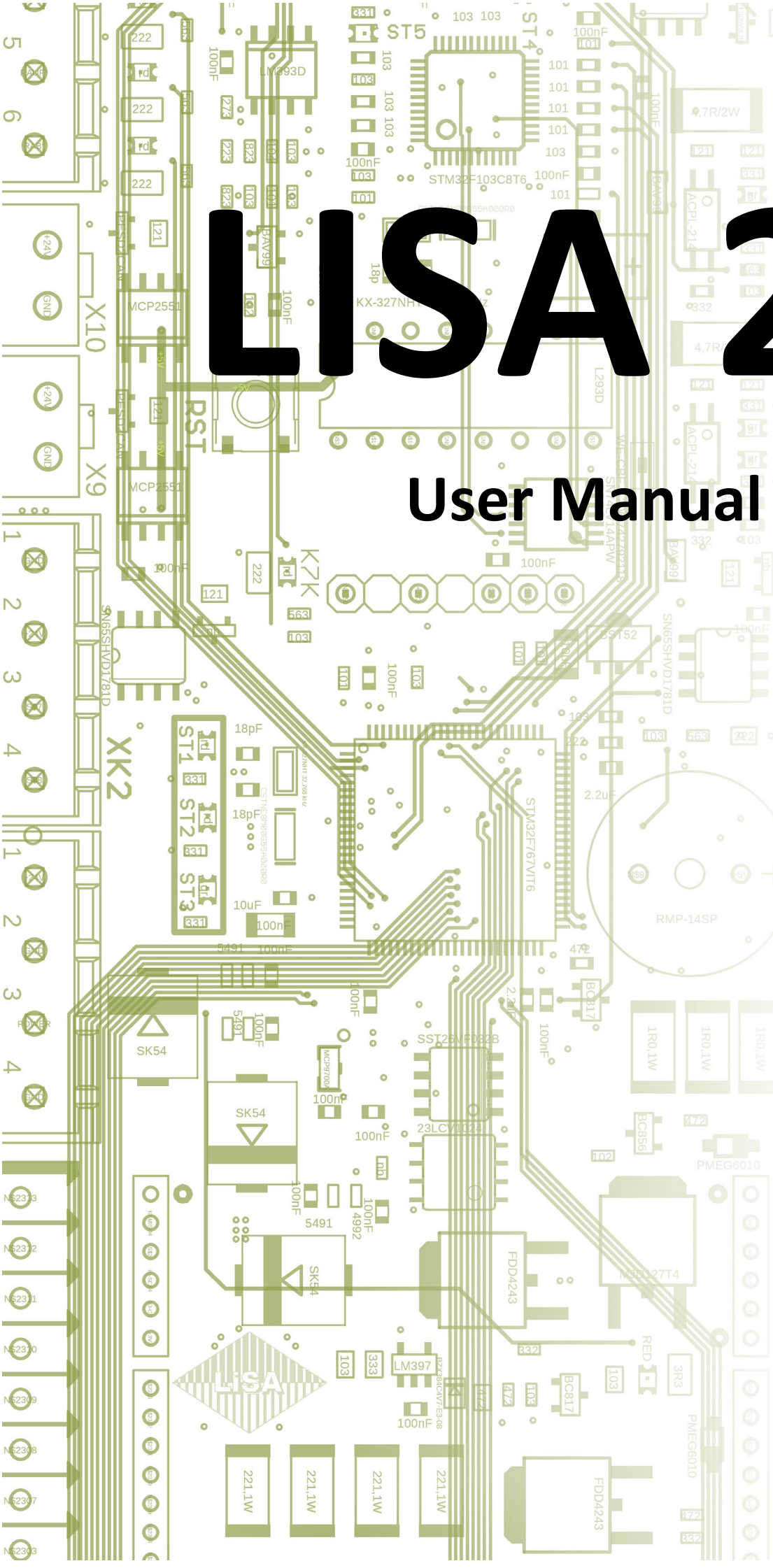


LISA 20

User Manual

W. Jaksch	26.03.2015	Versionsumstellung HB	Version 2.00
F. Giebel	05.08.2016	geändert auf LiSA V3.1	Version 2.01
F. Giebel	30.08.2016	Software-Update V2 / Sicherheitsschaltg. K40	Version 2.02
F. Giebel / V. Milanovic	03.01.2017	aktualisiert / Übersetzung Englisch	Version 2.03
F. Giebel	05.12.2017	umgestellt, erweitert,	Version 2.05
F. Giebel	24.04.2018	erweitert, Turnusgemäßer Austausch	Version 2.06
F. Giebel	27.02.2020	aktualisiert,	Version 2.07
F. Giebel	25.10.2022	APO16 eingefügt, LiMAX33CP	Version 2.08
F. Giebel	13.12.2023	Entstörplatine, Baumusterprüfb. aktualisiert	Version 2.09

As of: 14.12.2023

Table of contents

1. Overview of LiSA20

1.1. General information

LiSA20 is an innovative, future-oriented control system. Due to the two-part construction (processor board 95 x 290 x 20 mm and relay board 95 x 290 x 40 mm), this system can be used even if space is very limited. The boards can be installed above each other, next to each other or separately, if necessary in small areas. This allows to decouple the electronic components from the mains supply side and thus helps to avoid EMC-related problems.

1.2. EMC

LiSA20 complies with the requirements of EN12015 (emission) and EN12016 (immunity).

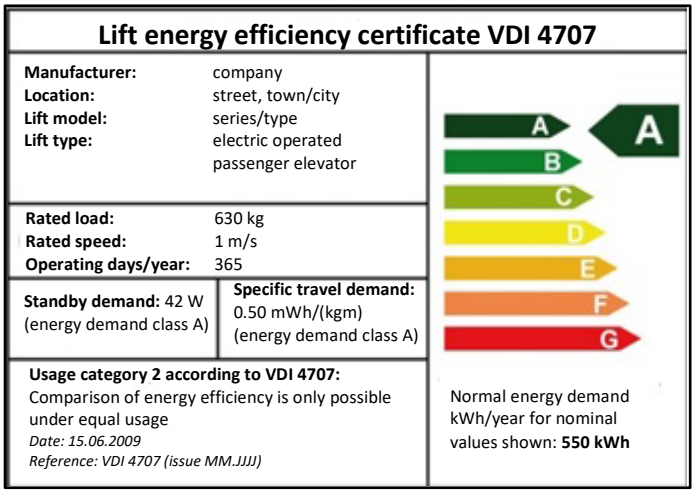
1.3. Interfaces

Thanks to its interfaces such as LiSA-bus, CAN BUS, DCP, LAN, USB and SD card it is all geared for tasks in the future.

1.4. Energy efficiency

Usage of state-of-the-art components and the sophisticated composition allow for operation at minimum consumption. Functions like switching the light and display off, putting the inverter in standby operation as well as switching the inverter and door drive off, allow very for economic consumption values of the whole lift system

➔ it has energy efficiency category A



2. Hardware

2.1. LiSA20 processor board (LiSA20 PB)

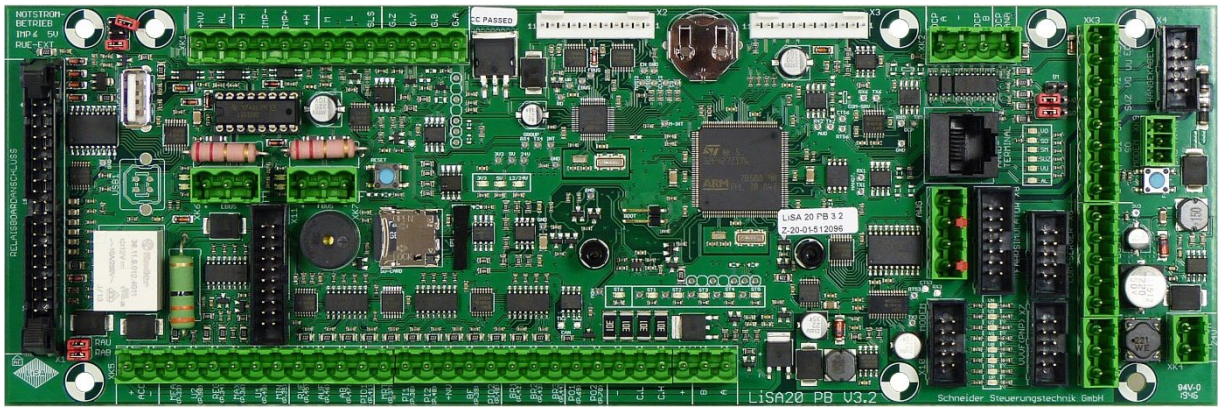


Figure 1

Technical Data:

- Dimensions (WxHxD) = 95x290x20 mm (35mm in depth with plug-in terminals)
- Voltage supply - 24 VDC, max. 3 A
- Switching voltage - 24 V DC npn (L<15V); pnp (H>15V)
- 32-bit ARM Cortex M4 micro-controller, 168 MHz clock frequency
- Monitoring electronics (watchdog)
- Programme memory 2 MB flash
- Working memory RAM 256k, SRAM 4k
- Storage battery CR1632, 3 V
- Parameters stored on exchangeable SD card
- Parameters loadable via USB ports (USB1 (PC), USB2 (stick))
- LEDs for diagnosis without display
- 3 serial interfaces (group connection, modem connection, COM-server connection)
- Connections for LiSA EBUS (landing bus) and FBUS (car bus)
- CAN bus
- DCP interface , DCP analogue interface
- LAN interface
- Inverter interface (digital inverter signals)
- Drive monitoring (PTC thermistor, maximum pressure, minimum pressure, controller fault, brake contacts)
- Pulse input for digital shaft selection
- Functions for emergency call system

Connections:

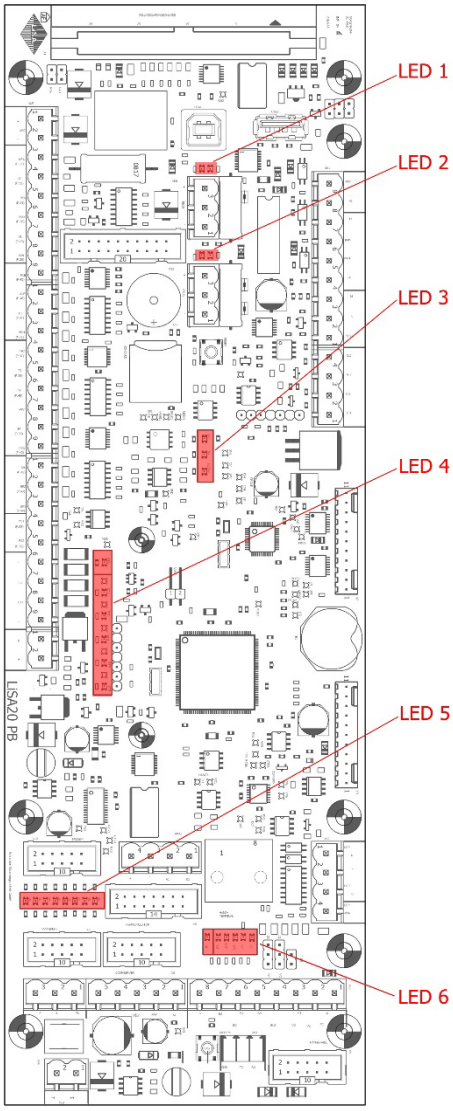
- X1 - 40-pole ribbon cable connector to relay board
- X2 - 11-pole ribbon cable connector for IO card 1 (16 input/output signals)
- X3 - 11-pole ribbon cable connector for IO card 2 (16 input/output signals)
- X4 - 10-pole ribbon cable connector for travelling cable (data transfer)
- X5 - 8-pole RJ45-connector for operating terminal
- X6 - 10-pole ribbon cable connector for COM server

- X7 - 10-pole ribbon cable connector for inverter signals (VVVF) - 24V pnp
- X8 - 10-pole ribbon cable connector for travelling simulator
- X10 - 10-pole ribbon cable connector for modem
- X11 - 20-pole ribbon cable connector for C-Box

- XK1 - 9/4-pole terminal
- XK2 - 4-pole terminal for DCP (A, B, analogue 0-10 V)
- XK3 - 8/5/3-pole terminal to car
- XK4 - 2-pole terminal for supply (24VDC)
- XK5 - 9/9/9/2-pole terminal
- XK6 - 3-pole terminal for EBUS (landing bus)
- XK7 - 3-pole terminal for FBUS (car bus
- XK9 3-pole terminal for modem (extra)
- X15 4-pole terminal for absolute encoder (travelling controller)

- USB1 – Connector (not equipped)
- USB2 – Connector for memory stick

LED-displays:



LED1: LiSA-EBUS:
EBUS - landing bus active (enable/data flashing)

LED 2: LiSA-FBUS:
FBUS - car bus active (enable/data flashing)

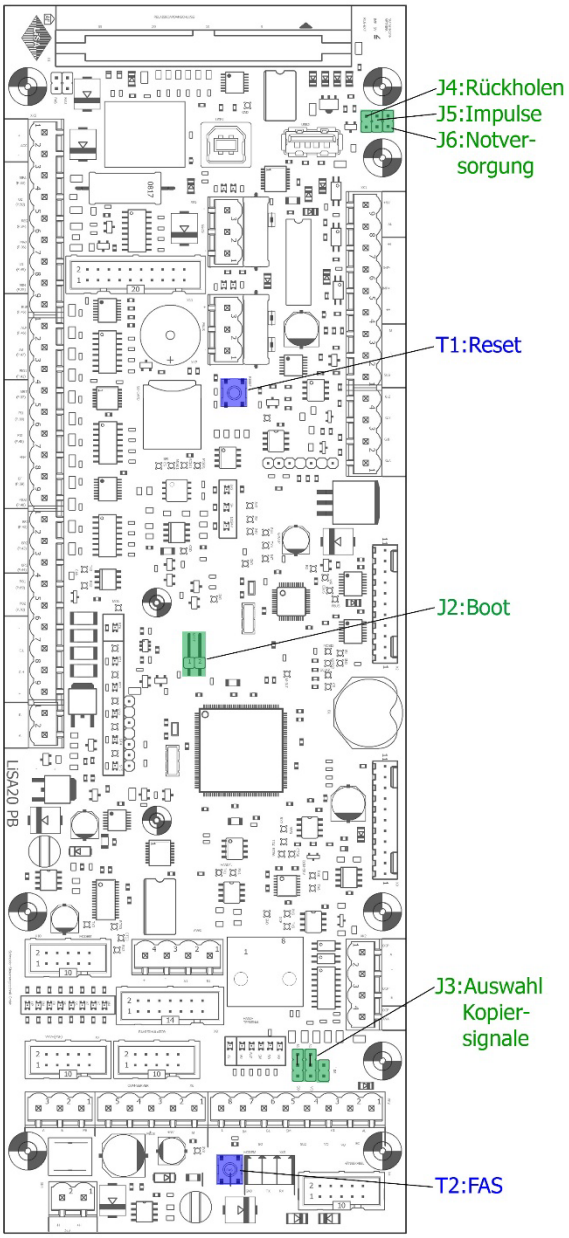
LED 3: Supply:
3V3 - 3.3V supply available (light on)
5V - 5V supply available (light on)
12/24V - 24V supply available (light on)

LED 4: Processors:
ST6 – phases OK (light on)
ST1-ST3- Processor 1 statuses
ST4-ST5- Processor 2 statuses

LED 5: Inverter signals:
UP = upwards
DN = Down
FR = release
V0 = positioning speed
V1 = inspection speed
V2 = intermediate speed
V3 = rated speed
VN = relevelling speed

LED 6: Selection signals:
AL = alarm
VU = bottom slow-down switch
SUZ = signal transmitter bottom/zone
SM = centrical signal transmitter
SO = signal transmitter top
VO = slow-down switch top

Jumper / Button :



Jumper:

J2: boot -> allows to boot from the USB stick

J3: ABE-KON -> selection whether selection signals come from absolute encoder (ABE) or selector block (Figure in ABE position)

J4: RUE -> recall activation
required if relay board is not connected

J5: IMP -> pulse level selection (HTL/TTL)

J6: NV -> supply of LiSA20 PB via 12V standby battery

Buttons:

T1: Reset -> reset processor board
T2: FAS -> remote release

Overview of the LiSA20 processor board (PB) connections:

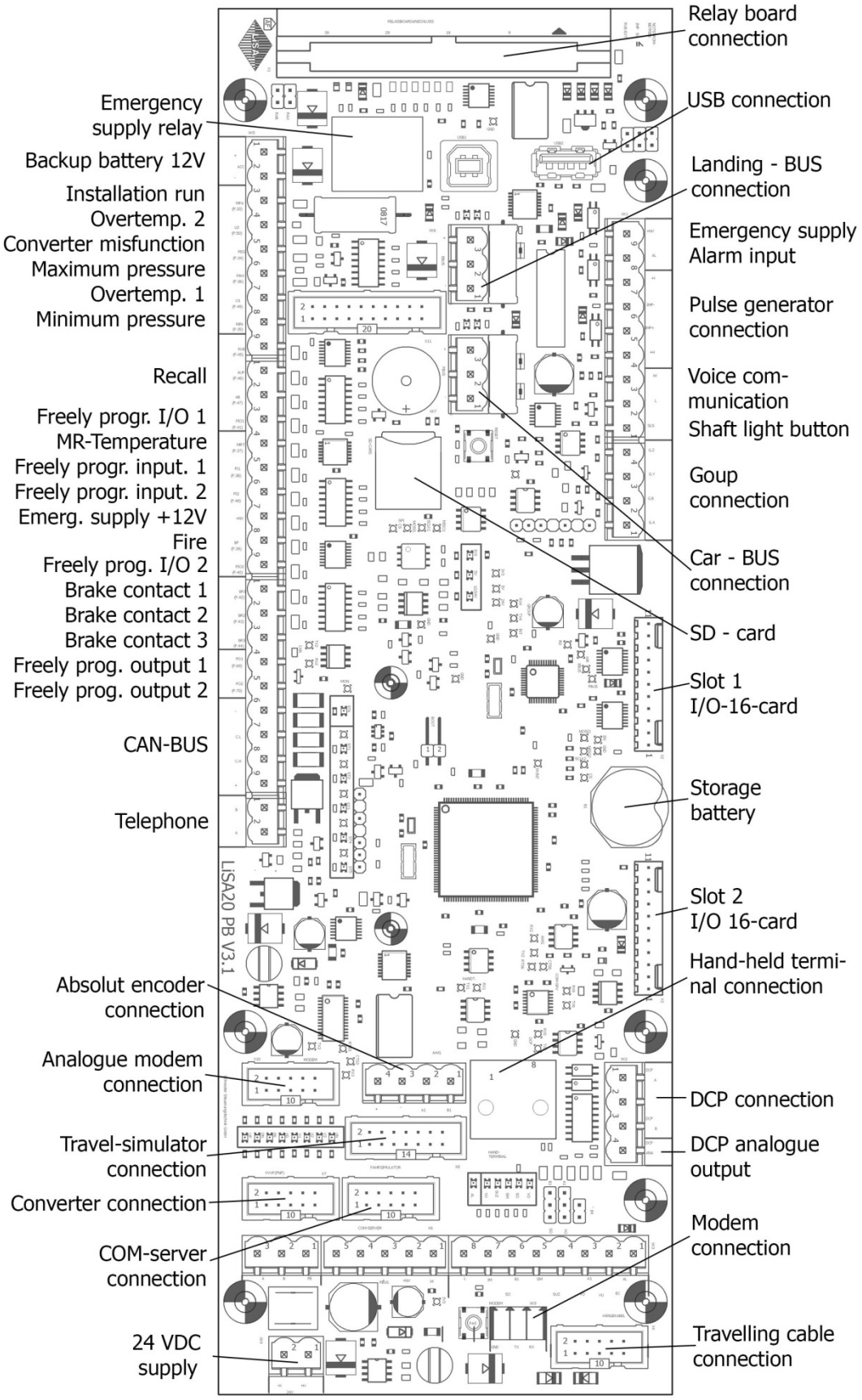
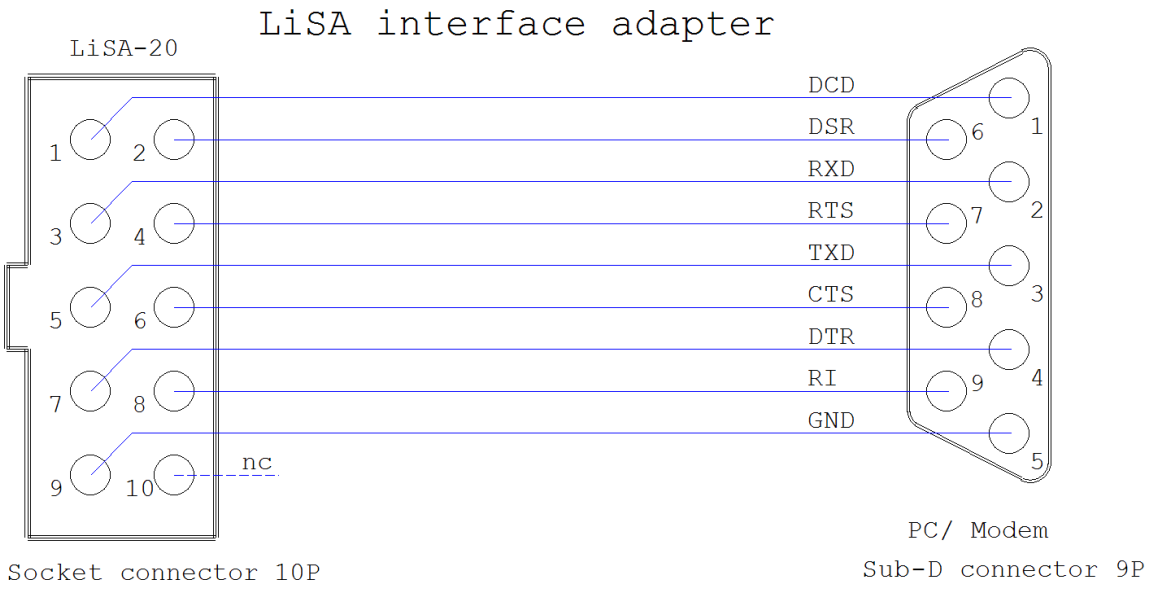


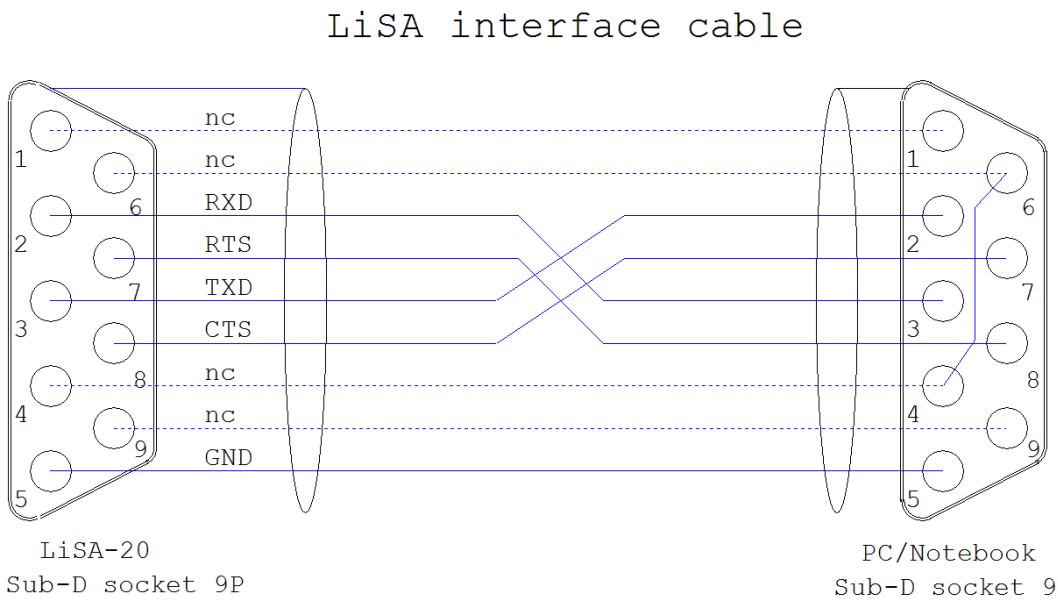
Figure 2: LiSA20 PB

Modem / COM-Port Connection

The ribbon cable pin header X10 (modem) or respectively X6 (COM-Port) are intended for connection of the modem or PC with the LiSA20 controller. Each connection requires an adapter cable connecting the 10-pole pin header with the 9-pole SUB-D-plug.
The assignment is demonstrated in the following graphic.



