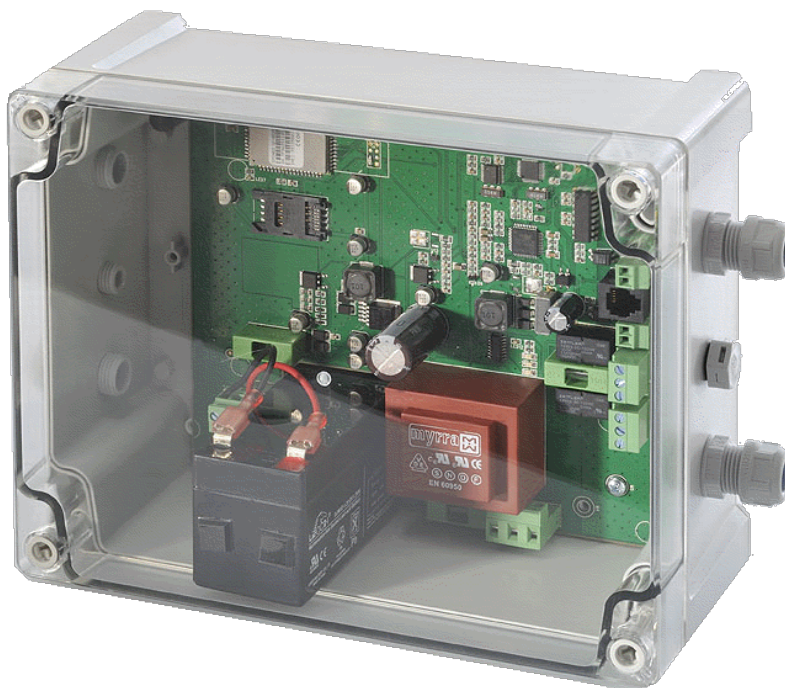


GSM-Nano



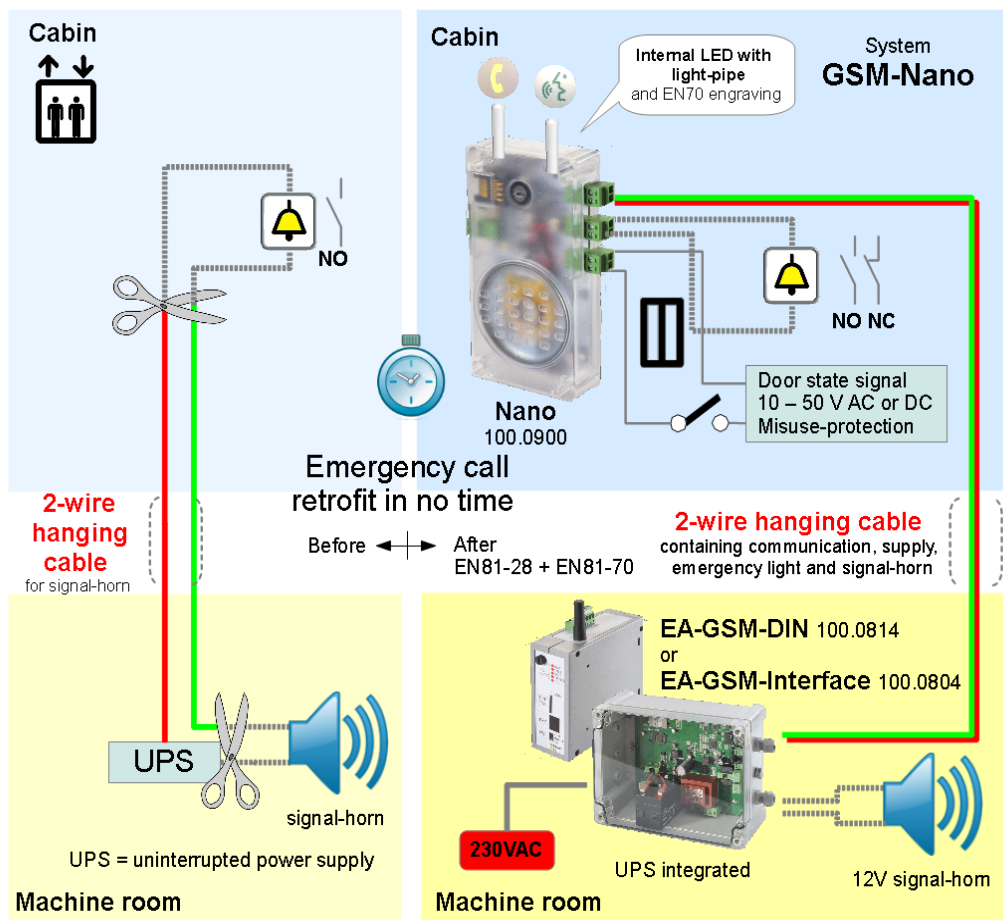


Contents

1 Overview.....	3
2 Specification.....	4
2.1 Communication unit Nano.....	4
2.1.1 Connectors.....	4
2.2 EA-GSM-Interface.....	5
2.2.1 Connectors.....	5
3 Mounting.....	6
3.1 Communication unit Nano.....	6
3.2 GSM-Interface.....	6
4 Wiring.....	7
5 Start-up.....	8
5.1 Accessories.....	8
6 Indicators.....	9
6.1 EA-GSM-Interface.....	9
6.2 Communication unit Nano.....	9
7 Programming over SMS.....	10
7.1 Advanced settings.....	10
7.2 Reply-SMS.....	11
7.3 Automatic Status-SMS.....	12
8 Troubleshooting.....	12
9 Reception test.....	13
10 Modem settings.....	13
10.1 General settings.....	13
10.2 Specific elevator controls.....	13
11 Accessories.....	14
11.1 Additional sub-communication unit in the cabin.....	14
11.2 Retrofit material.....	14
12 Short instruction for alarm point.....	15
12.1 Answering calls.....	15
12.2 Callback into cabin.....	15
13 Maintenance protocol.....	16
13.1 Values of the reception test (see 9) note within each maintenance	16



1 Overview



The elevator alarm system GSM Nano is **conform** to EN81-28 and EN81-70.

- The connection between the communication unit Nano and the EA-GSM-Interface needs **two wires only** (existing wires of alarm-horn may be used).
- The emergency call over GSM is a cost effective **alternative to landline installation**.
- No costs for an **analogue landline**.
- You may **change the provider** at any time.
- The elevator can already be used during **construction**.
- Programming over **SMS** (Calling numbers, identification and parameters).
- Connectivity for emergency button, misuse-protection-signal and external emergency light.
- Interface to connect to the elevator control (e.g. Böhnke+Partner, Kollmorgen, KW, L+L, Newlift, Rekoba, RST, Strack etc.) use as **GSM-Modem**.

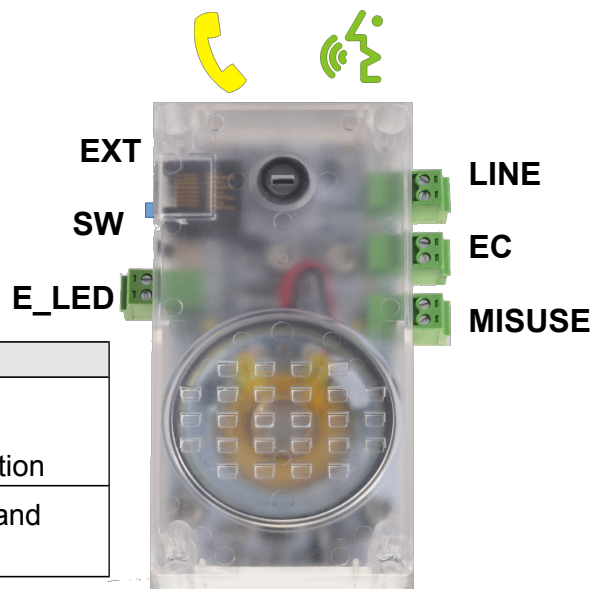
Safety note



- The location of the GSM-antenna **should be stationary** (e.g. in the machine room) in order that a stable reception is guaranteed.
- In case of an emergency call retro-fit (SNEL, ESBA), where no empty wires in the hanging cable are available, the EA-GSM-Interface can be located on top of the cabin, providing that the **GSM reception is guaranteed for the entire cabin travel** (Simple GSM reception diagnosis by SMS).
