

## NAVIPASS Modbus

00ANO0019-E



The NAVIPASS Modbus is a bypass that allows a boiler equipped with a NAVISTEM B2000, NAVISTEM B2100 or NAVISTEM B3000 regulator to communicate with a PLC controlling the heating plant.

## 1. WARNINGS AND RECOMMENDATIONS

### 1.1. Storage

The NAVIPASS Modbuses:

- must be stored in a place where the temperature is between  $-20^{\circ}\text{C}$  and  $+65^{\circ}\text{C}$  where the relative humidity between 5 and 95%.
- must be protected from humidity.

### 1.2. Symbols used in this document



**INFORMATION:** This symbol draws attention to comments.



**WARNING:** Failure to comply with these instructions may cause electrocution.

### 1.3. Safety instruction

Always disconnect the power supply to the boiler and shut off the main gas supply before carrying out any work on it.

### 1.4. Installation requirements specified by regulations

The installation and maintenance of the appliance must be done by a qualified professional, in accordance with regulatory texts and current industry good practice, and in particular with the national and local standards applying to low voltage electric systems.

### 1.5. Environmental compatibility



This appliance contains electrical and electronic elements which must not be disposed of with household waste.  
Local legislation must be complied with.

## 2. INSTALLING THE INTERFACE

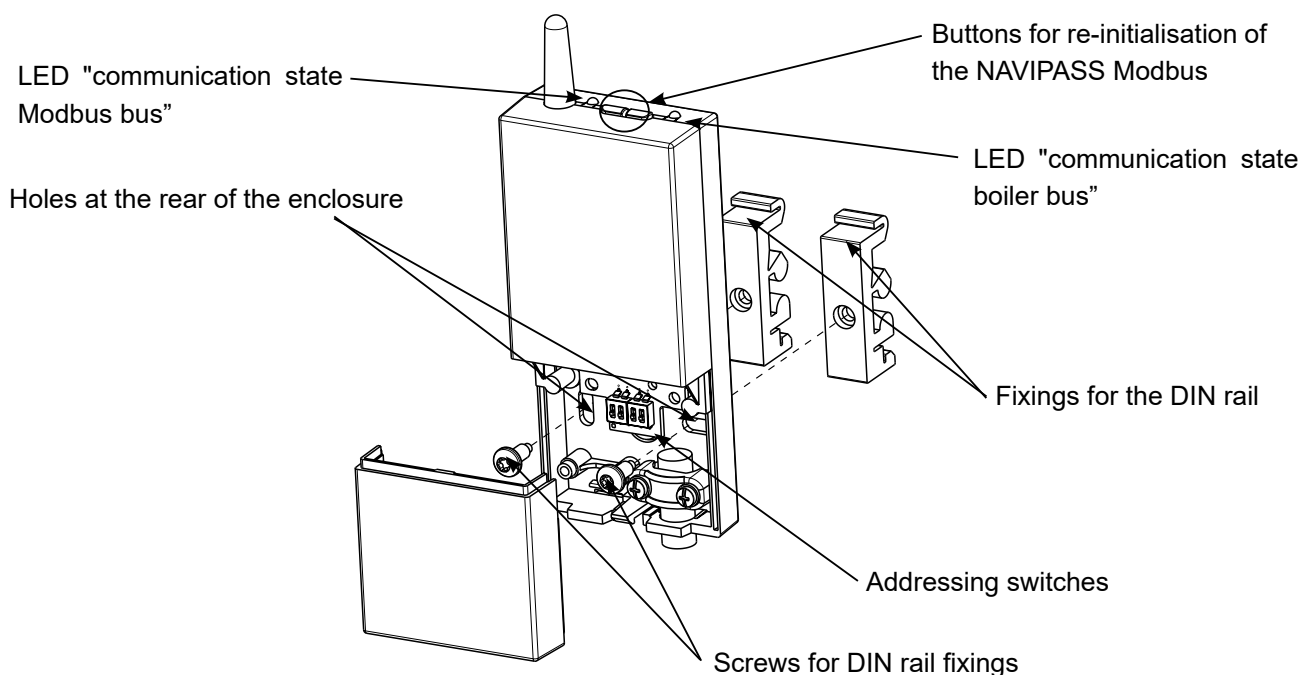


**WARNING:**

Ensure that the general electrical power supply has been cut off before starting any repair work.

### 2.1. Installing the enclosure

The Navipass Modbus box is not designed to be fitted inside the boiler. It should be mounted on a DIN rail (using the two fixings and screws supplied with the kit), fixed to a wall or possibly fitted.



### 2.2. Electrical connection

#### 2.2.1. Cable sections

The following cable sections are given for information purposes only and do not exempt the installer from checking that they meet requirements and comply with standards in force.

If a cable is damaged, it must be replaced by the manufacturer, its after-sales service or any suitably qualified person, in order to avoid any danger.

The interface is supplied with 12V dc solely via the Navistem Bxxxx regulator

Cable	Copper conductor section	Cable tray
Power supply	2 x 0.5 mm <sup>2</sup>	Low current
RTU/RS485 ModBus	3 x 0.5 mm <sup>2</sup>	Low current
Boiler communication bus	2 x 0.5 mm <sup>2</sup> (200m max)	Low current

