

**User manual**  
**RFID IND Modbus (Uni, H125, HT2)**



Soft >= 1.3

## **Dear Customer!**

Thank you very much for choosing our product. Before its use, please read these instructions carefully. Here you find the most appropriate ways of dealing with this device, the basic principles of safety and maintenance. Please, also keep the user manual so that you can read it during later use

### **Attention!**

**The manufacturer is not liable for any damage caused by improper use of the device which differ from its intended purpose, or improper handling, as well as a fault of driver resulting from improper use.**

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## 1 Preliminary information

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**Before starting work with the device, read The User manual and follow the instructions contained therein!**

Description of visual symbols used in this user manual:



This symbol is responsible for reviewing the appropriate place in the user instructions, warnings and important information. Failure to follow warnings could cause injury or damage to the device



Important information and guidelines



Following this guidelines makes the use of the device easier

**Attention:** The screenshots in this manual can be dissimilar from actual images at the time of the device purchase. Due to continuous development of the devices software, some of the functions may differ from these in the manual. The manufacturer claims no responsibility for any undesirable effects (misunderstanding) caused by changes of the software.

## 2 Application of the device

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The RFID IND Modbus-Uni device is used to read RFID Unique tags.  
The device is used for an integration with other systems using Modbus RTU.

## 3 Warranty and liability of the manufacturer

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The manufacturer provides a 2-year warranty on the device. The manufacturer also provides post-warranty service for 10 years from the date of the introducing the device on the market. The warranty covers all defects in material and workmanship.

The manufacturer undertakes to comply with the contract of guarantee, if the following conditions are met:

- all repairs, alterations, extensions and device calibrations are performed by the manufacturer or authorized service,
- supply network installation meets applicable standards in this regard,
- the device is operated in accordance with the recommendations outlined in this manual,
- the device is used as intended.

The manufacturer assumes no responsibility for consequences resulting from improper installation, improper use of the device, not following this manual and the repairs of the device by individuals without permission.



**This device doesn't contain serviceable parts.**

## 4 Safety guidelines

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The reader has been designed and built using modern electronic components, according to the latest trends in the global electronics. In particular, much emphasis was placed on ensuring optimum safety and reliability of control.

The device has a housing with a high-quality plastic.



### **4.1 Power supply**

The module is suitable for power supply 10-24VDC.

### **4.2 Storage, work conditions.**

The reader is equipped with a sealed IP65 enclosure which means:

- total resistance to foreign objects
- resistance to water jet directed directly to the device
- storage and operation at temperatures from -25°C to + 60°C,



### **4.3 Installation and use of the reader**

**The reader should be used following the guidelines shown in next part of the user manual.**

### **4.4 Utilization of the reader**

When it becomes necessary to liquidate the device (for instance retiring of the device from service), please contact the manufacturer or its representative, who are obliged to respond, appropriately, i.e. collecting the reader from the user. You can also ask the companies involved in utilization and/or liquidation of electrical or computer equipment. Under no circumstances should you place the device along with other waste material.

## 5 Construction of the module

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### 5.1 General features

The reader is equipped with an RS485 port supporting Modbus RTU protocol and a USB port used for configuration and testing of the module.

The device has two relay outputs and two inputs.

#### Technical data:

Supply voltage: 12-24VDC

Power supply: 15mA (12V)

#### Transponders:

Supported transponder standard: UNIQUE, Manchester,

Carrier frequency: 125kHz,

Reading distance up to 8cm from the directions of the device LEDs side.

#### Communication:

1 RS485 port – modbus RTU

1 USB port to configuration

#### Inputs:

number of inputs: 2

input type: opto-isolator, dry contact (NO)

