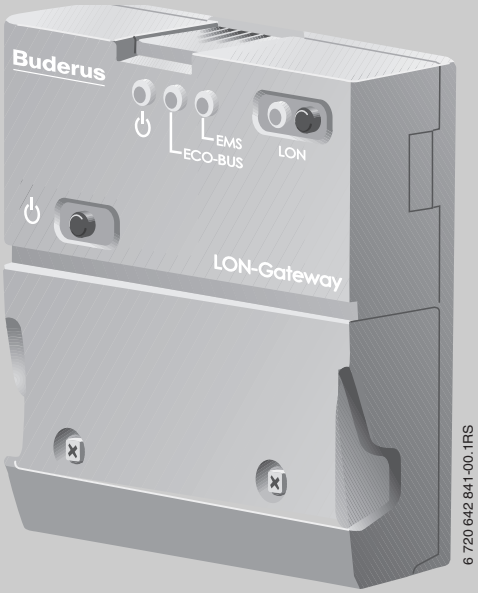
Technical Information

Interface with DDC



6 720 642 841-00.1RS

Logamatic LON-Gateway

For heating contractors

during project planning

6 720 643 554 (11/2010) US/CA

Buderus

Contents

1 Explanation of symbols and safety instructions

1.1 Guideline to symbols

Warnings

Warnings are indicated in the text by a warning triangle and a gray background.

In case of danger from electric shock, the exclamation point on the warning triangle is replaced with a lightning symbol.

Signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing damage are not taken.

- **NOTE** indicates that minor damage to property may occur.
- **CAUTION** indicates possible minor to medium personal injury.
- **WARNING** indicates possible severe personal injury.
- **DANGER** indicates that severe personal injury may occur.

Important information

Important information that presents no risk to people or property is indicated with this symbol. It is separated by horizontal lines above and below the text.

Additional symbols

Symbol	Meaning
▶	Sequence of steps
→	Cross-reference to other points in this document or to other documents
•	Listing/list entry
–	Listing/list entry (2nd level)

Tab. 1

WARNING: Only transformers with following specification are permitted:
6 V AC; 400 mA. The transformer is not part of the product! Please take care to use a reliable product which meets our requirements shown above. Do not mount the transformer internally!

Buderus does not accept responsibility for systems which contravene the Installation instruction or addition documentation in scope of delivery.
The transformer must be mounted in a separate enclosure which is rated for this purpose.

1.2 Safety instructions

Installation and commissioning

The Logamatic LON-Gateway interface module has been designed and built in accordance with currently recognized standards and safety requirements.
However, dangers or property damage may arise if it is used improperly.

- Observe these instructions to ensure satisfactory operation.
- The appliance may only be installed and started up by a trained installer.
- All changes and adjustments made via superior control systems must meet the heating system requirements.

Risk of death from electric shock

- The power supply must be connected by a qualified electrician.
- The terminal diagram must be followed.
- Before opening the appliance, isolate all poles of the mains power supply and secure against unintentional reconnection.
- Never install this appliance in wet rooms.
- Ensure that a circuit breaker is available to disconnect all poles from the mains power supply. If there is no circuit breaker, you will need to install one.

Risk of damage from operator error

Operator errors can cause injury and damage to property.

- Ensure that children never operate this appliance unsupervised or play with it.
- Ensure that only individuals who can operate this appliance correctly have access to it.

Device damage from electrostatic discharge (ESD)

- Before unpacking the module, touch a radiator or a grounded metal water pipe to discharge any electrostatic charge in your body.

Damage from incorrect spare parts

- Only use original Buderus spare parts. Damage caused by the use of spare parts not supplied by Buderus are excluded from the Buderus warranty.

2 Product description

2.1 Correct use

The Logamatic LON-Gateway may only be used to connect Buderus boilers with control panel from the Buderus Logamatic 4000 control series to superior control and/or building control systems via LON-BUS.

2.2 Disposal

- Electronic components do not belong in household waste.
  Dispose of defunct modules correctly through an authorized disposal site.

2.3 Product description

The Logamatic LON-Gateway is incorporated into a LON network via a twisted pair cable (twisted 2-wire line). The twisted pair cable is protected against reverse polarity.

Defined data of the Buderus control panel is implemented with the Logamatic LON-Gateway interface on standard network variable types (SNVTs) for the LON data bus. The communication includes forwarding of error messages, operating messages, and actual values, as well as changing of set points and operating modes for boilers and consumers.

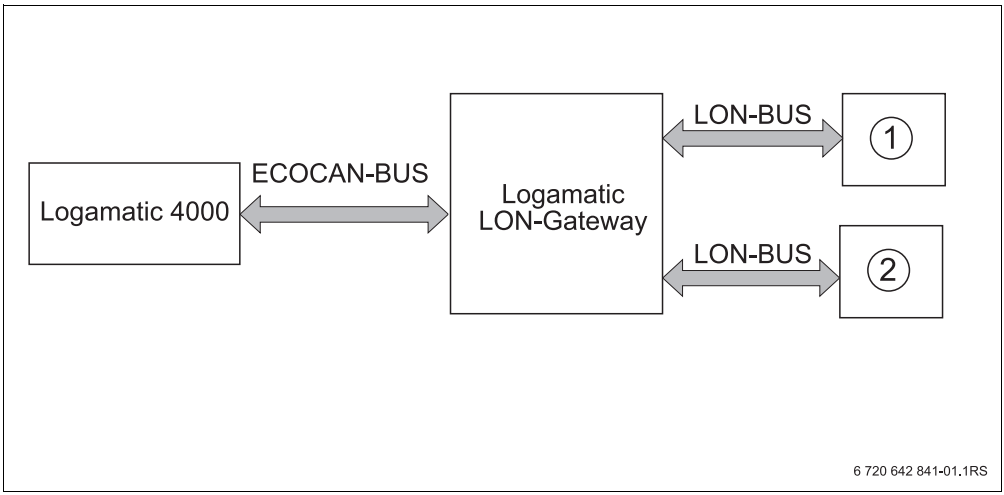


Fig. 1 Block diagram

1 Superior control system (building control system)
2 LON Gateway

Making the electrical connections

	Logamatic LON-Gateway
Connection of the Logamatic LON-Gateway with Logamatic 4000	ECOCAN-BUS interface (BUS communication), 3000 ft (1000 m) shielded cable
Connection of Logamatic LON-Gateway to LON networks	FTT-10A transceiver for incorporation via 2-wire cable (twisted pair) to standardized LON BUS network; line or free BUS topology possible
Maximum cable length for FTT 10 depending on the cable types used (see Echelon documentation).	JY(ST)Y 2x2x0,8: max. 1050 ft (320 m) for node to node, 1640 ft (500 m) total
	Cat5: max. 820 ft (250 m) for node to node 1480 t (450 m)

Tab. 2 Electrical connections on the LON-Gateway

Product features of the LON-Gateway

- Can be used with all digital Logamatic 4000 control panels
- Interface can be equipped after the fact for the superior control system or for LON thermostats, integration into existing building control technology/direct digital control (GLT/DDC)
- Interoperability through use of the standard network variable types (SNVT) assured according to LonMark®
- Provision of the SNVT data for systems consisting of:

Communication objects	Variant 2 boiler	Variant 4 boiler
Boiler	2	4
Heating zones	5	1
DHW zone with tank charging pump and recirculation pump	1	1
Solar thermal system for DHW heating	1	-

Tab. 3 Variants

2.4 Specifications

	Unit	Logamatic LON-Gateway
Power supply	L	6 V AC, 400 mA
Frequency	Hz	50/60 Hz
Power consumption	VA	1.5
Dimensions (width/height/depth)	inches (mm)	5-1/8" / 5-1/2" / 9/16" (130/140/40)
Weight	oz (g)	14 (400)
Operating temperature	°F (°C)	40 to 122 (5 to 50)
Protection level		IP40

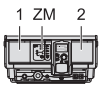
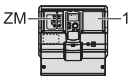
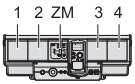
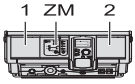
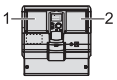
Tab. 4 Specifications

2.5 Specified communication objects

With the LON-Gateway, selected data from up to four Logamatic 4000 control panels can be exchanged via LON data bus with third-party control systems.

In addition to the communication objects for the first boilers, which are a component of the control panel, additional functions in the form of modules for multi-boiler systems, heating zones, DHW, and solar can be added.

If heating zones are served via LON, no other remote controls, e.g. Buderus remote control BFU, may be connected to this heating zone.

