Liftmaterial
SEMATIC GROUP

Manual
F5021B

Lift controller 32 bit system

version E02.2(MA)

Directory

Directory

1. F5021 Main board

Product characteristics

- 32bit processor ARM7 industrial standard

- Doubble-processor-architektur for extended security needs

- 2x CAN interfaces separate for internal and external communication

- high EMV-stability (EFT-4000V)

- high ESD- stability (ESD 8000V)

- certified for EN81, GB7588, CE
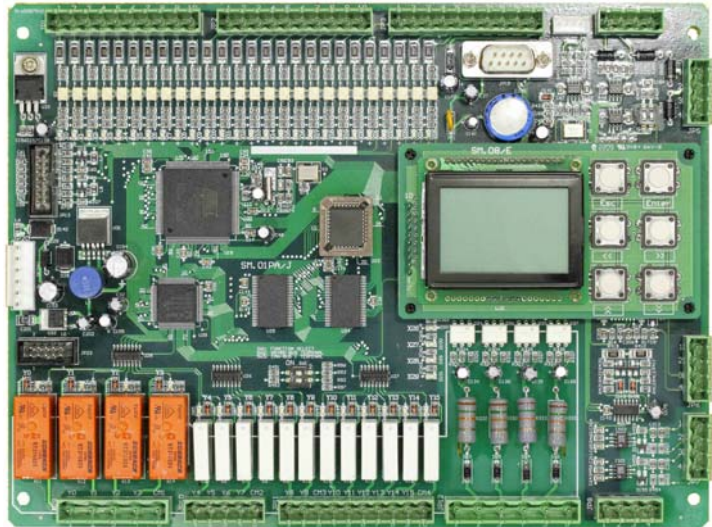
Functionallity area

- For rope- and hydraulik-lifts

- A lot of functions possible to parametize for nearly all kinds of lifts.

- Lifts from 0,63m/s to 4m/s.

- Up to 64stops, also with selective door controlling

- Replace the 16bit-board F2021 (longtime supply with replacement parts is secured)

- Analoge or digital triggering of the frequency inverter respectively chopper.

- Shaftdetection via incremental shaft encoder (RS422, HTL, SSI)

- Duplex groupe function integrated, possible to exted up to group times 8

- Weight compensation at start-up with according weight measuring system.

- ID-card system (credit card -transponder) possible to integrate.

- Remote control locally and globally

- Graphical LCD direct on board or a separate controller.

- Description of Drive cycle, on- and off- activities, status information etc.

- Error information memory (20 digits) with real-time coverage and full text advice.

- As standard are 2 cabine doors, possible to expand for 3 doors.

- Lot of special features, e.g. automatical evacuation with choose of direction conditioned to the weight.

2.System overview

SmartCom is a modern, based on newest technology controller system, especially for elevators.
The system basically composed of following components:

- Main module SM01
- Car module SM02
- Command-module SM03
- Floor module SM04
- Expansion module SM09

Different variations of the serveral modules make the best and optimized adjustment of the controller system possible for the respective lift and the requested functionallity area.
Based on the never changing CAN-journal its possible to realize controller for simple and complex lifts.
All components are, due to the CAN-systems, nearly in any order possible to be combined, and after all possible to be extended.

Main module SM01

The main module is in the Controlcabinet and is the heart of the controller. It contains all functions, especially trigging the handler, recognitize the possition of the lift and lots of special features, which are normally directed to the shaft and the engine room. It is communicating with the other modules via CAN-Bus.

Car module SM02

All functions, which are directed to the car, are done by the car module. It is linked via CAN with the main module.
There are two possible options, the „classic" with only one module SM02/03, and from now on the, with 32bit Board F5021 established „spreaded" option. In this case there are each a SM02/H in the Inspection box and a SM02/G in the car operation panel (COP) used. Due to this, the till now needed 36pin cable from the Inspection box to the COP, is reduced to a maximum of 12 pins. Now the connection for up to 3 cabinet tableas (2nd door side, console panel via CAN is really easy.

Command-module SM03

This module is connected with the cabinet module. It is possible to connect 8 of these modules with one SM02. One command module allocate 8 entrances for inside commands and 8 outputs for the respective indication.

Floor module SM04

Modules of this kind of art can be used as well as floor display in the car or as floor module with floor display and driving display at the floors. The addressing is really simple without any tools, by settings via the floor push buttons or via the DIL-switches.
The SM04 is available in different forms: horizontal, vertikal and vertikal slim. The Displays are different in their kind of art and coverage and it is also possible to be manufactered client-specific.
They are all communicating via CAN-Bus and can be teamed together nearly in any order.
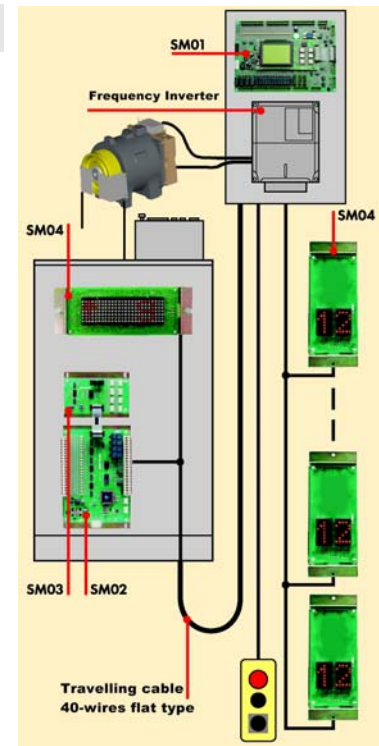
At the floors, the Exterior call buttons and key buttons will be conected with the AM04 modules (Display + CAN-module) for special features. Newer modules also allow the conection of a speaker to make possible the, in EN81-70 required, „tones".

Extra module SM09

Via this module client specific special features can be complemented without changing the central module. For example the conection to lift-maintenance-systems of the client or additional alerts, etc.

Function overview

Standardfunktionen		
1	Collectioncontrolling	Collecting hall calls with respect on the given direction
2	Inspection Drive	Manual drive up and down. Within the area of doors, the door open button can be used for opening the door.
3	Self liberation with slow drive	In case of missing the door area within the normal mode, the lift is driving slowly with closed safets circuit into flush position and open the door.
4	Test dive	For Testcases, the lift can do a indicated number of accidentally test drives.
5	Real time clock	Errors are registred with date and time. Time-dependent funktions can be activated.
6	Time to keep doors open	Dependent of the kind of call(interior, exterior, service, special call), the time to deep doors open can be indicated.
7	Door opening by lokal call	Is the lift allready in the floor from which the call comes, the door opens. With the Door open button, the door can be keept in open position
8	Early door closing	With the Close door button, the door can be closed, earlier than the keep door open time frame.
9	Forced opening of doors	Inside the door area, with the Door open botten, the door opening can be forced for closed doors or doors which are actually close.
10	Controlling of door closing. (return motion automatic)	In case the bar is not closed within 15 sec. after arrival at the door-close-endswitch, the door open again for a new try.
11	Controlling of door opening	In case that 15 seconds after the door opened and the door-opend-endswitch is not activated, the door is closing until further command.
12	Call cancel	By doubble-pushing a call button, the call is canceled.
13	Terminal stops	At paramount stage the up command gets canceled, at the lowermost stage the down command gets canceled.
14	Direct drive	Direct drive without rat run. This function is activated at standard when incremental detection and analog trigger of the inverter. The driving cycle is preset by the controller. There are no special demands on the inverter.
15	Cabinet full	If full load, the cabinet do not stop anymore for hall calls.
16	Cabinet light cut off	After 5 minutes without any activity, the cabinet light will be switched off.
17	Park drive	After an indicated time without any activity, the lift drives to the main purchase postion.
18	LCD controller	Graphical display with comprehensive status informations and menu navigation.
19	Analoge speed control	The rotation speed of the frequency inverter is triggered by the analog output

20	Digitale speed control	Alternatively the speed can be controlled via contactors
21	Error memory	The last 20 Errors get saved and displayed with information of time, floor and error code.
22	Learn trip for schaft information	The controller is learning with encoders and floor flags the bulk of the schaft and stopping distance. After that, the lift can merge into standard mode.
23	Floor approval	Free adjustments of floors, which can be departed.
24	Adjustment of the floor display	The icons, which should appear in the respective floors, can be free adjusted to a large extent.
25	Liftboy control	The lift gets drived via interior control manually. Hall calls will be served.
26	Priority inside	Hall calls are deactivated only interior calls are effective. The door must be closed with the door-close-button. The Push-button have to be compressed until the close-door-end-switch is activated.
27	LED-dot matrix-display, LCD graphic-display	At every stop there ist a dot matrix display with floor update, direction and status. The user can see that there is something going on.
28	Display with roll function	Respectively to the drive direction, the display is „rolling".
29	Automatic schaft data correction	Continously the schaft datas gets corrected
30	Remote off	The lift can be shut down, but before all still open cabinet commands need to be completed.
31	Door only opens inside the door areas	Outside the door areas, the cabinet doors can not be opened.
32	Safty light barrier/ light gate	The safty light barrier/ light gate gets evaluated by the controller. In case of activation, the controller avoids closing the door.
33	Overload	In case of overload, the door stay open and an alert sounds (buzzer)
34	Abuse recognition	If the cabinet is empty (empty load) the number of cabinet calls is bordered.
35	Stop in case of wrong agitator direction	In case the controller recognize a wrong agitator direction the handler gets stopped.
36	Drive inspection (skidding)	If the cabinet is not moving despite active handler, the handler gets stopped after 40 seconds (drive inspection). New drives only possible after Reset.
37	Inspection of traction	In case of cabinet is moven despite deadlock, alarm get raised.
38	Inspections end switch	The inspections end switch avoid, that the lift drives to the emergency limit switch during inspections, return motion drives or learn trip.
39	Contactor monitoring	The controller check at every drive the correct functionallity of the main contactors and brake contactor .
40	Speed monitoring	If over speed is detected an emergency stop will be effected
41	CPU monitoring	The processor is monitored by watchdog, if needed restarted.
	Optionale functions	
1	preopening doors	Using safty circuit
2	relevelling with open doors	Using safty circuit. At hydraulic lifts standard function
3	Fire controll	In case of fire signal the lift drive to the fire floor and stay there with open door.
4	Fireman control	All commands get canceled and the lift drives to the fire floor stage. Now the firemen can use the lift. The door is not open atuomatically, but have to be opened with the door-open-button. Unhand the button makes the doors closing immediatelly. European (EN81) und Russian (PUBEL) variant.
5	Additional COP	It is easy to install a second car operation panel
6	COP for 2nd door	Selective door control
7	Disabled COP	Particular COP (e.g. desk COP) for disabled people (longer door

8	Duplex-function	opening times) Via the second CAN-Bus 2 lifts can be conectetd to a two- groupe. The lifts than parting calls respective to the actual situation; so it can be achieved that the times of waiting can be reduced to a minimum. In addition there can be activated a function, that, if there are no more open calls, the one of the lifts which is nearer the main stop position, gets driven there an keep it prepared there.
9	Group function	With a optional group controler board, lift groups with up to 8 lifts can be realized. The group control collects the hall calls and allocate these respectivlly to the condition of the several lifts in order to reach short time of waiting.
10	Rush hour handling – fill up building	Via internal time frame inputs, the capacity can be adapted to the building. (type office buildings)
11	Rush hour handling – clear building	Via internal time frame inputs, the capacity can be adapted to the building. (type office buildings)
12	Distribution of waiting lifts	If there are no more open calls, the lifts of the groupe get distributed after 1 min. in the buildding, means one drives to main stop position, the others disperse themself, in order to achieve shorte waiting times.
13	Interface to building control service engineering	RS485 interface for connection to a PC of the building control service engineering.
14	Remote control	The lift can be integrated into a region comprehensive remote control system.
15	Lift arrival gong	During the drive in, the gong on the cabin roof or under the cabin floor, about the arrival of the lift.
16	direction indicator HOP	Inside the exterior panels it is possible to instal an optical and akustical continued travel display.
17	Floor gong	For every stop an lift arrival gong can be arranged.
18	Card reader in the cabin	With a transponder card, either a specific call can be activated or defined calls can be approved.
19	Card reader at the floor	Approval of exterior calls
20	Selective door triggering	Frontside and backside of the lift can be controlled seperatly.
21	Scramble	After one minute the door is closing slowling despite of the safty light barrier.
22	VIP Service	A key switch in exterior panels cancels all hall calls and fetches the empty cabin. Now multiple interior calls can be done. After these calls are done, the lift change back to standard handling.
23	PIN entry via Push buttons	For certain floor approvals the Push buttons can be used for entering a PIN.
24	Local controlled floor approval	For several and duplex lifts a changed floor approval via key switch can be activated.
25	Via group controlled floor approval	Floor approvals can be temporary changed via the group add-on.
26	Temporary block of sereral floors	Temporary, the user can block floors
27	Automatic evacuation	In case of black out with following auxiliary power supply, the cabine will be driven to the next stop.
28	Auxiliary power supply evacuation	For lift groups an evacuation will be done separate one after another
29	Earthquake function	Lift get stopped during the drive and will be driven to the evaktuaion stop.
30	Voice message	Serial and parallel access for voice message

3. Operation equipment

Overview of push button functions:

⬆	Next parameter/ menu item Increase the number of selected decimal
⬇	Former parameter/ menu item Decrease the number of selected decimal
⬅	Jump 10 parameters back, one decimal place to the left
➡	Jump 10 parameters forward, one decimal place to the right
ENTER	Access parameter menu parameter set/adopt
ESC	Parameter/menu item leaving
F1 2x F1 3x F1	Hot key: change from status-window to error display, to encoder diagnostic and to CAN-diagnostic
F2 2x F2	Hot key: change to call entry and to status display of in-/outputs.
F3	Hot key: to travel cycle display
All functions from F1 to F3 also accessable via the menu!	