- If the GSM reception is **inadequate or fails completely**, the elevator must **automatically be set out of order**: for example, command to the elevator control to move to the ground floor. Therefore the EA-GSM-Interface provides a relay contact (NO or NC).
- **Beware of using prepaid cards**: in case of an emergency there might be no credit left. **Better use a subscription or prepaid with topping up via auto reload**.
- **To ensure that the correct number is dialled even with roaming, the calling numbers must be entered including the country code.**

2 Specification

2.1 Communication unit Nano

Article-No: 100.0900
 Power supply: from EA-GSM-Interface
 Dimension (L x W x D): 112 x 56 x 21 mm
 Housing: ABS transparent
 Weight: 100 g

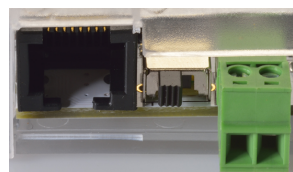


LED indicator	Comment
Green 	Flashes every 5 seconds (1x=NO, 2x=NC): Nano is ready Permanent on: during voice connection
Yellow 	During Misuse-protection, time-out and dial-up

2.1.1 Connectors

	Comment
EC Emergency-contact	Potential free emergency-contact Automatic detection of the contact type on power (e.g. voltage on LINE). NO = Normally open (1xPiep and every 5s a green flash) NC = Normally closed (2xPieps and every 5s a green double-flash)
LINE	Connect communication unit over two wires with the EA-GSM-Interface. Notes: <ul style="list-style-type: none"> Check polarity → same polarity as on EA-GSM-Interface → If the polarity is wrong the emergency light is on continuously. For retro-fits you may use the existing two wires of the siren. The siren is then connected to the switched output (+12V-Siren and +12V-GND) of the EA-GSM-Interface.
MISUSE	Misuse-protection door-signal-input: (active) = 10 to 50 V AC or DC If during this time-out (= max. travel time) the door-signal changes, the emergency call will be stopped.
E_LED Emergency-light	Emergency-light output for external LED: 6V DC / 20 mA The emergency-light is on in case of a mains loss on the EA-GSM-Interface and in case of any failure → 7.3. SW = Slide switch. Switches between internal LED and external emergency-light
EXT	e.g. for connecting an additional sub-communication unit EA-LMC70

