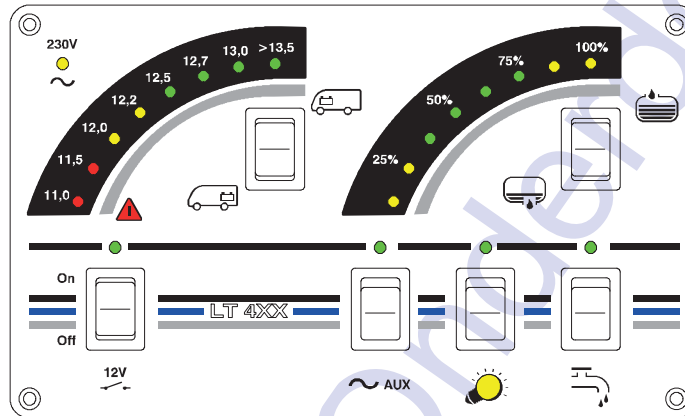


Instruction Manual



LT 4XX Family of Switch Panels

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1 Safety Information

1.1 Meaning of safety symbols



Y **DANGER!**

Failure to heed this warning may result in death or serious injury.



Y **WARNING!**

Failure to heed this warning may result in personal injuries.



Y **ATTENTION!**

Failure to heed this warning may result in damage to the device or connected consumers.

1.2 General safety information

The device is state-of-the-art and complies with approved safety regulations. Nonetheless, personal injuries or damage to the device may occur if the safety instructions contained herein are not followed.

Ensure that the device is in perfect working order before use.

Any technical faults which may impact personal safety or the safety of the device must be rectified immediately by qualified personnel.



Y **WARNING!**

Hot components!

Burns:

- F Only change blown fuses when the device is completely de-energised.
- F Only replace blown fuses once the cause of the fault has been identified and rectified.
- F Never bypass or repair fuses.
- F Only use original fuses rated as specified on the device.
- F Device parts can become hot during operation. Do not touch.
- F Never store heat sensitive objects close to the device (e.g. temperature sensitive clothes if the device has been installed in a wardrobe).

2 Introduction

This instruction manual contains important information on the safe operation of equipment supplied by Schaudt. Make sure you read and follow the safety instructions provided.

The instruction manual should be kept in the vehicle at all times. Ensure that other users are made aware of the safety regulations.

Configuration The switch panels differ in their configurations and the depiction of symbols.



Y This document covers all LT 4XX switch panels. The following table provides an overview of the configuration features.

| Model | Examples of front panels | 12V In/Out | Display of 230V connected | Voltage display of living area battery | Voltage display of starter battery | Total discharge | Fill level display of water tank | Fill level display of waste water tank | Switch for water pump | Switch for lighting | Switch for reserve output (AUX) |
|--------------------|--------------------------|------------|---------------------------|--|------------------------------------|-----------------|----------------------------------|--|-----------------------|---------------------|---------------------------------|
| LT 400 LT 400 A | | X | X | X | X | X | X | X | X | X | X |
| LT 402 | | X | X | X | X | X | X | X | | | X |
| LT 410 | | X | X | X | X | X | X | X | | | |
| LT 411 | | X | X | X | | X | X | | | | |

| Model | Examples of front panels | 12V In/Out | Display of 230V connected | Voltage display of living area battery | Voltage display of starter battery | Total discharge | Fill level display of water tank | Fill level display of waste water tank | Switch for water pump | Switch for lighting | Switch for reserve output (AUX) |
|----------|--------------------------|------------|---------------------------|--|------------------------------------|-----------------|----------------------------------|--|-----------------------|---------------------|---------------------------------|
| LT 412 | | X | X | X | | X | X | | | | |
| LT 413 | | X | X | X | | X | X | | X | | |
| LT 413-2 | | X | X | X | | X | X | X | X | | |
| LT 419 | | X | X | X | X | X | | X | | | |
| LT 420 | | X | X | X | X | X | X | X | X | | |
| LT 421 | | X | X | X | X | X | X | X | X | | |

3 Operation

3.1 Design

The switch panel is intended for installation in a cabinet or wall.