2.2.2. Electric connections to terminals



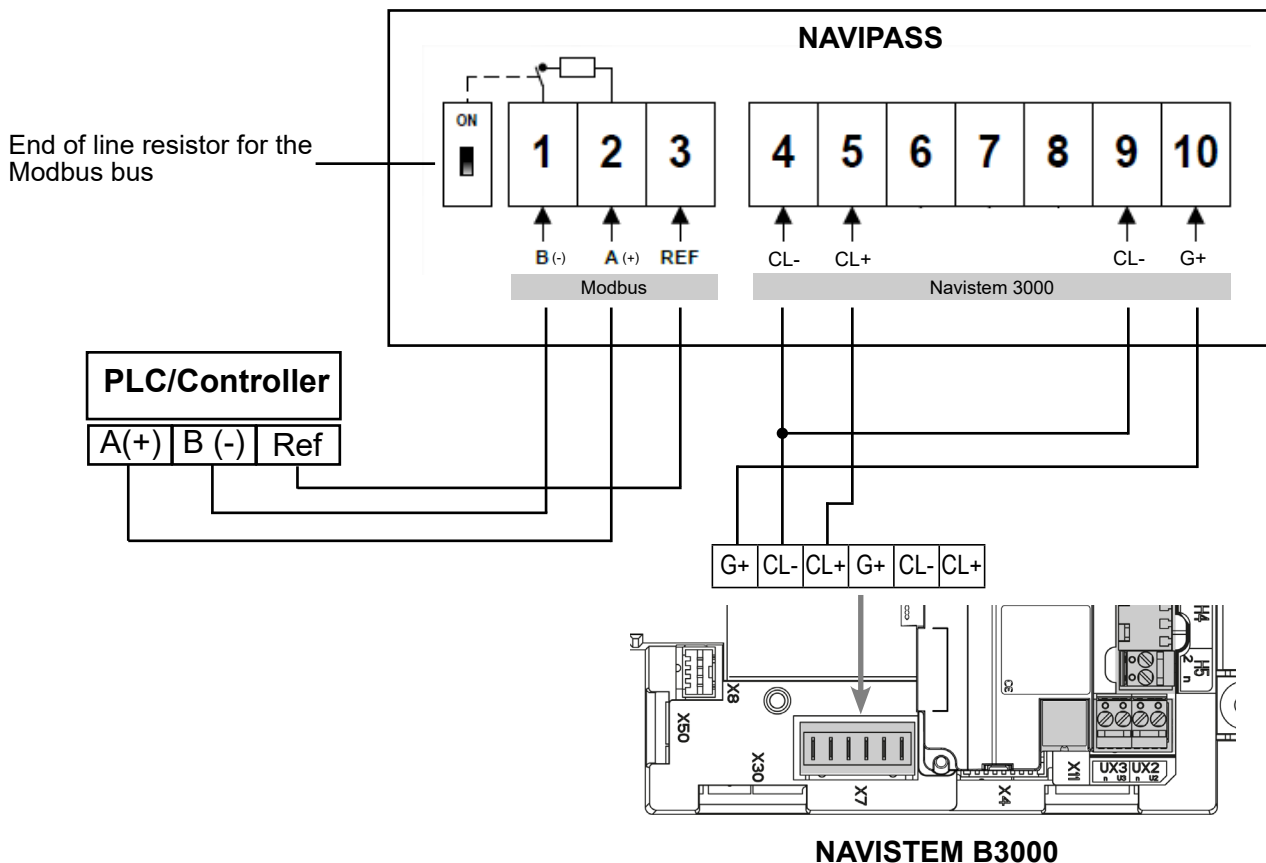
**INFORMATION:** The switch in the 'ON' position allows and end of line 120 Ω terminating resistor to be activated on the Modbus.

Function	Terminal no.	Terminal name	Connections
Modbus	1	B (-)	Modbus RTU RS485 for client PLC
	2	A (+)	
	3	REF	
BSB	4	CL-	CL terminal - Navistem Bxxxx regulator
	5	CL+	CL + terminal - Navistem Bxxxx regulator
	6		Not used
	7		
	8		
Power supply	9	CL-	CL terminal - Navistem Bxxxx regulator (see below).
	10	G+	G+ terminal - Navistem Bxxxx regulator (see below).