D1:driving
D2: up
D3: down
D4: error

Floor or
error code

LCD
with status
Menu, etc.

keypad

CAN
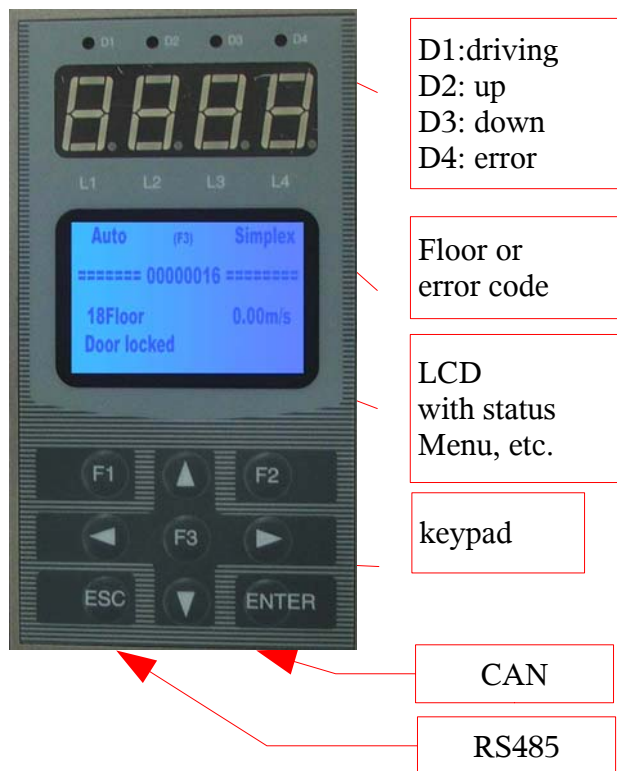
RS485

Optional a control element can be directly inserted on board F5021B, or the external control element can be connected with a special cable with the 9pin Sub-D-linkage JP15. The USB-plug of the cable have to be pluged in the left plug (RS485). A plug-in into the right plub by mistake arose no claims, the control element is just not working.

Attention! Never use the special cable to link with the PC. The PC can be damaged!

Again Attention!

The inserted control element and the external control element may not be connected at the same time! In case this occurs, there won´t be any damage, but the parameter are not possible to be setted because two control elements at one time are not allowed to access the parameter memory!

Handling:

The handling via the inserted control element and the external control element are identical. The external control element processes additionally to the shortcuts F1, F2 and F3 whereby assinged diagnostic-windows directly can be recalled. At the inserted control element all windows only accessable via the menu.
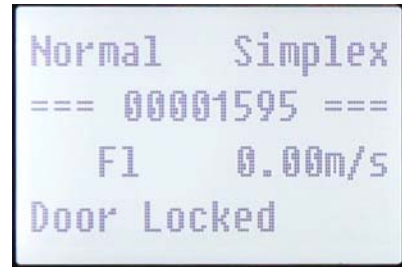
```
Normal   Simplex
=== 00001595 ===
   F1     0.00m/s
Door Locked
```
Start window

Log-in:

In order to see the status and for setting parameters, first you have to log-in. In case you are not logged in yet, it is displayed after pushing the ENTER button the window for log-in. By default the password is „1234". After log-in it is possible to change this in „Chg.Password". Attention! Do not forget the password!. The controller can without password only in the factory be unlocked!

```
    Password
================
      1234
```
Log-in

Menu

The complete menu tree you can find in: "Menu tree & parameter".

The start window shows mode, group status, journey counter, floor, speed and the actual activity. With Enter you can change to the main menu. Repushing Enter show you the monitor-menu auf, which occupies all diagnostic windows.
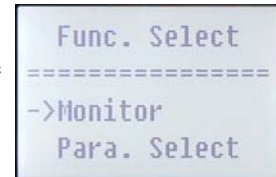
```
Func. Select
================
->Monitor
Para. Select
```
Main menu

Status window in Submenu „Monitor"

Run State is the start window.

In the first line you can see the mode (Normal, Inspection, Fire Return, Firemen, Park) and the group status (Simplex, Group).

Among the journey counter, floor, speed and actual activity.

```
Monitor
===========  Normal   Simplex
->Run State  === 00001596 ===
Call Func       F1 ↑  0.18m/s
             Running
```
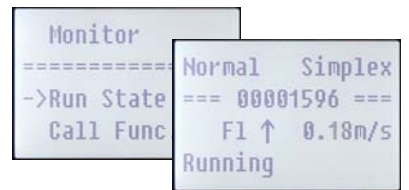
In Call. Func. are displayed the actuall calls and it is also possible to enter calls (with the arrow buttons on the respective call and Enter).

Cabin call, hall calls for up and down.

```
Monitor
===========   ↑   3  Call 4F1
->Call Func.  Ins.  ---*----
Speed Curv    Up    --------
              Down  ---*----
```
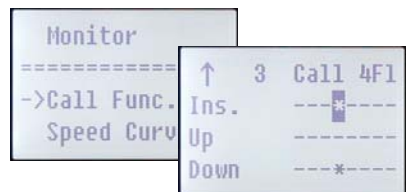
Speed Curve is the graphical display of the as-is-value (of the encoder) of the speed.

Above it is displayed the actual speed value and the time of journey.

```
Monitor
===========  SPEED:-0.85m/s 5.0s
->Speed Cu
Input&Ou
```
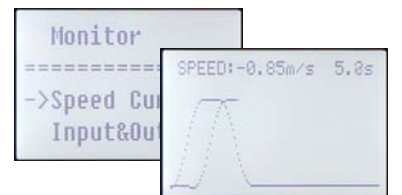
At the window Input&Output it is possible to display all outputs and inputs. With the up/down-buttons you can switch between the several 16fold groups. With the right/left-buttons a single input/output can be marked. Than in the line among is shown the function of the input/output.

The marking X (inputs SM01) and Y (outputs SM01), also TX (inputs SM02) and TY (outputs SM02) you can find again in the diagram.

```
Monitor
===========  TX0-TX15
->Input&Outp  ================
Fault Reco   *-----*---------
             Overload   (TX6)
```
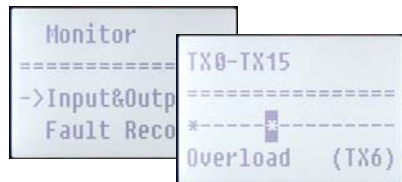
In the error memory (Fault Record) there are displayed the last 20 errors with date, time and floor.

The latest error is displayed at first.

With up/down you can move between the items in the list. With Enter an additional window pops up, in which date, time and full-text-error message is displayed.

```
Monit
=======   Number      1
->Fault   Erroe Code  6
  Shaft   Floor       3
          Time
                 Err Info
                 ================
                 Can't Close Door
                 09-11-18 16:49
```
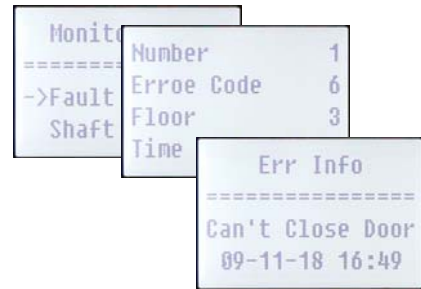
The list Shaft Data contains the floor postions in mm which were identified at the learn trip. If there are problems in the shaft selection you can really fast identify if the floors were learned correctly.

```
  Monitor
============   Floor    Data
->Shaft Data    1         0
  Encoder       2      2897
                3      5690
```

The two windows Encoder Eva and Communication are helpful if you have problems with the encoder or the CAN-bus.

```
Moni   <<Enco   << CAN Bus Status >>
=====  timely
->Enco  min:    Ovr Tec Rec TxBo
       max:      0   0   0   0
 Comm  max-mi
       AddIn:   Ovr Tec Rec TxBo
       Warnin    0  128   0   0
```
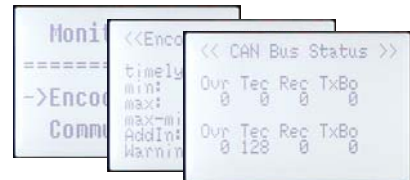
In the version window are shown date and version number of the firmware. Before doing an update it should be checked if the new software is really more active than the allready existing version.

```
  Monitor
============       Version
->Version     ================
              Nov 10 2009
              N01F3Q01.61.GE
```
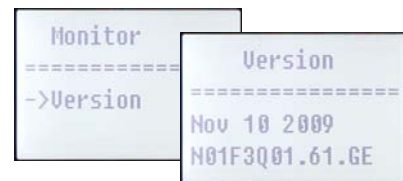
Parameter setting in the sub menu Para.Select

Via the parameter menu you can access to the numerous parameters. There are parameter groups, in which the parameters combined thematically (e.g. engine or door parameter), as well as a list in which all parameters are sorted by numbers.

```
 Para. Select
================
->Main Para.
  Insp. Option
```
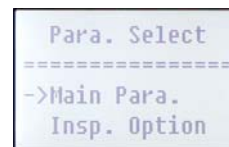
Most of the parameters can only be setted in the inspection or return motion mode. If the alert window shows up, switch to inspection.

```
      Error
================
To Insp. Mode
Down Select
```

All parameter are achived as 16bit integer. Most of them are shown as decimal, with adjustment value (e.g. means the value 50 at a device of 0,1s a parameter value of 5 seconds).

```
 Para. Select
================
F24 =    0
Drive Mode
```
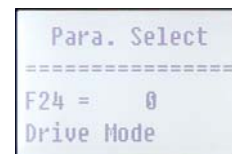
Some parameters are available as bitmask. Indeed is shown the decimal, at once you want to set the value, it will be shown as bitmask and you can set it with right/left button (move between the bits) and up/down button (* means setted/ - means canceled).
In the line below shows up the description of the bit.
Thus you can configure e.g. for every several input the logic (*NC/-NO)

```
X0-X15
================
*----X*****-*----
Up Limit   (X5)
```
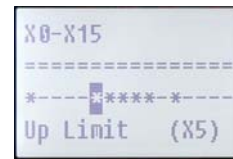
Lvl.Mic.Adj. allows you the correction of serverl precisions in all floors. Normally this is not necessary as the floors get messured at the learn trip.

```
Para. Select
============
->Lvl. Mic.    Lvl.Micro Adj
  Multi Spe  ================
                2      20
             Flr.  Lvl.M Adj
```
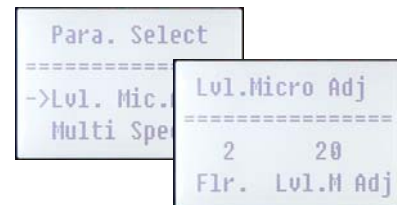
Multi Speed contains all parameters, which are necessary for the handling of the frequency inverters in multistep-mode (prallel control).

Door Control allows you to set parameter for the lift-door-control.

```
Para. Select
================
->Multi Speed
  Door Control
```
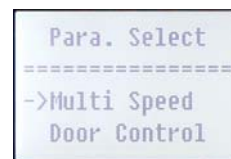
Flr.Disp. Guides you to the list with floor displays. For every floor it is possible to do the settings for the displayed letter-combination. (at Step SM04 displays). At the same time, the display code configure the voice message, which get annouced at the respective floor when lift drives in.
The display codes are configured in a table in the attachment.

```
Para. Select
================
->Flr. Disp.
  Service Flr.
```
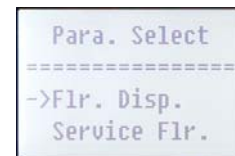
Service Floor configure the floors, which are approved. Furthermore floors can be configured, which are only can be unblocked via key-switch.

Block Floor allow the locking of a floor by time or key-switch.

```
Para. Select
================
->Service Flr.
  Block Flr.
```

Comp. Stop (forced stop) define stops, at which the lift by passing enforced stops. In some cases it make sence for hotels.
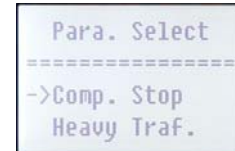
Heavy Traf. Allows the configuration of the function fill-up building and clear building. By this, especially for office buildings, it is possible to improve the hoisting capacity.

```
Para. Select
================
->Comp. Stop
  Heavy Traf.
```

In Test Run it is possible to configure the parameter F34 to a number of journeys, the lift have to do test journeay without any commands (accidentially).
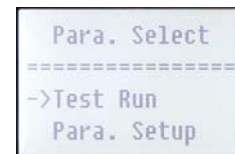
Para. Setup is the access to the complete parameter list.

```
Para. Select
================
->Test Run
  Para. Setup
```

Reset restores all parameters to factory setting. This should only be done if absolutely necessary. Before Reset there have to be entered a number in order to avoid to do a reset by mistake.

Attention! After entry of the number the reset of all parameters starts without any further query!

F146 necessarily have to be setted to "0"!

```
 Para. Select
========
->)Reset    Reset      ct
            ================
            Pls. Input: 5678
                      Reset Clew
                      ================
                      Reset
                      Reset Success!
```
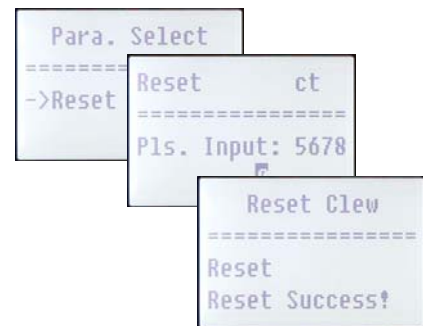
Different functions (Func.Select)

Time Setup: Configuration of the real time clock. This is used for Error recording and the time relevant floor approvals and the functions fill-up building and clear building.

```
 Func. Select
============    Time Setup
->)Time Setup  ================
  Door Teach    09Y 11M 18D
                 17:27:06
```
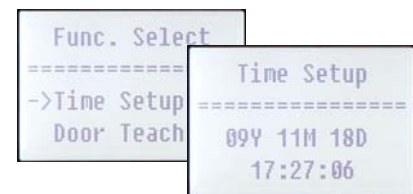
Door Teach: Detect by opening and closing the function of the door-end-switches.

```
 Func. Select
================
->)Door Teach
  Shaft Teach
```
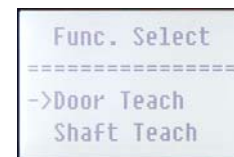
Shaft Teach:learn trip, have to be done before switch to standard mode (after installation or change of door positions).
Door, bus, shaft selection and cabine light have to operate correctly.
After activation of the learn trip, the lift is driving self-consistent to the lowermost stop and starts the learn trip. As soon as the learn trip is finished, the lift can be switched to standard mode. If an Error occours, the learn trip is stopped with an error message.

```
 Func. Select
================
->)Shaft Teach
  Reset Para.F
```
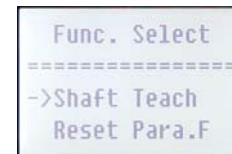
Reset Para.F: Restore to factory setting!!!

Reset Errco.: Clearance of the error memory!

```
 Func. Select
================
->)Reset Para  Reset Para.Fct
  Reset Erro   ================
               Pls. Input: 5678
                          C
```
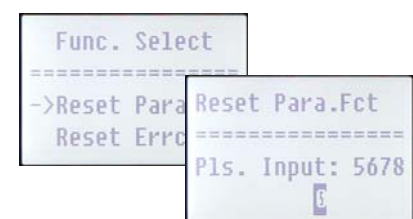
Error Reset: Reset after Lift Error (fatal error) as e.g. drive monitoring, contactor monitoring, brake monitoring, etc.

