Vehicle Identification

SPECTRE Access, ATX &ATX4 UHF RFID reader

SOMMAIRE

1- General principles of UHF technoly

1.1 How it works

Passive RFID applications are authorized in the range from 860 MHz to 960 MHz. The precise limits vary from one country to another. The two main frequency bands are 865-868 MHz and 902-928 MHz.

Depending on the power of the reader, the gain and the directivity of its antenna, and the characteristics of the tag to be read, the actual range of a passive UHF RFID system can extend from about 10 centimeters to about 10 meters..

1.2 Uses and limitations, environmental effects, tips

Certain physical rules apply to this technology that can influence operation and performance in terms of distance and speed.

The following salient points should be kept in mind.

- The influence of the materials on which or behind which the tag is used.

  Tags must be adapted to their environment in order to produce the best results.

- At this frequency, waves do not pass through liquids well. Human bodies between

  the reader/antenna can form an obstacle that prevents the tag from being read.

- Radiofrequency identification does not work through metals (problem with athermic windshields or armored vehicles).

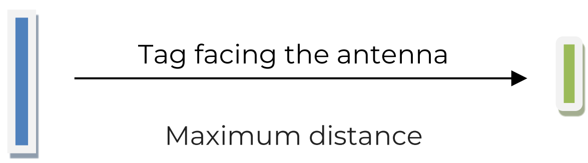
- The waves are frequently reflected on the surface of objects (metal, concrete, the ground, etc.) and the presence of obstacles in the read field can influence the results.

- UHF technology can be directive and systems are installed according to the read zone of the antenna and its characteristics.

- A UHF tag can also have a direction linked to the polarization of its antenna. “Linear” tags are susceptible to their direction and are better read horizontally than vertically, for example.

1.3 Optimal orientation

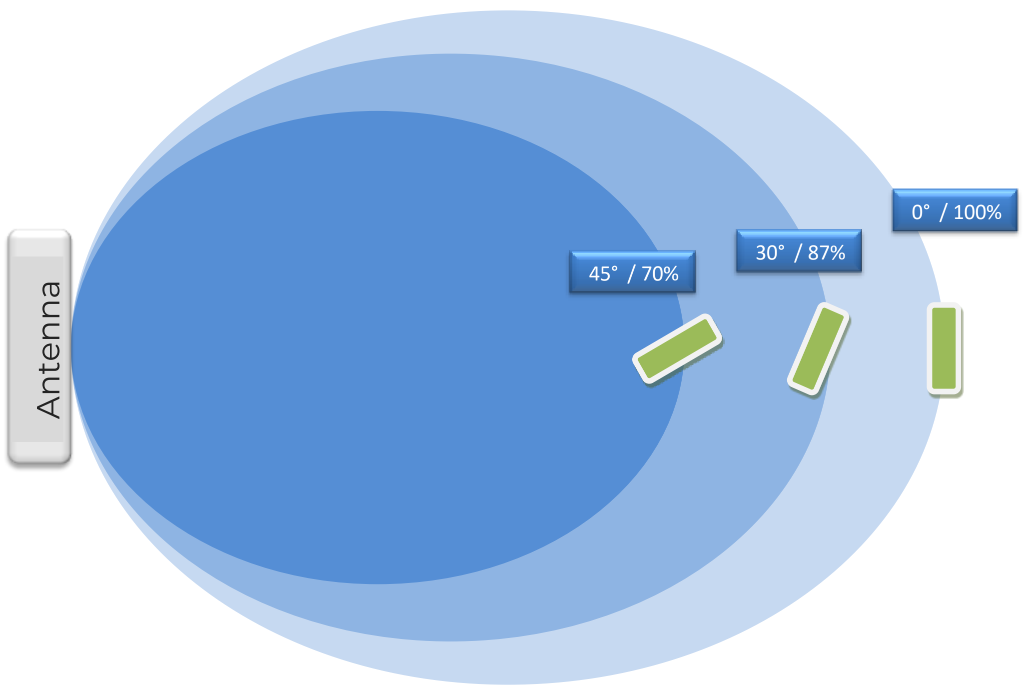
In view of the above-mentioned factors, it is preferable to find the conditions of implementation that optimize system performance, i.e., the best possible position between the antenna and the tag.



The distances in the technical specifications of readers are measured facing the reader, with the tag parallel to the antenna.

An angle may be formed horizontally or vertically, depending on:

- the height of the antenna relative to the vehicle,
- the offset of the antenna on the side relative to the road..

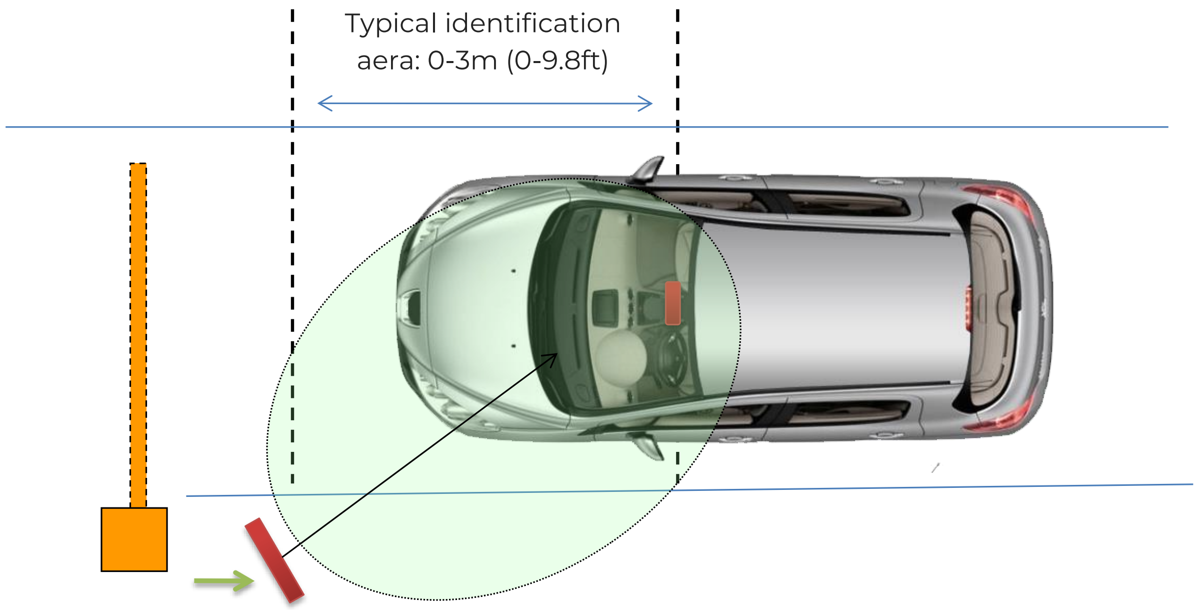


1.4 Installations: the basic rules

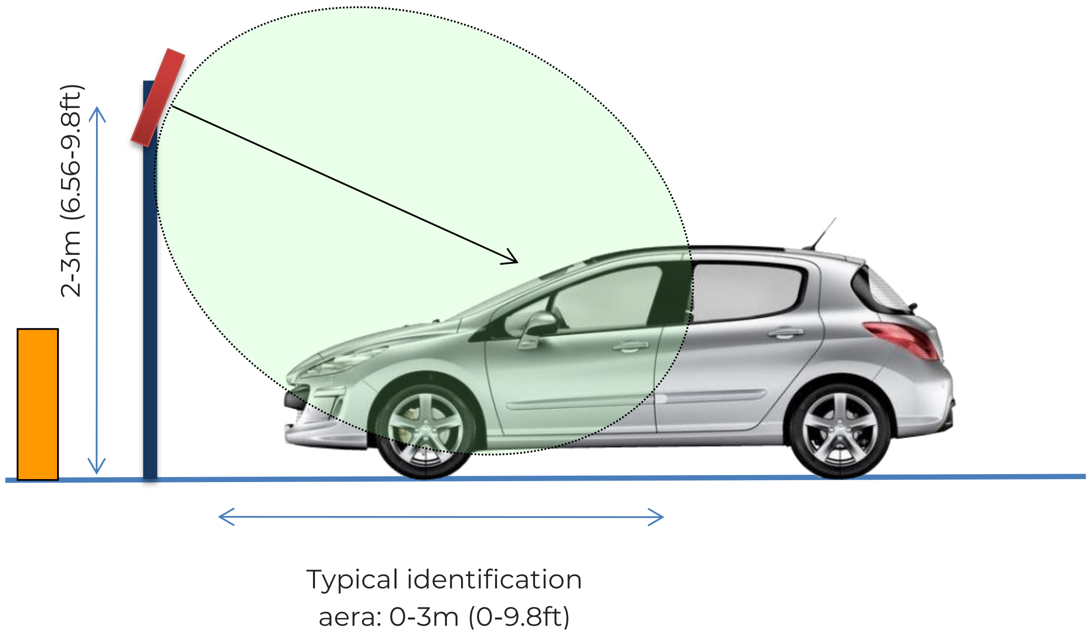
It is advisable to position the antenna and to determine the detection zone **before** the barrier.

This will make detection more reliable and leave the system time to open the barrier.

Make sure there are no obstacles (barrier, totem, etc.) between the tag and the antenna.



Installing the antenna at height allows it to be directed downwards in order to limit the reading distance on the ground and to avoid the unwanted detection of a second vehicle.



1.5 Positioning the tags

The position of the hardened TeleTag® or the ETA v2* label on the windshield affects the performance and depends on the type of windshield.

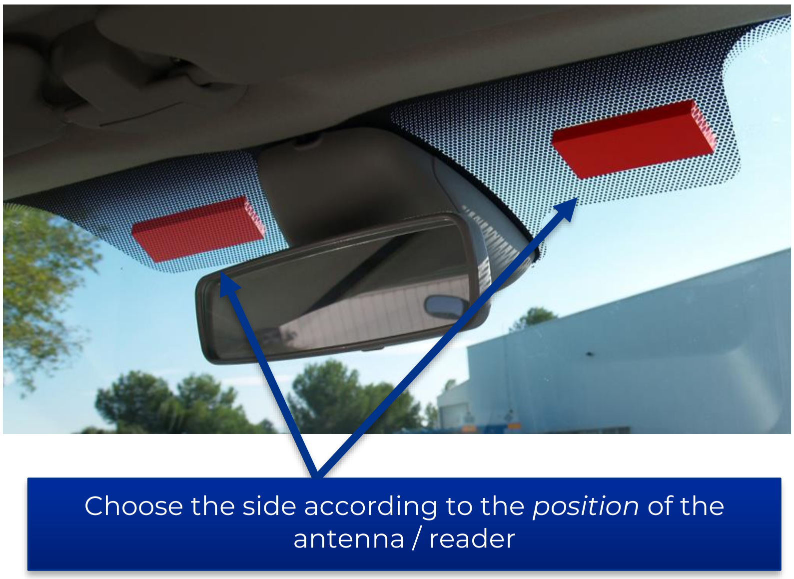
*TeleTag®: UHF EPC1 GEN2 movable.

*ETA v2: destructible UHF EPC1 GEN2 adhesive tag

Goal: to position the tag for optimal quality/performance of reading.

Standard light vehicles

Put the tag at the top of the windshield, behind the central rear view mirror, and on the side where the reader antenna is, if possible. Position the tag so that it does not adhere to the upper edge of the windshield.



Heavy vehicles / trucks / buses

There are two solutions:

- a TeleTag® model (TLTA) interior tag or an ETA tag on the windshield. The rules for positioning the tag are the same as for light vehicles.

- an exterior tag for metal supports installed on the bodywork. Put the tag in a position where it is as parallel as possible to the reader antenna and in the required reading zone.

Installig the TeleTag®

Once you have chosen the position, install the tag using the support provided:

- Insert the tag using the method of your choosing:
    - You can take the TeleTag® out of its support and keep it with you or install it on another vehicle.

    - The TeleTag® is permanently fixed.

- Fix the support horizontally to the windshield using the two-sided adhesive strips provided.

Caution: in view of the angle of certain windshields, remember to leave enough room to insert the tag in the support when choosing a position

1.6 Athermic windshields

Athermic windshields are made of sheets of metal in order to partially reduce the heat inside the vehicle's passenger compartment.

Athermic windshields can be recognized by the reflections on the glass.

Impact of athermic windshields on operation

Athermic windshields influence the performance of the system, because the metal blocks the radio waves. Most athermic windshields have a non-athermic section (see the non-exhaustive list in the Appendix). This section is intended for radio-based systems (GPS, toll payment badges, RFID, etc.). On the other hand, the reading distances may be shorter.

Therefore, it is important to take this parameter into consideration before installing and to proceed with tests in order to find the right position for the readers

2- SPECTRE range

ANT_SPECTRE-A/B

Antennas for SMA and SLA.

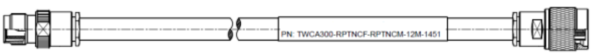
SMA

SPECTRE Access Module.
Possibility to connect up to four remote antennas.

SLA

SPECTRE Access Reader = SMA + ANT_UHF2.
Possibility to connect up to three remote antennas.

CAB_SPECTRE



The antenna cables are fitted with a module connector and an antenna connector (label on the antenna side of the cable).

Availables cables:

Length	Reference	Colored label on the cable
1.5 m	CAB-SPECTRE-1.5M	TECHNIWAVE PN: TWCA195-RPTNCF-RPTNCM-1.5M-1448
3 m	CAB-SPECTRE-3M	TECHNIWAVE PN: TWCA195-RPTNCF-RPTNCM-3M-1449
9 m	CAB-SPECTRE-9M	TECHNIWAVE PN: TWCA240-RPTNCF-RPTNCM-9M-1450
12 m	CAB-SPECTRE-12M	TECHNIWAVE PN: TWCA300-RPTNCF-RPTNCM-12M-1451

The cables can be serial-connected for intermediate lengths:

Length	Reference
3 m	CAB-SPECTRE-1.5M + CAB-SPECTRE-1.5M
4.50 m	CAB-SPECTRE-1.5M + CAB-SPECTRE-3M
6 m	CAB-SPECTRE-3M + CAB-SPECTRE-3M
10.5 m	CAB-SPECTRE-1,5M + CAB-SPECTRE-9M

ANT_SPECTRE-E/F

Antennas for ATX4.

ATX4

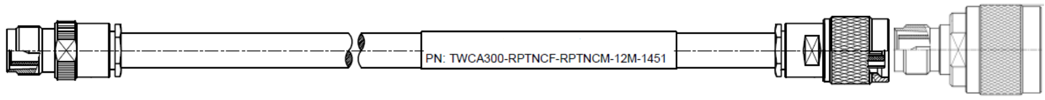
Module ATX4.
Possibility to connect up to four remote antennas.

ATX

ATX SPECTRE Access reader with integrated antenna.

CAB-ATEX

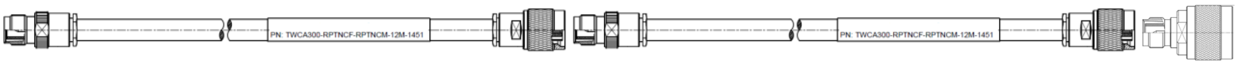
The CAB-ATEX includes a CAB-SPECTRE and an RP TNC adapter for connection to the GUB enclosure.



Availables cables:

Length	Reference	Colored label on the cable
1.5 m	CAB-ATEX-1.5M	TECHNIWAVE PN: TWCA195-RPTNCF-RPTNCM-1.5M-1448
3 m	CAB-ATEX-3M	TECHNIWAVE PN: TWCA195-RPTNCF-RPTNCM-3M-1449
9 m	CAB-ATEX-9M	TECHNIWAVE PN: TWCA240-RPTNCF-RPTNCM-9M-1450
12 m	CAB-ATEX-12M	TECHNIWAVE PN: TWCA300-RPTNCF-RPTNCM-12M-1451

The cables can be serial-connected for intermediate lengths:



Length	Reference
3 m	CAB-SPECTRE-1.5M + CAB-ATEX-1.5M
4.50 m	CAB-SPECTRE-1.5M + CAB-ATEX-3M
6 m	CAB-SPECTRE-3M + CAB-ATEX-3M

3- Hybrid UHF SPECTRE and URx installation

3.1 Powers

The maximum power of the UHF readers must not be exceeded.

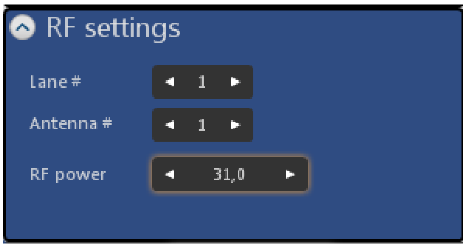
The power setting depends on the cables and antennas used.