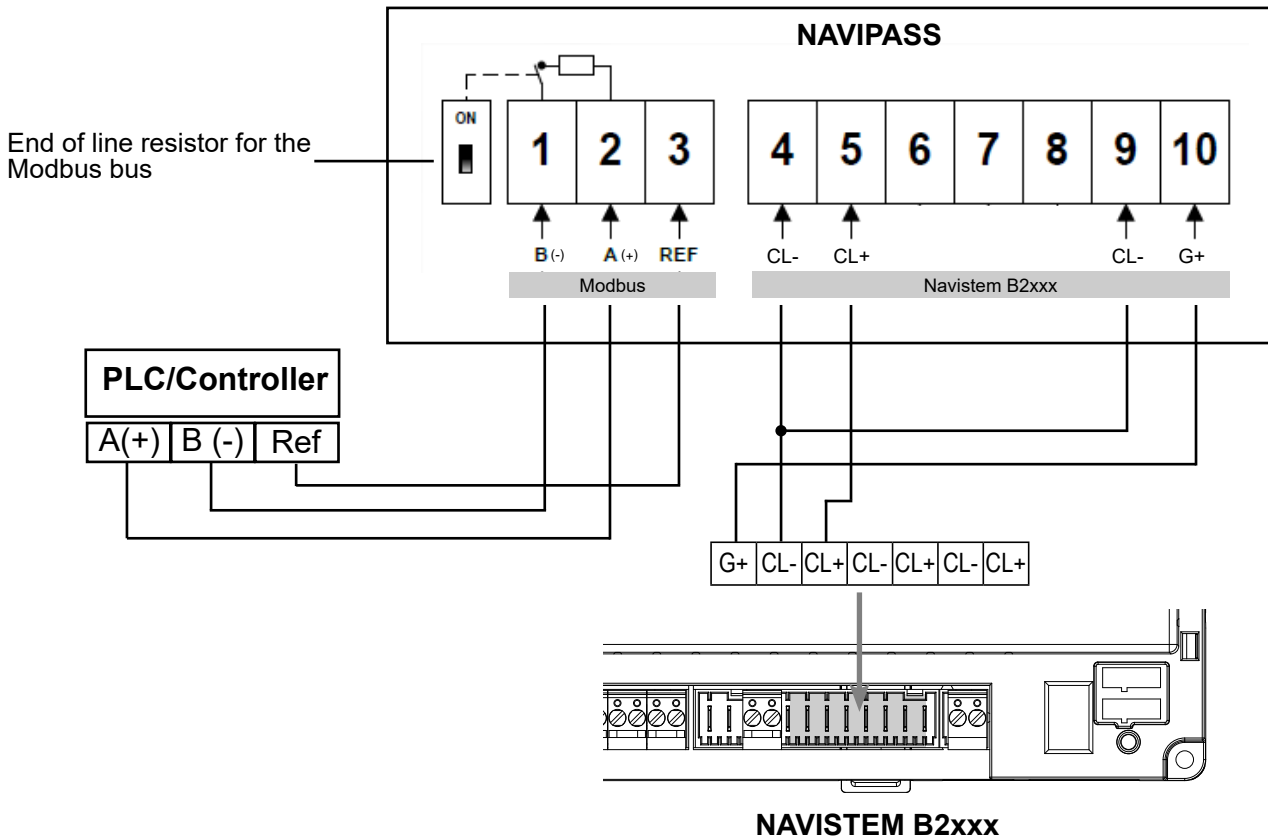


**INFORMATION:** To perform a shunt between terminals 4 and 9 of the NAVIPASS Modbus directly in the latter or connect the 2 wires on the same CL- terminal on the heater side.

**NAVISTEM B3000:**



**NAVISTEM B2xxx:**



### 3. CONFIGURATION

#### 3.1. Addressing the Modbus on the interface

The four selectors (switches) under the electrical connection terminal block are used to specify the Modbus address on the interface.

The address is coded in four bits, allowing a value between 1 and 16 to be specified. The selector on the extreme right is the least significant bit and the one on the extreme left the most significant bit.

The configuration of the address is taken into account only when the interface is started up.

Address examples:

Selectors				Corresponding Modbus address
no. 1	no. 2	no. 3	no. 4	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>1</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>2</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>3</b>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>4</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>5</b>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>6</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>16</b>



where:  = OFF position and  = ON position

### 3.2. Configuration of Modbus settings via the registry 8

The Modbus address 0x0008 (data of type u16) is used for configuring the communication. By default, it contains the value 0x1025 (or 4133 in decimals):

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
<b>Data length</b>				<b>Stop bit</b>				<b>Parity</b>				<b>Communication speed</b>			
0 = 7 bits <b>1* = 8 bits</b> (recommended in Modbus)				0* = 1 bit 1 = 1.5 bits 2 = 2 bits				0 = even 1 = odd <b>2* = any</b>				0 = 2400 bps 1 = 4800 bps 2 = 7200 bps 3 = 9600 bps 4 = 14400 bps <b>5* = 19200 bps</b> 6 = 38400 bps 7 = 57600 bps			

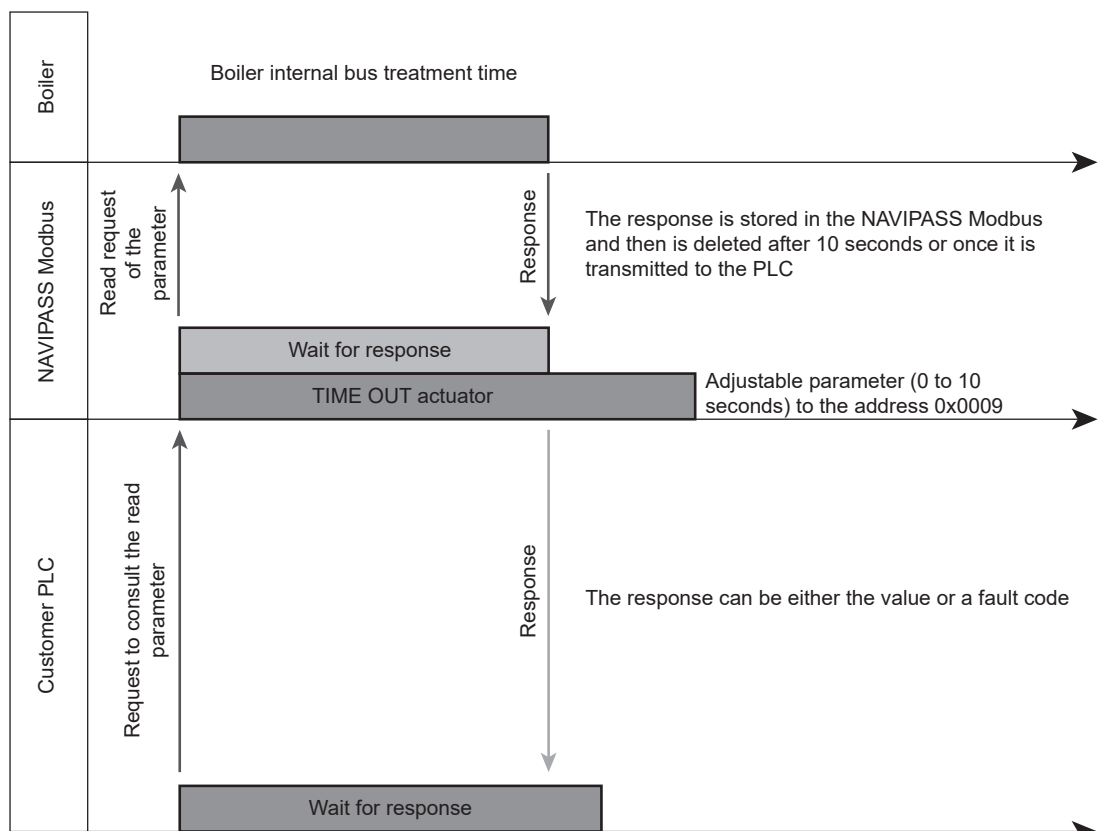
A factory reset (press for 10 seconds on any of the buttons) resets the configuration with the value 0x1025.

### 3.3. Adjusting the "time out" of response via the register 0x0009

The response time of the boiler varies based on your installation. Thus, to optimise the response time and avoid getting 0x0006 errors, you can change the time out.

