



User manual NANO RFID



Soft >= 0.1

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Dear Customer!

Thank you very much for choosing our product. Before its use, please read these instructions carefully. There are given here 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.

Remember!

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

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1 Preliminary informations

Before starting work with the controller, 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 module



Important informations and guidelines



Following this guidelines makes the use of the module easier.

Attention: The appearance of the screen shots shown in this manual may differ slightly from the actual work with the module. The differences may relate to the size and font type and size of symbols. There are no differences in the content of the information.

2 Purpose of the device

NANO RFID is used to read RFID Unique format tags i and integration with other systems via MODBUS TCP, HTTP client / server, SNMP.

3 Warranty and liability of the manufacturer



The manufacturer provides a 2-year warranty on the module. The manufacturer also provides post-warranty service for 10 years from the date of the introducing the module 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 module, not following this manual and the repairs of the module by individuals without permission.



This device doesn't contain serviceable parts. The repairs can be done only by manufacturers approved repair service.

4 Safety guidelines

The module has been constructed 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

Rfid Nano is adapted to supply 10-24VDC.

Powering of the device is carried out by the adapter POE.

4.2 Storage and working conditions

The device should be stored indoors, where the atmosphere is free from vapors and caustic agents and:

- the temperature is maintained in the range of -30 ° C to + 60 ° C,
- humidity range: 25% to 90% (no condensation)

The device is designed to operate under the following conditions:

- temperature range -10 ° C to + 55 ° C,
- relative humidity of 30% to 75%,

4.3 Installation and use of the module



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

4.4 Utilisation of the module

When it becomes necessary to liquidate the device (e.g., after the time of use), please contact the manufacturer or its representative, who are obliged to respond appropriately, i.e., collecting the module 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 garbage

5 Construction of the module

5.1 General features

General view of the Nano RFID module is shown below.



Nano RFID general view

Communication with the module is carried out by the LAN. User can choose from the following options to access the code read from the RFID tag:

- through built-in web server, using a standard web browser (preferred browsers are Mozilla Firefox, OPERA, CHROME)
- HTTP server mode
- HTTP client mode
- MODBUS TCP
- SNMP

The module is equipped with LEDs that indicate the power supply and the current state of the device.

5.2 Technical data

Supply voltage: 10-24VDC (POE)

Power consumption: 1,5W

Power / communication: RJ24

Tag standard: UNIQUE,

Reading distance: to 8cm

Dimensions: height: 20 mm; width: 66,3 mm; length: 50,0 mm

6 Device configuration

When you first start, you need to configure the device.

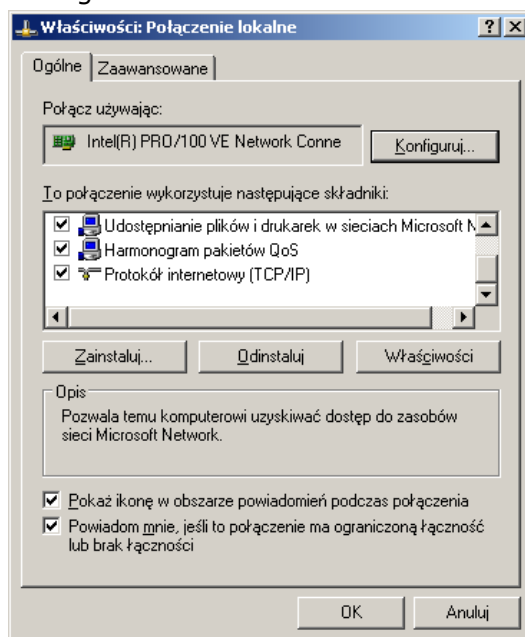
6.1 Changing the computer's subnet for configuration.

After connecting to the network, there is need to change the subnet of the computer connected to the same network.

To do this, proceed to network configuration: Start->Settings->Control panel ->Network connections.

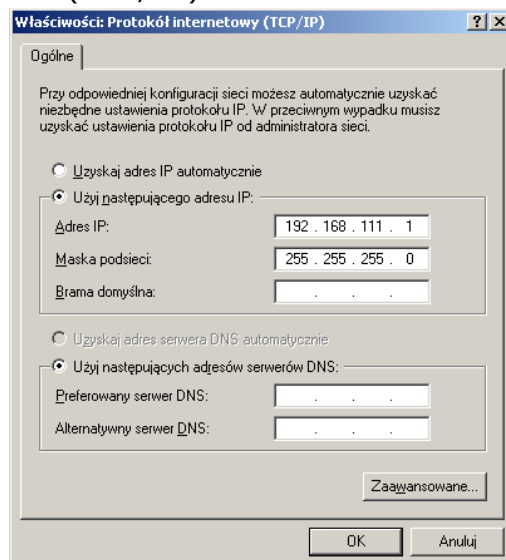
Then select the network connection with right click and click "Properties".

