Modbus for Residential units

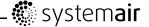## 🇬🇧 User Manual

Contents

1 Introduction

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

2 Transmission modes

Modbus RTU.

Supported function codes:

1: Read Coils

2: Read Discrete Input

3: Read Holding Register

4: Read Input Register

5: Write Single Coil

6: Write Single Register

15: Write Multiple Coils

16: Write Multiple Registers

3 Physical layer

Two wire RS-485.

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 Address * 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 a non-volatile memory (i.e. EEPROM) when writing to it.
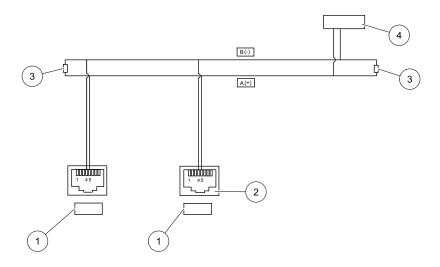
6 Wiring

Fig. 1 Modbus wiring

Position	Description
1	VTC unit.
2	RJ45 on PCB, seen from the top.
3	Termination resistor, close to the end of the line.
4	Modbus master.

7 Modbus variable list

7.1 Registers for fan control

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_FAN_SPEED_LEVEL	101	R/W	Y[1]	Reg	0: Fans off 1: Fans on low speed 2: Fans on normal speed 3: Fans on high speed 4: Auto mode
REG_FAN_SF_FLOW_LOW	102	R/W	Y[1]	Reg	Supply air fan speed for low speed
REG_FAN_EF_FLOW_LOW	103	R/W	Y[1]	Reg	Extract air fan speed for low speed
REG_FAN_SF_FLOW_NOM	104	R/W	Y[1]	Reg	Supply air fan speed for nominal speed
REG_FAN_EF_FLOW_NOM	105	R/W	Y[1]	Reg	Extract air fan speed for nominal speed
REG_FAN_SF_FLOW_HIGH	106	R/W	Y[1]	Reg	Supply air fan speed for high speed
REG_FAN_EF_FLOW_HIGH	107	R/W	Y[1]	Reg	Extract air fan speed for high speed

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_FAN_FLOW_UNITS	108	R/W	Y	Reg	0: l/s 1: m3/h
REG_FAN_SF_PWM	109	R		Reg	0..100: 0-10V
REG_FAN_EF_PWM	110	R		Reg	0..100: 0-10V
REG_FAN_SF_RPM	111	R		Reg	Rotations per minute
REG_FAN_EF_RPM	112	R		Reg	Rotations per minute
REG_FAN_ALLOW_MAN-UAL_FAN_STOP	114	R/W	Y	Reg + Coil	Coil 1809: manual fan stop allowed. 0: CD cannot set fan speed to off. 1: CD can set fan speed to off.
REG_FAN_SPEED_LOG_RESET	115	W	N	Reg	By writing the value 90 to this register, the values of REG_FAN_SPEED_LOG_xF_LVLx will be cleared.
REG_FAN_SPEED_LOG_SF_LVL1	116	R		Reg	Fan speed log values for supply fan, speed level 1.
REG_FAN_SPEED_LOG_SF_LVL2	117	R		Reg	Fan speed log values for supply fan, speed level 2.
REG_FAN_SPEED_LOG_SF_LVL3	118	R		Reg	Fan speed log values for supply fan, speed level 3.
REG_FAN_SPEED_LOG_SF_LVL4	119	R		Reg	Fan speed log values for supply fan, speed level 4.
REG_FAN_SPEED_LOG_SF_LVL5	120	R		Reg	Fan speed log values for supply fan, speed level 5.
REG_FAN_SPEED_LOG_EF_LVL1	121	R		Reg	Fan speed log values for extract fan, speed level 1.
REG_FAN_SPEED_LOG_EF_LVL2	122	R		Reg	Fan speed log values for extract fan, speed level 2.
REG_FAN_SPEED_LOG_EF_LVL3	123	R		Reg	Fan speed log values for extract fan, speed level 3.
REG_FAN_SPEED_LOG_EF_LVL4	124	R		Reg	Fan speed log values for extract fan, speed level 4.
REG_FAN_SPEED_LOG_EF_LVL5	125	R		Reg	Fan speed log values for extract fan, speed level 5.
REG_FAN_SPEED_LOG_SF_NR_LVL1	126	R		Reg	Fan speed log values for supply fan, speed level 1, non-resettable.
REG_FAN_SPEED_LOG_SF_NR_LVL2	127	R		Reg	Fan speed log values for supply fan, speed level 2, non-resettable.
REG_FAN_SPEED_LOG_SF_NR_LVL3	128	R		Reg	Fan speed log values for supply fan, speed level 3, non-resettable.
REG_FAN_SPEED_LOG_SF_NR_LVL4	129	R		Reg	Fan speed log values for supply fan, speed level 4, non-resettable.
REG_FAN_SPEED_LOG_SF_NR_LVL5	130	R		Reg	Fan speed log values for supply fan, speed level 5, non-resettable.
REG_FAN_SPEED_LOG_EF_NR_LVL1	131	R		Reg	Fan speed log values for extract fan, speed level 1, non-resettable.
REG_FAN_SPEED_LOG_EF_NR_LVL2	132	R		Reg	Fan speed log values for extract fan, speed level 2, non-resettable.
REG_FAN_SPEED_LOG_EF_NR_LVL3	133	R		Reg	Fan speed log values for extract fan, speed level 3, non-resettable.
REG_FAN_SPEED_LOG_EF_NR_LVL4	134	R		Reg	Fan speed log values for extract fan, speed level 4, non-resettable.
REG_FAN_SPEED_LOG_EF_NR_LVL5	135	R		Reg	Fan speed log values for extract fan, speed level 5, non-resettable.
REG_FAN_SYSTEM_CURVE_SF	136	R/W	Y	Reg	System curve for supply fan. Value can be from 1 to 20.