Now, it is possible to connect a modem to the interface adapter using a serial line.
Connecting a PC or COM-server however requires the use of a LiSA-interface cable (zero-modem cable) instead of a serial line. Use according to the following illustration.



2.2. LiSA20 relay board (LiSA20 RB)

Technical data

- Dimensions (WxHxD) = 95 x 290 x 40 mm
- 4 safety circuit queries via opto-coupler
- 1 light voltage query via opto-coupler
- Safety relay
- Phase monitoring
- Switch for recall and brake release (emergency rescue)
- Key switch for NoBo-inspection and emergency rescue
- Indication possibilities without display
- Battery charging and monitoring
- 5 preselection relays for travel signals
- Push button and relay for shaft light switching
- 1 emergency call relay
- 3 freely programmable relays

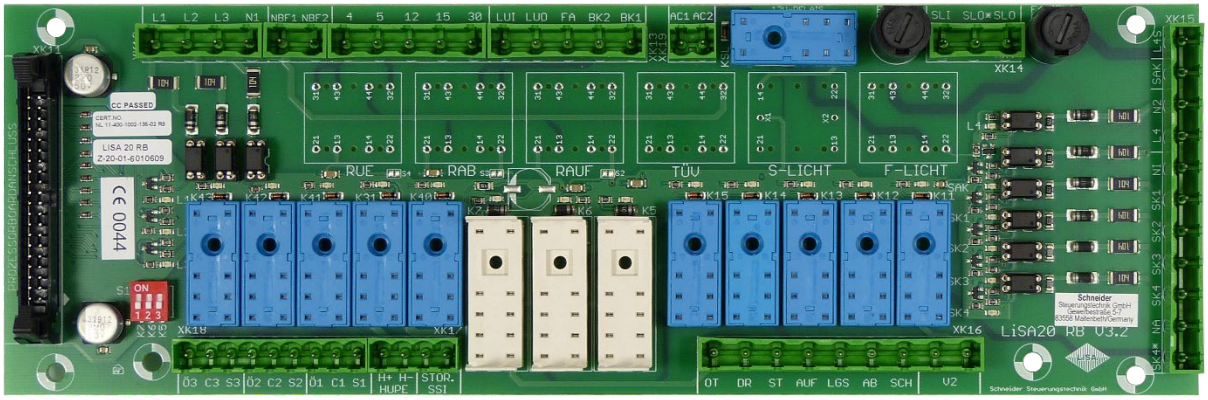


Figure 3

Connections:

- XK11 - 40-pole ribbon cable connector to processor board
- XK12 - 11-pole terminal (RM 7.62)
- XK13 - 5-pole terminal (RM 7.62)
- XK14 - 3-pole terminal (RM 7.62)
- XK15 - 11-pole terminal (RM 7.62)
- XK16 - 9-pole terminal (RM 7.62)
- XK17 - 4-pole terminal (RM 7.62)
- XK18 - 9-pole terminal (RM 7.62)
- XK19 – 2-pole terminal (RM 5.08)

LED displays:

- L1 - Phase L1 active (LED on)
- L2 - Phase L2 active (LED on)
- L3 - Phase L3 active (LED on)
- L4 - Light voltage L4 active (LED on)
- SAK - Contactor monitoring active
- SK1 - Safety circuit 1 active
- SK2 - Safety circuit 2 active
- SK3 - Safety circuit 3 active
- SK4 - Safety circuit 4 active

- LEDx - above the relays

Fuses:

- F4 - L4 light voltage (M4A)
- F5 - L5 shaft light voltage (M4A)

DIL switch:

- S1 - Test of safety relays K5, K6, K7

Switches, push buttons:

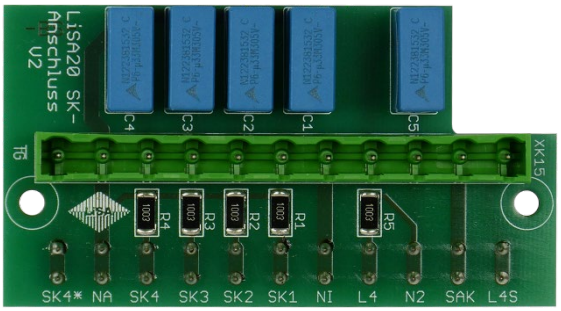
- RUE - Recall switch - on (AT2 - 2NO, 2NC)
- RAB - Recall button - down (AT2 - 2NO, 2NC)
- RAUF - Recall button - up (AT2 - 2NO, 2NC)
- ZÜS - NoBo-test switch, enables brake release buttons (AT2 – 2NO, 2NC)
- S-LICHT - Shaft light button (AT – 1NO, 1NC)
- F-Licht - Car light switch (AT2 - 2NO, 2NC)

Relays:

- K5, K6, K7 - Safety relays (Dold OA5670.52 24VDC)
- K31 - Emergency call relay (12 VDC, 2xNO)
- K40 - mute safety circuit
- K41-K43 - freely programmable relays (24VDC, 1 changeover)
- K11-K15 - Preselection relay for travel signals (24VDC, 1xNO)
- KSL - Relay for shaft light

2.2.1 The interference suppression board SK-Anschluss (optional):

Due to the very long cables of lifts and the way they are laid there may be interference coupling which can affect the evaluation of the safety circuit taps in some circumstances. An optional interference suppression board is used in these cases, reducing the interference voltage to a harmless minimum.



LiSA20 SK-Anschluss

If necessary, the board can also be added on easily. The interference suppression board is directly plugged into the relay board in position XK15 instead of the plug of the safety circuit taps. The plug of the safety circuit taps is then plugged into the interference suppression board.

Note: Observe the technical documentation of the LiSA SK-Anschluss interference suppression board!

Connections of LiSA20 RB

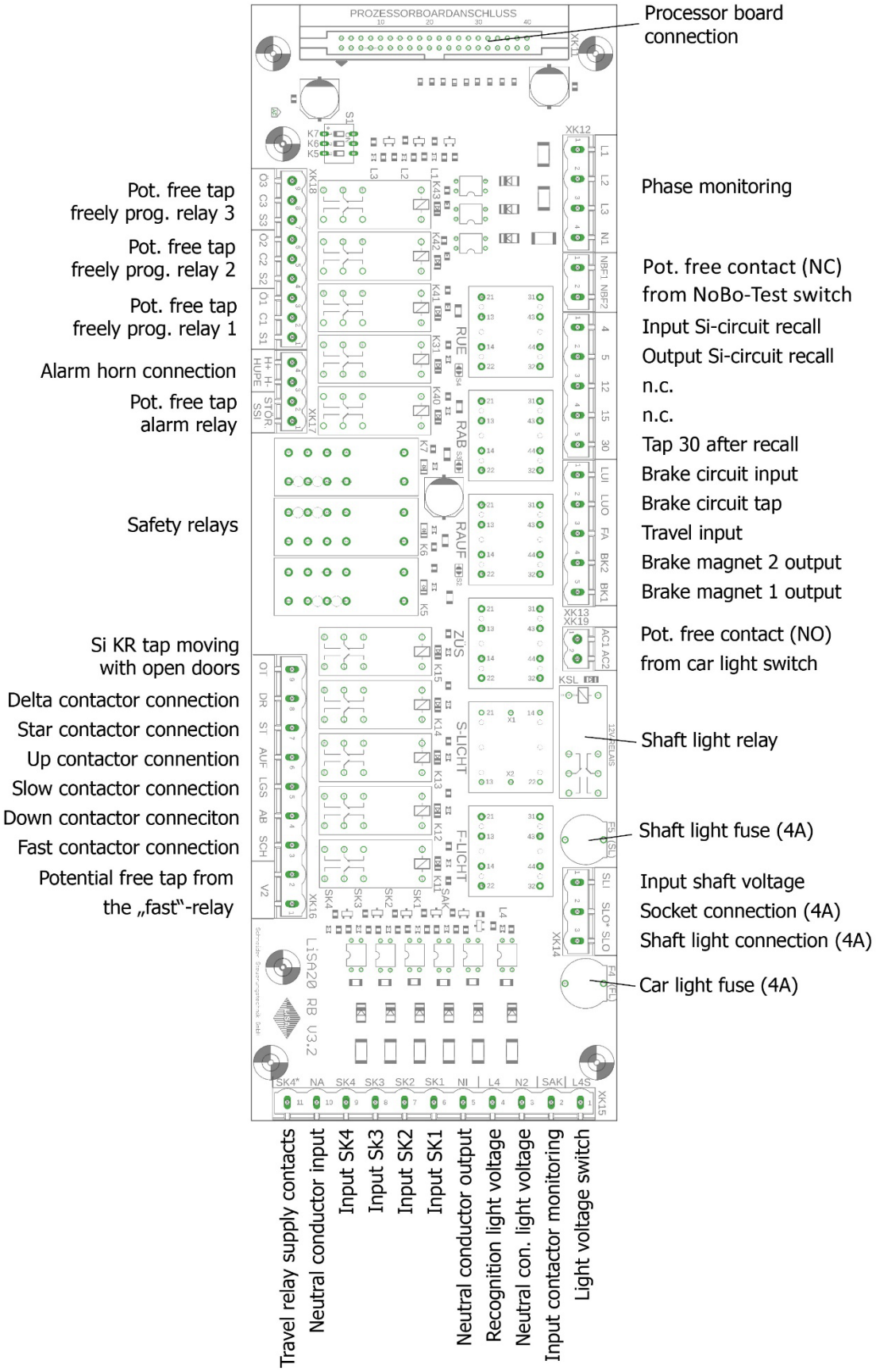


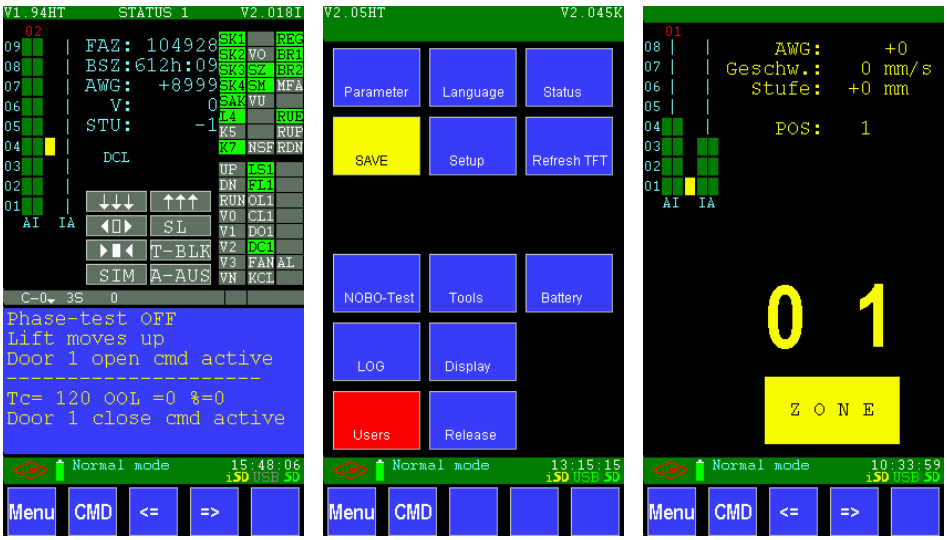
Figure 4: LiSA20 RB

2.3. TFT colour touch display (hand terminal)

Technical Data

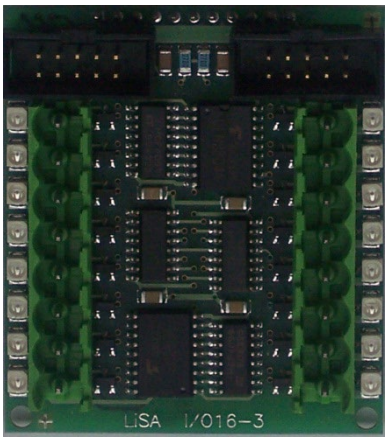
- TFT touch 4.3“
- 72 MHz CPU frequency
- 512 kB FLASH programme memory
- 64 kB SRAM working memory
- RS485 interface, 8-pole Western connector or optionally 10-pole ribbon cable
- Dimensions (WxHxD) = 88x113x25 mm

The TFT colour touch display serves for operation, programming, error analysis as well as direction and position indicator for emergency rescue.



2.4. I/O board (IO16)

There are 16 electronic inputs/outputs (I/Os) on the I/O board (IO16).
8 I/Os can be connected via a 10-pole ribbon cable connector. They are additionally (in parallel) connected to 8-pole edge connectors. In this way the I/Os may also be connected conventionally via screw terminals.
The status is displayed by LEDs.
An illuminated LED indicates that either -H is applied to the connector or that the output electronics has activated the output.
“8 I/Os” imply that each output can be permanently charged with 100 mA (in case of 24V switching voltage) if 8 connected I/Os (IO1 – IO8 / IO9 – IO16) are simultaneously activated. Individually, each I/O can be charged with a maximum of 500 mA.



Caution: Temporary short circuits can be absorbed. Sustained ones not.

2.5. LiSA Bus-Modul (LBM)

The LiSA bus module (LBM) provides 8 electronic inputs/outputs of 12V - 24V in npn or pnp design. The LBM is operated at the LiSA bus. 64 LBM each can be connected to car bus and landing bus.

Structure and functions:

- 8 short-circuit-proof (not sustained short-circuit-proof) freely programmable inputs/outputs (I/Os) at XK1 and XK2 or X1.
- 8 I/O input/output status LEDs
- 1 LED (L1) for the operating mode indication
  LED on: LBM-08 is OK
  LED flashes (frequency of 1 sec.): LBM-08 faulty
  LED flashes (frequency 0.2 sec.): faulty BUS code
- X1: 10-pole ribbon cable connector for connecting LiSA components.
- XK3 and XK4: Edge connectors for LBM on APO or LF (car) carrier boards
- XK5: Bus connector for LiSA bus components
- The jumpers JP1 - JP32 are used for addressing (0 - 63)

Normally the following address ranges are used to address the LBM.
Landing bus addresses:
0 – 63: address range for landing modules.

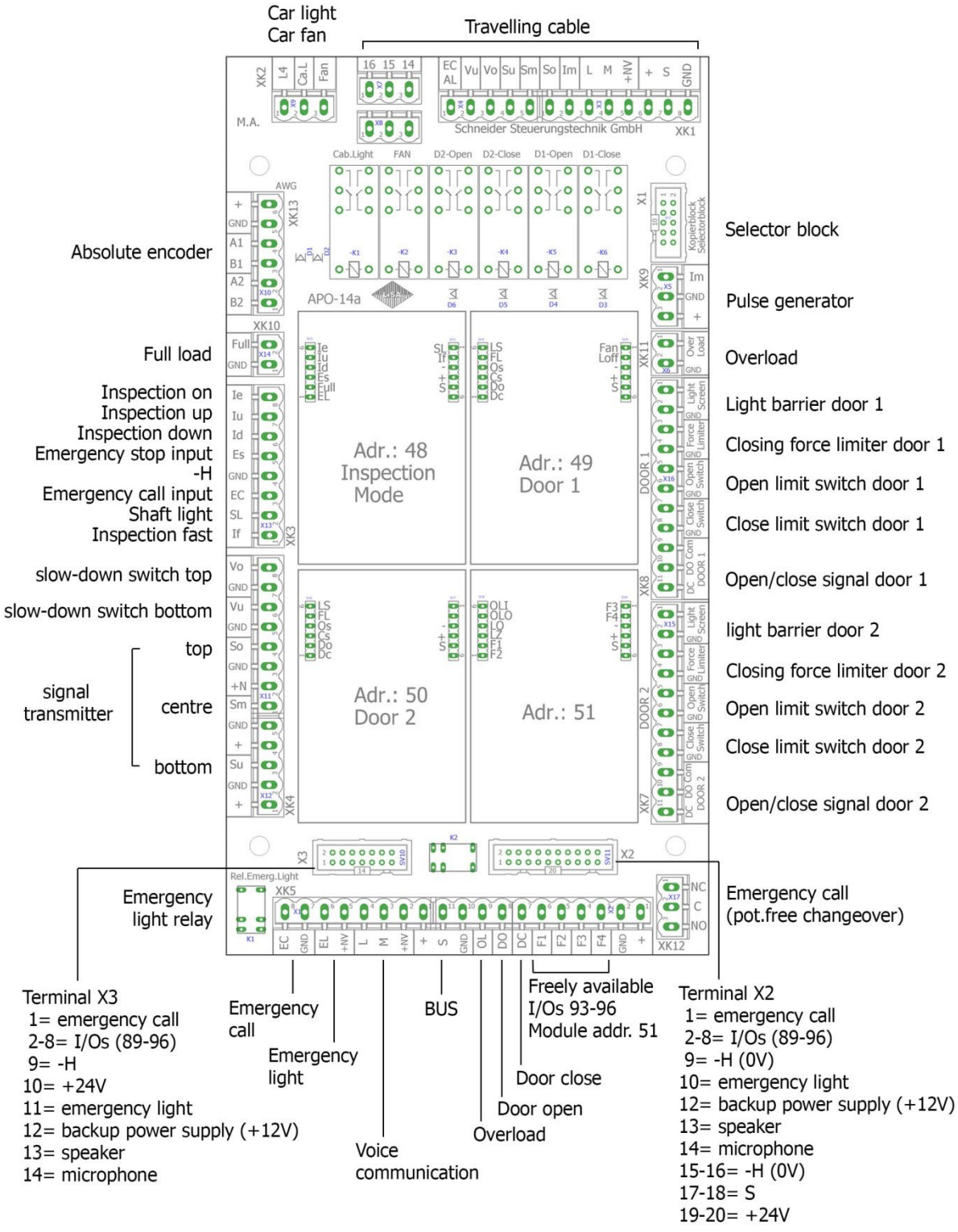
Car bus addresses:
0 – 47: address range for landing modules of door side 2 (in case of selective external door control)
48-60: address range for modules inside the lift cabin

2.6. APO-14 connection board on the car

The APO-14 is the central board for most of the connections on the car as well as a carrier board for four LBMs and 6 relays.

- Relay KF1: door-close-signal door 1 - connects the Com signal (XK8.3) (switching voltage of an electronic door drive) with Dc (door close) (XK8.1)
- Relay KF2: door-open-signal door 1 - connects the Com signal (XK8.3) (switching voltage of an electronic door drive) with Do (door open) (XK8.2)
- Relay KF3: door-close-signal door 2 - connects the Com signal (XK7.3) (switching voltage of an electronic door drive) with Dc (door close) (XK7.1)
- Relay KF4: door-open-signal door 2 - connects the Com signal (XK7.3) (switching voltage of an electronic door drive) with Do (door open) (XK7.2)
- Relay KF5: car fan - switches the light voltage L4 (XK2.1) to the fan output (XK2.3)
- Relay KF6: car light - switches the light voltage L4 (XK2.1) to the Ca.L output (XK2.2)

Connections of APO14



2.7. APO-16 connection board on the car

General:

APO-16 is an advancement of the previous car connection boards. With its width of only 78mm it has been designed as a space-saving car connection board for new controllers.
The connection options have been extended - now it is possible to connect a LiMAX33CP absolute encoder safety reading head directly to the APO 16. In order to simplify the wiring, the inspection signals are now additionally wired to a ribbon cable connection. Two discretionary CAN BUS ports are also new - they are now located on the APO16. Here you can connect door controllers, for instance, or a CAN BUS-capable handheld terminal. Thanks to this handheld terminal it is now possible to make control settings from the car.

