TECHNICAL INFORMATION MANUAL

Revision 1.1 – 11 March 2020

Quattro R4321P

Smart 4-port RAIN RFID Long Range Reader

easy read

CAENRFID

Visit the Quattro R4321P web page, you will find the latest revision of data sheets, manuals, certifications, technical drawings, software and firmware. All you need to start using your tag in a few clicks!

Scope of Manual

The goal of this manual is to provide the basic information to work with the Quattro R4321P Smart 4-port RAIN RFID Long Range Reader.

Change Document Record

Date	Revision	Changes	Pages
16 Sep 2019	00	Preliminary Release	-
17 Feb 2020	01	Added *CE Compliance* paragraph and *Quattro R4321P CE Declaration of Conformity*	40, 42
		Added notes regarding the Ethernet cable specification	8, 16, 26
11 Mar 2020	1.1	Added FCC Compliance	40

Reference Document

[RD1] EPCglobal: EPC Radio-Frequency Identity Protocols Class-1 Generation-2 UHF RFID Protocol for Communications at 860 MHz – 960 MHz, Version 2.0.1 (April, 2015).

[RD2] G.S.D. s.r.l. - Report CE mark – R4321P – Quattro. Test report n. 19517 Rev. 00 – 03 January 2020.

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Disposal of the product

Do not dispose the product in municipal or household waste. Please check your local regulations for disposal/recycle of electronic products.

Federal Communications Commission (FCC) Notice (Preliminary)

This device was tested and found to comply with the limits set forth in Part 15 of the FCC Rules. Operation is subject to the following 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. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This device generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, the product may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference, in which case, the user is required to correct the interference at their own expense. The authority to operate this product is conditioned by the requirements that no modifications be made to the equipment unless the changes or modifications are expressly approved by CAEN RFID.

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1 INTRODUCTION

Product Description

The Quattro (Model R4321P) is a smart 4-port RAIN RFID long range reader of the easy2read© product line, well suited for retail and warehousing installations.

The Quattro reader has 4 antenna ports capable of a 31.5 dBm maximum power enabling to build RAIN RFID portals for long range reading. Its slim form factor makes it easy to install even when limited space is available. It offers the Ethernet (PoE) and USB communication interface in order to simplify the installation both on large and single read point installations. The Power over Ethernet capability permits to provide power and to communicate with the reader with a single cable.

The USB host port, combined with the internal computing architecture, permits to connect USB peripherals like barcode scanners, keyboards, printers and many others transforming the Quattro reader in a powerful and versatile identification platform.

The Quattro is based upon an embedded Linux platform and it's easily configurable using an internal web interface. System integrators can customize the behaviour of the reader installing Java code that, having access to all the RFID features and interfaces, permits a full customization.

The Quattro reader complies with and can operate in both European and US regulatory environments and, due to its multiregional capabilities, it's ideal for integration in devices requiring compliance to different geographical regions.

Fig. 1.1: Quattro reader (Model R4321P)

Ordering Options

	Code	Description
Reader	WR4321PXAAAA	R4321P Quattro - Smart 4-port Long Range RAIN RFID
Development kit	WR4321PXDKEU	Quattro - ETSI Dev Kit including RFID antenna with cable, power supply, and tag samples (reader not included)
	WR4321PXDKUS	Quattro - FCC Dev Kit including RFID antenna with cable, power supply, and tag samples (reader not included)
Accessories	WANTENNAX019	Circular polarized antenna 5.5dBi – ETSI
	WANTENNAX020	Circular polarized antenna 5.5dBi – FCC
	WALIM0000005	R4321P - Auxiliary Power Supply

2 GETTING STARTED

Introduction

This quickstart guide will help you to get started with your Quattro (Model R4321P) reader.

The reader can be configured in two different profiles:

- **EASY2READ** (factory default): choosing this option you select the CAEN RFID easy2read communication protocol. Select this option in order to control the reader using the CAEN RFID Easy Controller Application or the SDK (Software Development Kits) library. For details on the use of the EASY2RD profile please refer to this quickstart guide.
- **CUSTOM**: the use of this profile allows the user to upload their own scripts to the reader. For details on the use of the Custom profile please refer to § *CUSTOM PROFILE* page 34.

The reader is sold with the factory profile set to *EASY2READ*. This guide helps you to getting started with your reader using the EASY2READ profile.

For more detailed information on reader configuration, connections and setup options please refer to the next chapters.

Connecting to the Quattro Reader using the Ethernet port

Ethernet Communication Setup

The Quattro reader can be connected to a PC using an Ethernet cable. In order to correctly operate with the reader follow the steps above:

1. Connect the Quattro to the power supply, the power LED will turn on, wait about 30 seconds until you hear a beep, wait 10 seconds again and the reader is ready to work with the *easy2read* profile active.
2. Plug an Ethernet cable[1] (not provided) into your computer and connect the other end of the Ethernet cable to the reader. If your private network matches the default network configuration of the reader (IP address 192.168.0.2) you can connect to it, otherwise you can:
    a. change the network configuration of the reader (see § *NETWORK* page 18) to connect it to your network

    or

    b. disconnect your PC from your network and connect it to the network of the reader.
3. Connect the antenna cable to Ant-0 (see § *Fig. 3.6: Antennas* page 15) of the reader.

Now you can use the CAEN RFID Easy Controller Application to control the reader.

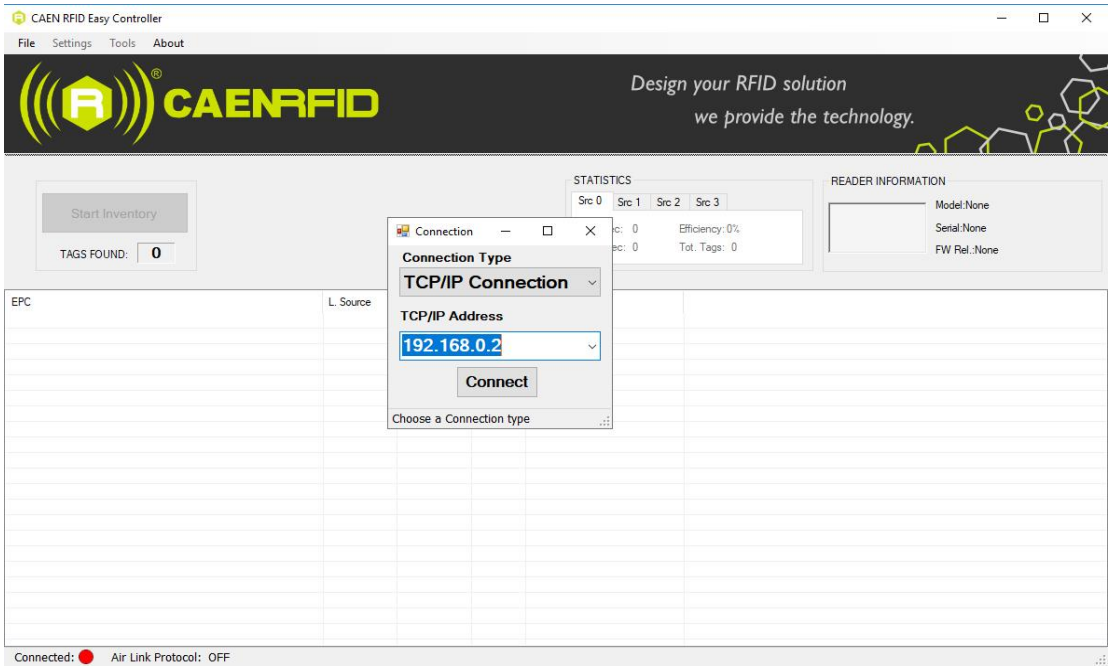
[1] For proper operation of the device:
- Ethernet cable shall be CAT6 at least (type S/FTP or S/STP)
- Put two ferrites (P.N. RRC-13-7-23-M-K5B by RICHCO; CAEN RFID ordering code LFAAFFP00004) on the Ethernet cable, near the reader connector.