In hybrid installations with a URx reader, the configuration of the reader must be modified with ULTRYS v1 to adapt the power to the new hardware and comply with the applicable regulations.

The drop-in power depends on the new cables used.

3.1.1 Table of URD powers

Modification of the power in ULTRYS v1: one single RF power field applies to the antennas.



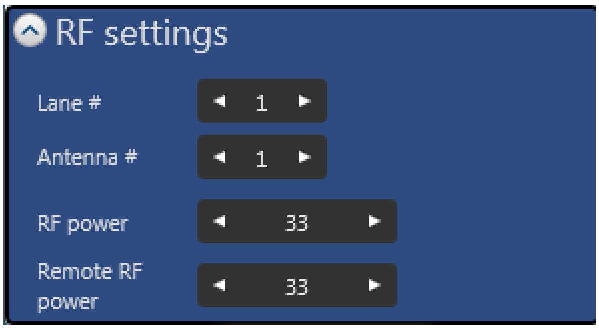
1 lane / 1 antenna

1 lane / 2 antennas

	ETSI (R4x)	FCC (R5x)
URD + CAB_URD + ANT-URD (power by default)	31 dBm	30,5 dBm
URD + CAB_URD + ANT_SPECTRE	28 dBm	27,5 dBm
URD + CAB_SPECTRE + ANT_URD	31 dBm	30,5 dBm
URD + CAB_SPECTRE 1,5 or 3m + ANT_SPECTRE	31 dBm	30,5 dBm
URD + CAB_SPECTRE 9 or 12m + ANT_SPECTRE	29,7 dBm	29,3 dBm

3.1.2 Table of URC2 powers

Modification of the power in ULTRYS v1. One power field for the integrated antenna and one for the remote antenna.

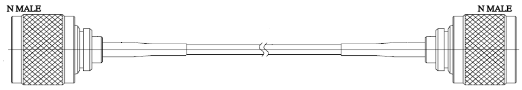


Power of the integrated antenna	ETSI (R4x)	FCC (R5x)
	On the adhesive label on the reader 	30 dBm

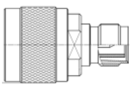
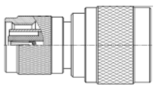
Power of remote antenna	ETSI (R4x)	FCC (R5x)
URC2 + CAB_URD + ANT-URD (Puissance par défaut)	31 dBm	30,5 dBm
URC2 + CAB_URD + ANT_SPECTRE	28 dBm	27,5 dBm
URC2+ CAB_SPECTRE + ANT_URD	31 dBm	30,5 dBm
URC2 + CAB_SPECTRE 1,5 or 3m + ANT_SPECTRE	31 dBm	30,5 dBm
URC2 + CAB_SPECTRE 9 or 12m + ANT_SPECTRE	29,7 dBm	29,3 dBm

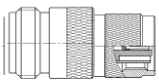
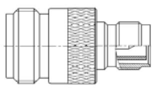
Modification of the power in ULTRYS v1. The power of the integrated antenna remains unchanged. Only the RF power of the remote antenna may have to be changed.

3.2 Details of the connector

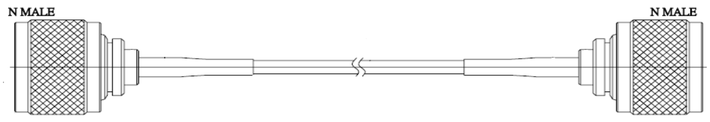
Hardware / Type of connector			
URD or URC2	CAB_URD		ANT_URD
			
Connector N female	Connector N male	Connector N male	Connector N female

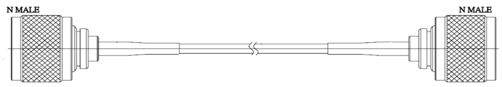
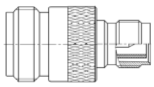
SMA	CAB_SPECTRE		ANT_SPECTRE
			
Connector RP TNC female	Connector RP TNC male	Connector RP TNC female	Connector RP TNC male

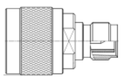
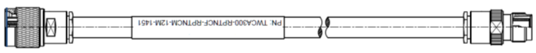
ADAPT-URD-ANT2			ADAPT-SMA-ANT-URD		
Connector N male		Connector RP TNC female	Connecteur RP TNC male		Connecteur N male

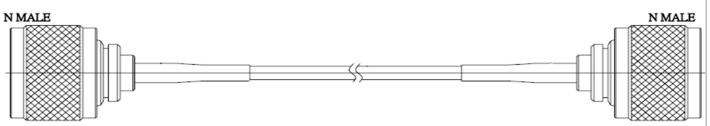
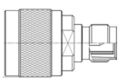
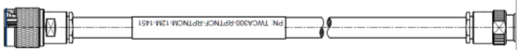
ADAPT-SMA-CAB-URD			ADAPT-CAB-URD-ANT2		
Connector N female		Connector RP TNC male	Connector N female		Connector RP TNC female

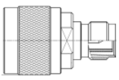
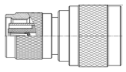
3.3 Hybrid system with a URD or URC2 reader

Initial installation		
 or URC2	 CAB_URD	

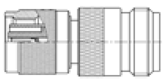
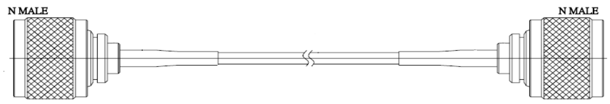
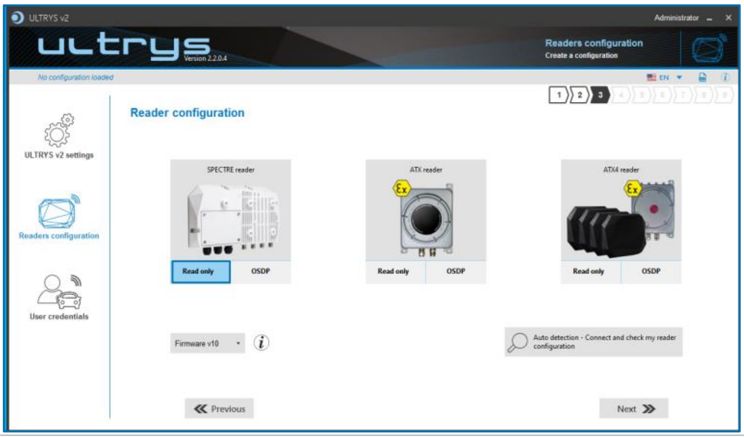
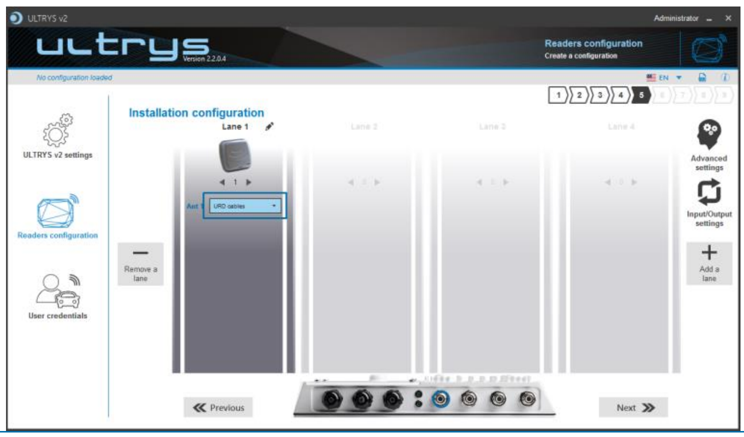
Replacement: ANT_URD by ANT_SPECTRE			
 or URC2	 CAB_URD	 ADAPT- CAB-URD-ANT2	
Configuration with ULTRYS v1: no changes. No control of the antenna LED.			

Replacement: CAB_URD + ANT_URD by CAB_SPECTRE + ANT_SPECTRE			
 or URC2	 ADAPT-URD-ANT2	 CAB_SPECTRE	
Configuration with ULTRYS v1: RF power setting (see table of powers). No control of the antenna LED.			

Ajout : ANT_SPECTRE + CAB_SPECTRE			
 or URC2	 CAB_URD		
	 ADAPT-URD-ANT2	 CAB_SPECTRE	
Configuration with ULTRYS v1: - Addition of the second antenna - RF power setting (see table of powers). No control of the antenna LED.			

Replacement: CAB_URD by CAB_SPECTRE				
 *or URC2*	 ADAPT-URD-ANT2	 CAB_SPECTRE	 ADAPT-SMA-ANT-URD	
Configuration with ULTRYS v1: no changes.				

3.4 Hybrid system with a SPECTRE reader

<table>
<tr><th colspan="4">SMA + CAB_URD + ANT_URD</th></tr>
<tr>
<td></td>
<td>
ADAPT- SMA-CAB-URD</td>
<td>
CAB_URD</td>
<td></td>
</tr>
<tr><td colspan="4">Configuration with ULTRYS v2:</td></tr>
<tr><td>Step 3: Select SPECTRE reader</td><td colspan="3"></td></tr>
<tr><td>Step 4: Select URD antenna</td><td colspan="3"></td></tr>
<tr><td>Step 5: Select URD cables</td><td colspan="3"></td></tr>
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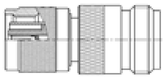
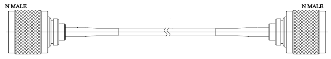
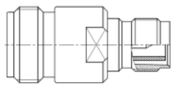
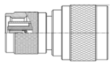
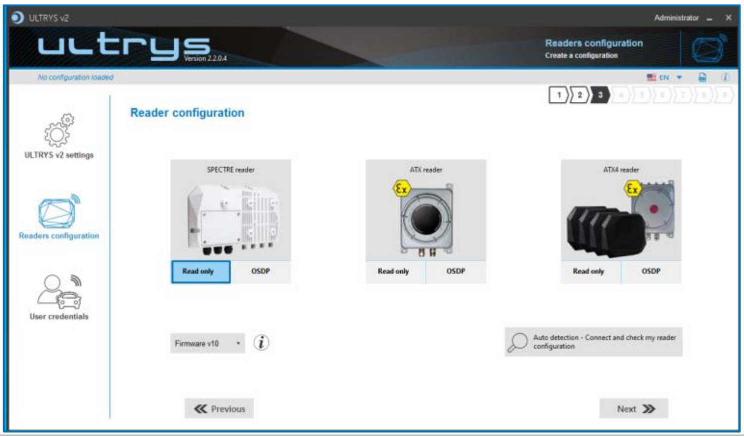
SMA + CAB_URD + ANT_SPECTRE				
	 ADAPT- SMA- CAB -URD	 CAB_URD	 ADAPT- CAB-URD-ANT2	
Configuration with ULTRYS v2:				
Step 3: Select SPECTRE reader				
Step 4: Select SPECTRE antenna				
Step 5 : Select URD cables				

SMA + CAB_SPECTRE + ANT_URD			
	 CAB_SPECTRE	 ADAPT-SMA-ANT-URD	

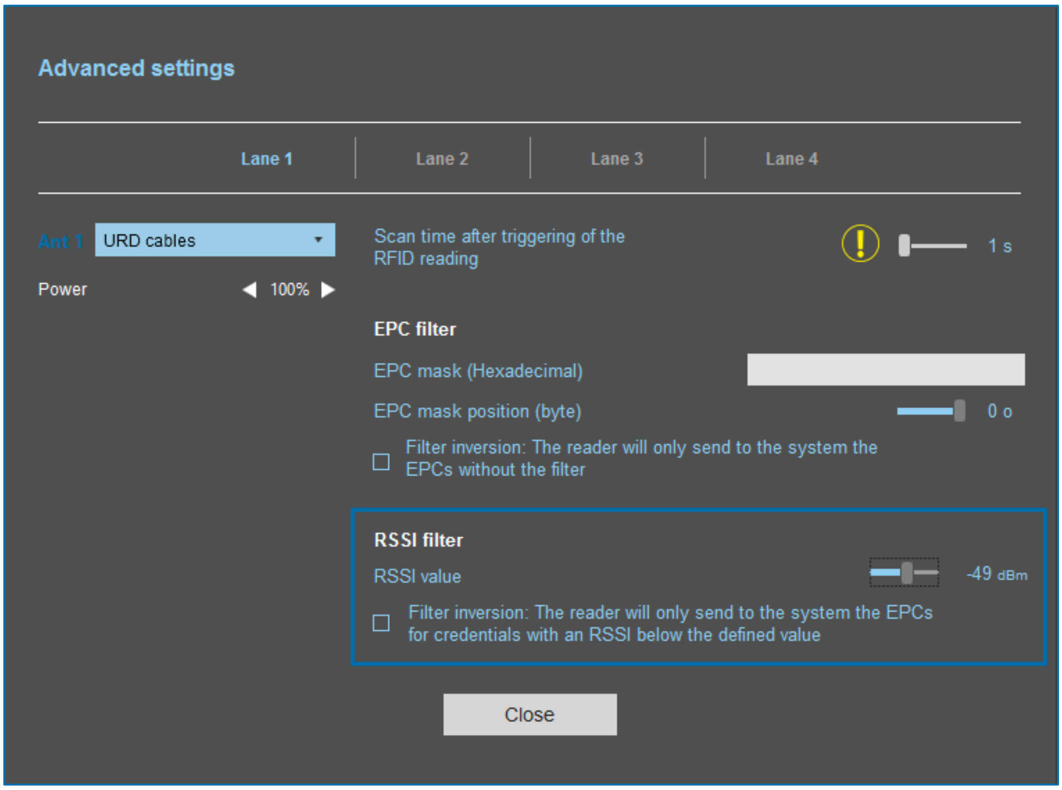
Configuration with ULTRYS v2:	
Step 3: Select SPECTRE reader	
Step 4: Select URD antenna	
Step 5: Select the length of the SPECTRE cable	

4- RSSI FILTERING

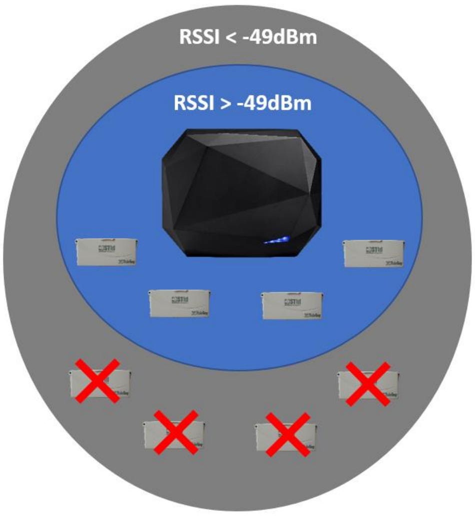
4.1 Introduction

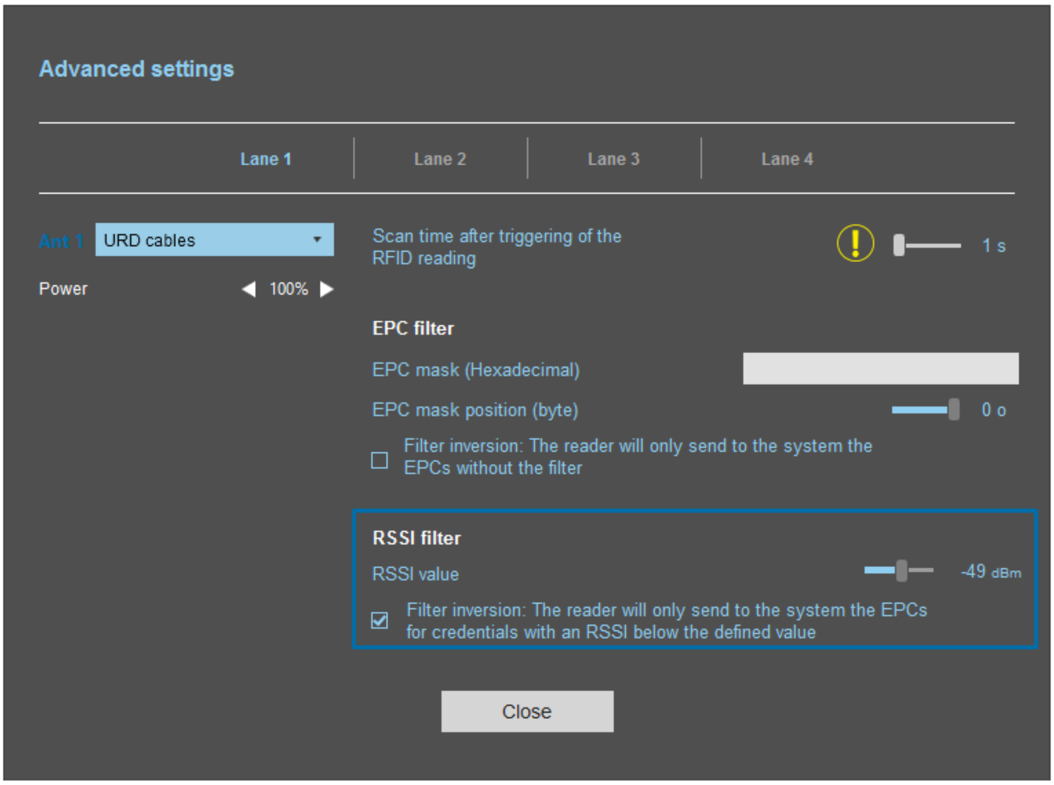
RSSI, or “Received Signal Strength Indication”, is a measurement of the strength of the response received from the tag. The value sent by the reader is proportional to the amplitude of the received signal.

