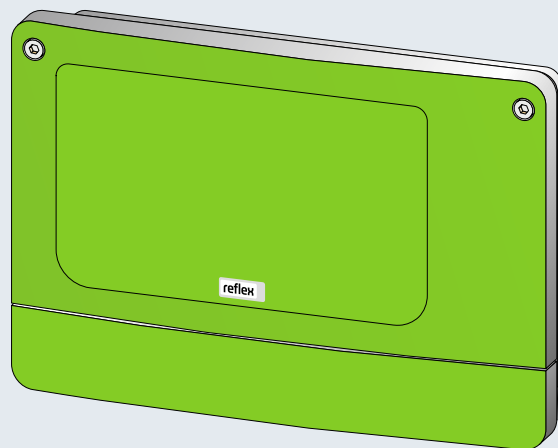


Busmodul - LonWorks (R)

GB Operating manual

Original operating manual



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1 Notes on the operating manual



Notice!

Every person installing this equipment or performing any other work at the equipment is required to carefully read this operating manual prior to commencing work and to comply with its instructions. The manual is to be provided to the device operator and must be stored near the device for access at any time.

2 Models

The "LonWorks®" bus module enables you to provide the operating status of the REflex controller within a LonWorks® network. The measured values and states of the controller are mapped on LonWorks® network variables in the bus module. Other devices within the LonWorks® network can read these network variables.

There are two variants:

- Standard (R-S-I Art.No. 003544)
 - The bus module assumes the "master function" on the RS-485 interface to the controller and retrieves the data.

This variant is used only when the "network interface" (S1) is used to connect the bus module to the controller.

- Module bus interface version (R-S-I Art.No. 003546)
 - The controller assumes the "master function". The bus module works as an "I/O module" and is cyclically polled by the controller.

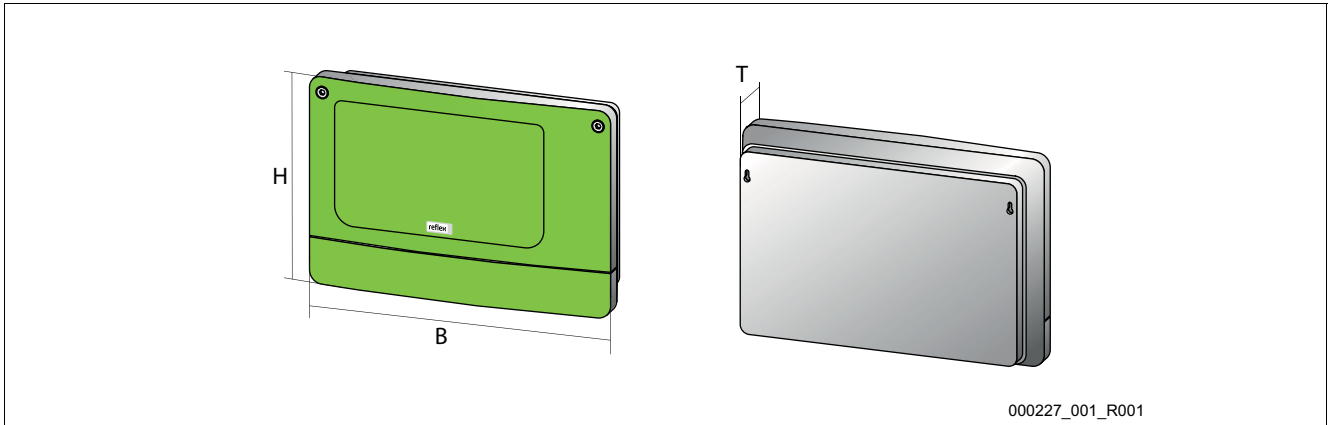
This variant is used when the bus module is connected to the "Control Touch" controller at the S2 module bus interface of Control Touch (in parallel to the main circuit board).



Notel

You use a DIP switch to select the mode, see chapter 10 "DIP switch" on page 21 .

3 Technical data



Housing	Plastic housing
Width	340 mm
Height	233.6 mm
Depth	77 mm
Weight	2.0 kg
Permissible operating temperature	-5° C – 55° C
Permissible storage temperature	-40° C – 70° C
Degree of protection IP	IP 64
Voltage supply	230 V AC, 50 – 60 Hz (IEC 38)
Fuses	<ul style="list-style-type: none"> • primary • secondary
LonWorks® interface	<ul style="list-style-type: none"> • Transceiver FTT-1 A 78 kbit/s – Connection with plug-in screw terminals
Interface to the controller	<ul style="list-style-type: none"> • RS-485 or RS-232 • 19.2 kbit/s • Floating • Connection with plug-in screw terminals • RSI-specific protocol