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_FAN_SYSTEM_CURVE_EF	137	R/W	Y	Reg	System curve for extract fan. Value can be from 1 to 10.
REG_FAN_CONTROL_TYPE	138	R/W		Reg	Type of fan control: 0: Air flow 1: Speed
REG_FAN_INTERLOCK	139	R		Reg	Interlock NO relay state: 0: Relay off 1: Relay active

1. *Stored by writing to register 549 (REG_STORE_NVM).*

7.2 Registers for heater control

Name	Register address	R or R/W	NVM	Scaling	Access (Reg./Coil)	Description/remarks
REG_HC_HEATER_TYPE	201	R/W	Y	1	Reg	0: no heater 1: Water heater 2: Electrical heater 3: Other
REG_HC_COOLER_TYPE	202	R/W	Y	1	Reg	0: no cooler 1: water cooler
REG_HC_WC_SIGNAL	204	R		1	Reg	Signal to cooler output (in %)
REG_HC_WH_SIGNAL	205	R		1	Reg	Signal to analog heater output (in %)
REG_HC_FPS_LEVEL	206	R/W	Y	1	Reg	Frost protection level. Allowed values: 70, 80, 90, 100, 110, 120 = 7, 8, 9, 10, 11, 12 °C.
REG_HC_TEMP_LVL	207	R/W	Y[1]		Reg	Temperature set point level: 0: Manual summer mode. 1 to 5: correspond to temperature levels as given by REG_HC_TEMP_LVL1 to REG_HC_TEMP_LVL5. 6 to 29: extension of levels 1 to 5.
REG_HC_TEMP_SP	208	R		1	Reg	Temperature set point.
REG_HC_TEMP_LVL1	209	R		10	Reg	Temperature level 1 * 10. Note: from PCU-ECx program version 5.01.00, this register is not supported anymore.
REG_HC_TEMP_LVL2	210	R		10	Reg	Temperature level 2 * 10. Note: from PCU-ECx program version 5.01.00, this register is not supported anymore.
REG_HC_TEMP_LVL3	211	R		10	Reg	Temperature level 3 * 10. Note: from PCU-ECx program version 5.01.00, this register is not supported anymore.
REG_HC_TEMP_LVL4	212	R		10	Reg	Temperature level 4 * 10. Note: from PCU-ECx program version 5.01.00, this register is not supported anymore.
REG_HC_TEMP_LVL5	213	R		10	Reg	Temperature level 5 * 10. Note: from PCU-ECx program version 5.01.00, this register is not supported anymore.
REG_HC_TEMP_IN1	214	R		10	Reg	Temperature on sensor 1 * 10. Supply air sensor.
REG_HC_TEMP_IN2	215	R		10	Reg	Temperature on sensor 2 * 10. Extract air sensor.