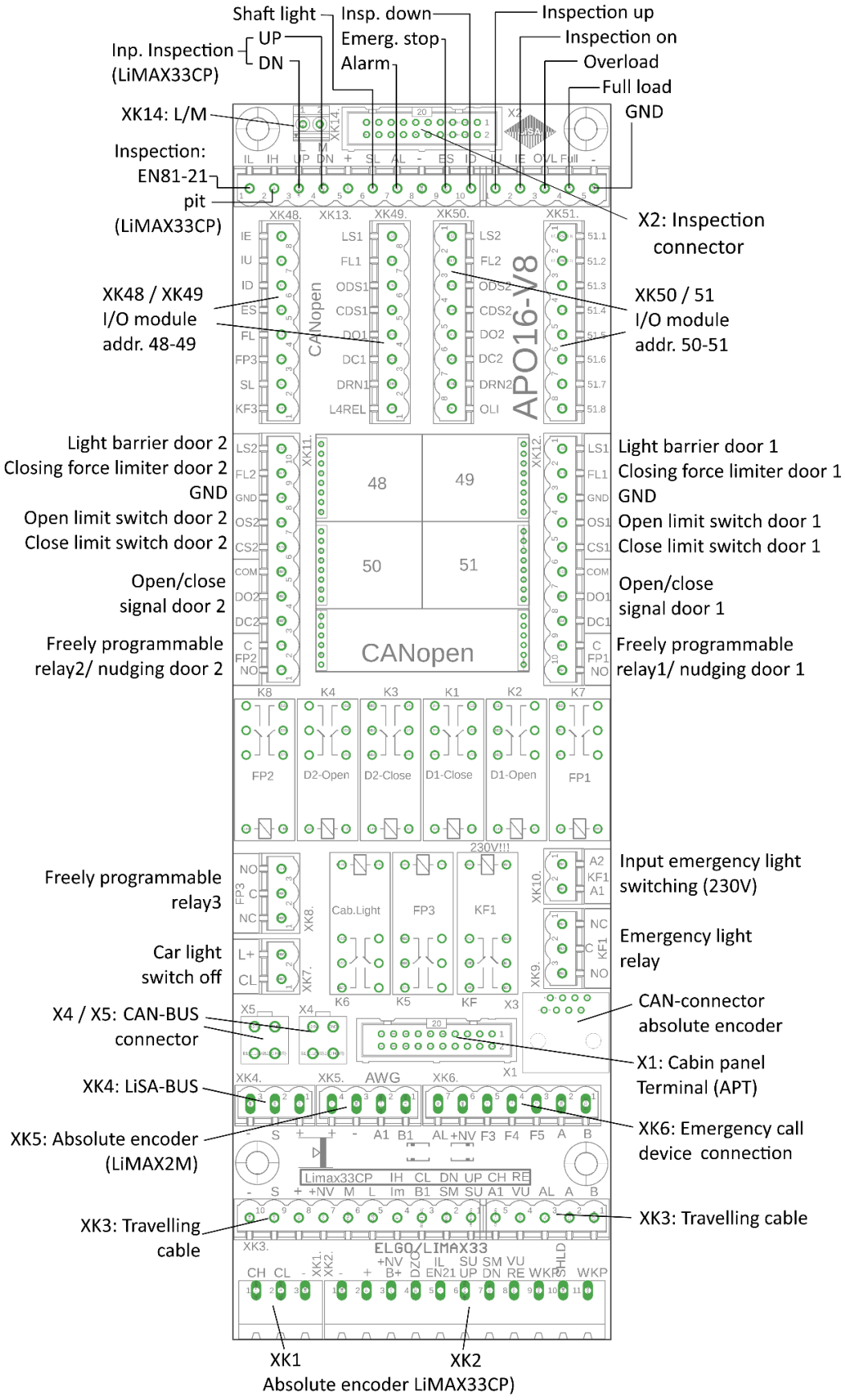
Instead of individual bus modules, a pluggable 4-fold bus module of type ION32 is used.
The I/Os of the bus modules, such as door signals, are all wired to contact strips now and can therefore be tapped. Furthermore there are 8 freely programmable I/Os at bus module 51 as well as 3 freely programmable relays on the APO-16 available.
The functions of the previous APO have been carried over to a large extent, only the connections for encoder and selector block are no longer contained in favour of smaller dimensions.

Note: *APO 16 is not plug compatible with previous APO versions.*

Connections:

- X1 : Connection to cabin control panel (APT)
- X2 : Inspection connector (Multibox)
- X3 : CAN-BUS absolute encoder (AWG)
- X4/X5 : CAN-BUS
- XK1/XK2 : Absolute encoder (LiMAX 33CP)
- XK3 : Travelling cable
- XK4 : LiSA-BUS connector
- XK5 : Absolute encoder (LiMAX 2M)
- XK6 : Emergency call device
- XK7 : Car light shut down
- XK8 : Freely prog. relay 3
- XK9 : Emergency light relay contacts
- XK10: Input emergency light switching (230V)
- XK11: Open/close signal door 2 / freely prog. relay 2
- XK12: Open/close signal door 1 / freely prog. relay 1
- XK13: Inspection control
- XK2.1: Inspection Control / load measurement
- XK14: Loudspeaker / Mikrophone
- XK48: tap I/O´s BUS-module address 48
- XK49: tap I/O‘s BUS-module address 49
- XK50: tap I/O‘s BUS-module address 50
- XK51: tap I/O‘s BUS-module address 51 (8 freely programmable I/O)

Connections of APO16



3. Operation

3.1. Basic features

The LiSA20 controller is equipped with a 4.3" graphic display touchscreen. It provides a structured and comprehensive overview of all inputs, outputs, error memories and equally serves to parameterise the controller.
Operation is intuitive and therefore requires only a short training period.

3.2. Menu structure

The menu structure depicted here merely serves as an overview and thus shows the first menu items only.

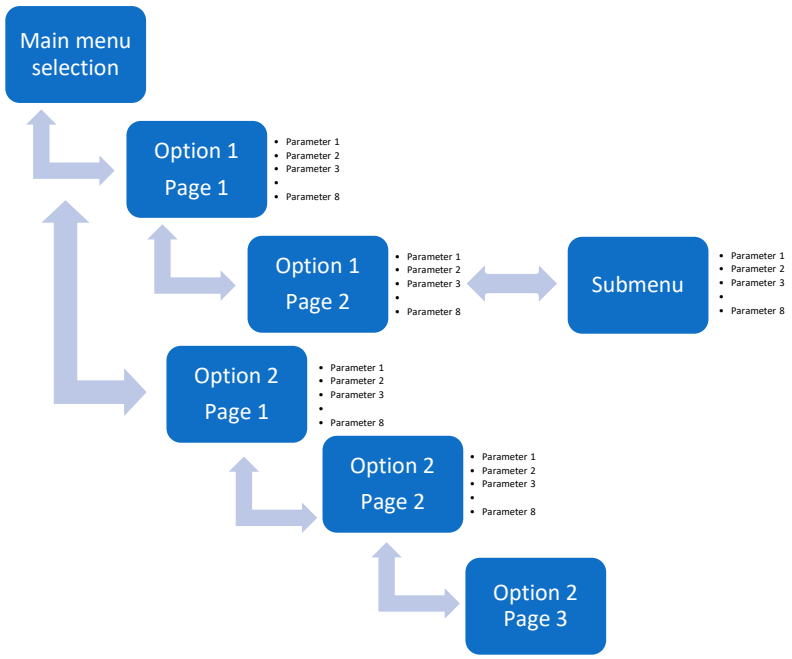
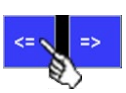


Figure: Menu structure

3.2.1. Operating concept

There are different buttons on the touch screen for menu navigation as well as parameter- and command entry.

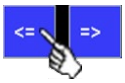
Depending on the configuration of the particular control, the individual screen pages are available dynamically.



In the following description, the hand-symbol indicates the button that needs to be pushed in order to navigate the touch screen accordingly.

A specific menu page is accessible by selecting the corresponding item on the main menu.

The upper green bar shows how many pages the selected menu item comprises and also the page number currently visible (e.g. 2/6 → page 2 of 6). By using the arrows < or > one can navigate to the next page or return to previous ones.

The buttons  may be used to scroll through the menu levels.

By pushing the menu button one is redirected to the main menu.
By pushing the CMD (command) button, the command level can be accessed

LiSA20-status screen page forward:

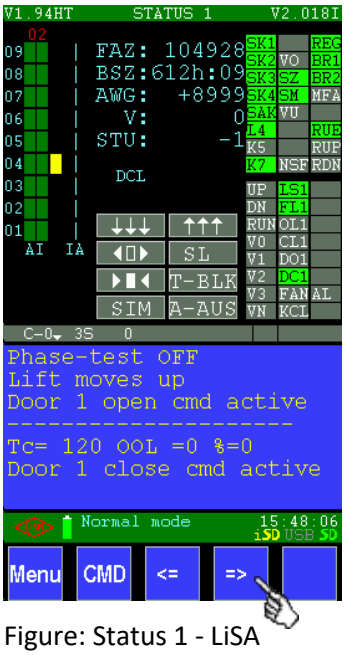


Figure: Status 1 - LiSA

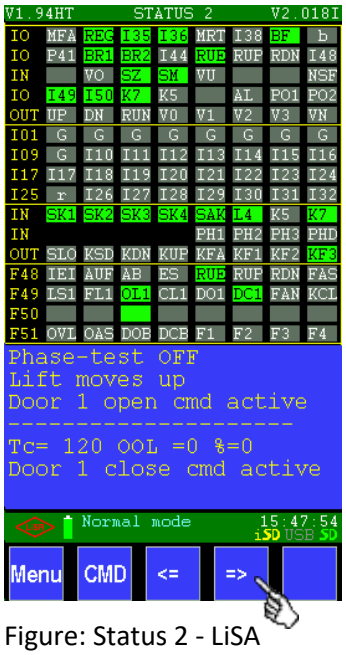


Figure: Status 2 - LiSA

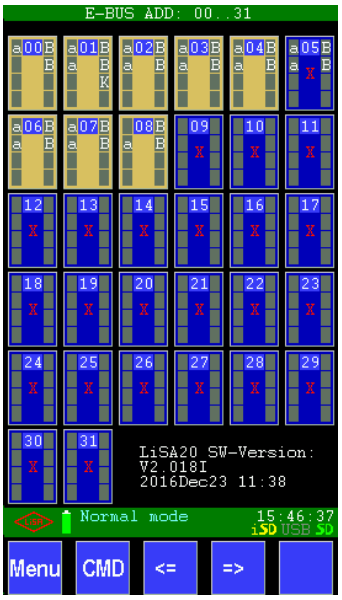


Figure Status landing bus

LiSA20-status screen page backwards:

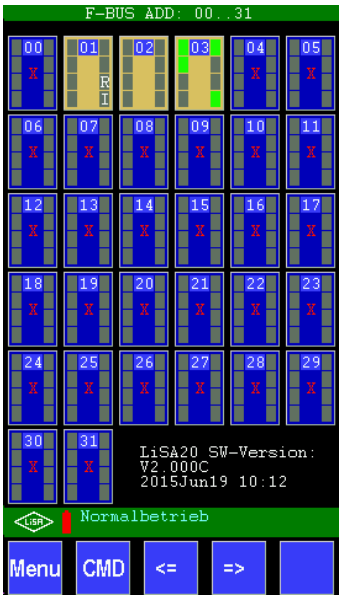


Figure: Status landing bus

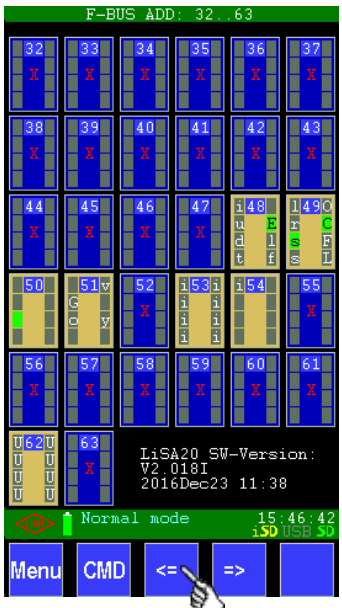


Figure: Status landing bus

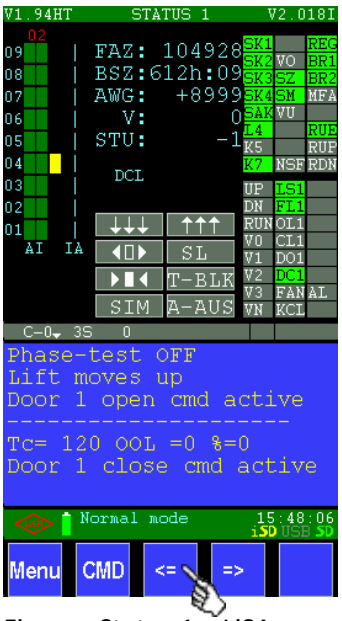


Figure: Status 1 _ LiSA

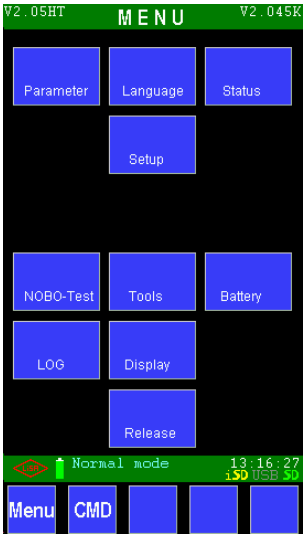


Bild: Home menu

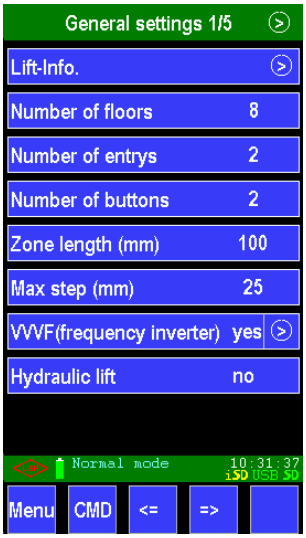


Figure: Submenu

Figure: Setting level

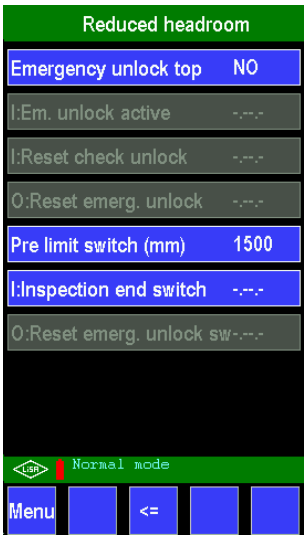
3.3. The LiSA20 command range

The LiSA20 command range enables to enter commands, to change between pages and to go back to the home menu.

Menu	Menu → back to main menu
CMD	Command → open the command level
=>	go to next page
<=	go to previous page

After opening the command level by means of CMD, any other parameter page can be called directly when entering 7 and the three-digit page number (e.g. page 60 -> 7060 -> OK)

3.4. Blue and grey input fields

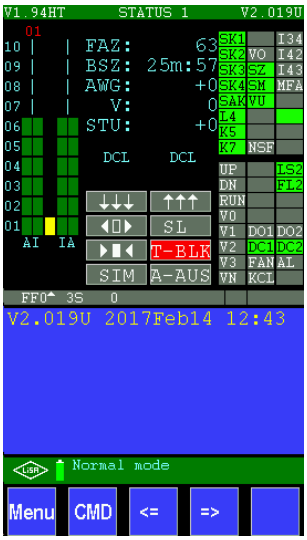


On the numerous system configuration pages you will find blue input fields, the value of which can be changed, and grey fields, which cannot be edited.

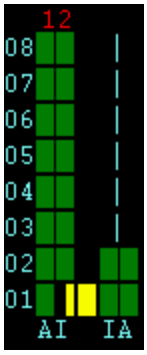
Depending on the controller settings, it is therefore easier for the user to change only the required and relevant parameters in the set-up. This is much more convenient and helps to faster complete the task at hand. Parameters not yet realised in the system are also shaded in grey.

3.5. LiSA status

The "LiSA status" menu serves to display an overview of the controller status. Here you can open any page and execute commands directly.



In Detail:

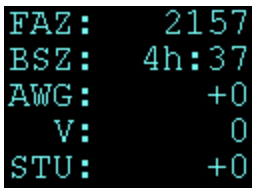


On the left you can see a symbolic lift with a maximum of 12 visible landings. If the actual lift has more than 12 landings, the picture is shifted in such a way that the car is displayed in the middle and the landings shift accordingly.

From left to right:

- landing number
- square symbol red = blocked or green=released landings for door 1 landing calls
- square symbol red = blocked or green=released landings for door 1 car calls
- cabin symbol. When within the zone, the car is coloured yellow, during travel it is red and orange (depending on speed applied). In the symbol itseld, there are small arrows indicating the direction of the onward journey. The current target landing is marked with a “Z”. When doors are being opened, this is indicated by small yellow stripes both to the left and right from the particular doors.
- square symbol red = blocked or green=released landings for door 2 car calls
- square symbol red = blocked or green=released landings for door 2 landing calls

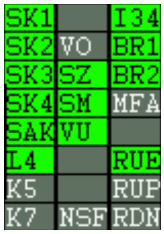
When a call is put out in a released landing, green symbols turn blue with either a white dot in the centre (car call) or white arrows indicating the onward direction (landing call).
Above the entire illustration, the landing number (here red “12”) marks the current lift position.



The FAZ travel counter, the BSZ operating hours counter, the relative or absolute encoder position (depending on the chosen setting), the current speed v and the STU step are displayed in the upper middle area of the car. If no absolute encoder reading head can be detected, it is not possible to determine the position. In consequence, “AWG: XXX” will be displayed.
During operation, the relevant times (in seconds) for opening and closing for doors are indicated below.

Underneath it one can find fields which can be activated.
The lower 6 buttons indicate the states for "door open" (arrows point outwards), "door closed"(arrows point inwards), “SIM=simulator de-/activate”, “SL=shaft light on/off", T-BLK="block door", AUS="landing call on/off". Touch these boxes to trigger the associated function.
In the case of 8 buttons (depending on the software version applied), the 2 uppermost buttons control the travel to the lowest (3 arrows point downwards) and highest landing (3 arrows point upwards).

On the right side are shown important signals of the control



AWG

Impulse method

- SK1=safety circuit 1 (green=active; grey=not active)
- SK2=safety circuit 2 (green=active; grey=not active)
- SK3=safety circuit 3 (green=active; grey=not active)
- SK4=safety circuit 4 (green=active; grey=not active)
- SAK=contact monitoring (green=active; grey=not active)
- L4=cabin light (green=active; grey=not active)
- K5 = safety relay door zone bridge (green=active; grey=not active)
- K7 = safety relay door zone bridge (green=active; grey=not active)

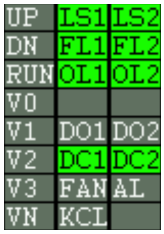
- VO=pre-limit switch TOP (green=active; grey=not active)
- SZ=signal switch zone (green=active; grey=not active)
- SM=signal switch CENTRE (green=active; grey=not active)
- VU= pre-limit switch BOTTOM (green=active; grey=not active)
- IVE=inspection pre-limit switch (green=active; grey=not active)

- IES=inspection limit switch (green=active; grey=not active)
- NSF=emergency stop in car (green=active; grey=not active)

- REG=inverter error (green=active; grey=not active)
- BR1=brake 1 active (green=active; grey=not active)
- BR2=brake 2 active (green=active; grey=not active)
- MFA = installation travel via IO 33 (green=active; grey=not active)
- --- = not assigned
- RUE=recall (green=active; grey=not active)
- RUP=recall up (green=active; grey=not active)
- RDN=recall down (green=active; grey=not active)

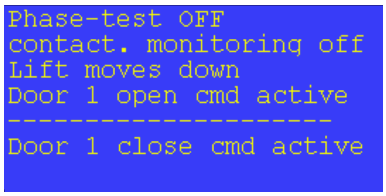
Only for impulse method:

- IMP=pulse input (green=active, grey=not active)
- SO = signal switch UP (green=active; grey = not active)
- SU = signal switch DOWN (green=active; grey = not active)

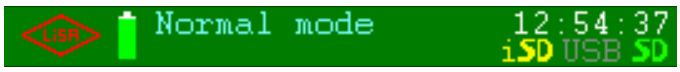


- UP=inverter direction UP (green=active; grey=not active)
- DN=inverter direction down (green=active; grey=not active)
- FA=inverter travel (green=active; grey=not active)
- V0=inverter speed v0 (green=active; grey=not active)
- V1=inverter speed v1 (green=active; grey=not active)
- V2=inverter speed v2 (green=active; grey=not active)
- V3=inverter speed v3 (green=active; grey=not active)
- VN=inverter rated speed (vnenn) (green=active; grey=not active)

- LS1=light barrier door 1 (green=active; grey=not active)
- LS2=light barrier door 2 (green=active; grey=not active)
- FL1=closing force limiter door 1 (green=active; grey=not active)
- FL2=closing force limiter door 2 (green=active; grey=not active)
- OL1=Open-limit switch door 1 (green=active; grey=not active)
- OL2=open-limit switch door 2 (green=active; grey=not active)
- CL1=close-limit switch door 1 (green=active; grey=not active)
- CL2=close-limit switch door 2 (green=active; grey=not active)
- DO1=door 1 open green=active; grey=not active)
- DO2=door 2 open (green=active; grey=not active)
- DC1=door 1 close (green=active; grey=not active)
- DC2=door 2 close (green=active; grey=not active)
- FAN=car fan (green=active; grey=not active)
- AL=alarm (green=active; grey=not active)
- KCL=relay cabin light (green=active; grey=not active)



The lower blue field contains the status text with a maximum of 7 lines which provides information about the current state of operation.

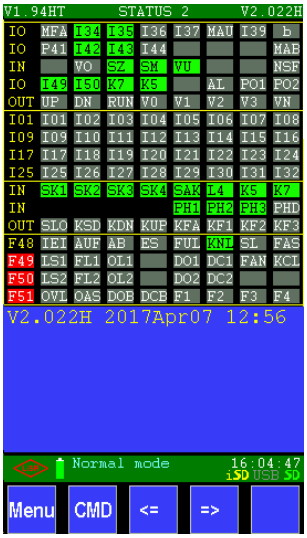


The green bar below starts with the LiSA hash. If you touch this hash and if there is additionally an SD card in the handheld terminal (symbol “iSD”), a screen shot of the currently visible screen will be saved as a file on the handheld terminal SD card.
The symbol next to it displays the BATTERY state: green in different shades means OK; red requires a battery change or it means that no battery is connected.
The operating state is display to the right of it. Here you can see "normal operation". At the far right the current date of the day as well as the non-/existent SD card in the control (grey=no/green=yes) are indicated.

At the bottom of the screen there are the Menu button, the command entry button (CMD), change to previous and next page and, if required "OK" for confirmation.

3.5.1. PB, RB, APO

All signals of the processor board (PB), the 2 IO16 cards, the relay board (RB) and the 4 bus modules of the APO board are displayed here. If a bus module is not available, the name (F48 - F51) is shaded in red.



Block 1: Processor board
Line 1-4 = I/O from 33
Line 5 = Inverter signals

Block 2: I/O-Cards 1+2, I/O 1-32

Block 3: Relay board

Block 4: Car (APO)

Abbreviations:

Block 1: The I/Os on the processor board with standard assignment are shown here. Non-programmed I/Os are indicated by the address, e.g. I35. I/Os which are not assigned in the standard way are indicated by a single letter. (see table 3.6.1. Abbreviations)
I/Os which are marked “fixed” cannot be re-programmed.

