ecoFOREST

Modbus KNX

EN

APIs BUS CLIENT MANUAL
V03

MODEL:

SERVICE CONTACT:

Contents

1. General considerations

1.1. General description

This manual includes the necessary information to use the client control applications by BUS for devices marketed by Ecoforest (APIs BUS Client).

The APIs BUS Client allow remote monitoring and management of devices by using a list of read and write registers for using with MODBUS RTU and KNX protocols. Within the APIs BUS Client applications, there are separately registers lists for the management of heat pumps, supervisor and the source manager, hereinafter called API HP Client, API ESB Client and API ESO Client, respectively.

The APIs BUS Client control applications are available for AWD24, WWD24, WWC24 software versions and later, and replace the register lists used in previous software versions, which are no longer available.

NOTE

- The API HP Client register list is common for all marketed heat pump models (ecoGEO, ecoGEO HP and ecoAIR).

- The register list included in this document corresponds to the software versions available at the date on which it was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

1.2. Software version compatibility

The APIS BUS Client control applications are available for software versions AWD24, WWD24, WWC24 and later, however, to guarantee a total compatibility, it is necessary that the list of registers used be the same than programmed in the software version of the device with which communication is to be established.

NOTE

- Using outdated registers lists may cause incompatibility issues and/or limited functionality of some applications.

- Previous software version to a AWD24, WWD24 y WWC24 are non-compatible with the APIs HP Client.

- This document includes a change log to identify the modifications included in the register list of each application version.

With the aim of make easier the identification of compatible versions, the BUS register list used in the software version installed in the device can be consulted in the user menu.

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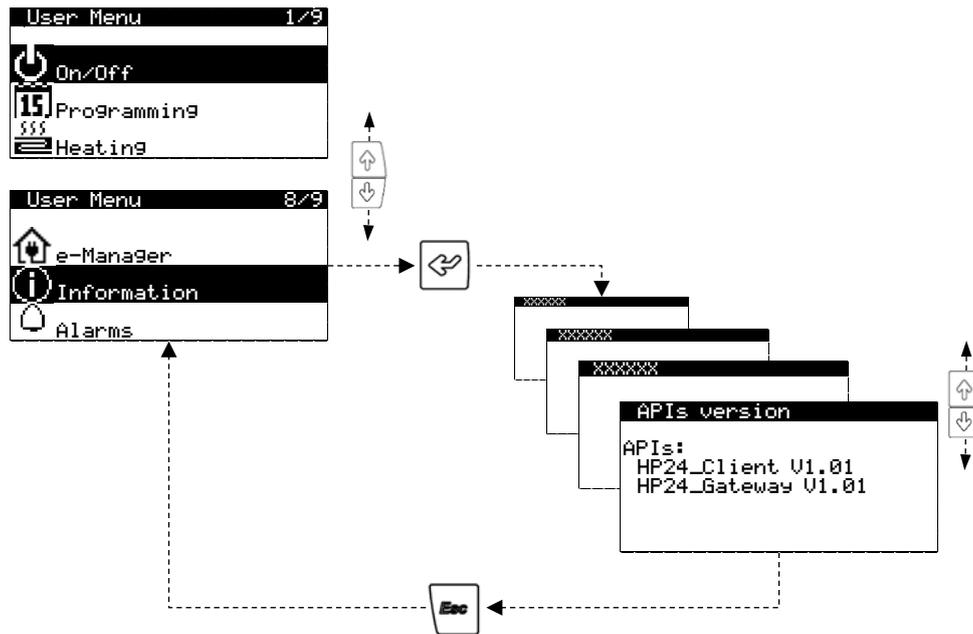
Figure 1.1. Access to the API BUS Client version display screen in the heat pump software.

The API BUS Client version code is made up of different digits that must be considered to evaluate compatibility:

Figure 1.2. API HP Client version display screen.

- Type of device: Indicates the type of device to which the BUS application version corresponds. The acronym HP indicates that it is a heat pump application, the acronym ESB corresponds to a supervisor and the acronym ESO indicates that it is a source manager application.

- Project code: The version of the project code changes if there are major changes in the structure or content of the register list, so that an incompatibility with previous versions is generated.

- Version code: The API version code changes if there is a modification in the registers list that allows to expand the functionalities that can be managed by means of the BUS communication. Modifications in the version code no generate incompatibilities with previous versions, but it requires an update if you want to use the new features.

- Subversion code: The API subversion code changes if there is a minor change or a correction respect a previous version that no requires an update.

2. Communications wiring

2.1. Modbus

The controllers used in heat pumps and source manager have two RS485 ports (BMS1 and BMS2) that can be used for BUS communication. If the BMS1 port is used, it is necessary to install an RS485 serial connection card, which is not included by default with the heat pump controller.
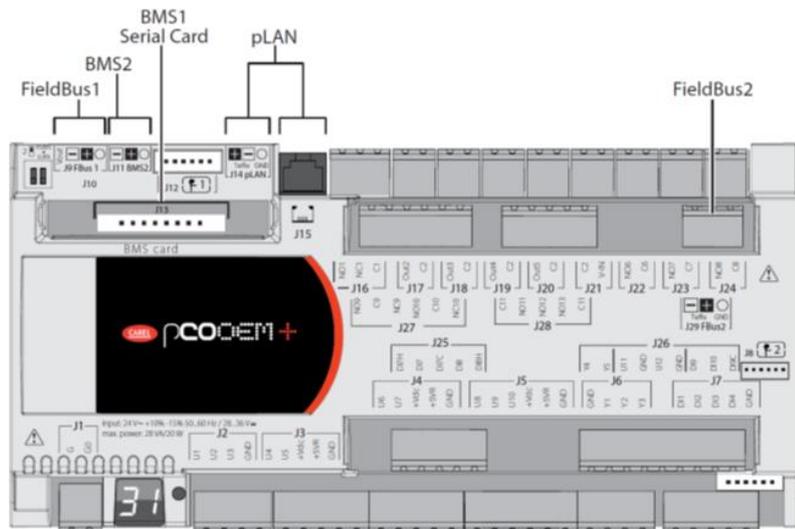
Figure 2.1. Identifying BUS connectors in the unit's driver.

To guarantee a correct operating of the communications network, follow the following recommendations:

- Use shielded 3-wire twisted pair cables. Using any other type of cable may cause communication interference.
- Be sure to connect the wiring to the corresponding terminal of each controller (Tx/Rx-, Tx/Rx+, GND).
- Connect the cable shield to earth to avoid interference.
- Do not install the pLAN network cable parallel to power cabling.

2.1.1. BMS2 port

BUS communication with the controller will generally be carried out through the BMS2 port according to the recommendations included in the previous section.

To establish communication with the BMS2 port, it is necessary to select the port address correctly in the remote-control submenu of the installer menu. The default values configured on the BMS2 port are baud rate 19200, parity none and 2 stop bits. The device address depends on the device type.

Type of device	BMS2 address
Heat pump	17
Supervisor	15
Source manager	14

The BMS2 port configuration parameters can be modified in the installer menu.

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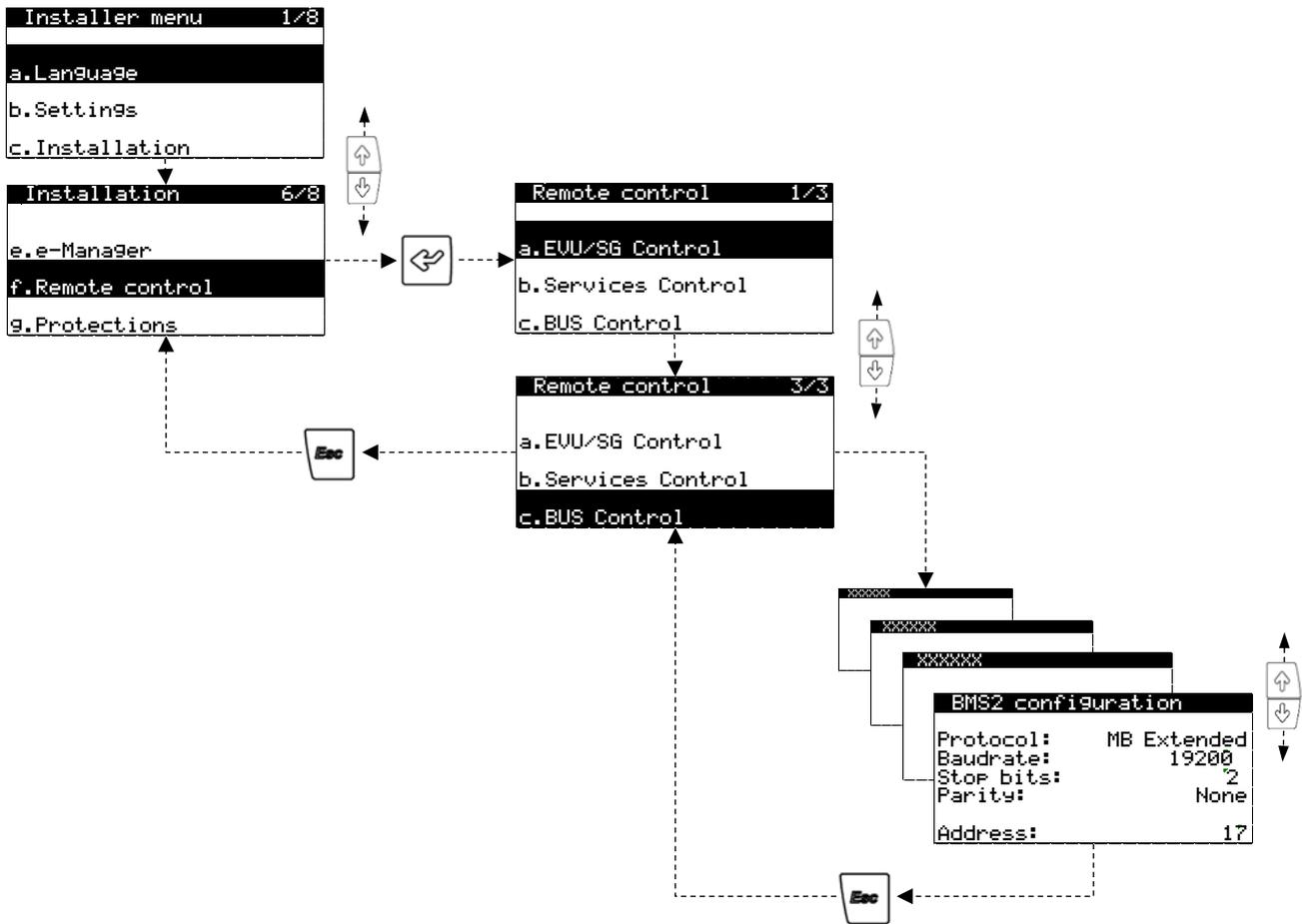
Figure 2.2. Access to the BMS2 port configuration screen in the heat pump software.

2.1.2. BMS port

The use of the BMS port for BUS communication requires the installation of an RS485 serial connection card not included by default with the controller, so in general this connection will only be used if the BMS2 is not available because it is being used by another application.

> ℹ️ **NOTE**
> - In the outdoor units of the ecoAIR heat pumps, the BMS2 port is used for communication with the indoor unit, so only is available the BMS port to perform BUS communication.

Once the RS485 serial connection card is installed, communication will be carried out analogously to the case of using the BMS2 port, and in this case the address of the BMS port must be configured correctly in the remote-control submenu.

The default values configured on the BMS2 port are baud rate 19200, parity none and 2 stop bits. The device address depends on the device type.

Type of device	BMS2 address
Heat pump	17
Supervisor	15
Source manager	14

2.2. KNX

To connect a heat pump to a KNX network, it is necessary a KNX expansion card (reference 3093) connected to the BMS1 port of the controller (see Figure 2.1). The BMS2 port configuration parameters can be modified in the installer menu.

