

Manual

Shaft copying system **Ants LEB01**
Absolute positioning

english



RS485 

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1. General information

Ants LEB01 is a measurement system consisting of a band and an encoder used to determine the absolute car position.

The band can easily be installed by the provided Ants LEB01 mounting kit. It is fixed on both ends of the shaft and inserted into the encoder. The band is made out of stainless steel.

The encoder has small dimensions and is built in an eloxed ALU-housing.

Special sliding jaws made of a synthetic material with ideal sliding properties make sure that the band stays in its position maintenance-free.

Because of the flexible mounting kit the encoder can be individually adjusted on any elevator car and is therefore also qualified for modernization.

It is possible to insert the band into the lateral opening of the encoder, without demounting the band at every time.

All used materials are extremely robust – neither dust, dirt and moisture, magnetic fields nor high temperature fluctuations or any electromagnetic perturbation have an influence on the measurement system.

By the use of the flexible mounting kit and the provided attachment set Ants LEB01 can be installed time effectively by any versed professional in just a few minutes.

The Ants LEB01 can provide the absolute position for shaft height up to 392 m and a speed up to 5 m/s with a precision of 1 mm at any time – even after power failure, without new referencing.




The Ants LEB01 communicates with elevator controllers which support CANopen, CAN or SSI (others on request). Please contact the Kübler Group, Fritz Kübler GmbH.

1.1 Abbreviations used

Ants LEB01	Shaft copying system Ants LEB01
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1.2 Symbols used / Warnings and safety information

Particularly important information in the manual are identified as follows:

	Together with the signal word „Danger“, this symbol indicates an immediately imminent danger for life and health of persons. The non-compliance with this information will lead to severe adverse health effects with the possibility of life threatening injuries.
	Together with the signal word „Warning“, this symbol indicates a possible danger for life and health of persons. The non-compliance with this information may lead to severe adverse health effects with the possibility of life threatening injuries.
	Together with the signal word „Caution“, this symbol indicates a possibly hazardous situation. The non-compliance with this information may lead to minor injuries or material damages.

NOTICE

Useful hints and recommendations, as well as information, for efficient and trouble-free operation.

1.3 Safety guidelines

NOTICE

Please read the operating manual carefully before commissioning the device. Installation instructions must be observed.
Only commission the device if you understand the operating manual.

1.4 Training of installation and operating personnel

The operator may only use people for installation and commissioning, which have the basic rules of accident prevention and safety knowledge and have read and understood the safety instructions in this manual.

1.5 Warranty and liability

The entitlement to warranty and liability becomes void if Ants LES01 is not used in the intended manner, if any damage can be traced back to a failure to observe the operating manual, or if installation and operating personnel are not properly qualified or trained.

Failure to observe these instructions voids all entitlement to warranty or guarantee as well as any possible liability claims. All regulations concerning accident prevention which are applicable on the elevator must be observed. In order to prevent damage due to improper handling of electrical voltages and currents, all relevant (including local) regulations must be observed, particularly in respect of protective measures and proper earthing.

1.6 Intended use

The Ants LEB01 has exclusively been developed for the following purpose of use:

NOTICE

The measurement system Ants LEB01 is used for the determination of absolute car position.
Any irregular use can cause dangerous situations.
The Ants LEB01 may only be used accordingly.
All in the manual mentioned specifications have to be strictly observed.
Any transformations of the construction or single components to change the operating conditions of the Ants LEB01 are prohibited.
The operator is liable for any damages resulting from the use of the product contrary to its designated use and all requirements will be lost.