During a query by the PLC, the Modbus NAVIPASS:

- either will respond immediately with an error code (wrong address, wrong length, wrong function, wrong data),
- or will give the response to the question. If the boiler does not respond to the Modbus NAVIPASS before the end of the "time out", the latter will send the code 0x0006 "server device busy" to the PLC.



Modbus address (Hexa)	Nb register	Data	Access		Possible values (Decimal)	Values displayed (Hexa)	Type of data
			Read	Write			
0x0009	1	Time out	✓	✓	0 ... 10000 ms	[0x0000..0x2710]	u16

The value is adjustable from 0 to 10000 milliseconds (which is 0x0000 to 0x2710). By default, this value is set to 5000 ms (factory output setting).



**CAUTION:**

During a power failure, the value of the time out is automatically re-initialised to 5000 ms (factory output setting).



**INFORMATION:**

The time out set in the Modbus NAVIPASS must be lower than that set in the PLC.

### 3.4. Modbus operation

#### 3.4.1. Functions supported

The following functions are supported by the Modbus

- 0x03: Simple / multiple reading
- 0x04: Simple / multiple reading
- 0x06: Simple writing
- 0x10: Multiple writing



**CAUTION:**

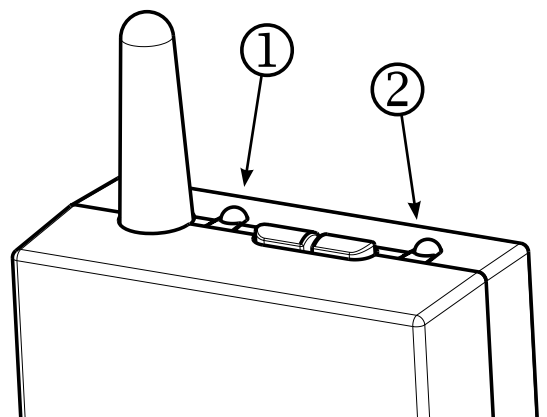
A read or write request may not contain more than one address at a time.

#### 3.4.2. LEDs

The LEDs ① and ② are a steady green when the interface is powered (terminals 9 and 10).

The LED ① flashes amber when there is a Modbus communication.

The LED ② flashes amber when the information circulates on the boiler bus (this is not necessarily the interface that communicates).



### 3.4.3. Error codes

The following error codes may be sent by the interface:

Code	Error	Cause
--	No response of the NAVIPASS Modbus	<ul style="list-style-type: none"> <li>wrong cable</li> <li>Time out of the PLC shorter than the that of the NAVIPASS Modbus (see adjustment of the registry 9 paragraph 3.3)</li> <li>wrong address</li> <li>Incorrect configuration of the communication (see adjustment of the register 8 paragraph 3.2)</li> </ul>
01	Illegal function	<ul style="list-style-type: none"> <li>the function requested is not supported</li> </ul>
02	Illegal data address	<ul style="list-style-type: none"> <li>The Modbus address does not correspond to a standard service</li> <li>The register number is different than expected</li> <li>the standard service is not implemented on the machine</li> <li>read requested with a standard write-only service</li> <li>write requested with a standard read-only service</li> </ul>
03	Illegal data value	<ul style="list-style-type: none"> <li>the data are not correct</li> </ul>
06	Server device busy	<ul style="list-style-type: none"> <li>The query is being dealt with, restart the query (see paragraph 3.3)</li> </ul>
0A	Gateway path unavailable	<ul style="list-style-type: none"> <li>the interface is not configured</li> </ul>
0B	Gateway target device failed to respond	<ul style="list-style-type: none"> <li>the boiler is not responding</li> </ul>
04	Server device failure	<ul style="list-style-type: none"> <li>for all other errors</li> </ul>

#### **Example of reading of the generator starting temperature (43.1°C):**

**Sending frame (Hexa) :**

0x02	0x03	0x00 0x6F	0x00 0x01	0xB4 0x24
Address of the interface on the bus (see § 3.1): 2 for example	Type of request (see § 3.3.1): read	Modbus address of the function: Generator starting temperature = 111 (decimal) = 006F (hexadecimal)	Length of the frame: 1 register	CRC code (automatically generated by the customer PLC)

**Sending frame (Hexa) :**

0x02	0x03	0x02	0x01 0xAF	0xBD 0xA8
Address of the interface on the bus	Type of request	Number of bytes read	Value of the temperature in 10 <sup>th</sup> °C: 01AF (hexa) = 431 (dec) = 43.1 °C	CRC response code (depends on the value of the previous case)

**3.5. Exchange table**

Line no. B2000 B2100	Corresponding Modbus address	Nb register	Data	Access		Possible values	Values displayed	Type of data
				Read	Write			
<i>Info key</i>	100	1	Error code	✓	✗	0 ... 999	[0..999]	u16
8700	101	1	Outdoor temperature	✓	✗	-40.0°C ... 50.0 °C	[-400..+500]	s16
8311	110	1	Generator starting set-point	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8310	111	1	Generator starting temperature	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8314	112	1	Generator return temperature	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8316	113	1	Generator fumes temperature	✓	✗	0.0 °C ... 350.0 °C	[0..3500]	u16
8005	114	1	Generator state	✓	✗	0 ... 255	[0..255] **	u8
--	8009	115	Burner state	✓	✗	0 ... 255	[0..255] **	u8
--	8326	116	Generator modulation	✓	✗	0 ... 100 %	[0..100]	u8
501 ... 506	300	42	Heating program, zone 1	✓	✓	---, 00:00...23:59	See end of table	
642	120	3	Start of absence date	✓	✓	---, jjmm	See end of table	
643	123	3	End of absence date	✓	✓	---, jjmm	See end of table	
714-1014-1314	126	1	No heating temperature set-point	✓	✓	Min temp heating set-point ... max temp heating set-point	[40..160] *	u16
720	131	1	Water law, zone 1	✓	✓	0.1 ... 4.0	[1..40]	u8
721	132	1	Water law offset, zone 1	✓	✓	-4.5 ... 4.5	[-45..45]	s8
8744	133	1	Calculated starting set-point, zone 1	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8743	134	1	Starting set-point, zone 1	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
710	135	1	Temp. set-point Comfort heating, zone 1	✓	✓	Eco heating temp set-point, zone 1 ... heating max temp set-point	[70..280] *	u16
712	136	1	Temp. set-point Eco heating, zone 1	✓	✓	Heating min temp set-point ... Heating comfort temp set-point, zone 1	[70..280] *	u16
8741	137	1	Temp. set-point Current thermal comfort, zone 1	✓	✗	4.0 °C ... 40.0 °C (by 0.5°C)	[40..400]	u16

\* Only modulo 5 values are accepted

\*\* See list of states in table no. 1 (paragraph , page 35).