3. BUS communication

3.1. Bus control enablement

To enable the BUS control of the heat pump it is necessary to configure this functionality in the heat pump installer menu.
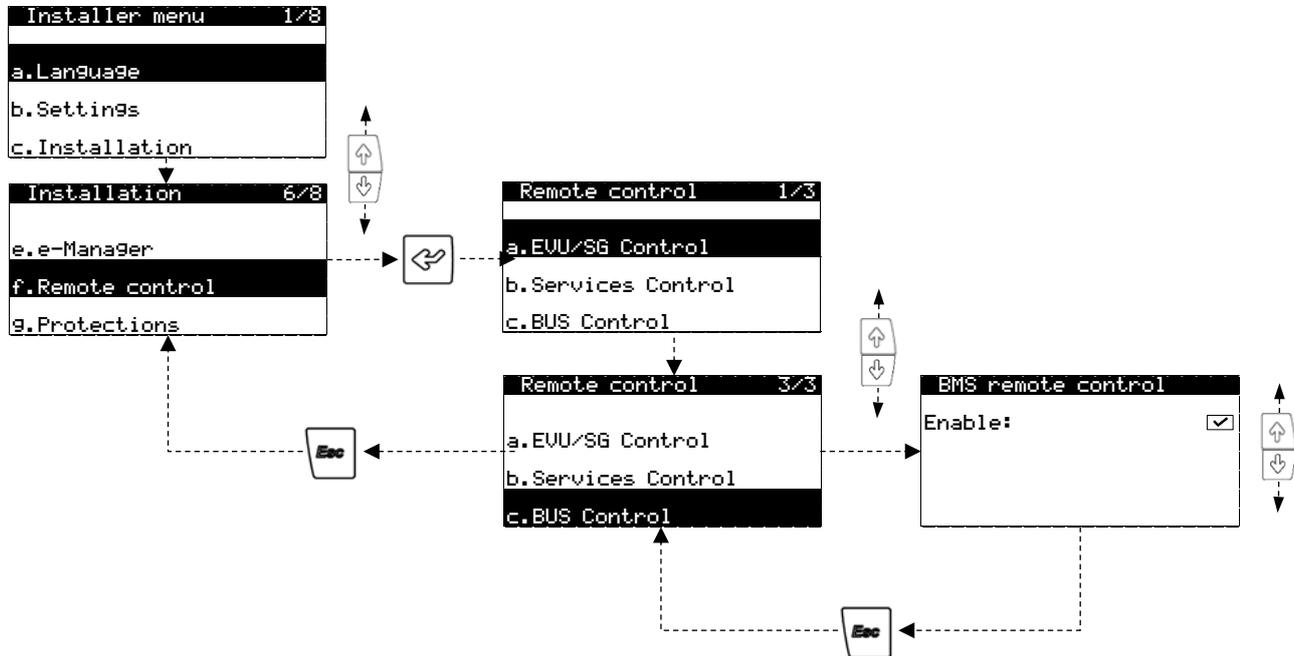
Figure 3.1. Access to the BUS remote control enablement screen in the heat pump software.

In the case of source manager, the BUS control is enabled by default and cannot be disabled by either the user or the installer.

3.2. Modbus protocol

Communications are carried out through the RS-485 port configured as indicated in the previous section using the Modbus RTU (Remote Terminal Unit) communications protocol.

The API HP Client BUS variables are of the holding register type with which the following Modbus functions can be used:

- Function 0x03: Read holding register

- Function 0x06: Present single register

- Function 0x10: Present multiple registers

- Register list with the addresses written in decimal format and the gains corresponding to each of them are shown in chapter 0.

NOTE

- Gain is defined as the factor by which the value of the read register needs to be multiplied to obtain the parameter in the indicated units.

- All communications BUS registers are 16-bit analog type variables.

3.3. Modbus communication examples

Heat pumps outdoor temperature reading

- Controller address 17 (default value) → 11 (HEX)

- Modbus read function → 03 (Function 0x03).

- Initial register address 2080 (see section 4.1.4) → 0820 (HEX)

- Number of registers to read 1 → 0001

- CRC code (Frame verification bytes) → 8530

Question				
Address	Function	Initial register	Nº of tegisters	CRC
11	03	0820	0001	8530

Answer				
Address	Function	Nº Bytes	Register 1	CRC
11	03	02	0106	F815

- Register 1 0106 (HEX) → 262 (DEC)

- Gain 0,1 (see section 4.1.4) → Outdoor temperature = 262*0,1 = 26,2 ºC

Writing the on state in the heat pump

- Controller address 17 (default value) → 11 (HEX)

- Modbus read function → 06 (Function 0x06).

- Register address 2700 (see section 4.2.1) → 0820 (HEX)

- Condition ON condition 2 (gain 1) → 0002 (HEX)

- CRC code (Frame verification bytes) → C8A8 (HEX)

Question				
Address	Function	Initial register	Value	CRC
11	06	0A8C	0002	C8H8

Answer				
Address	Function	Initial register	Value	CRC
11	06	0A8C	0002	C8H8

Writing the heat pump status and the operation program

- Controller address 17 (default value) → 11 (HEX)

- Modbus read function → 10 (Function 0x10).

- Number of register to read → 0002 (HEX)

- Number of bytes (2 x Nº registers) → 04

- Register address 2700 (see section 4.2.1) → 0820 (HEX)

- Condition ON condition 2 (gain 1) → 0002 (HEX)

- Winter program value 1 (gain 1) → 0001 (HEX)

- CRC code (Frame verification bytes) → C8A8 (HEX)

Question							
Address	Function	Initial register	Nº registers	Nº Bytes	Value 1	Value 2	CRC
11	10	0A8C	0002	04	0002	0001	B1FA

Answer				
Address	Function	Initial register	Nº registers	CRC
11	10	0A8C	0002	816B

3.4. KNX protocol

To establish a communication by means of the KNX protocol it is necessary the licensed ETS5 software (available in knx.org). In the ETS5 software it is necessary to install and enable the Dca Carel ETS App (freely available at knx.org) to program the datapoints links, furthermore it is necessary to add the Carel KNX card from the online catalogue to the project.
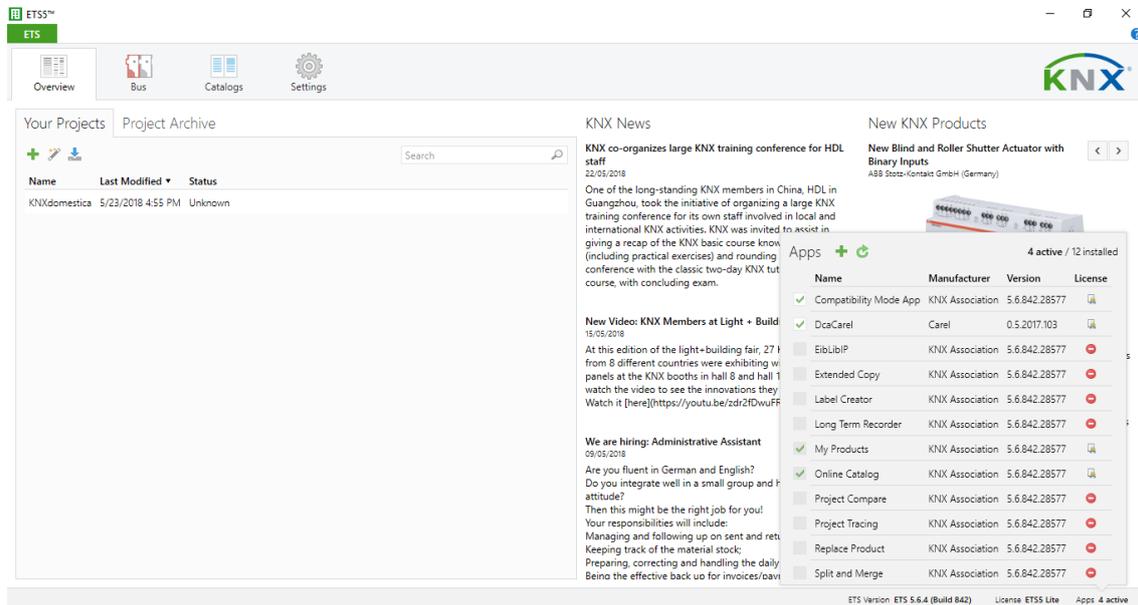
Figure 3.2. ETS5 screenshot with the Apps selection.

Once added the device to the project it is time to setup it up, to do that there are 3 tabs: Group Objects, Parameter and DCA. In the DCA tab under "General Settings" you will setup the KNX card (KNX-Modbus gateway). It is mandatory to set the slave address and the baud rate according to the configuration done in the heat pump.
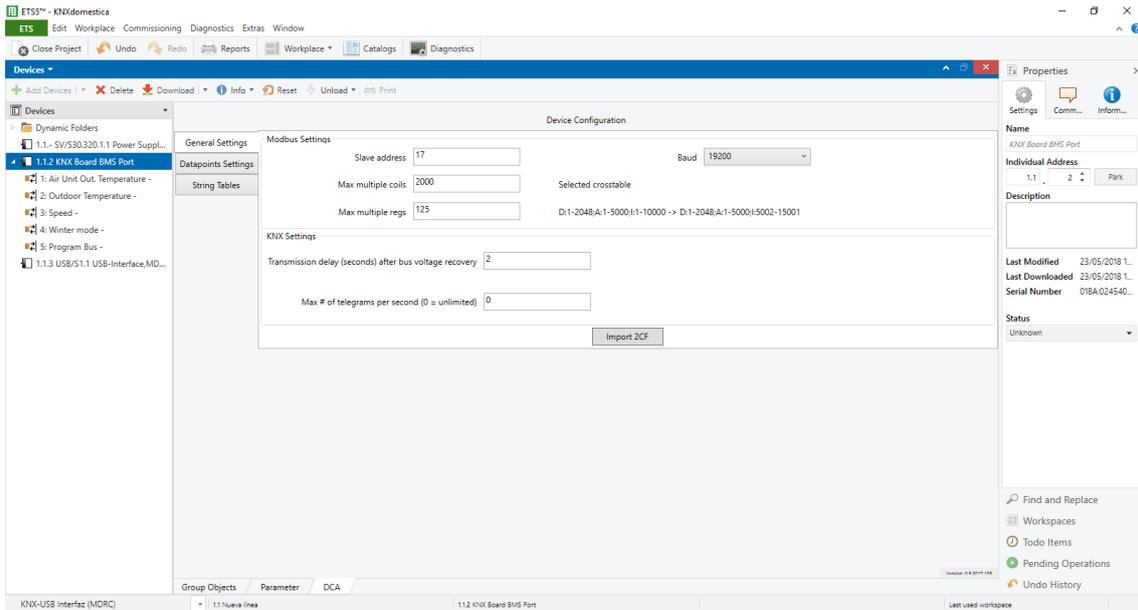
Figure 3.3. Device configuration at ETS5 software.
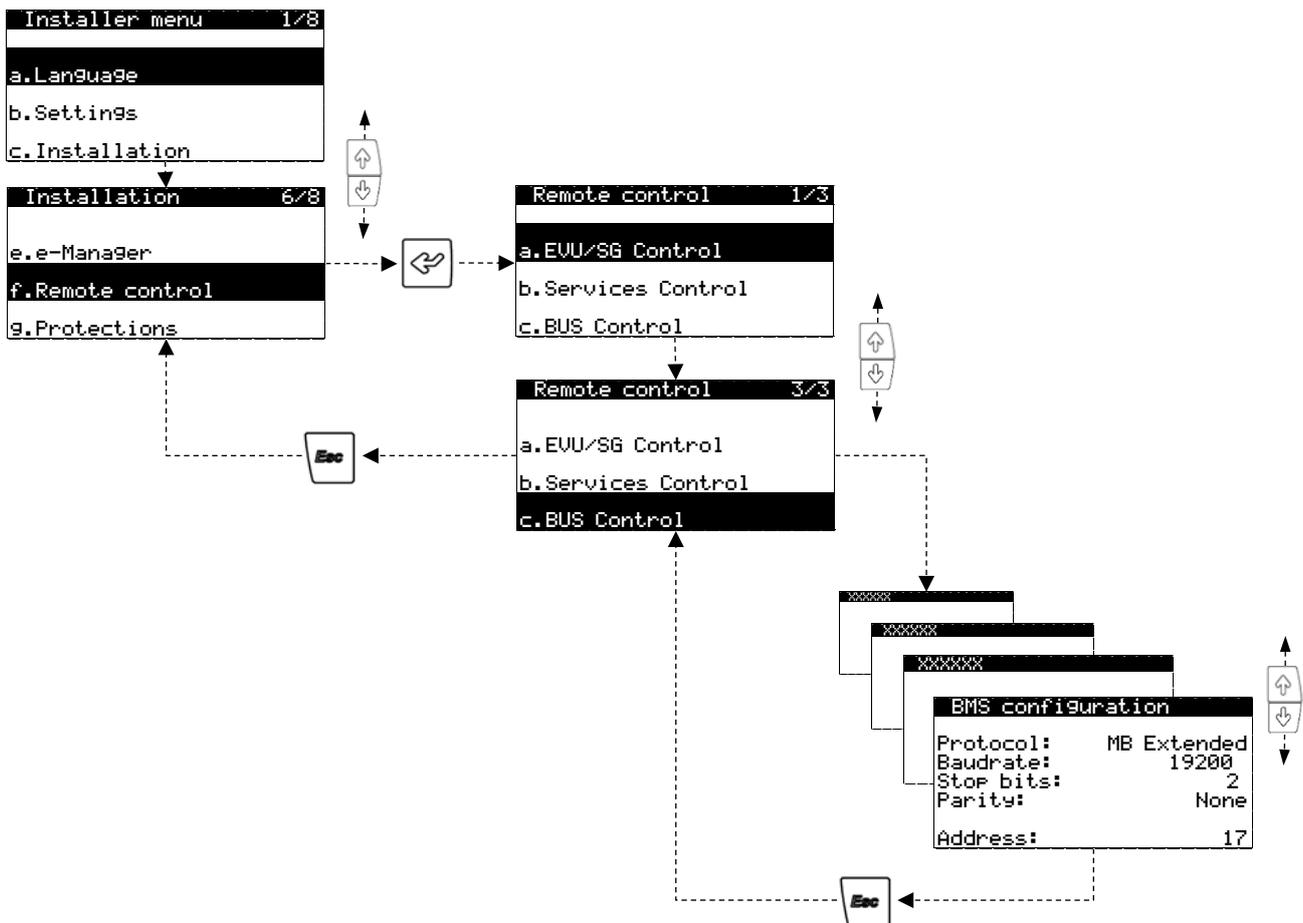
Figure 3.4. Access to the BMS port configuration screen in the heat pump software.

