

MODBUS Protocol

Product description: Sabiana New Cassette modbus protocol

| Rev | Date | Description | Author | Verified |
|-----|----------|---|------------|------------|
| 1 | 20/01/12 | First draft | I. Gioia | M.Felici |
| 2 | 13/02/12 | Registers table splitted into categories – examples added | M.Felici | I.Gioia |
| 3 | 16/02/12 | Added I/O Card data and examples | I.Gioia | M.Felici |
| 4 | 20/02/12 | Corrected serial communication configuration (no parity) | I.Gioia | M.Felici |
| 5 | 15/07/14 | Unified the documents for the different boards into this single document | I.Gioia | M.Felici |
| 6 | 10/03/15 | Set reduction via IN2, IAQ on/off, reset parameters via MB, ambiente probe via MB, bits for presence of T-MB/IR | I.Gioia | M.Felici |
| 7 | 06/10/15 | Added registers for T-MB dips, ± 3 mode set variation Added registers for mode and ventilation bit commands Added CCP-ECM description | I.Gioia | M.Felici |
| 8 | 16/03/17 | Added dip switch addressing | P.Saporiti | I.Gioia |
| 9 | 11/05/17 | Added writable data range | I.Gioia | P.Saporiti |
| 10 | 14/06/17 | Added register for writing time and week day | I.Gioia | M.Felici |
| 11 | 22/02/19 | Added documentation for Jumbo Cassette | I.Gioia | M.Felici |
| 13 | 29/06/20 | Added reg. 0x107A for CVP Added Atlas documentation Added CFF documentation | I.Gioia | M.Felici |
| 14 | 08/04/21 | Added CFF sub models, added new status registers, added dummy registers | I.Gioia | M.Felici |
| 15 | 18/02/22 | Added CFF reg 0x1064 for Night Mode | I.Gioia | M.Felici |
| 16 | 28/02/22 | Added CFF reg 0x1065 for Keyboard locked (EVO interface) | P.Saporiti | I.Gioia |
| 17 | 14/10/22 | Added CFF the 4 dip bank , only 15 address | P.Saporiti | I.Gioia |
| 18 | 09/05/23 | Added documentation for CVP2 and CRC | I.Gioia | |

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Connectors

The MODBUS RTU interface is available via the RS485 port

- ▲ Cassette/Fancoil/Atlas: connectors JP4A and JP4B
- ▲ I/O Board: connectors M8 and M9
- ▲ CVP/CCP-ECM: daughter board on MC3
- ▲ QCV: connector M6
- ▲ Jumbo: M7A and M7B

Serial interface configuration

The serial interface has to be configured as follows:

| | |
|-------------------|--|
| Speed | 9600 bit/sec (CFE via KNX 1200bit/sec) |
| Bit number | 8 |
| Parity | No |
| Stop bit | 1 |

MODBUS protocol

The MODBUS address of the board is selected by the ADDRESS dips in the range 1-60.

Only the data type “Holding Register” is supported.

The available MODBUS functions are:

- 0x03(3 dec) “Read Holding Registers”
- 0x06(6 dec) “Write Single Register”
- 0x10(16 dec) “Preset Multiple Registers”

The following tables show the data accessible via the MODBUS interface. For each data, the following information is specified:

- **Addr**, hexadecimal address
- **Type**, data type (see next table)
- **Attr**, attributes (R read only, W write only, RW read/write)
- **Symb**, short symbolic data name, used only for machine parameters; identifies the parameter name as defined in the technical specifications
- **Description**, short data-specific description (parameter, measure, etc..)
- **Notes**, information about data interpretation, etc...

Writing contiguous registers with a single operation is allowed only if all the registers are marked as writable.

In case of an error for:

- function not supported
- wrong data address
- wrong data length
- data not acceptable

the response will be a MODBUS exception.

Table 1: Data types

| Type | Description | Range | Dimension | Notes |
|-------|-------------------------|---------------|-----------|---|
| uns16 | 16 bit unsigned integer | 0..65535 | 2 bytes | |
| sig16 | 16 bit signed integer | -32768..32767 | 2 bytes | |
| uns32 | 32 bit unsigned integer | 0..4294836225 | 4 bytes | 2 contiguous MODBUS registers, the first one containing the most significant 16 bit |

Regarding the supported MODBUS standard, one can refer to the MODBUS official website ([Modbus Specifications](#)) and particularly to the documents: [Modbus Serial Line Protocol and Implementation Guide V1.02](#) e [Mosbus Application Protocol V1.1b](#).

Board address Dip Switch setting

The 6 dips bank is used to define the address number of each machine machine.(for CFF and CRC fan-coil only 4 dip bank, maximum 15 addresses). The assignment works according to the binary method; the number is defined by placing the different Dips at On or at Off. Use the following table to set the numbering. Pay particular attention to avoid assigning the same number to more units. **The address is sampled after power on, so be sure to set the address while the machine is not powered.**

| Indirizzo/Address | Dip Switches ON | Indirizzo/Address | Dip Switches ON | Indirizzo/Address | Dip Switches ON |
|-------------------|-----------------|-------------------|-----------------|-------------------|-----------------|
| 1 | 1 | 21 | 1+3+5 | 41 | 1+4+6 |
| 2 | 2 | 22 | 2+3+5 | 42 | 2+4+6 |
| 3 | 1+2 | 23 | 1+2+3+5 | 43 | 1+2+4+6 |
| 4 | 3 | 24 | 4+5 | 44 | 3+4+6 |
| 5 | 1+3 | 25 | 1+4+5 | 45 | 1+3+4+6 |
| 6 | 2+3 | 26 | 2+4+5 | 46 | 2+3+4+6 |
| 7 | 1+2+3 | 27 | 1+2+4+5 | 47 | 1+2+3+4+6 |
| 8 | 4 | 28 | 3+4+5 | 48 | 5+6 |
| 9 | 1+4 | 29 | 1+3+4+5 | 49 | 1+5+6 |
| 10 | 2+4 | 30 | 2+3+4+5 | 50 | 2+5+6 |
| 11 | 1+2+4 | 31 | 1+2+3+4+5 | 51 | 1+2+5+6 |
| 12 | 3+4 | 32 | 6 | 52 | 3+5+6 |
| 13 | 1+3+4 | 33 | 1+6 | 53 | 1+3+5+6 |
| 14 | 2+3+4 | 34 | 2+6 | 54 | 2+3+5+6 |
| 15 | 1+2+3+4 | 35 | 1+2+6 | 55 | 1+2+3+5+6 |
| 16 | 5 | 36 | 3+6 | 56 | 4+5+6 |
| 17 | 1+5 | 37 | 1+3+6 | 57 | 1+4+5+6 |
| 18 | 2+5 | 38 | 2+3+6 | 58 | 2+4+5+6 |
| 19 | 1+2+5 | 39 | 1+2+3+6 | 59 | 1+2+4+5+6 |
| 20 | 3+5 | 40 | 4+6 | 60 | 3+4+5+6 |

Examples – Cassette, Fancoil and I/O Board

Following, one can find a few transaction examples (directed to a cassette with address 1 and to an I/O card with address 2).

Next to the identifiers Request and Response there are the complete packets respectively transmitted and received on the serial line, including the CRC16, with the bytes represented in hexadecimal format.

Example 1: Reading the temperature of T1, T2, T3 probes

Reading of the 3 registers 1002, 1003 and 1004 with function 3.

Request 01 03 1002 0003 A0CB

Response 01 03 06 00F9 00C0 00D3 FCC0

The temperatures read are respectively F9, C0 e D3 in hexadecimal, or rather 249, 192 e 211.

The data description in the following tables explains that the data is conveyed as [$^{\circ}\text{C} \cdot 10$], or rather the data is represented in fixed point with 1 decimal.

The temperatures are respectively $T1=24,9^{\circ}\text{C}$, $T2=19,2^{\circ}\text{C}$ e $T3=21,1^{\circ}\text{C}$

Example 2: Reading board identification and firmware release

Reading of the 2 registers 1000 and 1001 with the function 3.

Request 01 03 1000 0002 C0CB

Response 01 03 04 5000 002E 6B2F

The model number is 5000 (hexadecimal) which - as shown in the table - means Cassette, and the firmware release is 002E, or rather 0.46.

Example 3: Reading DIP 3 value

Reading of the register 1007 with the function 3.

Request 01 03 1007 0001 310B

Response 01 03 02 0001 7984

The configuration dip for T3 probe is set to 1, hence T3 probe is active.

Example 4: Reading the Summer set-point parameter

Reading of the register 102D with the function 3.

Request 01 03 102D 0001 10C3

Response 01 03 02 00F0 B800

The setpoint is equal to F0 (hexadecimal) and is conveyed as [$^{\circ}\text{C} \cdot 10$], hence its value is $24,0^{\circ}\text{C}$.

Example 5: Writing the Summer set-point parameter

Writing of the register 102D with the function 6. The new setpoint is $23,5^{\circ}\text{C}$, so one has to write into the register 235 (EB hexadecimal)

Request 01 06 102D 00EB 5D4C

Response 01 06 102D 00EB 5D4C

Example 6: Writing the parameters “Fan maximum OFF time for antistratification” and “antistratification on time”

Writing of the 2 registers 1035 e 1036 with the function 16.

The two parameters new values are respectively 12min and 120sec, so one has to write into the first register C (hexadecimal) and into the second 78 (hexadecimal).

Request 01 10 1035 0002 04 000C 0078 3D65

Response 01 10 1035 0002 5506

Example 7: Setting the fan speed

Writing of the register 1059 with the function 6. The fan speed chosen for this example is maximum, hence the command value is 3.

Request 01 06 1059 0003 1D18

Response 01 06 1059 0003 1D18

Example 8: Reading the maximum fan speed on counter

One has to read the total active time of the relay that enables the fan maximum speed; the data type is uns32, hence a 32bit unsigned integer, so 2 contiguous registers are interested.

Reading of the 2 registers 1060 and 1061 with the function 3.

Request 01 03 1060 0002 C0D5

Response 01 03 04 00CA 05AB 98E2

The two values in the response are CA e 05AB, which combined form the value CA05AB, or 13239723 in decimal format, which in turn means 153days, 5hours, 42minutes and 3seconds.

Example 9: Reading inputs 2 and 3 from the I/O card

Reading of the registers 0103 and 0104, IN2 open and IN 3 closed

Request 02 03 0103 0002 35C4

Response 02 03 04 0001 0000 98F3

The value 1 for input 2 means open, the value 0 for input 3 means closed

Example 10: Activation of all of the 8 relays of the I/O card

Writing of the registers from 010A to 0111 with the function 16 (10 hex). The value to be written in each register is 1, relay activated.