- MFA = installation travel via IO 33 (green=active, grey=not active)
- REG = inverter malfunction
- MIN = minimum pressure (hydraulic only)
- MAX= maximum pressure (hydraulic only)
- MRT= machine room temperature
- MAU=installation run UP
- BF = fire case above IO39
- IO2= Free IO
- IO1= Free IO
- BR1 = brake 1 active
- BR2 = brake 2 active
- RUE = recall (fixed)
- RUP = recall up (fixed)
- RDN = recall down (fixed)
- MAB= installation run DOWN
- IMP = pulse input
- VO = pre-limit switch TOP (green=active, grey=not active)
- SZ = signal switch ZONE (green=active, grey=not active)
- SM = signal switch CENTRE (green=active, grey=not active)
- VU = pre-limit switch BOTTOM (green=active, grey=not active)
- --- not assigned
- --- not assigned
- NSF= Emergency stop in car (green=active, grey=not active)

- U1 = over temperature 1
- U2 = over temperature 2
- K5 = safety relay door zone bridge (green=active, grey=not active)
- K7 = safety relay door zone bridge (green=active, grey=not active)
- --- not assigned
- AL = alarm (green=active, grey=not active)
- P01= freely programmable output 1(adress P.69)
- P02= freely programmable output 2 (adress P.70)
- UP = inverter direction UP (green=active, grey=not active)
- DN = inverter direction down (green=active, grey=not active)
- RUN= inverter travel (green=active, grey=not active)
- V0 = inverter speed v0 (green=active, grey=not active)
- V1 = inverter speed v1 (green=active, grey=not active)
- V2 = inverter speed v2 (green=active, grey=not active)
- V3 = inverter speed v3 (green=active, grey=not active)
- VN = inverter rated speed (vnenn) (green=active, grey=not active)

Block 2: Here, the two possible I/O-16 cards on the processor board are indicated. The single-letter abbreviations from the abbreviation table in chapter 3.6.1 are used here.

Block 3: Inputs and outputs of the relay board are indicated here

- SK1 = safety circuit 1 (green=active, grey=not active)
- SK2 = safety circuit 2 (green=active, grey=not active)
- SK3 = safety circuit 3 (green=active, grey=not active)
- SK4 = safety circuit 4 (green=active, grey=not active)
- SAK = contact monitoring (green=active, grey=not active)
- L4 = cabin light (green=active, grey=not active)
- K5 = safety relay door zone bridge (green=active, grey=not active)
- K7 = safety relay door zone bridge (green=active, grey=not active)
- PH1= phase control L1
- PH2= phase control L2
- PH3= phase control L3
- PHD= phase monitoring
- SLO= relay slow (green=active; grey = not active)
- KSD= relay star/delta (green=active; grey = not active)
- KDN=relay downwards (green=active; grey = not active)
- KUP= relay upwards (green=active; grey = not active)
- KFA= relay fast (green=active; grey = not active)
- KF1 = freely programmable relay 1 (green=active; grey = not active)
- KF2 = freely programmable relay 2 (green=active; grey = not active)
- KF3 = freely programmable relay 3 (green=active; grey = not active)

Block 4: this block indicates the I/Os of the BUS modules on the car (APO)

Bus module 48:

- IEI = inspection ON (green=active; grey = not active)
- AUF= inspection UP(green=active; grey = not active)
- AB = inspection DOWN (green=active; grey = not active)
- ES = emergency stop (green=active; grey = not active)

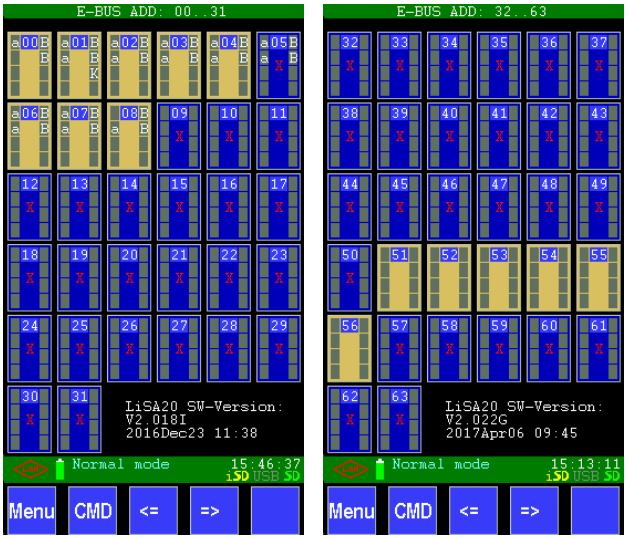
- FUL= full load (green=active; grey = not active)
- KNL= cabin emergency light (green=active; grey = not active)
- SL = shaft light (green=active; grey = not active)
- FAS= inspection fast (green=active; grey = not active)

Busmodul 49/50:

- LS1/LS2 = light barrier door 1/2 (green=active, grey=not active)
- FL1/FL2 = closing force limiter door 1/2 (green=active, grey=not active)
- OL1/OL2 = open limit switch door 1/2 (green=active, grey=not active)
- CL1/CL2 = close limit switch door 1/2 (green=active, grey=not active)
- DO1/DO2 = door 1/2 open (green=active, grey=not active)
- DC1/DC2 = door 1/2 close (green=active, grey=not active)
- KF5/FAN = car fan (green=active, grey=not active)
- KF6/KCL = relay cabin light (green=active, grey=not active)
- OVL= overload (green=active; grey = not active)
- OAS= Acoustic signal (green=active; grey = not active)
- DOB= door open push button (green=active; grey = not active)
- DCB= door close push button (green=active; grey = not active)
- F1-F4= freely programmable I/O

3.5.2. Landing bus

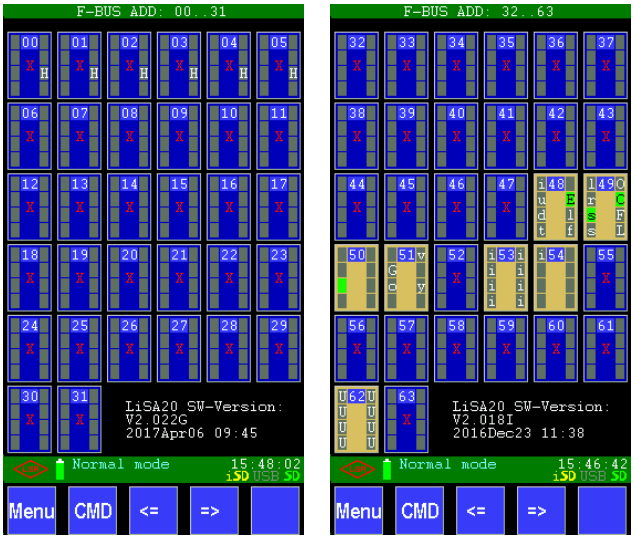
The landing modules of door side 1 are displayed. Recognized modules are shaded in beige.
Per each module the 8 I/O ports with the assignment abbreviation and the switching state are displayed.



When changing to the next page you can either display the landing bus with modules 32..63 (if assigned) or the car bus.
At the bottom there are the Menu button, the CMD button and the button to change to the previous and next page.

3.5.3. Car bus

Here the car bus or the landing modules of door side 2 are displayed (in case of a second door side it is the car bus). Per each module the 8 I/O ports with the assignment abbreviation and the switching state are displayed.



At the bottom there are the Menu button, the CMD button and the button to change to the previous and next page.

3.6. Abbreviations and addressing

Various abbreviations are used for operation and programming in order to realise a clearer representation.

>		go to next page (top right)
<		go back to previous page (top left)
T		parameter requiring to enter a time value in seconds
t		parameter requiring to enter a time value in milliseconds
I	*)	parameter requiring to determine an electronic input
O	*)	parameter requiring to determine an electronic output
IO	*)	parameter requiring to determine an electronic input and output

*) Explanation of I/O addressing with LiSA20.

In LiSA20, 8 I/O ports are always assigned to one port range. The port range is given an address (connection range, slot) which is assigned to the processor-, car- or landing bus depending on the location.

Bus	**Short designation**	**Address range**	**Max. I/O number**
Processor	P	2-5 (0 and 1 are reserved)	4*8 (2*8 reserved)
Car	F	0-63	64*8
Landing	E	0-63	64*8

The parameter description in the next chapter indicates the addressing in the following form:

I:VVVF failure	**x.yy.z**

x = location (P, F, E)
y = address (2-5 for P or 0-63 for F and E)
z = 1-8

Addressing example:

I: Down-valve 1 check P 05 1
The input is on the processor module, address (slot) 05, port 1.

Another example:
O: out of order F 00 4
The output is on the car bus, address (slot) 0, port 4.

3.6.1. Abbreviations

In dialogues with indicated signals, abbreviations are used in order to properly identify the assignment of in- and outputs.

Abbreviation	
?	IO not defined any more
o	I_DOOR_OPEN_PUSH_BUTTON_D1
z	I_DOOR_CLOSE_PUSH_BUTTON_D1
j	I_LOADING_MODE_FOR_DOOR_OPENING
K	O_MOTOR_OVERTRAVEL
U	O_INTERMEDIATE_SPEED_FOR_HYDRAULIC_LIFT
O	O_D1_OPEN_CMD; O_D2_OPEN_CMD
C	O_D1_CLOSE_CMD, O_D2_CLOSE_CMD
f	I_DISABLE_CABIN / LANDING_CALL_D1 / D2 I_ENABLE_CABIN / LANDING_CALL_D1 / D2
l	I_LIGHT_SCREEN_D1, I_LIGHT_SCREEN_D2
b	I_INSPECTION_END_LIMIT_UP
r	I_FORCE_LIMIT_D1; I_FORCE_LIMIT_D2
b	I_SCREEN_DUMP
s	I_OPEN_LIMIT_SWITCH_D1, I_CLOSE_LIMIT_SWITCH_D1
K	O_CLOSE_DOOR_WITH_URGENT_SIGNAL_D1 O_APRON_D1, O_APRON_D2, O_IGNORE_LIGHT_SCREEN_SIGNAL_D2,
b	I_APRON_D1, I_APRON_D2
T	O_TRAFFIC_LIGHTS_FOR_CAR_LIFT
P	O_POSITION_GUIDE_LIGHTS_FOR_CAR_LIFT
R	O_RETIRING_CAM_D1, O_RETIRING_CAM_D2
U	O_INVERTER_SIMULATOR_MODULE
K	O_UCM_TEST_MODE
r	I_FORCE_LIMIT_D2

F	O_MOTOR_FAN
s	I_OPEN_LIMIT_SWITCH_D2, I_CLOSE_LIMIT_SWITCH_D2
b	O_IGNORE_LIGHT_SCREEN_SIGNAL_D2
z	I_TIME_RELAY_1, I_TIME_RELAY_2, I_TIME_RELAY_3, O_TIME_RELAY_1, O_TIME_RELAY_2, O_TIME_RELAY_3
K	O_MINIMUM_ONE_PHASE_NOT_EXIST
b	I_DIAL_EMERGENCY_CALL_PLEASE_WAIT
b	I_EMERGENCY_CALL_ACTIVE_PLEASE_SPEAK
B	O_NOTRUF_AKTIV O_SPRECHVERB_KT_
K	O_OVER_SPEED O_SPEED_MORE_THAN_PRE_DOOR_OPENING_SPEED
b	I_HYDRAULIC_IVALVE_SMA, I_TUEV_SWITCH
W	O_ON_GOING_DIRECTION_D1_OTHER_LIFT_IN_GROUP O_ON_GOING_DIRECTION_D2_OTHER_LIFT_IN_GROUP O_ON_GOING_DIRECTION_D1 O_WARNIN_SIGNAL_BEFORE_DOOR_1_CLOSE, O_WARNIN_SIGNAL_BEFORE_DOOR_2_CLOSE
F	O_ERROR_TYPE_1_TRIGGER, O_ERROR_TYPE_2_TRIGGER, O_ERROR_TYPE_3_TRIGGER O_ERROR_TYPE_4_TRIGGER, O_ERROR_TYPE_5_TRIGGER, O_ERROR_TYPE_6_TRIGGER
G	O_CABIN_GONG
t	I_ROOM_MINIMUM_TEMPERATURE
K	O_AUTOMATIC_EMERGANCY_RELEASE_RESET, O_DFU_AMTS_UEBERNAHME
B	O:Fahrk. Richt. Auf/Ab, O:Richtung Auf/Ab T2
W	O:Weiterf. Auf/Ab T1, O:Weiterf. Auf/Ab T2
K	O_OUT_OF_ORDER_D1 / D2, O_CABIN_IN_BETRIEB_D1 / D2 O_CABIN_BESETZT_D1 / D2
b	I_EMERGANCY_RELEASE_UP_ACTIVE, I_EMERGANCY_RELEASE_RESET _DIVIDING_DOOR_, I_DIVIDING_DOOR_SPECIAL_SERVICE,
H	O_FK_HIER_D1; O_FK_HIER_D2
b	I_HYDRAULIC_RUN_SIGNAL, I_HYDRAULIC_READY_SIGNAL
t	I_TURN_OFF_MODE
T	O_TURN_OFF_MODE
R	O_RETIRING_CAM_D1_, O_RETIRING_CAM_D2_
b	I_INSTALATION_MODE_INPUT, I_INVERTER_OK, I_MINIMUM_PRESSURE, I_MAXIMUM_PRESSURE, I_MACHINE_ROOM_TEMPERTURE, I_MAINTENANCE
u	I_OVERTEMPERTURE_U1, I_OVERTEMPERTURE_U2
b	I_WRITE_ROLL_TEXT_IN_DISPLAY_LIFT
K	O_DECELERATION_POINT_IS_DETECTED, O_TURN_OFF_GRIPING_SPEED_IS_DETECTED, O_BRAKE_UEBERREGUNG
i	I_TRANSFER_IO_1, I_TRANSFER_IO_2, I_TRANSFER_IO_3, I_TRANSFER_IO_4, I_TRANSFER_IO_5, I_TRANSFER_IO_6
v	I_VK_D1_, F_I_VK_D2_, I_VK_D1_IN_CABIN, I_VK_D2_IN_CABIN
O	O_TRANSFER_IO_1, O_TRANSFER_IO_2, O_TRANSFER_IO_3, O_TRANSFER_IO_4, O_TRANSFER_IO_5, O_TRANSFER_IO_6
b	I_DEAD_MAN_CONTROL_ACTIVE
B	O_DEAD_MAN_CONTROL_ACTIVE
K	O_FIRE_MAN_MODE_ACTIVE

s	I_PRIORITY_TRAVEL_CABIN_MODE_0, I_PRIORITY_TRAVEL_CABIN_MODE_1, I_PRIORITY_TRAVEL_CABIN_MODE_2, I_PRIORITY_TRAVEL_CABIN_MODE_3, I_PRIORITY_TRAVEL_CABIN_MODE_4, I_PRIORITY_TRAVEL_CABIN_MODE_5, I_PRIORITY_TRAVEL_CABIN_MODE_6
T	O_TEXT_SF_0, O_TEXT_SF_1, O_TEXT_SF_2, O_TEXT_SF_3, O_TEXT_SF_4, O_TEXT_SF_5, O_TEXT_SF_6
G	O2_ON_GOING_GONG_IN_CASE_OF_DOOR_OPEN O_CABIN_GONG
O	O_D1_IS_COMPLETELY_OPENED O_D2_IS_COMPLETELY_OPENED
S	O_SF_AKTIV_D1_MODE_0, O_SF_AKTIV_D1_MODE_1, O_SF_AKTIV_D1_MODE_2, O_SF_AKTIV_D1_MODE_3, O_SF_AKTIV_D1_MODE_5, O_SF_AKTIV_D1_MODE_6,
s	I_PRIORITY_TRAVEL_D1_MODE_0, I_PRIORITY_TRAVEL_D1_MODE_1, I_PRIORITY_TRAVEL_D1_MODE_2, I_PRIORITY_TRAVEL_D1_MODE_3, I_PRIORITY_TRAVEL_D1_MODE_4, I_PRIORITY_TRAVEL_D1_MODE_5, I_PRIORITY_TRAVEL_D1_MODE_6, I_PRIORITY_TRAVEL_D2_MODE_0, I_PRIORITY_TRAVEL_D2_MODE_1, I_PRIORITY_TRAVEL_D2_MODE_2, I_PRIORITY_TRAVEL_D2_MODE_3, I_PRIORITY_TRAVEL_D2_MODE_4
H	O_PAWL_DEVICE_BOLT_IN, O_PAWL_DEVICE_BOLT_OUT
b	I_PAWL_DEVICE_BOLT_IS_IN, I_PAWL_DEVICE_BOLT_IS_OUT
g	I_IGNORE_PAWL_DEVICE_IN_EACH_MOVEMENTS
s	I_DETCT_STOP_POIT_FOR_PAWL_DEVICE,
p	I_REQUEST_FOR_PRESSURE_COMPENSATION_PAWL_DEVICE
t	F_IO_THYSSEN_TELE_SERVICE
Z	O_CABIN_IS_IN_SAFE_ZONE
b	I_LANDING_WITH_TOGGLE_FUNCTION_FOR_PENTHOUSE
K	I_LANDING_WITH_TOGGLE_FUNCTION_FOR_PENTHOUSE
b	IO_PENTHOUSE_GUEST_MODE
n	I_FIRE_EMERGENCY_BULDING I I_FIRE_EMERGENCY_D1, I_FIRE_EMERGENCY_D2
x	I_SHUT_DOWN_MODE_IN_CABIN, I_SHUT_DOWN_MODE_IN_FLOOR, I_SHUT_DOWN_MODE_INPUT_SS
b	I_LANDING_WITH_RESERVE_TIME_FOR_PENTHOUSE, I_LANDING_PENTHOUSE, I_CABIN_PENTHOUSE
v	IO_PENTHOUSE_VIP
b	I_QUICK_START
K	O_QUICK_START
c	I_PRESENCE_CAR_LIFT
b	I_VVVF_BEREIT
K	O_STAND_BY
l	I_LIGHT_SCREEN_D1_IS_OK, I_LIGHT_SCREEN_D2_IS_OK
G	O_LANDING_GONG_UP/DOWN_D1, O_LANDING_GONG_UP/DOWN_D2, O2_GONG_TO_ANNANCE_REACH_TO_FLOOR, O2_ON_GOING_DIRECTION_CABIN
T	O_DOOR_OPEN_TEXT, O_DOOR_CLOSE_TEXT
A	O_CONVENTIONAL_DISPLAY_FOR_D1, O_CONVENTIONAL_DISPLAY_FOR_D2, O_CONVENTIONAL_DISPLAY_USED_IN_CABIN
K	O_FULL_LOAD, O_OVER_LOAD
G	O_ACOUSTIC_SIGNAL
a	IO_LANDING_CALL_D1, F_IO_LANDING_CALL_D2
i	IO_CABIN_CALL_GENERATE_D1, IO_CABIN_CALL_GENERATE_D2 IO_CABIN_CALL
I	O_CABIN_CALL

G	O_GROUP_PACKET_ACKNOWLEDGE_NOT_DETECT
b	IO_START
T	O_EMERGENCY_STOP_IN_PIT_IS_PRESSED O_EMERGENCY_STOP_IN_INSPECTION_BOX_IS_PRESSED
b	I_TO_DISABLE_LANDING_CALL I_CHECK_BRAKE_1 , I_CHECK_BRAKE_2, I_CHECK_BRAKE_3,, I_KONTR_VENTIL_1, I_KONTR_VENTIL_2, I_KONTR_ABSINKVER, IO_START
v	I_FULL_LOAD
y	I_OVER_LOAD
b	I_ZERO_LOAD, I_HALF_LOAD
U	O_RUN_SIGNALS_2, O_RUN_SIGNALS_IN_CABIN_PAGE, O_RUN_SIGNALS_1
K	O_PENTHOUSE_MODE_1
b	I_TUERENBLOCK, IO_ANLAUFBLOCK
j	IO_CABIN_FAN_PUSH_BUTON
K	O_SF_AKTIV_MODE_0, O_SF_AKTIV_MODE_1, O_SF_AKTIV_MODE_2, O_SF_AKTIV_MODE_3, O_SF_AKTIV_MODE_4, O_SF_AKTIV_MODE_5, O_SF_AKTIV_MODE_6
f	I_FIRE_EMERGENCY__MODE_IS_FINISHED I_FIRE_MAN_MODE_IN_LANDING, I_FIRE_MAN_MODE_IN_CABIN
K	O_FIRE_MAN_MODE_ACTIVE
S	O_TRIGGER_CONVETIONAL_SPEECH_MODULE
l	I_CABIN_LIGTH_SENSOR
T	O_TEXT_FIRE_MAN_MODE O_FIRE_EMERGENCY_MODE_REACH_TO_TARGET_FLOOR
K	O_FIRE_MAN_MODE_ACTIVE
e	I_EVACUATION, I_EVACUATION_RELEASE
K	O_CAR_IS_IN_EVACUATION_FLOOR
E	O_EVACUATION_INPUT_IS_DETECTED
K	O_SHUT_DOWN_MODE_AKTIVE
m	O_CAR_IS_IN_EVACUATION_FLOOR, F_I_FIRE_DETECTOR_D2
R	O_LISA_BUS_SWITCH_OVER_IN_GROUP
T	O_TEXT_FIRE_EMERGENCY_MODE, O_TEXT_EVACUATION_MODE
h	I_EVACUATION_DIRECTION_UP
K	O_GENERAL_FAULT,O_DISABLE_ALARM, O_CABIN_IN_SM_ZONE, O_OUT_OF_ORDER_IN_CONTROLL_CABINET_1
G	F_O_LANDING_GONG_UP_MOVE_D1, F_O_LANDING_GONG_UP_MOVE_D2 F_O_LANDING_GONG_DOWN_MOVE_D1, F_O_LANDING_GONG_DOWN_MOVE_D2
K	O_REGLER_FERN, O_RELEASE_PERSON_TUEV_MODE
a	S_IO_LANDING_CALL_D1, S_IO_LANDING_CALL_D2
B	O_NOTRUF_AKTIV
R	O_BODE_RELAY
U	O_RELEVELING_SPEED
I	O_INSPECTION_MODE_1
R	O_RESEND_MODE
N	O_NORMAL_MODE_MODE
S	O_SF_AKTIV_D2_MODE_0, O_SF_AKTIV_D2_MODE_1, O_SF_AKTIV_D2_MODE_2, O_SF_AKTIV_D2_MODE_3, O_SF_AKTIV_D2_MODE_4, O_SF_AKTIV_D2_MODE_5, O_SF_AKTIV_D2_MODE_6,
H	O_CAR_POSITION_IS_MORE_THAN_THRESHOLD_VALUE O_CAR_POSITION_IS_LESS_THAN_THRESHOLD_VALUE
D	O_MOVEMENT_DIRECTION_IS_CHANGED