Requirement	1 boiler 5 heating zones 1 DHW 1 solar	2 boiler 5 heating zones 1 DHW 1 solar		4 boilers 1 heating zone 1 DHW		Expansion for heating zones 3, 4 [1]
						
	Logamatic 4211	**Logamatic 4121**		**Logamatic 4321**	**Logamatic 4323**	**Logamatic 4122**
Boiler with Logamatic 4000	• (ZM422)	–		o [2] (FM458)	o [2] (FM458)	–
Boiler with Logamatic EMS	–	• (ZM424)	o (FM456 in slot 2)	o [2] (FM458)	o [2] (FM458)	–
DHW heating	• (ZM422)	• (ZM424)		o (FM441 in slot 2)	o (FM441 in slot 1)	–
LON HK 1	o (FM442 in slot 1)	• (ZM424)		o (FM442 in slot 1)	o (FM441 in slot 1)	o (FM441 in slot 1)	–
LON HK 2	o (FM442 in slot 1)	• (ZM424)		o (FM442 in slot 1)	–	–	–
LON HK 5	• (ZM422)	–	–	o (FM442 in slot 3)	–	–	–
Solar DHW heating	o (FM443 in slot 2)	o (FM443 in slot 2)		o (FM443 in slot 2)	–	–	–
LON HK 3 LON HK 4	o [1]	o [1]	o [1]	o (4322 with FM442 in slot 2)	–	–	o (FM442 in slot 2)
LON flasher version	LON Flasher 2B_00	LON Flasher 2B_E_00	LON Flasher 2B_E_00	LON Flasher 2B_00	LON Flasher 4B_00	LON Flasher 4B_00	
XIF file version	LON_2B_00	LON_2B_00	LON_2B_00	LON_2B_00	LON_4B_00	LON_4B_00	
Address of Logamatic control panel	1	1	1	1 [3]	1 [3]	1	2

Tab. 5 Overview of LON-Gateway and Logamatic control system

1) Logamatic 4122 required if LON heating zones 3 and 4 are required in one and two-boiler systems.

2) Function module FM458 combines boiler with the Logamatic 4000 and Logamatic EMS control system.

3) ECOCAN-BUS address of the Logamatic 4321 control panel on the first boiler; additional boilers with Logamatic 4321 control panel of the 4322 are assigned ECOCAN-BUS addresses 2 to 4.

• = Basic equipment
o = Optional (required accessories in parentheses)
– = Not required

2.6 Logamatic LON-Gateway firmware

2.6.1 Firmware when delivered

When delivered, the firmware version LON_Flasher_2B_00 is preinstalled. This version is for a heating system with floor-standing boilers with Logamatic 4321. If you need another firmware variant (e.g. LON_Flasher_4B_00) for your installation, it is easy to update the firmware. (see procedure for updating firmware)

The firmware version of your LON-Gateway is displayed via the Logamatic ECO-SOFT 4000/EMS service software (Start communication -> Select COM port settings -> Direct connection).
You can find the correct COM port under: Windows XP from the device manager (Control panel -> System -> Hardware -> Device manager -> COM port).
Procedure for Windows Visa and Windows 7: Control panel -> Hardware and Sound -> Device manager -> COM port.

2.6.2 Procedure for updating firmware

First the LON-Gateway must be connected to the power supply and connected on-site to your computer via the RS232 interface or USB converter.

- Obtain the desired firmware from Buderus and, start the LONFlasher*******.exe.
- Select the COM port.
- Start the update with the Flash button.
  A display informs you about the current progress. The update is only complete when a message "...successful!" appears.
- When a message "...successful!" appears, confirm with OK.
  The update is complete.

After the successful update, disconnect the LON-Gateway from the line voltage for approx. 2 minutes to perform a reset. This completes the firmware update.

3 Network interface

3.1 Overview of the SNVTs for variant 2 boilers

The prerequisite for the proper function is that the firmware on the LON-Gateway interface has at least the version number indicated below and the following application file is used:

Alternative	Buderus (alternative of the LON-Flasher)	LON application file (XIF file)
2 boilers with Logamatic EMS	LON_Flasher_2B_E_00	LON_2B_00
2 boilers with Logamatic 4000	LON_Flasher_2B_00	LON_2B_00

Tab. 6

Communication via the Logamatic LON-Gateway takes place using standard network variable types (SNVT). Standard configuration parameter types (SCPTs) are not used.

Set the system up for repeated reading of SNVTs, which ensure data exchange between the network participants.

No.	Meaning	SNVT type	SNVT name
	General		
0	Time	SNVT_time_ stamp(84)	nviUhrzeit
1	Outdoor temperature	SNVT_temp_p(105)	nvoAussen_Tp
2	Error message 1 control unit addresses 1 + 2	SNVT_state(83)	nvoFehler1
3	Error message 2 control unit addresses 1 + 2	SNVT_state(83)	nvoFehler2
4	Error message 3 control unit addresses 1 + 2	SNVT_state(83)	nvoFehler3
5	Error message 4 control unit addresses 1 + 2	SNVT_state(83)	nvoFehler4
	Heating zone 1		
6	Change operating mode (D/N/A)	SNVT_hvac_mode(108)	nviHK1TgNtAt
7	Change room set point night temperature	SNVT_temp_p(105)	nviHK1RaumSNt_Tp
8	Change room set point day temperature	SNVT_temp_p(105)	nviHK1RaumSTg_Tp
9	Display room set point temperature	SNVT_temp_p(105)	nvoHK1Raum_S_Tp
10	Display operating mode (D/N/A)	SNVT_hvac_mode(108)	nvoHK1Betrieb
11	Display heating zone supply actual temperature	SNVT_temp_p(105)	nvoHK1VLIst_Tp
	Heating zone 2		
12	Change operating mode (D/N/A)	SNVT_hvac_mode(108)	nviHK2TgNtAt
13	Change room set point night temperature	SNVT_temp_p(105)	nviHK2RaumSNt_Tp
14	Change room set point day temperature	SNVT_temp_p(105)	nviHK2RaumSTg_Tp

Tab. 7 Service menu navigator

No.	Meaning	SNVT type	SNVT name
15	Display room set point temperature	SNVT_temp_p(105)	nvoHK2Raum_S_Tp
16	Display operating mode (D/N/A)	SNVT_hvac_mode(108)	nvoHK2Betrieb
17	Display heating zone supply actual temperature	SNVT_temp_p(105)	nvoHK2VLIst_Tp
	Heating zone 3		
18	Change operating mode (D/N/A)	SNVT_hvac_mode(108)	nviHK3TgNtAt
19	Change room set point night temperature	SNVT_temp_p(105)	nviHK3RaumSNt_Tp
20	Change room set point day temperature	SNVT_temp_p(105)	nviHK3RaumSTg_Tp
21	Display room set point temperature	SNVT_temp_p(105)	nvoHK3Raum_S_Tp
22	Display operating mode (D/N/A)	SNVT_hvac_mode(108)	nvoHK3Betrieb
23	Display heating zone supply actual temperature	SNVT_temp_p(105)	nvoHK3VLIst_Tp
	Heating zone 4		
24	Change operating mode (D/N/A)	SNVT_hvac_mode(108)	nviHK4TgNtAt
25	Change room set point night temperature	SNVT_temp_p(105)	nviHK4RaumSNt_Tp
26	Change room set point day temperature	SNVT_temp_p(105)	nviHK4RaumSTg_Tp
27	Display room set point temperature	SNVT_temp_p(105)	nvoHK4Raum_S_Tp
28	Display operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoHK4Betrieb
29	Display heating zone supply actual temperature	SNVT_temp_p(105)	nvoHK4VLIst_Tp
	Heating zone 5		
30	Change operating mode (D/N/A)	SNVT_hvac_mode (108)	nviHK5TgNtAt
31	Change room set point night temperature	SNVT_temp_p(105)	nviHK5RaumSNt_Tp
32	Change room set point day temperature	SNVT_temp_p(105)	nviHK5RaumSTg_Tp
33	Display room set point temperature	SNVT_temp_p(105)	nvoHK5Raum_S_Tp
34	Display operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoHK5Betrieb
35	Display heating zone supply actual temperature	SNVT_temp_p(105)	nvoHK5VLIst_Tp
	DHW		
36	Change operating mode (D/N/A)	SNVT_hvac_mode (108)	nviHK1TgNtAt
37	Change DHW set point temperature	SNVT_temp_p(105)	nviWW_Set_Tp
38	Change recirculation pump operating mode (D/N/A)	SNVT_hvac_mode (108)	nviZP_TgNtAt
39	Display operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoWW_Betrieb
40	Display DHW set point temperature	SNVT_temp_p(105)	nvoWW_S_Tp
41	Display DHW actual temperature	SNVT_temp_p(105)	nvoWW_Ist_Tp
42	Display recirculation pump operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoZP_Betrieb
	Strategy		
43	Change system operating mode (D/N/A)	SNVT_hvac_mode (108)	nviAnlTgNtAt
44	Change system supply set point temperature	SNVT_temp_p(105)	nviAnlVorgabe_Tp
45	Display system supply actual temperature	SNVT_temp_p(105)	nvoAnlVLIst_Tp
46	Display system return actual temperature	SNVT_temp_p(105)	nvoAnlRLIst_Tp

Tab. 7 Service menu navigator

No.	Meaning	SNVT type	SNVT name
	Boiler 1		
47	Status of burner boiler 1 [1)]	SNVT_state(83)	nvoKS1Br1Stufe1
48	Status burner boiler 1	SNVT_state(83)	nvoKS1Br1Stufe2
49	Display boiler actual temperature	SNVT_temp_p(105)	nvoKS1VLIst_Tp
	Boiler 2		
50	Status burner boiler 2 [1)]	SNVT_state(83)	nvoKS2Br1Stufe1
51	Status burner boiler 2	SNVT_state(83)	nvoKS2Br1Stufe2
52	Display boiler actual temperature	SNVT_temp_p(105)	nvoKS2VLIst_Tp
	Solar thermal system		
53	Change operating mode (D/N/A)	SNVT_hvac_mode (108)	nviSLTgNtAt
54	Display operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoSLBetrieb
55	Display collector actual temperature (FSK)	SNVT_temp_p(105)	nvoSLKoll_Tp
56	Display solar tank actual temperature (FSS1)	SNVT_temp_p(105)	nvoSLSP1Unten_Tp
57	Display solar yield (heat quantity)	SNVT_elec_kwh_l (146)	nvoSLWMZ_Ertrag
58		SNVT_file_pos(90)	nviParameter
59		SNVT_file_pos(90)	nviAdresse
60		SNVT_file_pos(90)	nvoMonitoring

Tab. 7 Service menu navigator

1) Display of the output for boilers with Logamatic EMS

3.2 Description of the SNVTs for variant 2 boilers

Note:
The right column indicates the number of bytes.