Name	Register address	R or R/W	NVM	Scaling	Access (Reg./Coil)	Description/remarks
REG_HC_TEMP_IN3	216	R		10	Reg	Temperature on sensor 3 * 10. Exhaust air sensor/Preheater sensor.
REG_HC_TEMP_IN4	217	R		10	Reg	Temperature on sensor 4 * 10. Overheating/Frost protection sensor.
REG_HC_TEMP_IN5	218	R		10	Reg	Temperature on sensor 5 * 10. Outdoor air sensor.
REG_HC_TEMP_STATE	219	R		1	Reg + Coil	Coil 3489: State of temperature sensor on input 1 Coil 3490: State of temperature sensor on input 2 Coil 3491: State of temperature sensor on input 3 Coil 3492: State of temperature sensor on input 4 Coil 3493: State of temperature sensor on input 5 Coil state: 0: no sensor fault 1: sensor fault
REG_HC_PRE-HEATER_TYPE	220	R/W	Y		Reg	0: No preheater 1: Electrical preheater
REG_HC_HEATER_TEMP_SP_HOME_LEAVE	221	R			Reg	Set point support control heater during "Home/Leave" function.
REG_HC_TEMP_SP_DEG	222	R/W			Reg	Setpoint for temperature regulation (*10).
REG_HC_INTERVAL_COOLING_LOW	223	R/W			Reg	Combined controller output at which cooling is at maximum.
REG_HC_INTERVAL_COOLING_HIGH	224	R/W			Reg	Combined Controller output at which cooling is at minimum.
REG_HC_INTERVAL_EX-CHANGING_LOW	225	R/W			Reg	Lower limit for heat exchanging range for combined temperature regulator.
REG_HC_INTERVAL_EX-CHANGING_HIGH	226	R/W			Reg	Upper limit for heat exchanging range for combined temperature regulator.
REG_HC_INTERVAL_HEATING_LOW	227	R/W			Reg	Lower limit for heating range for combined temperature regulator.
REG_HC_INTERVAL_HEATING_HIGH	228	R/W			Reg	Upper limit for heating range for combined temperature regulator.
REG_HC_P_BAND	229	R/W			Reg	P-Band for combined temperature regulator (*10). Range: 10-600 (corresponding to 1 to 60 °C)
REG_HC_I_TIME	230	R/W			Reg	I_Time for combined temperature regulator Range:1-240 0: no integration
REG_PREHEATER_SET-POINT	231	R/W			Reg	Preheater set point. Range: -300-0 (corresponding to -30 to 0 °C)
REG_PREHEATER_P_BAND	232	R/W			Reg	Preheater P-Band (* 10). Range: 10-600 (corresponding to 1 to 60 °C)
REG_PREHEATER_I_TIME	233	R/W			Reg	Preheater I-Time. Range:1-240 0: no integration
REG_HC_OUT	234	R			Reg	Output of the split level temperature controller. Range: 0-100%.
REG_PREHEATER_OUT	235	R			Reg	Output of the PI controller for the electrical preheater. Range: 0-100%.
REG_HC_TEMP_SP_DEG_STEP	236	R			Reg	Temperature setting step (*10). Example: 10 = 1 degree step. 25 = 2.5 degree step.

1. *Stored by writing to register 549 (REG_STORE_NVM).*

7.3 Registers for the damper

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_DAMPER_PWM	301	R		Reg	Output value for exchanger. 0-100 correspond to 0 to 10V.

7.4 Registers for the rotor

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_ROTOR_STATE	351	R		Reg	State for the rotor control state machine. 0: Normal 1: Rotor fault assumed 2: Rotor fault detected 3: Summer mode conditions valid, but summer mode not yet active. 4: Summer mode 5: Waiting to go out of Manual summer mode due to temperature conditions 6: Manual summer mode 7: Rotor cleaning during summer mode 8: Rotor cleaning during manual summer mode 9: Fans off 10: Rotor cleaning during fans off 11: Rotor fault, conditions for rotor fault not valid anymore
REG_ROTOR_RELAY_ACTIVE	352	R		Reg + Coil	Coil 5617: rotor relay active. 0: not active 1: active.
REG_SYSTEM_ROTOR_TYPE	353	R/W		Reg	Indicates the type of rotor control: 0: On/off control 1: Variable control
REG_SYSTEM_PASSIVE_HOUSE	354	R/W		Reg	0: Passive house mode not active 1: Passive house mode active Register introduced in PCU-EC4 program version 5.09.00

7.5 Registers for RH sensor

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_RH_SENSOR_VALUE	381	R		Reg	RH sensor value (in %).
Reserved					
REG_RH_SENSOR_DATA_VALID	383	R		Reg	Indicates that valid data from the RH sensor is available.