S	O_BGRENZER_GEGEN_GEWICHT
G	O_RUECKSKELLUNG_GESCHWINDIGKEIT_BEGRENZER
u	I_INSTALLATION_UP
d	I_INSTALLATION_DOWN
g	O_ACOUSTIC_FEEDBACK_CABIN_CALLS
z	O_MOVEMENT_COUNTER, O_MOVEMENT_COUNTER_UP, O_MOVEMENT_COUNTER_DOWN
R	I_RESEND_MODE
u	I_RESEND_UP
d	I_RESEND_DOWN
L	I_SHAFT_LIGTHE
S	O_RESET_SAFTY_LIGTH_SCREEN_IN_CASE_OF_SWING_DOOR
s	I_RESET_SAFTY_LIGTH_SCREEN_IN_CASE_OF_SWING_DOOR
e	I_EMERGENCY_CALL_SYSTEM_READY
k	I_APRON_D1_RESET
s	I_IGNORE_STAND_BY
s	I_START_STAND_BY_MODE
c	I_CLOCK_CONTROL_CONTROL_CABINET_1, I_CLOCK_CONTROL_CABINRT_3 I_CLOCK_CONTROL_CONTROL_CABINET_2, I_CLOCK_CONTROL_CABINET_4 I_CLOCK_CONTROL_CABIN_1, I_CLOCK_CONTROL_CABIN_2 I_CLOCK_CONTROL_CABIN_3, I_CLOCK_CONTROL_CABIN_4 I_CLOCK_CONTROL_LANDING_1 I_CLOCK_CONTROL_LANDING_2 I_CLOCK_CONTROL_LANDING_3 I_CLOCK_CONTROL_LANDING_4
C	O_ClOCK_CONTROL_1_ACTIVE, O_CLOCK_CONTROL_2_ACTIVE O_ClOCK_CONTROL_3_ACTIVE, O_CLOCK_CONTROL_4_ACTIVE O_CLOCK_CONTROL_1_ACTVE_DOOR_1, O_CLOCK_CONTROL_2_ACTVE_DOOR_1 O_CLOCK_CONTROL_3_ACTVE_DOOR_1, O_CLOCK_CONTROL_4_ACTVE_DOOR_1 O_CLOCK_CONTROL_1_ACTVE_DOOR_2, O_CLOCK_CONTROL_2_ACTVE_DOOR_2 O_CLOCK_CONTROL_3_ACTVE_DOOR_2, O_CLOCK_CONTROL_4_ACTVE_DOOR_2
i	I_INSPECTION_IN_PIT
u	I_INSPECTION_UP_IN_PIT
d	I_INSPECTION_DOWN_IN_PIT
s	I_EMERGENCY_STOP_IN_PIT
O	O_INVERTER_POWER_RESET
K	O_KLAPPSTUTZE
l	O_SHAFT_LIGTHE
i	I_FIXED_INSPECTION
u	I_FIXED_INSPECTION_UP
d	I_FIXED_INSPECTION_DOWN
f	I_FIXED_INSPECTION_FAST
l	I_FIXED_SHAFT_LIGTHE
t	I_FIXED_EMERGENCY_STOP
E	O_FIXED_CABIN_EMERGENCY_LIGTH
L	O_FIXED_CABIN_LIGTH
F	O_FIXED_CABIN_FAN
b	I_EMERGANCY_RELEASE_DOWN_ACTIVE
J	O_LOADING_MODE_FOR_DOOR_OPENING
h	I_EVACUATION_DIRECTION_DOWN
i	IO_CABIN_CALL
g	IO_GUEST_D1
G	IO_CABIN_CALL

t	IO_GUEST_D1
I	IO_CABIN_CALL
g	DANGER_GOODS_IN_CABIN, FI_DANGER_GOODS_IN_LANDING_D1
G	O_DANGER_GOODS
g	IO_GUEST_D2
O	O_OUT_OF_ORDER_D1_OTHER_LIFT_IN_GROUP O_OUT_OF_ORDER_D2_OTHER_LIFT_IN_GROUP
H	O_FK_HIER_D1_OTHER_LIFT_IN_GROUP O_FK_HIER_D2_OTHER_LIFT_IN_GROUP
G	O_LANDING_GONG_D1_OTHER_LIFT_IN_GROUP, O_LANDING_GONG_UP_MOVE_D1_OTHER_LIFT_IN_GROUP, O_LANDING_GONG_DOWN_MOVE_D1_OTHER_LIFT_IN_GROUP O_LANDING_GONG_D2_OTHER_LIFT_IN_GROUP, O_LANDING_GONG_UP_MOVE_D2_OTHER_LIFT_IN_GROUP, O_LANDING_GONG_DOWN_MOVE_D2_OTHER_LIFT_IN_GROUP
a	IO_LANDING_CALL_D1_UP_ONLY_IN_GROUP IO_LANDING_CALL_D1_DOWN_ONLY_IN_GROUP IO_LANDING_CALL_D2_UP_ONLY_IN_GROUP IO_LANDING_CALL_D2_DOWN_ONLY_IN_GROUP
i	IO_CABIN_CALL_D1_IN_GROUP_LIFT_1, IO_CABIN_CALL_D1_IN_GROUP_LIFT_2 IO_CABIN_CALL_D1_IN_GROUP_LIFT_3, IO_CABIN_CALL_D1_IN_GROUP_LIFT_4 IO_CABIN_CALL_D1_IN_GROUP_LIFT_5, IO_CABIN_CALL_D1_IN_GROUP_LIFT_6 IO_CABIN_CALL_D1_IN_GROUP_LIFT_7, IO_CABIN_CALL_D1_IN_GROUP_LIFT_8 IO_CABIN_CALL_D2_IN_GROUP_LIFT_1, IO_CABIN_CALL_D2_IN_GROUP_LIFT_2 IO_CABIN_CALL_D2_IN_GROUP_LIFT_3, IO_CABIN_CALL_D2_IN_GROUP_LIFT_4 IO_CABIN_CALL_D2_IN_GROUP_LIFT_5, IO_CABIN_CALL_D2_IN_GROUP_LIFT_6 IO_CABIN_CALL_D2_IN_GROUP_LIFT_7, IO_CABIN_CALL_D2_IN_GROUP_LIFT_8
s	I_SAFETY_RELAY_CHECK
L	O_LANDING_CALL_D1_PRESSED O_LANDING_CALL_D2_PRESSED
H	O_WARNIN_SIGNAL_D1_FOR_ANIMAL O_WARNIN_SIGNAL_D2_FOR_ANIMAL
s	I_SABBAT
S	FO_SABBAT_D1 O_SABBAT_MAIN_LANDING O_SABBAT_CABIN
I	O_INTERRUPT_SAFETY_BRIDGE
c	I_CLOCK_CONTROL_START_1, I_CLOCK_CONTROL_START_2 I_CLOCK_CONTROL_START_3, I_CLOCK_CONTROL_START_4 I_CLOCK_CONTROL_END_1, I_CLOCK_CONTROL_END_2 I_CLOCK_CONTROL_END_3, I_CLOCK_CONTROL_END_4
S	O_SABBAT_TURN_OFF_CABIN_CALL O_SABBAT_TURN_OFF_LANDING_CALL
R	O_ADDITIONAL_RETIRING_CAM_D1, O_ADDITIONAL_RETIRING_CAM_D2
t	I_WRITE_ROLL_TEXT_2_IN_DISPLAY_LIFT
O	O_VO_ACTIVE
U	O_VU_ACTIVE
F	O_ENABLE_CABIN_AND_LANDING_CALL_D1 O_ENABLE_LANDING_CALL_D1 O_ENABLE_CABIN_CALL_D1 O_ENABLE_CABIN_AND_LANDING_CALL_D2 O_ENABLE_LANDING_CALL_D2

	O_ENABLE_CABIN_CALL_D2
r	I_CLEAR_ERRORS
A	O_SPEED_LESS_THAN_LIMIT_FOR_SANDOR_DECEL_CONTROL O_VO_OR_VU_ACTIVE_CONSIDER_DIRECTION
a	I_DECEL_CONTROL_TO_CHECK_SPEED_REACH_TO_NOMINAL_SPEED I_ABFALLKONTROLL_FOR_SANDOR_DECEL_CONTROLL
h	I_HAMID_TEST
e	I_EML_IN_PROCESSOR_BUS, I_EML_IN_F_BUS
e	I_EARTHQUAKE_HORIZONTAL, I_EARTHQUAKE_VERTICAL I_EARTHQUAKE_COUNTERWEIGHT I_EARTHQUAKE_RESET
r	I_PLC_READY
a	I_PLC_IS_IN_AUTOAMTIC_MODE
A	O_REQUEST_TO_PLC_TO_GO_TO_AUTOAMTIC_MODE F_O_PLC_IS_IN_AUTOMATIC_MODE
m	I_PLC_IS_IN_MANUAL_MODE
M	O_REQUEST_TO_PLC_TO_GO_TO_MANUAL_MODE F_O_PLC_IS_IN_MANUAL_MODE
i	F_I_COMMAND_FROM_PLC
m	I_RESQUEST_FOR_MANUAL_MODE_IN_CABIN_PLC
b	I_BY_PASS_EIN I_BY_PASS_AUS
B	O_DOOR_IS_BY_PASS
u	I_OVERTEMPERATURE_U3, I_OVERTEMPERATURE_U4, I_OVERTEMPERATURE_U5
R	F_O_LANDING_CALL_RELEASED_D1 F_O_LANDING_CALL_RELEASED_D2
t	I_OVERTEMPERTURE_IN_GLASS_LIFT_IS_DETECT
T	O_OVERTEMPERTURE_IN_GLASS_LIFT_IS_DETECT
s	O_OVERTEMPERTURE_IN_GLASS_LIFT_IS_DETECT I_SHUT_DOWN_MODE_DEACTIVE_WITH_PULSE
e	I_SEISMIC_STANDBY_MODE I_SEISMIC_MODE
a	I_SEISMIC_DEVICE_IS_OK
T	O_SEISMIC_TESET_DEVICE
r	I_RESET_INSPECTION_IN_PIT
s	I_EMERGENCY_STOP_IN_MACHINE_ROOM
	Areas shaded in grey are not yet entirely implemented

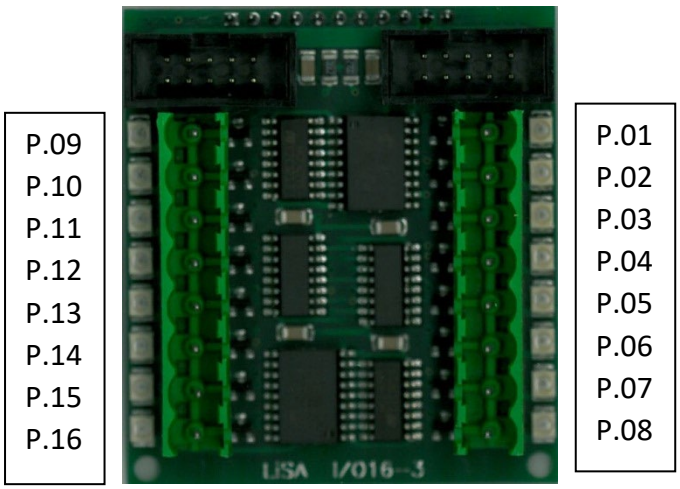
3.7. Adress ranges for inputs and outputs

Optionally you can also plug two I/O16 cards (slots X3 and X2) on the processor board in addition to various connectable inputs. For reasons of compatibility, the input definitions of the I/O16 cards were taken from LiSA10.
Processor board inputs of the "variable" type can be set to different inputs (e.g. to the I/O16) in the input/output configuration.
But: as a consequence, changed inputs will therefore not be shown at their usual positions in the signal status window, for the input has been changed!
And: U2 must be assigned!

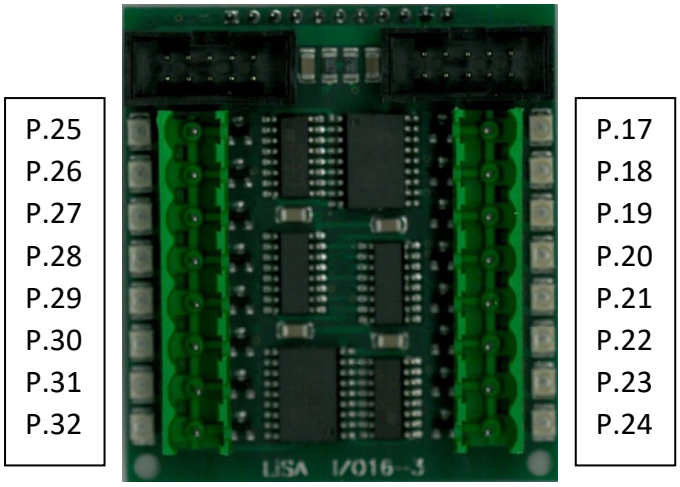
Signal	TYPE	Description	Origin	Adress input
MFA	variable	Installation travel	LiSA20 PB	P.33
REG	variable	Controller fault	LiSA20 PB	P.34
MIN	variable	Minimum pressure	LiSA20 PB	P.35
MAX	variable	Maximum pressure	LiSA20 PB	P.36
MRT	variable	Machine room temperature	LiSA20 PB	P.37
MAU	variable	Installation travel Up	LiSA20 PB	P.38
BF	variable	Free I/O (BF-Fire emerg.)	LiSA20 PB	P.39
IO1	variable	Free I/O (MAI-Maintena.)	LiSA20 PB	P.40
IO2	variable	Free I/O (FA-Travel)	LiSA20 PB	P.41
BR1	variable	Brake 1	LiSA20 PB	P.42
BR2	variable	Brake 2	LiSA20 PB	P.43
BR3	variable	Brake 3	LiSA20 PB	P.44
RUE	fixed	Recall	LiSA20 PB	P.45
RUP	fixed	Recall UP	LiSA20 PB	P.46
RDN	fixed	Recall DOWN	LiSA20 PB	P.47
MAB	variable	Installation travel Down	LiSA20 PB	P.48
U1	variable	Overtemperature 1	LiSA20 PB	P.49
U2	variable	Overtemperature 2	LiSA20 PB	P.50
K5	fixed	Safety relay	LiSA20 PB	Internal
K7	fixed	Safety relay	LiSA20 PB	Internal
AL	fixed	Alarm	LiSA20 PB	Internal
P01	variable	Free output	LiSA20 PB	P.69
P02	variable	Free output	LiSA20 PB	P.70
NoBo	variable	NoBo-switch input	LiSA20 PB	P.65
L4	fixed*	Car light input	LiSA20 PB	Internal
SL	fixed	Shaft light input	LiSA20 PB	Further input possible with bus module.

* Can be reprogrammed from software version V2.023A on.

IO16 at slot X3:



IO16 at slot X2:



The free relays on the relay board are addressed according to the following table:

Name	TYPE	Description	Origin	Adress input
K41	fixed	Free relay	LiSA20 RB	R.1
K42	fixed	Free relay	LiSA20 RB	R.2
K43	fixed	Free relay	LiSA20 RB	R.3
XK8, pin1	fixed	Free output O1	LiSA20 PB	R.4
XK8, pin2	fixed	Free output O2	LiSA20 PB	R.5

3.8. Operation via command level

The following table provides an overview of possible input commands which can be entered using the "CMD" button at the bottom of the display. Each command input must be confirmed using the "OK" button. "CL" serves to delete the entry. Pressing the "CMD" button again deletes the input range

Command overview

CMD	Action	Description	Info
1	Open door 1	Door 1 is opened regardless of the door open permission.	
2	Open door 2	Door 2 is opened regardless of the door open permission.	
3	Close door 1 and door 2	The doors are closed.	
4	Show DCP information	Indication of DCP information in the status text window	
5	Door blocking on/off	Doors are blocked or released.	Varying status
6	Switch off landing control	Enables or disables the landing control. No calls in the landings are accepted.	Varying status
7	Call simulation	Serves to simulate car and landing calls. The controller processes the calls.	
8	Recall control on / off	Serves to simulate the recall control by means of the software. Safety circuit equipment will not be bridged.	Varying status
9	Create parameter list	A parameter list in the form of a text file is created on the SD card of LiSA20.	
01	Initialise modem	If a modem is connected and configured in the menu, it can be re-initialised.	
44	Show (relative) absolute encoder values	If enabled, the absolute encoder values are displayed in the controller status window relative to the lowest landing.	
45	Show (actual) absolute encoder values	If enabled, the actual absolute encoder values are displayed in the controller status window (value on magnetic tape).	
91	Enable or disable phase monitoring	The 3 phases - connected to the relay board - are checked in terms of signal and direction. The parameter switches the phase monitoring off/on.	Varying status
97	DCP: Send / do not send package I7.	Package I7 provides the inverter with the estimated path value for the upcoming travel.	Varying status

CMD	Action	Description	Info
98	Enable or disable battery monitoring	The battery connected to the processor board is charged, discharged and checked. The parameter switches the battery monitoring off/on.	Varying status
99	DCP: Send / do not send package I9.	Package I9 provides the inverter with the exact path value for the upcoming travel.	Varying status
100	Test drive (impulse method)	Initiates the test drive from the lowest landing when the impulse method is activated	Vu and SM must apply or else an error message is issued

1xx	Car call for landing xx	The lift is called to landing xx. The car calls of a selective second door side follow those of the first door side.	15-OK= car call for landing 5, door side 1; *Assume 10 landings, selective:* 115-OK = car call for landing 5, door side 2
2xx	Upwards landing call for landing xx	Initiates an upwards landing call, depending on the call release. For a selective second door side, the maximum number of landings needs to be added to the actual landing.	25* = upwards landing call for landing 5
3xx	Downwards landing call for landing xx	Initiates a downwards landing call, depending on the call release. For a selective second door side, the maximum number of landings needs to be added to the actual landing.	35* = downwards landing call for landing 5
401	Relay test	Checks all relay outputs as well as travel signal outputs to the frequency inverter.	
403	Display the SD/USB data	Displays any folders and files available on SD/USB	
404	Display test	Checks the LiSA bus displays	
405	I/O test	Checks the IO16 cards on the processor board for functioning	
600	Save data	Saves parameters and settings to the internal flash memory as well as SD-card/USB drive in the root of the lift directory	
601	Data transmission to displays	All display characters set per each landing are transmitted to the displays connected to the LiSA bus.	
603	Special indication	Displays important information on the display, e.g. distances between landings, door- and control times	
6060	Controller restart	Restart of the control computer is enforced.	
690	IAP LiSA20 update	An “IAP.bin” from the root on the LiSA20 SD-card is sent to LiSA20 processor.	Still integrated from the log!

CMD	Action	Description	Info
691	Backup - save any data into a folder on the SD card	Saves the current lift software, errors in chronological order (Log-file) as well as parameters into a separate folder (SAVExyz) on the SD card/USB drive.	
692	Display backup folder	Displays all complete backups (folders) stored on the SD card	
692xxx	Complete recovery (lift software, parameters, saved errors)	Restores the data saved on the SD card/USB drive. For this purpose, the folder index (3-digit number) must be entered.	If the parameters have been saved in folder SAVE_003, enter 692003*
693xxx	Restore parameters from folder	Restores the parameters saved on the SD card/USB drive - for this purpose, the folder index (3-digit number) must be entered.	If the parameters have been saved in folder SAVE_005, enter 693005*
694xxx	Restore log-files from folder	Restores the log-files saved on the SD card/USB drive – for this purpose the folder index (3-digit number) must be entered.	If the software has been saved in folder SAVE_002, enter 694002*
695xxx	Restore software from folder	Restores the software saved on the SD card/USB drive - for this purpose, the folder index (3-digit number) must be entered.	If the software has been saved in folder SAVE_006, enter 694006*
696	Hand-held terminal software update	A hand-held terminal software “Lisa_ht.bin” from the root on the SD-card of LiSA20 is sent to the hand-held terminal.	Still integrated from the log!
697	Lift software backup	Backs up the current lift software onto the SD card/USB drive if no current backup is available.	File name in the SD-card root e.g. lisa001.bin
698	Current software version	Displays the current software version	
698xxx	Restore lift software	Restores the software saved on the SD card in the root - for this purpose, the file name index (3-digit number) must be entered.	Restore software with suffix 001 using 698001*
700	Delete UCM error / UCM test	Deletes the current UCM error	The UCM test mode can only be enabled if the car is in the zone and no UCM error is present
701	Travel to upper emergency limit switch	Car travels to upper emergency limit switch (also required for NoBo-test)	
702	Travel to lower emergency limit switch	Car travels to lower emergency limit switch (also required for NoBo-test)	
703	NoBo-test mode		
704	UCM valve test	Triggers an UCM valve test for hydraulic systems which, in case of a successful test, must shut down for UCM fault.	
7xxx	Call parameter page	Enter page number (three digits) to go to the associated parameter page	

CMD	Action	Description	Info
7xxyy	Call simulation between landings	Call simulation between pre-set landings: 7xxyy lift travels between landing xx and yy.	
800	Delete error	Deletes the current error	Note: This command must only be applied by qualified staff!
08xxY	Set I/O at the car bus module	Car bus: xx is the address of the bus module (between 00 and 63) y is the I/O number (1 to 8)	
9xxY	Reset I/O	Deletes the I/O number. See structure of 8xxy	
09xxY	Reset I/O	Deletes the I/O number. See structure of 08xxy	
052	Shaft light on/off	Switches the shaft light on/off	From SW of Nov. 2013
208207	Reference point top floor	Sets a reference point in the top floor.	
208206	Set absolute encoder zero point	Sets the absolute encoder zero point to the current position	
800010	Reset emergency release	Prerequisite: input from emergency release board must be enabled	

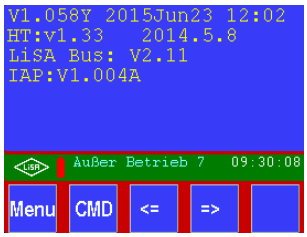
3.9. Data backup and recovery

3.9.1. Overview

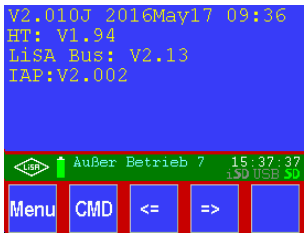
LiSA20 provides the possibility to save software, parameters and error memories on a micro-SD card as well as to restore software and parameters.
When doing so it is important to distinguish whether the installed software is of version 1.XX or the new version 2.XX. The two versions are subject to great differences in their saving and updating procedures and will thus be discussed individually in the following.