Following you need to import the 2cf file given by Ecoforest for each heat pump model and software version. Then you must select "D:1-2048;A:1-5000;I:1-10000 -> D:1-2048;A:1-5000;I:5002-15001" and in the heat pump set the communications port like "MB Extended" or "MB SVL/Ex1".
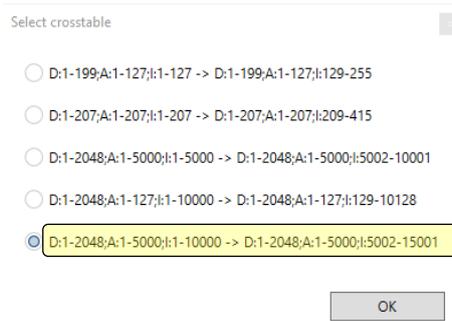
Figure 3.5. Selection Modbus crosstable.

Finally, go to Datapoint Settings tab and add the datapoints you need. Considering that variables available in the client BUS applications are all analog type, the KNX Datapoint will be defined as type (KNX Type) 9.XXX, the sending condition as "On change" with a cycling sending in 1 second intervals. To obtain the final value, the gain indicated in the corresponding registers table will be applied.
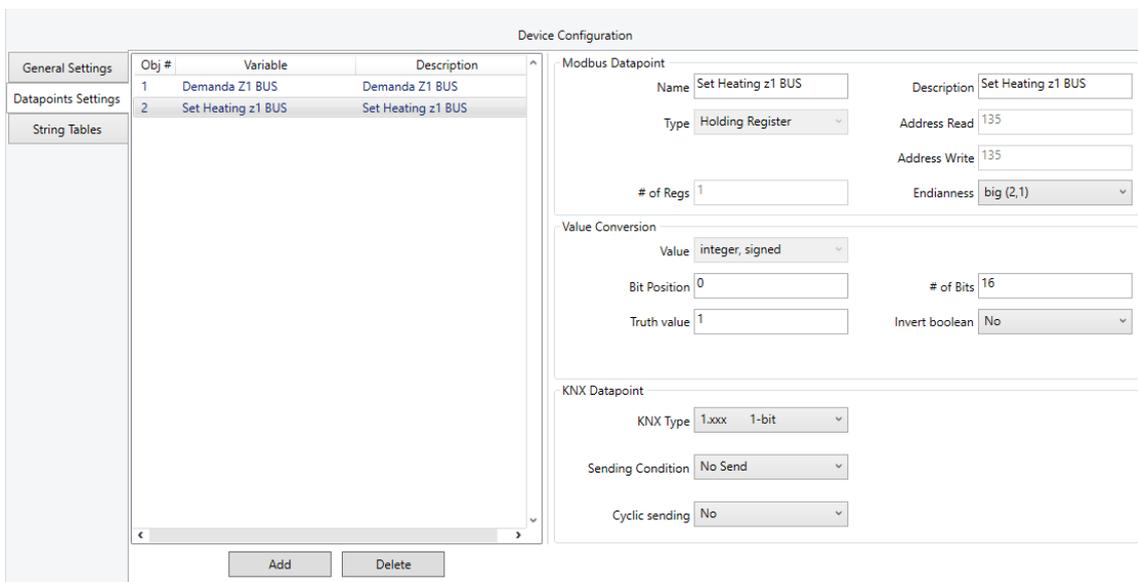
Figure 3.6. Datapoints configuration.

Group Objects Will be created to use in your KNX project.
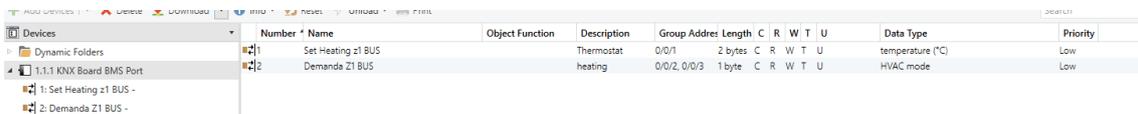
Figure 3.7. Created Group Objects.

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4. Heat pump registers list (API HP24_V01.02)

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NOTA

- The register list included in this document corresponds to the software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

- The API HP Client register list is common for all marketed heat pump models (ecoGEO, ecoGEO HP and ecoAIR).

- The API HP Client only is available for outdoor units of ecoAIR heat pumps if they have been configured as block slave or as a stand-alone.

4.1. Read variables

4.1.1. System variables

The system variables group includes information regarding the heat pump configuration (model code, role and software version) and the date and time used by the equipment.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Year (system)	2000	X		1	-
Month (system)	2001	X		1	-
Day (system)	2002	X		1	-
Hour (system)	2003	X		1	-
Minute (system)	2004	X		1	-

The software version code is built from five variables available in the API HP Client (software platform, product range, software version, compilation type letter, and software subversion) as shown as follows:
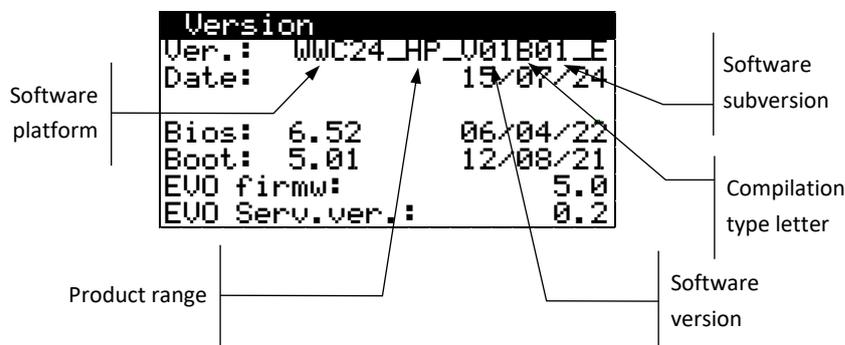
Figure 4.1. Software version code construction.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Software platform	2005	X		1	7=ESO22; 12=AWD24; 13=WWD24; 14=WWC24; 15=ESO24; 16=ESB24
Product range	2006	X		1	1=HP; 2=PS; 3=EM; 4=SM;
Software version VXX	2007	X		1	-
Compilation type letter (subversion)	2008	X		1	1=A; 2=B; 3=C; 4=D; 5=E; 6=F; 7=G; 8=H; 9=I; 10=J; 11=K; 12=L; 13=M; 14=N; 15=O; 16=P; 17=Q; 18=R; 19=S; 20=T; 21=U; 22=V; 23=W; 24=X; 25=Y; 26=Z;
Software version BXX	2009	X		1	-

The model code can be built from six variables existing in the API HP Client. Each of these variables corresponding to each of the digits that make up the model code. The addresses used for these variables are common for geothermal heat pumps and the outdoor units of aerothermal heat pumps, while in the case of the indoor unit of aerothermal heat pumps there are different addresses.

Finally, moreover than model code, the device role within the installation can be consulted.
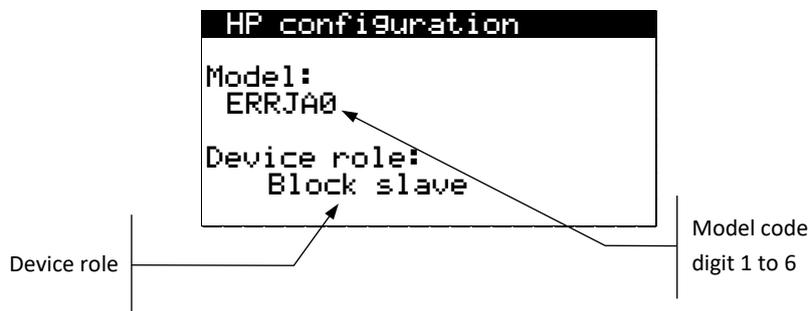
Figure 4.2. Model code construction and device role.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Model code digit 1 (HP model/ODU model)	2010	X		1	
Model code digit 2 (HP model/ODU model)	2011	X		1	
Model code digit 3 (HP model/ODU model)	2012	X		1	
Model code digit 4 (HP model/ODU model)	2013	X		1	1=0; 2=1; 3=2; 4=3; 5=4; 6=5; 7=6;
Model code digit 5 (HP model/ODU model)	2014	X		1	8=9;10=11; 11=A; 12=B; 13=C; 14=D; 15=E;
Model code digit 6 (HP model/ODU model)	2015	X		1	16=F; 17=G; 18=H; 19=I; 20=J; 21=K; 22=L;
Model code digit 1 (IDU model)	2018	X		1	23=M; 24=N; 25=O; 26=P; 27=Q; 28=R; 29
Model code digit 2 (IDU model)	2019	X		1	=S; 30=S; 31=U; 32=V; 33=W; 34=X; 35=Y;
Model code digit 3 (IDU model)	2020	X		1	36=Z;
Model code digit 4 (IDU model)	2021	X		1	
Model code digit 5 (IDU model)	2022	X		1	
Model code digit 6 (IDU model)	2023	X		1	
Device Role	2026	X		1	0 = None 1 = Individual master (IDU)/Stand alone 2 = ecoGEO block master 3 = Block slave 4 = Supervisor 5 = Individual slave 6 = ecoAIR block master

4.1.2. Status information

The state variables show information about the state of services, generators and consumption groups. State variables are all read variables and are generally defined with a value of 0 when the condition is OFF and a value of 1 when the condition is ON. In the case of the heat pump state, the value 2 is included for the case of the EMERGENCY state.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
DHW production mode status	2030	X		1	0 = OFF / 1= ON
Heating production mode status	2031	X		1	0 = OFF / 1= ON
Active cooling production mode status	2032	X		1	0 = OFF / 1= ON
Passive cooling production mode status	2033	X		1	0 = OFF / 1= ON
Pool production mode status	2034	X		1	0 = OFF / 1= ON
Afreeze production mode status	2035	X		1	0 = OFF / 1= ON

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Dryfloor production mode status	2036	X		1	0 = OFF / 1= ON
Operation program [1]	2044	X		1	0 = Winter 1 = Summer 2 = Combined
Heat pump status	2045	X		1	0 = OFF / 1= ON / 2 = EMERGENCY
Integrated auxiliary heater status (Aux 1)	2046	X		1	0 = OFF / 1= ON
Generic external auxiliary heater status (Aux 2)	2047	X		1	0 = OFF / 1= ON
DHW auxiliary heater status (Aux 3)	2048	X		1	0 = OFF / 1= ON
BUFFER auxiliary heater status (Aux 4)	2049	X		1	0 = OFF / 1= ON
Generic external auxiliary chiller status (Aux 5)	2050	X		1	0 = OFF / 1= ON
DHW recirculation status	2055	X		1	0 = OFF / 1= ON
Group 1 status	2056	X		1	0 = OFF / 1= ON
Group 2 status	2057	X		1	0 = OFF / 1= ON
Group 3 status	2058	X		1	0 = OFF / 1= ON
Group 4 status	2059	X		1	0 = OFF / 1= ON
Group 5 status	2060	X		1	0 = OFF / 1= ON

(1)   See change log (section 4.3).

4.1.3. Alarms display

The API HP Client uses a simplified alarm visualization system through which you can obtain a complete view of the current situation with a reduced number of variables. The information available in the API HP Client is as follows:

- Alarm level: Indicates the alarm level of the equipment. If there are more than one alarm level, is shown the most serious level of all existing alarms

- Lock alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are generating a locked condition.

- Long time alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are meeting the long-time alarm condition.

- Recurrent alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are meeting the recurrence condition.

- Active alarm codes: Are displayed the codes of the 5 alarms with the highest priority among active alarms existing at a given time.

NOTE
- The list with the alarm codes is presented in appendix 1.
- The alarm list included in this document corresponds to the alarm list used in software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Alarm level	2065	X		1	0 = No alarm 1 = Active alarm 2 = Active alarm + recurrence 3 = Recurrent alarm 4 = Long time alarm 5 = Lock-down due to alarm
Lock alarm code	2066	X		1	See alarm list (Appendix 1)
Long time alarm code	2067	X		1	

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Recurrence alarm code	2068	X		1	
Active alarm code 1	2069	X		1	
Active alarm code 2	2070	X		1	
Active alarm code 3	2071	X		1	
Active alarm code 4	2072	X		1	
Active alarm code 5	2073	X		1	

4.1.4. Heat pump general information

The API HP Client allows access to the values of the readings of the sensors of the heat pump as well as some parameters obtained from said readings to make easier monitoring the heat pump status.

NOTE

- ▪ The temperature readings through the communications BUS are always made in ºC, regardless of the units configured in the heat pump program.

- ▪ The pressure readings through the communications BUS are always manometric pressures and are always made in bar, regardless of the units configured in the heat pump program.