Relogin: Log out and if so new log in. Normally after 10 minutes without operation the log out is automatically.

Chg.Password: Changing password. Attention! Do not forget password! Only possible to can be restored without password in the factory!

```
 Func. Select
======   Func. Select
->)Err   ======   Func. Select
  Relo  ->)Relog  ================
         Chg.P   ->)Chg.Password
```
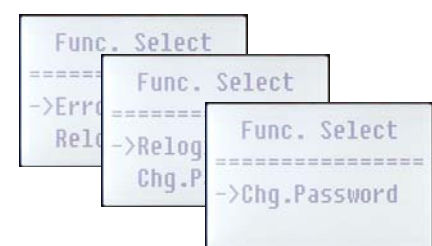
4.Menu tree & parameter

Func.Select	Monitor	Run State	Status of the lift (Floor, speed,. etc.)
		Call Func	Enter and display calls
		Speed Curve	Graphical display of the speed curve
		Input&Output	Status of the inputs and outputs
		Fault Record	Error memory
		Shaft Data	List of floor values
		Encoder	Analysis of encoder
		Communicat.	Analysis of CAN-system
		Version	Display of software version
	Para.Select	Main Para.	Basic parameter
		Insp.Option	Inpection parameter
		S-Curve	Travel cycle parameter
		Lvl.Mic.Adj	Fine adjustment precision
		Multi Speed	Parameter for multistep operation
		Door Control	Door-parameter
		Flr.Disp.	Adjustment of floor display
		Service Flr.	Floor approval
		Block Flr.	Floor blocking (access control)
		Comp.Stop	Define forced stops
		Heavy Traf.	Fill-up building/ clear building
		Test Run	Number of accidential test drives
		Para.Setup	All parameters in one list
		Reset	Restore to factory setting!
	Func.Select	Time Setup	Configure time
		Door Teach	Learns door-end-switches
		Shaft Teach	learn trip shaft
		Reset Para.F	Parameter to factory setting
		Reset Errco.	Reset Error memory
	Error Reset		Reset from error mode
	Relogin		Again log-in
	Chg.Password		Password change

Basic-parameter (Main Para.)

No.	Standard	Description	Advise
F6	1m/s	Nominal speed lift	
F7	1450rpm	Nominal rotation speed engine	
F8	1024ppr	Encoder pulses	
F24	1	Trigger of FU analog	
F11	18	Number of floors	
F182	1	Number of delay switches	
F60	3	motor contactors : 3= K1 and K2 after the inverter and monitored	
F36	0	Break-monitoring-switch, 0= no monitoring	
F153	0	Door lock det. type	
F156	1	Safety loop type	
F62	32	Journey time monitoring. For test set to 2s.	
F25	35296	Configureing, if the several inputs wired as closer (NO=normally open) or as opener (NC=normally closed). Depends on the diagram and the conected switches	Bitmasks
F26	83		
F27	835		
F28	0		
F23	0	Group function 0 : Simplex, or rather Duplex-master 1 : Duplex Slave 2 : for external groupe processor 3 : at group-ring (look at F181)	
F181	0	Lift number within a group: minimum value have most priority. (F32=3)	0~7; for F23=3

Inspections-parameter (Insp.Option)

No.	Value	Description	Advise
F201	0	at 1 it is possible to drive above the reference-journey-end-switch	For test purpose
F200	0	Distance for early stop at paramount stop (headgear)	mostly UK
F40		Top Access Dis.	
F42		Bot.Access Dis.	
F64	1	0= no door operation for inspection	
F165	Bit 1=0	Bit 1 avoid movements of door at inspection (door B)	

Travel cycle parameter (S-Curve)

No.	Value	Description	Advise
F0	0,55m/s²	Acceleration	
F1	0,55m/s²	Deceleration	
F2	1,3s	Rounding at start	

No.	Value	Description	Advise
F3	1,1s	Rounding at the change to constant drive	
F4	1,1s	Rounding at leaving of constant drive	
F5	1,3s	Rounding at stopping	
F12	0,25m/s	Inspection speed VI	
F13	0,06m/s	Levelling speed VN	
F48		Down Rev. Speed	
F183	0,8m/s	learn trip speed (for analog-trigger)	
F21	6mm	V0 stop distance	
F175	0,06m/s	Creep speed at start	
F186	0,5s	Time of creep speed at start	
F180	100,00%	Analog value at nominal speed (Vmax)	
F16	0,2	Time between inverter run signal and break release	
F58	0,5	Deceleration of the driving cycle at start	
F17	0,6	Deceleration of break after rotation speed Zero	
F122	0,3s	Time between break off and direction off	
F141	0,5s	Time between inverter run signal off and motor contactors off	
F144	0	Time between inverter direction off and inverter run signal off	
F56	50	Stopping distance up, >100 stop with creep speed	
F57	50	Stopping distance down, >100 stop with creep speed	
F126	300mm	Short-journey deceleration distance	
F193	0	Empty load-compensation	Only relevant for very high assets in order to balance the weight of the ropes.
F194	0	Full load compensation lowmost stop	
F195	0	Full load compensation paramount stop	

Multistep-parameter (Multi Speed)

No.	Value	Description	Advise
F32	0	Type of frequency inverter: 0: YASKAWA,CT,FUJI,iAStar 1：SIEMENS 2: KEB 3: MICO 4: SIEI 5: Dietz 6: NEW FUJI 7: user-defined (look at F240～F249)	
F63	2	Number of drive positions at Multistep-controler of inverter	
F16	0,2s	Deceleration between inverter run signal and break contactor on.	
F17	0,6s	Deceleration between inverter stop command and break contactor off	

No.	Value	Description	Advise
F58	0,5s	Deceleration between FU run signal and start of drive cycle	
F122	0,3s	Time between break off and FU drive signal off (speed and direction) .	
F141	0,5s	Follow-up time of the engine-schuetze: approval off=>Schuetze off.	
F144	0,000s	Follow-up FU-approval after switch off the direction signal.	
F21	6mm	V0 stop distance	
F45	1,300m	Breaking distance for V1 (floor drive)	
F46	2,900m	Breaking distance for V2 (2 floors drive)	
F47	4,000m	Breaking distance for V3 (more floors drive)	
F157	5,500m	Breaking distance for V4 at 4 floors drive (for fast lifts)	
F158	6,500m	Breaking distance for V5 at 5 floors drive (fast lifts)	
F126	300	Short drive deceleration distance	
F143	0	spare	
F147	0	spare	
F56	0	Fine adjustment for stopping upwards: 50 for direct drive in, >100 with creep speed	
F57	0	Fine adjustment for stopping downwards: 50 for direct drive in, >100 with creep speed	
F240	0	Release brake	User defined Multistep control of the frequency inverter: F24 = 0, F32 = 7
F241	4	Inspection slow	
F242	4	Releveling	
F243	3	Creep speed	
F244	4	Inspection fast	
F245	5	Speed floor-drive-in	
F246	6	Speed 2-floor-drive-in	
F247	7	Speed 3-floor-drive-in	
F248	1	Speed 4-floor-drive-in	
F249	2	Speed 5-floor-drive-in	

door Parameter (Door Control)

No.	Value	Description	Advise
F50	65535	Door A approval floor 1 to 16	
F51	65535	Door A approval floor 17 to 32	
F52	65535	Door A approval floor 33 to 48	
F191	65535	Door A approval floor 49 to 64	
F53	0	Door B approval floor 1 to 16	
F54	0	Door B approval floor 17 to 32	

F55	0	Door B approval floor 33 to 48	
F192	0	Door B approval floor 49 to 64	
F128	0	0= charging, 1 = selective door control	
F130	0	Door control (keep closed/keep open): 0 : no keeping of closed/open Bit 1 : keep door open (in case cabin door get drawed back from shaft door) Bit 2 : keep door closed (in case door-bracing opens without keep-shut moment) Bit 3 : keep shut during travel (in case door-braking would bump against the bar) Bit 4 : no door-close-end-switch Bit 5 : AT120 door control Bit 6 : manual door	
F140	0	At door open, second doorzone active: 0 : X9/X10 configures door opening. 1 : X18 configures door opening	
F129	0	re-levelling with open door/ in advance door opening (require safety circuit): 0 : no safety circuit 1 : preopening door 2 : re-levelling with open door 3 : both	
F14		Door-open-time frame after hallr call	
F15		Door-open-time frame after car call	
F121	0	Door scramble: 0 : on, 1 : off	
F115	15	Run-time at door closing (in case there is no end-switch)	
F116	15	Run-time at door opening (in case there is no end-switch)	
F117	60s	Door open time frame after confirmation keep-door-open-button.	
F118	30s	Door open time frame after confirmation open-door for disabled person.	
F165	0	Door opening functionallity: Bit 1: no opening/ closing during inspection. Bit 2: no opening of doors during test mode Bit 3: Door A basic postion open at main stop Bit 4: Door A basic postion open at every stop Bit 5: Door B basic postion open at main stop Bit 6: Door B basic postion open at every stop	
F142	0,1s	Follow-up time of the door-engine-contactors (after end-switch confirmation)	
F145	2	spare	
F119	0	Door mode when priority inside 0 : keep close-door-button pushed for closing the door 1 : Door is closing after command	

Floor display adjustment (Flr.Disp.)

No.	Value	Description	Advise
F65	49	Display Code for floor 1	

F66	1	Display Code for floor 2	
F67	etc.	Display-codes in respect to the table in the attachment.	

Floor approval (Service Flr.)

No.	Value	Description	Advise
F29	65535	Approval floors 1 - 16	
F30	65535	Approval floors 17 - 32	
F31	65535	Approval floors 33 - 48	Enter as bitmask!
F190	65535	Approval floors 49-64	
F137	65535	Defines floors, which can be blocked with key-switch: Bitmask 1-16	
F138	65535	Bitmask 17-32	
F139	65535	Bitmask 33-48	
F199	65535	Bitmask 49-64	
F236	65535	NS-CB Floor 1-16	
F237	65535	NS-CB Floor 17-32	
F238	65535	NS-CB Floor 33-48	
F239	65535	NS-CB Floor 49-64	

Floor blocking (Floor Block)

No.	Value	Description	Advise
F161	0	Floor blocking (F137,F138,F139) 0: no block 1: block by time F131 2: block by key-switch	
F131	0	Floors able to block 0: inactive 1～64: number of the floor to block.	
F132	0	Time from when floor <F131> have to be blocked: e.g. 730 for 7:30.	
F133	0	Time from when floor <F131> have to be un-locked. e.g.: 930 for 9:30.	

Forced stop definition (Comp. Stp.)

No.	Value	Description	Advice
F134	65535	Bitmask floors 1 - 16	When crossing the setted floors, the lift mandatory stops, even without command.
F135	65535	Bitmask floors 17 - 32	
F136	65535	Bitmask floors 33 - 48	Makes only sence in hotels.

Fill-up building/clear building definition (Heavy Traf.)

No.	Value	Description	Advice

F231	0	Approval for function fill-up building/ clear building 0: no function 1: fill-up building 2: clear building 3: both functions	
F232	730	Starting time for fill-up building: e.g. 730 means 7:30	
F233	930	Finish time for fill-up building: e.g. 930 means 9:30	
F234	1700	Starting time for clear building: z.B. 1700 means 17:00	
F235	1830	Finish time for clear building: z.B. 1830 means 18:30	

5.Shaft selection

The shaft selection consists of a incremental encoder and solenoid switches, respectiveley sensors.

The incremental encoder optinaly is positioned on the engine or in the shaft.

Especially for rope lifts it is used the encoder of the engine, which can hand over at the most of the frequency inverters via encoder output (encoder simulation) to the controller.

In this case it is entered the effectiv datas for the parameters F6 (nominal speed), F7 (engine speed) and F8 (encoder release).

For slowly running synchronous motors it mostly have to be juggeled with the parameters nominal-rotation-speed and encounter-puls-rate. E.g. 150U/min at 2048ppr changed to 600U/min (*4) and 512 ppr.

If the encoder is assembled in the shaft (rotating string) for the nominal-rotation-speed have to be entered an equivalence-rotation-speed (equates encoder-rotation-speed).

For the system used by us with carbon cord show up the following values:

(F7)	0,8	1	1,2	1,4	1,6	m/s
(F8)	294	367	441	514	588	RPM

NEO   (Emergency stop TOP)

IEO   (Inspection stop TOP)

Car

(Downslow switch TOP)

KO

Downslow switch v>2.5m/s

KO1

v	Distance (mm)	
	L.KO	L.KO1
0,63m/s:	950	
1,0m/s:	1300	
1,6m/s:	2400	
1,8m/s:	2600	
2,0m/s:	2400	3800
2,5m/s:	2400	5600

KO1
only if v>2.5m/s

KU1
v>2.5m/s

KU1

Downslow switch v>2,5m/s

C
D
Car

KU
Downslow switch DOWN

IEU

D
C
Inspection switch DOWN
EmergencyStop DOWN

KU

IEU
NEU
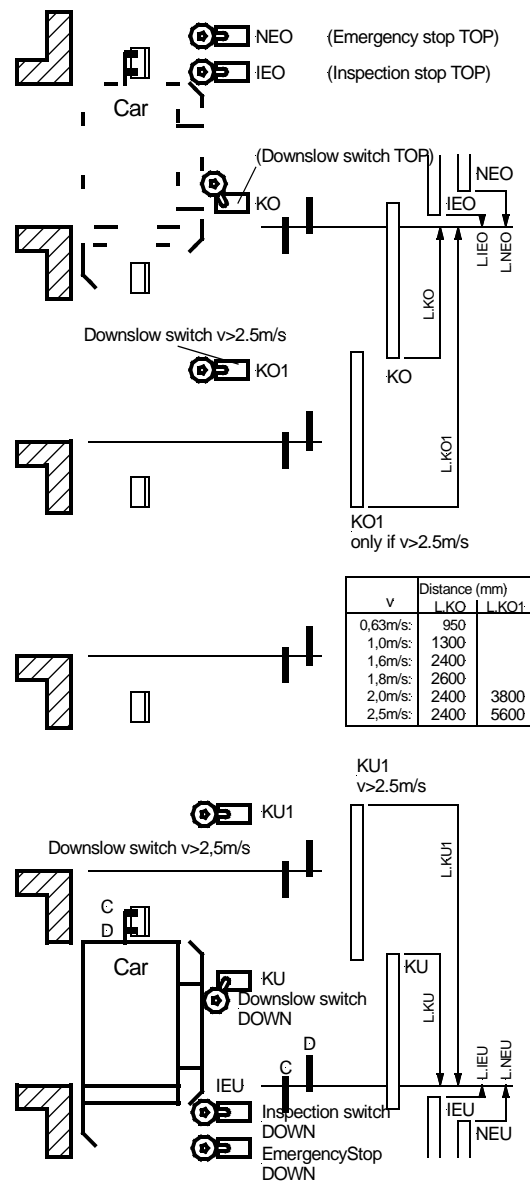
re-levelling sensors:

As the shaft selection is done with the engine encoder, the slip of the tractions sheave have to be compensated. For this, there are in every floor re-levelling-plates installed with about 220mm length. (The
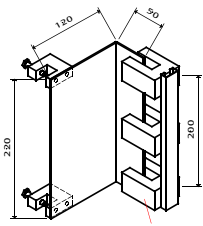
length is not important, but it have to be identic in all floors).