\*\* See list of states in table no. 2 (paragraph , page 37).



Line no. B2000 B2100	B3000	Corresponding Modbus address	Nb register	Data	Access		Possible values	Values displayed	Type of data
					Read	Write			
8740		138	1	Ambient temperature, zone 1	✓	✗	4.0 °C ... 40.0 °C	[40..400]	u16
8000		139	1	State, zone 1	✓	✗	0 ... 255	[0..255] **	u8
521 ... 526		400	42	Heating program, zone 2	✓	✓	---, 00:00...23:59	See end of table	
1020		151	1	Water law, zone 2	✓	✓	0.1 ... 4	[1..40]	u8
1021		152	1	Water law offset, zone 2	✓	✓	-4.5 ... 4.5	[-45..45]	s8
8774		153	1	Calculated starting set- point, zone 2	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8773		154	1	Starting set-point, zone 2	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
1010		155	1	Temp. set-point Comfort heating, zone 2	✓	✓	Eco heating temp set- point, zone 2 ... heating max temp set-point	[70..280] *	u16
1012		156	1	Temp. set-point Eco heating, zone 2	✓	✓	Heating min temp set-point ... Heating comfort temp set- point, zone 2	[70..280] *	u16
8771		157	1	Temp. set-point Current thermal comfort, zone 2	✓	✗	4.0 °C ... 40.0 °C (by 0.5°C)	[40..400]	u16
8770		158	1	Ambient temperature, zone 2	✓	✗	4.0 °C ... 40.0 °C	[40..400]	u16
8001		159	1	State, zone 2	✓	✗	0 ... 255	[0..255] **	u8
541 ... 546		500	42	Heating program, zone 3	✓	✓	---, 00:00...23:59	See end of table	
1320		171	1	Water law, zone 3	✓	✓	0.1 ... 4	[1..40]	u8
1321		172	1	Water law offset, zone 3	✓	✓	-4.5 ... 4.5	[-45..45]	s8
8803		173	1	Calculated starting set- point, zone 3	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8804		174	1	Starting set-point, zone 3	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
1310		175	1	Temp. set-point Comfort heating, zone 3	✓	✓	Eco heating temp set- point, zone 3 ... heating max temp set-point	[70..280] *	u16
1312		176	1	Temp. set-point Eco heating, zone 3	✓	✓	Heating min temp set-point ... Heating comfort temp set- point, zone 3	[70..280] *	u16
8801		177	1	Temp. set-point Current thermal comfort, zone 3	✓	✗	4.0 °C ... 40.0 °C (by 0.5°C)	[40..400]	u16
8800		178	1	Ambient temperature, zone 3	✓	✗	4.0 °C ... 40.0 °C	[40..400]	u16
8002		179	1	State, zone 3	✓	✗	0 ... 255	[0..255] **	u8
561 → 566		600	42	Domestic hot water program	✓	✓	---, 00:00...23:59	See end of table	
1610		191	1	Temp. set-point Domestic hot water comfort	✓	✓	ECO Domestic hot water temp set-point ... 80 °C	[8..80]	u8
1612		192	1	Temp. set-point ECO domestic hot water	✓	✓	8°C ... Domestic hot water comfort set- point	[8..80]	u8
8831		193	1	Temp. set-point Current domestic hot water	✓	✗	8 °C ... 80 °C	[8..80]	u8

\* Only modulo 5 values are accepted

\*\* See list of states in table no. 1 (paragraph , page 35).

\*\* See list of states in table no. 2 (paragraph , page 37).