- ▪ Relative humidity readings through the communications BUS are made as a percentage.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Outdoor temperature	2080	X		0,1	-
Primary circuit outlet temperature	2081	X		0,1	-
Primary circuit inlet temperature	2082	X		0,1	-
Primary circuit pressure	2083	X		0,1	-
Secondary circuit outlet temperature	2084	X		0,1	-
Secondary circuit inlet temperature	2085	X		0,1	-
Secondary circuit pressure	2086	X		0,1	-
Tertiary circuit outlet temperature	2087	X		0,1	-
Tertiary circuit inlet temperature	2088	X		0,1	-
Auxiliary heater outlet temperature	2089	X		0,1	-
Auxiliary chiller outlet temperature	2090	X		0,1	-
Air unit outlet temperature	2091	X		0,1	-
Compressor suction temperature	2092	X		0,1	-
Compressor suction pressure	2093	X		0,1	-
Compressor discharge pressure	2094	X		0,1	-
Compressor discharge temper. / Scroll temperature	2095	X		0,1	-
Superheat	2096	X		0,1	-
Inverter temperature	2097	X		0,1	-
Evaporation temperature	2098	X		0,1	-
Condensing temperature	2099	X		0,1	-
DT primary circuit	2100	X		0,1	-
DT secondary circuit	2101	X		0,1	-
DT tertiary circuit	2102	X		0,1	-
DHW tank temperature	2130	X		0,1	-
DHW recirculation temperature	2131	X		0,1	-
Heating buffer tank temperature	2132	X		0,1	-
Cooling buffer tank temperature	2133	X		0,1	-
Pool temperature	2134	X		0,1	-
Zone 1 temperature	2140	X		0,1	-

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Zone 2 temperature	2141	X		0,1	-
Zone 3 temperature	2142	X		0,1	-
Zone 4 temperature	2143	X		0,1	-
Zone 5 temperature	2144	X		0,1	-
Zone 1 humidity	2170	X		0,1	-
Zone 2 humidity	2171	X		0,1	-
Zone 3 humidity	2172	X		0,1	-
Zone 4 humidity	2173	X		0,1	-
Zone 5 humidity	2174	X		0,1	-
Zone 1 temperature	2175	X		0,1	-
Zone 2 temperature	2176	X		0,1	-
Zone 3 temperature	2177	X		0,1	-
Zone 4 temperature	2178	X		0,1	-
Zone 5 temperature	2179	X		0,1	-

4.1.5. Operating hours and compressor starts

In API HP client are available counters with the number of compressor starting up processes and the operating hours. Taking into account that both parameters may exceed the maximum admissible value for the employed variables, these parameters are sent by means of two variables, and the final value is obtained as follows:

▪ $Number\ of\ starts = High\ part\ of\ the\ starting\ up\ counter * 1000 + Low\ part\ of\ the\ starting\ up\ counter$

▪ $Operating\ hours = High\ part\ of\ compres.operating\ hours * 1000 + Low\ part\ of\ compres.operating\ hours$

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Compressor starts (high part)	2103	X		1	-
Compressor starts (low part)	2104	X		1	-
Compressor operating hours (high part)	2105	X		1	-
Compressor operating hours (low part)	2106	X		1	-

4.1.6. Setpoints information

The API HP Client allows to visualize the accumulation setpoint for each of the accumulated services and the consumption groups setpoint both for heating and cooling service. The setpoints displayed are the final setpoints that are being applied, so their calculation is taken into account the values configured on the screen, the values entered by BUS, the values configured in the calendars and the electrical conditions such as tariff control or surplus conditions.

(i) NOTE

▪ The temperature setpoints readings by BUS are always in ºC regardless of the units configured in the control of the heat pump.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
DHW setpoint	2150	X		0,1	-
Pool setpoint	2151	X		0,1	-
Buffer heating setpoint	2152	X		0,1	-
Buffer cooling setpoint	2153	X		0,1	-
HTR setpoint	2154	X		0,1	-
Group 1 heating setpoint (final setpoint)	2155	X		0,1	-
Group 1 cooling setpoint (final setpoint)	2156	X		0,1	-

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Group 2 heating setpoint (final setpoint)	2157	X		0,1	-
Group 2 cooling setpoint (final setpoint)	2158	X		0,1	-
Group 3 heating setpoint (final setpoint)	2159	X		0,1	-
Group 3 cooling setpoint (final setpoint)	2160	X		0,1	-
Group 4 heating setpoint (final setpoint)	2161	X		0,1	-
Group 4 cooling setpoint (final setpoint)	2162	X		0,1	-
Group 5 heating setpoint (final setpoint)	2163	X		0,1	-
Group 5 cooling setpoint (final setpoint)	2164	X		0,1	-

4.1.7. Power meter

The API HP Client allows both showing the powers produced by the heat pump for each service, differentiating active and passive cooling, and the total power consumed, and the power consumed in surplus conditions. All these measures are sent in the same units, which can be consulted at a specific address available on the communications BUS.

i NOTE
- The gain that is necessary apply to the power readings depending on the units employed to send those powers. The units employed can be consulted on the communications BUS.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Instantaneous power units	2185	X		1	10=W; 20=kW; 30=MW
Total heating power	2186	X			-
Heating service power	2187	X			-
DHW service power	2188	X			-
Pool service power	2189	X	W→1		-
Total cooling power	2190	X		kW →0,1	-
Active cooling service power	2191	X		MW→0,1	-
Passive cooling service power	2192	X			-
Total electric consumption	2193	X			-
Electric consumption in surplus mode	2194	X			-

4.1.8. Energy meters

In the API HP client is available information regarding the energy consumed and produced in the installation:

- It is shown the accumulated energy for the current day and month, for each of the last 12 months (excluding the current month) and the accumulated energy for the last 12 complete months.

- For each period are shown separately the energy produced by the heat pump and the electrical auxiliary equipment for each of the services.

- For each period are shown the energy consumed and the energy consumed in surplus conditions by the heat pump.

- Different units are defined for heat pump and auxiliary units, and for each of the periods considered.

i NOTE
- Current day energy meters update every 60 seconds and reset at the end of the day.

- Current month energy meters update at the end of the day and reset at the end of the month.

- Monthly historical energy meters are updated each time a month ends, replacing with the month just ended the same month of the previous year.

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> ▪ Yearly energy meter is updated each time a month ends, including the month just ended in calculus of yearly energy instead of the same month of the previous year.

DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
Current day energy units	2200	X		1	10=Wh; 20=kWh; 30=MWh;
DHW useful energy in current day	2201	X		0,1	-
Heating useful energy in current day	2202	X		0,1	-
Pool useful energy in current day	2203	X		0,1	-
Active cooling useful energy in current day	2204	X		0,1	-
Passive cooling useful energy in current day	2205	X		0,1	-
Energy consumption in current day	2206	X		0,1	-
Surplus energy consumption in current day	2207	X		0,1	-
Current day auxiliary heaters units	2208	X		1	10=Wh; 20=kWh; 30=MWh;
Pool service auxiliary heaters consump. current day	2209	X		0,1	-
DHW service auxiliary heaters consump. current day	2210	X		0,1	-
Heating service auxiliary heaters consump. current day	2211	X		0,1	-
Current month energy units	2220	X		1	10=Wh; 20=kWh; 30=MWh;
DHW useful energy in current month	2221	X		0,1	-
Heating useful energy in current month	2222	X		0,1	-
Pool useful energy in current month	2223	X		0,1	-
Active cooling useful energy in current month	2224	X		0,1	-
Passive cooling useful energy in current month	2225	X		0,1	-
Energy consumption in current month	2226	X		0,1	-
Surplus energy consumption in current month	2227	X		0,1	-
Current month auxiliary heaters units	2228	X		1	10=Wh; 20=kWh; 30=MWh;
Pool service auxiliary heaters consump. current month	2229	X		0,1	-
DHW service auxiliary heaters consump. current month	2230	X		0,1	-
Heating serv. auxiliary heaters consump. current month	2231	X		0,1	-
Annual counter units	2235	X		1	10=Wh; 20=kWh; 30=MWh;
Annual DHW useful energy	2236	X		0,1	-
Annual heating useful energy	2237	X		0,1	-
Pool heating useful energy	2238	X		0,1	-
Annual active cooling useful energy	2239	X		0,1	-
Annual passive cooling useful energy	2240	X		0,1	-
Annual energy consumption	2241	X		0,1	-
Annual surplus energy consumption	2242	X		0,1	-
Current month auxiliary heaters units	2243	X		1	10=Wh; 20=kWh; 30=MWh;
Pool service auxiliary heaters consumption current year	2244	X		0,1	-
DHW service auxiliary heaters consumption current year	2245	X		0,1	-
Heating service auxiliary heaters consump. current year	2246	X		0,1	-
Historical monthly units	2247	X		1	10=Wh; 20=kWh; 30=MWh;
DHW useful energy (January)	2248	X		0,1	-
DHW useful energy (February)	2249	X		0,1	-
DHW useful energy (March)	2250	X		0,1	-
DHW useful energy (April)	2251	X		0,1	-
DHW useful energy (May)	2252	X		0,1	-
DHW useful energy (June)	2253	X		0,1	-
DHW useful energy (July)	2254	X		0,1	-
DHW useful energy (August)	2255	X		0,1	-

DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
DHW useful energy (September)	2256	X		0,1	-
DHW useful energy (October)	2257	X		0,1	-
DHW useful energy (November)	2258	X		0,1	-
DHW useful energy (December)	2259	X		0,1	-
Heating useful energy (January)	2260	X		0,1	-
Heating useful energy (February)	2261	X		0,1	-
Heating useful energy (March)	2262	X		0,1	-
Heating useful energy (April)	2263	X		0,1	-
Heating useful energy (May)	2264	X		0,1	-
Heating useful energy (June)	2265	X		0,1	-
Heating useful energy (July)	2266	X		0,1	-
Heating useful energy (August)	2267	X		0,1	-
Heating useful energy (September)	2268	X		0,1	-
Heating useful energy (October)	2269	X		0,1	-
Heating useful energy (November)	2270	X		0,1	-
Heating useful energy (December)	2271	X		0,1	-
Pool useful energy (January)	2272	X		0,1	-
Pool useful energy (February)	2273	X		0,1	-
Pool useful energy (March)	2274	X		0,1	-
Pool useful energy (April)	2275	X		0,1	-
Pool useful energy (May)	2276	X		0,1	-
Pool useful energy (June)	2277	X		0,1	-
Pool useful energy (July)	2278	X		0,1	-
Pool useful energy (August)	2279	X		0,1	-
Pool useful energy (September)	2280	X		0,1	-
Pool useful energy (October)	2281	X		0,1	-
Pool useful energy (November)	2282	X		0,1	-
Pool useful energy (December)	2283	X		0,1	-
Active cooling useful energy (January)	2284	X		0,1	-
Active cooling useful energy (February)	2285	X		0,1	-
Active cooling useful energy (March)	2286	X		0,1	-
Active cooling useful energy (April)	2287	X		0,1	-
Active cooling useful energy (May)	2288	X		0,1	-
Active cooling useful energy (June)	2289	X		0,1	-
Active cooling useful energy (July)	2290	X		0,1	-
Active cooling useful energy (August)	2291	X		0,1	-
Active cooling useful energy (September)	2292	X		0,1	-
Active cooling useful energy (October)	2293	X		0,1	-
Active cooling useful energy (November)	2294	X		0,1	-
Active cooling useful energy (December)	2295	X		0,1	-
Passive cooling useful energy (January)	2296	X		0,1	-
Passive cooling useful energy (February)	2297	X		0,1	-
Passive cooling useful energy (March)	2298	X		0,1	-
Passive cooling useful energy (April)	2299	X		0,1	-
Passive cooling useful energy (May)	2300	X		0,1	-
Passive cooling useful energy (June)	2301	X		0,1	-
Passive cooling useful energy (July)	2302	X		0,1	-
Passive cooling useful energy (August)	2303	X		0,1	-
Passive cooling useful energy (September)	2304	X		0,1	-
Passive cooling useful energy (October)	2305	X		0,1	-

