

# uPASS Reach Installation Guide



**FCC ID: CGDUPASSREACH****IC: 1444A-UPASSRCH**

This device complies with part 15 of the FCC rules and to RSS210 of Industrial 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This device shall be installed to provide a separation distance of at least 20 cm from all persons.

## CONTENTS

1	INTRODUCTION .....	4
1.1	OVERVIEW .....	4
1.2	SUPPORTED TAGS .....	5
1.3	TAG SECURITY .....	5
2	INSTALLATION .....	6
2.1	SAFETY INSTRUCTION .....	6
2.2	MOUNTING INSTRUCTIONS .....	6
2.3	ADJUSTABLE MOUNTING BRACKET .....	7
2.4	OPENING THE SERVICE COVER .....	8
1T3	CONNECTIONS .....	9
3.1	CABLE CONNECTIONS .....	9
3.2	WIRE CONNECTIONS .....	10
3.3	POWER SUPPLY .....	11
3.4	COMMUNICATION .....	12
3.4.1	WIEGAND / MAGSTRIPE CONNECTION .....	12
3.4.2	WIEGAND TIMING .....	12
3.4.3	MAGSTRIPE TIMING .....	13
3.4.4	RS232 CONNECTION .....	14
3.4.5	RS422 CONNECTION .....	15
3.4.6	USB CONNECTION .....	16
3.5	DIGITAL I/O .....	17
3.5.1	RELAY OUTPUT .....	17
3.5.2	READ DISABLE INPUT .....	18
3.5.3	GENERAL PURPOSE INPUTS .....	18
3.5.4	TAMPER SWITCH .....	19
1T4	DIP-SWITCH SETTINGS .....	20
4.1	COMPATIBILITY MODE .....	20
4.2	RS232 / RS422 SELECTION .....	20
4.3	UNUSED SWITCHES .....	20
5	LED INDICATIONS .....	21
6	UHF FREQUENCIES .....	22
6.1	RADIO REGULATIONS .....	22
6.2	FREQUENCY CHANNEL SELECTION .....	22
7	READER CONFIGURATION .....	23
7.1	UHFTOOL SOFTWARE .....	23
7.2	SETTINGS .....	23
7.2.1	READ DATA .....	23
7.2.2	OUTPUT .....	24
7.2.3	OPTIONS .....	24
1T7.3	EXPERT SETTINGS .....	25
7.3.1	FREQUENCY .....	25
7.3.2	SQUELCH .....	25
A	TECHNICAL SPECIFICATIONS .....	26
B	PART NUMBERS .....	27

# 1 INTRODUCTION

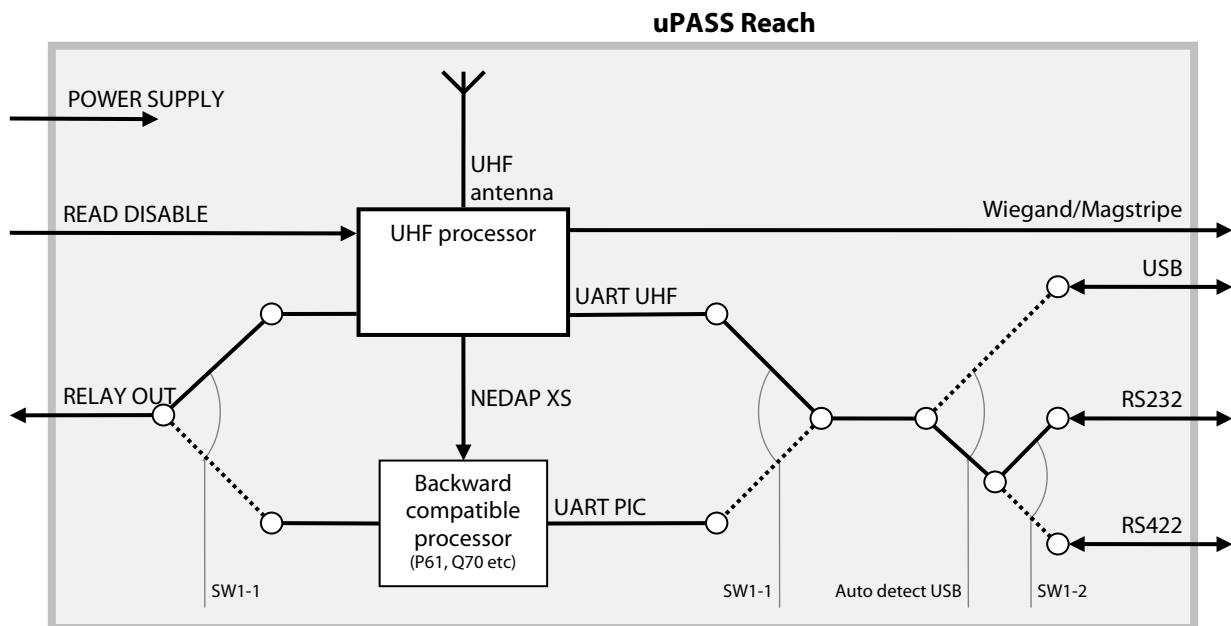
The uPASS Reach reader offers long range vehicle identification up to 4 meters using the latest UHF technology. Based on battery free passive UHF the uPASS Reach reader offers a cost effective and enduring solution for parking access.

The system is based on a uPASS Reach reader and an UHF tag. The readers are installed next to the gate on a maximum height of 2 meters. The reader is the perfect cure to the problems characteristic of prox and it's ideally suited for upgrading those installations as the reader can easily be installed on a gooseneck with no need for additional mounting or rewiring.

The reader output allows the access control or parking system to open the gate when authorized without the need to present a badge. The built-in high intensity LED provides the user visual feedback that the tag has been read.

## 1.1 OVERVIEW

The picture below shows a simplified overview of the components in the reader. The uPASS Reach reader contains an UHF antenna, UHF processor and an additional backwards compatible processor.



**Figure 1: uPASS Reach reader overview**

The backwards compatible processor supports existing communication protocols already implemented for the TRANSIT system. Therefore no additional integration effort is required.

*Note: The backwards compatible processor only operates with NEDAP UHF XS formatted tags.*

## 1.2 SUPPORTED TAGS

Any EPC Class 1 Gen 2 tag is supported by the uPASS Reach.

NEDAP formatted UHF tags can have the following formats:

- **NEDAP UHF Wiegand tags**  
These tags will contain all wiegand information including facility code and parity bits. All wiegand formats can be supported. The reader transparently sends this information via the wiegand outputs. There is no need to change any DIP-switches or configuration settings. See chapter 3.4.1 for wiring details.  
*Note: The wiegand output format is determined by the tag and not by the reader.*
- **NEDAP UHF Magstripe tags**  
These tags will contain all magstripe information. The reader transparently sends this information onto the magstripe interface. There is no need to change any DIP-switches or configuration settings. See chapter 3.4.1 for wiring details.  
*Note: The magstripe output format is determined by the tag and not by the reader.*
- **NEDAP UHF XS tag**  
These tags are especially programmed in the same format as our 2.45GHz AVI tags (Compact-Tag, Window-Button and Heavy-Duty-Tag). The tags will also have an customer-code and id-number. The reader will automatically transmit the tag-info to the backward compatible processor.  
*Note: When using the backwards compatible processor make sure the compatibility mode DIP-switch is set correctly (see chapter 4.1 on page 20).*

Non-nedap formatted EPC Class 1 Gen 2 tag are supported, but only using the RS232/422 or USB interface.