7.6 Registers for the week program

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_WP_ACTIVE	401	R		Reg + Coil	Coil address: 6401 0: week program not active 1: week program active
REG_WP_ON_LVL	402	R/W	Y	Reg	Week program active speed level.
REG_WP_OFF_LVL	403	R/W	Y	Reg	Week program inactive speed level.
REG_WP_WD1_PRD1_START_H	404	R/W	Y	Reg	Start of week program, day 1, period 1, hour
REG_WP_WD1_PRD1_START_M	405	R/W	Y	Reg	Start of week program, day 1, period 1, minute. Allowed values: 0, 10, 15, 20, 30, 40, 45, 50
REG_WP_WD1_PRD1_END_H	406	R/W	Y	Reg	End of week program, day 1, period 1, hour
REG_WP_WD1_PRD1_END_M	407	R/W	Y	Reg	End of week program, day 1, period 1, minute. Allowed values: 0, 10, 15, 20, 30, 40, 45, 50
REG_WP_WD1_PRD2_START_H	408	R/W	Y	Reg	
REG_WP_WD1_PRD2_START_M	409	R/W	Y	Reg	
REG_WP_WD1_PRD2_END_H	410	R/W	Y	Reg	
REG_WP_WD1_PRD2_END_M	411	R/W	Y	Reg	
REG_WP_WD2_PRD1_START_H	412	R/W	Y	Reg	
REG_WP_WD2_PRD1_START_M	413	R/W	Y	Reg	
REG_WP_WD2_PRD1_END_H	414	R/W	Y	Reg	
REG_WP_WD2_PRD1_END_M	415	R/W	Y	Reg	
REG_WP_WD2_PRD2_START_H	416	R/W	Y	Reg	
REG_WP_WD2_PRD2_START_M	417	R/W	Y	Reg	
REG_WP_WD2_PRD2_END_H	418	R/W	Y	Reg	
REG_WP_WD2_PRD2_END_M	419	R/W	Y	Reg	
REG_WP_WD3_PRD1_START_H	420	R/W	Y	Reg	
REG_WP_WD3_PRD1_START_M	421	R/W	Y	Reg	
REG_WP_WD3_PRD1_END_H	422	R/W	Y	Reg	
REG_WP_WD3_PRD1_END_M	423	R/W	Y	Reg	
REG_WP_WD3_PRD2_START_H	424	R/W	Y	Reg	
REG_WP_WD3_PRD2_START_M	425	R/W	Y	Reg	
REG_WP_WD3_PRD2_END_H	426	R/W	Y	Reg	
REG_WP_WD3_PRD2_END_M	427	R/W	Y	Reg	
REG_WP_WD4_PRD1_START_H	428	R/W	Y	Reg	
REG_WP_WD4_PRD1_START_M	429	R/W	Y	Reg	
REG_WP_WD4_PRD1_END_H	430	R/W	Y	Reg	
REG_WP_WD4_PRD1_END_M	431	R/W	Y	Reg	
REG_WP_WD4_PRD2_START_H	432	R/W	Y	Reg	
REG_WP_WD4_PRD2_START_M	433	R/W	Y	Reg	
REG_WP_WD4_PRD2_END_H	434	R/W	Y	Reg	
REG_WP_WD4_PRD2_END_M	435	R/W	Y	Reg	
REG_WP_WD5_PRD1_START_H	436	R/W	Y	Reg	
REG_WP_WD5_PRD1_START_M	437	R/W	Y	Reg	
REG_WP_WD5_PRD1_END_H	438	R/W	Y	Reg	
REG_WP_WD5_PRD1_END_M	439	R/W	Y	Reg	