3.9.2. Software version query

Which software version is at hand can be determined via [CMD 698 -> OK]. The respective version V1.XX or V2.XX will be indicated in status line 1.



Version 1



Version 2

The second line indicates the version of the hand terminal, the third line corresponds to the BUS-driver version and the fourth line shows the bootloader version at hand.

3.9.3. Saving of data on SD-card/USB drive (software version 2)

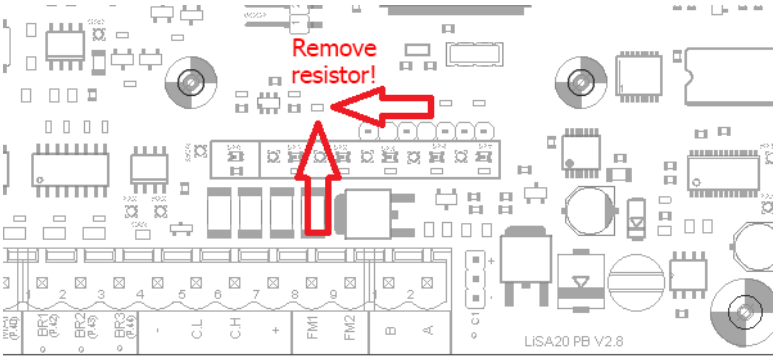
It is useful to save data before performing a test, changing settings or exchanging hardware (processor board).
A data backup can be selected via tools -> data/software -> restore data or directly called upon via the command [CMD -> 7016 -> OK]. Also refer to the user manual part B/tools/data recovery.
There are two different menu items available here: all on SD-card or all on USB-drive.
Selecting either one of these menu items causes the entire data of the controller to be saved either onto a SD-card or USB-drive. Furthermore, this function also enables the data to be restored on the same or a different hardware

All on SD-card

This item is active only if a valid SD-card is plugged on to the controller board of the LiSA20.
By selecting this, all parameters as well as log-files, the software, processor-IAP and one newly generated parameter-text-file are saved on the SD-card into a backup folder denoted with date and time. The main folder for this is named according to the lift-ID which is stored in the lift-info (only if a lift-ID has been assigned).
After activation of the button, the display will show one bar for several times, which serves to represent the backup before briefly depicting an “OK” button on the bottom of the displays in order to ensure enough time to read all information

All on USB-drive

This item is active only if a valid USB-drive is plugged on to the controller board of the LiSA20. Processor boards which have been delivered until the first quarter of 2015 can be used for this purpose only after performing a minor modification (=removal of a resistor) first:



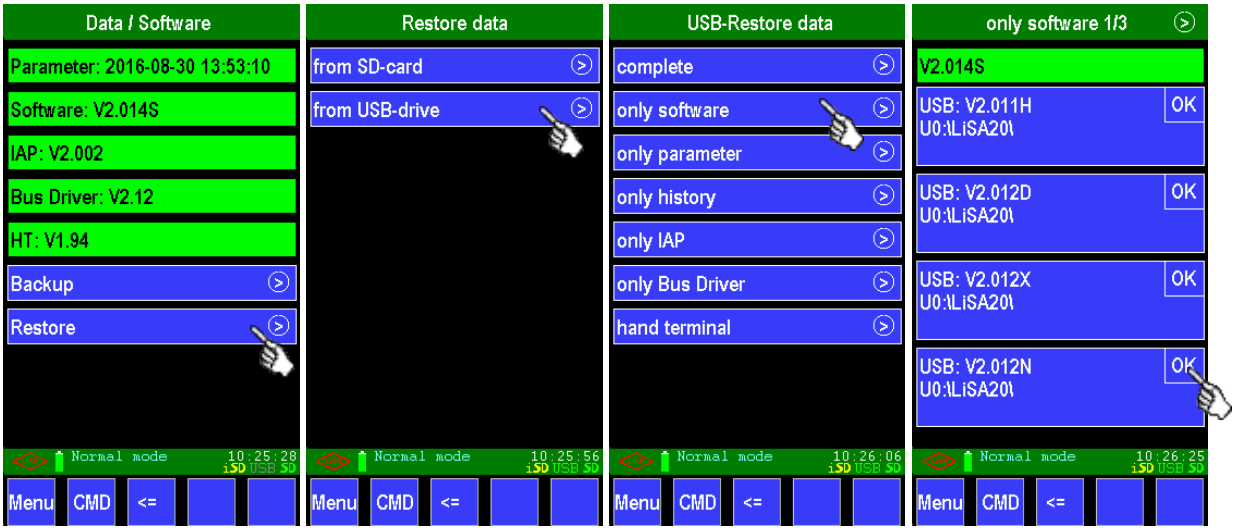
Removing the resistor is easiest when using a pointy plier. Grip the resistor tightly with the pliers pointy end and tilt it until the resistor beaks off. Since there are no other technical components allocated around this area, carrying out the removal should not cause any damage. After the modification has been carried out, a USB-drive should be recognized without further difficulties. The back-up process is equivalent to the procedure described above for the case of a SD-card.
Note: SD-Card and USB-drive need to be of filesystem FAT32 and must comprise one partition only

3.9.4. Data recovery (software version 2)

The item Data recovery is located in Tools → Data/Software → Restore data and can be directly accessed alternatively via the command [CMD -> 7017 -> OK]. Also refer to Manual Part B/Tools/Restore Data.
Here also, two menu items can be chosen from: From SD-card or from USB-drive
The items are active when an SD-card or a USB-drive are recognized on the processor board. When a storage medium has been chosen, an additional selection will be required concerning which software is to be recovered.
The selection is between:

- Conplete : LiSA20 software, LiSA20 IAP (bootloader) and parameters. History remains.
- Only software: Only LiSA20 software is targeted; the rest remains unaffected.
- Only parameter: Recovery of saved parameters; the rest remains unaffected.
- Only history.
- Only IAP : Only the processors bootloader is recovered.
- Only bus driver
- Hand terminal: Only the hand terminals software is recovered; all other software remains unaffected. Do not disconnect the hand terminal during update!

If there are multiple files available for recovery or updating, it will be indicated so in different folders from which one may select and directly run these files.



Example: Transfer of the software version V2.012N via USB.

Set-up of the folder structure (valid for SD-card and USB-drive):

- If the storage medium contains no data, there will – upon carrying out an action such as e.g. data back-up, saving of parameters - automatically be created a folder in the root with the name „LiSA20“. This folder acts as reference for all data!
- Has a lift-ID been assigned, then all data of that respective lift will be stored into a sub-folder. If the lift-ID is empty, no further subdivision into sub-folders is carried out.
- In contrast to past conventions, new back-ups are no longer stored in „SAVExxx“ folders but are described with current date and time. The correct format thus is “„JJMMDD_HHMMSS“. i.e. always a 2-digit indication of Year-Month-Day-Hour-Minute-Second. The back-up folder is located below the lift-ID folder.
- Name conventions:
  Abbreviations:
  - SW: Software
  - DRV: Driver
  - IAP: In Application Programming = Bootloader
  - HT: Hand terminal

- Software name conventions: (valid from software version 2.xx)

Description	New file name	Old file name
LiSA20 software for central processing unit	LiSA20SW_V#_###X.bin	LiSA.bin
LiSA20 IAP software for CPU	LiSA20SWIAP_V#_###.bin	IAP.bin
LiSA20 software for bus driver processor	LiSA20SWDRV_V#_##.bin	LiSA_BUS.bin
Hand terminal software	HTSW_V#_##.bin	LiSA_HT.bin

3.9.5. Saving of data on SD-card (software version 1)

Saving data is sensible before performing test, adjusting settings or changing hardware (the processor board).
In order to be able to use the data at an external installation (on a LiSA20) or when exchanging the LiSA20-processor board one can conduct an overall-backup to micro-SD via the command 691. All parameters, the operating software and errors are stored chronologically in a folder on the micro-SD card. Every such action creates a new folder which is named according to the following scheme: SAVE, underscore and a sequence number (e.g. SAVE_001, SAVE_002 …). Every saving procedure

creates several DMP-files and one bin-file, with the bin-file representing the software and the dmp-files containing parameters and error-logs.

If no micro-SD card can be found in the LiSA20 PB the saving procedure will be interrupted after max. 10 s while indicating “BACKUP-ERROR”. By verifying with “Yes”, the process can be aborted early.
It is not possible to “open” data which is stored on the micro-SD on a PC. However, this data may be copied and transferred, replaced or amended.

3.9.6. Data recovery (software version 1)

If a LiSA20 processor board had to be replaced, one can use a previously completed data backup on the SD-card to re-establish the original condition.
Firstly, the micro-SD card containing the required data needs to be placed into the sd-card slot. The command 692 lists all backups currently stored on the micro-SD. Entering the command 692 and subsequently the (above mentioned) sequence number loads the respective backup (e.g. 692001)
When entering the command 693 and the backup sequence number, only parameters are being recovered (e.g. 693002)

Saving and restoring **all data** to and from the micro-SD card:

LiSA20 flash memory		Micro-SD card
		SAVE000
Software (.bin)		SAVE001
Parameters	691 -> Save 692000 <- Restore	….
Error memories		SAVE999
		Lisa.bin

Saving and restoring only the **software** to and from the micro-SD card:

LiSA20 Flash-Speicher		Micro SD-Karte
		SAVE000
Software (.bin)		SAVE001
Parameter	697 -> Speichern 698001 <- Wiederherstellen	….
Fehlerspeicher		SAVE999
		Lisa.bin

Saving and restoring only the **parameters** to and from the micro-SD card:

LiSA20 flash memory		Micro-SD card
		SAVE000
Software (.bin)		SAVE001
Parameters	691 -> Save 693000 <- Restore	….
Error memories		SAVE999
		Lisa.bin

3.10. Software update

Updating the software is subject to risks and should therefore be carried out using these instructions and by trained staff only. Faulty updating can destroy the lift controller. Therefore you must carefully read the sections below and contact the hotline via +49 (0) 80 7691 87 - 222 in case of questions.

Safety instruction

If the controller is already in operation, put it out of operation first. Make sure that the car is empty and change the operating mode. There are several possibilities:

- Recall mode - by enabling the recall switch in the control cabinet
- Out-of-order mode - by turning off the master switch

In any case, it must be ensured that the car won't move due to landing or car calls, as this would disturb or even render the updating procedure impossible. Disabling the landing control is not sufficient.

Requirements

The following points must be fulfilled to be able to carry out a software update:

- micro-SD card or USB drive available (FAT32, max. 64 GB)
- software available (Lisa.bin)
- PC, notebook or netbook available to copy new files

When updating software it is furthermore important to reassure which software version (V1.XX or V2.XX) is being used and to conduct the following steps accordingly. Refer to item 3.9.2.

3.10.1. Carrying out a software update (software version 2)

In order to be able to run a software update it is sufficient to keep the new files at hand, e.g. on a USB-drive and to then transfer these files according to the data recovery procedure described under item 3.9.4. (***Note:*** the files must be in a folder named "LiSA20").
The menu item restore is located at Tools -> Data/Software -> Restore data and can be directly called upon by the command [CMD -> 7017-> OK].
Also refer to Manual Part B / Tools/ Data recovery.

3.10.2. Carrying out a software update (Software Version-1)

Update steps

In the following section, the update steps are explained in chronological order. They are imperative to avoid a faulty software update.

Copy the new software (Lisa.bin) to the micro-SD card

- Insert the micro-SD card into the controller
- Enter 691, confirm with OK (all current data are stored)
- In this way the current software, parameters and settings are backed up in a SAVE folder on the micro-SD card
- Enter 698xxx (e.g. 698000) and confirm with OK -> updates the software using the Lisa.bin file in the root directory of the card

Now insert the micro-SD card - if required with adapter - into your PC, netbook or similar. It is recognised as a mass storage device. Then copy the supplied software Lisa.bin into the root directory of the micro-SD card. Remove the card and insert it into the controller.

Carrying out the update

Click the KDO button in the LiSA20 main menu. Now you are in the status overview. Open the input keyboard by *clicking* on the CMD button. Now the screen should look as follows:

Restart the controller using the *6060 -> OK* commands. Enable the CMD menu again after the restart and open the input menu.

In the next step, the current program as well as the error log is saved. To do so, enter 691 and confirm with OK.

Now the lift software can be updated by entering 698 and the following backup number (e.g. 000). Click OK again to confirm.
You will be asked a few questions which you should usually answer YES. The controller now runs the fully automatic update process. As soon as the main menu is displayed again, the update is completed.

Here a short update overview:

Main menu → CMD → 6060 OK → main menu → CMD → 691 OK → 698000 OK

3.10.3. Update from software version 1.XX to version 2.XX

In order to be able to fully utilize the benefits of the newest software, it is possible to switch from V1.XX to version V2.XX.
To do so, one needs to create a folder “Lisa20” on the SD-card containing the following files in the new version:

- Lisa20SW_V2.0xx.bin
- Lisa20SWIAP_V2.002.bin
- HTSW_V1_xx.bin
- Lisa20SWDRV_V2_13.bin

The new software „Lisa20SW_V2.0xx.bin“ from this folder is saved in the main directory of the SD-card under a new name e.g. Lisa123.bin. There one can also find the previous Lisa.bin. The updating-

process can be started by entering [CMD 698123 -> OK] where 123 corresponds to the copied Lisa123.bin.
The software is now being updated to the new version V2.xx.

Further actualizations:

To ensure a fully updated state, one should furthermore actualize the bootloader, bus driver and the hand terminal.

1. Updating the bootloader : Menu -> Tools -> Data/Software -> Restore data -> from SD-card -> only IAP
2. Updating the bus driver : Menu -> Tools -> Data/Software -> Restore data -> from SD-card -> only Bus Driver
3. Updating the hand terminal: Menu -> Tools -> Data/Software -> Restore data -> from SD-card -> hand terminal

☞ ***Note:*** With hand terminals, updating is only possible from V1.39 on. Older hand terminals must be replaced.

Checking the update

After successful updating it might be necessary to select or adjust the contact type (NO/NC) for various switch inputs such as e.g.: light grids, recall or case of fire. To conclude one must save the parameters onto the SD-card with [CMD 600 -> OK]. Furthermore the most important parameters should be checked up on.
Those are:

- lift type
- absolute encoder values
- door masks
- building accesses

They are visible in the general parameters. If all parameters match their expected values, the system can be put into service again.

3.10.4. Backup

After successfull start of operation one should conduct a back-up of all data.
Via Menu -> Tools -> Data/Software -> Backup -> complete to SD-card, all parameters, the LiSA20 software, hand terminal, bus driver and bootloader are saved on the SD-card.

4. Installation and connection

4.1. General information

Important notes on safety at work

- Before the LiSA controller is put into operation in the control cabinet, you must by all means read the operating instructions and keep them at hand for future reference.
- Installation and commissioning of the LiSA controller must be carried out by instructed persons or accordingly trained experts only.
- As a basic principle you shall leave any maintenance and repair works to the service team of Schneider Steuerungstechnik GmbH or a qualified expert.
- Safeguard against any unauthorised or unintended switching-on of the power supply by suitable measures (remove fuses, place a warning sign, cordon off the area and/or if necessary, assign a guard with the supervision of the safety measures).
- The safety regulations of the relevant professional associations must be met by all means.

Before installation

- Check the delivered items for transport damages. Any transport damages must immediately be communicated to the forwarding agent or Schneider Steuerungstechnik GmbH.
- Unpack the LiSA controller / control cabinet.
- Check the delivered items for completeness.
- Compare the delivered components with the enclosed packing slip. Check your order with the delivery slip. In the event of discrepancies please contact Schneider Steuerungstechnik GmbH immediately.

As travelling cables are supposed to hang and untwist for 24 hours prior to being used, pull in the travelling cable first before starting any installation work in the machine room.

While pulling in the travelling cable, it must not be twisted or kinked by any means!

4.2. Installation and connection in the control cabinet

4.2.1. EMC-compliant installation

- Lay control cables and power cables separately.
- Provide connected inductors (e.g. brake magnets, interlock magnets, door motors, etc.) with suitable interference suppressors.
- Use shielded cables for control signals from frequency inverters. Apply the shield one-sidedly and extensively.
- Use shielded cables for connections to the motor, brake resistor, braking chopper and speedometer.
- Apply the shield extensively on both sides.

4.2.2. Installing the control cabinet

The control cabinet is fixed onto the wall using the mounting holes or brackets in the corners of the control cabinet. The component box for the control cabinet contains an accessory pack with mounting clips, dowels and the appropriate screws.

4.2.3. Connecting the main supply

After fixation of the control cabinet, the connection to the master switch needs to be established next. If supply of the master switch is provided on site, one must only establish a connection between master switch and controller. If an internal master switch is available, connect the mains line directly in the control cabinet.

The supply is connected to the terminals L1, L2, L3, N1 and PE (five-wire cable). If necessary, the main supply is connected directly to the master switch.

4.2.4. Connecting the light supply (L4)

If a separate light cable for car- and shaft light is intended, it must be connected to the terminals L4, N2 and PE in the control cabinet. If no separate light cable is intended, the terminals N1 and N2 as well as L1 and L4 need to be bridged in the control cabinet.

Do not yet enable the controller at this point of time. The machine installation should be completed first.

4.2.5. Connecting the drive

Installing a rope drive (2 speeds or regulated):

- Motor cables
  - 2*4 wires in case of 2-speed systems
  - 1*4 wires in case of 1-speed systems
  - 1*4 shielded wires in case of systems with frequency inverter
- brake cable (service brake or holding brake)
- PTC thermistor cable (shielded)
- if required: supply cable for the forced ventilation system
- if required: supply cable for brake release monitoring and/or brake shoe wear monitoring (shielded)
- in case of regulated systems, supply cables to the speedometer (shielded) might be necessary

Installing a hydraulic power unit

Depending on the components used, such a unit usually consists of:

- motor supply cable
- valve supply cable
- PTC thermistor cable (shielded)
- supply cable for the minimum-pressure and overload-switch contacts (shielded)

4.3. Installation and connection in the shaft

4.3.1. Installation run

On delivery, LiSA controllers are equipped with a firmly mounted jumper inserted between the MFA installation travel input (= terminal 7 of connector XK5-4) and –H. This mounting bridge is labelled with the inscription

"remove jumper only after end of installation"

The result is:

- switching to normal operation is only possible by removing the jumper
- in systems with absolute encoder, the pulse/encoder-errors monitoring is switched off, i.e. inspection or installation mode is possible without restrictions even if the absolute encoder is not installed or initialised
- traveling with relevelling control is not possible

During the entire installation procedure, the inspection travel must remain switched on!

If bridging any safety circuit equipment is necessary (e.g. because not installed), please insert jumpers (e.g. from terminal 4 to 9 and 11 to 14) for this purpose.

Use (yellow/green) grounding wires to jumper the safety circuits and leave long and noticeable wires in order to not accidentally forget a jumper in the control cabinet after installation.

Never override emergency stop switches!!

4.3.2. Installing the shaft selection

First install the reading head on the car or in the car panel using the provided bracket (see the following figures). The direction arrow of the reading head points **upwards**. Ensure an absolutely vertical installation. Check this by means of a level. Now mount the magnetic tape holder to the shaft ceiling (figure 7).

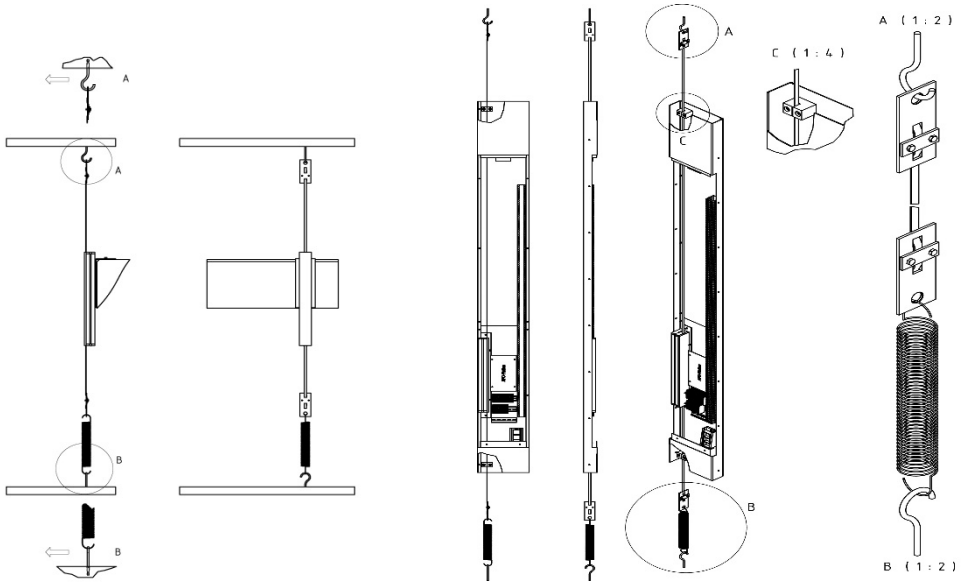


Figure 7

Please note that the steel side of the magnetic tape must slightly touch the plastic guide during operation. Now attach the magnetic tape to the tape holder. The direction arrow of the magnetic tape points upwards.

Hold the packaging containing the magnetic tape with the opening facing upwards and travel downwards in inspection mode.

In this way the magnetic tape is pulled out of the box. In the lowest position, cut off the magnetic tape at the appropriate length (fixing in the shaft pit), untwist it and feed it through the reading head (magnetic side = reader side). Now fix the hook for the tension spring in the shaft pit. Please note again that the steel side of the magnetic tape must slightly touch the plastic guide during operation.

In order to make sure that the required deflection is provided independently of the lift car position, use a plumb to check the magnetic tape installation. Attach the magnetic tape to the tape holder and hook in the tension spring. Please note that the tensile force is approx. 3 - 5 kg (corresponding to an elongation of 5 cm).

