



ID ISC.ANT.U500/270

Type DM Direction Mode



Note

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General information's regarding this document

- The sign "☞" indicates extensions or changes of this manual compared with the former issue.
- If bits within one byte are filled with "-", these bit spaces are reserved for future extensions or for internal testing- and manufacturing-functions. These bit spaces must not be changed, as this may cause faulty operation of the reader.
- The following figure formats are used:
0...9: for decimal figures
0x00...0xFF: for hexadecimal figures,
b0...1 for binary figures.
- The hexadecimal value in brackets "[]" marks a control byte (command).

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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.



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.ANT.U500/270 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 surface.

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

3.1 Scope of delivery

3.1.1 Antenna ID ISC.ANT.U500/270 Type DM (Direction Mode)

- Antenna ID ISC.ANT.U500/270 incl. UHF Reader Module and Mounting bracket.
- Mounting Instruction



3.2 Performance Features of the ID ISC.ANT.U500/270 Antennas

The ID ISC.ANT.U500/270-DM (**D**irection **M**ode) antenna is a version with integrated Long Range Reader ID ISC.LRU1002

Depending on the antenna configuration, one, two or all three read orientations of the Smart Tags and various distances are possible.

The antenna can be used for detecting both product and persons. Another feature is that the antenna gives the information of the moving direction of the detected transponders when passing the antenna.

It is for indoors use, only.

3.3 Available Antenna Types

The following products are currently available:

Antenna Type	Description
ID ISC.ANT.U.500/270-DM FCC Order No. 4922.000.00	Antenna with Reader, Multiplexer and Mounting bracket
ID ISC.ANT.U500/270-DM EU Order No. 4923.000.00	Antenna with Reader, Multiplexer and Mounting bracket
ID NET.24V-B Order No. 2557.000.00	Power Supply without power cable.
ID CAB.NET.24V-B-EU Order No. 2558.000.00	Cable with European Plug
ID CAB.NET.24V-B-GB Order No. 2559.000.00	Cable with GB/UK Plug
ID CAB.NET.24V-B-US Order No. 2560.000.00	Cable with US Plug

Table 1: Available Antenna Types and Accessories

4 Installation and Wiring

4.1 Mounting Preparation

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

Place the packed antenna on the floor or table with the top side facing up. Carefully open the box and then remove the antenna. Remove the mounting bracket from the antenna and use it as drilling template.

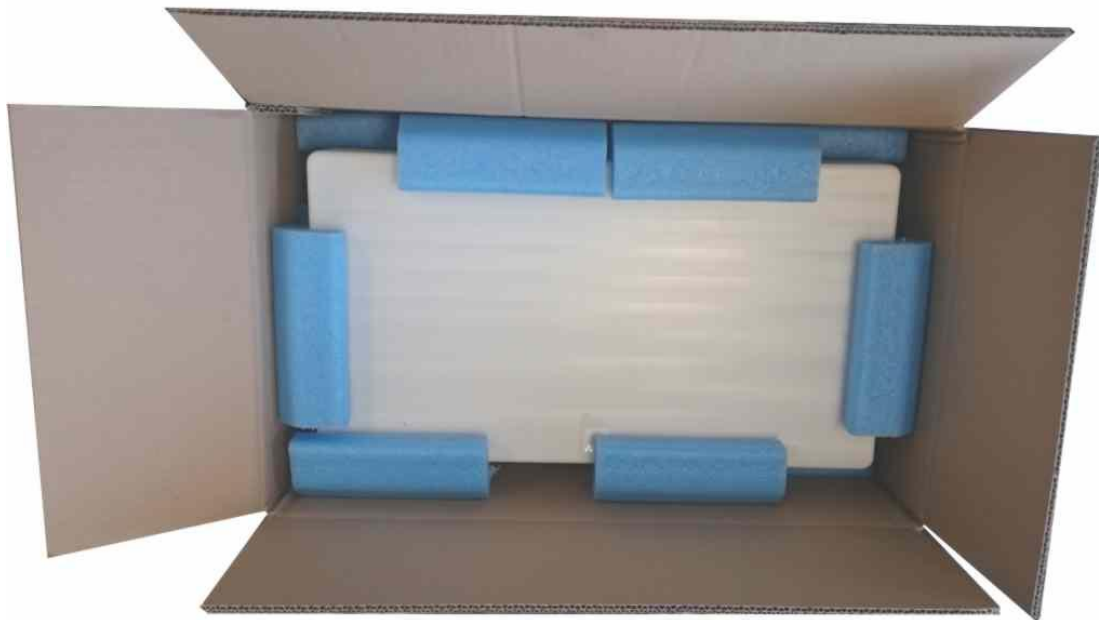


Fig. 1: Packed Antenna

4.2 Installing the antenna

4.2.1 Dimensions of the antenna

The overall dimensions of the antenna are shown in Fig. 2

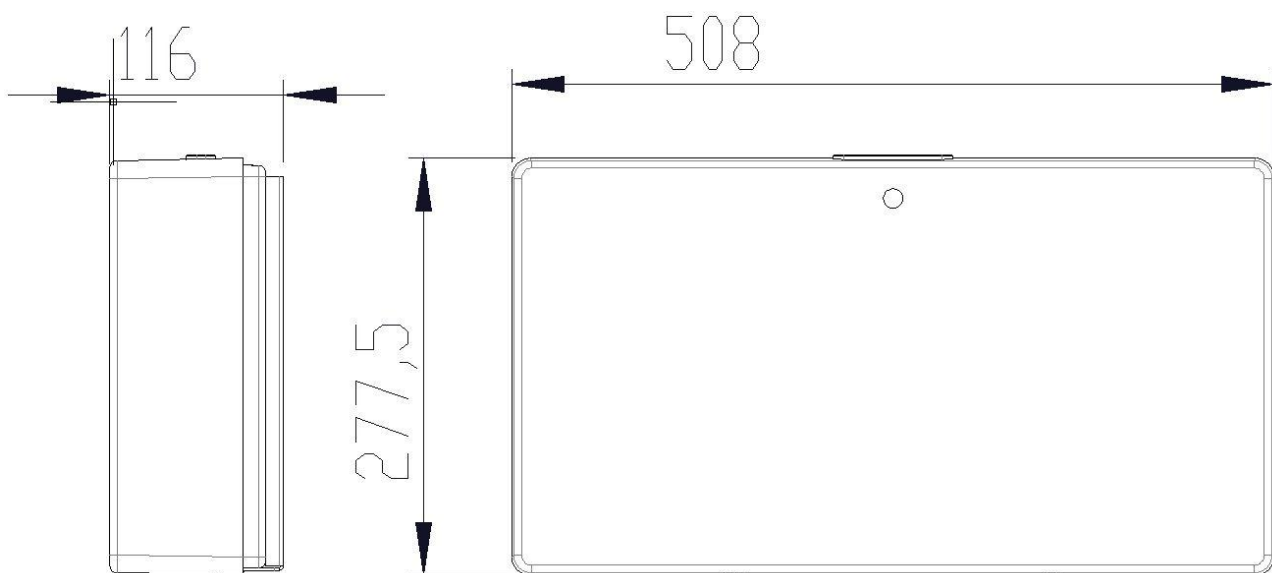


Fig. 2: Antenna outside dimensions

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 can be marked and drilled for the antenna mounting bracket. The mounting bracket could be used as drilling template. It is also possible to mount the antenna bracket to a VESA bracket.

The dimensions are shown in Fig. 3:

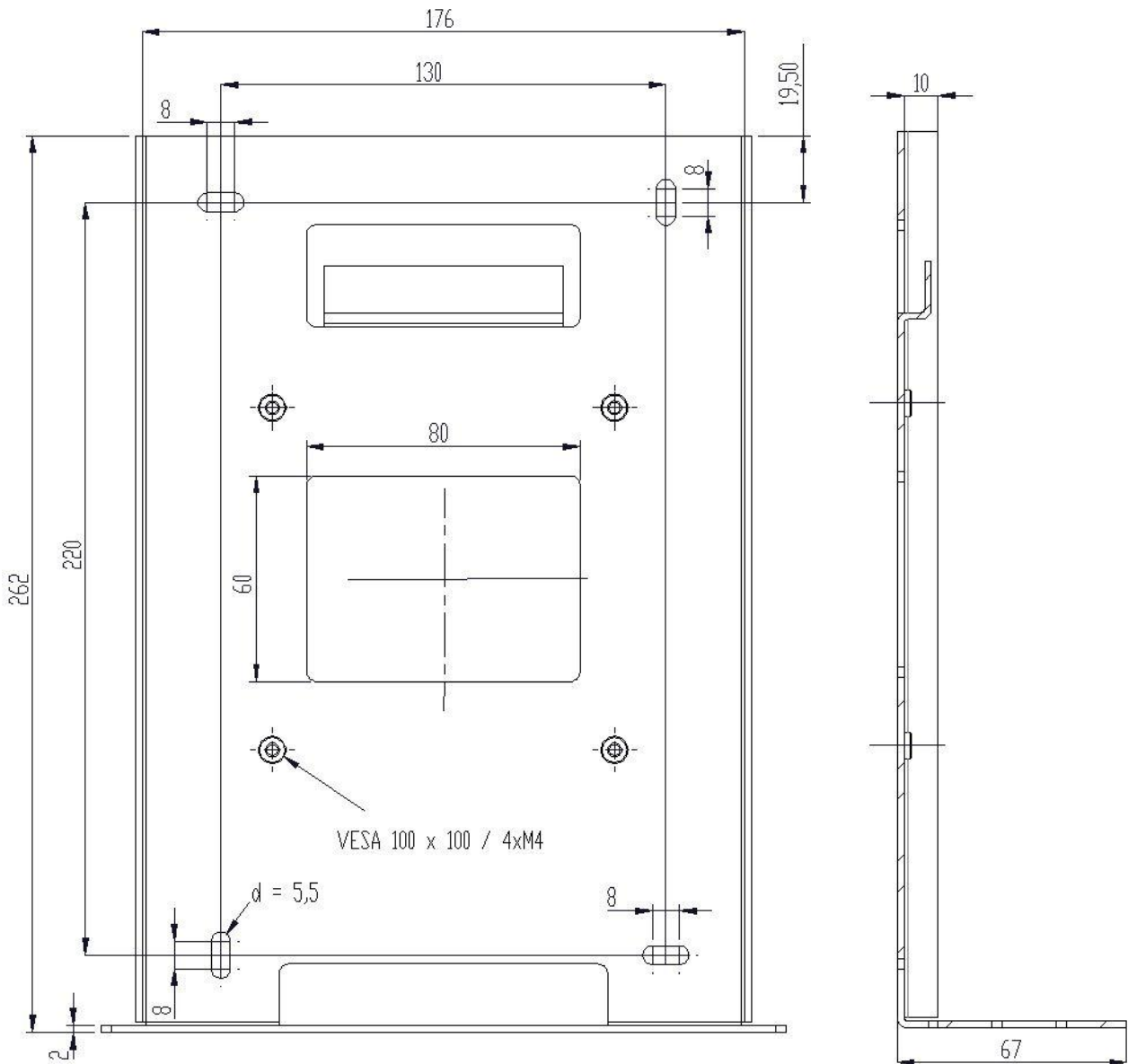






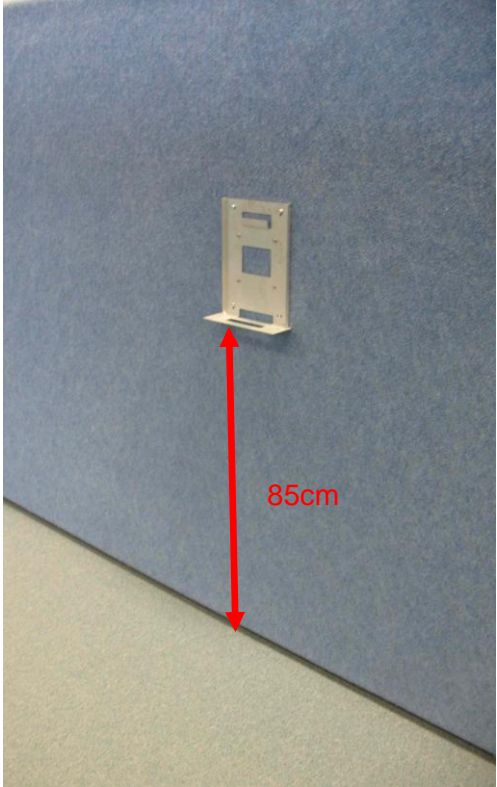
Fig. 3: Mounting bracket dimensions

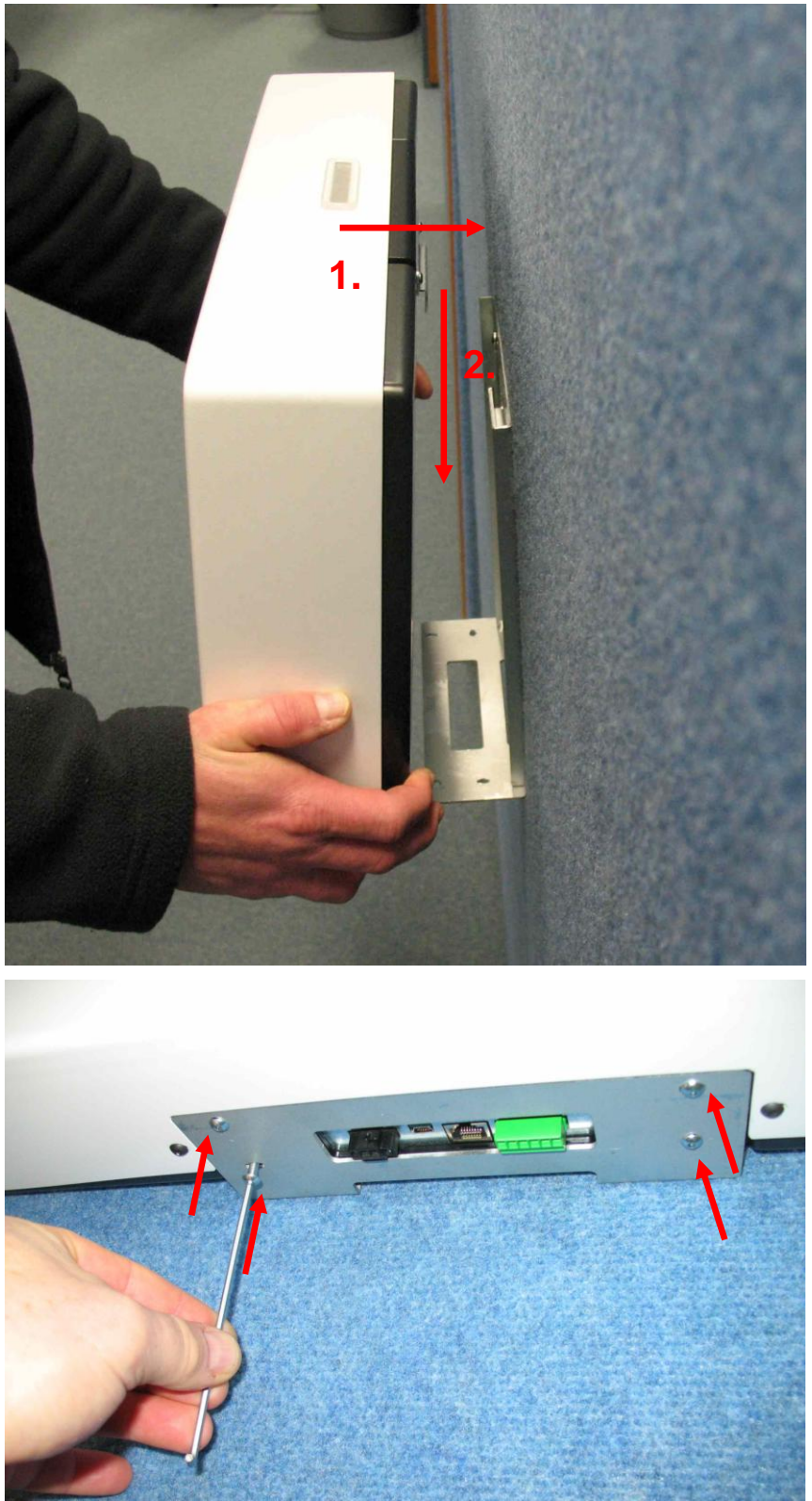
All dimensions are in mm with general tolerance to ISO 2768 m (middle)

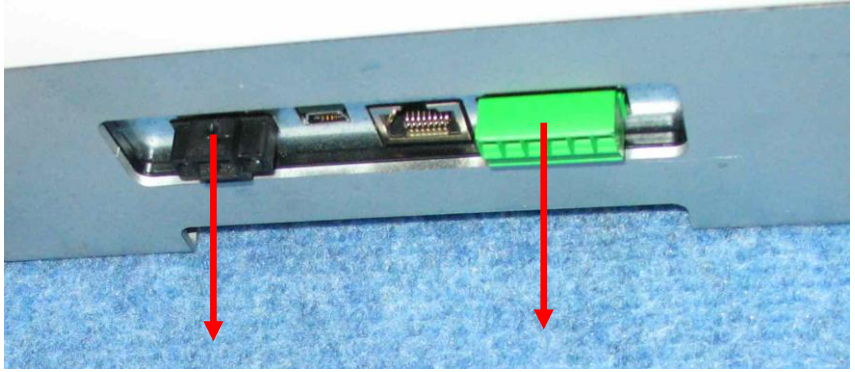
4.2.3 Installing the Antenna on the wall or ceiling

The antenna could be mounted on the floor or ceiling with the mounting bracket directly or with the use of a VESA bracket.


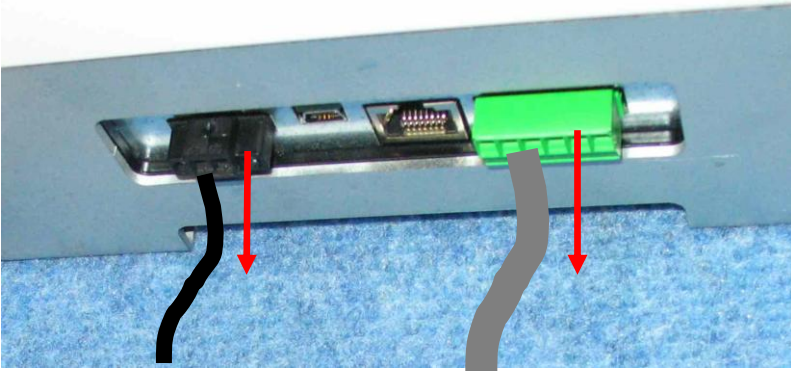
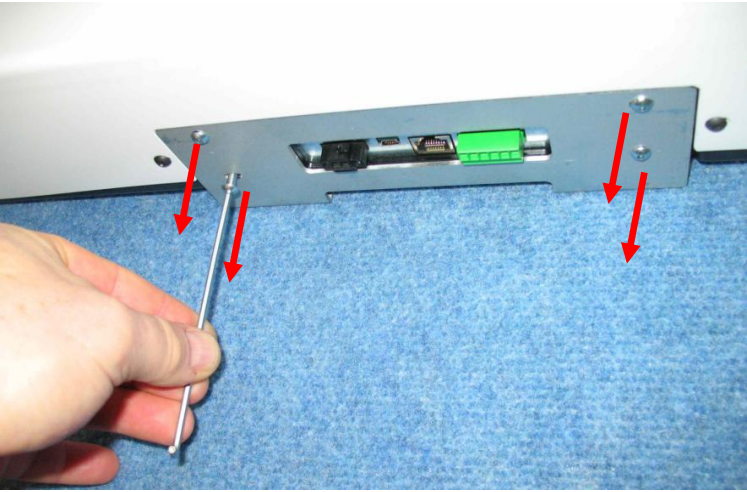
Step	Action	Note
1	Do not open the antenna body !	
2	Place the antenna with its front side carefully on a desk or a soft ground.	
3	Unscrew the 4 screws of the mounting bracket.	

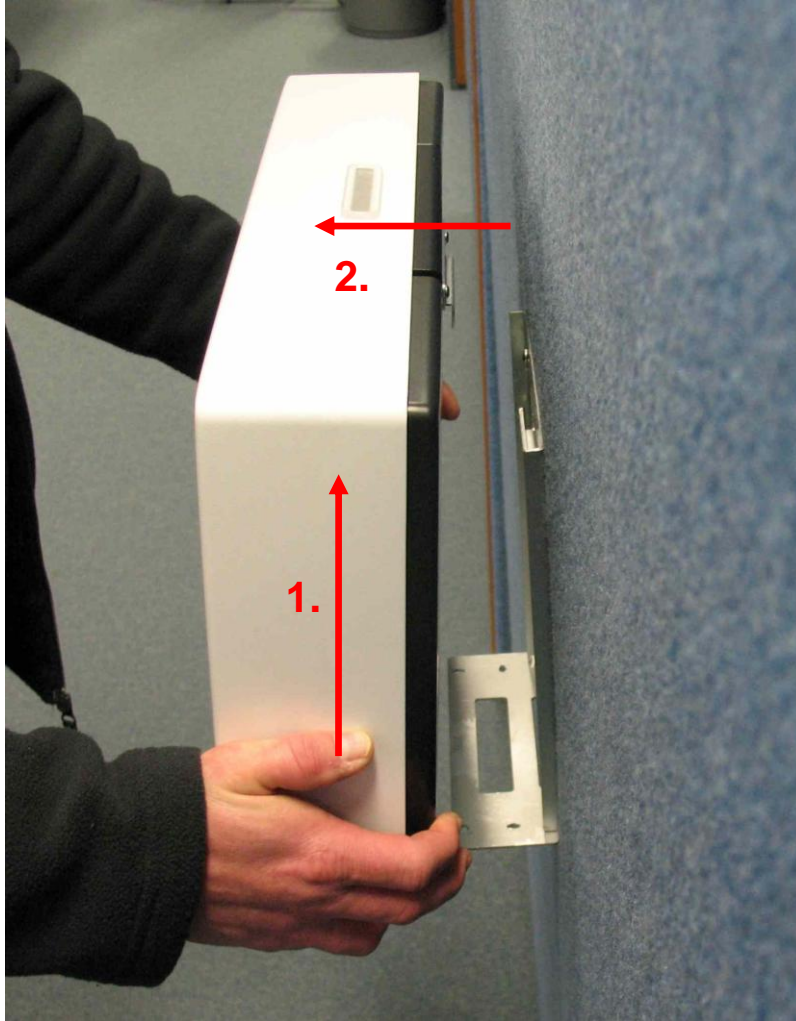
Step	Action	Note
4	<p>Pull the mounting bracket from the antenna housing.</p>	
5	<p>Install the mounting bracket at its position. e.g. Here at the wall at 85cm</p>	

Step	Action	Note
6	Hang the antenna on the mounting bracket and fix the antenna body at the mounting bracket with the 4 screws.	