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_WP_WD5_PRD2_START_H	440	R/W	Y	Reg	
REG_WP_WD5_PRD2_START_M	441	R/W	Y	Reg	
REG_WP_WD5_PRD2_END_H	442	R/W	Y	Reg	
REG_WP_WD5_PRD2_END_M	443	R/W	Y	Reg	
REG_WP_WD6_PRD1_START_H	444	R/W	Y	Reg	
REG_WP_WD6_PRD1_START_M	445	R/W	Y	Reg	
REG_WP_WD6_PRD1_END_H	446	R/W	Y	Reg	
REG_WP_WD6_PRD1_END_M	447	R/W	Y	Reg	
REG_WP_WD6_PRD2_START_H	448	R/W	Y	Reg	
REG_WP_WD6_PRD2_START_M	449	R/W	Y	Reg	
REG_WP_WD6_PRD2_END_H	450	R/W	Y	Reg	
REG_WP_WD6_PRD2_END_M	451	R/W	Y	Reg	
REG_WP_WD7_PRD1_START_H	452	R/W	Y	Reg	
REG_WP_WD7_PRD1_START_M	453	R/W	Y	Reg	
REG_WP_WD7_PRD1_END_H	454	R/W	Y	Reg	
REG_WP_WD7_PRD1_END_M	455	R/W	Y	Reg	
REG_WP_WD7_PRD2_START_H	456	R/W	Y	Reg	
REG_WP_WD7_PRD2_START_M	457	R/W	Y	Reg	
REG_WP_WD7_PRD2_END_H	458	R/W	Y	Reg	
REG_WP_WD7_PRD2_END_M	459	R/W	Y	Reg	

7.7 Registers for system parameters

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_SYSTEM_TYPE	501	R/W	Y	Reg	0: VR400 1: VR700 2: VR700DK 3: VR400DE 4: VTC300 5: VTC700 12: VTR150K 13: VTR200B 14: VSR300 15: VSR500 16: VSR150 17: VTR300 18: VTR500 19: VSR300DE 20: VTC200 21: VTC100 All other values are ignored.
REG_SYSTEM_PROG_V_HIGH	502	R		Reg	PCU-ECx Main program version, high number
REG_SYSTEM_PROG_V_MID	503	R		Reg	PCU-ECx Main program version, middle number

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_SYSTEM_PROG_V_LOW	504	R		Reg	PCU-ECx Main program version, low number
REG_SYSTEM_BOOT_PROG_V_HIGH	505	R		Reg	PCU-ECx Boot program version, high number
REG_SYSTEM_ BOOT_PROG_V_MID	506	R		Reg	PCU-ECx Boot program version, middle number
REG_SYSTEM_ BOOT_PROG_V_LOW	507	R		Reg	PCU-ECx Boot program version, low number
REG_SYSTEM_PROG_STATE	508	R		Reg	Program state: 1: Main program 2: Boot loader 3: Boot loading, boot loading request accepted Note: this register is also supported by the boot loader program.
REG_SYSTEM_START_BOOTLOADER	509	W	N	Reg	Writing a none-zero value to this register activates the boot loader. The following flags indicate what programs shall be downloaded: Bit 0: Download CD3 program Bit 8: Download PCU-EC3 program Note: this function is also supported by the boot loader program. **Can only be accessed by addressing with Function Code 6 ("Write single register").**
REG_SYSTEM_BOOT-LOADER_FLAGS	510	R		Reg	Bit 0: Boot loading is requested by the PCU-EC3 card .
REG_SYS-TEM_BRIDGE_CD3_FIRMWARE_H	518	R/W		Reg	Program version for CD2/3 available in Z-wave bridge, high number
REG_SYS-TEM_BRIDGE_CD3_FIRMWARE_M	519	R/W		Reg	Program version for CD2/3 available in Z-wave bridge, middle number
REG_SYS-TEM_BRIDGE_CD3_FIRMWARE_L	520	R/W		Reg	Program version for CD2/3 available in Z-wave bridge, low number
REG_SYSTEM_BRIDGE_PCU_EC3_F-IRMWARE_H	521	R/W		Reg	Program version for PCU-ECx available in Z-wave bridge, high number
REG_SYSTEM_BRIDGE_PCU_EC3_F-IRMWARE_M	522	R/W		Reg	Program version for PCU-ECx available in Z-wave bridge, middle number
REG_SYSTEM_BRIDGE_PCU_EC3_F-IRMWARE_L	523	R/W		Reg	Program version for PCU-ECx available in Z-wave bridge, low number
REG_SYSTEM_CDX_PROG_V_H	524	R		Reg	CDx program version, high number. Note: contains the program version of the CDx panel operated latest. If the CDx is not operated since power on, the value is 0.
REG_SYSTEM_CDX_PROG_V_M	525	R		Reg	CDx program version, middle number Note: contains the program version of the CDx panel operated latest. If the CDx is not operated since power on, the value is 0.