4.2 Exemple

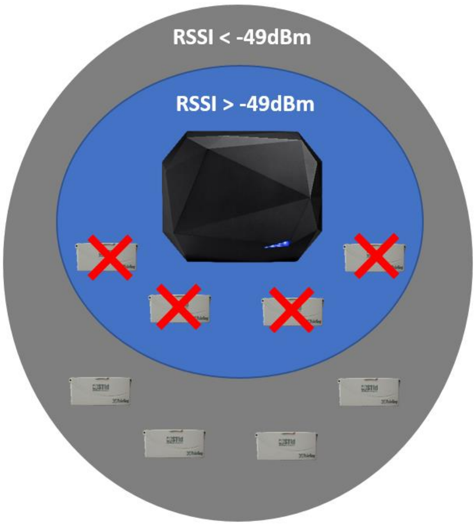


Tags with an RSSI higher than -49dBm are sent to the system. The others are not.





When “Inversion” is activated, tags with an RSSI lower than -49dBm are sent to the system. The others are not.



5- Input / output parameters

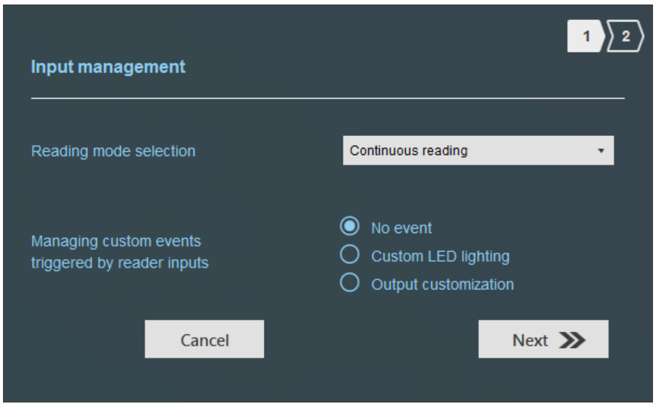
5.1 Introduction

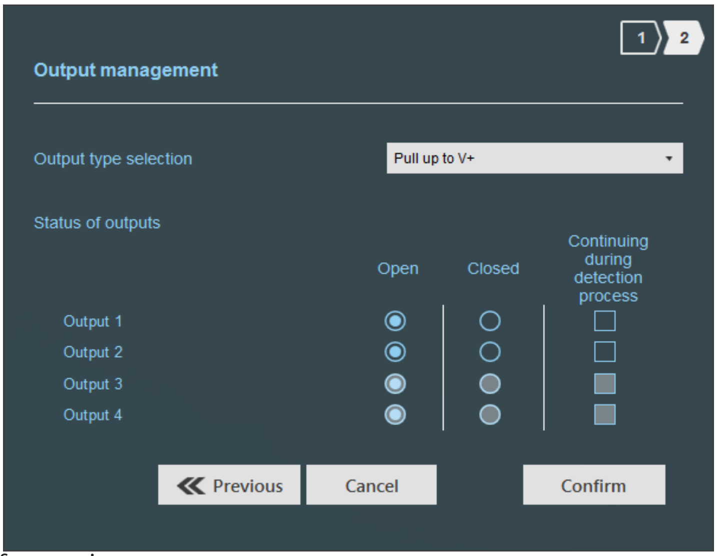
SPECTRE readers are fitted with four octo-coupled inputs (INx) and outputs (OUTx).

Therefore, the readers allow:

- the activation of the reading to be configured. For example, using a photoelectric barrier or a detection loop on the ground.
- an action to be taken at the reader outputs, for example by reading specific labels.

Their operation can be configured using the ULTRYS v2 software.





Refer to the ULTRYS v2 User Manual for more information.

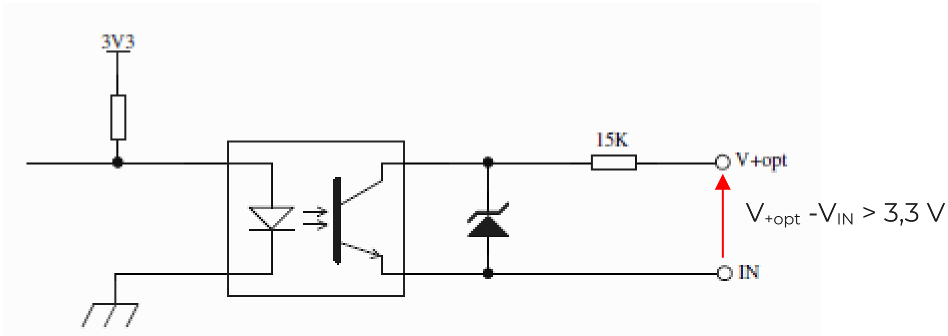
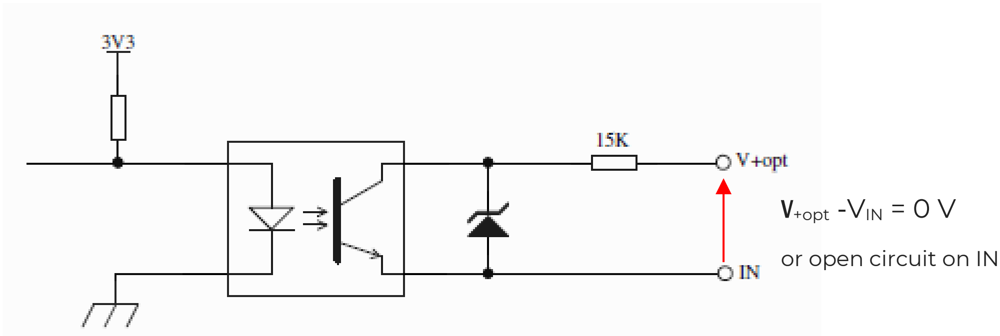
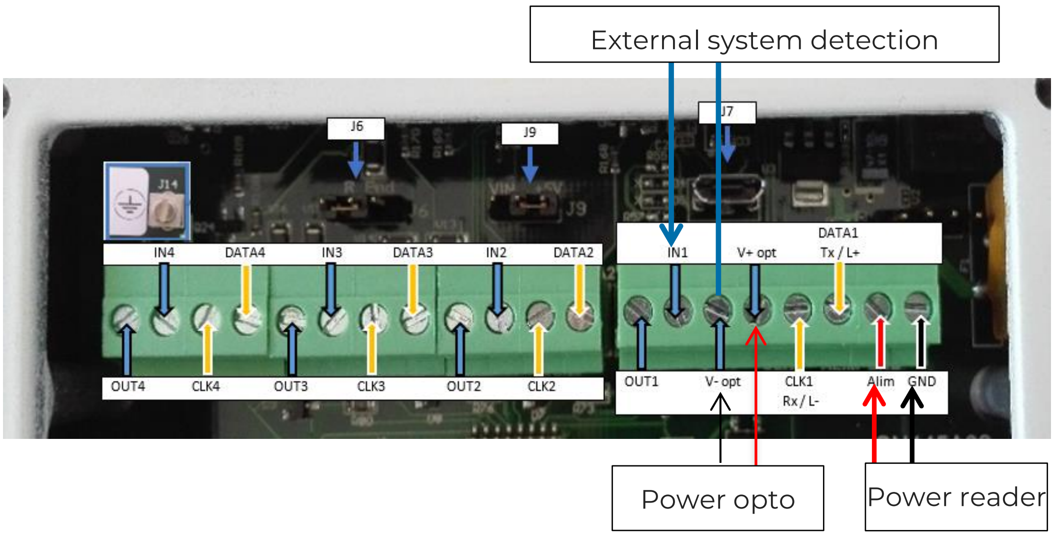
5.2 Inputs

The reader checks the inputs every 50 ms. When an input is detected, the reader takes the configured action and continues to check the other inputs.

By applying a potential to INx that induces a minimum difference in potential of 3.3 Vdc between INx and V+opt ($V^{+}opt - V_{IN} > 3,3$ V), the transistor turns on (switch closed), and the information indicating the presence of a signal at the input is transmitted to the reader. If no potential is applied to the IN input, the transistor is blocked (switch open).

Caution: the polarization voltage V+ depends on the voltage available on the IN of the external system.

For activation: 3.3 Vdc ≤ $V^{+}opt - V_{IN}$ ≤ 36 Vdc.

IN input active	
IN input inactive	
Connection	

5.3 Examples of input use

5.3.1 Reading activated when the presence of a vehicle is detected with detector OPTEX

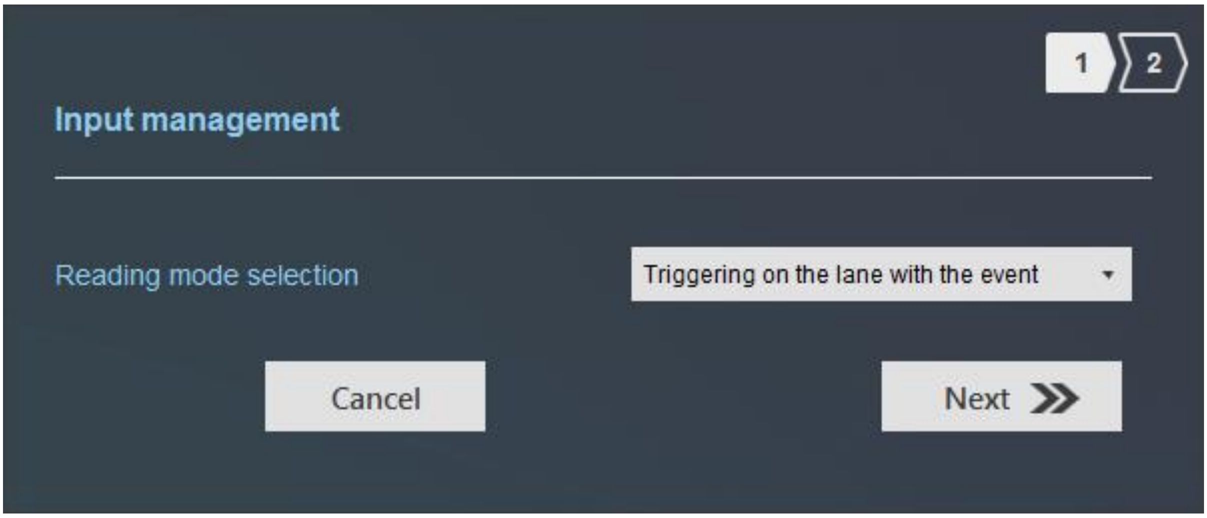
Vehicle presence detector

DETECT-VEHICLE-01

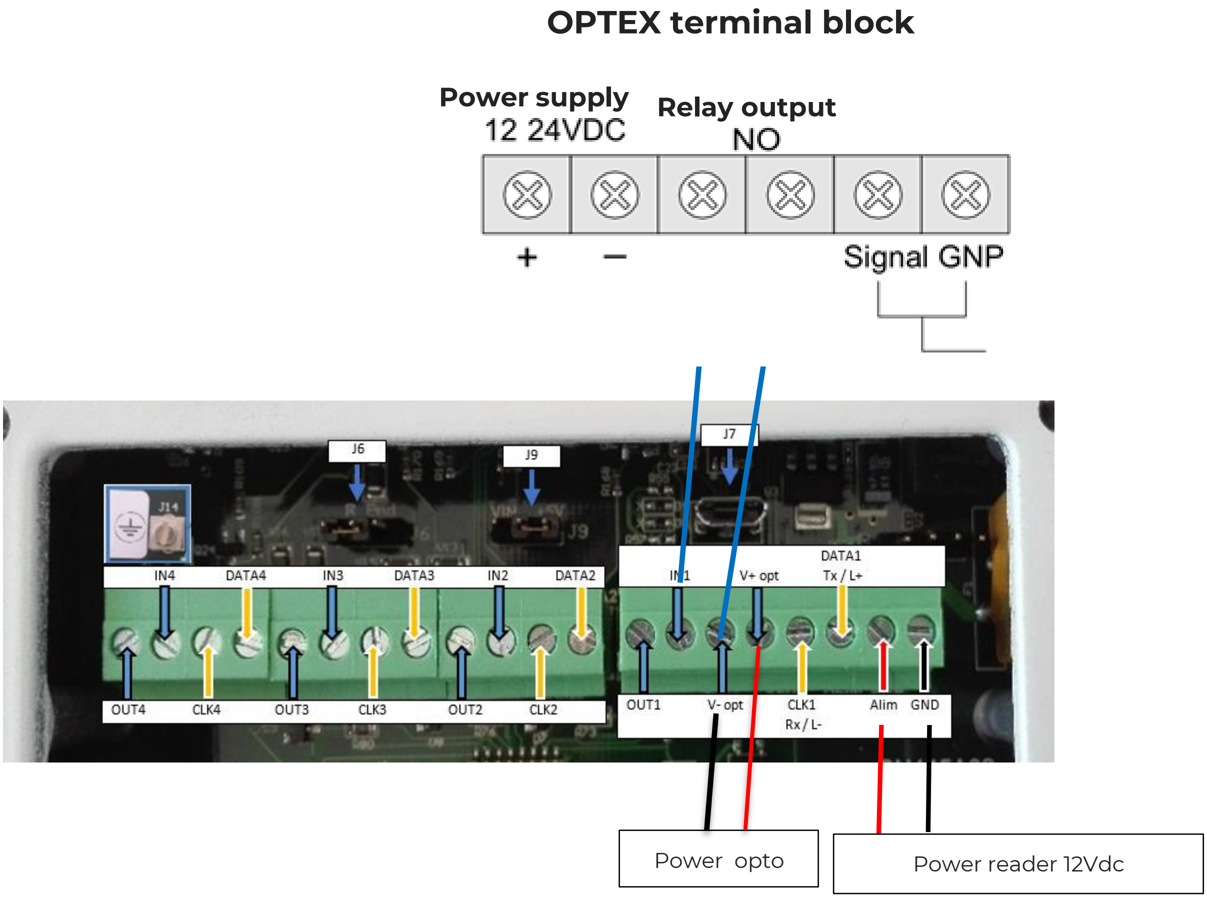
The OPTEX presence detector is designed to reliably detect the presence of a vehicle when it is stopped or moving at up to 20 km/h.

Combining microwave detection and ultrasonic sensor, it offers 5 levels of sensitivity adjustment. This accessory connects easily to the SPECTRE reader, allowing to activate the tag reading during the passage of the vehicle.