Step	Action	Note
7	Remove the plugs and make the needed cabling.	

4.2.4 Disassembly of the Antenna (for replacement/repair)

Step	Action	Note
1	Do not open the antenna body !	
2	Remove the plugs and all cable connections.	
3	Unscrew the 4 screws of the mounting bracket.	

Step	Action	Note
4	Pull the antenna upwards and away from the wall.	

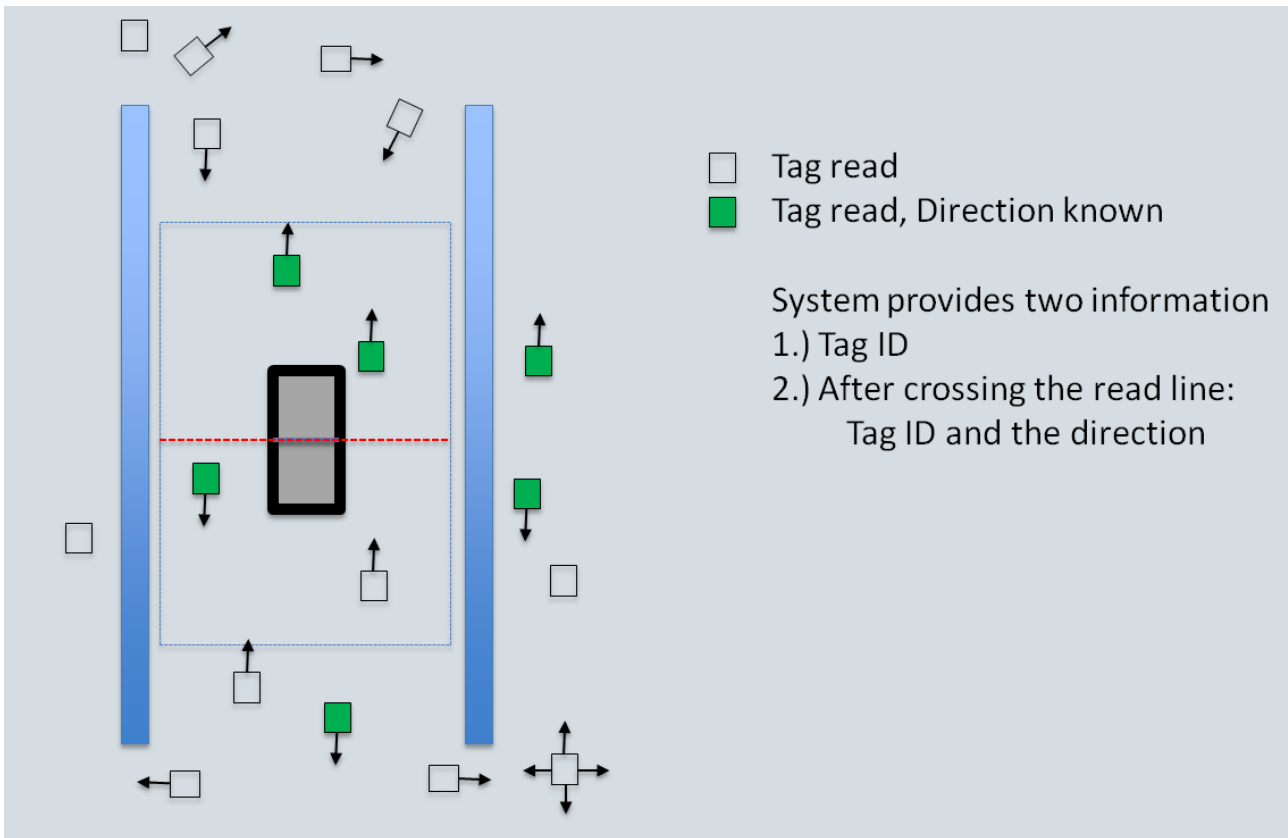
5 Typical Antenna Configuration

The standard configuration of the antenna with three-dimensional tag orientation consists of one ID ISC.ANT.U500/270-DM antenna with reader. If a tag moves, at horizontal line through the detection area, it can be detected with a high reliability. Best performance could be achieved if the antenna is mounted on the ceiling.

5.1 Project Notes Antenna

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

The reading area of the antenna is shown in the sketches below.



Ceiling mounted



Ceiling mounted



Wall mounted

Fig. 4: Capture area of the antenna

Notes: Note that the entire reading area of the antenna is larger than the three-dimensional area shown in the drawing (Fig. 4). This means tags can be detected outside the reading area.

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

To achieve three-dimensional reading of the tag in the reading area drawn above ([Fig. 4](#)), the following conditions must be fulfilled:

- Use of modern sensitive tags
- Tag length not below 9cm
- The antenna should be at least 50 cm away from any metal parts and more than 1m for larger metal parts

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

Metal walls and metal doors should be a few meters away from the antenna.

5.2 Antenna Configuration and Setup the Antenna

5.2.1 Required Components

To set up the gate you need the following components:

- Qty. 1 ID ISC.ANT.U500/270-DM
- Qty. 1 ID ISC.NET24V-B Power Supply Unit
- Power cable, interface cable LAN TCP/IP
- USB to USB mini cable
- Mounting materials (screws, anchors)

To configure the Reader you will need the software

- ISOStart 2017 Version 10.00.01 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 the Antenna

The antenna should be mounted in that way that the cable connections show to the floor if wall mounted or to the side /wall if ceiling mounted.

If wall mounted it should be installed in high of 85cm (distance from floor to the bottom side of the antenna).

If ceiling mounted it should be installed in the middle of the corridor.

The mounting position also depends on the detection area which should be covered and the usual transponder position when passing the antenna.

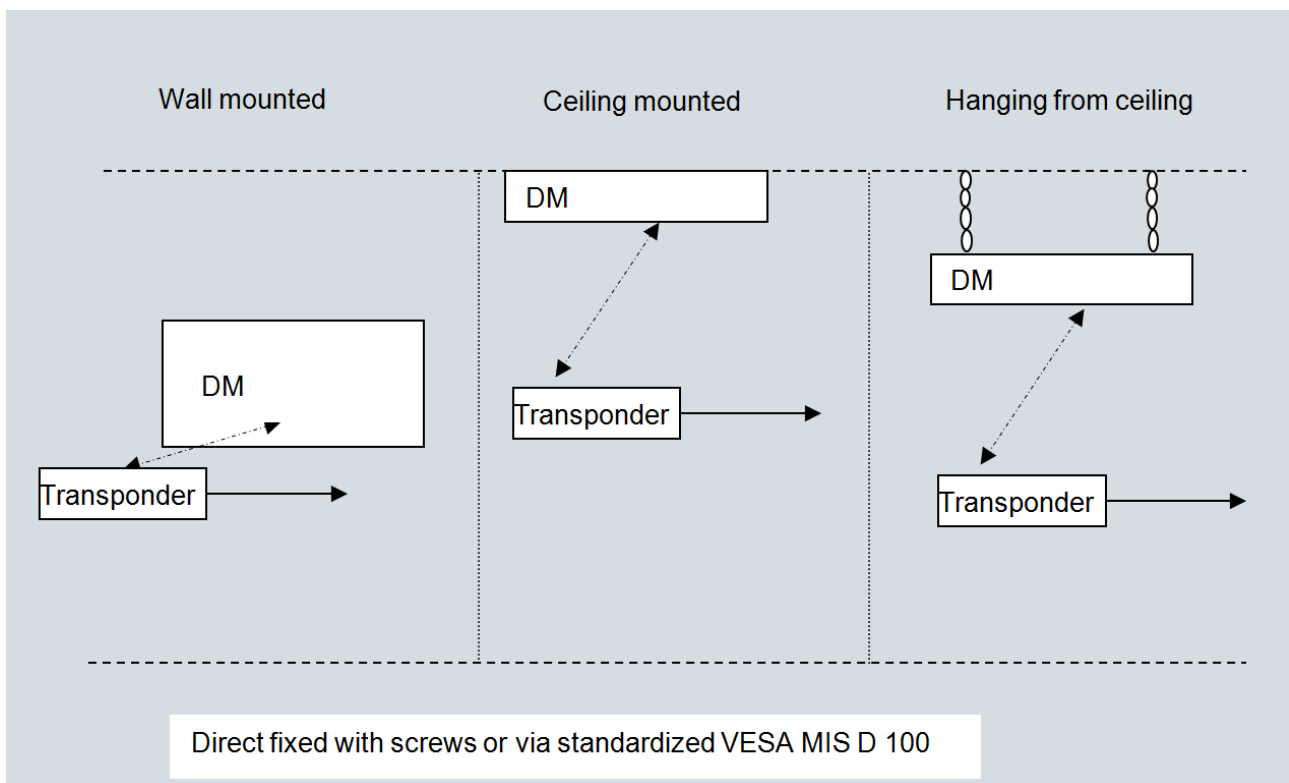


Fig. 5: Possible mounting positions of the antenna

5.2.3 Interface Connections

5.2.3.1 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.

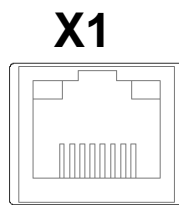


Fig. 6: LAN interface for host communication

With structured shielded 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 2 Standard factory configuration of the Ethernet connection

Note:

The Reader TCP/IP interface has a DHCP option.