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_SYSTEM_CDX_PROG_V_L	526	R		Reg	CDx program version, low number Note: contains the program version of the CDx panel operated latest. If the CDx is not operated since power on, the value is 0.
REG_STORE_NVM	549	W	N	Reg	Write value 165 will stores the following parameters in NVM: • REG_FAN_SPEED_LEVEL • REG_HC_TEMP_LVL • REG_FAN_SF_FLOW_LOW • REG_FAN_EF_FLOW_LOW • REG_FAN_SF_FLOW_NOM • REG_FAN_EF_FLOW_NOM • REG_FAN_SF_FLOW_HIGH • REG_FAN_EF_FLOW_HIGH All other values: no functionality. **Can only be activated by addressing with Function Code 6 ("Write single register").**

7.8 Registers for clock

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_CLK_S	551	R/W	Y	Reg	Clock: seconds (0..59)
REG_CLK_M	552	R/W	Y	Reg	Clock: minutes (0..59)
REG_CLK_H	553	R/W	Y	Reg	Clock: hours (0..23)
REG_CLK_D	554	R/W	Y	Reg	Clock: day of month (1..31)
REG_CLK_MNTH	555	R/W	Y	Reg	Clock: month (1..12)
REG_CLK_Y	556	R/W	Y	Reg	Clock: year (0 = 2000)
REG_CLK_WD	557	R		Reg	Clock: day of week (0..6: Monday..sunday)

7.9 Registers for the filter

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_FILTER_PER	601	R/W	Y	Reg	Filter replace time in months
REG_FILTER_DAYS	602	R/W	Y	Reg	Elapsed days since last filter replacement

7.10 Registers for VTC defrosting

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_DEFR_STATE_VTC	651	R		Reg	State of defrosting state machine. 0: No defrosting ongoing 2: Bypass defrosting 3: Stop defrosting 4: Defrost error
REG_DEFR_CONFIGURATION	652	R		Reg	Defrosting configuration. 0: A 1: B 2: C (no longer supported by PCU-EC4) 3: D (no longer supported by PCU-EC4)
REG_DEFR_UNBAL_ALLOWED	653	R/W	Y	Reg + Coil	Coil 10433: Unbalance allowed. 0: Unbalance not allowed. 1: Unbalance allowed.
REG_DEFR_MODE_VTC	654	R/W	Y	Reg	Defrosting mode. Allowed values: If no RH sensor is present: 1–5. If RH sensor is present: 1–3, corresponding to Soft, Normal and Hard.
REG_RH_SENSOR_PRESENT	655	R/W		Reg	Setting of presence of RH sensor. 0: Sensor is not connected, or the sensor is connected but shall not be used. 1: Sensor is connected and shall be used.

7.11 Register for VR/VTR defrosting

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_DEFR_STATE_VR	671	R		Reg	State of defrosting state machine. 0: Inactive 1: Low temperature 2: Defrosting
REG_DEFR_MODE_VR	672	R/RW	Y	Reg	Defrosting mode. Allowed values: 0-5.

7.12 Registers for the digital inputs

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_DI_ALL	701	R/W		Reg + Coil	When writing: activation of the functions connected to the digital inputs. 0: deactive input. 1: activate input. When reading: obtaining of the values on the physical inputs on the PCU-EC4 card. 0: actual input is not active, i.e. the input is not connected to signal GND. 1: actual input is active, i.e. the input is connected to signal GND. Bit 0: input 1 (DI1) Bit 1: input 2 (DI2) Bit 2: input 3 (DI3) Bit 3: input 4 (Heater on/off) Bit 4: input 5 (Extended running/Boost mode) Bit 5: input 6 (Rotor/Damper). Note: read only! Bit 6: input 7 (Home Leave/Away) Bit 7: not used. Write as 0. Coil 11201: input 1. Coil 11202: input 2. Coil 11203: input 3. Coil 11204: input 4. Coil 11205: input 5. Coil 11206: input 6. Note: read only! Coil 11207: input 7.
REG_DI_EXT_RUNNING_M	702	R/W	Y	Reg	Extended running time in minutes
REG_DI_EXT_RUNNING_SPEED_LVL	703	R/W	Y	Reg	Fan speed level during extended running: 0: Off 1: Low speed 2: Normal speed 3: High speed
REG_DI1_SF_LVL	704	R/W	Y	Reg	Supply fan speed level at activated digital input 1
REG_DI1_EF_LVL	705	R/W	Y	Reg	Extract fan speed level at activated digital input 1
REG_DI2_SF_LVL	706	R/W	Y	Reg	Supply fan speed level at activated digital input 2
REG_DI2_EF_LVL	707	R/W	Y	Reg	Extract fan speed level at activated digital input 2
REG_DI3_SF_LVL	708	R/W	Y	Reg	Supply fan speed level at activated digital input 3
REG_DI3_EF_LVL	709	R/W	Y	Reg	Extract fan speed level at activated digital input 3