ULTRYS v2 settings



Conection

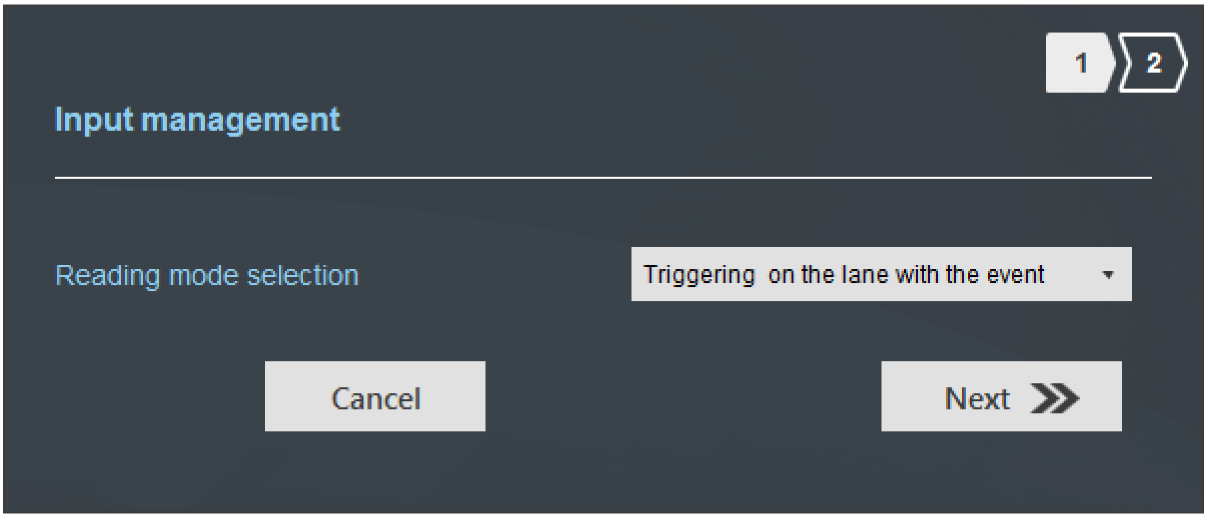


Operation

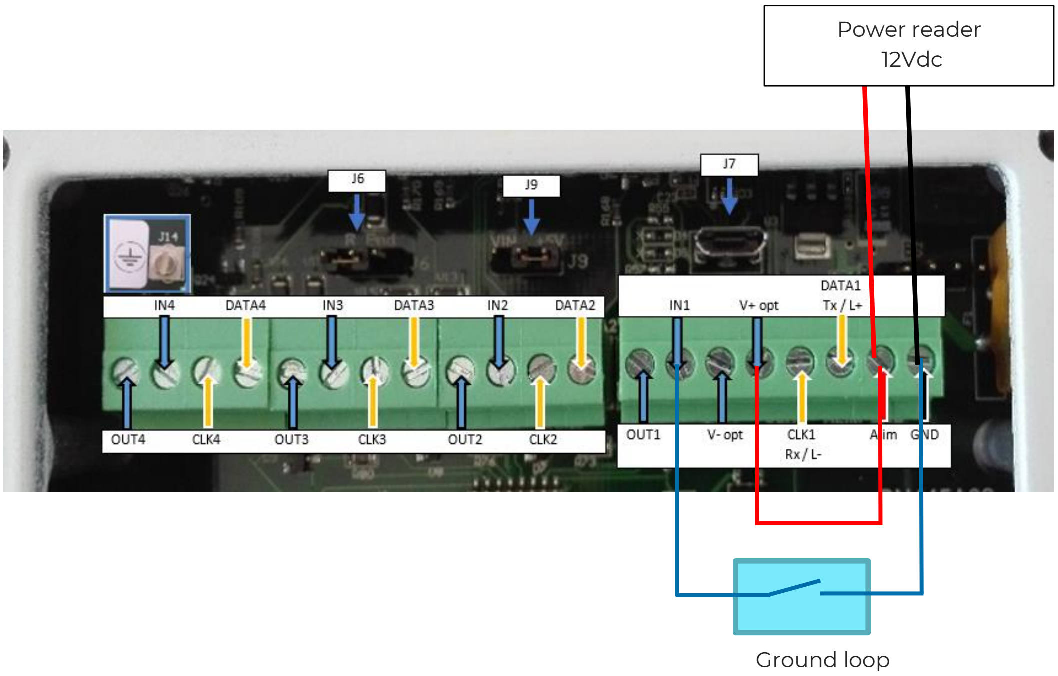
When a vehicle is detected by the OPTEX detector, the detector relay switches to "closed", the information is sent to the reader via the INx input of the corresponding channel (in the example channel 1). The reader will start reading on this channel as long as the input is active.

5.3.2 Reading activated when the presence of a vehicle is detected with ground loop

ULTRYS v2 settings



Connection



Operation

When the ground loop detects a vehicle, the information is sent to the reader through the IN input of the corresponding channel (channel 1 in this example). The reader reads on this channel for as long as the input is active.

5.4 Outputs

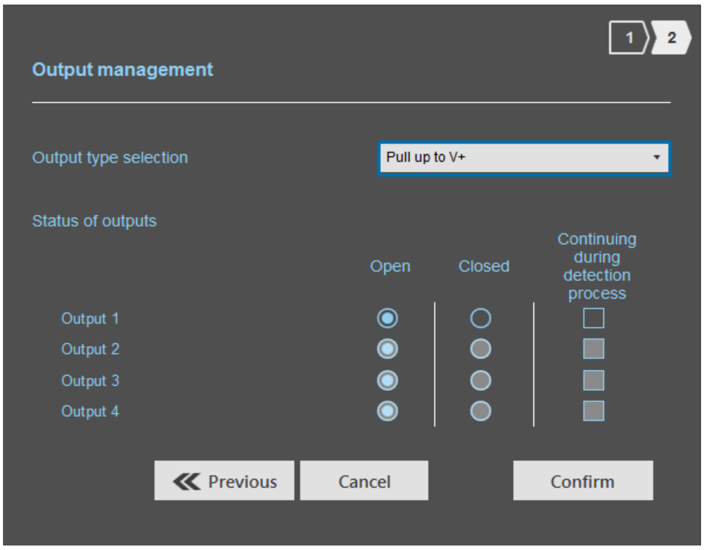
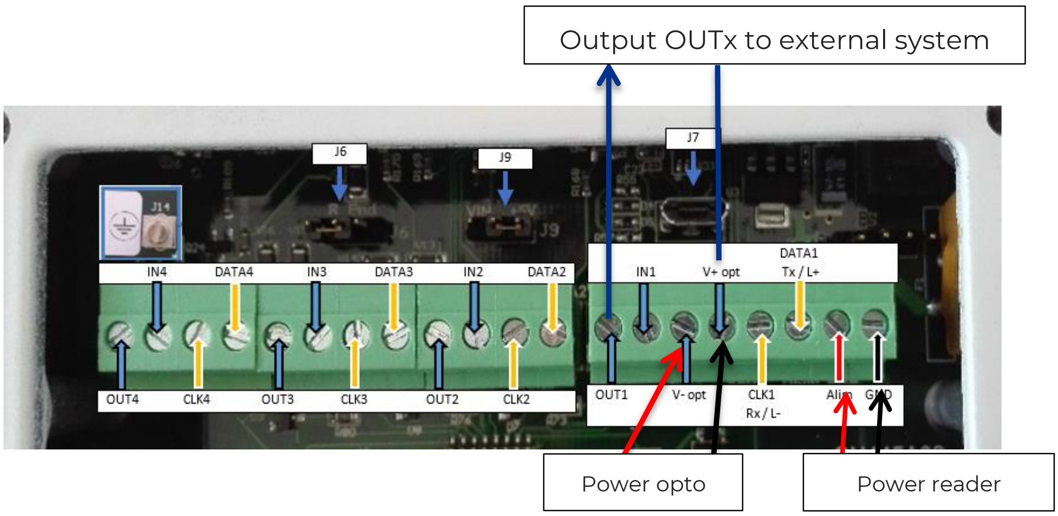
The outputs OUTx behave like open/closed switches. The rest state is configured using the ULTRYS v2 software. A normally open output will be closed by the action of the reader and vice versa (refer to the ULTRYS v2 User Manual).

Depending on the chosen option, the output will be connected to an internal pull-up (pull-up to V+) or left unconnected (collector open).

In both cases, the polarization potentials V+opt and V-opt must be connected.

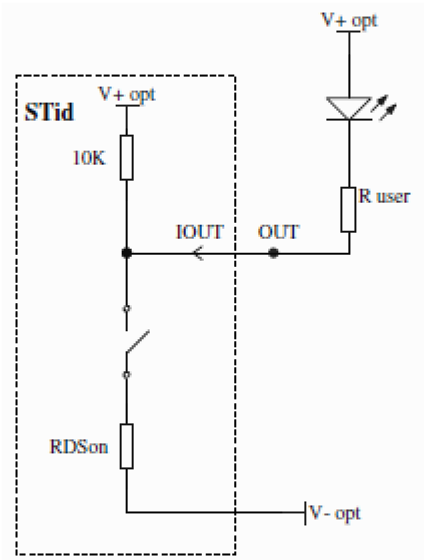
Caution: DO NOT CONNECT DIRECTLY THE OUTx OUTPUTS TO V+OPT

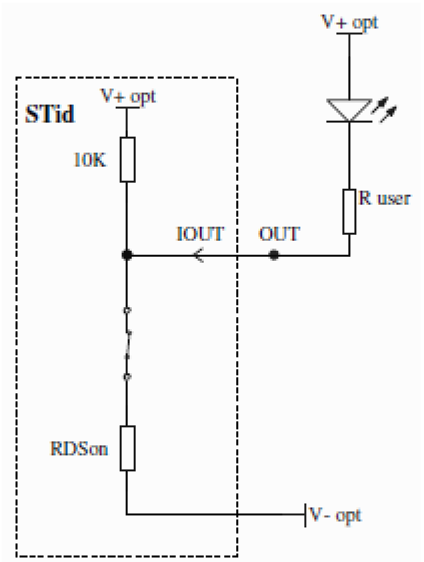
5.4.1 PULL UP TO V+

ULTRYS v2 settings Pull up to V+	
Connection Pull up à V+	

<table>
<tr>
<td rowspan="3">Operating diagram</td>
<td colspan="2">The operating diagram is given for outputs configured as Normally Open in ULTRYS v2.

The system is represented by a LED for better understanding, the value of the Ruser resistor is to be determined according to the client "system" connected.

Caution: I_{OUT} max 200mA</td>
</tr>
<tr>
<td>No tag detected:

</td>
<td>OUT is pull up to V+opt: Vout = V+opt

LED OFF</td>
</tr>
<tr>
<td>Tag detected:

</td>
<td>OUT is pull up to V-opt: Vout = V-opt

LED ON

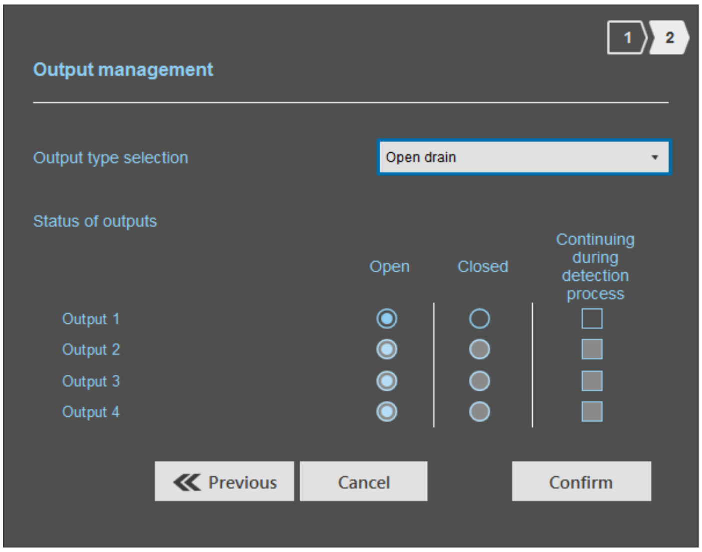
Note: RDSon max = 2Ω, the maximum residual voltage is therefore 0.4Volts.</td>
</tr>
</table>

5.4.2 Open drain

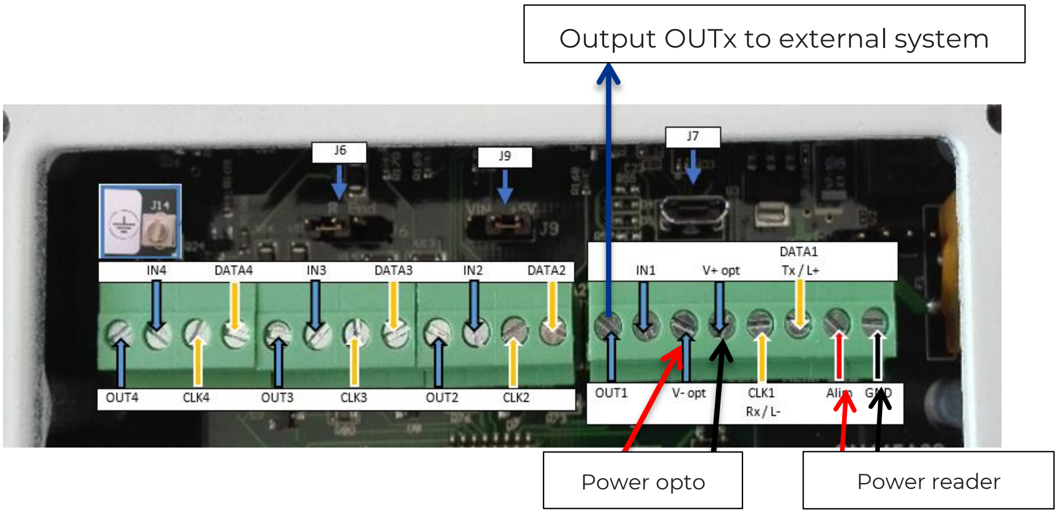
If the system is not compatible with the V+opt voltage used by the pull up, use the open drain setting and bring a voltage that we will call Vsystem.

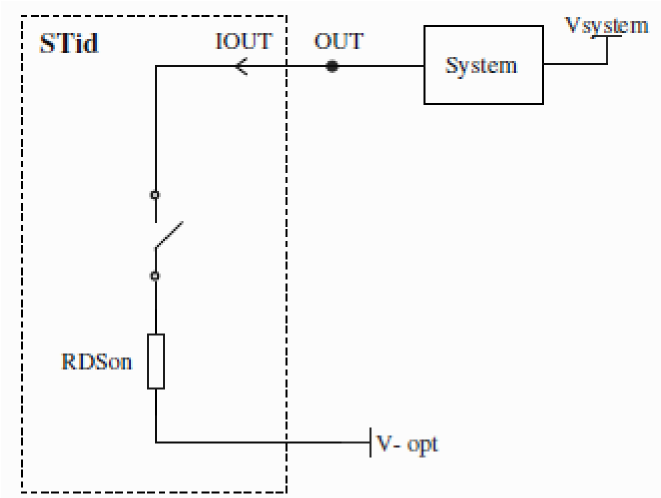
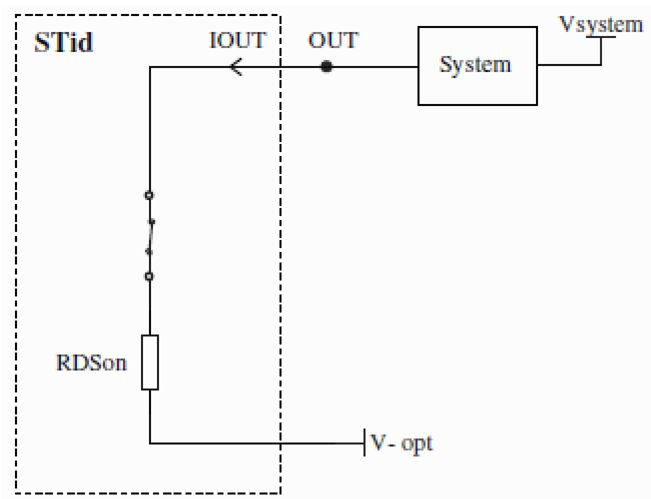
ULTRYS v2 Settings

Open drain

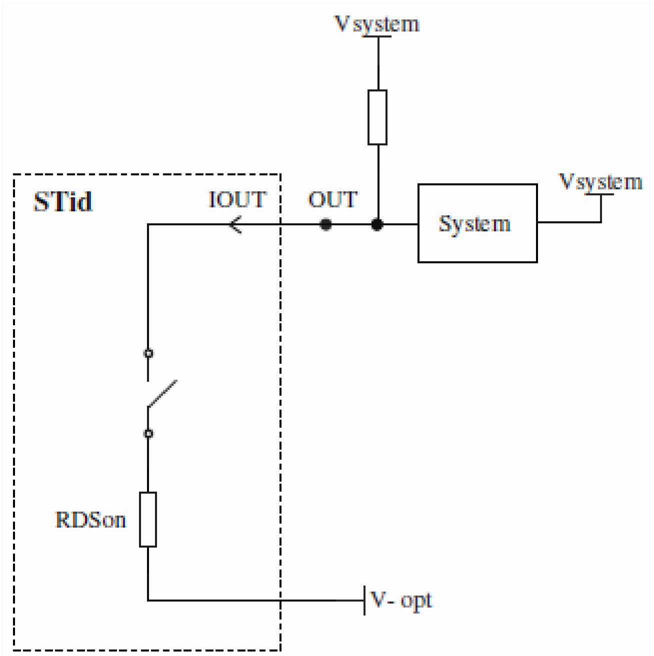
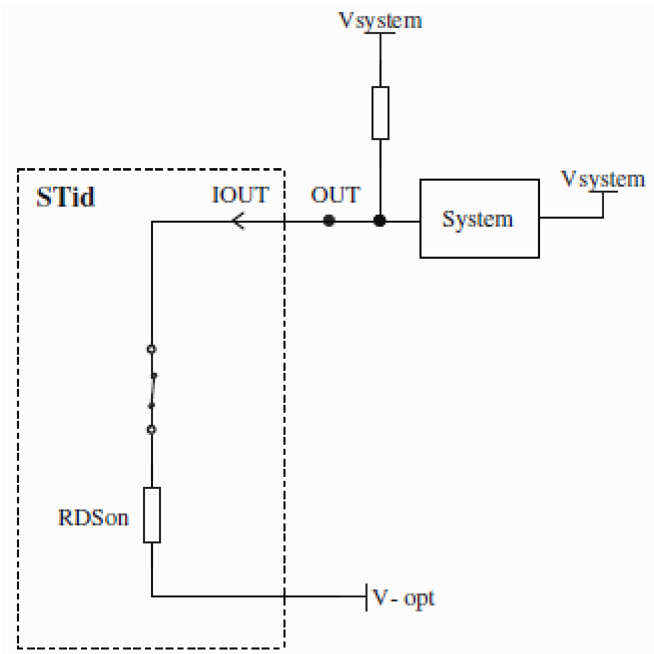