4 Connection



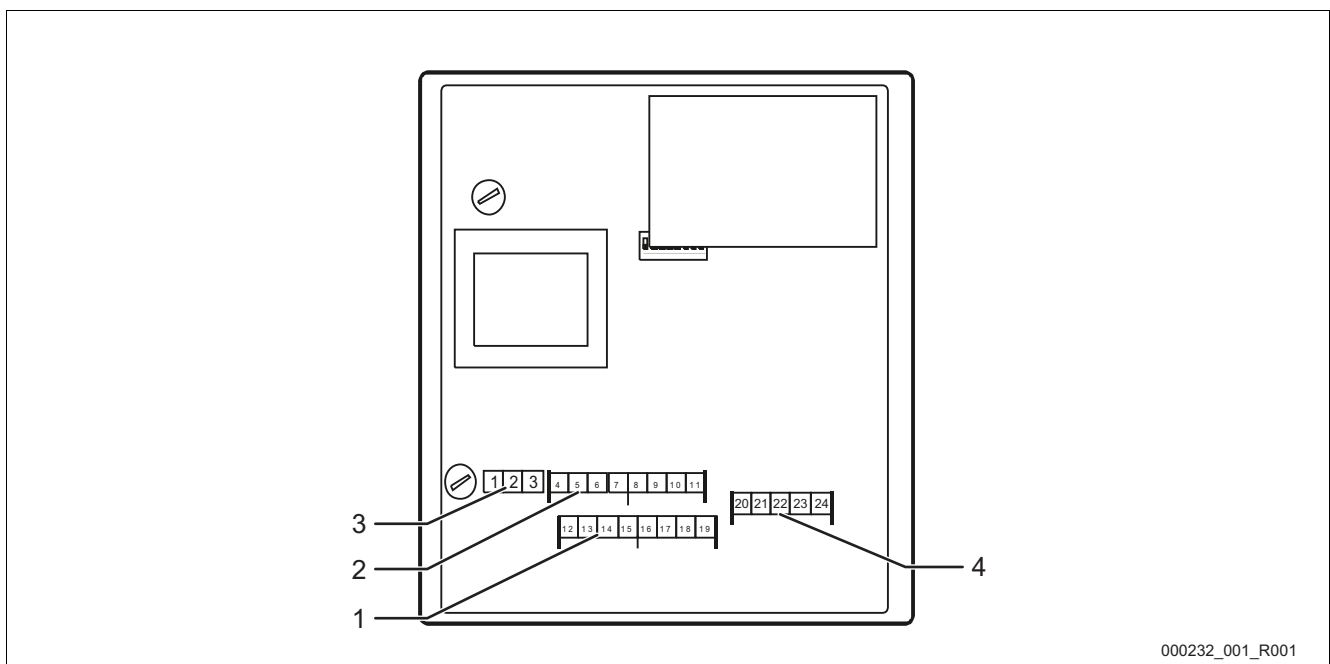
Danger – electric shock!

- Risk of serious injury or death due to electric shock.
 - Ensure that the system is voltage-free before installing the device.
 - Ensure that the system is secured and cannot be reactivated by other persons.
 - Ensure that installation work for the electric connection of the device is carried out by an electrician, and in compliance with electrical engineering regulations.

The bus module is shipped with a power cable including earthed plug as standard. If required, you may use a different power cable. Proceed as follows:

1. Pull the power plug from the device.
2. Open the housing cover.

The connection terminals are underneath the housing cover.



000232_001_R001

No.	Component
1	COM 1 RS-232 interface
2	COM 1 RS-485 interface

No.	Component
3	Power supply 230 V
4	Interface for LonWorks®

Terminal number	Signal	Function	Wiring
Power supply for the bus module			
1	L	Supply 230 V, maximal 16 A	On-site
2	N		
3	PE		
Interfaces for the bus module			
4	Signal A (+)	COM 1 RS-485 interface to the controller	User supplied
5	Signal B (-)		
6	Signal ground		
7	Shielding (optional)		
8	--	COM 2 RS-485 interface – Currently not used	--
9	--		
10	--		
11	--		
12	"RX" signal conductor for outgoing data	COM 1 RS-232 interface	User supplied
13	"TX" signal conductor for incoming data		
14	"GND" signal ground		
15	Shielding		
16	--	COM 2 RS-232 interface – Currently not used	--
17	--		
18	--		
19	--		
20	NETA signal	LonWorks® interface	User supplied
21	NETB signal		
22	Service key		
23	Signal ground		
24	Shielding		

**Note!**

You can connect the service key between the terminals 22 and 23.

4.1 RS-485 interface



Caution – Device damage!

- Using an incorrect bus module may cause the destruction of the interface drivers.
 - Ensure the use of a correct bus module.

Proceed as follows:

- Provide the correct bus module.
- Use a shielded cable to connect the interfaces to terminals 4 to 7 of the main circuit board.
 - Use a three-wire conductor as the interface is floating.
- Install a terminator at both ends of an RS-485 network.
 - Activate the terminators.



Note!

Upon request, the Reflex Customer Service will provide the following information, see chapter 10.1 "Reflex Customer Service" on page 22 .

- RS-485 interface protocol.
- Connection details.
- Details about the optional communication modules.