5.2.3.1 USB Mini Interface on connector X3

The reader is equipped with a USB on-the-go interface. This can either be used to connect the reader to a host system or by means of a special on-the-go adaptor for connection of a USB memory stick to the reader. In both cases the connection is carried out via terminal X3. The pinout is standardized.



Figure 1: USB-Interface for host communication

A standard shielded USB-cable can be used for connection of the reader to a host system. The data rate is reduced to 12 Mbit (USB full speed).

NOTE:

The length of the USB-cable can have a max. of 4 m (~ 150 inch). It is not allowed to use longer cables.

5.2.4 Digital Input / Output

The ID ISC.ANT.U500/270-DM has one digital Input and one digital Output which could be used.

5.2.4.1 Digital Input on connector X4

The optocoupler on Terminal X4 are galvanically isolated from the Reader electronics and must therefore be externally supplied.

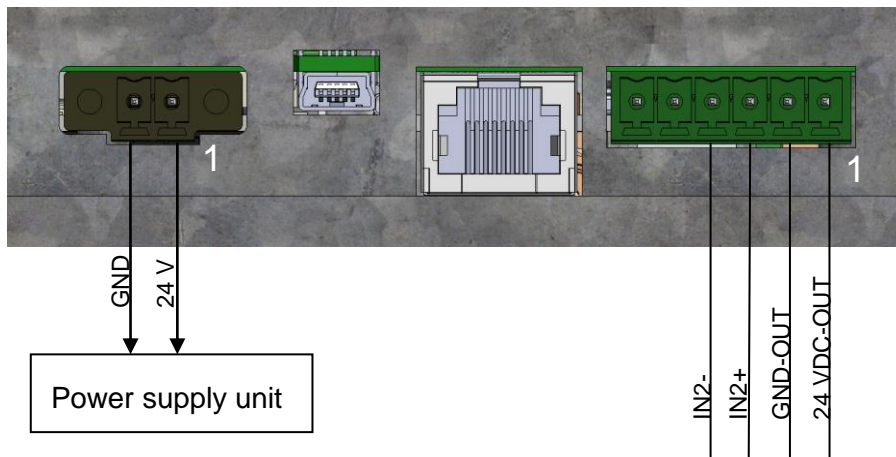


Table 3: Pin Assignment digital Input IN2

Pin Number at Connector X4	Pin Assignment
3	IN2 +
4	IN2 -

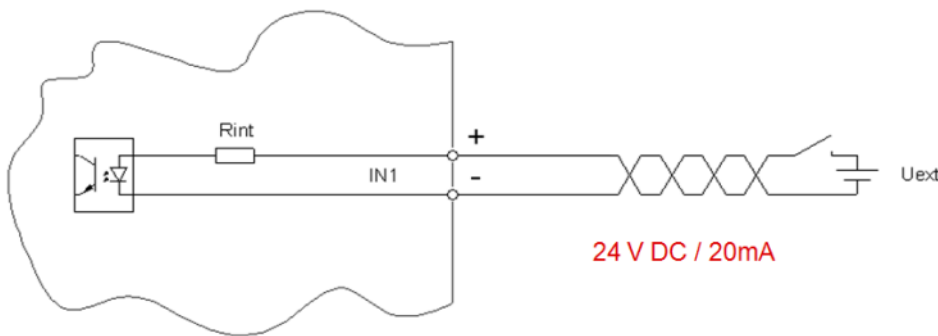


Figure 2: Internal and external wiring of the digital input IN2

NOTE:

The input IN2 is configured for a maximum input voltage of 24 V DC and an input current of max. 20 mA.

Polarity reversal or overload on the input will destroy it.

5.2.4.1 Digital Output on connector X4

The transistor connections, collector and emitter, of the optocoupler output are galvanically isolated from the Reader electronics and are carried to the outside without any internal ancillary circuitry on Terminal X4. The output must therefore be powered by an external power supply.

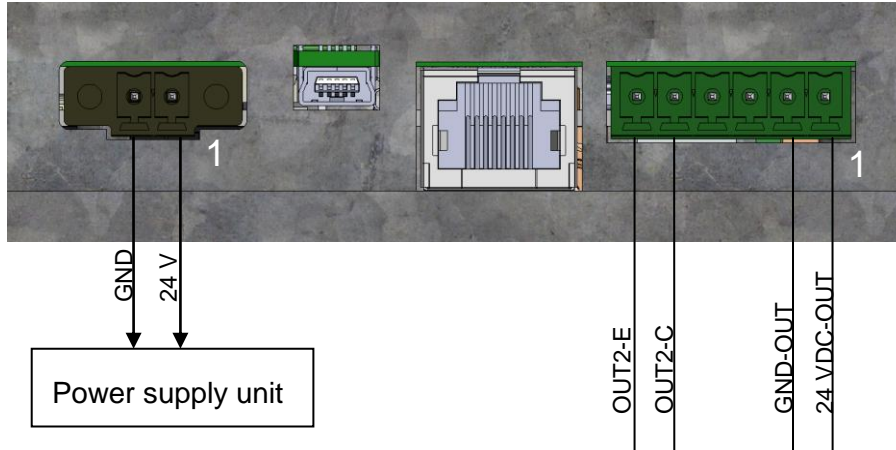


Table 4: Pin Assignment digital output OUT2

Pin Number at Connector X4	Pin Assignment
5	OUT2-C
6	OUT2-E

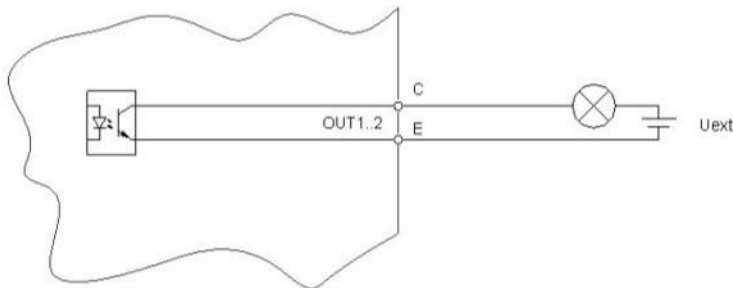


Figure 3: Internal and external wiring of the digital output OUT2

CAUTION:

The output OUT2 is configured for max. 24 V DC / 20 mA.

Polarity reversal or overload on the output will destroy it.

The output is intended for switching resistive loads only.

5.2.4.1 DC Output on connector X4

If needed the 24V DC output at X4 could be used to supply external devices or the digital Input / Output of the reader with the needed power.

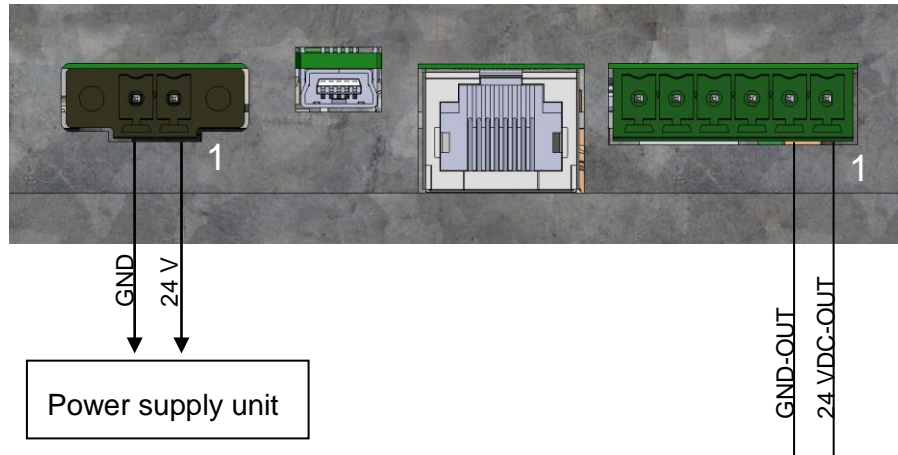


Table 5: Pin Assignment DC output


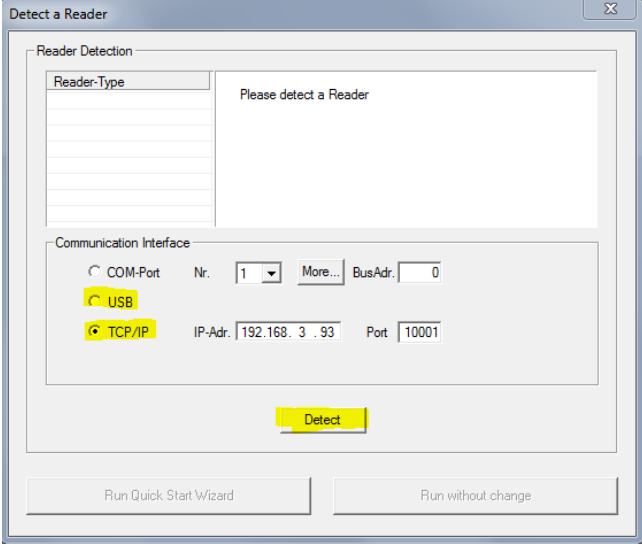
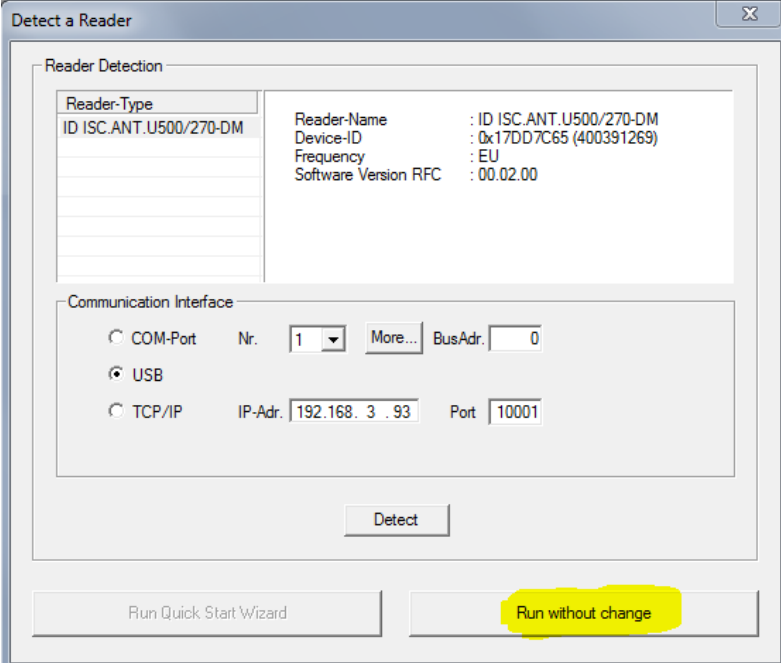
Pin Number at Connector X4	Pin Assignment
1	24V DC-OUT
2	GND - OUT