This plate will be evaluated by two inductiv sensors C and D. C is the upper, D the lower.

Solenoid switch:
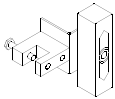
Additionally there are in the shaft ceiling and in the shaft pit each 2 bi-stable solenoid-switches (there could also be roller-switches with repective curves at the cabin). Correction above and below, as well as inspection-end above and below.

It is important, that the switches are installed as opener. By crossing the above correction- and inspection-switch they have to be open on the upper side and closed on the lower side. For the lower positioned ones, the same is valid respectively contrairiwise.

Correction switch

The correction switches serve the deceleration at the termian end stops in case of error (blackout of incremental encoder) and for learn trip. They are also used for correction of the incremental-encoder-datas. In the set of drawings, page 50 you can find these respectivly to the speed recommendet distances. The exact pitch for the braking distance which is choosen by the controller is not important, as this is assigned by the chossen parameters. However, braking distance and pitch should not have a bigger difference than 45cm.

Inspection end switch

The lower inspection end switch have to be installed in that way, that it opens right before the emergency limit switch is activated, but after the re-levelling-sensor D lower the precision plate is freed. C is mentionend in the plate.

For the upper inspection switch it is in the respective way, means IEO will be activated (open contact) if the sensor C is upper the precision plate and D is still at the plate. Also in this case the emergency limit switch should be a bit away, that the lift stops before the emergeny limit switch is activated.

The inspection end switches are important for the learn trip.

Intelligent magnetic sensors iMS45

Meanwhile, all above mentioned switches are integrated in one compact sensor-system. Due to this the montage and adjustments are made really easy.

The iMS45 have up to 4 solenoid sensors, which are together with a programm able analysis-electric can generate up to eight switching signals. For a complete shaft selection one iMS45-POS is enough. Especially for machineroomless an additonal iMS45-SPD sensor will be attached, which detect the speed and rotation of the driving wheel. This is displayed at the Drive monitor, which is the display and analysis unit.
The sending of datas itself will be done via a serial conection without malfunction rate RS485-connection.

Assembly and function

Assembly
The sensor is in a stable aluminium housing, which is also available as IP54-version which is used in firefighter lifts.
The solenoids are flat solenoids with 15mmx7mm of cross-section and a variable length. The solenoids are installed at the button of the arrester rails.

Function
In the iMS45 are 4 solenoid sensors, which are measuring the strengh and polarity of the magnetic field. An analysis unit detect the respective switching signals and send these serial to the cabine, respectively to the drive (driving wheel) for controlling/ stearing. Additionally the iMS45-POS have an independent transistor output for e.g. contacting a chanel of a security circuit.
different detections:
* Single magnet north
* Single magnet south
* Doubble magnet upper north/ lower south
* Doubble magnet upper south/ lower north
* Tripple magnet north in the middle
* Tripple magnet south in the middle
* Crossing direction
* Crossing speed
* North/south transition is detected exactly of each milimeter, mostlikely independent on the distace sensor/ magnet

Montage scheme iMS45_POS

Track Pos (Levelling X9/10, Doorzone Slowdown X7/8 and X3/X4 Learntriplimit X5/6)

Triple magnet (North in the middle) defines Learntriplimit up (X5, IEO)

Top Floor

short magnet south
short magnet north
reference point floor level
long magnet south

shortmagnets length 20mm
longmagnets length 150mm

Top Floor

distance by speed = 1.0 m/s 1.4m
distance by speed = 1.6 m/s 2.8m

Reference point slowdown up (X7)
double magnet short north below

Attention!
Sensor POS is asymetrical! The active Sensor element must show to the guiding rail (marked).
Pos sensor must be always right from rail.
Wrong installation may cause malefunction.

Slowdown magnet up doublemagnet round with north magnet below south magnet

Floor 2....
floor 2 ...n-1: no slowmagnets required!

Levelling and Doorzone:
flat magnet
Width 10, Depth 8, Length 150mm
Northmagnet (blank)

Reference point floor level

flat magnet
Width 10, Depth 8, Length 150mm
southmagnet (marked with white)

slowdown X8
double magnet north above south

reference point slowdown X8

Slowdown magnet down (only bottom floor)
doublemagnet round with north magnet above south magnet

Polarity North or South means the pole which shows to the sensor.
South is marked with **white**.

distance by speed = 1.0 m/s 1.4m
distance by speed = 1.6 m/s 2.8m

triple magnet (south in middle) defines learntrip limit x6 double magnet north above south

Bottom Floor

long magnet north
reference point floor level
short magnet south
short magnet north

10..30V
RS485
Sensor
0V

brown	1	+10...30VDC
white	2	D+ sLink
black	4	D-
gray	5	Out E NPN 200mA
blue	3	0V

POS position sensor

LED2
1 Ub brown
3 GND blue
2 D+ white
4 O- black
5 E gray
LED1

LED1: Sensor is online (connection to DriveMonitor Ok)
LED2: Sensor is detecting magnet

	name	date	magnetic sensor, shaft selector	No:		
created	M.Aicher	09.11.2009		Page	50	Ver. 0
last modif.						

Montage scheme iMS45_SPD (only for machine room less lifts)

traction wheel

magnets round D=6mm

polarity and number of magnets not important.
5 or 6 magnets around the wheel are ok

LED1: Sensor is online (connection to DriveMonitor Ok)
LED2: Sensor is detecting magnet

Position of sensor important for speed and direction detection!
In case of wrong direction on DriveMonitor turn sensor 180°.

Speed-Sensor MS485 SPD at traction wheel
check that sensor is in right position, because for correct function the sensors must be mounted in the right way!

SPD
LED1
1 Ub
3 GND
2 D+
4 D-
LED2

10..30V
RS485
Sensor
0V

brown	1	+10...30VDC
yellow	2	D+ sLink
green	4	D-
	5	
white	3	0V

	name	date	magnetic sensor, Speed Sensor	No:		
created	M.Aicher	09.11.2009		Page	52	Ver. 0
last modif.						

6.SM01 F5021 main board

SM01 F5021 Mainboard Terminals

Configuration of inputs and outputs:

The in- and outputs are limited free configurable. The following table shows the basic settings which are ok in the most of cases. Some signals have a different configuration in some special cases. These specials you can find in the electrical drawing of each case. Thus significant is the electrical drawing.

SM01 terminals:

Terminal		Name	Description	Function	Advise
JP1	1	X0	Signal inspection on, respectively normal operation	input N	
	2	X1	Inspection/return motion up	input N	
	3	X2	Inspection/return motion down	input N	
	4	X3	Delay switch upwards/above for v>2,5m/s,	input N	F24=5
			at short stop in the upmost stop.		
			Counting impulse B (hydraulic lift with magnet switch)		F24=3
	5	X4	Delay switch downwards for v>2,5m/s,	input N	F24=5
			at short floor in the lowest stop.		
			Counting impulse A (hydraulic lift with magnet switc)		F24=3
	6	X5	learn trip -end-switch upwards/top	input N	
	7	X6	learn trip -end-switch downwards/down	input N	
	8	X7	Delay switch upwards/top	input N	
	9	X8	Delay switch downwards/down	input N	
	10	X9	re-levelling upwards (levelled)	input N	
	1	X10	re-levelling upwards (levelled)	input N	
	2	X11	Converter error signal or ready signal	input N	Rope lift
			Monitoring approval-relay of the downwards valve		Hydraulic lift
	3	X12	Firedepartement-controlling on	input N	
	4	X13	Fire stop 1	input N	
	5	X14	Fire stop 2	input N	
	6	X15	Motor contactor K1 Monitoring	input N	
	7	X16	Motor contactor K2 Monitoring	input N	

Terminal		Name	Description	Function	Advise
	8	X17	Break contactor K8 Monitoring	input N	Rope lift
			Monitoring of the valve approval relay		Hydraulic lift
	9	X18	Door-zone-signal/ monitoring of safety circuit	input N	
	10	X19	Inverter RUN signal (open breaks signal)	input N	Rope lift
			Softstart RUN signal (Approval for drive upwards)		Hydraulic lift
JP3	1	X20	Monitoring of the engine temperature	input N	
	2	X21	Lift shutdown at the next stop	input N	
	3	X22	Monitoring open breaks	input N	Rope lift
			Monitoring minimum preasure		Hydraulic lift
	4	X23	Monitoring closed breaks	input N	Rope lift
			Monitoring preasure relief		Hydraulic lift
	5	X24	Anti surf (shaft door monitoring) deactivation	input N	
	6	X25	automatical evacuation on	input N	
	7	COM	common mass for inputs		
	8	COM			
	9	COM	Feed-in mass of the optocoupler	0V feed-in	
	10	+24V	Supply of the optocoupler	24V feed-in	
JP4	1	TXA1+	CAN_H of CAN-Bus 1 inside the lift	datas	Use Twisted Pair lines!
	2	TXA1-	CAN_L of CAN-Bus 1 inside the lift	datas	
	3	0V	GND		
	4	+24V	+24V		
JP5	1	TXA2+	CAN_H of CAN-Bus 2 for lift groups	datas	Use Twisted Pair lines!
	2	TXA2-	CAN_L of CAN-Bus 2 for lift groups	datas	
	3	0V	GND		
	4	+24V	+24V		
JP6	1	AI1	Analog output current 4...20mA	output AI	
	2	AGND	Feed-in mass for analog output	supply	
	3	AVS	Analog output power 0...10V speed set point FU	output AV	
	4	AVL	Analog output power 0...10V torque set point FU	output AV	
JP7	1	B-	Encoder input channel B symmetric	input RS422-	
	2	B+		input RS422+	
	3	A-	Encoder input channel A symmetrisch	input RS422-	
	4	A+		input RS422+	
JP8	1	+15V	Powersupply for HTL encoder!!	supply output	Attention! Do not conect 5V encoder!

Terminal		Name	Description	Function	Advise
	2	0V			
	3	A	HTL inputs A and B (Open Collector) 0-100kHZ		
	4	B			
JP9	1	Y0	Pre-controller-relay break contactor K8	relay-output	Rope lift
			Valve-approval-relay		Hydraulic lift
	2	Y1	Pre-controller-relay break contactor High voltage for arround 2s	relay-output	Rope lift
			Approval-relay downwards-valve		Hydraulic lift
	3	Y2	motor contactor K1	relay-output	
	4	Y3	motor contactor K2	relay-output	
	5	COM1	COM of relay-contacts Y0-Y3		
JP10	1	Y4	Door-open relay door A	relay-output	
	2	Y5	Door-close relay door A	relay-output	
	3	Y6	Door-open relay door B	relay-output	
			Collected malfunction message		Circuit plan!!
	4	Y7	door-close relay door B	relay-output	
			Engine tuning FUJI Gearless with incremental encoder		Circuit plan!!
	5	COM2	COM of relay-contacts Y4-Y7		
JP11	1	Y8	Trigger K14 (bypass door switch)	relay-output	For Safety circuit
	2	Y9	End of automatical evacuation	relay-output	
	3	COM3	COM of relay-contacts Y8-Y9		
	4	Y10	Trigger frequency inverter upwards	relay-output	Rope lift
			valve fast open		Hydraulic lift
	5	Y11	Trigger frequency inverter downwards	relay-output	Rope lift
			valve slow open		Hydraulic lift
	6	Y12	Inverter Run-signal	relay-output	Rope lift
			valve fast down		Hydraulic lift
	7	Y13	Multi-Step 1 speed signal	relay-output	Rope lift
			valve slow down		Hydraulic lift
	8	Y14	Multi-Step 2 speed signal	relay-output	Rope lift
			LRV inspection		Hydraulic lift
	9	Y15	Multi-Step 3 speed signal	relay-output	Rope lift
			LRV additional speed		Hydraulic lift
	10	COM4	COM of relay-contacts Y10-Y15		
JP12	1	N	N-wire of the input terminals	inputs 230VAC for scan of the	
	2	X26	Scan emergency stop sector of the safety loop		
	3	X27	scan end of safety loop		

Terminal		Name	Description	Function	Advise
	4	X28	scan revolving door contacts	security circuit	
	5	X29	additional highvoltage input		
	6	N	N-type to the engine and break contactor		
JP20	1	GND	Voltage supply contact of the main board		
	2	GND			
	3	-			
	4	+24V			
	5	GND			
	6	GND			
JP15	1	DCD	RS232 interface		
	2	RXD	RS232 interface		
	3	TXD	RS232 interface		
	4	DTR	RS232 interface		
	5	SGND	RS232 interface		
	6	X			
	7	X			
	8	X			
	9	+5V	Only active if jumper J2 is installed. (hand terminal)		
JP22	1	X			
	2	GND			
	3	D+	RS485-A		
	4	D-	RS485-B		