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_DI_FUNCTIONS	710	R		Reg	Functions active due to activated digital inputs. Bit 0: input 1 (DI1) Bit 1: input 2 (DI2) Bit 2: input 3 (DI3) Bit 3: input 4 (Heater on/off) Bit 4: input 5 (Extended running/Boost mode) Bit 5: input 6 (Rotor/Damper). Bit 6: input 7 (Home Leave/Away) Bit 7: not used.
REG_DI_MODBUS	711	R		Reg	Latest value written to register REG_DI_ALL. Bit 0: input 1 (DI1) Bit 1: input 2 (DI2) Bit 2: input 3 (DI3) Bit 3: input 4 (Heater on/off) Bit 4: input 5 (Extended running/Boost mode) Bit 5: not used. Bit 6: input 7 (Home Leave/Away) Bit 7: not used.
REG_DI_WIRELESS	712	R		Reg	OR-ed value of all Wireless inputs. Bit 0: input 1 (DI1) Bit 1: input 2 (DI2) Bit 2: input 3 (DI3) Bit 3: input 4 (Heater on/off) Bit 4: input 5 (Extended running/Boost mode) Bit 5: not used. Bit 6: input 7 (Home Leave/Away) Bit 7: not used.
REG_DI_REMAINING_TIME_1	713	R		Reg	Remaining time (in seconds) of set delay for DI 1.
REG_DI_REMAINING_TIME_2	714	R		Reg	Remaining time (in seconds) of set delay for DI 2.
REG_DI_REMAINING_TIME_3	715	R		Reg	Remaining time (in seconds) of set delay for DI 3.
REG_DI_REMAIN-ING_TIME_EXT_RUNNING	716	R		Reg	Remaining time (in seconds) of set delay for Extended running.

7.13 Registers for PCU-PB

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_PCU_PB_RELAYS	751	R		Reg + Coil	Coil Address 12001: relay for preheater on Coil Address 12002: relay for reheater on Coil Address 12003: common relay for heater and preheater on

7.14 Registers for alarms

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_ALARMS_ALL	801	R		Reg + Coil	Coil Address 12801: Filter alarm Coil Address 12802: Fan alarm Coil Address 12803: Not used Coil Address 12804: Rotor alarm Coil Address 12805: Frost alarm Coil Address 12806: PCU-PB alarm Coil Address 12807: Temperature sensor alarm Coil Address 12808: Emergency Thermostat alarm Coil Address 12809: Damper alarm Coil Address 12810: Low SS alarm Coil Address 12811: Defrost alarm Coil Address 12812: RH sensor Coil value 0: alarm not active Coil value 1: alarm active
REG_ALARMS_RELAY_ACTIVE	802	R		Reg + Coil	Coil address 12817: alarm relay active. 0: Relay not active. 1: Relay active.
REG_ALARMS_ALL_DETAILED	803	R		Reg	All alarm flags, including temperature sensor status flags. Bit 0: Filter alarm Bit 1: Fan alarm Bit 2: Rotor alarm Bit 3: Frost alarm Bit 4: PCU-PB alarm Bit 5: Emergency thermostat alarm Bit 6: Damper alarm Bit 7: Low SS alarm Bit 8: Defrost alarm Bit 9: RH sensor alarm Bit 10: Supply air sensor alarm Bit 11: Extract air sensor alarm Bit 12: Exhaust air/Preheater sensor alarm Bit 13: Over temperature/Frost protection sensor alarm Bit 14: Outdoor air sensor alarm