#### Outputs:

number of outputs: 2

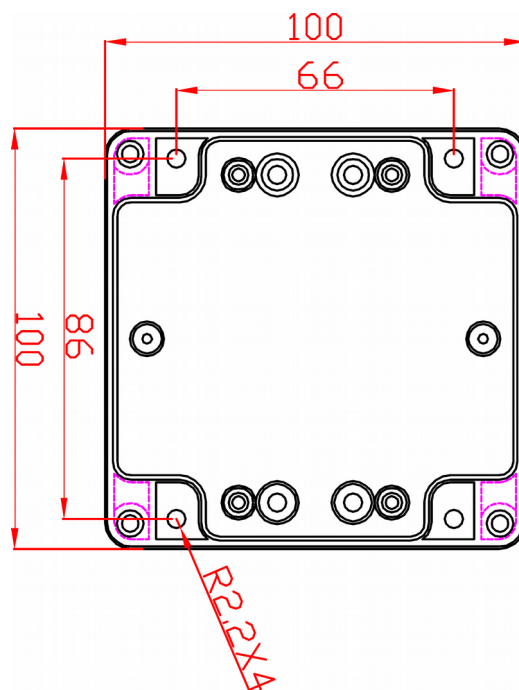
output type: relay NO

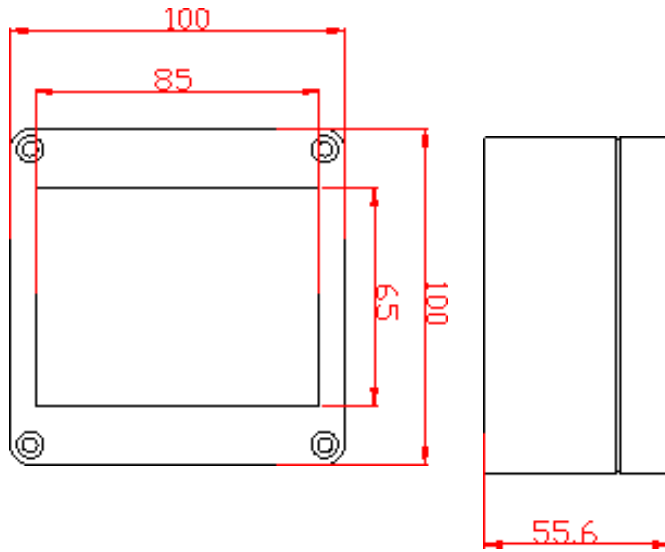
maximum relay current load: 1A @ 30VDC

#### Housing:

IP Code: IP65

Dimensions:





## 5.2 General view



## 5.3 Visual and sound signals

The device has been equipped with 3 LEDs indicating the module operation status and a sound generator informing about the application of the tag.

RFID IND Modbus-Uni	
Name	Description
POWER	Power LED
Status 1	Error
Status 2	Correct tag read



## 6 Device configuration

To configure the device use the Inveo **RFID M1 / U1 Configurator** software, which allows you to define the basic functions of the device. The program can be downloaded from <https://inveo.com.pl/software>.

After installing the **RFID M1 / U1 Configurator** configuration program and starting it, connect the USB cable to the computer and the module (in this case, the external power supply of the module is not required – the device is powered via the USB port).

INFO			
PC version: 0.12d	RFID Software: 1.3	RFID Hardware: 1.0 IND-U1	Connected

OUTPUTS		
Name	OUT1	OUT2
Mode	BISTABLE	BISTABLE
Power ON	INACTIVE	INACTIVE
Time ON	10	10
Time OFF	10	10
Active Relay on Card	<input type="checkbox"/> ENABLE	<input type="checkbox"/> ENABLE
State	<input type="checkbox"/> OUT 1	<input type="checkbox"/> OUT 2

INPUTS		
State	<input type="checkbox"/> INPUT 1	<input type="checkbox"/> INPUT 2

SETTINGS		
Buzzer	<input type="radio"/> OFF	<input checked="" type="radio"/> ON
Led 1	<input type="radio"/> OFF	<input checked="" type="radio"/> ON
Led 2	<input type="radio"/> OFF	<input checked="" type="radio"/> ON
Continuous Read Mode	0	x 0.1 s

RS485	
Mode	NONE
BaudRate	9600
Device Address	1

Card Serial Number
00-00-00-00-00

The first line of the program window displays information about the version of the configuration program – **PC version**, reader software version – **RFID Software** and reader version – **RFID Hardware**.

It is also an information on whether the configuration program was connected to a reader **Connected / Not connected**.

## 6.1 Outputs

The reader has 2 relay outputs. Each output can be programmed separately. The fields in the Outputs segment are used to configure the output settings.