7.SM02/SM03 cabin module
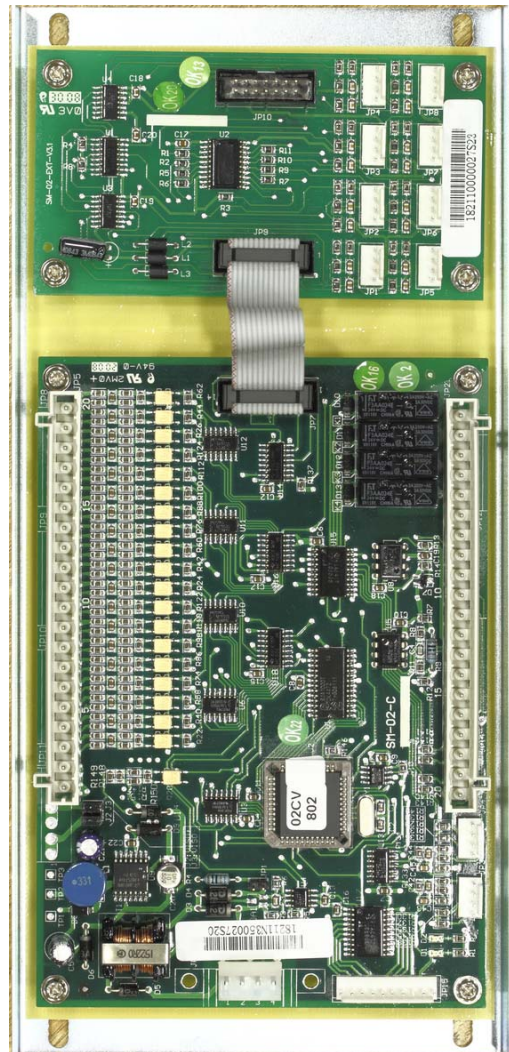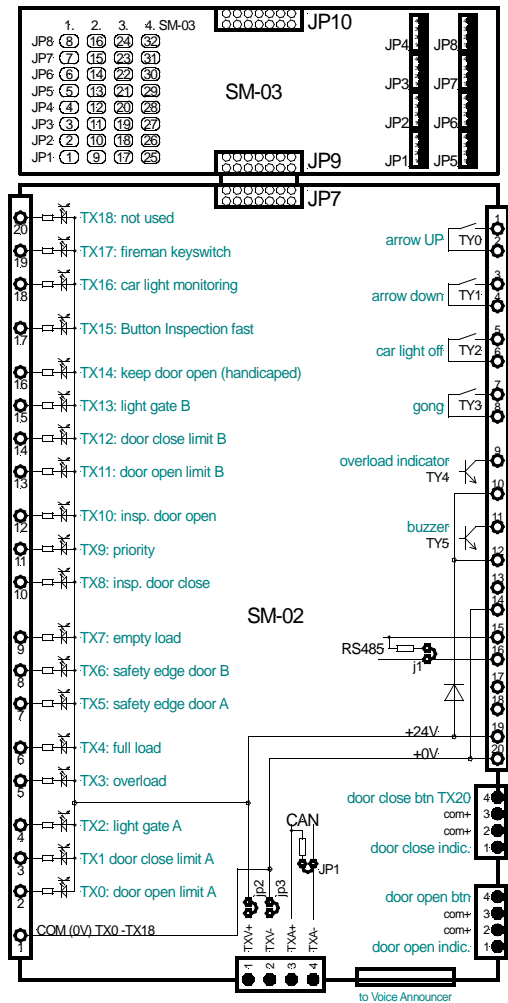
Advise:

This SM02 will be replaced in future by SM02/H (in the cartop box) and SM03/G (in the COP). The trigger of the doors (open and close) won´t be done anymore by SM01 in the control cabinet; this will be done by SM02/H in the cartop box. (changed configuration)

SM02 Anschlüsse

Terminal		Name	Descripion	Function	Advise
JP2	1	TY0	direction upwards	relay-output	
	2	C.TY0	COM TY0		
	3	TY1	direction downwards	relay-output	
	4	C.TY1	COMTY1		
	5	TY2	Cabin light switch off	relay-output	
	6	C.TY2	COMTY2		

Terminal		Name	Descripion	Function	Advise
	7	TY3	Gong (acustic signal)	relay-output	
	8	C.TY3	COM TY3		
	9	TY4-	Overload indicator -	Transistor NPN	
	10	TY+	Overload indicator +	+24V	
	11	TY5-	Buzzer- (acustic signal)	Transistor NPN	
	12	TY5+	Buzzer+ (acustic signal)	+24V	
	13	AV+	Analog input 0..10V (weight measurement)		
	14	AV-	Analog input GND		
	15	D+	RS485-A	datas	
	16	D-	RS485-B	datas	
	17	-			
	18	-			
	19	+24V	Power supply optocoupler		
	20	0V			
JP3	1	TY	Indicator door-open-button -	Transistor NPN	
	2	C+	Indicator door-open-button -	+24V ü. R	
	3	C+	Door-open-button contact	+24V ü. R	
	4	TX19	Door-open-button contact	input P	
JP4	1	TY	Indicator door-close-button -	Transistor NPN	
	2	C+	Indicator door-close-button -	+24V ü. R	
	3	C+	Door-close-button contact	+24V ü. R	
	4	TX20	Door-close-button contact	input P	
JP5	1	COM	COM for the inputs from TX0 till TX18	GND	
	2	TX0	Door-open-end-switch door A	input N	
	3	TX1	Door-close-end-switch door A	input N	
	4	TX2	Light gate door A	input N	
	5	TX3	Over load switch	input N	
	6	TX4	Full load switch	input N	
	7	TX5	Return motion switch door A	input N	
	8	TX6	Return motion switch door B	input N	
	9	TX7	Empty load-switch	input N	
	10	TX8	Door-open-button inspection	input N	
	11	TX9	Priority inside	input N	
	12	TX10	Door-close-button inspection	input N	
	13	TX11	Door-open-end-switch door B	input N	
	14	TX12	Door-close-end-switch door B	input N	

Terminal		Name	Descripion	Function	Advise
	15	TX13	Light gate door B	input N	
	16	TX14	button door keep open	input N	
	17	TX15	button inspection fast	input N	
	18	TX16	Cabin light monitoring	input N	
	19	TX17	Firedepartement-key-switch	input N	
	20	TX18	Free	input N	
JP6	1	TXV+	+24V supply SM02		
	2	TXV-	GND supply SM02		
	3	TXA+	CAN_H		
	4	TXA-	CAN_L		
JP15	1	D0	output to control of a voice announcement up to 255 annoucements.	output NPN	
	2	D1		output NPN	
	3	D2		output NPN	
	4	D3		output NPN	
	5	D4		output NPN	
	6	D5		output NPN	
	7	D6		output NPN	
	8	D7		output NPN	
	9	GND	Voltage supply voice message		
	10	+24V			
JP1			Jumper for CAN Bus termination. Only if the termination is not activated yet in the cabin indicator board. (SM04)		
JP7			Connector for button-connection-module SM03		
J2/J3			In case voltage supply is only via JP6 install both bridges. **In no case** install if JP2.19 and JP2.20 get supplied in separate!		

SM03 button module

It is possible to connect up to eight SM03 each with 8 buttons (up to 64 floor buttons)

Plug	SM03 Nr.1	SM03 Nr.2	...	SM03 Nr.8
JP1	floor 1	floor 9	...	floor 57
JP2	floor 2	floor 10	...	floor 58
JP3	floor 3	floor 11	...	floor 59
JP4	floor 4	floor 12	...	floor 60
JP5	floor 5	floor 13	...	floor 61
JP6	floor 6	floor 14	...	floor 62
JP7	floor 7	floor 15	...	floor 63
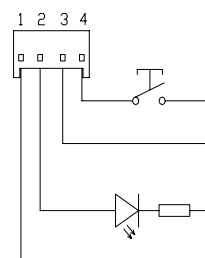
Plug	SM03 Nr.1	SM03 Nr.2	...	SM03 Nr.8
JP8	floor 8	floor 16	...	floor 64

8.SM02/H cartop box module

Terminal		Name	Description	Function	Advise
JP1	1	TXV+	+24V		
	2	TXV-	GND		
	3	TXA+	CANH		
	4	TXA-	CANL		
JP3	1	COM	COM for TY0,TY1		
	2	TY0	Drive-in-gong down	output TU	
	3	TY1	Drive-in-gong up	output TU	
	4	GND	GND		
	5	+24V	+24V		
JP4	1	COM	COM for TX0,TX1		
	2	TX0	End-switch door open door A	input N	
	3	TX1	End-switch door close door B	input N	
	4	COM	COM for TY2-TY4		
	5	TY2	Scrambling door A	output TU	
	6	TY3	Door A closing	output TU	
	7	TY4	Door A opening	output TU	
JP5	1	COM	COM for TX2,TX3		
	2	TX2	Return motionswitch door A	input N	
	3	TX3	Light grid door A	input N	
JP6	1	COM	COM TX4-TX6		
	2	TX4	Monitoring cabin light	input N	

Terminal		Name	Description	Function	Advise
	3	TX5	Full load	input N	
	4	TX6	Over load	input N	
JP8	1	COM	COM TY5	COM	
	2	TY5	Switch of cabin light	output relay	
JP2			Connection for SM09IO/B add-on module		
DB1			RS232 serial interface		
SW1		SW1.1	Both on for CAN-Bus scedulling		
		SW1.2			
SW2		SW2.1	Both on for programm opload.		
		SW2.2	Both on for standard operation.		
JP7	1	D0	Voice annoucement bit0	output TN	
	2	D1	Voice annoucement bit1	output TN	
	3	D2	Voice annoucement bit2	output TN	
	4	D3	Voice annoucement bit3	output TN	
	5	D4	Voice annoucement bit4	output TN	
	6	D5	Voice annoucement bit5	output TN	
	7	D6	Voice annoucement bit6	output TN	
	8	D7	Voice annoucement bit7	output TN	
	9	GND			
	10	+24V			

9.SM09IO/B Add-on module

Terminal		Name	Description	Function	Advise
JP1			Connection to SM02/G or SM02/H		
JP2			Connection for additional SM09IO/B add-on module		
JP3	1	EY0	Open door B	output relay	
	2	EY1	Close door B	output relay	
	3	EY2	Scramble door B	output relay	
	4	COM	COM for EY0-EY2		
JP4	1	EY3	Free	output relay	
	2	COM	COM EY3		
JP5	1	EY4	Free	output relay	
	2	COM	COM EY4		
JP6	1	EY5	Free	output relay	
	2	COM	COM EY5		
JP7	1	EX0	End-switch-door open door B	input N	
	2	EX1	End-switch-door close door B	input N	
	3	COM	COM EX0,EX1		
JP8	1	EX2	Light gate door B	input N	
	2	EX3	Return motion switch door B	input N	
	3	COM	COM EX2,EX3		
JP9	1	EX4	Free	input N	
	2	COM	COM EX4		
JP10	1	EX5	Free	input N	
	2	COM	COM EX5		

10.SM02/G car panel board-module
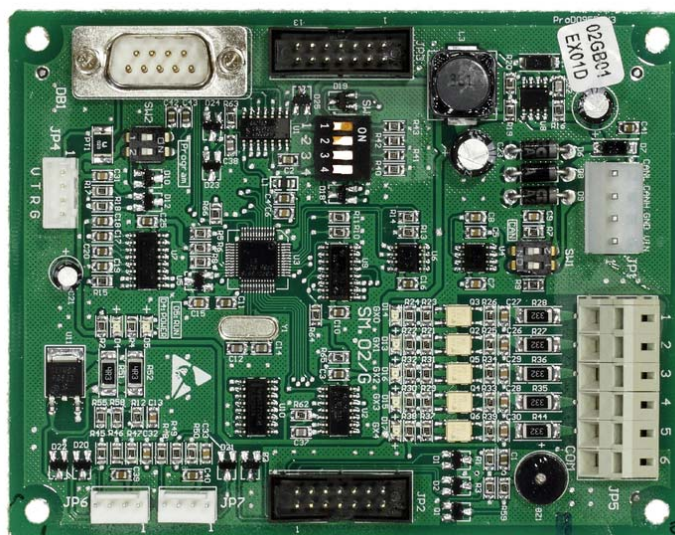
Terminal		Name	Description	Function	Advise
JP1	1	TXV+	+24VDC	Relay-output	
	2	TXV-	GND		
	3	TXA+	CANH	Relay-output	
	4	TXA-	CANL		
JP5	1	TX16	button door keep open (HOLD)	input N	
	2	TX17	Free	input N	
	3	TX18	Priority inside	input N	
	4	TX19	Free	input N	
	5	TX20	Firedepartment control key-switch	input N	
	6	COM	COM 0V, TX16-TX20		
JP6	1	TY	LED door-open-button minus	output N	
	2	LED+	LED door-open-button plus		
	3	GND	Door-open-button		
	4	TX21	Door-open-button	input N	
JP7	1	TY	LED door-close-button Minus	output N	
	2	LED+	LED door close button Plus		
	3	GND	Door-close-button		
	4	TX22	Door-close-button	input N	
JP2			Connection for SM03 call module		
JP3			Connection for SM09IOB add-on module		
DB1			RS232 serial interface		

Terminal	Name	Description					Function	Advise
SW1	SW1.1	Both on for turning on CAN scedulling resistor.						
	SW1.1							
SW2	SW2.1	Both on for programm upload.						
	SW2.2	Both off for standard operation						
SW3		SW3.1	SW3.2	SW3.3	SW3.4	Type cabin indicator board		
		ON	OFF	OFF	OFF	Standard-indicator board		
		OFF	ON	OFF	OFF	Indicator board B-flip side (selective door)		
		OFF	OFF	ON	OFF	Operator indicator board		
		OFF	OFF	OFF	ON	Additional indicator board		

11.SM04HRF floor module

Pin		Description	Function	Advise
JP1	1	TXV+ +24V		
JP2	2	TXV- 0V		
	3	TXA+ CAN_HI	datas	
	4	TXA- CAN_LO	datas	
JP10	1	+24 for button (COM)		For specail versions it is possible that there is a different assignment, e.g. In-use-light, cabine here, etc.
	2	Hall call downwards	input P	
	3	Hall call upwards	input P	
	4	input „Parking"	input P	
	5	Firedepartement control	input P	For spare part oder, please always mention the construction number
	6	VIP Control	input P	
	7	Door-locking-bolt-monitoring at anti-surf	input P	
	8	Not used	input P	
JP9	1	0V output		
	2	+24V output		
	3	Indicator Hall call down	output NPN	Belegung kann abweichen.
	4	Indicator Hall call up	output NPN	
	5	Continued travel arrow downwards	output NPN	
	6	Continued travel arrow upwards	output NPN	

Pin		Description	Function	Advise
JP11	2	GND		Instead of STEP LED dot-matrix-display it is possible to connect at this interface a display of other manufacturer with binary control, COM Anode. Switch SW2-1 to ON!
	4	+5V output (max. 50mA)		
	6	+24V output (max.50mA)		
	8	Free		
	10	A0	output NPN	
	12	A1	output NPN	
	14	A2	output NPN	
	16	A3	output NPN	
	18	A4	output NPN	
	20	In use/ lift in operation	output NPN	
	22	down	output NPN	
	24	up	output NPN	
	26	GND		
SW2	2	OFF: standard; ON: with call up or down you could set the adresse on the LED display.		
	1	OFF: STEP LED-display, ON: external display binary.		