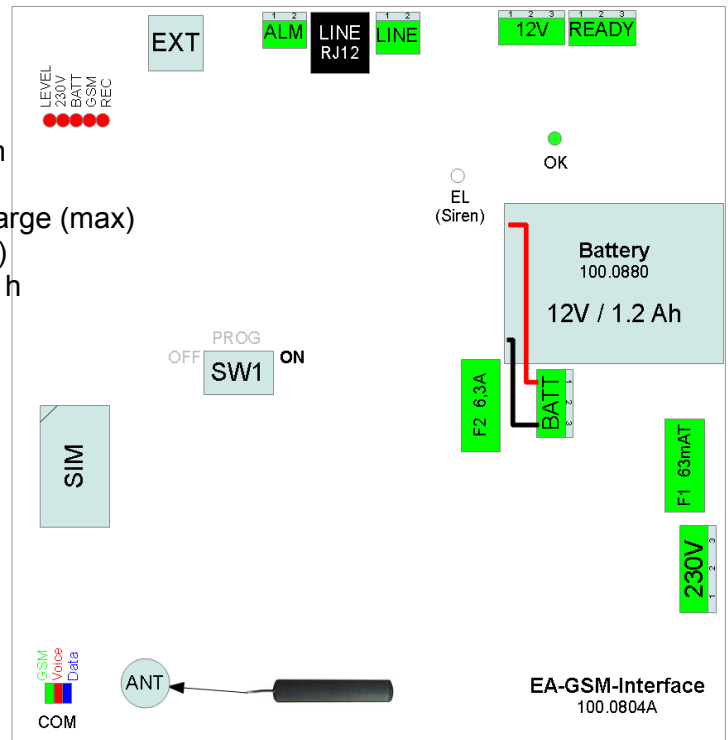
Left detail



EXT SW E_LED

2.2 EA-GSM-Interface

Article-No: 100.0804A
 Power supply: 230 VAC/50Hz/<15 W
 Standby: 5 W
 + 2 W during connection
 + load on 12V
 + 5 W during battery charge (max)
 Backup battery: 12 V / 1.2 Ah (100.0880)
 Typical charging time: 8 h
 GSM: Dual-Band
 900/1800 MHz
 Dimension (L x W x H): 240 x 191 x 107 mm
 Housing: ABS, IP65
 Weight: 1100 g (without battery)



2.2.1 Connectors

	Comment	
ANT	GSM-Antenne SMA	GSM-Antenna
ALM	Alarm-input:	1,2: active if signal 10 .. 50 V AC or DC
BATT	Connector for 12 V / 1.2 Ah battery	1: +BATT (red) 3: -BATT (black)
EXT	Data interface	For modem use
F1	Mains fuse	63 mA slow
F2	Battery fuse	6.3 A slow
LINE RJ12	Connection to communication unit Nano	3: +LINE (Nano) 4: -LINE (Nano)
LINE	Connection to communication unit Nano	1: -LINE (Nano) 2: +LINE (Nano)
230V	Mains plug	1: Neutral 2: Earth 3: Phase (F1)
READY	Relay: Operation control: „System ready“	1: Normally closed contact (NC) 2: C 3: Normally open contact (NO)
SIM	SIM-card holder	Set SIM-PIN to 0000
SW1	Mode switch	OFF: GSM-Modem use only (transparent) PROG: Programming of EA-GSM-Interface ON: Emergency call and GSM-Modem use
12V	Emergency power max. 250 mA	1: +12V-Siren *) 2: GND 3: +12V-UPS (uninterrupted power supply)

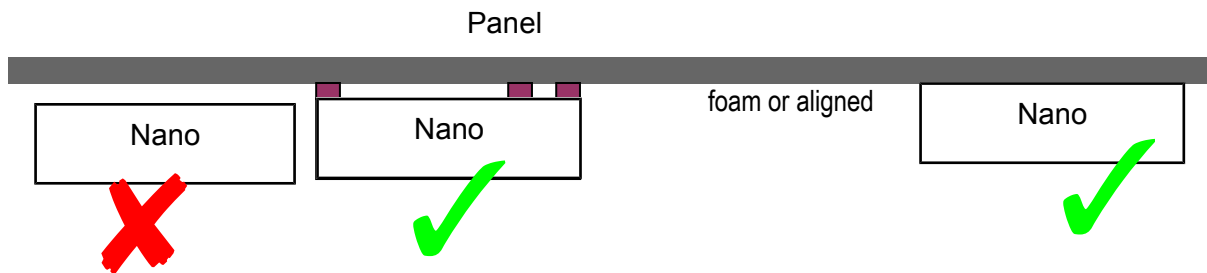
*) the output is active,

- as long as the emergency button is active
- if the communication unit Nano is not connected
- in case of any problem (short tone every 10s, can be switched off 7.1)

3 Mounting

3.1 Communication unit Nano

- Once mounted, the speaker and the **microphone** in particular should **not be covered**, otherwise the communication quality decreases (reduced volume, poor hands free quality).
- Make sure the **microphone hole** and the panel hole **fit**.
- The sub-communication unit must be mounted **directly** behind the panel **without any gap**, otherwise there will be an acoustic feedback. If necessary insulate speaker and microphone room acoustically using foam or rubber.