Request 02 10 010A 0008 10 0001 0001 0001 0001 0001 0001 0001 0001 B2BF

Response 02 10 010A 0008 E002

MODBUS Data – Cassette and Fancoil

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 5000 Cassette 5001 Cassette ECM 5002 FanCoil 5003 FanCoil ECM |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|-------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|---|
| 1005 | sig16 | R | Dip 1 configuration | 1: 4 pipes machine 0: 2 pipes machine |
| 1006 | sig16 | R | Dip 2 configuration | 1: Thermoregulation with fan only 0: Complete thermoregulation |
| 1007 | sig16 | R | Dip 3 configuration | 1: T3 probe on 0: T3 probe off |
| 1008 | sig16 | R | Dip 4 configuration | 1: T3 used in winter/summer 0: T3 used in winter only |
| 1009 | sig16 | R | Dip 5 configuration | 1: Continuous ventilation off 0: Continuous ventilation on |
| 100A | sig16 | R | Dip 6 configuration | 1: Electrical heater present 0: Electrical heater absent |
| 100B | sig16 | R | Dip 7 configuration | 1: El.heater integrates T1 probe 0: El.heater integrates T2 probe |
| 100C | sig16 | R | Dip 8 configuration | 1: Relay7 is associated to the condensation alarm (relay closed if alarm present) 0: Relay7 associated to the machine state (relay closed if machine on) |
| 100D | sig16 | R | Dip 9 configuration | 1: IN1 indicates the season 0: IN1 indicates the remote on/off |
| 100E | sig16 | R | Dip 10 configuration | 1: Slave Machine 0: Master Machine |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|------------------------|
| 100F | uns16 | R | Machine state | 0:OFF 1:ON |
| 1010 | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 1011 | uns16 | R | Dead Zone(Auto) mode | 0: OFF 1: ON |
| 1012 | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 1013 | uns16 | R | Season in use | 0: Summer 1: Winter |
| 1014 | uns16 | R | T2 probe found | 0: No 1: Yes |
| 1015 | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1016 | uns16 | R | Electrical heater state | 0: OFF 1: ON |
| 1017 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 1018 | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 1019 | uns16 | R | Fan Speed Min (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101A | uns16 | R | Fan Speed Med (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Max (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101C | uns16 | R | State of Relay 1 FAN LOW | 0: OFF 1: ON |
| 101D | uns16 | R | State of Relay 2 FAN MED | 0: OFF 1: ON |
| 101E | uns16 | R | State eof Relay 3 FAN HIGH | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 4 EV hot/Electrical heater (*) | 0: OFF 1: ON |
| 1020 | uns16 | R | State of Relay 5 EV cold/ Electrical heater (*) | 0: OFF 1: ON |
| 1021 | uns16 | R | State of Relay 6 Pump/IAQ (*) | 0: OFF 1: ON |
| 1022 | uns16 | R | State of Relay 7 Condensation alarm/Machine state (*) | 0: OFF 1: ON |
| 1023 | uns16 | R | Digital Input IN2 | 0: Closed 1: Opened |

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|------------------------|
| 1024 | uns16 | R | Digital Input IN1 | 0: Closed 1: Opened |
| 1025 | uns16 | R | Digital Input LNC condensation level (Cassette)/ Horizontal configuration (FanCoil) | 0: Closed 1: Opened |
| 1026 | uns16 | R | Digital Input LNA condensation level (Cassette)/ Vertical configuration (FanCoil) | 0: Closed 1: Opened |
| 1027 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1028 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1029 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 102A | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |
| 102B | uns16 | R | Allarm: Condensation level | 0: OFF 1: ON |

() depending on the configuration*

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 102C | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102D | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102E | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102F | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 1030 | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 1031 | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 1032 | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1033 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1034 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1035 | sig16 | RW | F-t1 | Fan maximum off time for antistratification | minutes; 5 ÷ 13 |
| 1036 | sig16 | RW | F-t2 | Antistratification on time (*) | seconds; 30 ÷ 120 |
| 1037 | sig16 | RW | F-t3 | Post-ventilation time | seconds; 5 ÷ 240 |
| 1038 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1039 | sig16 | RW | dEds | Dead zone central set | °C*10; 18,0 ÷ 30,0 |
| 103A | sig16 | RW | dEdr | Dead zone range | °C*10; 1,0 ÷ 6,0 |
| 103B | sig16 | RW | t1dS | T1 Compensation delta | °C*10; 0,5 ÷ 2,0 |
| 103C | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103E | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103F | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 1040 | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 1041 | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1042 | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1043 | sig16 | RW | dS | Allowed set point variation from ETN | °C*10; 0,0 ÷ 9,0 |
| 1044 | sig16 | RW | P-t1 | Pump, delay time | seconds; 0 ÷ 300 |
| 1045 | sig16 | RW | P-t2 | Pump, OFF time in summer | minutes; 30 ÷ 90 |
| 1046 | sig16 | RW | P-t2 | Pump, minimum ON time in summer | minutes; 0 ÷ 5 |
| 1047 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1049 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 104A | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 104B | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) | 0: OFF 1: ON |
| 104C | uns16 | RW | BLK1 | On-Off locked | 0: OFF 1: ON |
| 104D | uns16 | RW | BLK2 | Working mode locked | 0: OFF 1: ON |
| 104E | uns16 | RW | BLK3 | Set-point locked | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|--|---------------------|
| 104F | uns16 | RW | BLK4 | Fan mode locked | 0: OFF 1: ON |
| 1050 | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 1051 | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 1052 | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1053 | sig16 | RW | dTRE | Energy saving temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1054 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1055 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1056 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |

(*) depending on the configuration

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|--|
| 1057 | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 1058 | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation 3=Auto(Dead Zone) |
| 1059 | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed 2= Med Fan Speed 3= Max Fan Speed |

Counters

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|-----------------|
| 105A | uns32 | R | Board power-on time counter | seconds |
| 105C | uns32 | R | Relay min fan speed active time counter (not ECM)/ Inverter analog output on time counter (ECM) | seconds |
| 105E | uns32 | R | Relay med fan speed active time counter | seconds |
| 1060 | uns32 | R | Relay max fan speed active time counter | seconds |
| 1062 | uns32 | R | Inverter output voltage sum [V*10] updated every 1 second (ECM only) | seconds*Volt*10 |
| 1064 | uns32 | R | Machine on time counter | seconds |
| 1066 | uns32 | R | EV hot water relay on time counter / Electrical heater on time counter (*) | seconds |
| 1068 | uns32 | R | EV cold water relay on time counter/ Electrical heater on time counter (*) | seconds |
| 106A | uns32 | R | Pump relay on time counter (Cassette)/ IAQ on time counter (Fancoil) | seconds |

(*) depending on the configuration

Additional functionalities (Cassette until v0.54 - Fancoil until v0.59)

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|--|
| 106C | uns16 | RW | IAQ enabled | 1 On 0 Off |
| 106D | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 106E | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 106F | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 1070 | uns16 | RW | Ambient probe value | °C x10 |
| 1071 | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 1072 | uns16 | R | IR presence | 1 Present 0 Absent |
| 1073 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |

Additional functionalities (Cassette from v0.55 - Fancoil from v0.60)

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|---|
| 106C | uns16 | RW | IAQ enabled | 1 On 0 Off |
| 106D | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 106E | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 106F | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 1070 | uns16 | RW | Ambient probe value | °C x10 |
| 1071 | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 1072 | uns16 | R | IR presence | 1 Present 0 Absent |
| 1073 | uns16 | R | Dip 1 T-MB | 1: ON 0:OFF |
| 1074 | uns16 | R | Dip 2 T-MB | 1: ON 0:OFF |
| 1075 | uns16 | RW | Set variation value (± 3 mode) | °C*10; -(reg1043) ÷ reg1043 |
| 1076 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |

Additional functionalities (Cassette from v0.56 - Fancoil from v0.61)

| Addr | Type | Attr. | Description | Note |
|------|-------|-------|--------------|-------------------------|
| 1077 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1078 | uns16 | RW | Week day set | 1=Mon...7=Sun |

Bit Commands (Cassette from v0.55 - Fancoil from v0.60)

| Addr | Type | Attr. | Descrizione | Note |
|------|-------|-------|----------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Auto mode | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max | 1 executes the command |

MODBUS data – I/O Board

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---|--|
| 0100 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 5101 I/O board |
| 0101 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Inputs e Outputs

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|--------------------|-------------------------|
| 0102 | uns16 | R | Digital input IN1 | 0: Closed 1: Opened |
| 0103 | uns16 | R | Digital input IN2 | 0: Closed 1: Opened |
| 0104 | uns16 | R | Digital input IN3 | 0: Closed 1: Opened |
| 0105 | uns16 | R | Digital input IN4 | 0: Closed 1: Opened |
| 0106 | uns16 | R | Digital input IN5 | 0: Closed 1: Opened |
| 0107 | uns16 | R | Digital input IN6 | 0: Closed 1: Opened |
| 0108 | uns16 | R | Digital input IN7 | 0: Closed 1: Opened |
| 0109 | uns16 | R | Digital input IN8 | 0: Closed 1: Opened |
| 010A | uns16 | RW | Relay 1 state | 0: Not active 1: Active |
| 010B | uns16 | RW | Relay 2 state | 0: Not active 1: Active |
| 010C | uns16 | RW | Relay 3 state | 0: Not active 1: Active |
| 010D | uns16 | RW | Relay 4 state | 0: Not active 1: Active |
| 010E | uns16 | RW | Relay 5 state | 0: Not active 1: Active |
| 010F | uns16 | RW | Relay 6 state | 0: Not active 1: Active |
| 0110 | uns16 | RW | Relay 7 state | 0: Not active 1: Active |
| 0111 | uns16 | RW | Relay 8 state | 0: Not active 1: Active |

Examples - CVP

Following, one can find a few transaction examples (directed to a cassette with address 1 and to an I/O card with address 2).

Next to the identifiers Request and Response there are the complete packets respectively transmitted and received on the serial line, including the CRC16, with the bytes represented in hexadecimal format.

Example 1: Reading the temperature of T1, T2, T3 probes

Reading of the 3 registers 1002, 1003 and 1004 with function 3.

Request 01 03 1002 0003 A0CB

Response 01 03 06 00F9 00C0 00D3 FCC0

The temperatures read are respectively F9, C0 e D3 in hexadecimal, or rather 249, 192 e 211.

The data description in the following tables explains that the data is conveyed as [$^{\circ}\text{C} \cdot 10$], or rather the data is represented in fixed point with 1 decimal.

The temperatures are respectively $T1=24,9^{\circ}\text{C}$, $T2=19,2^{\circ}\text{C}$ e $T3=21,1^{\circ}\text{C}$

Example 2: Reading board identification and firmware release

Reading of the 2 registers 1000 and 1001 with the function 3.

Request 01 03 1000 0002 C0CB

Response 01 03 04 5003 0100 1AA3

The model number is 5003 (hexadecimal) which - as shown in the table - means CVP Asynchronous, and the firmware release is 0100, that means 1.00.

Example 3: Reading DIP 2 value

Reading of the register 1006 with the function 3.

Request 01 03 1006 0001 60CB

Response 01 03 02 0001 7984

The Master/Slave configuration dip is set to 1, hence the machine is configured as Slave.

Example 4: Reading the Summer set-point parameter

Reading of the register 102D with the function 3.