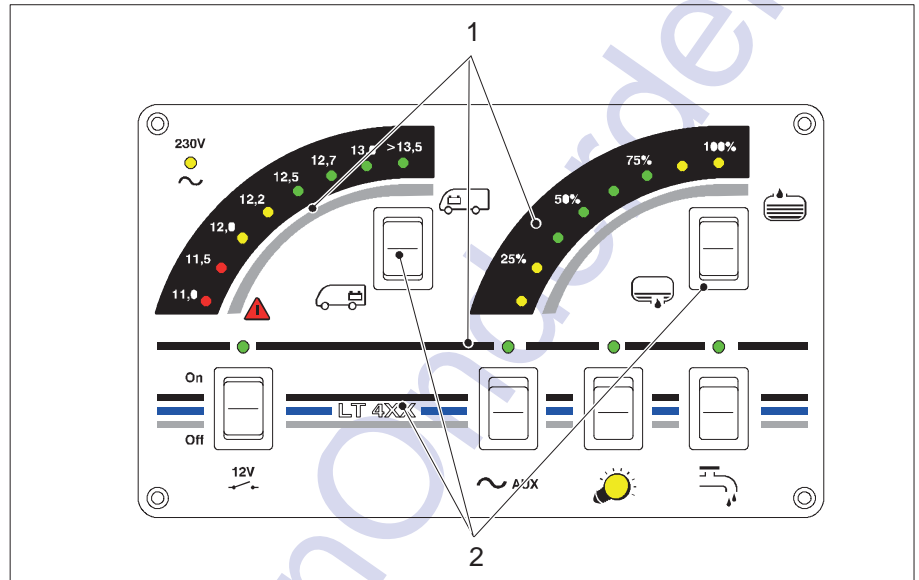


Fig. 1 Layout of LT 4XX switch panel


- 1 Displays
- 2 Control panels

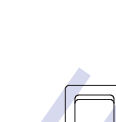



Y Symbols and inscription vary depending on vehicle manufacturer.


3.2 Operating controls


The LT 4XX switch panels have the following controls:


 Button: Main switch
Button to switch on and off the 12V supply of the motorhome.

 Button: Button for checking battery voltages
(for LT 411, LT 412 only for living area battery)


 Button: Button for checking the tank fill level
(for LT 411, LT 412, only for one water tank)



 *Only LT 400 and LT 420, 421:
Switch: Pump supply voltage

 **Only LT 400, 402:
Switch: Supply voltage for additional device



~ AUX

 **Only LT 400:
Switch: Supply voltage for lighting

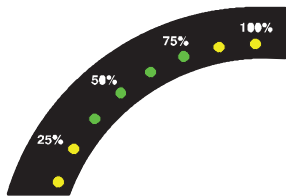



3.3 Displays

The LT 4XX switch panels have the following displays:



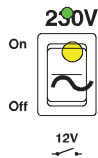
Display of the battery charge in eight increments with voltage information and total discharge warning




Display of the tank fill level in five increments: empty (no LED on), 25% (2 LEDs on), 50% (4 LEDs on), 75% (6 LEDs on), full (all LEDs on)



LED mains indicator (yellow)


The yellow LED is on when mains voltage is present at the input of the EBL electrobloc (see also Section "Starting up" in EBL.... electrobloc instruction manual)




Indicator LED (green)
Indicates the system is switched on.


 *Only LT 400 and LT 420, 421:
Indicator LED (green):
Indicates the pump supply voltage is switched on.






 **Only LT 400, 402:
Indicator LED (green):
Indicates the additional device supply voltage is switched on.



~ AUX

 **Only LT 400:
Indicator LED (green):
Indicates the lighting supply voltage is switched on.

3.4 Starting up

" Switch on LT 4XX switch panel (see Section 3.5).

230V mains operation

" Connect the plug for mains operation to the 230V power supply.

230V



Mains indicator LED lights up. The living area battery is being charged (also the starter battery if required; please refer to the instruction manual of the appropriate electrobloc for details on the charging functions).

3.5 Switching on

The 12V supply of the living area is switched on using the relevant button. Exceptions:

⊞ AES refrigerator controller

and, if available, the following outputs:

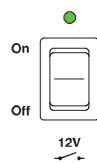
⊞ Compressor refrigerator

⊞ Frost protection valve heater system

⊞ Floor light

⊞ Spare 1

These consumers are also operable when the 12V power supply is switched off (as soon as a battery is connected or mains voltage is applied).