## 1.3 TAG SECURITY

EPC (Electronic Product Code) tags were introduced as a possible successor to the barcode with added functionalities. The tag emits its EPC in plain text. This makes the tags vulnerable to cloning and counterfeiting attacks. Unlike many 13MHz smartcards, EPC tags do not support any DES, 3DES or AES encryption.

EPC tags contain a data field known as the Tag Identifier (TID). At the discretion of the EPC manufacturer, the value may be factory programmed and locked, ensuring that tags have a unique identity and (theoretically) cannot be cross-copied. This TID based anti-cloning mechanism is not considered to be a strong protection.

NEDAP UHF tags support a locked serialized TID and the uPASS Reach reader can be configured to read the TID data field.

In addition NEDAP has also implemented an advanced anti-cloning and anti-counterfeiting method based upon a two way authentication. This feature is supported in combination with all NEDAP UHF tags. See also chapter 7.

By default the uPASS Reach reader is configured to read any EPC tag.

We encourage customers to enable the TID-check or the two way authentication. But also advise not to completely rely on these methods in high-security applications.

## 2 INSTALLATION

### 2.1 SAFETY INSTRUCTION

The following safety precautions should be observed during normal use, service and repair.

- All shields of the mandatory shielded cable shall be connected with safety ground.
- The uPASS Reach may only be installed and serviced by qualified service personnel.
- Disconnect the power supply before removing or installing any parts.
- To be sure of safety, do not modify or add anything to the uPASS Reach other than mentioned in this installation guide or indicated by NEDAP N.V.

### 2.2 MOUNTING INSTRUCTIONS

The uPASS Reach can be mounted to any surface, including directly to metal. Locate an appropriate position. Use the upper two keyholes (K) to mount the reader. Open the service cover to secure the reader using the two lower mounting positions (L).

See the picture below for details about the dimensions and the locations of the mounting positions.

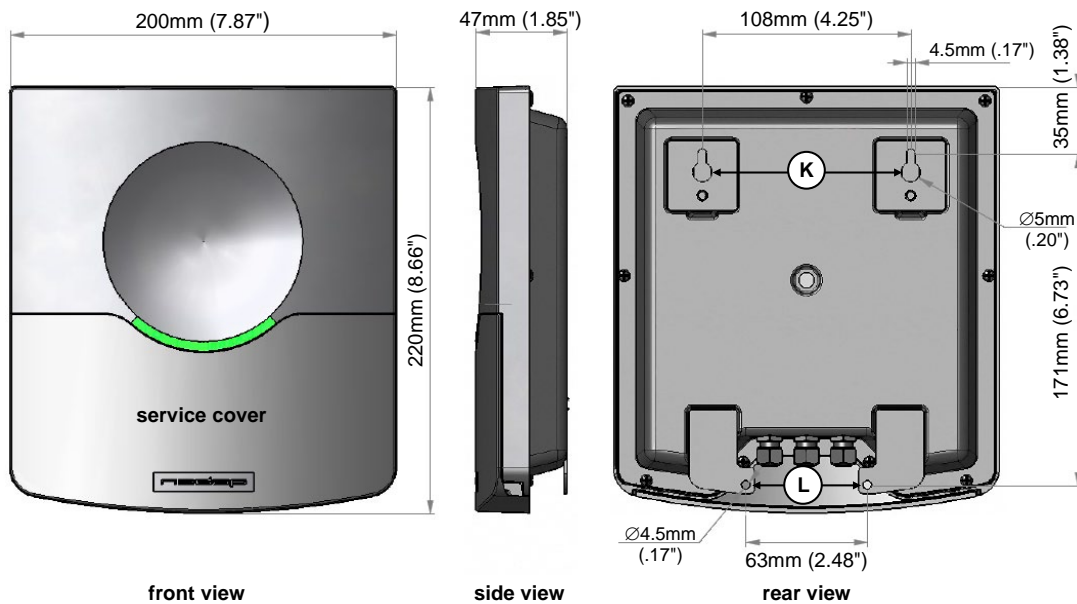
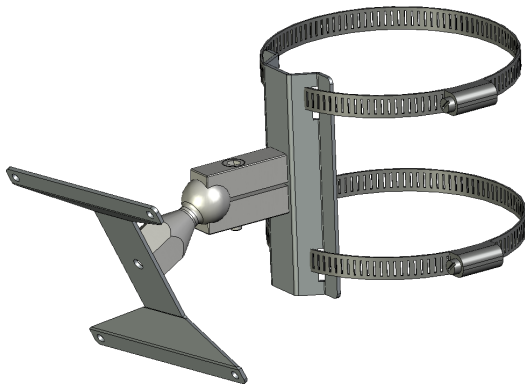


Figure 2: uPASS Reach reader dimensions

### 2.3 ADJUSTABLE MOUNTING BRACKET

With the adjustable mounting bracket, the uPASS Reach can be 'aimed' at the desired detection area. It can also be used for mounting the reader to round or square masts (see appendix B for part numbers).



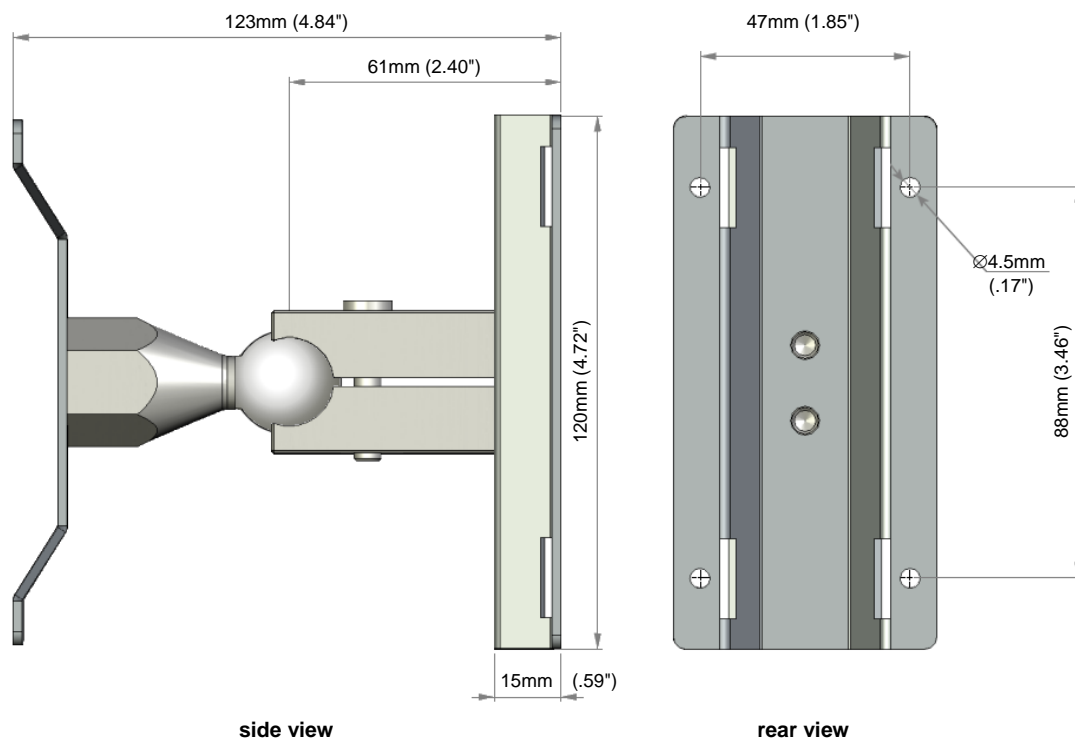
**Figure 3: Adjustable mounting bracket**

