Annex no. 12

Antenna Descriptions

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OBID i-*scan*®

INSTALLATION

ID ISC.ANT310310-A

HF Antenna

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FEIG ELECTRONIC

Note

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Contents

ENGLISH

1 Safety Instructions / Warning - Read before start-up !

- The device may only be used for the intended purpose designed by for 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.
- 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 and your cardiac pacemaker and not stay in an immediate proximity of the device respective the antenna for some time.
- Do not use harsh chemicals, cleaning solvents or strong detergents to clean the antenna. Wipe it with a soft cloth slightly dampened in a mild soap-and-water solution.

CAUTION! When working on an opened device, the Antenna-Tuner and the Antenna conductor carry voltages up to 1000V.

2 Features of the antenna ID ISC.ANT310/310

The Antenna ID ISC.ANT310/310 is a single-loop antenna with manual tuning board.

The antenna has been factory calibrated for the most applications. After having been installed in other surroundings, the antenna may be re-tuned for a optimal performance with the help of jumpers.

In combination with various reader of the Company FEIG ELECTRONIC GmbH, the antenna is suitable for many Long- and Mid-Range applications with reading performance. At a transmitting power of 8 W and a transponder in ISO Card size, a reading range of 60-70 cm is possible.

Furthermore, it can be used with other readers having a transmitter frequency of 13.56 MHz and an output impedance of 50 Ω.

The preferred orientation of a transponder is parallel to the antenna's surface. The right position to obtain a maximum range would be above the centre of the antenna's plane.

Due to its robust design, in conjunction with the protection class IP65, it is for almost all applications.

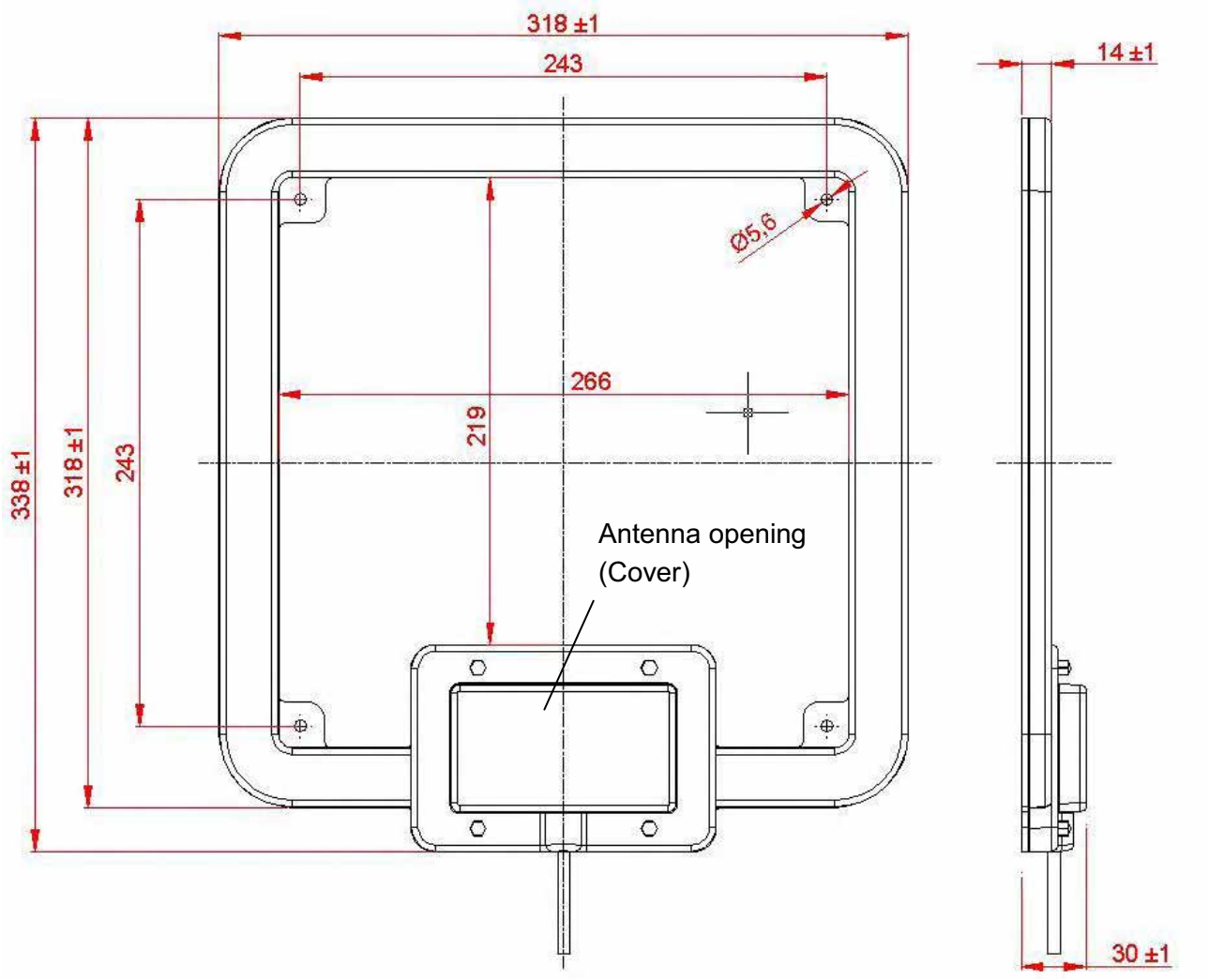
Typical application are book and video libraries, document tracking, Label programming, logistic application at conveyors and sorting systems, access control, people identification and collection of data in the office or in the Industry.

3 Installation and Wiring

The antenna has been especially designed for installation with holding devices made of non-conductive materials (e.g. plastic or wood). It is suitable for both indoor as well as outdoor use. In order to facilitate the mounting, there are four drill holes (d=5,6 mm) with a spacing of 243 mm at the inside of the antenna. For attachment, we recommend a wood screw size 5 mm (like DIN 96) or machine screw (like DIN 7985) with a pen head of minimum ∅ 10 mm till maximum ∅ 12 mm. The maximum tightening torque of the free turning screws are 2 Nm.

Please keep a minimum distance of 5 cm to all metal parts! Even a distance lower than 30 cm to metal parts will lead to a reduction of the reading range. See chapter 4.7 Antenna tuning

Figure 1: Installation drawing ID ISC.ANT310/310



All measurements in mm.

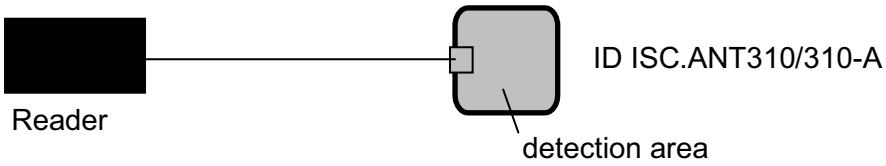
For antenna tuning open the housing by removing the four screws at the cover. The maximum tightening torque for the cover screws is 0,7 Nm – 0,9 Nm.

4 Start-up

4.1 Project Notes

The antenna is connected directly to the reader with the help of the connecting cable and the SMA-plug.

Figure 2: Wiring diagram – reader and antenna



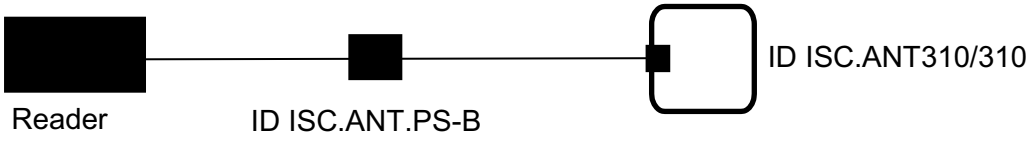
The antenna ID ISC.ANT310/310 permit the detection of the transponder inside the detection area. The preferred orientation of a transponder is parallel to the antenna's surface. The right position to obtain a maximum range would be above the centre of the antenna's plane. Exactly on the antenna wire the read range drops to zero.

In order to suppress possible interference's, in the frequency area of 20-100MHz, the reader ID ISC.LR2000 and ID ISC.MR200 is equipped with two respectively one torrid cores. One of these torrid cores must be integrated into the antenna connection cable. For this purpose, the coaxial cable has to be pulled through the core 4 times and has to be located as close as possible to the core. The maximum distance between reader and torrid core should be 10 cm.

Figure 3: Assembly of the torrid core at the coaxial cable

For industrial environments, to suppress interference's in the frequency area of 1-10MHz, we recommend to insert the device ID ISC.ANT.PS-B in the mode transformer between reader and antenna.

Figure 4: Wiring diagram - reader with transformer and antenna



Note: . The maximum tightening torque for the SMA connector is 0,45 Nm.

Please also observe the following recommendations:

- Up to a distance of 50 cm, the antenna cable should always be lead away from the antenna vertically and installed permanently.
- In order to obtain an optimum reading range, the antenna connection cable should not be shortened or extended. If an extension is absolutely necessary, please use a 50 Ω cable with a length of $\lambda/2$ (half the wavelength at 13,56 MHz, RG58=7,20 m). However, this may lead to a minor sensitivity reduction (approx. 2 cm reading range / extension).
- Please keep a minimum distance of 30 cm between the antenna cable and all parallel, power cables.

After the installation has been completed, an operational check can be performed with the help of the reader and a smart label. With a transmitting power of 4W and a label size of 75 mm x 46 mm (ISO-card size) the reading range in the centre of the antenna should be approx. 50 cm – 60 cm.

Otherwise, the following points should be reviewed:

- Is the antenna installed near metal?
- What is the difference between Umax-Umin of the Noise Level? The difference of the Noise Level should be less than 20 mV (see ISO Start, Test & Measurement).
- Is the matching of the antenna of the impedance to the impedance of 50 Ω okay?
  - Can be checked with the help of an SWR – Meter. See *Chapter 4.6 How to measure the voltage standing wave ratio (VSWR)*.
  - Do the reader signal a “RF-Warning”? See reader command “[0x6E] Reader Diagnostic”
- The distance from tag to tag should be greater than 8 cm. If the tag to tag distance is reduced, losses at the read range can be expected. This applies in particular to distances under 5 cm.
- If multiple gates are operated at the same time at a distance of less than 8 m, the Readers must by synchronized. Otherwise, losses at the read range can be expected
  See Application Note: “Synchronizing RFID Long Range Readers using the Reader Synchronization Interface” (N11200-3e-ID-B.pdf).

4.2 Configuring 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 ISC.ANT310/310 antenna with the reader ID ISC.LR2500, ID ISC.MR200 and ID.ISC.MR101, 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 99. This means that operation in the 29 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 Output power = 4W).

RF approval (at a maximum field strength of 84 dBµV/m at 30 m) for the ID ISC.ANT310/310 antenna with ID ISC.LRM2500 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: October 2009):

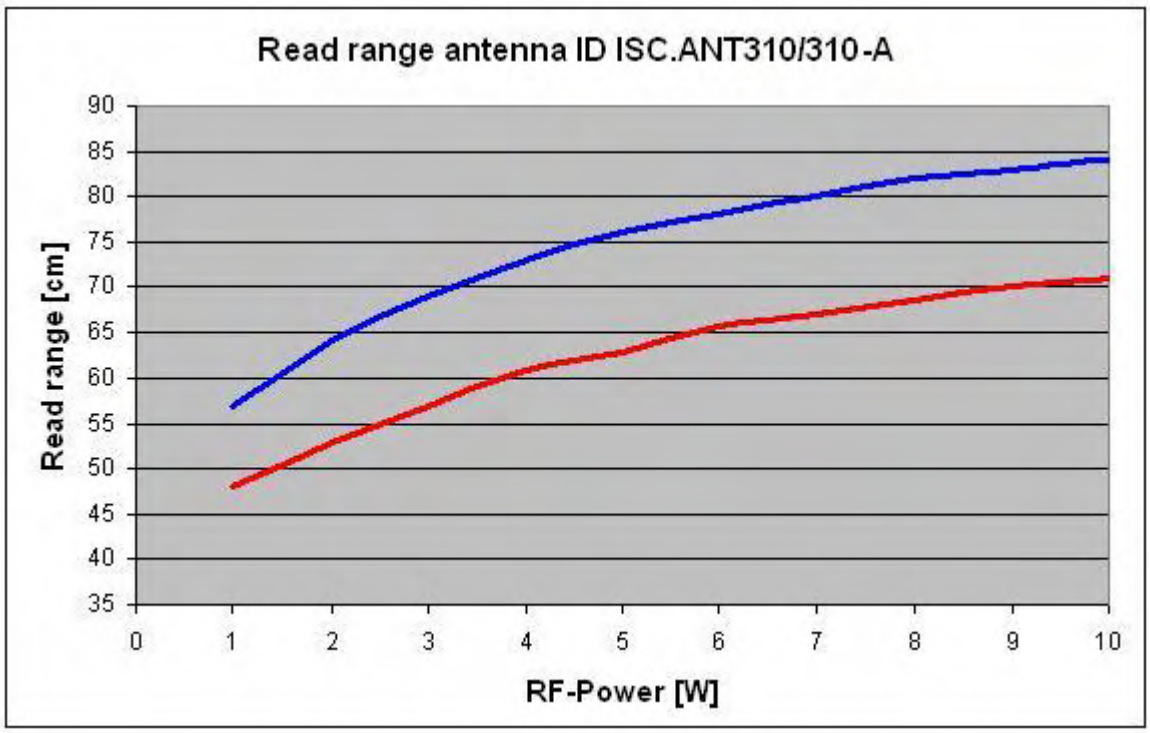
1. Outside the EFTA countries RF approval must in all cases be applied for. The existing measuring protocols in accordance with EN 300 330 are generally sufficient.

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.

4.3 The influence of the transmitting power on the reading range

The antenna's working range is dependent on the antenna itself, the reader, the transponder and the adjusted transmitting power of the reader. Due to the fact that the transponder gets its energy from the magnetic field produced by the antenna and that the field intensity decreases at higher distances, the radiated transmitting power has strong influence on the range.

Figure 5: Reading range of the antenna ID ISC.ANT310/310 in dependence on the RF power



Read range of two typical transponder, size 46 x 75 mm^2, over the centre of the antenna, parallel orientation to the antenna.

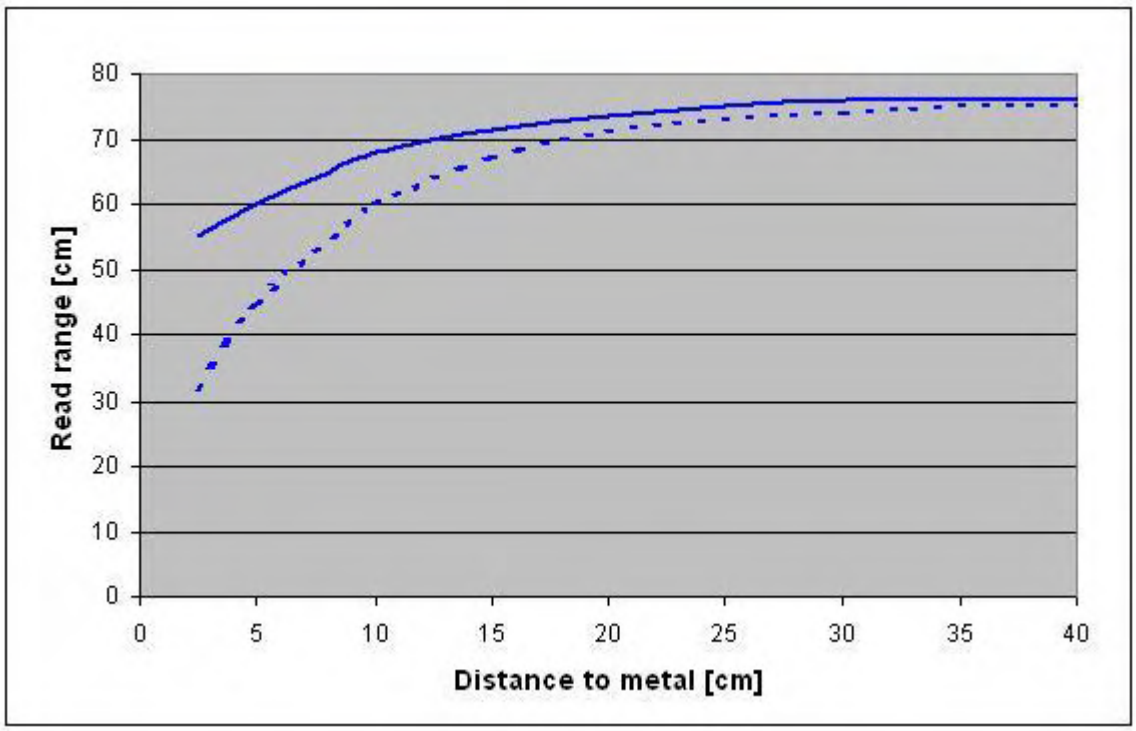
A transmitting power of more than 8 W could, in dependence on the ambient temperature, heat up the antenna and may even destroy it.

4.4 The influence of metal on the reading range

A magnetic field cannot penetrate metal or other magnetically conductive materials. The course of the lines of electric flux and the inductivity of the antenna is changed and has therefore a considerable influence on the reading range. Furthermore, the field is weakened by the mutual inductance response the eddy current within the metal.

The change of inductivity may often be compensated with the help of the (re-)tuning electronics. Figure 6 illustrates the influence of a metal plate on the antenna with (upper line) and without re-tuning (lower line).

Figure 6: Reading range* in dependence on the distance to metal



Read range of a typical transponder, size 46 x 75 mm^2, over the centre of the antenna, parallel orientation to the antenna.

If metal parts cannot be avoided close to the antenna, please observe the following:

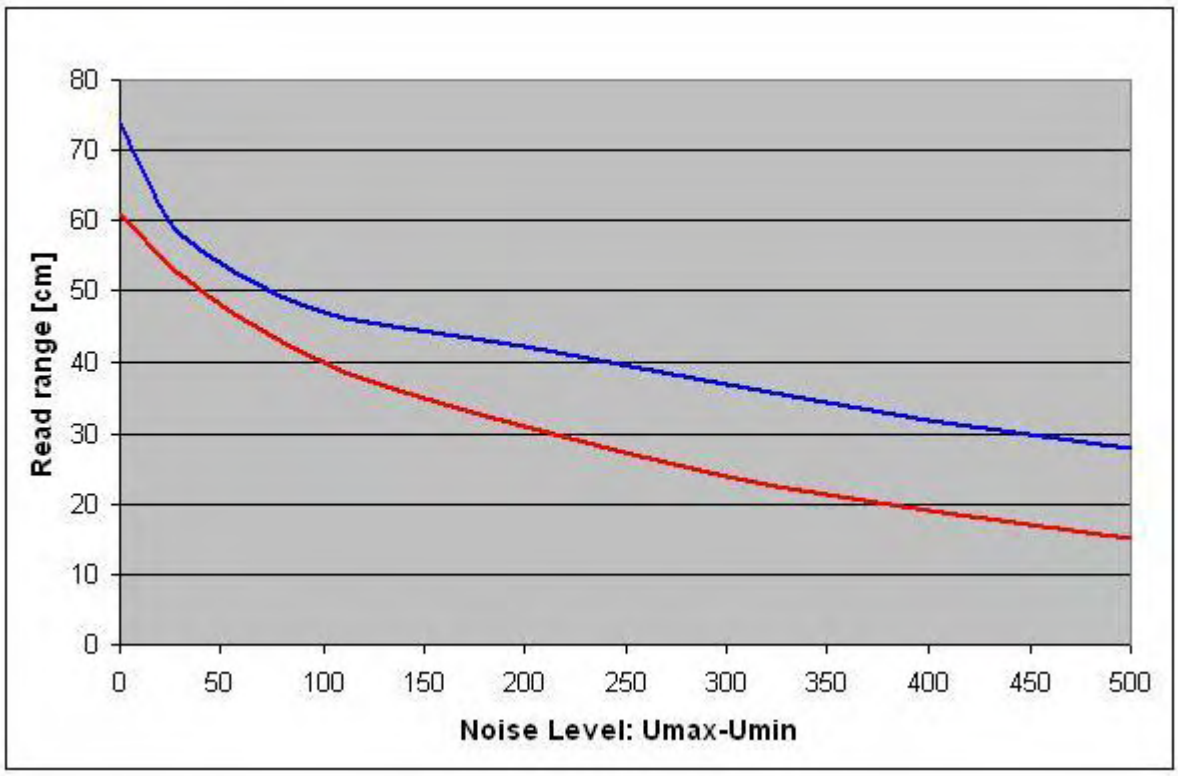
- The minimum distance between metal and antenna is 5 cm. A distance up to 30 cm will lead to a considerable reduction in the reading range. At a distance of 50 cm to metal parts, there will be almost no influence to be measured.
- Metal parts must not form closed loops or electric circuits. These have to be electrically separated at one point.
- Metal parts in close vicinity to the antenna have to be grounded in star configuration with a good HF-connection.

4.5 The influence of the noise level on the antenna's working range

Interferences have to be largely avoided, so that the smart label may be read by the receiver even at low signal levels. The amplitude of the interference levels can be found out at reader ID ISC.LR200 with the help of the noise levels. Critical are not the absolute measured values, but rather the difference between Umax-Umin.

This has been simulated at 4W and represented graphically in the following figure.

Figure 7: Reading range in dependence on the noise levels



Read range of two typical transponder, size 46 x 75 mm^2, over the centre of the antenna, parallel orientation to the antenna.

The difference of the noise levels (U_{max} - U_{min}) should be less than 20 mV.

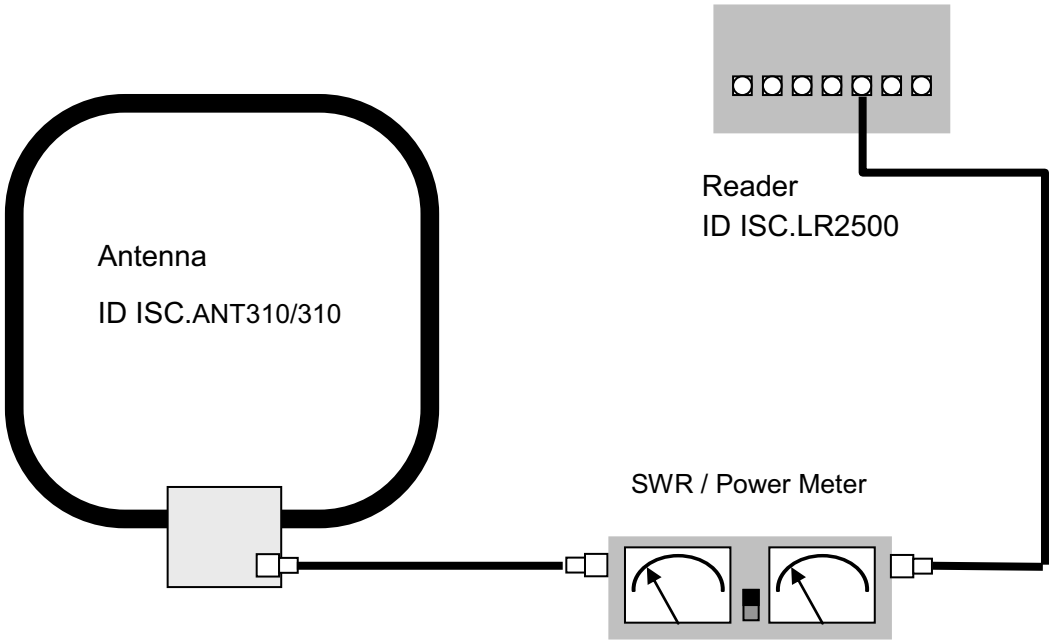
Possible reasons for excessive noise levels:

- Bad (HF-)connections between reader and antenna.
- Improper cable layout between antenna and reader
- Badly tuned antenna
- Interfering signals of other electronic appliances or transmitting stations.
- Interfering signals on the reader's power supply line.
- Interfering signals coming from other cables close to the cables leading to and away from the reader.
- Metal parts close to the antenna

4.6 How to measure the voltage standing wave ratio (VSWR)

If an antenna has been tuned, the question is: how good is the adjustment between reader and antenna? In this case, the VSWR –meter is a very useful tool. This device measures the ratio between supplied and reflected energy. A VSWR of up to 1.3 :1 is considered to be sufficient. Very often, a wattmeter is integrated into these devices.

Figure 8: Inserting a VSWR meter into the antenna cable



The cable between the Reader and the SWR meter should either be very short (< 20 cm) or 7.20 m (RG 58=Lambda/2) long. If the VSWR is greater than 1.3:1 after tuning, use the Jumper J1-J3 on the board of the antenna to perform a slight adjustment.

Furthermore the VSWR meter can be used at any time to check the tuning of the antennas. If changes in local conditions result in detuning of the antennas, this can be verified whenever desired.

In addition to the losses indicated by the SWR due to mismatching between the cable and the antenna, it happens that the Reader drives different output currents depending on the antenna impedance, resulting in power variance. This means that at 50 Ω a current of approx. 0.3 A flows. No current flows when an output is open, and when there is a short circuit the current is limited to approx. 1.0 A. Matching the antenna also has a slight effect on the noise levels.

4.7 Antenna tuning

The antenna has been factory-tuned on a wood block at an impedance of 50 Ω. If it is installed in a defined distance to metal or other magnetically conductive materials, no adjustment or re-adjustment will be necessary.

After installation in different ambience conditions, the antenna may be re-tuned for a limited sector with the help of jumpers. For this purpose you will either need an SWR – meter or a measuring device (antenna/impedance analyser) in order to determine the impedance at 13,56 MHz.

Before tuning, all antennas and antenna cables must be fixed in place. The antenna should be connected to the reader directly. A additional necessary power splitter or transformer should be looped in after the tuning procedure.

Figure 9: The antenna's impedance in dependence on the frequency
(measured at the SMA Connector)

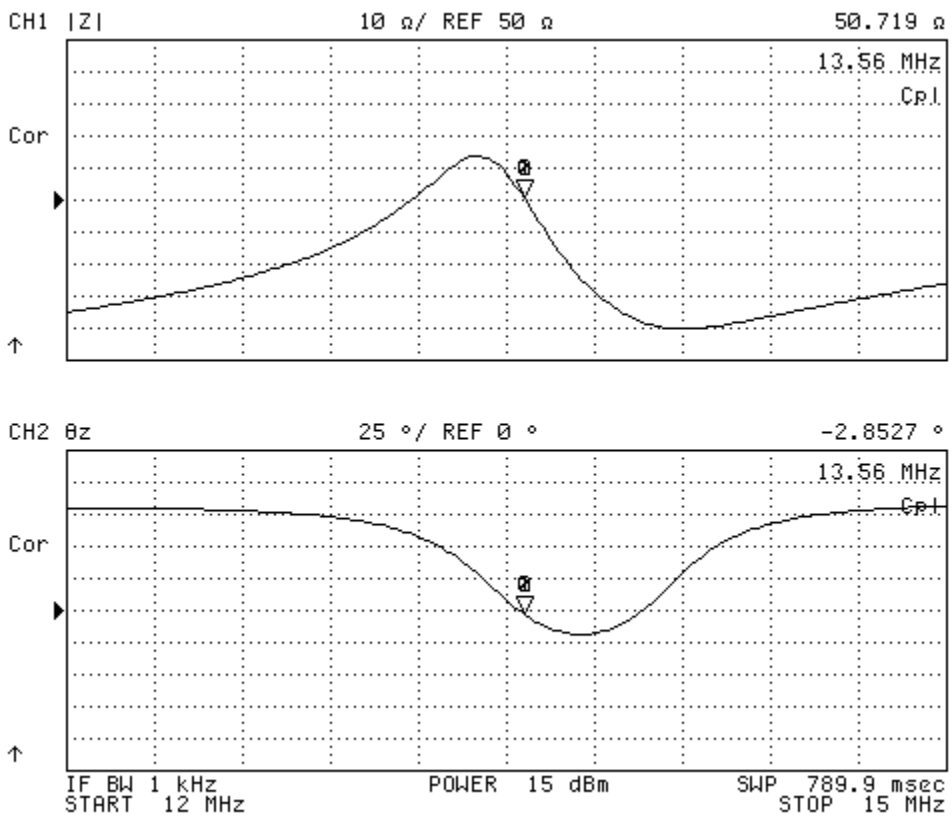


Figure 10 The antenna's impedance in dependence on the frequency
(measured direct at the antenna matching board)

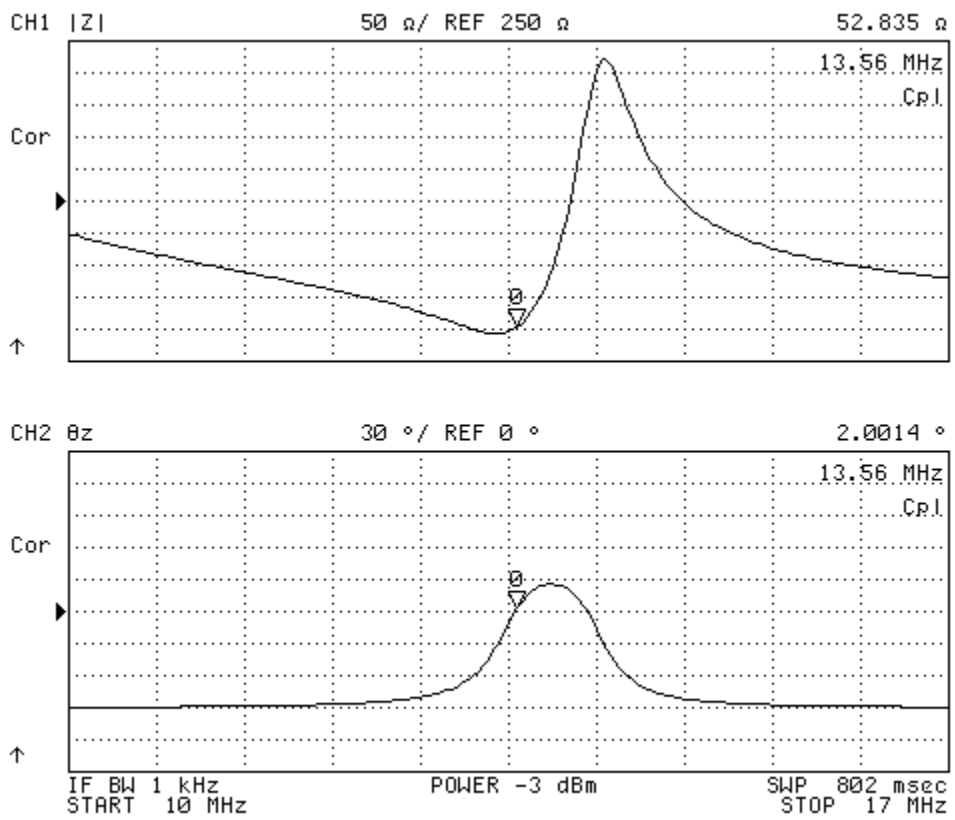
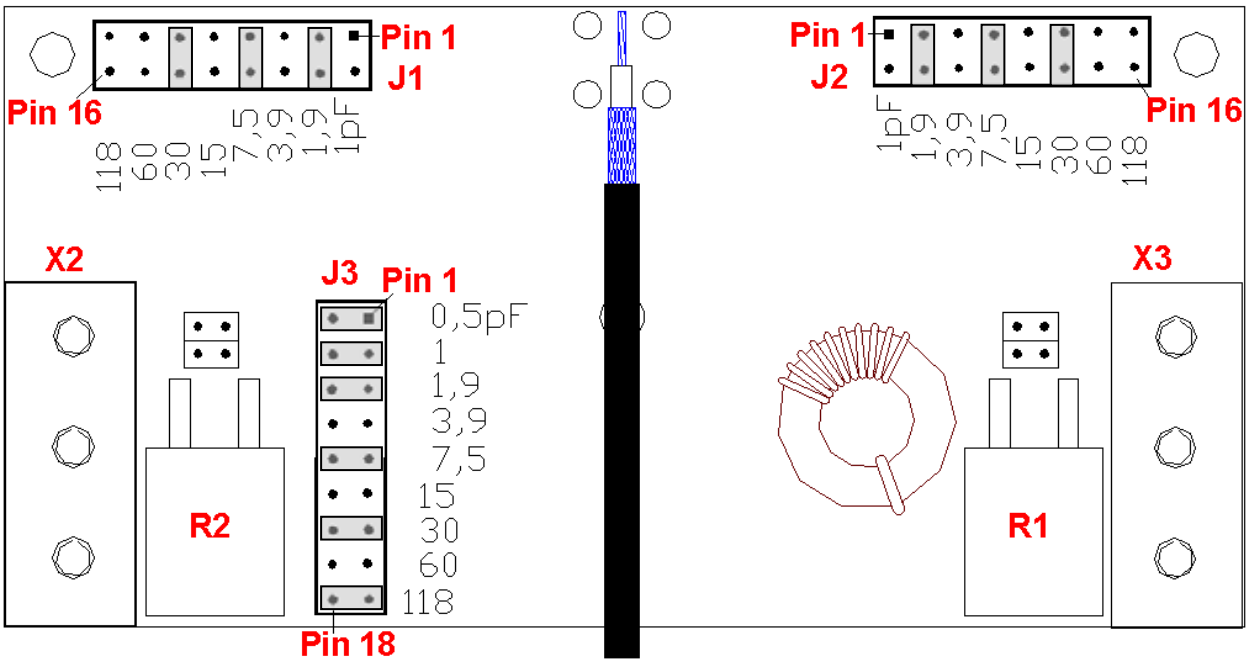


Figure 10 show the diagram of the impedance and phase in dependence of the frequency of the antenna ID ISC.ANT310/310. If the antenna had been tuned well, the (serial-) resonance point should be at the minimum of the impedance curve at 13.56MHz, 50 Ω. and a phase angle of 0°.

If metal is brought close to the antenna, the impedance curve shifts to the right and slightly downwards. This means that the closer the metal part comes, the impedance value will decrease and then increase more and more. During this process, the antenna will once again pass the value of 50 Ω. However, this operating point does not lead to optimal reading ranges. The optimal operating point always lies on the series resonance, which in this case equals the minimum value on the impedance curve.

ENGLISH

Figure 11 Top few tuning board with default Jumper positions



The following table has been made up in order to facilitate the process of tuning or re-tuning. The jumper positions may be used as a first start or reference values, only. In any case, the impedance or VSWR must be double checked, afterwards. And a matching of the optimised working point / jumper configuration is necessary.

Table 1: Jumper position

Distance to metal (plate)	Jumper closed at Pin No		
	J1	**J2**	**J3**
2,5 cm	5-6,7-8,9-10,11-12	5-6,7-8,9-10,11-12	3-4,9-10,13-14,15-16,17-18
5 cm	3-4,5-6,9-10,11-12	3-4,5-6,9-10,11-12	9-10,15-16, 17-18
7,5 cm	5-6,9-10,11-12	5-6,9-10,11-12	3-4,7-8,9-10,11-12,13-14,17-18
10 cm	3-4,7-8,11-12	3-4,7-8,11-12	1-2,3-4,7-8,11-12,13-14,17-18
15 cm	3-4,7-8,11-12	3-4,7-8,11-12	11-12,13-14,17-18
20 cm	3-4,7-8,11-12	3-4,7-8,11-12	3-4,7-8,9-10,13-14,17-18
25 cm	3-4,7-8,11-12	3-4,7-8,11-12	7-8,9-10,13-14,17-18
30 cm	3-4,7-8,11-12	3-4,7-8,11-12	1-2,3-4,5-6,9-10,13-14,17-18
35 cm	3-4,7-8,11-12	3-4,7-8,11-12	1-2,3-4,5-6,9-10,13-14,17-18
40 cm	3-4,7-8,11-12	3-4,7-8,11-12	1-2,3-4,5-6,9-10,13-14,17-18
Without metal (plate)	**3-4,7-8,11-12**	**3-4,7-8,11-12**	**1-2,3-4,5-6,9-10,13-14,17-18**

The default configuration are the jumper position in the row “without metal (plate)”!