5 Settings

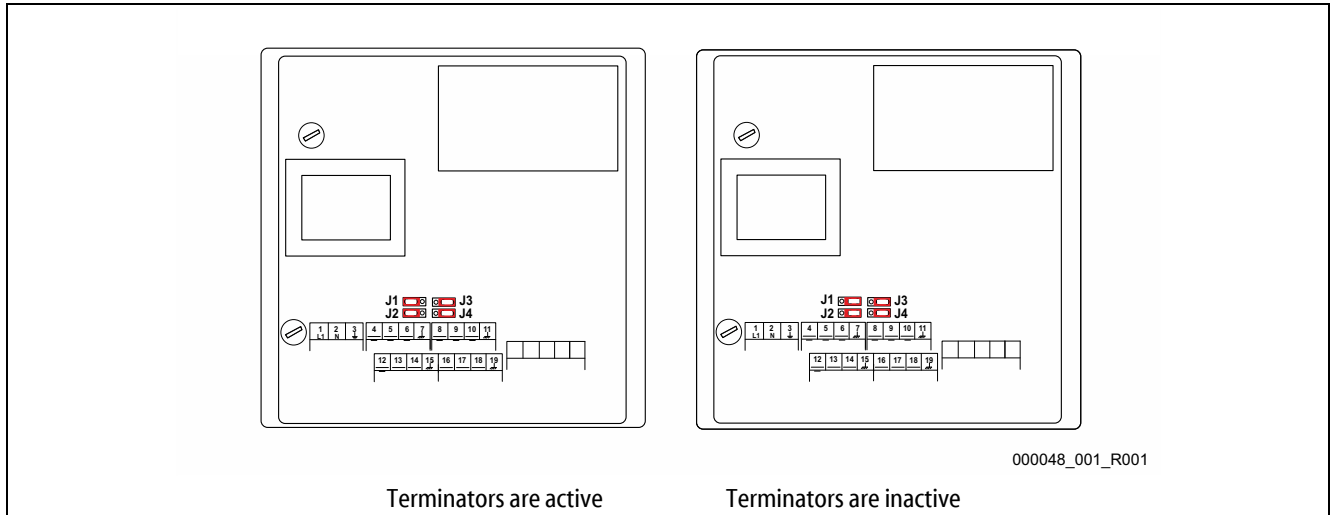


Danger – electric shock!

- Risk of serious injury or death due to electric shock. Some parts of the main board may still carry 230V voltage even with the device physically isolated from the 230 V power supply.
 - Before you remove the covers, completely isolate the device controller from the power supply.

5.1 Terminators of the RS-485 interface

You must activate or deactivate the terminators at both ends of an RS-485 network.



Select the setting:

- Active setting of the terminators.
 - The bus module is installed at the beginning or the end of the RS – 485 network.
 - For long conductors.
- Inactive setting of the terminators.
 - The bus module is not placed at the beginning or the end of the RS – 485 network.
 - A short conductor directly connects the bus module with the controller.
 - Use of more than two devices.

Proceed as follows:

1. Pull the power plug from the bus module.
2. Open the housing cover.
3. Select the required setting.
 - Jumper J1 and J2 installed at the left side.
 - The terminators are active.
 - Jumper J1 and J2 installed at the right side.
 - The terminators are inactive.

The setting process for the terminators is completed.



Note!

- The COM2 interface is inactive.
- The jumpers (J3-J4) are not functional.

5.2 Commissioning LonWorks®



Danger – electric shock!

- Risk of serious injury or death due to electric shock. Some parts of the main board may still carry 230V voltage even with the device physically isolated from the 230 V power supply.
 - Before you remove the covers, completely isolate the device controller from the power supply.

Only a specialist may integrate the bus module in the LonWorks® network. The integration requires a LonWorks® management tool:

- The XIF file of the bus module is provided on disk.
- Alternatively, you can directly read the configuration from the bus module.
 - The LonWorks® management tool must be suited for this task.



Note!

The service key required for the installation can be connected to the terminals 22 and 23 on the bus module's main circuit board.

6 Network variables



Note!

This section describes the currently used configuration of the network variables.

- This an application-specific configuration not meeting the "LonMark Application-Layer Interoperability Guidelines".

Version	2013-07-25
Program ID	RSI_R003
XIF file	Servako_2013-07-25.xif

6.1 Network variables up to Version 2.00

Network variables up to Version 2.00

NV Index	Name	SNVT Type
0	nvoPressure	SNVT_press (30)
1	nvoLevel	SNVT_lev_cont (21)
2	nvoRunHoursP1	SNVT_time_hour (124)
3	nvoRunHoursP2	SNVT_time_hour (124)
4	nvoWaterMeter	SNVT_vol_kilo (42)
5	nvoWaterMeter_32	User defined (0) – unsigned integer 32 bit
6	nvoInpState	SNVT_state (83)
7	nvoOutpState	SNVT_state (83)
8	nvoErrorState	SNVT_state (83)
9	nvoWarnState	SNVT_state (83)
10	nvoCommState	SNVT_state (83)
11	nvoLevel_16	SNVT_lev_percent_ (81)
12	nvoPressure2	SNVT_press (30)

Explanations to the network variables up to Version 2.00

Communication status	
nvoCommState.bit0	Faulty connection between controller and bus module. – The other network variables are invalid

System pressure	
nvoPressure	SNVT_press type

Pressure filling pipe	
nvoPressure2	SNVT_press type

Filling level	
nvoLevel	SNVT_lev_cont type – Range limited to 100 %
nvoLevel16	SNVT_lev_percent type – Identical value but different type

Operating hours	
nvoRunHoursP1	SNVT_time_hour type

Operating hours	
nvoRunHoursP2	SNVT_time_hour type

Water meter	
nvoWaterMeter	SNVT_vol_kilo type – Resolution 100 litres
nvoWaterMeter_32	User defined, 32 bit unsigned Integer – Resolution 1 litres