For mounting accessories (panels, drilling templates, transparent frames, emergency lights, etc.) have a look at our special document.

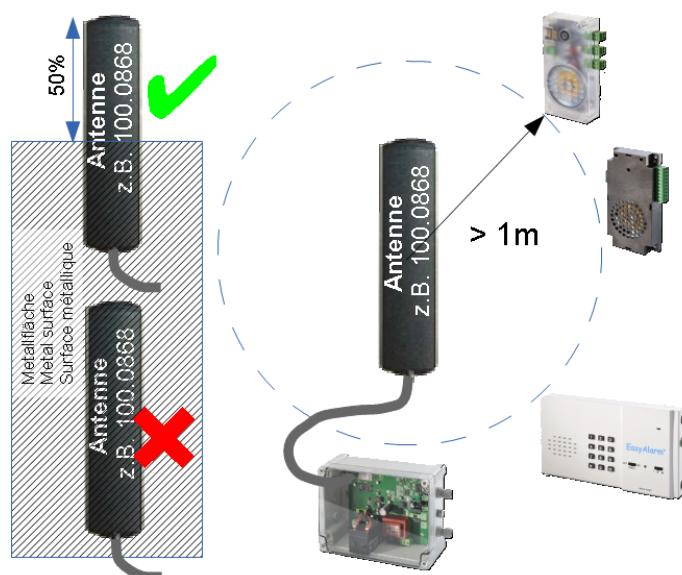
http://www.leitronic.ch/Documents/100.0xxx_Retrofit_Material-GB.pdf

3.2 GSM-Interface

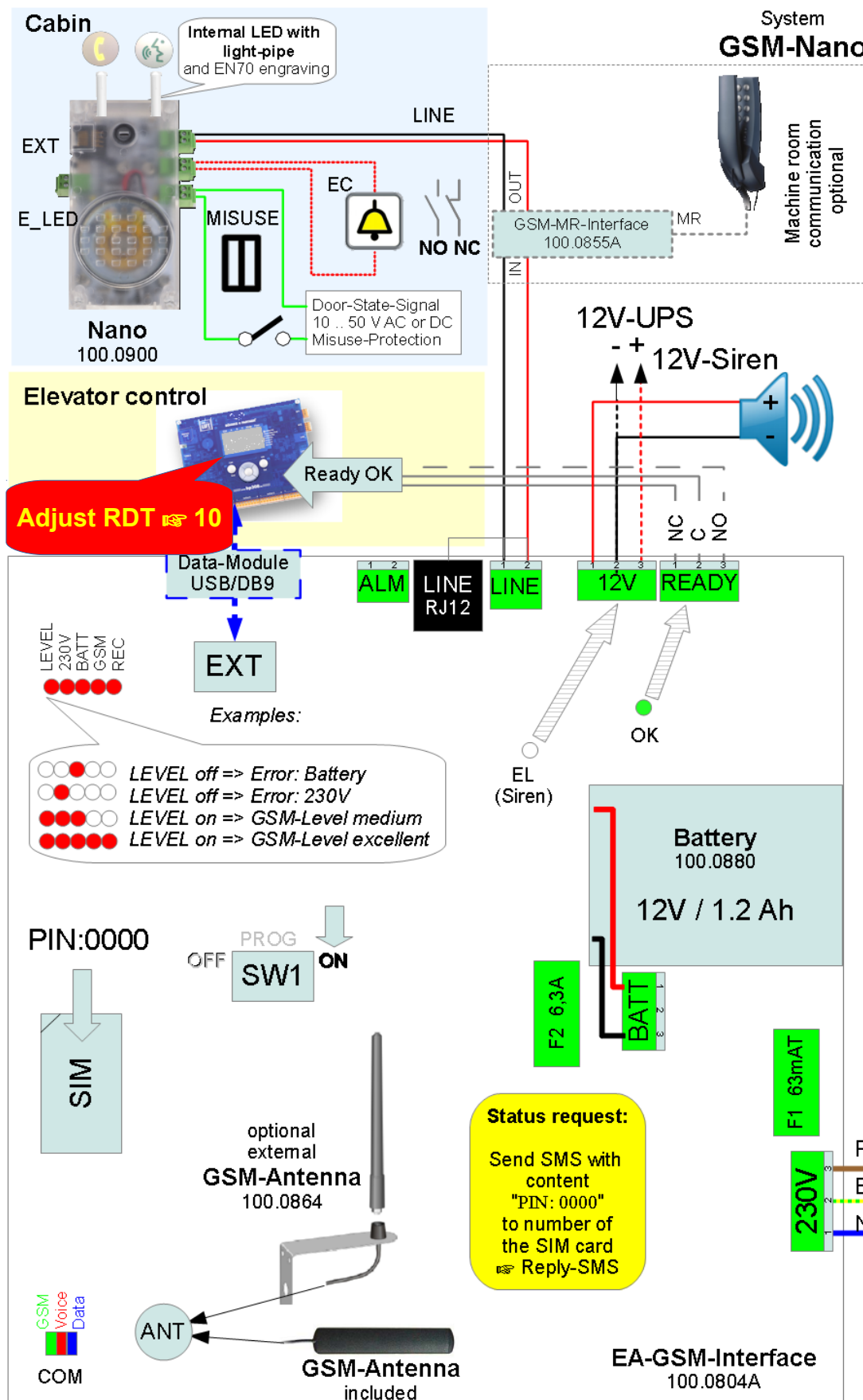
Find a suitable location for the EA-GSM-Interface according to the reception intensity indicator on the mobile phone.