" Briefly press the left-hand button upwards.

The green indicator LED lights up.

The 12V supply to the living area is now switched on.

3.6 Checking readings

3.6.1 Battery charge



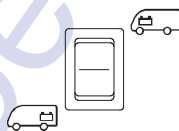
" Briefly press the button next to the left-hand scale upwards.

The charge of the starter battery is displayed (not present for LT411, LT412, LT 413):

⊞ Green LEDs: Battery charged sufficiently

⊞ Yellow LEDs: Battery partially discharged (below 12.4V)

⊞ Red LEDs: Battery flat (below 11.6V)



" Briefly press the button next to the left-hand scale downwards.

The charge of the living area battery is displayed.

⊞ Green LEDs: Battery charged sufficiently

⊞ Yellow LEDs: Battery partially discharged (below 12.4V)

⊞ Red LEDs: Battery flat (below 11.6V)



Y Note on LT 411, LT 412 LT 413:

The display is only for a living area battery for the LT 411, LT412, LT 413:

- Briefly press the button next to the right-hand scale upwards or downwards.

The following table shows the correct interpretation of the voltage of the living area battery displayed on the scale.

These values apply to actual operation, not off-load voltage.

| Battery voltage | Battery operation | Mobile operation | Power operation |
|--|--|--|---|
| | Vehicle stationary, no 230V connection | Vehicle moving | Vehicle stationary, 230V connection |
| less than 11.0V Risk of total discharge | If consumers are switched off: battery flat | the alternator is not charging the battery | the electrobloc is not charging the battery |
| | if many consumers are switched on: possible battery overload | 12V power supply overloaded | 12V power supply overloaded |
| 11,5V to 13.0V | normal range | the alternator is not charging the battery ¹⁾ | the electrobloc is not charging the battery ¹⁾ |
| | | 12V power supply overloaded ¹⁾ | 12V power supply overloaded ¹⁾ |
| 13,5V and over | occurs only briefly after charging | Battery being charged | Battery being charged |

¹⁾ If the voltage does not exceed this range for several hours.



Y ATTENTION!

Total discharge.

Damage to the living area battery:

- Prevent low battery charge (indicated by low voltage).
- Switch off some consumers in the event of an overloaded power supply.
- Prior to taking the motorhome out of service, ensure no more inactive consumers are connected.

Off-load voltage

Measuring the off-load voltage is a simple and effective method of checking the condition of the battery. Off-load voltage is the voltage of the charged battery in a passive state, with no current being supplied or drawn.

Take the measurement several hours after the last charging. In the meantime, no significant load should have been placed on the battery, meaning no current should have been drawn from it. There is a risk of total discharge if the off-load voltage of the battery is 12.0V or less.

The following table shows the correct interpretation of the off-load voltage displayed. The values specified are guidelines for gel batteries.

| Values for off-load voltage | Charge state of the battery |
|-----------------------------|------------------------------|
| 12.0V or less | discharge or total discharge |
| 12.2V | approx. 25% |
| 12.5V | approx. 50% |
| More than 12.7V | full |

3.6.2 Tank fill levels



Y **ATTENTION!**

Measuring too long.

Damage to rod tank probes or tank sensors:

F Briefly press keys to check tank fill levels.

" Briefly press the button next to the right-hand scale upwards.



The water tank level is displayed.

F All LEDs light up: full

F Six LEDs light up: 3/4 full

F Four LEDs light up: 1/2 full

F Two LEDs light up: 1/4 full

F No LEDs light up: Tank empty

" Briefly press the button next to the right-hand scale downwards.



The waste water tank level is displayed.

F All LEDs light up: full

F Six LEDs light up: 3/4 full

F Four LEDs light up: 1/2 full

F Two LEDs light up: 1/4 full

F No LEDs light up: Tank empty



Y **Note on LT 411, LT 412, LT 413:**

The display is only for a water tank on the LT 411, LT 412, LT 413:

" Briefly press the button next to the right-hand scale upwards or downwards.

3.6.3 Switching voltage supplies on and off

3.6.3.1 Water pump



*Only LT 400 and LT 420, 421:

" Press the switch with the pump symbol upwards.

