R		Reg	
REG_ALARM_ANALOG2_ACKNOWLEDGE	862	W	N	Reg	As for REG_ALARM_FAN_ACKNOWLEDGE
REG_ALARM_ANALOG2_STATE	863	R		Reg	As for REG_ALARM_FAN_STATE
Reserved	864				
REG_ALARM_ANALOG3_WEEKDAY	865	R		Reg	
REG_ALARM_ANALOG3_HOUR	866	R		Reg	
REG_ALARM_ANALOG3_MINUTE	867	R		Reg	
REG_ALARM_ANALOG3_SECOND	868	R		Reg	
REG_ALARM_ANALOG3_ACTIVE	869	R		Reg	
REG_ALARM_ANALOG3_ACKNOWLEDGE	870	W	N	Reg	As for REG_ALARM_FAN_ACKNOWLEDGE
REG_ALARM_ANALOG3_STATE	871	R		Reg	As for REG_ALARM_FAN_STATE
Reserved	872				
REG_ALARM_DIGITAL_WEEKDAY	873	R		Reg	
REG_ALARM_DIGITAL_HOUR	874	R		Reg	
REG_ALARM_DIGITAL_MINUTE	875	R		Reg	
REG_ALARM_DIGITAL_SECOND	876	R		Reg	
REG_ALARM_DIGITAL_ACTIVE	877	R		Reg	
REG_ALARM_DIGITAL_ACKNOWLEDGE	878	W	N	Reg	As for REG_ALARM_FAN_ACKNOWLEDGE

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_ALARM_DIGITAL_STATE	879	R		Reg	As for REG_ALARM_FAN_STATE
Reserved	880				
REG_ALARM_BATTERY_WEEKDAY	881	R		Reg	
REG_ALARM_BATTERY_HOUR	882	R		Reg	
REG_ALARM_BATTERY_MINUTE	883	R		Reg	
REG_ALARM_BATTERY_SECOND	884	R		Reg	
REG_ALARM_BATTERY_ACTIVE	885	R		Reg	
REG_ALARM_BATTERY_ACKNOWLEDGE	886	W	N	Reg	As for REG_ALARM_FAN_ACKNOWLEDGE
REG_ALARM_BATTERY_STATE	887	R		Reg	As for REG_ALARM_FAN_STATE
Reserved	888				
REG_ALARM_COMM_WEEKDAY	889	R		Reg	
REG_ALARM_COMM_HOUR	890	R		Reg	
REG_ALARM_COMM_MINUTE	891	R		Reg	
REG_ALARM_COMM_SECOND	892	R	-	Reg	
REG_ALARM_COMM_ACTIVE	893	R	-	Reg	
REG_ALARM_COMM_ACKNOWLEDGE	894	W	N	Reg	As for REG_ALARM_FAN_ACKNOWLEDGE
REG_ALARM_COMM_STATE	895	R	-	Reg	As for REG_ALARM_FAN_STATE

8.13 Registers for Passwords

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_PSWD_USER	901	R/W	Y	Reg	Bit 12-15: digit 1 Bit 8-11: digit 2 Bit 4-7: digit 3 Bit 0-3: digit 4
REG_PSWD_SERVICE	902	R/W	Y	Reg	Bit 12-15: digit 1 Bit 8-11: digit 2 Bit 4-7: digit 3 Bit 0-3: digit 4
REG_PSWD_SETUP	903	R/W	Y	Reg	Bit 12-15: digit 1 Bit 8-11: digit 2 Bit 4-7: digit 3 Bit 0-3: digit 4