Recommendation: stationary location in the machine room or shaft assembly, not in the vicinity of radio transmitters and interference sources. If there are no free wires in the hanging cable, the EA-GSM-Interface can be mounted on top of the cabin. In any case, the **GSM receive** must be **checked over the entire travel of the cabin** ☞ 9. Check Reception! Note that the **level-indicator** may be **delayed**.



4 Wiring



The device has been designed solely for operation on a 230 VAC / 50 Hz supply. Work on the 230 VAC power supply must be carried out by a qualified electrician. Doing so the applicable accident prevention regulations must be observed, to avoid electric shock, the mains has to be disconnected (trip the circuit breaker).

5 Start-up

- Connect **communication unit**, **alarm-horn** and **emergency button** according to wiring plan.
- Insert SIM-card with **PIN set to 0000**.

☞ To set PIN to 0000 use any mobile phone.










[*][*][0][4][*] <old PIN> [*][0][0][0][0][*][0][0][0][0][#] + ☎

- Connect **battery** 100.0880.
- Turn on **230V** mains. After two minutes the LEVEL indicators are showing the GSM reception. LED_COM flashes green every 3 seconds.
☞ Stick the antenna where the LEDs LEVEL show maximum reception.
- If you **call NANO**, the unit indicates sound while ringing and activating the green LED (speak). You may now record the individual announcement (identification) ☞ 12.

The calling-numbers can be **programmed via SMS**, by sending an SMS towards NANO ☞ 7.

- A short **pressing of the emergency button** activates the alarm-horn. If you press longer than the programmed debounce time-out, you will hear a dial tone during the selected misuse time-out.
- If there is **no change of the MISUSE signal** the first calling-number will be dialled.

5.1 Accessoires

Picture	Supply	Art.No.
	Battery 12 V / 1.2 Ah ☞ 100.0117, 100.080x and 100.081x	100.0880
Picture	Antenna accessories for all GSM-modules 100.080x and 100.081x	Art. No.
	External GSM-Antenna cable 5m	100.0864
	Antenna-Extension-cable cable 10m	100.0863
Picture	Serial interface	Art.No.
	Data-Module DB9 serial interface for elevator controls DB9	100.0850
	Data-Module USB interface for elevator controls MiniUSB	100.0851
Picture	Remote-communication unit to communicate with cabin	Art. No.
	GSM-MR (DIN-mounting, pluggable screw terminal and RJ12-jack) Machine room solution extension for DTMF capable telephone ☞ i.e. 118.0120	100.0855
	Wall mount telephone incl. cable 3m ☞ machine room solution	118.0120
Picture	Other accessories	Art.No.
	EA-LMC70 (pluggable screw terminal and RJ45-jack) Supply voltage: 8 - 35 V DC i.e. +12V from EA-GSM-Interface or EA-GSM-DIN 2xEN81-70 indicator (yellow/green): internal with light pipes, external symbols 1xInput for emergency button: potential free	118.0155
	LMC-EC (pluggable screw terminal and RJ45-jack) 1xEmergency-Button (Normally open: integrated or external) 1xMicrophone + 1xSpeaker	118.0158
	EC-MIC (screw terminal and RJ45-jacks) 1xEmergency button 1xMicrophone	118.0152
	12V-SIR siren horn	100.0020

6 Indicators

6.1 EA-GSM-Interface

LED_COM	Comment
Green	SIM-error: flashes every 1/2 second During network registration: flashes every second Flashes every 3 seconds if connected to the GSM network
Red	Communication unit Nano connected
Blue	Elevator control in connection: over serial interfaces

LED	Normally showing the GSM-reception level	In case of an error the LED shows error code 1_LEVEL is inactive
LEVEL	GSM Level poor	Inactive ↳ LED2..5 showing errors *)
230V	GSM Level low	Problem with supply voltage
BATT	GSM Level medium	Problem with battery/charging
GSM	GSM Level high	Problem with GSM-Network or Roaming or Nano not connected to LINE
REC	GSM Level excellent	Problem with GSM-reception (Level Alarm)

*) Error analysis by Status-SMS:


↳ send SMS with content „PIN:0000“ ↳ Reply-SMS ↳ 7.3

LED	Comment
EL	Indicator of the alarm-horn output
OK (READY)	Ready-indicator for GSM-Interface, if <ul style="list-style-type: none"> Battery and battery-charging ok SIM-card inserted with correct SIM-PIN GSM-reception sufficient Otherwise the elevator may not perform any further trips. Note: OK (READY) can be delayed up to two minutes (GSM-reception)

6.2 Communication unit Nano

LED	Comment
Green	Flashes every 5 seconds (1x=NO, 2x=NC): Nano is ready Permanent on: In voice connection
Yellow	During Misuse-protection time-out and dial-up

7 Programming over SMS

Programming is done by **SMS**. An SMS containing PIN:0000 will be evaluated and answered  7.2 to the sender. All **commands** are written in **CAPITAL LETTERS**.