Connection Open drain



<table>
<tr><td rowspan="3">Operating diagram 1: Without pull up to Vsystem</td><td colspan="2">The operating diagram is given for outputs configured as Normally Open in ULTRYS v2.
Caution: I_{OUT} max 200mA</td></tr>
<tr><td>No tag detected:

</td><td>OUT is not connected
The system is not powered</td></tr>
<tr><td>Tag detected:

</td><td>OUT is pull up to V-opt: Vout = V-opt
The system is powered

Note: RDSon max = 2Ω, the maximum residual voltage is therefore 0.4Volts.</td></tr>
</table>

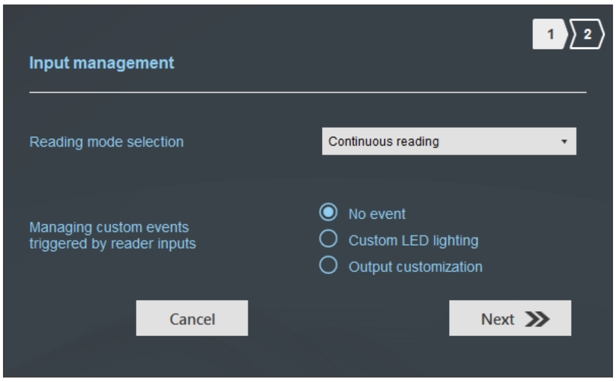
<table>
<tr><td rowspan="3">Operating diagram 2:
With pull up to Vsystem</td><td colspan="2">The operating diagram is given for outputs configured as Normally Open in ULTRYS v2.
Caution: I_{OUT} max 200mA</td></tr>
<tr><td>No tag detected:

</td><td>OUT is pull up to Vsystem
The system is not powered</td></tr>
<tr><td>Tag detected:

</td><td>OUT is pull up to V-opt: Vout = V-opt
The system is powered

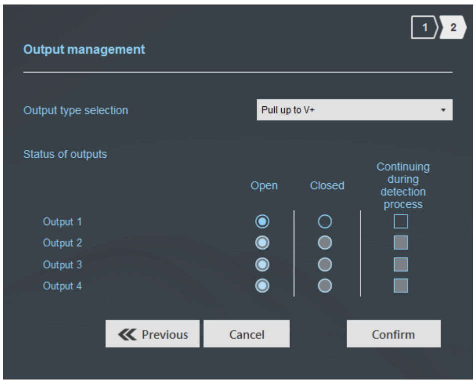
Note: RDSon max = 2Ω, the maximum residual voltage is therefore 0.4Volts..</td></tr>
</table>

5.5 Examples of output use

5.5.1 Activation of an external optical warning

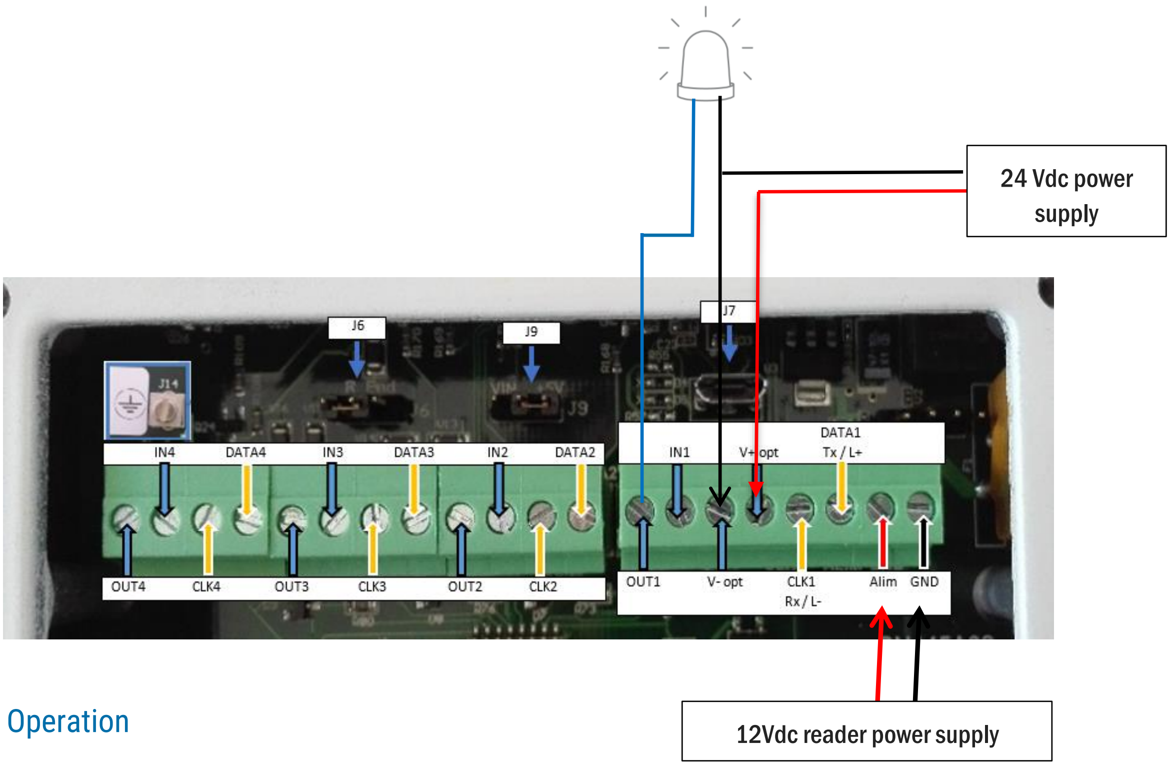
ULTRYS v2 settings





Connection

In this example, the optical warning operates at 24 Vdc.

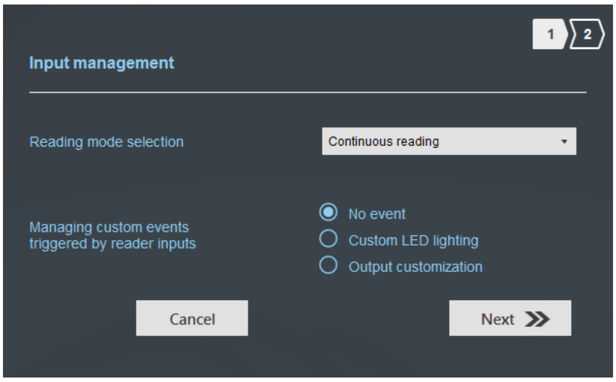


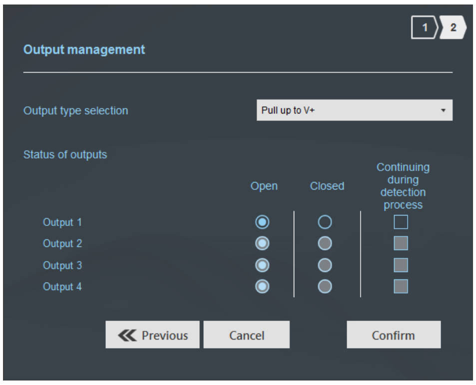
Operation

The reader reads continuously. When the reader sends a tag to the system on channel 1, the state of output 1 changes for 200 ms and returns to its normally open default position in this example.

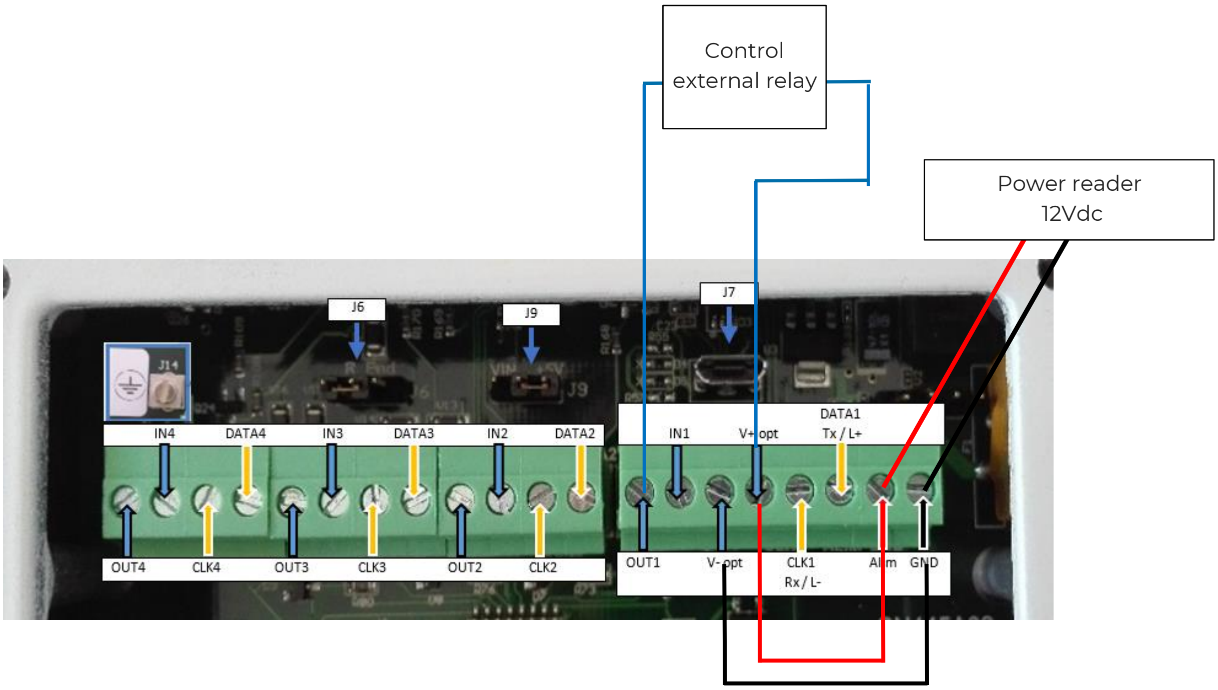
5.5.2 Control of an external relay

ULTRYS v2 settings





Connection



Operation

The reader reads continuously.
When the reader sends a tag to the system on channel 1, the OUT_1 is pull up to V+opt, the relay is piloted. When there is no tag, the relay is not piloted.

6- Approach to projects

A number of steps must be followed when equipping a site with a SPECTRE Access configuration.

Site analysis
Collect the basic information required to define the configuration to be installed:

- Site map,
- Direction of the traffic flows,
- Dimensions,
- Types of vehicles to be identified.

Definition of the targets
Identification zones: choose the point where the vehicles are to be identified:

- Positions,
- Dimensions.

Choice of hardware
On the basis of the targets and restrictions identified in the preceding steps, the first hardware choices can be made (type of reader, number of readers, type of tag, etc.).

The technical options are determined by the constraints. This analysis produces a clear vision of the feasibility of the preferred configuration and any arrangements or compromises that may be necessary.

Definition of the tests
It is advisable to define the tests required to validate the configuration with the customer, if necessary, right from the outset. Make sure that representative vehicles (vehicles with athermic and non-athermic windshields) and the equipment required for the purposes of the validation are available.

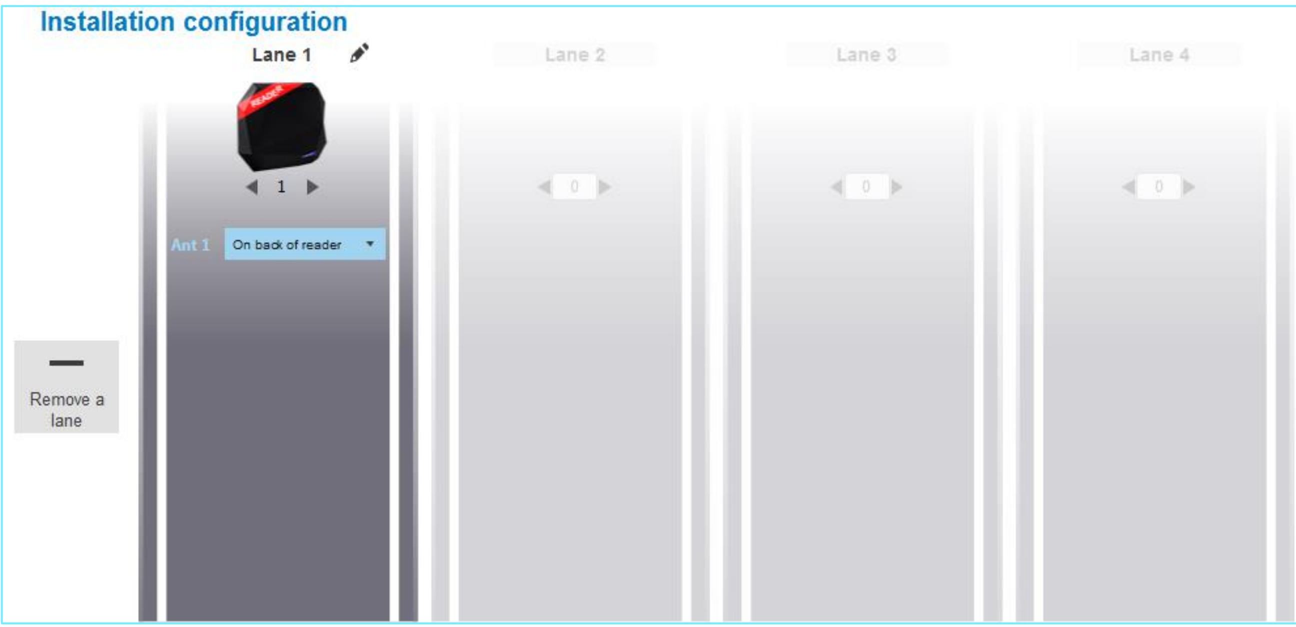
7- Examples of configurations

Some conventional vehicle access configurations are described below, with an indication of the typical positions of the antennas/readers.

These configurations are just examples. They are generic and intended to provide food for thought.
Certain functional factors may be influenced by external parameters.

7.1 One-lane single access

- An SLA reader is installed on the side.
- It is positioned before the barrier so that vehicles can be detected early enough.



7.2 One-lane single access – Double height

When a single antenna is not sufficient to cover the entire height required to identify light vehicles and heavy goods vehicles.