3.2.1 General

0	**Time**	SNVT_time_ stamp(84)	nviUhrzeit	7

Tab. 8 Value for comparison of the time in the Buderus control system with the LON network

Format: YYYY/MM/DD hh:mm:ss

1	**Outdoor temperature**	SNVT_temp_p(105)	nvoAussen_Tp	2

Tab. 9 Display of the current outdoor temperature

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.)

2	**Error message 1 control panel address 1 + 2**	SNVT_state(83)	nvoFehler1	2

Tab. 10 Output for error messages: error 1 of control panel 1 and 2

For the error list, see Chapter 7, page 43.

Error messages are displayed as 2-byte values (2 x 8 bits). The first byte (the first 8 bits seen from the left) is the interpretation of the error message of control panel address 2. The second byte (the remaining 8 bits) is the interpretation of the error message of control panel address 1:

	First byte - error boiler 2								**Second byte - error boiler 1**							
Display	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interpretation	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7

Tab. 11

Errors are displayed as binary values and must be converted to decimal values. By comparing with the error list (see Chapter 7, page 43), the associated texts are assigned to the error numbers.

Example: see page 27

Example:

3	**Error message 2 control panel address 1 + 2**	SNVT_state(83)	nvoFehler1	2
4	**Error message 3 control panel address 1 + 2**	SNVT_state(83)	nvoFehler1	2
5	**Error message 4 control panel address 1 + 2**	SNVT_state(83)	nvoFehler1	2

Tab. 12 Outputs for error messages

Second, third, and fourth current errors in the control panel in question. List of the error list, see Chapter 7, page 43.

Interpretation as described for error message 1.

3.2.2 Heating zones

This section describes only heating zone 1. For heating zones 2 to 5, the details apply accordingly.

6	**Operating mode (Day/Night/Auto)**	SNVT_hvac_mode (108)	nviHK1TgNtAt	1

Tab. 13 Value for changing the operating mode of a heating zone

Format:

Value	Designation	Description
0	HVAC_AUTO	The heating zone is controlled according to the set heating program (automatic mode).
1	HVAC_heat	The heating zone is controlled in day mode (manual day mode).
6	HVAC_off	The heating zone is controlled in setback mode (manual night mode – see note about setback).

Tab. 14

Changing the operating mode

With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

Type of setback:

The type of setback set in the control panel has a direct influence on the behavior of the consumer in setback mode or night mode. The following functions are available for selection:

- Switch off: the heating mode with activation of the pump is turned off entirely with this operating mode, however the frost protection is active.
- Reduced: the controls are set to a lower room temperature set point (night temperature) and they constantly activate the heating pump. The controls work with a parallel heating curve moved downwards depending on the outdoor temperature.
- Outside stop: this operating mode combines the setback mode and the reduced heating mode. Below a set outdoor temperature, the boiler operates in reduced mode and above that temperature, in off mode.

7	**Room set point night temperature**	SNVT_temp_p(105)	nviHK1RaumSNt_Tp	2

Tab. 15 Value for changing the set point temperature for the setback heating mode (night mode)

Setting: 36 °F to 84 °F (2 °C to 29 °C) in 1-degree intervals

Notes:

- The room set point night temperature specifies the temperature level in the setback mode or night mode for the consumer. With this setting, the heating curve moves in parallel. If you change the room set point temperature by 2 °F (1 °C), then the supply temperature changes by approx. 6 °F (3 °C).
- The room set point night temperature is not active with the setback type "off."
- The room set point night temperature is not taken into account with the setting heating system "constant." The temperature set in the control panel for the heating zone and the temperature setback are active.

8	**Room set point day temperature**	SNVT_temp_p(105)	nviHK1RaumSTg_Tp	2

Tab. 16 Value for changing the set point temperature for the setback heating mode (day mode)

Setting: 52 °F to 86 °F (11 °C to 30 °C) in 1-degree intervals

Notes:

- The room set point day temperature specifies the temperature level in day mode for the consumer. With this setting, the heating curve moves in parallel. If you change the room set point temperature by 2 °F (1 °C), then the supply temperature changes by approx. 6 °F (3 °C).
- The room set point day temperature is not active with the setback type "off."
- The room set point night temperature is not taken into account with the setting heating system "constant." The temperature set in the control panel for the heating zone and the temperature setback are active.

9	**Room set point temperature**	SNVT_temp_p(105)	nviHK1Raum_S_Tp	2

Tab. 17 Display of the currently-valid room set point temperature for the consumer

10	**Operating mode (Day/Night/ Auto)**	SNVT_hvac_mode (108)	nvoHK1Betrieb	1

Tab. 18 Display of the currently-valid operating mode for the consumer

11	**Heating zone supply actual temperature**	SNVT_temp_p(105)	nvoHK1VLIst_Tp	2

Tab. 19 Display of the currently-measured supply temperature for the consumer

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

3.2.3 DHW heating

36	**Operating mode (Day/Night/ Auto)**	SNVT_hvac_mode (108)	nviHK1TgNtAt	1

Tab. 20 Value for changing the operating mode of DHW heating

Format:

Value	Designation	Description
0	HVAC_AUTO	The DHW control follows the set DHW program (automatic mode).
1	HVAC_heat	The DHW control operates in constant operation (manual day mode).
6	HVAC_off	The DHW controls are turned off (manual night mode).

Tab. 21

Changing the operating mode With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

37	**DHW set point temperature**	SNVT_temp_p(105)	nviWW_Set_Tp	2

Tab. 22 Value for changing the DHW set point temperature (DHW heating)

Set range: 86 °F to 140 °F (30 °C to 60 °C) (with approval up to 176 °F (80 °C)); in 1-degree intervals

WARNING: Risk of scalding at the hot water taps.
There is a risk of scalding at the hot water taps if DHW temperatures can be set above 140 °F (60 °C) and during thermal disinfection.

- Select settings > 140 °F (60 °C) only if a thermostatic mixing valve is installed as protection against scalding.

Notes:

- The set point temperature for DHW heating specifies the temperature level for the consumer in automatic mode or day mode.
- If for DHW heating temperatures > 140 °F (60 °C) are desired, the range up to 176 °F (80 °C) can be released on the service level in the DHW menu.

38	**Recirculation pump operating mode (D/N/A)**	SNVT_hvac_mode (108)	nviZP_TgNtAt	1

Tab. 23 Value for changing the operating mode of the recirculation pump

Format:

Value	Designation	Description
0	HVAC_AUTO	The activation of the recirculation pump works according to the recirculation pump program set (automatic mode).
1	HVAC_heat	The recirculation pump is activated constantly (manual day mode).
6	HVAC_off	The recirculation pump is turned off (manual night mode).

Tab. 24

Changing the operating mode
With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

39	**Operating mode (Day/Night/ Auto)**	SNVT_hvac_mode (108)	nvoWW_Betrieb	1

Tab. 25 Display of the currently-valid operating mode for DHW heating

40	**DHW set point temperature**	SNVT_temp_p(105)	nvoWW_S_Tp	2

Tab. 26 Display of the currently-valid set point temperature for DHW heating

41	**DHW actual temperature**	SNVT_temp_p(105)	nvoWW_Ist_Tp	2

Tab. 27 Display of the actual temperature measured in the DHW tank

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

42	**Recirculation pump operating mode (D/N/A)**	SNVT_hvac_mode (108)	nvoZP_Betrieb	1

Tab. 28 Display of the currently-selected operating mode for the recirculation pump

3.2.4 Strategy

In the "Strategy" section, the values for the entire heating system are summarized.
This is especially important for multi-boiler systems (cascades).

43	**Operating mode (D/N/A) system**	SNVT_hvac_mode (108)	nviAnl_TgNtAt	2

Tab. 29 Value for changing the operating mode of the entire system (all heating zones)

Format:

Value	Designation	Description
0	HVAC_AUTO	The system works according to the internal setting on the control panel (automatic mode).
1	HVAC_heat	The system is turned on (all on) and works in manual day mode.
6	HVAC_off	The system is turned off (all off).

Tab. 30

Changing the operating mode
With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

44	**System supply set point temperature**	SNVT_temp_p(105)	nviAnlVorgabe_Tp	2

Tab. 31 Value for changing the system set point temperature (boiler supply temperature)

Set range: 32 °F to 194 °F (0 °C to 90 °C); in 1-degree intervals

45	**System supply actual temperature**	SNVT_temp_p(105)	nvoAnlVLIst_Tp	2

Tab. 32 Display of the currently-measured supply temperature for a floor-standing multi-boiler system

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

46	**System return actual temperature**	SNVT_temp_p(105)	nvoAnlRLIst_Tp	2

Tab. 33 Display of the currently-measured return temperature for a floor-standing multi-boiler system

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

3.2.5 Floor-standing boilers

This section describes "floor-standing boiler 1."
For boiler 2, the details apply accordingly.