8.14 Registers for inputs

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_INPUT_CB_CH1_VALUE	1001	R		Reg	Depends on input type: Voltage * 10 Temperature * 10 Humidity in % Pressure in Pa, Flow CO2: ppm Percentage: % Digital: 0 or 1.
REG_INPUT_CB_CH1_TYPE	1002	R		Reg	0: Voltage 1: Temperature 2: Humidity 3: Pressure 4: Flow 5: CO2 6: % 7: Digital
REG_INPUT_CB_CH2_VALUE	1003	R		Reg	As for REG_INPUT_CB_CH1_VALUE
REG_INPUT_CB_CH2_TYPE	1004	R		Reg	As for REG_INPUT_CB_CH1_TYPE
REG_INPUT_CB_CH3_VALUE	1005	R		Reg	As for REG_INPUT_CB_CH1_VALUE
REG_INPUT_CB_CH3_TYPE	1006	R		Reg	As for REG_INPUT_CB_CH1_TYPE
REG_INPUT_OCCUPIED_CB	1007	R		Reg + coil	Occupied inputs on CB: Bit 0 (coil 16.097): input 1 Bit 1 (coil 16.098): input 2 Bit 2 (coil 16.099): input 3 0: not used 1: in use
Reserved	1008-1010	R			
REG_INPUT_RU1_CH1_VALUE	1011	R		Reg	As for REG_INPUT_CB_CH1_VALUE
REG_INPUT_RU1_CH1_TYPE	1012	R		Reg	As for REG_INPUT_CB_CH1_TYPE
REG_INPUT_RU1_CH2_VALUE	1013	R		Reg	As for REG_INPUT_CB_CH1_VALUE, but without temperature
REG_INPUT_RU1_CH2_TYPE	1014	R		Reg	As for REG_INPUT_CB_CH1_TYPE, but without temperature
REG_INPUT_RU1_INT_T_VALUE	1015	R		Reg	Temperature * 10
REG_INPUT_RU1_INT_RH_VALUE	1016	R		Reg	Humidity * 10

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_INPUT_RU1_OCCUPIED	1017	R		Reg + coil	Occupied inputs on RU1: Bit 0 (coil 16.257): internal humidity sensor Bit 1 (coil 16.258): internal temperature sensor Bit 2 (coil 16.259): not used Bit 3 (coil 16.260): input 1 Bit 4 (coil 16.261): input 2 0: not used 1: in use
Reserved	1018-1020				
As for RU input 2	1021-1027				As for RU input 2; coil numbers 16.417-16.421.
Reserved	1028-1030				
As for RU input 3	1031-1037				As for RU input 3; coil numbers 16.577-16.581.
Reserved	1038-1040				
As for RU input 4	1041-1047				As for RU input 4; coil numbers 16.737-16.741.
Reserved	1048-1050				
As for RU input 5	1051-1057				As for RU input 5; coil numbers 16.897-16.901.
Reserved	1058-1060				
As for RU input 6	1061-1067				As for RU input 6; coil numbers 17.057-17.061.
Reserved	1068-1070				
As for RU input 7	1071-1077				As for RU input 7; coil numbers 17.217-17.221.
Reserved	1078-1080				
As for RU input 8	1081-1087				As for RU input 8; coil numbers 17.377-17.481.
Reserved	1088-1090				
As for RU input 9	1091-1097				As for RU input 9; coil numbers 17.537-17.541.
Reserved	1088-1090				
As for RU input 10	1101-1107				As for RU input 10; coil numbers 17.697-17.701.

8.15 Registers for fan

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_FAN_RPM	1151	R		Reg	RPM value from Fan port
REG_FAN_PWM	1152	R		Reg	Value on Fan output
REG_FAN_PWM_ADJUSTING	1153	R		Reg	PWM value according to adjusting menu
REG_FAN_PWM_DI1	1154	R		Reg	PWM value according to DI1 controller
REG_FAN_PWM_DI2	1155	R		Reg	PWM value according to DI2 controller