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DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
Passive cooling useful energy (November)	2306	X		0,1	-
Passive cooling useful energy (December)	2307	X		0,1	-
Energy consumption (January)	2308	X		0,1	-
Energy consumption (February)	2309	X		0,1	-
Energy consumption (March)	2310	X		0,1	-
Energy consumption (April)	2311	X		0,1	-
Energy consumption (May)	2312	X		0,1	-
Energy consumption (June)	2313	X		0,1	-
Energy consumption (July)	2314	X		0,1	-
Energy consumption (August)	2315	X		0,1	-
Energy consumption (September)	2316	X		0,1	-
Energy consumption (October)	2317	X		0,1	-
Energy consumption (November)	2318	X		0,1	-
Energy consumption (December)	2319	X		0,1	-
Surplus energy consumption (January)	2401	X		0,1	-
Surplus energy consumption (February)	2402	X		0,1	-
Surplus energy consumption (March)	2403	X		0,1	-
Surplus energy consumption (April)	2404	X		0,1	-
Surplus energy consumption (May)	2405	X		0,1	-
Surplus energy consumption (June)	2406	X		0,1	-
Surplus energy consumption (July)	2407	X		0,1	-
Surplus energy consumption (August)	2408	X		0,1	-
Surplus energy consumption (September)	2409	X		0,1	-
Surplus energy consumption (October)	2410	X		0,1	-
Surplus energy consumption (November)	2411	X		0,1	-
Surplus energy consumption (December)	2412	X		0,1	-
Auxiliary heaters historical monthly units	2425	X		1	10=Wh; 20=kWh; 30=MWh;
Pool auxiliary heaters historical meters (January)	2426	X		0,1	-
Pool auxiliary heaters historical meters (February)	2427	X		0,1	-
Pool auxiliary heaters historical meters (March)	2428	X		0,1	-
Pool auxiliary heaters historical meters (April)	2429	X		0,1	-
Pool auxiliary heaters historical meters (May)	2430	X		0,1	-
Pool auxiliary heaters historical meters (June)	2431	X		0,1	-
Pool auxiliary heaters historical meters (July)	2432	X		0,1	-
Pool auxiliary heaters historical meters (August)	2433	X		0,1	-
Pool auxiliary heaters historical meters (September)	2434	X		0,1	-
Pool auxiliary heaters historical meters (October)	2435	X		0,1	-
Pool auxiliary heaters historical meters (November)	2436	X		0,1	-
Pool auxiliary heaters historical meters (December)	2437	X		0,1	-
DHW auxiliary heaters historical meters (January)	2438	X		0,1	-
DHW auxiliary heaters historical meters (February)	2439	X		0,1	-
DHW auxiliary heaters historical meters (March)	2440	X		0,1	-
DHW auxiliary heaters historical meters (April)	2441	X		0,1	-
DHW auxiliary heaters historical meters (May)	2442	X		0,1	-
DHW auxiliary heaters historical meters (June)	2443	X		0,1	-
DHW auxiliary heaters historical meters (July)	2444	X		0,1	-
DHW auxiliary heaters historical meters (August)	2445	X		0,1	-
DHW auxiliary heaters historical meters (September)	2446	X		0,1	-
DHW auxiliary heaters historical meters (October)	2447	X		0,1	-
DHW auxiliary heaters historical meters (November)	2448	X		0,1	-

DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
DHW auxiliary heaters historical meters (December)	2449	X		0,1	-
Heating auxiliary heaters historical meters (January)	2450	X		0,1	-
Heating auxiliary heaters historical meters (February)	2451	X		0,1	-
Heating auxiliary heaters historical meters (March)	2452	X		0,1	-
Heating auxiliary heaters historical meters (April)	2453	X		0,1	-
Heating auxiliary heaters historical meters (May)	2454	X		0,1	-
Heating auxiliary heaters historical meters (June)	2455	X		0,1	-
Heating auxiliary heaters historical meters (July)	2456	X		0,1	-
Heating auxiliary heaters historical meters (August)	2457	X		0,1	-
Heating auxiliary heaters historical meters (September)	2458	X		0,1	-
Heating auxiliary heaters historical meters (October)	2459	X		0,1	-
Heating auxiliary heaters historical meters (November)	2460	X		0,1	-
Heating auxiliary heaters historical meters (December)	2461	X		0,1	-

4.1.9. e-MANAGER information

The API HP Client allows to access to information of the e-MANAGER application. Values available are the power consumption from electrical network and electrical power injected into network. Moreover, the units used to send the values those parameters are available.

> **ⓘ NOTE**
>
> ▪ The gain that is necessary apply to the power readings depending on the units employed to send those powers. The units employed can be consulted on the communications BUS.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
e-manager units	2501	X		1	10=W; 20=kW; 30=MW
Power consumption from electrical network	2504	X		W→1 kW →0,1 MW→0,1	-
Electrical power injected into network	2508	X		W→1 kW →0,1 MW→0,1	-

4.2. Read/Write variables

4.2.1. Time settings

The application API HP client allows modify remotely the time settings of the heat pump. To make a change to any of the parameters, it is necessary to write the new value in the corresponding parameter and then confirm the value.

DESCRIPCIÓN	DIREC.	R	R/W	GAN.	VALORES
New year (Last digits)	2690		X	1	[Min=0 … Max=99]
New month	2691		X	1	[Min=1 … Max=12]
New day	2692		X	1	[Min=1 … Max=31]
New hour	2693		X	1	[Min=0 … Max=23]
New minute	2694		X	1	[Min=0 … Max=59]
Year replacement confirmation	2695		X	1	0=OFF; 1=ON
Month replacement confirmation	2696		X	1	0=OFF; 1=ON
Day replacement confirmation	2697		X	1	0=OFF; 1=ON
Hour replacement confirmation	2698		X	1	0=OFF; 1=ON

DESCRIPCIÓN	DIREC.	R	R/W	GAN.	VALORES
Minute replacement confirmation	2699		X	1	0=OFF; 1=ON

(1)   See change log (section 4.3).

4.2.2. Status management

The API HP Client allows to select the heat pumps status and the operation program remotely.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Heat pump status	2700		X	1	1=OFF; 2=ON; 3=EMERGENCY
Operation program	2701		X	1	1 = Winter 2 = Summer 3 = Combined

4.2.3. Service demands management

The control of demands by BUS of the API HP Client allows both generate and cancel demands, and to define the criteria used for the setpoints management. This option allows to choose between applying setpoints written by BUS or setpoints configured in the heat pump control.

- In case of accumulated services (DHW, heating buffer and cooling buffer) and DHW recirculation a "0" means that setpoints introduced by BUS are not applied and "1" means that both setpoint and offset are taken from the BUS communication.

- In case of HTR demand a "0" means that HTR setpoint by BUS is not applied and a "1" means that setpoint is taken from the BUS communication. Offset cannot be modified by BUS.

- For pool service, in case of equipment with temperature probe for pool is applied the same criteria that for the other accumulated services. In case of equipment without temperature probe a "0" means that there is not demand by BUS and "1" and "1"c means that there is a BUS demand and both setpoint and offset are taken from the BUS communication.

- In case of consumption groups, a "0" means that there is not demand by BUS. In the other cases there is BUS demand, and the setpoints are taken from the BUS communication or the heat pump configuration depending on the case.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
DHW BUS control	2705		X	1	0 = No setpoint/offset by BUS 1 = Setpoint/Offset by BUS
DHW recirculation BUS control	2706		X	1	0 = No setpoint/offset by BUS 1 = Setpoint/Offset by BUS
Pool BUS control	2707		X	1	Equipment with temperature probe: 0 = No setpoint/offset by BUS 1 = Setpoint/Offset by BUS Equipment without temperature probe: 0 = No demand by BUS 1 = Demand by BUS
Group 1 demand	2708		X	1	0 = No demand by BUS 1 = Heating demand and setpoint by BUS 2 = Cooling demand and setpoint by BUS 11 = Heating demand by BUS and setpoint from HP 12 = Cooling demand by BUS and setpoint from HP
Group 2 demand	2709		X	1	0 = No demand by BUS 1 = Heating demand and setpoint by BUS 2 = Cooling demand and setpoint by BUS 11 = Heating demand by BUS and setpoint from HP

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
					12 = Cooling demand by BUS and setpoint from HP
Group 3 demand	2710		X	1	0 = No demand by BUS
					1 = Heating demand and setpoint by BUS
					2 = Cooling demand and setpoint by BUS
					11 = Heating demand by BUS and setpoint from HP
					12 = Cooling demand by BUS and setpoint from HP
Group 4 demand	2711		X	1	0 = No demand by BUS
					1 = Heating demand and setpoint by BUS
					2 = Cooling demand and setpoint by BUS
					11 = Heating demand by BUS and setpoint from HP
					12 = Cooling demand by BUS and setpoint from HP
Group 5 demand	2712		X	1	0 = No demand by BUS
					1 = Heating demand and setpoint by BUS
					2 = Cooling demand and setpoint by BUS
					11 = Heating demand by BUS and setpoint from HP
					12 = Cooling demand by BUS and setpoint from HP
Heating buffer BUS control	2713		X	1	0 = No setpoint/offset by BUS
					1 = Setpoint/Offset by BUS
Cooling buffer BUS control	2714		X	1	0 = No setpoint/offset by BUS
					1 = Setpoint/Offset by BUS
HTR BUS control	2715		X	1	0 = No setpoint by BUS
					1 = Setpoint by BUS (fix offset = 3 ºC)

4.2.4. Setpoint management

The application API HP Client allows configure by BUS the setpoints for all services attended by the heat pump as well as the temperature offsets to define the starting condition in accumulated services. The application of the setpoints depends on the demands configuration by BUS (see section 4.2.3).

Values entered by BUS in the indicated addresses are not written in the configuration variable of the heat pump, so that both values are available in the control. The heat pump control gives priority of the value configured by BUS if this kind of control is enabled. The entered setpoints are not the final values but they can be modified by the tariff control.

> **i**
> **NOTE**
> ▪ The temperature setpoints by BUS must be introduced in ºC regardless of the units configured in the control of the heat pump.

The setpoints introduced by BUS are filtered in the heat pump to keep the value in the admissible range. If value introduced is outside the range the value is changed to the minimum or maximum value of the admissible range depending on the case. The limit values of some parameters are not fix, but they are linked to the limit temperature introduced by the installer in the protections menu.

> **i**
> **NOTE**
> ▪ Due to the filtering of the entered setpoints, it is recommended to check the final values applied to guarantee a right display in the BUS application.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
DHW setpoint	2720		X	0,1	[Min=10,0 … Max=82,0] [ºC]
DHW recirculation setpoint	2721		X	0,1	[Min=0,0 … Max=99,9] [ºC]
Buffer tank heating setpoint	2722		X	0,1	[Min=20,0 … Max=T_lim] [ºC]
Buffer tank cooling setpoint	2723		X	0,1	[Min=T_lim … Max=25,0] [ºC]
HTR setpoint by BUS	2724		X	0,1	[Min=0,0 … Max=82,0] [ºC]
Offset DHW	2725		X	0,1	[Min=2,0 … Max=25,0] [ºC]

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Offset DHE recirculation	2726		X	0,1	[Min=0,0 … Max=99,9] [ºC]
Offset heating buffer tank	2727		X	0,1	[Min=2,0 … Max=10,0] [ºC]
Offset cooling buffer tank	2728		X	0,1	[Min=2,0 … Max=10,0] [ºC]
HTR setpoint BUS	2729		X	0,1	[Min=0,5 … Max=20,0] [ºC]
Heating group 1 setpoint	2730		X	0,1	[Min=20,0 … Max=T_lim] [ºC]
Cooling group 1 setpoint	2731		X	0,1	[Min=T_lim … Max=25,0] [ºC]
Heating group 2 setpoint	2732		X	0,1	[Min=20,0 … Max=T_lim] [ºC]
Cooling group 2 setpoint	2733		X	0,1	[Min=T_lim … Max=25,0] [ºC]
Heating group 3 setpoint	2734		X	0,1	[Min=20,0 … Max=T_lim] [ºC]
Cooling group 3 setpoint	2735		X	0,1	[Min=T_lim … Max=25,0] [ºC]
Heating group 4 setpoint	2736		X	0,1	[Min=20,0 … Max=T_lim] [ºC]
Cooling group 4 setpoint	2737		X	0,1	[Min=T_lim … Max=25,0] [ºC]
Heating group 5 setpoint	2738		X	0,1	[Min=20,0 … Max=T_lim] [ºC]
Cooling group 5 setpoint	2739		X	0,1	[Min=T_lim … Max=25,0] [ºC]
Pool setpoint (delivery temperature/pool)	2740		X	0,1	[Min=20,0 … Max=T_lim] [ºC]

4.2.5. BUS ambient terminals management

The API HP Client allows the remote management of the BUS ambient terminals. The control allows switching on and switching off the ambient terminals and introduce the temperature setpoint for each of them.

NOTA

▪ The temperature setpoints by BUS must be introduced in ºC regardless of the units configured in the control of the heat pump.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Zone 1 BUS terminal ON/OFF	2750		X	1	0=OFF; 1=ON;
Zone 2 BUS terminal ON/OFF	2751		X	1	0=OFF; 1=ON;
Zone 3 BUS terminal ON/OFF	2752		X	1	0=OFF; 1=ON;
Zone 4 BUS terminal ON/OFF	2753		X	1	0=OFF; 1=ON;
Zone 5 BUS terminal ON/OFF	2754		X	1	0=OFF; 1=ON;
Zone 1 ambient temperature setpoint	2755		X	0,1	[Min=5,0 … Max=35,0] [ºC]
Zone 2 ambient temperature setpoint	2756		X	0,1	[Min=5,0 … Max=35,0] [ºC]
Zone 3 ambient temperature setpoint	2757		X	0,1	[Min=5,0 … Max=35,0] [ºC]
Zone 4 ambient temperature setpoint	2758		X	0,1	[Min=5,0 … Max=35,0] [ºC]
Zone 5 ambient temperature setpoint	2759		X	0,1	[Min=5,0 … Max=35,0] [ºC]

4.2.6. Alarms management

The API HP Client allows the remote resetting of the heat pump alarms.

