

Instructions

TSG

Contactless synchronisation



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1 Basic information

1.1 Copyright

We reserve all rights to this document. Without our prior consent is not permitted to copy it, make it available to third parties or otherwise use it without authorisation. Changes require our express prior written consent.

1.2 Notes in the manual

All notes in the instructions must be observed.

1.3 Informal measures by the installer

The installer of the system must ensure that he himself attends a training course. He must immediately inform the manufacturer/supplier of missing or defective parts.

1.4 Requirements for installation personnel

Persons responsible for installation and maintenance should be informed about the generally applicable safety and occupational hygiene regulations. They should be familiar with Langer&Laumann products. The installation tools should be functional and the measuring instruments should be checked continuously.

1.5 Explanation of symbols



WARNING:

You are advised of a possible impending danger that can lead to serious physical injuries or death.



CAUTION:

You are warned of a possible impending danger that can lead to minor physical injuries. You will also find this signal for warnings of property damage.



NOTE:

You will be informed about applications and other useful information.

2 General

By using the TSG V4 IR module for contactless synchronisation, TSG door drives can be optically coupled with each other and moved simultaneously.

Only the TSG door drive of the car is controlled by the lift controller. There can be any number of landing doors.

3 Interface

The IR module is an extension board installed on the TSG V4 electronics, to which the optical transceiver unit is connected via a cable.

The TSG V4 electronics on the car is parameterised as a master by means of parameters. The door drives of the landing doors are parameterised as slaves.

4 Functional description

The car and all landing doors to be approached are equipped with a Langer & Laumann TSG door drive. The IR module for contactless synchronisation is an expansion board that is screwed onto the main board of the TSG V4 electronics by the manufacturer and connected to the optical transceiver unit by a connecting cable.

The optical transceiver is mounted on the car or landing door so that the car's optical transceiver is level with the landing door's optical transceiver when the car is flush with the landing.

If the car is on a landing, the IR module establishes communication between both TSG door drives via the optical transceiver units. By applying a travel command to the TSG V4 electronics on the car (master) and applying a signal to X1.1 from the slave (latch query), the landing door and car door open or close simultaneously.

As soon as one of the two door leaves detects an obstacle or the light grid has been interrupted, both doors open again or stop, depending on the parameterisation.

If communication is interrupted, both doors are forced closed.

The travel curve can be adjusted via the TSG V4 electronics on the car (master). As soon as communication is established between master and slave, the parameters are adopted by the respective slave.

5 Hardware

5.1 IR module

The IR module is an expansion board that is screwed onto the main board of the TSG V4 electronics by the manufacturer and is connected to the optical transceiver unit by a connecting cable.

The IR module is connected to the optical transceiver unit via a cable with connector ①.