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_FAN_PWM_DI3	1156	R		Reg	PWM value according to DI3 controller
REG_FAN_PWM_AWAY	1157	R		Reg	PWM value according to Away mode
REG_FAN_PWM_SCHEDULE	1158	R		Reg	PWM value of active schedule, if schedule type is Gixed Fan Speed.
REG_FAN_PWM_CTRL1	1159	R		Reg	PWM value according to controller 1. 0 if not enabled or not highest controller 1-5 output.
REG_FAN_PWM_CTRL2	1160	R		Reg	PWM value according to controller 2. 0 if not enabled or not highest controller 1-5 output.
REG_FAN_PWM_CTRL3	1161	R		Reg	PWM value according to controller 3. 0 if not enabled or not highest controller 1-5 output.
REG_FAN_PWM_CTRL4	1162	R		Reg	PWM value according to controller 4. 0 if not enabled or not highest controller 1-5 output.
REG_FAN_PWM_CTRL5	1163	R		Reg	PWM value according to controller 5. 0 if not enabled or not highest controller 1-5 output.
REG_FAN_PWM_MANUAL	1164	R		Reg	PWM valued according to manual controller.
REG_FAN_PWM_SELECTION	1165	R	-	Reg+Coil	Bit 0 (coil 18.625): Set if Adjusting active. Bit 1 (coil 18.626): Set if operating mode is Boost. Bit 2 (coil 18.627): Set if DI1 type is “Fixed speed”. Bit 3 (coil 18.628): Set if DI2 type is “Fixed speed”. Bit 4 (coil 18.629): Set if DI3 type is “Fixed speed”. Bit 5 (coil 18.630): Set if operating mode is Away. Bit 6 (coil 18.631): Set if operating mode is Extended running. Bit 7 (coil 18.632): Set if schedule is active. Bit 8 (coil 18.633): Set if schedule output is “Fixed Speed”. Bit 9 (coil 18.634): Set if frost guard overrides fan speed.

8.16 Registers for modbus communication

Name	Register address	Register address (Hex)	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_MB_SENS_A_VALUE	1201	04B1	R	-		
REG_MB_SENS_A_TYPE	1202	04B2	R	-		0: Voltage 1: Temperature 2: Humidity 3: Pressure 4: Flow 5: CO2 6: % 7: Digital
REG_MB_SENS_A_FUNCTION	1203	04B3	R	-		0: Linear. 1: Exponential.
REG_MB_SENS_A_MIN	1204	04B4	R	-		
REG_MB_SENS_A_MAX	1205	04B5	R	-		
REG_MB_SENS_B_VALUE	1206	04B6	R	-		
REG_MB_SENS_B_TYPE	1207	04B7	R	-		As for REG_MB_SENS_A_TYPE
REG_MB_SENS_B_FUNCTION	1208	04B8	R	-		As for REG_MB_SENS_A_FUNCTION
REG_MB_SENS_B_MIN	1209	04B9	R	-		
REG_MB_SENS_B_MAX	1210	04BA	R	-		
REG_MB_SENS_C_VALUE	1211	04BB	R	-		
REG_MB_SENS_C_TYPE	1212	04BC	R	-		As for REG_MB_SENS_A_TYPE
REG_MB_SENS_C_FUNCTION	1213	04BD	R	-		As for REG_MB_SENS_A_FUNCTION
REG_MB_SENS_C_MIN	1214	04BE	R	-		
REG_MB_SENS_C_MAX	1215	04BF	R	-		
REG_MB_SENS_D_VALUE	1216	04C0	R	-		
REG_MB_SENS_D_TYPE	1217	04C1	R	-		As for REG_MB_SENS_A_TYPE
REG_MB_SENS_D_FUNCTION	1218	04C2	R	-		As for REG_MB_SENS_A_FUNCTION
REG_MB_SENS_D_MIN	1219	04C3	R	-		
REG_MB_SENS_D_MAX	1220	04C4	R	-		
REG_MB_SENS_E_VALUE	1221	04C8	R	-		
REG_MB_SENS_E_TYPE	1222	04C9	R	-		As for REG_MB_SENS_A_TYPE
REG_MB_SENS_E_FUNCTION	1223	04CA	R	-		As for REG_MB_SENS_A_FUNCTION
REG_MB_SENS_E_MIN	1224	04CB	R	-		
REG_MB_SENS_E_MAX	1225	04CC	R	-		
REG_MB_SENS_F_VALUE	1226	04CD	R	-		
REG_MB_SENS_F_TYPE	1227	04CE	R	-		As for REG_MB_SENS_A_TYPE
REG_MB_SENS_F_FUNCTION	1228	04CF	R	-		As for REG_MB_SENS_A_FUNCTION
REG_MB_SENS_F_MIN	1229	04D0	R	-		
REG_MB_SENS_F_MAX	1230	04D1	R	-		