In order to re-adjust the antenna on 50 Ω and phase angle 0°, the jumper terminals J1, J2 and J3 may be used for re-tuning. See *chapter 4.6 How to measure the voltage standing wave ratio (VSWR)*.

The purpose of the tuning process is to tune the antenna, again, as close as possible to 50 Ω. maintain the following tolerances:

Z = 50 +/- 3 Ω and phase angle Phi = 0° +/- 3° or R = 50 +/- 3 Ω and X = 0 +/- 5 Ω or VSWR <= 1:1.3

Please proceed as follows:

1. Adjust jumper terminals J1, J2 and J3 according Table 1
2. Adjust capacities by using terminal J3 at the optimal value lying close to 50 Ω (minimum value VSWR).
3. Adjust capacities by using terminal J1 and J2 at the optimal value lying close to 50 Ω (minimum value VSWR).
1. Repeat step no. 2. and 3. till a impedance of 50 Ω ± 1 Ω and phase angle 0°± 3° is reached (minimum value VSWR <=1:1.3)

Setting the capacity at the terminals J1, J2, J3 at the best matching point close to 50 Ω and phase angle 0° must be done by insert or remove the jumper. Thereby, the value at the analyser or VSWR meter before and after the change has to be compare.

As first step, the small capacities should be changed. If this change get an improvement or if the jumper is inserted already with the next larger value has to be continued

If the closing of Pin 1-2 improve the matching, the next step would be to close Pin 3-4 and open Pin 1-2. This is because the capacitor at Pin 3-4 has approximately twice the value of the capacitor at Pin 1-2.

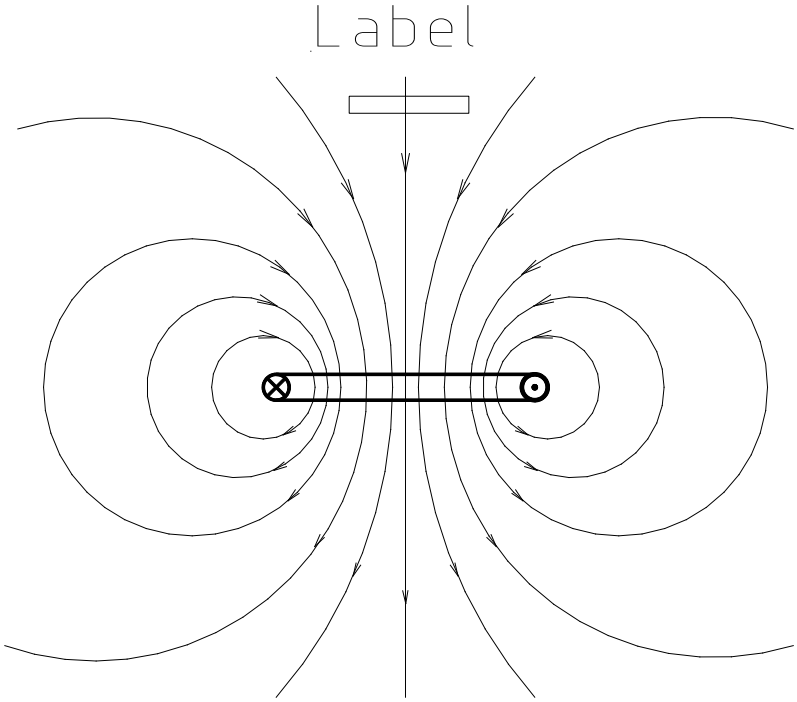
The jumper configuration at terminal J1 and J2 should be put equal. Big capacities at terminal J1 and small values at J2 lead to asymmetry in the antenna. This can lead to performance losses and/or damage of the components in the antenna

Note: Voltages as high as 1000V may be present on the antenna wire or on various components of the tuning boards. Before starting your work first disconnect the antenna from the Reader. When tuning the antenna make sure no components inside the housing are touched.

5 Course of the antenna's magnetic lines of electric flux

Figure 1 shows the field alignment of a simple single loop antenna. This is the most simple and most frequently used antenna type in the sector of **OBID® i-*scan***. Its size depends highly on the reading range requirements and the place of application as well as the national limiting values.

Figure 1: course of the magnetic lines of electric flux of a single loop antenna



The working range of an antenna depends very much on the position and alignment of the transponder. A single loop antenna has the highest range in the centre of the antenna and if the transponder is aligned parallel to the antennas surface.

The transponder is powered only when sufficient field lines flow through him. Therefore, the activation of the transponder in the direction perpendicular to the antenna surface, within the antenna area, is not possible.

6 Technical data

Mechanical data

• **Housing**	Plastic ABS-ASA
• **Dimensions (W x H x L)**	318 mm x 338 mm x 30 mm ± 1 mm
• **Weight**	approx. 0,7 kg
• **Protection class**	IP 65
• **Colour**	White

Electrical data

• **Maximum transmitting power**	8 W
• **Admissible transmitting power**	
– EU (according EN 300 330)	8.0 W
– U.S. (according FCC Part 15)	4.0 W
- Canada (according RSS 210)	4.0 W
• **Operating frequency**	13.56 MHz
• **Working range**	
– 1 W (ID ISC.MR101)	Typical 43 cm *
– 1.8 W (ID ISC.MR200)	Typical 50 cm *
– 4 W	Typical 60 cm *
– 8 W	Typical 70 cm *
• **Antenna connection**	1 x SMA plug (50 Ω)
• **Antenna connection cable**	RG58, 50 Ω, approx. length of 3,56 m

Ambience conditions

• **Temperature range**	
– operation	–25°C to +55°C
– storage	–25°C to +60°C
• **Vibration**	EN60068-2-6 10 Hz to 150 Hz : 0,15 mm / 20m/s^2 (~ 2 g)

• **Shock**	EN60068-2-27 Acceleration : 20m/s^2 (~ 30 g)

Applicable standards	
• **EMV**	EN 300 683
• **Safety**	EN 60950

*Size Transponder coil 46 x 75 mm^2,' over the centre of the antenna, sensitivity / minimum operating field H_{min}=60mA/m rms, parallel orientation to the antenna,. transmitting power 4 /8 W.

6.1 Approval

6.1.1 Europe (CE)

When properly used this radio equipment conforms to the essential requirements of Article 3 and the other relevant provisions of the R&TTE Directive 1999/5/EC of March 99.

CE

Equipment Classification according to ETSI EN 300 330 and ETSI EN 301 489: Class 2

The technical data of the ID ISC.LRM2500 Reader can be found in the Installation Manual of the reader.

6.1.2 USA (FCC) and Canada (IC)

Product name:	**ID ISC.ANT310/310**
Antenna name:	**ID ISC.ANT310/310-A**
Reader name:	**ID ISC.LRM2500-A** **ID ISC.LRM2500-B**
FCC ID: **IC:**	**PJMLRM2500** **6633A-LRM2500**
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 ISC.LRM2500 Reader can be found in the Installation Manual of the reader.

7 System delivery contents

- HF antenna ID ISC.ANT310310-A
- Qty: 6 Jumper
- Installation manual

OBID i-scan® HF

INSTALLATION

ID ISC.ANT1690/600
Type A and B Crystal Gate

English

final
public (B)
2011-04-06
M91200-3e-ID-B.doc

FEIG ELECTRONIC

Note

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Contents

1. Safety Instructions / Warning - Read before Start-Up !

- The device may only be used for the intended purpose designed by for 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 antenna housing could be sharp-edged.

CAUTION! The Antenna-Tuner and the Antenna conductor carry voltages up to 1000V.

The Antenna is not water proof and should not be exposed to rain or humidity.
Under extreme circumstances water could seep into the antenna and damage the electronic circuits.

Special advice for wearers 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 and your cardiac pacemaker and not stay in an immediate proximity of the reader's antennas for any length of time.

- **CAUTION! Do not look directly into the Alarm LED light. There is a danger of injury of the eyes!**

2. Maintenance

The antenna ID ISC.ANT1690/600 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.

⚠ **Attention! The surfaces should be cleaned with a clean, soft cloth dampened in a dishwashing liquid – water solution. 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.

3. Performance Features of the ID ISC.ANT1690/600 Antennas

The ID ISC.ANT1690/600-A antenna is a version with integrated Dynamic Antenna Tuning Board ID ISC.DAT , Long Range Reader ID ISC.LRM2500-B, 4-times Multiplexer Module ID ISC.ANT.MUX M4, additional Alarm LED light and Alarm sounder .

The ID ISC.ANT1690/600 Type B antenna is a version with integrated Dynamic Antenna Tuning Board ID ISC.DAT and Alarm LED light mounted, only.

Up to

- 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 8 antennas as multiple gate with up to 7 aisle at the use of the 8-times Multiplexer ID ISC.ANT-MUX M8.

can be operated.

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 ID ISC.ANT1690/600-A/B is a „figure-of-eight“ antenna with tuner and has been optimized as transmitting and receiving antennas for the ID ISC.LRM2500 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 both product and persons. It is for indoors use, only.

3.1 Performance Features of the People Counter ID ISC.ANT1690/600-GPC

The product ID ISC.ANT1690/600-GPC, short form “Gate People Counter” or “GPC”, are made for mounting in the gate antennas ID ISC.ANT1690/600.

A Gate People Counter consist of a People Counter board (PC) and one Radar Detector! The product ID ISC.ANT.GPC-E 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.

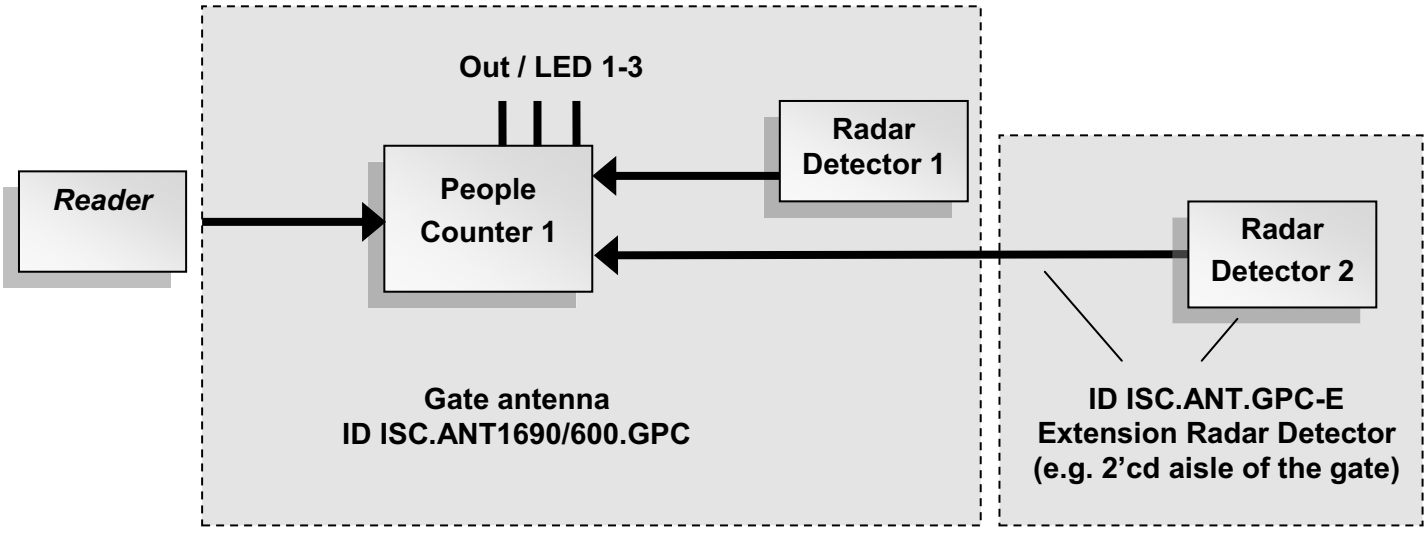
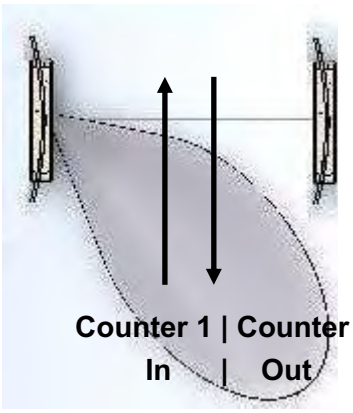


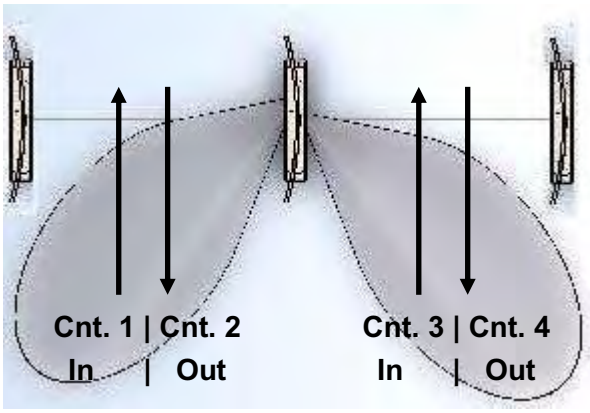
Fig. 1: Gate People Counter Structure (2-3 antennas, 1-2 gate aisles)

A change of the counter values 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.

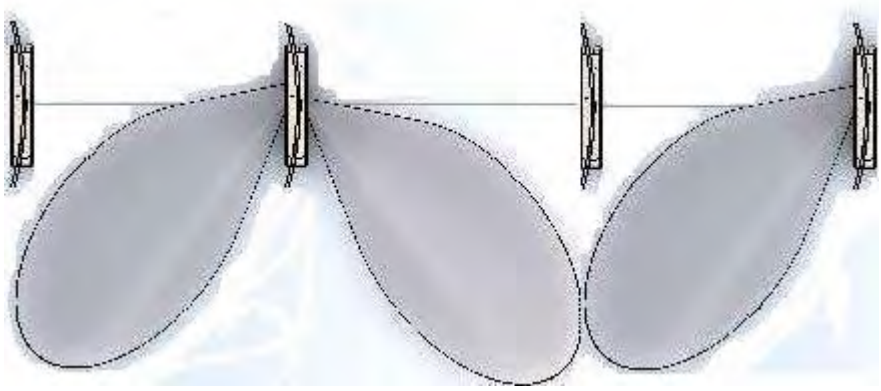
Radar detection zone of a single gate



Radar detection zone with two aisles



Radar detection zone with three aisles



Radar detection zone with four aisles

Fig. 2: Top view of the detection areas (2-3 antennas, 1-2 gate 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 three digital output 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 trough 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.

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 the reader configuration to the host.

See also System Manual H01011-0e-ID-B.DOC

3.2 Available Antenna Types

The following products are currently available:

Antenna Type	Description
ID ISC.ANT1690/600-A Crystal Gate	Antenna with Reader, Multiplexer , dynamic tuning board, Alarm LED light, Alarm Sounder and 24 VDC power supply.
ID ISC.ANT1690/600-B Crystal Gate	Antenna with dynamic tuning board ID ISC.DAT and Alarm LED light
ID ISC.ANT1690/600-GPC Gate People Counter	People Counter and one piece of radar detector for antenna ID ISC.ANT1690/600 incl. Mounting and cabling set. (optional)
ID ISC.ANT.GPC-E Extension Radar Detector	Second radar detector with cable for the second direct parallel aisle (optional)

Table 1: Available Antenna Types and Accessories

Required components to setup a gate by using the Gate People Counter:

Number of antennas	Antenna		People Counter (Optional)		
	ID ISC. ANT1690/600 -A	ID ISC. ANT1690/600 -B	ID ISC. ANT1690/ 600-GPC	ID ISC.ANT. GPC-E	Note
2 Antennas	1	1	1		
3 Antennas	1	2	1	1	
4 Antennas	1	3	2	1	
5 Antennas	1	4	2	2	8 Chanel Multiplexer
6 Antennas	1	5	3	2	8 Chanel Multiplexer
7 Antennas	1	6	3	3	8 Chanel Multiplexer

Table 2 Required components for gates with People Counter

4. Installation and Wiring

Notes:

Before installing the antennas please read 5.1 Project Notes . The spacing of the antennas in a gate depends on the antenna configuration.

If multiple antennas or gates are connected to different readers, a minimum clearance of 8 m must be kept between the antennas or gates. For shorter distances (1 m – 8 m) the readers must be synchronized. The synchronization of the readers (see application note N10311-xe-ID-B.doc) is only possible in one of the Automatic Modes (Buffered Read, Notification or Scan Mode). Below a distance of 1.5 m the antennas must also be shielded from each other. Otherwise the read range will be significantly reduced. The antennas must have a minimum distance of 20 cm to all larger metal parts! At a distance of less than 50 cm between the antenna and metal parts the read range will be significantly reduced.

4.1 Mounting Preparation

For the assembly of the antenna it has to be carefully unpacked and the antenna base to be opened. This is done as described in the following steps:

1. Place the packed antenna on the floor with the top side facing up. Carefully open the box and then remove the antenna.

Fig. 3: Packed Antenna

2. Afterwards, the antenna has to be placed carefully on the floor again. Now, the two fastening screws (hexagon socket width AF 2,5) have to remove of the antenna base cover. By moving the cover upwards, carefully, remove the cover from the antenna base. Fig. 4

Step 1	Step 2
	

Fig. 4: Opening the antenna base

4.2 Installing the antenna

4.2.1 Dimensions of antenna

The overall dimensions of the antenna are shown in Fig. 5

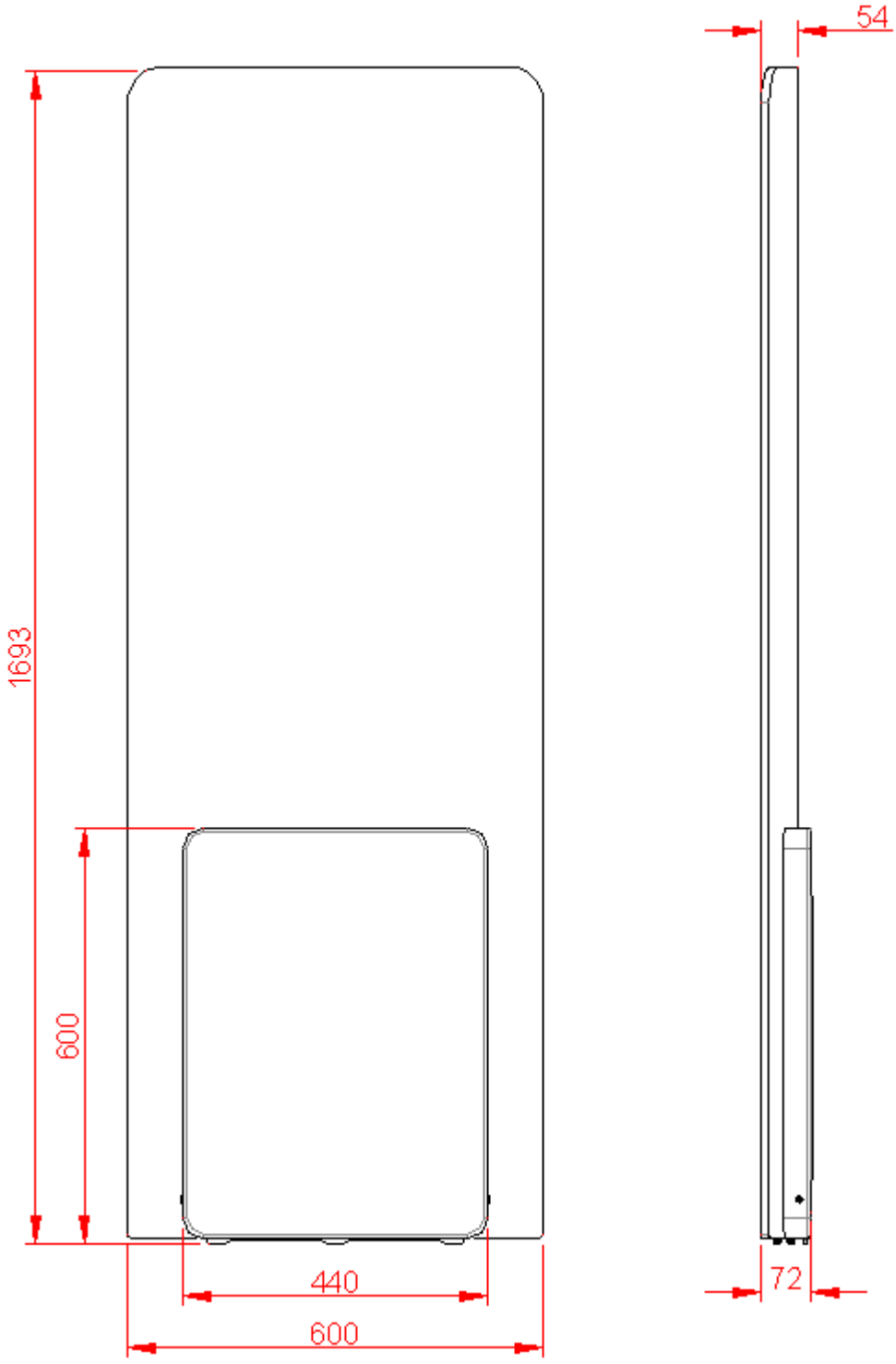


Fig. 5: Antenna outside dimensions

All dimensions are in mm with general tolerance according to ISO 2768 m (mean).

4.2.2 Drilling the Mounting Holes

If the position of the antennas has been marked or determined, the mounting holes and the holes for the cable entry, can be marked and drilled. The dimensions are shown in Fig. 6:

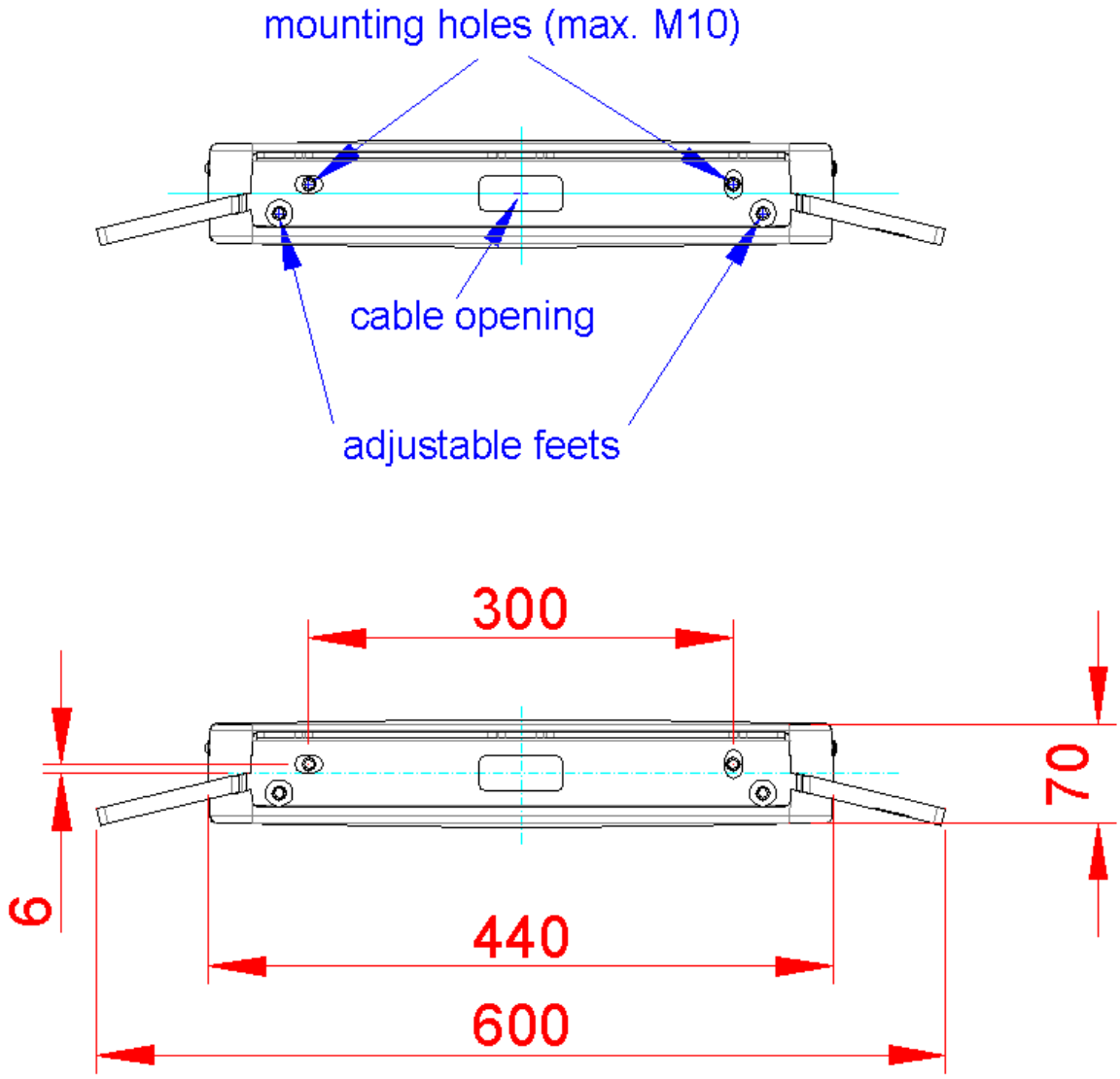


Fig. 6: Floor plate dimensions

All dimensions are in mm with general tolerance to ISO 2768 m (middle).

The size and type of the anchors depends considerably on the strength of the base or floor. The anchors should be capable of withstanding a permissible load of at least 5 kN per anchor for all load directions (e.g. for concrete floor Hilti HVA anchors with HAS-(E) M8 threaded rod or Hilti HIS-N M8 (5/16”) threaded inserts). The size of the mounting holes in the antenna is 10 mm (.39”). The length of the anchors or bolts should be selected such so they jut out at least 40 mm (1.6”) and maximum of 55 mm (2.2”) of the floor.

Please follow the mounting instructions of the anchor manufacturer!

A cable opening is provided for the necessary connection cable (see Fig. 6). The cable opening is dimensioned such as up to 10 cables having a diameter of 6 mm can be passed through the opening.

Alternatively the cables can be routed at the sides of the antenna bas like shown in Fig. 7

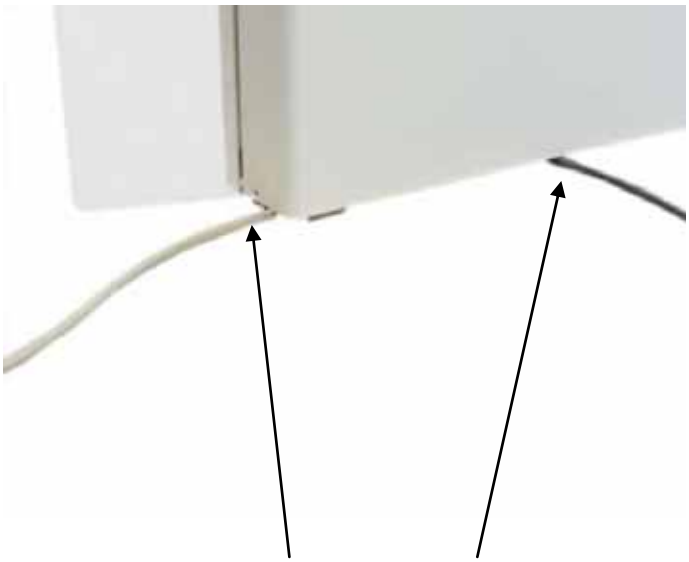


Fig. 7 Cable routing at the antenna sides

4.2.3 Installing the Antenna Base and Antenna Body

The antenna will be mounted on the floor. Please note, the antenna conductors in the middle of the antenna body have to have the same direction (Fig. 8). Afterwards, the antenna has to be aligned the antenna vertically, by using the adjusting screws (Fig. 9).

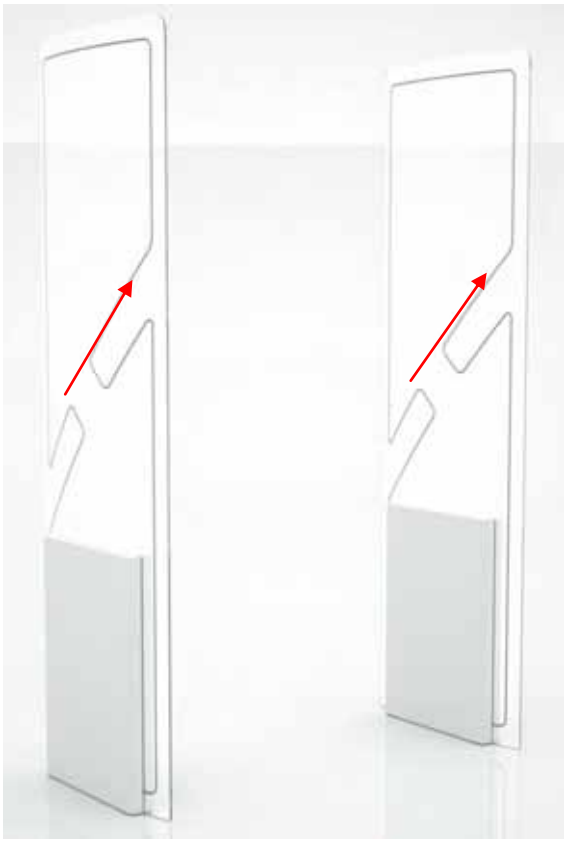


Fig. 8 Conductors shape have to have same direction

Adjusting screws (hexagon socket width AF 4)

Fig. 9: Attaching and aligning the antenna

5. Typical Antenna Configuration (Gate Antenna with two Antennas)

The standard configuration of a gate with three-dimensional tag orientation consists of one ID ISC.ANT1690/600-A with reader and multiplexer and one ID ISC.ANT1690/600-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.

5.1 Project Notes

The antenna configuration as described allows detection of a tag moving at a horizontal line, through the reading area of the gate. The tag orientation is non-critical. The tags are detected along a horizontal axis of motion in certain regions within the antennas. The area of detection depends on the tag orientation.

The size of the three-dimensional reading area of the antennas is shown in the sketch below.

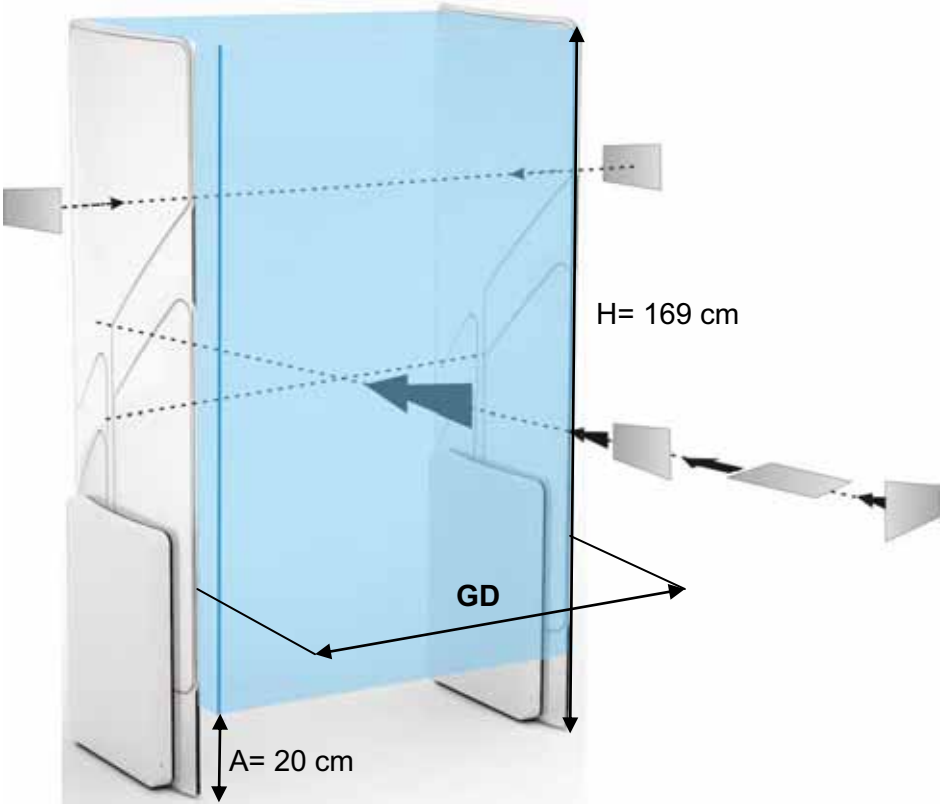


Fig. 10: Capture area and tag orientation

Notes:

Note that the entire reading area of the antenna gate is larger than the three-dimensional area shown in the drawing. This means there are tag orientations in which the tag can be detected outside the reading area.

To get a optimal performance the reader has to be configured and run in one of the Automatic Modes (Buffered Read, Notification or Scan Mode).

If multiple gates are arranged with short distances (1-8m) between each other, these will mutually interfere with each other. In this case, the readers for the individual gates have to be synchronized and run in one of the automatic modes.

To achieve three-dimensional reading of the tag in the reading area drawn above, 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 work station or terminals (transmitting frequency 13,56 MHz) should be:

Table 3: Minimum Distances

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

- 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 ISC.LRM2500 reader should be set to an RF power of 8 watts.
- When using ISO 15693 transponders, the Readers should be set as described in **5.2.6 Reader Configuration**.
- 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	≤ 95 cm
Number of tags at a speed of 1 m/s - Read serial number - Read data	 16 8

Table 4: Gate distance

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

5.2 Gate Configuration and Setup using Antennas

5.2.1 Required Components

To set up the gate you need the following components:

- Qty. 1 ID ISC.ANT1690/600-A Crystal Gate (Base)
  (incl. Qty. 1 ID ISC.NET24V-B Power Supply Unit)
- Qty. 1 ID ISC. ANT1690/600-B Crystal Gate
- Power cable, interface cable and connection cable for the DC power supplies (2-wire, twisted)
- Mounting materials (screws, anchors)

To calibrate the Reader you will need the software

- ISOStart 2011 Version 8.03

and for tuning the antennas the service software

- DATuningTool Version 1.10 or higher

on a personal computer running under Microsoft® Windows®. The service can be downloaded at the Download Area of the Homepage www.feig.de.

5.2.2 Configuration of a Gate Antenna with Multiplexer

Connect the components as shown in Fig. 11. Almost, all cable should be mounted already. Normally, the antenna cable from antenna Type B has to be connected to OUT2 at the multiplexer and the 24V DC power supply to X11 of the terminal board only. Optional the cable of the Alarm LED light of antenna Type B has to be connected to X12 LED2 (third antenna X14 LED3) of the terminal board.