After selecting shows the configuration screen:



Changing the network configuration in the Windows system

Then select "Internet Protocol (TCP / IP)" and enter the following settings:



Examples of settings TCP / IP

After accepting the settings, click OK, open a Web browser and enter the address: **192.168.111.15** .

Then select the "NETWORK" (**The default user and password:** admin/admin00)

Configure the network connection

To change the network settings of the module are the following fields:

MAC Address – MAC network address of the module – the read-only

Host Name – NETBIOS name,

Enable DHCP – Checking this box forces use the address assigned by the DHCP server

IP Address – IP address of the module (at the following module will be visible on the network)

Gateway

Subnet Mask –

Primary DNS, Secondary DNS – DNS servers addresses,

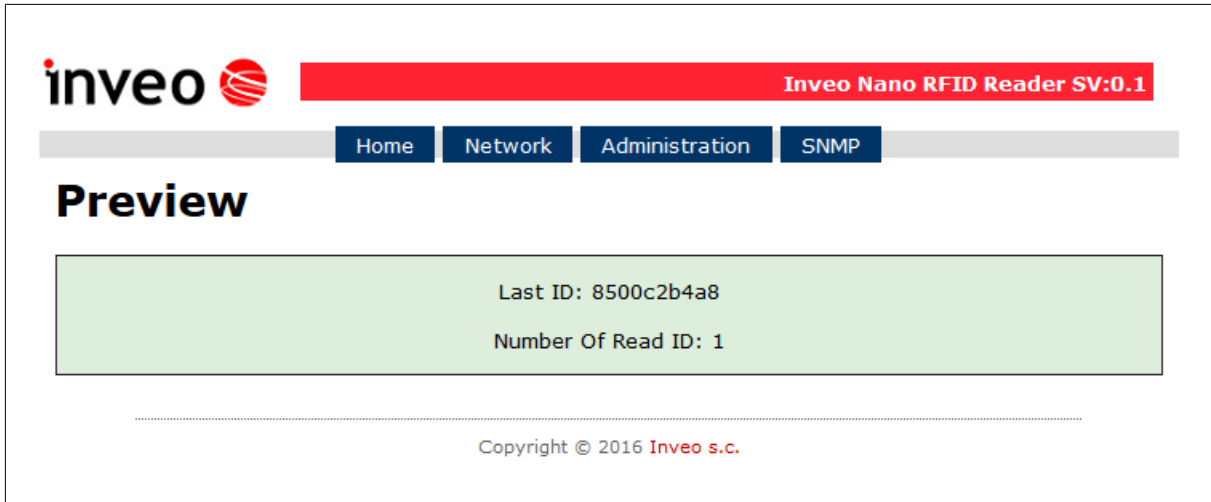
HTTP Srv IP: – address of the server to which the module link in the "Control only to HTTP Client" mode

HTTP Srv Port: – port on which the server is listening,

HTTP Resource: - resource to call on the server side

After making changes, click **Save Config**.

6.2 HOME tab



The screenshot shows the web interface for the Inveo Nano RFID Reader. At the top left is the 'inveo' logo. To its right is a red bar containing the text 'Inveo Nano RFID Reader SV:0.1'. Below this is a navigation menu with four tabs: 'Home', 'Network', 'Administration', and 'SNMP'. The 'Home' tab is selected. The main content area is titled 'Preview' and contains a green box with the following information: 'Last ID: 8500c2b4a8' and 'Number Of Read ID: 1'. At the bottom of the page, there is a copyright notice: 'Copyright © 2016 Inveo s.c.'

