Annex acc. to FCC Title 47 CFR Part 15
relating to
FEIG ELECTRONIC GmbH
ID LRM5400

Annex no. 5
User Manual
Functional Description

Title 47 - Telecommunication
Part 15 - Radio Frequency Devices
Subpart C – Intentional Radiators
Measurement Procedure:
ANSI C63.4-2014
ANSI C63.10-2013

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User manual/ Functional description of the test equipment (EUT)

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Installation

ID ANT.1710/690
Crystal Gate Wave

Type A and Type B

NOTE

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Documentation provided

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Quickstart	ID ANT1710/690 Crystal Gate Wave	M30421-xde-ID-B
Manual	ID ISC.ANT.GPC	H01011-xe-ID-B
Start Information	ID ISC.ANT.GPC	M70110-xde-ID-B
Manual	ID ANT.MUX.M5	H21123-xe.ID-B
Installation guide	ID ANT.MUX.M5	M21122-xe-ID-B
Quickstart	ID ANT.MUX.M5	M21024-xde-ID-B
Installation	Ethernet-Interface	M81010-xd-ID-B
Installation	ID ISC.DAT	M40401-xde-ID-B

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1 Safety Instructions

- The device may only be used for the intended purpose designed by the manufacturer.
- The operation manual should be conveniently kept available at all times for each user.
- Unauthorized changes and the use of spare parts and additional devices which have not been sold or recommended by the manufacturer may cause fire, electric shocks or injuries. Such unauthorized measures shall exclude any liability by the manufacturer.
- The liability-prescriptions of the manufacturer in the issue valid at the time of purchase are valid for the device. The manufacturer shall not be held legally responsible for inaccuracies, errors, or omissions in the manual or automatically set parameters for a device or for an incorrect application of a device.
- Repairs may only be executed by the manufacturer.
- Installation, operation and maintenance procedures should only be carried out by qualified personnel.
- Use of the device and its installation must be in accordance with national legal requirements and local electrical codes.
- When working on devices the valid safety regulations must be observed.
- Please observe that some parts of the device may heat severely.
- Before touching the device, the power supply must always be interrupted. Make sure that the device is without voltage by measuring. The fading of an operation control (LED) is no indicator for an interrupted power supply or the device being out of voltage!
- For installation and dismantling you should wear suitable safety gloves, because parts of the antenna housing could be sharp-edged.
- Special advice for carriers of cardiac pacemakers:
  Although this device doesn't exceed the valid limits for electromagnetic fields you should keep a minimum distance of 25 cm between the device or the antenna and your cardiac pacemaker.

CAUTION	
	Voltages of up to 1000 V can occur at the antenna tuner and the antenna conductor.
	Do not look directly into the alarm LED with your eyes. There is a risk of damage to the eyes.
	Avoid humidity on the antenna. The Antenna is not waterproof and should not be exposed to rain or humidity.

2 Instruction on transportation and shipping of the antenna

The packaging of the antennas has been designed to transport antennas vertically standing on a pallet to the site of installation.

NOTE:

The antenna must be transported vertically on the base side of the pallet. Transport or storage in the wrong orientation can cause damage to the antenna.

In case a vertically positioned transport is not possible, the antenna can be transported lying on the narrow side. A transporting lying on the flat side of the packaging can cause damage to the device.

The pallet has to be adapted to the size and the number of antennas. In no case shall the packaging stand out of the range. An additional protection of the edges of the pallet is recommended.

The packaging must never become wet. When transporting overseas by ship or plane, the packaging must be protected from moisture at all times.

Temperatures above or below the specified temperature range may damage the antenna.

Any mechanical stress on the packaging is not permitted. Any stacking of the packaging may cause damage to the packaging below.

Even after the unpacking of the antenna the face of the antenna plate must always be transported and stored vertically. Horizontal transport of an antenna may deform the antenna plate.

Figure 1: Antenna storage

3 Maintenance and Cleaning

The antenna ID ANT1710/690 Crystal Gate Wave is a design product with high quality surfaces and should always be handled with caution. The antenna was designed to work reliably and flawlessly for years without special maintenance.

NOTE:

- Under no circumstances should water get into the antenna base. Water damages the electronics in the antenna!
- The use of alcohol, spirit, thinners, glass cleaners or other harsh cleaning liquids is prohibited and will damage the acrylic plate.

To improve the durability and the appearance, please follow the instructions below:

- Keep the antenna clean and take care the antenna is not scratched. Also regularly apply specific antistatic products for acrylic surfaces.
- Regularly remove dust and other impurities with a soft cloth and a solution of water with a little dishwashing liquid.
- Keep the antenna dry. All kinds of moisture should be avoided during operation and storage. Precipitation, humidity and liquids contain minerals that will corrode electronic circuits and damaging transparent plastic parts.
- Protect the antenna from high temperatures. Mount the antenna away from heaters and other heat sources. Operation under direct sunlight can cause extreme high temperatures and a fading cause of the surface.
- Avoid storing or operating the antenna at dirty or wet locations. The surfaces or electronic components may be-damaging.
- Handle the device with care. Shocks may break internal circuit boards.
- Do not try to open the antenna during operation or outside maintenance periods. Non-professional management can result in damage to the device.

  If any device not working properly, please contact the appropriate representative.

4 Scope of delivery

4.1 Antenna ID ANT1710/690 Crystal Gate Wave Type A

- 1 x Antenna Gate Wave
- 1 x Dynamic Antenna Tuning board ID ISC.DAT
- 1 x Long Range Reader Modul ID LRM5400
- 1 x Power supply ID ISC.Net24V-B 100-240V/ 24V
- 1 x People Counter ID ISC.ANTGPC
- 1 x Alarm LED / Summer
- 1 x Quickstart guide ID ANT1710/690 Crystal Gate Wave
- 1 x Quickstart guide Reader ID LRM5400

NOTE:

Power cord is no delivery component.

4.2 Antenna ID ANT1710/690 Crystal Gate Wave Type B

- 1 x Antenna Gate Wave
- 1 x Dynamic Antenna Tuning board ID ISC.DAT
- 1 x Alarm LED
- 1 x Data cable 3,5 m, for LED / People Counter
- 1 x Connecting cable. 8 m

5 Performance Features

The ID ANT1710/690 Crystal Gate Wave Type A antenna is a version with integrated dynamic Antenna Tuning Board ID ISC.DAT, Long Range Reader ID LRM5400, additional Alarm LED light, alarm sounder and Gate People Counter GPC.

Additionally, one People Counter board and one radar sensor are already integrated in the antenna.

The ID ANT1710/690 Crystal Gate Wave Type B antenna is a version with integrated dynamic Antenna Tuning Board ID ISC.DAT and alarm LED light mounted, only.

Antenna combination

- two antennas with reader and multiplexer as a single gate,
- three to four antennas with reader and multiplexer as a double gate or triple gate
- up to 7 antennas as multiple gates with up to 6 aisles at the use of the multiplexer ID ANT.MUX M5.(not included)

Depending on the antenna configuration, one, two or all three read orientations of the smart tags and various aisle widths (gate widths) are possible.

The People Counter, integrated in antenna type A, can be easily extended to two passages with the help of the option ID ISC.ANT.GPC-E2 extension radar detector.

The ID ANT1710/690 Crystal Gate Wave Type A/B is a „figure-of-eight“ antenna with tuner and has been optimized as transmitting and receiving antennas for the ID LRM5400 Reader. It is however also possible to operate them with other readers at a transmission frequency of 13.56 MHz and an output impedance of 50 Ω. The read ranges indicated in this document and the tuning procedures may vary.

The antennas comprise the electrical antenna conductor, the housing, the ID ISC.DAT Dynamic Antenna Tuner and the connection cables. The antennas are tuned to the factory default to an impedance of 50 Ω in a magnetically neutral environment at a distance of 95 cm. When installing in different ambient conditions the antenna can be retuned using the “DATuningTool“ PC software.

After tuning, the antennas will retain their settings as long as the ambient conditions remain unchanged.

The antennas can be used for detecting product and persons.

NOTE:

It is for indoors use, only.

5.1 Performance Features of the ID ANT1710/690 Crystal Gate Antennas

The product ID ISC.ANT.GPC, short form “Gate People Counter” or “GPC”, are made for mounting in the antennas ID ANT1710/690 Crystal Gate.
A Gate People Counter consist of a People Counter board (PC) and one Radar Detector! The product ID ISC.ANT.GPC-E2 Extension Radar Detector is used to extend the People Counter to a second gate aisles.
The People Counter has two counters per aisle. The values of the incoming and outgoing persons will be separately captured.

NOTE:

A change of the countervalues will be stored in the EEPROM of the People Counter board. By sending the command “0x78 Set People Counter” the values could be set/reset to the needed value.

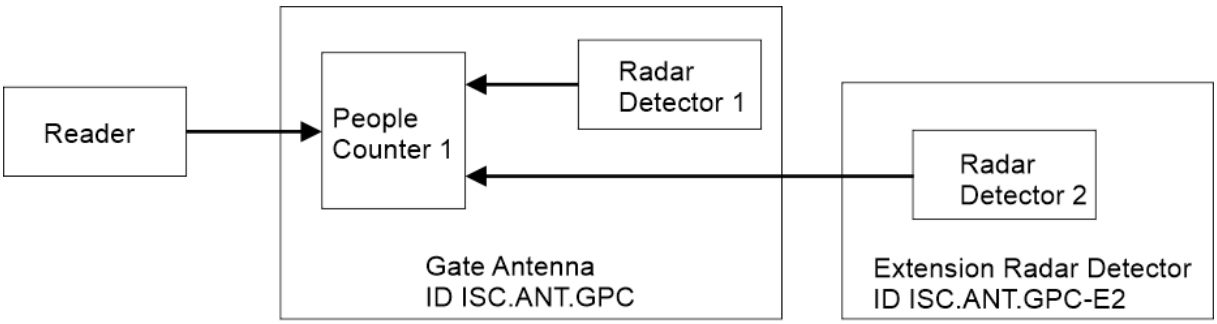


Figure 2: Gate People Counter Structure (2-3 Antennas, 1-2 Gates)

2 Antenna panels, 1 aisle

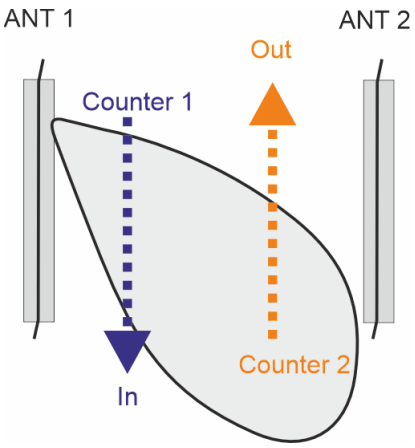


Figure 3: "Radar detection area" with 1 aisle

3 Antenna panels, 2 aisles

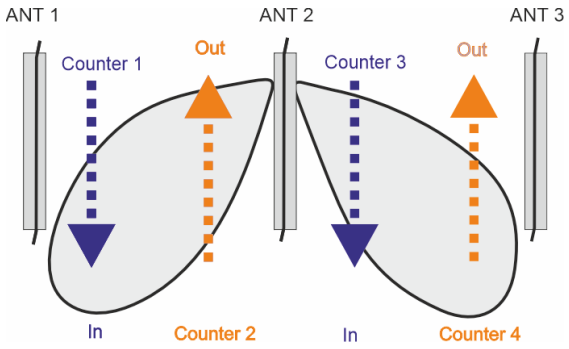


Figure 4: "Radar detection area" with 2 aisles

4 Antenna panels, 3 aisles

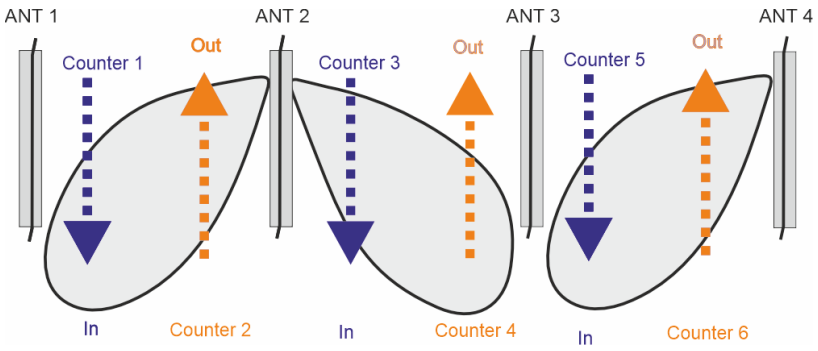


Figure 5: "Radar detection area" with 3 aisles

The People Counter board and the Radar detectors are mounted in the base of the antennas. Due to the radar beam can pervade the plastic housing of the antenna, no openings a necessary.

The two digital outputs can be used, to enable a alarm light at every gate antenna or activate an alarm sounder in the gate antenna.

The Connection between reader and people counter takes place through the RS485 Interface of the reader, inside the antenna.

There is no need of a direct connection from the GPC to the Host. All commands from the Host to the People Counters are embedded in the Pickyback command of the reader.

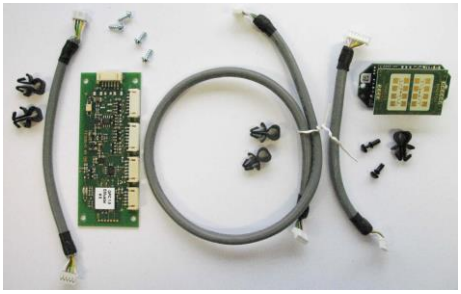
NOTE:

Generally, there are two possibilities to get the actual people counter values. Either the Host poll the People Counter periodically or in the Notification Mode of the reader, the reader send a notification protocol at every change.

In ISO Host or Buffered Read Mode, the host poll the GPC by sending protocols. Only, in the Notification Mode, the reader poll the counter values, automatically and send data according to the reader configuration to the host.

See System Manual ID ISC.ANT.GPC (H01011-xe-ID-B)

5.2 Device and Accessories

Antenna	Order-No.	Description	Figure
ID ANT1710/690-A Crystal Gate Wave	5400.001.01	• Antenna with reader • Multiplexer • automatic alignment • Alarm LED Light • Buzzer • People counter (GPC)	
ID ANT1710/690-B Crystal Gate Wave	5401.001.01	• Antenna • automatic alignment • Alarm LED Light	
ID ISC.ANT.GPC Gate People Counter	4704.000.00	• People counter (GPC) • Radar detector for Antenna ID ANT1710/690 • Optional: mounting and cable set	

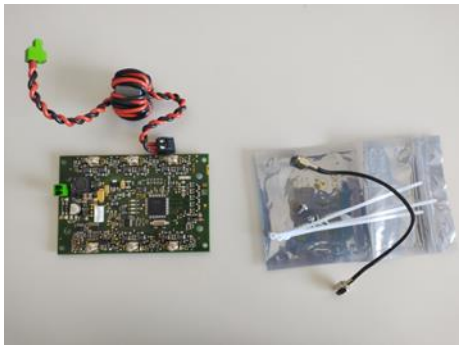
ID ISC.ANT.GPC-E2 Extension Radar Detector	4718.000.00	• Second radar detector • cable for second pass • Mounting Material	
ID ISC.ANT.CRG-MP Crystal Gate Mounting plate	4412.000.00	• Metal mounting plate for soft floor surface	
ID ISC.ANT.CRG-DT Crystal Gate Drilling Template	3827.000.00	• Drilling Template • Metal mounting plate for soft floor surface	
ID ANTMUX.M5 GMK	6696.000.00	• 5-Kanal Multiplexer inclusive Gates Mounting Kid	

Table 1: Device Accessories

Required components when using the People Counter (max. 7 antennas)

	Antenna		Multiplexer	People counter		
Number of antennas	ID ANT 1710/690-A	ID ANT 1710/690-B	ID ANT MUX GMK	ID ISC. ANT.GPC	ID ANT. GPC-E2	Description
2	1	1		0		1 x GPC in Antenna Type A included
3	1	2		0	1	1 x GPC in Antenna Type A included
4	1	3		1	1	1 x GPC in Antenna Type A included
5	1	4	1	1	2	Add 5-channel multiplexer, 1 x GPC in Antenna Type A included
6	1	5	1	2	2	Add 5-channel multiplexer, 1 x GPC in Antenna Type A included
7	1	6	1	2	3	Add 5-channel multiplexer, 1 x GPC in Antenna Type A included

Table 2: Required components when using people counter

6 Installation

- If several antennas or gates are connected to different readers, a minimum distance of 8 m between the antennas or gates must be maintained. For smaller distances (1-8 m), synchronization of the readers is necessary (see Application Note N10311-xd-ID). Synchronization is only possible in one of the "Reader Automatic Modes". (Buffered Read Mode or Notification Mode).
- If the antennas are less than 1.5 m apart, the antennas must be additionally shielded from each other.
  Otherwise, the reading range is significantly reduced.
- The antennas must have a minimum distance ≥ 20 cm from all larger metal parts!
  From a distance < 50 cm from the antenna to metal parts, the reading range is significantly reduced.

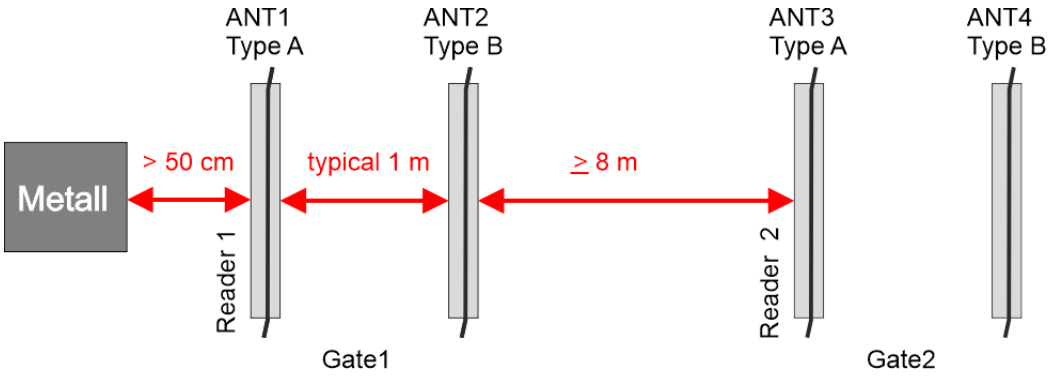


Figure 6: Antenna distance

NOTE:

- Please read 6.1 Project planning notes before mounting the antennas.
- The spacing of the antennas, that together form a gate, depends on the antenna configuration.

6.1 Preparing for assembly

- Place the antenna on the ground with the top of the carton facing up,
- open the carton
- Carefully lay the antenna on the floor with a pad

Figure 7: Antenna packaging

Remove the cover of the antenna base

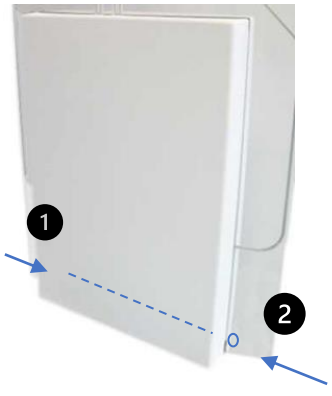
Remove the two fastening screws of the antenna base cover (hexagon socket SW 3.5) Number ❶ + ❷	❸ Slide the lid up in the direction of the arrow. ❹ Remove the cover in the direction of the arrow
	

Figure 8: Remove the base cover

6.2 Dimension and Installation of the antenna

The overall dimensions of the antenna
All dimensions are in mm with general tolerance according to ISO 2768 m (mean).