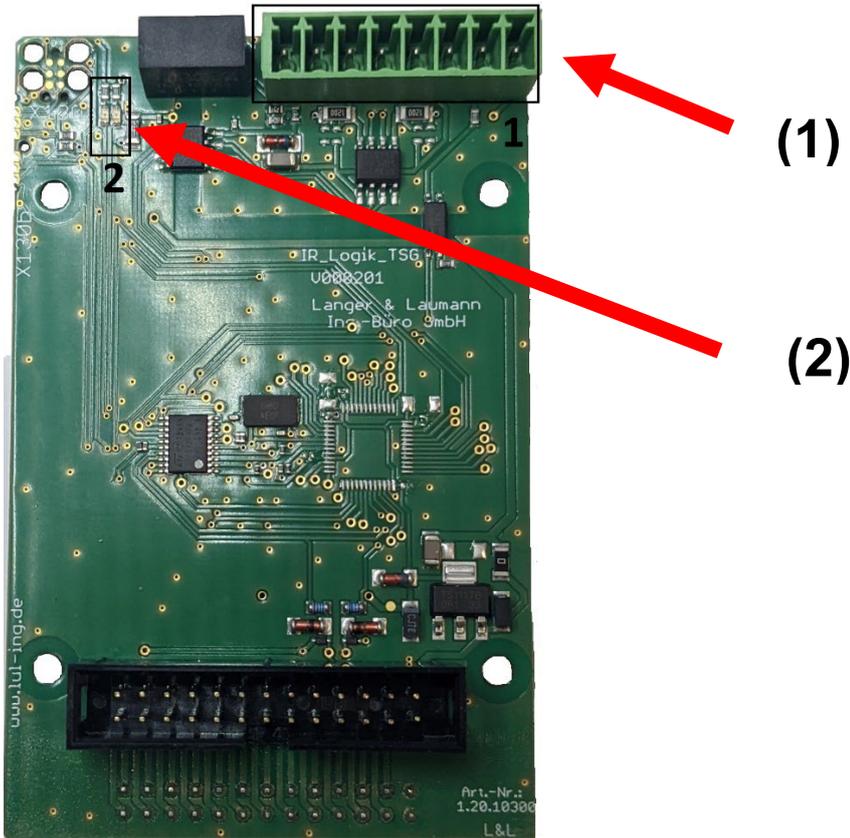


Fig. 1: IR module, mounted on TSG V4 electronics.

Table 1: Connector and LED designations IR module

No.	Name	Description			
①	X137	Con- nector	RJ45 con- nector	M8 connection¹	
		X138 - 1	Orange/White	Brown	
		X138 - 2	Orange	White	
		X138 - 3	Green/White	Blue	
		X138 - 4	Blue	Black	
		X138 - 5	Blue/White	Grey	
		X138 - 6	Green	Screen	
		X138 - 7	Brown/White	Pink	
		X138 - 8	Brown	-	
②	LED1	Error red (see chapter 10.1 LED1, error LED, IR module / page 11)			
	LED2	Check yellow (see chapter 10.2 LED2, check LED, IR module / page 11)			

¹ Version with M8 connector is discontinued

5.2 Optical transceiver unit

The optical transceiver is rigidly mounted on the car or landing door so that the car's optical transceiver is level with the landing door's optical transceiver when the car is flush with the landing.

The optical transceiver is connected, on one side, to the Ethernet port, and, on the other, via an 8-pin connector to an IR module.

Alternatively, the optical transceiver can be connected, on the one side, to the M8 port, and, on the other, via an 8-pin connector to the IP module.



Fig. 2: Optical transceiver unit with supply cable

Table 2: Connector and LED designations optical transceiver unit

No.	Name	Description
①	LED3	Ready for operation yellow (see chapter 10.3 LED3 ready for operation, optical transceiver unit / page 12)
	LED4	Communication active green (see chapter 10.4 LED4 Communication active, optical transceiver. / page 12)
②	IR LED	Viewing window with optical transceiver unit (see also chap. 11 Technical data / page 13)

6 Installation and assembly

The optical transceiver unit of the car door drive is attached to the door drive so that the IR LED points in the direction of the landing doors.

The optical transceiver unit of the landing door drive is attached to the door drive so that the IR LED points in the direction of the car door.

If the car is on the floor, the optical transceiver units of the car and landing door operators must face each other.

The maximum line-of-sight corridor between the optical transceiver units is shown in the following diagram.