Easy Controller

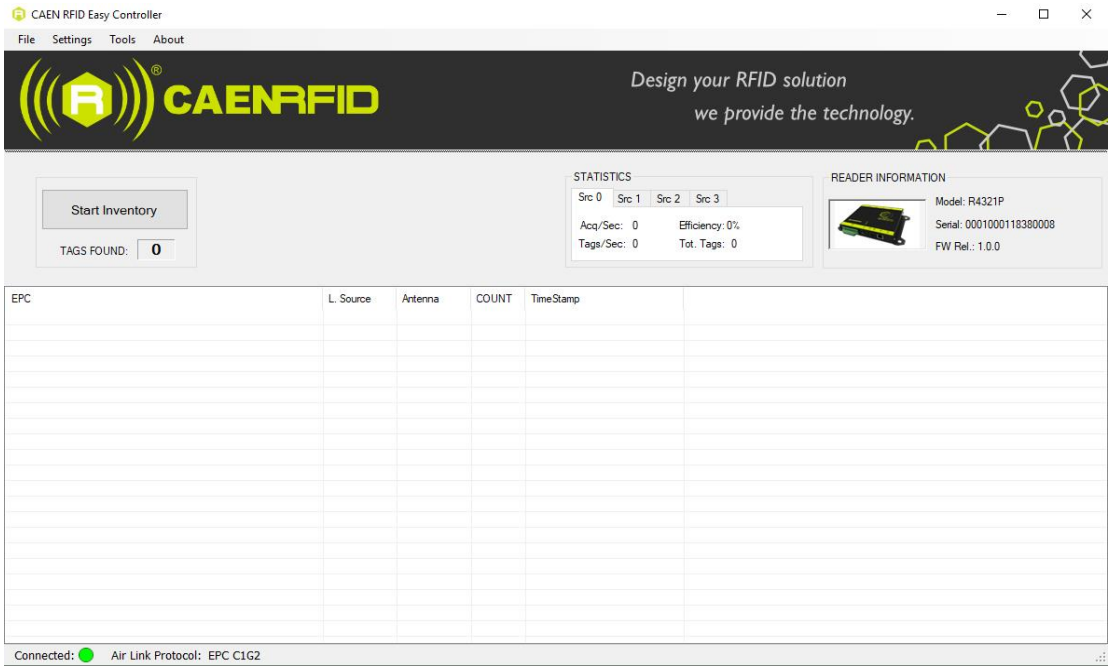
Follow these steps to connect the Quattro using the *Easy Controller* application for Windows:

1. Download the latest version of the *Easy Controller software* from the Quattro R4321P web page, *Downloads* section and install it.
2. Launch the *Easy Controller* application:

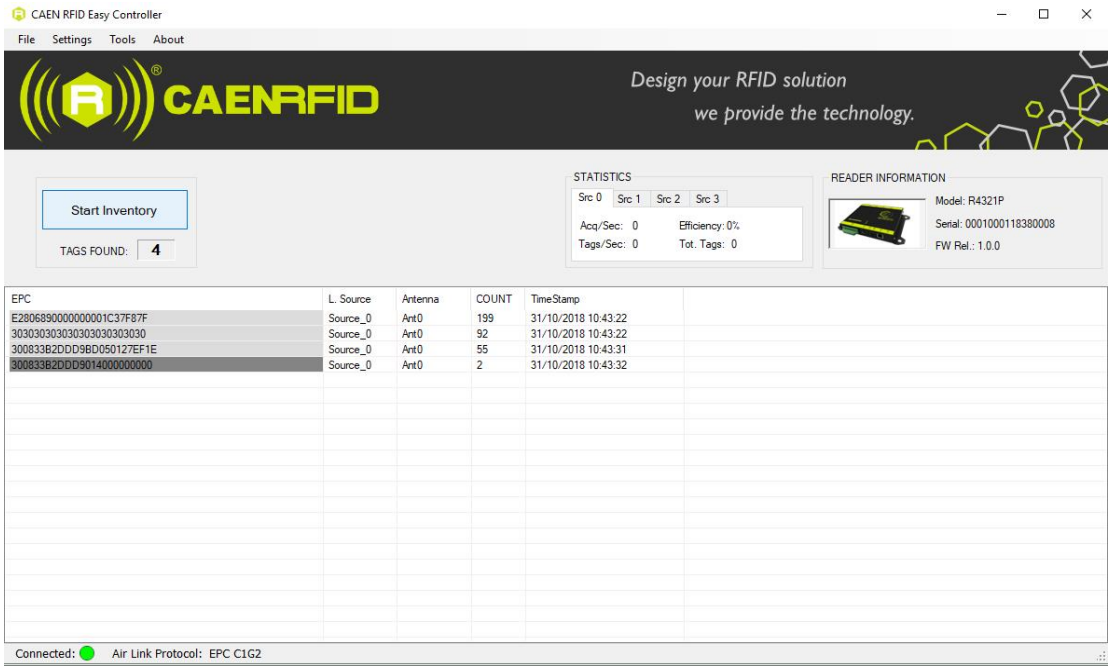
3. On the main screen click on *File → Connect.* A Connection windows will open. Select the *Connection Type* (TCP/IP Connection) and type the Quattro IP address into the *TCP/IP Address* box (default value is 192.168.0.2). Then click on *Connect*:



4. To verify if the connection with the reader has been established, check the green dot on the bottom left side of the sidebar. Into the *READER INFORMATION* box you can find information on reader model, serial number and firmware release:



5. Place a tag in the read range of the reader, click on *start inventory* and see the tag information displayed on the main window:



For more info on the use of the *Easy Controller*, please refer to the *CAEN RFID Easy Controller Software Technical Information Manual*, you can download it from the Quattro R4321P web page, *Downloads* section or in the Manual and Documents web area.

3 EXTERNAL INTERFACE DESCRIPTION

LEDS

Fig. 3.1: LEDs

No.	Name	Description
1	Power	Power On – Green LED
2	Communication	Communication activity – Blinking Yellow LED
3	Tag-ID	Tag Detection – Blinking Red LED

Tab. 3.1: LEDs

Connectors

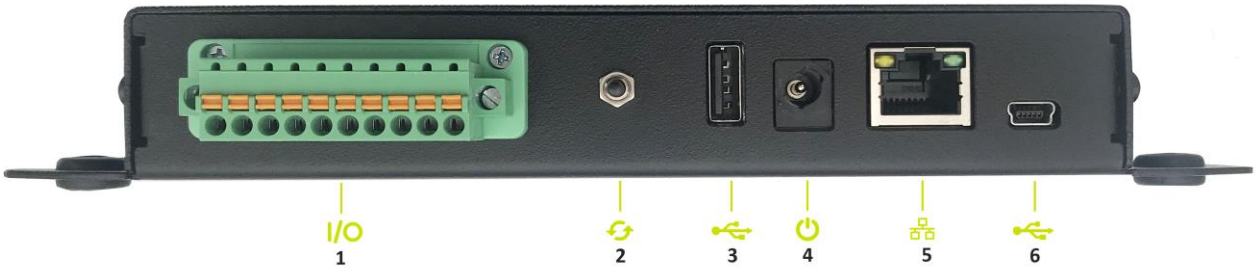


Fig. 3.2: Interfaces Panel

No.	Name	Description
1	GPIO	General Purpose Input Output
2	UPGRADE	Upgrade operative system
3	USB host	USB 2.0 Hi-speed Host port
4	Power	Power Supply Connector
5	Ethernet	Ethernet 10/100/1000BASE-T (RJ45) / POE standard IEEE 802.3af
6	USB device	USB 2.0 Hi-Speed Device port

Tab. 3.2: Interfaces Panel

GPIO

10 Poles terminal block with screw connection with tension sleeve:

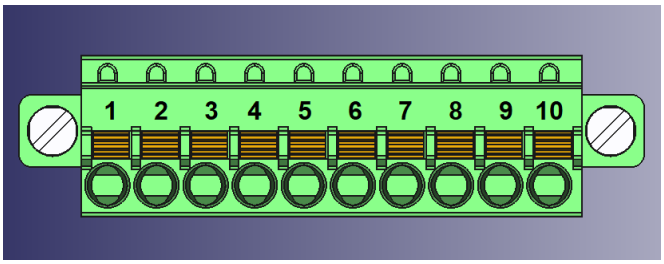


Fig. 3.3: GPIO Connector

No.	Name	Description
1	+5V	5VDC
2	GND	Ground
3	GPI0	General purpose input 0
4	RTN	Return
5	GPI1	General purpose input 1
6	RTN	Return
7	OUTPUT1.1	SS-Relay 1 Contact 1
8	OUTPUT1.2	SS-Relay 1 Contact 2
9	OUTPUT2.1	SS-Relay 2 Contact 1
10	OUTPUT2.2	SS-Relay 2 Contact 2

Tab. 3.3: GPIO Connector Poles

Input signal

To have a valid input signal, apply a voltage between 4V and 48V to the pin indicated by GPI0 (or GPI1) and its return (RTN) pin.

The most simply way to have a valid input signal is connecting the +5V pin, present on the terminal block connector, to the GPI0 pin through a switch that enables the input signal when it is closed. The connection between ground (GND) and return (RTN) is also required to complete the circuit.