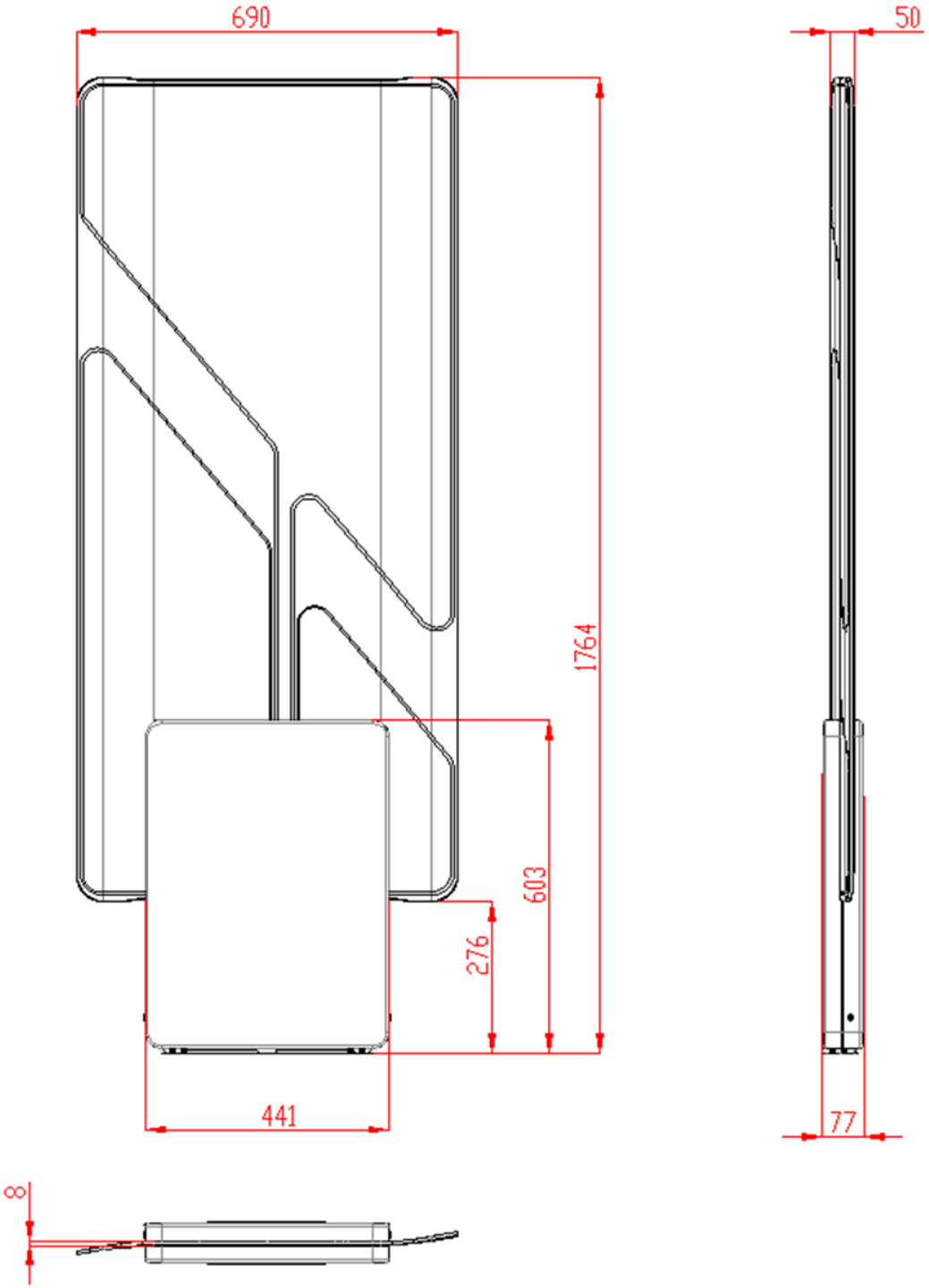


Figure 9: Dimension [mm]

6.2.1 Drilling the fixing holes

1. Mark the position of the antennas

2. Mark and drill the mounting holes and the openings for the cable entry.
   The dimensions are shown in Fig.10/11.

3. The ID ISC.ANT.CRG-MP Crystal Gate mounting plate or the ID ISC.ANT.CRG-DT Crystal Gate drilling template can be used to facilitate this. (optional). The drilling template can be mounted under the antenna base at the same time as stabilization and weight distribution on soft ground.

4. Select fastening anchors according to the ground conditions

5. Load capacity of the anchors: 5 kN per anchor for all load directions.
   (e.g. for concrete floor: Hilti compound anchor HVA with anchor rod HAS-(E) size M8 or Hilti internally threaded sleeve HIS-N size M8).

6. The size of the mounting holes in the antenna is 10 mm. The length of the anchor or mounting screws should protrude ≥ 40 mm and ≤ 55 mm from the floor.

7. The cable opening is dimensioned so that up to 10 cables with a diameter of 6 mm can be passed through.

8. If empty conduits are laid in the ground, an inner diameter of ≥ 30 mm is recommended, for gate assemblies with more than 3 antennas ≥ 50 mm.

9. Alternatively, the cables can also be routed out of the side of the antenna base
   (see picture 12)

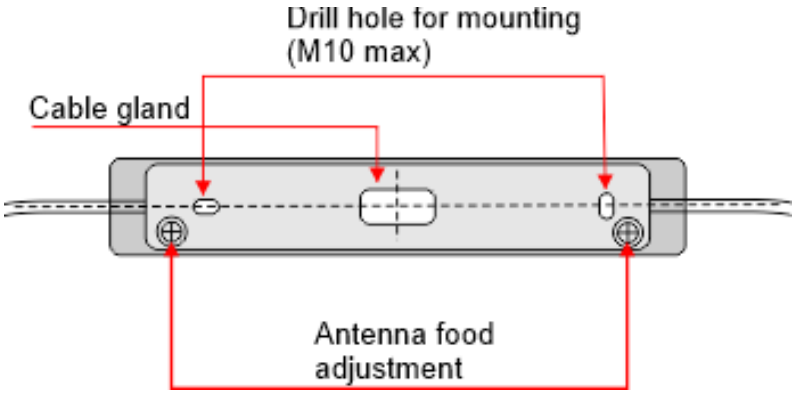


Figure 10: Drill hole mounting

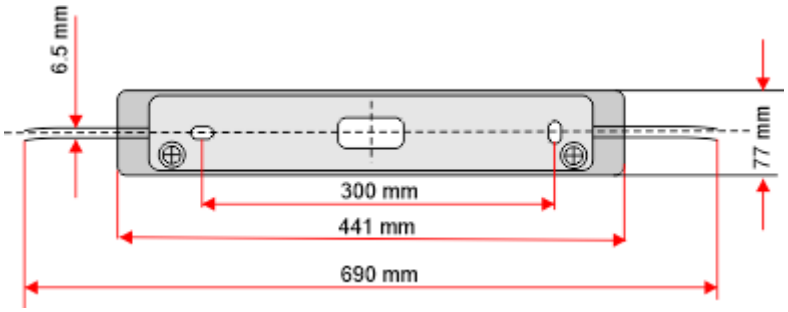


Figure 11: Dimension antenna food

Figure 12: Side cable gland

6.2.2 Mounting distance

- Screw antennas on the ground
- All antennas must point in the same direction. (Fig.12).
- The alignment of the antenna is done with the help of the adjusting screws (Fig. 13)
- If a gate people counter (GPC) is installed in the antenna, the “Start Information People Counter (ID ISC.ANT.GPC(M70110-xde-ID-B) must be observed.

Recommended entrance direction

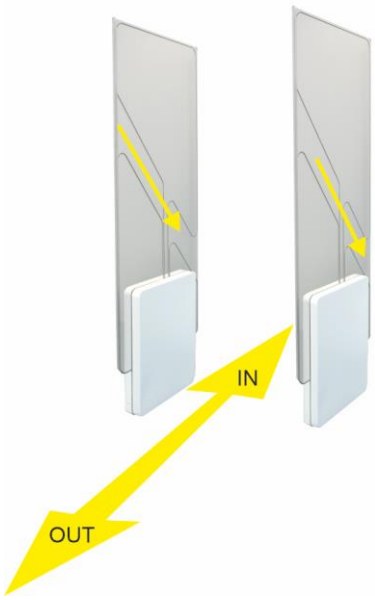


Figure 13: Recommended direction of the antenna

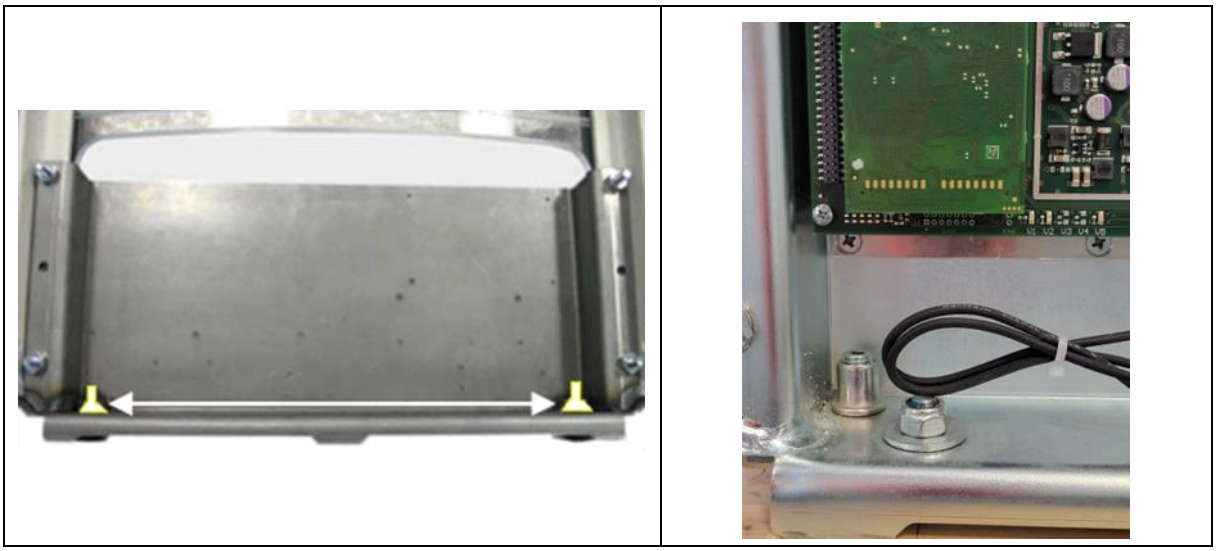


Figure 14: Adjustment screws (hexagon socket SW4)

7 Antenna Configuration (1 Gate)

Configuration of 1 gate / 2 antennas with three-dimensional tag orientation:

- Antenna ID ANT1710/690-Crystal Gate Wave-Type A **(reader include)**
- Antenna ID ANT1710690-Crystal Gate Wave Type B

If a tag moves, at horizontal line, through the gate, it can be read at least once. This ensures high reliability of the antenna system.

Size of the three-dimensional reading area of the antennas:

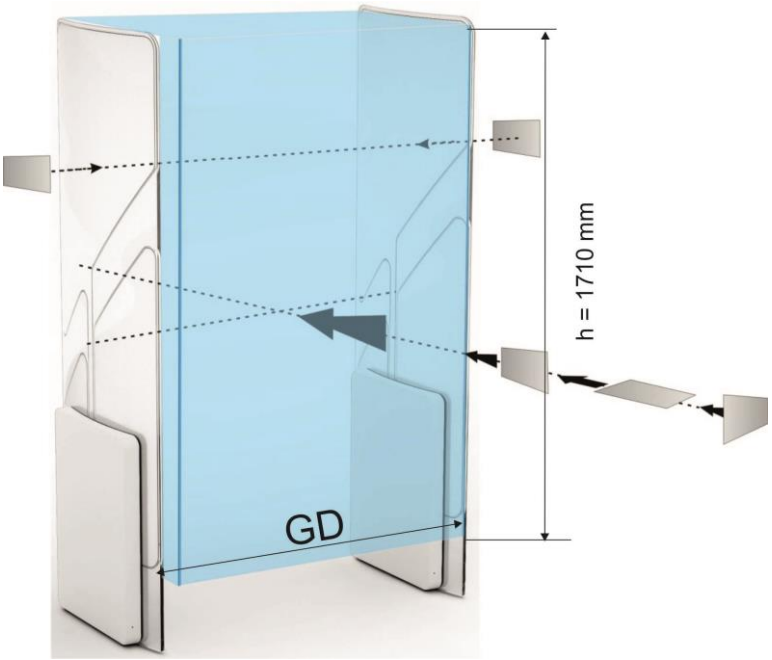


Figure 15: Detection range with three-dimensional tag orientation

NOTE:

- Note that the entire reading area of the antenna gate is larger than the three-dimensional area shown in the drawing (Fig. 16). This means there are tag orientations in which the tag can be detected outside the reading area.
- To achieve optimal performance, the reader must be configured and operated in one of the Reader Automatic Modes “Buffered Read”, “Notification”.
- If multiple gates are arranged at short distances (1-8m) from each other, they interfere with each other. In this case, the readers for the individual gates must be synchronized and operated in one of the Reader Automatic Modes.

Detection area for unwanted detection (gray area)

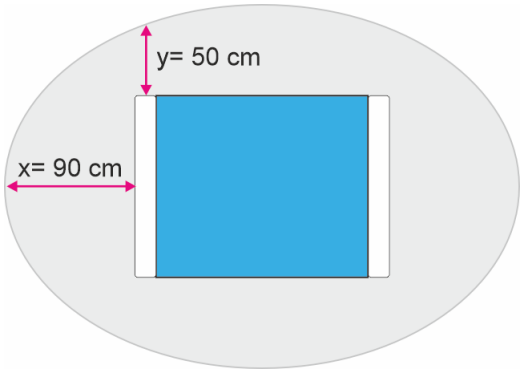


Figure 16: Top view, detection area unwanted detection

To achieve three-dimensional reading of the tag in the reading area drawn above (Fig. 15) the following conditions must be fulfilled:

- The gate distance (GD) depends on the antenna configuration (see Table 4).
- The tags should be at least ISO card size (46 mm x 75 mm).
- The activation field strength of the tags should be less than or equal to 60 mA/m.
- The distance from tag to tag should be greater than 10 cm. If the tag to tag distance is reduced, the gate distance GD must be reduced correspondingly. This applies in particular to distances under 5 cm.
- The maximum number of tags (serial number or data) depends on the traverse speed with which the tags are brought through the capture area of the gate (see Table 4). The number of tags may be increased in the gate distance GD is correspondingly reduced and the maximum speed adjusted accordingly.
- The antenna should be at least 50 cm away from metal parts.
- The minimum distance between the antennas of a gate and other antennas of RFID workstation or terminals (transmitting frequency 13,56 MHz) should be:

Transmitted output power	Minimum Distance
< 0.5 W	1 m
0.5 W-1.0 W	2 m
1.1 W – 2.0 W	3 m
> 2 W	4 m
>= 4 W	8 m

Table 3: Minimum Distances

- There should be no interference of the Reader from other electrical devices in the environment. The Noise Level difference should be less than 20 mV.
- The ID LRM5400 reader should be set to an RF power of 8 watts.
- When using ISO 15693 transponders, the Readers should be set as described in the Reader Manual ID LR5400 H20820-xe-ID-B

- If multiple gates are operated at the same time at a distance of less than 8 m, the Readers must by synchronized.
  See Application Note Synchronizing RFID Long Range Readers using the digital in-/outputs (N10311-xe-ID-B.pdf).

	Gate with antenna Type A and Type B
Gate distance GD	≤ 100 cm
Number of tags at a speed of 1 m/s • Read serial number • Read data	 16 8

Table 4: Gate Distance

Supplementary equipment (e.g. light barrier, lighting, etc.), mounted directly on the antenna or in the immediate vicinity of the antenna can interference with the functioning of the system.
A minimum distance of 20 cm is required.

Electrical cable, directly at the antenna or in the immediate vicinity of the antenna, can be cause interference. A minimum distance of 20 cm is required.

A minimum distance of 65cm between the two gate antennas is required.

7.1 Project Notes People Counter (GPC)

Radar sensors of the people counter detect moving objects, within their detection range E1 and E2, see Fig. 18.
If a People Counter is installed the antenna conductors in the middle of the antenna body must be mounted in the direction of the red arrows.

The size of the detection area, and hence the sensitivity of the devices can be adjusted with the ISO-Start Software see 10.3.2 Configuration and test (ISO-Host Mode or Buffered Read Mode)

NOTE:

Moving objects, especially automatic doors, can influence the counting result of the people counters.

Figure 17: Direction of antenna conductor in front of Library door

That means, the antennas are installed close to the entrance and exit, the detection area of the radar sensors must show away from the door. Otherwise, a minimum distance of 1.0 m between moving objects and detection areas must be guaranteed.

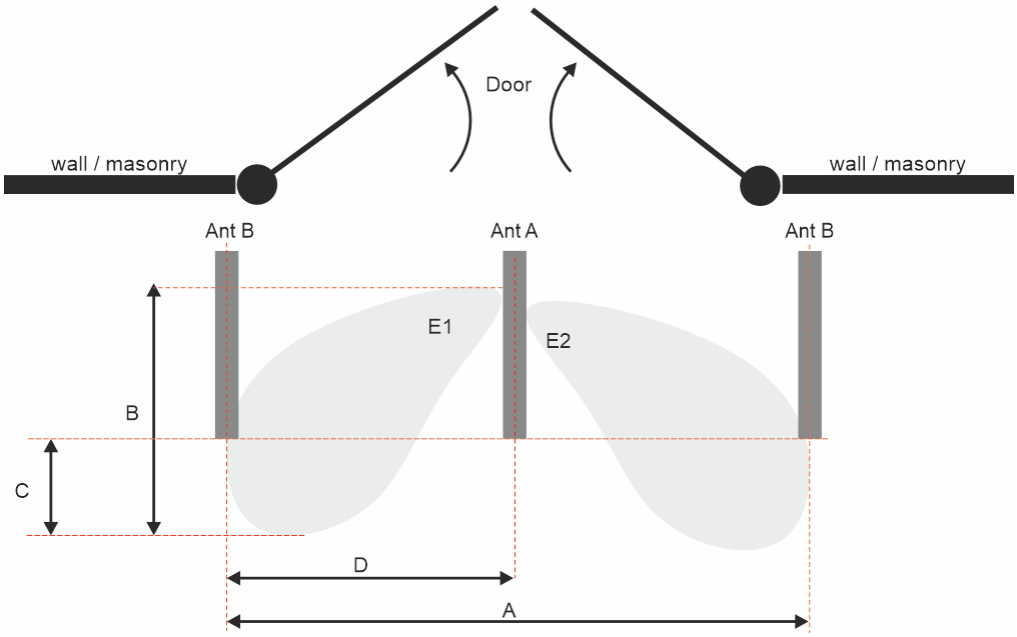


Figure 18: Detection area E1 and E2

Settings of sensitivity in [cm]

Distance	low	medium	default: high	very high
A	180	200	200-220	240-260
B	60-70	80-90	100-110	120-130
C	20-30	40-50	60-70	80-90
D	90	100	100-110	120-130

Table 5: Settings of sensitivity

Evaluation criteria

- All values given are guide values, depending on the size of the objects, the reflection behavior of the floor and the material of the moving object.
- If there are several persons or moving objects in one of the detection fields of the radar sensors at the same time, only one object is counted.
- Minimum distance between two objects in the passage: 60 - 130 cm.
- Cross traffic in the detection field, are also detected.
- To avoid interference, the detection area of radar sensors must not overlap with the detection area of people counters (GPC).
- (Mounting above or on automatic doors with a transmission frequency = 24.125 GHz should be avoided).

NOTE:

- The People Counter generates statistical measured values about the visitor flows.
- Due to people with small distances, disturbances or cross traffic, the determined values can deviate from actual values.
- If major deviations are noticed, first the sensitivity of the radar sensors should be gradually reduced.

7.2 Project Notes People Counter Direction Detection Mode

In combination with the People Counter a direction detection of the transponders could be performed in that way, that only transponder will cause an alarm which move in the not allowed direction through the gate. Also at people how pass the gate transverse or pass outside gate setup alarm should occur. If people with transponder move in the allowed direction through the gate, no alarm occur.
This reduces false alarms.

According to the reader configuration, only alarm LED1 and/or LED2 are triggered.

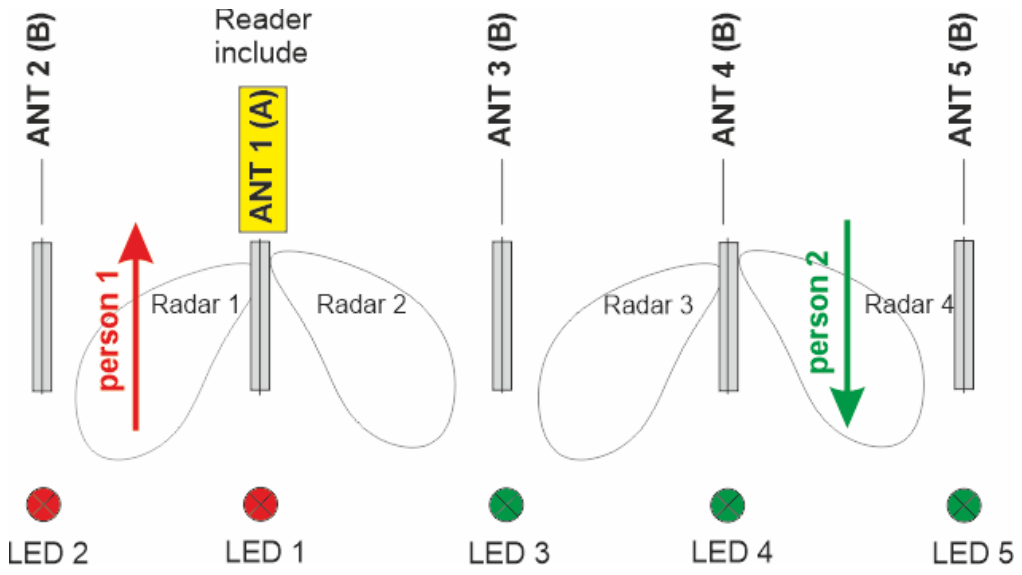


Figure 19: Set up with 4 aisles. At aisle 1, person 1 activates an alarm

7.3 Hardware structure of the gates

7.3.1 Antenna ID ANT1710/690-A Crystal Gate Wave Type A

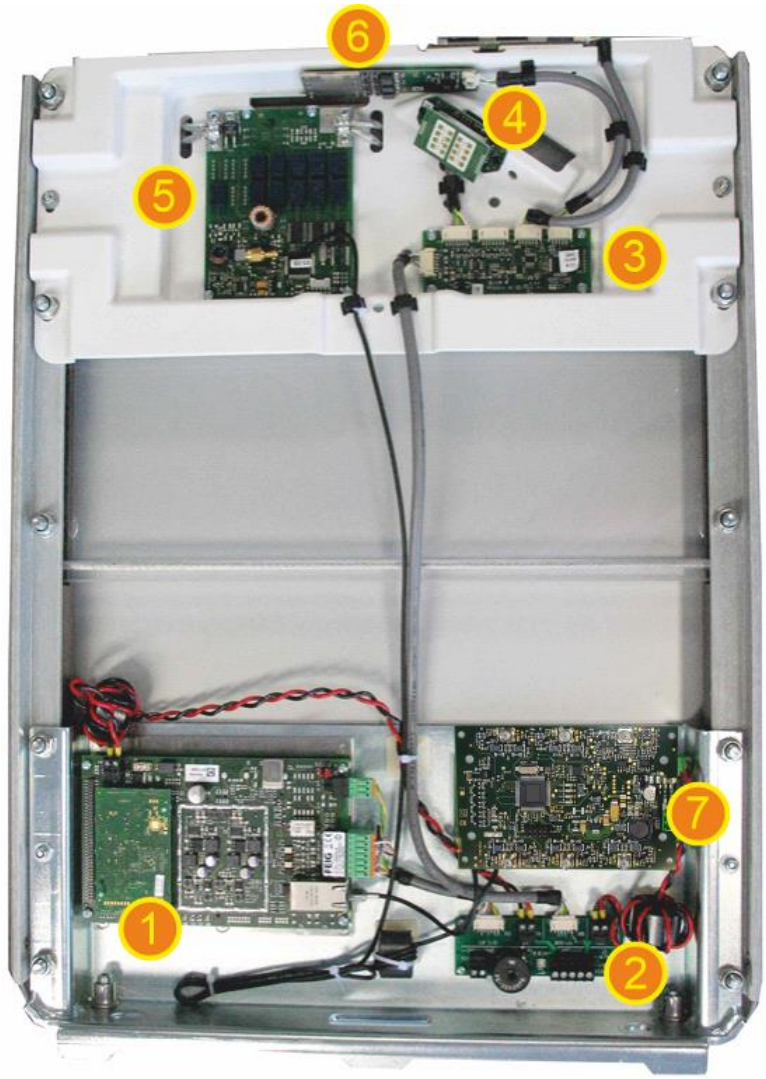


Figure 20: Cable connection of the components in antenna type A

Factory mounting Antenna Type A:

1. ID LR5400 (Reader)
2. Connecting board
3. ID ISC.ANT.GPC (People Counter)
4. Radar-Modul 1
5. DAT-Board (Tuning board)
6. LED Controller
7. Multiplexer MUX.M5 (optional)

Cable management

- The cables must not be shortened. Cables are tied together in loops.
- Do not lay in the immediate vicinity of the antenna conductor
- Laying not parallel to the antenna conductor
- Do not place cable loops in the antenna base above the reader and multiplexer.
- The power supply unit must not be placed in the antenna base of the type A antenna.
- After laying the cable, the enclosed ferrite core must be laid with 3 turns (approx. 10 cm) in front of the cable end in the type A antenna.