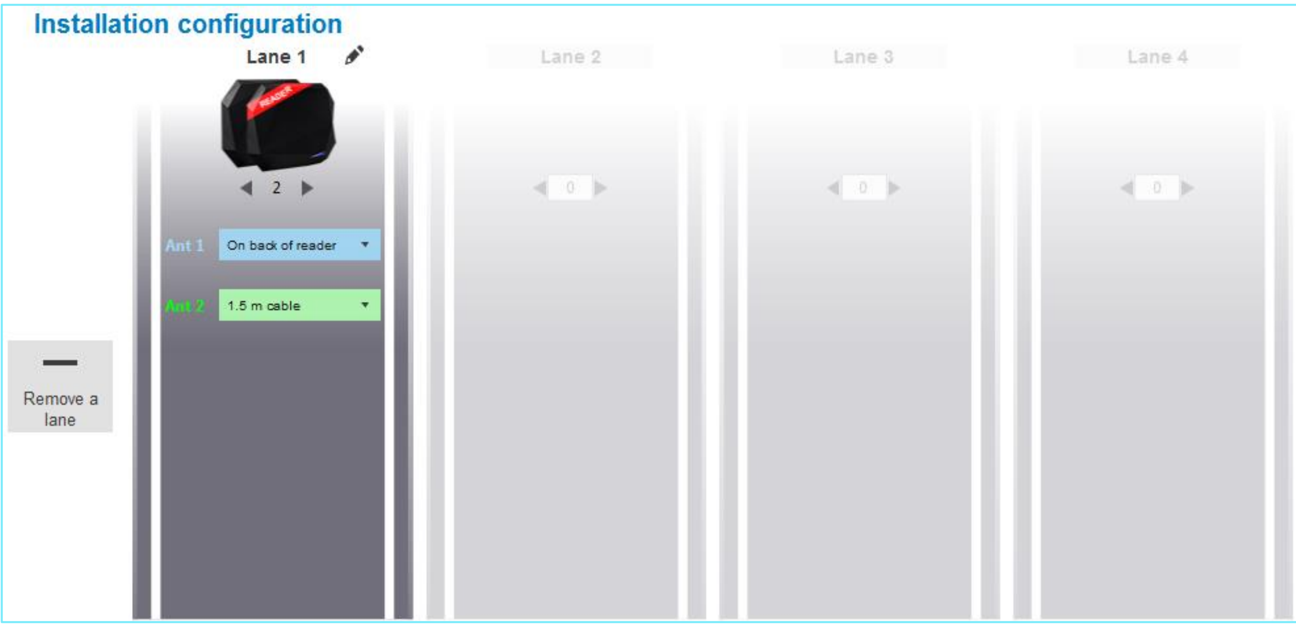
SPECTRE

2 ANTENNAS CONFIGURATION

- One SLA reader and one SPECTRE antenna installed on the side.
- One 1.5m cable to connect the external antenna to the SLA reader.

- One antenna optimally positioned to detect light vehicles.
- One antenna optimally positioned to detect heavy goods vehicles.

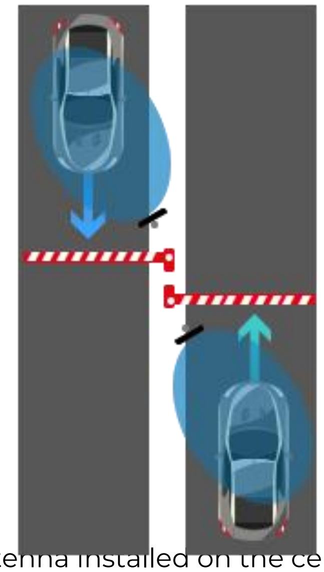
- The reader is placed in front of the barrier in order to detect vehicles at a sufficient distance before the barrier.
- Both antennas are controlled by the same reader to avoid any risks of interference.



7.3 Single Entrance / Exit for light vehicles only with a central island

SPECTRE

2 ANTENNAS CONFIGURATION



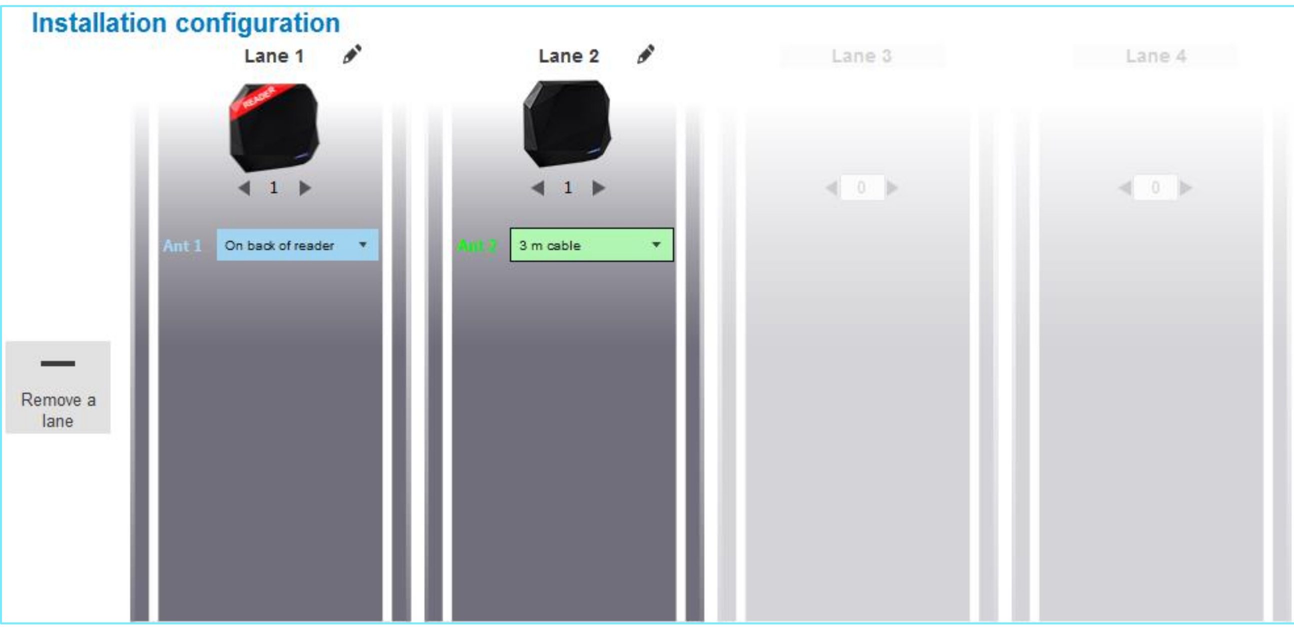
- One SLA reader and one SPECTRE antenna installed on the central island.
- One antenna cable to connect the external antenna to the SLA reader.

- One antenna installed to detect vehicles at the entrance.
- One antenna installed to detect vehicles at the exit.

- Each antenna monitors one lane and sends the data to its own specific reader output.

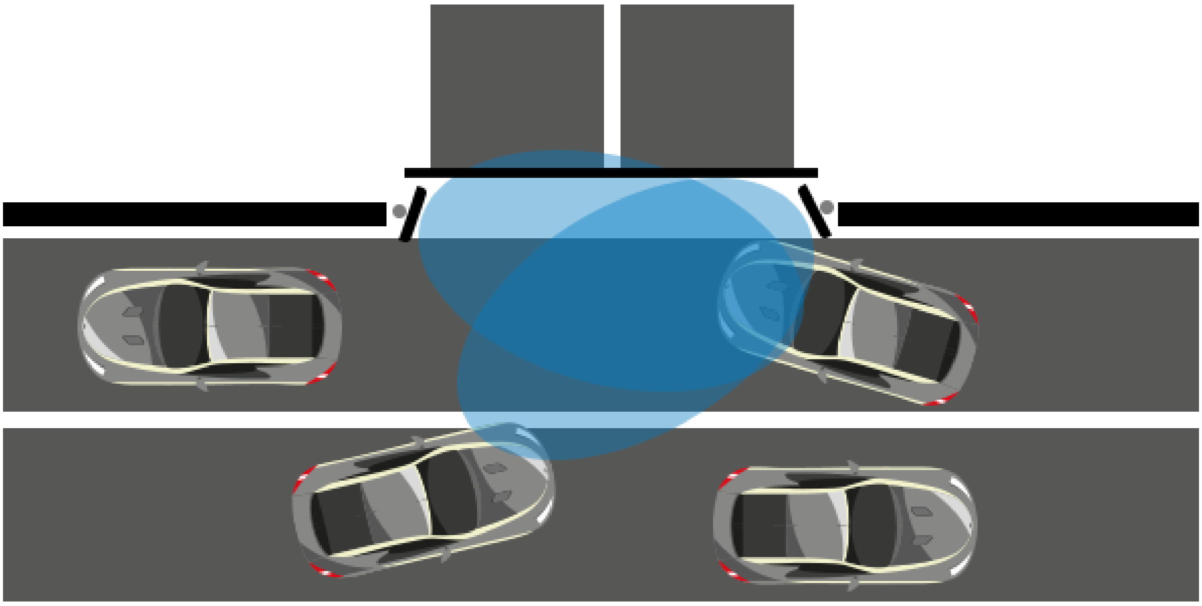
- The reader is placed in front of the barrier in order to detect vehicles at a sufficient distance before the barrier. This also limits the number of unwanted readings on another lane.

- Both antennas are controlled by the same reader to avoid any risks of interference.



7.4 Double-width access on a two-way public road

Vehicles can arrive from both sides / sliding gate.



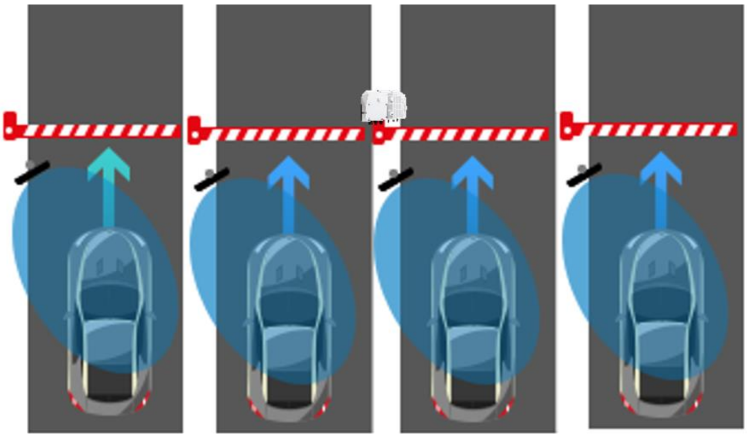
- SLA reader with a remote antenna, if an antenna cable can be routed.
- One antenna on each side of the gate in order to be in the axis of arriving vehicles.
- **Pay close attention to the width in order to remain in a zone covered by the reader**.

7.5 Multiple-lane access

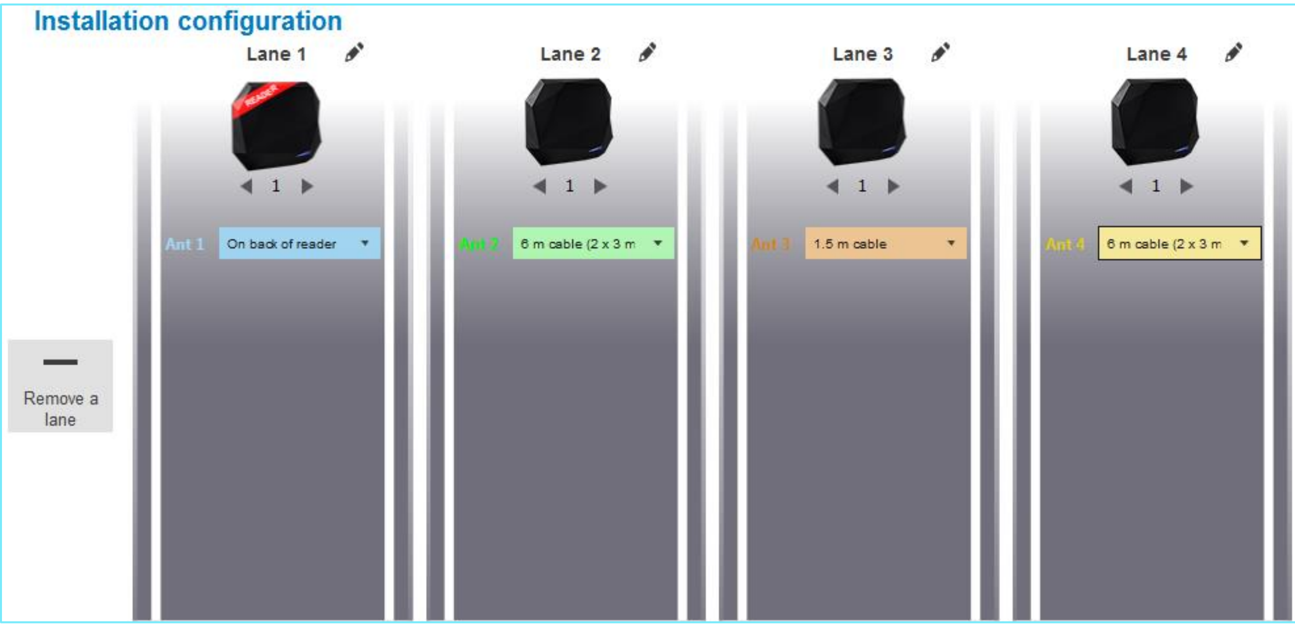
One SMA reader with four remote antennas.

SPECTRE

4 ANTENNAS CONFIGURATION



- The antennas are controlled by the same reader to avoid any risks of interference.
- Each antenna monitors one lane and sends the data to an independent output.
- The antennas can be installed up to 12m from the module, which is positioned in the center.



8- Installation methodology

- Position the tag inside the vehicle. **Do not hold the tag in your hand when validating**

- Put the vehicle in the typical / preferred identification zone.

- Adjust the height and direction of the antenna until a reading is obtained.

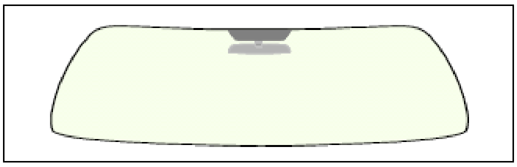
- Test the configuration with the vehicle in motion.

- Adjust the antenna until it produces an optimal result.

This configuration is optimized for the test vehicle. Ideally, these settings must also be configured using a vehicle that is very different from the first one (higher windshield, LCV, etc.) in order to install the antenna in a position covering as many use cases as possible.

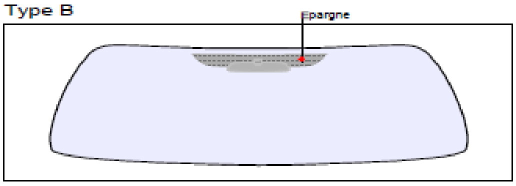
9- Athermic windshields

Type A



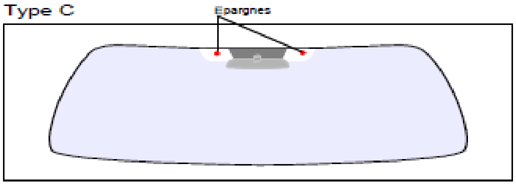
verre teinté (non athermique)

Type B



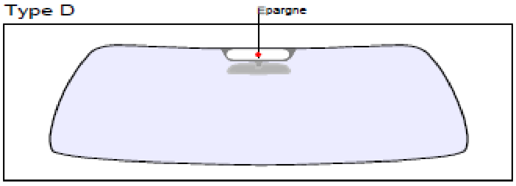
verre athermique épargne

Type C



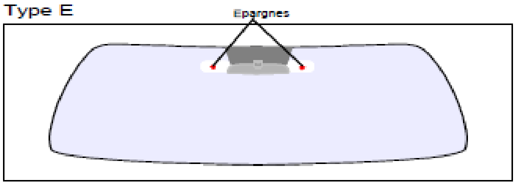
verre athermique

Type D



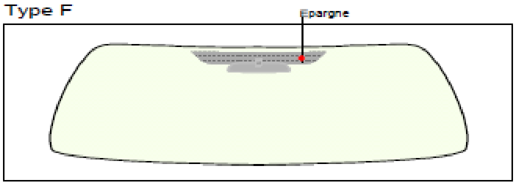
verre athermique

Type E



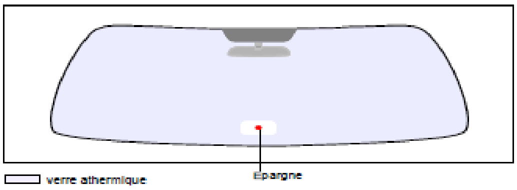
verre athermique

Type F



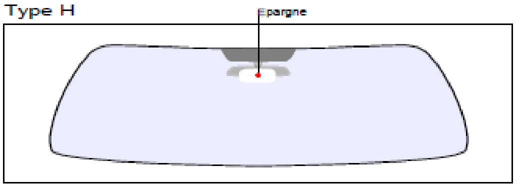
verre athermique de couleur neutre épargne

Type G



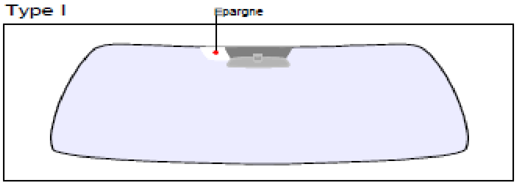
verre athermique

Type H



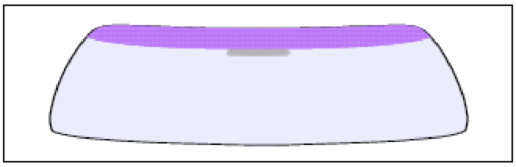
verre athermique

Type I



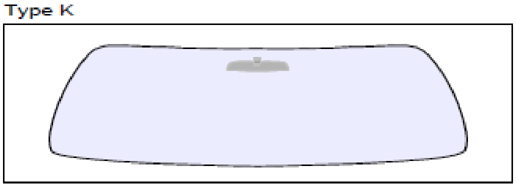
verre athermique

Type J



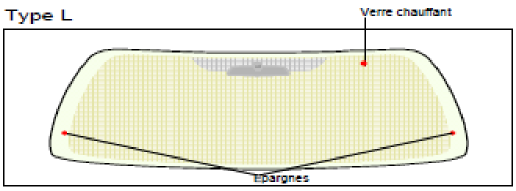
verre athermique (sans épargne) verre athermique de couleur dégradée