Status	
nvoInptState.bit0	Feedback Pump 1
nvoInptState.bit1	Feedback Pump 2
nvoInptState.bit2	Insufficient water switch

Status	
nvoOutpState.bit0	Pump 2 ON
nvoOutpState.bit1	Pump 1 ON
nvoOutpState.bit2	Overflow valve 2 OPEN
nvoOutpState.bit3	Overflow valve 1 OPEN
nvoOutpState.bit4	Make-up valve OPEN
nvoOutpState.bit5	Message: min. level
nvoOutpState.bit6	Message: Group fault
nvoOutpState.bit7	Message: Make-up fault – Identical value but different types only

Faults	
nvoErrorState.bit0	Expansion module – Option defective
nvoErrorState.bit1	EEPROM defective
nvoErrorState.bit2	Undervoltage
nvoErrorState.bit3	Below minimum pressure
nvoErrorState.bit4	Insufficient water
nvoErrorState.bit5	Fault pump 1
nvoErrorState.bit6	Fault compressor 1
nvoErrorState.bit7	Fault pump 2
nvoErrorState.bit8	Fault compressor 2
nvoErrorState.bit9	Fault pressure measuring
nvoErrorState.bit10	Level measurement fault
nvoErrorState.bit11	Fault pressure measuring in spray tube – Only with Servitec
nvoErrorState.bit12	The device is in "STOP" mode for more than 4 hours
nvoErrorState.bit13	Insufficient water 2 – Only with Servitec

Warnings	
nvoWarnState.bit0	Not used
nvoWarnState.bit1	Maximum level exceeded
nvoWarnState.bit2	Pump runtime exceeded
nvoWarnState.bit3	Make-up time exceeded
nvoWarnState.bit4	Make-up cycles exceeded
nvoWarnState.bit5	Maximum pressure exceeded
nvoWarnState.bit6	Make-up quantity exceeded
nvoWarnState.bit7	Filling time exceeded – Only with Servitec
nvoWarnState.bit8	Filling quantity exceeded – Only with Servitec
nvoWarnState.bit9	Discharge period exceeded – Only with Servitec
nvoWarnState.bit10	Make-up valve leaking
nvoWarnState.bit11	Power failure
nvoWarnState.bit12	Null balancing defective
nvoWarnState.bit13	Parameter defective
nvoWarnState.bit14	Maximum make-up quantity exceeded
nvoWarnState.bit15	Maintenance requested

6.2 Network variables from Version 2.00

Network variables from Version 2.00

NVIndex	Name	SNVT Type
13	nvoErrorState2	SNVT_state (83)
14	nvoErrorState3	SNVT_state (83)
13	nvoWarnState2	SNVT_state (83)
14	nvoWarnState3	SNVT_state (83)
15	NvoRunHoursP1_32	User defined (0) – unsigned integer 32 bit
16	NvoRunHoursP2_32	User defined (0) – unsigned integer 32 bit

Explanations to the network variables from Version 2.00

Faults	
nvoErrorState2.bit0	Main circuit board fault – Not with "Control Basic" controller
nvoErrorState2.bit1	Digital input voltage fault – Not with "Control Basic" controller
nvoErrorState2.bit2	Analogue input voltage fault – Not with "Control Basic" controller
nvoErrorState2.bit3	Input voltage ball valve 1 fault
nvoErrorState2.bit4	Input voltage ball valve 2 fault
nvoErrorState2.bit5	"Pressure" jumper fault – Not with "Control Basic" controller
nvoErrorState2.bit6	"Level" jumper fault – Not with "Control Basic" controller
nvoErrorState2.bit7	Pump running dry – Only with "Control Basic" controller
nvoErrorState2.bit8	Insufficient water 3 – Only with "Control Basic" controller
nvoErrorState2.bit9	Insufficient water 4 – Only with "Control Basic" controller

Faults	
nvoErrorState3	Currently not used

Warnings	
nvoWarnState2.bit0	Replace battery – Not with "Control Basic" controller
nvoWarnState2.bit1	Softening, replace cartridge
nvoWarnState2.bit2	Check data logger
nvoWarnState2.bit3	---
nvoWarnState2.bit4	The device is in "STOP" mode for more than 4 hours – Only with "Control Basic" controller

Warnings	Expansion module
nvoWarnState3.bit0	Message digital input 1
nvoWarnState3.bit1	Message digital input 2
nvoWarnState3.bit2	Message digital input 3
nvoWarnState3.bit3	Message digital input 4
nvoWarnState3.bit4	Message digital input 5
nvoWarnState3.bit5	Message digital input 6
nvoWarnState3.bit6	Message digital output 6

Operating hours	Pump 1 or Compressor 1
nvoRunHoursP1_32	32 Bit, unsigned Integer. – Resolution 1 hour

Operating hours	Pump 2 or Compressor 2
nvoRunHoursP2_32	32 Bit, unsigned Integer. – Resolution 1 hour