Figure 21: ferrite core

Table 6: Antenna Type A

7.3.2 Antenna ID ANT1710/690-B Crystal Gate Wave Type B

Figure 22: Cable connection of the components in antenna type B

Factory mounting Antenna Type B:

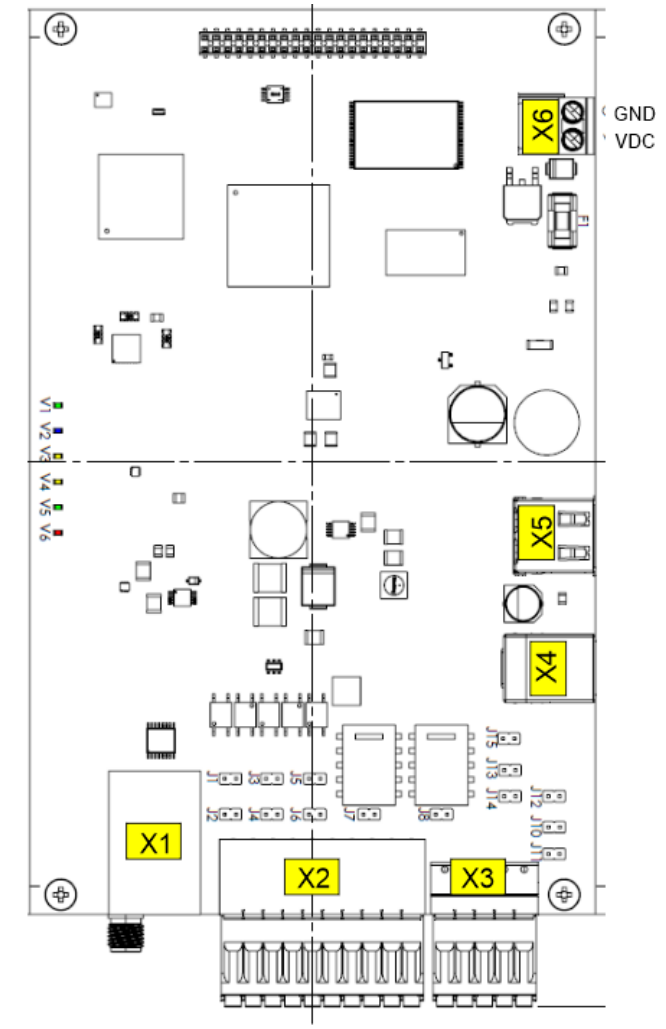
❶ Connecting board
❷ DAT Board (Tuning board)
❸ LED Controller

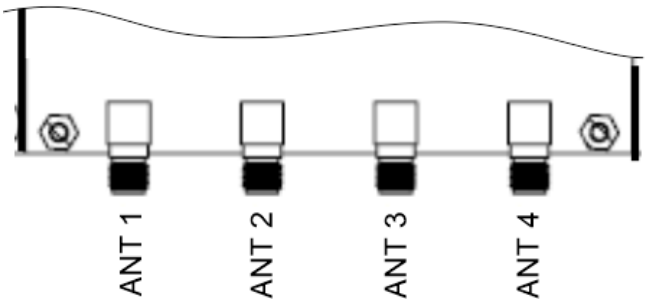
Cable management

- Lay the cable connection from antenna type B to antenna type A as short as possible.
- Tie up any unused cable length in the base of the type B antenna.

7.4 Interfaces of the reader & connecting board

Reader interfaces





X1: Ethernet-Interface

10/100Tbase Network Interface
Cable type CAT5
see Installation M81010-Xd-ID-B

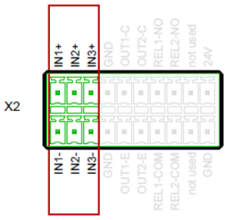
X1

Default-IP-Address

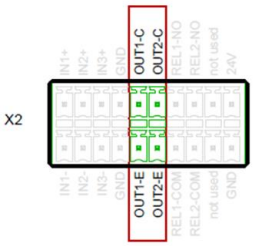
Network	Address
IP-Address	192.168.10.10
Subnet -Mask	255.255.255.0
Port	10001
DHCP	ON

X2: Digital Input

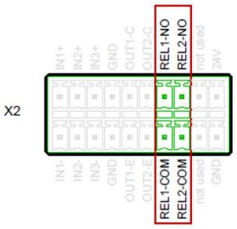
IN1, IN2, IN3

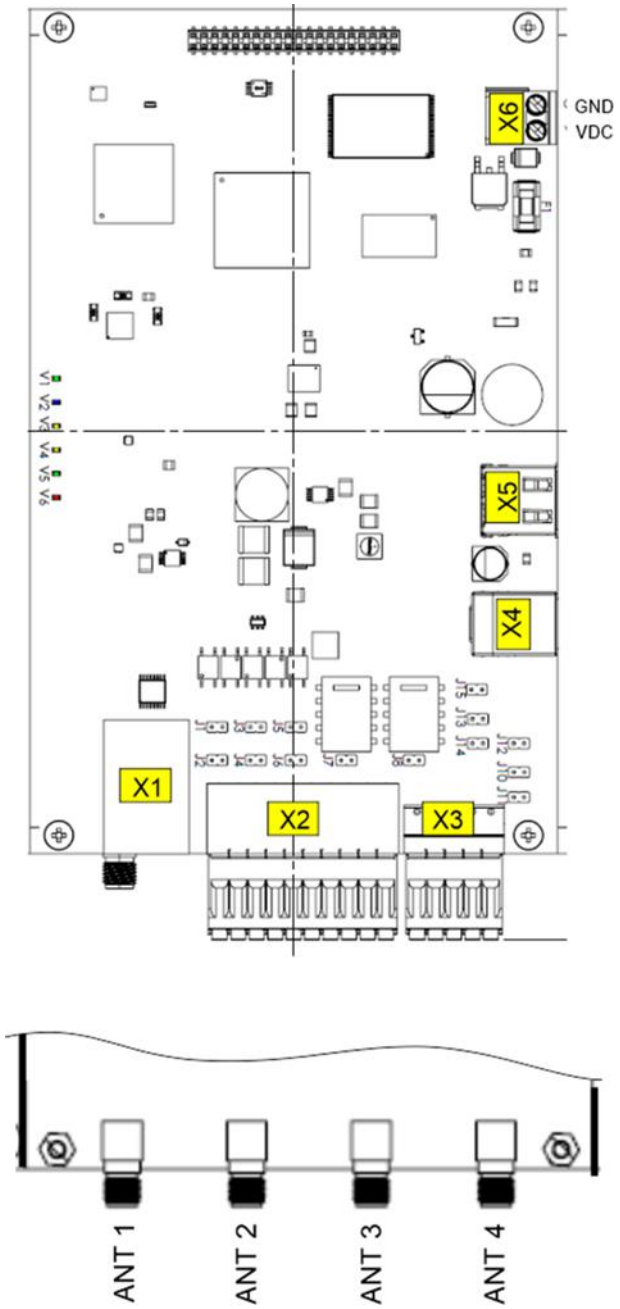


Digital Output (OUT1, OUT2)

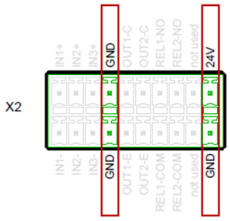


Relay REL1, REL2

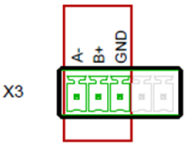




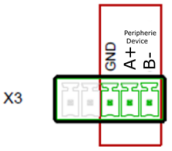
X2: Power supply
24 VDC / GND



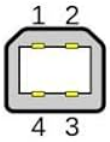
X3: RS485
Host



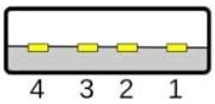
Peripheral Device



X4: USB-Device Interface (Type B)



X5: USB-Host Interface (Type A)



X6: Power supply

Terminal 1: + 24 V
Terminal 2: GND

ANT 1-4:

4 x SMA Socket
Input Impedance 50 Ω

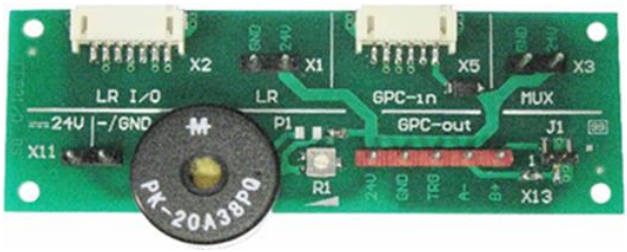
	**Connecting board** **X1:** 24 VDC LR5400 **X2:** In-/Output LR5400 **X3:** 24 VDC Multiplexer **X5:** Connection to People Counter GPC **X11:** Spannungsversorgung 24 VDC / IN **X13:** GPC / LED / DC

Table 7: Interfaces

7.5 Antenna connection cable

The connection of antenna type A with antenna type B is made via the connection board in antenna type A.

The 3.5 m long connection cable with ferrite core is included in the scope of delivery (LiYCY 3x (2x0.25).

Figure 23: Connecting cable+ ferrite core

For a single gate with 2 antennas, a connection is made between X13/GPC-out of the connection board in antenna type A and X13-outof the connection board in antenna type B. The end with the ferrite core must be installed in antenna type B.

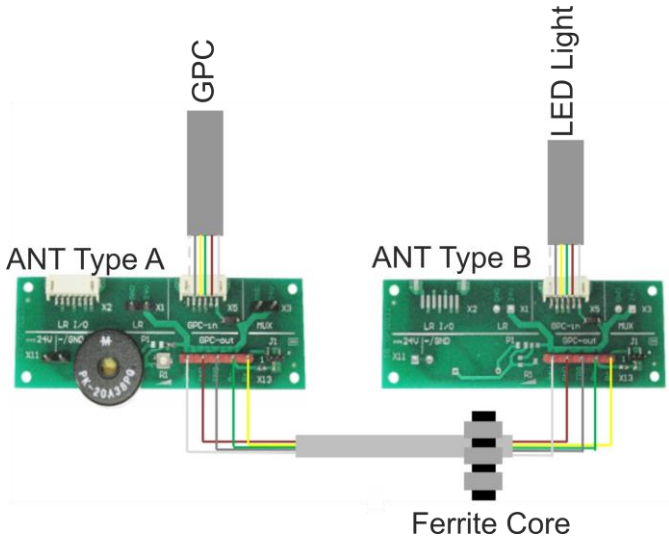


Figure 24: Wiring LED lights between antenna type A and type B

Cable management “douple gate with 3 antennas”

Connecting board 1. Antenna Type A	X13/GPC-out	⟷	X13/GPC-out	Connecting board 3. Antenna Type B
Connecting board 1. Antenna Type A	X13/GPC-out	⟷	X13/GPC-out	Connecting board 2. Antenna Type B

Table 8: Cable management double gate

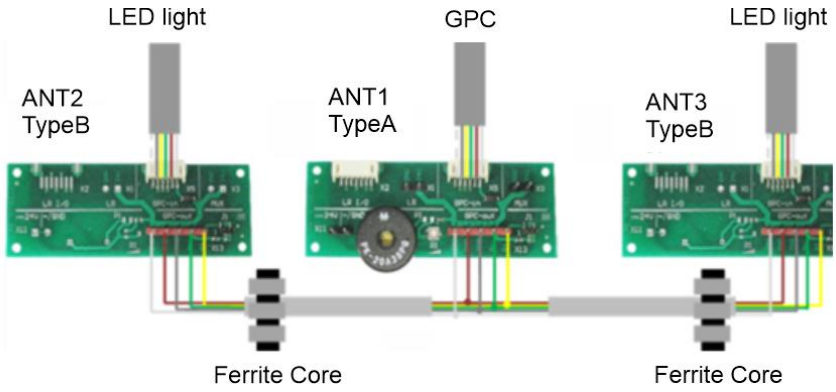


Figure 25: Cable management “double gate with 3 antennas”

NOTE:

Reversing the polarity can destroy the digital inputs/outputs.

7.6 Extension up to 8 antennas by using ID ANTMUX.M5 GMK

NOTE:

Setups with more than 4 antennas require an external multiplexer with mounting accessories (ID ANTMUX.M5 GMK Gate Multiplexer Kit).

Communication between Reader, Multiplexer and Antennas:

- RF connection cable (coaxial cable) Reader - Multiplexer.
- Connection to the reader via RF input (ANT IN)
- Connection antennas via the 5 RF-OUT
- Supply voltage 8 VDC for FEIG antennas and antenna tuners at RF output ANT1-5
- Power supply: 24 VDC

NOTE:

The individual antennas can be switched by Reader Commands.

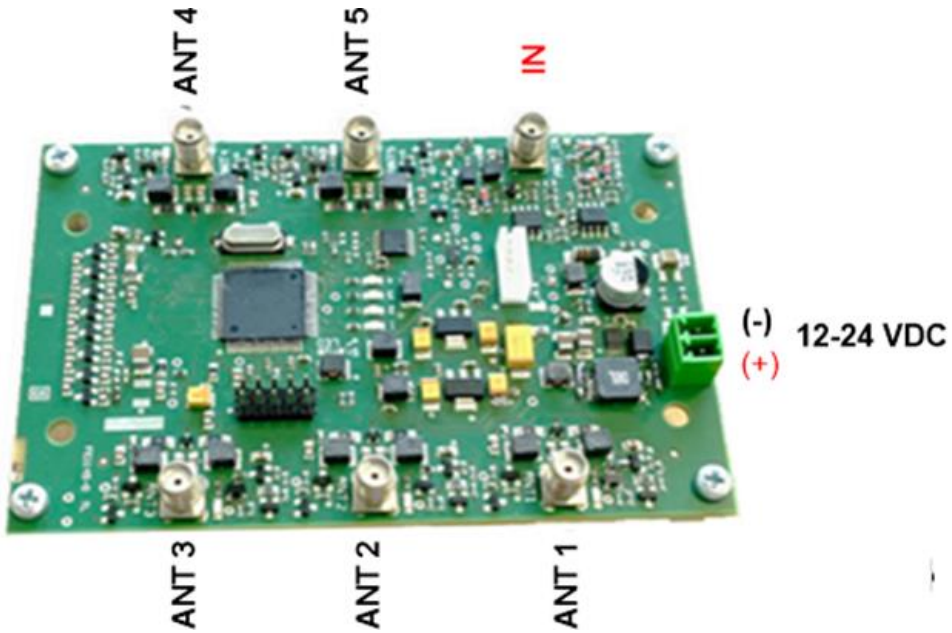


Figure 26: Multiplexer Module ID ANTMUX.M5

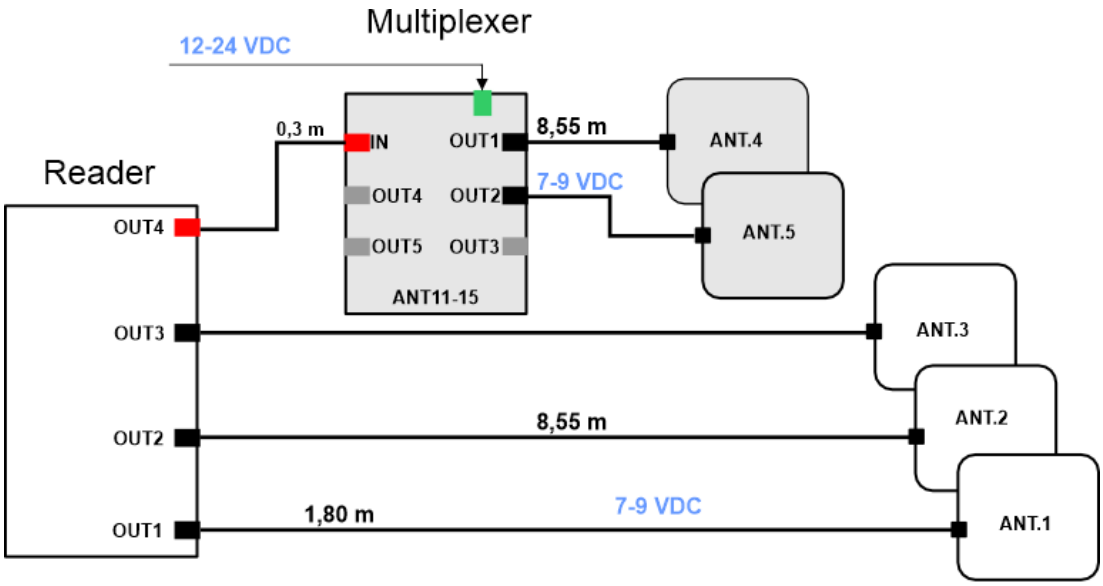
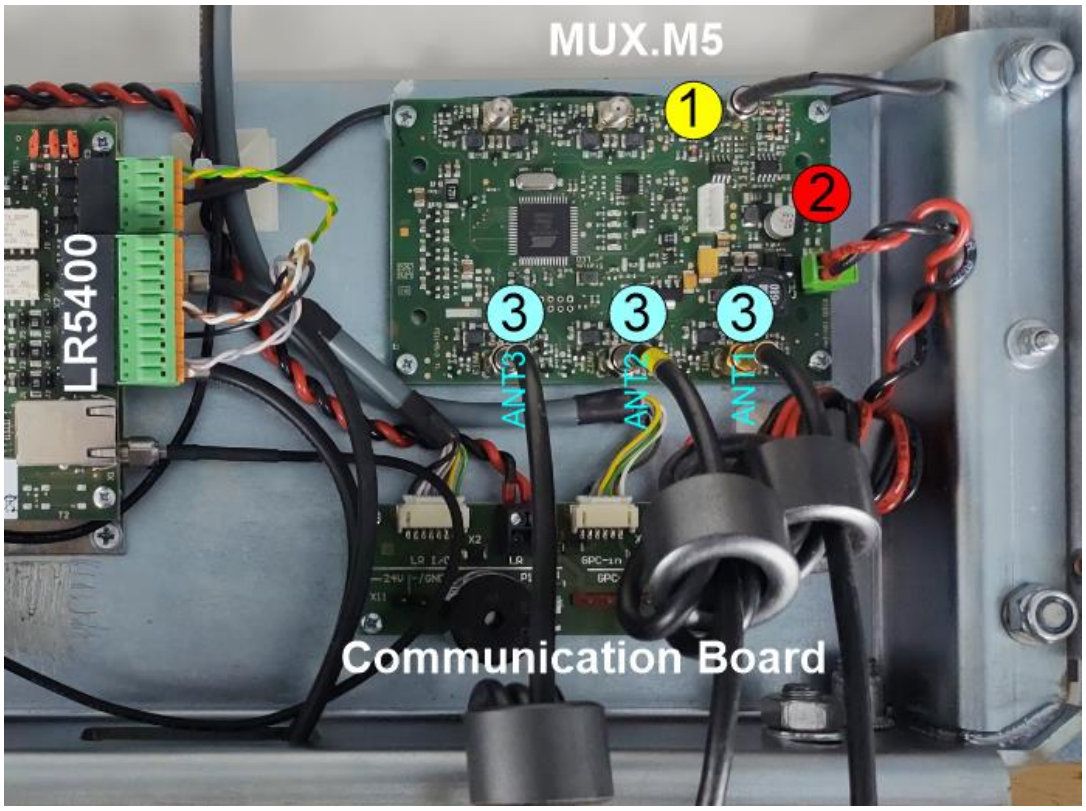