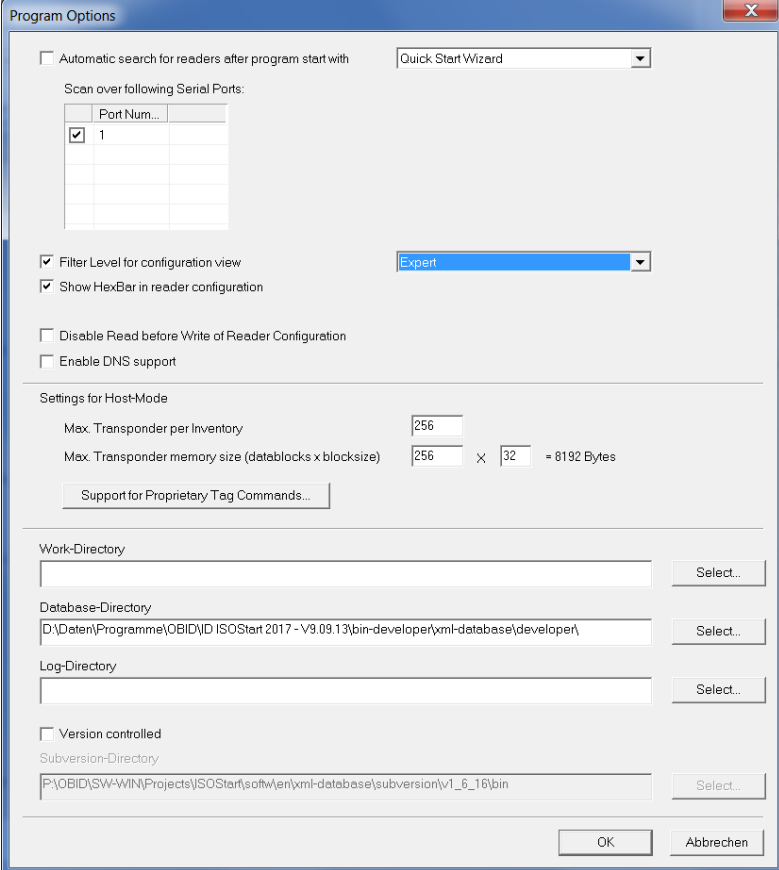
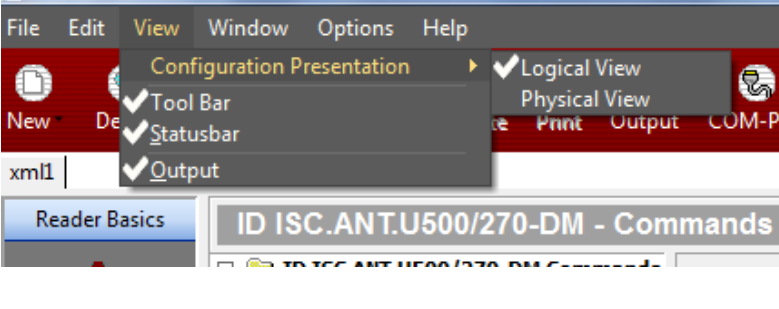
CAUTION:

Take care that the overall power consumption of the reader and the external device does not exceeds the maximum allowed power of the power supply unit.


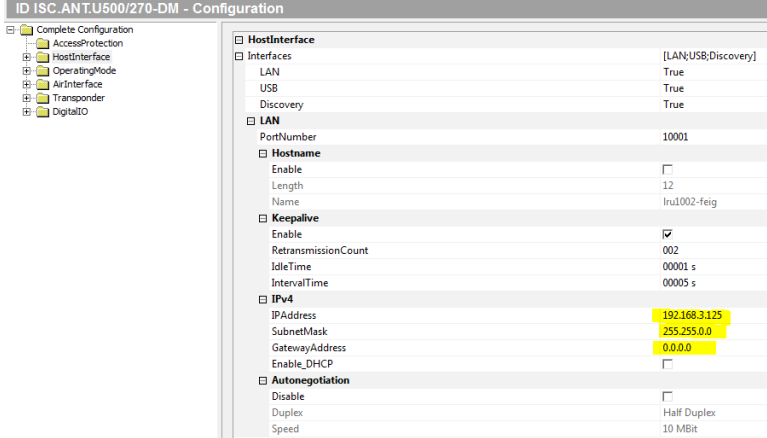

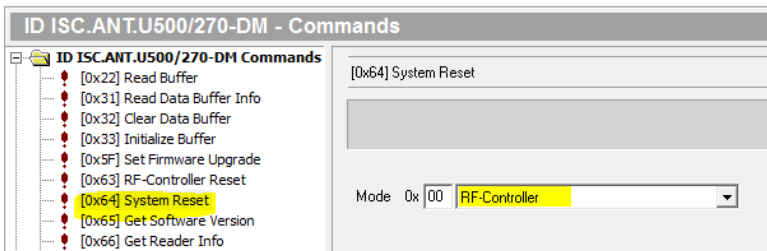

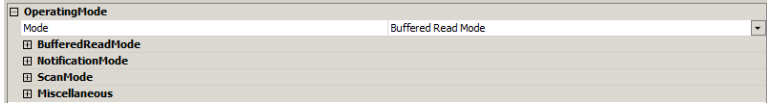

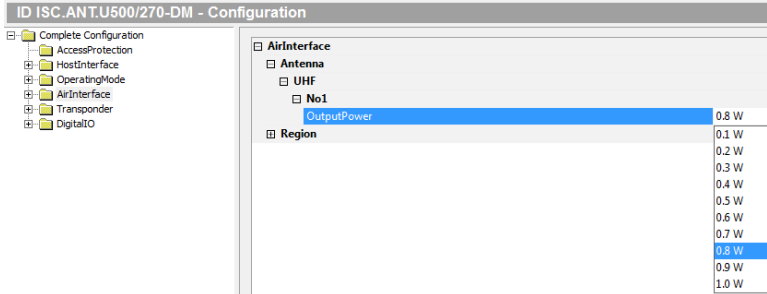
5.2.5 Reader/Antenna Configuration

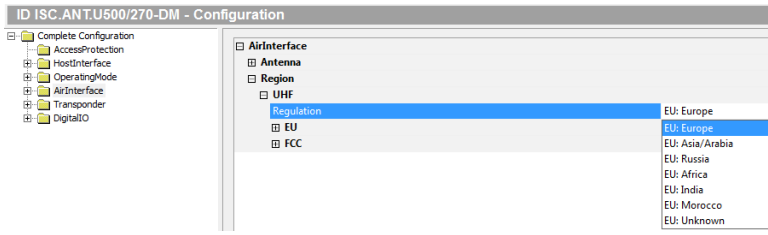

To configure the antennas, open the ISOStart software and read out the current configuration of the Reader:

Step	Action	Note
1	Start ISO Start Software	
2	Select „Detect“ Use USB Port or default TCP/IP address 192.168.10.10 Port 10001 to detect reader.	
3	Select „Run without change“ Note: This has to be done at each start of ISO-Start program	

Step	Action	Note
4	Select „Options => Program“	
5	Select „Expert Mode“ and confirm with OK.	
6	Select “Logical View”	

Afterwards set the Interface settings and the operating mode:



Step	Action	Note
1	Select “Configuration”	
2	Select -HostInterface -LAN Set LAN settings.	
3	Set by clicking on „Apply“ .	
4	Select command “System reset”	
5	Confirm with “Send”	
6	Select -Operating Mode -Mode Set to Buffered Read Mode	
7	Set by clicking on „Apply“ .	
8	Select -Air Interface -Antenna -UHF No. 1 Set right Output Power	

Step	Action	Note
	<p>-Region Set right “Region”.</p>	 <p>The screenshot shows a configuration window titled 'ID ISC.ANT.U500/270-DM - Configuration'. On the left is a tree view with folders: Complete Configuration, AccessProtection, HostInterface, OperatingMode, AirInterface, Transponder, and DigitalIO. On the right, the 'AirInterface' section is expanded, showing 'Antenna', 'Region', and 'UHF'. The 'Region' sub-menu is open, listing: Regulation, EU (highlighted), Asia/Arabia, Russia, Africa, India, Morocco, and Unknown.</p>
<p>9</p>	<p>Set by clicking on „Apply“.</p>	 <p>An 'Apply' button with a small icon to the left of the text.</p>

5.3 Testing the Gate Antenna

After configuring and installing the gate antenna, you can check for proper function using a reader, the ISOStart service software and a Transponder.