¡DANGER!

▪ Resetting alarms without having solved the problem that caused the alarm appears can cause damage to the equipment. This fact is especially dangerous when the heat pump is locked by alarm.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Reset alarm by BUS	2074		X		0 = OFF / 1= ON

4.2.7. Protections management

The application API HP Client allows configuring a maximum regulation of the compressor that is applied to all services attended from the heat pump.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Maximum reference of compressor (%)	2765		X	0,1	0-100,0 [%]

4.2.8. e-MANAGER management

The API HP Client allows remote management of e-MANAGER application, allowing the enabling and disabling of the "surplus control" and "consumption limit" functionalities, and entering the corresponding setpoints for each of them.

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NOTE

▪ The surplus control and consumption limit setpoints must necessarily be entered in kW.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Surplus control enabled by BUS	2775		X	1	0=OFF; 1=ON;
Maximum consumption enabled by BUS	2776		X	1	0=OFF; 1=ON;
Surplus regulation setpoint	2777		X	0,1	[Min=-99,9 … Max=99,9] [kW]
Maximum consumption setpoint	2778		X	0,1	[Min=-99,9 … Max=99,9] [kW]

4.3. Changes log

This section contains the changes implemented in registers list for each software version.

VERSION	DESCRIPTION
HP24_V01.01	New reading register is introduced for operation program (address 2044).
HP24_V01.02	New registers are introduced for the time setting (addresses 2690 to 2699).

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5. Supervisor registers list (API ESB24_V01.01)

i
NOTA

- The register list included in this document corresponds to the software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

- The application with the new registers list for source manager management is available starting with version WWC24_V01B04.

5.1. Read variables

5.1.1. System variables

The system variables group includes information regarding the device configuration (model code and software version) and the date and time used by the equipment.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Year (system)	2000	X		1	-
Month (system)	2001	X		1	-
Day (system)	2002	X		1	-
Hour (system)	2003	X		1	-
Minute (system)	2004	X		1	-

The software version code is built from five variables available in the API ESB Client (software platform, product range, software version, compilation type letter, and software subversion) as shown as follows:
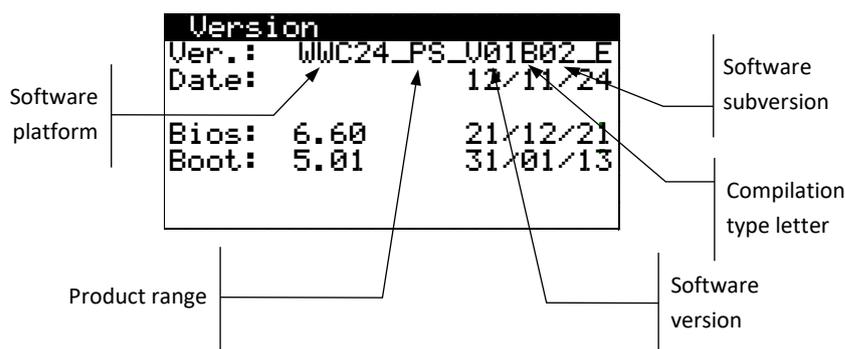
Figure 5.1. Software version code construction.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Software platform	2005	X		1	7=ESO22; 12=AWD24; 13=WWD24; 14=WWC24; 15=ESO24; 16=ESB24
Product range	2006	X		1	1=HP; 2=PS; 3=EM; 4=SM;
Software version VXX	2007	X		1	-
Compilation type letter (subversion)	2008	X		1	1=A; 2=B; 3=C; 4=D; 5=E; 6=F; 7=G; 8=H; 9=I; 10=J; 11=K; 12=L; 13=M; 14=N; 15=O; 16=P; 17=Q; 18=R; 19=S; 20=T; 21=U; 22=V; 23=W; 24=X; 25=Y; 26=Z;
Software version BXX	2009	X		1	-

The model code can be built from six variables existing in the API ESB Client. Each of these variables corresponding to each of the digits that make up the model code. Finally, moreover than model code, the device role within the installation can be consulted.
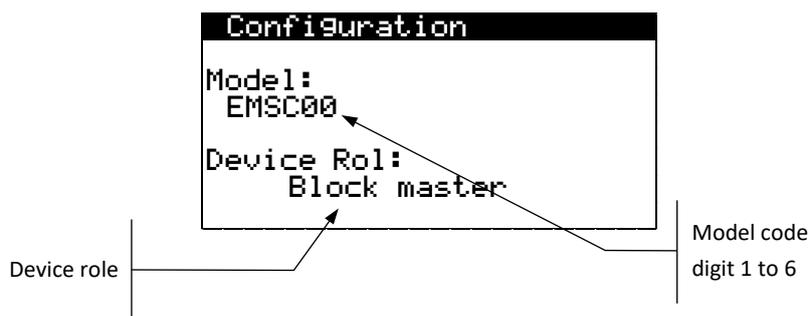
Figure 5.2. Model code construction.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Model code digit 1	2010	X		1	1=0; 2=1; 3=2; 4=3; 5=4; 6=5; 7=6;
Model code digit 2	2011	X		1	8=9;10=11; 11=A; 12=B; 13=C; 14=D; 15=E;
Model code digit 3	2012	X		1	16=F; 17=G; 18=H; 19=I; 20=J; 21=K; 22=L;
Model code digit 4	2013	X		1	23=M; 24=N; 25=O; 26=P; 27=Q; 28=R; 29
Model code digit 5	2014	X		1	=S; 30=S; 31=U; 32=V; 33=W; 34=X; 35=Y;
Model code digit 6	2015	X		1	36=Z;

5.1.2. Alarms display

The API ESB Client uses a simplified alarm visualization system through which you can obtain a complete view of the current situation with a reduced number of variables. The information available in the API ESB Client is as follows:

- Alarm level: Indicates the alarm level of the equipment. If there are more than one alarm level, is shown the most serious level of all existing alarms

- Lock alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are generating a locked condition.

- Long time alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are meeting the long-time alarm condition.

- Recurrent alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are meeting the recurrence condition.

- Active alarm codes: Are displayed the codes of the 5 alarms with the highest priority among active alarms existing at a given time.

NOTE
- The list with the alarm codes is presented in appendix 2.
- The alarm list included in this document corresponds to the alarm list used in software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Alarm level	2065	X		1	0 = No alarm 1 = Active alarm 2 = Active alarm + recurrence 3 = Recurrent alarm 4 = Long time alarm 5 = Lock-down due to alarm
Lock alarm code	2066	X		1	See alarm list (Appendix 2)
Long time alarm code	2067	X		1	
Recurrence alarm code	2068	X		1	
Active alarm code 1	2069	X		1	
Active alarm code 2	2070	X		1	
Active alarm code 3	2071	X		1	
Active alarm code 4	2072	X		1	
Active alarm code 5	2073	X		1	

5.1.3. Supervisor general information

The API ESB Client allows access to the values of the readings of the sensors of the supervisor as well as some parameters obtained from said readings to make easier monitoring the installation status.

> **ⓘ NOTE**
> ▪ The temperature readings through the communications BUS are always made in ºC, regardless of the units configured in the supervisor program.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Outdoor temperature	2080	X		0,1	-
Primary circuit outlet temperature	2081	X		0,1	-
Primary circuit inlet temperature	2082	X		0,1	-
Secondary circuit outlet temperature	2084	X		0,1	-
Secondary circuit inlet temperature	2085	X		0,1	-
Auxiliary heater outlet temperature [1]	2089	X		0,1	-
Auxiliary chiller outlet temperature [1]	**2090**	**X**		**0,1**	-

(1) See change log (section 5.3).

5.1.4. Power meter

The API ESB Client allows both showing the powers produced for each service, differentiating active and passive cooling, and the total power consumed, and the power consumed in surplus conditions. All these measures are sent in the same units, which can be consulted at a specific address available on the communications BUS.

> **ⓘ NOTE**
> ▪ The gain that is necessary apply to the power readings depending on the units employed to send those powers. The units employed can be consulted on the communications BUS.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Instantaneous power units	2185	X		1	10=W; 20=kW; 30=MW
Total heating power	2186	X		W→1	-
Heating service power	2187	X		kW →0,1	-
DHW service power	2188	X		MW→0,1	-
Pool service power	2189	X			-

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Total cooling power	2190	X			-
Active cooling service power	2191	X			-
Passive cooling service power	2192	X			-
Total electric consumption	2193	X			-
Electric consumption in surplus mode	2194	X			-

5.1.5. Energy meters

In the API ESB client is available information regarding the energy consumed and produced in the installation:

- It is shown the accumulated energy for the current day and month, for each of the last 12 months (excluding the current month) and the accumulated energy for the last 12 complete months.

- For each period are shown separately the energy produced by the heat pumps and electrical auxiliary equipment for each of the services.

- For each period are shown the energy consumed and the energy consumed in surplus conditions by the heat pumps.

- Different units are defined for heat pumps and auxiliary units, and for each of the periods considered.

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NOTE

- Current day energy meters update every 60 seconds and reset at the end of the day.

- Current month energy meters update at the end of the day and reset at the end of the month.

- Monthly historical energy meters are updated each time a month ends, replacing with the month just ended the same month of the previous year.

- Yearly energy meter is updated each time a month ends, including the month just ended in calculus of yearly energy instead of the same month of the previous year.

DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
Current day energy units	2200	X		1	10=Wh; 20=kWh; 30=MWh;
DHW useful energy in current day	2201	X		0,1	-
Heating useful energy in current day	2202	X		0,1	-
Pool useful energy in current day	2203	X		0,1	-
Active cooling useful energy in current day	2204	X		0,1	-
Passive cooling useful energy in current day	2205	X		0,1	-
Energy consumption in current day	2206	X		0,1	-
Surplus energy consumption in current day	2207	X		0,1	-
Current day auxiliary heaters units	2208	X		1	10=Wh; 20=kWh; 30=MWh;
Pool service auxiliary heaters consump. current day	2209	X		0,1	-
DHW service auxiliary heaters consump. current day	2210	X		0,1	-
Heating service auxiliary heaters consump. current day	2211	X		0,1	-
Current month energy units	2220	X		1	10=Wh; 20=kWh; 30=MWh;
DHW useful energy in current month	2221	X		0,1	-
Heating useful energy in current month	2222	X		0,1	-
Pool useful energy in current month	2223	X		0,1	-
Active cooling useful energy in current month	2224	X		0,1	-
Passive cooling useful energy in current month	2225	X		0,1	-
Energy consumption in current month	2226	X		0,1	-
Surplus energy consumption in current month	2227	X		0,1	-
Current month auxiliary heaters units	2228	X		1	10=Wh; 20=kWh; 30=MWh;

DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
Pool service auxiliary heaters consump. current month	2229	X		0,1	-
DHW service auxiliary heaters consump. current month	2230	X		0,1	-
Heating serv. auxiliary heaters consump. current month	2231	X		0,1	-
Annual counter units	2235	X		1	10=Wh; 20=kWh; 30=MWh;
Annual DHW useful energy	2236	X		0,1	-
Annual heating useful energy	2237	X		0,1	-
Pool heating useful energy	2238	X		0,1	-
Annual active cooling useful energy	2239	X		0,1	-
Annual passive cooling useful energy	2240	X		0,1	-
Annual energy consumption	2241	X		0,1	-
Annual surplus energy consumption	2242	X		0,1	-
Current month auxiliary heaters units	2243	X		1	10=Wh; 20=kWh; 30=MWh;
Pool service auxiliary heaters consumption current year	2244	X		0,1	-
DHW service auxiliary heaters consumption current year	2245	X		0,1	-
Heating service auxiliary heaters consump. current year	2246	X		0,1	-
Historical monthly units	2247	X		1	10=Wh; 20=kWh; 30=MWh;
DHW useful energy (January)	2248	X		0,1	-
DHW useful energy (February)	2249	X		0,1	-
DHW useful energy (March)	2250	X		0,1	-
DHW useful energy (April)	2251	X		0,1	-
DHW useful energy (May)	2252	X		0,1	-
DHW useful energy (June)	2253	X		0,1	-
DHW useful energy (July)	2254	X		0,1	-
DHW useful energy (August)	2255	X		0,1	-
DHW useful energy (September)	2256	X		0,1	-
DHW useful energy (October)	2257	X		0,1	-
DHW useful energy (November)	2258	X		0,1	-
DHW useful energy (December)	2259	X		0,1	-
Heating useful energy (January)	2260	X		0,1	-
Heating useful energy (February)	2261	X		0,1	-
Heating useful energy (March)	2262	X		0,1	-
Heating useful energy (April)	2263	X		0,1	-
Heating useful energy (May)	2264	X		0,1	-
Heating useful energy (June)	2265	X		0,1	-
Heating useful energy (July)	2266	X		0,1	-
Heating useful energy (August)	2267	X		0,1	-
Heating useful energy (September)	2268	X		0,1	-
Heating useful energy (October)	2269	X		0,1	-
Heating useful energy (November)	2270	X		0,1	-
Heating useful energy (December)	2271	X		0,1	-
Pool useful energy (January)	2272	X		0,1	-
Pool useful energy (February)	2273	X		0,1	-
Pool useful energy (March)	2274	X		0,1	-
Pool useful energy (April)	2275	X		0,1	-
Pool useful energy (May)	2276	X		0,1	-
Pool useful energy (June)	2277	X		0,1	-
Pool useful energy (July)	2278	X		0,1	-
Pool useful energy (August)	2279	X		0,1	-
Pool useful energy (September)	2280	X		0,1	-
Pool useful energy (October)	2281	X		0,1	-