47	**Status burner boiler 1**	SNVT_state(83)	nvoKS1Br1Stufe1	2

Tab. 34 Display of the current burner level in operation and/or display of the current boiler output for boilers with Logamatic EMS

Boiler with Logamatic 4000				
	Burner 1st level on		**Burner 2nd level on / modulating**	
	High byte	Low byte	High byte	Low byte
OFF	xxxx xxxx	0xxx xxxx	xxxx xxxx	x0xx xxxx
ON	xxxx xxxx	1xxx xxxx	xxxx xxxx	x1xx xxxx

Tab. 35

x = the bit is not used

Boiler with Logamatic EMS boiler output

Example:

	First byte								**Second byte**							
Factor	1	2	4	8	16	32	64	128	1	2	4	8	16	32	64	128
Display	x	x	x	x	x	x	x	x	0	0	1	0	0	1	1	0

Tab. 36

Result: 64 + 32 + 4 = 100% (only evaluate second byte)
X - is not used

49	Boiler supply temperature (FK) actual	SNVT_temp_p(105)	nvoKS1VLIst_Tp	2

Tab. 37 Display of the currently-measured supply temperature for a floor-standing multi-boiler system

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

3.2.6 Solar

53	**Solar operating mode (Day/Night/ Auto)**	SNVT_hvac_mode (108)	nviSLTgNtAt	2

Tab. 38 Value for changing the operating mode of the solar heating system

Format:

Value	Designation	Description
0	HVAC_AUTO	The solar thermal system works according to the internal setting on the control panel (automatic mode).
1	HVAC_heat	The solar thermal system is turned on and works in manual day mode (heed instructions - no control function!).
6	HVAC_off	The solar thermal system is turned off (see instructions!).

Tab. 39

Changing the operating modeWith the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

54	**Solar operating mode (Day/ Night/Auto)**	SNVT_hvac_mode (108)	nvoSLBetrieb	2

Tab. 40 Display of the currently-valid operating mode for the solar heating system

55	**Collector actual temperature (FSK)**	SNVT_temp_p(105)	nvoSLKoll_Tp	2

Tab. 41 Display of the currently-measured collector temperature for the solar heating system

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

56	**Temperature tank 1 bottom actual (FSS1)**	SNVT_temp_p(105)	nvoSLSP1Unten_Tp	2

Tab. 42 Display of the currently-measured actual temperature in the solar part of the DHW tank

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

57	**Solar yield (heat quantity)**	SNVT_elec_kwh_l (146)	nvoSLWMZ_Ertrag	4

Tab. 43 Display of the current quantity of heat brought into the solar part of the DHW tank

Format: yield as numeric value in kWh

3.3 Overview of the SNVTs for variant 4 boilers

The prerequisite for the proper function is that the firmware on the LON-Gateway interface has at least the version number indicated below and the following application file is used:

Alternative	Buderus (alternative of the LON-Flasher)	LON application file (XIF file)
4 boilers with Logamatic EMS or Logamatic 4000	LON_Flasher_4B 00	LON_4B_00

Tab. 44

Communication via the Logamatic LON-Gateway takes place using standard network variable types (SNVT). Standard configuration parameter types (SCPTs) are not used.

For the data exchange between the network devices to work properly, set up the cyclical query of the SNVTs.

No.	Meaning	SNVT type	SNVT name
	General		
0	Time	SNVT_time_ stamp(84)	nviUhrzeit
1	Outdoor temperature	SNVT_temp_p(105)	nvoAussen_Tp
2	Error message 1 boiler 1,2	SNVT_state(83)	nvoFehler1_R1_R2
3	Error message 2 boiler 1,2	SNVT_state(83)	nvoFehler2_R1_R2
4	Error message 3 boiler 1,2	SNVT_state(83)	nvoFehler3_R1_R2
5	Error message 4 boiler 1,2	SNVT_state(83)	nvoFehler4_R1_R2
6	Error message 1 boiler 3,4	SNVT_state(83)	nvoFehler1_R3_R4
7	Error message 2 boiler 3,4	SNVT_state(83)	nvoFehler2_R3_R4
8	Error message 3 boiler 3,4	SNVT_state(83)	nvoFehler3_R3_R4
9	Error message 4 boiler 3,4	SNVT_state(83)	nvoFehler4_R3_R4
	Heating zone 1		
10	Change operating mode (D/N/A)	SNVT_hvac_mode (108)	nviHK1TgNtAt
11	Change room set point night temperature	SNVT_temp_p(105)	nviHK1RaumSNt_Tp
12	Change room set point day temperature	SNVT_temp_p(105)	nviHK1RaumSTg_Tp
13	Display room set point temperature	SNVT_temp_p(105)	nvoHK1Raum_S_Tp
14	Display operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoHK1Betrieb
15	Display heating zone supply actual temperature	SNVT_temp_p(105)	nvoHK1VLIst_Tp
	DHW		
16	Change operating mode (D/N/A)	SNVT_hvac_mode (108)	nviHK1TgNtAt

Tab. 45 Service menu navigator

No.	Meaning	SNVT type	SNVT name
17	Change DHW set point temperature	SNVT_temp_p(105)	nviWW_Set_Tp
18	Change recirculation pump operating mode (D/N/A)	SNVT_hvac_mode (108)	nviZP_TgNtAt
19	Display operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoWW_Betrieb
20	Display DHW set point temperature	SNVT_temp_p(105)	nvoWW_S_Tp
21	Display DHW actual temperature	SNVT_temp_p(105)	nvoWW_Ist_Tp
22	Display recirculation pump operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoZP_Betrieb
	Strategy		
23	Change system operating mode (D/N/A)	SNVT_hvac_mode (108)	nviAnl_TgNtAt
24	Change system supply set point temperature	SNVT_temp_p(105)	nviAnl_Soll_Tp
25	Display system supply set point temperature	SNVT_temp_p(105)	nvoAnl_Soll_Tp
26	Display system supply actual temperature	SNVT_temp_p(105)	nvoAnlVLIst_Tp
27	Display system return actual temperature	SNVT_temp_p(105)	nvoAnlRLIst_Tp
	Boiler 1		
28	Status burner 4000 boiler 1	SNVT_lev_cont (21)	nvoKS1VLIst_4000
29	Temperature 4000 boiler 1 (FK) actual	SNVT_temp_p(105)	nvoKS1FZIst_4000
30	Additional temperature 4000 boiler 1 (FZ) actual	SNVT_temp_p(105)	nvoKS1Br4000S1_h
31	Boiler hours of operation 4000 boiler 1 level 1	SNVT_time_hour(124)	nvoKS1Br4000S2_h
32	Boiler hours of operation 4000 boiler 1 level 2	SNVT_time_hour(124)	nvoKS1PU_4000
33	Pump 4000 boiler 1	SNVT_lev_cont (21)	nvoKS1Br_EMS
34	Status burner EMS boiler 1	SNVT_lev_cont (21)	nvoKS1VLIst_EMS
35	Temperature EMS boiler 1 (FK) actual	SNVT_temp_p(105)	nvoKS1Br_EMS_h
36	Burner hours of operation EMS boiler 1	SNVT_time_hour(124)	nvoKS1PU_EMS
37	Pump EMS boiler 1	SNVT_lev_cont (21)	nvoKS1_Br_4000
	Boiler 2		
38	Status burner boiler 2	SNVT_lev_cont (21)	nvoKS2_BrStatus
39	Temperature boiler 2 (FK) actual	SNVT_temp_p(105)	nvoKS2VLIst_Tp
40	Boiler hours of operation 4000 boiler 2 level 1	SNVT_time_hour(124)	nvoKS2Br4000S1_h
41	Boiler hours of operation 4000 boiler 2 level 2	SNVT_time_hour(124)	nvoKS2Br4000S2_h
42	Pump 4000 boiler 2	SNVT_lev_cont (21)	nvoKS2PU_4000
43	Burner hours of operation EMS boiler 2	SNVT_time_hour(124)	nvoKS1Br_EMS_h
44	Pump EMS boiler 2	SNVT_lev_cont (21)	nvoKS1PU_EMS

Tab. 45 Service menu navigator

No.	Meaning	SNVT type	SNVT name
	Boiler 3		
45	Status burner boiler 3	SNVT_lev_cont (21)	nvoKS3_BrStatus
46	Temperature boiler 3 (FK) actual	SNVT_temp_p(105)	nvoKS3VLIst_Tp
47	Boiler hours of operation 4000 boiler 3 level 1	SNVT_time_hour(124)	nvoKS3Br4000S1_h
48	Boiler hours of operation 4000 boiler 3 level 2	SNVT_time_hour(124)	nvoKS3Br4000S2_h
49	Pump 4000 boiler 3	SNVT_lev_cont (21)	nvoKS3PU_4000
50	Burner hours of operation EMS boiler 3	SNVT_time_hour(124)	nvoKS3Br_EMS_h
51	Pump EMS boiler 3	SNVT_lev_cont (21)	nvoKS3PU_EMS
	Boiler 4		
52	Status burner boiler 4	SNVT_lev_cont (21)	nvoKS4_BrStatus
53	Temperature boiler 4 (FK) actual	SNVT_temp_p(105)	nvoKS4VLIst_Tp
54	Boiler hours of operation 4000 boiler 4 level 1	SNVT_time_hour(124)	nvoKS4Br4000S1_h
55	Boiler hours of operation 4000 boiler 4 level 2	SNVT_time_hour(124)	nvoKS4Br4000S2_h
56	Pump 4000 boiler 4	SNVT_lev_cont (21)	nvoKS4PU_4000
57	Burner hours of operation EMS boiler 4	SNVT_time_hour(124)	nvoKS4BrEMS_h
58	Pump EMS boiler 4	SNVT_lev_cont (21)	nvoKS4PU_EMS
	Status		
59	Status ECOCAN-BUS	SNVT_state(83)	nvo_CAN_Adressen
60	Status LON version	SNVT_str_asc (36)	nvo_LONVersion

Tab. 45 Service menu navigator

3.4 Description of the SNVTs for variant 4 boilers

3.4.1 General

0	**Time**	SNVT_time_ stamp(84)	nviUhrzeit	7

Tab. 46 Value for comparison of the time in the Buderus control system with the LON network

Format: YYYY/MM/DD hh:mm:ss

1	**Outdoor temperature**	SNVT_temp_p(105)	nvoAussen_Tp	2

Tab. 47 Display of the current outdoor temperature

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.)