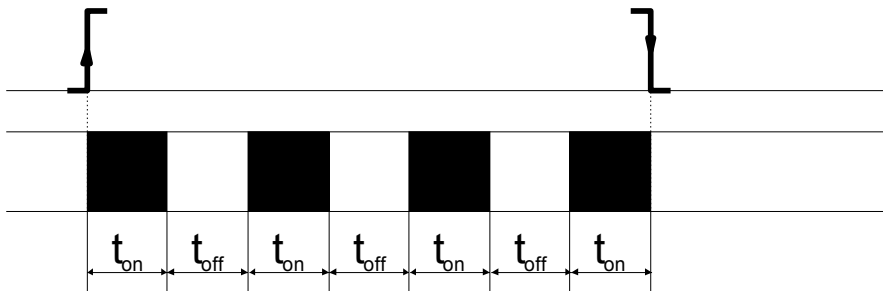
Name	OUT1	OUT2
Mode	BISTABLE	BISTABLE
Power ON	INACTIVE	INACTIVE
Time ON	10	10
Time OFF	10	10

**Mode** – Sets the output mode. The output can work in the following modes:

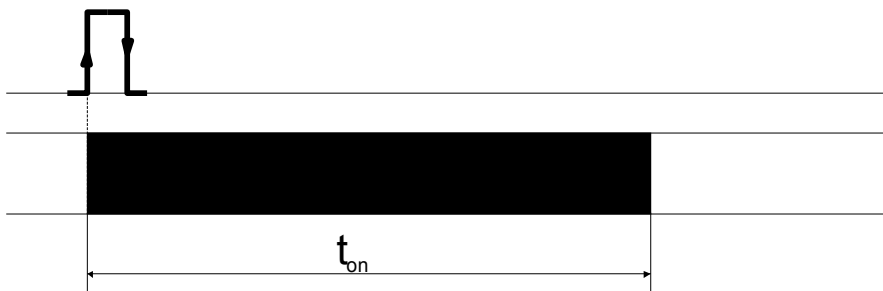
- **Disable** – output is disabled,
- **Bistable mode** – a relay has one determined status (is engaged or disengaged).



- **Astable** mode – if the channel will be enabled, the relay is engage and disengage cyclically. Time of engage and disengage relay:
  - **Time On** – time when a relay is engaged,
  - **Time Off** – time when a relay is disengaged.



- **TIME** – the output will enable for the **Time ON** and then the output will disable (e.g. the control of the electromagnet).



**Power ON** – the state of the output after powering the device

- **Active** – output enabled,
- **Inactive** – output disabled.

**State** – visualization of the output, if a rectangle is yellow it means that the output current is turned on.

Buttons Out 1 and Out 2 outputs can activate or deactivate the output.



**Active Relay on Card** – if the TAG will be read, the output enables.

To set the duration of the active output it is necessary to select the **TIME** mode and set appropriate Time ON.

## 6.2 Inputs

Fields **STATE INPUT 1** and **STATE INPUT 2** displays the actual state of inputs. Square field in black – input inactive, field in yellow – active input.



## 6.3 LEDs and sound signaling control

The **RFID M1/U1 Configurator** allows user to customize visual and sound indication. All you have to do is select the appropriate configuration settings and upload it to the module.



Two options can be set for the Buzzer:

- OFF – signaling device switched off,
- ON – sound signaling at the moment of reading the TAG.

The device has 3 LEDs:

- Power supply diode, green LED,
- LED 1 – red LED,
- LED 2 – green LED.

**Regardless of the selected setting, it is always possible to control the signaling via the Modbus RTU protocol.**

#### 6.4 Continuous Read Mode

The device allows the user to define the delay of reading TAGs.

Continuous Read Mode	<input type="text" value="0"/>	x 0.1 s
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The **Continuous Read Mode** means that the same TAG can be read only after the defined time has elapsed **but** another TAG is read immediately. This means that the same card will not be accidentally read several times. (30 = 3 seconds)

**Attention!** If the user uses this option, the read flag of the new TAG will **NOT** appear. The device will operate autonomously and automatically allow another reading of the same TAG after the declared time.

#### 6.5 RS485 – Configuration of transmission

The RS485 section is used to configure device communication.

RS485	
Mode	NONE
BaudRate	9600
Device Address	1

**MODE** (setting of 9th bit of transmission):

- **None**
- **Even** – parity bit
- **Odd** – odd bit

**BaudRate** – transmission speed (**1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200**)

**Device Address** – device address for Modbus protocol



**Attention! After customizing the settings and saving in the device, it is necessary to restart the device.**

## 7 Modbus RTU

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### Supported Modbus functions

The device supports the following MODBUS functions:

- 0x01 Read Coils,
- 0x03 Read Holding Register,
- 0x05 Write Single Coil,
- 0x06 Write Single Register,
- 0x0F Write Multiple Coils,
- 0x10 Write Multiple Registers.