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DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
Pool useful energy (November)	2282	X		0,1	-
Pool useful energy (December)	2283	X		0,1	-
Active cooling useful energy (January)	2284	X		0,1	-
Active cooling useful energy (February)	2285	X		0,1	-
Active cooling useful energy (March)	2286	X		0,1	-
Active cooling useful energy (April)	2287	X		0,1	-
Active cooling useful energy (May)	2288	X		0,1	-
Active cooling useful energy (June)	2289	X		0,1	-
Active cooling useful energy (July)	2290	X		0,1	-
Active cooling useful energy (August)	2291	X		0,1	-
Active cooling useful energy (September)	2292	X		0,1	-
Active cooling useful energy (October)	2293	X		0,1	-
Active cooling useful energy (November)	2294	X		0,1	-
Active cooling useful energy (December)	2295	X		0,1	-
Passive cooling useful energy (January)	2296	X		0,1	-
Passive cooling useful energy (February)	2297	X		0,1	-
Passive cooling useful energy (March)	2298	X		0,1	-
Passive cooling useful energy (April)	2299	X		0,1	-
Passive cooling useful energy (May)	2300	X		0,1	-
Passive cooling useful energy (June)	2301	X		0,1	-
Passive cooling useful energy (July)	2302	X		0,1	-
Passive cooling useful energy (August)	2303	X		0,1	-
Passive cooling useful energy (September)	2304	X		0,1	-
Passive cooling useful energy (October)	2305	X		0,1	-
Passive cooling useful energy (November)	2306	X		0,1	-
Passive cooling useful energy (December)	2307	X		0,1	-
Energy consumption (January)	2308	X		0,1	-
Energy consumption (February)	2309	X		0,1	-
Energy consumption (March)	2310	X		0,1	-
Energy consumption (April)	2311	X		0,1	-
Energy consumption (May)	2312	X		0,1	-
Energy consumption (June)	2313	X		0,1	-
Energy consumption (July)	2314	X		0,1	-
Energy consumption (August)	2315	X		0,1	-
Energy consumption (September)	2316	X		0,1	-
Energy consumption (October)	2317	X		0,1	-
Energy consumption (November)	2318	X		0,1	-
Energy consumption (December)	2319	X		0,1	-
Surplus energy consumption (January)	2401	X		0,1	-
Surplus energy consumption (February)	2402	X		0,1	-
Surplus energy consumption (March)	2403	X		0,1	-
Surplus energy consumption (April)	2404	X		0,1	-
Surplus energy consumption (May)	2405	X		0,1	-
Surplus energy consumption (June)	2406	X		0,1	-
Surplus energy consumption (July)	2407	X		0,1	-
Surplus energy consumption (August)	2408	X		0,1	-
Surplus energy consumption (September)	2409	X		0,1	-
Surplus energy consumption (October)	2410	X		0,1	-
Surplus energy consumption (November)	2411	X		0,1	-
Surplus energy consumption (December)	2412	X		0,1	-

DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
Auxiliary heaters historical monthly units	2425	X		1	10=Wh; 20=kWh; 30=MWh;
Pool auxiliary heaters historical meters (January)	2426	X		0,1	-
Pool auxiliary heaters historical meters (February)	2427	X		0,1	-
Pool auxiliary heaters historical meters (March)	2428	X		0,1	-
Pool auxiliary heaters historical meters (April)	2429	X		0,1	-
Pool auxiliary heaters historical meters (May)	2430	X		0,1	-
Pool auxiliary heaters historical meters (June)	2431	X		0,1	-
Pool auxiliary heaters historical meters (July)	2432	X		0,1	-
Pool auxiliary heaters historical meters (August)	2433	X		0,1	-
Pool auxiliary heaters historical meters (September)	2434	X		0,1	-
Pool auxiliary heaters historical meters (October)	2435	X		0,1	-
Pool auxiliary heaters historical meters (November)	2436	X		0,1	-
Pool auxiliary heaters historical meters (December)	2437	X		0,1	-
DHW auxiliary heaters historical meters (January)	2438	X		0,1	-
DHW auxiliary heaters historical meters (February)	2439	X		0,1	-
DHW auxiliary heaters historical meters (March)	2440	X		0,1	-
DHW auxiliary heaters historical meters (April)	2441	X		0,1	-
DHW auxiliary heaters historical meters (May)	2442	X		0,1	-
DHW auxiliary heaters historical meters (June)	2443	X		0,1	-
DHW auxiliary heaters historical meters (July)	2444	X		0,1	-
DHW auxiliary heaters historical meters (August)	2445	X		0,1	-
DHW auxiliary heaters historical meters (September)	2446	X		0,1	-
DHW auxiliary heaters historical meters (October)	2447	X		0,1	-
DHW auxiliary heaters historical meters (November)	2448	X		0,1	-
DHW auxiliary heaters historical meters (December)	2449	X		0,1	-
Heating auxiliary heaters historical meters (January)	2450	X		0,1	-
Heating auxiliary heaters historical meters (February)	2451	X		0,1	-
Heating auxiliary heaters historical meters (March)	2452	X		0,1	-
Heating auxiliary heaters historical meters (April)	2453	X		0,1	-
Heating auxiliary heaters historical meters (May)	2454	X		0,1	-
Heating auxiliary heaters historical meters (June)	2455	X		0,1	-
Heating auxiliary heaters historical meters (July)	2456	X		0,1	-
Heating auxiliary heaters historical meters (August)	2457	X		0,1	-
Heating auxiliary heaters historical meters (September)	2458	X		0,1	-
Heating auxiliary heaters historical meters (October)	2459	X		0,1	-
Heating auxiliary heaters historical meters (November)	2460	X		0,1	-
Heating auxiliary heaters historical meters (December)	2461	X		0,1	-

5.1.6. e-MANAGER information

The API ESB Client allows to access to information of the e-MANAGER application. Values available are the power consumption from electrical network and electrical power injected into network. Moreover, the units used to send the values those parameters are available.

> **NOTE**
> ▪ The gain that is necessary apply to the power readings depending on the units employed to send those powers. The units employed can be consulted on the communications BUS.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
e-manager units	2501	X		1	10=W; 20=kW; 30=MW
Power consumption from electrical network	2504	X		W→1 kW →0,1 MW→0,1	-
Electrical power injected into network	2508	X		W→1 kW →0,1 MW→0,1	-

5.2. Read/Write variables

5.2.1. Time settings

The application API ESB client allows modify remotely the time settings of the source manager. To make a change to any of the parameters, it is necessary to write the new value in the corresponding parameter and then confirm the value.

DESCRIPTION	ADD.	R	R/W	GAIN	VALUES
New year (Last digits) [1]	2690		X	1	[Min=0 … Max=99]
New month [1]	2691		X	1	[Min=1 … Max=12]
New day [1]	2692		X	1	[Min=1 … Max=31]
New hour [1]	2693		X	1	[Min=0 … Max=23]
New minute [1]	2694		X	1	[Min=0 … Max=59]
Year replacement confirmation [1]	2695		X	1	0=OFF; 1=ON
Month replacement confirmation [1]	2696		X	1	0=OFF; 1=ON
Day replacement confirmation [1]	2697		X	1	0=OFF; 1=ON
Hour replacement confirmation [1]	2698		X	1	0=OFF; 1=ON
Minute replacement confirmation [1]	2699		X	1	0=OFF; 1=ON

5.2.2. Status management

The API ESB Client allows to select the heat pumps status and the operation program remotely.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Operation program	2701		X	1	1 = Winter 2 = Summer 3 = Combined

5.2.3. Alarms management

The API ESB Client allows the remote resetting of the source manager alarms.

⚠️ **¡DANGER!**
- Resetting alarms without having solved the problem that caused the alarm appears can cause damage to the equipment. This fact is especially dangerous when the heat pump is locked by alarm.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Reset alarm by BUS	2074		X		0 = OFF / 1= ON

EN

5.3. Changes log

This section contains the changes implemented in registers list for each software version.

VERSION	DESCRIPTION
V01.01	Auxiliary heater (2089) and auxiliary chiller (2090) outlet temperature are included.

6. Source manager registers list (API ESO24_V01.00)

NOTA

- The register list included in this document corresponds to the software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

- The application with the new registers list for source manager management is available starting with version WWC24_V01B03.

6.1. Read variables

6.1.1. System variables

The system variables group includes information regarding the device configuration (model code and software version) and the date and time used by the equipment.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Year (system)	2000	X		1	-
Month (system)	2001	X		1	-
Day (system)	2002	X		1	-
Hour (system)	2003	X		1	-
Minute (system)	2004	X		1	-

The software version code is built from five variables available in the API ESO Client (software platform, product range, software version, compilation type letter, and software subversion) as shown as follows:
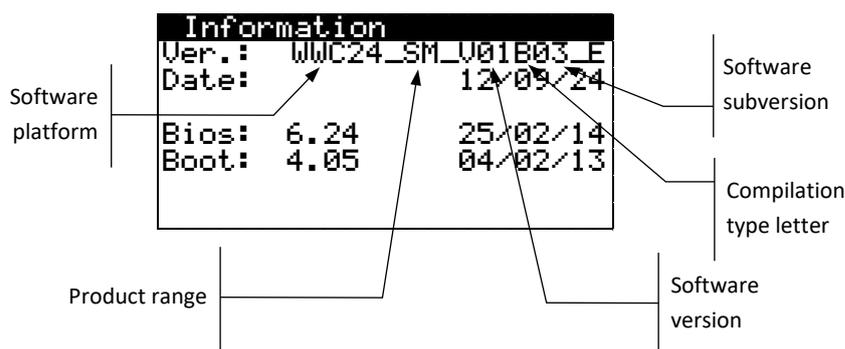

Figure 6.1. Software version code construction.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Software platform	2010	X		1	7=ESO22; 12=AWD24; 13=WWD24; 14=WWC24; 15=ESO24; 16=ESB24
Product range	2011	X		1	1=HP; 2=PS; 3=EM; 4=SM;
Software version VXX	2012	X		1	-
Compilation type letter (subversion)	2013	X		1	1=A; 2=B; 3=C; 4=D; 5=E; 6=F; 7=G; 8=H; 9=I; 10=J; 11=K; 12=L; 13=M; 14=N; 15=O; 16=P; 17=Q; 18=R; 19=S; 20=T; 21=U; 22=V; 23=W; 24=X; 25=Y; 26=Z;
Software version BXX	2014	X		1	-

The model code can be built from six variables existing in the API ESO Client. Each of these variables corresponding to each of the digits that make up the model code.
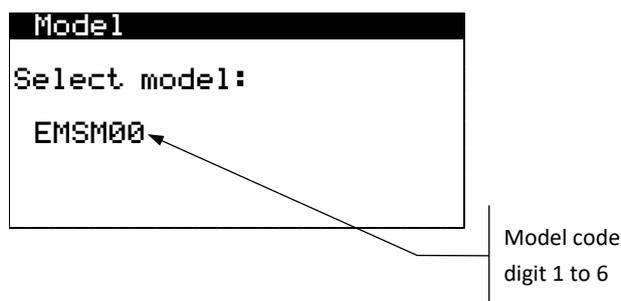
Model code
digit 1 to 6

Figure 6.2. Model code construction.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Model code digit 1	2015	X		1	1=0; 2=1; 3=2; 4=3; 5=4; 6=5; 7=6;
Model code digit 2	2016	X		1	8=9;10=11; 11=A; 12=B; 13=C; 14=D; 15=E;
Model code digit 3	2017	X		1	16=F; 17=G; 18=H; 19=I; 20=J; 21=K; 22=L;
Model code digit 4	2018	X		1	23=M; 24=N; 25=O; 26=P; 27=Q; 28=R; 29
Model code digit 5	2019	X		1	=S; 30=S; 31=U; 32=V; 33=W; 34=X; 35=Y;
Model code digit 6	2020	X		1	36=Z;

6.1.2. Alarms display

The API ESO Client uses a simplified alarm visualization system through which you can obtain a complete view of the current situation with a reduced number of variables. The information available in the API ESO Client is as follows:

- Alarm level: Indicates the alarm level of the equipment. If there are more than one alarm level, is shown the most serious level of all existing alarms

- Lock alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are generating a locked condition.

- Long time alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are meeting the long-time alarm condition.

- Recurrent alarm code: Is displayed the code of the alarm with the highest priority among all alarms that are meeting the recurrence condition.

- Active alarm codes: Are displayed the codes of the 5 alarms with the highest priority among active alarms existing at a given time.

NOTE

- The list with the alarm codes is presented in appendix 2.