Figure 27: Reader with 1 Multiplexer and 5 Antennas



1 RF connection cable from OUT 4 (Reader)

2 Power supply: 12-24 VDC with ferrite core

3 Connection to antennas via the RF outputs (ANT1-5)

Figure 28: Cable connection ID ANTMUX.M5

7.6.1 DAT-Modul / Automatic Antenna Tuning board

Terminals and Jumper

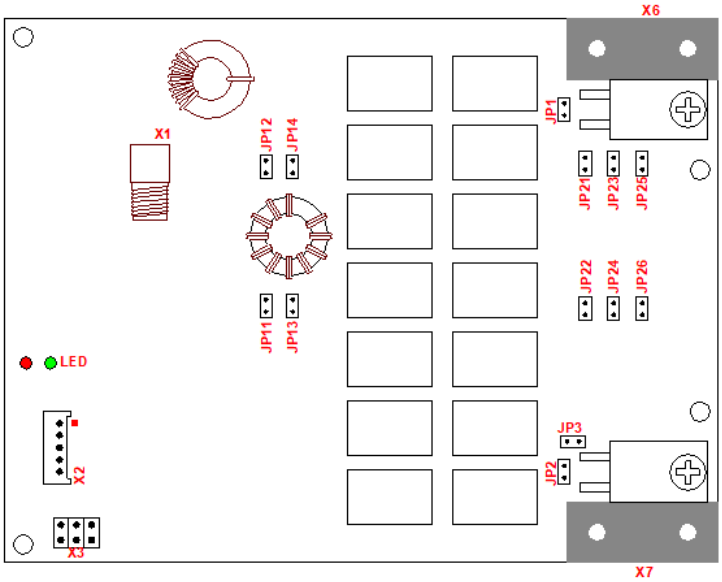


Figure 29: Terminals and Jumper

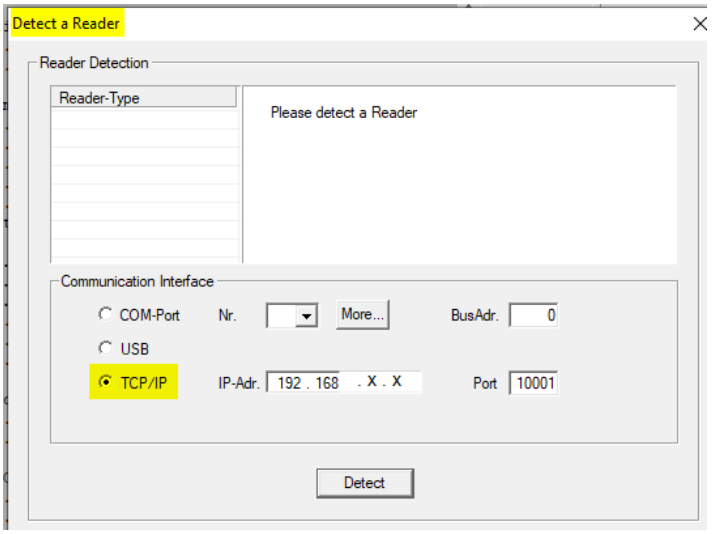
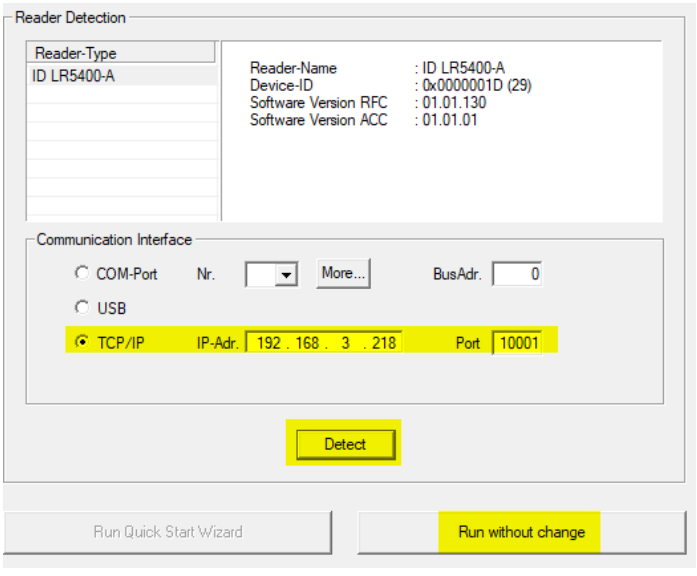
Default Jumper setting

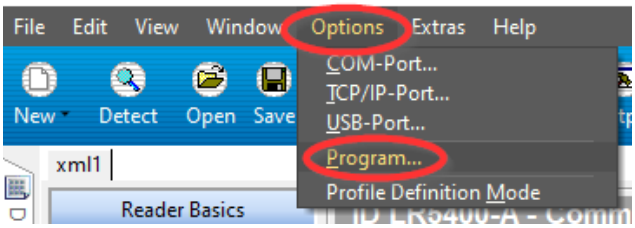
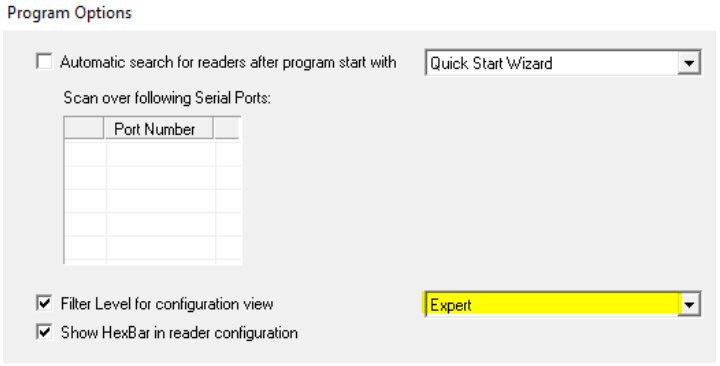
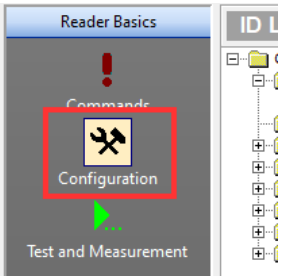
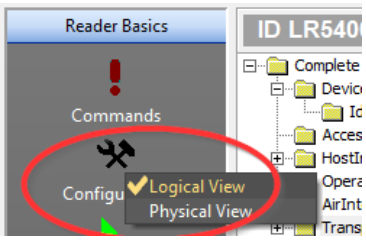
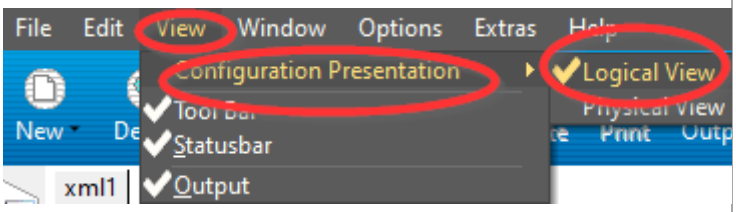
Function	Jumper	Position
R = 1 Ω Antenna quality	JP1	open
R = 2 Ω Antenna quality	JP2	closed
Antenna switch	JP3	closed
C1	JP 11,12,13,14	open
C2	JP 21,22,23,24 JP 25,26	open closed

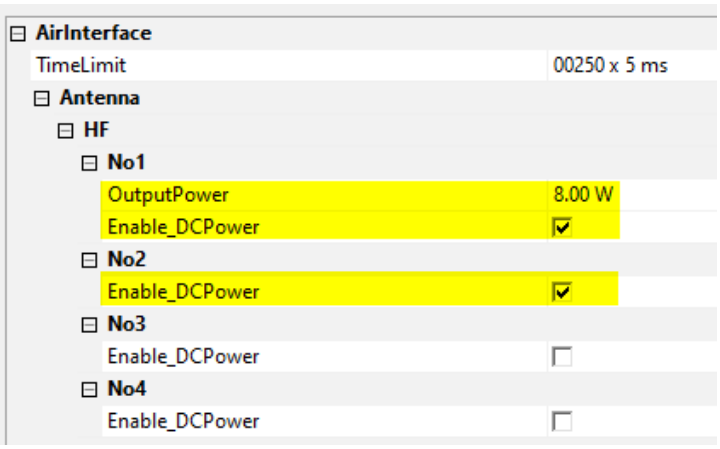
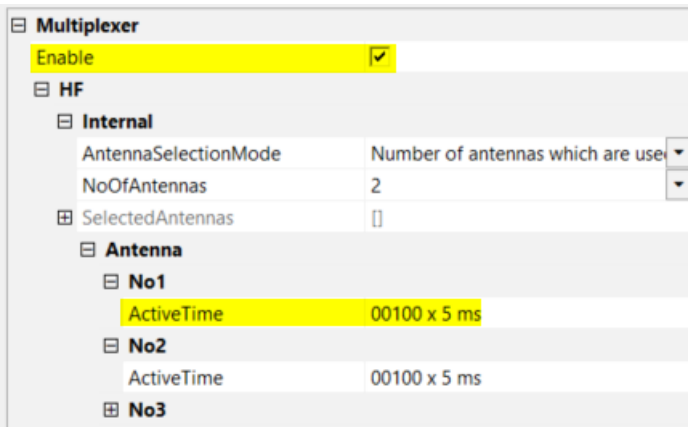
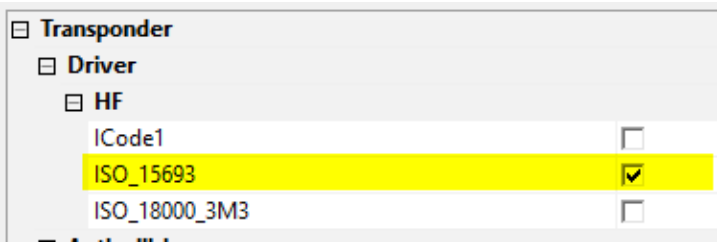
Table 9: Jumper setting

7.6.2 Configuration Reader with Multiplexer

- Open the ISOStart software for antenna tuning
- Read out the current reader configuration

	Operation	screenshot
1	**Open ISOStart** Press start button	 ISOStart
2	Select interface Check IP address Klick Detect	
3	Press Run without change The configuration is not changed	

4	Menu / Options / Program Select Expert Mode	 
5	Press the configuration button Press right mouse klick Select Logical View or Menu / View / Config. Presentation/Logical View	  or 

6	**Configuration**	
7	**AirInterface** Antenna No1: OutputPower = 8.00 W Enable_DCPower= true No2: Enable_DCPower = true	
	Multiplexer Enable = true Internal AntennaSelectionMode = Number of antennas are used NoOfAntennas = 2 No 1/2: ActiveTime = 100 x 5ms No 3, 4, 5 = 100 x 5ms	
8	**Transponder** Driver HF/ISO_15693 = true	

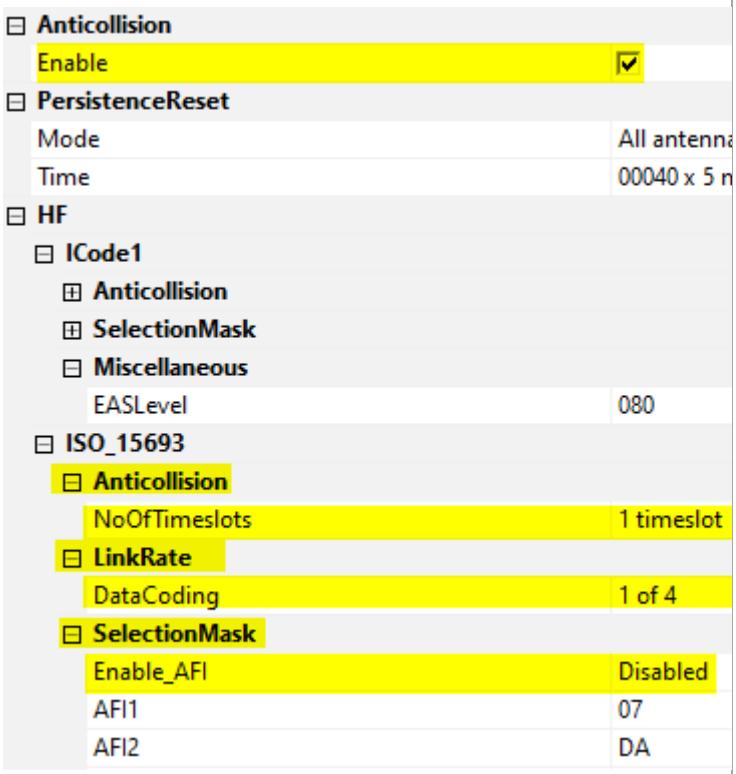
	Anticollision Anticollision = true No of Timeslots = 1 timeslot LinkRate DataCoding = 1-4 SelectionMask Enable_AFI = Disabled	

Table 10: Configuration Reader with Multiplexer

7.6.3 Antenna tuning

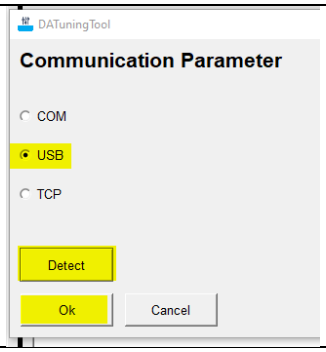
	Operation	Screenshot
1	**Quit** “ISOStart”	
2	**Start** “DATuningTool”	
3	**Communication Parameter** Select interface Detect OK	
4	**Settings** Antenna installation = Gates Antennas = No.of antennas = e.g 2 Max. Tuning Iterations = e.g. 3	
5	**Start Tuning**	
6	**Tuning Status** green: Tuning ok **QUIT** DATuning tool yellow: Warning **REPEAT** the procedure red: Tuning not ok **REPEAT** the procedure	**Tuning Report** Check antenna tuner addresses Detect antenna 1: Reader.Out1->ANT Tuner Addresses: 1 Detect antenna 2: Reader.Out2->ANT Tuner Addresses: 1 Detect antenna 3: Reader.Out3->ANT Tuner Addresses: 1 Detect antenna 4: Reader.Out4->ANT Tuner Addresses: 1 1. Iteration Tuning antennas Reader.Out1->ANT.1 Reader.Out2->ANT.1 Reader.Out3->ANT.1 Reader.Out4->ANT.1 Read tuning status Reader.Out1->ANT.1 : Ok Reader.Out2->ANT.1 : Tuning not ok Reader.Out3->ANT.1 : Ok Reader.Out4->ANT.1 : Ok Tuning successfully finished

Table 11: Antenna tuning

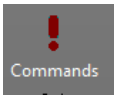
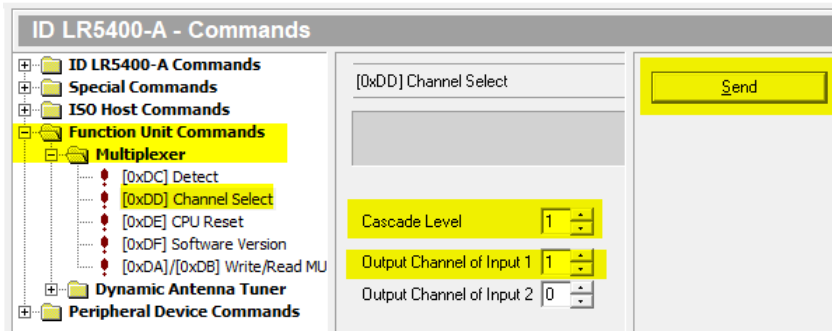
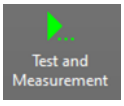
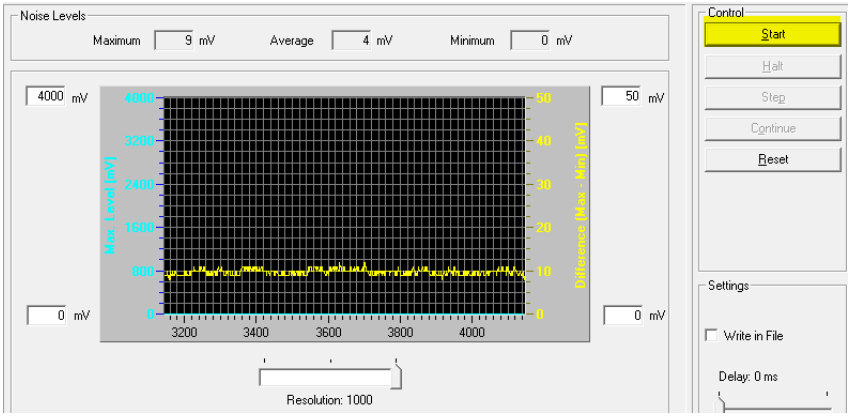
NOTE:

When tuning not successful repeat the procedure.

7.7 Test the Gate antenna setup

After tuning the antennas, the function can be checked with the reader, the "ISOStart service software" and a transponder.
Before the noise level must be measured.

7.7.1 Measurement “Noise Level”

	Operation	Screenshot
1	**Commands**	
2	**Activate Antenna 1** Function Unit Commands / Multiplexer Channel Select Cascade Level = 1 Output Channel of Input 1= 1 Send	
3	**Test and Measurement**	
4	Measurement / Noise Level Klick Start Average: < 50 mV Difference Max-Min: < 20mV	

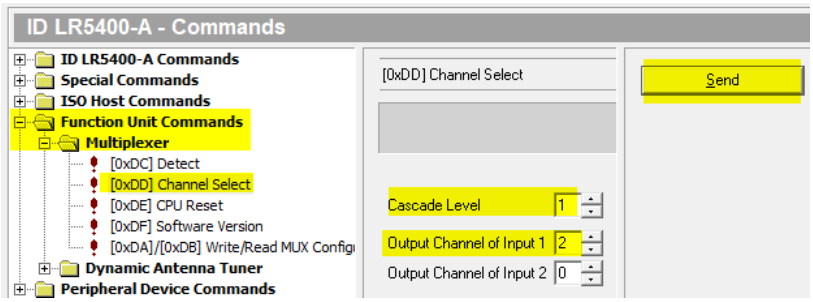
5	**Multiplexer** Activate antenna 2 Function Unit / Multiplexer Cannel Select Cascade Level> = 1 Output Channel of Input1 = 2 Send For further antennas repeat step 2 und 3	

Table 12: Measurement „Noise Level“

If the values are not proper, check the following:

- Are all cables pulled tight and will contact well?
- Are the ring cores installed in the antenna cable?
- Are the cables routed as specified?
- Are other RFID systems installed closed by?
- Are there large metal parts close to the antenna (distance < 1.0 m)?
- Are there devices nearby which may emit noise interferences (larger machines or wireless devices)?
- Are there interferences from the mains?

To determine which devices may be disturbing the gate, briefly disconnect them from the mains.

7.7.2 Read out of a serial number

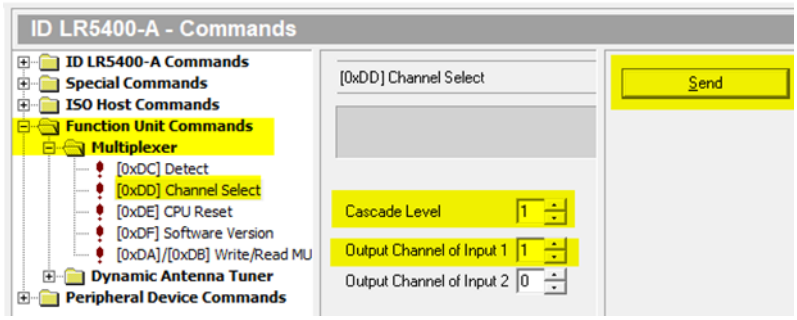
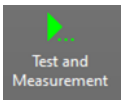
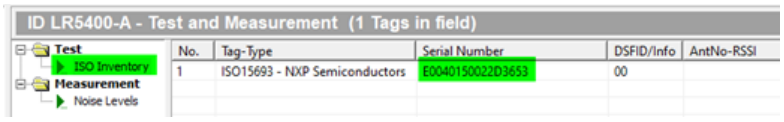
	Operation	Screenshot
1	Fix the transponder to an antenna	Adhesive Tape
2	**Activate Antenna 1** Function Unit Commands / Multiplexer Channel Select Cascade Level = 1 Output Channel of Input 1= 1 Send	
3	**Activate Test and Measurement”**	
4	Select ISO Inventory Klick Start The serial number is Displayed in the table Repeat step1-4 for each additional antenna at Output 2- 4 of the multiplexer	

Table 13: Readout serial number

8 Performance-Test

For testing the performance you must switch the reader to one of the Automatic Modes.
9.3 Activating Automatic Mode

A read transponder will be displayed by a blue LED on the reader, the Alarm LED light of the antenna and the buzzer.
9.1 Buzzer settings on the reader (e.g. Output 2)

In this test the capture area of the gate antenna described in 7 Antenna Configuration (1 Gate) is checked. For other tags or other configurations the indicated ranges and read areas may differ accordingly.