2	**Error message 1 boiler 1, 2**	SNVT_state(83)	nvoFehler1_R1_R2	2
3	**Error message 2 boiler 1, 2**	SNVT_state(83)	nvoFehler2_R1_R2	2
4	**Error message 3 boiler 1, 2**	SNVT_state(83)	nvoFehler3_R1_R2	2
5	**Error message 4 boiler 1, 2**	SNVT_state(83)	nvoFehler4_R1_R2	2

Tab. 48 Outputs for error messages 1 (control panel with address 1) and boiler 2 (control panel with address 2)

For the error list, see Chapter 7, page 43.

The current errors are displayed per control panel. Up to 4 errors that occurred at the same time can be displayed. If an error has been eliminated, it disappears from the error list. If more than four errors have occurred, an error not yet eliminated moves up and is displayed.

Error messages are displayed as 2-byte values (2 x 8 bits). The first byte (the first 8 bits seen from the left) displays errors from the control panel of boiler 2. The second byte (the remaining 8 bits) displays errors from the control panel of boiler 1.

Errors that occur are to be interpreted as follows:

	First byte - error control panel 2								**Second byte - error control panel 1**							
Display	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interpretation	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7

Tab. 49

Errors are displayed as binary values and must be converted to decimal values. By comparing with the error list (see Chapter 7, page 43), the associated texts are assigned to the error numbers.

Example: nvoFehler changes

On the display, you see:

nvoFehler1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0

Tab. 50

Boiler 2 has no error. Boiler 1 has a fault with the following error number:

nvoFehler1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0
Interpretation	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7
Meaning									1				16	32		

Tab. 51

Boiler 1 has the error no. 49 (49 = 1 + 16 + 32), the boiler sensor has a fault

6	**Error message 1 boiler 3, 4**	SNVT_state(83)	nvoFehler1_R3_R4	2
7	**Error message 2 boiler 3, 4**	SNVT_state(83)	nvoFehler2_R3_R4	2
8	**Error message 3 boiler 3, 4**	SNVT_state(83)	nvoFehler3_R3_R4	2
9	**Error message 4 boiler 3, 4**	SNVT_state(83)	nvoFehler4_R3_R4	2

Tab. 52 Outputs for error messages of boiler 3 (control panel with address 3) and boiler 4 (control panel with address 4)

For the error list, see Chapter 7, page 43.

Error messages are displayed as 2-byte values (2 x 8 bits). The first byte (the first 8 bits seen from the left) displays errors from the control panel of boiler 4. The second byte (the remaining 8 bits) displays errors from the control panel of boiler 3. Errors that occur are to be interpreted as follows:

	First byte - error control panel 2								**Second byte - error control panel 1**							
Display	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interpretation	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7

Tab. 53

Interpretation as described for error messages boiler 1, 2.

3.4.2 Heating zones

This section describes only heating zone 1.

10	**Operating mode (Day/Night/ Auto)**	SNVT_hvac_mode (108)	nviHK1TgNtAt	1

Tab. 54 Value for changing the operating mode of a heating zone

Format:

Value	Designation	Description
0	HVAC_AUTO	The heating zone is controlled according to the set heating program (automatic mode).
1	HVAC_heat	The heating zone is controlled in day mode (manual day mode).
6	HVAC_off	The heating zone is controlled in setback mode (manual night mode – see note about setback).

Tab. 55

Changing the operating mode

With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

Type of setback:

The type of setback set in the control panel has a direct influence on the behavior of the consumer in setback mode or night mode. The following functions are available for selection:

- Switch off: the heating mode with activation of the pump is turned off entirely with this operating mode, however the frost protection is active.
- Reduced: the controls are set to a lower room temperature set point (night temperature) and they constantly activate the heating pump. The controls work with a parallel heating curve moved downwards depending on the outdoor temperature.
- Outside stop: this operating mode combines the setback mode and the reduced heating mode.

11	**Room set point night temperature**	SNVT_temp_p(105)	nviHK1RaumSNt_Tp	2

Tab. 56 Value for changing the set point temperature for the setback heating mode (night mode)

Setting: 36 °F to 84 °F (2 °C to 29 °C) in 1-degree intervals

Notes:

- The room set point night temperature specifies the temperature level in the setback mode or night mode for the consumer. With this setting, the heating curve moves in parallel. If you change the room set point temperature by 2 °F (1 °C), then the supply temperature changes by approx. 6 °F (3 °C).
- The room set point night temperature is not active with the setback type "off."
- The room set point night temperature is not taken into account with the setting heating system "constant." The temperature set in the control panel for the heating zone and the temperature setback are active.

12	**Room set point day temperature**	SNVT_temp_p(105)	nviHK1RaumSTg_Tp	2

Tab. 57 Value for changing the set point temperature for the setback heating mode (day mode)

Setting: 52 °F to 86 °F (11 °C to 30 °C) in 1-degree intervals

Notes:

- The room set point day temperature specifies the temperature level in day mode for the consumer. With this setting, the heating curve moves in parallel. If you change the room set point temperature by 2 °F (1 °C), then the supply temperature changes by approx. 6 °F (3 °C).
- The room set point day temperature is not active with the setback type "off."
- The room set point night temperature is not taken into account with the setting heating system "constant." The temperature set in the control panel for the heating zone and the temperature setback are active.

13	**Room set point temperature**	SNVT_temp_p(105)	nviHK1Raum_S_Tp	2

Tab. 58 Display of the currently-valid room set point temperature for the consumer

14	HZ operating mode (D/N/A)	SNVT_hvac_mode (108)	nvoHK1Betrieb	1

Tab. 59 Display of the currently-valid operating mode for the consumer

15	**Heating zone supply actual temperature**	SNVT_temp_p(105)	nvoHK1VLIst_Tp	2

Tab. 60 Display of the currently-measured supply temperature for the consumer

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

3.4.3 DHW heating

16	**Operating mode (D/N/A)**	SNVT_hvac_mode (108)	nviHK1TgNtAt	1

Tab. 61 Value for changing the operating mode of DHW heating

Format:

Value	Designation	Description
0	HVAC_AUTO	The DHW control follows the set DHW program (automatic mode).
1	HVAC_heat	The DHW control operates in constant operation (manual day mode).
6	HVAC_off	The DHW controls are turned off (manual night mode).

Changing the operating mode
With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

17	**DHW set point temperature**	SNVT_temp_p(105)	nviWW_Set_Tp	2

Tab. 62 Value for changing the DHW set point temperature (DHW heating)

Set range: 86 °F to 140 °F (30 °C to 60 °C) (with approval up to 176 °F (80 °C)); in 1-degree intervals

WARNING: Risk of scalding at the hot water taps.
There is a risk of scalding at the hot water taps if DHW temperatures can be set above 60 °C and during thermal disinfection.

- Select settings > 140 °F (60 °C) only if a thermostatic mixing valve is installed as protection against scalding.

Notes:

- The set point temperature for DHW heating specifies the temperature level for the consumer in automatic mode or day mode.
- If for DHW heating temperatures > 140 °F (60 °C) are desired, the range up to 176 °F (80 °C) can be released on the service level in the DHW menu.

18	**Recirculation pump operating mode (D/N/A)**	SNVT_hvac_mode (108)	nviZP_TgNtAt	1

Tab. 63 Value for changing the operating mode

Format:

Value	Designation	Description
0	HVAC_AUTO	The activation of the recirculation pump works according to the recirculation pump program set (automatic mode).
1	HVAC_heat	The recirculation pump is activated constantly (manual day mode).
6	HVAC_off	The recirculation pump is turned off (manual night mode).

Changing the operating mode
With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

19	**Operating mode (D/N/A)**	SNVT_hvac_mode (108)	nvoWW_Betrieb	1

Tab. 64 Display of the currently-valid operating mode for DHW heating

20	**DHW set point temperature**	SNVT_temp_p(105)	nvoWW_S_Tp	2

Tab. 65 Display of the currently-valid set point temperature for DHW heating

21	**DHW actual temperature**	SNVT_temp_p(105)	nvoWW_Ist_Tp	2

Tab. 66 Display of the actual temperature measured in the DHW tank

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

22	**Recirculation pump operating mode (D/N/A)**	SNVT_hvac_mode (108)	nvoZP_Betrieb	1

Tab. 67 Display of the currently-selected operating mode for the recirculation pump

3.4.4 Strategy

In the "Strategy" section, the values for the entire heating system are summarized. This is especially important for multi-boiler systems (cascades).