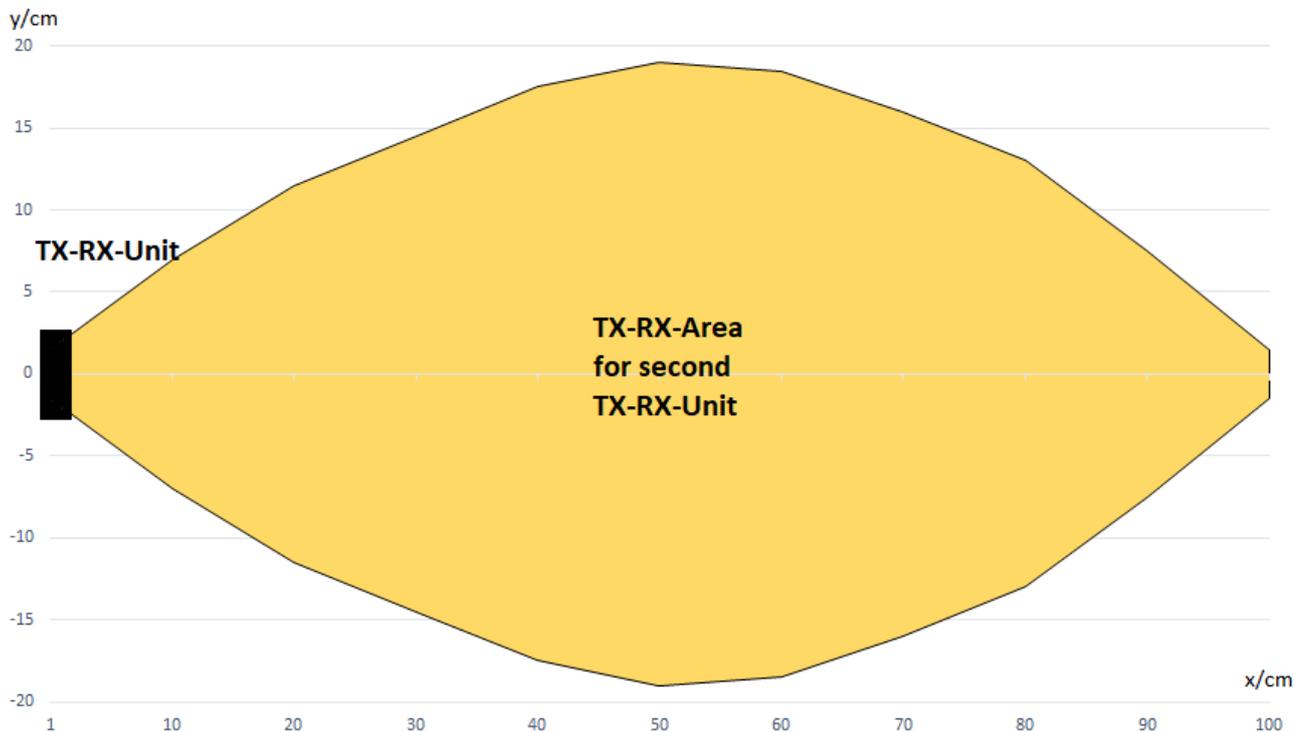


Fig. 3: View corridor between 1st and 2nd transceiver unit



NOTE:

Objects, foreign objects or substances must be prevented from interfering with the optical transmission between the transceiver units.

7 Configuration

In order for wireless communication to be established, the TSG V4 electronics must be parameterised. The TSG V4 electronics on the car are parameterised as masters and the TSG V4 electronics of the landing doors are parameterised as slaves.

Parameter	Meaning	Value
hA	Optical transceiver unit Master mode (car door)	27
	Optical transceiver unit Slave mode (landing door)	28



NOTE:

If the parameter hA is set the same for both TSG V4 electronics, no communication can be established between them.

If the parameter hA=27 or hA=28 is set, the following parameters are automatically changed in the TSG:

- **c0 = 1** (there must be at least 1cm creepage distance when opening)
- **b4 = 0** (the activation of the reversing function in case of obstacle detection in closing direction must be started by the higher-level control)
- **bd = 99** (in case of triggered obstacle detection the door reverses completely to the open position)
- **h3 = 02** (the connection of a light curtain is expected at terminal X1.3, with the function "low active":
 - o Light curtain not interrupted => 24 V DC applied to X1.3
 - o Light curtain interrupted => 0 V DC applied to X1.3)
 If no light curtains are installed on the slave devices, input X1.3 must be connected to terminal X1.6.

8 Behaviour and functions

This chapter describes the possible errors, their causes and remedial actions.