7 Diagnosis



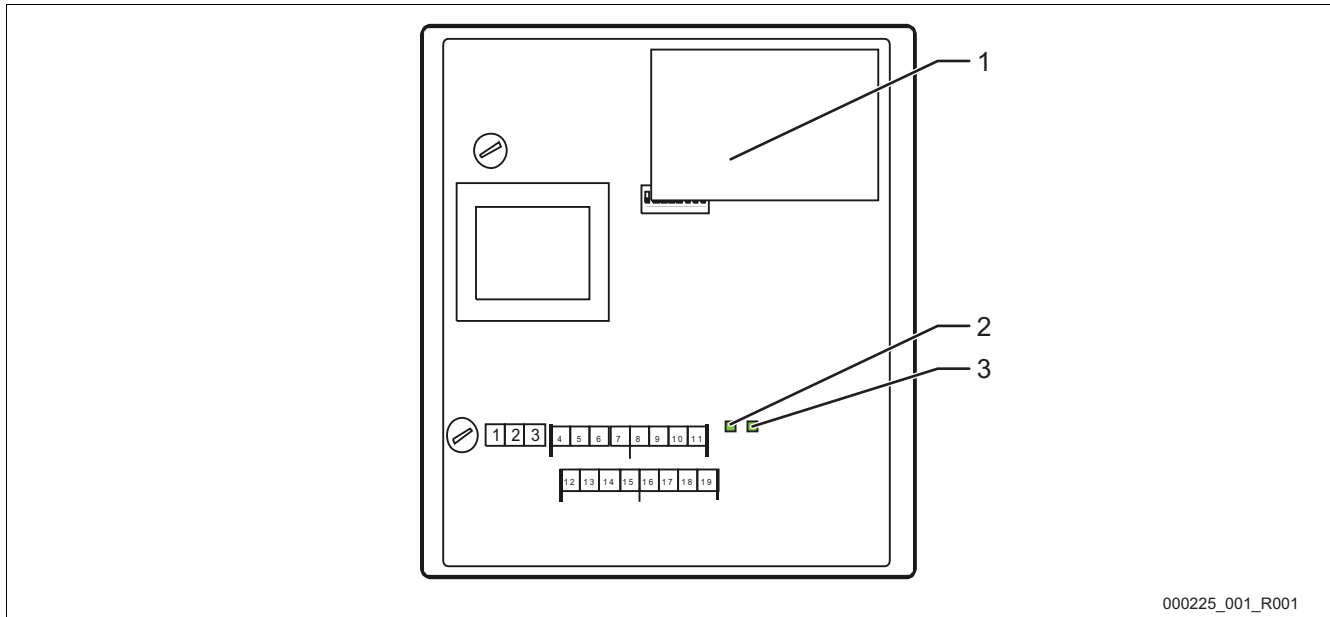
Danger – electric shock!

- Risk of serious injury or death due to electric shock. Some parts of the main board may still carry 230V voltage even with the device physically isolated from the 230 V power supply.
 - Before you remove the covers, completely isolate the device controller from the power supply.

The bus module features 6 LEDs indicating the operating state.

- LED1 and LED2 are located in the terminal space next to the terminal strip for the interfaces.
- LED3 to LED6 are located on the LonWorks® plug-in module.

LED 1 and LED 2 in the terminal space



000225_001_R001

No.	Component
1	LonWorks® plug-in module
2	LED 1

No.	Component
3	LED 2

LED 1 function:

Visual signal display of the controller connection

- Illuminated in normal mode.
 - The LED illuminates when a connection to the controller is established.
 - The LED flashes when there is no connection to the controller.

LED 2 function:

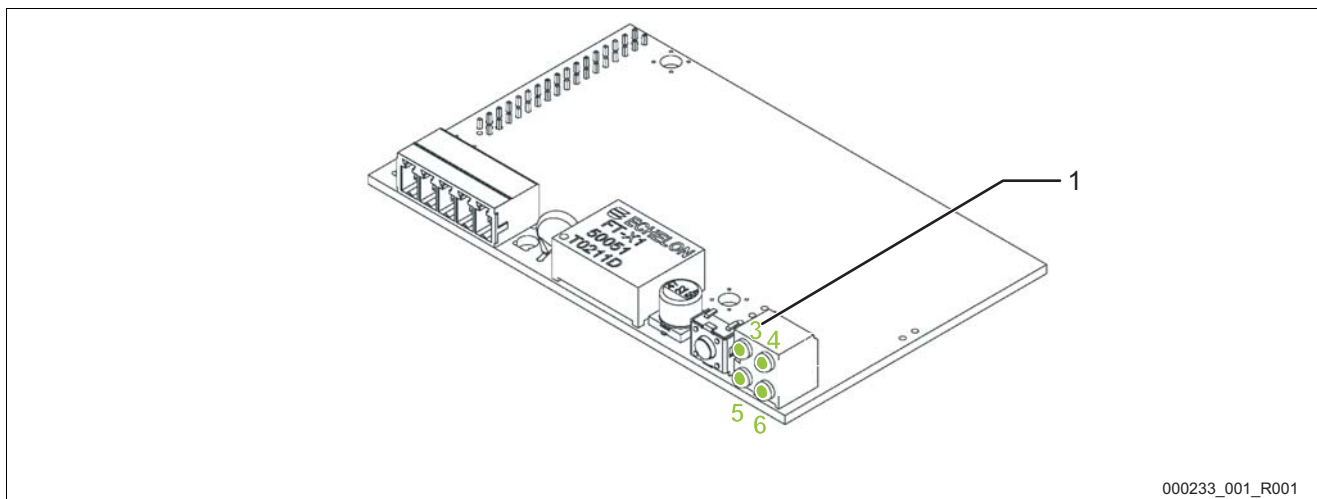
Visual signal display for the detection of the field bus module.