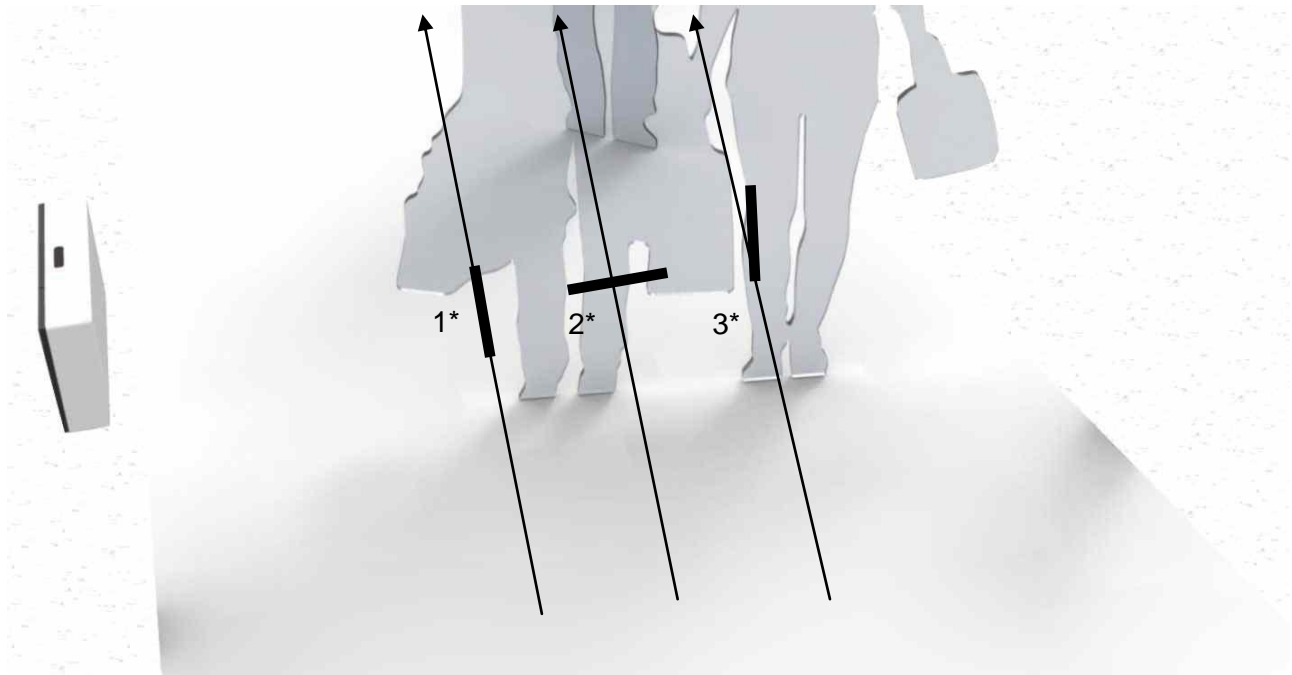
5.3.1 Reading a Serial Number

Step	Action	Note																																										
1	Attach a tag to an antenna or in the gate	Use adhesive tape, for example																																										
2	Select „Buffered Read Mode“ window																																											
4	Click on “Start” Button																																											
5	Transponder in the antenna will be displayed (and others in detection range)	<table border="1"> <thead> <tr> <th colspan="6">ID ISC.ANT.U500/270-DM - Buffered Read Mode - 5 Records</th> </tr> <tr> <th>No.</th> <th>Type</th> <th>Serial No.</th> <th>Data Block</th> <th>Date</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010443A021902</td> <td></td> <td>2017-11-23</td> <td>08:56:53.100</td> </tr> <tr> <td>2</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010440A021102</td> <td></td> <td>2017-11-23</td> <td>08:56:53.185</td> </tr> <tr> <td>3</td> <td>EPC Class 1 Gen 2</td> <td>300833B2DD9014028050000</td> <td></td> <td>2017-11-23</td> <td>08:56:54.235</td> </tr> <tr> <td>4</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010442A021802</td> <td></td> <td>2017-11-23</td> <td>08:56:56.345</td> </tr> <tr> <td>5</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010443A021902</td> <td></td> <td>2017-11-23</td> <td>08:56:58.595</td> </tr> </tbody> </table>	ID ISC.ANT.U500/270-DM - Buffered Read Mode - 5 Records						No.	Type	Serial No.	Data Block	Date	Time	1	EPC Class 1 Gen 2	A02A051015A010443A021902		2017-11-23	08:56:53.100	2	EPC Class 1 Gen 2	A02A051015A010440A021102		2017-11-23	08:56:53.185	3	EPC Class 1 Gen 2	300833B2DD9014028050000		2017-11-23	08:56:54.235	4	EPC Class 1 Gen 2	A02A051015A010442A021802		2017-11-23	08:56:56.345	5	EPC Class 1 Gen 2	A02A051015A010443A021902		2017-11-23	08:56:58.595
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5.3.2 Testing the performance

In this test the capture area of the antenna is checked. For different tags or other configurations the ranges and read areas may differ.

Regarding used tags please refer to [5.1 Project Notes Antenna](#).



1* Horizontal, pointing in walk direction

2* Horizontal, 90° to walk direction

3* Vertical

Fig. 7: Performance Test of the antenna

There is a big difference between a RF antenna and the UHF antenna. For UHF it is not sufficient that a tag is detected. The UHF antenna has to detect the moving transponder in front of below the antenna. So the test should start at least 1,75m upfront the antenna and the tag has to be moved up to at least 1.75m behind the antenna.




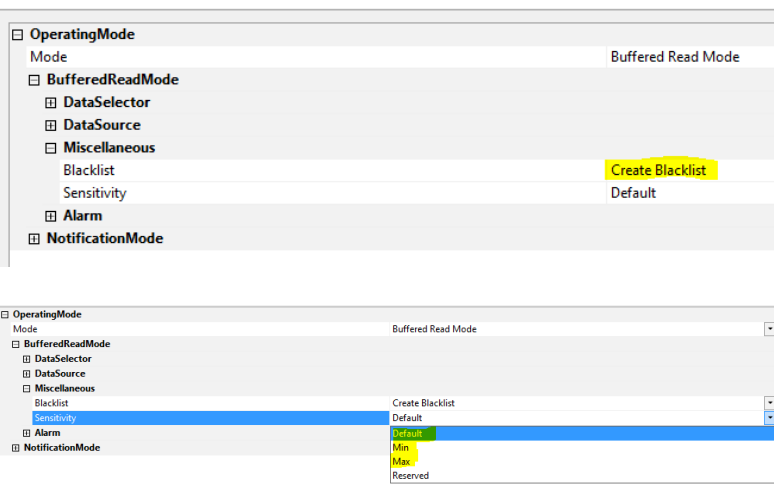


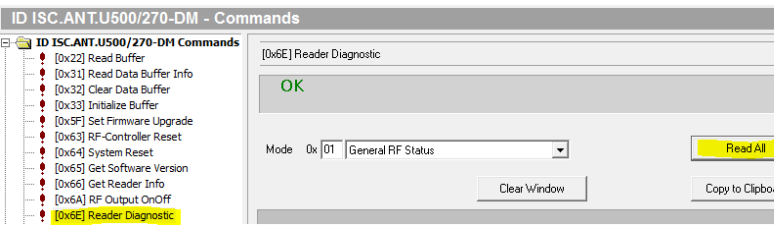

The possible 3 tag orientations can be tested - horizontal in walk direction, horizontal 90° to walk direction and vertical.

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.
- Transponder too insensitive, detuned or defective , see as well 5.1 Project Notes Antenna.
- Reader improperly configured (transmitting power, transponder type, modulation, transponder parameters, etc.).
- A cable is defect or has a weak contact.
- Reader or antenna defect.

5.3.3 Reducing false readings




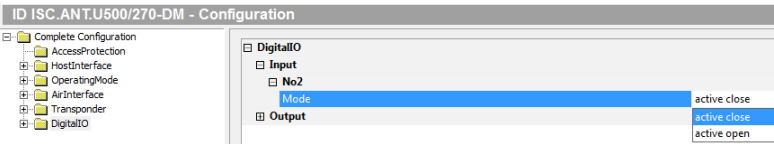

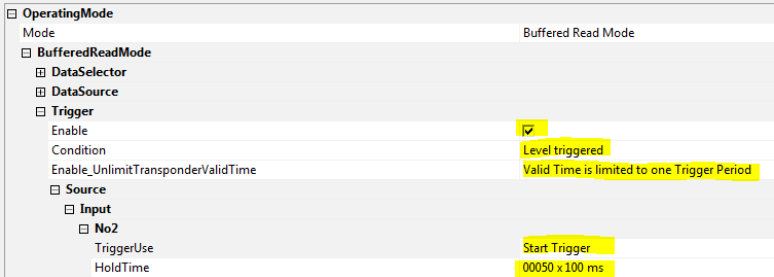


By creating a blacklist, all transponders placed in the surrounding of the antenna will be read and stored in the blacklist, this will reduce/avoid false readings.

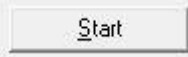
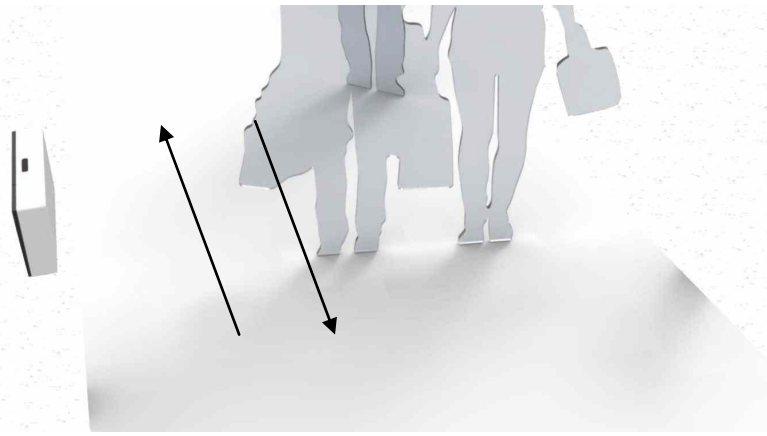
Step	Action	Note
1	Start ISOStart Software	 ISOStart.exe
2	Select “Configuration” and click on “Read” to read the complete configuration.	 
3	Select -Operating Mode Select “Create Blacklist” Select “Sensitivity” Transponders will never alarm, also not if they move through the gate	 <p>The screenshot shows the 'Operating Mode' configuration window. The 'Mode' is set to 'Buffered Read Mode'. Under 'BufferedReadMode', 'DataSelector', 'DataSource', and 'Miscellaneous' are expanded. In 'Miscellaneous', 'Blacklist' is set to 'Create Blacklist' and 'Sensitivity' is set to 'Default'. The 'Alarm' and 'NotificationMode' sections are also visible.</p>
4	Set by clicking on „Apply“ .	
5	The Blacklist will be created after a “Power On” or “System Reset” command of the reader/gate.	Up to 100 Transponder can be stored in the Blacklist. If more than 100 Transponder are detected an error will be displayed.
6	Select “Commands”	
7	Select “ID ISC.ANTU500270-DM Commands” “Reader Diagnostic”	 <p>The screenshot shows the 'ID ISC.ANT.U500/270-DM - Commands' window. The 'Reader Diagnostic' command is selected in the list. The right pane shows the 'Reader Diagnostic' dialog with 'OK' and 'Read All' buttons. The 'Mode' is set to '0x01 General RF Status'.</p>
8	Confirm with „Send“	

<p>9</p>	<p>Among other information a blacklist overflow is indicated</p>	<pre> General RF Status: 1: Noise-Level.....OK 4: False Power.....No 5: Temperature.....OK 0: Ant1 Z <> 50 Ohm...No 1: Ant2 Z <> 50 Ohm...No 2: Ant3 Z <> 50 Ohm...No 3: Ant4 Z <> 50 Ohm...No Hardware and Configuration Status: Communication with... 0: EEPROM-Device1.....OK 3: RF-Decoder.....OK 5: UPC.....OK 6: RTC.....OK 7: ADC.....OK 13: Tags in field.....OK 14: Create Blacklist...OK Firmware Status: Result of Firmware Update: OK </pre>
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5.3.4 Using the Trigger function with the digital Input

By using the digital input, the antenna could be triggered to switch on/off the RF-field, if a motion detector or light barrier is connected to this input.