The necessary connections for the optional People Counter will be described in 6. Installation of the Gate People Counter ID ISC.ANT1690/600-GPC

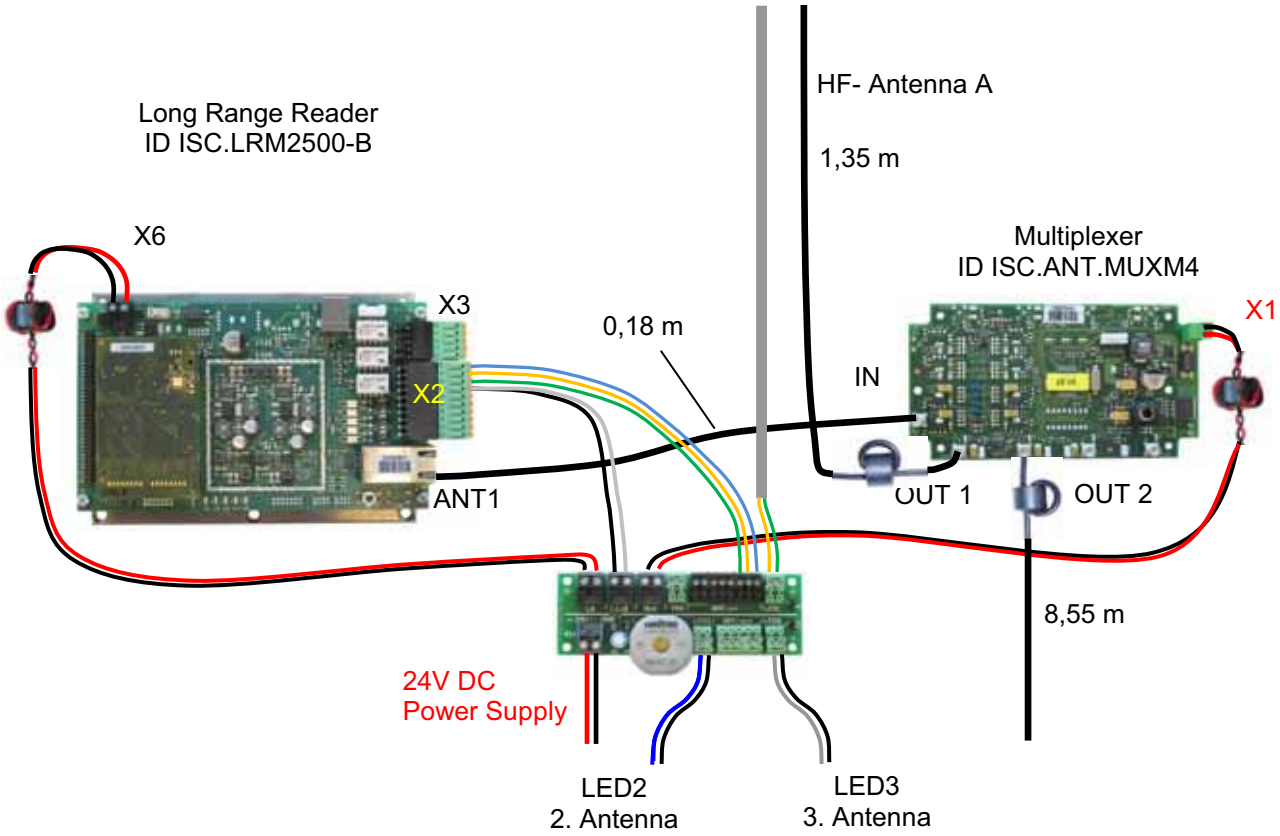


Fig. 11: Connecting the components for a gate consisting of two antennas, reader and multiplexer

Fig. 12: Terminal board

An overview of the terminal board assignment is given in 9. Annex A

Note:

- **A reverse polarity could damage the device or the In-/Outputs.**

The coax cables have fixed lengths and may not be shortened and therefore need to be tied into small loops (see Fig. 13). Tie all cables as far away from the antenna conductor as possible. The cables must never be allowed to contact the antenna conductor. The cable from antenna type B to the antenna type A should preferably be connected shortly. Unused cable lengths are possible should be tied in antenna B type.

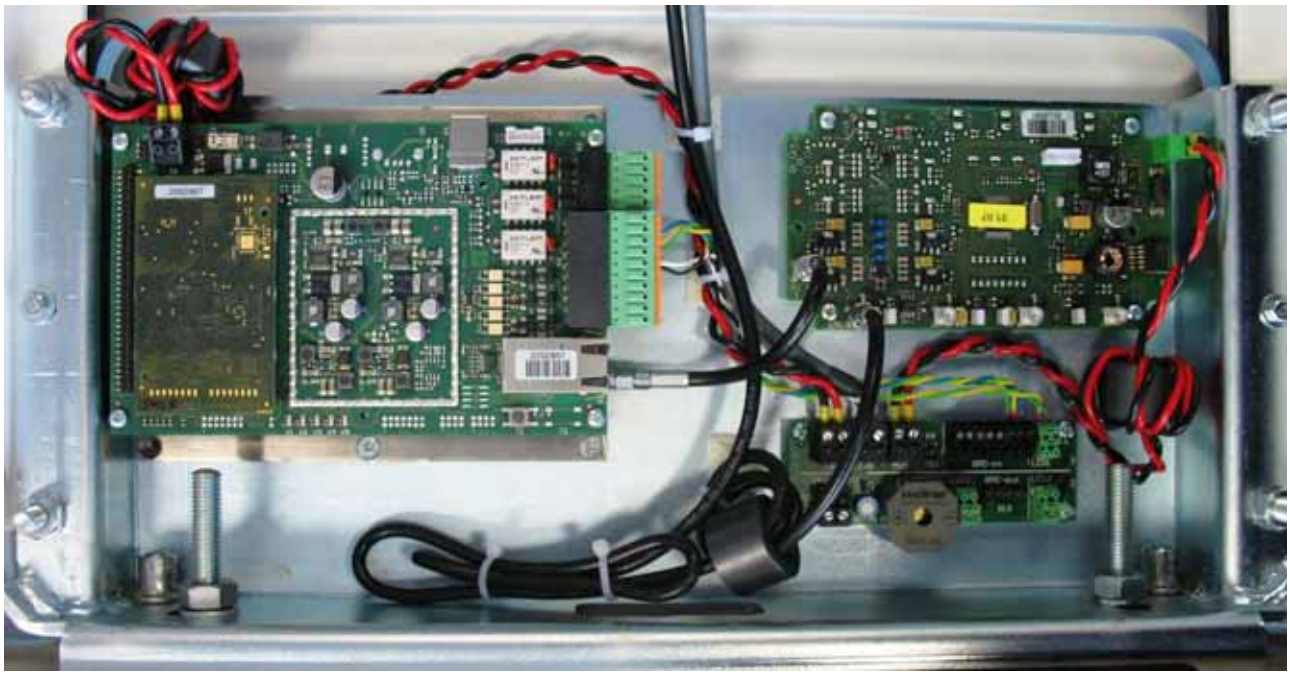


Fig. 13:Connection of the components in an antenna Type A

Fig. 14: Unused coaxial cables are tied in antenna Type B

5.2.3 Setting the Multiplexer

The jumpers JP11-JP14 should be set (factory setting) as shown. More on setting the ID ISC.ANT.MUX.M4 Multiplexer can be found in the corresponding installation manual (M90700-xde-ID-B).

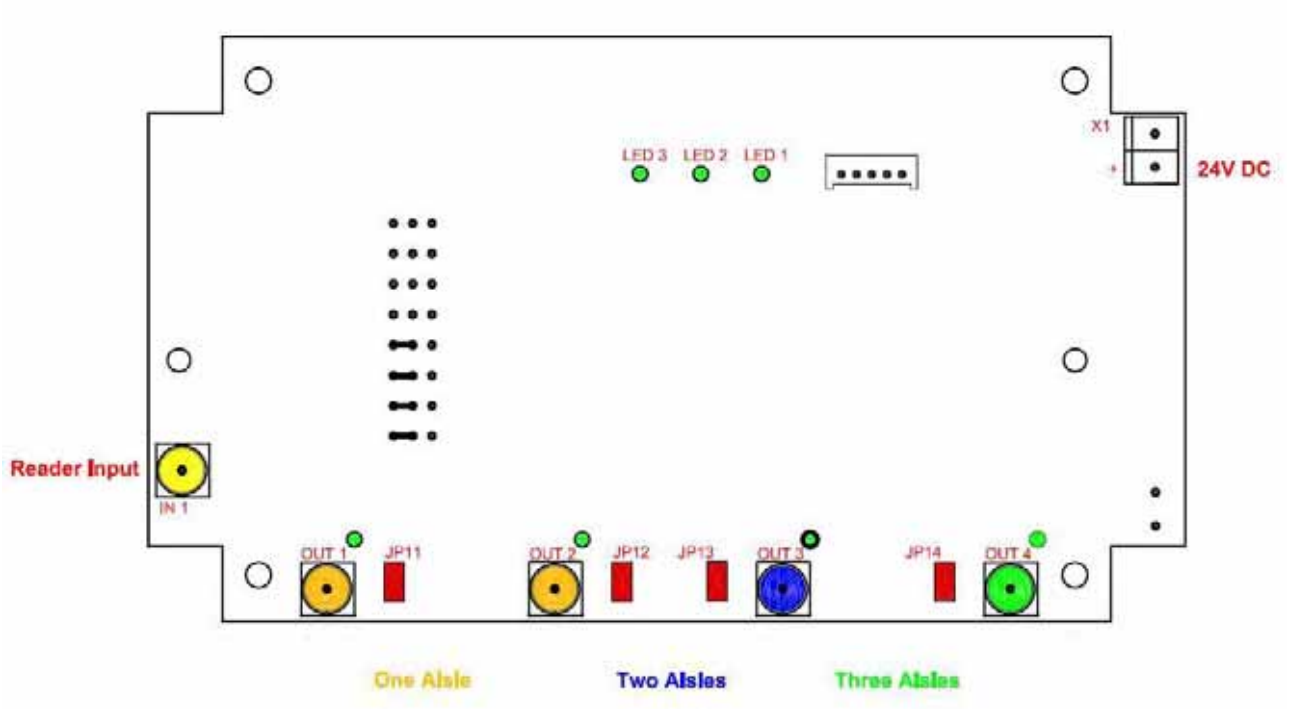


Fig. 15: Jumper positions

5.2.4 Setting the Antenna Tuner

For checking the settings of the antenna tuner the antenna base has to be opened. For this the two fastening screws (hexagon socket width AF 2,5) have to remove of the antenna base cover. By moving the cover upwards, carefully, remove the cover from the antenna base.

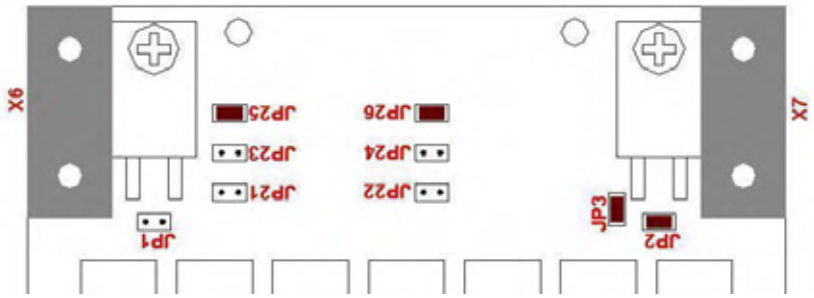
Step 1	Step 2
	

Fig. 16 Removing the antenna base covers

The jumpers JP1-JP26 of the Dynamic Antenna Tuning board should be set (factory setting) as follows:

Table 5: Jumper settings for Antenna Tuner

Function	Jumper	Position
1Ω Q resistor	JP1	open
2Ω Q resistor	JP2	closed
Antenna switch	JP3	closed
Capacitor C1	JP 11,12,13,14	open
Capacitor C2	JP 21,22,23,24 JP 25,26	Open closed



Verify these settings. More on setting the ID ISC.DAT antenna tuner can be found in the corresponding installation manual (M40401-xde-ID-B).

5.2.5 Interface Connections

5.2.5.1 RS 232

The RS232 interface is connected on X3.

The transmission parameters can be configured by means of software protocol.

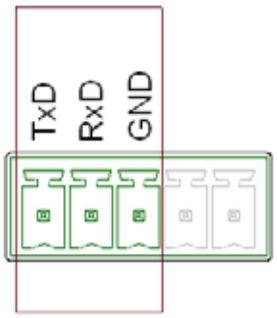


Fig. 17: RS232 interface pin-outs on X3

Acronym	Description
TxD	RS232 – (Transmit)
RxD	RS232 – (Receive)
GND	RS232 – (Ground)

Table 6: RS232 interface pin-outs

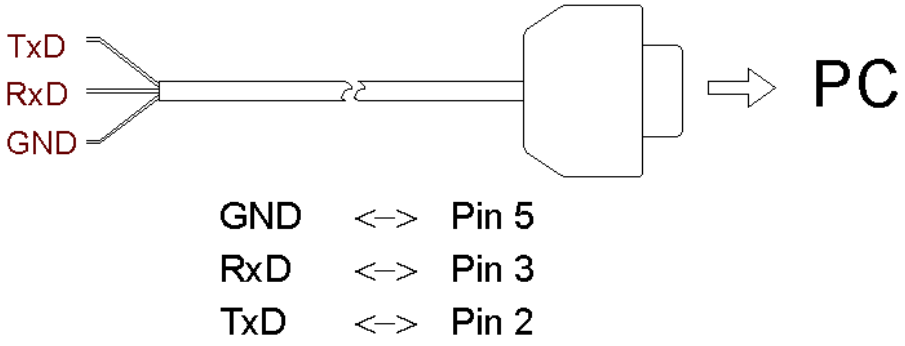


Fig. 18: Wiring example for connecting the RS232 interface

Note:
If there is an USB/RS232 converter used on the PC/Notebook side, we recommend to increase the „Char Timeout Multiplier“ parameter in the COM-Port settings from „1“ to about „5“.

5.2.5.2 LAN / TCP/IP

The Reader has an integrated 10 / 100 Base-T network port for an RJ-45. Connection is made on X1 and has an automatic “Crossover Detection” according to the 1000 Base-T Standard.

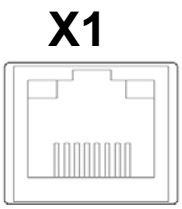


Fig. 19: LAN interface for host communication

With structured cabling CAT 5 cables should be used. This ensures a reliable operation at 10 Mbps or 100 Mbps.

The prerequisite for using TCP/IP protocol is that each device has a unique address on the network. All Readers have a factory set IP address.

Network	Address
IP-Adresse	192.168.10.10
Subnet-Mask	255.255.255.0
Port	10001
DHCP	OFF

Table 7 Standard factory configuration of the Ethernet connection

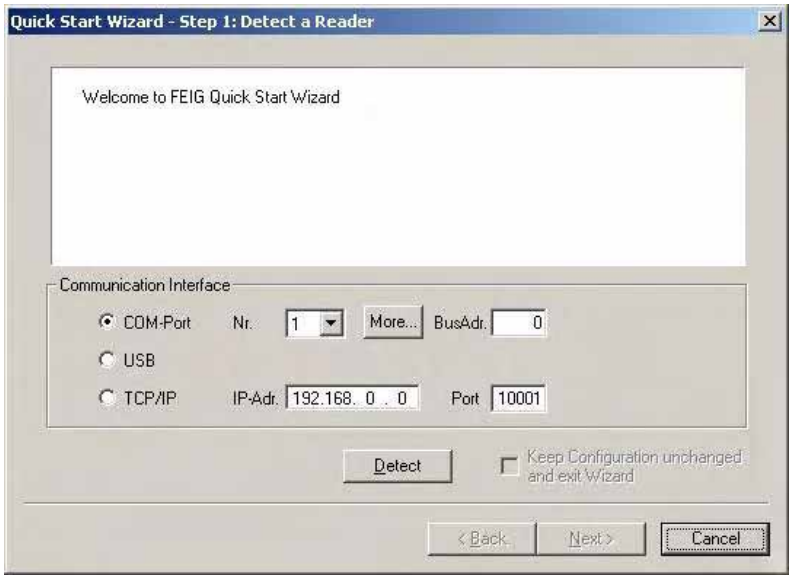
Note:

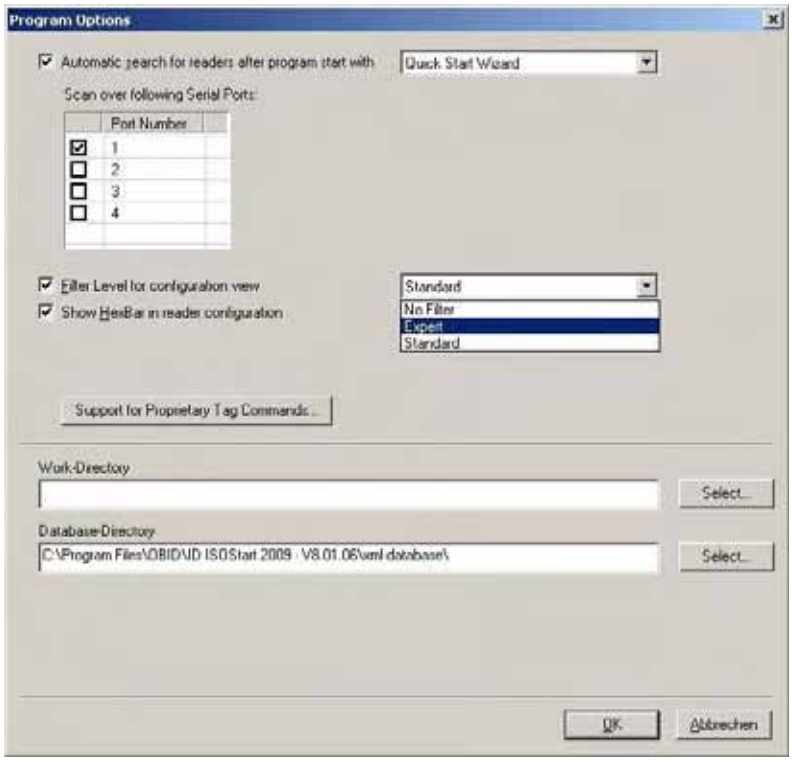
The Reader TCP/IP interface has a DHCP option.

More Information about the interfaces you will find in the manual **M01111-xde-ID-B** of the reader.

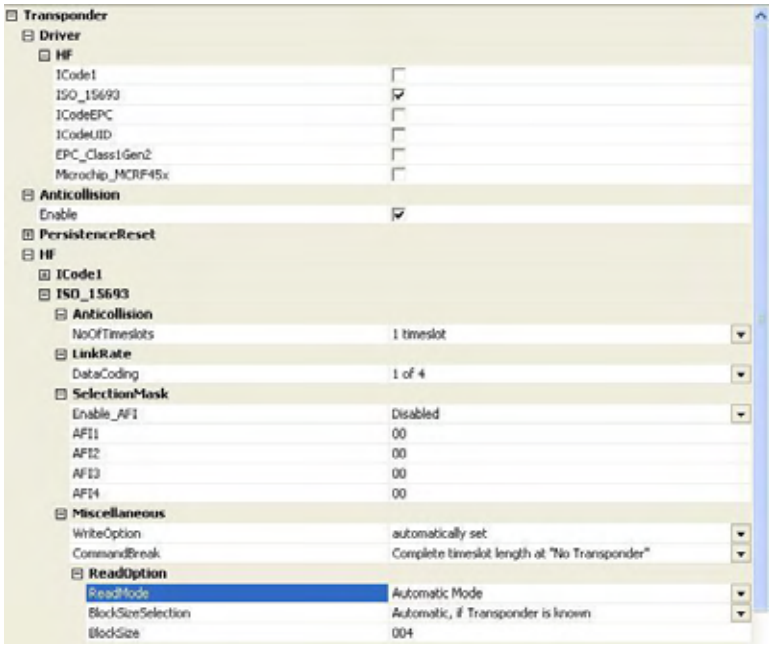
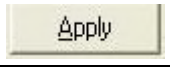
5.2.6 Reader Configuration with Multiplexer

To tune the antennas, open the ISOStart software and read out the current configuration of the Reader:

Step	Action	Note
1	Start ISO Start Software	
2	Select „Detect“	
3	Select „Keep Configuration unchanged and exit Wizard“ and click on „Exit“ Note: This has to be done at each start of ISO-Start program otherwise the configuration of the reader will be changed by the wizard.	
4	Select „Options => Program“	

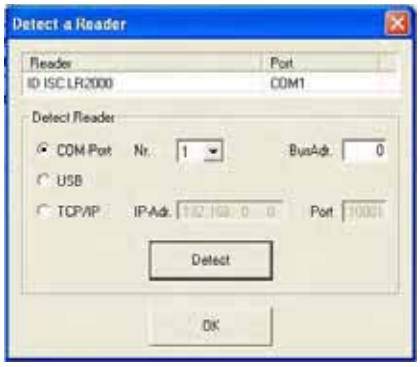
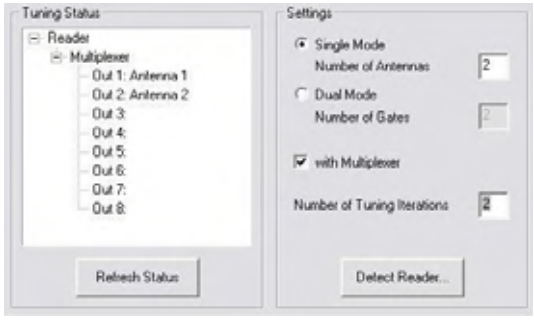
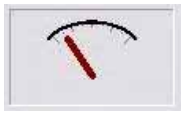
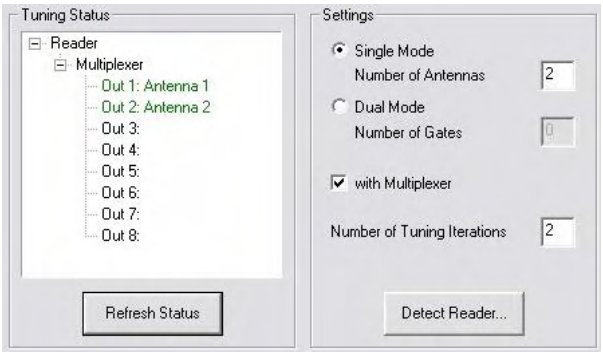
Step	Action	Note
5	Select „Expert Mode“ and confirm with OK.	
6	Select “Logical View”	

Afterwards set the operating power, Transponder Parameters and ISO Host Mode:

Step	Action	Note
1	Select “Configuration”	
2	**Air Interface:** “Output -Power” = 8W „Multiplexer Enable“ „1 Input (Single Mode)“ „No of Output Channels „ (e.g. 2) „Antenna Active Time“ 100 x 5ms	
3	Set by clicking on „Apply“.	
4	**Transponder:** Configure the parameters as following: • „Driver“ – here ISO 15693 • „Anticollision“ – enable • „No of Timeslots“ – 1 timeslot • „Data Coding“ – 1 of 4 • „AFI“ – Disabled	 Note: National RF regulations may require different settings. 7 Configure the reader in accordance with national RF regulations
5	Set by clicking on „Apply“.	
6	**Operating Mode:** For antenna tuning the reader has to be set to „Host Mode“.	
7	Set by clicking on „Apply“.	

5.2.7 Tuning the Gate Antenna

Before tuning the gate antenna, you must quit the ISOStart software. Then the gate can be tuned as follows:

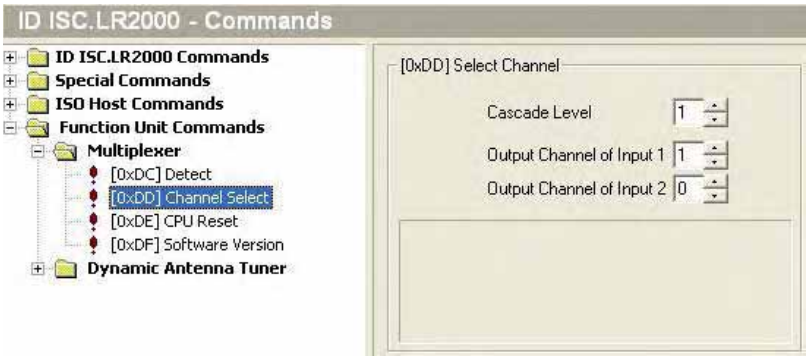
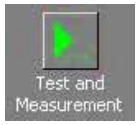
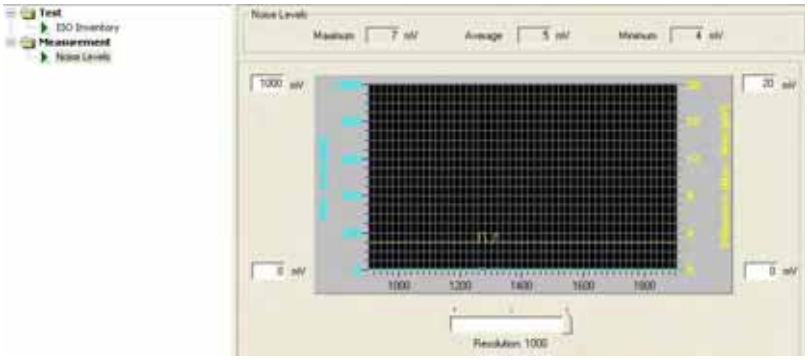
Step	Action	Note
1	Start “DATuningTool” software	 DATuningTool
2	Select “Detect Reader...”. In the „Detect Reader“ window select the interface (COM-Port 1, BusAdr. 0) and then click on “Detect”.	 
3	Use „Settings“ to enter the configuration: Single Mode, Number of Antennas 2 Click on “with Multiplexer“ Number of Tuning Iterations 3	
4	Activate „Start Tuning“ and wait until the tuning process is finished.	 
5	The tuning status is displayed after each tuning pass. After successful tuning both antennas are shown in green.	
6	If this does not succeed on the first try, start the process again by clicking on „Start Tuning“	

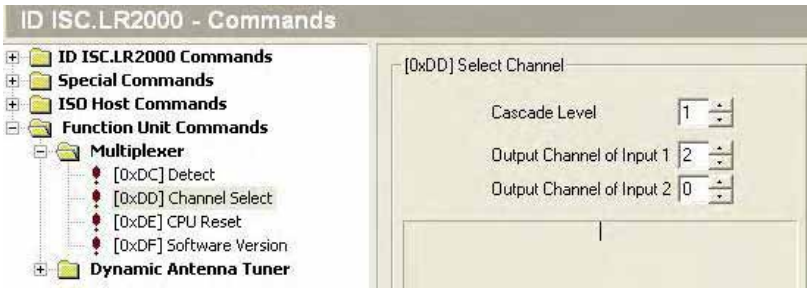
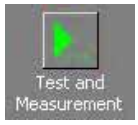
After successful tuning, close the DATuningTool.

5.3 Testing the Gate Antenna

After tuning the gate antenna, you can check for proper function using a reader, the ISOStart service software and a Transponder. Here the Noise Level and performance of the gate are tested.

5.3.1 Checking the Noise Level

Step	Action	Note
1	Activate antenna 1 with command: „Function Unit Commands - Multiplexer“ Parameter: „Channel Select“ „Cascade Level = 1“ „Output Channel of Input 1 = 1“	
2	Confirm with “Send”	
3	Activate “Test and Measurement”	
4	Select „Noise Level“ and start by clicking on „Start“	
5	Normal Noise Level values: Average: < 30mV Difference (Max-Min): < 20mV	

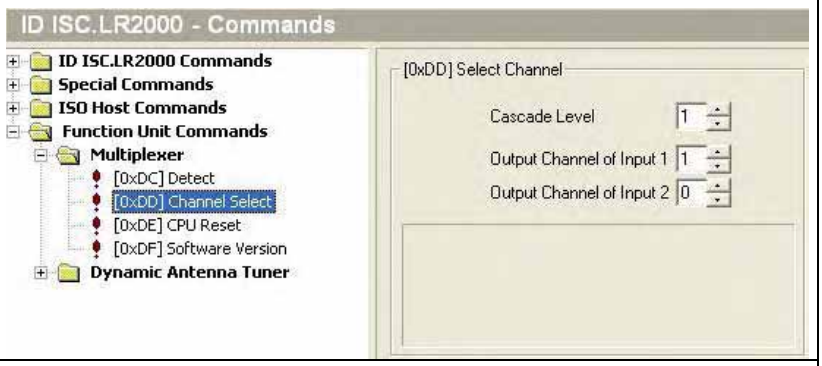
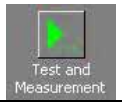
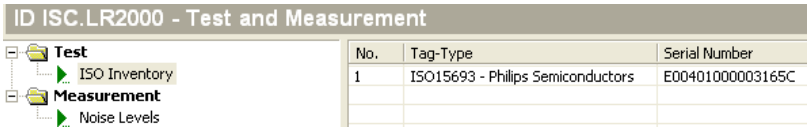
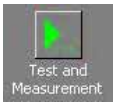
Step	Action	Note
6	Activate antenna 2 with command: „Function Unit Commands - Multiplexer“ Parameter: „Channel Select“ „Cascade Level = 1“ „Output Channel of Input 1 = 2“	
7	Confirm with “Send”	
8	Repeat Step 3 to 5 for every further antenna	

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.

5.3.2 Reading a Serial Number

Step	Action	Note
1	Attach a tag to an antenna Here to antenna at multiplexer output 1	Use adhesive tape, for example
2	Activate antenna 1 with command: „Function Unit Commands - Multiplexer“ Parameter: „Channel Select“ „Cascade Level = 1“ „Output Channel of Input 1 = 1“	
3	Confirm with “Send”	
4	Select „Test and Measurement“	
5	Select „ISO Inventory“ function and activate by clicking on „Start“. The serial number and tag type will be shown in the display.	
6	Repeat Step 1 to 5 for every further antenna	

5.3.3 Testing the performance

For testing the performance you must switch the reader to one of the Automatic Modes.
See 5.5 Activating the Automatic Mode

A read transponder will be displayed by a blue LED on the reader, the Alarm LED light of the antenna and the Alarm sounder. See also 5.4.1 Reader Setting for Alarm Indicator

In this test the capture area of the gate antenna described in 5.1 Project Notes is checked. For other tags or other configurations the indicated ranges and read areas may differ accordingly.

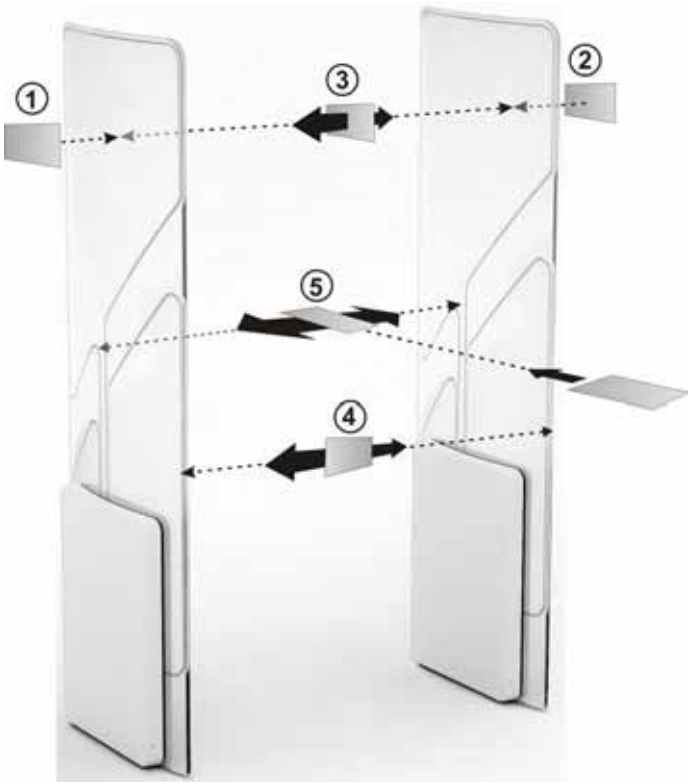


Fig. 20: Performance Test of the gate antenna

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 (see 5.3.1 Checking the 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.

5.4 Setting the Alarm Indicators (Alarm sounder and Alarm LED lights)

The solution provided here presumes that the Alarm Sounder is switched through the digital output 2 (X2 Pin OUT2-C,OUT2-E), Alarm LED 1 of antenna No.1 through relay No.1 (X2, Pin REL1-COM) , Alarm LED 2 of antenna No.2 through relay No.2 (X2, Pin REL2-COM) and Alarm LED 3 of antenna No.3 through relay No.3 (X2, Pin REL3-COM) on the ID ISC.LRM2500-B reader. The pulse duration can be set (Digital IO / OUTPUT or RELAY) between 100 ms and 6553.5 s by adjusting the Reader configuration. The volume of the sounder could be adjusted by a potentiometer on the terminal board.

Fig. 21 Volume adjusting

To supply the Alarm LED lights with 24V DC the following jumper on the LRM2500 has to be set. JP7,8 and 9.

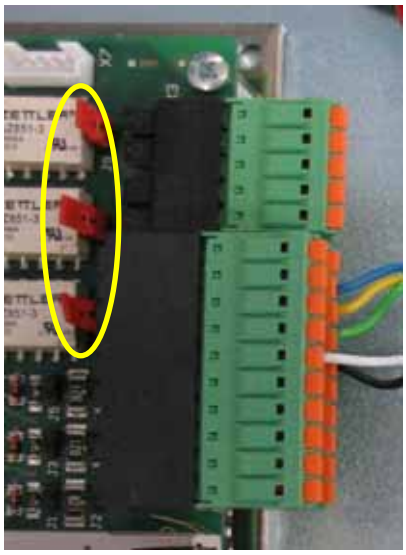
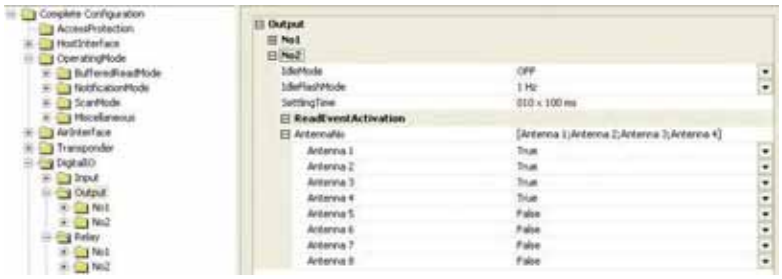
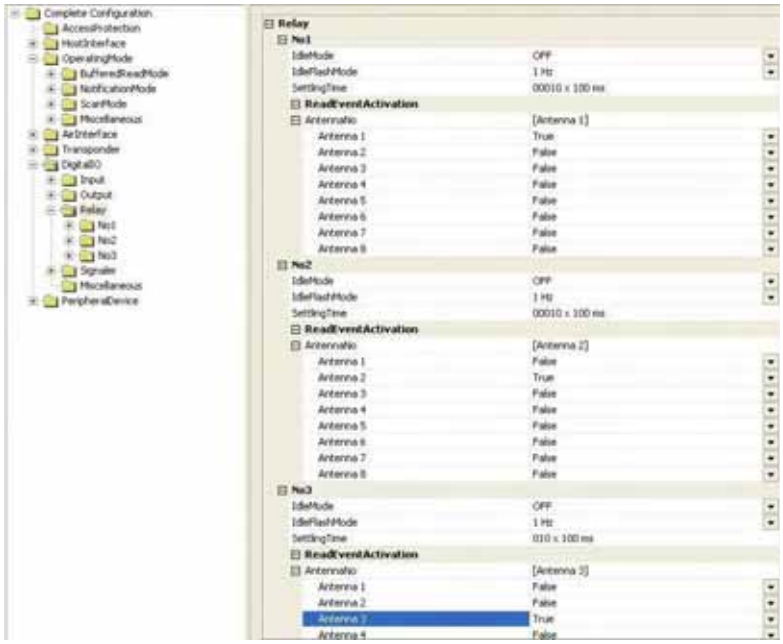
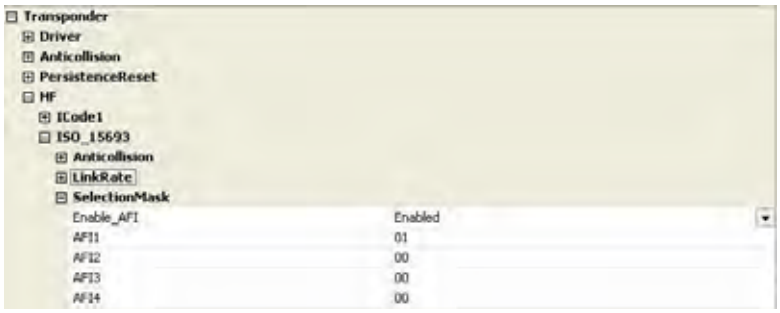
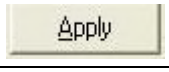


Fig. 22 Jumper settings for relay

5.4.1 Reader Setting for Alarm Indicators

The ISOStart software can be used to set the Reader configuration so that the output 2 or the relays 1 to 3 opens or closes when a Transponder is read.