SMS-Commands	Comment	Reply-SMS
PIN:0000	Default-PIN:0000 Note: PIN 4-digits	leitronic.ch Nano V.F.x.y ready
NEW:1234	Change PIN to 1234 and activate SIM-card protection Note: PIN 4-digits	New Pin:1234
CALLNx=<Calling-No.>_ CALLN1 to CALLN9 will be called until DTMF 0 acknowledges call	Calling-numbers x=1..9 completed with a space (max. 24 digits) CALLN9 (Routine-No.)	CallNx: <Calling-number>
ALARM=<Alarm-number>_	Status-SMS number with +country code e.g. +41 completed with a space (max. 24 digits)	Alarm: <Alarm-number>
ALARM=OFF	Disable Status-SMS	Alarm:OFF
RESET	Set to factory defaults	Reset

7.1 Advanced settings

Advanced settings can be read-out or changed as following:

EE_R: <adresse>	Read EEPROM <adresse> is 4-digits	adr: <adresse>:<read out value>
EE_W: <adresse>=<value>	Write EEPROM <adresse> is 4-digits <value> is 3-digits (000..255)	adr: <adresse>:<written value>

<adresse>	Function	<value>	Default
0001	Signal errors on alarm-horn	000 disabled 001 enabled	001
0002	Connection time-out	030 to 255 s	120
0003	Debounce time: Emergency button (Nano)	000 to 255 * 20ms	050 = 1s
0018	Debounce time: Alarm-input ALM until Status-SMS	000 to 255 * 20ms	050 = 1s
0023	Routine call interval (CALLN9)	000 to 255 h	072
0024	Misuse protection time=max. cabin travel time	000 to 255 s	030
0127	Announcement every x seconds	000 off 001 to 255 s	000

Example:

PIN=0000, **Calling-No. 1:** 044 111 22 33, **Calling-No. 2:** 044 111 22 44, **Routine-No. 9:** 044 123 45 567, **Status-SMS:** +41 79 100 10 10, max. cabin travel time= 20 s

 send SMS with content

PIN:0000 CALLN1=0041441112233 CALLN2=0041441112244 CALLN9=0041441234567
ALARM=+41791001010 EE_W:0024=020

 Reply-SMS

leitronic.ch Nano V.F.x.y ready, CallN1:0041441112233
CallN2:0041441112244, CallN9:0041441234567, Alarm:+41791001010,
adr:0024:20, Batt:96, Ri:18, Charge:255, Power:34, last Call:26,
Rssi:12(9-15), Ber:0(0-2), Errors:----+,-----,--- (limited to 160 characters)

7.2 Reply-SMS

Example of a Reply-SMS:

leitronic.ch Nano V.F.x.y xx, (adr:<adresse>:<value>), (New Pin:<new PIN>),
(Alarm:<alarm number>), Batt:xx, Ri:xx, Charge:xx, Power:xx, last Call:xx,
Rssi:xx(xx-xx), Ber:xx(xx-xx), Errors:-----,-----,---

Label	Comment	Value xx	Info
Nano	Status	ready	System ready to use
V.F.x.y	Software-Version	not ready	System not ready
Batt:	Battery voltage	0 to 97	Calculate voltage: $0.145 * <value>$ e.g. 97 ↗ 14.05V or 92 ↗ 13.34V
Ri:	Battery-resistance	10 to 70	10 – 23 ↗ battery o.k.
defect!	Battery- or Fuse F2 defect	-	Battery failure or blown fuse F2 6.3AT ↗ check and replace
Charge:	Battery charge value	0 to 255	Charge: * 255s / Discharge: * 15s
Power:	Battery charging voltage	0 to 38	≤ 25 ↗ Supply voltage missing ≤ 28 ↗ Supply voltage too low to charge battery 34 ↗ Supply voltage sufficient
last Call:	Hours since last call	0 to 255	in hours
Roaming	GSM-Roaming		Not home GSM-network => higher costs
Rssi: <mom> (<min>- <max>)	GSM-Level Momentary Min. since last call Max. since last call	0 to 31	Calculate level: $2 * <Value> - 113\text{dB}$ e.g. 10 ↗ $2 * 10 - 113 = -93\text{dB}$ GSM poor ≥ 5 LED1 GSM low ≥ 10 LED2 GSM medium ≥ 15 LED3 GSM high ≥ 20 LED4 GSM excellent ≥ 25 LED5
Ber: <mom> (<min>- <max>)	BitErrorRate Momentary Min. since last call Max. since last call	0 to 7	0: minimum BitErrorRate 7: maximum BitErrorRate
Errors	Error-No. 0 to 12 e.g. ----+,---*,--*	- + * ,	-: inactive *: active ,: separator before error 5/10 +: delayed error not jet active

Example:

Change PIN from 0000 to 1234, set Alarm to +41791234567, set EEPROM 0018 to 100

↗ send SMS with content

PIN:0000 NEW:1234 ALARM=+41791234567 EE_W:0018=100

↗ Reply-SMS

leitronic.ch Nano V.F.x.y ready, New Pin:1234, Alarm:+41791234567,
adr:0018:100, Batt:96, Ri:18, Charge:255, Power:34, last Call:26,
Rssi:12(9-15), Ber:0(0-2), Errors:--*+,-,-----,---