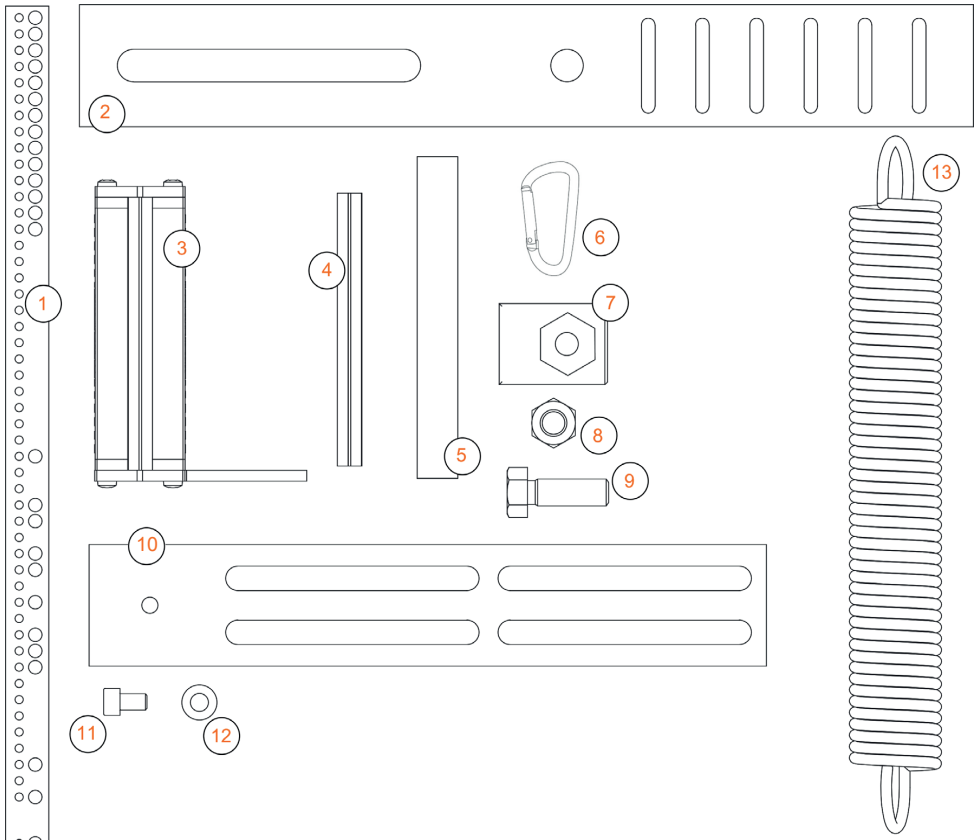
1.7 Transportation and delivery

Proper transport of the carton – no throwing or pushing!

Immediate inspection of the delivery to identify losses or damages during transportation.

Note any signs of damage on the transport documents and file complaint immediately.

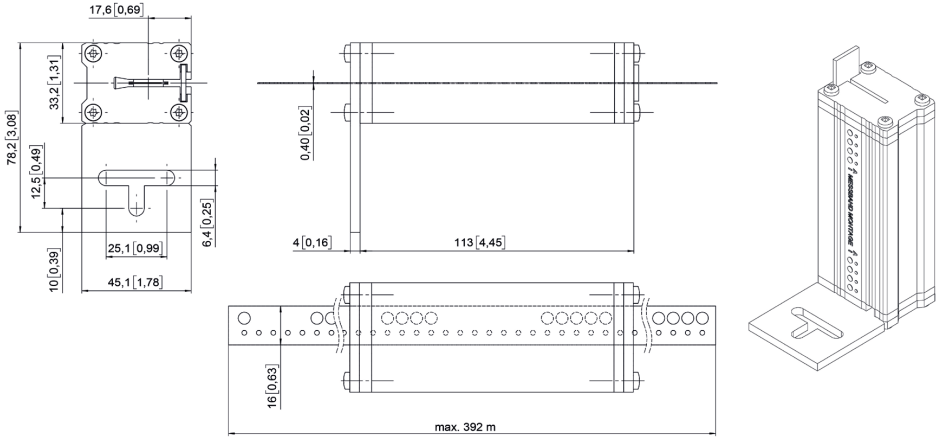
1.8 Scope of delivery



1. 1x band
2. 2x suspension device
3. 1x encoder
4. 2x sliding jaw (1x inside unit, 1x enclosed)
5. 1x aluminum rail
6. 1x carabiner-hook
7. 4x clamping plates
8. 4x M10 screw-nut
9. 4x M10 screw
10. 1x fastening angle
11. 1x connecting screw
12. 1x plain washer
13. 1x spring

2. Dimensions of the encoder

Dimensions in mm [inch]



3. Assembling of the band

Use the clamping plates to fix one suspension device on the elevator rail above the highest station. Connect suspension device and band by the carabiner hook.

NOTICE

The correct adjustment is essential for the proper function of the device!