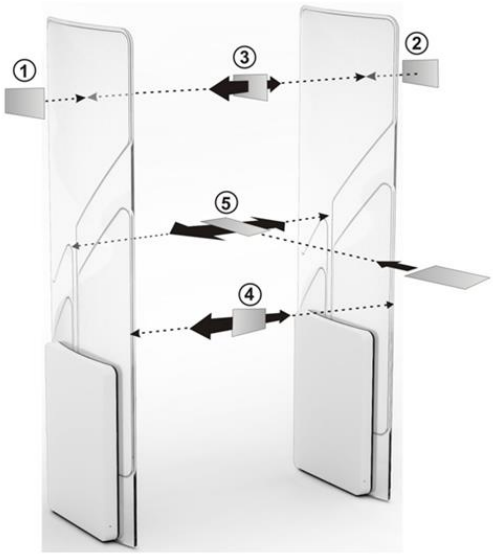


Figure 30: Performance test

The test begins by checking the read range outside the gate (see Fig. points ① and ②), assuming the configuration and locality permit it. If the tag is oriented parallel to the antenna at the outside, a read range of 65 to 70 cm should be achieved.

The three tag orientations are checked inside the gate. This corresponds to the lines and orientations ③④⑤. Now slowly move the tag in the vertical and parallel direction with respect to the antenna along the line ③ from one side to the other. The tag should always be read.

Then repeat this along the line ④ in the vertical tag direction transverse to the antenna and on the line ⑤ in the horizontal tag orientation. Here again the tag should always be read.

The tag should be read within the gate by moving in a horizontal line through the gate in all three read orientations.

If one or more „holes“ are detected, check the noise values on the Reader
7.7.1 Measurement “Noise Level”

The following may result in faulty readings:

- Antenna improperly installed (orientation, antenna distance, check cabling)
- Metal near the antennas is detuning or interfering with them.
- The antennas are not properly tuned.
- Noise level too high (Vmax – Vmin ≥ 20 mV)
- Transponder too insensitive, detuned or defective
- Reader improperly configured (transmitting power, transponder type, modulation, transponder parameters, etc.).
- A cable is defect or has a weak contact.
- Reader, multiplexer or antenna defect.

9 Settings

9.1 Buzzer settings on the reader (e.g. Output 2)

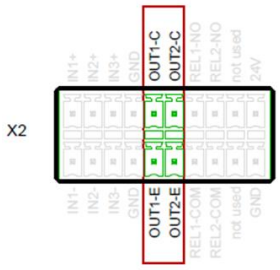
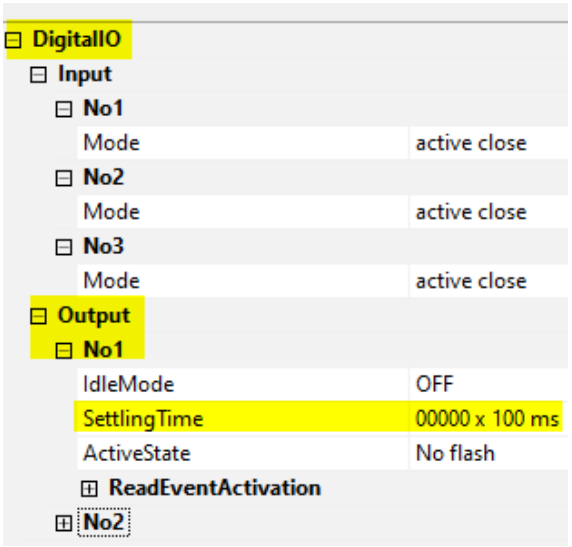
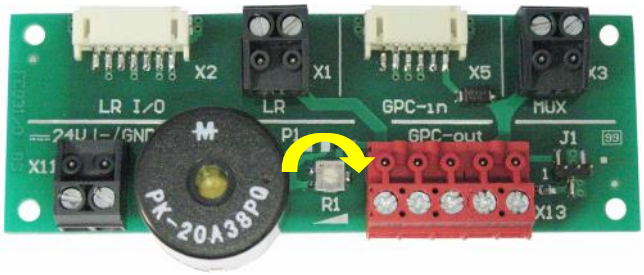
Output 2 (X2) Pin OUT2-C Pin OUT2-E,	
Pulse duration Output 1 / Output 2 t = 100 ms bis 65535 s	
Volume Potentiometer P1 on connecting board	

Table 14: Buzzer settings

9.2 Alarm LEDs

The alarm LEDs are switched by a command from the reader via the RS485 bus.
For this reason, the connection boards of all antennas must be connected 1:1 in parallel with each other.

- The bus address of each LED controller depends on the antenna number in which it is installed.

- The antenna number is determined by the multiplexer output to which the antenna is connected.
- The bus address is assigned automatically depending on the selected automatic operation mode.
- The successful bus addressing of the LEDs can be checked with the command "Get Reader Info".

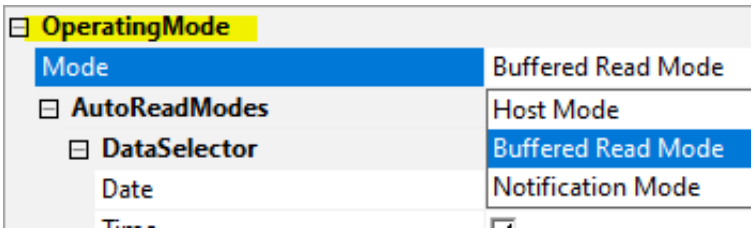
LED in Antenna	Antenna No.	Bus Address No.
1	1	11
2	2	12
3	3	13
4	4	14
n.a.	5	n.a.

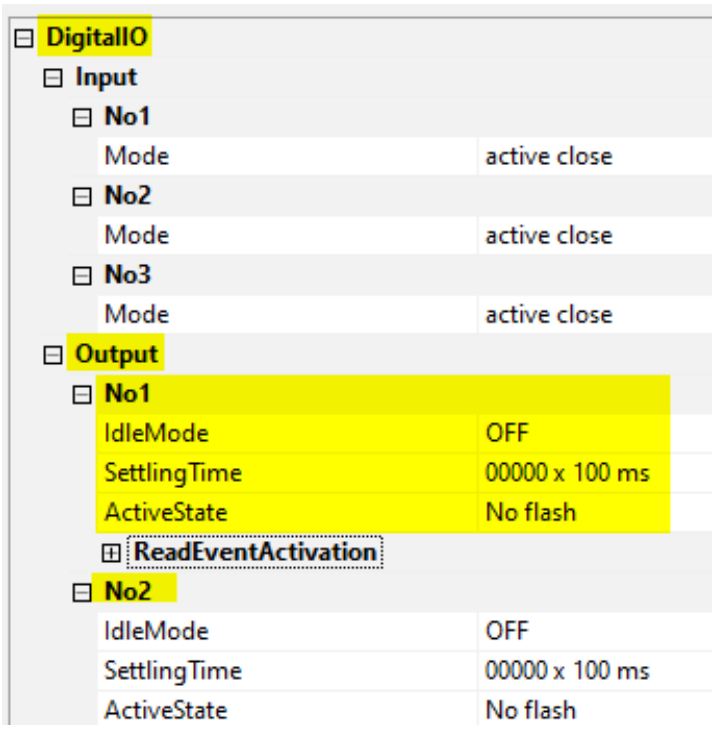
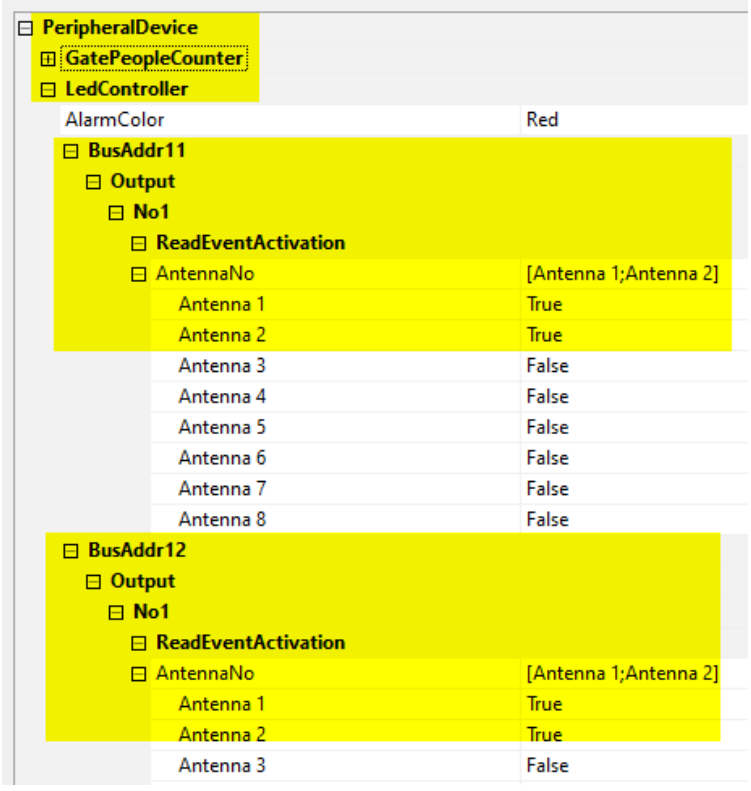
Table 15: LED Bus Address

9.4 Automatic Bus Addressing

9.2.1 Settings for Alarm Indicators (Reader)

Control of the LED controller via digital output 2 as soon as a transponder is read.

	Description	Screenshot
1	**Start ISOStart**	
2	**Reading the reader configuration** Klick READ	
3	**Operating Mode** Select Mode =BRM “Buffered Read Mode” Apply	

4	**Digital IO** Output / No1/2 IdleMode = OFF SettingTime = 0010x100 Alarm duration Output 2 ActiveState = 1 Hz Output 1/2 can be assigned to all antennas	
5	**Peripheral Device** LEDController BusAddr 11 / Output / No / AntennaNo1/2> = true LEDController BusAddr 12 / Output / No / AntennaNo 1/2 = true Apply	

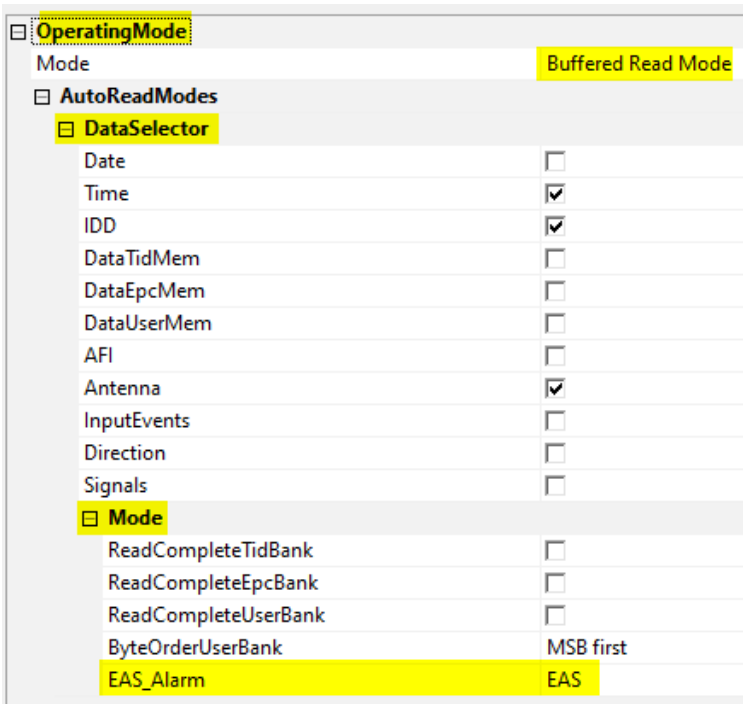
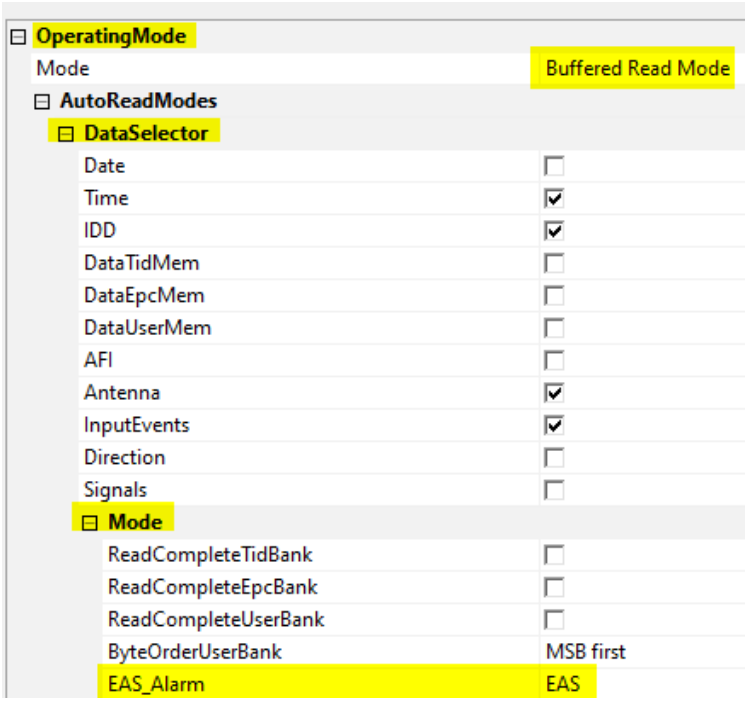
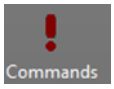
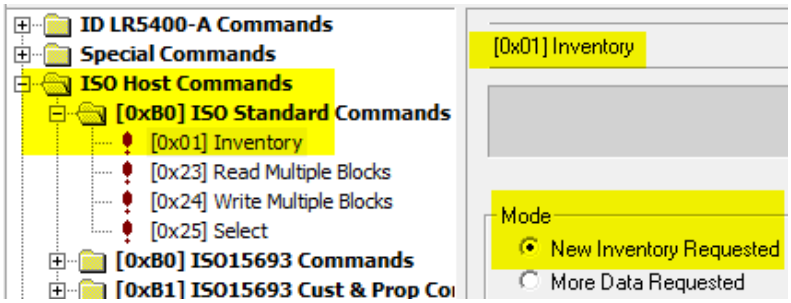
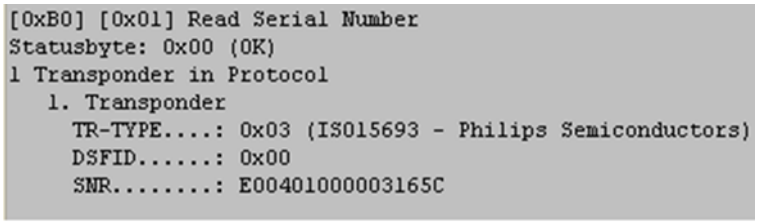
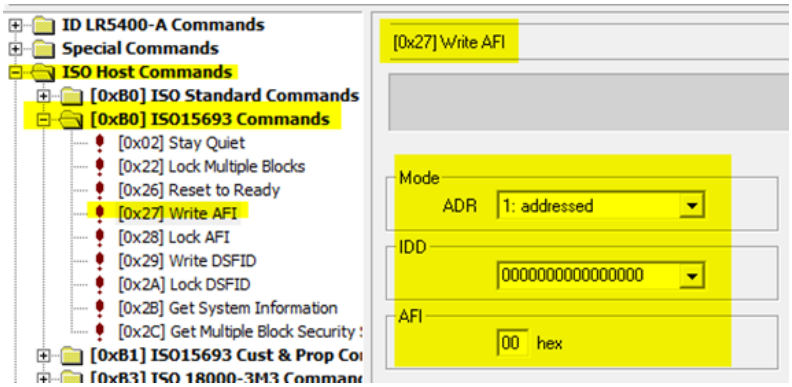
6	**Operating Mode** Select Buffered Read Mode Data selector / Mode / EAS_Alarm = EAS Apply	 

Table 16: Setting digital Output

9.2.2 Programming a transponder with the AFI Byte

If the transponders will remain on the object when leaving the storage location, they must first be disabled. This is generally done by writing to a particular area of the transponder.
The AFI byte (Application Family Identifier) is useful for this purpose since it is contained in nearly all transponder models in the ISO15693 family. To disable, simply write a different code to the transponder than for valid transponders which trigger an alarm.

	Description	Screenshot
1	**Commands**	
2	**ISO Host Commands** Place transponder in antenna field. (Antenna 1) [0xB0] ISO Standard Commands Select [0x01] Inventory Select Mode „New Inventory Requested“ Send	
3	Serial number, DSFID and transponder type are displayed in one window Note the serial number of the transponder	
4	**ISO Host Commands / [0xB0] ISO Commands** Select [0x27] Write AFI Mode / ADR = addressed Select Serial Number IDD AFI = AFI Number ≠ 00 [hex] Send	

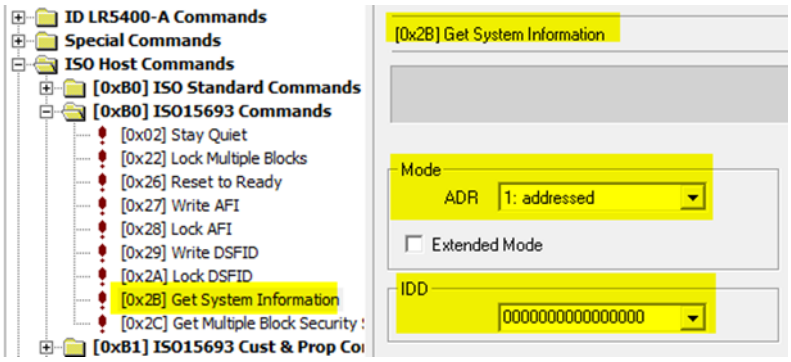
5	For control: Read AFI byte with [0x2B] Get System Information	

Table 17: Setting digital Output

9.3 Activating Automatic Mode

- Select the appropriate operating mode
- The "Buffered Read Mode" is selected here as an example (mode with the best performance).
- In this mode, transponders are read at maximum speed and stored in a ring buffer in the reader. This can be read out by the host. Due to the alarm functions in the automatic modes, the reader or the gate can also be operated without an interface connection (RS485/Ethernet) to the host.
  See Manual H20820-Xe-ID-B ID LR5400

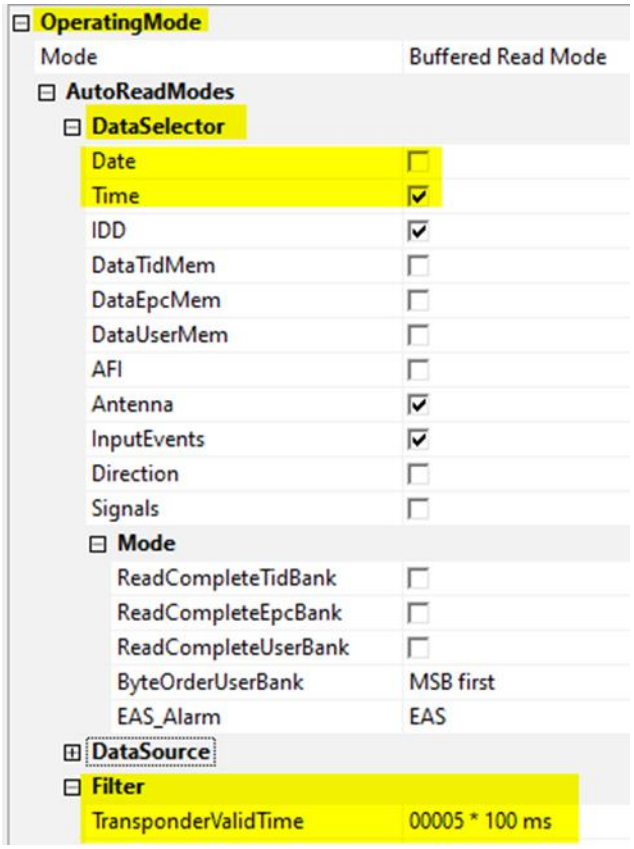
	Description	Screenshot
1	**Commands**	
2	**Operation Mode** Mode = Buffered Read Mode Data Selector IDD = true Antenna No = true Time = true Date = true Filter / Transponder Valid Time = 55 x 100ms Apply	

Table 18:Select „Automatic Mode“

9.4 Automatic Bus Addressing

9.4.1 Requirements for Automatic Bus Addressing

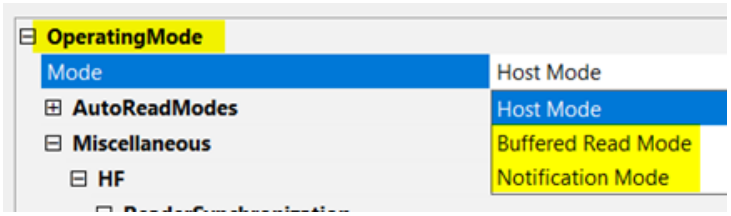
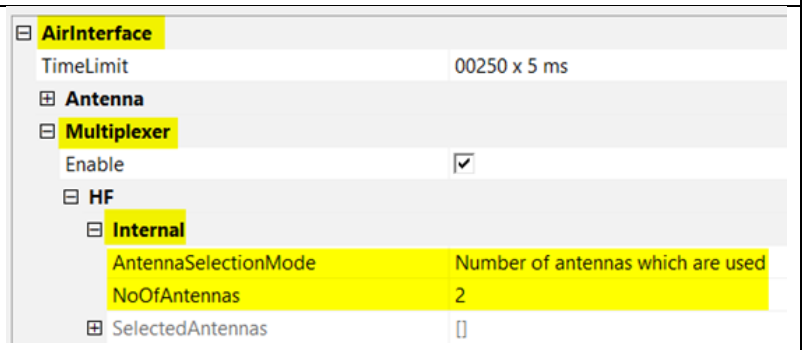
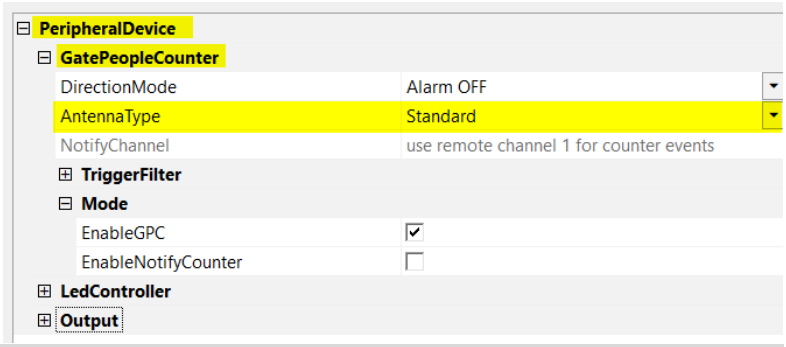
	Description	Screenshot
1	**Select the Operating mode** From “ISO-Host Mode” to “Buffered Read Mode“ or “Notification Mode”.	
2	Select the number of antennas of the multiplexer **AirInterface** Multiplexer enable = true AntennaSelectionMode = Number of antennas which are used NoOfAntennas = e.g.2 **PeripheralDevice** AntennaType = Standard*	 
	NOTE: ***AntennaType:** Standard**:** ID ANT1710/690 Crystal Gate Wave Type A/B HPDx: ID ANT1710/690 Crystal Gate Excellence Type A/B	

Table 19: Requirements for automatic Bus Addressing

9.4.2 Bus Addressing:

The correct addressing is indicated by the ALARM LED of the antenna.