Name	Register address	Register address (Hex)	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_MB_CTRL1_PARAMS	1231		R	-	Reg	Modbus parameters for main sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL1_DISPL_PARAMS	1232		R	-	Reg	Modbus parameters for displacement sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL2_PARAMS	1233		R	-	Reg	Modbus parameters for main sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL2_DISPL_PARAMS	1234		R	-	Reg	Modbus parameters for displacement sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL3_PARAMS	1235		R	-	Reg	Modbus parameters for main sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL3_DISPL_PARAMS	1236		R	-	Reg	Modbus parameters for displacement sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL4_PARAMS	1237		R	-	Reg	Modbus parameters for main sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL4_DISPL_PARAMS	1238		R	-	Reg	Modbus parameters for displacement sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.

Name	Register address	Register address (Hex)	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_MB_CTRL5_PARAMS	1239		R	-	Reg	Modbus parameters for main sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_CTRL5_DISPL_PARAMS	1240		R	-	Reg	Modbus parameters for displacement sensor of controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_HC_PARAMS	1241		R	-	Reg	Modbus parameters for main sensor for heater/cooler. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_HC_MM_PARAMS	1242		R	-	Reg	Modbus parameters for min/max sensor for heater/cooler. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MM_HC_FG_PARAMS	1243		R	-	Reg	Modbus parameters for min/max sensor for heater/cooler. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_DI1_PARAMS	1244		R	-	Reg	Modbus parameters for sensor for DI controller 1. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_DI2_PARAMS	1245		R	-	Reg	Modbus parameters for sensor for DI controller 2. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.
REG_MB_DI3_PARAMS	1246		R	-	Reg	Modbus parameters for sensor for DI controller 3. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor. Bit 7..0: Modbus address.

Name	Register address	Register address (Hex)	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_MB_ADJ_A_PARAMS	1247		R	-	Reg	Modbus parameters for adjusting menu. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor (always A for this register). Bit 7..0: Modbus address.
REG_MB_ADJ_B_PARAMS	1248		R	-	Reg	Modbus parameters for adjusting menu. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor (always B for this register). Bit 7..0: Modbus address.
REG_MB_ADJ_C_PARAMS	1249		R	-	Reg	Modbus parameters for adjusting menu. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor (always C for this register). Bit 7..0: Modbus address.
REG_MB_ADJ_D_PARAMS	1250		R	-	Reg	Modbus parameters for adjusting menu. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor (always C for this register). Bit 7..0: Modbus address.
REG_MB_ADJ_E_PARAMS	1251		R	-	Reg	Modbus parameters for adjusting menu. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor (always C for this register). Bit 7..0: Modbus address.
REG_MB_ADJ_F_PARAMS	1252		R	-	Reg	Modbus parameters for adjusting menu. Bit 11: 1: Use Modbus sensor. 0: do not use Modbus sensor. Bit 10..8: channel of sensor (always C for this register). Bit 7..0: Modbus address.
REG_MB_FAN_TYPE	1254		R/W	-	Reg	Type of modbus fan to be controlled by this CB. 0: No Modbus fan shall be controlled by this CB. 1: Ziehl-Abegg fan shall be controlled by this CB. 2: EBM fan shall be controlled by this CB.
REG_MB_FAN_SPEED	1255		R	-	Reg	Desired speed of modbus fans to be controlled by this CB