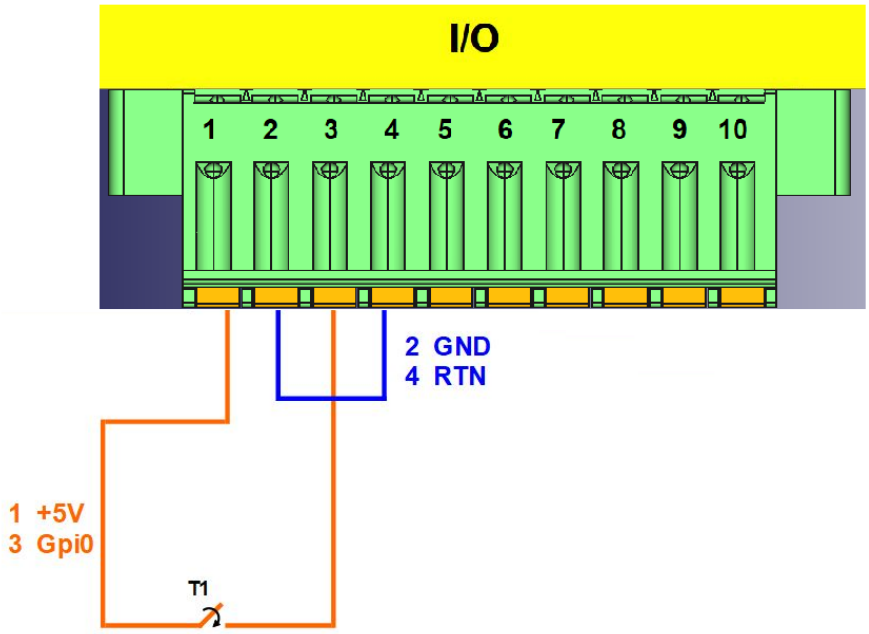
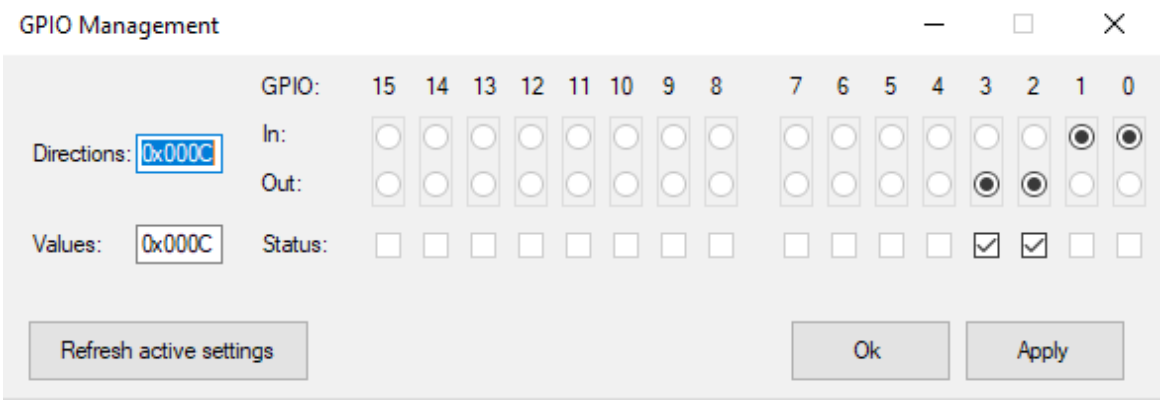


Fig. 3.4: GPIO Input Signal

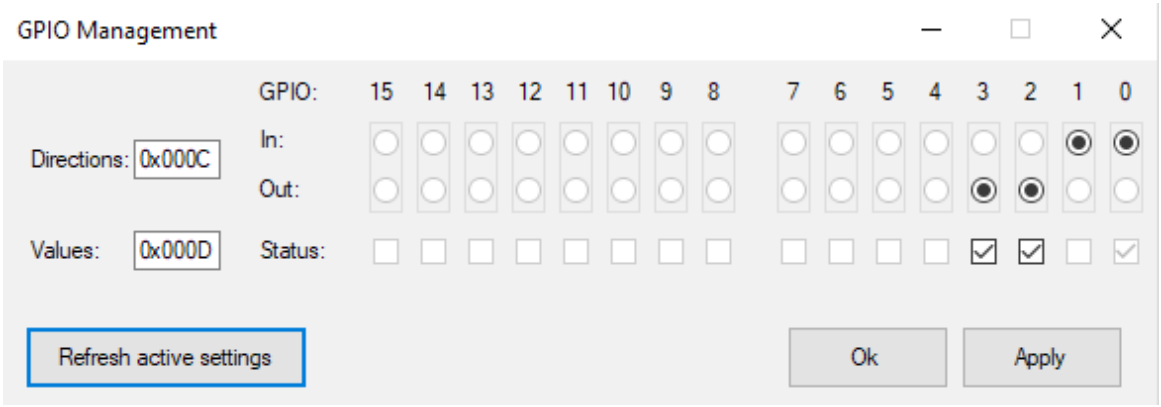
It is possible to verify the correct functioning of the circuit by connecting the reader to the CAEN RFID Easy Controller software, Tools-I/O management section:

GPI0 corresponds to GPIO0 of the Easy Controller software

GPI1 corresponds to GPIO1 of the Easy Controller software



When a valid input is present on the GPI0 pin, a check “V” appears in the Status box at the GPIO 0:



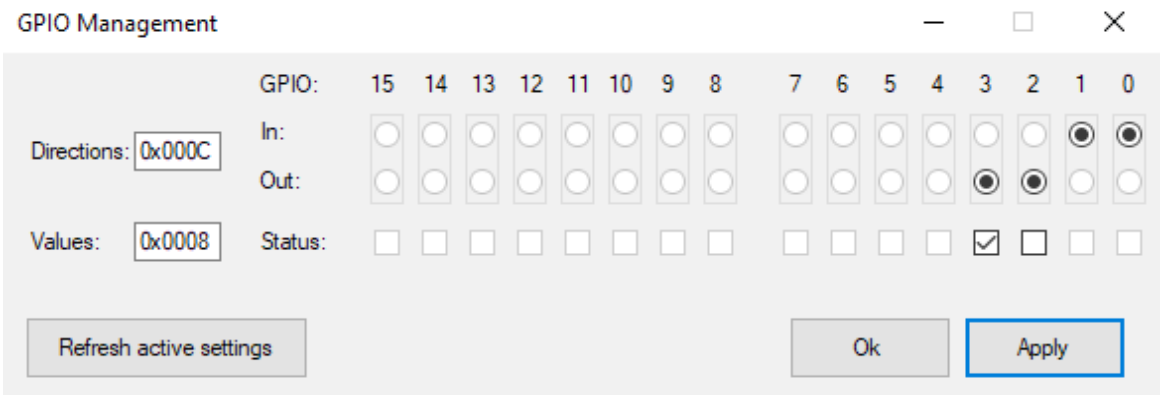
Output signal

The OUTPUT1.1 – OUTPUT1.2 and OUTPUT2.1 – OUTPUT2.2 pins are the terminals of a normally open dry contacts.

By connecting to the CAEN RFID Easy Controller Software, Tools-I/O management section, you can close the contact by removing the check from the Status box related to GPIO 2 and GPIO 3 and then press the Apply button.

OUTPUT1.1 – OUTPUT1.2 correspond to GPIO2 of the Easy Controller software

OUTPUT2.1 – OUTPUT2.2 correspond to GPIO3 of the Easy Controller software



To power a generic device at 5V DC (U1 symbol in *Fig. 3.5: GPIO Output Signal*), for example a light signal tower, a photocell or an alert siren, it is possible to use the connection shown in the drawing below. When you close the contact by the software command, the device is powered.