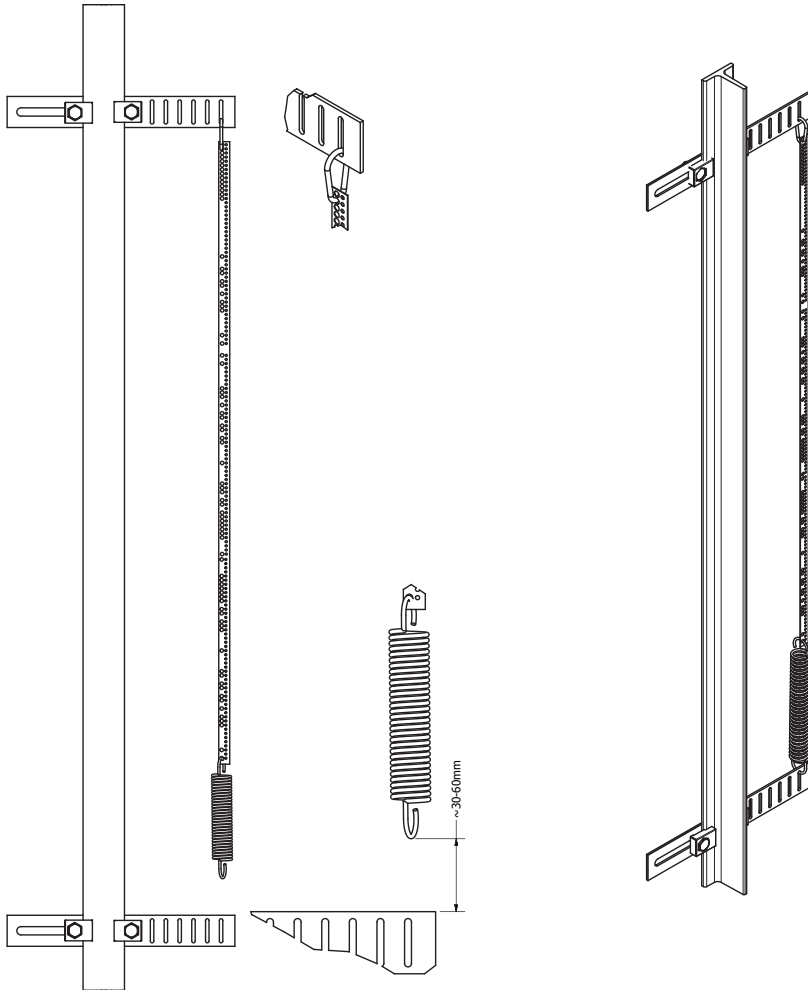
The upper end of the 16 bit band can be identified by 15 big holes placed directly next to each other.

CAUTION

Also pay attention to the side-orientation of the holes.
You can find a marking which demonstrates the correct orientation on the encoder.

Now hook the spring into the bottom end of the band.

Fix the second suspension device at a distance of 30-60 mm to the bottom end of the spring and tight the band by hooking in the spring.



4. Assembling of the encoder

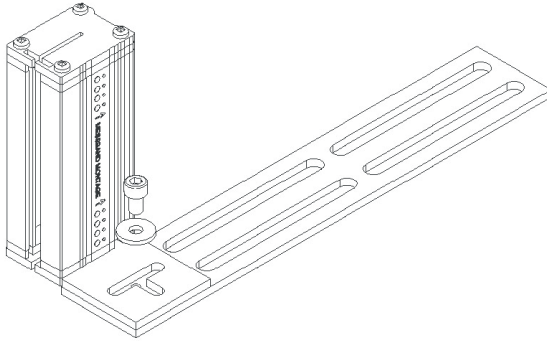


Fig. 1:

Initially connect fastening angle and encoder with the connecting screw. For further improvements do not tighten the screw.