Request 01 03 102D 0001 10C3

Response 01 03 02 00F0 B800

The setpoint is equal to F0 (hexadecimal) and is conveyed as [$^{\circ}\text{C} \cdot 10$], hence its value is $24,0^{\circ}\text{C}$.

Example 5: Writing the Summer set-point parameter

Writing of the register 102D with the function 6. The new setpoint is $23,5^{\circ}\text{C}$, so one has to write into the register 235 (EB hexadecimal)

Request 01 06 102D 00EB 5D4C

Response 01 06 102D 00EB 5D4C

Example 6: Writing the T3 minimum values for ventilation to begin in summer and in winter mode.

Writing of the 2 registers 1032 e 1033 with the function 16.

The two parameters new values are respectively 37°C and 21°C, so one has to write into the first register 172 (hexadecimal) e and into the second D2 (hexadecimal).

Request 01 10 1032 0002 04 0172 00D2 9D18

Response 01 10 1032 0002 E4C7

Example 7: Setting the fan speed

Writing of the register 105E with the function 6. The fan speed chosen for this example is maximum, hence the command value is 3.

Request 01 06 105E 0003 ACD9

Response 01 06 105E 0003 ACD9

Example 8: Reading the maximum fan speed on counter

One has to read the total active time of the relay that enables the fan maximum speed; the data type is uns32, hence a 32bit unsigned integer, so 2 contiguous registers are interested.

Reading of the 2 registers 1065 and 1066 with the function 3.

Request 01 03 1065 0002 D0D4

Response 01 03 04 00CA 05AB 98E2

The two values in the response are CA e 05AB, which combined form the value CA05AB, or 13239723 in decimal format, which in turn means 153days, 5hours, 42minutes and 3seconds.

MODBUS Data - CVP

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 5004 CVP Asynchronous 5005 CVP ECM |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|-------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---------------------|--|
| 1005 | sig16 | R | Dip 1 configuration | <u>CVP (machines without resistance)</u> 1: Continuous ventilation off 0: Continuous ventilation on <u>CVP (machines with resistance)</u> 1:ECM machine 0: Asynchronous machine |
| 1006 | sig16 | R | Dip 2 configuration | 1: Slave machine 0: Master machine |
| 1007 | sig16 | R | Non used | |
| 1008 | sig16 | R | Non used | |
| 1009 | sig16 | R | Non used | |
| 100A | sig16 | R | Non used | |
| 100B | sig16 | R | Non used | |
| 100C | sig16 | R | Non used | |
| 100D | sig16 | R | Non used | |
| 100E | sig16 | R | Non used | |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|------------------------|
| 100F | uns16 | R | Machine state | 0:OFF 1:ON |
| 1010 | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 1011 | uns16 | R | Dead Zone(Auto) mode | 0: OFF 1: ON |
| 1012 | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 1013 | uns16 | R | Season in use | 0: Summer 1: Winter |
| 1014 | uns16 | R | T2 probe found | 0: No 1: Yes |
| 1015 | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1016 | uns16 | R | Electrical heater state | 0: OFF 1: ON |
| 1017 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 1018 | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 1019 | uns16 | R | Fan Speed Min (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101A | uns16 | R | Fan Speed Med (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Max (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101C | uns16 | R | State of Relay 1 - Electrovalve | 0: OFF 1: ON |
| 101D | uns16 | R | State of Relay 2 - Resistance (if present) | 0: OFF 1: ON |
| 101E | uns16 | R | State of Relay 3 - FAN LOW (if present) | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 4 - FAN MED (if present) | 0: OFF 1: ON |
| 1020 | uns16 | R | Non used | |
| 1021 | uns16 | R | Non used | |
| 1022 | uns16 | R | State of Relay 5 - FAN HIGH/Inverter on (if ECM) | 0: OFF 1: ON |
| 1023 | uns16 | R | Digital Input - Window | 0: Closed 1: Opened |
| 1024 | uns16 | R | Digital Input – Pump Alarm | 0: Closed 1: Opened |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|----------------------------|----------------------------------|
| 1025 | uns16 | R | Non used | |
| 1026 | uns16 | R | Resistance availability | 0: Not available 1: Available |
| 1027 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1028 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1029 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 102A | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |
| 102B | uns16 | R | Allarm: Condensation level | 0: OFF 1: ON |

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 102C | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102D | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102E | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102F | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 1030 | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 1031 | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 1032 | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1033 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1034 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1035 | sig16 | RW | | Non used | minutes; 5 ÷ 13 |
| 1036 | sig16 | RW | | Non used | seconds; 30 ÷ 120 |
| 1037 | sig16 | RW | | Non used | seconds; 5 ÷ 240 |
| 1038 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1039 | sig16 | RW | dEds | Dead zone central set | °C*10; 18,0 ÷ 30,0 |
| 103A | sig16 | RW | dEdr | Dead zone range | °C*10; 1,0 ÷ 6,0 |
| 103B | sig16 | RW | t1dS | T1 Compensation delta | °C*10; 0,5 ÷ 2,0 |
| 103C | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103E | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103F | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 1040 | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 1041 | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1042 | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1043 | sig16 | RW | dS | Allowed set point variation from ETN | °C*10; 0,0 ÷ 9,0 |
| 1044 | sig16 | RW | | Non used | seconds; 0 ÷ 300 |
| 1045 | sig16 | RW | | Non used | minutes; 30 ÷ 90 |
| 1046 | sig16 | RW | | Non used | minutes; 0 ÷ 5 |
| 1047 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1049 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 104A | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 104B | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) | 0: OFF 1: ON |
| 104C | uns16 | RW | BLK1 | On-Off locked | 0: OFF 1: ON |
| 104D | uns16 | RW | BLK2 | Working mode locked | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|--|---------------------|
| 104E | uns16 | RW | BLK3 | Set-point locked | 0: OFF 1: ON |
| 104F | uns16 | RW | BLK4 | Fan mode locked | 0: OFF 1: ON |
| 1050 | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 1051 | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 1052 | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1053 | sig16 | RW | dTRE | Energy saving temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1054 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1055 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1056 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |
| 1057 | sig16 | RW | Ft1 | Anti-stratification wait time | minutes; 10 ÷ 20 |
| 1058 | sig16 | RW | t1SE | T1 Summer base compensation | °C*10; 0,5 ÷ 2,0 |
| 1059 | sig16 | RW | Ft2E | Summer anti-stratification time | Seconds; 30 ÷ 180 |
| 105A | sig16 | RW | t1SI | T1 Winter base compensation | °C*10; 0,5 ÷ 5,0 |
| 105B | sig16 | RW | Ft2I | Winter anti-stratification time | Seconds; 30 ÷ 180 |

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|--|
| 105C | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 105D | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation 3=Auto(Dead Zone) |
| 105E | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed 2= Med Fan Speed 3= Max Fan Speed |

Counters

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|-----------------|
| 105F | uns32 | R | Board power-on time counter | seconds |
| 1061 | uns32 | R | Relay min fan speed active time counter (not ECM)/ Inverter analog output on time counter (ECM) | seconds |
| 1063 | uns32 | R | Relay med fan speed active time counter | seconds |
| 1065 | uns32 | R | Relay max fan speed active time counter | seconds |
| 1067 | uns32 | R | Inverter output voltage sum [V*10] updated every 1 second (ECM only) | seconds*Volt*10 |
| 1069 | uns32 | R | Machine on time counter | seconds |
| 106B | uns32 | R | EV water relay on time counter | seconds |

Additional functionalities (Async until v1.15 - ECM until v0.14 - R until v 0.12)

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|--|
| 106D | uns16 | | Not used | |
| 106E | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 106F | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 1070 | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 1071 | uns16 | RW | Ambient probe value | °C x10 |
| 1072 | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 1073 | uns16 | R | IR presence | 1 Present 0 Absent |
| 1074 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |

Additional functionalities (Async from v1.16 - ECM from v0.15 - R from v 0.13)

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|---|
| 106D | uns16 | RW | IAQ enabled | 1 On 0 Off |
| 106E | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 106F | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 1070 | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 1071 | uns16 | RW | Ambient probe value | °C x10 |
| 1072 | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 1073 | uns16 | R | IR presence | 1 Present 0 Absent |
| 1074 | uns16 | R | Dip 1 T-MB | 1: ON 0:OFF |
| 1075 | uns16 | R | Dip 2 T-MB | 1: ON 0:OFF |
| 1076 | uns16 | RW | Set variation value (± 3 mode) | °C*10; -(reg1043) ÷ reg1043 |
| 1077 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |

Additional functionalities (Async from v1.17 - ECM from v0.16 - R from v 0.14)

| Addr | Type | Attr. | Description | Note |
|------|-------|-------|--------------|-------------------------|
| 1078 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1079 | uns16 | RW | Week day set | 1=Mon...7=Sun |

Additional functionalities (Async from v1.23 - ECM from v0.21 - R from v 0.16)

| Addr | Type | Attr. | Description | Note |
|------|-------|-------|---------------------|--|
| 107A | uns16 | RW | Force flap position | 0: Flap standard position (or swing stop) 1: Force summer position 2: Force winter position 3: Force all open position 4: Force flap swing |

Bit Commands (Async from v1.16 - ECM from v0.15 - R from v 0.13)

| Addr | Type | Attr. | Descrizione | Note |
|------|-------|-------|----------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Auto mode | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max | 1 executes the command |

Examples - QCV

Following, one can find a few transaction examples (directed to a QCV with address 1).

Next to the identifiers Request and Response there are the complete packets respectively transmitted and received on the serial line, including the CRC16, with the bytes represented in hexadecimal format.

Example 1: Reading the temperature of T1, T2, T3 probes

Reading of the 3 registers 1002, 1003 and 1004 with function 3.

Request 01 03 1002 0003 A0CB

Response 01 03 06 00F9 00C0 00D3 FCC0

The temperatures read are respectively F9, C0 e D3 in hexadecimal, or rather 249, 192 e 211.

The data description in the following tables explains that the data is conveyed as [$^{\circ}\text{C} \cdot 10$], or rather the data is represented in fixed point with 1 decimal.

The temperatures are respectively $T1=24,9^{\circ}\text{C}$, $T2=19,2^{\circ}\text{C}$ e $T3=21,1^{\circ}\text{C}$

Example 2: Reading board identification and firmware release

Reading of the 2 registers 1000 and 1001 with the function 3.

Request 01 03 1000 0002 C0CB

Response 01 03 04 5000 0009 6B2F

The model number is 5006 (hexadecimal) which - as shown in the table - means QCV Asynchronous, and the firmware release is 0009, or rather 0.09.

Example 3: Reading DIP 4 value

Reading of the register 1008 with the function 3.

Request 01 03 1008 0001 0108

Response 01 03 02 0001 7984

The configuration dip for the electric heater (resistance) is 1, hence the resistance is used.

Example 4: Reading the Summer set-point parameter

Reading of the register 102D with the function 3.

Request 01 03 102D 0001 10C3

Response 01 03 02 00F0 B800

The setpoint is equal to F0 (hexadecimal) and is conveyed as [$^{\circ}\text{C} \cdot 10$], hence its value is $24,0^{\circ}\text{C}$.