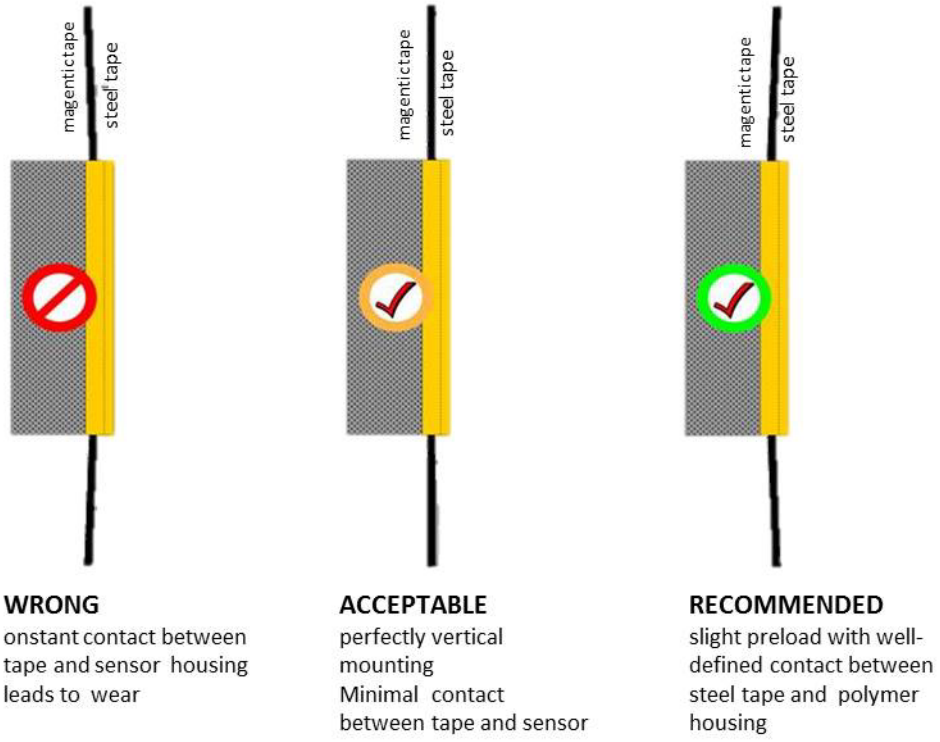


Figure 8

Mount the magnetic switch in the rail area using the provided fixture. The distance between magnet and switch is supposed to be 8 - 10 mm. Select the polarity of the magnets in such a way that the switch is closed in the zone. The magnets are arranged symmetrically to the zone centre.

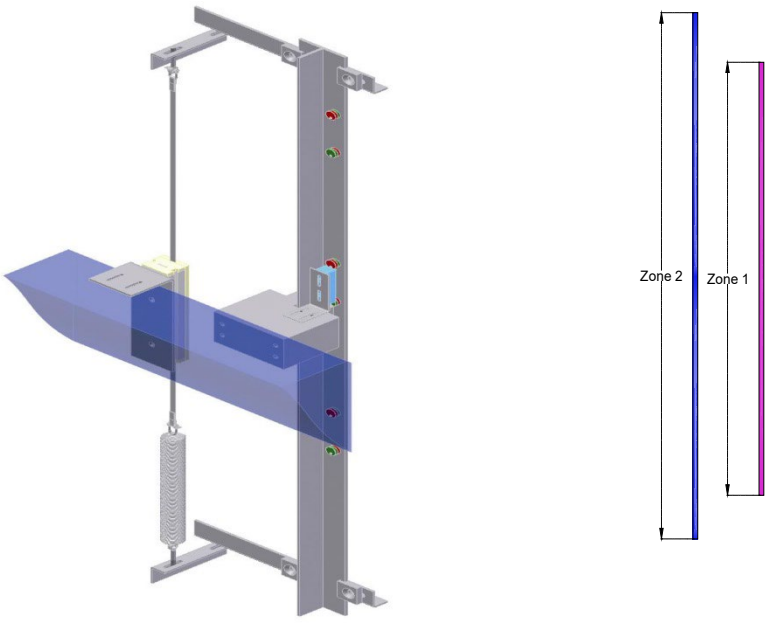


Figure 9

Due to the requirements of EN81-1/2 A3, (UCM = unintended car movement) and the associated certification, the zone length (Z1) is usually supposed to be 100 to 140 mm. Due to the signal sequence required for the safety circuit (consisting of relays K5, K6 and K7), the zone length Z2 must at least be 20 mm larger than the parameter defined zone length Z1 (= rail length). Controllers which have to meet the requirements of EN81-1/2-A3 are delivered with a zone length Z1 (= rail length) of 100 mm by default. Therefore, zone length Z2 should at least be 120 mm. Recommended magnet distance for EN81-A3:

adjusted rail length (mm)	**100**
magnet distance (mm)	140

(half of which is assigned both up and down from the zone centre)

Recommended magnet distance if EN81-A3 is not required:

adjusted rail length (mm)	**50**	**100**	**200**	**300**	**400**	**500**
magnet distance (mm)	100	200	300	400	500	600

(half of which is assigned both up and down from the zone centre)

According to EN81, the zone magnets must be glued on. The required glue is included in the delivery.

4.3.3. Electric connection of the zone switch

The zone switch is connected to the APO-14 via the terminal block XK4.2 (-H) and XK4.3 (Su).

4.4. Shaft selection

In the following, "shaft selection" refers to counting the landings, initiating the deceleration, and stopping (levelling of the system).

There are 2 alternative methods:

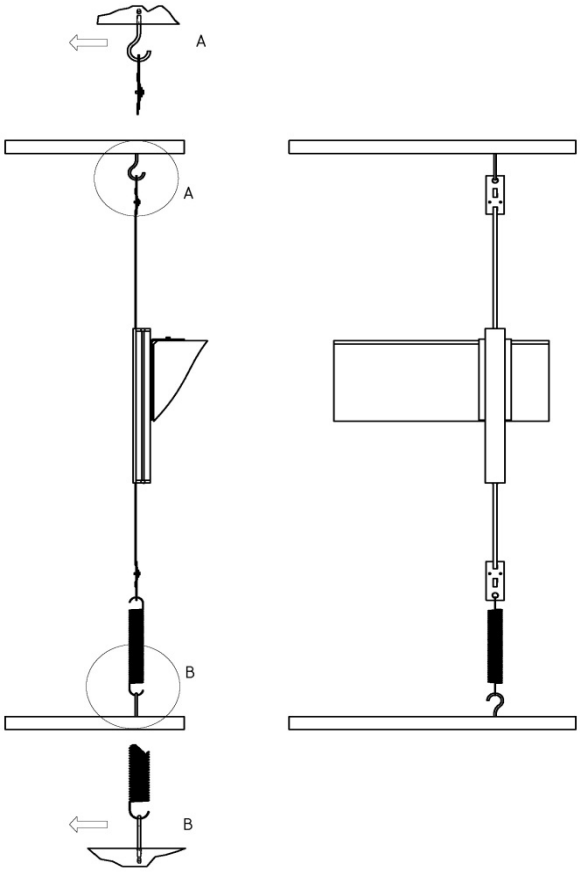
- use of the LiSA absolute encoder, LiMAX2M / LiMAX33 (with integrated safety functions)
- pulse method

4.4.1. The absolute encoder system

This system consists of a magnetic tape in the shaft and a reader fixed to the car. Systems in which doors are open within the zone require a magnetic switch to generate the second zone signal for the safety circuit. The magnetic tape contains a kind of barcode indicating the car position with an

accuracy of +/- 1 mm. The magnetic tape is fed through the tape reader such that the maximum distance between reader's hall sensors and magnetic tape is at most 1 m

This technology allows for speed up to 10 m/s, with minimum noise generation.



The magnetic tape is fixed to a holder in the top of the shaft and stretched in the shaft pit using a 3-5 kg tension spring. The magnetic tape data are permanently read by a reading unit (reading head) and transmitted to the LiSA20 (PB). The LiSA20 then directly processes the received signals while generating various discrete signals for e.g. activation of the safety relay.

You can choose between two readers to be used:

a) The standard reader (LiMAX2M) only consists of a reading unit and is connected to the LiSA20 via a serial interface (RS422).

b) The safety reader (LiMAX33CP) additionally contains safety functions detailed in EN81-20 and shaft components such as limit switches and zone switches. If you use this variant, the magnetic switches for zone 2, for instance, are also omitted. This reader is connected to the controller via the CAN open bus.

4.4.2. a) Standard reader LiMAX2M

The transfer rate is 19200 bit/s.
Connection to the controller is established via single conductors in the travelling cable or in event of a traveling control unit directly to LiSA20.

The reader signals are transmitted to the LiSA20 processors via the RS422 interface. In this way, the processors are provided with the absolute car position which enables them to control the car motion due to the zero point and landing distances registered during teach-in.
Signals required for the safety circuit are emulated.
These are:

- bottom-signal transmitter (SGU) (in case of double reader)
- centre- signal transmitter (SGM)
- top- signal transmitter (SGO) (in case of double reader)

LiSA20 furthermore emulates the following discrete signals:

- top slow-down switch (VO)
- bottom slow-down switch (VU)
- pulses (1000 pulses/m)

Travelling/relevelling with open doors within the zone always requires two independent zone signals (Z1, Z2); they are evaluated by the safety circuit on the LiSA20 RB.
Z1 = zone signal 1: SGM
Z2 = zone signal 2: SGO/SGU. This zone (Z2) must be a few mm longer than zone 1, i.e. when approaching, zone signal 1 must always be received a few milliseconds after zone signal 2.

Zone signal 2 (Z2) is usually generated by an additional switch which is connected to LiSA20 via a travelling cable. When using the double reader, Z2 can be generated by LiSA20 itself. Note however, that this design is not certified.

Setting zero point and landing heights

In order to set the absolute encoder zetro and landing distances, proceed as follows:

1. Park the car in a flush position in the lowest landing
2. Deactivate the installation travel; the following settings are only possible in inspection or normal operation
3. Call the "Reset AWG zero point" in the "Setup" menu and confirm with yes.
4. Check and/or enter the values of landing heights in the Setup menu -> landing heights. If the values are unknown, the respective landing can be approached and the current

absolute encoder value is displayed in the handheld terminal status display.

5. Move between the landings, set the deceleration values in order that the step is virtually zero when approaching the landing.

Check the flushness and correct the settings, if needed.

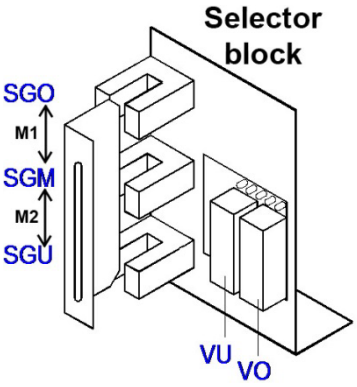
4.4.3. b) Safety reader LiMAX33CP

The safety functions provided by LiMAX33CP are very comprehensive, and further information is required for the set-up. Therefore please refer to the respective manual appendix for the configuration of the LiMAX33CP in conjunction with a LiSA controller.

4.4.4. The impulse method

The impulse method requires a shaft selection via a selector block (see fig. 6) with either one zone signal (SM=signal transmitter, middle) or 3 zone signals (SO= signal transmitter, up; SM= signal transmitter, middle; SU=signal transmitter, down).
Switching vanes (zone rails) and correction magnets or respectively pre-limit switches for up (Vo) and down (Vu) must be available and set. Depending on the speed and distance between landings, the

switching point for the pre-limit switch must be located in such distance from the lowest landing as to ensure that during a teaching run, the lift will safely come to stop at that position.



The offset of the signal transmitter up and down is set at the selector block according to the respective rail length.
Example: Rail length is 200mm, relevelling zone 15 mm; the distance M1 and M2 are thus set to 85mm each.
These values need to be put in at the controller settings for the impulse method under So- and Su-offset.

Figure 6

The jumpers at the processor board (see fig. 2) need to be configured according to impulse method specifics:

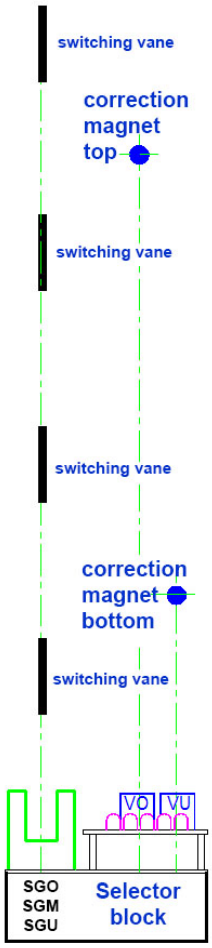
Jumper 3:

- SO placed in position SO
- VO placed in position VO
- IM placed only if the impulses (pos. logic) are issued by a generator at the car

Jumper 5:

- 5V placed only if the impulse generator level is ≤ 5V

Floor distance as well as deceleration- and braking point are determined by a certain amount of pulses which are being generated by an inverter or rotary encoder and logged in a counter.
Corresponding to the polarity of the pulse generator, the impulse generator input (Fig. 3) has to be equipped with a proper jumper:
For PNP-encoders, -IMP is bridged with –H and the encoder is connected to +IMP and +H.
For NPN-encoders, +IMP is bridged with +H and the encoder is connected between –IMP and -H



In the shaft:

Landing distance, impulse contacts as well as deceleration- and braking point are determined by means of a teaching run:

- park the lift in the lowest landing (Vu and SM must apply)
- the correction position up and down must be programmed at the controller
- start the teaching run via CMD -> 100 -> OK or via the menu Setup -> test travel

Important: the impulse method must be selected in the general settings!

Note: A teaching run can only be performed for installations with more than 2 landings. Approximate values are used for lifts with 2 landings.

The lift travels upwards quickly. The distance passed between switching of the Vo and the signal transmitter middle is recorded as the deceleration distance “up” at speed Vnenn. Subsequently, the lift travels downwards and determines landing distances by means of the impulses and the deceleration distance “down” via Vu.

The deceleration distances which are determined by means of teaching run only represent the distances between the pre-limit switches and terminal stops and can be further optimized by performing test drives.

5. Functions to meet standards, testing

5.1. Approaching and levelling with open doors

Systems which approach or level (regulate) with open doors require additional components to jumper the door contacts.

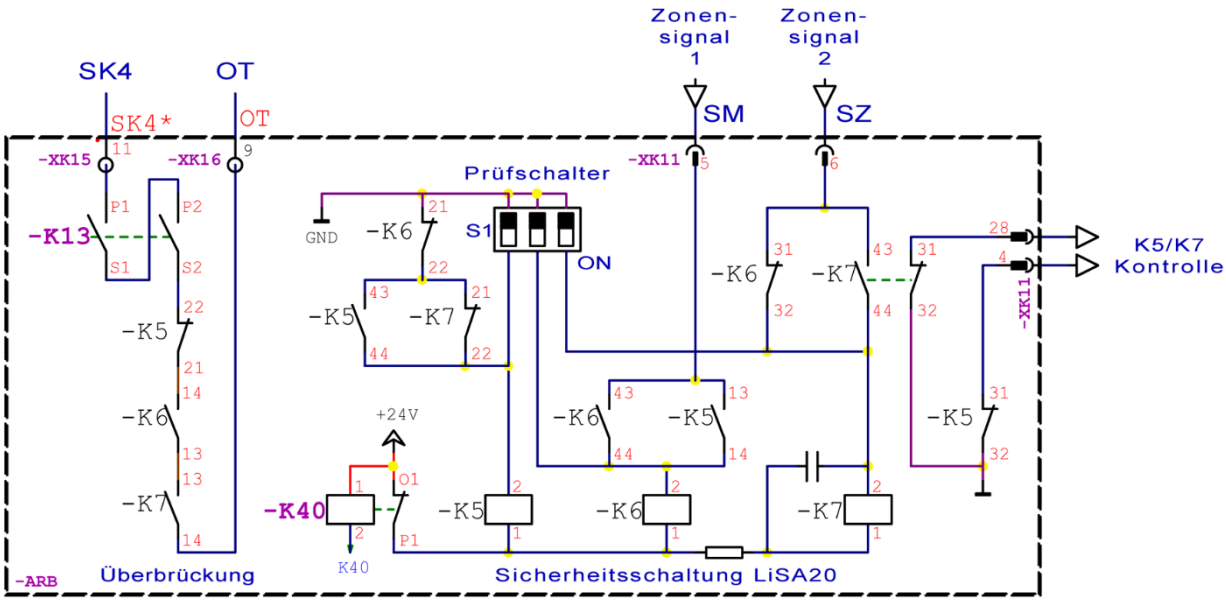
Therefore it needs to be checked whether the LiSA controller

- is equipped with 3 safety relays K5, K6, K7 (on the LiSA20 RB) and the relay K40
- has one additional magnetic switch (in the case of lifts with absolute encoders) and
- whether the jumper branch for the door contacts (see wiring diagram "safety circuit") is wired accordingly. Connection of terminal OT (on the LiSA20 RB) with terminal 94 (beginning of doors in the safety circuit).

5.1.1. Purpose and function of the safety circuit

According to EN81-20 5.12.1.4 and EN81-1/-2, no. 14.2.1.2., the switching components which – by overriding the door contacts - allow for the motion of the lift car with open shaft and car doors in the release zone, must either be safety switches or realised in such way that they meet the requirements for safety circuits according to 14.1.2.3.

For this purpose, LiSA controllers are equipped with a safety circuit located on the LiSA20 RB.



Wiring diagram of safety circuit

From V3.1 on, a relay (K40) is employed to mute the safety circuit when travelling through landings. In this way, unnecessary applying of the safety circuit is being circumvented and the related noise emission disappears.

Functional routine

Switching on supply voltage:

After applying the supply voltage, K5 activates first. This is only possible if K6 and K7 have deenergised. In this way, all 3 gates on the LiSA20 between terminal OT and K5:21 are open in the jumper branch (ÜZ).
Note: When the mute status of the safety relays is active, it is required to perform a travel before the above mentioned state can be reached.

Approaching the zone:

K40 is energized outside of the zone and when travelling through landings.
It is only after having reached the target landing that K40 deenergises and K5 is activated; K6 and K7 are deenergised.
When zone signal 2 (Z2) arrives, K7 is being activated. As K6 is deenergised, K7 pulls in. As soon as zone signal 1 (Z1) is issued by the absolute encoder, K6 also pulls in. As a consequence, K5 is deenergised and the jumper circuit of the door contacts is closed when the slow-relay (K13) has pulled in.
Compliance with the maximum approach speed (< 0.8 m/s according to EN81 14.2.1.2b) is checked by means of data from the absolute encoder. If this maximum value is not underrun, the doors will not open.

Leaving the zone:

When zone signal 1 (Z1) is switched off after having left zone 1, K6 deenergises. K7 remains energised until, after having left zone 2, zone signal 2 (Z2) is also switched off. K40 activates again.

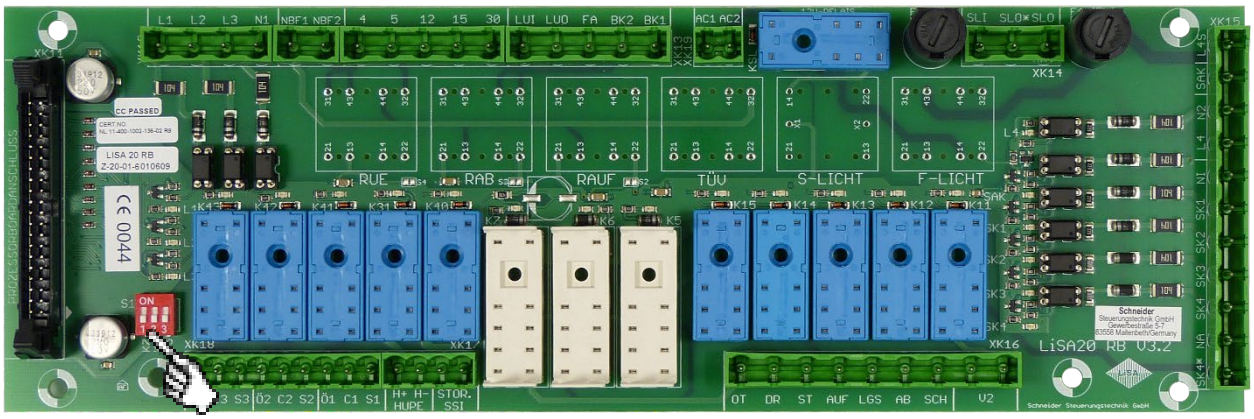
Moving in the zone (levelling)

If the safety circuit works correctly, K6 and K7 are energised after having approached, K5 is deenergised, and the jumper circuit is open as the K13 slow-relay is deenergised.
When a position which is not flush is detected (max. step to levelling), the levelling process is initiated and K13 is activated. Thereby the jumper circuit closes and the lift can level.

Compliance with the maximum levelling speed (< 0.3m/s according to EN81 14.2.1.2c) is checked up on by means of the absolute encoder data. If the maximum speed is exceeded, the levelling is terminated immediately by deenergising all contactors.

5.1.2. Checking the safety circuit

For testing the safety circuit, the LiSA20 RB provides three DIL switches (K5, K6, K7). By flipping one DIL switch (e.g. K6), the associated relay is prevented from de-energising. The next ride will cause a malfunctioning of the safety circuit and therefore the lift will be put out of operation.
Corresponding error codes: Error 5, Error 6



Relay board with DIL-switch for testing

Enabling the DIL-switch S1-[3] energizes K5. This immediately causes an error message to occur.

➔ Error 006 safety relay K5 always energized.

Enabling the DIL-switch S1-[2] holds K6. Here, it is required to perform a travel first. Consequently, K5 cannot pick up.

➔ Error 005 safety relay K5 is not active

Enabling the DIL-switch S1-[1] holds K7. Here, it is required to perform a travel first. Consequently, K5 cannot pick up.

➔ Error 005 safety relay K5 is not active

Behaviour of the control in case of a safety circuit error:

Traction lift: Remains in "out of operation" mode at the last approached landing. Doors remain open.

Hydraulic: Lowers down to the last landing and remains in "out of operation" mode. Doors remain closed. Door-open-buttons remain activated.

5.1.3. Bypass switch

The introduction of EN81-20 had the effect that a bypass switch pursuant to sec. 5.12.1.8 is required to override the car door and shaft door contacts. Additionally, a warning buzzer and a flashing light under the car must be activated whenever the car travels with the bypass switch turned on. Car door contacts and shaft door contacts must not be overridden at the same time. The effect of normal operation as well as the movement of automatic doors must be prevented when the bypass is turned on. During an inspection, pressing a direction button initiates the closing process of automatic doors pursuant to sec. 5.12.1.5.2.1 Inspection Control. A door closing limit switch (NO) is required in the car door. In order to be able to move during inspection or recall, it must be closed.