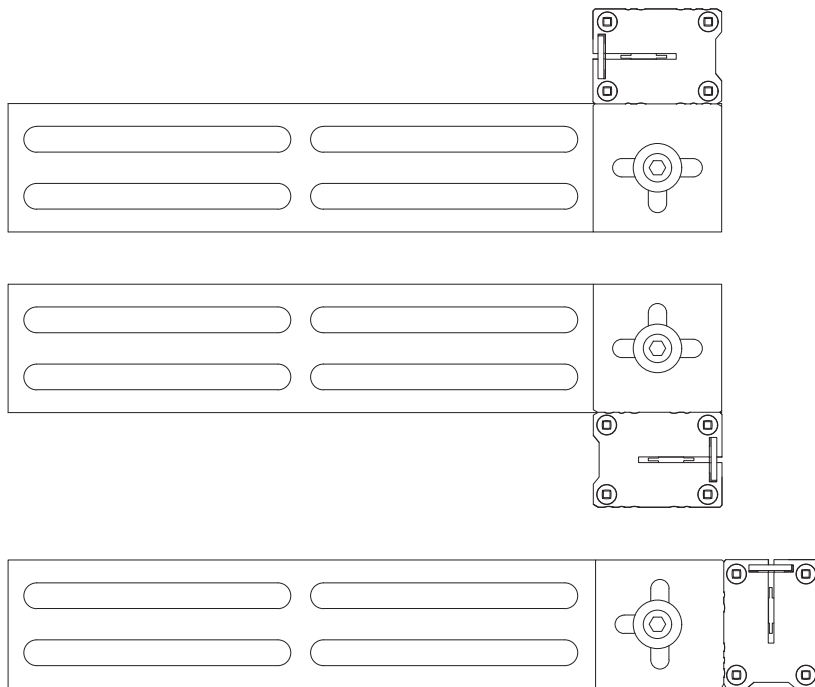


Fig. 2:

Pay attention to the right position which depends on the already installed measurement tape.

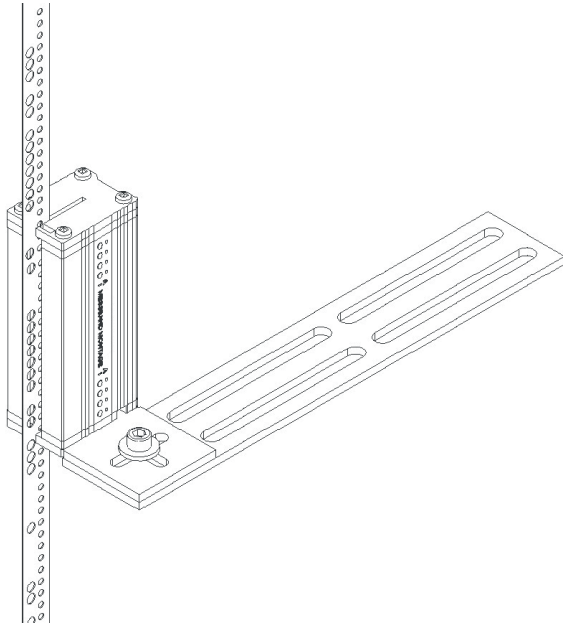


Fig. 3:

Put the band into the encoder through the lateral opening. Check the right orientation of the holes with the aid of the marking on the encoder.

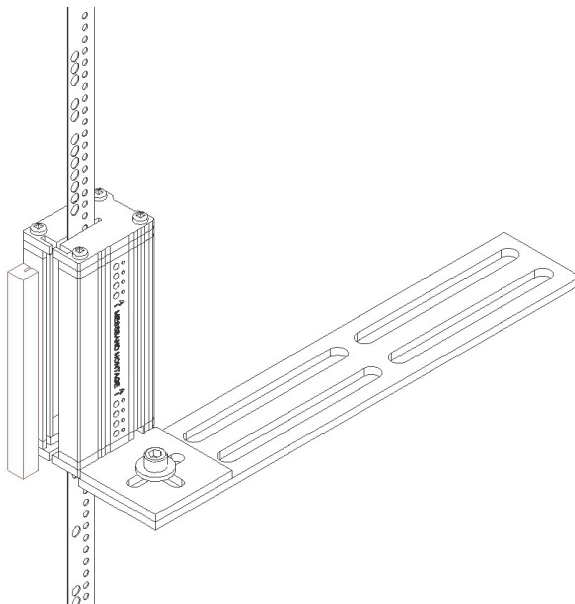


Fig. 4:

Push the sliding jaw with the designated tapekerf into the lateral opening.

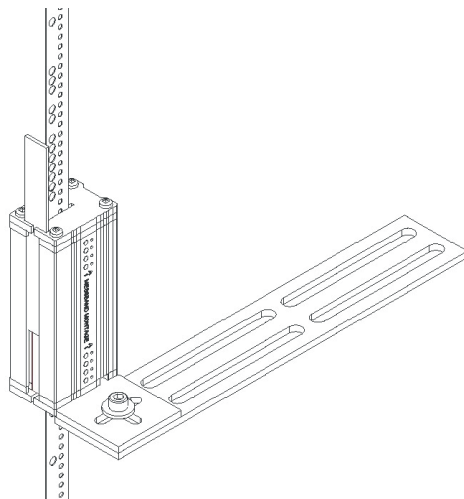


Fig. 5:
 Insert the aluminum rail from top to bottom as far as it can go into the allocated insertion slide-in.