Example 5: Writing the Summer set-point parameter

Writing of the register 102D with the function 6. The new setpoint is $23,5^{\circ}\text{C}$, so one has to write into the register 235 (EB hexadecimal)

Request 01 06 102D 00EB 5D4C

Response 01 06 102D 00EB 5D4C

Example 6: Writing the parameters "Fan on by T3 probe" for Summer and Winter

Writing of the 2 registers 1032 e 1033 with the function 16.

The two parameters new values are respectively 33,0°C and 19,0°C, so one has to write into the first register 14A (330 in hexadecimal format) and into the second BE (190 in hexadecimal format).

Request 01 10 1032 0002 04 014A 00BE 1CF8

Response 01 10 1032 0002 5506

Example 7: Setting the fan speed

Writing of the register 1059 with the function 6. The fan speed chosen for this example is maximum, hence the command value is 3.

Request 01 06 1059 0003 1D18

Response 01 06 1059 0003 1D18

Example 8: Reading the maximum fan speed on counter

One has to read the total active time of the relay that enables the fan maximum speed; the data type is uns32, hence a 32bit unsigned integer, so 2 contiguous registers are interested.

Reading of the 2 registers 1060 and 1061 with the function 3.

Request 01 03 1060 0002 C0D5

Response 01 03 04 00CA 05AB 98E2

The two values in the response are CA e 05AB, which combined form the value CA05AB, or 13239723 in decimal format, which in turn means 153days, 5hours, 42minutes and 3seconds.

MODBUS Data – QCV

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 0x5006 QCV Asynchronous 0x5007 QCV ECM |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|-------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|--|
| 1005 | sig16 | R | Dip 1 configuration | 1: 4 pipes machine 0: 2 pipes machine |
| 1006 | sig16 | R | Dip 2 configuration | 1: Continuous ventilation off 0: Continuous ventilation on |
| 1007 | sig16 | R | Dip 3 configuration | 1: T3 used in winter/summer 0: T3 used in winter only |
| 1008 | sig16 | R | Dip 4 configuration | 1: Electrical heater present 0: Electrical heater absent |
| 1009 | sig16 | R | Dip 5 configuration | 1: El.heater integrates T1 probe 0: El.heater integrates T2 probe |
| 100A | sig16 | R | Dip 6 configuration | 1: IN1 indicates the season 0: IN1 indicates the remote on/off |
| 100B | sig16 | R | Dip 7 configuration | 1: Slave Machine 0: Master Machine |
| 100C | sig16 | R | Dip 8 configuration | Actuator time configuration bit0 |
| 100D | sig16 | R | Dip 9 configuration | Actuator time configuration bit1 |
| 100E | sig16 | R | Dip 10 configuration | Actuator time configuration bit2 |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|------------------------|
| 100F | uns16 | R | Machine state | 0:OFF 1:ON |
| 1010 | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 1011 | uns16 | R | Dead Zone(Auto) mode | 0: OFF 1: ON |
| 1012 | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 1013 | uns16 | R | Season in use | 0: Summer 1: Winter |
| 1014 | uns16 | R | T2 probe found | 0: No 1: Yes |
| 1015 | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1016 | uns16 | R | Electrical heater state | 0: OFF 1: ON |
| 1017 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 1018 | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 1019 | uns16 | R | Fan Speed Min (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101A | uns16 | R | Fan Speed Med (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Max (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101C | uns16 | R | State of Relay 1 FAN LOW/Inverter ON (if ECM) | 0: OFF 1: ON |
| 101D | uns16 | R | State of Relay 2 FAN MED | 0: OFF 1: ON |
| 101E | uns16 | R | State eof Relay 3 FAN HIGH | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 4 Electrical heater 1 | 0: OFF 1: ON |
| 1020 | uns16 | R | Not used | 0: OFF 1: ON |
| 1021 | uns16 | R | Not used | 0: OFF 1: ON |
| 1022 | uns16 | R | State of Relay 5 Electrical heater 2/IAQ (IAQ if electrical heater is absent, see reg.1008) | 0: OFF 1: ON |
| 1023 | uns16 | R | Digital Input IN2 | 0: Closed 1: Opened |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---------------------|------------------------|
| 1024 | uns16 | R | Digital Input IN1 | 0: Closed 1: Opened |
| 1025 | uns16 | R | Not used | 0: Closed 1: Opened |
| 1026 | uns16 | R | Not used | 0: Closed 1: Opened |
| 1027 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1028 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1029 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 102A | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 102C | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102D | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102E | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102F | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 1030 | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 1031 | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 1032 | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1033 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1034 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1035 | sig16 | RW | | Not used | minutes; 5 ÷ 13 |
| 1036 | sig16 | RW | | Not used | seconds; 30 ÷ 120 |
| 1037 | sig16 | RW | F-t3 | Post-ventilation time | seconds; 5 ÷ 240 |
| 1038 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1039 | sig16 | RW | dEds | Dead zone central set | °C*10; 18,0 ÷ 30,0 |
| 103A | sig16 | RW | dEdr | Dead zone range | °C*10; 1,0 ÷ 6,0 |
| 103B | sig16 | RW | | Not used | °C*10; 0,5 ÷ 2,0 |
| 103C | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103E | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103F | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 1040 | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 1041 | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1042 | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1043 | sig16 | RW | dS | Allowed set point variation from ETN | °C*10; 0,0 ÷ 9,0 |
| 1044 | sig16 | RW | | Not used | seconds; 0 ÷ 300 |
| 1045 | sig16 | RW | | Not used | minutes; 30 ÷ 90 |
| 1046 | sig16 | RW | | Not used | minutes; 0 ÷ 5 |
| 1047 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1049 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 104A | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 104B | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) | 0: OFF 1: ON |
| 104C | uns16 | RW | BLK1 | On-Off locked | 0: OFF 1: ON |
| 104D | uns16 | RW | BLK2 | Working mode locked | 0: OFF 1: ON |
| 104E | uns16 | RW | BLK3 | Set-point locked | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|--|---------------------|
| 104F | uns16 | RW | BLK4 | Fan mode locked | 0: OFF 1: ON |
| 1050 | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 1051 | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 1052 | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1053 | sig16 | RW | dTRE | Energy saving temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1054 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1055 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1056 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|--|
| 1057 | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 1058 | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation 3=Auto(Dead Zone) |
| 1059 | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed 2= Med Fan Speed 3= Max Fan Speed |

Counters

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|-----------------|
| 105A | uns32 | R | Board power-on time counter | seconds |
| 105C | uns32 | R | Relay min fan speed active time counter (not ECM)/ Inverter analog output on time counter (ECM) | seconds |
| 105E | uns32 | R | Relay med fan speed active time counter | seconds |
| 1060 | uns32 | R | Relay max fan speed active time counter | seconds |
| 1062 | uns32 | R | Inverter output voltage sum [V*10] updated every 1 second (ECM only) | seconds*Volt*10 |
| 1064 | uns32 | R | Machine on time counter | seconds |

Additional functionalities (until v0.13)

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|---|
| 1066 | uns16 | RW | IAQ enabled | 1 On 0 Off |
| 1067 | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 1068 | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 1069 | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 106A | uns16 | RW | Ambient probe value | °C x10 |
| 106B | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 106C | uns16 | R | IR presence | 1 Present 0 Absent |
| 106D | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |

Additional functionalities (from v0.14)

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|---|
| 1066 | uns16 | RW | IAQ enabled | 1 On 0 Off |
| 1067 | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 1068 | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 1069 | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 106A | uns16 | RW | Ambient probe value | °C x10 |
| 106B | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 106C | uns16 | R | IR presence | 1 Present 0 Absent |
| 106D | uns16 | R | Dip 1 T-MB | 1: ON 0:OFF |
| 106E | uns16 | R | Dip 2 T-MB | 1: ON 0:OFF |
| 106F | uns16 | RW | Set variation value (± 3 mode) | °C*10; -(reg1043) ÷ reg1043 |
| 1070 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |

Additional functionalities (from v 0.16)

| Addr | Type | Attr. | Description | Note |
|------|-------|-------|--------------|-------------------------|
| 1071 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1072 | uns16 | RW | Week day set | 1=Mon...7=Sun |

Bit Commands (from v0.14)

| Addr | Type | Attr. | Descrizione | Note |
|------|-------|-------|----------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Auto mode | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |

| Addr | Type | Attr. | Descrizione | Note |
|-------------|-------------|--------------|--------------------|------------------------|
| 1105 | uns16 | W | Fan speed Min | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max | 1 executes the command |

Examples – CCP/CFP-ECM

Following, one can find a few transaction examples (directed to a CCP-ECM with address 1).

Next to the identifiers Request and Response there are the complete packets respectively transmitted and received on the serial line, including the CRC16, with the bytes represented in hexadecimal format.

Example 1: Reading the temperature of T1, T2, T3 probes

Reading of the 3 registers 1002, 1003 and 1004 with function 3.

Request 01 03 1002 0003 A0CB

Response 01 03 06 00F9 00C0 00D3 FCC0

The temperatures read are respectively F9, C0 e D3 in hexadecimal, or rather 249, 192 e 211.

The data description in the following tables explains that the data is conveyed as [$^{\circ}\text{C} \cdot 10$], or rather the data is represented in fixed point with 1 decimal.

The temperatures are respectively $T1=24,9^{\circ}\text{C}$, $T2=19,2^{\circ}\text{C}$ e $T3=21,1^{\circ}\text{C}$

Example 2: Reading board identification and firmware release

Reading of the 2 registers 1000 and 1001 with the function 3.

Request 01 03 1000 0002 C0CB

Response 01 03 04 5008 0100 6B61

The model number is 5008 (hexadecimal) which means CCP-ECM and the firmware release is 0100, that means 1.00.

Example 3: Reading DIP 2 value

Reading of the register 1006 with the function 3.

Request 01 03 1006 0001 60CB

Response 01 03 02 0001 7984

The Master/Slave configuration dip is set to 1, hence the machine is configured as Slave.

Example 4: Reading the Summer set-point parameter

Reading of the register 102D with the function 3.

Request 01 03 102D 0001 10C3

Response 01 03 02 00F0 B800

The setpoint is equal to F0 (hexadecimal) and is conveyed as [$^{\circ}\text{C} \cdot 10$], hence its value is $24,0^{\circ}\text{C}$.

Example 5: Writing the Summer set-point parameter

Writing of the register 102D with the function 6. The new setpoint is $23,5^{\circ}\text{C}$, so one has to write into the register 235 (EB hexadecimal)

Request 01 06 102D 00EB 5D4C

Response 01 06 102D 00EB 5D4C

Example 6: Writing the T3 minimum values for ventilation to begin in summer and in winter mode.

Writing of the 2 registers 1032 e 1033 with the function 16.

The two parameters new values are respectively 37°C and 21°C, so one has to write into the first register 172 (hexadecimal) e and into the second D2 (hexadecimal).