The supply voltage for the water pump is enabled:

F Green LED lights up.

F The pump may switch on briefly (e.g. in a pressure system).

3.6.3.2 Lighting



*Only LT 400:

" Press the switch with the lighting symbol upwards.

The supply voltage for the lighting is switched on:


F Green LED lights up.

F Lighting can be switched on.

3.6.3.3 Additional devices



*Only LT 400, 402:

Press the switch with the symbol for additional device(s) (Aux, ) upwards.

The supply voltage for the additional device(s) is switched on:

- ☐ Green LED lights up.
- ☐ Connected device(s) can be switched on.

3.7 Troubleshooting and remedies

3.7.1 Alarms



⚠ ATTENTION!

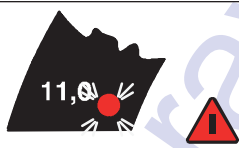
Total discharge.

Damage to the living area battery:

- ☐ Prevent low battery charge (indicated by low voltage).
- ☐ Check the voltage regularly (see Section 3.6.1).



Carry out checks in the mornings before 12V consumers are switched on.

| Alarm | Possible cause | Remedy |
|---|--|---|
|  | Risk of draining the living area battery. | Switch off all 12V consumers. |
| | Voltage of the living area battery has fallen below 11.0V. | Recharge the battery: - Start engine or - connect to 230V power supply |

3.7.2 Faults

Flat vehicle fuses

The majority of power supply system faults are caused by blown fuses (refer to the instruction manual for the relevant electrobloc for information on voltage distribution and fusing).

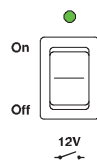
Please contact our customer service department if you can not rectify the fault using the following table.

If this is not possible, e.g. if you are abroad, the switch panel can be repaired at a specialist workshop. Please note that the warranty will become void if incorrect repair work is carried out. Schaudt GmbH shall not accept liability for any damages resulting from such repairs.

| Fault | Possible cause | Remedy |
|---|----------------------------------|---|
| 12V supply does not function (or some areas are not powered). | 12V main switch is switched off. | 12V main switch must be switched on. |
| | Fuse blown. | See EBL ... electrobloc instruction manual. . |

| Fault | Possible cause | Remedy |
|--|---|---|
| 12V indicator LED (green) does not light up. | 12V main switch is switched off. | 12V main switch must be switched on. |
| | Living area battery not charged | Recharge the living area battery. |
| | Fuse blown. | See EBL ... electrobloc instruction manual. |
| Living area battery is flat. | Living area battery has been discharged | Recharge the living area battery immediately. The living area battery will be damaged beyond repair if it remains totally discharged for a lengthy period. |
| | The battery can be discharged by inactive consumers, such as the frost protection valve in the combined heating system. | Fully recharge the living area battery before taking the motorhome out of service for a lengthy period. |
| The "Check mains" LED (yellow) does not light up even though the 230V mains supply is connected. | No power coming from the mains supply. | Check the mains connection (e.g. camping site). |
| | The power cut-out in front of the Electrobloc has tripped or is switched off. | Reset the power cut-out. |

3.8 Switching off



" Briefly press down the left-hand button.

The green indicator LED goes out.

The 12V supply to the living area is now switched off.

Exceptions:

- ⊞ Compressor/AES refrigerator control unit, possibly step

These consumers are still operable even when the 12V power supply is switched off.

3.9 Closing down the system

The system should be switched off if the vehicle is not being used for a lengthy period, such as during the winter.

- " Disconnect the living area battery from the 12V onboard supply (remove battery poles).
- " More detailed information on closing down the system can be found in the EBL ... electrobloc instruction manual.

4 Maintenance

The LT 4XX switch panels require no maintenance.

Cleaning

Clean the device with a soft, slightly damp cloth and mild detergent. Never use spirit, thinners or similar substances. Do not allow fluid to penetrate the inside of the switch panel.

5 Application and function

The LT 400, LT 410, LT 420 and LT 421 switch panels are the central control panels for the EBL ... Electrobloc supplying all 12V consumers in the electrical system on board the motorhome. They are usually installed in an easily accessible place high up near the door of the motorhome.