Once the adjustable mounting bracket is assembled, attach the bracket to the wall or mast. After that the uPASS Reach can be mounted onto the bracket. The ball and socket joint can be used to adjust the reader's orientation. Tighten the hex screw on top of the joint to fix the correct orientation.

---

*Note:*     Maximum diameter for round masts 125mm (4.9 inch)  
               Maximum diameter for square masts 100mm (3.9 inch)

---

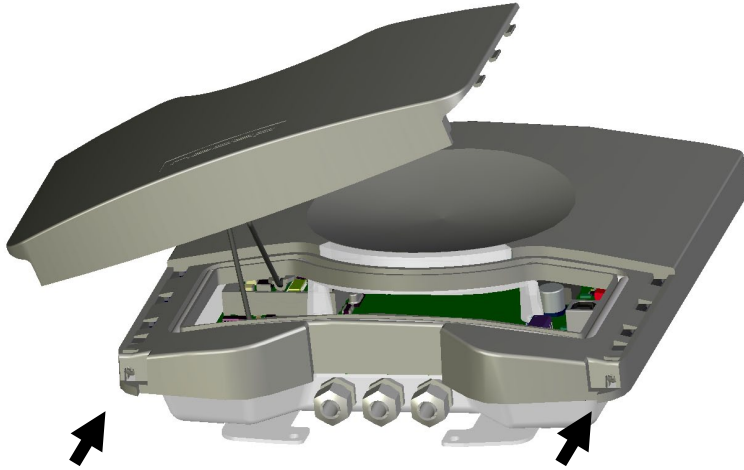


**Figure 4: Adjustable mounting bracket dimensions (in mm)**

## 2.4 OPENING THE SERVICE COVER

The service cover can be opened to access the connections (including the USB connector), setup the operating frequency and view the LED indicators.

Open the screws on the bottom of the device to unlock the service cover. Once the service cover is unlocked, lift it off.



**Figure 5: Opening the service cover**

---

*Note: Make sure the screws are completely opened (and closed when placing the cover back on). Don't worry about losing the screws, they cannot fall out.*

---



### 3 CONNECTIONS

#### 3.1 CABLE CONNECTIONS

Cable connections to the uPASS Reach are made using the EMC cable glands.

**Shielded cable shall be used for all connections including the DC-supply connection.**

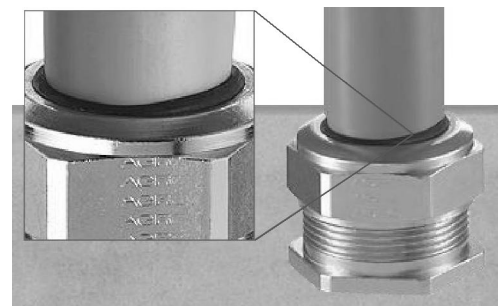
Assembly instructions:

1. Push the cap nut (1), seal insert (2) and gland contact socket (3) onto the cable.
2. Cut back the outer sheath to desired length.
3. Bend over the screen braiding (4) over the gland contact socket and cut back the screen braiding as shown in Figure 6.



*Figure 6: Cable shield*

4. Screw the cap nut onto reader part until the seal insert is pushed out of the gland. See Figure 7.



*Figure 7: Gland tightening*

Correct mounting and tightening the EMC cable glands is essential for water protection.

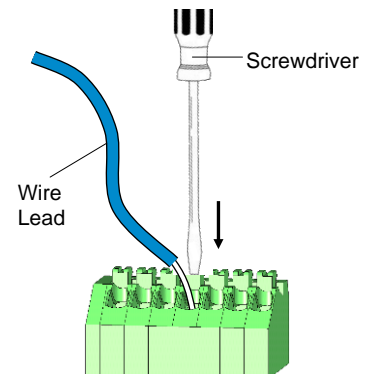
See appendix A for detailed information on the cable glands.

## 3.2 WIRE CONNECTIONS

Wire connections to the uPASS Reach are user friendly spring cage terminal connectors.

Connection procedure with spring cage terminal connectors.

1. Strip wire lead for about 9 mm (0.35 inch).
2. Push the screwdriver straight down to release the spring cage. Use a slotted, narrow-head screwdriver.
3. Insert the wire lead into the wire terminal.
4. Remove the screwdriver, this clamps the wire.
5. Gently pull on the installed wire to make sure the connection is reliable.



**Figure 8: Wiring detail**

---

*Note 1: Each connector terminal can accommodate only 1 solid or stranded wire.*

*Note 2: Wiring is normally done without ferrules. However, it is possible to use ferrules, provided that they are properly crimped.*

---

See appendix A for recommended maximum and minimum conductor cross sections and for the recommended wire stripping length.

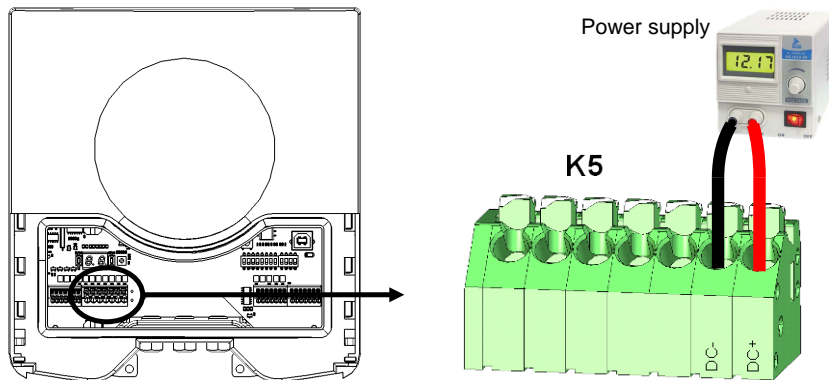
### 3.3 POWER SUPPLY

The UF reader requires DC power supply in the range from 12 – 24V. Maximum current consumption is 1A @ 12VDC, 0.5A @ 24VDC.