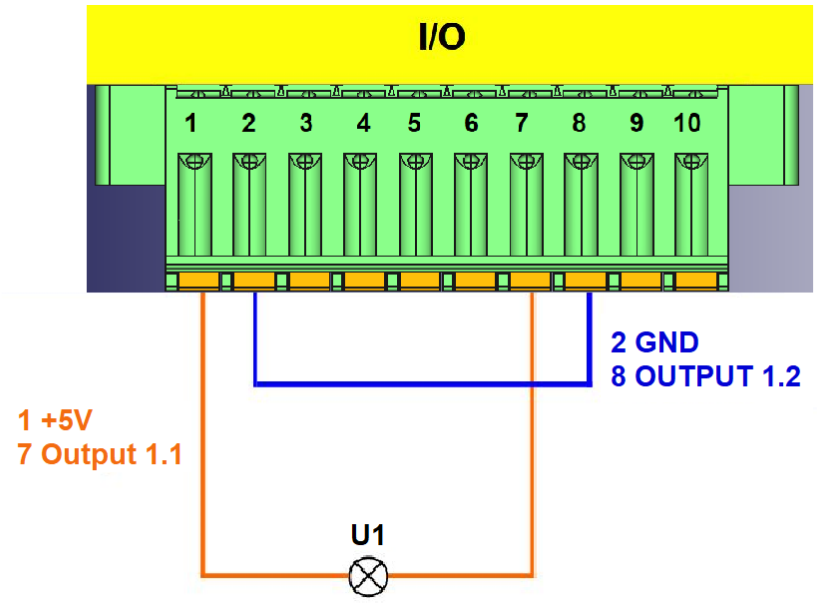


Fig. 3.5: GPIO Output Signal

Antennas

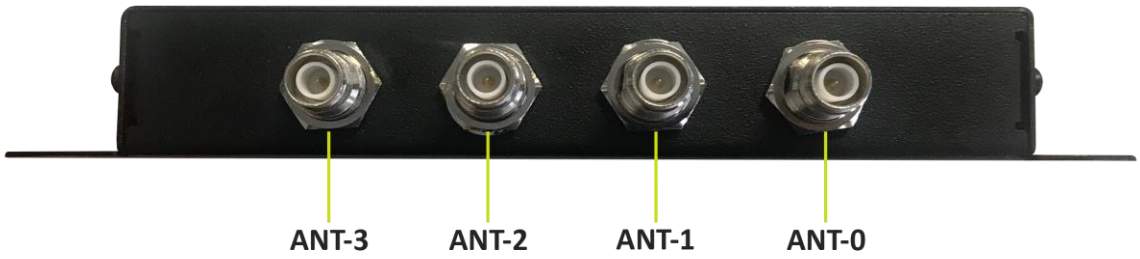


Fig. 3.6: Antennas

Name	Description
ANT 0	50Ω RP-TNC jack connector Antenna 0
ANT 1	50Ω RP-TNC jack connector Antenna 1
ANT 2	50Ω RP-TNC jack connector Antenna 2
ANT 3	50Ω RP-TNC jack connector Antenna 3

Tab. 3.4: Antennas

In order to achieve the best reading performances, the VSWR of the antenna shall be lower than 1.5:1.

4 CONFIGURATION USING THE WEB INTERFACE

Introduction

The reader can be configured via web interface.

The Web Interface is accessible only via the Ethernet connection:

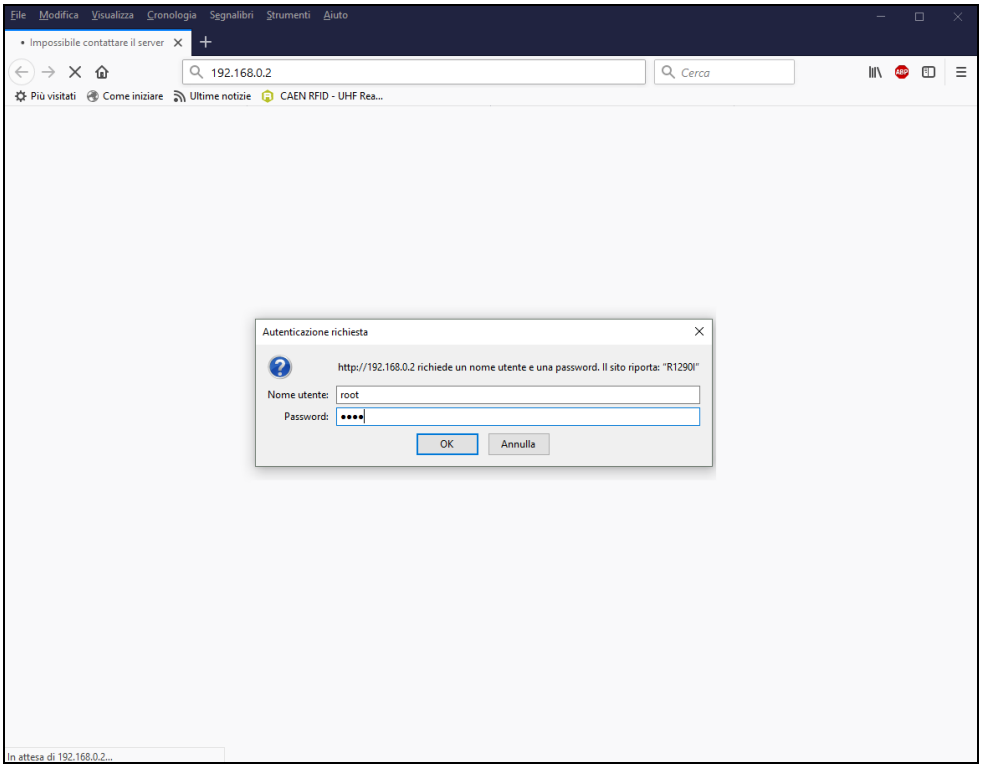
1. Connect the Quattro to the power supply.
2. Plug an Ethernet cable[2] (not provided) into your computer and connect the other end of the Ethernet cable to the reader. If your private network matches the default network configuration of the reader (IP address 192.168.0.2) you can connect to it, otherwise you can:
   a. change the network configuration of the reader (see § *NETWORK* page 18) to connect it to your network

      or

   b. disconnect your PC from your network and connect it to the network of the reader.

By factory default, the Quattro web interface is reachable at the following IP address: 192.168.0.2.

To login, type ***root*** in the Username text box and ***root*** in the Password textbox. To change the username and password please refer to *§ SYSTEM* page 19.



[2] For proper operation of the device:
- Ethernet cable shall be CAT6 at least (type S/FTP or S/STP)
- Put two ferrites (P.N. RRC-13-7-23-M-K5B by RICHCO; CAEN RFID ordering code LFAAFFP00004) on the Ethernet cable, near the reader connector.

When the connection with the reader is established, the main screen of the web interface is displayed:

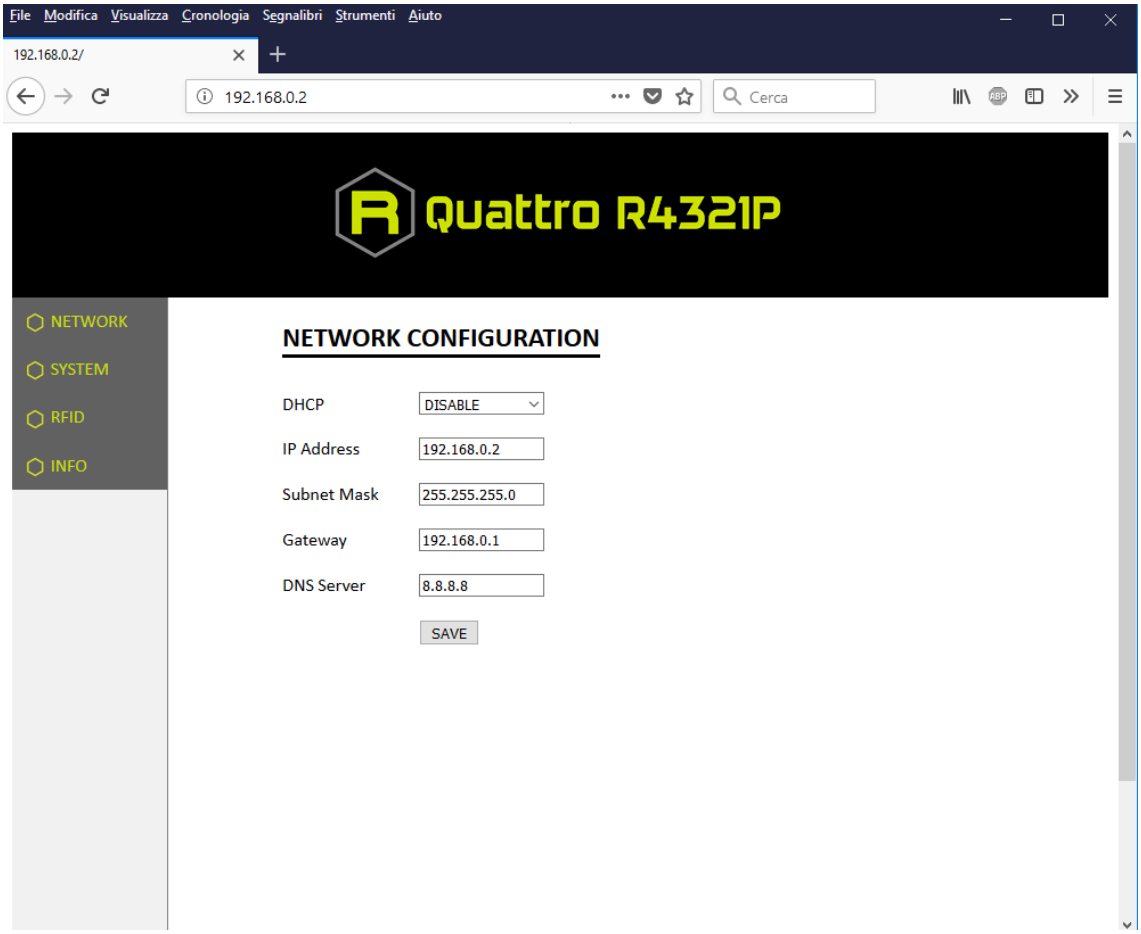
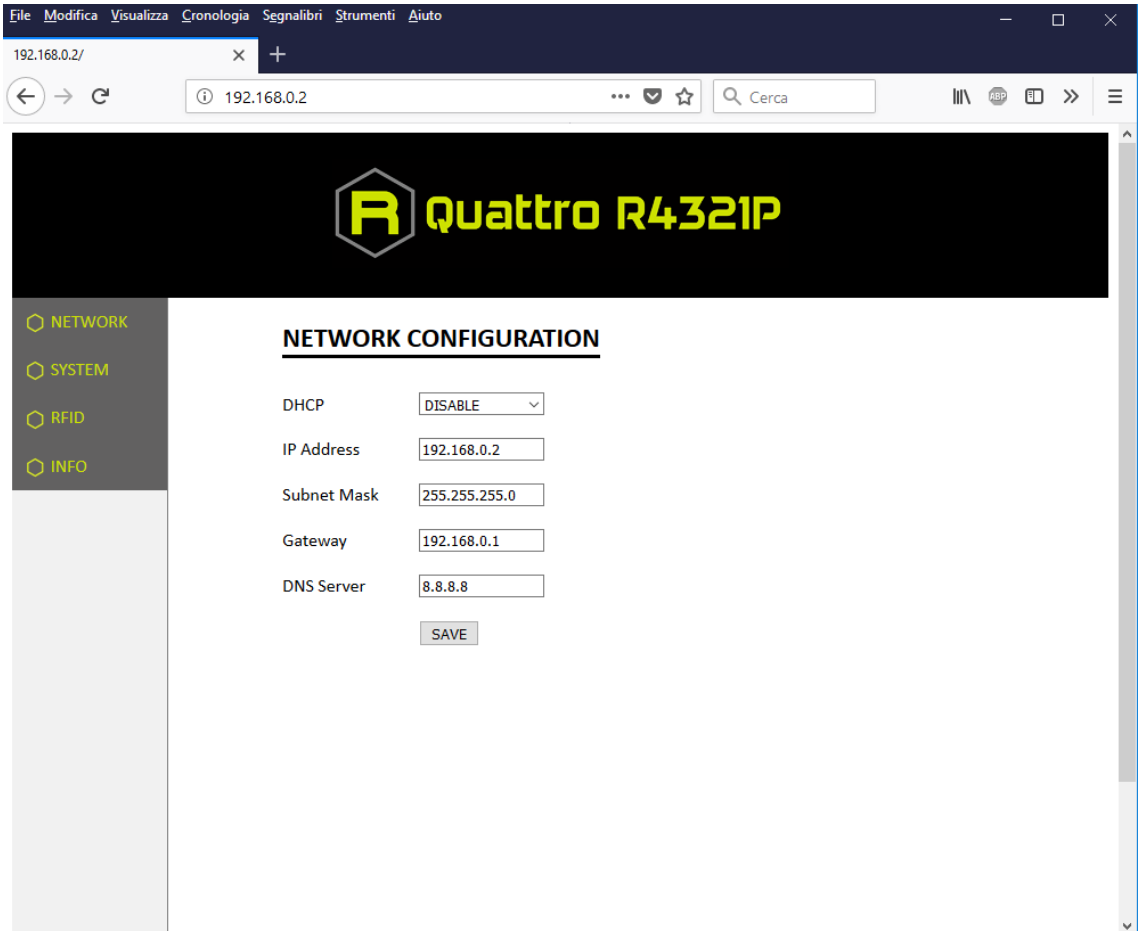