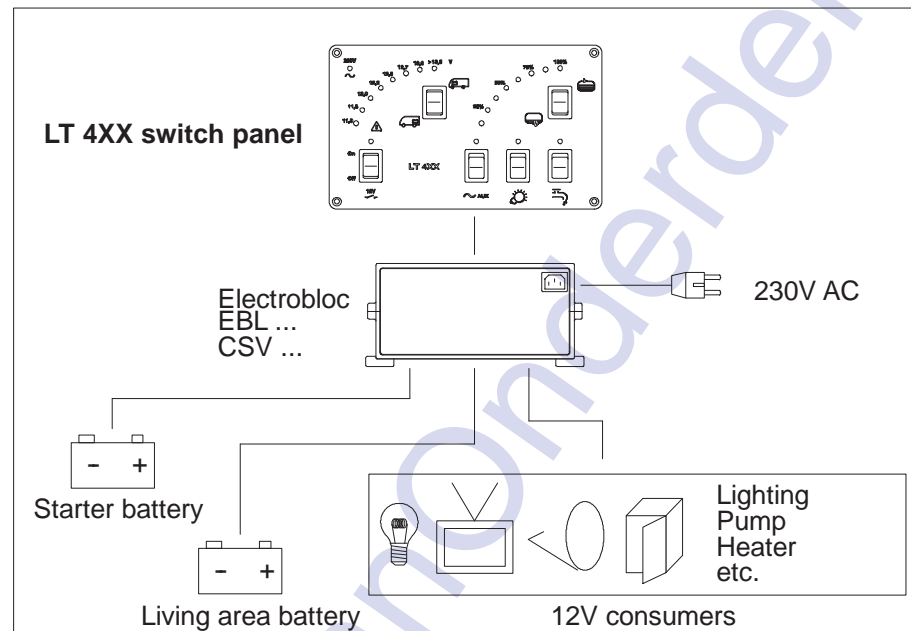


Fig. 2 On-board power supply system

System devices An Electrobloc EBL ... must be connected for operation. This provides the 12V supply to the devices in the motorhome and charges the living area and vehicle batteries

The following connection options are possible:

- ☐ Electrobloc EBL ...
- ☐ Sensors and/or probe for water tank
- ☐ Sensors or probe for waste water tank

The LT 4XX switch panel has the task of switching on and off the 12V supply for the living area and of displaying the different readings.

Display functions The following data can be displayed:

- ☐ Voltage of living area battery
- ☐ Voltage of vehicle battery (starter battery)
- ☐ Fill level of water tank
- ☐ Mains supply present

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Appendix

A EC Declaration of Conformity

Schaudt GmbH hereby confirms that the design of switch panels LT 4XX complies with the following relevant regulations:

Directive on electromagnetic compatibility

2004/108/EC dated 15.12.2004

The original EC Declaration of Conformity is available for reference at any time.

Manufacturer Schaudt GmbH, Elektrotechnik & Apparatebau

Address Planckstraße 8
88677 Markdorf
Germany

B Special fittings/accessories

Rod-type tank probes 2 x rod-type tank probe, 2 x seal,
2 x locking nut, 2 x probe cable (5 x 0.5)

Tank sensors Alternative:
10 x tank sensor, 2 x sensor cable 5 x 0.5

Mixed operation Mixed operation of tank probes and tank sensors is possible.

C Customer service

Customer service address Schaudt GmbH, Elektrotechnik & Apparatebau
Planckstraße 8
D-88677 Markdorf

tel.: +49 7544 9577-16 e-mail: kundendienst@schaudt-gmbh.de

Office hours Mon to Thurs 08.00 - 12.00, 13.00 - 16.00
 Fri 08.00 - 12.00

Send in the device Returning a defective device:

- " Fill in and enclose the fault report, see Appendix D.
- " Send it to the addressee (free of charge).

D Fault report

In the event of damage, please return the defective device together with the completed fault report to the manufacturer.