HOME tab

After selecting the HOME appears:

- **SV:0.1** – software version
- **Last ID: 8500c2b4a8** – last read TAG code in HEX format
- **Number Of Read ID: 1** – the number of tags read from the device reset

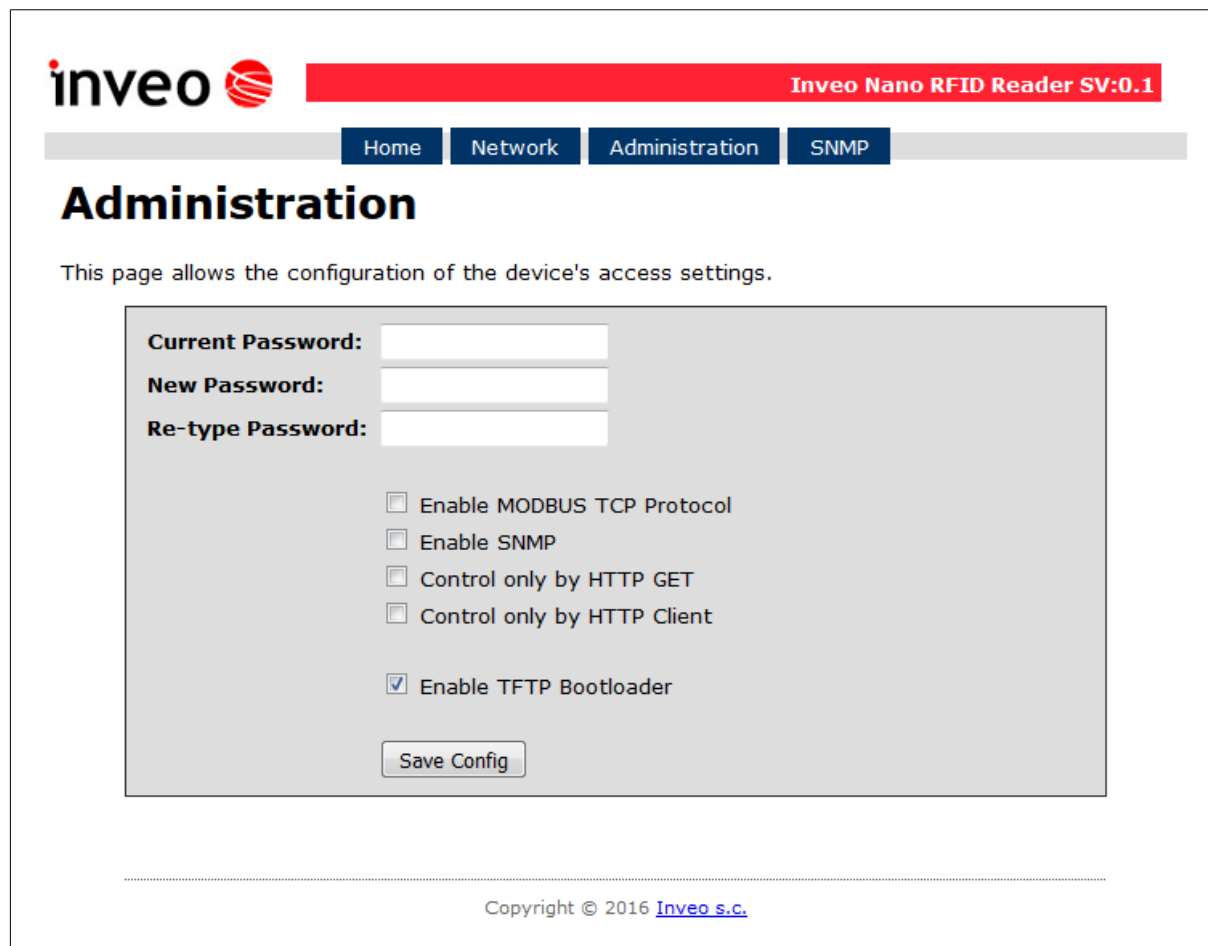


Warning:

When after *Last ID: 8500c2b4a8* appears **(LOCK!)** it means that reading of following tags is locked until reset command **releaseid**.

6.3 Communication protocols and administration

Administration menu allows to select services to be active and change the password.



The screenshot shows the 'Administration' page of the Inveo Nano RFID Reader. The page header includes the Inveo logo and the text 'Inveo Nano RFID Reader SV:0.1'. A navigation bar contains links for 'Home', 'Network', 'Administration', and 'SNMP'. The main heading is 'Administration', followed by a description: 'This page allows the configuration of the device's access settings.' The configuration area is enclosed in a grey box and contains three password input fields labeled 'Current Password:', 'New Password:', and 'Re-type Password:'. Below these are five checkboxes: 'Enable MODBUS TCP Protocol', 'Enable SNMP', 'Control only by HTTP GET', 'Control only by HTTP Client', and 'Enable TFTP Bootloader' (which is checked). A 'Save Config' button is located at the bottom of the configuration area. At the bottom of the page, there is a copyright notice: 'Copyright © 2016 Inveo s.c.'.