- Switched off in normal mode
 - The LED flashes when the LonWorks® plug-in module has not been detected.

Alternate flashing of the LEDs 1 and 2 indicates that the bus module is in "firmware update" state:

- DIP switch 8 is set to "ON".
- A previous firmware update has been aborted.

LEDs 3 to 6 on the LonWorks® plug-in module



000233_001_R001

No.	Component
1	LEDs 3 to 6

LED 3 function:

No function.

- Not used for visual signal.

LED 4 function:

Visual maintenance display of the bus module

- The LED is switched off.
 - The bus module is installed in a LonWorks® network and works correctly.
- The LED flashes "green".
 - The bus module is not installed in a LonWorks® network.
- The LED illuminates "green".
 - Fault in the bus module:
 1. Switch off the power supply of the bus module.
 2. Switch on the power supply of the bus module.
 3. The bus module is defective if the fault is still present.

LED 5 function:

Visual signal for the bus module status.

- The LED illuminates "green".
 - The bus module works correctly.
- The LED illuminates or flashes "red".
 - Fault in the bus module:
 1. Switch off the power supply of the bus module.
 2. Switch on the power supply of the bus module.
 3. The bus module is defective if the fault is still present.

LED 6 function:

Visual signal display of the "wink" command.

- The LED flashes "red"
 - A "wink" command is received via the LonWorks® network.

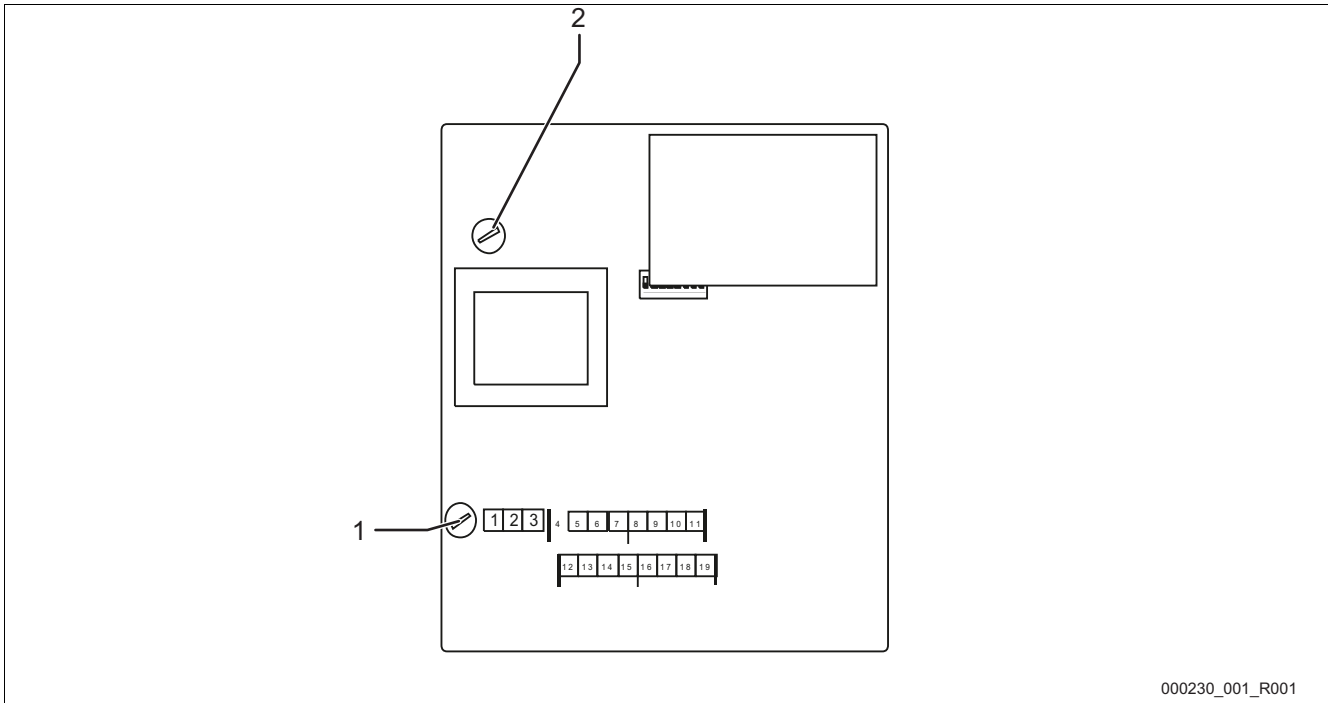
8 Replacing the fuses



Danger – electric shock!

- Risk of serious injury or death due to electric shock. Some parts of the main board may still carry 230V voltage even with the device physically isolated from the 230 V power supply.
 - Before you remove the covers, completely isolate the device controller from the power supply.

The fuses are installed in the terminal space of the bus module.