Connections:

DC-	Power supply 0V.
DC+	Power supply 12 - 24VDC.

*Note: The power supply connection has an auto resetting fuse protection.*



**Figure 9: Power supply wiring**

### 3.4 COMMUNICATION

#### 3.4.1 WIEGAND / MAGSTRIPE CONNECTION

Figure 10 indicates the wiring for the wiegand interface. The same connections also supports magstripe. NEDAP UHF Wiegand tags will generate a wiegand message on the interface. NEDAP UHF Magstripe tags will generate a magstripe message on the interface. Other UHF tags will not generate any message on this interface!

The wiegand/magstripe output format is determined by the programmed format of the tag. Make sure to order the correct tag formatting if you want to use the wiegand or magstripe interface. See also the UHF tags order guide for more information.

Interface connections:

	Wiegand connections	Magstripe connections
OUT1	-	CLS: Card loaded
OUT2	Data-0 (green)	RCP: Clock
OUT3	Data-1 (white)	RDP: Data
GND	Ground (black)	GND: Ground

Note 1: Maximum cable length 150 meters (500 feet)

Note 2: The wiegand/magstripe interface is not supported by the backward compatible processor !

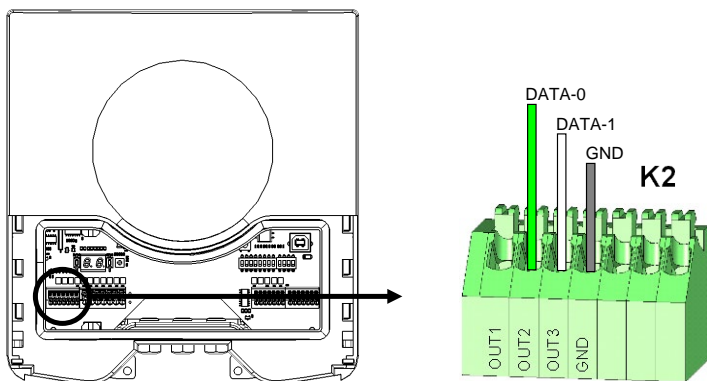
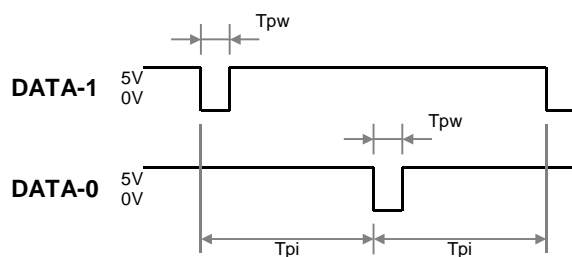


Figure 10: Wiegand wiring

#### 3.4.2 WIEGAND TIMING

In the figure below the Wiegand protocol timing is specified.



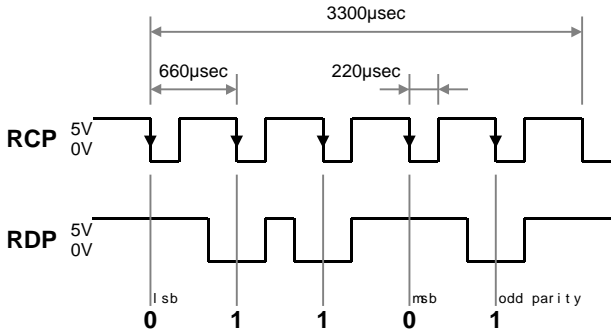
**Timing constants:**

Tpi	Pulse interval time	1 msec
Tpw	Pulse width time	50µsec

Figure 11: Wiegand protocol timing

### 3.4.3 MAGSTRIPE TIMING

In the figure below the timing for one magstripe character is specified. Each bit consists out of one period low (220µsec) and two periods high (440µsec). The bit times have an accuracy of 10 percent. The data-signal RDP is valid and stable on the falling edge of the clock-signal RCP.



**Timing constants:**

Clock period	660µsec
Clock high	440µsec
Clock low	220µsec
Data preamble	11msec
Data postamble	11msec

Figure 12: Magstripe protocol timing one character

The CLS card loaded signal will be active (=low) during the complete transmission. Before and after the data 16 clock pulses are generated (postamble and preamble). The number of data characters is determined by the tag. Below is an example of a complete magstripe event.

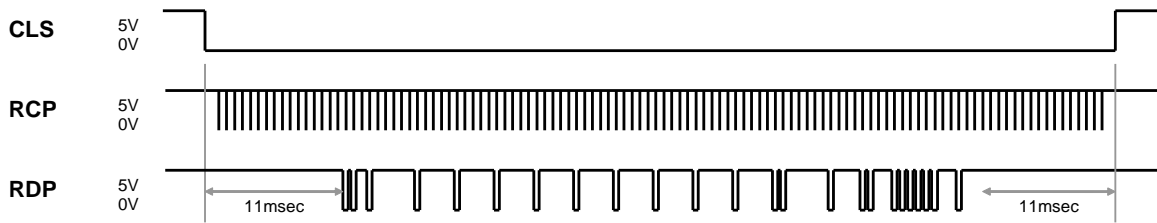


Figure 13: Example magstripe event

### 3.4.4 RS232 CONNECTION

The uPASS Reach reader has an on-board RS232 interface for communication with a host system or for configuring reader settings.

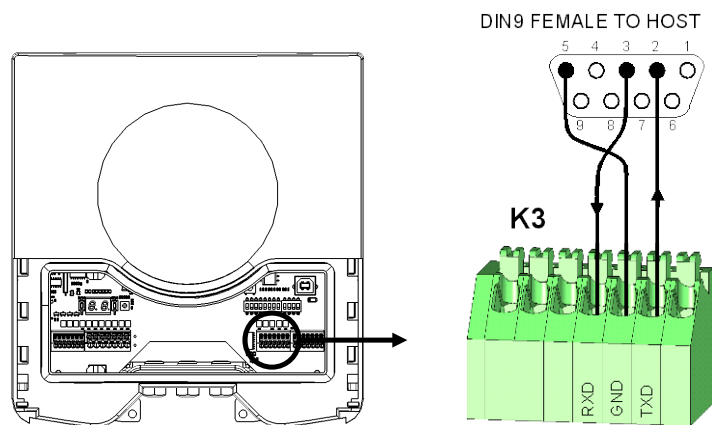
By default the RS232 interface is connected to the UHF processor. This is required when using the UHFtool software. It is advised to use this tool to configure the reader. Software developers can find the RS232 communication protocol description in the firmware manual.

The RS232 interface can also be connected to the backwards compatible processor. This offers users a compatible interface with the TRANSIT reader. The communication protocol, baud rate, data format and flow control depend upon the firmware in the backward compatible processor (e.g. P61 or Q70). See separate documentation.