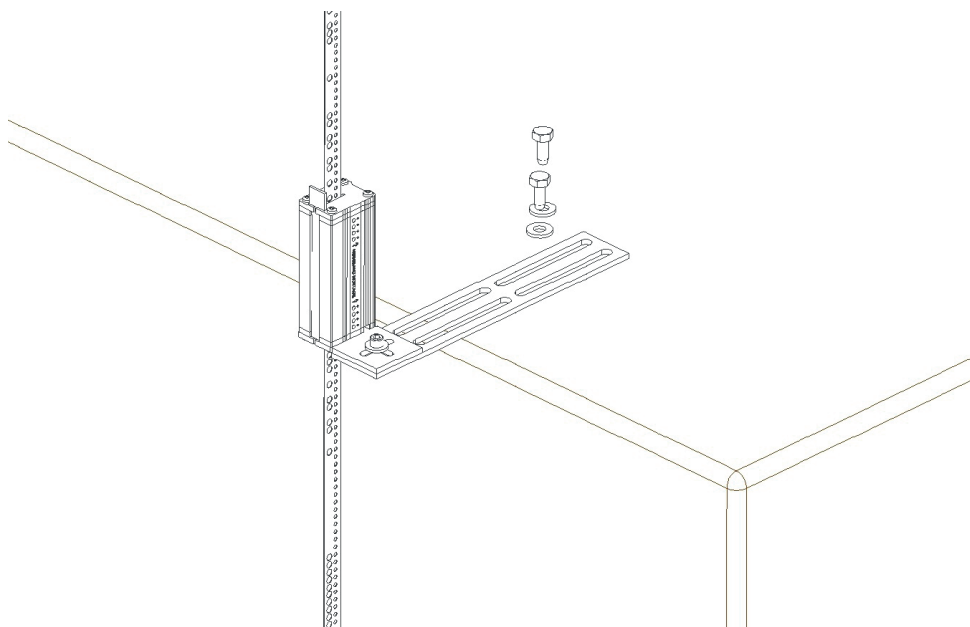


Fig. 6:
 Put the fastening angle on the car roof and re-adjust, if necessary.