12.Security

	.name	.date		No
.created	M.Aicher	29.10.2009	Safety-Loop	
last modif.	M.Aicher	07.01.2010		Page 03 Vers. 1
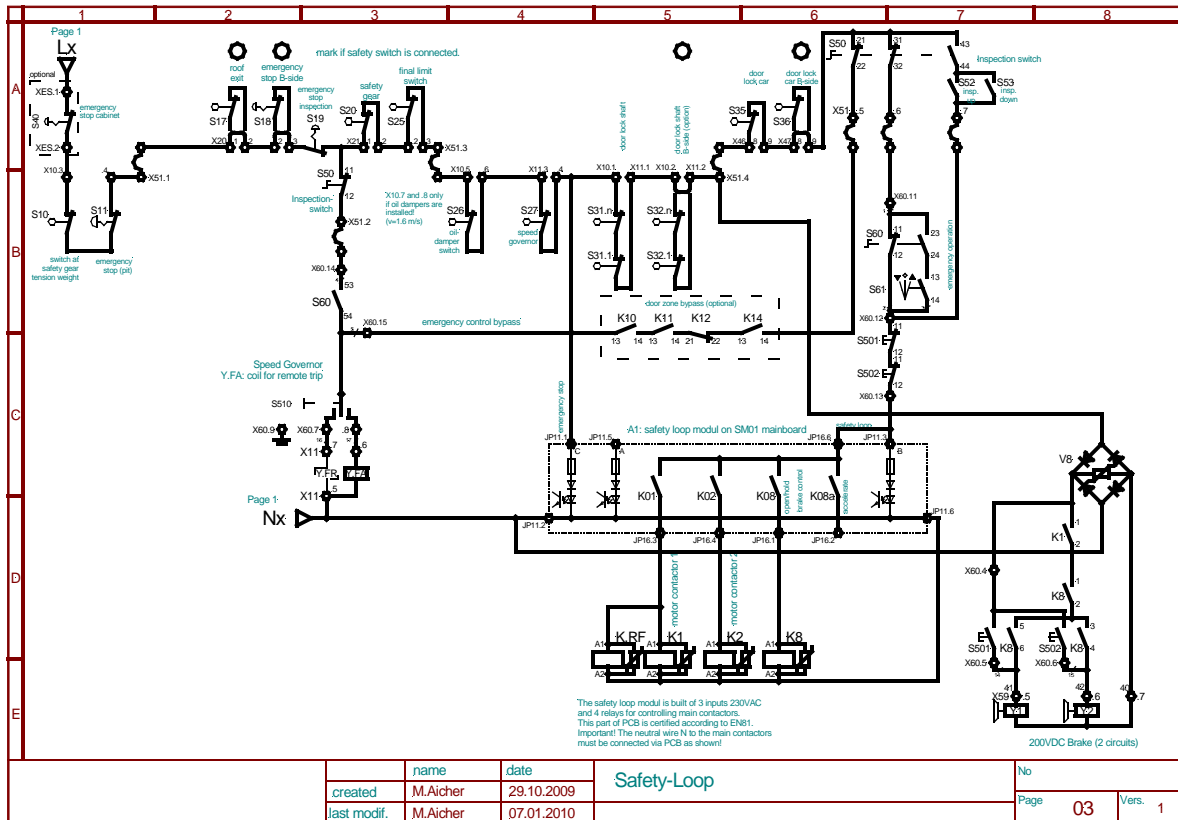
Security circuit

The safety circuit always builded up in the same way and is devided into 3 sections for security switches:

Emergency stop	contains all security switches, which are always activ, thus never are allowed to be by-passed. This affects all emergency stop switches, the counterweight switch, maintenace openings, etc.
emergency control bypass	contains all security switches, which get by-passed in return motion control, thus safty gear, emergency-end-switch, speed restrictor.
doorzonenbypass	contains all blocking switches of the shaft doors and the door contacts of the cabin doors.

At the end of the security circuit conditioned the inspections- and return motion control.

Optional security switch

In the connection scheme all popular security switches drawn in. Security switches which are not always necessary, like blocking switch of the B-door, are drawn in as optional. If it is availble it have to be marked on the connection scheme and certainly also connected.

The terminals for optional security switches are factory-provided by-passed with wire-bridge. So it is secured, that the bridge get removed by connection of a switch.

Matter: By-passing of security circuits!
Basically it is not allowed to make security circuits effectless per by-passing.
But it is not possible to install a lift without by-passing temporary parts of the security circuits.
Only use wire-bridges for by-passing, which you install at the terminals for the security switches.
With this handling in any case the bridge will be removed when you install the switch. Never use
shorting plug bridges – you might forget these conventionally! As wire, please use an eye-catching
one, but not the greenyellow colored one! Please also avoid to have these too long (they should not
loll out of the cabinet – in worst case somebody is closing the door and you may have 230V of the
**Security circuit at the cabinet).**

Security circuit

The security circuit is only needed, if re-levelling with open or pre-operating doors is required! For hydraulic lifts is due to the re-levelling the security circuit mandantory!

The assignment of the security circuit are two sensors, which are operating independent one from the other, to recognize where the door zones are, to compare the datas and respectivley make it possible to by-pass the door contacts within the door zones or not. For instance it should be attained the security of a castor security switch.

The security circuit is based on the common principle of the strip circuit. Every circuit switch part have to change it´s attitude in order to make an alliance possible.

The used security circuit is on a seperate board and is type-examination tested.
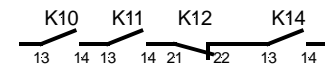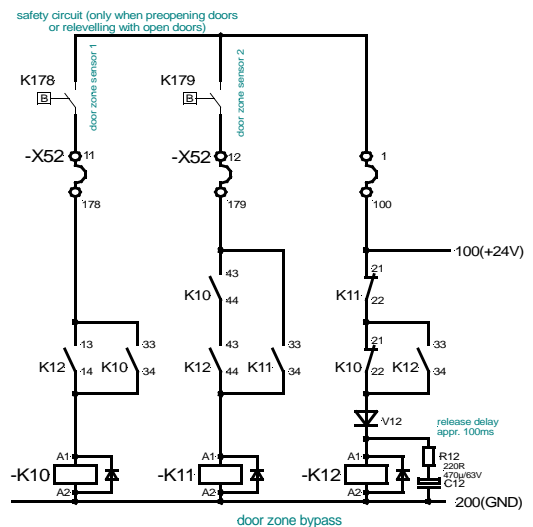
Components

K10, K11 und K12 are contactor or security-relays with **positively driven** contacts. If a closer bonds, the opener stay open and contrariwise.

K10	allocated to the sensor B178 of door zone 1
K11	allocated to the sensor B179 of door zone 2
K12	monitoring of K10/B178 and K11/B 179
K14	relay without security function, allows the controller the disconnection of the bypass.
S 50	security contact in the inspections switch avoid bypassing during inspection.
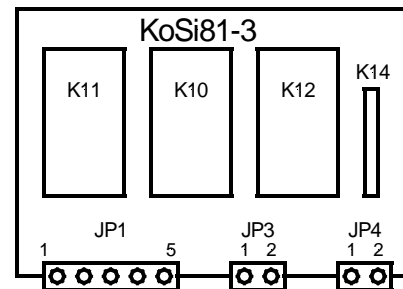
Functionality:

Initial position:	Lift outside of the doorzone, K10 and K11 dropped-out, K12 tightened.
Lift runs in door zone:	B178 and B179 get closed successive or simultaneous. First K10, than K11 activates. K12 drop-out after activation of K11.➔ by-pass completed. R12 and C12 delay the depression of K12 for max. 100ms, in order to make lock K11 possible.

Lift is leaving door zone: B178 and B179 opens, K10 and K11 depresses, K12 activate.
The circuit is ready for the next switching cycle.

Possible sources of error:

Error	Simulation	Action at early opening door (door opens in doorzone)
B178 discontinued/K10 no activation	Pinch off B178	No hand-off. Lift stops in door zone
B179 discontinued/K11 no activation	Pinch off B179	No hand-off. Lift stops in door zone
K12 do not depress	Restrain K12	No hand-off. Lift stops in door zone
B178 hot-wired/K10 do not depress	While leaving door zone, restrain K10 until next run-in.	While leaving the door zone K11 is depressing, K12 do not activate anymore. At the next run-in K11 is not activating anymore. Lift make stop by open the door➔ emergency stop
B179 hot-wired/K11 do not depress	While leaving door zone, restrain K11 festhalten until next run-in.	While leaving the door zone K10 is depressing, K12 do not activate anymore. At the next run-in K10 is not activationg anymore. Lift makes stop by open the door➔ emergency stop
K12 do not activate anymore	Disconnect K12.A1	K10 and K11 do not activate anymore. Lift stop while open the door in the door zone➔ emergency stop

According to EN81 14.1.1 one single error do not lead to a dangerous operating conditon and will be recognized, as the lift will make an emergency stop by disconnecting the security circuit while opening the door within a door zone.

In addition there is existing a further monitoring done by the controller.

Dependent up on the re-levelling sensors, which are independent from the door zone sensors, K14 is activated.

In the unlikely case, that both door-zone-sensors by leaving the door zone would be hot-wired, a by-pass outside of the door zone will be avoided by the circuit via K14.

Additional monitoring by controller

The controller is monitoring via K10, K11, and K12 the security circuit. During the journey the contact chain have to be closed once inside the door zone and have to be opend once outside the door zone. In case of an error, the installation will be shut down at the next stop with error message. Part of encoder

Scan control at security circuit

On the board SM01 F5021 there are 3 inputs for 230V. These are installed according to the requirements of EN81 at scan controls for security circuits. This is confrimed by TÜV with a confirmation assessment.

Basically the circuit consist of pre-resistors, protection diodes and optocoupler with VDE-approbation.

It is executed the terms accourding to EN81 for a secure disconnection of the 230VAC-page from the 24VDC-page as well as for exclusion of errors.

N-Wire

The N-wire of the security contactor , means motor contactor K1 and K2, as well the break contactor K8 and maybe K8a have to be controlled via the board!

At a N-wire-breakage the contactor than have the necessity of drop-out, independent of the theoretical possible chance of a hot-wire in the optocouplers which may make a partial by-pass of the security circuit possible.

Check:

Connect the controller free of voltage!

With the continuity checker between N-input terminal and A2 (N-terminal) of security contactor (K1, K2, K3, K8), check the run.

With a pluged JP11(main board) you have a run, with pultruded JP11 there must not be any run..

Pilot relay

On the board SM01sup (F5021) there are also 4 pilot relays for security contactors . This part of circuit is also confirmation checked, means it is possible to connect directly the end of the security circle, the security contactore sources their controller voltage directly out of the security circle.

The security contactors, motor contactors K1 and K2, as well the break contactor K8 are seperatly monitored. If there is one of the contactors is not depressed before a journey, the control get´s blocked and have tho be reseted manually.

Monitoring of journey

SmartCom F5021 is monitoring via the encoder of the engine and the re-levelling-sensons the reaktions of the lift in regards on the driving commands to the inverter. If there are signals missing, the drive get´s shut-down, latest after 20sec. .

Restart of journey only possible after reset of the main board.

Check:

1. Advise the lift to drive from the lowest to the topmost stop and do the unplug JP7 respectively JP8 (Encoder-inputs) at the main board. The lift have to be shut dwon after arround 20 sec.

2. Uninstall 170 or 171 (re-levelling-sensors). After arround 20sec. re-levelling the lift get shut dwon.

   You easily can set diving commands via the status window "Call.Func".

   For short lifts 20sec. may be a long time frame. In this case you could reduce temporarily the parameter "Monitoring of journey" via the menu "parameter-group F" in order to simplify the checking.

Subsidiary advises for inspection:

Lift controller of STEP Sigriner Elektronik GmbH are manufactured and checked with EN81 and VDE-standards. The used components, especially the main- and auxiliary contactore are selected respectively to the requirements of EN81, VDE0100, VDE0660.

All adjustable components, like engine-security-switch, frequency inverter etc. are allready pre-adjusted by us as far as possible. It is incumbent upon the installing company to adjust these components before implementation with respect to the resources..

By default the security cycle is fused with a power protection switch with F2 (2A Charakteristik C). As a maximum a power protection switch with 4A can be used.

gernerally:

Keep door closed:	In order to be able to check without any interruption, it is possible to block the door in the menu under subtitle Test Run and unter subtitle Reg it is possible to make calls.
Inspection travel:	always have priority before return motion and is also possible with activated

	return motion control. The by-pass of the security switch is raised. With reaching the correction switch above or below, the speed is reduced. At the inspections-end-switch will be stopped. Inside of the door zone the function of the door can be checked with "door open/close". Otherwise during inspection the door is always closed.
Retrun motion drive:	this is only possible with deactivated inspection control. Appropriate security switches, like emergency-end-switch, arrester-switch etc. will be by-passed. Also the return-motion-drive is stopped at the inspection-end-switches. These have to be by-passed for testing the driving-ability.
Cabin light:	If blackout of cabin light (simulation with F02) the lift will be shut down in the next stop and the door will be opened.
Temperature of engine:	A PTC thermistor switch-off leads as well to a shut down in the next possible stop.

Isolation measurement:

By default the controller undergo a isolation masurement in the factory. The at face arranged measurement refers only to the connected resources of the lift.

Absolutely consider the valid security instruction for at face isolation measurement. There is a danger for humans and technique!

In order to avoid damages of the controller, switch off the respective fuse F2 at the controller for measurements.

Connection of frequency inverter, USV-systems and other systems with power semiconductors and filter, most likely have to be disconnected or hot-wired according to manufactures for testing purpose. For this follow the advises of the manufactures.

Incorrect done isolation measurement can lead to extensive damage. In this case STEP Sigriner Elektronik Gmbh explicit do not guarantee!

13.Triggering of frequency inverter

SmartCom have 2 kinds of triggering a frequency inverter available:

1. Analog: The converter is triggered via the analog output. The travel curve at this will be created by the controller, whereby direct drive-in makes possible with every converter with analog input.

2. Multistep binary: The converter provides dependent of 3 binary signals, up to 6 steps of driving. The travel cycle mostly defined by the converter.Direct drive-in is not possible. Through ideal choice of speed, it is however possible to reach minimal creep ways. Binary triggering is for most of the industry converters possible.