Fig. 4.1: Quattro R4321P Web Interface

The Web Interface menu options are the following:

- **NETWORK**
- **SYSTEM**
- **RFID**
- **INFO**

NETWORK

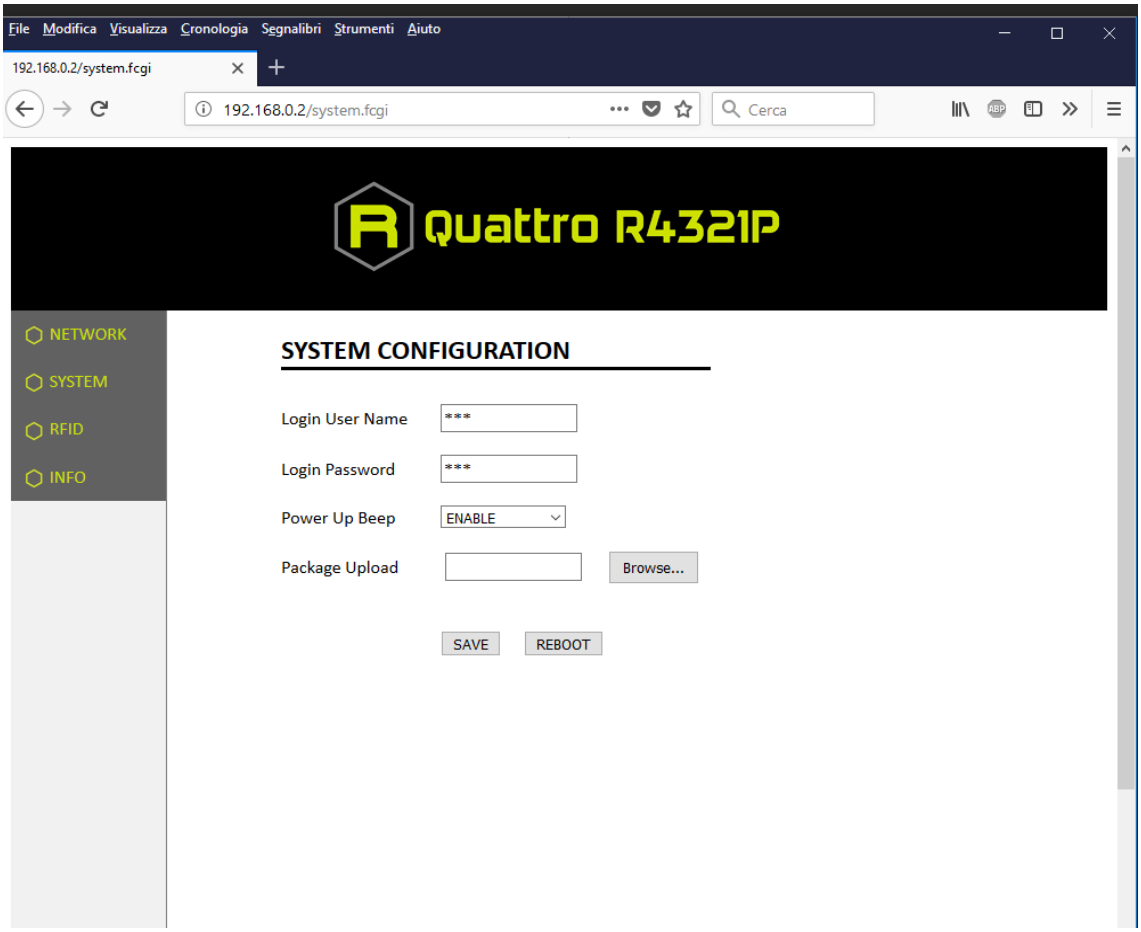


The NETWORK submenu options are the following:

- **DHCP:** Enable/Disable. By default the DHCP is set to *disable.* You can change the default value using the drop-down menu
- **IP Address:** the reader default IP address is 192.168.0.2. The Quattro reader can be connected to a PC using an Ethernet cable: in order to correctly operate with the reader refer to *Ethernet Communication Setup* page 26.
- **Subnet Mask:** the reader default subnet mask is 255.255.255.0.
- **Gateway:** the reader default gateway is 192.168.0.1.
- **DNS Server:** the reader default DNS server is 8.8.8.8.

> **Warning:** To save the changes click on the "*SAVE*" button. Note that all changes made via the web interface are active only after the reader's reboot. Click on *SYSTEM* option in the Web Interface panel and then click on the "Reboot" button. After reboot, the new settings are active.

SYSTEM



The SYSTEM CONFIGURATION options are the following:

- **Login User Name:** To access the web interface, the default username is “root”. Use this option to change the login username.