Step	Action	Note
1	Start ISOStart Software	
2	Select “Configuration” and click on “Read” to read the complete configuration.	 
3	**Operating Mode** Select Buffered Read Mode.	
4	Set by clicking on „Apply“.	
5	**Digital IO:** **Output2 / Sounder** Output Idle Mode: OFF Idle Flash Mode: 1Hz Setting Time: 10 „Setting Time“ set the duration time of output 2 for the alarm. (10 means 1 second) (e.g. 10 x 100ms) Assign Output 2 to antenna to all antennas of the set up „True“ means: Output 2 will be active if the reader read a valid transponder at the corresponding antenna.	

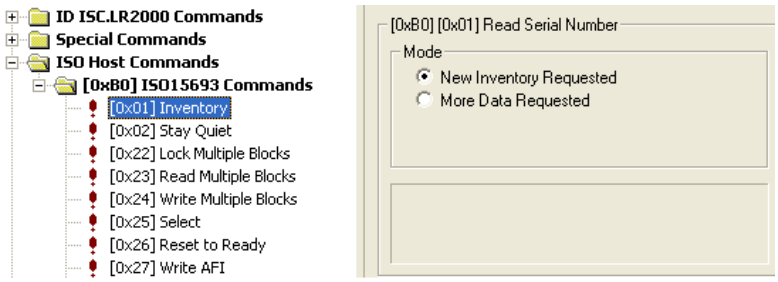
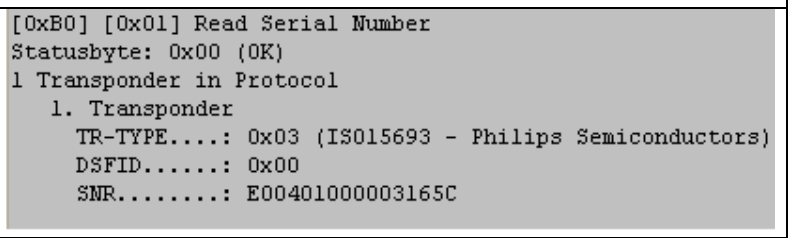
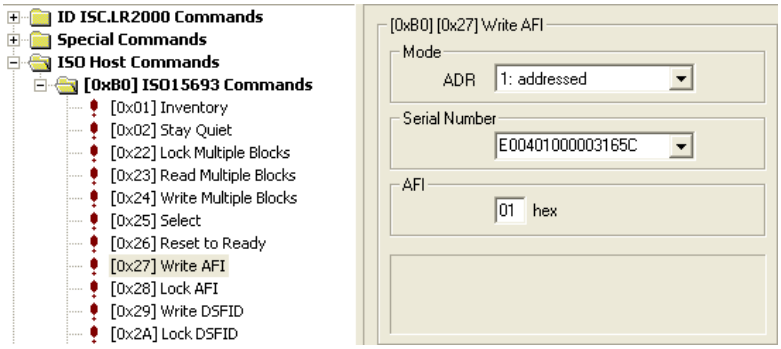
6	**Digital IO:** **Relay 1,2,3 / LED's** Output Idle Mode: OFF Idle Flash Mode: 1Hz Setting Time: 10 „Setting Time" set the duration time of relay 1,2 and 3 for alarm. (10 means 1 second) (e.g. 10 x 100ms) Relay 1 to antenna 1, Relay 2 to antenna 2 and Relay 3 to antenna 3 „True" means: Relay 1,2 or 3 will be active if the reader read a valid transponder at the corresponding antenna.	
7	Set by clicking on „Apply".	
8	**Transponder** If the alarm should occur by a transponder with valid AFI byte, you have to configure the reader as follow: ISO-15693 – Selection Mask Set "Enable AFI" Set the value for the AFI in field "AFI1" (e.g. 01) Note: Up to four different AFI values could be set.	
9	Set by clicking on „Apply"	
10	**Operating Mode Data selector (EAS-Alarm)** If the alarm should occur by an EAS, you have to configure the reader as follow: Set "EAS"	
11	Set by clicking on „Apply"	

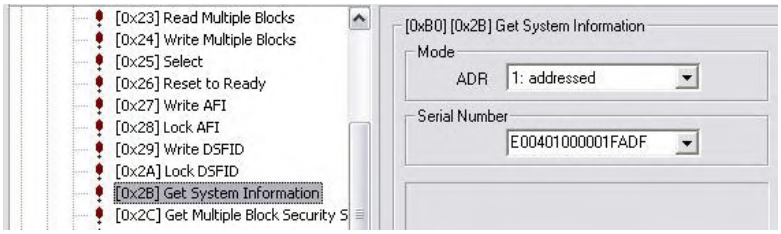
If a Gate People Counter GPC is installed, the Alarm LED lights LED 1 to 3 will be switched by the digital outputs 1 to 3 of the GPC. See page: 6.3.2 Configuration and Test in ISO-Host or Buffered Read.

5.4.2 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.

Step	Action:	Note:
1	Select „Commands“	
2	Place the Transponder in the antenna field (Antenna 1) Select [0x01] Inventory Mode: “New Inventory Requested “	
3	Read UID by clicking on „Send“	
4	The serial number, DSFID and Transponder type are displayed in a window. Write down the serial number of the Transponder	
5	Select „[0x27] Write AFI“ ADR: 1: addressed Serial Number: Select Transponder UID AFI: Desired AFI Number (not equal to 00)	
6	Write AFI byte on to the transponder by click on „Send“	

7	To verify, read AFI byte by using the command [0x2B] Get System Information	

5.5 Activating the Automatic Mode

The gate has to be used in one of the Automatic Modes (Buffered Read, Notification or Scan Mode) to get a maximum performance. Otherwise the reading performance will be significantly reduced.

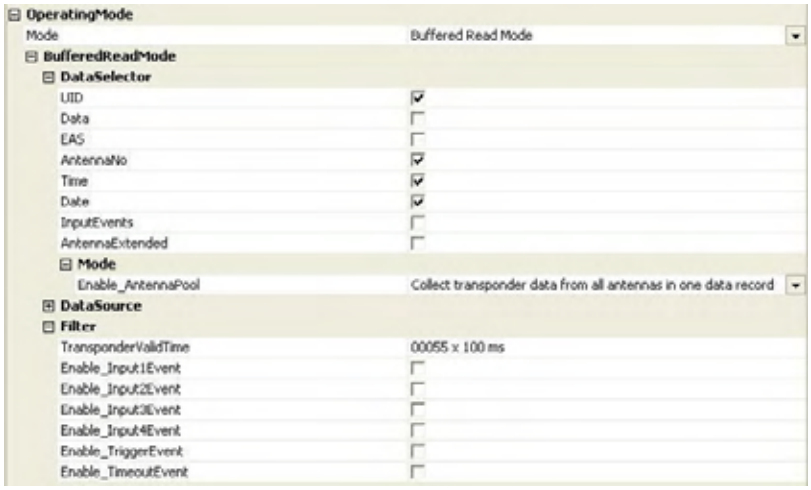
For more information, see System Manual **H01112-0e-ID-B.pdf** *ID ISC.LRM2500-A/B*

Which mode the most suitable is for your application has to be defined in advance.

In this example it is described how to activate the Buffered Read Mode.

In the automatic modes, the tags are read at maximum speed and the information is stored in the ring buffer of the reader. Data set can be read by the host.
Due to the automatic alarm features at the automatic mode, the reader/gate can also run without any interface connection (Serial, Ethernet).

To activate „Buffered Read Mode“ proceed as follows:

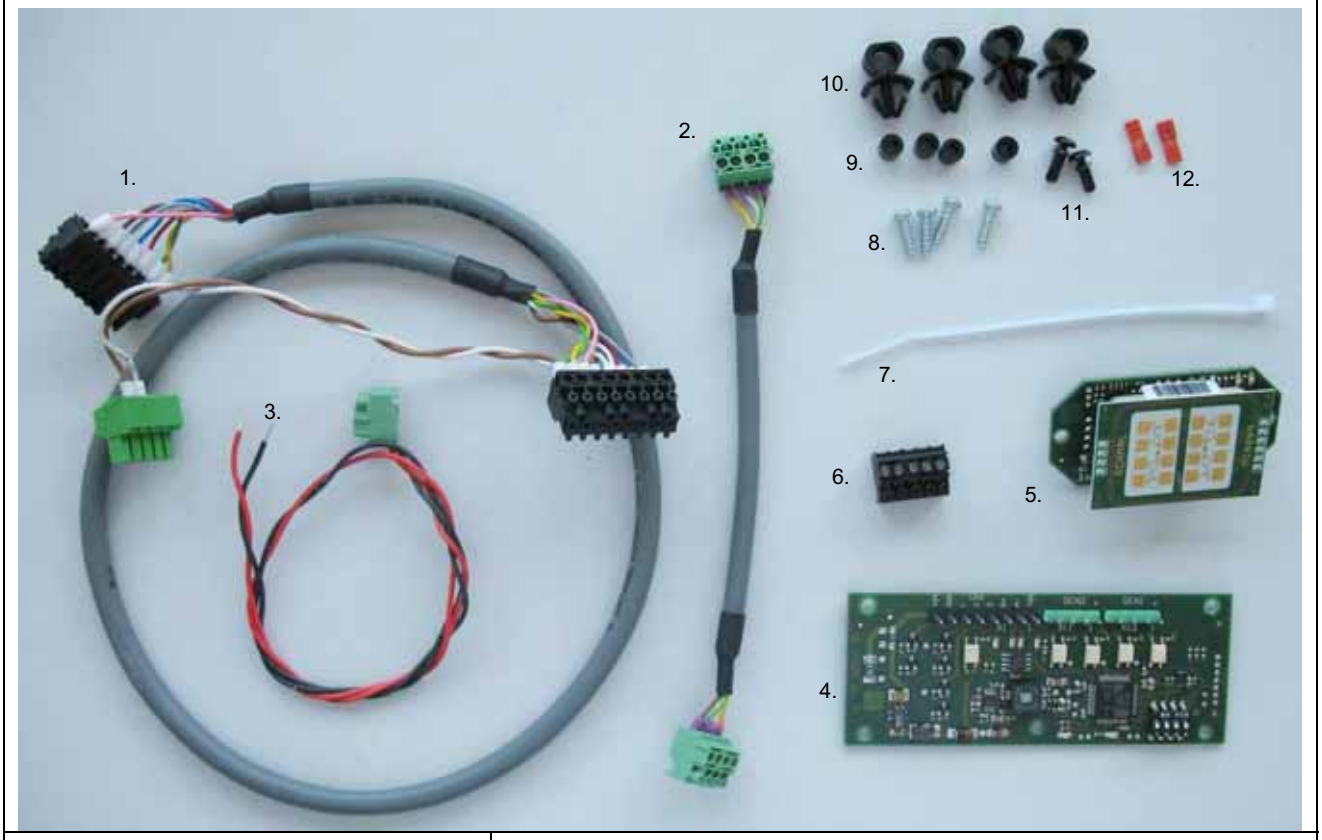
Step	Action	Note
1	Select „Configuration“	
2	**Operation Mode:** „Mode“ - Buffered Read Mode „Data Selector“ -UID -Antenna No -Time -Date „Filter“ Set Transponder Valid Time. (e.g. 55 x 100ms)	
3	Set clicking on „Apply“	

Note:

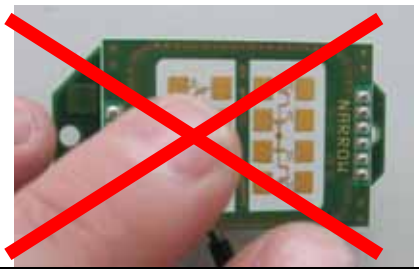
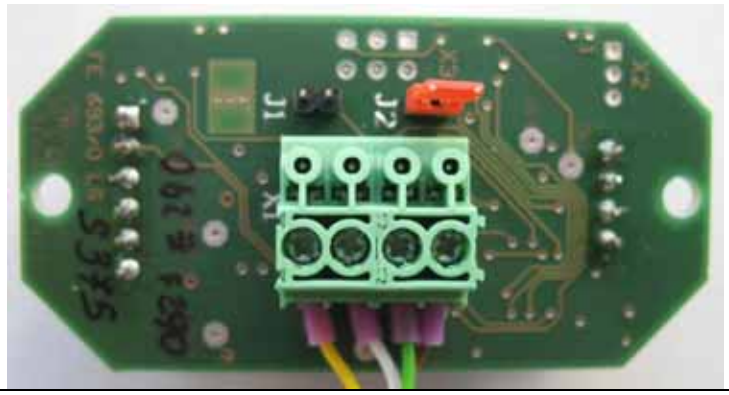
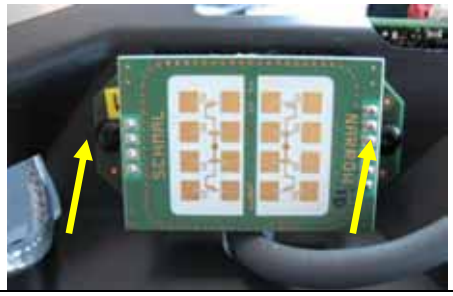
The configuration of the Notification or Scan Mode are similar (See System Manual of the reader)
To test the function of the Gate in the Buffered Read Mode, the BRM Window of ISOStart or the BRMDemo program can be used.

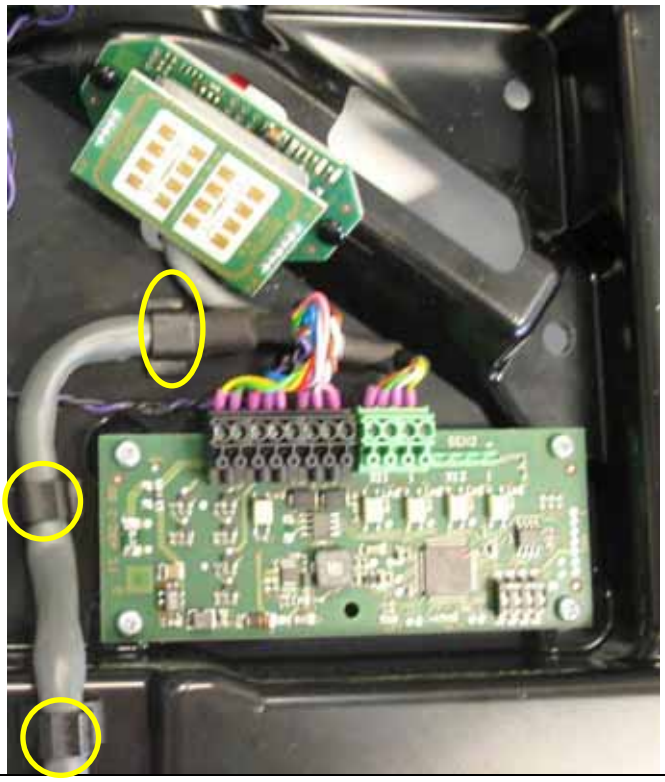
6. Installation of the Gate People Counter ID ISC.ANT1690/600-GPC

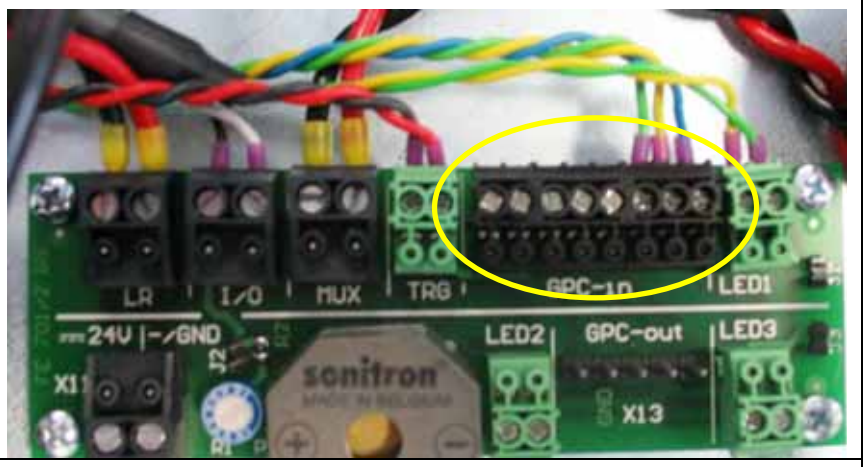
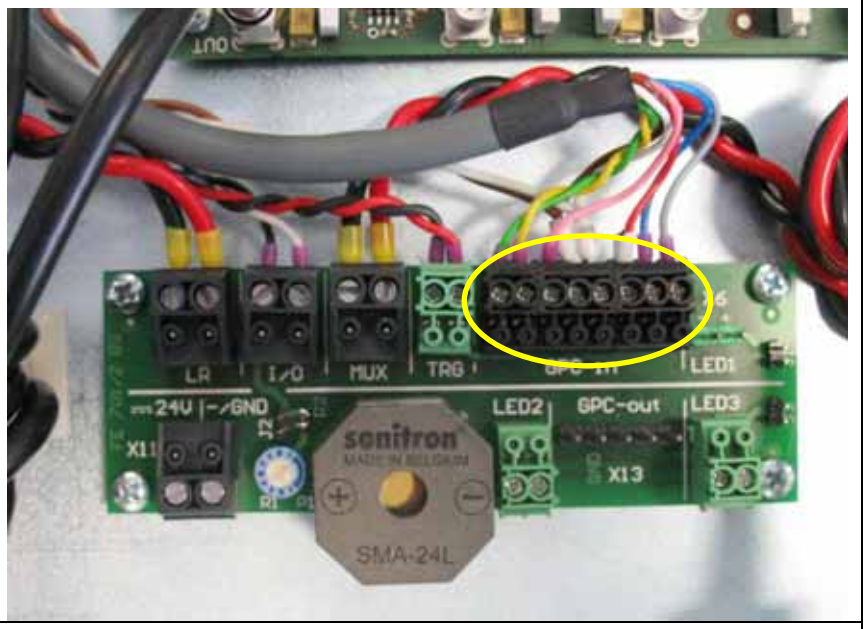
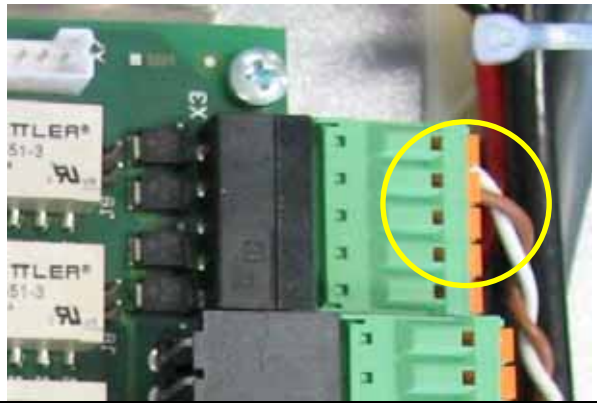
6.1 Installation and Connections

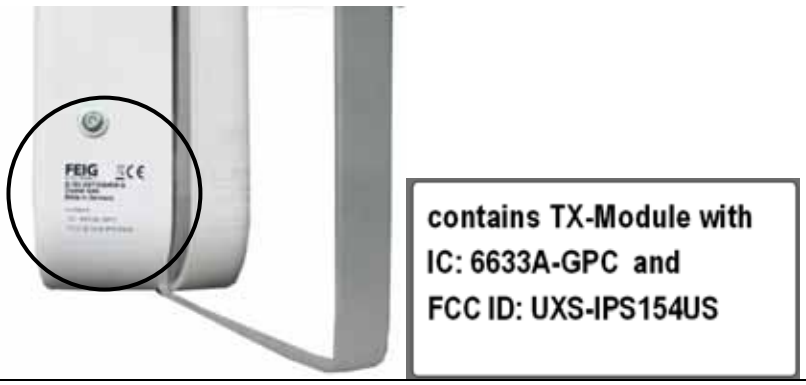


Contents of the ID ISC.ANT1690/600-GPC	1. 1 piece connection cable People Counter –Terminal board 2. 1 piece Radar connection cable 3. 1 piece trigger cable 4. 1 piece People Counter Board 5. 1 piece Radar module 6. 1 piece 5 pin connection plug for 2. GPC 7. 1 piece cable tie 8. 4 piece screw for plastic 3x12mm 9. 4 piece spacer bolts M3x5 10. 4 piece cable-clip 11. 2 piece split rivet 3,0mm 12. 5 piece jumper 13. 1 piece FCC / IC Label

Step	Action	Note
1.	Attention !! Note: Do not touch the antenna surface of the Radar module to avoid damaging the electronic components and soiling.	
2.	Connect radar connection cable with X1 of Radar module.	
3.	Set sensitivity of Radar sensor by setting jumper J1 and J2. <u>Sensitivity:</u> JP1+2 open: Low JP1 closed: Middle <u>JP2 closed: High</u> JP1+2 closed: Very high Recommended Sensitivity: High	
4.	Install Radar module with split rivet	

5.	Install People Counter Board into antenna with screws for plastic	
6.	Plug Radar connection cable onto X11 Sen 1 Plug connection cable of people counter onto X1	
7.	Fix the cables with the cable-clips	

8.	Remove connector form X5 GPC-in and the three wires from X2 of the reader ID ISC.LRM2500.	
9.	Plug connection cable of People Counter onto X5/GPC-IN of Terminal Board.	
10.	Connect RS485 cable to X3 of reader.	
11.	Fix cables with cable tie.	

12.	Plug 5 pin connection plug onto X13/GPC-OUT of Terminal Board.	
13.	**Installing the People Counter at antennas Type B** The installation must be done in the same way like at the antenna Type A. Only the RS485 cable will not be connected. This cable has to be tied together to small loops with the cable tie.	
14.	After the installation you have to stick the adhesive label of the GPC below the type plate of the antenna	

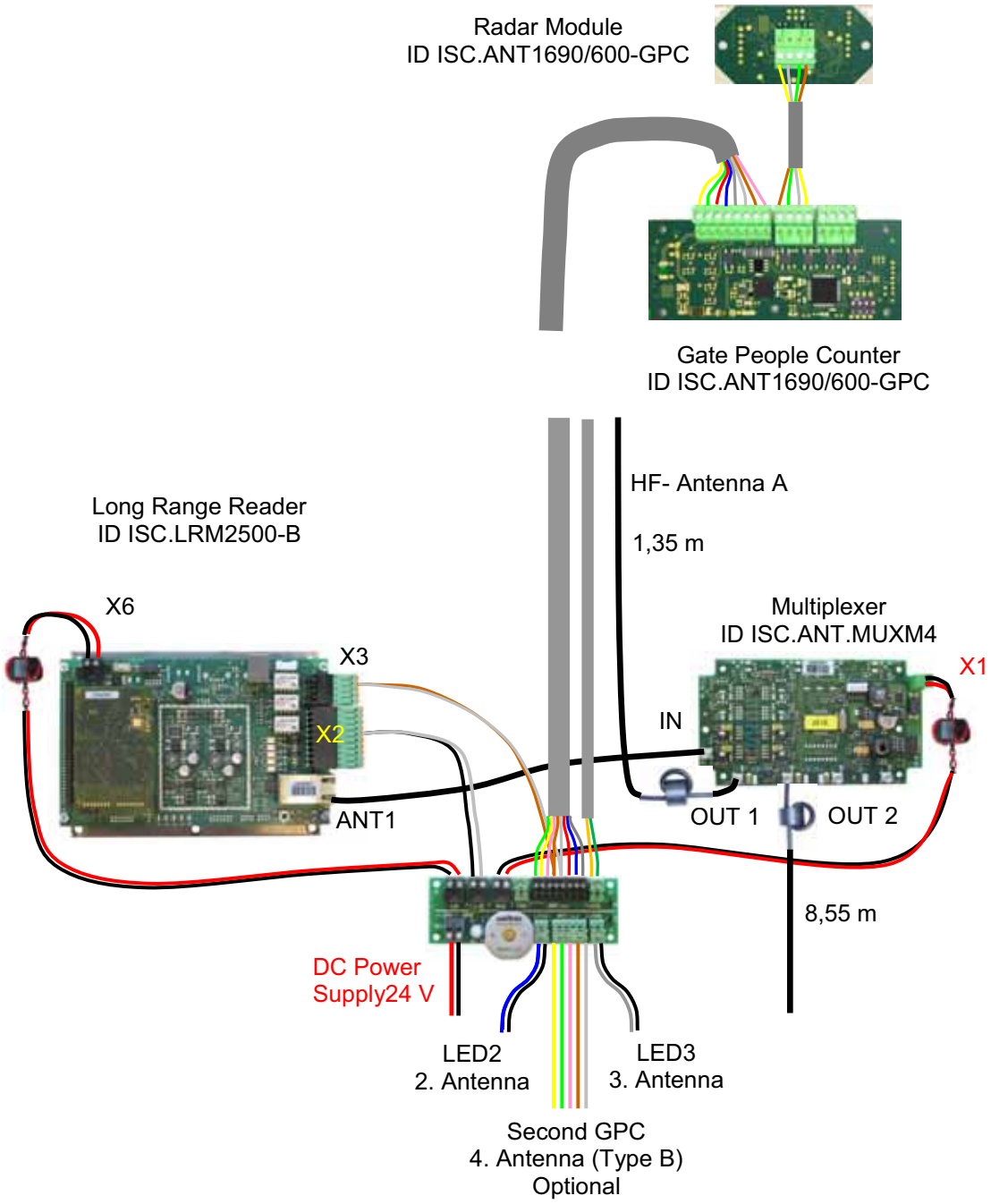
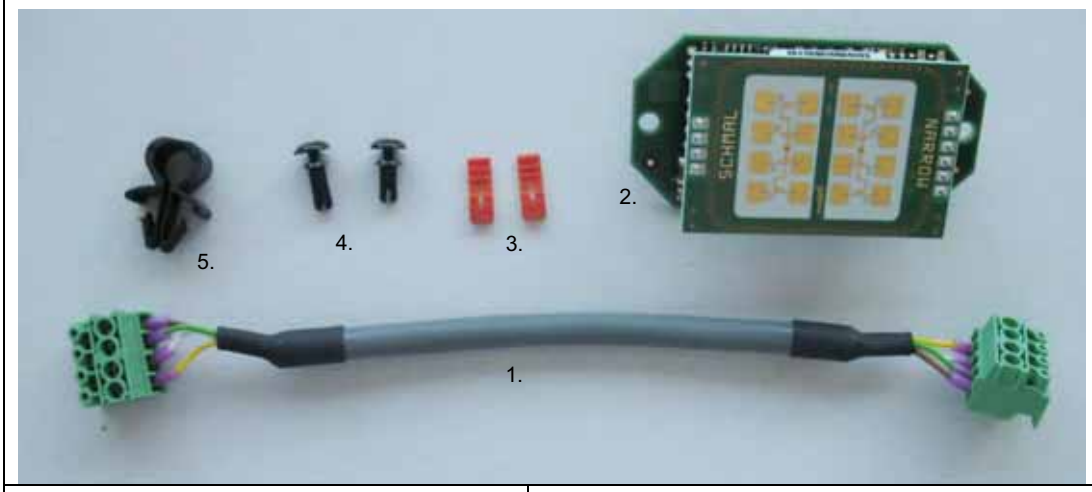
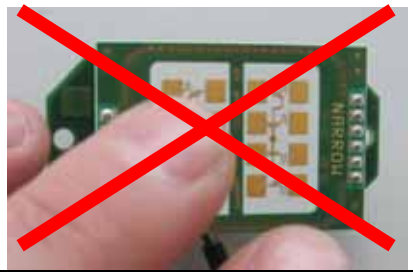


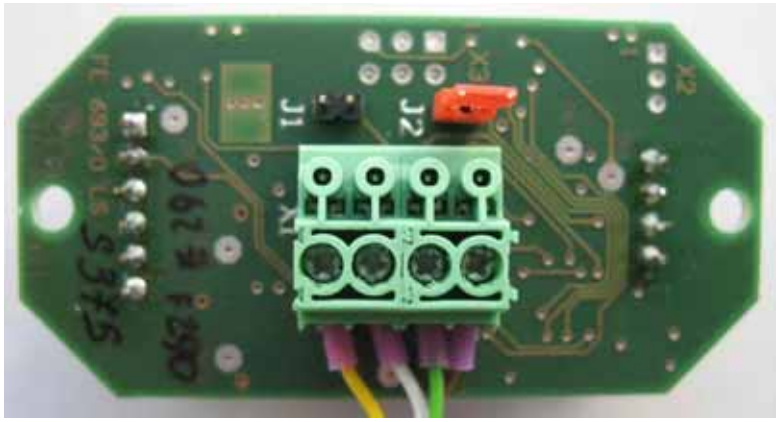
Fig. 23: Connections ID ISC.ANT1690/600-GPC

6.2 Installation ID ISC.ANT.GPC-E



Content of the ID ISC.ANT.GPC-E	1. 1 piece Radar connection cable 2. 1 piece Radar module 3. 2 piece Jumper 4. 2 piece spilt rivet 3,0mm 5. 1 piece cable-clip

Step	Action	Note
1.	Attention !! Note: Do not touch the antenna surface of the Radar module to avoid damaging the electronic components and soiling.	
2.	Connect radar connection cable with X1 of Radar module.	

3.	Set sensitivity of Radar sensor by setting jumper J1 and J2. Sensitivity: JP1+2 open: Low JP1 closed: Middle JP2 closed: High JP1+2 closed: Very high Recommended Sensitivity: High	
4.	Install Radar module with split rivet See also picture in Step 4	
5.	Plug Radar connection cable onto X12 Sen 2	

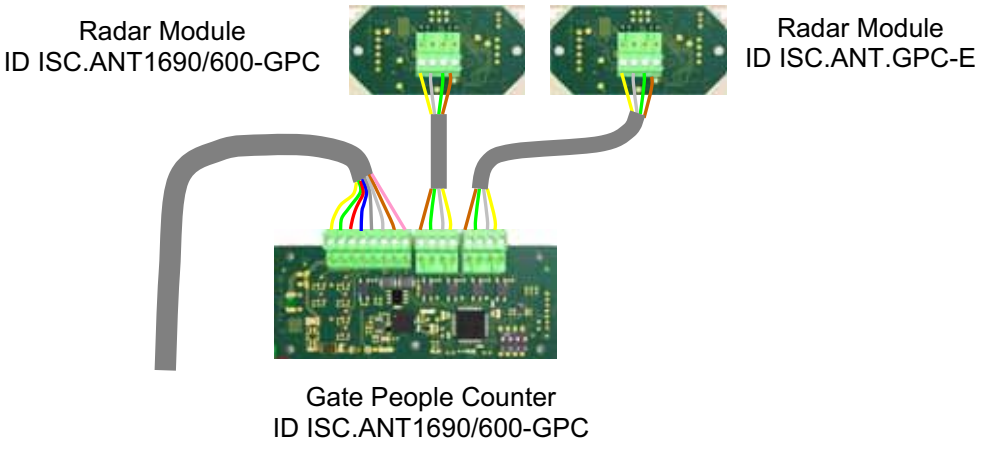


Fig. 24: Connections GPC-E 2.Radarmodule

6.3 Configuration and Test

To activate the People Counters the following settings has to be done.

Set additional the Jumpers JP10 and J11 of Reader ID ISC.LRM2500-B to configure the RS485 interface. (see also manual M01111-xde-ID-B , page 54 and 55). The Termination has to be activated via software in the reader configuration.

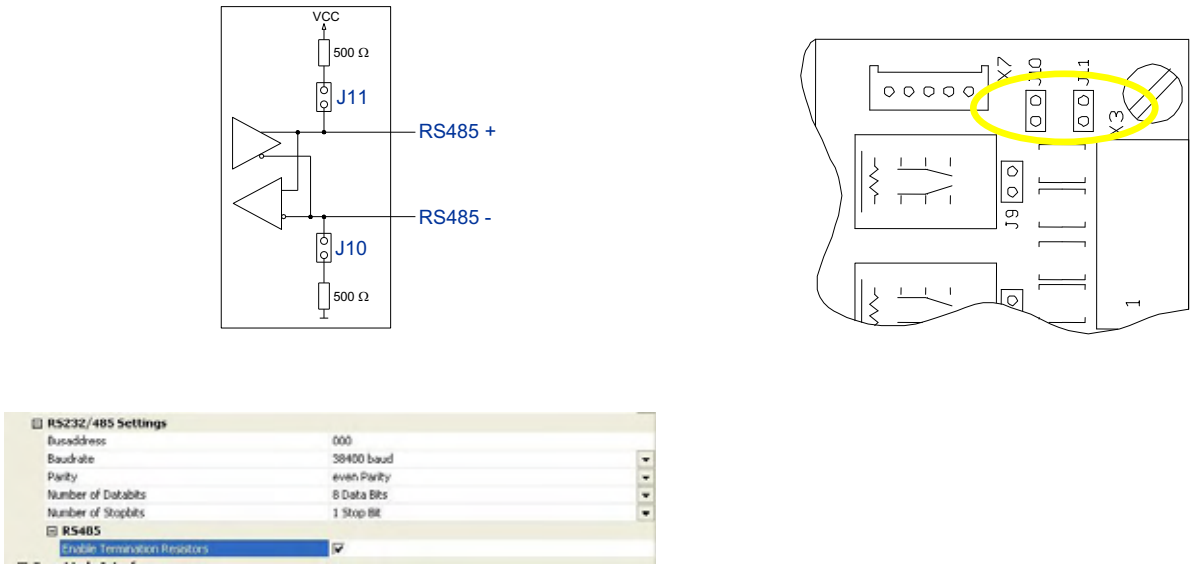


Fig. 25: Jumper settings RS485 Interface

By using several People Counters at gates with 3 to 6 aisles, you have to set the corresponding bus address. The bus address could be set by the Dip-Switch at the People Counter Board. See Fig. 26. At one reader, up to 3 People Counter (bus address 1-3) could be operated.

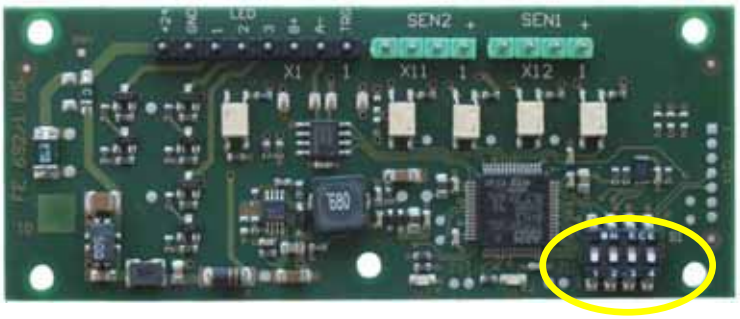


Fig. 26: Position of Dip Switch at People Counter Board

bus address	DIP-Switch S1			
	1	2	3	4
1	OFF/ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	OFF	OFF	ON	OFF
4	Reserved			

Table 8 Setting the bus address of the People Counter

6.3.1 Connecting several People Counter

When using several People Counters (up to 3), at one reader, have to be on the terminal board with each other in parallel. For the connection you have to use 5 pin shielded, twisted-pair cable. Example: LiYCY (TP) 3x2x0,25

The connection X13/GPC-Out of the first Terminal Board has to connected to X13 GPC-out of the second and third Terminal Board of the antenna /People Counter. More details to the terminal assignment of X13 you will find in 9.Annex A

e.g.