Connections:

RXD	Receive data (input)
GND	Ground
TXD	Transmit data (output)

- 
- Note 1: The RS232 interface is disabled while the USB interface is in use !!!*
  - Note 2: Enable the on-board RS232 interface by setting DIP-switch SW1-2 to ON. See chapter 4.1 for details.*
  - Note 3: Optionally select the backward compatible processor with DIP-switch SW1-1.*
  - Note 4: Maximum cable length of 15 meters (50 feet) or the cable length equal to a capacitance of 2500pF.*
  - Note 5: The RS232 interface does not support any hardware handshake signals.*
- 



**Figure 14: RS232 wiring**

### 3.4.5 RS422 CONNECTION

The uPASS Reach reader has an on-board RS422 interface. The RS422 interface is similar to the RS232 interface. It shares the same communication protocol. The RS422 interface is commonly used when longer cable lengths are required.

Connections:

RX+	Receive line (positive)
RX-	Receive line (negative)
GND	Ground
TX+	Transmission line (positive)
TX-	Transmission line (negative)

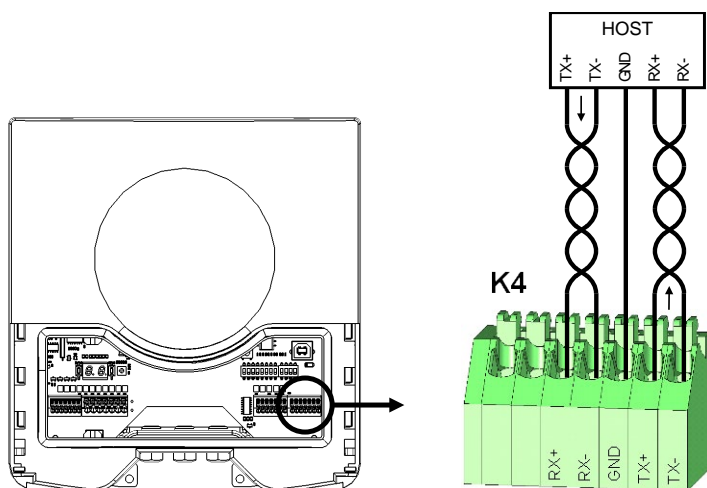
RX+ and RX- inputs are terminated with a 120Ω resistor.  
TX+ and TX- must be terminated at the host side.

*Note 1: The RS422 interface is disabled while the USB interface is in use !!!*

*Note 2: Enable the on-board RS422 interface by setting DIP-switch SW1-2 to OFF. See chapter 4.1 for details.*

*Note 3: Optionally select the backward compatible processor with DIP-switch SW1-1.*

*Note 4: Maximum cable length 1200 meters (4000 feet).*



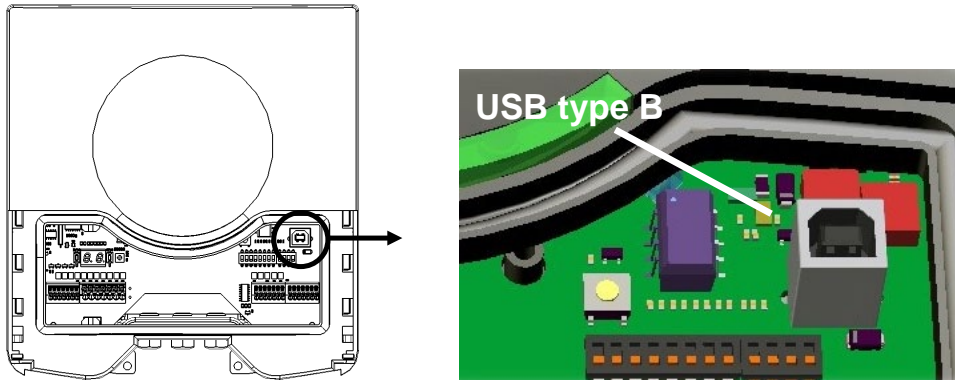
**Figure 15: RS422 wiring**

### 3.4.6 USB CONNECTION

The uPASS Reach reader features a USB interface for service and installation purposes. The USB connector (Type B) is accessible behind the service cover. The reader will automatically detect when the USB cable is connected.

The USB interface can be used to configure the reader using the UHFtool software (as described in chapter 7).

The USB interface can also be used to communicate with the backward compatible processor. For example upgrade the firmware in the backward compatible processor using the PICload software. Ensure that DIP-switch SW1-1 is in the correct position.



**Figure 16: USB interface**

---

*Note: While the USB interface is in use, the on-board RS232 and RS422 interfaces are disabled !!!*

---

#### USB Driver installation

Make sure your computer is connected to the internet. The driver should install automatically via Windows update when the uPASS Reach reader is connected to your PC via the USB cable. Follow the driver installation wizard. If you do not see the Windows update pop-up, you can manually install the driver. To manually install, you need to go to FTDI's website at [www.ftdichip.com/Drivers/VCP.htm](http://www.ftdichip.com/Drivers/VCP.htm) and download the VCP (Virtual Com Port) drivers for your operating system. Drivers for MacOS and Linux are available as well.



### 3.5 DIGITAL I/O

#### 3.5.1 RELAY OUTPUT

By default the relay output is automatically activated upon identification of a tag.

When the backward compatible processor is selected, the relay output is controlled by the backward compatible processor. Please refer to the corresponding firmware manual for details.



The 'smile' on the front cover lights-up simultaneously with the relay output.

Connections:

NC	Relay contact normally closed
COM	Relay contact common
NO	Relay contact normally open

Contact ratings:

- Max. switching current: 2A
- Max. switching voltage: 24VDC
- Max. switching power: 50W

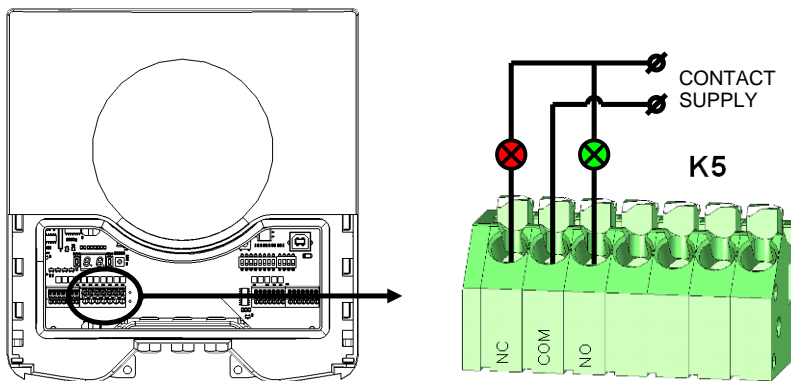


Figure 17: Relay output

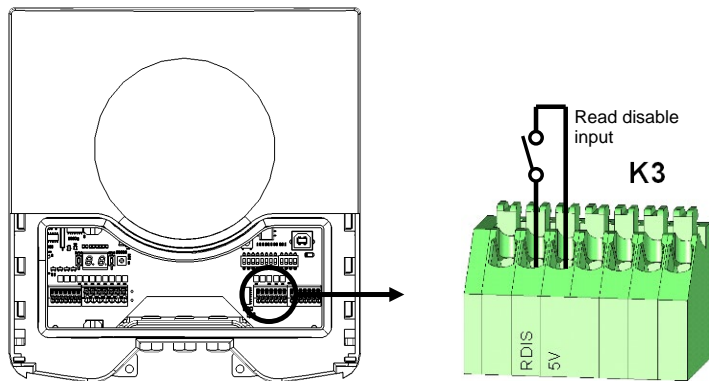
### 3.5.2 READ DISABLE INPUT

The reading of the uPASS Reach can be completely disabled with the RDIS input. This input is commonly used in combination with a sensor (e.g. inductive loop) that detects the presence of a person or vehicle. Use always a relay contact to connect the internal 5V to the RDIS input. When the RDIS input is unused the reader is enabled.