Step	Action	Note
1	Start ISOStart Software	 ISOStart.exe
2	Select “Configuration” and click on “Read” to read the complete configuration.	 
3	Select -Digital IO -Input -Mode Set Mode to active open or active close	
4	Set by clicking on „Apply“ .	
5	Select -Operating Mode -Trigger Enable Trigger Set Condition Set Valid Time Select -Input No. 2 Set Start Trigger Set Hold Time e.g here 50x100ms = 5sec	
4	Set by clicking on „Apply“ .	
5	Select “Buffered Read Mode”	

6	Click on “Start”																																											
7	Walk in front or under the antenna in both directions by passing the light barrier or the motion detector with a valid transponder																																											
8	Transponder data will be displayed.	<table border="1"> <thead> <tr> <th colspan="6">ID ISC.ANT.U500/270-DM - Buffered Read Mode - 5 Records</th> </tr> <tr> <th>No.</th> <th>Type</th> <th>Serial No.</th> <th>Data Block</th> <th>Date</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010443A021902</td> <td></td> <td>2017-11-23</td> <td>08:56:53.100</td> </tr> <tr> <td>2</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010440A021102</td> <td></td> <td>2017-11-23</td> <td>08:56:53.185</td> </tr> <tr> <td>3</td> <td>EPC Class 1 Gen 2</td> <td>300833B2DD9014028050000</td> <td></td> <td>2017-11-23</td> <td>08:56:54.235</td> </tr> <tr> <td>4</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010442A021802</td> <td></td> <td>2017-11-23</td> <td>08:56:56.345</td> </tr> <tr> <td>5</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010443A021902</td> <td></td> <td>2017-11-23</td> <td>08:56:58.595</td> </tr> </tbody> </table>	ID ISC.ANT.U500/270-DM - Buffered Read Mode - 5 Records						No.	Type	Serial No.	Data Block	Date	Time	1	EPC Class 1 Gen 2	A02A051015A010443A021902		2017-11-23	08:56:53.100	2	EPC Class 1 Gen 2	A02A051015A010440A021102		2017-11-23	08:56:53.185	3	EPC Class 1 Gen 2	300833B2DD9014028050000		2017-11-23	08:56:54.235	4	EPC Class 1 Gen 2	A02A051015A010442A021802		2017-11-23	08:56:56.345	5	EPC Class 1 Gen 2	A02A051015A010443A021902		2017-11-23	08:56:58.595
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5.4 Activating the Automatic Mode



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


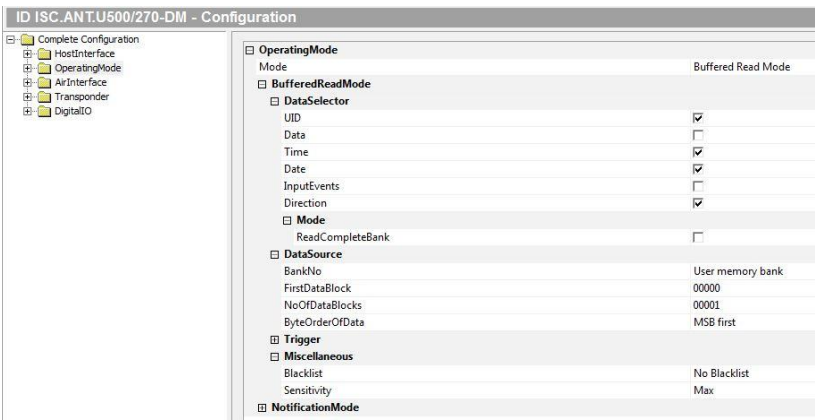

For more information, see System Manual ID ISC.LRU1002

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.

To activate „Buffered Read Mode“ proceed as follows:


Step	Action	Note
1	Select „Configuration“	
2	<p>Operation Mode: „Mode“ - Buffered Read Mode</p> <p>„Data Selector“ e.g. -UID -Time -Date -Direction</p>	
3	Set clicking on „Apply“	

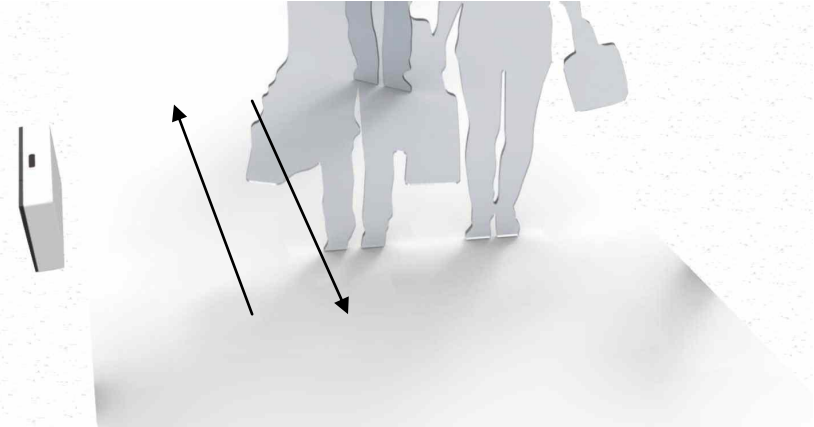
Note:

The configuration of the Notification Mode is similar. [5.4.2 Configuration and Test in Notification Mode](#)

To test the function of the Gate in the Buffered Read Mode, the BRM Window of ISOStart program can be used.


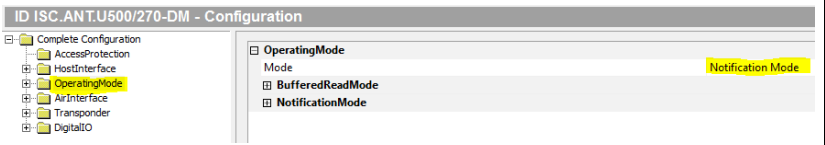

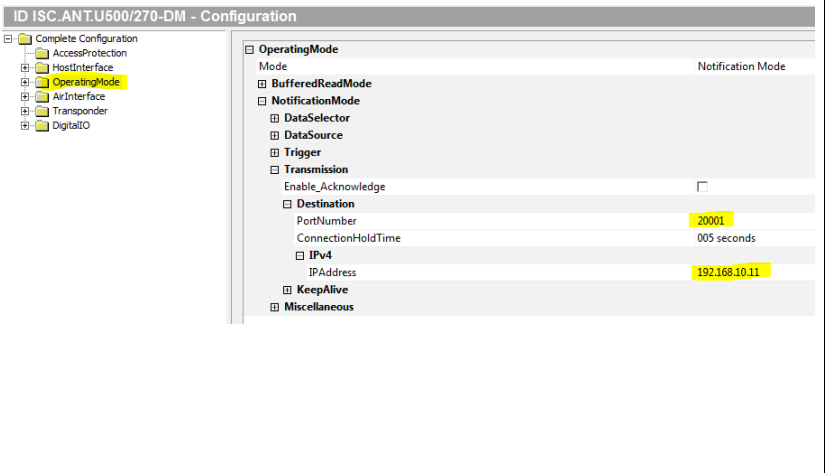


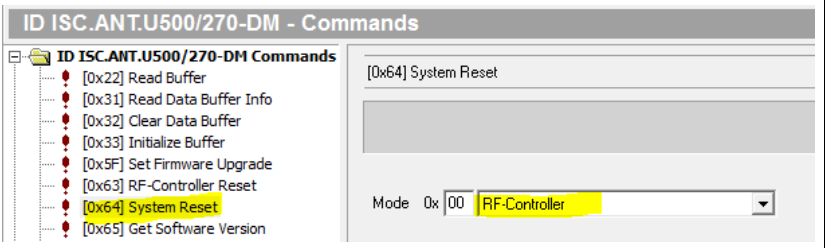

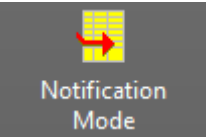
5.4.1 Testing the antenna in Buffered Read Mode

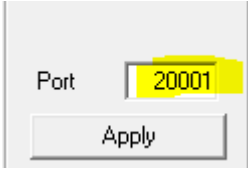

1	Select „Buffered Read Mode“	
2	Click on „Start“	

<p style="text-align: center; font-size: 24pt;">3</p>	<p>Walk in front or under the antenna in both directions with a valid transponder.</p>																																											
<p style="text-align: center; font-size: 24pt;">4</p>	<p>Transponder data will be displayed.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th colspan="6">ID ISC.ANT.U500/270-DM - Buffered Read Mode - 5 Records</th> </tr> <tr style="background-color: #cccccc;"> <th>No.</th> <th>Type</th> <th>Serial No.</th> <th>Data Block</th> <th>Date</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010443A021902</td> <td></td> <td>2017-11-23</td> <td>08:56:53.100</td> </tr> <tr> <td>2</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010440A021102</td> <td></td> <td>2017-11-23</td> <td>08:56:53.185</td> </tr> <tr> <td>3</td> <td>EPC Class 1 Gen 2</td> <td>30083382DD9014028050000</td> <td></td> <td>2017-11-23</td> <td>08:56:54.235</td> </tr> <tr> <td>4</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010442A021802</td> <td></td> <td>2017-11-23</td> <td>08:56:56.345</td> </tr> <tr> <td>5</td> <td>EPC Class 1 Gen 2</td> <td>A02A051015A010443A021902</td> <td></td> <td>2017-11-23</td> <td>08:56:58.595</td> </tr> </tbody> </table>	ID ISC.ANT.U500/270-DM - Buffered Read Mode - 5 Records						No.	Type	Serial No.	Data Block	Date	Time	1	EPC Class 1 Gen 2	A02A051015A010443A021902		2017-11-23	08:56:53.100	2	EPC Class 1 Gen 2	A02A051015A010440A021102		2017-11-23	08:56:53.185	3	EPC Class 1 Gen 2	30083382DD9014028050000		2017-11-23	08:56:54.235	4	EPC Class 1 Gen 2	A02A051015A010442A021802		2017-11-23	08:56:56.345	5	EPC Class 1 Gen 2	A02A051015A010443A021902		2017-11-23	08:56:58.595
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5.4.2 Configuration and Test in Notification Mode


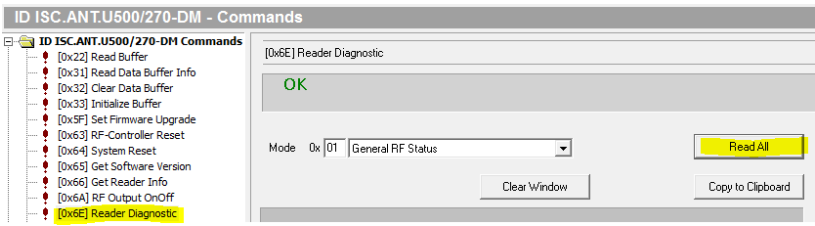

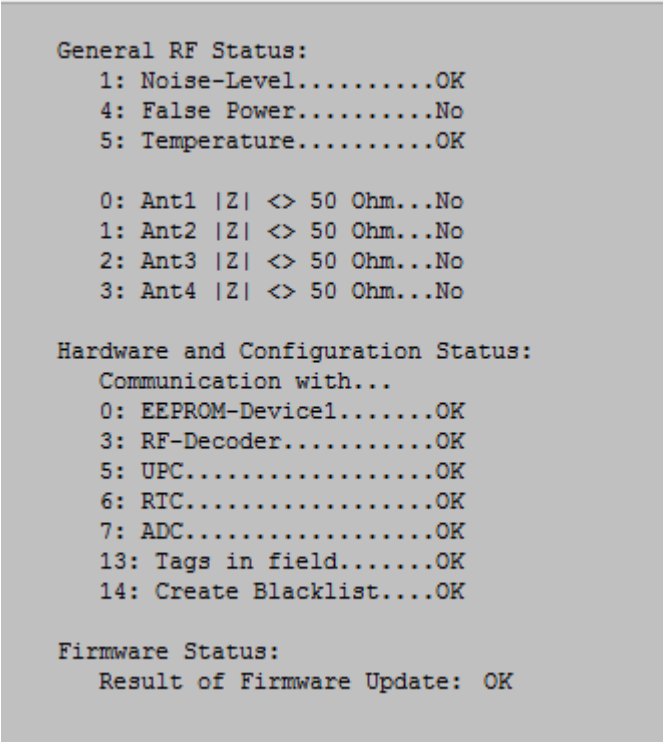

In Notification Mode the Reader sends the People Counter Data automatically to the Host.
The following configuration has to be done:



