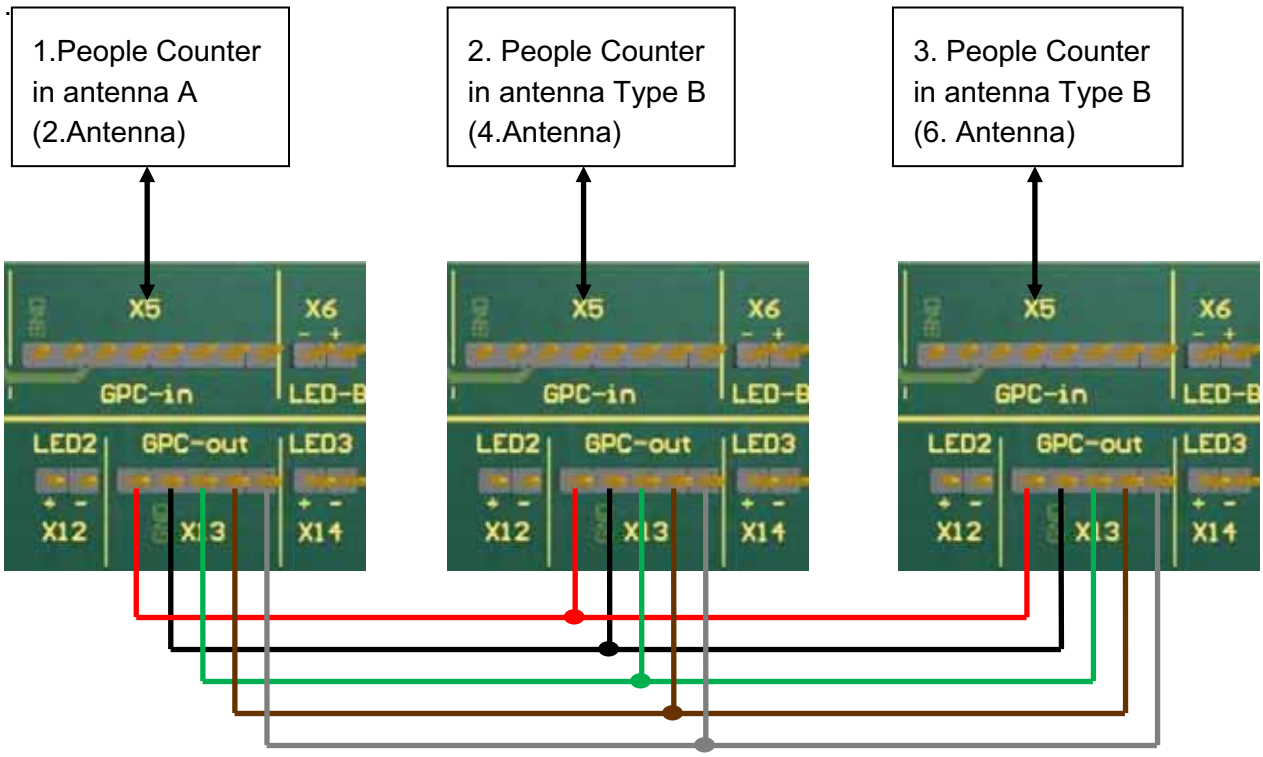
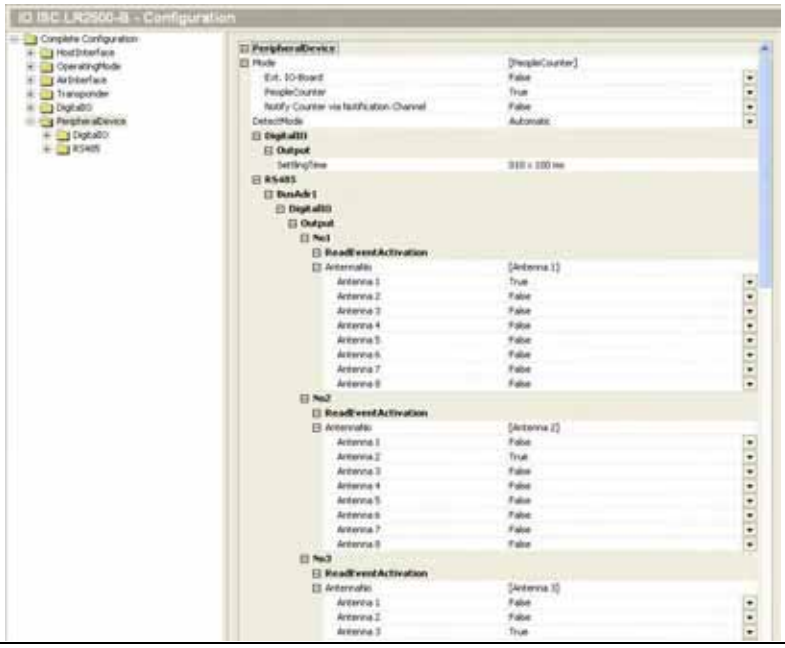
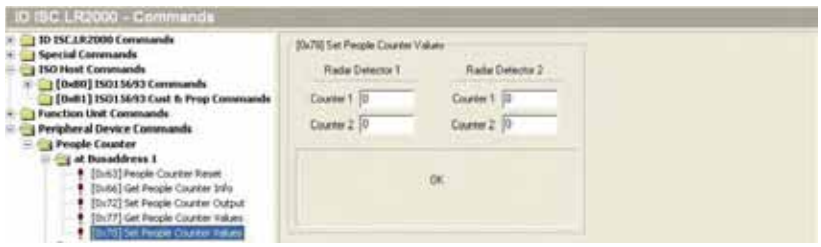
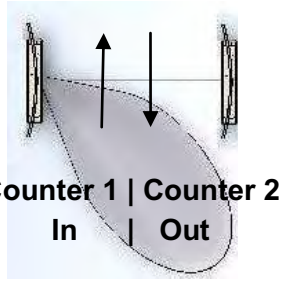
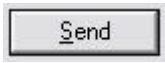
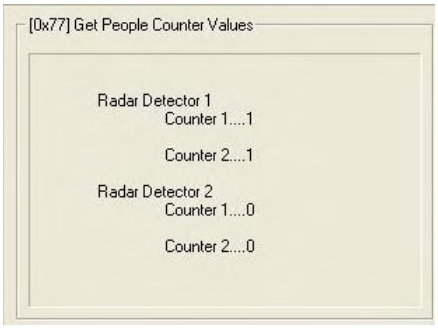


Fig. 27 Connecting the People Counters

6.3.2 Configuration and Test in ISO-Host or Buffered Read

Step	Action	Note
1	Select „Configuration“	
2	**Host Interface** Set RS 485 to “True” „Enable Termination Resistors“ The RS232/485 Settings should be set to: Busaddress=0, Baudrate=38400 baud, Parity = even , Number of Databits = 8, Number of Stopbits = 1	
3	Confirm with „Apply“	
4	**Peripheral Devices** Set People Counter to„True“ and Detection Mode for Ext. I/O-Boards to “Search up to Busaddress 1”	
5	Confirm with „Apply“	
6	**Peripheral Device Digital IO:** Setting Time: „Setting Time“ set the duration time for the alarm. (10 means 1 second) (e.g. 10 x 100ms) Assign Output 1 to antenna 1. Output 2 to antenna 2. Output 3 to antenna 3. „True“ means: Output 1,2 or 3 will be active if the reader read a valid transponder on the corresponding antenna	

7	Set by clicking on „Apply“.	
	Test: People Counter	
8	Select „Commands“	
9	Select Command - „Get Reader Info“ - Peripheral Devices	
10	Confirm with „Send“ Number of Devices should be 1	
11	Select Command „Set People Counter Values“	
12	Confirm with „Send“	
13	Select Command „Get People Counter Values“	
14	Confirm with „Send“ All counter values should be 0	
15	Walk through the gate from both directions.	

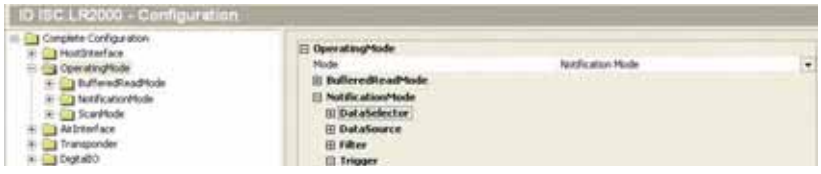
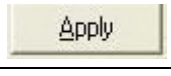
16	Select Command „Get People Counter Values“	
17	Confirm with „Send“	
18	Counter values will be displayed.	

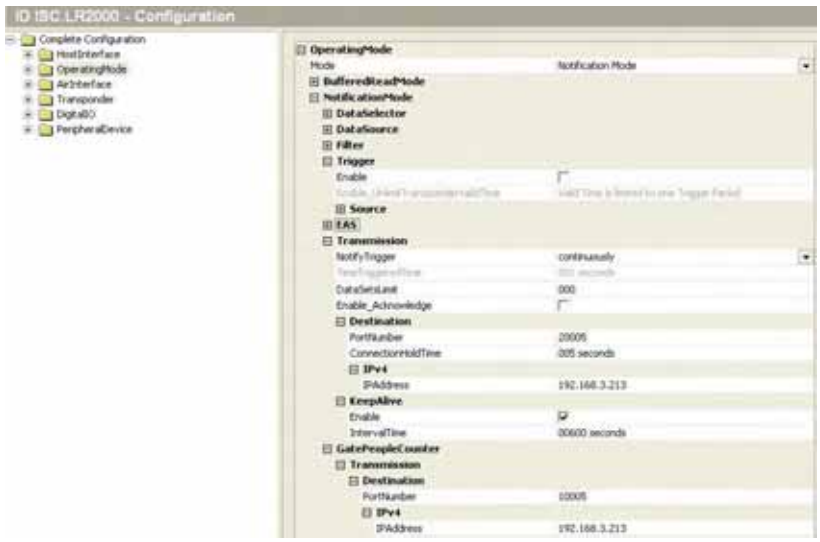
In ISO-Host and Buffered Read the People Counter has to be polled by the Host Application to get the data.

In Notification Mode the Reader sends the People Counter Data automatically to the Host.

6.3.3 Configuration and Test in Notification Mode

The following configuration hast o be done:

Step	Action	Note
1	Select „Configuration“	
2	**Peripheral Devices** Set People Counter and Notify Counter to „True“	
3	Confirm with „Apply“	
4	**Operating Mode** Select -Notification Mode	
5	Confirm with „Apply“	

6	**Set IP Address and Port for Notification Mode** IP Address of Host e.g. here : 192.168.3.213 Port:20005 **Set IP Address and Port for People Counter** IP Address of Host e.g. here: 192.168.3.213 Port:10005	
7	Confirm with „Apply“	
8	A Test could be done with the People Counter Sample.	

7. 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 ISC.ANT1690/600 antenna with the ID ISC.LRM2500 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 ISC.ANT1690/600 antenna with ID ISC.LRM2500 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: October 2009):

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 / ISO-MODE / MOD	10%
RF Data coding ISO-MODE:	Fast (1/4) or Normal (1/256)
Timeslots ISO-MODE / NO-TS	1 or 16 Timeslots
ISO Option – BREAK:	Complete Timeslot length at „NO TAG“

8. Technical Data

8.1 Antenna ID ISC.ANT1690/740 Type A and B

Mechanical Data

• Housing	UV stabilized ABS and Acrylic
• Dimensions (W x H x D)	
– Antenna	600 mm x 1693 mm x 72 mm ± 3 mm
– Packing	800 mm x 1800 mm x 150 mm ± 10 mm
• Weight	
– ID ISC.ANT1690/600-A	Approx. 23 kg without / 28 kg with packing
– ID ISC.ANT1690/600-B	Approx. 21 kg without / 26 kg with packing
• Enclosure rating	IP 41
• Color	Antenna frame: clear transparent Antenna base: signal white RAL 9003
• Mounting	
– No. of attaching points	2
– Recommended anchors	∅ 10 mm
– Recommended minimum load capacity of the floor fastener	5000 N / anchor
• Maximum horizontal load on the top edge of the antenna	250 N*

Electrical Data****

• Supply Voltage	24 V ⎓ ± 15 % Noise Ripple : max. 150 mV
• Power Consumption	max. 32 VA
• Operating Frequency	13,56 MHz
• Maximum transmitting power per antenna	8 W
• Permissible overall transmitting power per antenna gate	
– EU-territory (per EN 300 330)	8.0 W
– USA (per. FCC Part 15)	8.0 W
- Canada (per. RSS 210)	8.0 W

• **Outputs**	
– 1 Optocoupler	**24 V ⎓ / 30 mA**
– 1 Optocoupler	**Reader Synchronization**
– 3 Relay (3 x NO)	**24 V ⎓ / 1 A for Alarm Kit**
• **Inputs**	
– 1 Optocoupler	**Max. 24 V ⎓ / 20 mA**
– 1 Optocoppler	**Reader Synchronisation**
• **Interfaces**	**RS232 / RS485** **USB** **Ethernet (TCP/IP)**
• **Protocol Modes**	**FEIG ISO HOST** **BRM (Data Filtering and Data Buffering)** **Scan Mode (RS 232/485)** **Notification Mode (TCP/IP)**
• **Supported Transponders**	**ISO 15693, ISO 18000-3-A Mode 1,** **(EM HF ISO Chips, Fujitsu HF ISO Chips, KSW Sensor Chips, Infineon my-d, NXP I-Code , STM ISO Chips, TI Tag-it)** **NXP I-Code 1**
• **Ranges / pass-through width in gate with multiplexer**	
– One tag orientation	**approx. 110 /120 cm****
– All tag orientations	**approx. 95 / 105 cm*****
• **Antenna connection**	**1 x SMA plug (50 Ω)**
• **Antenna connector cable**	
- Type B	**RG58, 50 Ω, approx. 8,55 m long**

Ambient Conditions

- **Temperature range**
  - **– Operating** **–25 °C to +50 °C**
  - **– Storage** **–25 °C to +70 °C**

Applicable Standards

- **RF approval**
  - **– Europe** **EN 300 330**
  - **– USA** **FCC Part 15**
  - **- Canada** **RSS-210**
- **EMC** **EN 301 489**
- **Safety**
  - **– Low Voltage Directive** **EN 60950-1**
  - **– Human Exposure** **EN 50364**

* Persistent deformation after load release approx. 2 cm.

** Qty. 2 ID ISC.ANT1690/600-A/-B antennas, antenna spacing (antenna center), same flow direction, Tag 46 mm x 75 mm ISO15693, sensitivity / minimum field strength H_{min}=60 / 40 mA/m rms, transmitting power 8 W, tag orientation parallel to antenna for horizontal movement through the antenna. The maximum antenna distance also depending of the strength of the Transponder answer signal! Z.B NXP I-Code SLi / NXP I-Code SLi-S

*** Qty. 2 ID ISC.ANT1690/600-A/-B antennas, antenna spacing (antenna center), Tag 46 mm x 75 mm ISO 15693, sensitivity / minimum field strength H_{min}=60 / 40 mA/m rms, transmitting power 8 W, aligned in all 3 dimensions for horizontal movement through the antenna. The maximum antenna distance also depending of the strength of the Transponder answer signal! Z.B NXP I-Code SLi / NXP I-Code SLi-S

8.2 People Counter ID ISC.ANT1690/600-GPC and ID ISC.ANT.GPC-E

Mechanical Data

• Housing	Printed Boards
• Board Dimensions (B x H x T)	
– People Counter Board	100 mm x 40 mm x 16 mm ± 1 mm
– Radar Sensor Board	60 mm x 30mm x 25 mm ± 1 mm
• Weight	
– ID ISC.ANT1690/600-GPC	ca. 200 g / 250 g (0.55 lb) with packing
– ID ISC.ANT.GPC-E	ca. 50 g / 100 g (0.22 lb) with packing
• Mounting	
– No. of attaching points	People Counter: 4 / Radar Sensor: 2

Electrical Data

• Supply Voltage	• 24 V ⎓ ± 15 %
• Power Consumption	• max. 2 VA
• Operating Frequency	• 24,125 GHz
• RF-transmitting power	• 16 dBm (e.i.r.p.)
• Temperature range	
– Operation	–25 °C to +55 °C
– Storage	–25 °C to +85 °C

8.3 Approvals

As per Section 7

8.3.1 Europe (CE)

8.3.1.1 Antenne ID ISC.ANT1690/600

This RF equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC dated March 99.

Equipment Classification according to ETSI EN 300 330 and ETSI EN 301 489: Class 2

The technical data of the ID ISC.LRM2500-B Reader built into the ID ISC.ANT1690/600-A antenna can be found in the Installation Manual which is included with the device.

8.3.1.2 People Counter ID ISC.ANT1690/600-GPC

This RF equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC dated March 99.

Equipment Classification according to ETSI EN 300 330 and ETSI EN 301 489: Class 2

8.3.2 USA (FCC) and Canada (IC)

8.3.2.1 Antenna ID ISC.ANT1690/600

Product name:	**ID ISC.ANT1690/600**
Antenna name:	**ID ISC.ANT1690/600 Type A**
Reader name:	**ID ISC.LRM2500-B**
FCC ID: **IC:**	**PJMLRM2500** **6633A-LRM2500**
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 ISC.LRM2500-B Reader built into the ID ISC.ANT1690/600 antenna can be found in the Installation Manual of the reader.

8.3.2.2 People Counter ID ISC.ANT1690/600-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.

8.3.3 USA and Canada (UL)

In preparation !

The following picture indicates the label position:

9. Annex A

9.1 Terminal assignment “Terminal Board”

Terminal	Acronym	Description
X1 / LR		**24V DC Reader**
X1 / Pin 1		+24 V DC Reader
X1 / Pin 2	GND	GND Reader
X2 / I/O		**24V DC Input/Output**
X2 / Pin 1		+24 V DC Input/Output
X2 / Pin 2	GND	GND Input/Output
X3 / MUX		**24V DC Multiplexer**
X3 / Pin 1		+24 V DC Multiplexer
X3 / Pin 2	GND	GND Multiplexer
X4 / TRG		**Trigger People Counter 1**
X4 / Pin 1	+	TRG Trigger People Counter
X4 / Pin 2	-	GND Trigger People Counter
X5 / GPC-in		**Connection Cable to People Counter**
X5 / Pin 1		+24V DC LED2
X5 / Pin 2		+24V DC LED3
X5 / Pin 3		n.c.
X5 / Pin 4		RS485-A
X5 / Pin 5		RS485-B
X5 / Pin 6		TRG Trigger People Counter
X5 / Pin 7		+24 V DC People Counter
X5 / Pin 8	GND	GND People Counter
X6 / LEDB		**Connection LED / Alarm light B-Antenna**
X14 / Pin 1	+	+24V DC LEDB
X14 / Pin 2	-	GND LEDB
X11		**24V DC Power Supply**
X11 / Pin 1	24V	Power Supply +24 V DC
X11 / Pin 2	- / GND	Ground – Power Supply

X12 / LED2		**Connection LED / Alarm light 2. Antenna**
X12 / Pin 1	+	+ 24 V DC LED2
X12 / Pin 2	-	GND LED2
X13 / GPC-out		**Connection Cable to 2. People Counter**
X13 / Pin 1	+	+24 V DC People Counter 2
X13 / Pin 2	GND	GND People Counter 2
X13 / Pin 3		TRG Trigger People Counter
X13 / Pin 4		RS485-A
X13 / Pin 5		RS485-B
X14 / LED3		**Connection LED / Alarm light 3. Antenna**
X14 / Pin 1	+	+24V DC LED3
X14 / Pin 2	-	GND LED3

Table 9: Pin-Configuration X11-X14 Terminal Board

9.2 Internal wiring

Terminal	Acronym	Description
X1 / LR		**24V DC Reader**
X1 / Pin 1		X13 +24 V DC Reader (red)
X1 / Pin 2	GND	X13 GND Reader (black)
X2 / I/O		**24V DC Input/Output**
X2 / Pin 1		Reader LR2500 X2 Pin Out2-C (white)
X2 / Pin 2	GND	Reader LR2500 X2 Pin Out2-E (black)
X3 / MUX		**24V DC Multiplexer**
X3 / Pin 1		X1 +24 V DC Multiplexer (red)
X3 / Pin 2	GND	X1 GND Multiplexer (black)
X5 / I/O		**Relay Output**
X5 / Pin 1		Reader LR2500 X2 Pin REL3-COM (blue)
X5 / Pin 2		Reader LR2500 X2 Pin REL2-COM (yellow)
X5 / Pin 3		Reader LR2500 X2 Pin REL1-COM (green)
X6 / LED 1		**LED**
X6 / Pin 1		LED X1 + (green)
X6 / Pin 2	GND	LED X1 - (yellow)

OBID®
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INSTALLATION

ID ISC.ANT1700/740-A /-B
Clear Gate

English

final
public (B)
2011-04-12
M91201-3e-ID-B.doc

FEIG ELECTRONIC

Note

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Tag-it™ is a registered trademark of Texas Instruments Incorporated.

Contents

1 Safety Instructions / Warning - Read before Start-Up !

- The device may only be used for the intended purpose designed by for 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 antenna housing could be sharp-edged.

CAUTION! The Antenna-Tuner and the Antenna conductor carry voltages up to 1000V.

The Antenna is not water proof and should not be exposed to rain or humidity.
Under extreme circumstances water could seep into the antenna and damage the electronic circuits.

Special advice for wearers 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 and your cardiac pacemaker and not stay in an immediate proximity of the reader’s antennas for any length of time.

2 Maintenance

The antenna ID ISC.ANT1700/740 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.

⚠ **Attention! The surfaces should be cleaned with a clean, soft cloth dampened in a dishwashing liquid – water solution. The use of alcohol, spirit, thinners, glass cleaners or other harsh cleaning liquids is prohibited and will damage the housing.**

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

- Keep the antenna clean and take caret the antenna is not scratched.
- 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.

3 Performance Features of the ID ISC.ANT1700/740 Antennas

The ID ISC.ANT1700/740-A antenna is a version with DynamicTuning Board ID ISC.DAT , Long Range Reader ID ISC.LRM2500-B, 4- times Multiplexer Module ID ISC.ANT.MUX M4 and additional signal light and buzzer already mounted.

The ID ISC.ANT1700/740-B antenna is a version with DynamicTuning Board ID ISC.DAT and signal light mounted.

Up to

- 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 8 antennas as multiple gate with up to 7 aisle at the use of the 8-times Multiplexer ID ISC.ANT-MUX M8.

can be operated.

Depending on the antenna configuration, one, two or all three read orientations of the Smart Tags and various antenna spacing (gate widths) are possible.

The ID ISC.ANT1700/740-A/B is a „figure-of-eight“ antenna with tuner and have been optimized as transmitting and receiving antennas for the ID ISC.LRM2500 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 however then vary.

The antennas comprise the electrical antenna conductor, the housing, the ID ISC.DAT *Dynamic Antenna Tuner* and the connection cable. The antennas are factory tuned 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 both product and persons. It is suitable for installation indoors or outdoors if weather-protected.

3.1 Performance Features of the People Counter ID ISC.ANT1700/740-GPC

The product ID ISC.ANT1700/740-GPC, short form “Gate People Counter” or “GPC”, are made for mounting in the gate antennas ID ISC.ANT1700/740.

A Gate People Counter consist of a People Counter board (PC) and one Radar Detector! The product ID ISC.ANT.GPC-E 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 out going persons will be separately captured.

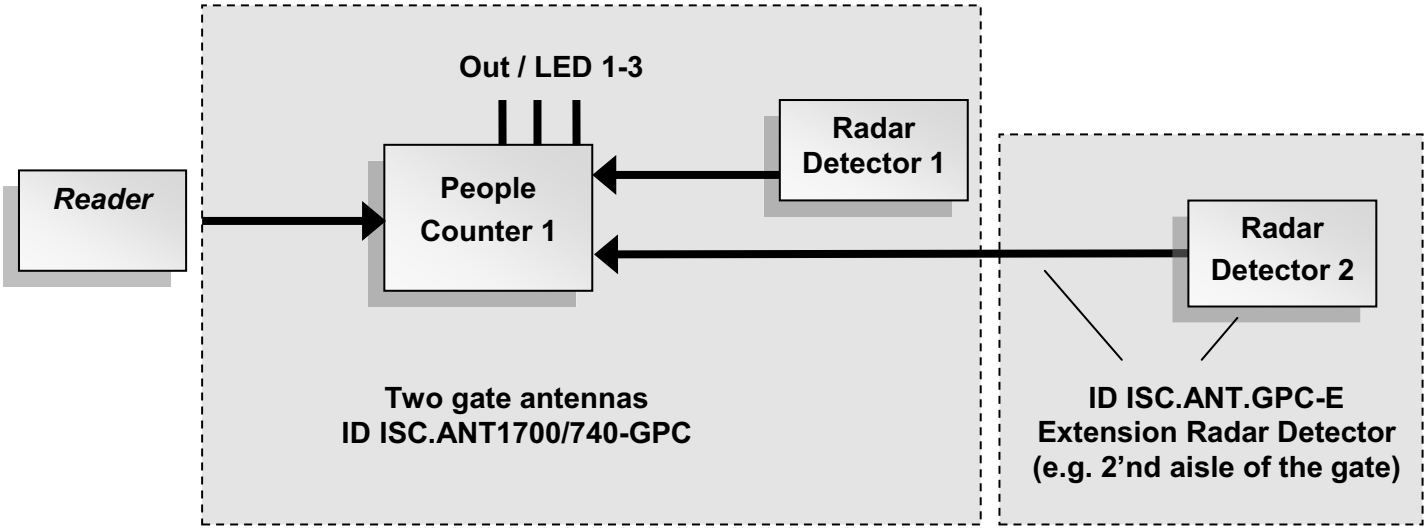


Fig. 1: Gate People Counter Structure (2-3 antennas, 1-2 gate aisles)

A change of the counter values will be stored in the EEPROM of the People Counter Board. With the command “0x78 Set People Counter” the values could be set/reset to the needed value.

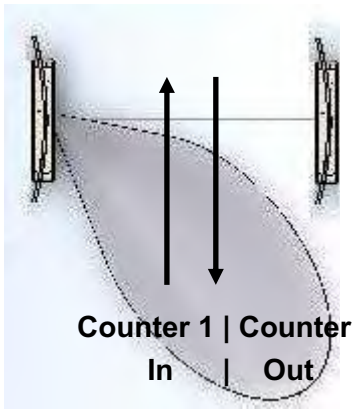
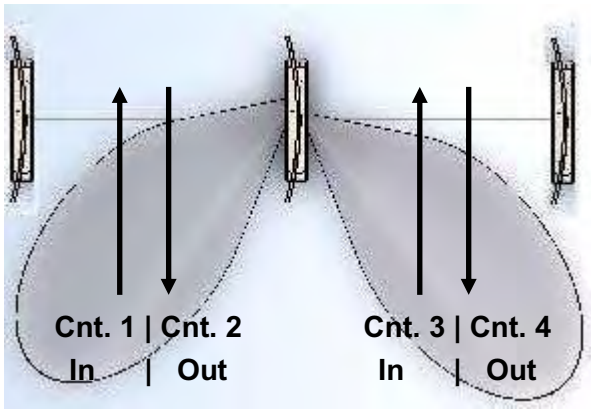
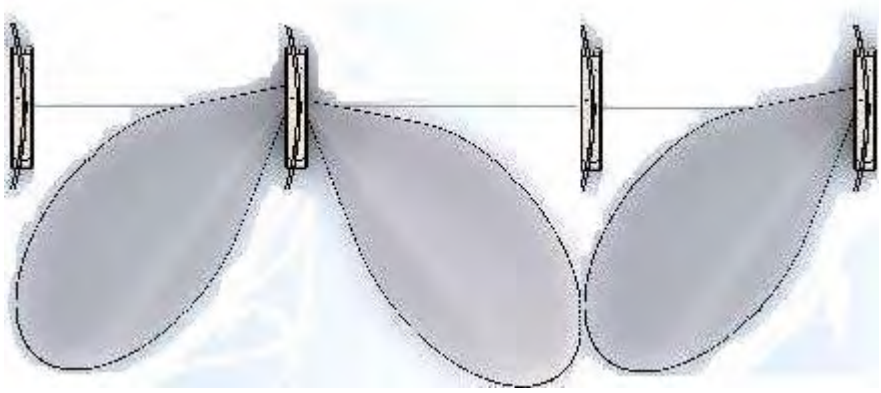
Radar Detection zone of a single gate	Radar Detection zone with two aisles
	
Radar Detection zone with three aisles	
	
Radar Detection zone with four aisles	
	

Fig. 2: Top view of the detection areas (2-3 antennas, 1-2 gate 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 three digital output can be used, to enable a signal light at every gate antenna or activate an alarm buzzer in the gate antenna.

The Connection between reader and people counter takes place trough the RS485 Interface of the reader.

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.

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

So, 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 any change of the counter values.

See also System Manual H01011-0e-ID-B.DOC

3.2 Available Antenna Types

The following products are currently available:

Antenna Type	Description	Picture
ID ISC. ANT1700/740-A Clear Gate	Antenna with Reader, Multiplexer , dynamic tuning board, signal light and buzzer	
ID ISC. ANT1700/740-B Clear Gate	Antenna with dynamic tuning board ID ISC.DAT and signal light	
ID ISC. ANT1700/740-AGP	Acrylic glass plate window for Clear antennas	
ID ISC.ANT1700/740-GPC Gate People Counter	People Counter and one piece of radar detector for antenna ID ISC.ANT1700/740 incl. Mounting and cabling set. (optional)	
ID ISC.ANT.GPC-E Extension Radar Detector	Second radar detector with cable for the second direct parallel aisle (optional)	

Table 1: Available Antenna Types and Accessories

Needed components for at the usage of the Gate People Counter:

Number of antennas	Antenna		People Counter (Optional)		
	ID ISC. ANT1700/740 -A	ID ISC. ANT1700/740 -B	ID ISC. ANT1700/ 740-GPC	ID ISC.ANT. GPC-E	Note
2 Antennas	1	1	1		
3 Antennas	1	2	1	1	
4 Antennas	1	3	2	1	
5 Antennas	1	4	2	2	8 Chanel Multiplexer
6 Antennas	1	5	3	2	8 Chanel Multiplexer
7 Antennas	1	6	3	3	8 Chanel Multiplexer

Table 2 Needed components for gates with People Counter

4 Installation and Wiring

Notes:

Before installing the antennas please read 5.1 Project Notes . The spacing of the antennas in a gate depends on the antenna configuration.

If multiple antennas or gates are connected to different readers, a minimum clearance of 8 m must be kept between the antennas or gates. For shorter distances (1 m – 8 m) the readers must be synchronized. The synchronization of the readers (see application note N10311-xe-ID-B.doc) is only possible in one of the Automatic Modes (Buffered Read, Notification or Scan Mode). Below a distance of 1.5 m the antennas must also be shielded from each other. Otherwise the read range will be significantly reduced. The antennas must have a minimum distance of 20 cm to all larger metal parts! At a distance of less than 50 cm between the antenna and metal parts the read range will be significantly reduced.

4.1 Mounting preparation

For assembly the antenna must be carefully unpacked. This is done as described in the following steps:

1. Place the packed antenna on the floor with the top side facing up. Carefully open the box and then remove the antenna.

Fig. 3: Antenna in its packaging

2. After that the antenna has to be placed carefully again on the floor. Now you must remove the two fastening screws (hexagon socket width A/F2,5) of the antenna cover at the antenna foot and remove it upwards. Fig. 4

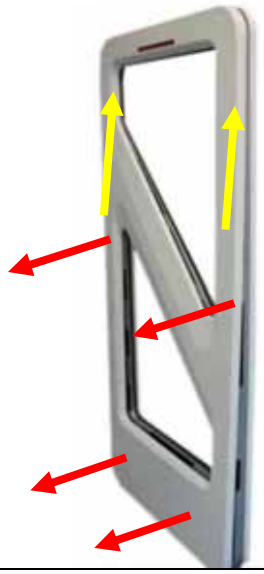
Step 1	Step 2
	

Fig. 4: Opening the antenna base

4.2 Dimensions of antenna

The outside dimensions of the antenna are shown in Fig. 5

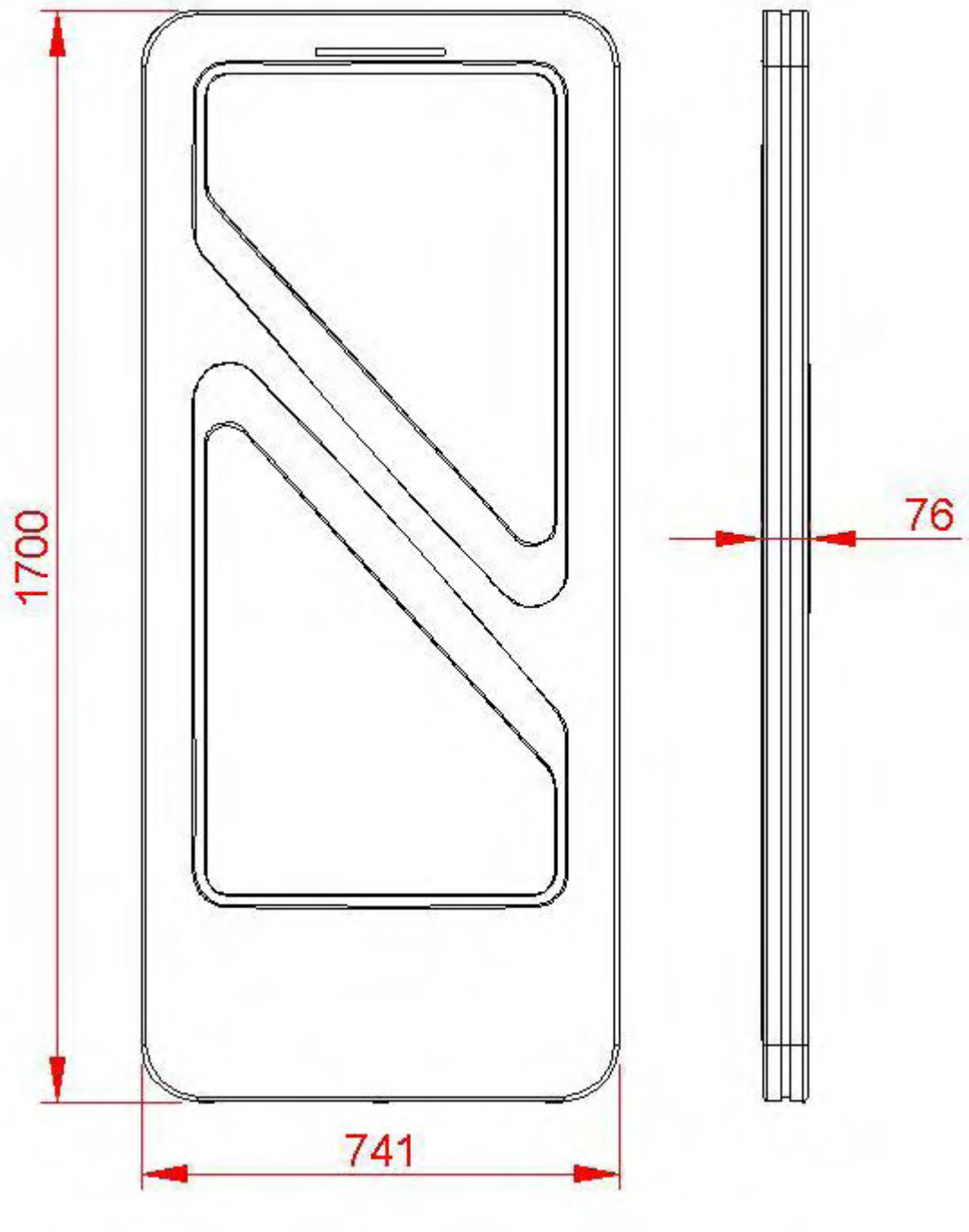


Fig. 5: Antenna outside dimensions

All dimensions are in mm with general tolerance to ISO 2768 m (mean).