Connections:

RDIS	Read disable input
5V	Internal 5V source for read disable input

*Warning: Using an external 5V supply can damage the unit.*



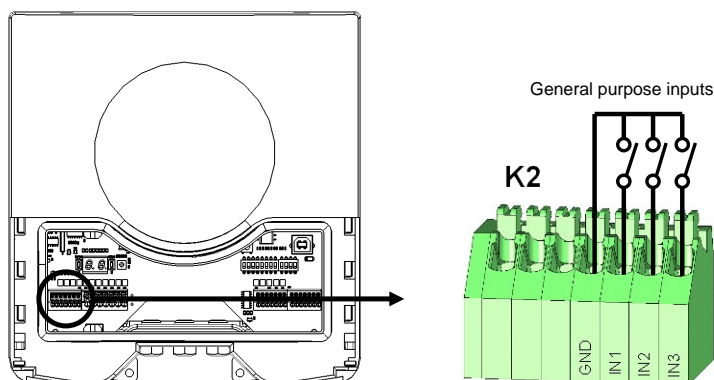
**Figure 18: Read disable input**

### 3.5.3 GENERAL PURPOSE INPUTS

Three general purpose inputs are available on the uPASS Reach reader. They have the function as described in the firmware manual.

Connections:

IN1	General purpose input 1 (active low)
IN2	General purpose input 2 (active low)
IN3	General purpose input 3 (active low)
GND	Ground



**Figure 19: GPIO inputs**

### 3.5.4 TAMPER SWITCH

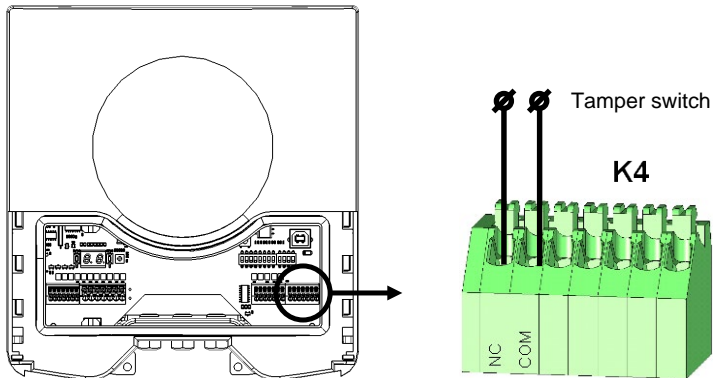
An internal magnet provides tamper indication when the service cover is opened. This contact may be connected to an external alarm system. The contacts are normally closed when the cover is in place. Tamper switches of multiple readers can be connected in series.

Connections:

NC	Tamper switch (normally closed)
COM	Tamper switch (common)

Contact ratings:

Max. current	50 mA (0.5 Volt voltage drop)
Max. switching voltage	+24 VDC



**Figure 20: Tamper switch**

## 4 DIP-SWITCH SETTINGS

The DIP-switches are located behind the service cover. Switches SW1-1 through SW1-4 are described below.

The switches SW2-1 through SW2-8 are reserved for the backward compatible processor (e.g. P61 or Q70). Please refer to the firmware manual for details.

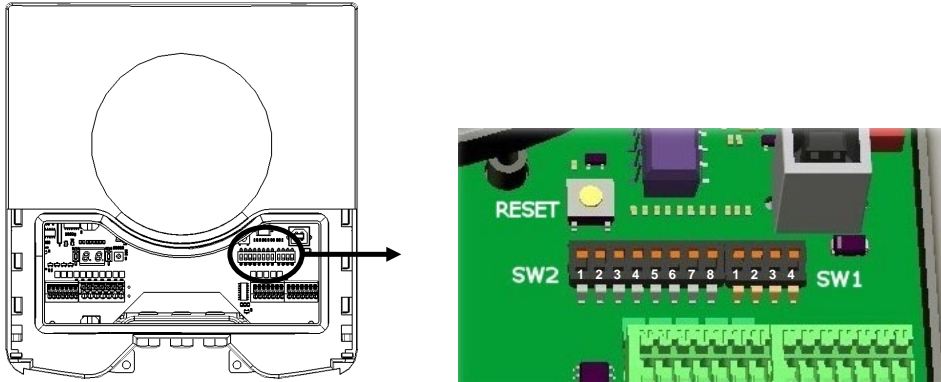
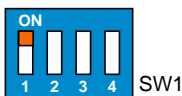


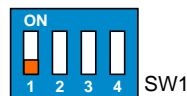
Figure 21: DIP-switches

### 4.1 COMPATIBILITY MODE

Compatibility mode selection. Enable UHF processor or backward compatible processor (e.g. P61 or Q70). This selection determines the communication protocol on the USB and RS232/RS422 interfaces. It also determines the relay output control. When using wiegand or magstripe communication the setting of this switch has no effect.



UHF processor



Backward compatible processor (e.g. P61 or Q70)

### 4.2 RS232 / RS422 SELECTION

On-board RS232 or RS422 interface selection.



On-board RS232 interface enabled



On-board RS422 interface enabled

### 4.3 UNUSED SWITCHES

The switches SW1-3 and SW1-4 are reserved for future use. It is recommended to leave these switches in the ON position.

## 5 LED INDICATIONS

A number of LED's indicate the current status of the uPASS Reach reader.

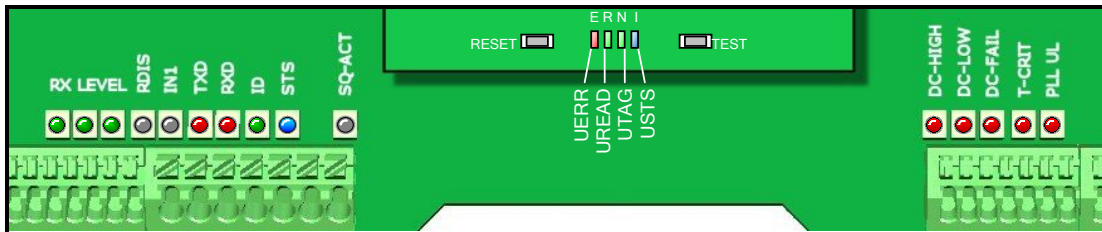


Figure 22:

### LED locations

Table 1 below describes the function of each LED.