7.15 Register for demand control

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_DEMC_CO2_SP	851	R/W		Reg	Range: 0-2000 0: Off
REG_DEMC_CO2_P_BAND	852	R/W		Reg	Range: 1-2000
REG_DEMC_CO2_I_TIME	853	R/W		Reg	Range:1-120 0: no integration
REG_DEMC_RH_SP_SUMMER	854	R/W		Reg	Range: 0-100 0: Off Note: old register name (before PCU-EC4 program version 5.09.00) is REG_DEMC_RH_SP
REG_DEMC_RH_P_BAND	855	R/W		Reg	Range: 1-100
REG_DEMC_RH_I_TIME	856	R/W		Reg	Range:1-120 0: no integration
REG_DEMC_STATE	857	R		Reg	0: Start up 1: Waiting for sensor network 2: Waiting for sensor data 3: Auto mode 4: normal mode
REG_DEMC_MODBUS_CO2_VALUE	858	W		Reg	Value in ppm. Range: 0-2000.
REG_DEMC_MODBUS_RH_VALUE	859	W		Reg	Value in %. Range: 0-100.
REG_DEMC_MODBUS_CO2_OUT	860	R		Reg	Output of PI controller for CO2 regulation.
REG_DEMC_MODBUS_RH_OUT	861	R		Reg	Output of PI controller for RH regulation.
REG_DEMC_ALLOWED	862	R		Reg	Indicates if auto mode can be set (based on sensor data and demand control set points). Bit 0: 0: Auto mode cannot be activated 1: Auto mode can be activated Bit 1-15: not used.
REG_DEMC_RH_SP_WINTER	863	R/W		Reg	Range: 0–100 Register introduced in PCU-EC4 program version 5.09.00.
REG_DEMC_SUMMER_WINTER_MODE	864	R		Reg	0: Summer 1: Winter Register introduced in PCU-EC4 program version 5.09.00.
REG_DEMC_SUMMER_WINTER_CNTR_H	865	R		Reg	Highest 16 bits of remaining time until summer mode.
REG_DEMC_SUMMER_WINTER_CNTR_H	866	R		Reg	Lowest 16 bits of remaining time until summer mode.

7.16 Register for wireless network

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_WL_NODE_1_TYPE	901	R		Reg	0: No connected 1: CO2 sensor 2: RH sensor 3: DI module 4: User interface
REG_WL_NODE_1_VALUE_T	902	R		Reg + Coil	Value depending on node type: REG_WL_NODE_1_TYPE = 1: CO2 value REG_WL_NODE_1_TYPE = 2: RH value REG_WL_NODE_1_TYPE = 3: use coils to read: Coil Address 14417: input 1 Coil Address 14418: input 2 All other node types: 0.
REG_WL_NODE_1_STATUS	903	R		Reg	Node state: 0: not bound 1: OK 2: Battery failure 3: Communication failure 4: No network 5: Sensor failure
REG_WL_NODE_2_xx	911-920				As for register addresses 901-910
REG_WL_NODE_3_xx	921-930				As for register addresses 901-910
REG_WL_NODE_4_xx	931-940				As for register addresses 901-910
REG_WL_NODE_5_xx	941-950				As for register addresses 901-910
REG_WL_NODE_6_xx	951-960				As for register addresses 901-910
REG_WL_NODE_7_xx	961-970				As for register addresses 901-910
REG_WL_NODE_8_xx	971-980				As for register addresses 901-910
REG_WL_NODE_9_xx	981-990				As for register addresses 901-910
REG_WL_NODE_10_xx	991-1000				As for register addresses 901-910
REG_WL_DI_CONNECTION_1	1001				0: Not connected 1: DI1 2: DI2 3: DI3 4: DI4 5: DI5 6: not acctepted 7: DI7 Other values: not accepted
REG_WL_DI_CONNECTION_2	1002				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_3	1003				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_4	1004				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_5	1005				As for REG_WL_DI_CONNECTION_1

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_WL_DI_CONNECTION_6	1006				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_7	1007				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_8	1008				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_9	1009				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_10	1010				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_11	1011				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_12	1012				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_13	1013				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_14	1014				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_15	1015				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_16	1016				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_17	1017				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_18	1018				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_19	1019				As for REG_WL_DI_CONNECTION_1
REG_WL_DI_CONNECTION_20	1020				As for REG_WL_DI_CONNECTION_1

7.17 Registers for RH transfer control

Name	Register address	R or R/W	NVM	Access (Reg./Coil)	Description/remarks
REG_RH_TC_SP	1101	R/W		Reg	Setpoint for RH transfer control.
REG_RH_TC_PBAND	1102	R/W		Reg	P-band for RH transfer control.
REG_RH_TC_ITIME	1103	R/W		Reg	I-time for RH transfer control.
REG_RH_TC_OUT	1104	R		Reg	Output of RH transfer controller.

Systemair Sverige AB reserves the right to make changes and improvements to the contents of this manual without prior notice.