↗ Error 2 active: GSM bad and Error 4: Supply voltage too low (in delay)

If you **do not get any Reply-SMS**, please check the following points:

- EA-GSM-Interface is **not connected** to the GSM-network ↗ check LED_GSM
- PIN-Code** is incorrect
- SIM number** is incorrect
- No money** left on SIM-card
- Mode switch **SW1 not on ON**

7.3 Automatic Status-SMS

The Status-SMS will be sent to the **defined alarm-number** ALARM= , **completed with a space.**

To disable the **Status-SMS** ➡ send SMS with content: PIN:0000 ALARM=OFF

Example:

Signal on input ALM ➡ SMS with content:

leitronic.ch Nano V.F.x.y ready, Alarm X4, Batt:96, Ri:18, Charge:255, Power:34, last Call:26, Rssi:12(9-15), Ber:0(0-2) Errors:*----,-----,---

Errors	< State / Error>	READY (OK)	Emergency light	Delayed	Send Alarm	SMS content	Error code LED					Test interval	Send Restore	Restore-SMS content
							1	2	3	4	5			
0	Alarm X4 / ALM	●	Off	0	✉	Alarm X4	○	○	○	○	○	(50)* 20ms	-	No Alarm X4
1	Supply voltage missing	●	On	0	-	Power off	○	●	○	○	○		-	Power on
2	GSM poor	●	On	15 s	✉	GSM poor	○	○	○	○	●	2 s	-	GSM ok
3	GSM Roaming	●	On	0	✉	Roaming	○	○	○	●	○	2 s	-	Home
4	Supply voltage too low to charge battery	●	On	15 s	✉	Power poor	○	●	○	○	○		✉	Power not poor
5	No call within routine interval	●	On	0	✉	No routine call	○	○	○	○	○	(74) h	-	Routine call ok
6	Unacknowledged calls	●	On	0	✉	Emergency Call	○	○	○	○	○		✉	Emergency ended *)
7	Battery not charged within 24 h	○	On	0	✉	Charge problem	○	○	●	○	○	24 h	✉	Charge ok
8	No or bad battery or fuse F2 defect or battery test circuit defect (Ri<10)	○	On	0	✉	Battery failure	○	○	●	○	○	1h	✉	Battery ok
9	GSM bad	○	On	15 s	✉	GSM bad	○	○	○	○	●	2 s	✉	GSM ok
10	No GSM network or not registered or mode switch SW1 not on ON	○	On	0	✉	No GSM	○	○	○	●	○		✉	GSM registered
11	Nano not connected	○	On	0	✉	Line problem	○	○	○	●	○	1 h	✉	Line OK
12	Battery end	○	Off	0	✉	Battery end	○	○	●	○	○	2 s	✉	Charging

*) Emergency ended: Door-state changes / Alarm acknowledged by DTMF 0 / New connection

8 Troubleshooting

Faults and errors are displayed by the various indicators (LED) ➡ 6

Detailed error information available through a status inquiry via SMS or automatically by **Status-SMS** in case of a new error (if <Send Alarm> is ✉ ➡ Table)

➡ send SMS with content

PIN:0000

➡ Reply-SMS ➡ 7.3

9 Reception test



1. If the EA-GSM-Interface is mounted on the cabin roof, send the cabin to the location with the **worst** GSM reception (check reception with LED1. .5). Attention: The level-indicator may be delayed.
2. Start test call and check if the connection is established ☞ terminate test call.
3. **Re-start test call** ☞ Connection must be established ☞ Stay in connection and move the cabin over the complete shaft ☞ Check if connection remains stable ☞ Terminate test call ☞ Send SMS to verify GSM-levels: Rssi:<mom> (<min>-<max>)
 - ☞ The minimum value <min> must be higher than 5!
 - ☞ **Report** Rssi-Value with date (see last page)!
4. If a problem occurred during test, change or optimize the placement of the EA-GSM-Interface.
5. If you cannot find an improved placement use an external antenna ☞ e.g. Article-no 100.0864 and / or extension cord 100.0863.

10 Modem settings

10.1 General settings

<adresse>	function	<value>	Default
0004	Auto-Answer ATS0=<n>	<n>	0
0125	Select Baud rate for transparent mode	0=9600 1=19200	1
0126	Quiet-Mode (Modem does not answer or indicate RING)	0=disabled (ATQ0) 1=enabled (ATQ1)	0
0128	Result-Code	0=Text (ATV1) 1=Numerical (ATV0)	0

If modem should work in transparent-mode, you have to configure by SMS as following:

Example:

PIN is 0000. Modem with 19200 Baud, Auto-Answer after „four cycles“, Quiet-Mode enabled