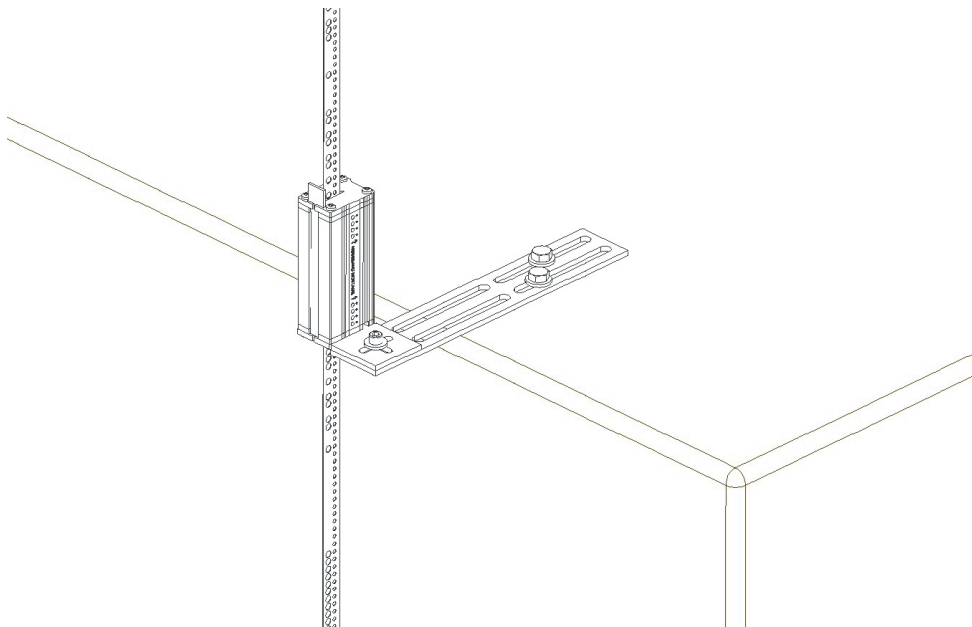
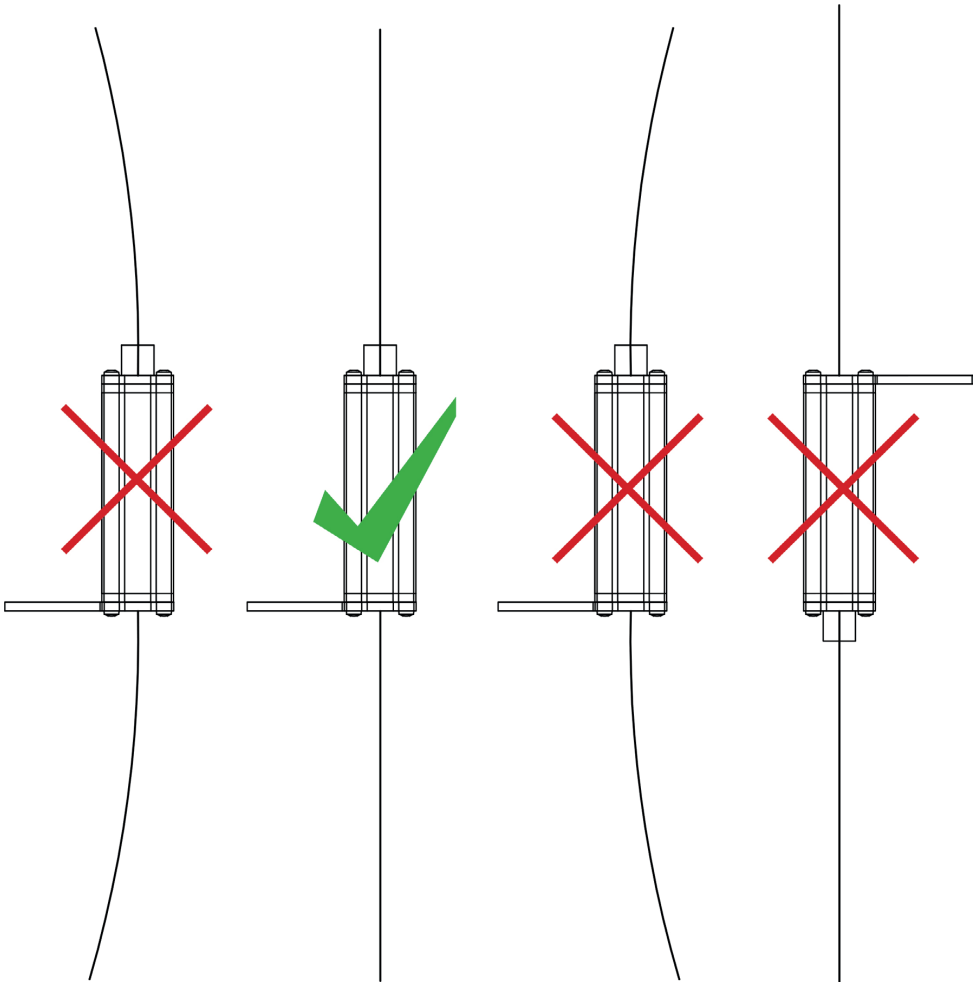


Fig. 7:
Screw the fastening angle and retighten the connecting screw.