Line no. B2000 B2100	B3000	Corresponding Modbus address	Nb register	Data	Access		Possible values	Values displayed	Type of data
					Read	Write			
8830		194	1	DHW temperature	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8832		195	1	Domestic hot water temperature 2, bottom of tank	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8003		196	1	Domestic hot water state	✓	✗	0 ... 255	[0..255] **	u8
5952	1859	200	1	Starting set-point, consumer 1	✓	✓	8.0 °C ... 120.0 °C	[8..1200]	s16
--	1909	201	1	Starting set-point, consumer 2	✓	✓	8.0 °C ... 120.0 °C	[8..1200]	u16
8139		210	1	Cascade starting set- point	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8138		211	1	Cascade starting temperature	✓	✗	0.0 °C ... 140.0 °C	[0..1400]	u16
8101		212	1	State, generator 1	✓	✗	0 ... 255	[0..255] ***	u8
8103		213	1	State, generator 2	✓	✗	0 ... 255	[0..255] ***	u8
8105		214	1	State, generator 3	✓	✗	0 ... 255	[0..255] ***	u8
8107		215	1	State, generator 4	✓	✗	0 ... 255	[0..255] ***	u8
8109		216	1	State, generator 5	✓	✗	0 ... 255	[0..255] ***	u8
8111		217	1	State, generator 6	✓	✗	0 ... 255	[0..255] ***	u8
8113		218	1	State, generator 7	✓	✗	0 ... 255	[0..255] ***	u8
8115		219	1	State, generator 8	✓	✗	0 ... 255	[0..255] ***	u8
8117		220	1	State, generator 9	✓	✗	0 ... 255	[0..255] ***	u8
8119		221	1	State, generator 10	✓	✗	0 ... 255	[0..255] ***	u8
8121		222	1	State, generator 11	✓	✗	0 ... 255	[0..255] ***	u8
8123		223	1	State, generator 12	✓	✗	0 ... 255	[0..255] ***	u8
8125		224	1	State, generator 13	✓	✗	0 ... 255	[0..255] ***	u8
8127		225	1	State, generator 14	✓	✗	0 ... 255	[0..255] ***	u8
8129		226	1	State, generator 15	✓	✗	0 ... 255	[0..255] ***	u8
8131		227	1	State, generator 16	✓	✗	0 ... 255	[0..255] ***	u8
5950		228	1	H1 input function	✓	✓	See table AA for B3000 and AC for B2000/B2100	0...14/0...58	u8
5951		229	1	Contact action H1	✓	✓	Rest contact/working contact	0...1	u8
5962	--	230	1	Minimum flow setpoint H3	✓	✓	8...120	8...120	s16
5960	--	231	1	H3 input function	✓	✓	AC table	0...14	u8
5961	--	232	1	Contact action H3	✓	✓	Rest contact/working contact	0...1	u8
--	5977	233	1	H5 input function	✓	✓	See table AB	0...32	u8
--	5978	234	1	Contact action H5	✓	✓	0...1	0...1	u8
8330		235	2	No. of hours burner	✓	✗	0...65535 hours	00 ... 65535	u32
8331		236	2	No. of starts burner	✓	✗	0...199999	00...199999	s32
5710		237	1	On/Off heating circuit 1	✓	✓	On / off	0...1	u8
5715		238	1	On/Off heating circuit 2	✓	✓	On / off	0...1	u8
8308		241	1	Boiler pump speed	✓	✗	0...100%	0...100	u8
900		246	1	Change of heating circuit 1 mode.	✓	✓	See AD list	0...4	u8
1200		247	1	Change of heating circuit 2 mode.	✓	✓	See AD list	0...4	u8

\* Only modulo 5 values are accepted

\*\* See list of states in table no. 1 (paragraph , page 35).

\*\* See list of states in table no. 2 (paragraph , page 37).

Line no.		Corresponding Modbus address	Nb register	Data	Access		Possible values	Values displayed	Type of data
B2000 B2100	B3000				Read	Write			
1500		248	1	Change of HCP mode.	✓	✓	See AD list	0...4	u8
--	1680	249	1	Change of DHW mode.	✓	✓	Without/off/on	1/2/3	u8
3510		250	1	Cascade strategy	✓	✓	See AE list	0...3	u8
3511		251	1	Minimum range of power	✓	✓	0...100%	0...100	s8
3512		252	1	Maximum range of power	✓	✓	0...100%	0...100	s8
3530		253	1	Release integral of the generators in the cascade	✓	✓	0...500°C*min	0...500	s16
3531		254	1	Stop integral of the generators in the cascade	✓	✓	0...500°C*min	0...500	s16
--	5721	255	1	On/Off heating circuit 3	✓	✓	On / off	0...1	u8
--	8366	256	1	Reading of the boiler flow	✓	×	0...3267.7 l/min	0...32767	s16
--	9009	257	1	Hydraulic pressure of the boiler	✓	×	0...10 bars	0...100	s16
1640		258	1	Anti-legionella function	✓	✓	Stop/period/day of the fixed week	0...2	u8
8338		259	2	No. of hours of operation of the heating	✓	✓	0...199999 hours	0...199999	u32
8339		260	2	No. of hours of operation of the DHW	✓	✓	0...199999 hours	0...199999	u32
8300	--	239	1	1st burner stage	✓	×	On / off	0...1	u8
8301	--	240	1	2nd burner stage	✓	×	On / off	0...1	u8
8332	--	242	2	Hours of operation of the second stage	✓	×	0...65535 hours	0...65535	u32
8333	--	243	2	No. to start 2nd stage	✓	×	0...199999	0...199999	s32
9000	--	244	1	H1 flow setpoint	✓	✓	5...130,0°C	5...1300	s16
9004	--	245	1	H3 flow setpoint	✓	✓	5...130,0°C	5...1300	s16

### Values displayed for the time schedules (Modbus addresses: 300, 400, 500 and 600):

The time is codified on 1 register in the following manner:

hh:mm → (hh x 60) + mm to be transformed into hexadecimal

e.g.: 22:30 → (22 x 60) + 30 = 1350 (decimal) = 0546 (hexadecimal)

If no time is programmed, the registry must have the value FFFF.

The 42 registers are distributed as follows:

	Phase 1		Phase 2		Phase 3	
	Engagement	Triggering	Engagement	Triggering	Engagement	Triggering
<b>Monday</b>	1	2	3	4	5	6
<b>Tuesday</b>	7	8	9	10	11	12
<b>Wednesday</b>	13	14	15	16	17	18
<b>Thursday</b>	19	20	21	22	23	24
<b>Friday</b>	25	26	27	28	29	30
<b>Saturday</b>	31	32	33	34	35	36
<b>Sunday</b>	37	38	39	40	41	42



#### INFORMATION:

The 42 registers should be read and written simultaneously (functions 0x03, 0x04 and 0x10: see § 3.4.1).