☞ send SMS with content

PIN:0000 EE_W:0004=004 EE_W:0125=001 EE_W:0126=001

☞ Reply-SMS

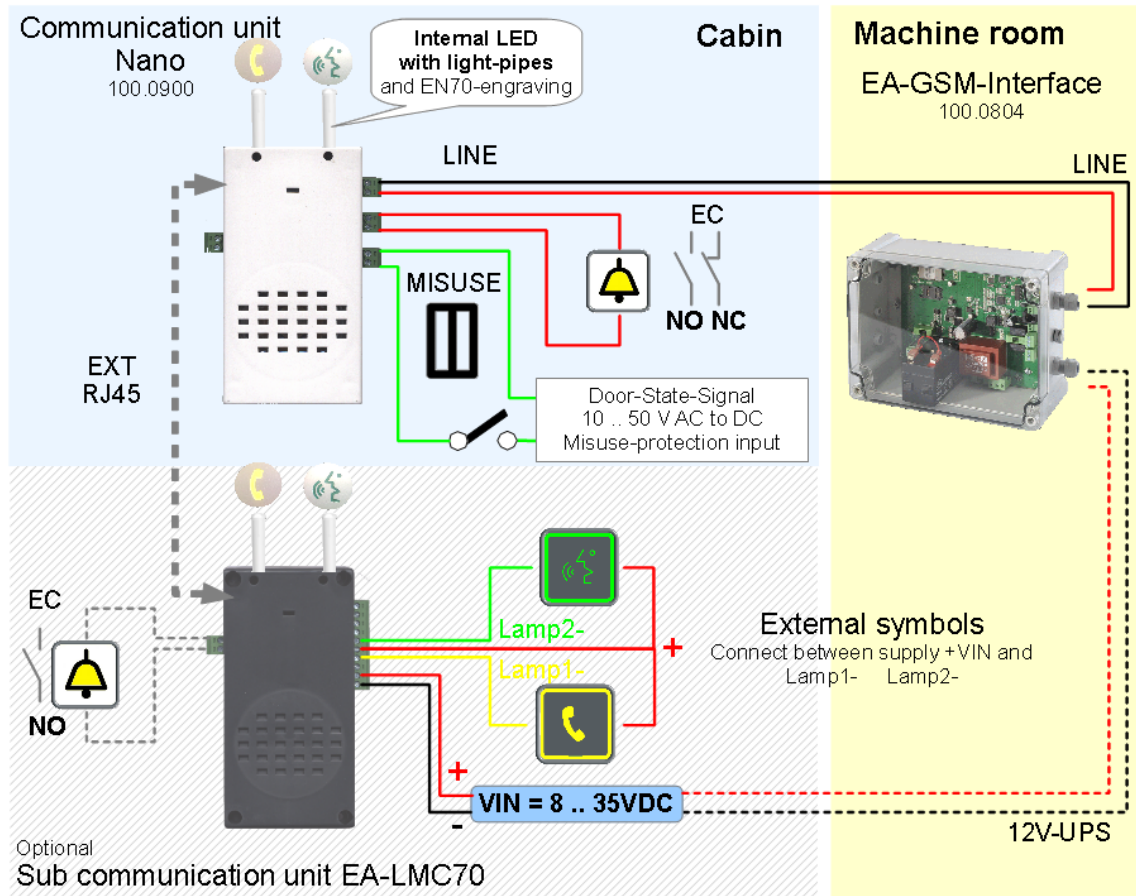
leitronic.ch Nano V.F.x.y ready, adr:0004:4, adr:0125:1, adr:0126:0,
Batt:96, Ri:18, Charge:255, Power:34, last Call:26, Rssi:12(9-15),
Ber:0(0-2), Errors:----+,-----,---

10.2 Specific elevator controls

refer to special document: http://www.leitronic.ch/Documents/100.085x_Data-Modules-GB.pdf

11 Accessories

11.1 Additional sub-communication unit in the cabin




The two emergency call buttons EC inputs are connected in parallel, e.g. attach either two normally open contacts (NO) to both EC-inputs or two normally closed contacts (NC) in series to one EC-input.

11.2 Retrofit material

See individual document http://www.leitronic.ch/Documents/100.0xxx_Retrofit_Material-GB.pdf

12 Short instruction for alarm point

12.1 Answering calls

Accept call  Indication on communication unit



The called party can initiate the following remote-commands:

DTMF key	Comment
[0]	Terminate call
[1] or [3]	Renew connection for another 120 seconds
[2]	Play individual announcement (Identification)
[8]	In case of an alarm call: Terminate connection and call next alarm-number In case of callback into cabin: Terminate connection and call number 8
[]*#	Record individual announcement (12 seconds). After recording the new text will be announced.

Each call must be terminated by key **[0]**. Otherwise GSM-Nano calls the next alarm-number. If the alarm remains **unacknowledged**, a **Status-SMS** will be sent with contents:

```
leitronic.ch Nano V.F.x.y ready, Emergency Call, Batt:96, Ri:18,
Charge:255, Power:34, last Call:26, Rssi:12(9-15), Ber:0(0-2)
Errors:-----,*-----,---
```

If there is a **change** of the door-state a Restore-SMS will be sent:

```
leitronic.ch Nano V.F.x.y ready, Emergency ended, Batt:96, Ri:18,
Charge:255, Power:34, last Call:26, Rssi:12(9-15), Ber:0(0-2)
Errors:-----,*-----,---
```

12.2 Callback into cabin

Call telephone number of the GSM-Nano. Ten seconds later you are connected with the cabin

 Indicated in the cabin by



16/16