  > If you forgot your username you must necessarily make a factory reset (see *§ FIRMWARE UPGRADE* page 36)

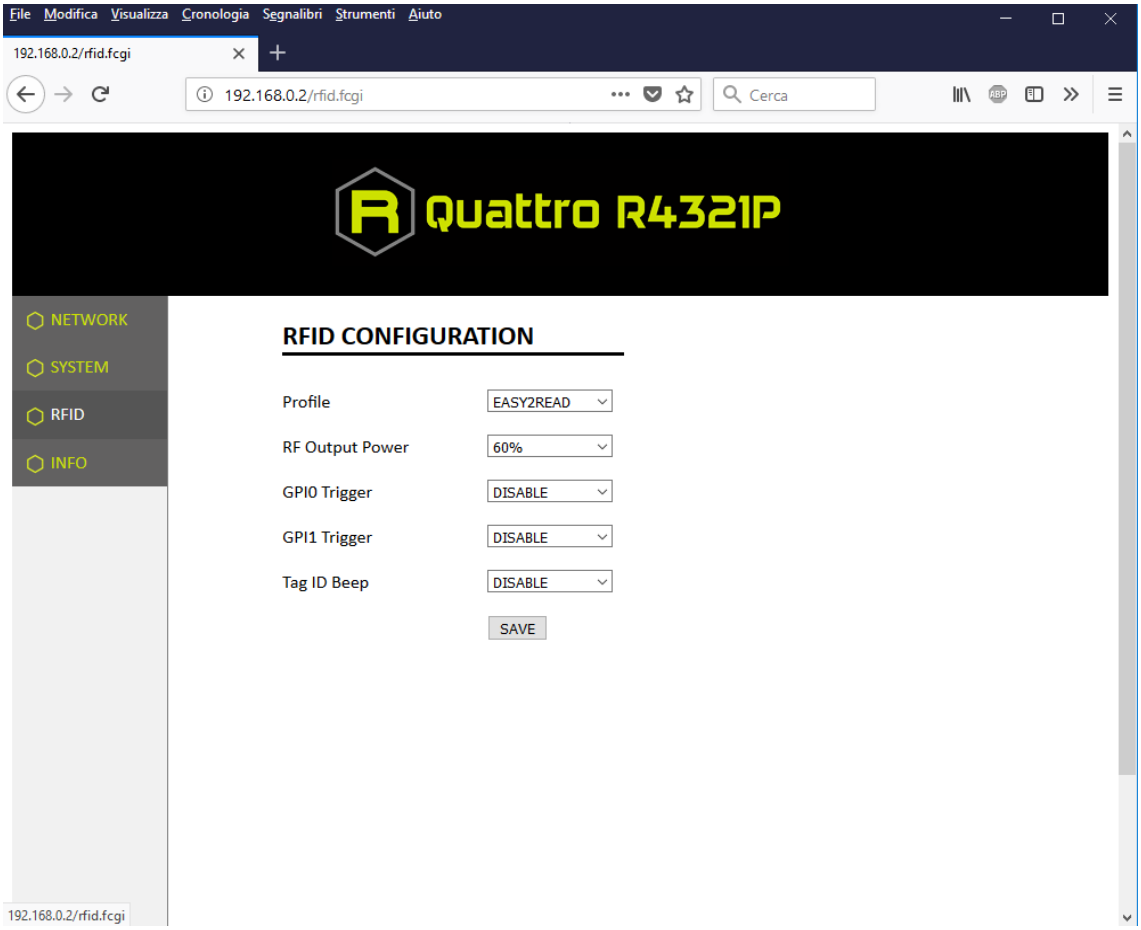
- **Login Password:** To access the web interface, the default password is “root”. Use this option to change the login password.

  > If you forgot your password you must necessarily make a factory reset (see *§ FIRMWARE UPGRADE* page 36)

- **Power Up Beep:** enable or disable. By default, the *Power Up Beep* is enabled. Through this option you can enable or disable the beep at the power up of the reader.
- **Package Upload:** use this function to upload the script program to be used with the custom profile. Give the package the same name used for the code. Please remember to keep your code as simple as possible; the R4321P reader scripting capability is meant for running inside the reader very simple task (max 3 MB). For more information on the use of the custom profile please refer to § Custom Profile page 34.

> **Warning:** To save the changes click on the “*SAVE*” button. Note that all changes made via the web interface are active only after the reader’s reboot. Click on the “Reboot” button. After reboot, the new settings are active.

RFID



Use this section in order to set the desired profile and then the related configuration options.

The available profiles are:

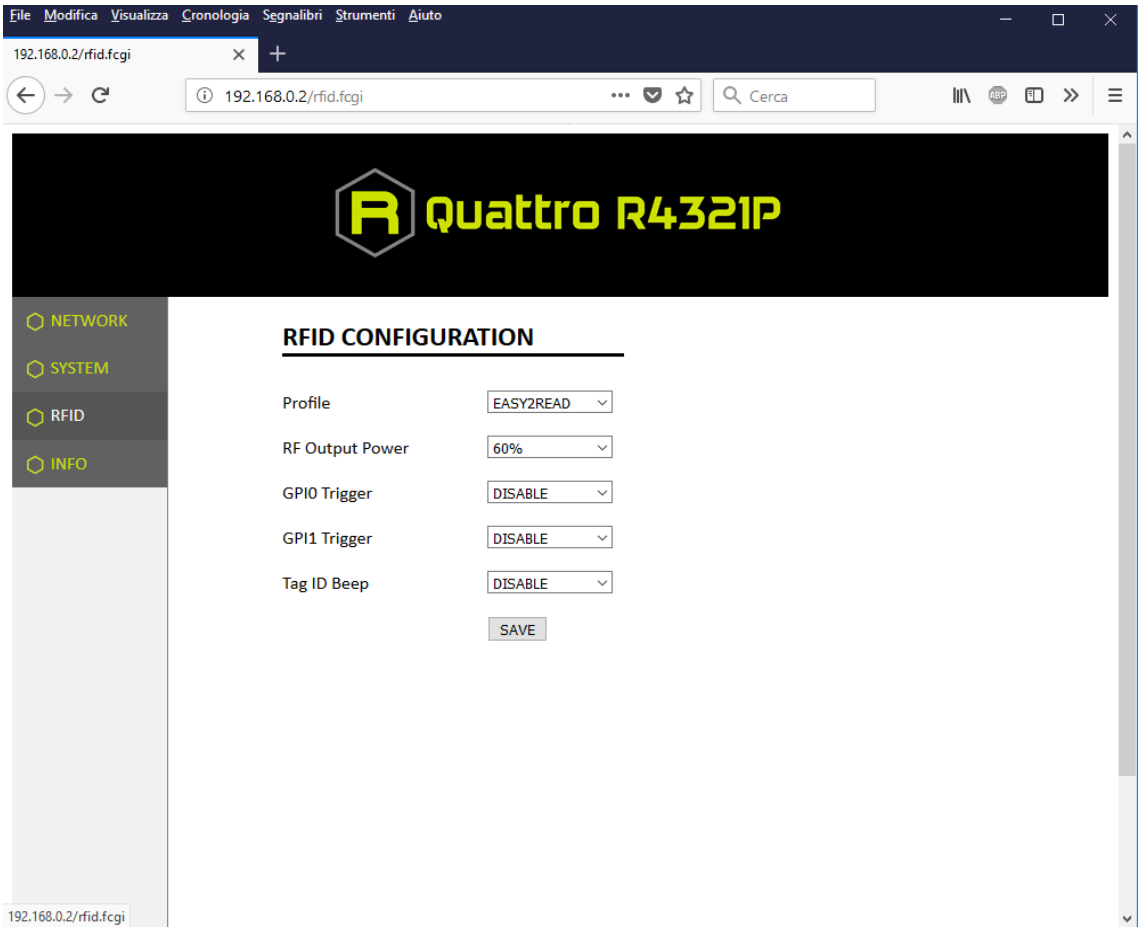
- **Easy2read (factory default)** is the CAEN RFID easy2read communication protocol that permits to control the reader using the CAEN RFID Easy Controller Application or the SDK (Software Development Kit) library. For details on the use of the easy2read profile please refer to *§ Easy2read Profile* chapter page 26.

  For details on the easy2read configuration options, refer to § *Easy2read* page 21.

- **Custom:** the use of this profile allows the user to upload his own scripts to the reader. For details on the use of the Custom profile please refer to § *CUSTOM PROFILE* page 34.

  For details on the Custom configuration options, refer to § *Custom* page 23.

Easy2read



Choosing the easy2read profile, the RFID Configuration submenu options are the following:

- **RF Output Power:** the default RF Power is 60%. The RF Power value at power up is expressed as a percentage value of the maximum RF output power. Through the *RF Output Power* submenu you can set the power level emitted by the reader. You can change the default value using the drop-down menu:
  - **5%**
  - **10%**
  - **20%**
  - **40%**
  - **60%**
  - **80%**
  - **100%**

The correspondent values are:

Percentage	Conducted Power ETSI (mW)	Conducted Power FCC (mW)
5%	70	70
10%	140	140
20%	280	280
40%	560	560
60%	840	840
80%	1120	1000[3]
100%	1400	1000[2]

Tab. 4.1: Conducted power

Note that, when the reader is configured in the easy2read profile, to set the power you can also use the CAEN RFID Easy Controller Application or the *SetPower* function of the SDK (Software Development Kit) library.

- **GPIO0 Trigger:** enable or disable. By default, the *GPIO0 Trigger* is disabled. You can change the default value using the drop-down menu. Through this option you can enable/disabled the tag inventory at the change of state of the GPIO0.

> ***Note:*** In the easy2read profile, in order to enable the tag inventory on GPIO0 trigger, it is necessary to perform a second activation via software:
>
> - ***Using the Easy controller Software:*** for more details see § *Inventory on GPIO state change* page 32.
>
> or
>
> - ***Using the API:*** for more details see the *EventInventoryTag* Method (the *event trigger flag*, bit 5, set to 1) in the *CAEN RFID API Reference Manual* downloadable from Quattro R4321P web page, *Documents* section or in the Manual and Documents web area.