5. Direction of the band

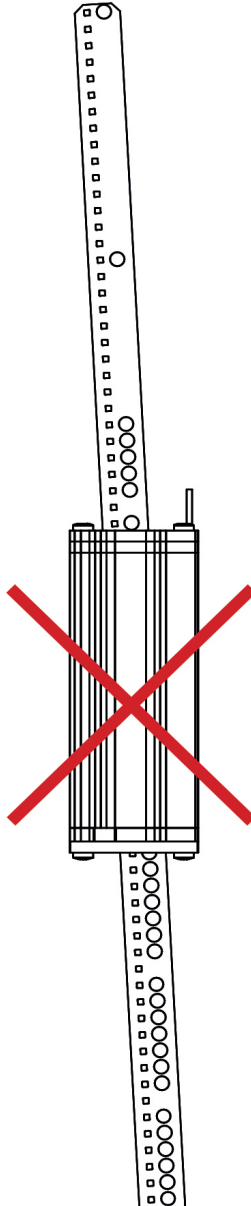
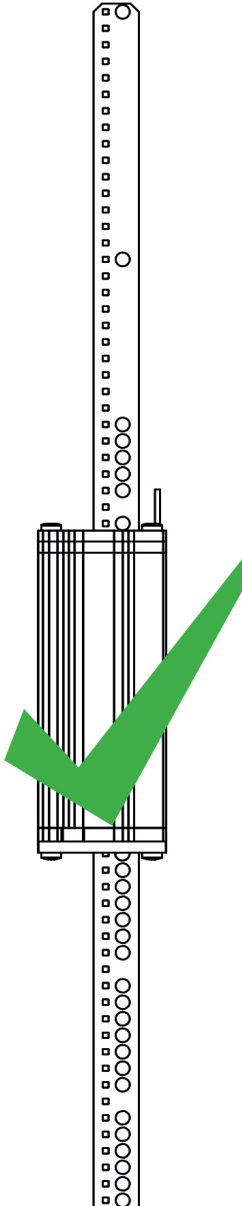
 **CAUTION**

The band must be mounted vertically and straight.
A slight curvature of the measurement tape has no impact on the result, attention only has to be paid on the aluminum rail which has to be inserted from top to bottom.



CAUTION

In addition, the tape must be fed straight through the encoder in order to prevent premature wear of the sliding jaws. Incorrect assembly can have a negative effect on the service life or lead to malfunctions or failure of the measuring system.



6. SSI

6.1 Specification

The data is transmitted in slave mode.

Standard SSI factory settings:

Resolution setting: 0.25 mm

Data: 25 bit + 1 power failure bit (low)

MSB first

Coding: Gray Code

Double data transmission

Max. clock rate: 200 kHz

Min. time between pulls: 500 μ s

6.2 Cable connection

Open cable head:

Brown: Supply 10-30VDC

White: 0V / GND

Gray: Data +

Pink: Data -

Yellow: Clock -

Green: Clock +

Terminated: yes

6.3 Protocol description

One single position data needs to be pulled out by the SSI Master through 52 clocks:

1-25: MSB first absolut position in Graycode,

26: data low (PFB),

27-51: second transmission (same as 1-25),

52: data low (PFB)

For costumer specific adjustments please contact the manufacturer.

7. CANopen Lift (DS-417)

7.1 Specification

A standard Ants LEB01 is delivered with the following configuration:

Bitrate:	250 kbit/s
Identifier:	0x18C
NodeID:	0x04
Eventtimer:	10 ms
Precision:	1 mm
Heartbeat:	500 ms
Terminated:	yes

Only for a short overview. For further information please visit the CiA homepage.

7.2 Cable connection

Open cable head:

Brown:	Supply 10 ... 30VDC
White:	OV / GND
Green:	CAN HIGH
Yellow:	CAN LOW
Cable shield:	PE

Shielding only machine sided!

7.3 Operating modes

Sends position data in interval: **Attention:** valid for all slaves.

Master → for all slaves:

	ID HEX	DLC	DATA_HEX	
Operational	00	2	01	00
PRE-Operational	00	2	80	00
STOP-Modus	00	2	02	00

7.4 Programming

NOTICE

When programming, there must always be a band in the sensor.

7.4.1 Layer Setting Services (LSS)

The Ants LEB01 has to be put into STOP mode. Change into LSS configuration mode:

Master → Slave:

	ID HEX	DLC	DATA_HEX							
LSS-Mode	7e5	8	04	01	00	00	00	00	00	00

7.4.2 Setting baud rate

The Ants LEB01 has to be put into pre-operational mode or operational mode.

Master → Slave:

	ID HEX	DLC	DATA_HEX							
new baudrate	7e5	8	13	00	XX	00	00	00	00	00
XX = 1->800kB2->500kBit, 3->250kBit, 4->125kBit, 6->50kBit,7->20kBit										

Slave → Master:

	ID HEX	DLC	DATA_HEX							
new baudrate ok	7e5	8	13	00	00	00	00	00	00	00

For storage and changes please follow instructions in „LSS-Save“.

7.4.3 Setting NodeID

The Ants LEB01 has to be put into pre-operational mode or operational mode.