Type K



verre athermique (sans épargne)

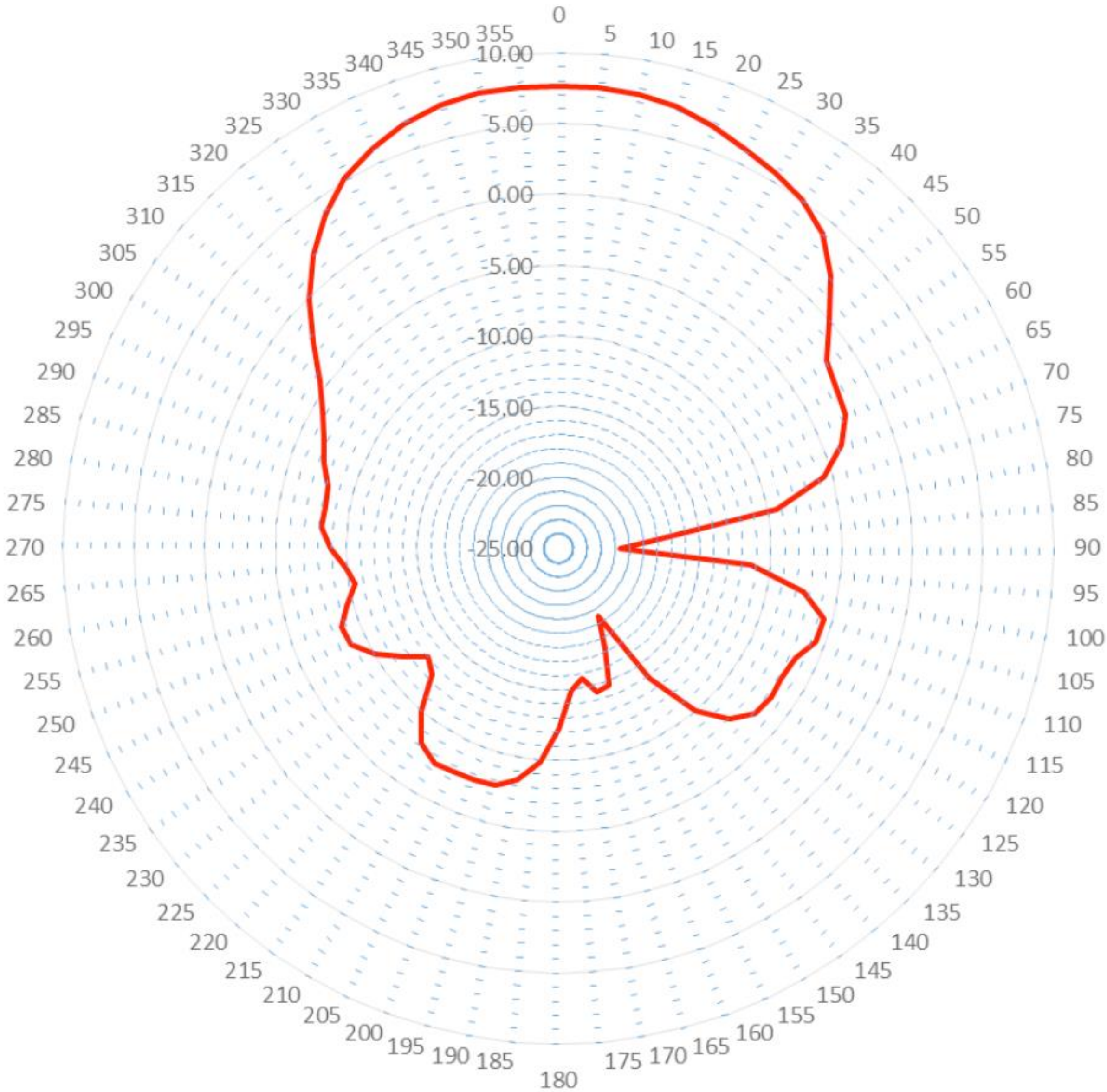
Type L



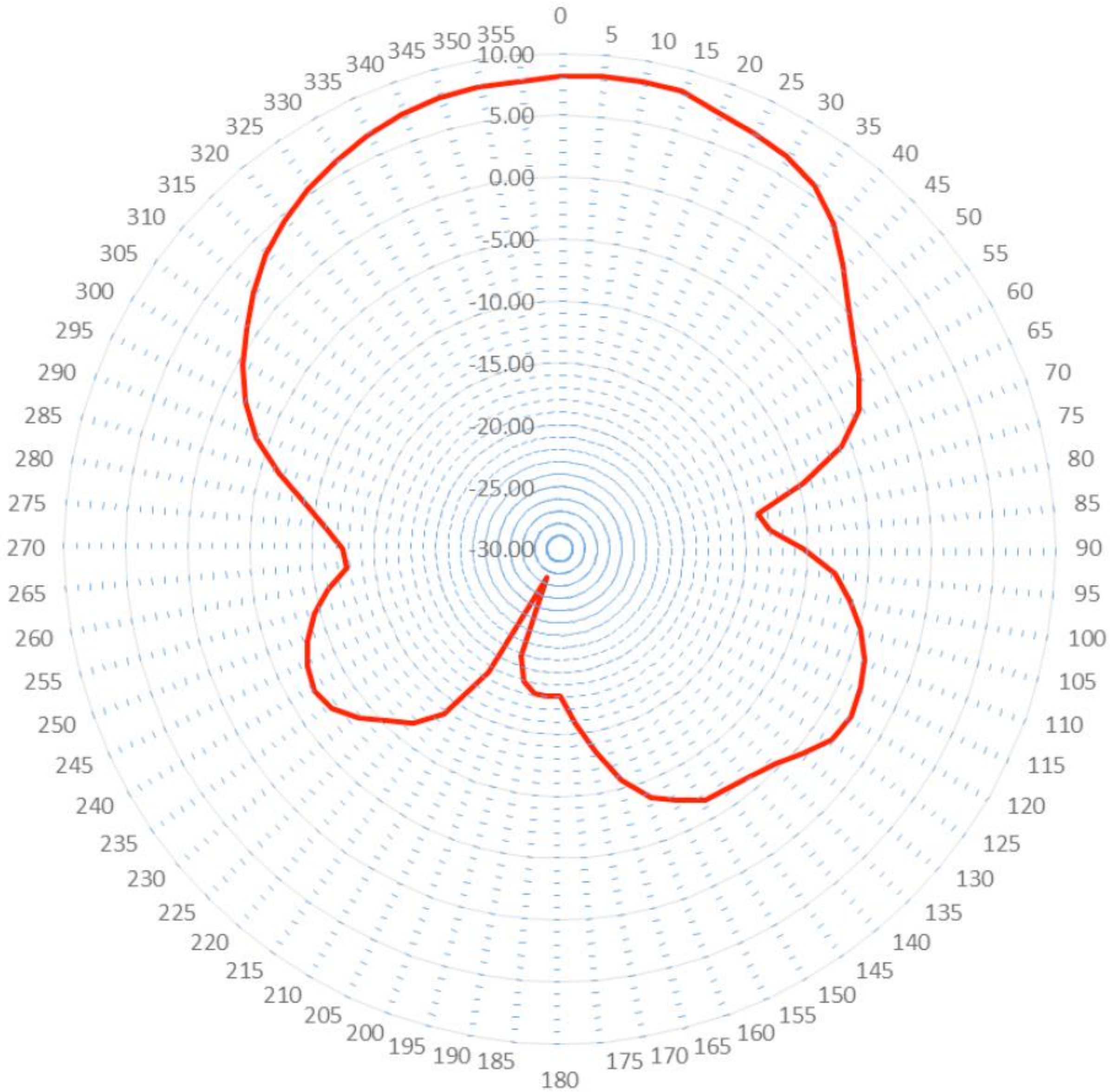
verre athermique de couleur neutre verre chauffant

10- Radiation pattern ANT-SPECTRE

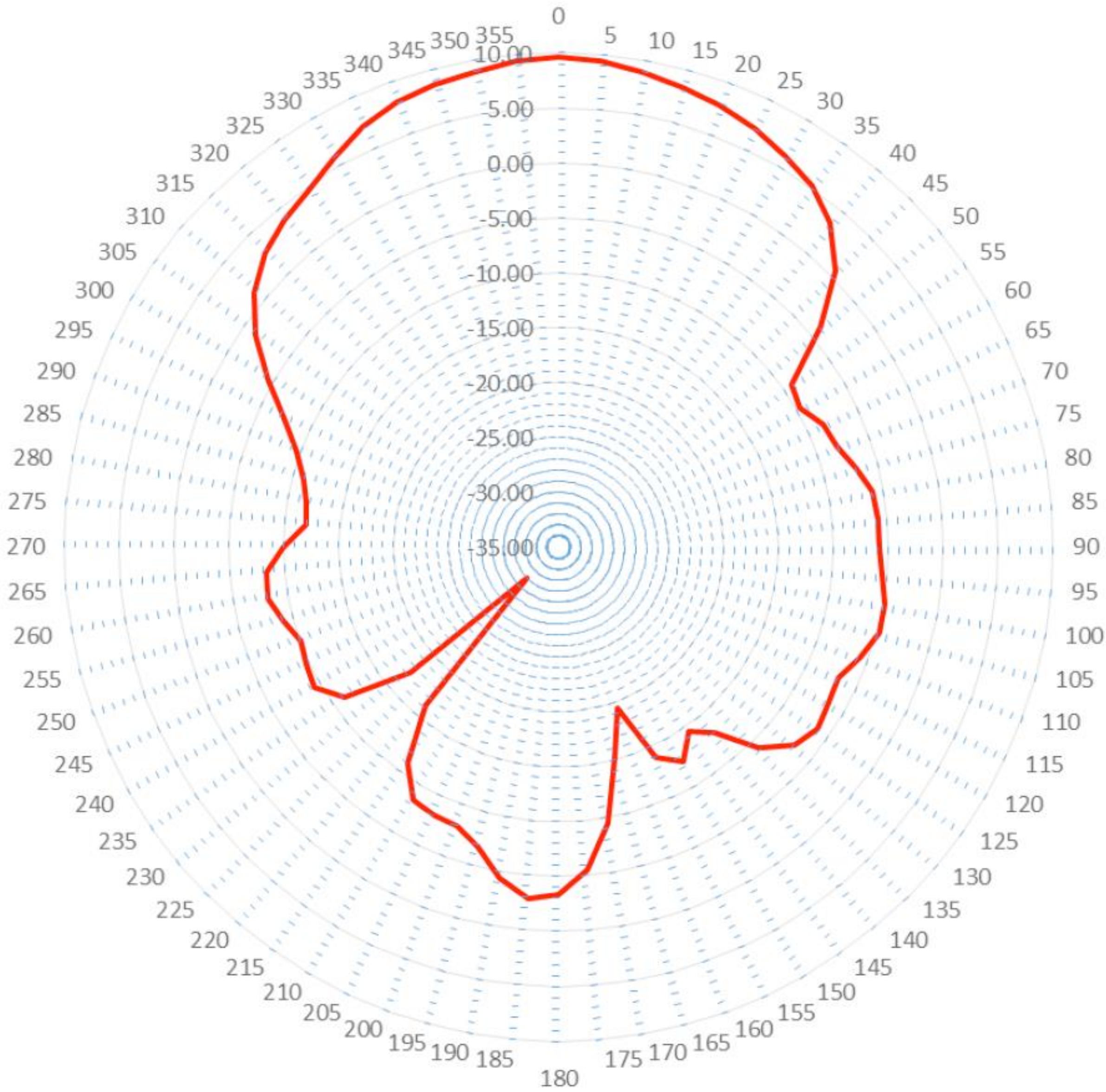
10-1 Lower band – Horizontal polarization; 867 MHz



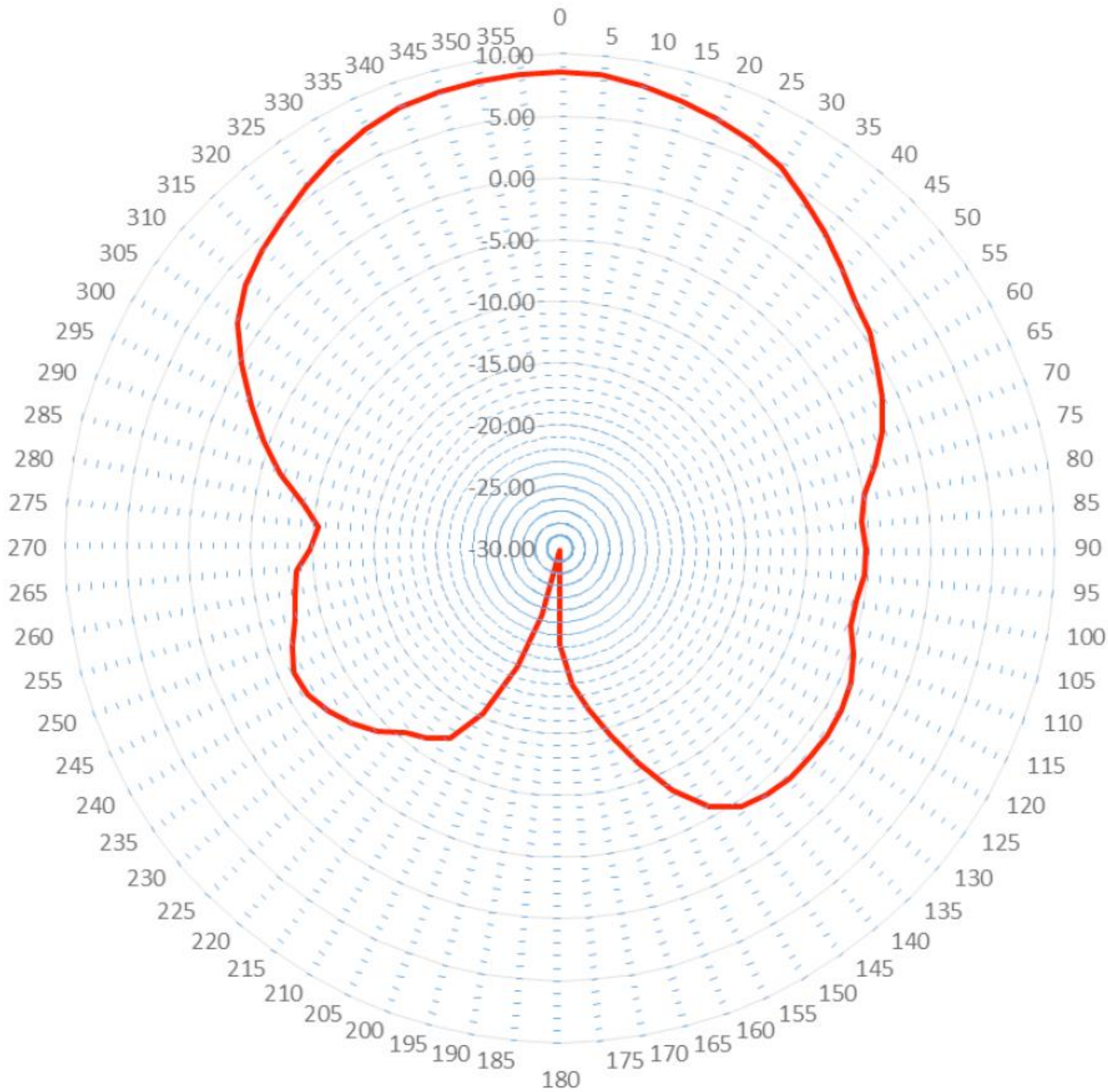
10-2 Lower band – Vertical polarization; 867 MHz