- **GPIO1 Trigger:** enable or disable. By default, the *GPIO1 Trigger* is disabled. You can change the default value using the drop-down menu. Through this option you can enable/disabled the tag inventory at the change of state of the GPIO1.

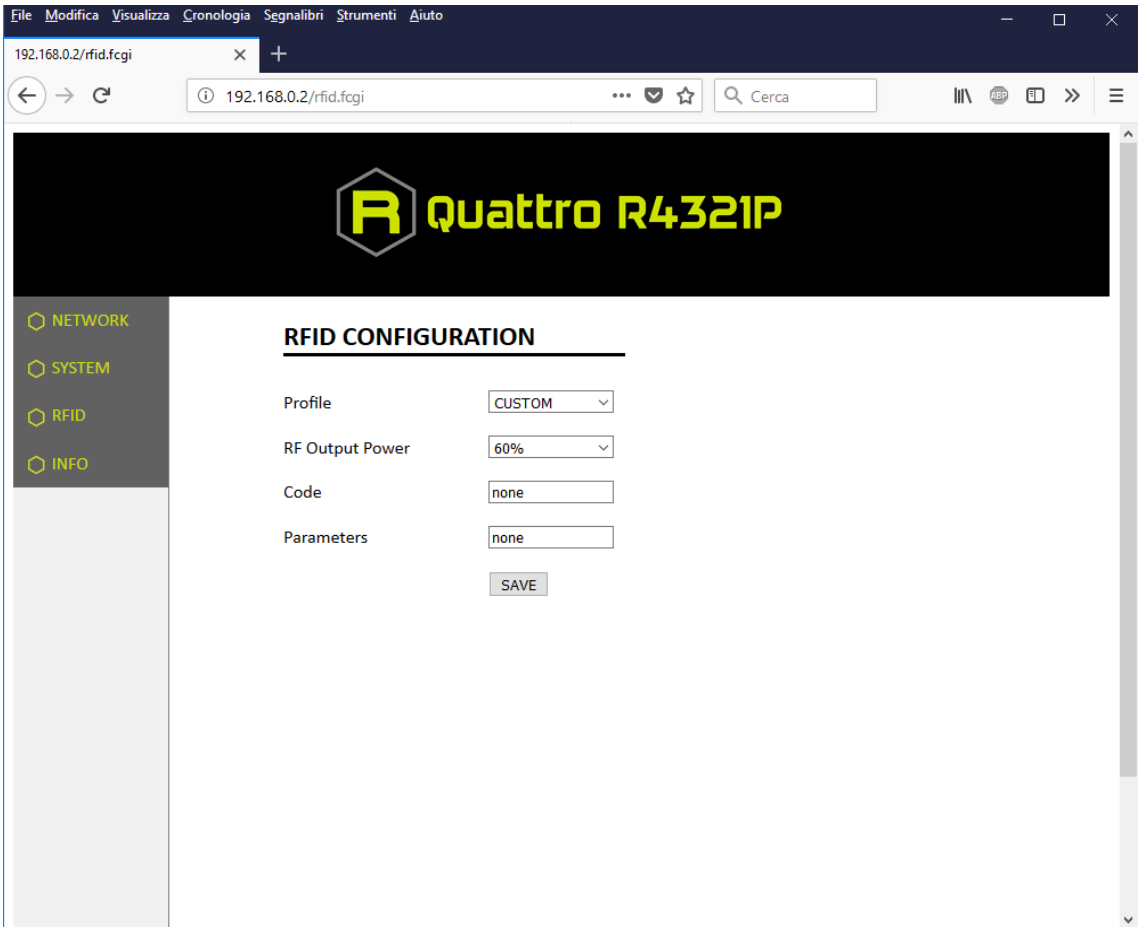
> ***Note:*** In the easy2read profile, in order to enable the tag inventory on GPIO1 trigger, it is necessary to perform a second activation via software:
>
> - ***Using the Easy controller Software:*** for more details see § *Inventory on GPIO state change* page 32.
>
> or
>
> - ***Using the API:*** for more details see the *EventInventoryTag* Method (the *event trigger flag*, bit 5, set to 1) in the *CAEN RFID API Reference Manual* downloadable from Quattro R4321P web page, *Documents* section or in the Manual and Documents web area.

- **Tag ID Beep:** enable or disable. By default, the *Tag ID beep* is disabled. You can change the default value using the drop-down menu. If the *Tag ID beep* is enabled, the reader will beep when a tag is detected.

> **Warning:** To save the changes click on the "*SAVE*" button. Note that all changes made via the web interface are active only after the reader's reboot. Click on *SYSTEM* option in the Web Interface panel and then click on the "Reboot" button. After reboot, the new settings are active.

[3] The reader with the FCC regulation cannot supply more than 1000 mW to the connector. By analogy with the power expressed in the ETSI table, the percentage refers to the full scale of 1400mW, but the percentage of 80% and 100% (that exceed 1000mW) are limited to the maximum of 1000 mW.

Custom



The use of the *Custom* profile allows the user to upload his own scripts to the reader.

Choosing the Custom profile, the RFID Configuration submenu options are the following:

- **RF Output Power:** the default RF Power is 60%. The RF Power value at power up is expressed as a percentage value of the maximum RF output power. Through the *RF Output Power* submenu you can set the power level emitted by the reader. You can change the default value using the drop-down menu:
  - **5%**
  - **10%**
  - **20%**
  - **40%**
  - **60%**
  - **80%**
  - **100%**

The correspondent values are:

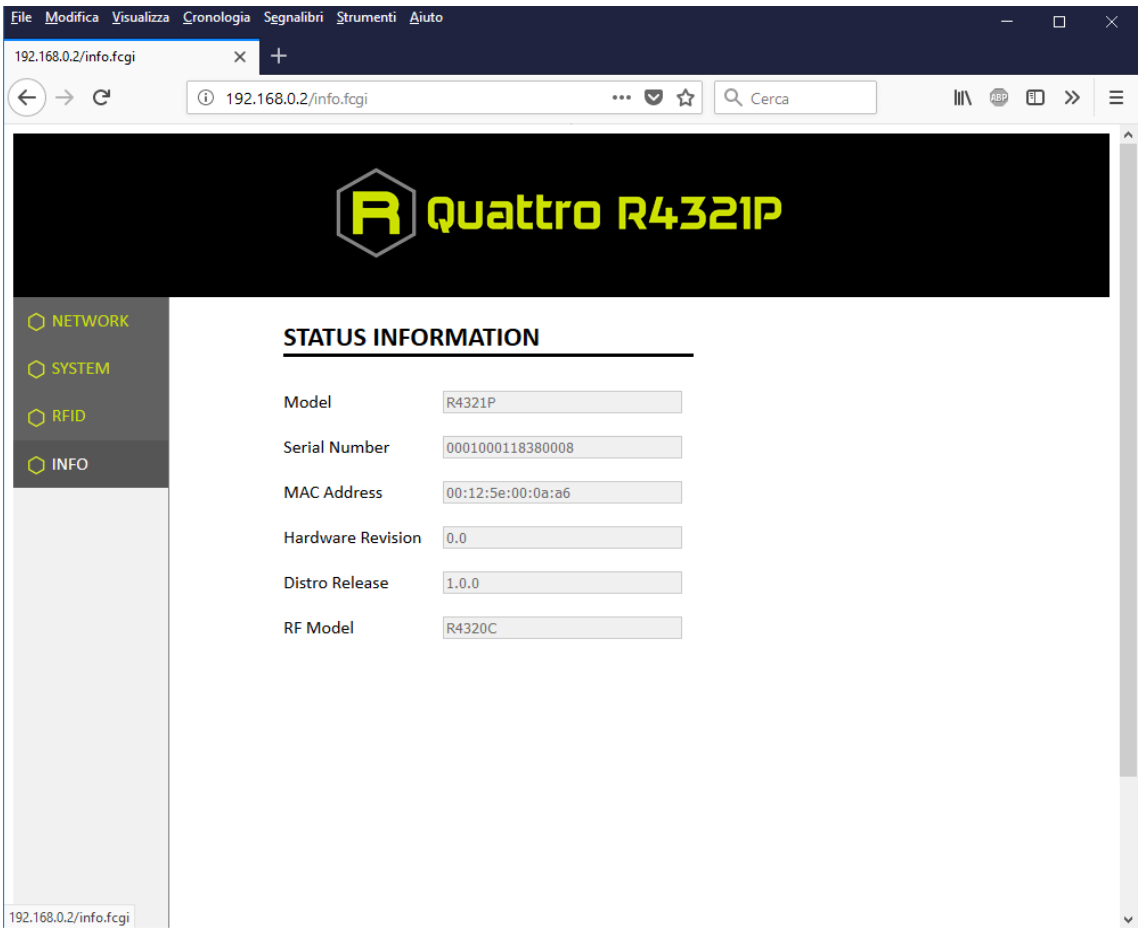
Percentage	Conducted Power ETSI (mW)	Conducted Power FCC (mW)
5%	70	70
10%	140	140
20%	280	280
40%	560	560
60%	840	840
80%	1120	1000[4]
100%	1400	1000[3]

Tab. 4.2: Conducted power

- **Code:** alphanumeric characters. The “code” is the name assigned by the user to the custom program. When the reader is turned on, if the profile is set to custom, among all the programs loaded by the user, the reader starts the custom program named "code".
- **Parameters:** alphanumeric characters. This string can be used to assign values to the parameters defined by the user in the custom program (e.g. Q=8; n=6; cycles=20, etc…).