Request 01 10 1032 0002 04 0172 00D2 9D18

Response 01 10 1032 0002 E4C7

Example 7: Setting the fan speed

Writing of the register 105E with the function 6. The fan speed chosen for this example is maximum, hence the command value is 3.

Request 01 06 105E 0003 ACD9

Response 01 06 105E 0003 ACD9

MODBUS Data - CCP-ECM

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 5008 CCP-ECM |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|----------------------|--------------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---------------------|---|
| 1005 | sig16 | R | Dip 1 configuration | 1: Continuous ventilation on 0: Continuous ventilation off |
| 1006 | sig16 | R | Dip 2 configuration | 1: Slave machine 0: Master machine |
| 1007 | sig16 | R | Non used | |
| 1008 | sig16 | R | Non used | |
| 1009 | sig16 | R | Non used | |
| 100A | sig16 | R | Non used | |
| 100B | sig16 | R | Non used | |
| 100C | sig16 | R | Non used | |
| 100D | sig16 | R | Non used | |
| 100E | sig16 | R | Non used | |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|--|
| 100F | uns16 | R | Machine state | 0:OFF 1:ON |
| 1010 | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 1011 | uns16 | R | Dead Zone(Auto) mode | 0: OFF 1: ON |
| 1012 | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 1013 | uns16 | R | Season in use | 0: Summer 1: Winter |
| 1014 | uns16 | R | T2 probe found | 0: No 1: Yes |
| 1015 | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1016 | uns16 | R | Not used | Returns 0 |
| 1017 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 1018 | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 1019 | uns16 | R | Fan Speed Min (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101A | uns16 | R | Fan Speed Med (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Max (for ECM machines, this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101C | uns16 | R | State of Relay 1 - Electrovalve cold water | 0: OFF 1: ON |
| 101D | uns16 | R | State of Relay 2 - Electrovalve hot water | 0: OFF 1: ON |
| 101E | uns16 | R | Not used | |
| 101F | uns16 | R | Not used | |
| 1020 | uns16 | R | Not used | |
| 1021 | uns16 | R | Not used | |
| 1022 | uns16 | R | Not used | |
| 1023 | uns16 | R | Digital Input - Window | 0: Closed 1: Opened |
| 1024 | uns16 | R | Digital Input - 4 pipes mode | 0: Closed (2 pipes) 1: Opened (4 pipes) |
| 1025 | uns16 | R | Non used | |
| 1026 | uns16 | R | Not used | |
| 1027 | uns16 | R | Analog output 0-10V | Volt*10 |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|--------------------|-----------------|
| 1028 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1029 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 102A | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |
| 102B | uns16 | R | Not used | Returns 0 |

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 102C | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102D | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102E | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102F | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 1030 | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 1031 | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 1032 | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1033 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1034 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1035 | sig16 | RW | | Not used | minutes; 5 ÷ 13 |
| 1036 | sig16 | RW | | Not used | seconds; 30 ÷ 120 |
| 1037 | sig16 | RW | F-t3 | Post-ventilation time | seconds; 5 ÷ 240 |
| 1038 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1039 | sig16 | RW | dEds | Dead zone central set | °C*10; 18,0 ÷ 30,0 |
| 103A | sig16 | RW | dEdr | Dead zone range | °C*10; 1,0 ÷ 6,0 |
| 103B | sig16 | RW | t1dS | T1 Compensation delta | °C*10; 0,5 ÷ 2,0 |
| 103C | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103E | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103F | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 1040 | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 1041 | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1042 | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1043 | sig16 | RW | dS | Allowed set point variation from ETN | °C*10; 0,0 ÷ 9,0 |
| 1044 | sig16 | RW | | Not used | seconds; 0 ÷ 300 |
| 1045 | sig16 | RW | | Non used | minutes; 30 ÷ 90 |
| 1046 | sig16 | RW | | Non used | minutes; 0 ÷ 5 |
| 1047 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1049 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 104A | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 104B | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) | 0: OFF 1: ON |
| 104C | uns16 | RW | BLK1 | On-Off locked | 0: OFF 1: ON |
| 104D | uns16 | RW | BLK2 | Working mode locked | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|--|---------------------|
| 104E | uns16 | RW | BLK3 | Set-point locked | 0: OFF 1: ON |
| 104F | uns16 | RW | BLK4 | Fan mode locked | 0: OFF 1: ON |
| 1050 | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 1051 | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 1052 | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1053 | sig16 | RW | dTRE | Energy saving temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1054 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1055 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1056 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|--|
| 1057 | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 1058 | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation 3=Auto(Dead Zone) |
| 1059 | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed 2= Med Fan Speed 3= Max Fan Speed |

Counters

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|-----------------|
| 105A | uns32 | R | Board power-on time counter | seconds |
| 105C | uns32 | R | Inverter analog output on time counter (ECM) | seconds |
| 105E | uns32 | R | Inverter output voltage sum [V*10] updated every 1 second | seconds*Volt*10 |
| 1060 | uns32 | R | Machine on time counter | seconds |
| 1062 | uns32 | R | Hot water valve on time | seconds |
| 1064 | uns32 | R | Cold water valve on time | seconds |

Additional functionalities

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|--|--|
| 1066 | uns16 | | Not used | |
| 1067 | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 1068 | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 1069 | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 106A | uns16 | RW | Ambient probe value | °C x10 |
| 106B | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 106C | uns16 | R | IR presence | 1 Present 0 Absent |
| 106D | uns16 | R | Dip 1 T-MB | 1: ON 0:OFF |
| 106E | uns16 | R | Dip 2 T-MB | 1: ON 0:OFF |
| 106F | uns16 | RW | Set variation value (±3 mode) | °C*10; -(reg1043) ÷ reg1043 |
| 1070 | uns16 | RW | Antistratification mode | 0:Off 1:Summer 2:Winter |
| 1071 | uns16 | W | Parameters reset | The reset takes effect by writing 0x005A |

Additional functionalities (from v 0.04)

| Addr | Type | Attr. | Description | Note |
|-------------|-------------|--------------|--------------------|-------------------------|
| 1072 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1073 | uns16 | RW | Week day set | 1=Mon...7=Sun |

Bit Commands

| Addr | Type | Attr. | Descrizione | Note |
|-------------|-------------|--------------|--------------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Auto mode | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max | 1 executes the command |

MODBUS Data – Jumbo Cassette

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 500A Jumbo Cassette |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|-------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|---|
| 1005 | sig16 | R | Dip 1 configuration | 1: 4 pipes machine 0: 2 pipes machine |
| 1006 | sig16 | R | Dip 2 configuration | 1: Thermoregulation with fan only 0: Complete thermoregulation |
| 1007 | sig16 | R | Dip 3 configuration | 1: T3 probe on 0: T3 probe off |
| 1008 | sig16 | R | Dip 4 configuration | 1: T3 used in winter/summer 0: T3 used in winter only |
| 1009 | sig16 | R | Dip 5 configuration | 1: Continuous ventilation off 0: Continuous ventilation on |
| 100A | sig16 | R | Dip 6 configuration | 1: Electrical heater present 0: Electrical heater absent |
| 100B | sig16 | R | Dip 7 configuration | 1: El.heater integrates T1 probe 0: El.heater integrates T2 probe |
| 100C | sig16 | R | Dip 8 configuration | 1: Relay7 is associated to the condensation alarm (relay closed if alarm present) 0: Relay7 associated to the machine state (relay closed if machine on) |
| 100D | sig16 | R | Dip 9 configuration | 1: IN1 indicates the season 0: IN1 indicates the remote on/off |
| 100E | sig16 | R | Dip 10 configuration | 1: Slave Machine 0: Master Machine |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|------------------------|
| 100F | uns16 | R | Machine state | 0:OFF 1:ON |
| 1010 | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 1011 | uns16 | R | Dead Zone(Auto) mode | 0: OFF 1: ON |
| 1012 | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 1013 | uns16 | R | Season in use | 0: Summer 1: Winter |
| 1014 | uns16 | R | T2 probe found | 0: No 1: Yes |
| 1015 | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1016 | uns16 | R | Electrical heater state | 0: OFF 1: ON |
| 1017 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 1018 | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 1019 | uns16 | R | Fan Speed Min (this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101A | uns16 | R | Fan Speed Med (this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Max (this field is not valid with automatic fan speed) | 0: OFF 1: ON |
| 101C | uns16 | R | State of Relay 1 EV hot/Electric heater | 0: OFF 1: ON |
| 101D | uns16 | R | Stato Relè 2 EV cold | 0: OFF 1: ON |
| 101E | uns16 | R | State of Relay 3 Pump | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 4 Inverter activation | 0: OFF 1: ON |
| 1020 | uns16 | R | State of Relay 5 Alarm/ Machine state State (*) | 0: OFF 1: ON |
| 1021 | uns16 | R | Output connector 3-4 state IAQ | 0: OFF 1: ON |
| 1022 | uns16 | R | Not used | |
| 1023 | uns16 | R | Digital Input IN2 | 0: Closed 1: Opened |
| 1024 | uns16 | R | Digital Input IN1 | 0: Closed 1: Opened |
| 1025 | uns16 | R | Digital Input LNC condensation level | 0: Closed 1: Opened |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---|------------------------|
| 1026 | uns16 | R | Digital Input LNA condensation level | 0: Closed 1: Opened |
| 1027 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1028 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1029 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 102A | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |
| 102B | uns16 | R | Allarm: Condensation level | 0: OFF 1: ON |

() depending on the configuration*

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 102C | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102D | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102E | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102F | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 1030 | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 1031 | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 1032 | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1033 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1034 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1035 | sig16 | RW | F-t1 | Fan maximum off time for antistratification | minutes; 5 ÷ 13 |
| 1036 | sig16 | RW | F-t2 | Antistratification on time (*) | seconds; 30 ÷ 120 |
| 1037 | sig16 | RW | F-t3 | Post-ventilation time | seconds; 5 ÷ 240 |
| 1038 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1039 | sig16 | RW | dEds | Dead zone central set | °C*10; 18,0 ÷ 30,0 |
| 103A | sig16 | RW | dEdr | Dead zone range | °C*10; 1,0 ÷ 6,0 |
| 103B | sig16 | RW | t1dS | T1 Compensation delta | °C*10; 0,5 ÷ 2,0 |
| 103C | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103E | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103F | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 1040 | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 1041 | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1042 | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1043 | sig16 | RW | dS | Allowed set point variation from ETN | °C*10; 0,0 ÷ 9,0 |
| 1044 | sig16 | RW | P-t1 | Pump, delay time | seconds; 0 ÷ 300 |
| 1045 | sig16 | RW | P-t2 | Pump, OFF time in summer | minutes; 30 ÷ 90 |
| 1046 | sig16 | RW | P-t2 | Pump, minimum ON time in summer | minutes; 0 ÷ 5 |
| 1047 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1049 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 104A | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 104B | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) | 0: OFF 1: ON |
| 104C | uns16 | RW | BLK1 | On-Off locked | 0: OFF 1: ON |
| 104D | uns16 | RW | BLK2 | Working mode locked | 0: OFF 1: ON |
| 104E | uns16 | RW | BLK3 | Set-point locked | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|--|---------------------|
| 104F | uns16 | RW | BLK4 | Fan mode locked | 0: OFF 1: ON |
| 1050 | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 1051 | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 1052 | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1053 | sig16 | RW | dTRE | Energy saving temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1054 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1055 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1056 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |

(*) at 5Volt, plus 40seconds at 3Volt

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|--|
| 1057 | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 1058 | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation 3=Auto(Dead Zone) |
| 1059 | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed 2= Med Fan Speed 3= Max Fan Speed |

Counters

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|-----------------|
| 105A | uns32 | R | Board power-on time counter | seconds |
| 105C | uns32 | R | Inverter active time counter | seconds |
| 105E | uns32 | R | Not used | |
| 1060 | uns32 | R | Not used | |
| 1062 | uns32 | R | Inverter output voltage sum [V*10] updated every 1 second (ECM only) | seconds*Volt*10 |
| 1064 | uns32 | R | Machine on time counter | seconds |
| 1066 | uns32 | R | EV hot water relay on time counter / Electrical heater on time counter (*) | seconds |
| 1068 | uns32 | R | EV cold water relay on time | seconds |
| 106A | uns32 | R | Pump on time | seconds |

(*) depending on the configuration

Additional functionalities

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|--|
| 106C | uns16 | RW | IAQ enabled | 1 On 0 Off |
| 106D | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 106E | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 106F | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 1070 | uns16 | RW | Ambient probe value | °C x10 |
| 1071 | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 1072 | uns16 | R | IR presence | 1 Present 0 Absent |
| 1073 | uns16 | R | Dip 1 T-MB | 1: ON 0:OFF |
| 1074 | uns16 | R | Dip 2 T-MB | 1: ON 0:OFF |
| 1075 | uns16 | RW | Set variation value (mode ±3) | °C*10; -(reg1043) ÷ reg1043 |
| 1076 | uns16 | W | Parameters reset | The reset takes effect by writing 0x005A |
| 1077 | uns16 | RW | Current Time | MSB: Ora, LSB: Minuti |
| 1078 | uns16 | RW | Current Day | 1=Lun...7=Dom |
| 1079 | uns16 | RW | Flap Swing | 1: ON 0:OFF |
| 107A | uns16 | RW | Force flap position | 0: Flap standard position 1: Force summer position 2: Force winter position 3: Force all open position 4: Force flap swing |
| 107B | uns16 | RW | Flap1 activation | 1: ON 0:OFF |
| 107C | uns16 | RW | Flap2 activation | 1: ON 0:OFF |
| 107D | uns16 | RW | Flap3 activation | 1: ON 0:OFF |
| 107E | uns16 | RW | Flap4 activation | 1: ON 0:OFF |

Bit Commands

| Addr | Type | Attr. | Descrizione | Note |
|------|-------|-------|----------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Auto mode | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max | 1 executes the command |

MODBUS Data – Atlas and Janus

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 0x500B Atlas 0x500C Janus |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|-------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|---|
| 1005 | sig16 | R | Dip 1 configuration | 1: Janus 0: Atlas |
| 1006 | sig16 | R | Dip 2 configuration | 1: Thermoregulation with fan only 0: Complete thermoregulation |
| 1007 | sig16 | R | Dip 3 configuration | 1: Continuous ventilation off 0: Continuous ventilation on |
| 1008 | sig16 | R | Dip 4 configuration | 1: T3 probe on 0: T3 probe off |
| 1009 | sig16 | R | Dip 5 configuration | 1: D0D0 output used for pump or boiler/chiller 0: D0D0 output used for machine state |
| 100A | sig16 | R | Dip 6 configuration | 1: IN1 for season choice 0: IN1 for remote Off |
| 100B | sig16 | R | Dip 7 configuration | 1: IN2 for night mode choice 0: IN2 for anti freeze mode |
| 100C | sig16 | R | Dip 8 configuration | Not used |
| 100D | sig16 | R | Dip 9 configuration | Not used |
| 100E | sig16 | R | Dip 10 configuration | 1: Slave Machine 0: Master Machine |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---------------------------------|------------------------|
| 100F | uns16 | R | Machine state | 0:OFF 1:ON |
| 1010 | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 1011 | uns16 | R | Not used | |
| 1012 | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 1013 | uns16 | R | Season in use | 0: Summer 1: Winter |
| 1014 | uns16 | R | T2 probe used for season choice | 0: No 1: Yes |
| 1015 | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1016 | uns16 | R | Not used | |
| 1017 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 1018 | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 1019 | uns16 | R | Fan Speed Min (legacy) | 0: OFF 1: ON |
| 101A | uns16 | R | Fan Speed Med (legacy) | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Max (legacy) | 0: OFF 1: ON |
| 101C | uns16 | R | State of Relay 1 | 0: OFF 1: ON |
| 101D | uns16 | R | State of Relay 2 | 0: OFF 1: ON |
| 101E | uns16 | R | State eof Relay 3 | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 4 | 0: OFF 1: ON |
| 1020 | uns16 | R | State of Relay 5 | 0: OFF 1: ON |
| 1021 | uns16 | R | State of Relay 6 | 0: OFF 1: ON |
| 1022 | uns16 | R | State of Relay 7 | 0: OFF 1: ON |
| 1023 | uns16 | R | Digital Input IN2 | 0: Closed 1: Opened |
| 1024 | uns16 | R | Digital Input IN1 | 0: Closed 1: Opened |
| 1025 | uns16 | R | Not used | |
| 1026 | uns16 | R | Not used | 0: Closed 1: Opened |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|----------------------------|-----------------|
| 1027 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1028 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1029 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 102A | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |
| 102B | uns16 | R | Allarm: Condensation level | 0: OFF 1: ON |

() depending on the configuration*

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 102C | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102D | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102E | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102F | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 1030 | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 1031 | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 1032 | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1033 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1034 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1035 | sig16 | RW | | Not used | |
| 1036 | sig16 | RW | | Not used | |
| 1037 | sig16 | RW | F-t3 | Post-ventilation time | seconds; 5 ÷ 240 |
| 1038 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1039 | sig16 | RW | | Not used | |
| 103A | sig16 | RW | | Not used | |
| 103B | sig16 | RW | | Not used | |
| 103C | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103E | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103F | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 1040 | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 1041 | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1042 | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1043 | sig16 | RW | dS | Allowed set point variation from ETN | °C*10; 0,0 ÷ 9,0 |
| 1044 | sig16 | RW | | Not used | |
| 1045 | sig16 | RW | | Not used | |
| 1046 | sig16 | RW | | Not used | |
| 1047 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1049 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 104A | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 104B | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) | 0: OFF 1: ON |
| 104C | uns16 | RW | BLK1 | On-Off locked | 0: OFF 1: ON |
| 104D | uns16 | RW | BLK2 | Working mode locked | 0: OFF 1: ON |
| 104E | uns16 | RW | BLK3 | Set-point locked | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|---|---------------------|
| 104F | uns16 | RW | BLK4 | Fan mode locked | 0: OFF 1: ON |
| 1050 | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 1051 | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 1052 | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1053 | sig16 | RW | dTRE | Energy saving or night mode temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1054 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1055 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1056 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|---|
| 1057 | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 1058 | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation |
| 1059 | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed (legacy) 2= Med Fan Speed (legacy) 3= Max Fan Speed (legacy) |

Additional functionalities

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|--|--|
| 105A | uns16 | RW | Not used | |
| 105B | uns16 | RW | Not used | |
| 105C | uns16 | RW | Not used | |
| 105D | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 105E | uns16 | RW | Ambient probe value | °C x10 |
| 105F | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 1060 | uns16 | R | IR presence | 1 Present 0 Absent |
| 1061 | uns16 | R | Dip 1 T-MB | 1: ON 0:OFF |
| 1062 | uns16 | R | Dip 2 T-MB | 1: ON 0:OFF |
| 1063 | uns16 | RW | Set variation value (± 3 mode) | $^{\circ}\text{C} * 10; -(\text{reg}1043) \div \text{reg}1043$ |
| 1064 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |
| 1065 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1066 | uns16 | RW | Week day set | 1=Mon...7=Sun |
| 1067 | uns16 | RW | Fan Voltage Set | 10 (1.0V) --- 100 (10.0V) |

Bit Commands

| Addr | Type | Attr. | Descrizione | Note |
|-------------|-------------|--------------|------------------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Auto mode | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min (legacy) | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med (legacy) | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max (legacy) | 1 executes the command |

MODBUS Data – CFF

(for CFF fan-coil only 4 dip bank ,maximum 15 address)

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 0x5020 CFF Evo Display Evo 0x5023 CFF Evo Display Eco 0x5024 CFF Evo w/o Display |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|----------------------|--------------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---------------------|---|
| 1005 | sig16 | R | Dip 1 configuration | 1: Continuous ventilation off 0: Continuous ventilation on |
| 1006 | sig16 | R | Dip 2 configuration | 1: Slave machine 0: Master machine |
| 1007 | sig16 | R | Dip 3 configuration | 1: Radiant panel present 0: Radiant panel not present |
| 1008 | sig16 | R | Dip 4 configuration | 1: Connectivity OFF 0: Connectivity ON |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---|----------------------------|
| 1009 | uns16 | R | Machine state | 0:OFF 1:ON |
| 100A | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 100B | uns16 | R | Not used | |
| 100C | uns16 | R | Not used | |
| 100D | uns16 | R | Season in use | 0: Summer 1: Winter |
| 100E | uns16 | R | T2 probe used for season choice | 0: No 1: Yes |
| 100F | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1010 | uns16 | R | Radiant panel state | 0: Off 1: On |
| 1011 | uns16 | R | Night mode | 0: Not active 1: Active |
| 1012 | uns16 | R | Not used | |
| 1013 | uns16 | R | Keyboard locked (EVO Interface) | 0: Off 1: On |
| 1014 | uns16 | R | Not used | |
| 1015 | uns16 | R | On/Off memorized machine state (regardless of remote off input) | 0: OFF 1: ON |
| 1016 | uns16 | R | Slave Machine | 0: OFF 1: ON |
| 1017 | uns16 | R | Not used | |
| 1018 | uns16 | R | Not used | |
| 1019 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 101A | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Min (legacy-only T-MB) | 0: OFF 1: ON |
| 101C | uns16 | R | Fan Speed Med (legacy-only T-MB) | 0: OFF 1: ON |
| 101D | uns16 | R | Fan Speed Max (legacy-only T-MB) | 0: OFF 1: ON |
| 101E | uns16 | R | Fan Speed Linear (Free User Choice) | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 1 (Inverter) | 0: OFF 1: ON |
| 1020 | uns16 | R | State of Relay 2 (Valve) | 0: OFF 1: ON |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|----------------------------------|------------------------|
| 1021 | uns16 | R | State of Relay 3 (Radiant panel) | 0: OFF 1: ON |
| 1022 | uns16 | R | State of Relay 4 (Boiler) | 0: OFF 1: ON |
| 1023 | uns16 | R | State of Relay 5 (Chiller) | 0: OFF 1: ON |
| 1024 | uns16 | R | Digital Input IN1 | 1: Closed 0: Opened |
| 1025 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1026 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1027 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 1028 | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 1029 | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102A | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102B | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102C | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 102D | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 102E | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 102F | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1030 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1031 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1032 | sig16 | RW | | Not used | |
| 1033 | sig16 | RW | | Not used | |
| 1034 | sig16 | RW | | Not used | |
| 1035 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1036 | sig16 | RW | | Not used | |
| 1037 | sig16 | RW | | Not used | |
| 1038 | sig16 | RW | | Not used | |
| 1039 | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103A | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103B | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103C | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 103E | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 103F | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1040 | sig16 | RW | dS | Allowed set point variation from T-MB | °C*10; 0,0 ÷ 9,0 |
| 1041 | sig16 | RW | | Not used | |
| 1042 | sig16 | RW | | Not used | |
| 1043 | sig16 | RW | | Not used | |
| 1044 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1045 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1046 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1047 | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) only T-MB | 0: OFF 1: ON |
| 1049 | uns16 | RW | BLK1 | On-Off locked (only T-MB) | 0: OFF 1: ON |
| 104A | uns16 | RW | BLK2 | Working mode locked (only T-MB) | 0: OFF 1: ON |
| 104B | uns16 | RW | BLK3 | Set-point locked (only T-MB) | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|---|---------------------|
| 104C | uns16 | RW | BLK4 | Fan mode locked (only T-MB) | 0: OFF 1: ON |
| 104D | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 104E | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 104F | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1050 | sig16 | RW | dTRE | Energy saving or night mode temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1051 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1052 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1053 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|---|
| 1054 | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 1055 | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation |
| 1056 | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed (legacy) 2= Med Fan Speed (legacy) 3= Max Fan Speed (legacy) |