**For the correct work operation of the device and Modbus protocol, the **RFID M1 / U1 Configurator** must be closed!**

### 7.1 Modbus Holding Registers addresses

Address	R/W	Description
1000	R/W	<b>IsNewTag</b> – the tag has been read 1 – a new tag 0 – no tag  <b>Flag must be reset (clear to 0) before read next tag.</b> Same as Single Coil Register 1016.
1001	R	<b>UID Length</b> – length of the UID
1002 -1011	R	<b>UID</b> – UID number
1017	R	<b>MODEL ID</b> – ID of the device
1018	R	<b>Software Version</b>
1019	R	<b>Hardware Version</b>
1020	R/W	<b>Mode OUT1</b> – output number 1 mode: 0 – <b>Disable</b> – output disabled 1 – <b>Bistable</b> – bistable mode 2 – <b>Astable</b> – astable mode 3 – <b>Time</b> – enable the output for Ton time
1021	R/W	<b>Time On OUT1</b> – time determining how long the output will be enabled (1-65535) (*0,1 sec) 120 means 12 seconds
1022	R/W	<b>Time Off OUT1</b> – time determining how long the output will be disabled (1-65535) (*0,1 sec) 120 means 12 seconds
1023	R/W	<b>Mode OUT2</b> – output number 2 mode, as above
1024	R/W	<b>Time On OUT2</b> – as above
1025	R/W	<b>Time Off OUT2</b> – as above

## 7.2 Modbus Single Coil addresses

Address	R/W	Description
1000	R/W	<b>ON 1</b> – control relay 1 (off/on)
1001	R/W	<b>ON 2</b> – control relay 1 (off/on)
1002	R	<b>COIL STATE 1</b> – relay 1 coil state
1003	R	<b>COIL STATE 2</b> – relay 2 coil state
1010	R	<b>INPUT 1</b> – input 1 state
1011	R	<b>INPUT 2</b> – input 2 state
1012	R/W	<b>LED1</b> – control LED 1
1013	R/W	<b>LED2</b> – control LED 2
1014	W	<b>BUZZ ACCEPT</b> – enable accept sound
1015	W	<b>BUZZ REJECT</b> – enable reject sound
1016	R/W	<p><b>IsNewTag</b> – the tag has been read</p> <p>1 – a new tag</p> <p>0 – no tag</p> <p><b>Flag must be reset (clear to 0) before read next tag.</b></p> <p>Same as Holding Register 1000.</p>
1017	R/W	<p><b>ResetFlag:</b></p> <p>1 – default state for power-on reader</p> <p>It can be clear and set by user for diagnostic purpose</p>

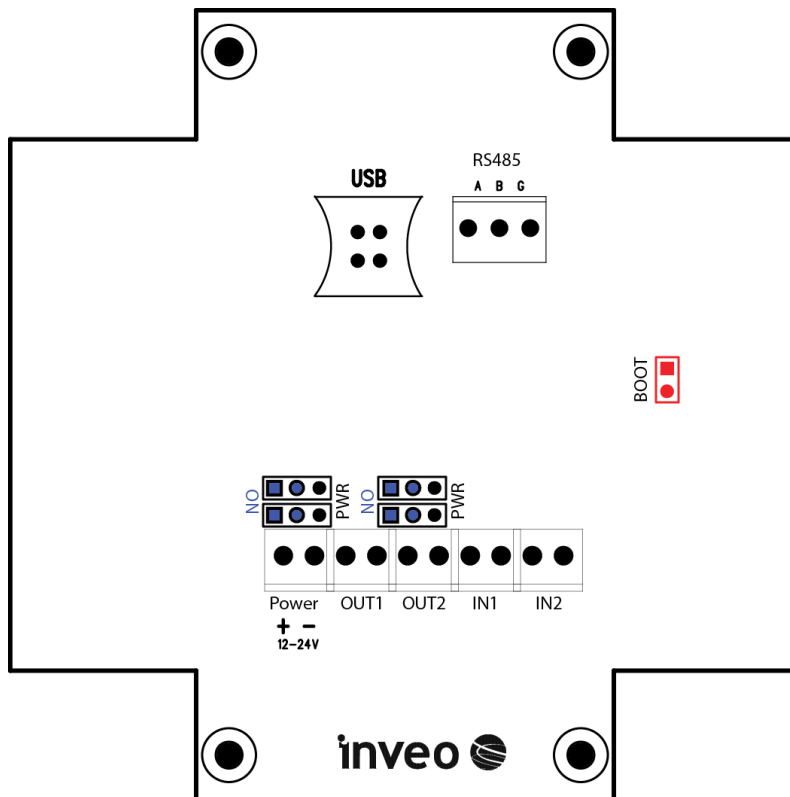
The most frequently checked is Single Coil 1016. If its value changes to 1, it means that the device has read the new tag. Holding Registers 1002-1011 registers contain the ID of the tag.