**Displayed values for the start and end dates of absences (Modbus addresses: 120 123):**

The date is codified on 3 registers in the following manner:

- 1<sup>st</sup> register: 0000
- 2<sup>nd</sup> register: ddmm with dd the no. of the day in hexadecimal (01 to 1F)  
and mm the no. of the month in hexadecimal (01 to 0C)  
e.g.: 29 November = 1D0b (hexadecimal)
- 3<sup>rd</sup> register: 0000

**3.6. List of functions**

**3.6.1. Table AA (function H1 entry to B3000)**

Data in decimals	Data in hexa	Selection
0	0	without
1	1	Switching of heating circuit + DHW operation
2	2	Switching of heating circuit + DHW operation
3	3	Switching of heating circuits
4	4	Switching of heating circuit 1
5	5	Switching of heating circuit 2
6	6	Switching of heating circuit 3
7	7	Blocked generator, waiting
8	8	Error/alarm message
9	9	Consumption circuit 1 request
10	A	Consumption circuit 2 request
11	B	Release pool generator
12	C	Excess heat evacuation
13	D	Release solar swimming pool
14	E	DHW temperature level
15	F	HC1 temperature level
16	10	HC2 temperature level
17	11	HC3 temperature level
18	12	Ambient thermostat HC1
19	13	Ambient thermostat HC2
20	14	Ambient thermostat HC3
21	15	DHW flow rate controller
22	16	DHW thermostat
23 to 27	17 to 1B	---
28	1C	Info smoke damper
29	1D	Start prevention
30	1E	---
31	1F	Boiler flow switch
32	20	Boiler pressure switch
33 to 50	21 to 32	---
51	33	Consumption circuit 1 request 10V

Data in decimals	Data in hexa	Selection
52	34	Consumption circuit 2 request 10V
53	35	---
54	36	Measurement of pressure 10V
55 to 57	37 to 39	---
58	3A	10V power request

### 3.6.2. Table AB (function H5 entry to B3000)

Data in decimals	Data in hexa	Selection
0	0	without
1	1	Switching of heating circuit + DHW operation
2	2	Switching of heating circuit + DHW operation
3	3	Switching of heating circuits
4	4	Switching of heating circuit 1
5	5	Switching of heating circuit 2
6	6	Switching of heating circuit 3
7	7	Blocked generator, waiting
8	8	Error/alarm message
9	9	Consumption circuit 1 request
10	A	Consumption circuit 2 request
11	B	Release pool generator
12	C	Excess heat evacuation
13	D	Release solar swimming pool
14	E	DHW temperature level
15	F	HC1 temperature level
16	10	HC2 temperature level
17	11	HC3 temperature level
18	12	Ambient thermostat HC1
19	13	Ambient thermostat HC2
20	14	Ambient thermostat HC3
21	15	DHW flow rate controller
22	16	DHW thermostat
23 to 27	17 to 1B	---
28	1C	Info smoke damper
29	1D	Start prevention
30	1E	---
31	1F	Boiler flow switch
32	20	Boiler pressure switch

**3.6.3. Table AC (function H1 and H3 entry to B2000 / B2100)**

Data in decimals	Data in hexa	Selection
0	0	Switching of heating circuit + DHW operation
1	1	Switching of heating circuits
2	2	Switching of heating circuit 1
3	3	Switching of heating circuit 2
4	4	Switching of heating circuit + HCP operation
5	5	Blocked generator, waiting
6	6	Error/alarm message
7	7	Minimum flow temperature setpoint
8	8	Excess heat evacuation
9	9	Swimming pool release
10 and 11	A et B	---
12	C	Heat request 10V
13	D	Measurement of pressure 10V
14	E	DHW temperature level

**3.6.4. Table AD (heating system mode)**

Data in decimals	Data in hexa	Selection
0	0	Without
1	1	Protection mode
2	2	Reduced
3	3	Comfort
4	4	Automatic

**3.6.5. Table AE (cascade strategy)**

Data in decimals	Data in hexa	Selection
0	0	without
1	1	Switch-on delayed / early stop
2	2	Switch-on delayed / stop delayed
3	3	Switch-on early / stop delayed

Refer to the regulator leaflet for more information.

### 3.7. Status list

#### 3.7.1. Table no. 1

##### **Boiler state messages (lines No. 8000 / 8001 / 8002)**

State No.	Final user (info level)	Commissioning, specialist
3	Thermostat response	Thermostat response
4	Man intervention active	Man intervention active
102	Drying mode activated	Drying mode activated
56 103 104 105 106	Heating operation restrict.	Active overheating protect. Boiler restriction, prot. Restriction, DHW priority Restriction, storage tank
107 108 109 110 17 110	Forced draught	Forced draught, storage tank Forced draught, DHW Forced draught boiler Forced draught Delayed power-cut response active.
111 112 113 114	Heating mode, comfort.	Opt. start. + warmup. acc. Optimisation when started Accelerated heating up Heating mode, comfort.
115 116	Heating mode, low.	Optimum stop control Heating mode, low.
101 117 23 24	Antifreeze protection enabled	Ambient antifreeze protect. Active antifreeze start Active install antifreeze prot.
118	Summer mode	Summer mode
119 120 121 122 25	Stop	Eco active day Reduced lowering Reduced antifreeze prot. Ambient temperature limitation Stop

##### **DHW state messages (line No. 8003)**

State No.	Final user (info level)	Commissioning, specialist
3	Thermostat response	Thermostat response
4	Man intervention active	Man intervention active
199	Fluid decanting regime	Fluid decanting regime
222 221 221	Heat maintenance mode EN	Heat maintenance mode active Heat maintenance mode EN
77 78 53	Adiabatic cooling active	Adiabatic cooling by collector Adiabatic cooling by generator / heating circuits
79 80 81 82	Load lock active	Discharge prot. active Load duration limit active Load locked

State No.	Final user (info level)	Commissioning, specialist
83 84 85 86 67	Forced load active	Forcing, maximum temperature of the tank Forcing, maximum temperature of load Forcing, anti-legionella setpoint Forcing, comfort setpoint
87 88 89 90 91 66	Electrical resistance load	Electrical resistance load, anti-legionella setpoint El. load setp. Comfort Electrical resistance load, reduced setpoint Electrical resistance load, anti-freeze setpoint Release el. resistance
92 93 94	Accelerated load active	Active start Accelerated anti-legionella load.
95 96 97 69	Activated load	Load, anti-leg. setpoint Load, comfort setpoint Load, reduced setpoint
24 223 24	Antifreeze protection enabled	Antifreeze protection enabled Antifreeze protection of water heater snapshot
17	Delayed power-cut response active.	Delayed power-cut response active.
201	Load on standby	Load on standby
70 71 98 99 100 75	Under load	Under load, maximum temperature of the tank Under load, maximum temperature of load Load, anti-legionella temperature Under load, comfort T° Under load, reduced temperature
25	Stop	Stop
200	Ready	Ready