Step	Action	Note
1	Select „Configuration“	
2	Operating Mode Select -Notification Mode	
3	Confirm with „Apply“	
6	Set Destination IP Address and Port for Notification Mode IP Address and Port of Host e.g. here: IP Adr.: 192.168.10.11 Port :20001	
7	Confirm with „Apply“	
8	Select “Commands”	
9	Select “ID ISC.ANTU500270-DM Commands” “System Reset”	
10	Confirm with „Send“	
11	Select “Notification Mode” window	

<p>12</p>	<p>Set right Port number, e.g. 20001; value defined from Computer that shall receive the antenna data</p> <p>Click on “Apply”</p>	
<p>13</p>	<p>Walk in front or under the antenna in both directions with a valid transponder.</p>	
<p>14</p>	<p>Transponder data will be displayed.</p>	<pre> ID ISC.ANT.U500/270-GA - Notification Mode ----- Date/Time: 2017-11-22 09:23:20.416 Source: 192.168.3.93 ----- [0x22] Read Buffer >> Statusbyte: 0x00 (OK) TR-DATA...0xE1 0x20 DATA-SETS..1 1. Transponder TR-TYPE.....: 0x84 (EPC Class 1 Gen 2) PC.....: 3000 IDD.....: 300833B2DDD9014028050000 DATE.....: 2017-11-22 TIME: 09172F17, (09:23:12.055) DIRECTION...: 0x02 </pre>

5.5 Reader Diagnostic

An error of the reader/antenna will be displayed by the diagnostic LED in the type DM antenna. Detailed information about the error could be analyzed with the ISO-Start program.

Step	Action	Note
	Reader Diagnostic	
1	Select “Commands”	
2	Select “ID ISC.ANTU500270-DM Commands” “Reader Diagnostic”	
3	Confirm with „Read All”	
4	Status of errors will be displayed	 <pre> General RF Status: 1: Noise-Level.....OK 4: False Power.....No 5: Temperature.....OK 0: Ant1 Z <> 50 Ohm...No 1: Ant2 Z <> 50 Ohm...No 2: Ant3 Z <> 50 Ohm...No 3: Ant4 Z <> 50 Ohm...No Hardware and Configuration Status: Communication with... 0: EEPROM-Device1.....OK 3: RF-Decoder.....OK 5: UPC.....OK 6: RTC.....OK 7: ADC.....OK 13: Tags in field.....OK 14: Create Blacklist....OK Firmware Status: Result of Firmware Update: OK </pre>
5	Error signaling over special diagnostic LEDs	

Step	Action	Note																														
		<p>Coding:</p> <table border="1"> <thead> <tr> <th data-bbox="635 309 724 369">LED green</th> <th data-bbox="724 309 810 369">LED red</th> <th data-bbox="810 309 903 369">LED blue (Comm.)</th> <th data-bbox="903 309 1187 369">UPC / LED Board</th> <th data-bbox="1187 309 1449 369">Integrated Reader</th> </tr> </thead> <tbody> <tr> <td data-bbox="635 369 724 405">bl. </td> <td data-bbox="724 369 810 405">off</td> <td data-bbox="810 369 903 405">-</td> <td data-bbox="903 369 1187 405">OK</td> <td data-bbox="1187 369 1449 405">OK</td> </tr> <tr> <td data-bbox="635 405 724 441">bl. </td> <td data-bbox="724 405 810 441"></td> <td data-bbox="810 405 903 441">-</td> <td data-bbox="903 405 1187 441">OK</td> <td data-bbox="1187 405 1449 441">Reader error</td> </tr> <tr> <td data-bbox="635 441 724 477">off</td> <td data-bbox="724 441 810 477">bl. </td> <td data-bbox="810 441 903 477">off</td> <td data-bbox="903 441 1187 477">UPC offline, no requests from reader</td> <td data-bbox="1187 441 1449 477">Reader error or cable to UPC defective</td> </tr> <tr> <td data-bbox="635 477 724 512">off</td> <td data-bbox="724 477 810 512"></td> <td data-bbox="810 477 903 512">off</td> <td data-bbox="903 477 1187 512">UPC or sensor board error</td> <td data-bbox="1187 477 1449 512">-</td> </tr> <tr> <td data-bbox="635 512 724 548">-</td> <td data-bbox="724 512 810 548">-</td> <td data-bbox="810 512 903 548"></td> <td data-bbox="903 512 1187 548">UPC is receiving valid protocols from reader</td> <td data-bbox="1187 512 1449 548">-</td> </tr> </tbody> </table>	LED green	LED red	LED blue (Comm.)	UPC / LED Board	Integrated Reader	bl. 	off	-	OK	OK	bl. 		-	OK	Reader error	off	bl. 	off	UPC offline, no requests from reader	Reader error or cable to UPC defective	off		off	UPC or sensor board error	-	-	-		UPC is receiving valid protocols from reader	-
LED green	LED red	LED blue (Comm.)	UPC / LED Board	Integrated Reader																												
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6 Configure the reader in accordance with national RF regulations

To achieve the optimum reading performance it might be sensible to increase the reader output power compared to the default settings given in 5.2.5. The maximum allowed power depends on the used reader type (EU / FCC) and the regulation in the country where the reader is used.

6.1.1 EU reader according to EN 302 208

According to the standard EN 302 208 the maximum radiated power is 2 W e.r.p. (Effective Radiated Power) in countries of the European Union. The in the reader configured output power P_{out} depends on the antenna gain in dBi and the attenuation of the antenna cable. If a circular polarized antenna is used the antenna gain [dBic] can be reduced by 3dB. At a linear polarized antenna the maximum linear antenna gain [dBi] must be used.

$$P_{out} = P_{erp} - \text{Antenna Gain} + \text{Cable loss} + 2,1\text{dB}^{**}$$

** Correction Factor to convert the radiated power from e.r.p to e.i.r.p.

For the calculation of the reader output power P_{out} an Excel file „Calc-RF-Power.xls“ can be used. Available from Feig Electronic GmbH.

Example:

Radiated Power		2.0 W [e.r.p]	<>	33.0 dBm
correction factor ERP-> EIRP	*	1.64	+	2.1 dB
Radiated Power Isotrop	=	3.28 W [e.i.r.p]	=	35.1 dBm
Antenna Gain		9.0 dBic	-	9.0 dBi
Polarization of antenna **		1 3	+	3.0 dB
External Multiplexer ***		0 0	+	0.0 dB
cable losses / 100m		30.7 dB		
cable losses / 1m		0.3 dB		
Length of the antenna cable	*	0 m		
	=	0.0 dB	+	0.0 dB
Radiated power in dB				29.1 dBm
Output power in mW				815 mW
Configuration in the Reader (CFG3)			<=	0.8 W

** linear antenna = „0“, circular antenna = „1“

Figure 4: Calculation of the output power

In Figure 4 the allowed antenna power is shown for the UHF antenna.

Antenna: 9dBic, circularly polarised

Cable loss: 0m cable → 0dB loss for the antenna

For EU region the max. allowed reader output power is:

- 0.8W for antennas 1 and 2

EU region (max. 2 W e.r.p)		
	Recommended Reader Power	Max. allowed Reader Power
	Ant. 1 Ant. 2	Ant. 1 Ant. 2
RF power setting in ISOStart	0.5 W	0.8 W

6.1.2 FCC Reader according to FCC 47 Part 15

According to the FCC approval, Title 47, Part 15 the maximum output power of the reader is limited to 1 W (30dBm). The maximum radiated power of the antenna must not be more than 4 W e.i.r.p, (corresp. to 36dBm e.i.r.p or 33.75 dBm e.r.p. resp).

As for ID ISC.ANT.U500/270-DM-FCC:

Antenna: 9dBic, circularly polarised

Cable loss: 0m cable → 0dB loss for A side

According to FCC 47 Part 15 the max. allowed reader output power is:

- 1 W for antennas 1 and 2

USA/Canada (max. 4 W e.i.r.p, max. 1 W conducted)		
	Recommended Reader Power	Max. allowed Reader Power
	Ant. 1 Ant. 2	Ant. 1 Ant. 2
RF power setting in ISOStart	0.5 W	1 W

7 Technical Data

7.1 Antenna ID ISC.ANT.U500/270 Type DM

Mechanical Data

- **Housing** UV stabilized ABS and steel
- **Dimensions (W x H x D)**
 - Antenna 506 mm x 275 mm x 103 mm ± 3 mm
 - Packing 565 mm x 335 mm x 175mm ± 10 mm
- **Weight**
 - ID ISC.ANT.U500/270 Type DM Approx. 7 kg without / 9 kg with packing
- **Enclosure rating** IP 41
- **Color** Antenna Housing: white and black
- **Mounting**
 - No. of attaching points 4
 - Recommended anchors Ø 10 mm
 - Recommended minimum load capacity of the floor fastener 5000 N / anchor

Electrical Data

- **Supply Voltage** 24 V \pm 15 %
Noise Ripple : max. 150 mV
- **Power Consumption** max. 32 VA
- **Operating Frequency** 865 - 870 MHz EU , 902 – 928 MHz FCC
- **Gain, typ.** 9dBic
- **Bandwidth** 3dB
- **Polarization** Circular
 - E-Plane 65°
 - H-Plane 65°
- **Maximum transmitting power per antenna** 2 W but consider limit due to national RF regulations

- **Permissible overall transmitting power per antenna gate**
 - EU-territory (per EN 302 208) 0.8 W for Ant. 1 and 3

 - USA (per. FCC Part 15) 1.0 W for Ant. 1 and 3

 - **Outputs**
 - 1 Optocoupler

 - **Inputs**
 - 1 Optocoupler

 - **Interfaces** USB mini
Ethernet (TCP/IP)

 - **Protocol Modes** BRM (Data Filtering and Data Buffering)
Notification Mode (TCP/IP)

 - **Supported Transponders** EPC Class 1 Generation 2
ISO 18000-6-C (Upgrade Code required)
Further transponder types on request possible

 - **Ranges / distance to antenna** Recommended 50cm to 200cm
- Ambient Conditions**
- **Temperature range**
 - Operating 0°C to +50 °C
 - Storage -25 °C to +70 °C