- The alarm list included in this document corresponds to the alarm list used in software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Alarm level	2040	X		1	0 = No alarm 1 = Active alarm 2 = Active alarm + recurrence 3 = Recurrent alarm 4 = Long time alarm 5 = Lock-down due to alarm

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Lock alarm code	2041	X		1	
Long time alarm code	2042	X		1	
Recurrence alarm code	2043	X		1	
Active alarm code 1	2044	X		1	See alarm list (Appendix 3)
Active alarm code 2	2045	X		1	
Active alarm code 3	2046	X		1	
Active alarm code 4	2047	X		1	
Active alarm code 5	2048	X		1	

6.1.3. Source manager general information

Within of general information variables group of the source manager, information regarding general configuration and monitoring parameters of the source manager is included.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Operation mode	2100	X		1	1=Source; 2=Sink
Source manager state	2101	X		1	0=OFF; 1=ON; 2=Emergency
Block manifold inlet temperature	2102	X		0,1	-
Block manifold outlet temperature	2103	X		0,1	-
Block manifold temperature difference	2104	X		0,1	-
Source manager control type	2105	X		1	0=Inlet temperature 1=DT air/glycol
Temperature regulation setpoint of the sources control	2106	X		0,1	-
Actual temperature of regulation parameter of the sources control	2107	X		0,1	-
Outdoor temperature	2108	X		0,1	-
Defrost production circuit outlet temperature	2109	X		0,1	-
Some source defrosting	2110	X		1	0 = OFF / 1= ON

6.1.4. Source 1 information

Within the source 1 information group, information related to the configuration and monitoring parameters of source 1 is included.

DESCRIPTION	ADDR.	R	R/W	GAIN	VALUES
Source 1 type	2150	X		1	1=Geothermal source 2=Aerothermal source 3=Groundwater
Source 1 operation mode	2151	X		1	0=Not available 1=Standby 2=On 3=Defrosting
Source 1 outlet temperature	2152	X		0,1	-
Source 1 inlet temperature	2153	X		0,1	-
Source 1 temperature difference	2154	X		0,1	-
Source 1 actual ASR	2155	X		0,1	-

EN

6.1.5. Source 2 information

Within the source 2 information group, information related to the configuration and monitoring parameters of source 2 is included.

DESCRIPTION	ADDR.	R	R/W	GAIN	VALUES
Source 2 type	2200	X		1	1=Geothermal source 2=Aerothermal source 3=Groundwater
Source 2 operation mode	2201	X		1	0=Not available 1=Standby 2=On 3=Defrosting
Source 2 outlet temperature	2202	X		0,1	-
Source 2 inlet temperature	2203	X		0,1	-
Source 2 temperature difference	2204	X		0,1	-
Source 2 actual ASR	2205	X		0,1	-

6.1.6. Source 3 information

Within the source 3 information group, information related to the configuration and monitoring parameters of source 3 is included.

DESCRIPTION	ADDR.	R	R/W	GAIN	VALUES
Source 3 type	2250	X		1	1=Geothermal source 2=Aerothermal source 3=Groundwater
Source 3 operation mode	2251	X		1	0=Not available 1=Standby 2=On 3=Defrosting
Source 3 outlet temperature	2252	X		0,1	-
Source 3 inlet temperature	2253	X		0,1	-
Source 3 temperature difference	2254	X		0,1	-
Source 3 actual ASR	2255	X		0,1	-

6.2. Read/Write variables

6.2.1. Time settings

The application API ESO client allows modify remotely the time settings of the source manager. To make a change to any of the parameters, it is necessary to write the new value in the corresponding parameter and then confirm the value.

DESCRIPTION	ADDR.	R	R/W	GAIN	VALUES
New year (Last digits)	2690		X	1	[Min=0 … Max=99]
New month	2691		X	1	[Min=1 … Max=12]
New day	2692		X	1	[Min=1 … Max=31]
New hour	2693		X	1	[Min=0 … Max=23]
New minute	2694		X	1	[Min=0 … Max=59]
Year replacement confirmation	2695		X	1	0=OFF; 1=ON
Month replacement confirmation	2696		X	1	0=OFF; 1=ON
Day replacement confirmation	2697		X	1	0=OFF; 1=ON
Hour replacement confirmation	2698		X	1	0=OFF; 1=ON
Minute replacement confirmation	2699		X	1	0=OFF; 1=ON

6.2.2. Alarms management

The API ESO Client allows the remote resetting of the source manager alarms.

¡DANGER!

- Resetting alarms without having solved the problem that caused the alarm appears can cause damage to the equipment. This fact is especially dangerous when the heat pump is locked by alarm.

DESCRIPTION	ADDRESS	R	R/W	GAIN	VALUES
Reset alarm by BUS	2049		X		0 = OFF / 1= ON

6.3. Changes log

This section contains the changes implemented in registers list for each software version.

VERSION	DESCRIPTION

EN

7. Anexo

7.1. Appendix 1. Heat pump alarm list.

ℹ NOTE

▪ The alarm list included in this document corresponds to the alarm list used in software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

ALARM DESCRIPTION	ALARM CODE
Wrong model configuration	1
Wrong Outdoor Unit model configuration	2
Wrong Indoor Unit model configuration	3
Emergency mode manual activation	4
Heat pump not available	10
Boiler not available	11
Electric heater not available	12
DHW electric heater not available	13
Buffer electric heater not available	14
External Chiller not available	15
External Chiller not available	16
DHW service not available	20
DHW recirculation not available	21
Pool service not available	22
Heating service not available	23
Active Cooling service not available	24
Passive Cooling service not available	25
SG1 group not available	30
SG2 group not available	31
SG3 group not available	32
SG4 group not available	33
SG5 group not available	34
Lock alarm reset	35
High discharge pressure	40
Low suction pressure	41
High discharge temperature	42
High evaporation temperature	43
Low condensation temperature	44
Low superheating	45
High superheating	46
Inverter alarm	50
Safety stop pressure/flow switch	51
Inverter locked (switch off 2 minutes)	52
Low Voltage	53
Wrong configuration PowerPlus	54
Low brine pressure	60
Low brine temperature	61
High brine temperature	62
Low clima pressure	63
Low outdoor temperature	64

ALARM DESCRIPTION	ALARM CODE
High outdoor temperature	65
Low evaporator flow	66
Sources out of range	67
pCO fault: clock / EEPROM	70
pCO fault: driver EEV	71
e-Source Alarm	72
e-Source OFF	73
Discharge pressure sensor broken or disconnected	80
Discharge temperature sensor broken or disconnected	81
Suction pressure sensor broken or disconnected	82
Suction temperature sensor broken or disconnected	83
Intermediate pressure sensor broken or disconnected	84
Brine circuit pressure sensor broken or disconnected	85
Brine circuit supply temperature sensor broken or disconnected	86
Brine circuit return temperature sensor broken or disconnected	87
Production circuit pressure sensor broken or disconnected	88
Production circuit supply temperature sensor broken or disconnected	89
Production circuit return temperature sensor broken or disconnected	90
Group 1 temperature sensor broken or disconnected	91
Group 2 temperature sensor broken or disconnected	92
Group 3 temperature sensor broken or disconnected	93
Group 4 temperature sensor broken or disconnected	94
Group 5 temperature sensor broken or disconnected	95
DHW temperature sensor broken or disconnected	96
DHW recirculation temperature sensor broken or disconnected	97
Pool temperature sensor broken or disconnected	98
Heating buffer tank temperature sensor broken or disconnected	99
Cooling buffer tank temperature sensor broken or disconnected	100
Outdoor temperature sensor broken or disconnected	101
Boiler temperature sensor broken or disconnected	102
Air unir return temperature sensor broken or disconnected	103
Production circuit 2 supply temperature sensor broken or disconnected	104
Production circuit 2 return temperature sensor broken or disconnected	105
Condenser outlet temperature sensor broken or disconnected	106
Solar tank temperature sensor broken or disconnected	107
Heating/cooling buffer tank temperature sensor broken or disconnected	108
Chiller temperature sensor broken or disconnected	109
Condenser 2 outlet temperature sensor broken or disconnected	110
Oil circuit pressure sensor broken or disconnected	111
Oil circuit supply temperature sensor broken or disconnected	112
Oil circuit return temperature sensor broken or disconnected	113
Inverter cooling outlet temperature sensor broken or disconnected	114
Inverter cooling inlet temperature sensor broken or disconnected	115
Thermostat th-Tune 1 fault	120
Thermostat th-Tune 2 fault	121
Thermostat th-Tune 3 fault	122
Thermostat th-Tune 4 fault	123
Thermostat th-Tune 5 fault	124
Thermostat th-T 1 fault	130
Thermostat th-T 2 fault	131

EN

ALARM DESCRIPTION	ALARM CODE
Thermostat th-T 3 fault	132
Thermostat th-T 4 fault	133
Thermostat th-T 5 fault	134
Device failure	140
Device failure	141
Device failure	142
Device failure	143
Device failure	144
Slaves not available	150
Heat Pump 1 not available	151
Heat Pump 2 not available	152
Heat Pump 3 not available	153
Heat Pump 4 not available	154
Heat Pump 5 not available	155
Heat Pump 6 not available	156
pCOe 1 offline	160
pCOe 2 offline	161
Inverter offline	162
Cascade offline	163
e-Manager offline	164
e-Source offline	165
Outdoor unit offline	166
EVD offline	167
Grid Meter offline	168
cpCOe1 offline	169
cpCOe2 offline	170
Heat Pump offline	171
Heat Pump 1 offline	172
Heat Pump 2 offline	173
Heat Pump 3 offline	174
Heat Pump 4 offline	175
Heat Pump 5 offline	176
Heat Pump 6 offline	177
Outdoor BUS Temp probe offline	178
Thermostat th-Tune 1 offline	180
Thermostat th-Tune 2 offline	181
Thermostat th-Tune 3 offline	182
Thermostat th-Tune 4 offline	183
Thermostat th-Tune 5 offline	184
Thermostat th-T 1 offline	190
Thermostat th-T 2 offline	191
Thermostat th-T 3 offline	192
Thermostat th-T 4 offline	193
Thermostat th-T 5 offline	194
Device offline	200
Device offline	201
Device offline	202
Device offline	203
Device offline	204
Legionella failed	220

ALARM DESCRIPTION	ALARM CODE
Defrosting failed	221
Service fault DHW	230
Service fault Pool	231
Service fault Heating	232
Service fault Active cooling	233
Service fault Passive cooling	234
Simultaneous heat/cool SG1	240
Simultaneous heat/cool SG2	241
Simultaneous heat/cool SG3	242
Simultaneous heat/cool SG4	243
Simultaneous heat/cool SG5	244
Low brine pressure warning	250
Low production circuit pressure warning	251
High brine pressure warning	252
High production circuit pressure warning	253

7.2. Appendix 2. e-SUPERVISOR alarm list

ⓘ **NOTE**	▪ The alarm list included in this document corresponds to the alarm list used in software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

ALARM DESCRIPTION	ALARM CODE
Wrong model configuration	1
Emergency mode manual activation	4
Wrong configuration	5
pCO fault: clock / EEPROM	70
e-Source Alarm	72
e-Source OFF	73
Brine circuit supply temperature sensor broken or disconnected	86
Brine circuit return temperature sensor broken or disconnected	87
Production circuit supply temperature sensor broken or disconnected	89
Production circuit return temperature sensor broken or disconnected	90
DHW temperature sensor broken or disconnected	96
Heating buffer tank temperature sensor broken or disconnected	99
Outdoor temperature sensor broken or disconnected	101
Slaves not available	150
Heat Pump 1 not available	151
Heat Pump 2 not available	152
Heat Pump 3 not available	153
Heat Pump 4 not available	154
Heat Pump 5 not available	155
Heat Pump 6 not available	156
e-Manager offline	164
e-Source offline	165
Heat Pump 1 offline	172
Heat Pump 2 offline	173
Heat Pump 3 offline	174
Heat Pump 4 offline	175
Heat Pump 5 offline	176
Heat Pump 6 offline	177

7.3. Appendix 3. Source manager alarm list.

ⓘ NOTE

- ▪ The alarm list included in this document corresponds to the alarm list used in software versions available at the date on which the document was issued. Other versions, both earlier and later, may differ slightly from the contents found in this section.

ALARM DESCRIPTION	ALARM CODE
Wrong model configuration	1
Wrong pLAN net configuration	2
Sources not configured	3
Wrong sources control type configuration	4
Manual emergency	5
Device offline	20
Sources not available	40
Alarm by digital input in source 1	41
Alarm by digital input in source 2	42
Alarm by digital input in source 3	43
pCO controller fault	60
Block manifold inlet temperature sensor alarm	61
Block manifold outlet temperature sensor alarm	62
Source 1 outlet temperature sensor alarm	63
Source 2 outlet temperature sensor alarm	64
Source 3 outlet temperature sensor alarm	65
Defrost system temperature sensor alarm	66
Outdoor temperature sensor alarm	67

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API BUS Client manual 03E/2024

The manufacturer reserves the right to make modifications without prior notice.