Name	Register address	Register address (Hex)	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_MB_FAN_ADR_0	1261		R/W	-	Reg	Flags for control of fans 0: fan on corresponding address shall not be controlled 1: fan on corresponding address shall be controlled Bit 0: not used, always 0 Bit 1: flag for fan on address 1 Bit 15: flag for fan on address 15
REG_MB_FAN_ADR_1	1262		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 16 Bit 15: flag for fan on address 31
REG_MB_FAN_ADR_2	1263		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 32 Bit 15: flag for fan on address 47
REG_MB_FAN_ADR_3	1264		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 48 Bit 15: flag for fan on address 63
REG_MB_FAN_ADR_4	1265		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 64 Bit 15: flag for fan on address 79
REG_MB_FAN_ADR_5	1266		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 80 Bit 15: flag for fan on address 95
REG_MB_FAN_ADR_6	1267		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 96 Bit 15: flag for fan on address 111
REG_MB_FAN_ADR_7	1268		R/W	-	Reg|	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 112 Bit 15: flag for fan on address 127
REG_MB_FAN_ADR_8	1269		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 128 Bit 15: flag for fan on address 143
REG_MB_FAN_ADR_9	1270		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 144 Bit 15: flag for fan on address 159

Name	Register address	Register address (Hex)	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_MB_FAN_ADR_10	1271		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 160 Bit 15: flag for fan on address 175
REG_MB_FAN_ADR_11	1272		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 176 Bit 15: flag for fan on address 191
REG_MB_FAN_ADR_12	1273		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 192 Bit 15: flag for fan on address 207
REG_MB_FAN_ADR_13	1274		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 208 Bit 15: flag for fan on address 223
REG_MB_FAN_ADR_14	1275		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 224 Bit 15: flag for fan on address 239
REG_MB_FAN_ADR_15	1276		R/W	-	Reg	Flags for control of fans, see REG_MB_FAN_ADR_1. Bit 0: flag for fan on address 240 Bit 7: flag for fan on address 247 Bit 8-15: not used, always 0.
REG_MB_CTRL1_VALUE	1281		W	N	Reg	
REG_MB_CTRL1_DISPL_VALUE	1282		W	N	Reg	
REG_MB_CTRL2_VALUE	1283		W	N	Reg	
REG_MB_CTRL2_DISPL_VALUE	1284		W	N	Reg	
REG_MB_CTRL3_VALUE	1285		W	N	Reg	
REG_MB_CTRL3_DISPL_VALUE	1286		W	N	Reg	
REG_MB_CTRL4_VALUE	1287		W	N	Reg	
REG_MB_CTRL4_DISPL_VALUE	1288		W	N	Reg	
REG_MB_CTRL5_VALUE	1289		W	N	Reg	
REG_MB_CTRL5_DISPL_VALUE	1290		W	N	Reg	
REG_MB_HC_VALUE	1291		W	N	Reg	
REG_MB_HC_MM_VALUE	1292		W	N	Reg	
REG_MB_HC_FG_VALUE	1293		W	N	Reg	
REG_MB_DI1_VALUE	1294		W	N	Reg	
REG_MB_DI2_VALUE	1295		W	N	Reg	
REG_MB_DI3_VALUE	1296		W	N	Reg	
REG_MB_ADJ_A_VALUE	1297		W	N	Reg	
REG_MB_ADJ_B_VALUE	1298		W	N	Reg	
REG_MB_ADJ_C_VALUE	1299		W	N	Reg	
REG_MB_ADJ_D_VALUE	1300		W	N	Reg	

Name	Register address	Register address (Hex)	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_MB_ADJ_E_VALUE	1301		W	N	Reg	
REG_MB_ADJ_F_VALUE	1302		W	N	Reg	
REG_MB_FAN_FAULT_VALUE	1303		W	N	Reg	
REG_MB_FAN_STATUS	1311		W	N	Reg	Status of modbus fans to be controlled by this CB. Fields to be defined.
REG_MB_FAN_STATUS_ADDRESS	1312		W	N	Reg	Upon writing this address, the fault value in location REG_MB_FAN_STATUS is registered to be at this address.

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