LED	Description
	LED bar indicating the received tag signal strength. This LED bar may also indicate the presence of radio interference. In case of interference, try switching to a different frequency. See chapter 6.
RX LEVEL	
RDIS	Read Disable LED. On while reading disabled. See chapter 3.5.2.
IN1	Input 1 status. On when input 1 contact is closed. See chapter 3.5.3.
TXD	Transmit serial data (backward compatible processor).
RXD	Receive serial data (backward compatible processor).
ID	Identification. Blinks fast when a valid transponder is identified (backward compatible processor).
STS	Status LED (only backward compatible processor). Slow blinking: System's heartbeat (0.8 sec on / 0.8 sec off). Indicates that the power is on and the processor is running. Fast blinking: Bootloader says hello. Indicated after a restart. Twice blinking: Configuration menu active. Off: Abnormal situation.
SQ-ACT	Squelch active. When squelch is enabled and the transponder return signal below threshold level.
DC-HI	Power supply voltage too high. See chapter 3.3.
DC-LO	Power supply voltage too low. See chapter 3.3.
DC-FAIL	Internal supply voltage failure. See chapter 3.3.
T-CRIT	Temperature critically high.
PLL UL	PLL unlocked. Error indication only. No direct hardware action implemented.
USTS	UHF processor status LED. Should be slowly blinking.
UTAG	Tag found. RN16 received.
UREAD	Tag data read complete.
UERR	Error during tag identification.

Table 1: LED indicators

## 6 UHF FREQUENCIES

### 6.1 RADIO REGULATIONS

The uPASS Reach reader operates on the 860 – 960 MHz band. Regulations in this band are not standardized world-wide. Generally the regulations can be divided into several regions.

Per region a specific frequency band is available. This frequency band is divided into frequency channels. If local radio regulations require frequency hopping (FHSS), then the uPASS Reach automatically selects and uses the available channels.

Region	Technique	Frequency	Channels
Europe		865.6 - 867.6 MHz	4
Americas	FHSS	902.0 - 928.0 MHz	52
Brazil	FHSS	915.0 - 928.0 MHz	43
China	FHSS	920.5 - 924.5 MHz	20
Australia	FHSS	920.0 - 926.0 MHz	12
Israel		915.0 - 917.0 MHz	4
Japan	LBT	952.0 - 954.0 MHz	-
Korea	FHSS	917.0 - 920.8 MHz	-

Table 2: Region specific parameters

### 6.2 FREQUENCY CHANNEL SELECTION

If no frequency hopping is required, you should select an available frequency channel manually. This can be realized as described below. Select an available frequency channel to achieve the best performance and to avoid interference from other readers or equipment.

Press the UP or DOWN switch once and the display will show a value indicating the currently selected frequency. Lookup the display value in the table below to find out what the actual operating frequency is.

When the display is on, press the UP switch to select a higher frequency. Similarly, press the DOWN switch to select a lower frequency.

Alternatively the UHFtool software can be used to setup the frequency channel selection. See also chapter 7.

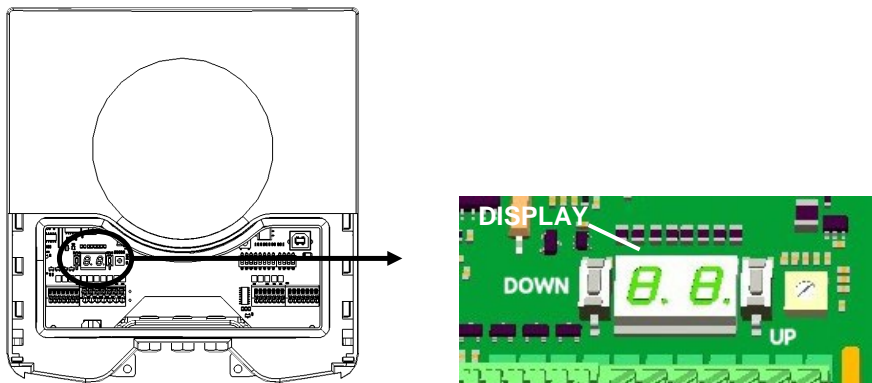


Figure 23: frequency channel setting

Display value	Frequency
1	865.7 MHz
2	866.3 MHz
3	866.9 MHz
4	867.5 MHz

Table 3: Frequency values for Europe

Display value	Frequency
1	915.1 MHz
2	915.7 MHz
3	916.3 MHz
4	916.9 MHz

Table 4: Frequency values for Israel

## 7 READER CONFIGURATION

The uPASS Reach reader settings can be configured easily using the UHFtool software. Software developers can find the communication protocol description in the firmware manual.

### 7.1 UHF TOOL SOFTWARE

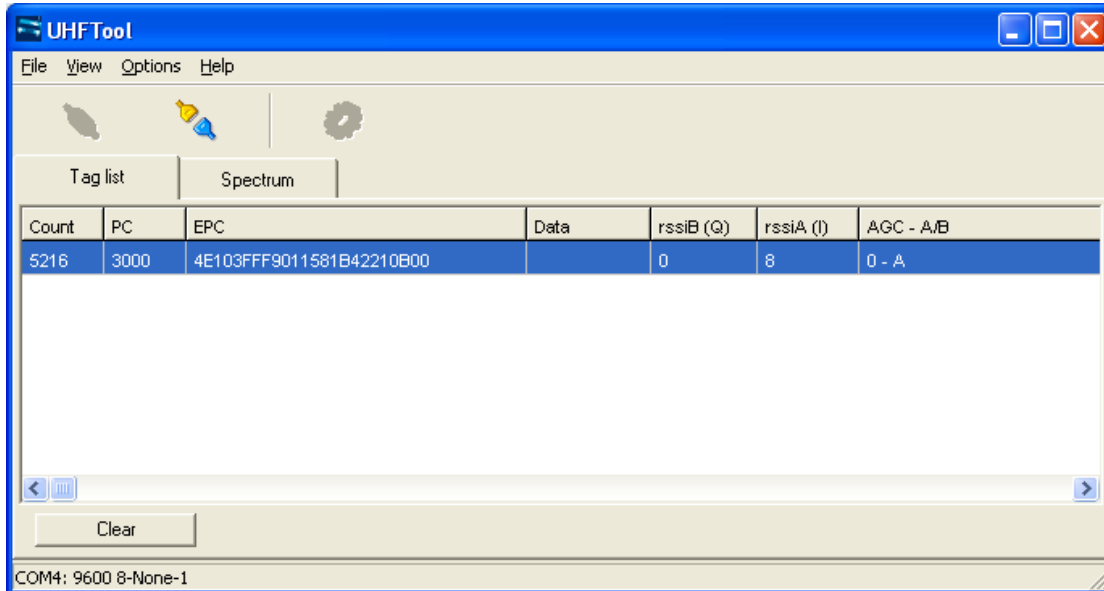


Figure 24: UHFtool software

### 7.2 SETTINGS

Click 'View', 'Show config sidebar' or press F11 to show the configuration sidebar. In the sidebar the configuration categories are shown. Expand or collapse the setting panels by clicking on it.