Device type: _____

Article no.: _____

Vehicle: _____

Manufacturer: _____

Model: _____

Own installation? Yes - No -

Upgrade? Yes - No -

There is the following defect:
(please select)

| | | | |
|---|--|------|---------|
| no Battery-charge during mains operation | | | |
| no Battery-charge during mobile operation | | Tank | Voltage |
| The following electrical consumers do not work: | | | |
| Malfunction of switch panel | | | |
| Permanent fault | | | |
| Intermittent fault/loose contact | | | |

Other remarks:

E Block diagram/connection diagram

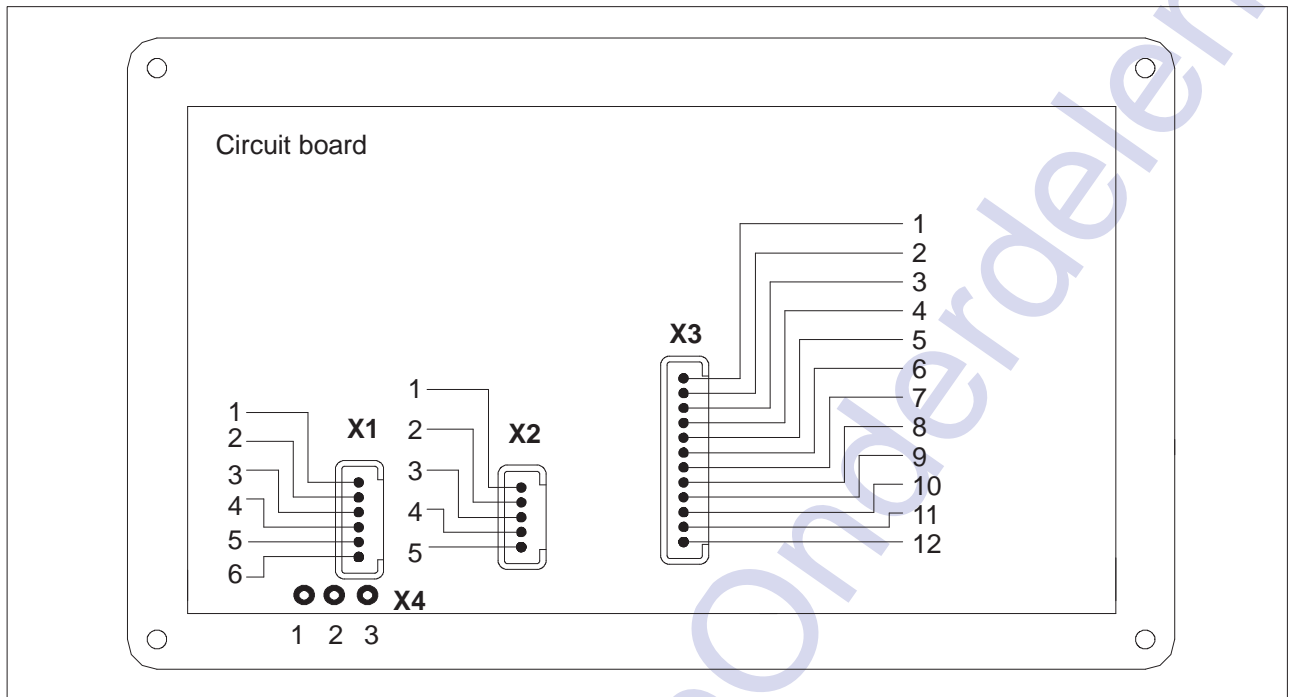


Fig. 3 Connection diagram of LT 4XX switch panels

X1 Lumberg MSFQ 6-way on water tank

- 1 full
- 2 3/4
- 3 1/2
- 4 1/4
- 5 Base water tank
- 6 n.c.

X2 Lumberg MSFQ 5-way on waste water tank (not for LT 411, LT 412)

- 1 full
- 2 3/4
- 3 1/2
- 4 1/4
- 5 Base waste water tank

X3 Lumberg MSFQ 12-way on EBL ... Electrobloc

- 1 n.c.
- 2 Negative living area battery sensor
- 3 + Lighting, only LT 400
- 4 n.c.
- 5 12V indicator
- 6 230V indicator
- 7 + Additional device(s) (AUX), only LT 400, 402
- 8 + Starter battery, 12V
- 9 12V On
- 10 + Pump (only LT 400 and LT 420, 421)
- 11 + Sensor, living area battery
- 12 12V Off

X4 Solder pads

- 1 GND
- 2 +12V permanent positive
- 3 +12V, connected via "12V On/Off"

(---)