Generally

Before start of a journey for all controllers the erroroutput and the ready message of the converter have to be inactive, also all security contactors (K1, K2, K8) have to be depressed. First of all, after a driving command the main contactors K1 and K2 will be activated. Via the feedback (contactor monitoring) SmartCom is checking the activation. If this is effective, the conrol of the converter will be activated. Now a RUN-signal is happen from the converter to the control. After that the break is opening. The triggering of the contactore always have to be happen from the controller, as otherwise the timing of the contactor monitoring would not work.

If you buy the controller completly with converter or provide the converter, it will be pre-programmed and adjusted with intelligent values at our testbed. Than the normal case you just need to do at face adapting the motor datas and maybe have to do a auto-tuning.

Triggering Multistep binary

At nearly all industrie-converters it is possible to choose more speeds binary, means e.g. with 3 control cables it is possible to choose 8 speed variants.

Smartcom is using 3 cables for choosing 6 speeds. Based on this the travel characteristics could be better optimazed. V1 to V3 intended as follows:

V1: Journey from floor to floor

V2: Journey with a floor in between

V3: Journey with more than one floor in between

In the normal case V1 is enough, but for fast lifts (V>1,6m/s) or for short stops V1 is needed for Journey from floor to floor, V2 for long-distance journey. For lifts faster than that (>3m/s) V3 come into the play.

The proper breaking distances are setted at the encoder with the speeds, high- respectively lowruntimes and roundings (S-curve). Which speed is choosen by the controller depends on the respective prameters in the controller (F6-F11).

Multistep 1	Multistep 2	Multi Step 3		e.g. Parameter Yaskawa
Y13	Y14	Y15	speed	
0	0	0	Stop	D1-01
1	1	0	re-levelling	D1-04
0	0	1	Inspection	D1-05
1	0	1	V1	D1-06
0	1	1	V2	D1-07
1	1	1	V3	D1-08

Travel cycle

Speeds and breaking distances

Out of the lift datas result the frequenzes which have to be setted up at the encoder: $f = v \bullet \dfrac{f_{Nenn}}{v_{Nenn}}$

For a lift with 1m/s with 50Hz the inspection speed 12,5Hz have to be setted, if 0,25m/s are desired.

The braking distance results out of the desired delay, of the speed and of the rounding.

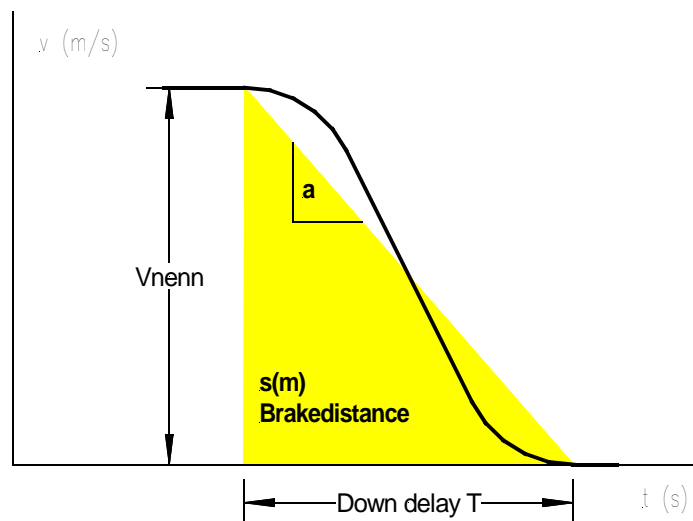Approximately we forget about the rounding off and act on the assumption of a middle delay.

The time for the looping floor results out of "Vnenn" and "a" as follows: $T = \dfrac{v_{Nenn}}{a}$

With a deceleration of 0.5m/s²it results a down delay of 2s.

In thes time the lift runs
$s = 0,5 \bullet v_{Nenn} \bullet T$

For 1m/s and 2s results a brakedistance of 1m.

14.Parameter list

No.	Marking	Description	Stand.	Area	Unit	Value
F0	acceleration	acceleration	550	200~1500	mm/s2	0.55m/s2
F1	deceleration	deceleration	550	200~1500	mm/s2	0.55m/s2
F2	S Jerk T0	Rounding off at start	1300	100~4000	ms	1.300s
F3	S Jerk T1	Rounding off at crossing to standard operation	1100	100~4000	ms	1.100s
F4	S Jerk T2	Rounding off at the beginning of the delay phase	1100	100~2000	ms	1.100s
F5	S Jerk T3	Rounding off at stopping	1300	100~2000	ms	1.300s
F6	Rated speed	Nominal speed of the lift	1750	200~6000	mm/s	1.75m/s
F7	Motor speed	Nominal rotation speed of engine	1450	50~10000	rpm	1450rpm
F8	Encoder Pulses	Encoder release (Pulse per rotation)	1024	100~20000	ppr	1024ppr
F9	Parking floor	Parking floor	1	1~48		
F10	Floor offset	Floor offset at lift groups	0	0~48		
F11	No. of Floor	Number of floors	18	2~48		
F12	Inpection Speed	Speed for inspection	250	10~500	mm/s	0.250m/s
F13	Relevel Speed	re-levelling speed	60	10~400	mm/s	0.060m/s
F14	Hall call door close delay	Door-open-time frame after exterior call	40	0~600	0.1s	4.0s
F15	Car call door close delay	Door-open-time frame after interior call	25	0~600	0.1s	2.5s
F16	Brake open delay	Delay between FU Run signal and break contactor on.	2	0~50	0.1s	0.2s
	Softstart Delay	Delay between K1 off and K2 off	5			
F17	Brake close delay	Delay between FU-stop command and break contactor off	6	0~50	0.1s	0.6s
F18	Fire home	fire floor 1	1	1~48		
F19	Second fire home	fire floor 2 (have priority)	1	1~48		
F20	Homing Delay	Parking time frame (until journey to <F9>) 0 : no parking journey	0	0~600	s	0s
F21	Level adjust distance	V0 stop Distance	6	2~40	mm	6mm
F22	Main landing	Main stop at group function, see (F20, F196, F197)	1	1~48		
F23	Group control mode	Groupfunction 0 : Simplex or Duplex-Master 1 : Duplex slave 2 : at external group processor 3 : at ring groups (see F181)	3	0~3		
F24	Drive Mode	Triggering the frequency inverter 0 : Multistep ; 1 : Analog	0	0~5		

No.	Marking	Description	Stand.	Area	Unit	Value
		3: Hydraulic with solenoid switch, 5: Hydraulic with encoder				
F25	Input Type 1	Typ of input closer alternatively opener for inputs X0-X15	480	0～65535		
F26	Input Type 2	Typ of inputs closer alternatively opener for inputs X16-X31	83	0～65535		
F27	Input Type 3	Typ of inputs closer alternatively opener for inputs TX0-TX15	6283	0～65535		
F28	Input Type 4	Typ of inputs closer alternatively opener for inputs TX16-TX31	0	0～65535		
F29	Service floor setting 1	Approval floor 1 - 16	65535	0～65535		
F30	Service floor setting 2	Approval floor 17 - 32	65535	0～65535		
F31	Service floor setting 3	Approval floor 33 - 48	65535	0～65535		
F32	Inverter type selection in Digital control	frequency inverter typ: 0: YASKAWA,CT,FUJI,iAStar 1 : SIEMENS 2: KEB 3: MICO 4: SIEI 5: Dietz 6: NEW FUJI 7: User defined (look F240～F249)	0	0～7		
F33	Interval between trips in automatic running test	Time between calls at automatic test (accidental commands) 0: no function	0	0～65535	s	0s
F34	Number of trips in automatic running test	Number of automatical test drives 0: no test-drive	0	0～65535		
F35	Fireman mode	0 : Standard EN81-71 firedepartment control 2 : without key in the cabin 3 : with key in the cabin Pubel (RUS) firedept. control 4 : without key in the cabin 5 : with key in the cabin	2	0~5		
F36	Brake switch detection time	Waiting time for break monitoring switch 0 : no break monitoring	10	0～100	0.1s	1s
F37~F43	Spare	Buffer				
F44	Local address in 485 serial communication	Adress for remote surveillance via RS485 network: 255 standard for single lift	255	0～255		
F45	V1 Dec.distance	Breaking distance for V1 (floor drive)	1300	200～2500	mm	1.300m
F46	V2 Dec.distance	Breaking distance for V2 (2-floor drive)	2900	500～4500	mm	2.900m
F47	V3 Dec.distance	Breaking distance for V3 (multiple floor drive)	4000	500～6500	mm	4.000m

No.	Marking	Description	Stand.	Area	Unit	Value
F48~F 49	Spare	Buffer				
F50	Front door-open allowed 1	approval door A at floors 1-16	65535	0~65535		
F51	Front door-open allowed 2	approval door A at floors 17-32	65535	0~65535		
F52	Front door-open allowed 3	approval door A at floors 33-48	65535	0~65535		
F53	Rear door-open allowed 1	approval door B at floors 1-16	0	0~65535		
F54	Rear door-open allowed 2	approval door B at floors 17-32	0	0~65535		
F55	Rear door-open allowed 3	approval door B at floors 33-48	0	0~65535		
F56	Leveling adjustment up	Fine settup for stop upwards: 50 for direct drive-in, >100 with creep drive	50	0~200	mm	50mm
		V0 shut down delay upwards. (at Hydraulic with solenoid switch)	0	0~50	0.1s	
F57	Leveling adjustment down	Fine settup for stop downwards: 50 for direct drive-in, >100 with creep drive	50	0~200	mm	50mm
		V0 shut down delay downwards. (at Hydraulic with solenoid switch)	0	0~50	0.1s	
F58	Speed curve delay at start	Delay between FU Run signal and start of driving cycle	5	0~50	0.1s	0.5s
F59	Spare	Buffer				
F60	Motor contactor 1 detection mode	Engine contactor arrangement: K1 can be positioned before und behind the encoder, K2 is always behind the encoder and always controlled. 0: Engine contactor K1 before FU without monitoring.; 1: Engine contactor K1 before FU with monitoring; 2: Engine contactor K1 behind FU without monitoring 3: Engine contactor K1 behind FU with monitoring	3	0~3		
F61	Gong Output distance	Distance before floor for triggering the gongs	1200	0~1500	mm	1200mm
F62	Traval time limit	time for travel-time-controlling	32	2~45	s	32s
F63	Multi-speed setting	Number of travel steps at Multistep-control of the FU	2	1~5		
F64	Inspection allowed door operate	Approval of door movements at inspection 0 : doors blocked 1 : doors enabled	1	0~1		

No.	Marking	Description	Stand.	Area	Unit	Value
F65〜 F112	Indication of floors	Configuration of the displays (display codes) for the floors 1-48		0〜255		
F113~ F114	Spare	Buffer				
F115	Door close time limit	Door run time close (in case of no end-switch)	15	5〜30	s	15s
F116	Door open time limit	Door run time open (in case of no end-switch)	15	5〜30	s	15s
F117	Holding time	Door-open time frame after pushing the keep-door-open-button.	60	0〜255	s	60s
F118	Holding time for the handicapped	Door-open time frame after pushing the keep-door-open-button for disabled person.	30	0〜255	s	30s
F119	Priority Mode	Door mode if priority inside 0 : Hold door close button for closing the door 1 : Door make close after command	0			
F120	Number of registrations an-nuisance	Violation detection interior call 0 : no function 1 : Stop without erasing light grid command 2〜20 : max. Number of accepted commands at the same time when empty load TX7 (cabin empty) is active.	1	0〜20		
F121	Forced door-closing enable	Door scrambling: 0 : off, 1 : on	0	0〜1		
F122	Run enable delay	Time between break off and FU drive signal off (speed and direction).	3	0〜100	0.1s	0.3s
F123	Call classification	Type of existing exterior-calls 0 : only simple calls (not selective) 1 : Selective doors: SM-04 address 49~96 for B-door exterior-calls. 2 : calls for disabled persons: SM-04 address 49~96 for disabled person exterior-call (priority). 3 : Selective door and disabled-person-calls: SM-04 address 33~64 for B-door calls, 65~96 for disabled person-calls (priority).	0	0~3		
F124	Spare	Buffer				
F125	releveling times	Number of failed tries of re-levelling until malfunction is displayed.	0	0〜5		
F126	Short floor deceleration distance	Short travel delay distance	300		mm	300mm

No.	Marking	Description	Stand.	Area	Unit	Value
F127	deceleration switch distance detect	Monitoring the distance of the delay switches before terminal stops (in case of to short) 0 : no 1 : yes	0	0～1		
F128	Front and rear door operate mode	Door mode at two doors 0 : selective door control active 1 : both doors controlled together	0	0～1		
F129	Relevelling with door open and/or pre-open door Enable	re-levelling with open door/ prerunning door opening (requires security circuit): 0 : no security circuit 1 : prerunning door 2 : re-levelling with open door 3 : both	0	0～7		
F130	Holding door-opening/closing torque.	Door triggering (keep close/open): 0 : no close/open-keeping Bit 1 : door open-keeping (in case cabin door is pulled by the shaft door) Bit 2 : door close-keeping (in case tie bolt opens without keep-close-moment) Bit 3 : keep close during the journey (in case tie bolt bangs against the locking bolt) Bit 4 : no door-close-end-switch Bit 5 : AT120 door control Bit 6 : revolving door	0	0～65535		
F131	block floor NO.	blockable floors 0: not active 1～64: number of the floor which have to be blocked.	0	0～64		
F132	block floor start time	Time at which the floor <F131> should be closed: e.g. 730 for 7:30 o´clock	0	0～65535		
F133	block floor end time	Time at which the floor <F131> should be released. e.g.: 930 for 9:30 o`clock	0	0～65535		
F134	Compulsory Stop Floor 1	floor with forced stop (by crossing the lift is stopping mandatory, also without a call) Bit mask for floors 1－16	0	0～65534		
F135	Compulsory Stop Floor 2	Bit mask for floors 17－32	0	0～65535		
F136	Compulsory Stop Floor 3	Bit mask for floors 33－48	0	0～65535		
F137	NS-SW Floor 1	Defines floors, which can be blocked with a key-switch: Bit mask 1-16	65535	0～65535		
F138	NS-SW Floor 2	Bit mask 17-32	65535	0～65535		
F139	NS-SW Floor 3	Bit mask 33-48	65535	0～65535		