23	**Operating mode (D/N/A) system**	SNVT_hvac_mode (108)	nviAnl_TgNtAt	2

Tab. 68 Value for changing the operating mode of the entire system (all heating zones)

Format:

Value	Designation	Description
0	HVAC_AUTO	The system works according to the internal setting on the control panel (automatic mode).
1	HVAC_heat	The system is turned on (all on) and works in manual day mode.
6	HVAC_off	The system is turned off (all off).

Changing the operating mode

With the HVAC_heat / HVAC_off setting, the operating mode for the consumer is changed externally via the LON data bus.

24	**System supply set point temperature**	SNVT_temp_p(105)	nviAnlVorgabe_Tp	2

Tab. 69 Value for changing the system set point temperature (boiler supply temperature)

Set range: 32 °F to 194 °F (0 °C to 90 °C); in 1-degree intervals

25	**System supply set point temperature**	SNVT_temp_p(105)	nvoAnlVLIst_Tp	2

Tab. 70 Display of the currently-valid set point temperature for the boiler system

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

26	**System supply actual temperature**	SNVT_temp_p(105)	nvoAnlRLIst_Tp	2

Tab. 71 Display of the currently-measured supply temperature for the boiler system

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

27	**System return actual temperature**	SNVT_temp_p(105)	nvoAnlRLIst_Tp	2

Tab. 72 Display of the currently-measured return temperature for the boiler system

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

3.4.5 Boiler 1

This section describes "boiler 1."

28	**Status burner 4000 boiler 1**	SNVT_lev_cont (21)	nvoKS1_Br_4000	2

Tab. 73 Indicator for boiler 1 with Logamatic 4000 and third party burner

Burner OFF [0 %]

ON [> 0 %]

Current output [%]

29	**Temperature 4000 boiler 1 (FK) actual**	SNVT_temp_p(105)	nvoKS1VLIst_4000	2

Tab. 74 Display of the current boiler temperature for boiler 1 with Logamatic 4000 and third party burner

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

30	**Additional temperature 4000 boiler 1 (FZ) actual**	SNVT_temp_p(105)	nvoKS1FZIst_4000	2

Tab. 75 Display of the measured temperature on the additional temperature sensor FZ in the supply of boiler 1 with Logamatic 4000 and third party burner

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

31	**Boiler hours of operation 4000 boiler 1 level 1**	SNVT_time_hour(124)	nvoKS1Br4000S1_h	2

Tab. 76 Display of the hours of operation for the level 1 (basic load) of boiler 1 with Logamatic 4000 and third party burner

32	**Boiler hours of operation 4000 boiler 1 level 2**	SNVT_time_hour(124)	nvoKS1Br4000S2_h	2

Tab. 77 Display of the hours of operation for the level 2 (basic load) of boiler 1 with Logamatic 4000 and third party burner

33	**Pump 4000 boiler 1**	SNVT_lev_cont (21)	nvoKS1PU_4000	2

Tab. 78 Indicator for boiler 1 with Logamatic 4000 and third party burner

Pump OFF [0 %]

ON [> 0 %]

Current output [%]

34	**Status burner EMS boiler 1**	SNVT_lev_cont (21)	nvoKS1Br_EMS	2

Tab. 79 Indicator for boiler 1 with Logamatic EMS

Burner OFF [0 %]

ON [> 0 %]

Current output [%]

35	**Temperature EMS boiler 1 (FK) actual**	SNVT_temp_p(105)	nvoKS1VLIst_EMS	2

Tab. 80 Display of the current boiler temperature for boiler 1 with Logamatic EMS

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

36	**Burner hours of operation EMS boiler 1**	SNVT_time_hour(124)	nvoKS1Br_EMS_h	2

Tab. 81 Display of the hours of operation for the level 1 (basic load) of boiler 1 with Logamatic EMS

37	**Pump EMS boiler 1**	SNVT_lev_cont (21)	nvoKS1PU_EMS	1

Tab. 82 Operating message for the boiler circulation pump of the boiler 1 with Logamatic EMS

Pump OFF [0 %]

ON [> 0 %]

Current output [%]

3.4.6 Boiler 2

This section describes "boiler 2." For boilers 3 and 4, the details apply accordingly.

38	**Status burner boiler 2**	SNVT_lev_cont (21)	nvoKS2_BrStatus	1

Tab. 83 Indicator for boiler with Logamatic EMS or 4000

Burner OFF [0 %]

ON [> 0 %]

Current output [%]

39	**Temperature boiler 2 (FK) actual**	SNVT_temp_p(105)	nvoKS2VLIst_Tp	2

Tab. 84 Display of the current boiler temperature for boiler with Logamatic EMS or 4000

Note:
230 °F (110 °C) is an invalid value (e.g. no temperature sensor connected, sensor defective, etc.).

40	**Boiler hours of operation 4000 boiler 2 level 1**	SNVT_time_hour(124)	nvoKS2Br4000S1_h	2

Tab. 85 Display of the hours of operation for the level 1 (basic load) of boiler with Logamatic 4000 and third party burner

41	**Boiler hours of operation 4000 boiler 2 level 2**	SNVT_time_hour(124)	nvoKS2Br4000S2_h	2

Tab. 86 Display of the hours of operation for the modulation/level 2 (large load) of boiler with Logamatic 4000 and third party burner

42	**Pump 4000 boiler 2**	SNVT_lev_cont (21)	nvoKS2PU_4000	1

Tab. 87 Operating message for the boiler circulation pump of the boiler with Logamatic 4000 and third party burner

Pump OFF [0 %]

ON [> 0 %]

Current output [%]

43	**Burner hours of operation EMS boiler 2**	SNVT_time_hour(124)	nvoKS1Br_EMS_h	2

Tab. 88 Display of the hours of operation for boiler with Logamatic EMS

44	**Pump EMS boiler 2**	SNVT_lev_cont (21)	nvoKS1PU_EMS	1

Tab. 89 Operating message for the boiler circulation pump of the boiler with Logamatic EMS

Pump OFF [0 %]

ON [> 0 %]

Current output [%]

3.4.7 Status

59	**Status ECOCAN-BUS**	SNVT_state(83)	nvo_CAN_Adressen	2

Tab. 90 With these variables, a status report of the ECOCAN-BUS is transmitted to LON

Using the feedback from the Logamatic control panels, you can get information about whether control panels were turned off, etc.

Logamatic controls	**First byte**								**Second byte**							
Address (ECOCAN-BUS)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Status	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Status "1" means Logamatic controls are present on the ECOCAN-BUS.

Status "0" means Logamatic controls are not present on the ECOCAN-BUS.

Example:

Logamatic controls	**First byte**								**Second byte**							
Address (ECOCAN-BUS)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Status	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0

In this example, Logamatic controls are connected to the ECOCAN-BUS addresses 1, 2, and 3.

60	**Status LON version**	SNVT_str_asc (36)	nvo_LONVersion	31

Tab. 91 Information display via the LON-Gateway

With this variable, information about the LON-Gateway is output.

1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3
									0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
C	A	N			.		x	x	.	y	y		/	L	O	N		L	.		x	x	.	y	y			

"CAN V. XX.YY" indicates the firmware version of the LON-Gateway.
"LON V.XX.YY" indicates the software version of the LON-Gateway (XIF file).

4 Operating basics

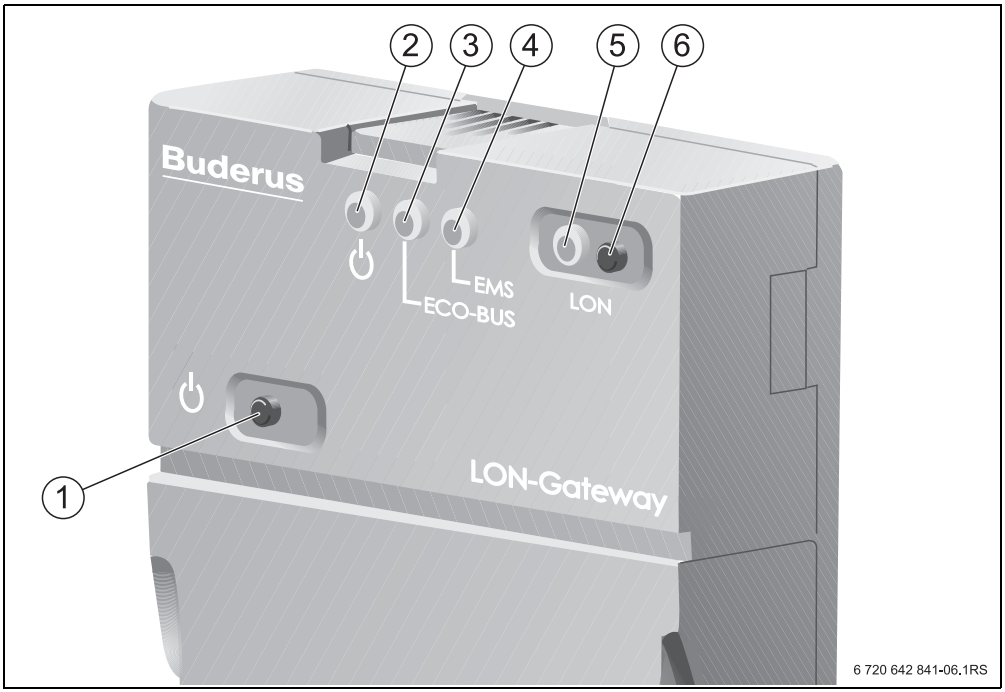


Fig. 2 Attaching the user interface

Position	Operating element/function
1	Button for turning the gateway ON/OFF.
2	Status LED lights up if the gateway is turned on.
3	"ECO-BUS" LED flashes during data transmission via ECO-BUS.
4	"EMS" LED
5	"LON" LED flashes for the successful commissioning of the LON-Gateway.
6	"LON" service button

Tab. 92 Key to Fig. 2

If the EMS LED lights up, there is a communication problem on the ECOCAN-BUS.