### **Boiler state messages (line No. 8005)**

State No.	Final user (info level)	Commissioning, specialist
1	STB response	STB response
123	Test limit. active safety	Test limit. active safety
2	Fault	Fault
232 233 234	T° excessive smoke	T° smoke, cut-off T° smoke power limitation
3	Thermostat response	Thermostat response
4	Man intervention active	Man intervention active
5 6 7	Chimney function active	Chimney function, nominal load Chimney function, partial load
8 172 9 176 198 10	Blocked	Manual locking Locked, solid boiler comb Auto-lock Locked, temperature ext Locked, ecological mode



State No.	Final user (info level)	Commissioning, specialist
20 21 22	Min limitation active	Minimum limitation Min. limitation part. load Min limitation active
11 12 13 14 18	In operation	Offloading at startup Offloading at startup part. load Limitation of reloading Limitation of reloading, partial load
59 170 171 173 168 169 174 166 167 175 17	Storage tank load In operation for heating circuit, sanitary hot water Under partial load for heating circuit, sanitary hot water Released for heating circuit, sanitary hot water In operation for the DHW Under partial load for sanitary hot water Released for sanitary hot water In operation for the heating circuit Under partial load for the heating circuit Released for heating circuit Delayed power-cut response active.	Storage tank load In operation for heating circuit, sanitary hot water Under partial load for heating circuit, sanitary hot water Released for heating circuit, sanitary hot water In operation for the DHW Under partial load for sanitary hot water DHW production release In operation for the heating circuit Under partial load for the heating circuit Released for heating circuit Delayed power-cut response active.
19	Released	Released
23 24	Antifreeze protection enabled	Active install antifreeze prot.
25	Stop	Stop

### **Burner state messages (line No. 8009)**

State No.	Final user (info level)	Commissioning, specialist
211	Fault position	Fault position
212	Start prevention	Start prevention
18	In operation	In operation
214 218 215	Start-up	Safety time delay Pre-ventilation Start-up
219 213 217		Post-ventilation Deactivation Reset to zero
216	Reduced	Reduced

### **3.7.2. Table no. 2**

No	Title
0	Absent
1	In fault condition
2	Man. adjustment active
3	Boiler lock activated
4	Chimney function active

No	Title
5	Temporarily not available
6	T°ext. limitation active
7	Not released
8	Released
9 - ...	Not used

## 4. APPLICATION EXAMPLES

### 4.1. Control of boilers in the starting temperature setpoint



**INFORMATION:**

The following settings must be performed in addition to the settings listed in the boiler leaflet.

**Step 1:** Adjust the following settings on the boiler **or** with the NAVIPASS modbus

**values**

**Configure the H1 input function**

on NAVISTEM Bxxxx, parameter 5950	consumption circuit request 1
On NAVIPASS, modbus address 228 (0xE4)	9 (0x0009)

**Configure contact action H1**

on NAVISTEM Bxxxx, parameter 5951	normally-closed contact (NC)
On NAVIPASS, modbus address 229 (0xE5)	0 (0x0000)

**Step 2:** Modify the starting temperature setpoint

**configure the starting temperature setpoint**

on NAVISTEM B3xxx, parameter 1859	-- in °C
on NAVISTEM B2xxx, parameter 5952	-- in °C
On NAVIPASS, modbus address 200 (0xC8)	temperature in tenth °C (e.g.: 500 (0x01F4) for 50 °C)

### 4.2. Heating circuit control



**INFORMATION:**

The following settings must be performed in addition to the settings listed in the boiler leaflet.

**Example for the heating circuit 1:**

**values**

**Configure the "comfort" ambient temperature**

on NAVISTEM Bxxxx	-- in °C
Heating circuit 1 → parameter 710	
on the NAVIPASS Modbus	-- (0x--) in °C
Heating circuit 1 → modbus address 135 (0x87)	

## values

**Configure the "reduced" ambient temperature**

on NAVISTEM Bxxxx

Heating circuit 1 → parameter 712

-- in °C

on the NAVIPASS Modbus

Heating circuit 1 → modbus address 136 (0x88)

-- (0x--) in °C

**If necessary, modify the incline of the water heating curve**

on NAVISTEM Bxxxx

Heating circuit 1 → parameter 720

1 to 40

on the NAVIPASS Modbus

Heating circuit 1 → modbus address 131 (0x83)

from 1 to 40 (0x01 to 0x28)

**Case no. 1: Use of the programming schedule set on the boiler**

on NAVISTEM Bxxxx

Heating circuit 1 → parameters 500 to 516.

refer to the leaflet of the NAVISTEM Bxxxx

on the NAVIPASS Modbus

Heating circuit 1 → modbus address 300 (0x12C)

see page 11 of this leaflet

**Case no. 2: Use of the programming schedule set on the customer PLC***Step 1: Adjust the following settings on the boiler or with the NAVIPASS modbus***Configure the H1 input function**

on NAVISTEM Bxxxx, parameter 5950

Optg mode changeover HCs

On NAVIPASS, modbus address 228 (0xE4)

2 (0x0002) for B2xxx

3 (0x0003) for B3000

**Configure the desired switching in the heating circuits (e.g.: circuit 1)**if comfort / reduced

on NAVISTEM Bxxxx

Heating circuit 1 → parameter 900

reduced

on the NAVIPASS Modbus

Heating circuit 1 → modbus address 246 (0xF6)

2 (0x2)

	<b>values</b>
<u>if comfort / protection mode</u>	
on NAVISTEM Bxxxx Heating circuit 1 → parameter 900	protection mode
on the NAVIPASS Modbus Heating circuit 1 → modbus address 246 (0xF6)	1 (0x1)
 <b><i>activate the change of mode</i></b>	
on NAVISTEM Bxxxx, parameter 5951	normally-closed contact (NC)
On NAVIPASS, modbus address 229 (0xE5)	0 (0x0000)