4.3 Drilling the Mounting Holes

If the position of the antennas has been marked or determined a hole template, can be used to mark and drill the mounting holes and the holes for the cable entry. The dimensions are shown in Fig. 6:

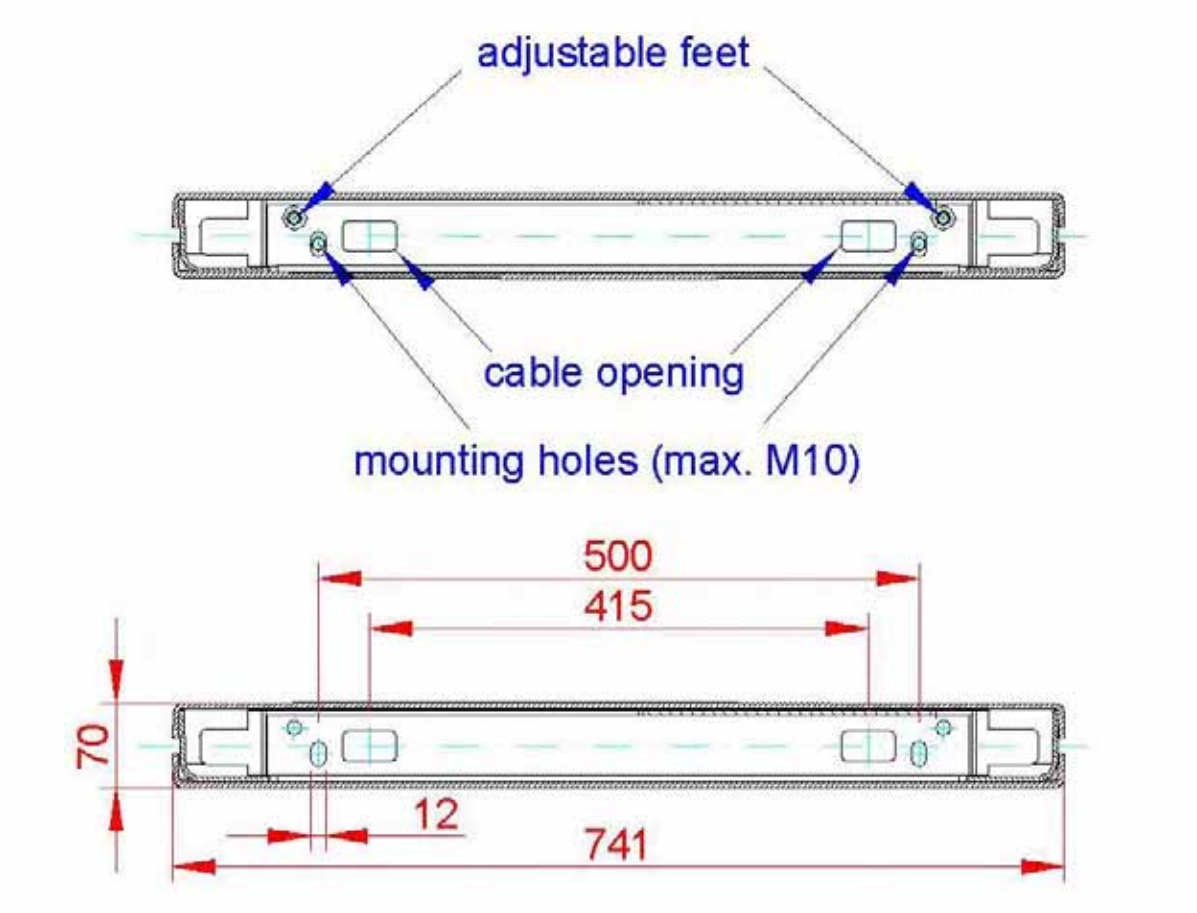


Fig. 6: Floor plate dimensions

All dimensions are in mm with general tolerance to ISO 2768 m (middle).

The size and type of the screw anchors depends considerably on the strength of the base or floor. The anchors should be capable of withstanding a permissible load of at least 5 kN per anchor for all load directions (e.g. for concrete floor Hilti HVA anchors with HAS-(E) M8 threaded rod or Hilti HIS-N M8 (5/16”) threaded inserts). The size of the mounting holes in the antenna is 10 mm (.39”). The length of the anchors or bolts should be selected such that they extend at least 50 mm (2.0”) and a maximum of 65 mm (2.6”) from the floor.

Please follow the mounting instructions of the anchor manufacturer!

Two cable openings are provided for the necessary connection cable (see Fig. 6). The cable openings are dimensioned such that up to 10 cables having a diameter of 6 mm can be passed through each opening.

We recommend routing the antenna cables through the cable opening on the Multiplexer side. All other cables such as the supply voltage and synchronization cable should be routed through the cable opening on the Reader side.

Alternatively the cables can be routed at the sides of the antenna bas like shown in Fig. 7

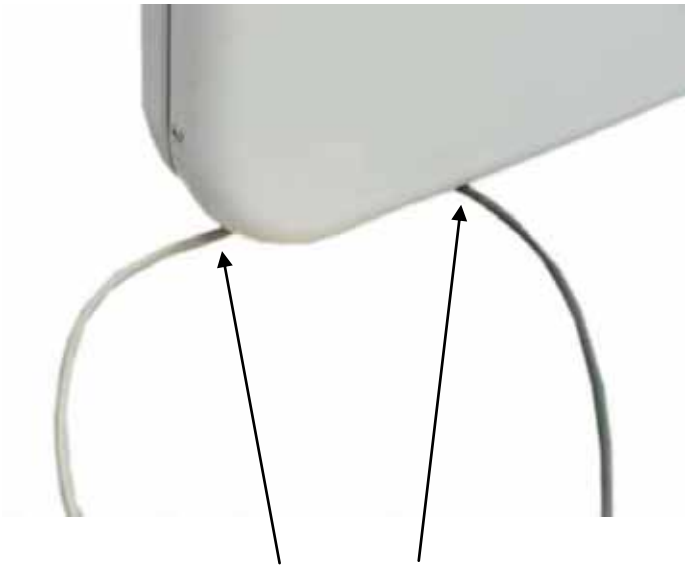


Fig. 7 Cable routing at the antenna sides

4.4 Installing the Antenna Base and Antenna Body

The antenna will be screwed on the floor. The transverse antenna conductors in the middle of the antenna body have to face the same direction at all antennas.(Fig. 8) Use the adjusting screws (Fig. 9) to align the antenna vertically.

Fig. 8 Transverse conductors facing same direction

Adjusting screws (hexagon socket width A/F4)

Fig. 9: Attaching and aligning the antenna

5 Typical Antenna Configuration (Gate Antenna with two Antennas)

The standard configuration of a gate with three-dimensional tag orientation consists of one antenna ID ISC.ANT1700/740 Type A with reader and multiplexer and one antenna ID ISC.ANT1700740 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.

5.1 Project Notes

The antenna configuration as described allows detection of a tag moving horizontally through the capture area of the gate. The tag orientation is non-critical. The tags are detected along a horizontal axis of motion in certain regions within the antennas. The area of detection depends on the tag orientation.

The size of the three-dimensional capture area of the antennas is shown in the sketch below.

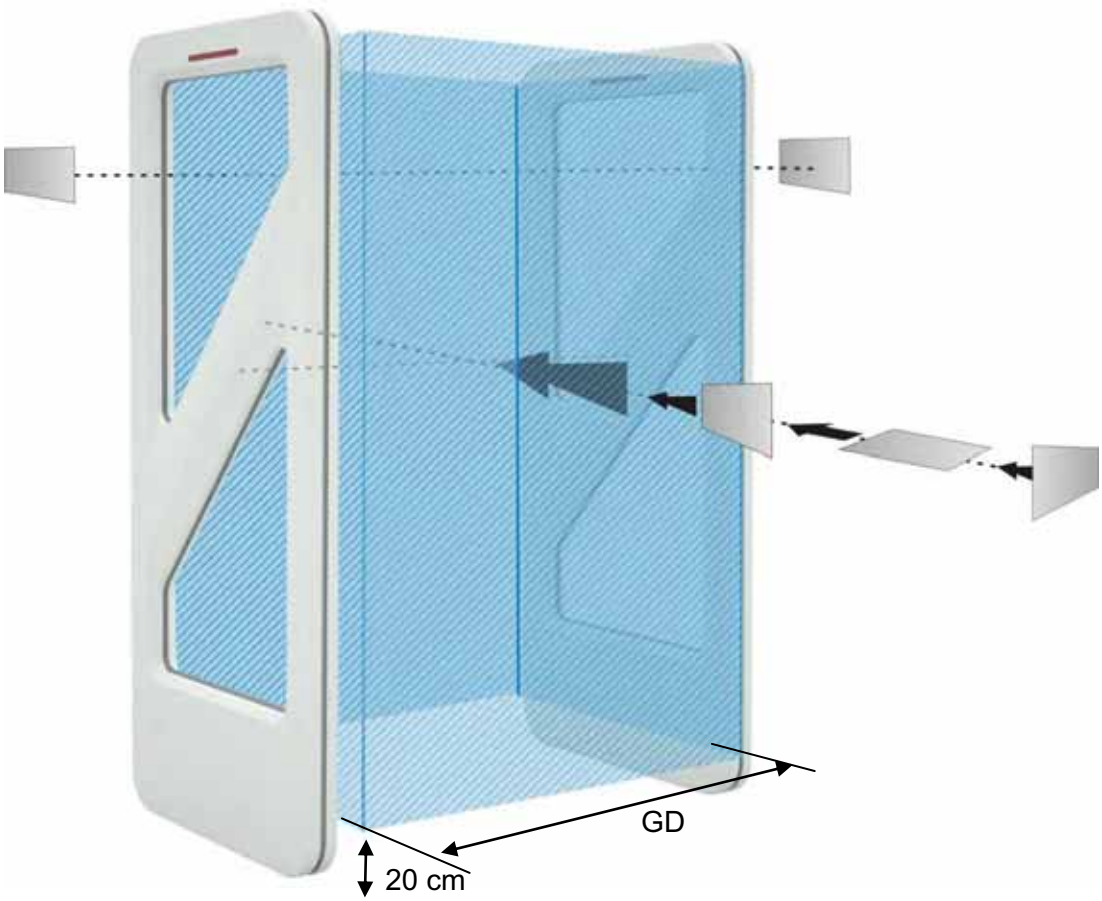


Fig. 10: Capture area and tag orientation

Notes:

Note that the entire capture area of the antenna is larger than the three-dimensional area shown in the drawing. This means there are tag orientations in which the tag can be detected outside the capture area.

To get a optimal performance the reader has to be configured and run in one of the Automatic Modes (Buffered Read, Notification or Scan Mode).

If multiple gates are arranged with short distances (1-8m) between each other, these will mutually interfere with each other. In this case, the readers for the individual gates have to be synchronized and run in one of the automatic modes.

To achieve three-dimensional capture of the tag in the capture area drawn above, the following conditions must be met:

- The gate distance GD depends on the antenna configuration (see Table 4: Design notes).
- 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: Design notes). 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 from metal parts.
- The minimum distance between the antennas of a gate and antennas of RFID work station or terminals (transmitting frequency 13,56 MHz) should be:

Table 3: Minimum Distances

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

- 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 ISC.LRM2500 Reader should be set to an RF power of 8 watts.
- When using ISO 15693 transponders, the Readers should be set as described in **5.2.6 Reader Configuration** .
- 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	≤ 104 cm
Number of tags at a speed of 1 m/s - Read serial number - Read data	 16 8

Table 4: Design notes

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

5.2 Gate Configuration and Setup using Antennas Type -A and -B

5.2.1 Required Components

To construct the gate you need the following components:

- Qty. 1 ID ISC.ANT1700/740-A Clear
  (incl. Qty. 1 ID ISC.NET24V-B Power Supply Unit)
- Qty. 1 ID ISC. ANT1700/740-B Clear
- Qty. 1 ID ISC.NET24V-B Power Supply Unit
- Power cable, interface cable and connection cable for the DC power supplies (2-wire, twisted)
- Mounting materials (screws, anchors)

Optional:

- Qty. 2 ID ISC.ANT1700/740-AGP Acrylic glass plate windows for Clear antenna.

To calibrate the Reader you will need the software

- ISOStart Version 2011 Version 8.03 or higher

and for tuning the antennas the service software

- DATuningTool Version 1.10 or higher

on a personal computer running under Microsoft® Windows®. The Service Software can be downloaded at the Download Area of the Homepage www.feig.de.

5.2.2 Configuration of a Gate antenna with Multiplexer

Connect the components as shown in Fig. 11. Almost, all cable should be mounted already. Normally, the antenna cable from antenna Type B has to be connected to OUT2 at the multiplexer and the 24V DC power supply to X11 of the terminal board only. Optional the cable of the signal light of antenna Type B has to be connected to X14 LED3 (third antenna X12 LED2) of the terminal board.

The necessary connections for the optional People Counter will be described in 6. Installation of the Gate People Counter ID ISC.ANT1700/740-GPC

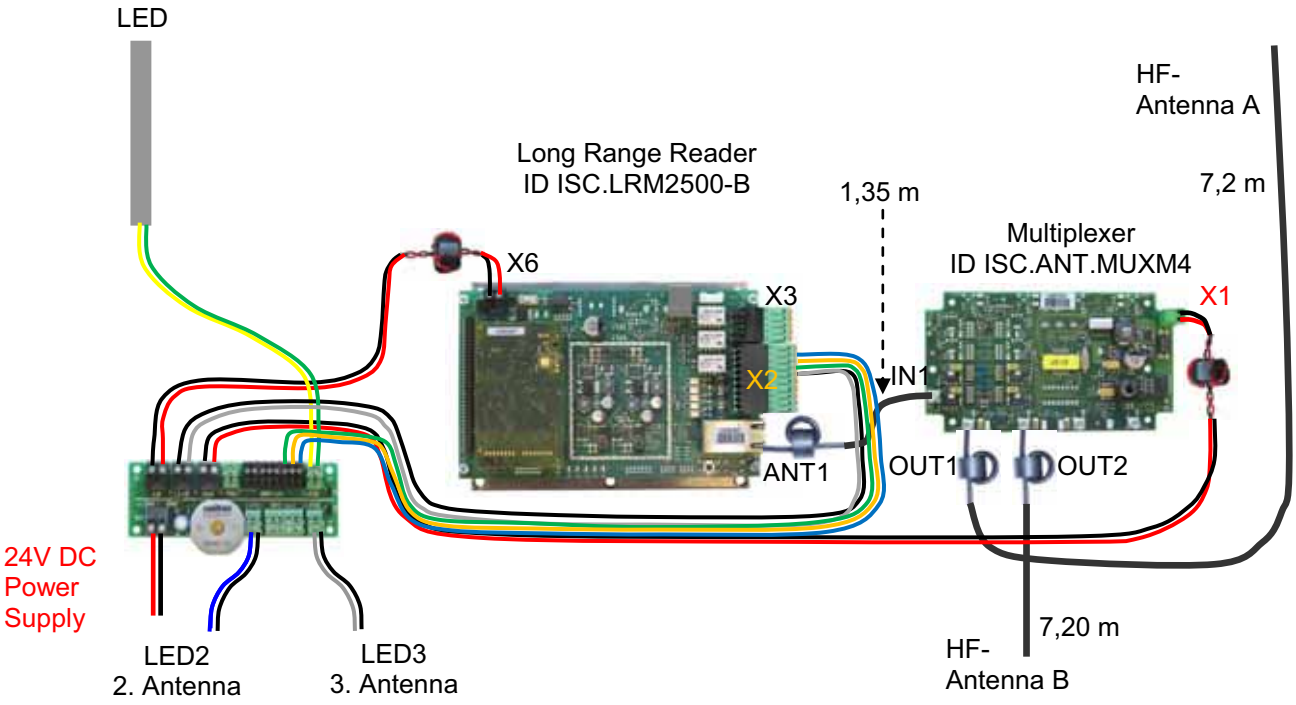


Fig. 11: Connecting the components for a gate consisting of two antennas, reader and multiplexer

Fig. 12: Terminal board

An overview of the terminal board connections you will find in 9. Annex A

Note:

- **A reverse polarity could damage the device or the In-/Outputs.**

The coax cables have fixed lengths and may not be shortened and therefore need to be tied into small loops (see Fig. 13). Tie all cables as far away from the antenna conductor as possible. The cables must never be allowed to contact the antenna conductor. The cable from antenna type B to the antenna type A should preferably be connected shortly. Unused cable lengths are possible should be tied in antenna B type.

Fig. 13:Connection of the components in an antenna Type A

Fig. 14:Tie together the cables in an antenna Type B

5.2.3 Setting the Multiplexer

Set the jumpers JP11-JP14 shown. More on setting the ID ISC.ANT.MUX.M4 Multiplexer can be found in the corresponding installation manual (M90200-xde-ID-B).

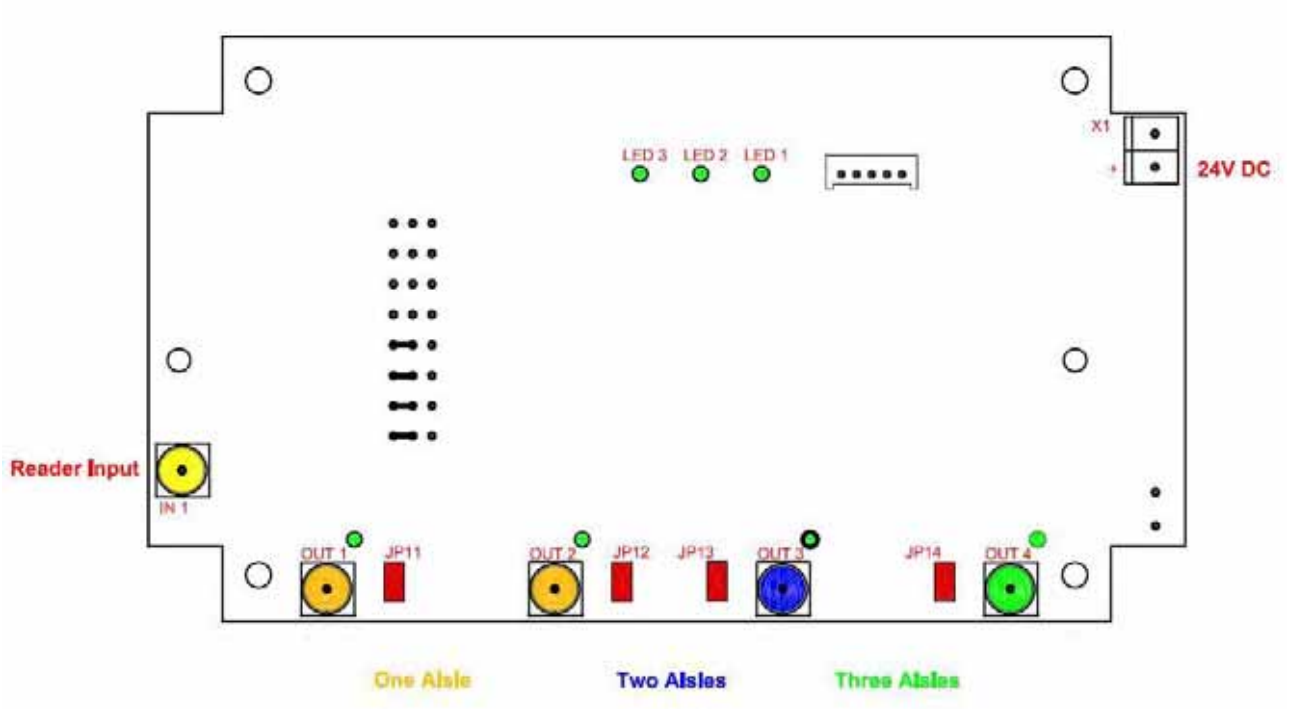


Fig. 15: Jumper positions

5.2.4 Setting the Antenna Tuner

For checking the settings of the antenna tuner the antenna has to be opened. For that, remove the two fastening screws (hexagon socket width A/F2,5) at the antenna base cover and move it upwards. Fig. 16

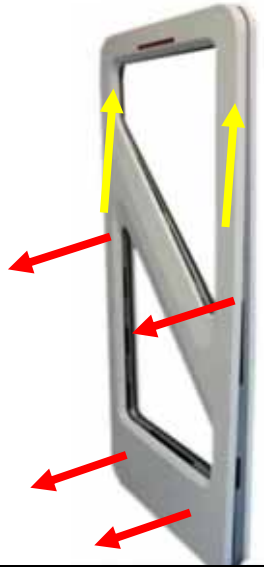
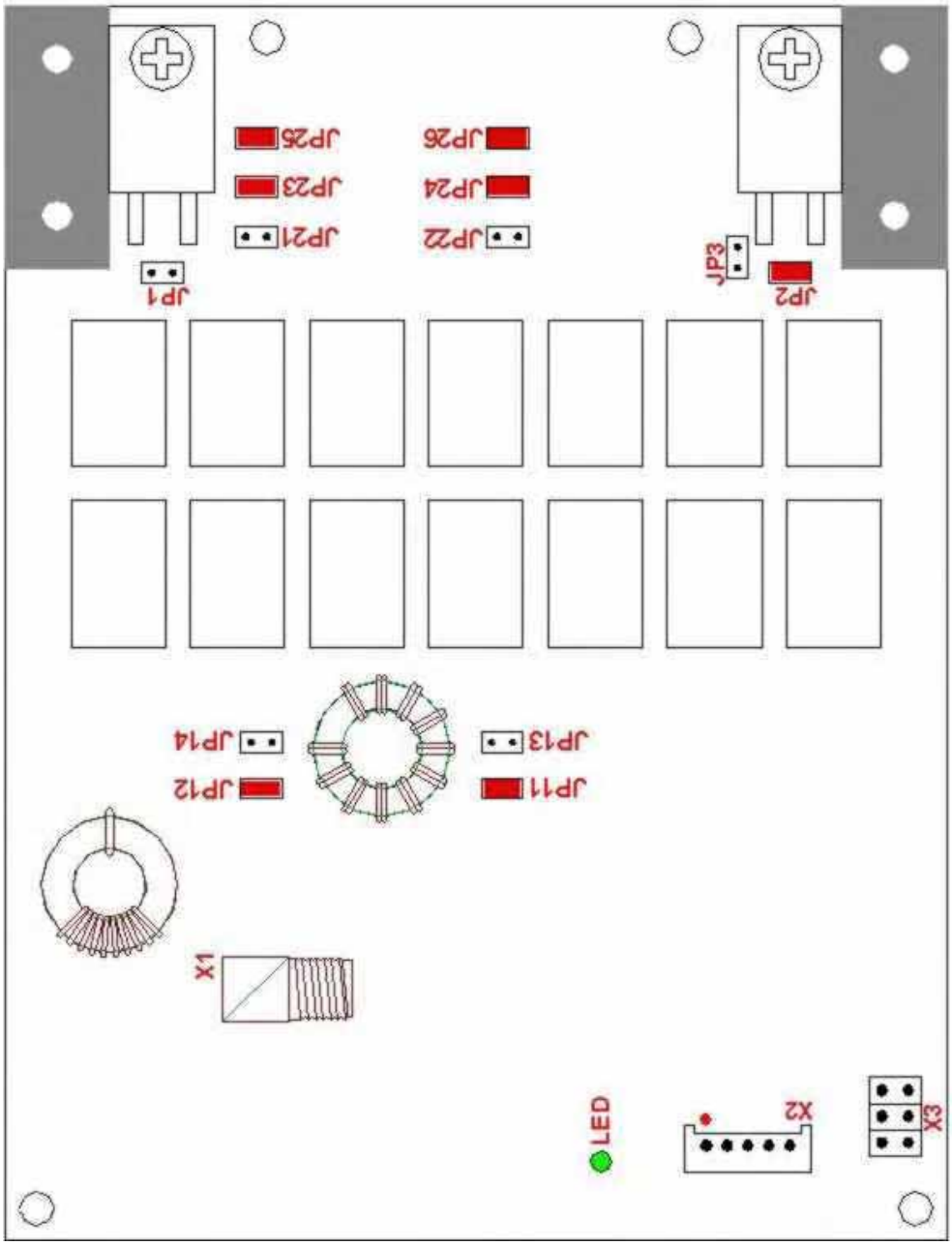
Step 1	Step 2
	

Fig. 16: Opening of the antenna base

The jumpers JP1-JP26 of the Dynamic Antenna Tuning board should be set (factory setting) as follows:

Table 5: Jumper settings for Antenna Tuner

Function	Jumper	Position
1Ω Q resistor	JP1	open
2Ω Q resistor	JP2	closed
Antenna switch	JP3	offen
Capacitor C1	JP 11,12 JP 13,14	closed open
Capacitor C2	JP 21,22 JP 23,24,25,26	open closed



Verify these settings. More on setting the ID ISC.DAT antenna tuner can be found in the corresponding installation manual (M40401-xde-ID-B).

5.2.5 Interface Connections

5.2.5.1 RS 232

The RS232 interface is connected on X3.

The transmission parameters can be configured by means of software protocol.

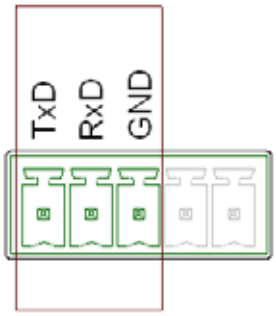


Fig. 17: RS232 interface pin-outs on X3

Acronym	Description
TxD	RS232 – (Transmit)
RxD	RS232 – (Receive)
GND	RS232 – (Ground)

Table 6: RS232 interface pin-outs

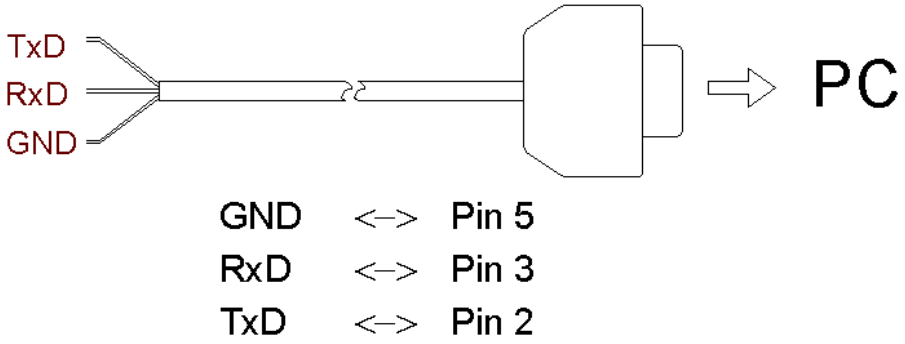


Fig. 18: Wiring example for connecting the RS232 interface

Note:
If there is an USB/RS232 converter used on the PC/Notebook side, we recommend to increase the „Char Timeout Multiplier“ parameter in the COM-Port settings from „1“ to about „5“.

5.2.5.2 LAN / TCP/IP

The Reader has an integrated 10 / 100 Base-T network port for an RJ-45. Connection is made on X1 and has an automatic “Crossover Detection” according to the 1000 Base-T Standard.

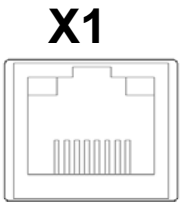


Fig. 19: LAN interface for host communication

With structured cabling CAT 5 cables should be used. This ensures a reliable operation at 10 Mbps or 100 Mbps.

The prerequisite for using TCP/IP protocol is that each device has a unique address on the network. All Readers have a factory set IP address.

Network	Address
IP-Adresse	192.168.10.10
Subnet-Mask	255.255.255.0
Port	10001
DHCP	OFF

Table 7 Standard factory configuration of the Ethernet connection

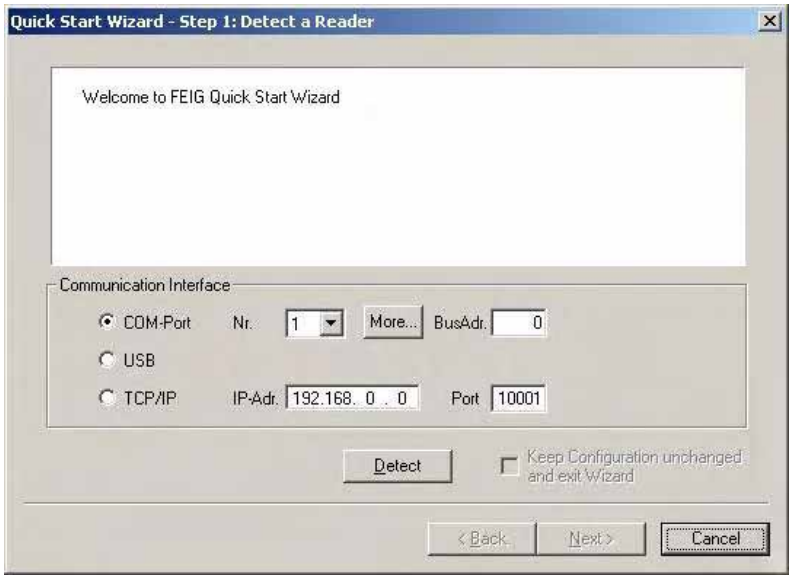
Note:

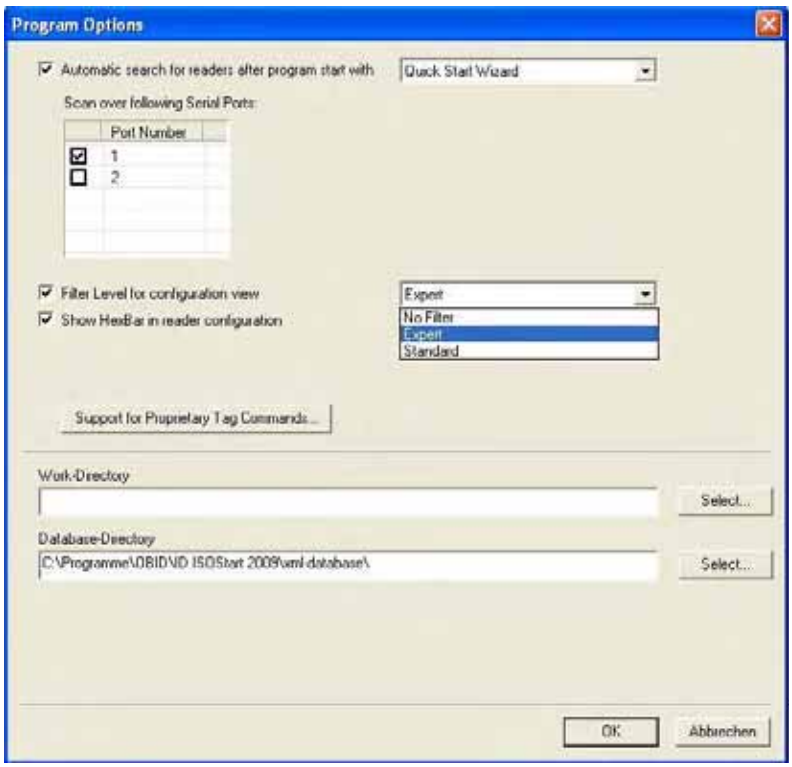
The Reader TCP/IP interface has a DHCP option.

More Information about the interfaces you will find in the manual **M01111-xde-ID-B** of the reader.

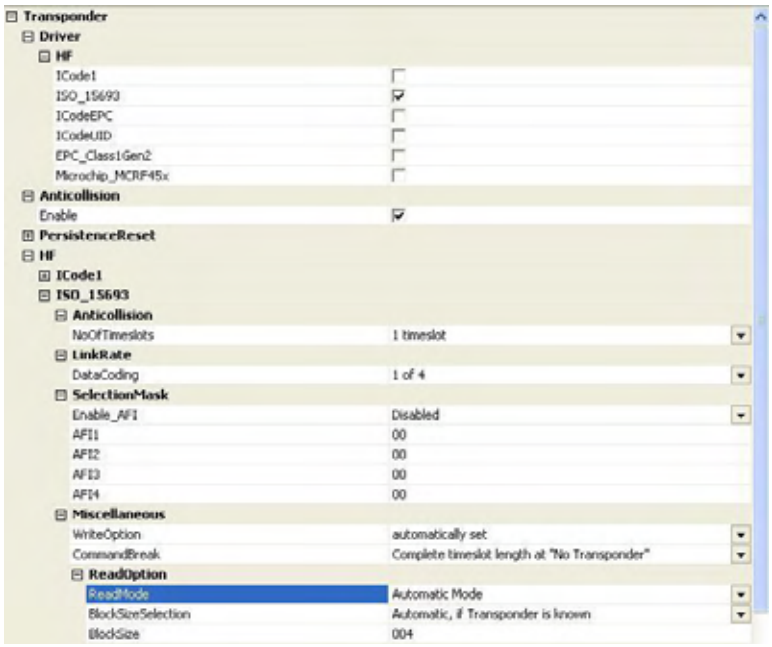
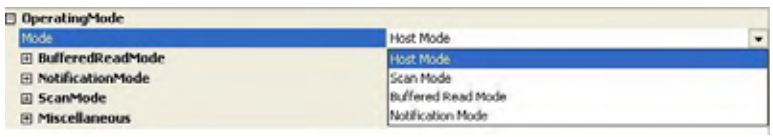
5.2.6 Reader Configuration with Multiplexer

To tune the antennas, open the ISOStart software and read out the current configuration of the Reader:

Step	Action	Note
1	Start ISO Start Software	
2	Select „Detect“	
3	Select „Keep Configuration unchanged and exit Wizard“ and click on „Exit“ This has to be done at each start of ISO-Start program otherwise the configuration of the reader will be changed.	
4	Select „Options => Program“	

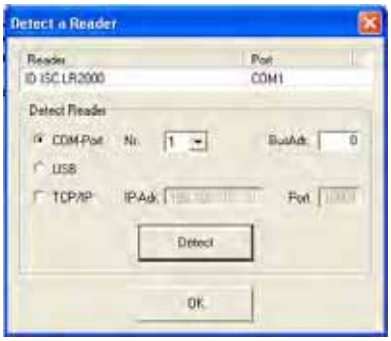
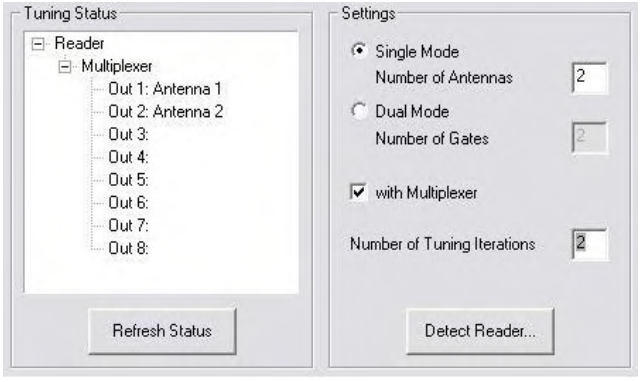
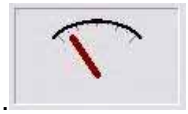
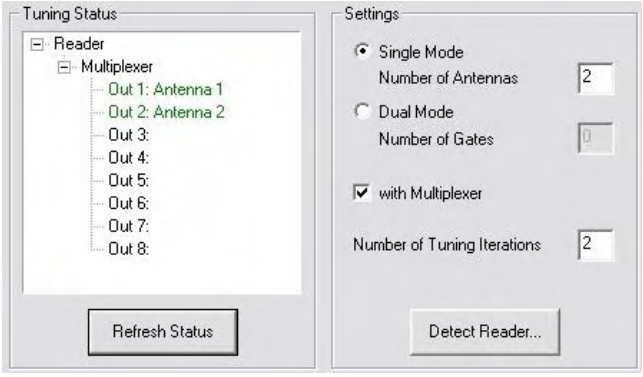
Step	Action	Note
5	Select „Expert Mode“ and confirm with OK.	
6	Select “Logical View”	

Then set the operating power, Transponder Parameters and ISO Host Mode:

Step	Action	Note
1	Select “Configuration”	
2	**Air Interface:** “RF-POWER” (here 8W) „Mulitplexer Enable“ „1 Input (Single Mode)“ „No of Output Channels „ (e.g. 2) „Antenna Active Time“ 100 x 5ms	
3	Set by clicking on „Apply“.	
4	**Transponder:** Configure the parameters as follows: • „Driver“ – here ISO 15693 • „Anticollision“ – enable • „No of Timeslots“ – 1 timeslot • „Data Coding“ – 1 of 4 • „AFI“ – Disabled	 Note: National RF regulations may require different settings. 7 Configuring the Reader in accordance with national RF regulations
5	Set by clicking on „Apply“.	
6	**Operating Mode:** For antenna tuning the reader must be set to „Host Mode“.	
7	Set by clicking on „Apply“.	