000230_001_R001

No.	Component
1	Feeble current fuse F1 <ul style="list-style-type: none"> • 250 V • 0.25 A time-lag

No.	Component
2	Feeble current fuse F2 <ul style="list-style-type: none"> • 250 V • 0.8 A time-lag

Proceed as follows:

1. Disconnect the bus module from the power supply.
 - Pull the power plug from the bus module.
2. Open the housing cover.
3. Replace the defective fuses.
4. Close the housing cover.
5. Reconnect the power supply for the bus module.

The fuse replacement is completed.

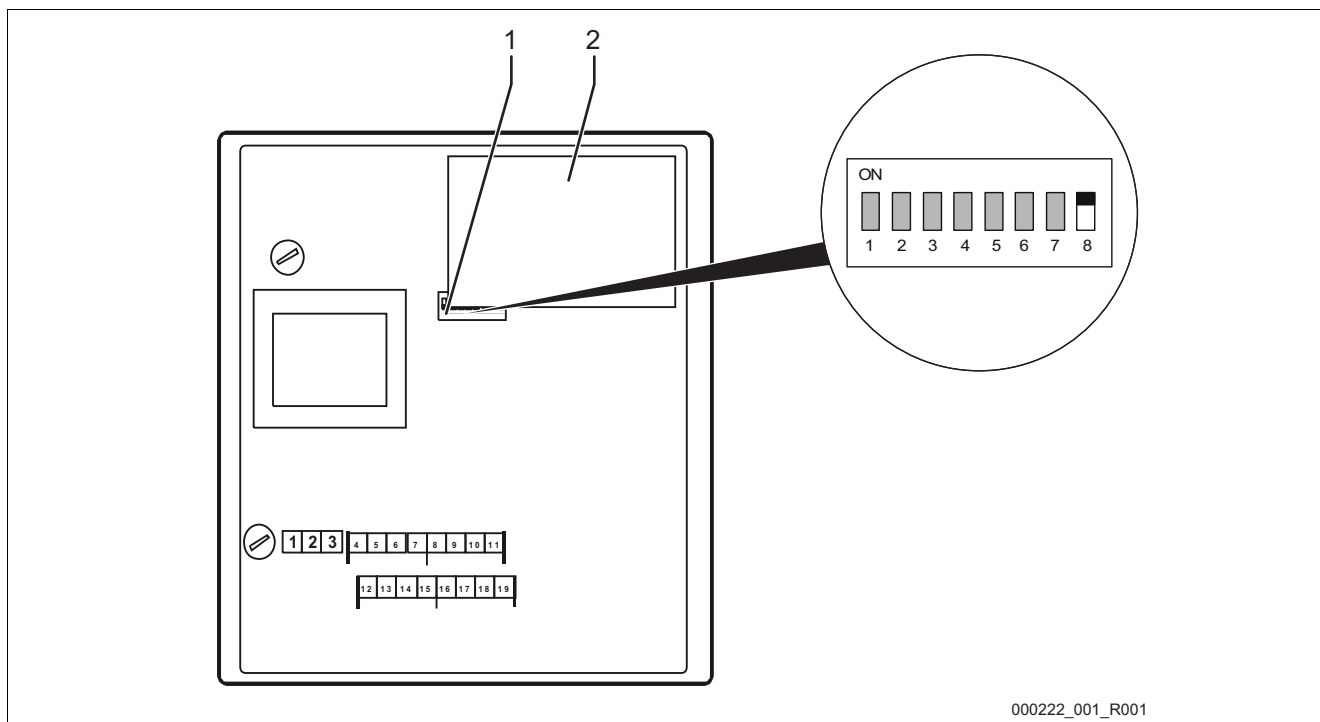
9 Firmware update



Danger – electric shock!

- Risk of serious injury or death due to electric shock. Some parts of the main board may still carry 230V voltage even with the device physically isolated from the 230 V power supply.
 - Before you remove the covers, completely isolate the device controller from the power supply.

A new firmware version is loaded to the bus module using the "COM1" serial interface.



No.	Component
1	DIP switch

No.	Component
2	LonWorks® plug-in module

To load the new firmware to the bus module, you need:

- A PC with an RS – 232 interface.
- A software for flash programming for the PC.
 - flash-xxx.exe
- The new firmware for the bus module (*.hex).

To connect the "COM1" interface, you have two options:

- COM 1 RS – 485.
 - Terminals 4 – 7
- COM 1 RS – 232.
 - Terminals 12 – 15

Connect a "COM1" of the bus module with the RS-232 interface of the PC.

You need:

- RS – 232/RS – 485 converter.
 - For terminals 4 – 7
- Optional flash programming adapter.
 - For terminals 4 – 7
- Optional cable for the direct connection of the PCs RS – 232 interface with the bus module.
 - For terminals 12 – 15