Additional functionalities

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|---|
| 1057 | uns16 | RW | Not used | |
| 1058 | uns16 | RW | Reserved | Must be 0 |
| 1059 | uns16 | RW | Not used | |
| 105A | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 105B | uns16 | RW | Ambient probe value | °C x10 |
| 105C | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 105D | uns16 | R | Mode ±3 | 0: OFF 1:ON |
| 105E | uns16 | R | NTC T-MB | 0: ON 1:OFF |
| 105F | uns16 | RW | Set variation value (±3 mode) | °C*10; -(reg1043) ÷ reg1043 |
| 1060 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |
| 1061 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1062 | uns16 | RW | Week day set | 1=Mon...7=Sun |
| 1063 | uns16 | RW | Fan Voltage Set | 10 (1.0V) --- 100 (10.0V) |
| 1064 | uns16 | RW | Night mode | 1: Night mode On 0: Night mode Off |
| 1065 | uns16 | RW | Keyboard locked (EVO Interface) | 1: On 0: Off |
| 1066 | uns16 | RW | Not used | When read returns 0 |
| 1067 | uns16 | RW | Not used | When read returns 0 |
| 1068 | uns16 | RW | Not used | When read returns 0 |
| 1069 | uns16 | RW | Not used | When read returns 0 |
| 106A | uns16 | RW | Not used | When read returns 0 |
| 106B | uns16 | RW | Not used | When read returns 0 |
| 106C | uns16 | RW | Not used | When read returns 0 |
| 106D | uns16 | RW | Not used | When read returns 0 |

Bit Commands

| Addr | Type | Attr. | Descrizione | Note |
|------|-------|-------|------------------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Not used | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min (legacy) | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med (legacy) | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max (legacy) | 1 executes the command |

MODBUS Data – CVP2

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 0x500D CVP2 |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------------|-------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|---------------------|---|
| 1005 | sig16 | R | Dip 1 configuration | 1: Continuous ventilation off 0: Continuous ventilation on |
| 1006 | sig16 | R | Dip 2 configuration | 1: Anti-stratification w/o EV or Res 0: Standard anti-stratification |
| 1007 | sig16 | R | Dip 3 configuration | 1: ECM motor 0: Async motor |
| 1008 | sig16 | R | Dip 4 configuration | 1: Slave 0: Master |
| 1009 | sig16 | R | Dip 5 configuration | 1: Resistance on if water is cold 0: Resistance instead of water |
| 100A | sig16 | R | Dip 6 configuration | 1: Connectivity Off 0: Connectivity On |
| 100B | sig16 | R | Not used | |
| 100C | sig16 | R | Not used | |
| 100D | sig16 | R | Not used | |
| 100E | sig16 | R | Not used | |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|--|------------------------|
| 100F | uns16 | R | Machine state | 0:OFF 1:ON |
| 1010 | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 1011 | uns16 | R | Auto mode | 0: OFF 1: ON |
| 1012 | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 1013 | uns16 | R | Season in use | 0: Summer 1: Winter |
| 1014 | uns16 | R | T2 probe used for season choice | 0: No 1: Yes |
| 1015 | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1016 | uns16 | R | Resistance state | 0: Off 1: On |
| 1017 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 1018 | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 1019 | uns16 | R | Fan Speed Min (legacy-only T-MB) | 0: OFF 1: ON |
| 101A | uns16 | R | Fan Speed Med (legacy-only T-MB) | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Max (legacy-only T-MB) | 0: OFF 1: ON |
| 101C | uns16 | R | State of Relay 1 (Fan Min) | 0: OFF 1: ON |
| 101D | uns16 | R | State of Relay 2 (Fan Med) | 0: OFF 1: ON |
| 101E | uns16 | R | State eof Relay 3 (Fan Max or Inverter On) | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 4 (Resistance) | 0: OFF 1: ON |
| 1020 | uns16 | R | State of Relay 5 (EV) | 0: OFF 1: ON |
| 1021 | uns16 | R | State of Relay 6 (Boiler) | 0: OFF 1: ON |
| 1022 | uns16 | R | State of Relay 7 (Chiller) | 0: OFF 1: ON |
| 1023 | uns16 | R | Digital Input - Window | 0: Closed 1: Opened |
| 1024 | uns16 | R | Digital Input – Pump Alarm | 0: Closed 1: Opened |
| 1025 | uns16 | R | Not used | |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---------------------|-----------------|
| 1026 | uns16 | R | Not used | |
| 1027 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1028 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1029 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 102A | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |
| 102B | uns16 | R | Alarmp: Pump input | 0: OFF 1: ON |

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 102C | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102D | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102E | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102F | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 1030 | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 1031 | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 1032 | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1033 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1034 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1035 | sig16 | RW | | Not used | °C*10; 18,0 ÷ 30,0 |
| 1036 | sig16 | RW | | Not used | °C*10; 1,0 ÷ 6,0 |
| 1037 | sig16 | RW | | Not used | |
| 1038 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1039 | sig16 | RW | dEds | Auto mode Setpoint | °C*10; 18,0 ÷ 30,0 |
| 103A | sig16 | RW | dEdr | Auto mode Range | °C*10; 1,0 ÷ 6,0 |
| 103B | sig16 | RW | | Not used | |
| 103C | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103E | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103F | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 1040 | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 1041 | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1042 | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1043 | sig16 | RW | dS | Allowed set point variation from T-MB | °C*10; 0,0 ÷ 9,0 |
| 1044 | sig16 | RW | | Not used | |
| 1045 | sig16 | RW | | Not used | |
| 1046 | sig16 | RW | | Not used | |
| 1047 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1049 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 104A | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 104B | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) only T-MB | 0: OFF 1: ON |
| 104C | uns16 | RW | BLK1 | On-Off locked (only T-MB) | 0: OFF 1: ON |
| 104D | uns16 | RW | BLK2 | Working mode locked (only T-MB) | 0: OFF 1: ON |
| 104E | uns16 | RW | BLK3 | Set-point locked (only T-MB) | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|---|---------------------|
| 104F | uns16 | RW | BLK4 | Fan mode locked (only T-MB) | 0: OFF 1: ON |
| 1050 | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 1051 | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 1052 | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1053 | sig16 | RW | dTRE | Energy saving or night mode temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1054 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1055 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1056 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |
| 1057 | sig16 | RW | Ft1 | Anti-stratification wait time | minutes; 10 ÷ 20 |
| 1058 | sig16 | RW | t1SE | T1 Summer base compensation | °C*10; 0,0 ÷ 2,0 |
| 1059 | sig16 | RW | Ft2E | Summer anti-stratification time | Seconds; 0 ÷ 180 |
| 105A | sig16 | RW | t1SI | T1 Winter base compensation | °C*10; 0,0 ÷ 5,0 |
| 105B | sig16 | RW | Ft2I | Winter anti-stratification time | Seconds; 0 ÷ 210 |

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|--|
| 105C | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 105D | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation 3=Auto |
| 105E | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed 2= Med Fan Speed 3= Max Fan Speed |

Additional functionalities

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|--|--|
| 106D | uns16 | RW | Not used | |
| 106E | uns16 | RW | IN2 used for decreasing setpoint | 1 Yes 0 No |
| 106F | uns16 | RW | decreasing setpoint from IN2 value | 3°C - 6°C |
| 1070 | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 1071 | uns16 | RW | Ambient probe value | °C x10 |
| 1072 | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 1073 | uns16 | R | IR presence | 1 Present 0 Absent |
| 1074 | uns16 | R | Mode ±3 | 0: OFF 1:ON |
| 1075 | uns16 | R | NTC T-MB | 0: ON 1:OFF |
| 1076 | uns16 | RW | Set variation value (±3 mode) | °C*10; -(reg1043) ÷ reg1043 |
| 1077 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |
| 1078 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1079 | uns16 | RW | Week day set | 1=Mon...7=Sun |
| 107A | uns16 | RW | Force flap position | 0: Flap standard position (or swing stop) 1: Force summer position 2: Force winter position 3: Force all open position 4: Force flap swing |
| 107B | uns16 | RW | Fan Voltage Set | 10 (1.0V) --- 100 (10.0V) |
| 107C | uns16 | RW | Night mode | 1: Night mode On 0: Night mode Off |

Bit Commands

| Addr | Type | Attr. | Descrizione | Note |
|------|-------|-------|----------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Auto Mode | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max | 1 executes the command |

MODBUS Data – CRC

(for CRC fan-coil only 4 dip bank ,maximum 15 address)

Hardware and software identification

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---|--|
| 1000 | uns16 | R | Controller model, identifies the board type (hexadecimal data) | 0x5025 CRC |
| 1001 | uns16 | R | Firmware Release (most significant byte major release, less significant byte minor release) | Ex. If this register contains 106 (hexadecimal) then the release is 1.06 |

Temperatures read by the probes

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|----------------------|--------------|
| 1002 | sig16 | R | Temperature probe T1 | °C*10 |
| 1003 | sig16 | R | Temperature probe T2 | °C*10 |
| 1004 | sig16 | R | Temperature probe T3 | °C*10 |