Security settings.

Changing password

To change password follow the instructions in frames: **Current Password**, **New Password**, **Re-type Password**. New password need to be confirmed by clicking **Save Config**. Disable the password takes place by leaving the **New Password** empty.

Services settings

The device allows you to choose which services will be available. Select the check box next to the name of the service activates the selected service.

Enable MODBUS TCP Protocol

Enable SNMP

Control only by HTTP GET

Control only by HTTP Client

Enable TFTP Bootloader



Warning:

TFTP bootloader during normal operation should be **turned off**. Enabling should only occur before updating the software.

6.4 SNMP Configuration

The module is equipped with a server SNMP v2c.
Activation of the functions is possible in the tab Administration->Enable SNMP.
SNMP allows you to retrieve the read tag number
MIB file describing the structure is to download in the SNMP tab **Download MIB file**.

The module allows you to send TRAP messages after correctly reading of the RFID tag.
The destination address is written in the **Trap IP Address** fields.

The screenshot shows the web interface for the Inveo Nano RFID Reader. At the top left is the 'inveo' logo. To its right is a red bar with the text 'Inveo Nano RFID Reader SV:0.1'. Below this is a navigation menu with four tabs: 'Home', 'Network', 'Administration', and 'SNMP'. The 'SNMP' tab is selected. The main heading is 'SNMP Configuration'. Below the heading is the text 'Configuration for SNMP v2c Agent.' The configuration area contains the following fields and options:

- Read Community :** public
- Write Community:** private
- Trap IP Address 1:** [empty text box]
- Enable Trap 1
- Trap IP Address 2:** [empty text box]
- Enable Trap 2
-

Below the configuration area is a red link: [Download MIB file](#)

At the bottom of the page, there is a copyright notice: Copyright © 2016 [Inveo s.c.](#)

7 Communication with the module

7.1 MODBUS addresses

The device supports the following functions MODBUS RTU:

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

Lp	Adres	Typ	R/W	Opis
1	1000	Holding Reg	R	The transponder code [0]
2	1001	Holding Reg	R	The transponder code [1]
3	1002	Holding Reg	R	The transponder code [2]
4	1003	Holding Reg	R	The transponder code [3]
5	1004	Holding Reg	R	The transponder code [4]
6	1005	Holding Reg	R	Device model
7	1006	Holding Reg	R	Software version
8	1007	Holding Reg	R	Hardware version
15	1000	Single Coil	R	Reserve
16	1001	Single Coil	R	Reserve
17	1002	Single Coil	R	Reserve
18	1003	Single Coil	R	Reserve
19	1004	Single Coil	R/W	Reading flag Read: 1 – new transponder read Record: 0 – reset reading flag
20	1005	Single Coil	R/W	Reset status Read: 1 – there was a restart of the reader (eg. by power failure) Record: 1 – forcing the device reset 0 – reset restart flag

After a correct reading of the tag in the registry Single Coil 1004 is stored a value of 1 – read a new transponder, and in the registers Holding Registers (1000-1004) following values of the transponder code. The next reading of the transponder is only possible after resetting the reading flag and entered into the register 1004 a zero value.

7.2 Readout module status

NANO RFID modules might be control via the HTTP protocol.
To read the current status of the module in the browser refer to sub for example:
<http://192.168.111.15/status.xml>

Appears a resource in XML format that describes the basic information:

```
<status>
<netbios>NANO RFID</netbios>
<mac>d8:80:39:5c:6b:7a</mac>
<id>8500c2b4a8</id>
<newId>0</newId>
<cnt>1</cnt>
<resetFlag>1</resetFlag>
<enable>1</enable>
<httpClientStatus>0</httpClientStatus>
</status>
```