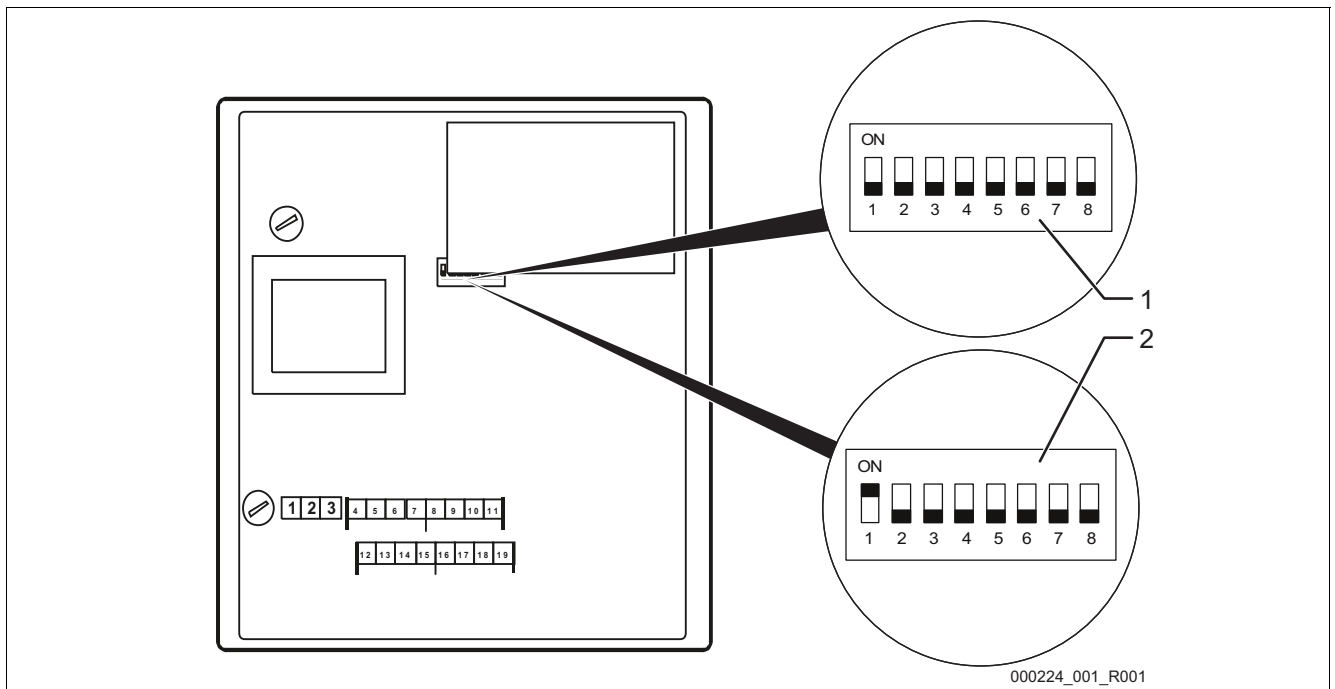
To load the new firmware, proceed as follows:

1. Disconnect the bus module from the 230V power supply.
2. Open the housing cover.
3. Set the DIP switch "8" to "ON".
 - Do not change the settings of the other DIP switches "1 – 7".
4. Remove the connection between the Reflex controller and the bus module.
5. Connect the selected "COM1" interface with the PC.
6. Close the housing cover of the bus module.
7. Connect the bus module to the 230V power supply.
8. Start the "Flash programming" program on the PC.
9. In the program, click "Open".
10. Select the required HEX file in the program.
11. In the program, click "Burn".
 - If necessary, change the interface setting in the program.
12. Click "OK" to start the programming process.
13. Close the program when programming has completed.
 - The status bar displays the progress of programming.
14. Disconnect the 230V power supply of the bus module.
15. Open the housing cover of the bus module.
16. Disconnect the "COM 1" connection between PC and bus module.
17. Re-connect the Reflex controller and the bus module.
18. Set the DIP switch "8" to "OFF" for the bus module to enter the operating mode when switched on.
 - Do not change the settings of the other DIP switches "1 – 7".
19. Close the housing cover of the bus module.
20. Re-connect the 230V power supply of the bus module.
21. Check the functioning of the bus module.

Loading the new firmware to the bus module is completed.

10 DIP switch

DIP switch settings



000224_001_R001

DIP switch:	Designation:
Magnifier 1 (optional)	Bus module for LonWorks® • Standard design
Magnifier 2 (optional)	Bus module for LonWorks® • MK200 design • Module bus interface version Control Touch » RS485-s2
1	"COM1" interface function. • "ON": Slave • "OFF": Master
2	Selection of the used field bus plug-in module. • "ON": RSI Profibus module (Profibus bus module) • "OFF": HMS AnyBus module (other bus modules)
3	Reserved

DIP switch:	Designation:
4	Reserved
5	Reserved
6	FTP and Tenet activation. • "ON": FTP and Telnet activated (for diagnostics) • "OFF": Standard operation
7	Switch to configuration mode. (currently only internally used by RSI) • "ON": Configuration mode • "OFF": Standard operation
8	Switch to firmware update mode. • "ON": Firmware update • "OFF": Standard operation



Note!

Change the DIP switches when a firmware update is executed on the bus module.



Note!

The bus module reimports the DIP switch settings when the power supply is switched on or off.

10.1 Reflex Customer Service

Central customer service

Switchboard: Telephone number: +49 (0)2382 7069 - 0

Customer Service extension: +49 (0)2382 7069 - 9505

Fax: +49 (0)2382 7069 - 523

E-mail: service@reflex.de

Technical hotline

For questions about our products

Telephone number: +49 (0)2382 7069-9546

Monday to Friday, 8:00 a.m. – 4:30 p.m.



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