When you read ID number you should release Coil 1016 (or Holding Reg 1000) flag (clear to 0). Only after that the reader is able to read next ID tag.

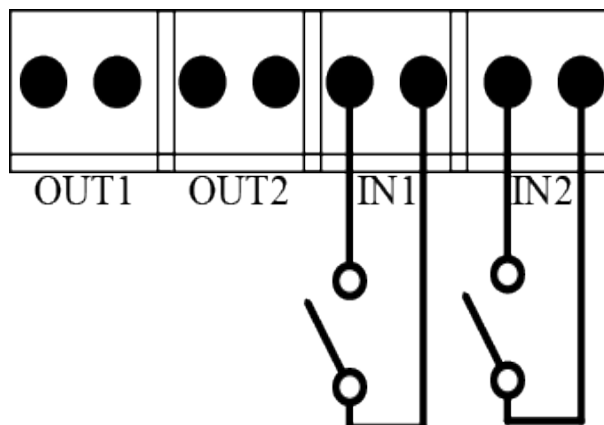
Modification of the output parameters can be done by the **Modbus** protocol. It **is not stored** in the module's permanent memory. That means **after reboot**, the output **parameters** previously saved to the EEPROM by the configuration **program** will be **restored**.

## 8 Description of terminals

The view of the PCB is shown in the figure below.



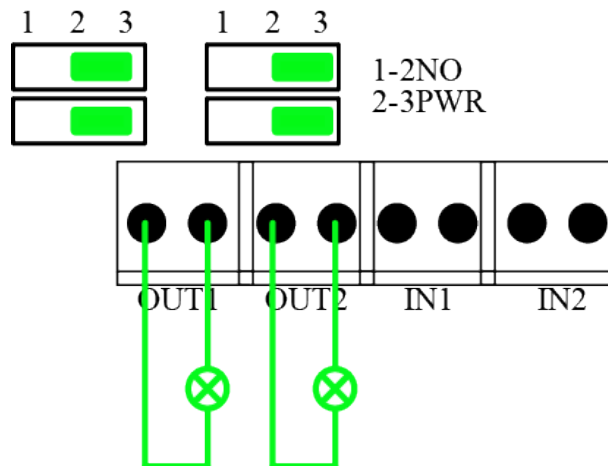
Name	Description
Power	Power connector 12-24VDC
OUT 1	Relay output 1
OUT 2	Relay output 2
IN 1	Input 1
IN 2	Input 2
USB	USB port – module configuration
RS485	Connector RS485 MODBUS
<b>Boot</b>	Short the BOOT pins when power is applied causes the module to enter into the bootloader mode



*Illustration of the inputs arrangement*

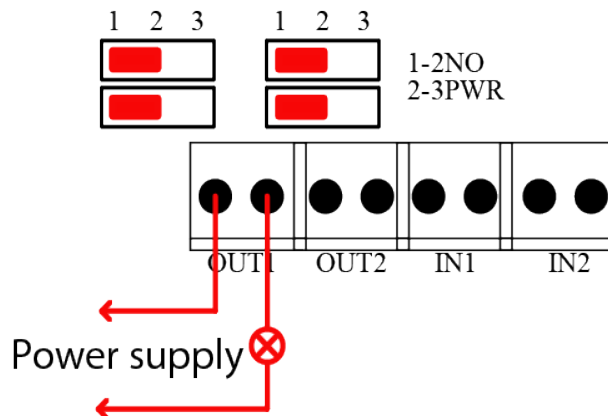
**The OUT1 and OUT2 outputs can work in two modes:**

- PWR mode** – the configuration jumpers set to 2-3 (see the picture below). In this mode, after the activation of the relay, the output voltage is e.g. 12VDC. If the reader is powered from 24VDC then the voltage will be 24VDC.
 **Attention!** If the reader is powered through PoE802.3af and there is no power supply connected to the power input then the OUT1 and OUT2 outputs **will be without voltage**.



*Illustration of the outputs arrangement (OUT1 and OUT2) for 12VDC mode*

- NORMALLY OPEN mode** – the configuration jumpers set to 1-2 (see the picture below). In this mode, an external power source is required.



*Illustration of the output arrangement (OUT1) for NORMALLY OPEN mode*