#### 7.2.1 READ DATA

Configure here which tags should be selected, how to access these tags, what data should be read from these tags and if a security check should be performed.

By default the reader is configured to select any tag and read its EPC number.

Read only NEDAP UHF tags and use two way authentication:

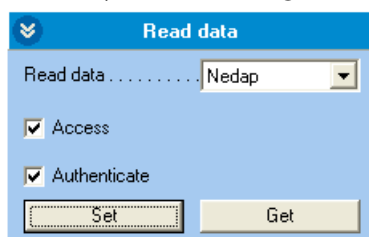


Figure 25: Read data example 1

Read only NXP UCODE tags (TID starts with E2006) and read 4 words from user memory.

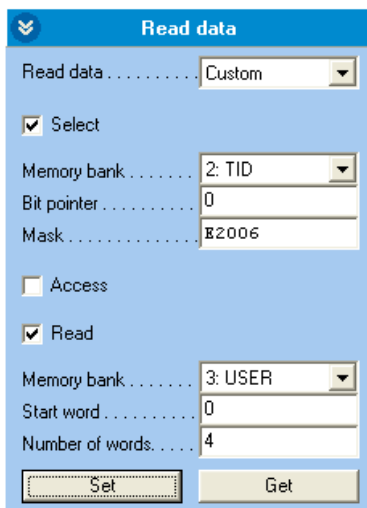


Figure 26: Read data example 2

### 7.2.2 OUTPUT

Configure UHF processor outputs.

Enable 'Serial dump' to enable the serial output upon identification. Only disable 'Serial dump' to optimize the identification speed when using the wiegand or magstripe interface or the backwards compatible processor.

Enable 'Automatic relay activation' to activate the relay upon identification. When disabled the relay can only be activated manually.

The 'Relay hold time' setting is the minimum time the relay is activated.

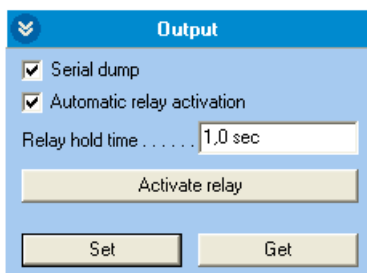


Figure 27: Output settings

### 7.2.3 OPTIONS

Configure RF options.

Here the tag searching and RF output power can be enabled/disabled.

For systems that do not use frequency hopping (e.g. in europe) the RF off time parameter can be used to enable time sharing between multiple readers on the same frequency.

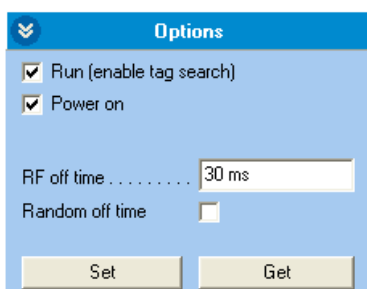


Figure 28: RF Options



## 7.3 EXPERT SETTINGS

Click 'Options', 'Usermode', 'Expert' to show additional configuration settings for advanced users.

### 7.3.1 FREQUENCY

Here you select the operating frequency. Only for systems that do not use frequency hopping (e.g. in europe).

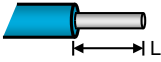
### 7.3.2 SQUELCH

Enable the squelch to reduce the read range. This is useful to optimize lane separation.

When the squelch is enabled, you can set the squelch level. This level ensures that only tags with a returned signal strength higher than the squelch level are identified.

When the squelch is enabled and the returned signal strength is lower than the squelch level, the SQ-ACT LED indicates that the tag is rejected. See also chapter 5.

## A TECHNICAL SPECIFICATIONS

ITEM	SPECIFICATION	REMARK
Dimensions	200x220x46.5mm (7.87 x 8.66 x 1.83 inch)	
Weight	0.75 kg (1.65 lbs)	
Enclosure color	RAL7016 (light gray)	
Enclosure material	Polycarbonate	
Chassis material	Aluminum	
Cable entry fittings	AGRO Progress MS EMC IP68	4-6mm cable diameter
Recommended wire stripping length	8 ... 10mm (0.3 ... 0.4 inch)	
Connector K5	0.5mm <sup>2</sup> ... 1.5mm <sup>2</sup> (AWG20 ... 16)	Springcage type PTSA 1.5
Connector K2,3,4	0.14mm <sup>2</sup> ... 0.5mm <sup>2</sup> (AWG24 ... 20)	Springcage type PTSA 0.5
Protection class	IP65	
Operational temperature	-30 °C ... + 60 °C	
Relative humidity	10 .. 93 % non condensing	
Identification range	Up to 4 meters (12 feet)	With passive NEDAP UHF tags
Power supply	12 ... 24VDC ±10% linear power supply	
Current consumption	1.0A @ 12VDC, 0.5A @ 24VDC	
Operating frequency	Europe: 865 ... 868 MHz Americas: 902 ... 928 MHz (FHSS) Brasil: 915 ... 928 MHz (FHSS) China: 920 ... 928 MHz (FHSS) Australia: 920 ... 926 MHz (FHSS) Japan: 952 ... 954 MHz	
Polarisation	Horizontal	
ERP / EIRP	< 2 W (33 dBm) ERP (CE) < 4 W (36 dBm) EIRP (FCC)	
Immunity	EN 301 489 part 1&3 v1.4.1	
Safety	EN 60950-1:2006	
Emission	EN 302 208-2 v1.3.1 FCC part 15.247 incl. Spread Spectrum Industry Canada RSS210	
Shock	IEC 68-2-27 Ea	50 G, 6 ms, 10x3 dir
Bump	IEC 68-2-29 Eb	25 G, 6ms, 1000x3 dir
Random vibration	EN 50155	5 – 150Hz, 5 G, 20 sweeps x 3 dir

## B PART NUMBERS

### READERS



NEDAP uPASS Reach (EUR)	part number: 9942319
NEDAP uPASS Reach (USA)	part number: 9945466
NEDAP uPASS Reach (JPN)	part number: 9945474

### ACCESSORIES



Adjustable mounting bracket	part number: 9875840
Weather protection hood	part number: 7591152
Pole mounting kit (includes 7591152)	part number: 9943803

### TRANSPONDERS

UHF Windshield Tag	part number: 9942327
UHF Windshield Tag Tamperproof	part number: 9442335
Combi card UHF + Mifare	part number: 9442343
Combi card UHF + Nedap	part number: 9442351
Combi card UHF + EM	part number: 9442360