Bypass switch:

Position 0: normal travel

- No contacts overridden, normal travel possible without restrictions

Position 1: car door overridden

- The car door(s) contact in the safety circuit (SK3) is overridden.
- Only inspection travel and recall are possible.
- When pressing the travel buttons during inspection or recall, the buzzer and the flashing light under the car are activated.

Position 2: shaft doors overridden

- The interlock contact of the shaft doors in the safety circuit (SK4) is overridden.
- Only inspection travel and recall are possible.
- When pressing the travel buttons during inspection or recall, the buzzer and the flashing light under the car are activated.

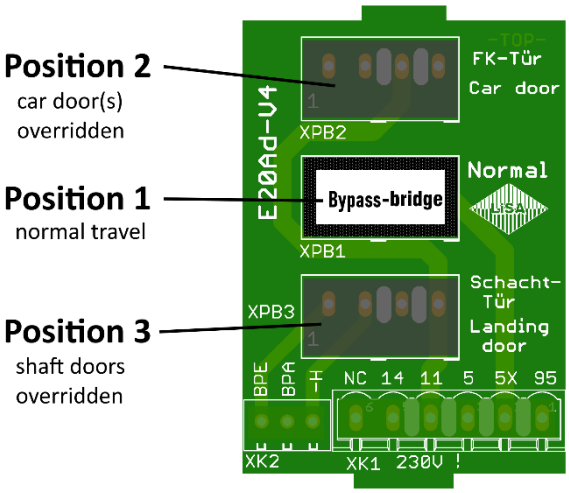
Position 3: hinged door contact overridden (only for hinged doors)

- The contact of the hinged shaft doors in the safety circuit (SK2) is overridden.
- Only inspection travel and recall are possible.
- When pressing the travel buttons during inspection or recall, the buzzer and the flashing light under the car are activated.

Bypass PCB:

For simplification and space saving, the Bypass PCB can be used instead of the bypass switch.
In this case, the selection between normal travel and the contacts to be bridged is realized using a jumper.
Position 1 is provided for normal travel, position 2 to override the car doors and position 3 to override the shaft doors.

The override functions for car and shaft doors are identical with those provided by the bypass switch. However, there is no possibility to override any hinged-door contacts on the Bypass PCB.



5.2. UCM

The safety device against unintended car movement required according to EN81-1/2 9.11 and EN81-20/5.6.7 has been certified for LiSA20 by type approval certificate NL 11-400-1002-135-02 Rev.8
For further information please refer to the LiSA20-A3 V3.5 UCM description.

5.2.1. Functional description of the UCM

"The system must be able to detect UCM and to stop and hold the car."
The drive control in LiSA20 controllers is dependent on the safety circuit end (see figure 10). That is, in case of open doors no main contactor is able to energise, thereby excluding the possibility of an unintended car movement.

For lifts travelling with open doors (approaching, levelling), the door contacts are overridden in the zone. Errors in activation or drive can lead to uncontrolled movement of the car with open doors. When leaving the zone, all contactors are deenergised as the door override is removed. Uncontrolled car movement is therefore limited to zone length / 2 + response distance + stopping distance and must not exceed the value specified in EN81-20 5.6.7.5 or EN81 1/2-A3.

In LiSA20 controllers the zone length is defined by the "rail length / zone length" parameter and can directly be modified by using the controller. After each change, this value is stored in the flash memory of the processor.

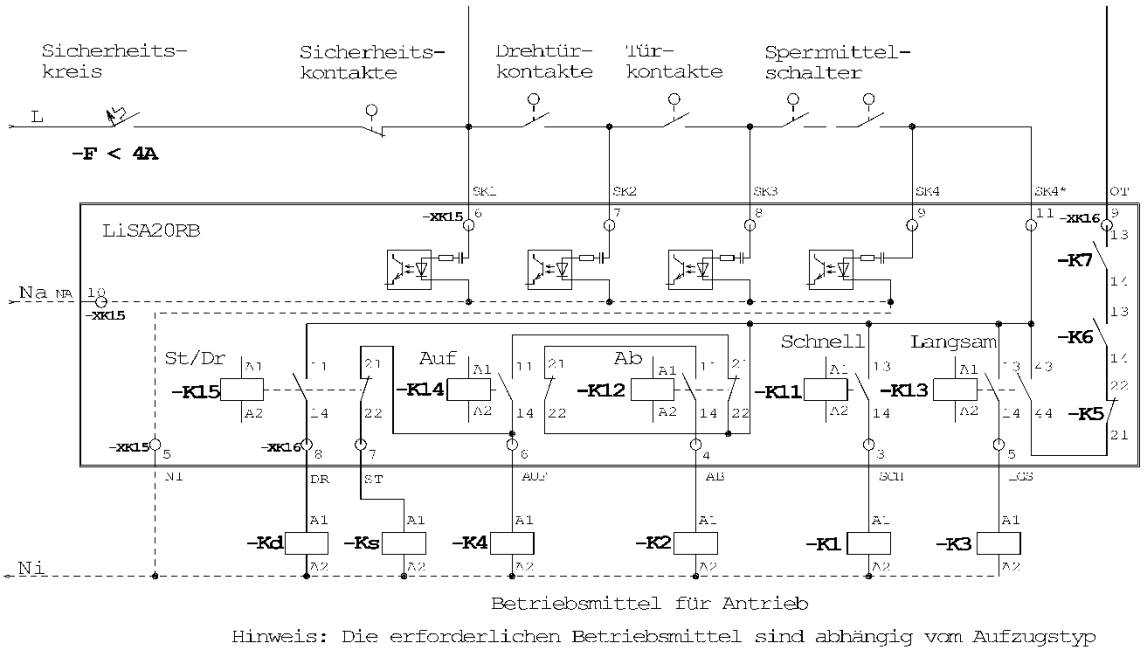


Figure 10

Operating principle of the UCM control by LiSA20:

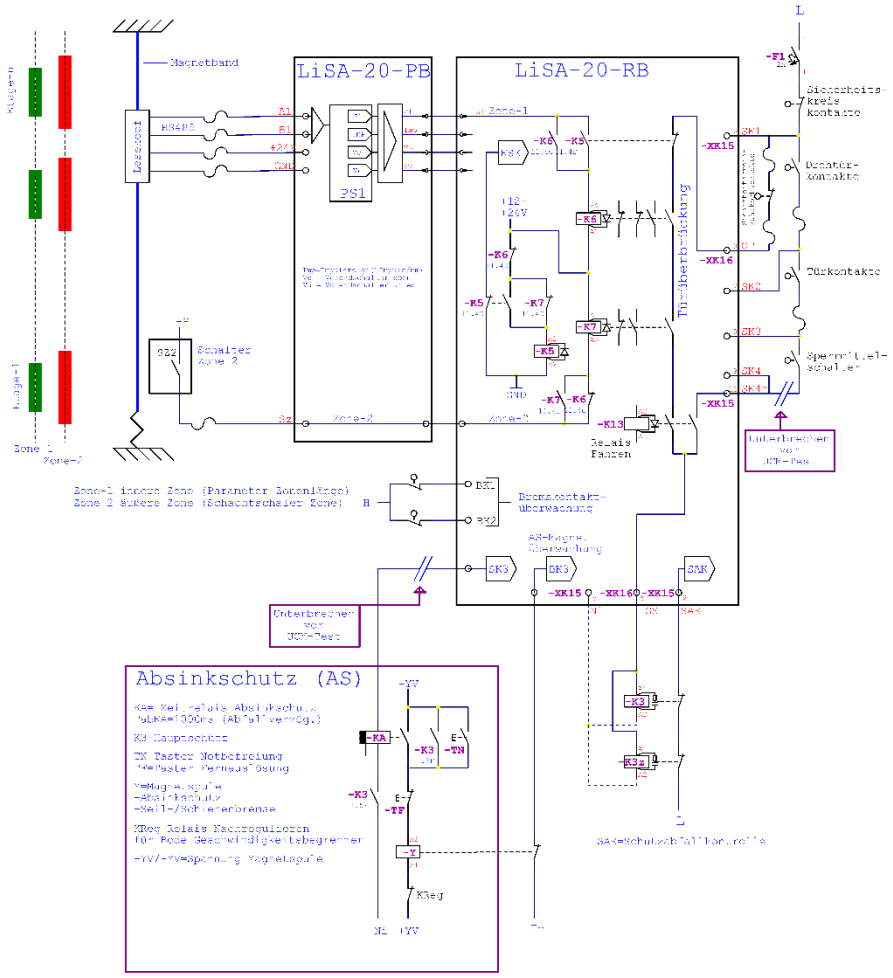


Figure 11

If both the zone 2 (Z2) and zone 1 (Z1) signals are active simultaneously, the safety circuit on the LiSA2020-RB-Vx board will override the door contacts. If the car leaves Z1, and the safety circuit is not closed (= doors open), an emergency stop will be initiated.
The car is safely stopped

- by the engine brake in case of gearless drives
- by triggering the speed governor (GB) or a rope or rail brake in case of drives with gears, or
- by closing the down valve in hydraulic drives.

As the controller detects that the safety circuit is open, it simultaneously detects an unintended car movement and thereupon changes to “out of operation” state.
Returning to normal operation is only possible by entering the defined code [700] in the entry mode.

In this way the two cases where

- the car quickly moves away from the zone, and where
- the car "sneaks away" from the zone

are detected by the UCM control.

Another way of controlling is the monitoring of the speed as long as the car moves within zone 1.
If the current speed exceeds the UCM test speed (vA), an emergency stop
is triggered.

> ***Note:*** the speed monitoring is not part of the type approval certificate.

5.2.2. Checking the UCM

In order to check the behaviour of controller and drive in the UCM case there is a test function.
There are three ways to test the behaviour of the system in the UCM case:

1. Test under normal conditions
2. Test under worst case conditions
3. Test of the speed
4. Test of the brake shoe monitoring (valve monitoring)

It eventually depends on the responsible testing agency which test is used, with the test under normal conditions being the most likely.

On 1.) Test under normal conditions
Test criterion: leaving the zone with closed doors.
This test serves to check the behaviour of the entire lift system when the car leaves zone 1 at normal speed and it comes to a UCM case.

> ***Note***: The test is carried out with closed doors, however the interruption of the safety circuit at SK4 has the same effect as if the doors were open when leaving the zone.

The test under normal conditions can be used for all lift types.

Test procedure:

- The car is parked with closed door without load in the second to last landing or with full load and closed door in the second landing
  Note: In case of hydraulic lifts, it can be parked in any landing above the lowest one.

- Start test by entering UCM in the NoBo-menue
  There are two ways to test the device:

  a) The “UCMtest mode” resay is installed and opens the safety circuit at SK4

  b) The safety circuit is opened at SK4 behind the interlock contacts before the test:

  1. switch off the safety circuit by means of fuse F1.
  2. interrupt the safety circuit after the door lock contacts (SK4), marked with # in the schematic -> SK4 connection directly on the LiSA board should not be disconnected!
  3. switch on F1

- enter a command to the last floor on the controller

  Attention: in case of hydraulic lifts enter a command to the landing below.

  Note : Calling the test causes the safety circuit - which opened behind the interlock contacts - to close prior to starting by activating the K13 relay; otherwise the controller would not start.

Additional measures for the functional test using the fall-arresting device as braking element:
If the fall-arresting device is to act as braking element, you must

- disconnect the supply voltage for the KA relay before starting the test (either Ni or the connection at SK3) and
- release the brakes immediately upon start of travel in order ensure that the braking process is exclusively effected by the fall-arresting device
- without releasing the bakes if it seems appropriate, e.g. in systems with large payload, to carry out a less radical test. This makes the service brakes already apply before the fall-arresting device can take effect.

Note: In case of electrically applied brakes, they are lifted after turning on the NoBo-test/rescue switch using the brake release button or, in case of mechanic operation, when using the brake release lever.

Hydraulic lifts with the down valves as braking elements do not require any additional measures for the UCM case. Instead of the brake or fall-arresting device, the valves are switched off when leaving the zone.

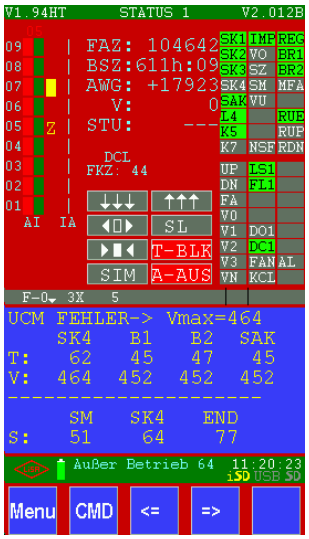
A UCM error is entered into the error log and the handheld terminal displays the following measured values until reset.

These measured values are only for information regarding deceleration times, speeds and distances, however they allow for conclusions about the sensor and actuator quality.
The braking device quality of the actuator itself can only be evaluated from the resulting distance to the flush position.

The events at a glance:
All events refer to the point time when they are detected by the processor.

- SK4: interruption at the end of the safety circuit
- B1: brake 1 input on the processor board (brake 1 applied)
- B2: brake 2 input on the processor board (brake 2 applied)
- SAK: contactor monitoring input on the processor board (all travel and brake contactors deenergised)
- SM: zone 1 left

- END: car stopped after UCM
- T(ms): line indicating the time from leaving zone 1 to detecting the incident
- V(mm/S): speeds at the time of the respective incident
- S (mm): distance travelled after starting



SK4 event event (SK4 interruption detected):
T = 62ms: time from leaving the zone until detecting SK4 is off.
V = 464 mm/s: speed when SK4 is off
S = 64 mm: path travelled until point in time when SK4 is off
B1 event (brake 1 applied):
T = 45ms: time between leaving the zone and closing the contact of brake 1
V = 452 mm/s: speed when brake 1 applies.
B2 event (brake 2 applied):
T = 47ms: time between leaving zone 1 and closing the contact of brake 2.
V = 452 mm/s: speed when brake 2 applies.

SAK event (contactors deenergised):
T = 45ms: time between leaving zone 1 and closing the contactor contacts.
SM event (leaving zone 1):
S = 51: path travelled from start until the leaving of zone 1.
END event (UCM completed):
S = 77: path travelled from start until standstill of the car.
Vmax measured value:
speed maximum during UCM.

> ***Note:*** The measured values for the test under normal conditions do of course not represent the worst case scenario. However they allow for a calculatory approximation to it.

On 2.) Test under worst case conditions
Test criterion: leaving the zone with closed doors in the worst case
This test is only possible for rope-traction lifts with inverter from currently only certain manufacturers. The required inverters have a signal input, the activation of which makes the inverter carry out the next travel under worst case conditions, i.e. at largest possible acceleration.

Additionally, a parameter in the inverter serves to specify the torque at which the test is to be carried out.
Torque = 0: The power unit is switched off and all travel signals are issued. The car moves away.

Torque > 0: Depending on the selected direction, all travel signals are issued and the motor is (uncontrolledly) driven with the specified torque.

The test procedure is analogous to the one described under 1.) with the exception that prior to entry of the travel command, the signal at the inverter input must apply for the UCM-worst-case.

On 3.) Test of the speed:
Test criterion: monitoring the speed in the zone
Monitoring the speed in the zone is not part of the UCM control in the type approval certificate, as there is only "one channel" for its evaluation, rendering it unacceptable as criterion for UCM monitoring by the testing agencies.

However it is monitored by the controller, since in worst case the UCM might be detected before leaving the zone.

If the car speed falls below 300 mm/s when approaching the landing, the system will thereafter recognise every movement in the zone which is conducted a speed larger than that specified by the parameter "UCM speed" (= triggering speed vA) as ab UCM case.
In this way the criterion to detect the UCM case is essentially tightened.

Test procedure:

- Set parameter "UCM speed" to a value that will certainly be exceeded when starting within the zone, e.g.: 200 mm/s.
  Note: Calling the test is not necessary.
- Enter a travel command at the controller.

After the error has occurred, "**UCM by speed**" is entered into the error log and the following measured values are displayed:

- **Distance:** is the distance from the floor landing at the time of registering the UCM-case.
- **Speed:** represents the velocity in mm/sec. at the point in time when the UCM-speed is detected.
- **Delay:** Time between start and detecting the UCM-case / -closing the Brake contacts / -SAK
- **End:** is the distance from the floor landing at which the lift cabin comes to a stop.

On 4.) Test of the brake shoe monitoring:
Test criterion: monitoring of the proper brake function
In gearless drives, the service brakes are used as a device to avoid unintended car movement. In order to check the proper functioning of the individual brake shoes, they are applied at standstill. To avoid that the car moves we recommend to apply the brakes separately.
In case of electrically released brakes you usually find the brake release buttons in the control cabinet or
rescue panel.
Note: In case of mechanically released brakes please refer to the manufacturer's operating instructions.

Test procedure:
- The car is empty and within the zone, the doors are closed. Use the "NoBo-test/brake" switch or the UCM menu item in the NoBo-menu to switch off the landing control and block the doors.
- At standstill both brake shoes have dropped out, i.e. the electronic inputs for the brake shoe monitoring (BR1, BR2, BR3) are active. This is visible from the activated bar on the handheld terminal. If you release one brake shoe now by hitting a brake release button (or mechanically), the associated input is switched off (the display goes off) and after 3s the controller detects an error of brake x (x = 1, 2 or 3).

The detected error is entered into the error log and the handheld terminal displays the following information until reset.

- Then you carry out this test with the other brake shoes.
- If the above test procedure is completed successfully, the functioning of the brake shoe monitoring contacts is clearly proven.

In order to test the monitoring during the travel - i.e. in order to see whether all the brake shoes are applied and whether the controller evaluates this fact correctly - it is sufficient to carry out a regular travel and to assign a brake monitoring input at terminal Br1, Br2 or Br3 with minus (-H). The controller detects the error and goes out of operation by displaying the message "brake x" (x = 1, 2 or 3).

Alternatively, the supply line of a brake shoe can be removed in order to prevent it from applying. However, this leads to strong strain on the brake shoes and the brake mechanics. In some circumstances, the inverter prematurely produces a fault.

5.3. Motor runtime monitoring (EN81-20 5.9.2.6/5.9.3.10 and EN81-1/2 12.10)

The motor runtime monitoring is realised by the LiSA20 software. The "Travel monitoring time" parameter serves to specify the required time (according to EN81 = 45 s).

5.3.1. Functional description of the motor runtime monitoring

The runtime is monitored by checking the car movement after issuance of the travel signals. If the next landing has not been reached after the specified time, the travel is aborted and the system switches to the "out-of-order" state.
Resetting is only possible by hand (e.g. recall control, reset).

5.3.2. Checking the runtime monitoring

The NoBo-test menu provides the selection "test travel monitoring time". If selected, the next travel is effected with a travel monitoring time of 2 s (see also part B 2.2).

5.4. Phase monitoring (EN81-20 5.11.1.2, EN81-1/2 14.1.1.1)

5.4.1. Functional description of the phase monitoring

The LiSA20 relay board provides the connectors L1, L2, L3 (max. 1.5 mm^2) in order to monitor the main supply according to the above-mentioned lift standard for

- voltage failure
- voltage drop
- phase reversal

If one of the errors above is detected, the controller does not issue any further travel commands. The display indicates the message (phase error).
If possible, hydraulic lifts go to the lowermost landing.

5.4.2. Checking the phase monitoring

By removing or switching off a fuse in the supply one can simulate a phase failure.
The error is indicated on the display by the "phase error" message.
Incoming calls should not be accepted.

5.5. Operation and maintenance

When switching on the controller or plugging-on the display, the start screen appears. Using CMD one can enter commands as listed in 3.8.

Use the MENU button to change to the menu level.
The items Status, Log, NoBo-test, Display and Rescue described in section B's parameter description will help to operate and maintain the system.

5.5.1. Replacement of components according to schedule

Due to mechanic stress and natural aging of components it is recommeded to replace any wearing and aging components after the specified amount of switching operations or years of operation at the latest.
As the amount of switching operations of individual components is associated with the number of travels of the lift, we recommend to take the number of travels (viewable on LiSA) as a decision criterion, even if some components switch more frequently than others.

Here a list of the affected components:

Component	Switching operations	Operating time in years	Notes
3V lithium battery		5	Check voltage (=3VDC) during each maintenance! Type: CR1632
12V emergency battery		2	Check voltage (=12VDC) during each maintenance, observe capacity (e.g. 1.2Ah, 2.1Ah) if replacing.
12/24V safety relay	100.000		Type: DOLD, OA5670.52/3204L1/61
Preselection relays, door relays	500.000		
Main contactors, door contactors	500.000		

5.5.2. EU-Type Examination Certificate

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Industrie Service

EU-BAUMUSTERPRÜFBESCHEINIGUNG

EU-TYPE EXAMINATION CERTIFICATE

gemäß Anhang IV, Absatz A der Richtlinie 2014/33/EU /
According to Annex IV, Part A of Directive 2014/33/EU

Bescheinigungs-Nr. / ***Certificate No.:***	EU-ESD 041-1
Notifizierte Stelle / ***Notified Body:***	TÜV SÜD Industrie Service GmbH Westendstr. 199 80686 München - Germany Kennnummer 0036
Bescheinigungsinhaber / ***Certificate Holder:***	Schneider Steuerungstechnik GmbH Gewerbestr. 5-7 83558 Maitenbeth - Germany
Hersteller des Prüfmusters / ***Manufacturer of the Test Sample:*** (Hersteller Serienfertigung - siehe Anlage / *Manufacturer of Serial Production - see Enclosure)*	Schneider Steuerungstechnik GmbH Gewerbestr. 5-7 83558 Maitenbeth - Germany
Produkt / ***Product:***	Sicherheitsschaltung mit elektronischen Bauelementen auf einer Steuerungsplatine/ *Safety circuit with electronic components on a control board*
Typ / ***Type:***	LiSA20 RB V3.2 / LiSA20 RB V3.2a
Richtlinie / ***Directive:***	2014/33/EU
Prüfgrundlage / ***Reference Standards:***	EN 81-20:2020 EN 81-50:2020
Prüfbericht / ***Test report:***	No. EU-ESD 041-1 dated 2023-10-04
Ergebnis / ***Outcome:***	Das Sicherheitsbauteil entspricht den wesentlichen Gesundheitsschutz- und Sicherheits-anforderungen der o.g. Richtlinie, sofern die Anforderungen des Anhangs dieser EU-Baumusterprüfbescheinigung eingehalten sind. *The product conforms to the essential health and safety requirements of the mentioned Directive if the requirements of the annex to this EU-type examination certificate are kept.*
Ausstellungsdatum / ***Date of Issue:***	2023-10-12

TÜV SÜD Industrie Service GmbH 00 36 Notified Body

Achim Janocha

Notifizierte Stelle LCC

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