5.2.7 Tuning the Gate Antenna with Multiplexer

Before tuning the gate antenna, you must quit the ISOStart software. Then the gate can be tuned as follows:

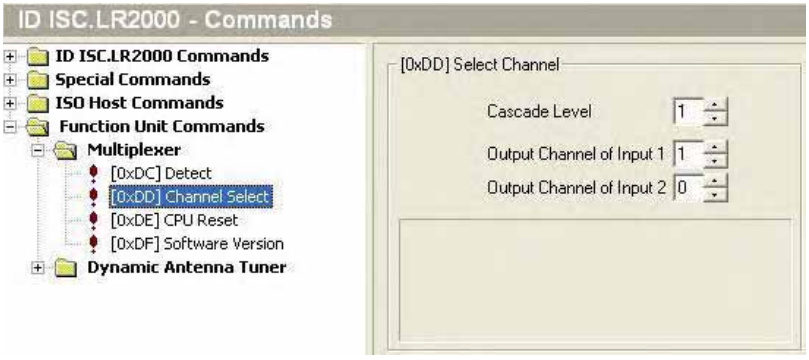
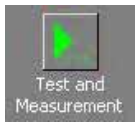
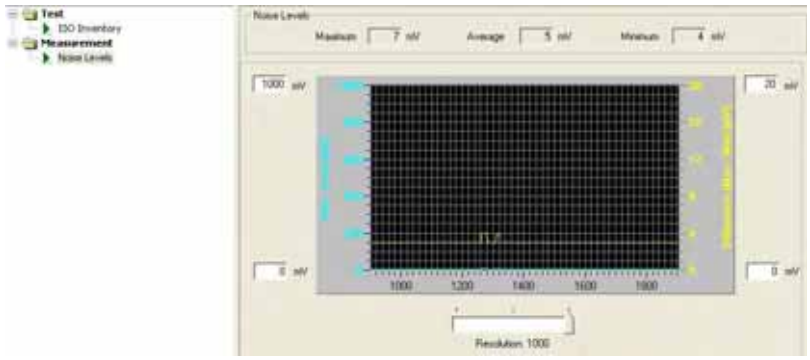
Step	Action	Note
1	Start “DATuningTool” software	 DATuningTool
2	Select “Detect Reader...”. In the „Detect Reader“ window select the interface (COM-Port 1, BusAdr. 0) and then click on “Detect”.	 
3	Use „Settings“ to enter the configuration: Single Mode, Number of Antennas 2 Click on “with Multiplexer“ Number of Tuning Iterations 3	
4	Activate „Start Tuning“ and wait until the tuning process is finished.	 ...  ...
5	The tuning status is displayed after each tuning pass. After successful tuning both antennas are shown in green.	
6	If this does not succeed on the first try, start the process again by clicking on „Start Tuning“	

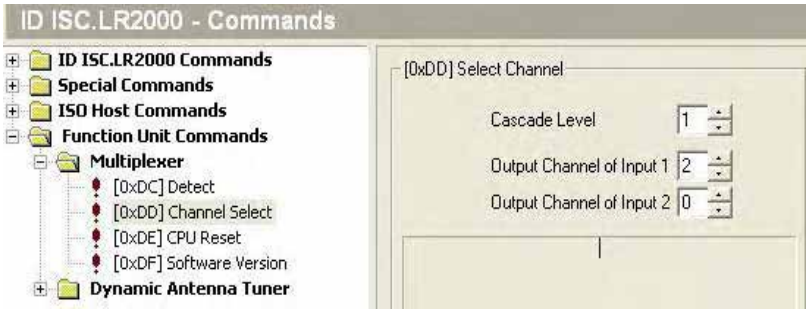
After successful tuning, close the DATuningTool.

5.3 Testing the Gate Antenna

After tuning the gate antenna, you can check for proper function using a Reader, the ISOStart service software and a Transponder. Here the Noise Level and performance of the gate are tested.

5.3.1 Checking the Noise Level

Step	Action	Note
1	Select „Function Unit Command“ „Multiplexer“ „Channel Select“ activate antenna 1. „Cascade Level = 1“ „Output Channel of Input 1 = 1“	
2	Set by clicking on “Send”	
3	Activate “Test and Measurement”	
4	Select „Noise Level“ and start by clicking on „Start“	
5	Normal Noise Level values at antenna 1: Average: < 30mV Difference (Max-Min): < 20mV	

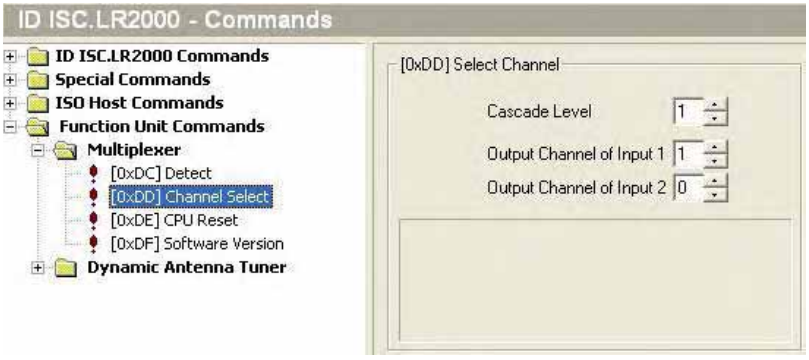
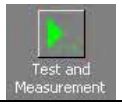
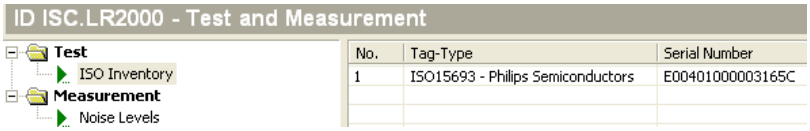
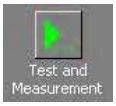
Step	Action	Note
6	Select „Function Unit Command“ „Multiplexer“ „Channel Select“ activate antenna 2. „Cascade Level = 1“ „Output Channel of Input 1 = 2“	
7	Set by clicking on „Send“.	
8	Repeat step 3 to 7 for every further antenna.	

If the values are not met, check the following:

- Are all cables pulled tight and do they make good contact?
- Were the ring cores installed in the antenna cable?
- Were the cables routed as specified?
- Are other RFID systems installed nearby?
- Are there large metal parts near 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.

5.3.2 Reading a Serial Number

Step	Action	Note
1	Attach a tag to an antenna Here to antenna at multip-lexer output 1	Use adhesive tape, for example
2	Activate antenna 1 with command: „Function Unit Commands - Multiplexer“ Parameter: „Channel Select“ „Cascade Level = 1“ „Output Channel of Input 1 = 1“	
3	Confirm with “Send”	
4	Select „Test and Measurement“	
5	Select „ISO Inventory“ function and activate by clicking on „Start“. The serial number and tag type will be shown in the display.	
6	Repeat Step 1 to 5 for every further antenna	

5.3.3 Testing the performance

For testing the performance you have to switch the reader to one of the Automatic Modes. See 5.5Activating the Automatic Mode.

A read transponder will be displayed by a blue LED on the reader or by the LED light of the antenna. See also 5.4.1Reader Setting for Indicator.

In this test the capture area of the gate antenna described in 5.1 Project Notes is checked. For other tags or other configurations the indicated ranges and read areas may differ accordingly.

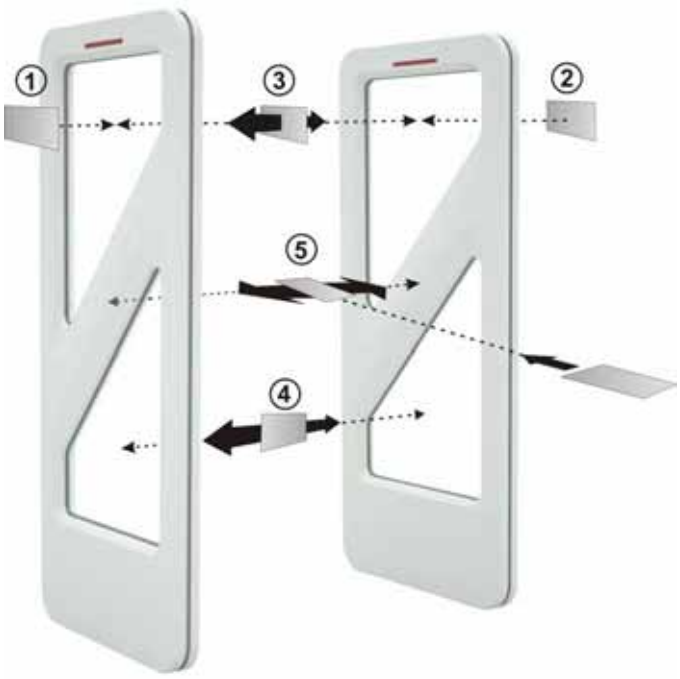


Fig. 20: Performance Test of the gate antenna

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 towards the outside, a read range of 65 to 75 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 when moving horizontally through the gate in all three read orientations.

If one or more „holes“ are detected, check the noise values on the Reader (see 5.3.1 Checking the 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 defective or has a poor contact.
- Reader, Power Splitter, Multiplexer or antenna defective.

5.4 Setting the Alarm indicators (Alarm sounder and Alarm LED lights)

The solution provided here presumes that the Alarm Sounder is switched through the digital output 2 (X2 Pin OUT2-C,OUT2-E), Alarm LED 1 of antenna No.1 through relay No.1 (X2, Pin REL1-COM) , Alarm LED 2 of antenna No.2 through relay No.2 (X2, Pin REL2-COM) and Alarm LED 3 of antenna No.3 through relay No.3 (X2, Pin REL3-COM) on the ID ISC.LRM2500-B reader. The pulse duration can be set (Digital IO / OUTPUT or RELAY) between 100 ms and 6553.5 s by adjusting the Reader configuration. The volume of the sounder could be adjusted by a potentiometer on the terminal board.

Fig. 21 Volume adjusting

To supply the Alarm LED lights with 24V DC the following jumper on the LRM2500 has to be set. JP7,8 and 9.

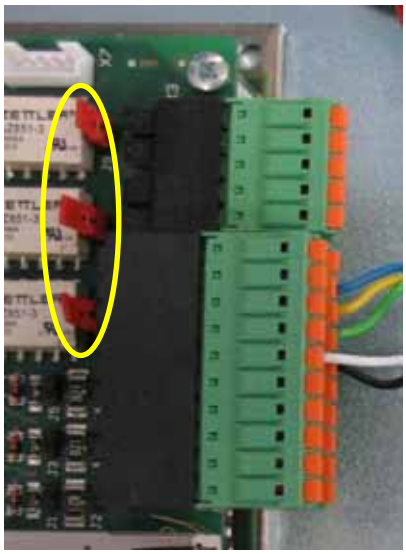
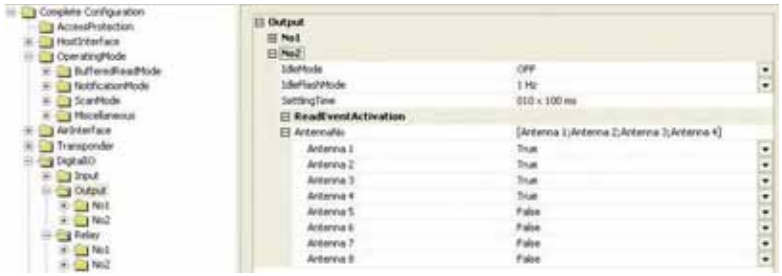
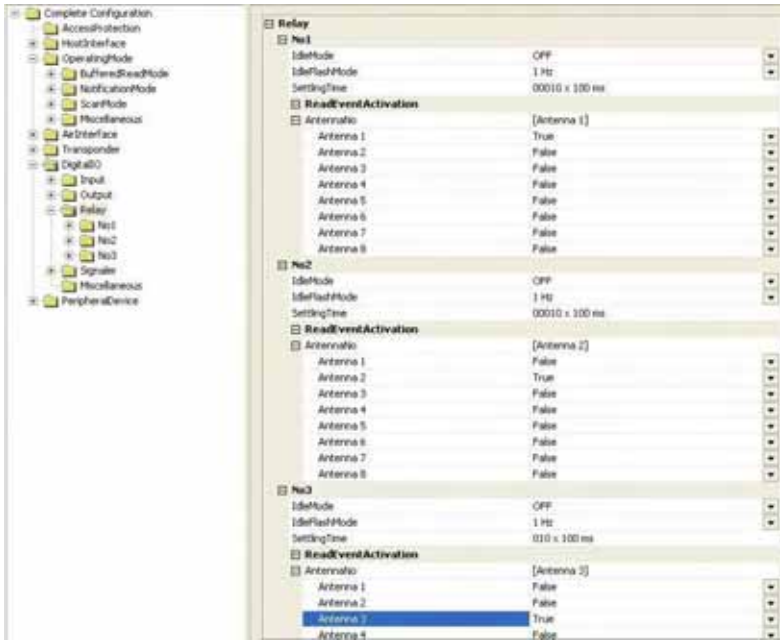


Fig. 22 Jumper settings for relay

5.4.1 Reader Setting for Indicator

The ISOStart software can be used to set the Reader configuration so that the output 2 or the relays 1 to 3 opens or closes when a Transponder is read.

Step	Action	Note
1	Start ISO Start Software	
2	Select “Configuration” and click on “Read” to read the complete configuration.	
3	**Operating Mode** Select Buffered Read Mode.	
4	Set by clicking on „Apply“.	
5	**Digital IO:** **Output2 / Sounder** Output Idle Mode: OFF Idle Flash Mode: 1Hz Setting Time: 10 „Setting Time“ set the duration time of output 2 for the alarm. (10 means 1 second) (e.g. 10 x 100ms) Assign Output 2 to antenna to all antennas of the set up „True“ means: Output 2 will be active if the reader read a valid transponder at the corresponding antenna.	
5	Set by clicking on „Apply“.	

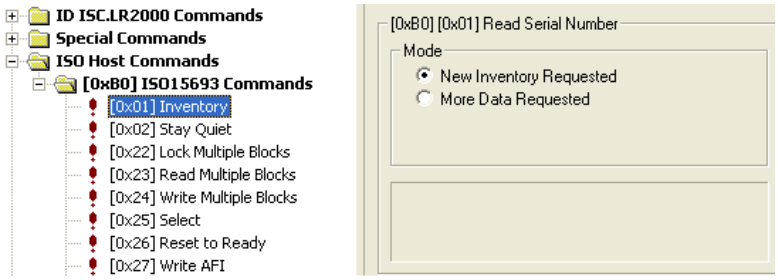
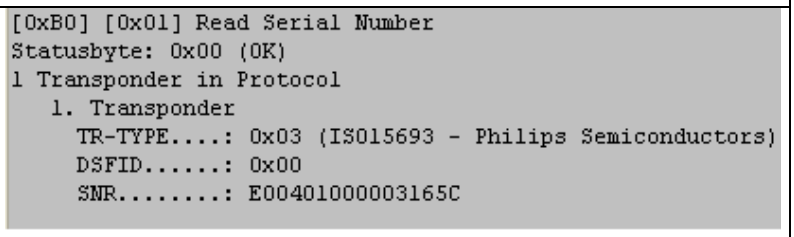
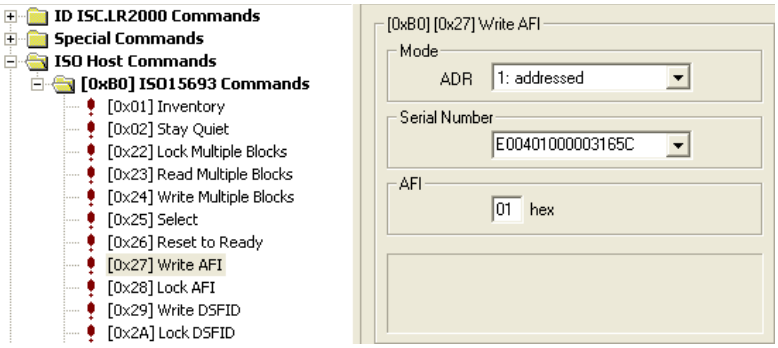
6	**Digital IO:** **Relay 1,2,3 / LED's** Output Idle Mode: OFF Idle Flash Mode: 1Hz Setting Time: 10 „Setting Time" set the duration time of relay 1,2 and 3 for alarm. (10 means 1 second) (e.g. 10 x 100ms) Relay 1 to antenna 1, Relay 2 to antenna 2 and Relay 3 to antenna 3 „True" means: Relay 1,2 or 3 will be active if the reader read a valid transponder at the corresponding antenna.	
7	Set by clicking on „Apply".	
8	**Transponder** If the alarm should occur by a transponder with valid AFI byte, you have to configure the reader as follow: ISO-15693 – Selection Mask Set "Enable AFI" Set the value for the AFI in field "AFI1" (e.g. 01) Note: Up to four different AFI values could be set.	
9	Set by clicking on „Apply"	
10	**Operating Mode Data selector (EAS-Alarm)** If the alarm should occur by an EAS, you have to configure the reader as follow: Set "EAS"	
11	Set by clicking on „Apply"	

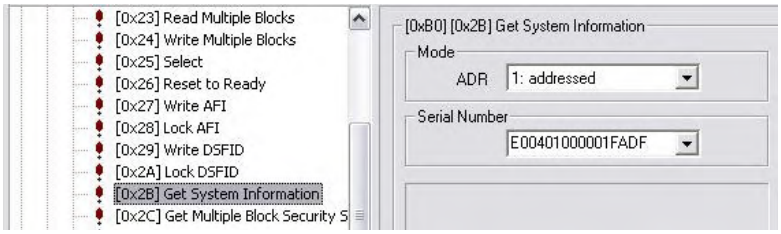
If a Gate People Counter GPC is installed, the Alarm LED lights LED 1 to 3 will be switched by the digital outputs 1 to 3 of the GPC. See page: 6 Installation of the Gate People Counter ID ISC.ANT1700/740-GPC

5.4.2 Programming a Transponder with the AFI Byte

If the Transponders will remain on the object when leaving the storage location, they must first be cancelled. 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 cancel, simply write a different code to the Transponder than for valid Transponders which trigger an alarm.

Step	Action:	Note:
1	Select „Commands“	
2	Place the Transponder in the antenna field (Antenna 1) Select [0x01] Inventory Mode: New Inventory Requested	
3	Read UID by clicking on „Send“	
4	The serial number, DSFID and Transponder type are displayed in a window. Write down the serial number of the Transponder	
5	Select „[0x27] Write AFI“ ADR: 1: addressed Serial Number: Select TransponderUID AFI: Desired AFI Number (not equal to 00)	
6	Write AFI byte on to the transponder by click on „Send“	

7	To verify, read AFI byte by using the command [0x2B] Get System Information	

5.5 Activating the Automatic Mode

The gate must be used in one of the Automatic Modes (Buffered Read, Notification or Scan Mode) to get a maximum performance. Otherwise the reading performance will be significantly reduced.

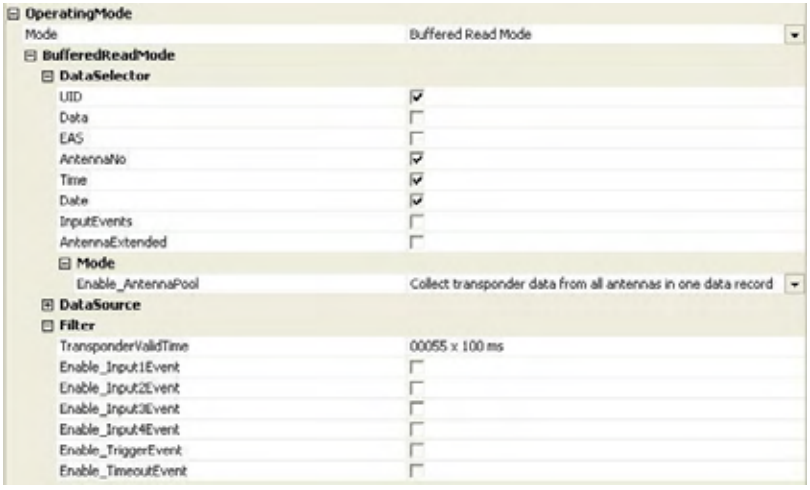
For more information, see System Manual **H01112-0e-ID-B.pdf** *ID ISC.LRM2500-A/B*

Which mode the most suitable is for your application has to be defined in advance.

In this example it is described how to activate the Buffered Read Mode.

In the automatic modes, the tags are read at maximum speed and the information is stored in the ring buffer of the reader. Data set can be read by the host.
Due to the automatic alarm features at the automatic mode, the reader/gate can also run without any interface connection (Serial, Ethernet).

To activate „Buffered Read Mode“ proceed as follows:

Step	Action	Note
1	Select „Configuration“	
2	**Operation Mode:** „Mode“ - Buffered Read Mode „Data Selector“ -UID -Antenna No -Time -Date „Filter“ Set Transponder Valid Time. (e.g. 55 x 100ms)	
3	Set clicking on „Apply“	

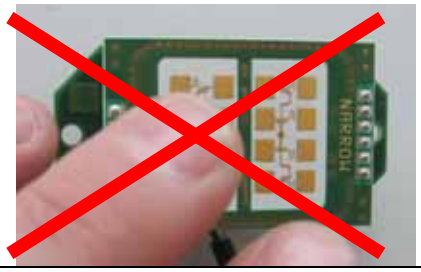
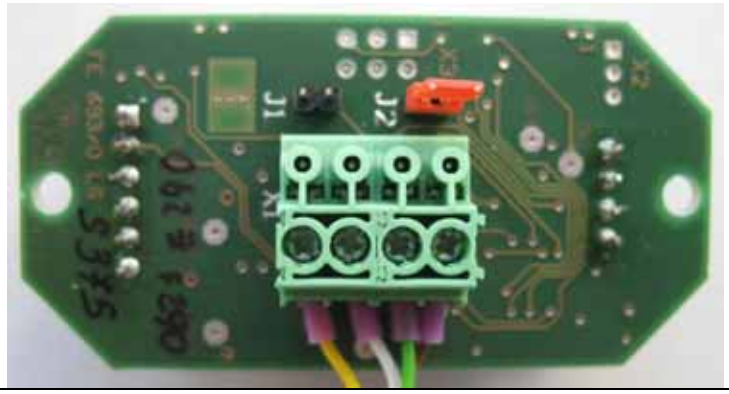
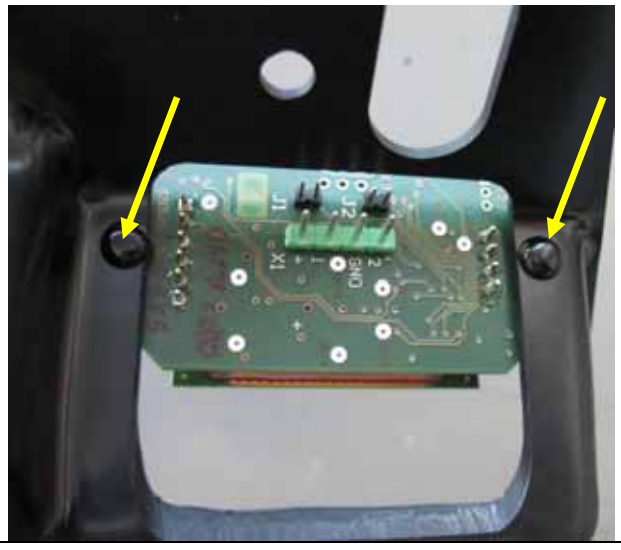
Note:

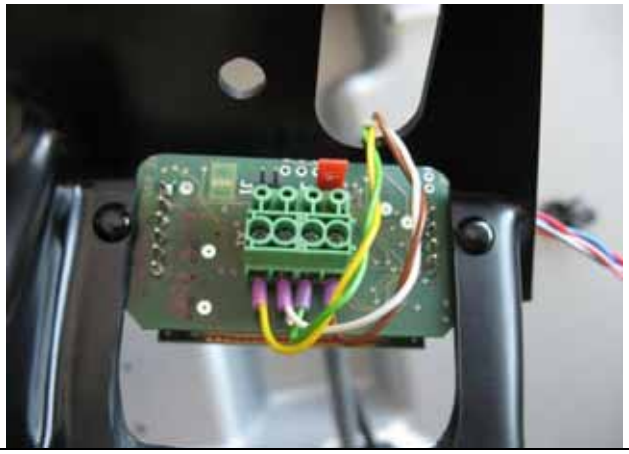
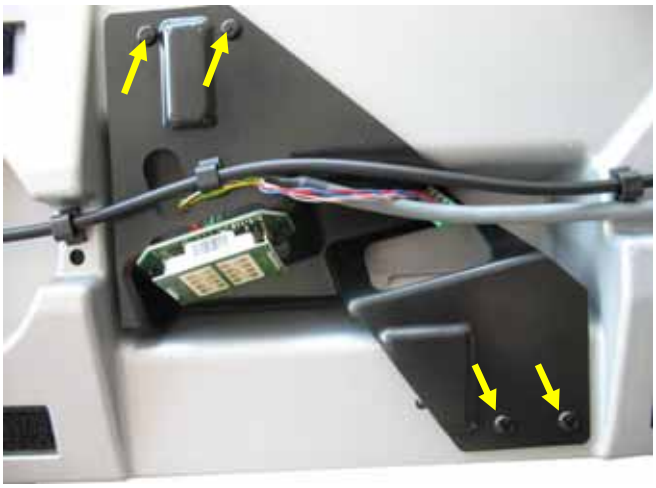
The configuration of the Notification or Scan Mode are similar (See System Manual of the reader)
To test the function of the Gate in the Buffered Read Mode, the BRM Window of ISOStart or the BRMDemo program can be used.

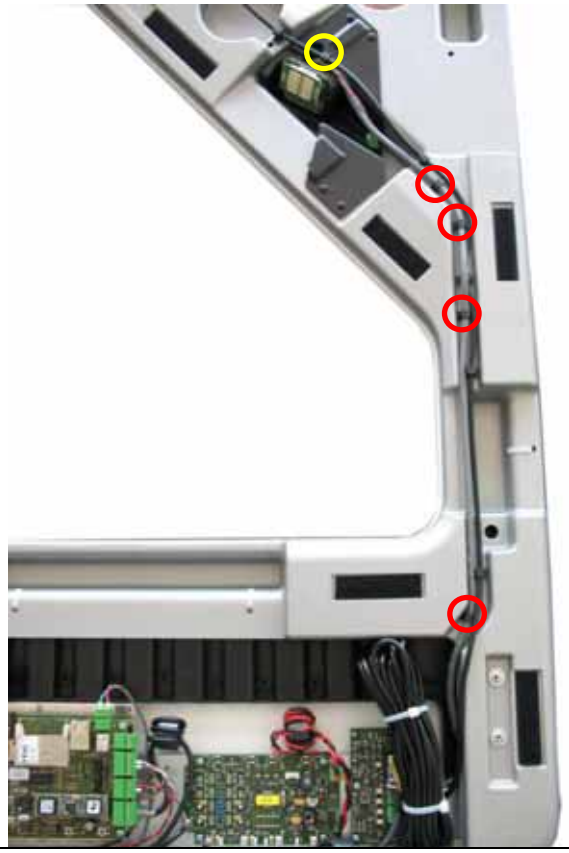
6 Installation of the Gate People Counter ID ISC.ANT1700/740-GPC

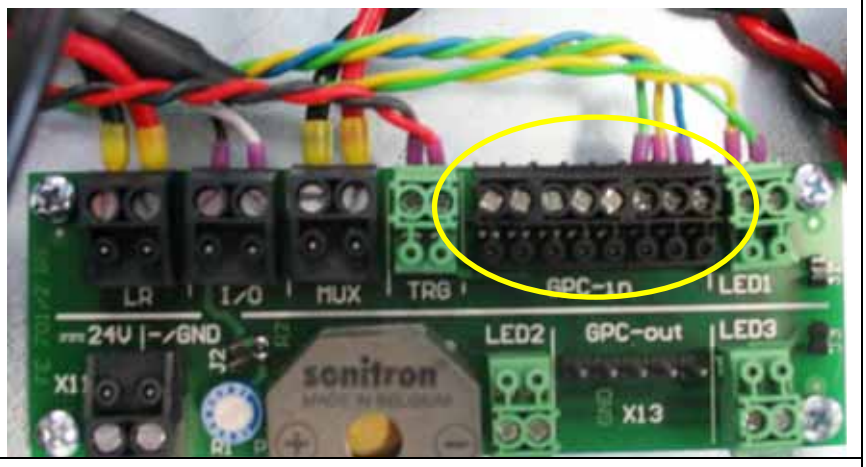
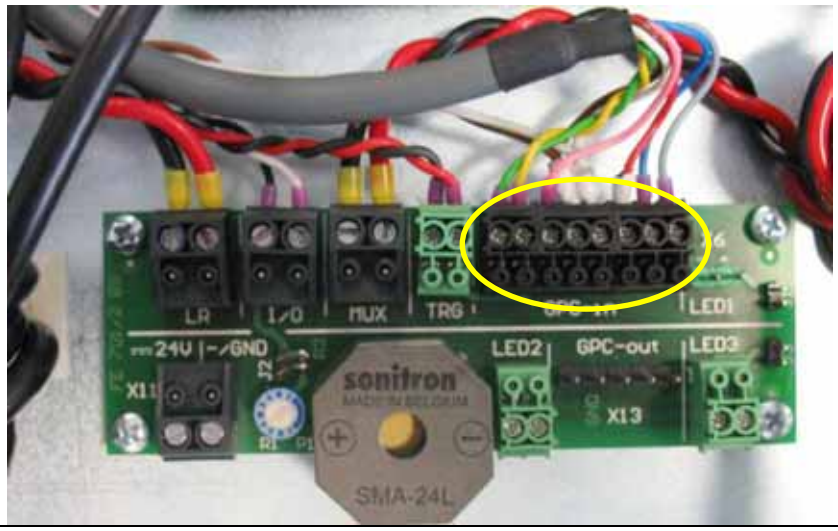
6.1 Installation and Connections

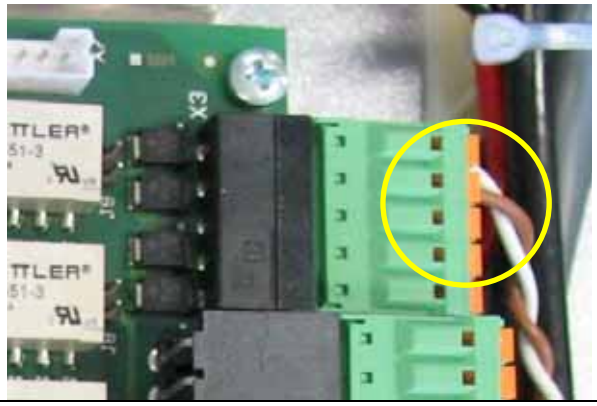
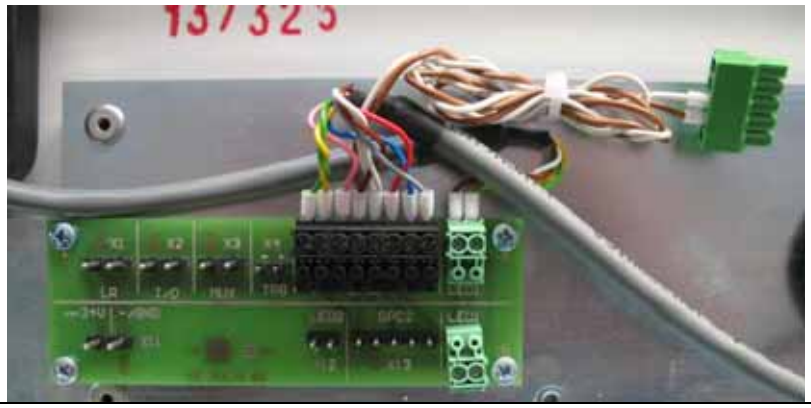
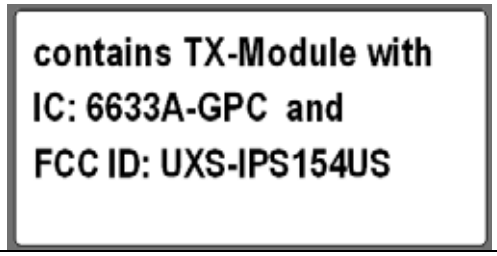
Content of the ID ISC.ANT1700/740-GPC	1. 1 piece mounting bracket 2. 1 piece Radar connection cable 3. 1 piece connection cable People Counter –Terminal board. 4. 1 piece Triggercable 5. 1 piece People Counter Board 6. 1 piece Radar module 7. 5 piece jumper 8. 4 piece Split rivet 4,0mm 9. 2 piece split rivet 3,0mm 10. 4 piece hexagon spacer sleeve M3x6 11. 4 piece screw M3x6 12. 1 piece 5 pin connection plug for 2. GPC 13. 5 piece cable-clip 14. 1 piece FCC / IC label

Step	Action	Note
1.	Attention !! Note: Do not touch the antenna surface of the Radar module to avoid damaging the electronic components and soiling.	
2.	Set sensitivity of Radar sensor by setting jumper J1 and J2. <u>Sensitivity:</u> JP1+2 open : Low JP1 closed: Middle <u>JP2 closed: High</u> JP1+2 closed: Very high Recommended Sensitivity: High	
3.	Install Radar module with split rivet 3,0 mm at the mounting bracket.	 

4.	Connect one plug of radar connection cable with X1 of Radar module. Here: yellow/white/green/brown The other plug will be used for the second radar sensor, in case of a gate with two aisle.	
5.	Install the mounting bracket in the antenna with 4 pieces. split rivet 4,0 mm	 

6.	Fix the cable with the cable clips beside the coax cable.	
7.	Install People Counter Board with the hexagon spacers and the screws into antenna foot beside the multiplexer.	

8.	Plug Radar connection cable onto X11 Sen 1 Here: yellow/white/green/brown The other plug should be connected to X12 Sen 2, but has no function at the use of only one radar sensor. Plug connection cable of people counter onto X1	
9.	Remove connector form X5 GPC-in and the three wires from X2 of the reader ID ISC.LRM2500.	
10.	Plug connection cable of People Counter onto X5/GPC-IN of Terminal Board..	