10-3 Upper band - Horizontal polarization; 915 MHz

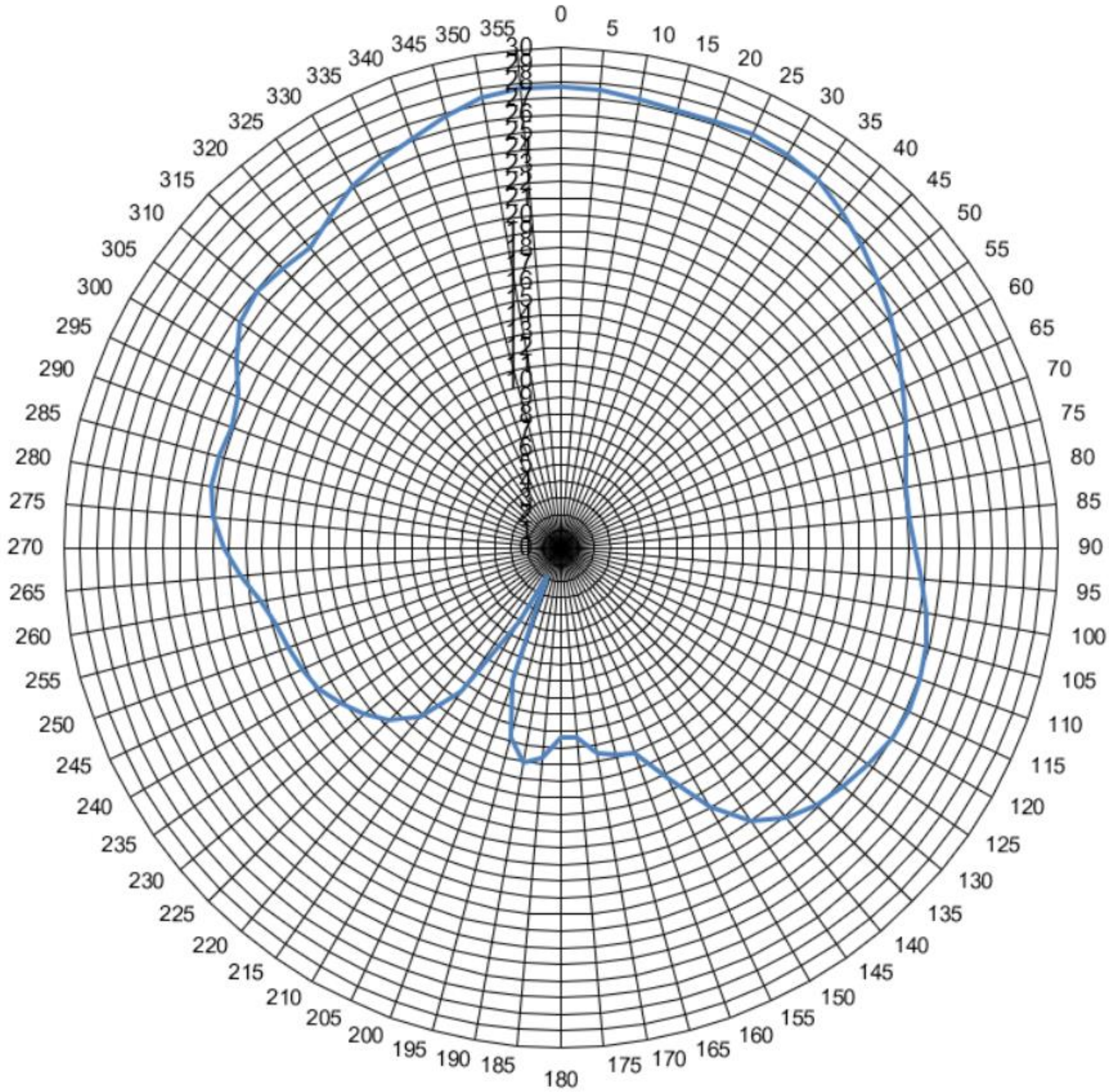


10-4 Upper band - Vertical polarization; 915 MHz

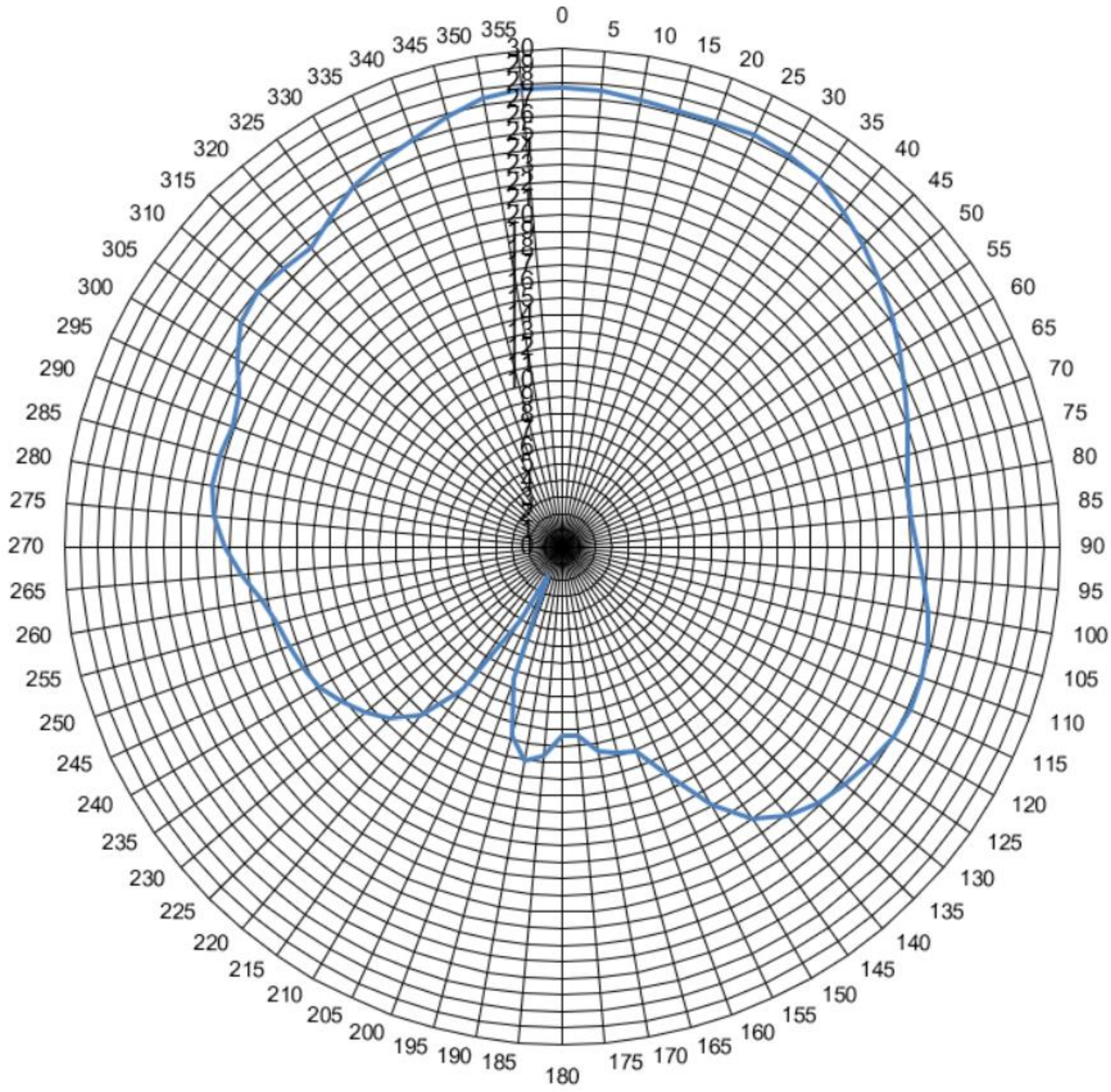


11- Radiation pattern integrated antenna ATX

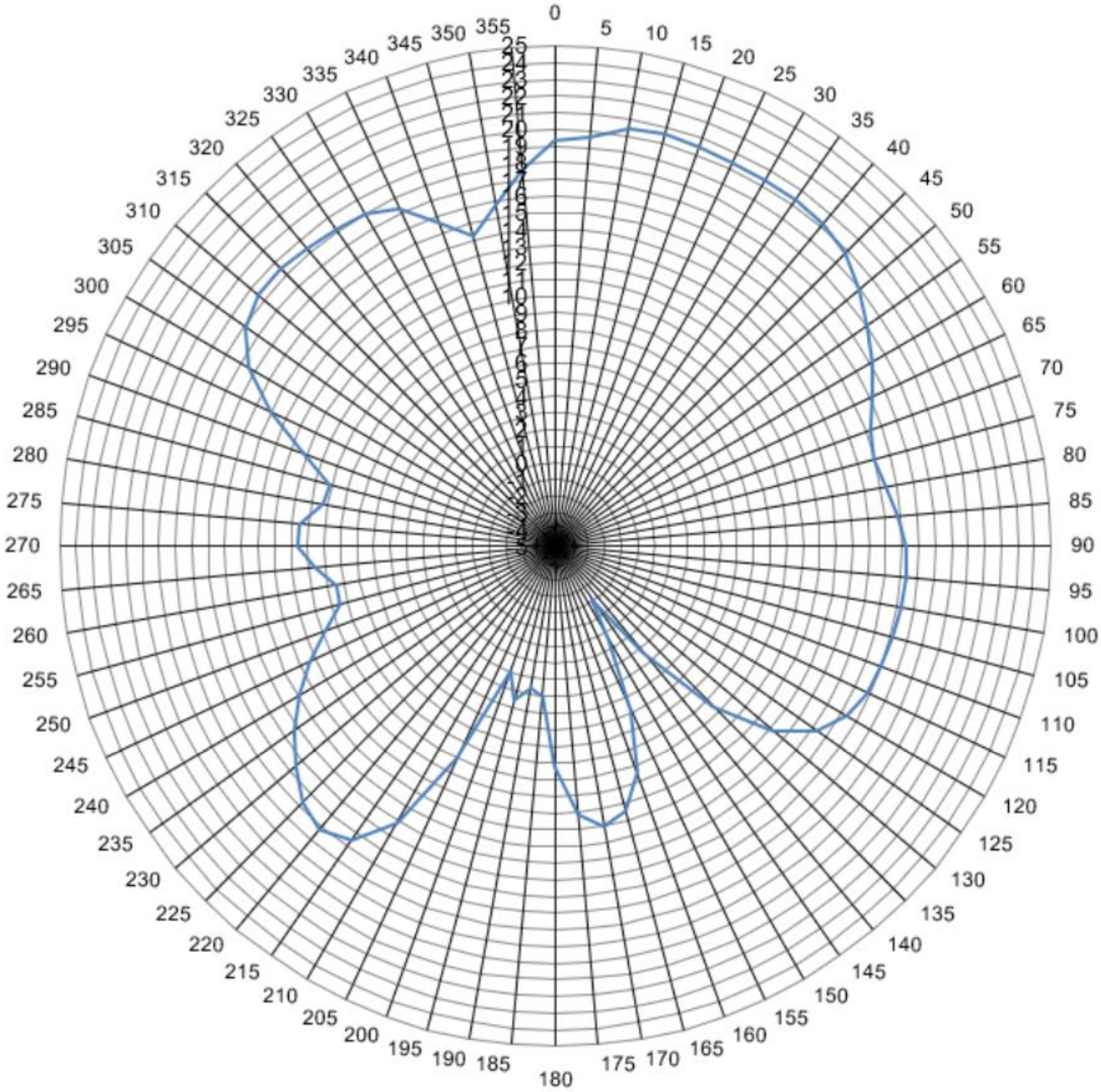
11-1 Lower band – Horizontal polarization; 867 MHz



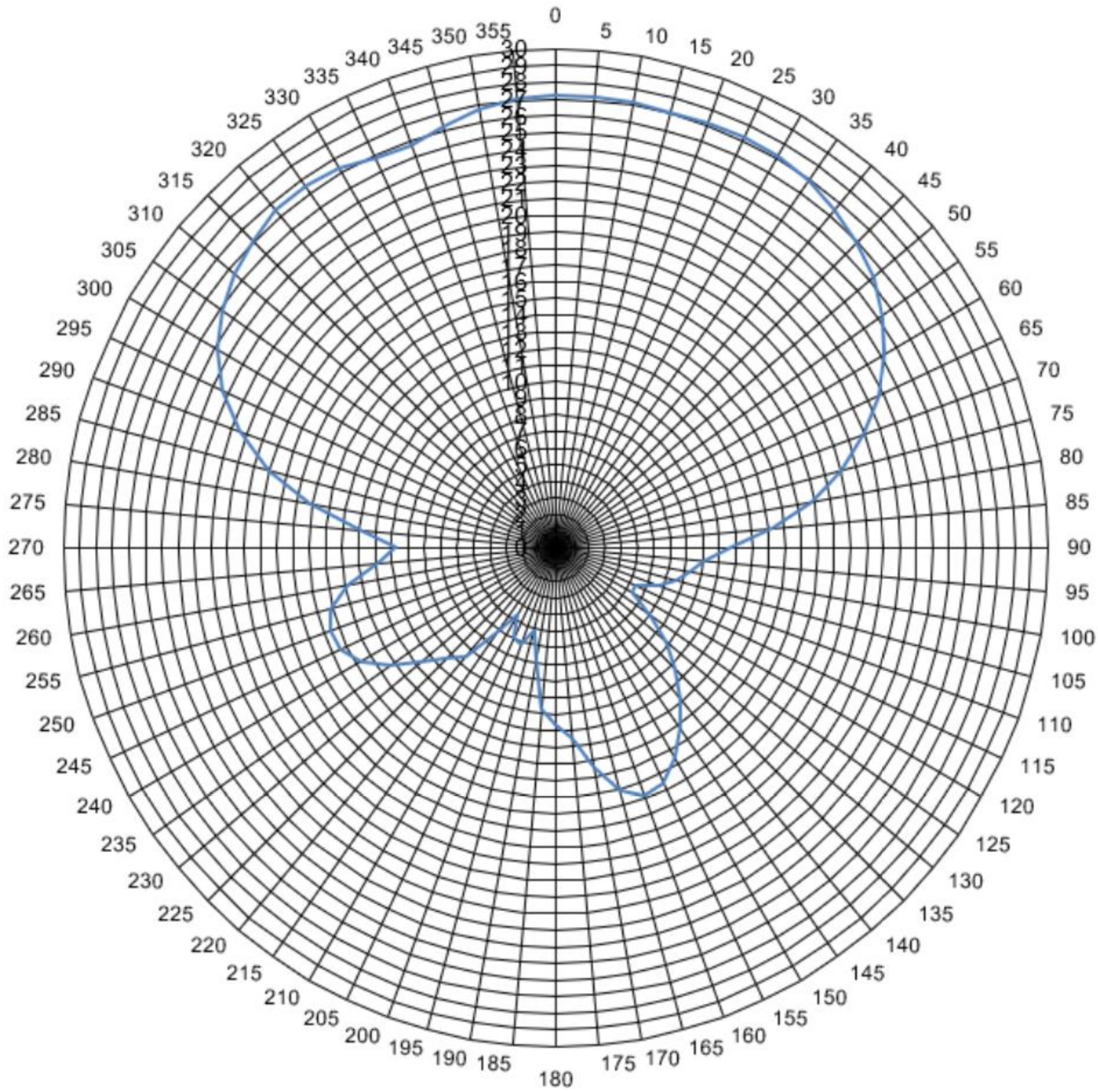
11-2 Lower band – Vertical polarization; 867 MHz



11-3 Upper band - Horizontal polarization; 915 MHz



11-4 Upper band - Vertical polarization; 915 MHz



12- FAQ

Question	Cause	Recommendation
The red LED on the SMA flashes.	Power supply problem.	Check: - The maximum current supplied by the power supply. - The supply voltage in the reader. - the type of cable - the distance between the power supply and the reader.
My reader does not start up.	Insufficient voltage. Incorrect wiring.	Check the voltage at the terminals of the reader. Use a regulated power supply.
The red LED on the SMA flashes three times after every RF scan sequence.	RF connection problem with one or more cables and/or antennas.	Check: - the connections of the antenna cables. - the condition of the antenna cables.
The red LED on the SMA flashes five times after every RF scan sequence.	System temperature too high.	Install the SMA module in the shade.
No reading on one of the antennas, even over short distances.	Incorrect configuration of the channels.	Check the configuration (ground loop, EPC or RSSI filter) and the connections of the antennas to the channels.
My tag cannot be identified due to an athermic windshield.	The non-athermic section is incorrectly positioned or the reader is too far from the vehicle.	Position the tag correctly in the non-athermic section or change the position of the reader.
The vehicle does not have a non-athermic section.		Change the position or the type of the tag.

13- VERSION

Date	Version	Description
11/04/2019	*1.0*	*New document.*
18/06/2019	*2.0*	*Addition of input / output management // Migration between the two ranges*
28/07/2020	*3.0*	*Addition ATX // VIIK OPTEX captor // IN OUT diagram modified*