- ▶ Check the cable.

5 Incorporation of Logamatic 4000 in LON networks via Logamatic LON-Gateway

5.1 Structure of the hardware

A main component of the products that communicate via LON data bus such as the Logamatic LON-Gateway is the neuron chip. Each neuron chip has a unique ID, the neuron ID making each device unique. For commissioning, operation, service or replacement, each device is identified via the unique neuron ID. This ensures that no errors take place in communication.

5.2 Creating LON networks

For the creation of networks in which products from various manufacturers communicate via LON data bus, special PC software, a so-called binding tool, is required. For each project, a new database is created and stored separately.

Devices with LON data bus interface are incorporated into this PC software as LON nodes. For this software incorporation, product-specific application files are required. These application files are provided by the manufacturer and contain the product-specific data points, the so-called SNVTs (for details, see Chapter 3). Input network variables (nvi) and output network variables (nvo) of the various products are connected to one another in the PC software. This way, the required functions are created in the PC software.

5.2.1 Commissioning LON networks

The PC software saves the database structure in the respective project. In order to be able to use the functions created in the PC software, the assignment of the functions in the PC software to the device is required. This assignment takes place during "commissioning" via the neuron ID of the device.

During commissioning, a dialog requires the PC software to press the "LON" service button on the LON-Gateway. The LON-Gateway sends a neuron ID to the LON data bus. This neuron ID is registered in the database. From the database of the PC software, the application file is downloaded into the device. This way, the PC software is linked with the hardware (LON-Gateway) on site. This link between software and hardware is called "commissioning."

5.2.2 Decommissioning LON networks

During "decommissioning," a device in the form of a LON node is removed from the network, the neuron ID is deleted from the database of the PC software, and the credit for the neuron ID is released again in the PC software.

For each LON node that is incorporated into this software, license fees in the form of credits are from Echelon. Since the neuron ID is unique, before removing the device, the decommissioning via the PC software is recommended.

6 The LON-Gateway as LonMark object

6.1 Variant 2 boiler

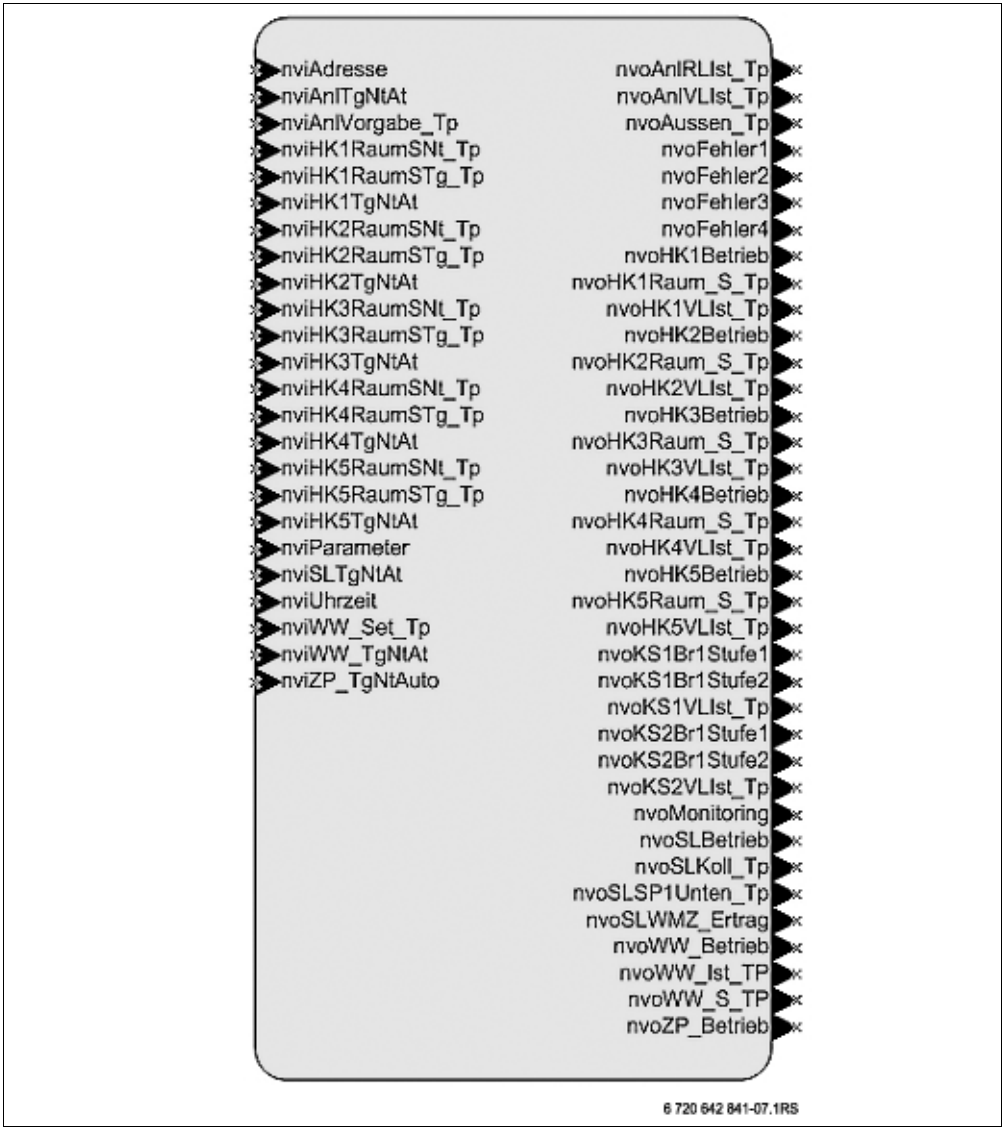


Fig. 3 Buderus function block (variant 2 boiler)

6.2 Variant 4 boiler

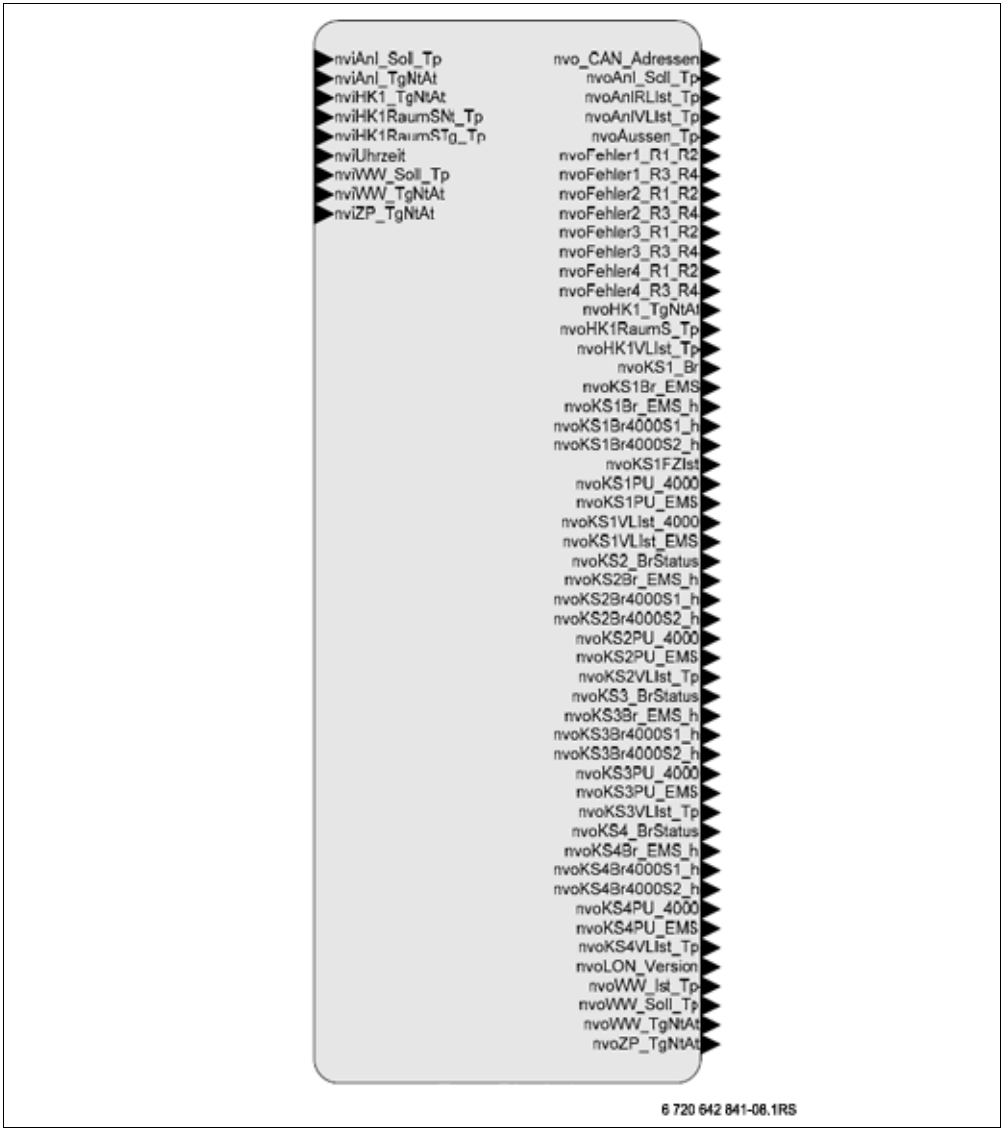


Fig. 4 Buderus function block (variant 4 boiler)