11.	Connect RS485 cable to X3 of reader.	
12.	Plug 5 pin connection plug onto X13/GPC-OUT of Terminal Board.	
13.	**Installing the People Counter at antennas Type B** The installation must be done in the same way like at the antenna Type A. Only the RS485 cable will not be connected. This cable has to be tied together to small loops with the cable tie..	
14.	After the installation you have to stick the adhesive label of the GPC below of the type plate of the antenna	

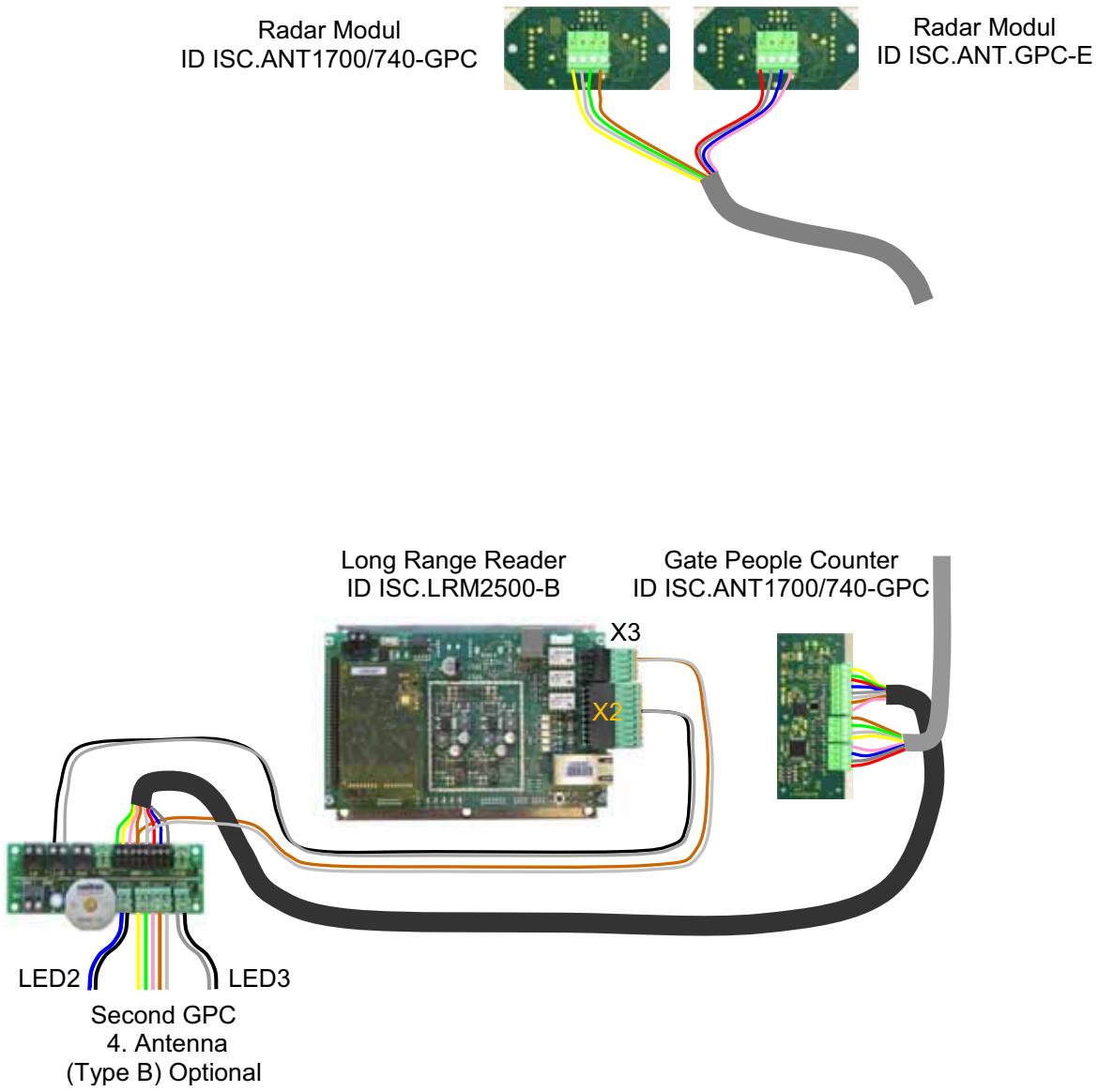
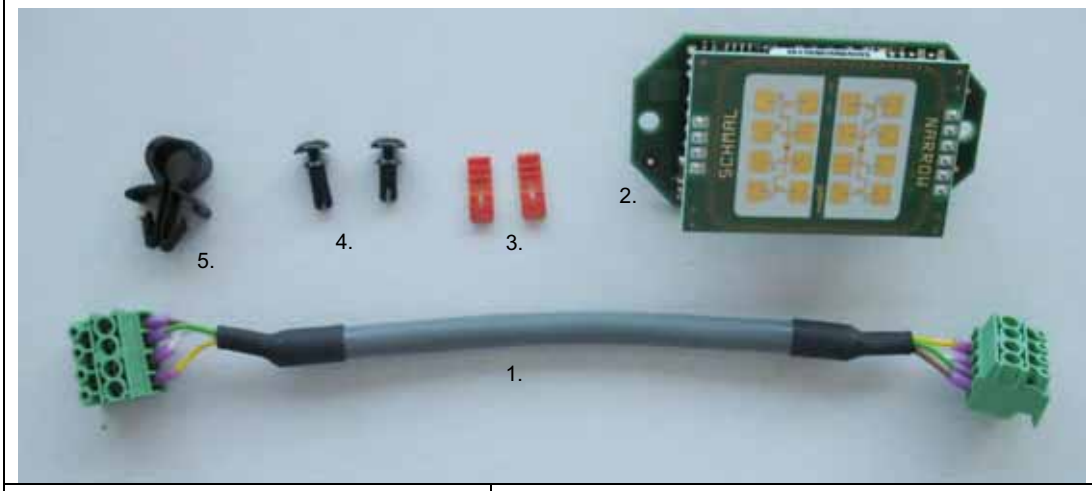
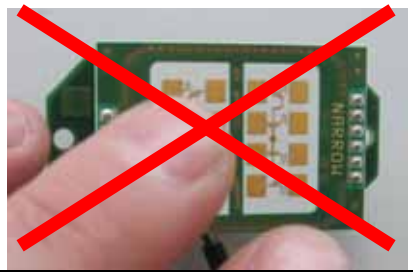
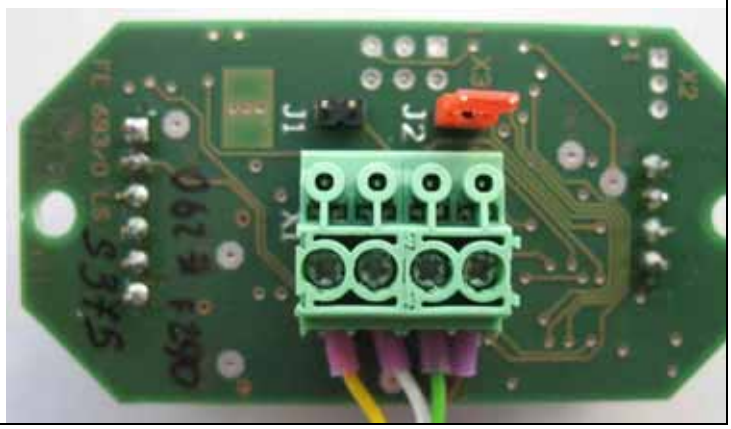


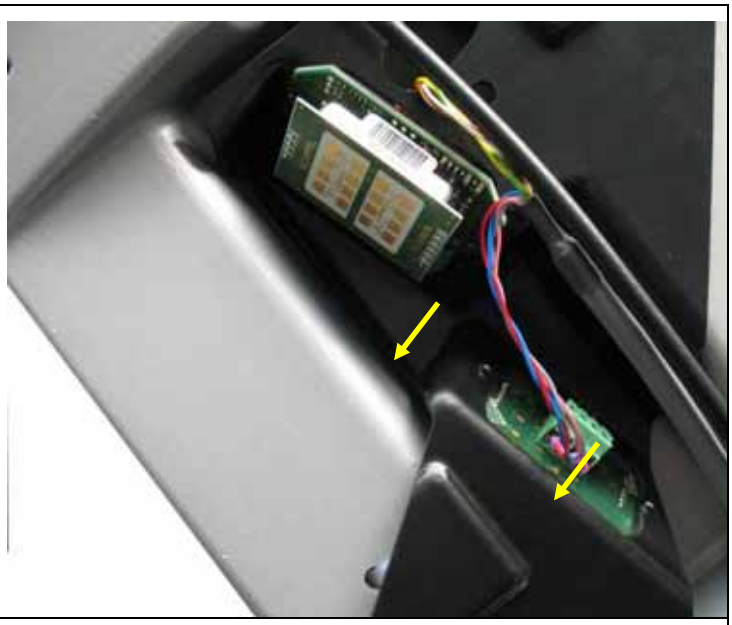
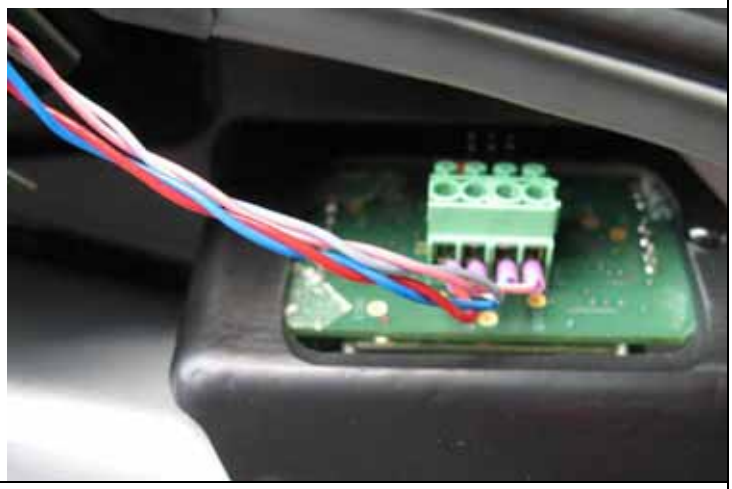
Fig. 23: Connections ID ISC.ANT1700/740-GPC

6.2 Installation ID ISC.ANT.GPC-E



Content of the ID ISC.ANT.GPC-E	1. 1 piece Radar connection cable 2. 1 piece Radar module 3. 2 piece Jumper 4. 2 piece spilt rivet 3,0mm 5. 1 piece cable-clip

Step	Action	Note
1.	Attention !! Note: Do not touch the antenna surface of the Radar module to avoid damaging the electronic components and soiling.	
2.	Set sensitivity of Radar sensor by setting jumper J1 and J2. Sensitivity: JP1+2 open: Low JP1 closed: Middle JP2 closed: High JP1+2 closed: Very high Recommended Sensitivity: High	

3.	Install Radar module with split rivet 3,0mm at the back of the mounting bracket	
4.	Connect second plug of radar connection cable with X1 of Radar module. Here: red/Grey/blue/pink	
5.	Plug second plug of Radar connection cable onto X12 Sen 2	

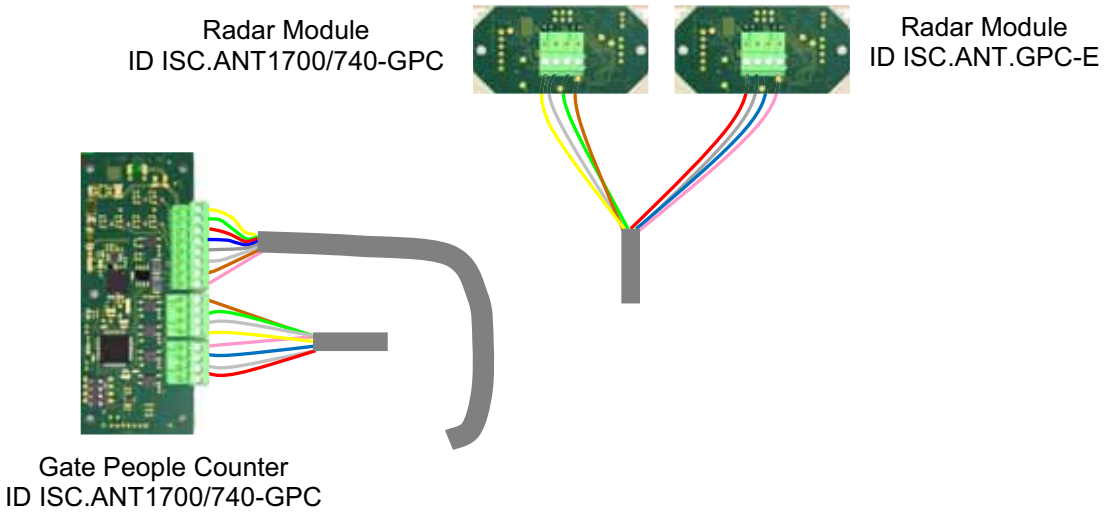


Fig. 24: Connections GPC-E 2.Radarmodule

6.3 Configuration and Test

To activate the People Counters the following settings has to be done.

Set additional the Jumpers JP10 and J11 of Reader ID ISC.LRM2500-B to configure the RS485 interface. (see also manual M01111-xde-ID-B , page 54 and 55). The Termination has to be activated via software in the reader configuration.

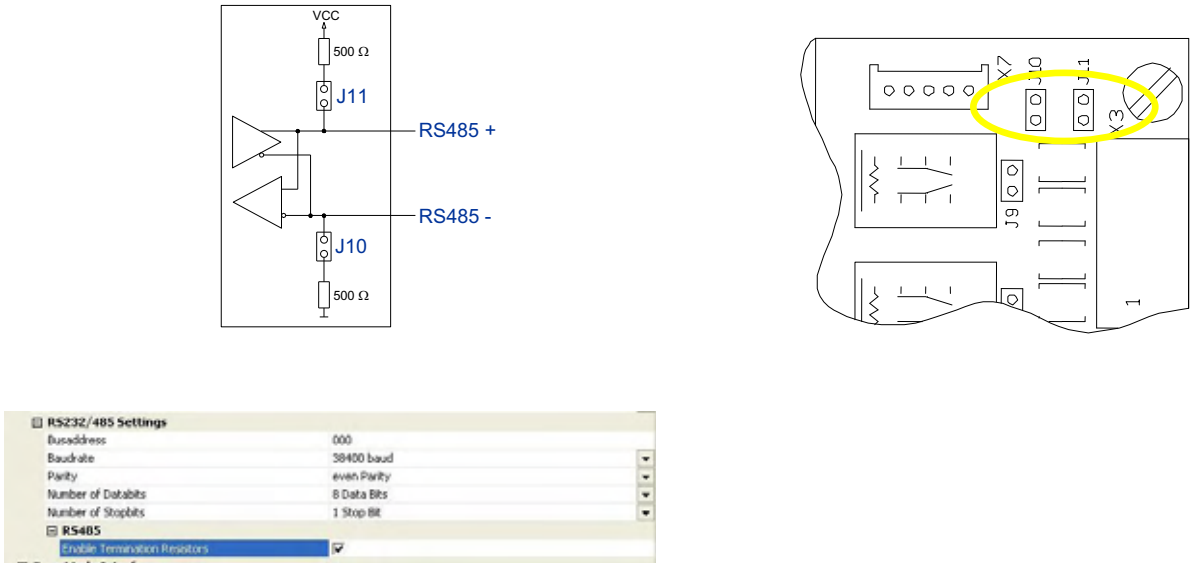


Fig. 25: Jumper settings RS485 Interface

By using several People Counters at gates with 3 to 6 aisles, you have to set the corresponding bus address. The bus address could be set by the Dip-Switch at the People Counter Board. See Fig. 26. At one reader, up to 3 People Counter (bus address 1-3) could be operated.

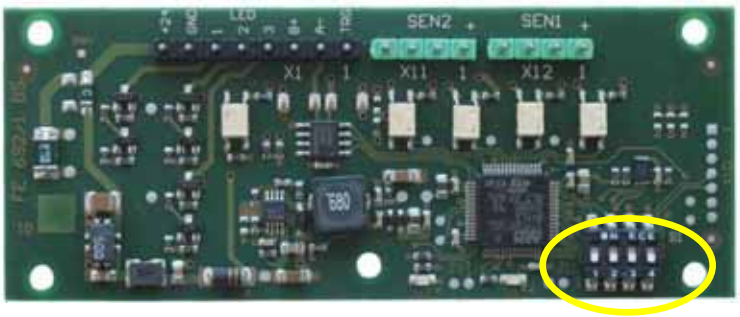


Fig. 26: Position of Dip Switch at People Counter Board

bus address	DIP-Switch S1 1	2	3	4
1	OFF/ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	OFF	OFF	ON	OFF
4	Reserved			

Table 8 Setting the bus address of People Counter

6.3.1 Connecting several People Counter

If you have to use several People Counters (max. up to 3) you could connect them parallel at the Terminal Board. For the connection you must use 5 pin shielded, twisted-pair cable. Example: LiYCY (TP) 3x2x0,25

The connection X13/GPC-Out of the first Terminal Board has to connected to X13 GPC-out of the second and third Terminal Board of the antenna /People Counter. More details to the terminal assignment of X13 you will find in 9.Annex A

e.g.

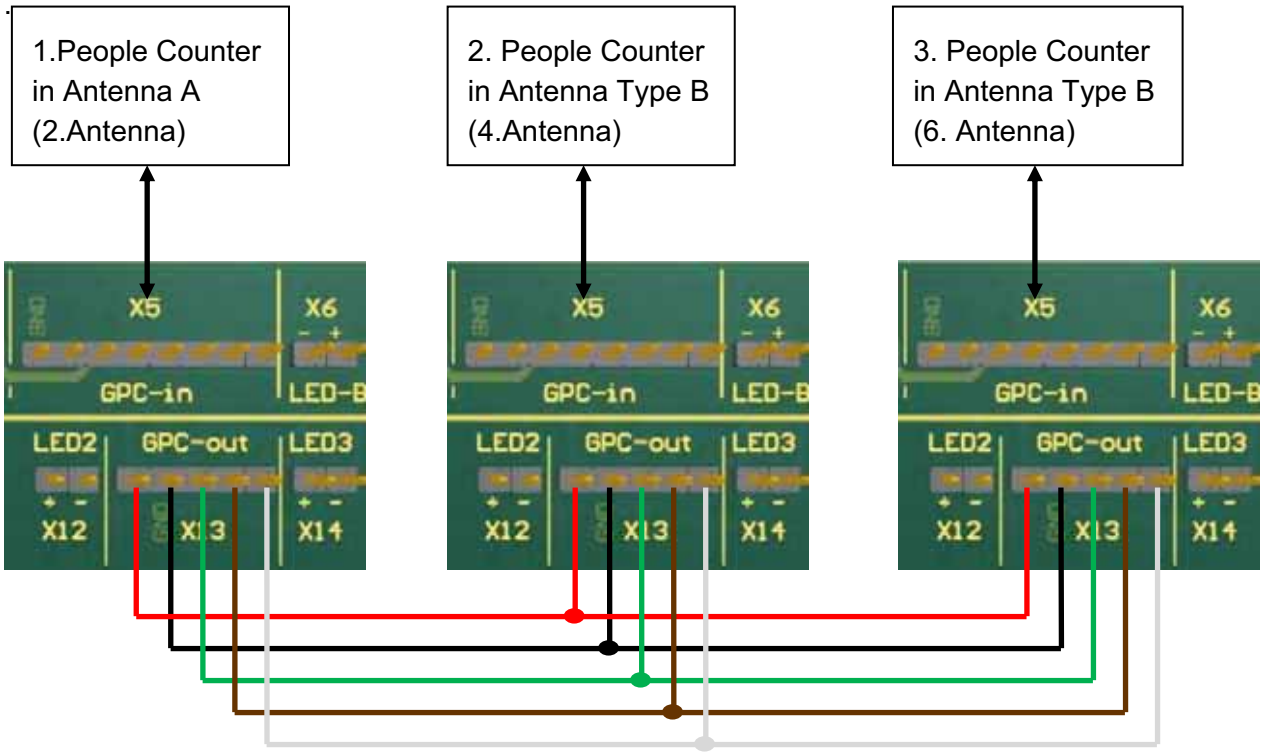
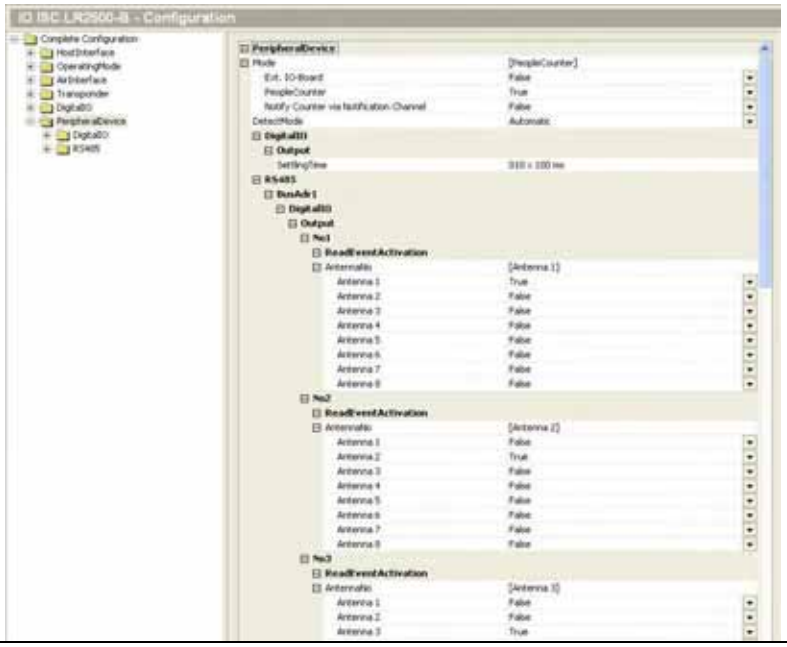
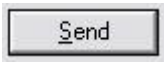
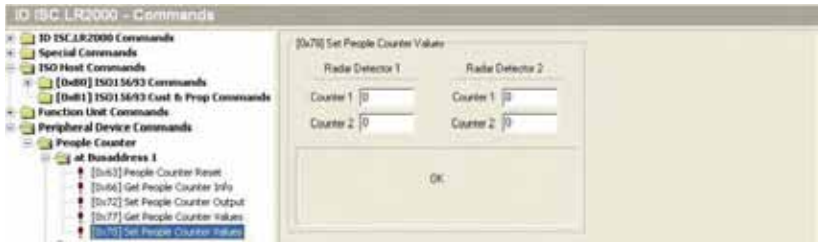
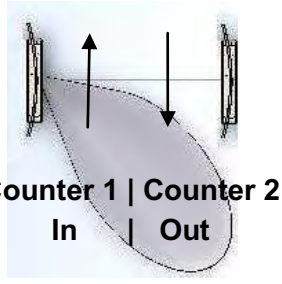
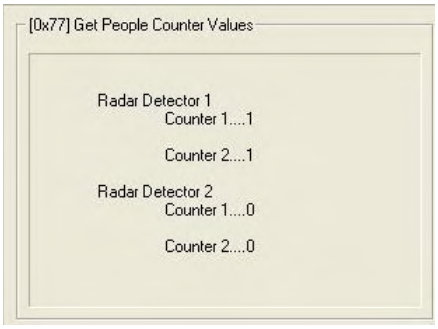


Fig. 27 Connecting the People Counters

6.3.2 Configuration and Test in ISO-Host or Buffered Read

Step	Action	Note
1	Select „Configuration“	
2	**Host Interface** Set RS 485 to “True” „Enable Termination Resistors“ The RS232/485 Settings should be set to: Busaddress=0, Baudrate=38400 baud, Parity = even , Number of Databits = 8, Number of Stopbits = 1	
3	Confirm with „Apply“	
4	**Peripheral Devices** Set People Counter to„True“ and Detection Mode for Ext. I/O-Boards to “Search up to Busaddress 1”	
5	Confirm with „Apply“	
6	**Peripheral Device Digital IO:** Setting Time: „Setting Time“ set the duration time for the alarm. (10 means 1 second) (e.g. 10 x 100ms) Assign Output 1 to antenna 1. Output 2 to antenna 2. Output 3 to antenna 3. „True“ means: Output 1,2 or 3 will be active if the reader read a valid transponder on the corresponding antenna	

7	Set by clicking on „Apply“.	
	Test: People Counter	
8	Select „Commands“	
9	Select Command - „Get Reader Info“ - Peripheral Devices	
10	Confirm with „Send“ Number of Devices should be 1	
11	Select Command „Set People Counter Values“	
12	Confirm with „Send“	
13	Select Command „Get People Counter Values“	
14	Confirm with „Send“ All counter values should be 0	
15	Walk through the gate from both directions.	

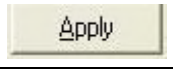
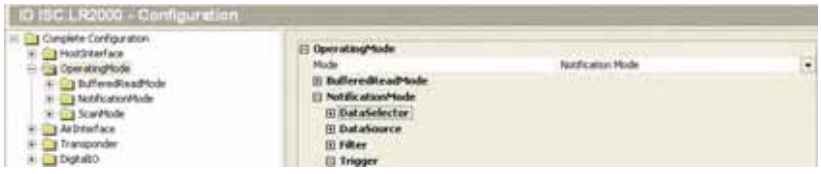
16	Select Command „Get People Counter Values“	
17	Confirm with „Send“	
18	Counter values will be displayed.	

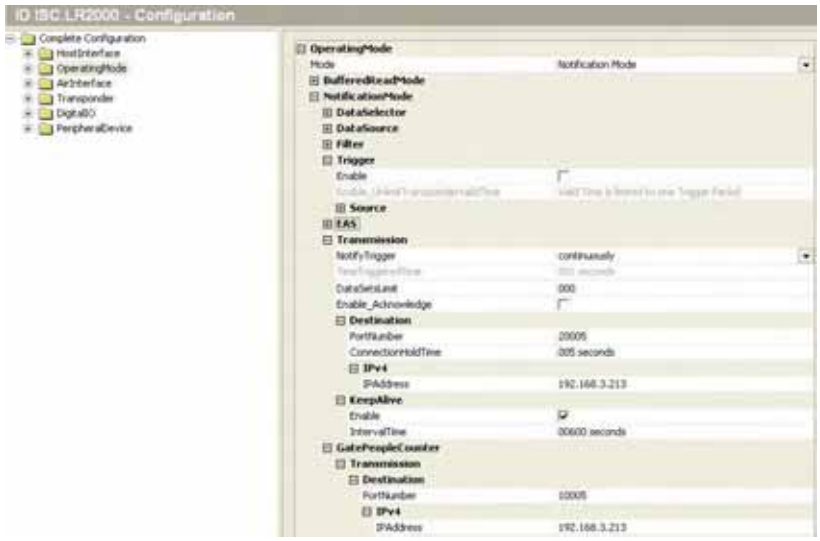
In ISO-Host or Buffered Read the People Counter has to be polled by the Host Application to get the data.

In Notification Mode the Reader sends the People Counter Data automatically to the Host.

6.3.3 Configuration and Test in Notification Mode

The following configuration hast o be done:

Step	Action	Note
1	Select „Configuration“	
2	**Peripheral Devices/CFG8** Set People Counter and Notify Counter to „True“	
3	Confirm with „Apply“	
4	**Operating Mode** Select -Notification Mode	
5	Confirm with „Apply“	

6	**Set IP Address and Port for Notification Mode** IP Address of Host e.g. here : 192.168.3.213 Port:20005 **Set IP Address and Port for People Counter** IP Address of Host e.g. here: 192.168.3.213 Port:10005	
7	Confirm with „Apply“	
9	A Test could be done with the People Counter Sample.	

7 Configuring 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 ISC.ANT1700/740 antenna with the ID ISC.LRM2500 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 ISC.ANT1700/740 antenna with ID ISC.LRM2500 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: October 2009):

1. Outside the 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
Air Interface	
RF-Power:	maximum 8 W
RF Modulation:	15%
Transponder Parameters	
RF Modulation / ISO-MODE / MOD	10%
RF Data coding ISO-MODE:	Fast (1/4) or Normal (1/256)
Timeslots ISO-MODE / NO-TS	1 or 16 Timeslots
ISO Option – BREAK:	Complete Timeslot length at „NO TAG“

8 Technical Data

8.1 Antenna ID ISC.ANT1700/740 Type A and B

Mechanical Data

• Housing	UV stabilized ABS
• Dimensions (W x H x D)	
– Antenna	741 mm x 1700 mm x 76 mm ± 3 mm
– Packing	870 mm x 1800 mm x 180 mm ± 10 mm
• Weight	
– ID ISC.ANT1700/740-A C	Approx. 19,5 kg / 24,5 kg with packing
– ID ISC.ANT1700/740-B Clear	Approx. 18,0 kg / 23 kg with packing
• Enclosure rating	IP 43
• Color	Antenna frame: signal white RAL 9003 Antenna base: silver grey RAL 9022
• Mounting	
– No. of attaching points	2
– Recommended anchors	∅ 10 mm
– Recommended minimum load capacity of the floor fastener	5000 N / anchor
• Maximum horizontal load on the top edge of the antenna	250 N*

Electrical Data****

• Supply Voltage	24 V ⎓ ± 15 % Noise Ripple : max. 150 mV
• Power Consumption	max. 32 VA
• Operating Frequency	13,56 MHz
• Maximum transmitting power per antenna	8 W
• Permissible overall transmitting power per antenna gate	
– EU-territory (per EN 300 330)	8.0 W
– USA (per. FCC Part 15)	8.0 W
- Canada (per RSS 210)	8.0 W

• **Outputs**	
– 1 Optocoupler	**24 V ⎓ / 30 mA**
– 1 Optocoupler	**Reader Synchronization**
– 3 Relay (3 x NO)	**24 V ⎓ / 1 A (LED Alarm Antenna 1-3)**
• **Inputs**	
– 1 Optocoupler	**Max. 24 V ⎓ / 20 mA**
– 1 Optocoppler	**Reader Synchronisation**
• **Interfaces**	**RS232 / RS485** **USB** **Ethernet (TCP/IP)**
• **Protocol Modes**	**FEIG ISO HOST** **BRM (Data Filtering and Data Buffering)** **Scan Mode (RS 232/485)** **Notification Mode (TCP/IP)**
• **Supported Transponders**	**ISO 15693, ISO 18000-3-A, (EM HF ISO Chips, Fujitsu HF ISO Chips, KSW Sensor Chips, Infineon my-d, NXP I-Code , STM ISO Chips, TI Tag-it)** **NXP I-Code 1**
• **Ranges / pass-through width in gate with multiplexer**	
– One tag orientation	**approx. 114 / 124 cm****
– All tag orientations	**approx. 104 / 110 cm*****
• **Antenna connection**	**1 x SMA plug (50 Ω)**
• **Antenna connector cable**	
- Type B	**RG58, 50 Ω, approx. 7,20 m long**

Ambient Conditions

- **Temperature range**
  - **– Operating** **–25 °C to +50 °C**
  - **– Storage** **–25 °C to +70 °C**

Applicable Standards

- **RF approval**
  - **– Europe** **EN 300 330**
  - **– USA** **FCC Part 15**
  - **- Canada** **RSS 210**
- **EMC** **EN 301 489**
- **Safety**
  - **– Low Voltage Directive** **EN 60950-1**
  - **– Human Exposure** **EN 50364**

* Persistent deformation after load release approx. 1 cm.

** Qty. 2 ID ISC.ANT1700/740-A/-B antennas, antenna spacing (antenna center), same flow direction, Tag 46 mm x 75 mm ISO15693, sensitivity / minimum field strength H_{min}=60 / 40 mA/m rms, transmitting power 8 W, tag orientation parallel to antenna for horizontal movement through the antenna. The maximum antenna distance also depending of the strength of the Transponder answer signal! Z.B NXP I-Code SLi / NXP I-Code SLi-S

*** Qty. 2 ID ISC.ANT1700/740-A/-B antennas, antenna spacing (antenna center), Tag 46 mm x 75 mm ISO 15693, sensitivity / minimum field strength H_{min}=60 / 40 mA/m rms, transmitting power 8 W, aligned in all 3 dimensions for horizontal movement through the antenna. The maximum antenna distance also depending of the strength of the Transponder answer signal! Z.B NXP I-Code SLi / NXP I-Code SLi-S

8.2 People Counter ID ISC.ANT1700/740-GPC and ID ISC.ANT.GPC-E

Mechanical Data

• Housing	Printed Boards
• Board Dimensions (B x H x T)	
– People Counter Board	100 mm x 40 mm x 16 mm ± 1 mm
– Radar Sensor Board	60 mm x 30mm x 25 mm ± 1 mm
• Weight	
– ID ISC.ANT1700/740-GPC	ca. 200 g / 290 g (0.64 lb) with packing
– ID ISC.ANT.GPC-E	ca. 50 g / 100 g (0.22 lb) with packing
• Mounting	
– No. of attaching points	People Counter: 4 / Radar Sensor: 2

Electrical Data

• Supply Voltage	• 24 V ⎓ ± 15 % Noise Ripple : max. 150 mV
• Power Consumption	• max. 2 VA
• Operating Frequency	• 24,125 GHz
• RF-Output power	• 16 dBm (e.i.r.p.)
• Temperature range	
– Operation	–25 °C bis +55 °C
– Storage	–25 °C bis +85 °C

8.3 Approval

As per Section 7 Configuring the Reader in accordance with national RF regulations

8.3.1 Europe (CE)

8.3.1.1 Antenna ID ISC.ANT1700/7400

This RF equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC dated March 99.

CE

Equipment Classification according to ETSI EN 300 330 and ETSI EN 301 489: Class 2

The technical data of the ID ISC.LRM2500 Reader built into the ID ISC.ANT1700/740-A antenna can be found in the Installation Manual which is included with the device.

8.3.1.2 People Counter ID ISC.ANT1700/740-GPC

This RF equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC dated March 99.

CE !

Equipment Classification according to ETSI EN 300 330 and ETSI EN 301 489: Class 2

8.3.2 USA (FCC) and Canada (IC)

8.3.2.1 Antenna ID ISC.ANT1700/740

Product name:	**ID ISC.ANT1700/740**
Antenna name:	**ID ISC.ANT1700/740 Type A and Type B**
Reader name:	**ID ISC.LRM2500-B**
FCC ID: **IC:**	**PJMLRM2500** **6633A-LRM2500**
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 ISC.LRM2500-B Reader built into the ID ISC.ANT1700/740 antenna can be found in the Installation Manual which is included with the device.

8.3.2.2 People Counter ID ISC.ANT1700/740-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.

8.3.3 USA and Canada (UL)

In preparation!

The following picture indicates the label position:

9 Annex A

9.1 Terminal assignment “Terminal Board”

Terminal	Acronym	Description
X1 / LR		**24V DC Reader**
X1 / Pin 1		+24 V DC Reader
X1 / Pin 2	GND	GND Reader
X2 / I/O		**24V DC Input/Output**
X2 / Pin 1		+24 V DC Input/Output
X2 / Pin 2	GND	GND Input/Output
X3 / MUX		**24V DC Multiplexer**
X3 / Pin 1		+24 V DC Multiplexer
X3 / Pin 2	GND	GND Multiplexer
X4 / TRG		**Trigger People Counter 1**
X4 / Pin 1	+	TRG Trigger People Counter
X4 / Pin 2	-	GND Trigger People Counter
X5 / GPC-in		**Connection Cable to People Counter**
X5 / Pin 1		+24V DC LED2
X5 / Pin 2		+24V DC LED3
X5 / Pin 3		n.c.
X5 / Pin 4		RS485-A
X5 / Pin 5		RS485-B
X5 / Pin 6		TRG Trigger People Counter
X5 / Pin 7		+24 V DC People Counter
X5 / Pin 8	GND	GND People Counter
X6 / LEDB		**Connection LED / Alarm light B-Antenna**
X14 / Pin 1	+	+24V DC LEDB
X14 / Pin 2	-	GND LEDB
X11		**24V DC Power Supply**
X11 / Pin 1	24V	Power Supply +24 V DC
X11 / Pin 2	- / GND	Ground – Power Supply

X12 / LED2		**Connection LED / Alarm light 2. Antenna**
X12 / Pin 1	+	+ 24 V DC LED2
X12 / Pin 2	-	GND LED2
X13 / GPC-out		**Connection Cable to 2. People Counter**
X13 / Pin 1	+	+24 V DC People Counter 2
X13 / Pin 2	GND	GND People Counter 2
X13 / Pin 3		TRG Trigger People Counter
X13 / Pin 4		RS485-A
X13 / Pin 5		RS485-B
X14 / LED3		**Connection LED / Alarm light 3. Antenna**
X14 / Pin 1	+	+24V DC LED3
X14 / Pin 2	-	GND LED3

Table 9: Pin-Configuration X11-X14 Terminal Board

9.1 Internal wiring

Terminal	Acronym	Description
X1 / LR		**24V DC Reader**
X1 / Pin 1		X13 +24 V DC Reader (red)
X1 / Pin 2	GND	X13 GND Reader (black)
X2 / I/O		**24V DC Input/Output**
X2 / Pin 1		Reader LR2500 X2 Pin Out2-C (white)
X2 / Pin 2	GND	Reader LR2500 X2 Pin Out2-E (black)
X3 / MUX		**24V DC Multiplexer**
X3 / Pin 1		X1 +24 V DC Multiplexer (red)
X3 / Pin 2	GND	X1 GND Multiplexer (black)
X5 / I/O		**Relay Output**
X5 / Pin 1		Reader LR2500 X2 Pin REL3-COM (blue)
X5 / Pin 2		Reader LR2500 X2 Pin REL2-COM (yellow)
X5 / Pin 3		Reader LR2500 X2 Pin REL1-COM (green)
X6 / LED 1		**LED**
X6 / Pin 1		LED X1 + (green)
X6 / Pin 2	GND	LED X1 - (yellow)