Section	Description
<netbios>NANO RFID</netbios>	NETBIOS name of the module
<mac>d8:80:39:5c:6b:7a</mac>	MAC address of the module
<id>8500c2b4a8</id>	The last code read from the RFID tag in hexadecimal format
<newId>0</newId>	In mode: Control only by HTTP GET 1- read new RFID tag 0-not read the new RFID tag
<cnt>1</cnt>	Number of read RFID tags from the device reset
<enable>1</enable>	1-radio module activated 0-radio module deactivated
<resetFlag>1</resetFlag>	1-there was a module reset
<httpClientStatus>0</httpClientStatus>	The current state of the TCP connection in Control only by HTTP Client mode 1-connected to the server -socket open 2-received data from the server 3-connection completed 100-not connected to the server

7.3 Control via HTTP.

Control of the module in **Control only by HTTP GET** mode is based on sending the appropriate command to the module by HTTP protocol.

http://192.168.111.15/status.xml?			
Lp	Command	Name	Description
1	enable	Enable RFID	Enabling the antenna in the RFID module http://192.168.111.15/status.xml?enable=1 Disabling the antenna in RFID module http://192.168.111.15/status.xml?enable=0
2	resetFlag	Reset Flag	After starting or reset the module flag set to 1. Deleting reset flag http://192.168.111.15/status.xml?resetFlag=0
3	releaseId	Release ID	Deleting read flag and waiting for the RFID tag http://192.168.111.15/status.xml?releaseid=1
4	led	Led control	Enabling of the signaling LED led=TimeOn,TimeOff,Cnt TimeOn*0.1 second, TimeOff*0.1 second http://192.168.111.15/status.xml?led=5,3,4 Enabling led for 0.5 seconds, off for 0.3 seconds and repeat the sequence 4 times
5	buzz	Buzzer control	Enabling of the signaling LED led=TimeOn,TimeOff,Cnt TimeOn*0.1 second, TimeOff*0.1 second http://192.168.111.15/status.xml?buzz=5,3,4 Enabling sounder for 0.5 seconds, off for 0.3 seconds and repeat the sequence 4 times

7.4 Integration with own software

Nano RFID modules can be integrate with own software. They can work as a server (in o **Control only by HTTP GET** mode) or client (in **Control only by HTTP Client** mode)

Server mode (Control only by HTTP GET):

In this mode, an external host connects to the module and manages it through the http protocol. The manager host must periodically read the status.xml resource in Nano-RFID module and depending on the state read from xml file call the appropriate functions.

After approaching the tag to the field of reading, in the status.xml resource will be completed the appropriate fields and the module locks the ability to read until calling the *releaseid* function causing transition module to a state of waiting for next tag approaching. Through appropriate functions the LED indicating reading the card can be light, a beep can be generate, etc. The disadvantage of this method is the need to the cyclic reading of status.xml resource .

Client mode (Control only by HTTP Client):

In this mode, after the correct reading of the RFID tag, module automatically connects to the server and sends the readout data to the appropriate server resource (by HTTP GET).

As the answers can be retrieved information about the state of the LED or buzzer.

The advantage of this mode is that immediately after reading the card, the device itself sends the code to the server or controlling application.

An example might be to record to the mysql database or to the file on server the readout RFID tag the MAC number of the reader and the readout time.

7.5 Communication with the module from the external network

If the module is in a different LAN than the computer that connects to it, it is required port forwarding.

Depending on the used method of communication with the module, it is necessary to contact the network administrator and port forwarding:

Operation via the website and http:

- port TCP/IP 80

Operation via the MODBUS TCP:

- port TCP/IP 502

Operation via the SNMP:

- port UDP 161

8 DHCP

To enable / disable DHCP needs:

1. Press the RESET button on the time between 5 and 10 seconds
2. The indicator will blink approximately 2 times per second
3. Release the RESET button

9 Factory Default Reset

To restore the factory setting need to:

1. Switch on the device.
2. Press the RESET button on the time between 10 and 15 seconds
3. The green LED will start flashing about 4 times per second
4. Release the RESET button

After the above steps the device will set the following parameters:

- IP address: 192.168.111.15
- IP mask: 255.255.255.0
- User: admin
- Password: admin00

10 Software Update

The module is equipped with the ability to update the software. The program is delivered as a file with the extension .bin



Warning! Improper use of the update feature may damage the module.

To carry out programming operations, go to the Windows command line interface (Start->Run-> type 'cmd' and confirm with Enter).

Then go the catalog where the file .bin is located and enter the command:

```
tftp -i <ip_address_of_the_module> PUT file.bin
```

Programming takes approx. 1 minute. End of programming confirms the message 'File Transferred'.

The latest software is available at: www.inveo.com.pl