7 Error list

Consec. no.	Error message
1	Supply sensor strategy (FVS) fault
2	Outdoor temperature sensor
3	Heating zone 1 supply sensor fault
4	Heating zone 2 supply sensor fault
5	Heating zone 3 supply sensor fault
6	Heating zone 4 supply sensor fault
7	Supply sensor pre-control defective
8	DHW sensor fault
9	DHW remains cold
10	Thermal disinfection fault
11	Heating zone 1 remote control fault
12	Heating zone 2 remote control fault
13	Heating zone 3 remote control fault
14	Heating zone 4 remote control fault
15	Heating zone 1 communication fault
16	Heating zone 2 communication fault
17	Heating zone 3 communication fault
18	Heating zone 4 communication fault
19	Magnesium anode used up
20	Fault burner 1 EMS+UBA1
21	Fault burner 2 EMS+UBA1
22	Fault burner 3 EMS+UBA1
23	Fault burner 4 EMS+UBA1
24	Boiler 1 no connection fault
25	Boiler 2 no connection fault
26	Boiler 3 no connection fault
27	Boiler 4 no connection fault

Consec. no.	Error message
28	Function module has no connection fault
29	Function module manual OFF fault
30	Internal error no. 1 = internal error no. 30
31	Internal error no. 2 = internal error no. 31
32	Internal error no. 3 = internal error no. 32
33	Internal error no. 4 = internal error no. 33
34	Heating zone 0/5 supply sensor fault
35	Heating zone 6 supply sensor fault
36	Heating zone 7 supply sensor fault
37	Heating zone 8 supply sensor fault
38	Heating zone 0 supply sensor fault
39	Heating zone 0/5 remote control fault
40	Heating zone 6 remote control fault
41	Heating zone 7 remote control fault
42	Heating zone 8 remote control fault
43	Heating zone 0 remote control fault
44	Heating zone 0/5 communication fault
45	Heating zone 6 communication fault
46	Heating zone 7 communication fault
47	Heating zone 8 communication fault
48	Heating zone 0 communication fault
49	Boiler supply sensor fault
50	Boiler additional sensor fault
51	Boiler remains cold
52	Burner fault
53	Safety sequence fault
54	External fault boiler

Tab. 93 Error list

Consec. no.	Error message
55	Flue gas sensor defective
56	Flue gas limit exceeded
57	External fault HK1
58	External fault HK2
59	External fault HK3
60	External fault HK4
61	External fault HK0/5
62	External fault HK6
63	External fault HK7
64	External fault HK8
65	External fault HK0
66	Internal error no. 66 = internal error no. 5
67	Internal error no. 67 = internal error no. 6
68	Internal error no. 68 = internal error no. 7
69	Bus system Ecobus has no reception fault = internal error no. 8
70	Bus system no master (fault)
71	Bus system address conflict fault
72	Address conflict 1 fault
73	Address conflict 2 fault
74	Address conflict 3 fault
75	Address conflict 4 fault
76	Address conflict slot A fault
77	Address wrong module 1 fault
78	Address wrong module 2 fault
79	Address wrong module 3 fault
80	Address wrong module 4 fault

Consec. no.	Error message
81	Address wrong module A fault
82	Address unknown module slot 1 fault
83	Address unknown module slot 2fault
84	Address unknown module slot 3 fault
85	Address unknown module slot 4 fault
86	Address unknown module slot A fault
87	System return sensor fault (Bottle)
88	DHW inert anode fault
89	DHW external fault input fault
90	Strategy configuration return control fault
91	Strategy configuration supply sensor fault
92	Reset
93	Manual switch heating zone 1
94	Manual switch heating zone 2
95	Manual switch heating zone 3
96	Manual switch heating zone 4
97	Manual switch heating zone 5 (0/5)
98	Manual switch heating zone 6
99	Manual switch heating zone 7
100	Manual switch heating zone 8
101	DHW manual switch
102	Manual burner switch
103	Manual switch for boiler loop
104	Strategy module missing
105	LAP primary pump manual switch
106	LAP secondary pump manual switch
107	LAP heat exchanger sensor defective
108	LAP tank bottom sensor defective

Tab. 93 Error list

Consec. no.	Error message
109	DHW solar sensor defective
110	Collector sensor defective
111	Fault burner 5 EMS+UBA1
112	Fault burner 6 EMS+UBA1
113	Fault burner 7 EMS+UBA1
114	Fault burner 8 EMS+UBA1
115	No connection to burner control 1
116	No connection to burner control 2
117	No connection to burner control 3
118	No connection to burner control 4
119	No connection to burner control 5
120	No connection to burner control 6
121	No connection to burner control 7
122	No connection to burner control 8
123	Low-loss header supply sensor fault
124	Boiler 1 3-way valve fault
125	Fill level limit value underrun fault
126	Substation heat undersupply
127	Substation supply sensor fault
128	Solar collector sensor fault
129	Solar bypass return fault
130	Solar bypass buffer fault
131	Solar heat quantity supply sensor fault
132	Solar heat quantity return sensor fault
133	Solar tank 1 bottom sensor fault
134	Solar tank 2 bottom sensor fault
135	Solar flow rate measurement fault
136	Solar hysterisis setting fault

Consec. no.	Error message
137	Heating zone 1 EIB setting fault
138	Heating zone 2 EIB setting fault
139	Heating zone 3 EIB setting fault
140	Heating zone 4 EIB setting fault
141	Heating zone 5 EIB setting fault
142	Heating zone 6 EIB setting fault
143	Heating zone 7 EIB setting fault
144	Heating zone 8 EIB setting fault
145	Heating zone 0 EIB setting fault
146	Heating zone EIB setting fault
147	Blocking error UBA
148	Locking error UBA
149	Solar tank 1 in manual mode
150	Solar tank 2 in manual mode
151	Heating zone 0 in manual mode fault
152	Maintenance required after operating hours
153	Maintenance required after date
154	DHW is cold
155	Feed pump in manual mode fault
156	EMS boiler 1 manual mode
157	EMS boiler 2 manual mode
158	EMS boiler 3 manual mode
159	EMS boiler 4 manual mode
160	EMS boiler 5 manual mode
161	EMS boiler 6 manual mode
162	EMS boiler 7 manual mode
163	EMS boiler 8 manual mode
164	EMS boiler 1 fault

Tab. 93 Error list

Consec. no.	Error message
165	EMS boiler 2 fault
166	EMS boiler 3 fault
167	EMS boiler 4 fault
168	EMS boiler 5 fault
169	EMS boiler 6 fault
170	EMS boiler 7 fault
171	EMS boiler 8 fault
172	EMS DHW fault
173	Maintenance required EMS boiler 1
174	Maintenance required EMS boiler 2
175	Maintenance required EMS boiler 3
176	Maintenance required EMS boiler 4
177	Maintenance required EMS boiler 5
178	Maintenance required EMS boiler 6
179	Maintenance required EMS boiler 7
180	Maintenance required EMS boiler 8
181	FM444 PWE manual switch
182	FM444 WE-ON manual switch
183	Sensor heat source return
184	Heat source flow sensor
185	Sensor buffer tank center
186	Sensor buffer tank bottom
187	Sensor buffer tank top
188	Sensor system return
189	Sensor buffer tank center
190	Sensor buffer tank bottom
191	Locking FA heat source
192	Emergency cooling heat source
193	FM458: assignment boiler 1
194	FM458: assignment boiler 2
195	FM458: assignment boiler 3
196	FM458: assignment boiler 4
197	FM458: assignment boiler 5
198	FM458: assignment boiler 6
199	FM458: assignment boiler 7
200	FM458: assignment boiler 8
201	FM458: boiler 1 no connection
202	FM458: boiler 2 no connection
203	FM458: boiler 3 no connection
204	FM458: boiler 4 no connection
205	FM458: boiler 5 no connection
206	FM458: boiler 6 no connection
207	FM458: boiler 7 no connection
208	FM458: boiler 8 no connection
209	FM458: supply sensor strategy
210	FM458: return sensor strategy
211	FM458: configuration of return
212	FM458: configuration supply
213	FM458: output for boiler is missing

Tab. 93 Error list

Explanation for Tab. 93

EIB (today also KNX[1)])	=	European Installation Bus
EMS	=	Energy Management System
Remote control	=	User interface that controls a heating zone, e.g. BFU, BFU/F
HK	=	Heating zone
Strategy module or sensor	=	for multi-boiler systems required control module or temperature sensor
UBA	=	Universal burner control unit

1) KNX = Konnex (arose from a combination of EIB with additional bus systems)

For information about troubleshooting, please see the included documentation for the boiler or the control panel.

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