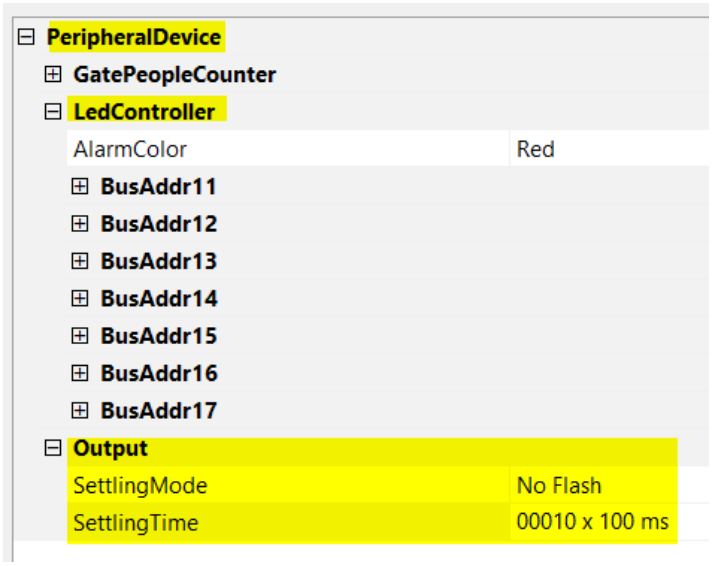
Bus Addressing	Display
LEDController AlarmColor = red Output SettingMode = no flash SettingTime = 00010 x 100 ms (1s)	
LED is installed	LED is switched on at the corresponding antenna switched on 1s (One peak for each antenna No. 2,3,5,7)
LED and GPC are installed	LED is switched on at the corresponding antenna switched on 3 x 1s (Three peaks for each antenna with GPC No. 1,4,6 GPC2 on Antenna ANT4 GPC3 on Antenna ANT6

Table 20: BUS Addressing

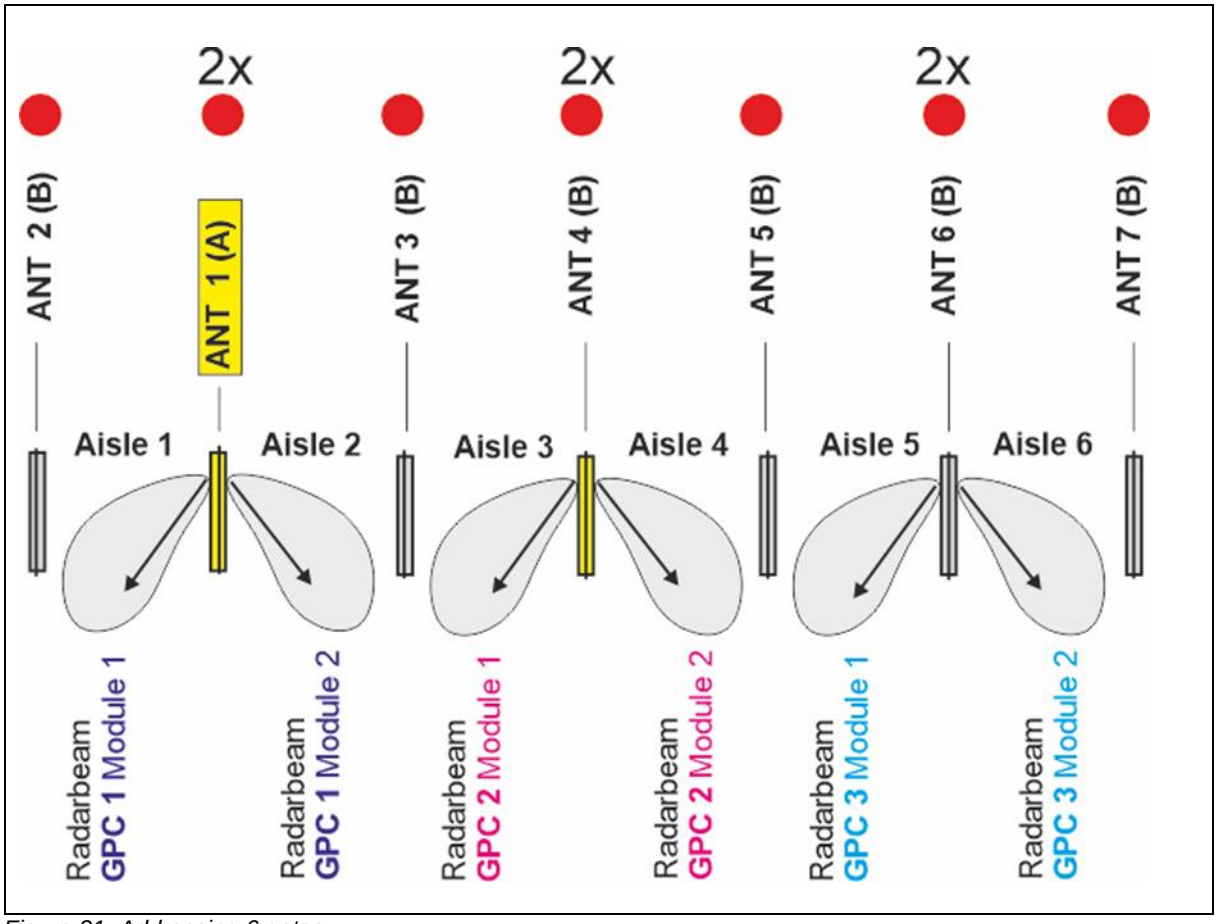
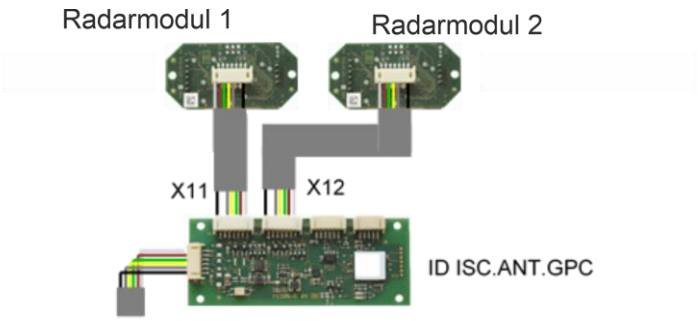


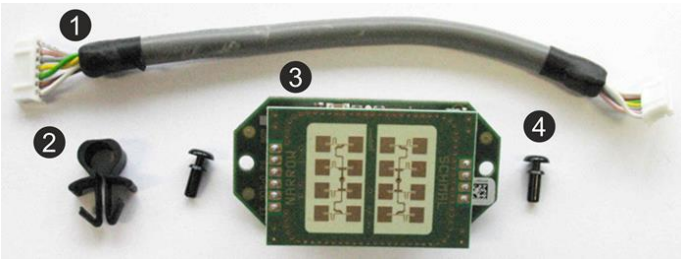
Figure 31: Addressing 6 gates

10 Commissioning 2. People Counter ID ISC.ANT.GPC

10.1 Installation parts



Scope of delivery second people counter



❶ 1 x Radar cable
❷ 1 x Cable clip
❸ 1 x Radar module
❹ 2 x Fastening rivet 3,0 mm

ⓘ ***NOTE:***

Do not touch the antenna surface of the radar module to avoid damage to the electronic components and contamination.

Table 21: Installation parts

Installation

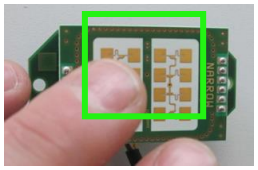
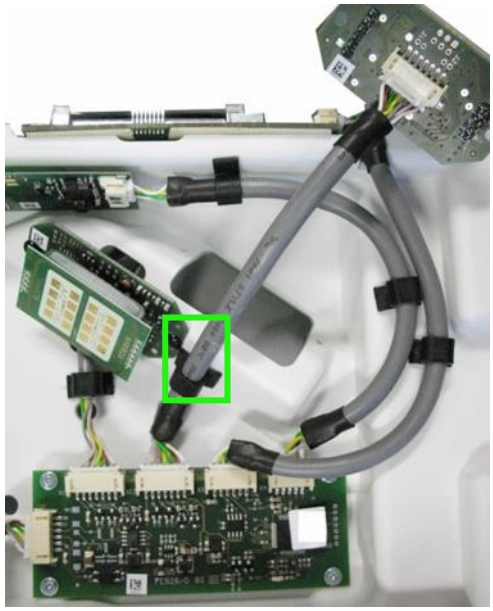
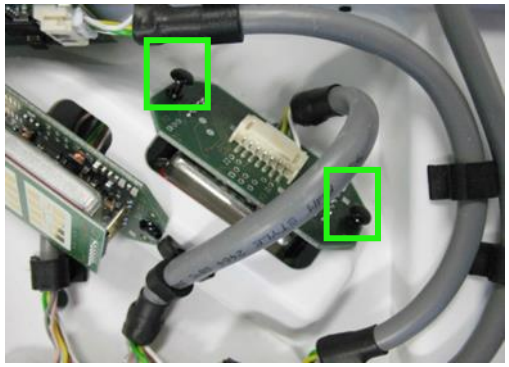
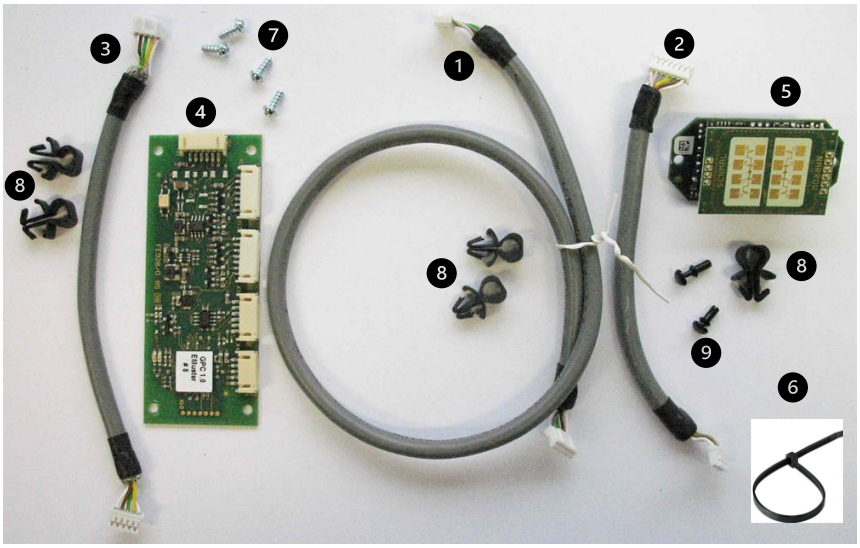
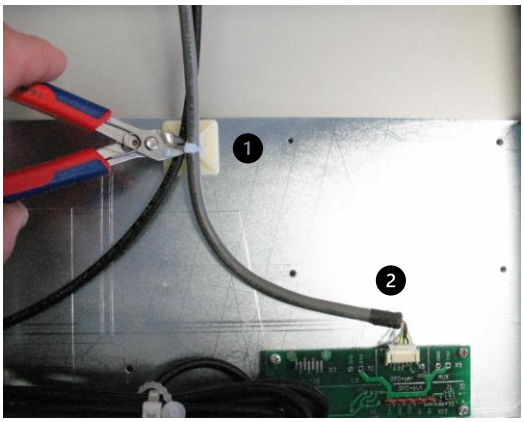
Step	Description	Screenshot
1	Do not touch the antenna surface of the radar module to avoid damage to the electronic components and contamination.	
2	Connect radar connection cable to radar module: Terminal X1	
3	Radar cable Terminal X12 Sensor 2 Using cable clips	
4	Mount radar module in antenna with expanding rivet	
5	Set sensitivity of the radar module	10.3 Configuration and test of People Counter

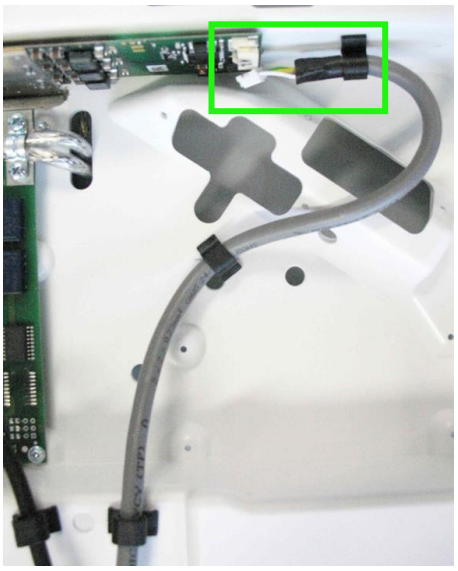
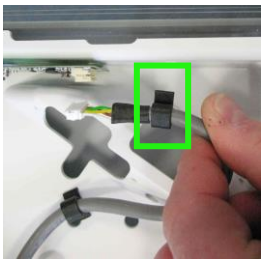
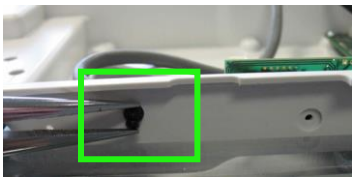
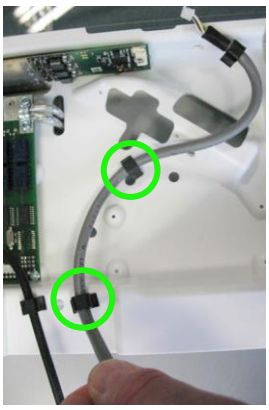
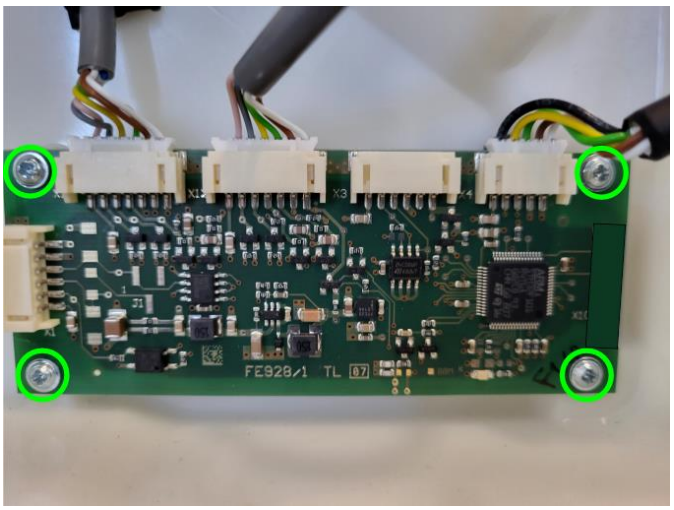
Table 22: Installation second people counter

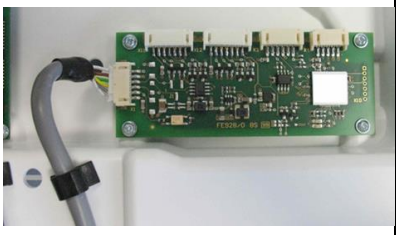
10.2 Installation People Counter on Antenna Type B (ANT4, ANT6)

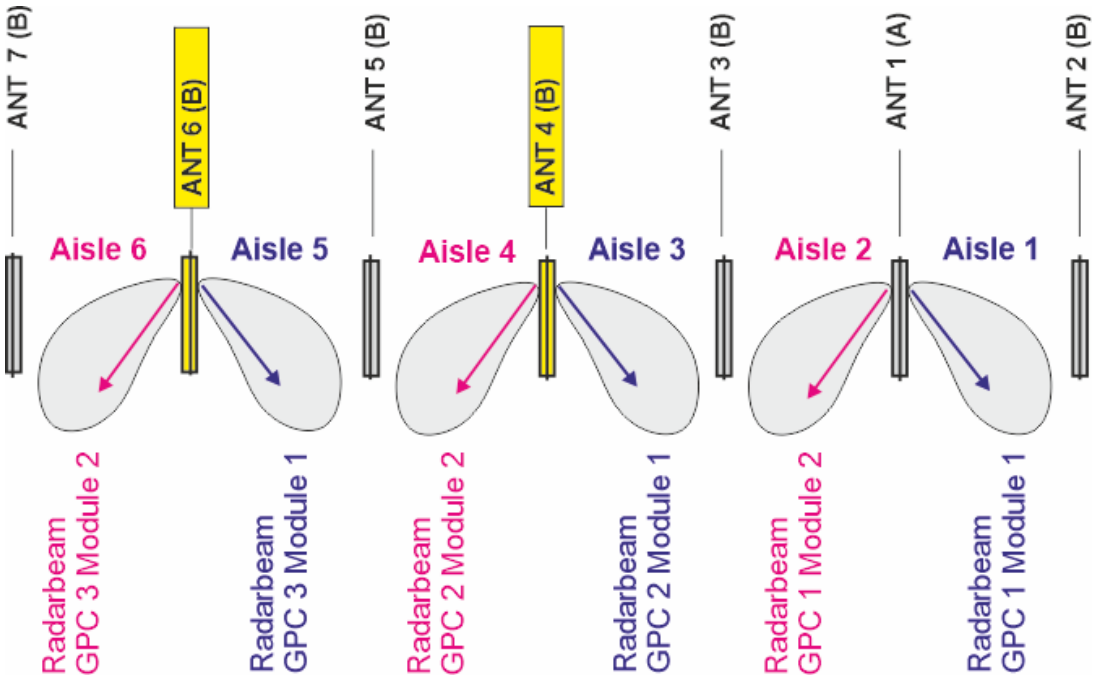


1. 1 x Connecting cable People Counter to connecting board
2. 1 x Radar Connecting cable
3. 1 x LED-Connecting cable
4. 1 x People Counter Board
5. 1 x Radar module
6. 1 x fixing tie
7. 4 x Plastic bolt 3x12mm
8. 5 x Cable clip
9. 2 x Rivet 3,0mm
10. 1 x FCC / IC Label

	Description	Screenshot
1	1. Remove cable tie 2. Disconnect the cable of the LED from the connection board	

2	Disconnect the connection cable of the LED from the LED controller	
3	Remove cable clip in front of LED controller	 Hintere Ansicht 
4	Removing all cable clips	
5	Fixing with 4 screws	

6	The GPC board 2 must be installed in antenna ANT4. The GPC board 3 must be installed in ANT6. Only then, the automatic bus addressing is possible.		
7	The GPC connection cable is plugged into terminal X5/GPC-IN of the connection board. Fix the connection cable with two cable clips and the cable tie.		