No.	Marking	Description	Stand.	Area	Unit	Value
F140	Alone door zone	Second door zone active at door open: 0 : X9/X10 configures door opening. 1 : X18 configures door opening.	0	0～1		
F141	Motor contactor off delay	Caster time of engine contactore : approval off=>contactore off.	5	5～100	0.1s	0.5s
F142	door open/close delay	Caster time of the door engine contactore (after activation of the end-switch)	1	0～10	0.1s	0.1s
F143	Spare	Buffer				
F144	Enable off delay	Caster FU-approval after deactivation of the direction signals.	0	0～100	0.1s	
F145	Spare	Buffer	2			
F146	Spare	Release the scan of SM02	1	Have to be "0"!		0
F147	Spare	Buffer	0			
F148	Valid Period password	PIN for run-time-bound	0	0～65535		
F149	Valid Period mode	0: no run-time-bound 1: approval till date 2: approval for run-time-hours 3:	0	0～3		
F150	Valid Period time 1	Number of year (F149=1) e.g. F150=10 => 2010	0	0～99		
		Number of run-time-hours if <149=2>	0	0～65535		
F151	Valid Period time 2	Month and day if <F149=1> e.g. 531 mean 31st may	0	0～1231		
		F149 = multiplier for F150	0	0～65535		
F152	Fan & light Delay	Caster time for cabin light/ fan after the last travel	180	0～65535	s	180s
F153	Spare	Buffer				
F154	Short Floor	Definition of the short drive floors at hydraulic with solenoid switch	0	0～65535		Bitmask
F155~ F156	Spare	Buffer				
F157	V4 Dec.distance	Breaking distance for V4 at 4 floors drive (at fast lifts)	5500	1500～65535	mm	5.500m
F158	V5 Dec.distance	Breaking distance for V5 at 5 floors drivefahrt (fast lifts)	6500	1500～65535	mm	6.500m
F159	Spare	Buffer				
F160	Cancel Call model	call liquidation Bit 1: Doubble klick on interior-commands liquids all calls. Bit 2: Doubble klick on exterior-commands liquids all calls Bit 3: Violation detection	1	0～7		

No.	Marking	Description	Stand.	Area	Unit	Value
F161	Block floor during time	Blocking of floors (F137,F138,F139) 0: no blocking 1: block with time F131 2: blocking with key-switch	0	0~1		
F162	Spare	Buffer				
F163	OEPS Running	Operation with emergency-power-supply 0: no 1: possible	0	0~1		
F164	Load device type	Type of load-measure-equipment and load-compensation at FU start. 0: Load measurement via CAN-Bus, over-load and full-load-switch via the cabine module, load-compensation calculated by the main module. 1: Load measurement and -compensation via CAN-Bus, over load and full load calculated by the main module. 2: Loadmeasurement and -compensation via CAN-Bus, over load- and full load switch via the cabin module. 3: Load measurement via CAN-Bus, over load, full load, load compensation calculated by the main board	2	0~3		
F165	Door open selection.	Door open functionality: Bit 1: no open/close during inspection. Bit 2: no opening of the door during test-operation Bit 3: door A basic position open at main stop Bit 4: door A basic position open at every stop Bit 5: door B basic position open at main stop Bit 6: door B basic position open at every stop	0	0~65535		
F166~ 167	Spare	Buffer				
F168	Lift numbering for IC card service	RFID card reader 0: no RFID card reader 1~255 adress of the lift	0	0~255		
F169	Setting landings for up/down calls by IC card	RFID card reader generates 0- downwards calls 1- upwards calls	0	0~1		
F170	IC card service floor 1	Floors which are only approved with RFID: Bit mask Interior calls 1~16	0	0~65535		

No.	Marking	Description	Stand.	Area	Unit	Value
F171	IC card service floor 2	Floors wich are only approved with RFID: Bit mask interior calls 17~32	0	0～65535		
F172	IC card service floor 3	Floors wich are only approved with RFID: Bit mask interior calls 33~48	0	0～65535		
F173~ F174	Spare	Buffer				
F175	Creeping speed at start	Start of creep speed also see F186	6	0～100	mm/s	0.006m/s
F176~ F179	Spare	Buffer				
F180	Speed Gain	Assignment of the nominal speed of the lift with top values of the analog outputs. 50.0% - 150.0%, standard 100%	1000	500～1500	0.1%	100.0%
F181	Group Lift No.	Number of the lift within a group: smallest number have highest priority (F32=3)	0	0～7		
F182	Steps of speed reduction switches	Number of driving-steps, which are used for stopping (only at Multistep-control)	2	1～4		1
F183	Speed at self-learning for Analog	Speed at reference journey (only analog-control)	800	100～800	mm/s	0.800m/s
F184~ F185	Spare	Buffer				
F186	Creeping time at start	Time of creeping at start also see F175	50	0～1000	10ms	0.50s
F187	Monitor state	Status Monitoring 0 : Journey counter 1 : Malfunction of encoder 2 : CAN-Bus Rx malfunctions 3 : CAN-Bus Tx malfunctions 4 : CAN-Bus Error-Resets/sec 5 : Duplex Rx-Error 6 : Duplex Tx Error 7 : Duplex Error Resets/sec	0	0～7		
F188	Spare	Buffer				
F189	Spare	Buffer				
F190	Service floor setting 4	Floor approval bit mask 49-64	65535	0～65535		
F191	Front door-open allowed 4	Door A approval bit mask 49-64	65535	0～65535		
F192	Rear door-open allowed 4	Door B approval bit mask 49-64	0	0～65535		
F193	Empty-load compensation at lowest landing	Empty load-compensation at lowest floor	0	1～1000	%%	0.0%

No.	Marking	Description	Stand.	Area	Unit	Value
F194	Full-load compensation at lowest landing	Full-load-compensation at lowest floor	0	1～1000	%%	0.0%
F195	Full-load compensation at top landing	Full load-compensation in topmost floor	0	1～1000	%%	0.0%
F196	2nd main landing by duplex control	2. main stop at Duplex	1	1～48		
F197	3rd main landing by duplex control	3. main stop at Duplex	1	1～48		
F198	Spare	Buffer				
F199	NS-SW Floor 4	Blockable floors bit maks 49-64	65535	0～65535		65535
F200	limited distance in inspection mode	Virtual inspections-end-switch (mm before topmost stop)	0		mm	0
F201	Inspection move for limit switch active	Movements of the cabin moreover the inspection-end-positions (test end-switch and driving ability) 0 : no 1 : relesed	0			0
F202	Button beep and flicker enable	Enabling button Piep and flick of call buttons: Bit 1: button-Piep Bit 2 : flickering ot the interior calls at arrival at the aimed floor Bit 3 : flickering of the exterior calls at arrival Bit 4 : Piep at crossing floors (e.g. for blind persons)	`0	0～15		0
F203	Brightness of button normally	Brightness of the indicators for interior- and exterior calls if not indicated: The low-order 4 bits define the brightness of the external indicators, the more significant 4 bits the brightness of the internal indicators. There are 9 steps of brightness: e.g. Hex 0x11 = Dez 17 defines as well inside, as outside indicators a basic brightness of 12,5% the full brightness (if indicator active) function is also common as dual-illumination.	0			0
F204~ F230	Spare	Buffer				
F231	Heavy up demand and heavy down traffic	Enable function building fill-up/clear 0: no function 1: building fill-up 2: clean building 3: both functions	0	3		
F232	Heavy up demand start time	Start time for buliding fill-up: e.g. 730 means 7:30 o´clock	730	0～2359		

No.	Marking	Description	Stand.	Area	Unit	Value
F233	Heavy up demand end time	End time for building fill-up: e.g. 930 means 9:30 o´clock	930	0～2359		
F234	Heavy down traffic start time	Start time for clean builiding: e.g. 1700 means 17:00 o´clock	1700	0～2359		
F235	Heavy down traffic end time	End time for clean builiding: e.g. 1830 means 18:30 o´clock	1830	0～2359		
F236~ F239	Spare	Buffer				
F240	User-defined break open speed code		0	0～255		
F241	User-defined inspection low speed code		4	0～255		
F242	User-defined releveling speed code		4	0～255		
F243	User-defined creeping speed code		3	0～255		
F244	User-defined inspection high speed code	User-defined Multistep control of the frequency inverters: F24 = 0, F32 = 7	4	0～255		
F245	User-defined single floor speed code		5	0～255		
F246	User-defined double floor floor speed code		6	0～255		
F247	User-defined triple floor speed code		7	0～255		
F248	User-defined quadruple floor speed code		1	0～255		
F249	User-defined pentaple floor speed code		2	0～255		

15.Error codes

Code	Error display	Error	Comment
01	The period of validity of maintenance is over.	Definded attendence interval expired	No inspection travel possible if the attendence interval is expired.
02	Safety Circuit Breaks off	Security cicle open	
03	Up limit switch breaks off	upper end-switch reached	
04	Down limit switch breaks off	lower end-switch reached	
05	Door can't be opened.	Door can not be opened.	8 failure tryies of open (std. operation mode)
06	Door can't be closed.	Door can not be closed	8 failure tryies of close (std. operation mode)
07	Landing door lock is short.	Shaft door locking blot block	Door blocks 3s after door opening it´s still closed.
08	Car Board communication err.	CAN-bus connection to cabin module is jammed	No connection to the cabin module, or the closing-off resistor is not active.
09	Inverter Failure	Errof encoder	input X9 show errrof of the encoder
10	Up deceleration switch has errors.	Correction switch above out of order	
11	Down deceleration switch has errors.	Correction switch below out of order	
13	Terminal switch has errors.		Up/down force slow switch acts the same time as up/down limit switch more than 3 seconds, when the lift stops at door zone.
15	Terminal floor is split-level.		When the lift stops at leveling zone and terminal switch active, but the 01 board shows that it is not at terminal position.
16	Up deceleration switch installation distance is not enough	The distance of the above correction switch to the terminal end stop is not far enough	Choose the distance respective to the nominal speed.
17	Down deceleration switch installation distance is not enough	The distance of the below correction switch to the terminal end stop is not far enough	Choose the distance respective to the nominal speed.
18	Attached door lock detection input has error.	Anti surf input in the floor active. (door monitoring)	X24 is active, but SM04 Antisurf door monitoring reports error (SM-04 /JP10.7)
19	Door open limit and closed limit acts at the same time	Both door endswitch are active at the same time	TX0 and TX1 respectively TX11 and TX12 are active at the same time.
20	Ground floor and service floor setting are wrong.	Buliding ground floor and service floor can not be reached, because floors are blocked.	floor=1 : Ground floor blocked respectivly door side blocked. floor=2 : Fire stop is a blocked floor.

Code	Error display	Error	Comment
			floor=3 : Fire stop door A is blocked.
			floor=4 : Less than 2 floors are enabled
21	Motor overheat protection	Motor overheated	PTC input more than 2 sec active.
22	The lift runs in reverse	Current direction is not according to the triggered direction.	Encoder signal in wrong direction in standard mode at more than 0,15m/s.
23	The lift is over speed.	Lift is driving to fast. Excess speed	Multistep mode: After 1,5sec delay the speed is still at 0,2m/s. Analog mode: As is-speed is 25% above the desired speed. As is-speed is more than 8% higher as the nominal speed. Speed at drive-in into the door zone is above the drive-in speed limit warning.
24	The lift is under-speed.	Under speed	Multistep: after 3s still below 50mm/s. Analog-mode: Lift is 50% slower than the desired speed.
25	Running time restriction failure	Run-time-control activated!	Lift is longer in operation than in F62 defined time; without change of the door/flush signals.
27	Up-leveling switch failure	re-levelling up sensor out of order	
28	Down-leveling switch failure	re-levelling down sensor out of order	
29	Machine room temperature sensor failure.	Temerature monitoring machine room active	X21 active
30	Car illumination failure	Cabine light dropped out	input TX16 active.
31	The lift is slippage failure	Engine is suddenly rotating	Encoder reports movement despite of stop
32	Safety circuit switch is fauilure in running.	Security cycle opens during journey	e.g. due to door locking bolt
33	Door lock is short.	Door-locking bolt is by-passed!	door open end-switch reports door open, but locking bolt is closed.
34	Motor contactor 1 is failure	contactor monitoring engine contactor K1 reports error	output Y2 do not communicate with input X15.
35	Brake Contact is failure	contactor monitoring break contactor K8 reports error	output Y0 do not communicate with input X17.
36	Motor Contact 2 is failure	contactor monitoring engine contactor K2 reports error	output Y3 do not communicate with input X16.
37	Door lock relay detection is failure.		Door lock relay detection input is no signal, but both landing and car door lock are closed. Door lock relay detection input has signal, but either landing or car door lock is opened.

Code	Error display	Error	Comment
38	Brake switch failure	Break switch monitoring reports error	Break contactor active, but break do not get active, respectively breaks do not work synchron(X22,X23).
39	Safety Circuit relay contact is failure		Safety circuit input signal differ from safety circuit relay detection signal.
40	Inverter running signal detection has errors.	Inverter enable control recognize malfunction	Bremslüftsignal vorhanden, aber keine Umrichter Run (Enable) Signal.
45	Door open with re-leveling relay contact failure		The detection with door open with re-leveling ouput and relay contact is different.
54	Landing and car door lock is different		The landing and car door lock have different for 3seconds.
58	Down direction single decerlation switch is installed falsely.	Correction downwards is installed incorrectly. Sequence is wrong.	switch liefert falsche Signale.
59	Down direction double decerlation switch is installed falsely.	Correction downwards 2 is installed incorrectly. Sequence is wrong.	
60	Down direction triple decerlation switchAufwärts is installed falsely.	Correction downwards 3 is installed incorrectly. Sequence is wrong.	
61	Down direction fourfold decerlation switch is installed falsely.	Correction downwards 4 is installed incorrectly. Sequence is wrong.	
62	Up direction single decerlation switch is installed falsely.	Correction upwards is installed incorrectly. Sequence is wrong.	
63	Up direction double decerlation switch is installed falsely.	Correction upwards 2 is installed incorrectly. Sequence is wrong	
64	Up direction triple decerlation switch is installed falsely.	Correction upwards 3 is installed incorrectly. Sequence is wrong	
65	Up direction fourfold decerlation switch is installed falsely.	Correction upwards 4 is installed incorrectly. Sequence is wrong.	
66	The steps of deceleration switch have errors.	Number of installed correction switches is not according to the definded parameters	

Code	Error display	Error	Comment
67	Leveling switches have been connected in reverse	re-levelling switches are interchanged installed.	
68	Leveling zone or leveling plate failure	Length of the flush/door zone is shorter as the distance to the stop	
69	Floor err in self-learning.	Number of the flush/door zones is not according to the number of floors	
70	The lift can't do self-learning	Reference journey not possible	Correction below, reference journey end -switch, or flush signal not correct at reference journey start position