8.1 Different door widths on one floor level

- In the case of different door widths on a floor level, the door width of the shaft side may be up to 1,000mm shorter than that of the car.
- The car side must always have a longer door width than the landing door side.
- The car side opens the door together with the landing door and stops at the open position of the landing door.
- The car door then generates the "Door Opened" signal.
- Activation of the door holding force is not possible in this open position.

8.2 Description of the display in the event of an error

Table 3: Description of the display in the event of an error

Display - TSG	Description of condition	Possible causes	Actions
----	No errors present	----	----
Eu	Communication failure	<ul style="list-style-type: none"> - Flat cable connection from IR module to TSG V4 electronics faulty. - incorrect parametrisation of TSG V4 electronics - IR module defective 	<ul style="list-style-type: none"> - Check the flat cable connection - Adjust parameter hA (See chapter 7 Configuration / page 9) - Restart TSG V4 electronics - Exchange of the TSG V4 electronics
F0	Connection established between the units, but no communication	<ul style="list-style-type: none"> - Units are configured the same (both as master or both as slave) 	<ul style="list-style-type: none"> - TSG V4 electronics on the car as master, hA=27 - TSG V4 electronics on the landing door as slave, hA=28
F1	Run command is present, but doors do not open	<ul style="list-style-type: none"> - no communication between master and slave - TSG V4 electronics configured as slave 	<ul style="list-style-type: none"> - Connector of optical transceiver unit not plugged in (both LEDs off) - Optical transceiver unit not aligned correctly, or too far apart (yellow LED on, green LED off) - TSG V4 electronics on the car as master, hA=27 - TSG V4 electronics on the landing door: Control must be via the TSG V4 electronics on the car.
FA	There is an open command at the car door, but shaft door is still locked	<ul style="list-style-type: none"> - Check the auxiliary contact of the landing door locking device -The landing door lock does not unlock 	<ul style="list-style-type: none"> - Shaft door interlock check contacts - Check landing door locking mechanism

10.3 LED3 ready for operation, optical transceiver unit

The operating status of the optical transceiver unit is displayed.

Table 6: Ready for operation LED, optical transceiver unit

Status LED	Description of condition	Possible causes
Off	No voltage present.	<ul style="list-style-type: none"> – No mains voltage supply or emergency power supply available to TSG V4 electronics. – Flat cable connection to TSG V4 electronics not present or faulty. – Check plug connection of optical transceiver unit to IR module of TSG V4 electronics.
On	Optical transceiver unit is ready for operation.	

10.4 LED4 Communication active, optical transceiver.

The status of the communication between the two optical transceiver units is displayed.

Table 7: Communication active LED, optical transceiver unit

Status LED	Description of condition	Possible causes
Off	No communication between master and slave TSG.	<ul style="list-style-type: none"> – Car is outside the landing – Car is inside the landing, but optical transceiver units are not aligned. – Objects, foreign parts or materials interfere with the optical transmission between the transceiver units. – Incorrect parameterisation of the TSG V4 electronics (both set as master, hA=27 or both set as slave, hA=28).
Flickering (20Hz)	Communication between master and slave present.	

11 Technical data

Light transmitter	IRED
Operating range	0 – 0.8m
Limit range	1m
Light type	Infrared, alternating light, 900nm
Output radiation intensity, Angle of half intensity	+/- 25°
Storage/transport temperature	0°C – 60°C; maximum change: 20K/h
Permissible average operating ambient temperature	5°C – 40°C with nominal data
Installation altitude	Up to 1,000m above sea level without restriction
Relative humidity	10% – 90%, non-condensing
Protection class	IP20
Enclosure material	PC UL 94 V-0 (material PC V-0 is flame-retardant, self-extinguishing and suitable for outdoor use; f1 listing to UL 746C)
Colour of enclosure	Black, similar to RAL 9005
Material of connection cable	PUR halogen-free black
Earth	approx. 270g per unit incl. connection cable

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