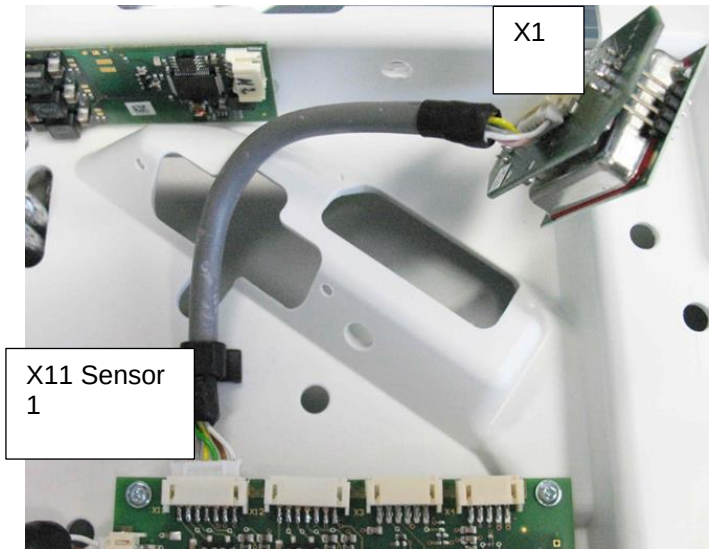


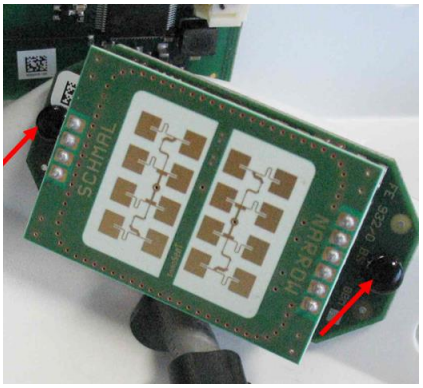
<table>
<tr>
<td>8</td>
<td>
Connection radar module to GPC
<table>
<tr><th>Radar modul</th><th>GPC</th></tr>
<tr><td>X1</td><td>X11 Sensor 1</td></tr>
</table>

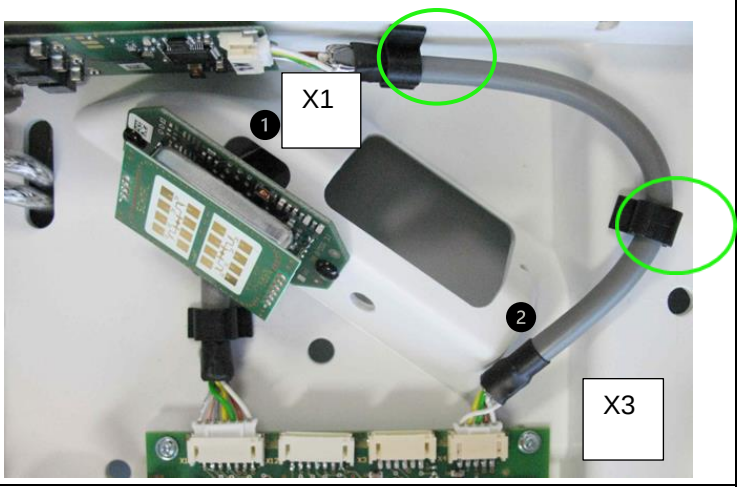
Fix the radar module with the expanding rivets
Fasten cable

<table>
<tr><th>LED-Controller</th><th>GPC</th></tr>
<tr><td>X1</td><td>X3</td></tr>
</table>

Fasten cable

</td>
<td>






</td>
</tr>
<tr>
<td>9</td>
<td>Setting the sensitivity of the radar module</td>
<td>10.3.2 Configuration and test (ISO-Host Mode or Buffered Read Mode)</td>
</tr>
</table>

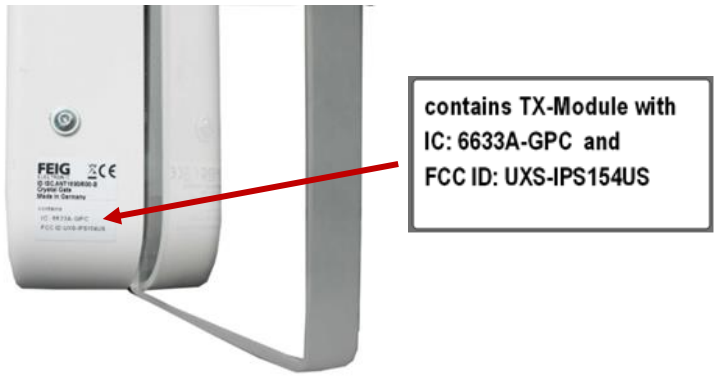
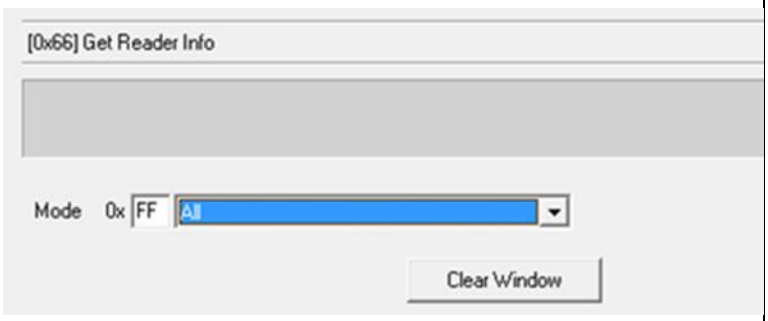
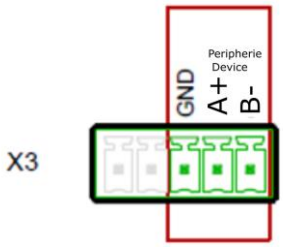
10	Close the antenna cover • Stick FCC/ID sticker of the GPC below the nameplate.	
11	The detection and bus addressing of the 2nd and 3rd GPC is performed automatically, after Power Up, or after "System Reset" command. The successful detection or bus addressing can be confirmed with the command "Get Reader Info"	 Peripheral Devices Number of Devices:.....6 1. Device:.....People Counter Bus-Address:.....1 2. Device:.....People Counter Bus-Address:.....2 3. Device:.....LED controller Bus-Address:.....11 4. Device:.....LED controller Bus-Address:.....12 5. Device:.....LED controller Bus-Address:.....13 6. Device:.....LED controller Bus-Address:.....14

Table 23: Installation People Counter on Antenna Type B

10.3 Configuration and test of People Counter

The jumpers J10, J11 are plugged on the Reader ID LRM5400.
The interface becomes active as soon as the "Enable GPC" parameter in the "Peripheral Device" configuration block is switched on (see H20820-xe-ID-B).



Terminal	Description
GND	RS485 GND
A-	RS485 Peripheral Device
B+	RS485 Peripheral Device

Table 24: Terminal X3 (RS485- Peripheral-Device Interface)

Jumper	Jumper closed	Jumper open
J11	Enable Pull-Down at RS4xx - A	Disable Pull Down at RS4xx - A
J10	Enable Pull-Up at RS4xx - B	Disable Pull-Up at RS4xx - B
J12	BUS Terminating resistor active	BUS Terminating resistor active not active

Table 25: Jumper J10, J11, J12

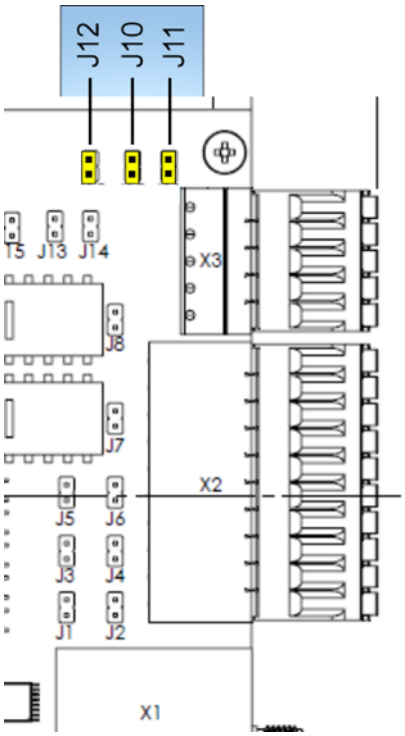


Figure 32: Jumper for RS485 Peripheral interface

10.3.1 Connecting of three People Counter (GPC)

When using several people counters (max. 3) on one reader, they must be connected in parallel via the connection board.
A 6-pole shielded, pair-stranded cable is required (e.g. LiYCY 3x2x 0.25 mm²).

The connection cable (length 3.5 m) is included in the scope of delivery of the antenna type B.

The X13/GPC-out connection of the 1st terminal board is connected in parallel with X13 GPC-out of the respective 2nd and 3rd terminal board of the antennas.

See 13 Terminal Management

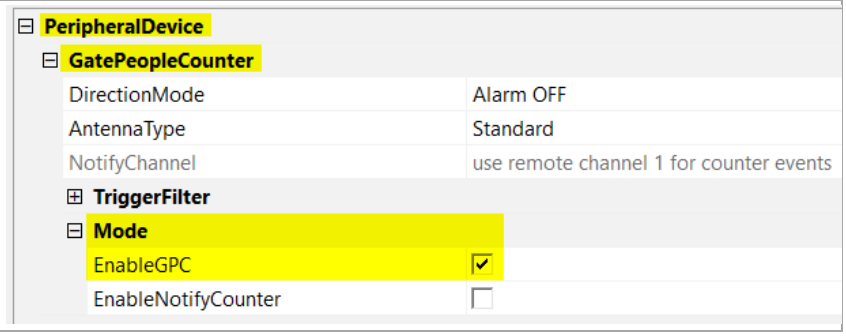
The bus address of the people counter is determined by the antenna number in which it is installed.

GPC1 in Antenna No.1 = Bus Address No. 1
GPC2 in Antenna No.4 = Bus Address No. 2
GPC3 in Antenna No.6 = Bus Address No. 3

The bus address of the people counter is determined by the antenna number in which it is installed.

See 9.4 Automatic Bus Addressing
The bus addressing of the connected gate people counter must be checked with the command "Get Reader Info".

10.3.2 Configuration and test (ISO-Host Mode or Buffered Read Mode)

	Description	Screenshot
1	**Configuation**	
2	**Host Interface** Enable USB Interface Apply	
3	**Activate GatePeopleCounter** Mode / EnableGPC = true Apply	

4

LED Controller

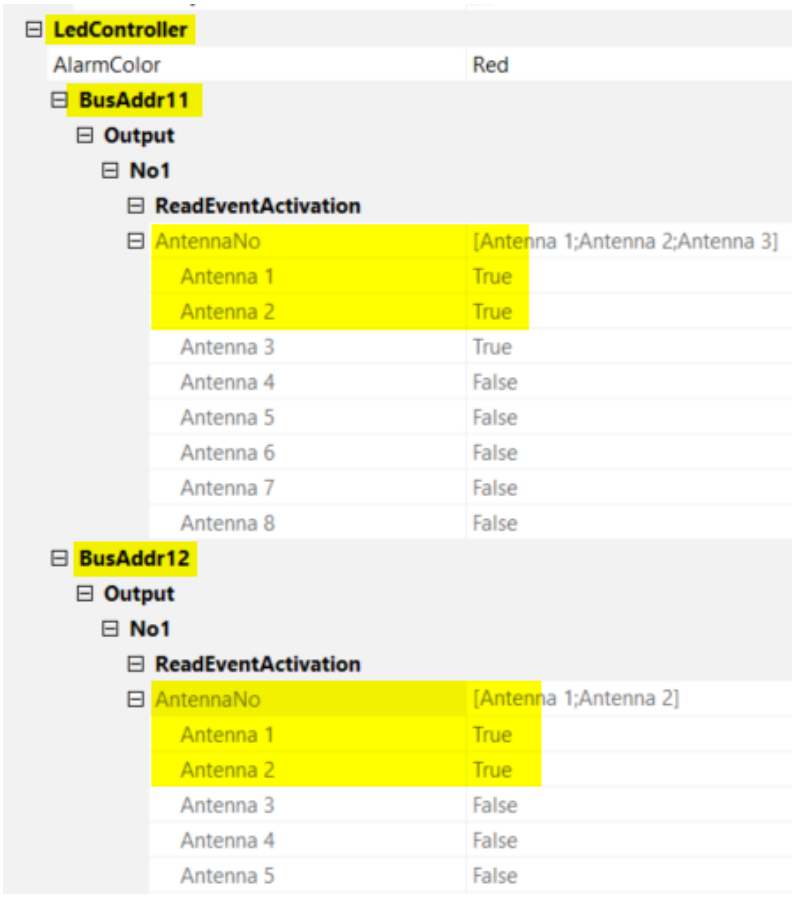
BusAddr 11 / No / Antenna No = true
(Antenna 1)

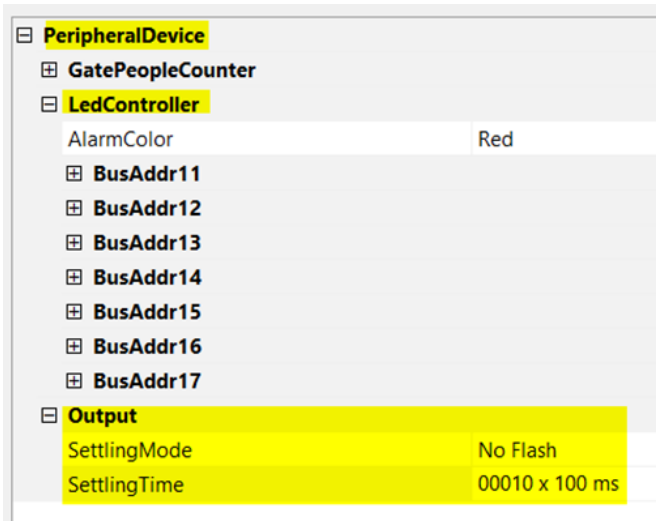
BusAddr 12 / No / Antenna No = true
(Antenna 2)

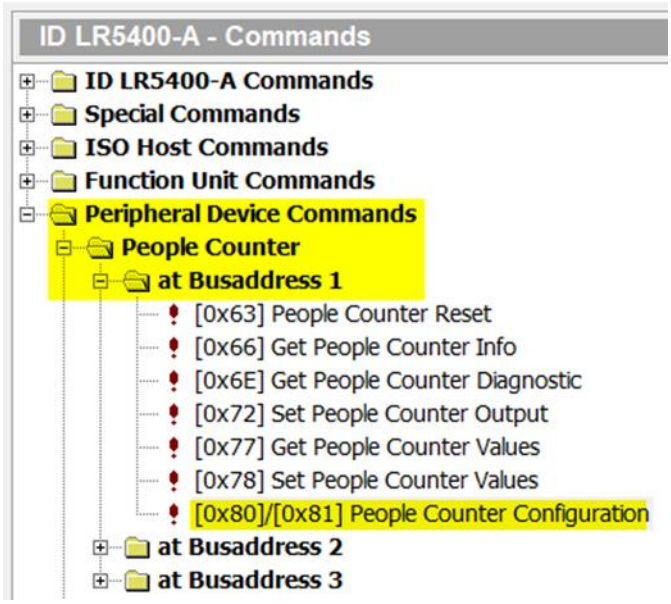
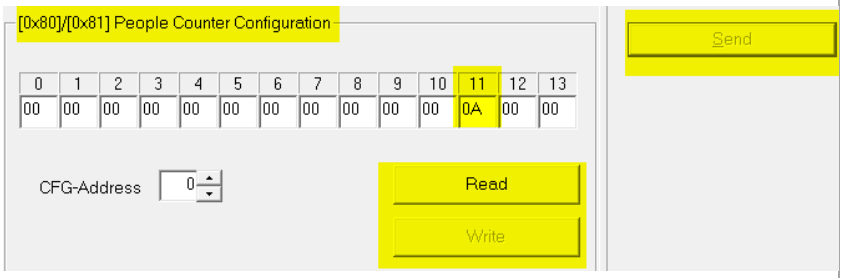
BusAddr 11 -17
true: LED controller 11 - 17 is activated with valid transponder at the assigned antenna

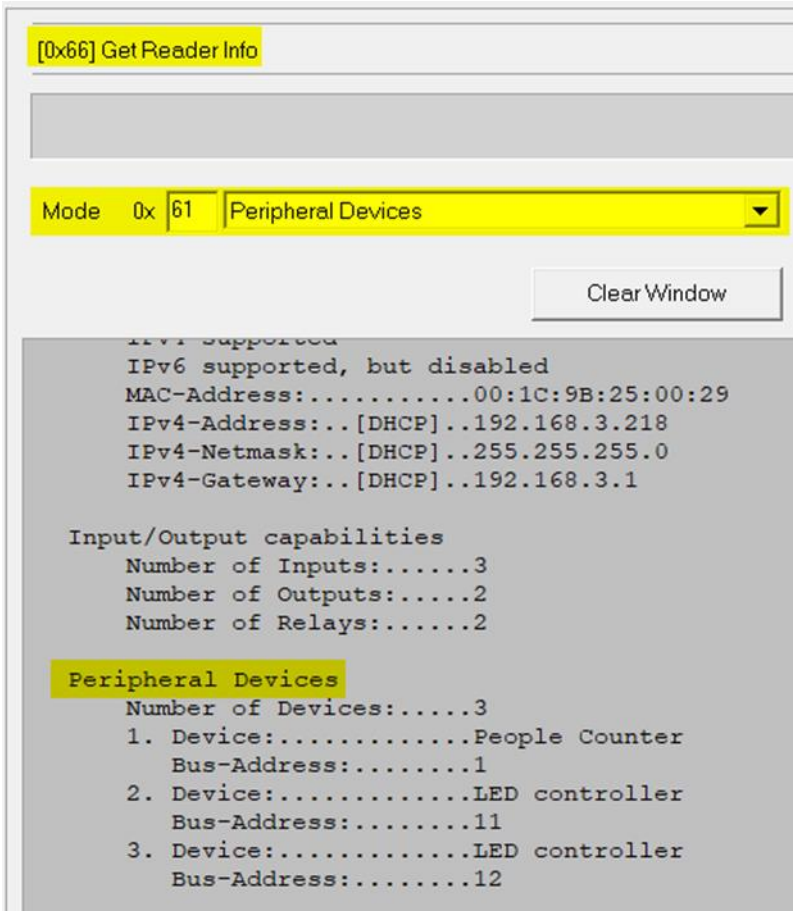
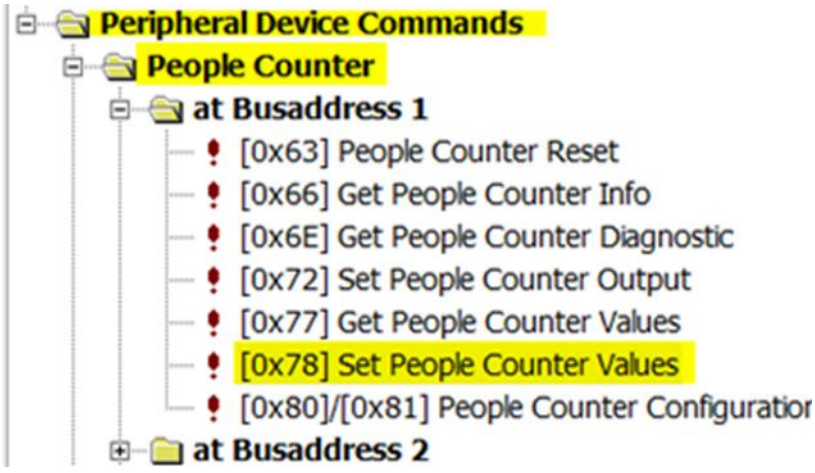
SettingTime
Alarm time LED Controller
e.G. 10 x 100 ms = 1s

Apply





5	**Radar module sensitivity** **Peripheral Decvice Command** **for BusAddr 1,2+3** Byte 11 = 0F = very high 0A = high (default) 05 = medium 00 = low **Read:** Read out value **Write**: Write new value in the people Counter **send:** Confirmation of the change	 

Test People Counter (switch to Commands)		
6	**Get Reader Info** Mode = Peripheral Devices” Send	
7	**Get People Counter Values** At the start of the application the counters are at zero “Set People Counter”: (Counter = “0”) **<Send>**	

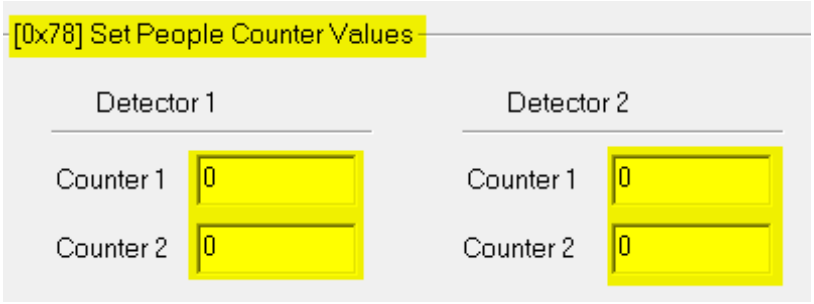
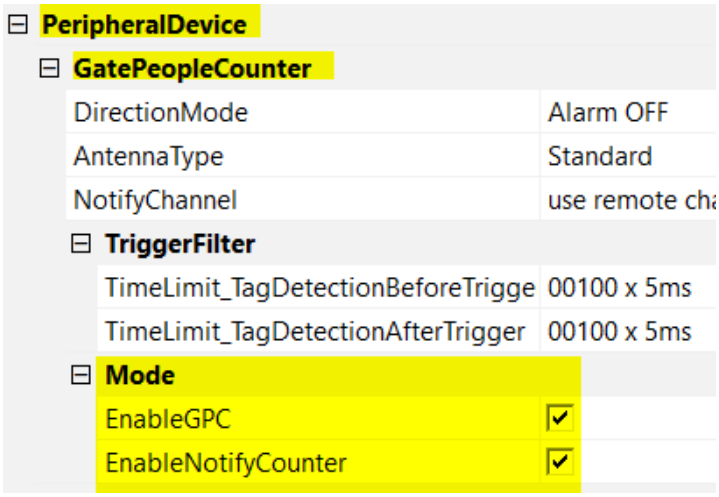
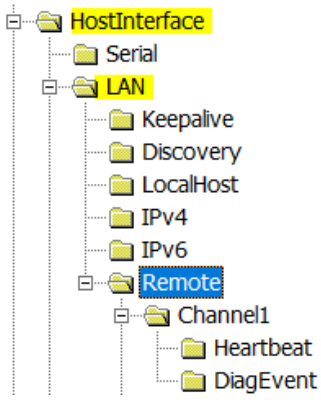
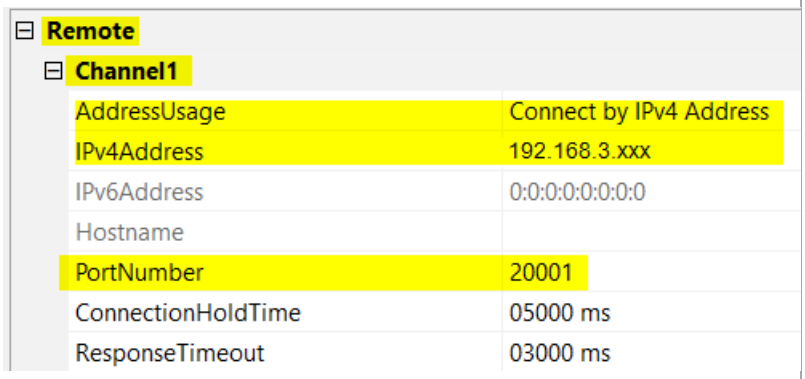
		Counter status = “0” 

Table 26: Configuration and Test (ISO-Host Mode or Buffered Read Mode)

NOTE:

- In ISO-Host and Buffered Read Mode the People Counter must be polled by the host application to retrieve the data.
- Notification Mode:
  The reader automatically sends the people counter data to the host.