Master → Slave:

	ID HEX	DLC	DATA_HEX							
new NodeID	7e5	8	11	XX	00	00	00	00	00	00
XX = 01-7F // Default CANopenLift : 04										

Slave → Master:

	ID HEX	DLC	DATA_HEX							
new NodeID ok	7e4	8	11	00	00	00	00	00	00	00

For storage and changes please follow instructions in „LSS-Save“.

7.4.4 Storage LSS data

For permanent storage of baud rate and NodeID.

Changes will not be effective after re-start.

Master → Slave:

	ID HEX	DLC	DATA_HEX							
save Baudrate+NodeID	7e5	8	17	00	00	00	00	00	00	00
XX = 01-7F // Default CANopenLift : 04										

Slave → Master:

	ID HEX	DLC	DATA_HEX							
Baudrate+NodeID ok	7e4	8	17	00	00	00	00	00	00	00

Restart the Ants LEB01.

7.4.5 Permanent data storage

Permanent storage of parameter:

- heartbeat interval
- position data interval

The Ants LEB01 has to be put into pre-operational mode or operational mode.

Master → Slave:

	ID_HEX	DLC	DATA_HEX								
	600+NodeID	8	23	10	10	01	73	61	76	65	
save	604	8	23	10	10	01	73	61	76	65	

Slave → Master:

	ID_HEX	DLC	DATA_HEX								
	580+NodeID	8	60	10	10	01	00	00	00	00	
save ok	584	8	60	10	10	01	00	00	00	00	

7.4.6 Setting the heartbeat interval

The Ants LEB01 has to be put into pre-operational mode or operational mode.

Master → Slave:

	ID_HEX	DLC	DATA_HEX								
	600+NodeID	8	2b	17	10	00	LSB	MBS	00	00	
set 500ms	604	8	2b	17	10	00	f4	01	00	00	

Slave → Master:

	ID_HEX	DLC	DATA_HEX								
	580+NodeID	8	60	17	10	00	00	00	00	00	
500ms ok	584	8	60	17	10	00	00	00	00	00	

7.4.7 Setting position-interval

To receive position data, the Ants LEB01 has to be put into operational mode.

The Ants LEB01 has to be put into pre-operational mode or operational mode.

Master → Slave:

	ID_HEX	DLC	DATA_HEX								
	600+NodeID	8	2b	06	19	05	LSB	MBS	00	00	
set 10ms	604	8	2b	06	19	05	0a	00	00	00	

Slave → Master:

	ID_HEX	DLC	DATA_HEX							
	580+NodeID	8	60	06	19	05	00	00	00	00
10ms ok	584	8	60	06	19	05	00	00	00	00

8. Electric installation

Please note the respective wiring diagram depending on the model.

Please note further that our product is already equipped with a terminating resistor.

9. Maintenance

Generally the Ants LEB01 does not demand high maintenance requirements.

In the course of routine servicing, proceed as follows:

- Make sure the band is correctly directed between the sliding jaws (see “Direction of the band”)
- Control the sliding jaws for abrasion and dirt and replace as necessary. Also pay attention on the second sliding jaw which is positioned inside the encoder.
- Clean the inside of the encoder carefully to remove dust and dirt.
- Examine the band for damages which could affect the result.
- Check the tightening of the band. If it is insufficient because of the abrasion of the spring retighten it.
- Clean the band with a cloth during an inspection run.

10. Possible errors

No communication to elevator controller:

- Check support voltage.
- Make sure the connection to CAN-Bus is installed properly.

The Ants LEB01 can not be put into operational mode:

- Check if the band is correctly inserted.
- Inspect the sliding jaws for abrasion.

11. Ordering information & spare parts

Any components (see „scope of delivery) can be reordered separately.

Therefore please contact the Kübler Group, Fritz Kübler GmbH.

12. Disposal and recycling

Unusable or irreparable devices and devices which have exceeded their lifecycle have to be disposed in accordance to the applicable waste disposal regulations.

13. Specifications

Measurement:	absolute
Resolution:	1 mm
Precision:	1 mm
Housing:	aluminum
Dimensions:	135 mm (h) x 45 mm (l) x 33 mm (w)
Max. measurement length:	392 m
Max. speed:	5 m/s
Connection:	Cable 5 m, open end
Operating temperature:	-5°C ... +70°C
Storage temperature:	-10°C ... +70°C
Supply voltage:	10 ... 30 VDC +/- 10%
Interfaces:	CANopen Lift, SSI, further on request

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