Dip switches configuration

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---------------------|---|
| 1005 | sig16 | R | Dip 1 configuration | 1: 4 tubes 0: 2 tubes |
| 1006 | sig16 | R | Dip 2 configuration | 1: Continuous ventilation off 0: Continuous ventilation on |
| 1007 | sig16 | R | Dip 3 configuration | 1: T3 for summer and winter 0: T3 for winter |
| 1008 | sig16 | R | Dip 4 configuration | 1: Slave machine 0: Master machine |

Machine state and alarms

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|--|----------------------------|
| 1009 | uns16 | R | Machine state | 0:OFF 1:ON |
| 100A | uns16 | R | Fan Only mode | 0: OFF 1: ON |
| 100B | uns16 | R | Not used | |
| 100C | uns16 | R | Machine is in dead zone | 0: OFF 1: ON |
| 100D | uns16 | R | Season in use | 0: Summer 1: Winter |
| 100E | uns16 | R | T2 probe used for season choice | 0: No 1: Yes |
| 100F | uns16 | R | Thermoregulation requested | 0: No 1: Yes |
| 1010 | uns16 | R | Resistance state | 0: Off 1: On |
| 1011 | uns16 | R | Night mode | 0: Not active 1: Active |
| 1012 | uns16 | R | Not used | |
| 1013 | uns16 | R | Keyboard locked (EVO Interface) | 0: Off 1: On |
| 1014 | uns16 | | Not used | |
| 1015 | uns16 | | On/Off memorized machine state (regardless of remote off input) | 0: OFF 1: ON |
| 1016 | uns16 | | Slave Machine | 0: OFF 1: ON |
| 1017 | uns16 | | Not used | |
| 1018 | uns16 | | Not used | |
| 1019 | uns16 | R | State of Automatic Ventilation | 0: OFF 1: ON |
| 101A | uns16 | R | Ventilation is stopped | 0: OFF 1: ON |
| 101B | uns16 | R | Fan Speed Min (legacy-only T-MB) | 0: OFF 1: ON |
| 101C | uns16 | R | Fan Speed Med (legacy-only T-MB) | 0: OFF 1: ON |
| 101D | uns16 | R | Fan Speed Max (legacy-only T-MB) | 0: OFF 1: ON |
| 101E | uns16 | R | Fan Speed Linear (Free User Choice) | 0: OFF 1: ON |
| 101F | uns16 | R | State of Relay 1 (Inverter) | 0: OFF 1: ON |
| 1020 | uns16 | R | State of Relay 2 (Valve) | 0: OFF 1: ON |

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|---|------------------------|
| 1021 | uns16 | R | State of Relay 3 (Hot water valve/resistance) | 0: OFF 1: ON |
| 1022 | uns16 | R | State of Relay 4 (Boiler) | 0: OFF 1: ON |
| 1023 | uns16 | R | State of Relay 5 (Chiller) | 0: OFF 1: ON |
| 1024 | uns16 | R | Digital Input IN1 | 1: Closed 0: Opened |
| 1025 | uns16 | R | Analog output 0-10V | Volt*10 |
| 1026 | uns16 | R | Alarm: T1 fault | 0: OFF 1: ON |
| 1027 | uns16 | R | Alarm: T2 fault | 0: OFF 1: ON |
| 1028 | uns16 | R | Alarm: T3 fault | 0: OFF 1: ON |

Machine Parameters

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|-------|--|--------------------------|
| 1029 | sig16 | RW | OFS | T-MB NTC probe offset | °C*10; -3,0 ÷ 3,0 |
| 102A | sig16 | RW | LSE | Summer set-point | °C*10; reg1047 ÷ reg1048 |
| 102B | sig16 | RW | LSI | Winter set-point | °C*10; reg1049 ÷ reg104A |
| 102C | sig16 | RW | T2-1 | T2 change-over temperature: ventilation-->cooling | °C*10; 12,0 ÷ 22,0 |
| 102D | sig16 | RW | T2-2 | T2 change-over temperature: ventilation-->heating | °C*10; 28,0 ÷ 36,0 |
| 102E | sig16 | RW | T2-3 | T2 change-over hysteresis | °C*10; 2,0 ÷ 5,0 |
| 102F | sig16 | RW | T3-1 | T3 Fan ON when heating | °C*10; 30,0 ÷ 40,0 |
| 1030 | sig16 | RW | T3-2 | T3 Fan ON when cooling | °C*10; 10,0 ÷ 25,0 |
| 1031 | sig16 | RW | I-T3 | T3 Fan control hysteresis | °C*10; 2,0 ÷ 8,0 |
| 1032 | sig16 | RW | | Not used | |
| 1033 | sig16 | RW | | Not used | |
| 1034 | sig16 | RW | | Not used | |
| 1035 | sig16 | RW | I-rL | Thermoregulation hysteresis | °C*10; 0,5 ÷ 2,0 |
| 1036 | sig16 | RW | | Not used | |
| 1037 | sig16 | RW | | Not used | |
| 1038 | sig16 | RW | | Not used | |
| 1039 | sig16 | RW | SLu1 | ECM Voltage MIN Speed | Volt*10; 1,0 ÷ 6,0 |
| 103A | sig16 | RW | SCu2 | ECM Voltage MED Speed | Volt*10; 3,0 ÷ 8,0 |
| 103B | sig16 | RW | SHu3 | ECM Voltage MAX Speed | Volt*10; 6,0 ÷ 10,0 |
| 103C | sig16 | RW | LLSI | ECM auto fan speed minimum voltage in Winter | Volt*10; 1,0 ÷ 6,0 |
| 103D | sig16 | RW | HLSI | ECM auto fan speed maximum voltage in Winter | Volt*10; 5,0 ÷ 10,0 |
| 103E | sig16 | RW | PFC | Summer proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 103F | sig16 | RW | PFH | Winter proportional bandwidth | °C*10; 2,0 ÷ 6,0 |
| 1040 | sig16 | RW | dS | Allowed set point variation from T-MB | °C*10; 0,0 ÷ 9,0 |
| 1041 | sig16 | RW | | Not used | |
| 1042 | sig16 | RW | | Not used | |
| 1043 | sig16 | RW | | Not used | |
| 1044 | sig16 | RW | SminE | Summer set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1045 | sig16 | RW | SmaxE | Summer set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1046 | sig16 | RW | SminI | Winter set-point min limit | °C*10; 10,0 ÷ 30,0 |
| 1047 | sig16 | RW | SmaxI | Winter set-point max limit | °C*10; 10,0 ÷ 30,0 |
| 1048 | uns16 | RW | BLK0 | All settings locked (see the next 4 registers) only T-MB | 0: OFF 1: ON |
| 1049 | uns16 | RW | BLK1 | On-Off locked (only T-MB) | 0: OFF 1: ON |
| 104A | uns16 | RW | BLK2 | Working mode locked (only T-MB) | 0: OFF 1: ON |
| 104B | uns16 | RW | BLK3 | Set-point locked (only T-MB) | 0: OFF 1: ON |

| Addr | Type | Attr. | Symb | Description | Notes |
|------|-------|-------|------|---|---------------------|
| 104C | uns16 | RW | BLK4 | Fan mode locked (only T-MB) | 0: OFF 1: ON |
| 104D | sig16 | RW | LLSE | ECM auto fan speed minimum voltage in Summer | Volt*10; 1,0 ÷ 6,0 |
| 104E | sig16 | RW | HLSE | ECM auto fan speed maximum voltage in Summer | Volt*10; 5,0 ÷ 10,0 |
| 104F | sig16 | RW | T-AG | Antifreeze temperature | °C*10; 4,0 ÷ 8,0 |
| 1050 | sig16 | RW | dTRE | Energy saving or night mode temperature delta | °C*10; 3,0 ÷ 8,0 |
| 1051 | uns16 | RW | t-Pr | Weekly Timer programmed by the T-MB | 0: OFF 1: ON |
| 1052 | uns16 | RW | AGon | Antifreeze function | 0: OFF 1: ON |
| 1053 | uns16 | RW | REon | Energy saving function | 0: OFF 1: ON |

Commands

| Addr | Type | Attr. | Description | Notes |
|------|-------|-------|----------------|---|
| 1054 | uns16 | W | ON-OFF command | 1=ON 0=OFF |
| 1055 | uns16 | W | Mode command | 0=Summer 1=Winter 2=Only Ventilation |
| 1056 | uns16 | W | Fan command | 0= Automatic Fan Speed 1= Min Fan Speed (legacy) 2= Med Fan Speed (legacy) 3= Max Fan Speed (legacy) |

Additional functionalities

| Addr | Type | Attr. | Description | Notes |
|-------------|-------------|--------------|--|---|
| 1057 | uns16 | RW | Not used | |
| 1058 | uns16 | RW | Reserved | Must be 0 |
| 1059 | uns16 | RW | Not used | |
| 105A | uns16 | RW | Enabling of ambient probe value via MB | 1 Yes 0 No |
| 105B | uns16 | RW | Ambient probe value | °C x10 |
| 105C | uns16 | R | T-MB presence | 1 Present 0 Absent |
| 105D | uns16 | R | Mode ±3 | 0: OFF 1:ON |
| 105E | uns16 | R | NTC T-MB | 0: ON 1:OFF |
| 105F | uns16 | RW | Set variation value (±3 mode) | °C*10; -(reg1043) ÷ reg1043 |
| 1060 | uns16 | W | Parameters Reset | The reset takes place by writing 0x005A |
| 1061 | uns16 | RW | Time set | MSB: Hour, LSB: Minutes |
| 1062 | uns16 | RW | Week day set | 1=Mon...7=Sun |
| 1063 | uns16 | RW | Fan Voltage Set | 10 (1.0V) --- 100 (10.0V) |
| 1064 | uns16 | RW | Night mode | 1: Night mode On 0: Night mode Off |
| 1065 | uns16 | RW | Keyboard locked (EVO Interface) | 1: On 0: Off |
| 1066 | uns16 | RW | Not used | When read returns 0 |
| 1067 | uns16 | RW | Not used | When read returns 0 |
| 1068 | uns16 | RW | Not used | When read returns 0 |
| 1069 | uns16 | RW | Not used | When read returns 0 |
| 106A | uns16 | RW | Not used | When read returns 0 |
| 106B | uns16 | RW | Not used | When read returns 0 |
| 106C | uns16 | RW | Not used | When read returns 0 |
| 106D | uns16 | RW | Not used | When read returns 0 |

Bit Commands

| Addr | Type | Attr. | Descrizione | Note |
|-------------|-------------|--------------|------------------------|------------------------|
| 1100 | uns16 | W | Summer mode | 1 executes the command |
| 1101 | uns16 | W | Winter mode | 1 executes the command |
| 1102 | uns16 | W | Not used | 1 executes the command |
| 1103 | uns16 | W | Only Fan mode | 1 executes the command |
| 1104 | uns16 | W | Fan speed Auto | 1 executes the command |
| 1105 | uns16 | W | Fan speed Min (legacy) | 1 executes the command |
| 1106 | uns16 | W | Fan speed Med (legacy) | 1 executes the command |
| 1107 | uns16 | W | Fan speed Max (legacy) | 1 executes the command |