10.3.3 Configuration and test in Notification Mode

	Description	Screenshot
1	**Configuration**	
2	**Activate GatePeopleCounter** Mode / EnableGPC = true EnableNotifyCounter = true Apply	
3	**OperatingMode** **Select** = “Notification Mode”	
4	**Setting IP Adresse Host and port for Notification Mode** Setting IP Address and Port for Notification Mode e.G. IP Address: 192.168.3.170 PortNumber: 20001 The same IP address and the same port are valid for: - Notification Channel, - People Counter - Notification Channel data. Apply	 

5	Test the setting with: People Counter Sample “Name” available at the FEIG download area	

Table 27: Configuration and test in „Notification Mode“ „

10.3.4 Reading direction of the Radar Module (GPC)

- Transponders are read in one direction only.
- The radar module is aligned so, that the transponder to be read must pass through the gate. Only in this way is the transponder able to trigger an alarm.
  (In libraries, the radar module points to the inside of the building).

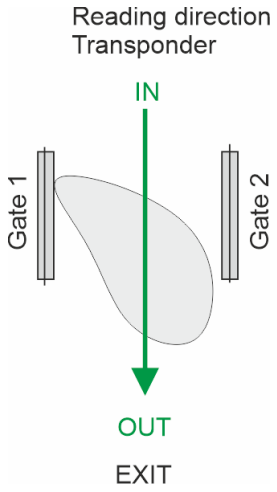


Figure 33: Reading direction Radar module

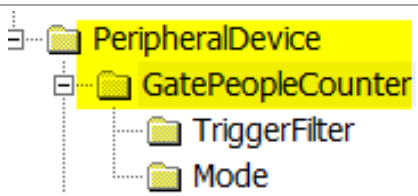
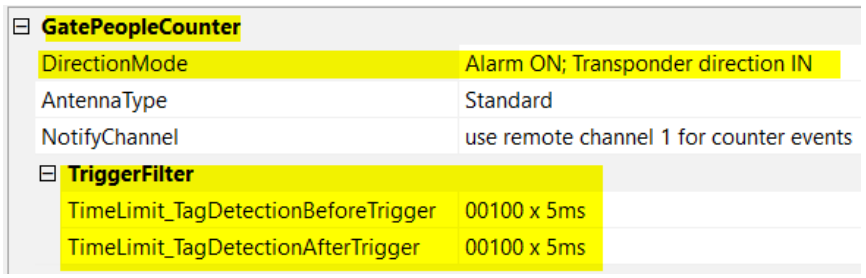
	Description	Screenshot
1	**Configuration DirectionMode**	
2	**PeripheralDevice GatePeopleCounter** Select DirectionMode **TriggerFilter** Timelimit_DetectionBeforeTrigger Timelimit_DetectionAfterTrigger = 500ms Apply	 
3	Go through the gate with a valid transponder and check the direction.	

Table 28: Reading direction of the Radar Module (GPC)

> ⓘ ***NOTE:***
>
> In case of multiple gates it is necessary that the sequence of connected antennas, alarm LED and people counter with radar modules is kept
> (see Application Note).

10.3.5 Detection range depending on direction of motion

Test

- Gate width: 100 cm
- Radar sensitivity: „high“
- Transponder type: e.G: ICODE® SLiX 2

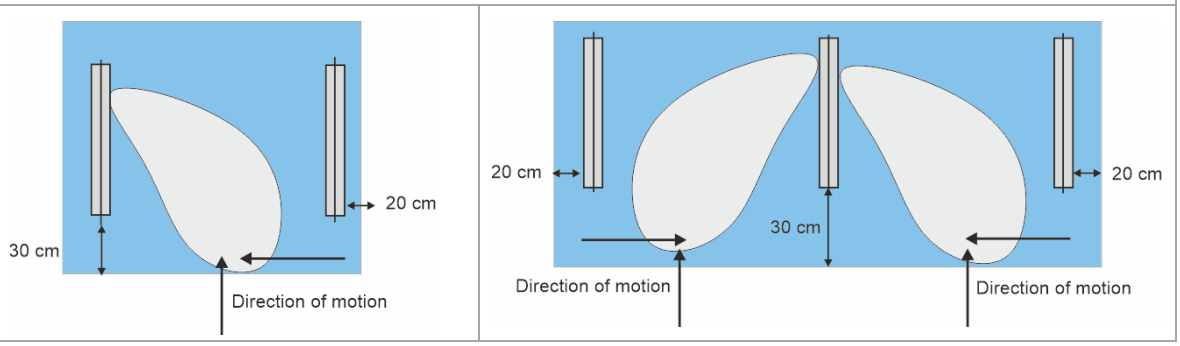


Table 29: Detection range depending on direction of motion

10.3.6 Setting trigger function

The trigger function always works bidirectionally.
Only one reading direction is used for transponder detection,
in order to reduce the error frequency.

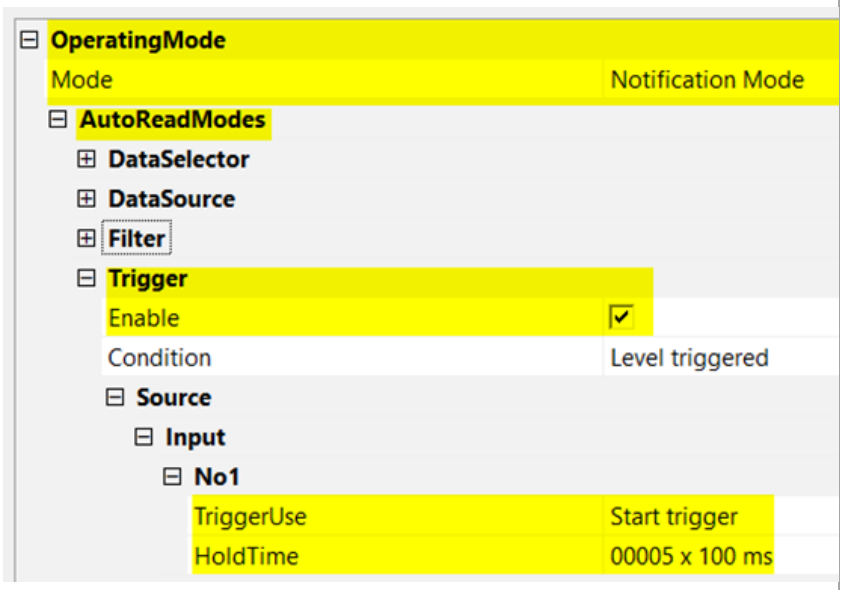
	Description	Screenshot
1	**Configuration** **Set Trigger function**	
2	**OperatingMode /** AutoReaderModes / Trigger Trigger / Enable> = true E.G.. No1: Source / Input / No1 / TriggerUse = „Start trigger“ HoldTime = 500 ms Apply	
3	Passing the gate with valid transponder The gate is active according to the set "Hold time". After the "Hold time" has elapsed, multiplexer stops switching of antennas. All Output LED´s at Outputs of Multiplexer are switched off.	

Table 30: Setting trigger function

11 Radio approvals

11.1 Configure the reader in accordance with national RF regulations

Configuration of the RFID readers and the maximum transmitting power of the antennas are affected mainly by the country-specific RF regulations. For the entire EU the limits are set forth in the R&TTE Directive and EN 300 330. In North America this is regulated by FCC Part 15 (USA) and by the RSS-210 (Canada).

The ID ANT1710/690 Crystal Gate Wave antenna with the ID LRM5400 Reader, when used as intended, complies with the basic requirements of article 3 and the other relevant clauses of the R&TTE Directive 1999/5/EG of March 1999. This means that operation in the 27 EU countries and the EFTA countries (EU countries plus Switzerland, Norway and Iceland) is possible with a maximum field strength of 42 dBµA/m at 10 m distance.

RF approval (at a maximum field strength of 84 dBµV/m at 30 m) for the ID ANT1710/690 Crystal Gate Wave antenna with ID LRM5400 Reader has been granted in accordance with FCC Part 15 for the USA and the RSS-210 for Canada

RF approval in accordance with EN 300 330 is still possible in all 46 CEPT countries.

The CEPT countries are:

Albania (ALB), Andorra (AND), Austria (AUT), Azerbaijan (AZE), Belarus (BLR), Belgium (BEL), Bulgaria (BUL), Bosnia and Herzegovina (BIH), Croatia (HRV), Cyprus (CYP), Czech Republic (CZE), Denmark (DNK), Estonia (EST), Finland (FIN), France (F), Germany (D), Greece (GRC), Hungary (HNG), Iceland (ISL), Ireland (IRL), Italy (I), Latvia (LVA), Liechtenstein (LIE), Lithuania (LTU), Luxembourg (LUX), Malta (MLT), Former Yugoslav Republic of Macedonia (MKD), Moldova (MDA), Monaco (MCO), Netherlands (HOL), Norway (NOR), Poland (POL), Portugal (POR), Romania (ROU), Russian Federation (RUS), San Marino (SMR), Slovak Republic (SVK), Slovenia (SVN), Spain (E), Sweden (S), Switzerland (SUI), Turkey (TUR), Ukraine (UKR), United Kingdom (G), Vatican City (CVA) and Yugoslavia.

The following restrictions are in effect (as of: August 2011):

1. Outside the EU and EFTA countries RF approval must in all cases be applied for. The existing measuring protocols in accordance with EN 300 330 are generally sufficient.

When placing the antennas in service, the systems integrator must ensure that the prescribed mounting instructions are followed, the necessary Reader settings are made and permissible limits according to the national regulations are not exceeded.

The reader needs to be configured as follows depending on the installation location:

Parameter	USA / Canada / Europe (42dBuA/m)
Air Interface	
RF-Power:	maximum 8 W
RF Modulation:	15%
Transponder	
RF Modulation	10%
RF Data coding	Fast (1/4) or Normal (1/256)
No of Timeslots	1 or 16 Timeslots

Table 31: Radio approvals

11.2 Europe (CE), UK (UKCA)

11.2.1 Declaration of Conformity for ID ANT1710/690

CE	**Declaration of Conformity (CE)** Hereby, FEIG ELECTRONIC GmbH declares that the radio equipment type **ID ANT1710/690** is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://www.feig.de/en/service/eu-declarations-of-conformity/
UKCA	**UKCA Declaration of Conformity** Hereby FEIG ELECTRONIC GmbH declares that the radio equipment type **ID ANT1710/690** is in compliance with Directive No. 1206 Radio Equipment Regulations 2017. The full text of the UKCA declaration of conformity is available at the following internet address: https://www.feig.de/en/service/ukca-declarations-of-conformity/

11.2.2 Declaration of Conformity for People Counter ID ISC.ANT.GPC

CE	**Declaration of Conformity (CE)** Hereby, FEIG ELECTRONIC GmbH declares that the radio equipment type **ID ISC.ANT.GPC** is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://www.feig.de/en/service/eu-declarations-of-conformity/
UKCA	**UKCA Declaration of Conformity** Hereby FEIG ELECTRONIC GmbH declares that the radio equipment type **ID ISC.ANT.GPC** is in compliance with Directive No. 1206 Radio Equipment Regulations 2017. The full text of the UKCA declaration of conformity is available at the following internet address: https://www.feig.de/en/service/ukca-declarations-of-conformity/

11.3 USA (FCC) and Canada (IC)

11.3.1 Antenna ID ANT1710/690 Crystal Gate

Product name:	**ID ANT1710/690-A** **ID ANT1710/690-B**
Antenna name:	**ID ANT1710/690-A** **ID ANT1710/690-B**
Reader name:	**ID LRM5400**
FCC ID: **IC:**	**PJMLRM5400** **6633A-LRM5400**
Notice for USA and Canada	This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions. (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Unauthorized modifications may void the authority granted under Federal communications Commission Rules permitting the operation of this device. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Further information and technical data of the ID LR5400 Reader built into the ID ANT1710/690 Crystal Gate Wave antenna can be found in the Installation Manual of the reader which is content of the delivery.

11.3.2 People Counter ID ISC.ANT.GPC

FCC ID: IC:	UXS-IPS154US 6633A-GPC
Notice for Canada	Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Usually this is followed by the following RSS caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

11.4 USA and Canada (UL)

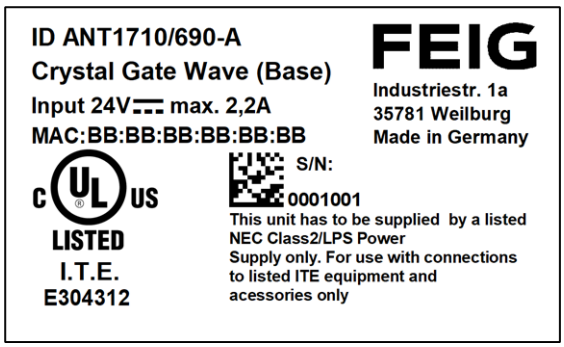


Figure 34: Gate Wave Type A

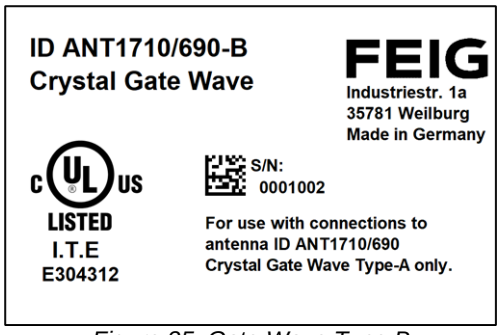


Figure 35: Gate Wave Type B

The following picture indicates the label position:

Figure 36: Label position

12 Technical Data

ID ANT1710/690 Crystal Gate Wave Type A and Type B

Mechanical Data	
Dimensions (w x h d)	• 690 mm x 1764 mm x 77 mm ± 3 mm • 27.2” x 69.7” x 2.8” ± 0.1“
Weight • ID ANT1710/690-A • ID ANT1710/690-B	 • approx. 25 kg / 29.5 kg with packaging • approx. 24 kg / 28.1 kg with packaging
Protection Class	IP 41
Housing	Acrylic glass and ABS UV stabilized
Color	• Crystal clear (acrylic panel), signal white (base) • more colors available on request
Electrical Data	
Supply Voltage	24 V ⎓ ± 15 %
Power Consumption	32,0 VA
Operating Frequency	13,56 MHz
Antenna tuning	ID ISC DAT (automatic)
Max. transmitting power per antenna	8.00 W
Alarm functions	Automatic without host connection; with optical and acoustic indicator; EAS, AFI, UID/SNR
Transponders	ISO 15693, ISO 18000-3 Mode 1, NXP I-Code 1
Interfaces	USB, Ethernet (TCP/IP)
Maximal aisle width • Undimensional • Tridimensional	 • up to 130 cm (51.2 inches) • up to 120 cm (47.2 inches)
Environmental Conditions	
Temperature Range • Operating • Storage	 • –25 °C bis 50 °C / –13 °F up to 122 °F • –25 °C bis 70 °C / –13 °F up to 158 °F
Humidity	10–95% non condensation
Applicable Standards	
RF Approvals • Europa / Europe • UK • USA • Canada	 • EN 300 330 • EN 300 330 • FCC Part 15 • RSS-210

EMC	EN 301 489
Safety: • Low Voltage Directive • Human Exposure • Product Testing	 • EN 62368 • EN 50364 • ISO 18046-4 / VDI-4478-1

Table 32:Technical data Gate Wave Type A und B

12.1 People counter ID ISC.ANT.GPC and ID ISC.ANT.GPC-E2

Mechanical Data	
Dimension (B x H x T) • People Counter board • Radar Detector board	 • 100 mm x 40 mm x 16 mm • 60 mm x 30mm x 25 mm
Wight • ID ISC.ANT.GPC • ID ISC.ANT.GPC-E2	 • ca. 200 g / 250 g with packaging • ca. 50 g / 100 g with packaging
Mounting points	• People Counter: 4 • Radar Detector: 2
Electrical Data	
Power supply	24 V ⎓ ± 15 % Noise Ripple : max. 150 mV
Power consumption	max. 2 VA
Frequency	24,125 GHz
RF-Transmitting power	16 dBm (e.i.r.p.)
Temperature range • Operating • Storage	 • -25 °C bis +55 °C • -25 °C bis +85 °C
Function	
Number of aisle per people counter Extension	• 1 or 2 aisles using the second radar module (ID ISC.ANT.GPC-E2) • up to 6 aisles → 2nd +3rd people counter are required
Direction detection	yes
Counter per aisle • 1 x direction 1 / In • 1 x direction 2 / Out	 • 0..4 294 967 295 • 0..4 294 967 295
Equipment Classification according ETSI EN 300 440 and ETSI EN 301 489: Class 2	

Table 33: Technical data GPC

12.2 Power supply unit ID.ISC.NET24V-B

Mechanical Data	
Type	Power supply (IEC 60320-C13, 3-pin)
Housing	plastic
Dimensions (W x H x L)	58 x 30,5 x 132 mm ± 1 mm
Wight	ca. 345 g
Color	black
Protection Class	IP41
Electrical Data	
Power supply	110–240 VAC, 50–60 Hz
Voltage out	24 V ⎓ ± 5 %
Current consumption	max. 3,0 A
Transmitting power	max. 70 VA
Safety	IEC 62368-1

Table 34: Technical data power supply

13 Terminal Management

Terminal		Description
X1 / LR		24V DC Reader
X1 / Pin 1	24V	+24 V DC Reader
X1 / Pin 2	GND	GND Reader
X2 / LR I/O		24V DC Input/Output , RS485
X2 / Pin 1		RS485 A-
X2 / Pin 2		RS485 B+
X2 / Pin 3		GND
X2 / Pin 4		TRG Trigger People Counter
X2 / Pin 5		GND
X2 / Pin 6		Buzzer
X2 / Pin 7		Shield
X3 / MUX		24V DC Multiplexer
X3 / Pin 1	24V	+24 V DC Multiplexer
X3 / Pin 2	GND	GND Multiplexer
X5 / GPC-in		Connecting cable to People Counter or LED
X5 / Pin 1		+24V DC
X5 / Pin 2		GND People Counter or LED
X5 / Pin 3		RS485 A-
X5 / Pin 4		RS485B+
X5 / Pin 5		TRG Trigger People Counter
X5 / Pin 6		Shield
X11		24V DC Power Supply
X11 / Pin 1	24V	Power Supply +24 V DC
X11 / Pin 2	- / GND	Ground (Power Supply)
X13 / GPC-out		Connection cable to the next antenna
X13 / Pin 1	24V	+24 V DC
X13 / Pin 2	GND	GND
X13 / Pin 3	TRG	TRG Trigger People Counter
X13 / Pin 4	A-	RS485 A-
X13 / Pin 5	B+	RS485 B+

Table 35: Terminal Management

Internal Cable Management

Terminal		Description
X1 / LR		24V DC Reader
X1 / Pin 1		X13 +24 V DC Reader (red)
X1 / Pin 2	GND	X13 GND Reader (black)
X2 / LR/I/O		24V DC Input/Output, RS485
X2 / Pin 1		Reader LR2500 X3 Pin RS485 B+ (green)
X2 / Pin 2		Reader LR2500 X3 Pin RS485 A- (yellow)
X2 / Pin 3		Reader LR2500 X2 Pin IN2- (brown)
X2 / Pin 4		Reader LR2500 X2 Pin IN2+ (grey)
X2 / Pin 5		Reader LR2500 X2 Pin Out2-E (pink)
X2 / Pin 6		Reader LR2500 X2 Pin Out2-C (white)
X2 / Pin 7		Reader LR2500 X2 GND (black)
X3 / MUX		24V DC Multiplexer
X3 / Pin 1		X1 +24 V DC Multiplexer (red)
X3 / Pin 2	GND	X1 GND Multiplexer (black)
X5 / GPC-in		Connecting cable to People Counter /LED
X5 / Pin 1		GPC X1 Pin 1 +24 V DC GPC/LED (white)
X5 / Pin 2		GPC X1 Pin 2 GND GPC/LED (brown)
X5 / Pin 3		GPC X1 Pin 3 RS485-A (green)
X5 / Pin 4		GPC X1 Pin 4 RS485+B (yellow)
X5 / Pin 5		GPC X1 Pin 5 TRG Trigger People Counter (grey)
X5 / Pin 6		GPC X1 Pin 6 Shield (blue)

Table 36: Internal cable management

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