Warning: To save the changes click on the “*SAVE*” button. Note that all changes made via the web interface are active only after the reader’s reboot. Click on *SYSTEM* option in the Web Interface panel and then click on the “Reboot” button. After reboot, the new settings are active.

INFO



[4] The reader with the FCC regulation cannot supply more than 1000 mW to the connector. By analogy with the power expressed in the ETSI table, the percentage refers to the full scale of 1400mW, but the percentage of 80% and 100% (that exceed 1000mW) are limited to the maximum of 1000 mW.

The INFO submenu options are the following:

- **Model**: the model name (e.g. R4321P)
- **Serial Number**: the reader serial number (16 numbers)
- **MAC Address:** the reader MAC address
- **Hardware Revision**: the hardware revision of the reader
- **Distro Release:** Distribution firmware release
- **RF Model**: the internal RF module model, R4320C

5 EASY2READ PROFILE

Introduction

By default. the reader profile is set to easy2read. For details on the available profiles and on the activation method, please refer to § *RFID* paragraph page 20 (configuration via web interface).

With the *easy2read* profile active you will use the CAEN RFID easy2read communication protocol. Select this option in order to control the reader using the CAEN RFID Easy Controller Application or the SDK (Software Development Kit) library.

To configure the reader when using the easy2read profile please refer to the § *Easy2read* paragraph page 21.

Connecting to the Quattro Reader using the Ethernet port

Ethernet Communication Setup

The Quattro reader can be connected to a PC using an Ethernet cable. In order to correctly operate with the reader follow the steps above:

1. Connect the Quattro to the power supply, the power LED will turn on, wait about 30 seconds until you hear a beep, wait 10 seconds again and the reader is ready to work with the easy2read profile active.
2. Plug an Ethernet cable[5] (not provided) into your computer and connect the other end of the Ethernet cable to the reader. If your private network matches the default network configuration of the reader (IP address 192.168.0.2) you can connect to it, otherwise you can:
    a. change the network configuration of the reader (see § *NETWORK* page 18) to connect it to your network

    or

    b. disconnect your PC from your network and connect it to the network of the reader.
3. Connect the antenna cable to Ant-0 (see § *Fig. 3.6: Antennas* page 15) of the reader.

Now you can use the CAEN RFID Easy Controller Application to control the reader.

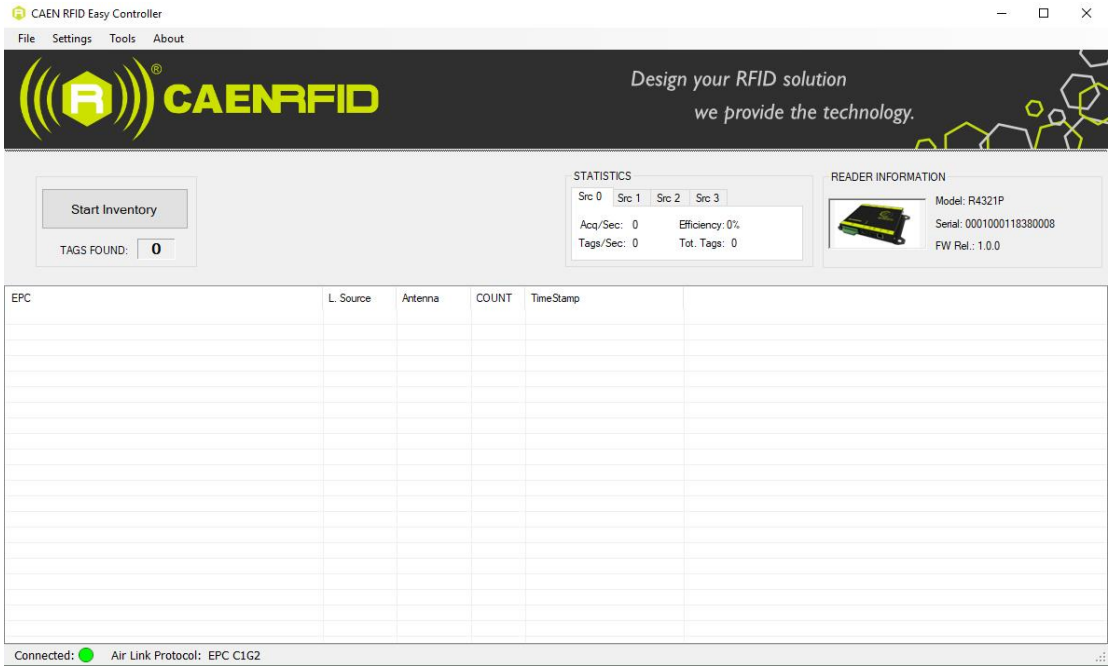
[5] For proper operation of the device:
- Ethernet cable shall be CAT6 at least (type S/FTP or S/STP)
- Put two ferrites (P.N. RRC-13-7-23-M-K5B by RICHCO; CAEN RFID ordering code LFAAFFP00004) on the Ethernet cable, near the reader connector.

Easy Controller

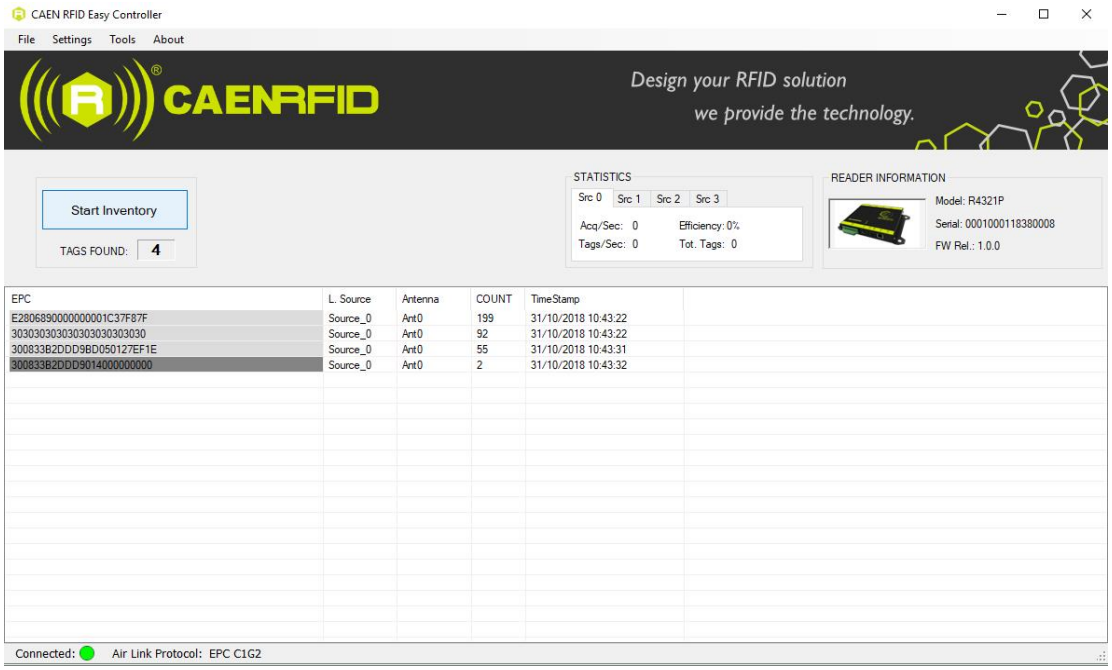
Follow these steps to connect the Quattro using the *Easy Controller* application for Windows:

1. Download the latest version of the Easy Controller software from the Quattro R4321P web page, Downloads section and install it.
2. Launch the *Easy Controller* application:
3. On the main screen click on *File → Connect.* A Connection windows will open. Select the C*onnection Type* (TCP/IP Connection) and type the Quattro IP address into the *TCP/IP Address* box (default value is 192.168.0.2). Then click on *Connect*:

4. To verify if the connection with the reader has been established, check the green dot on the bottom left side of the sidebar. Into the *READER INFORMATION* box you can find information on reader model, serial number and firmware release:



5. Place a tag in the read range of the reader, click on *start inventory* and see the tag information displayed on the main window:



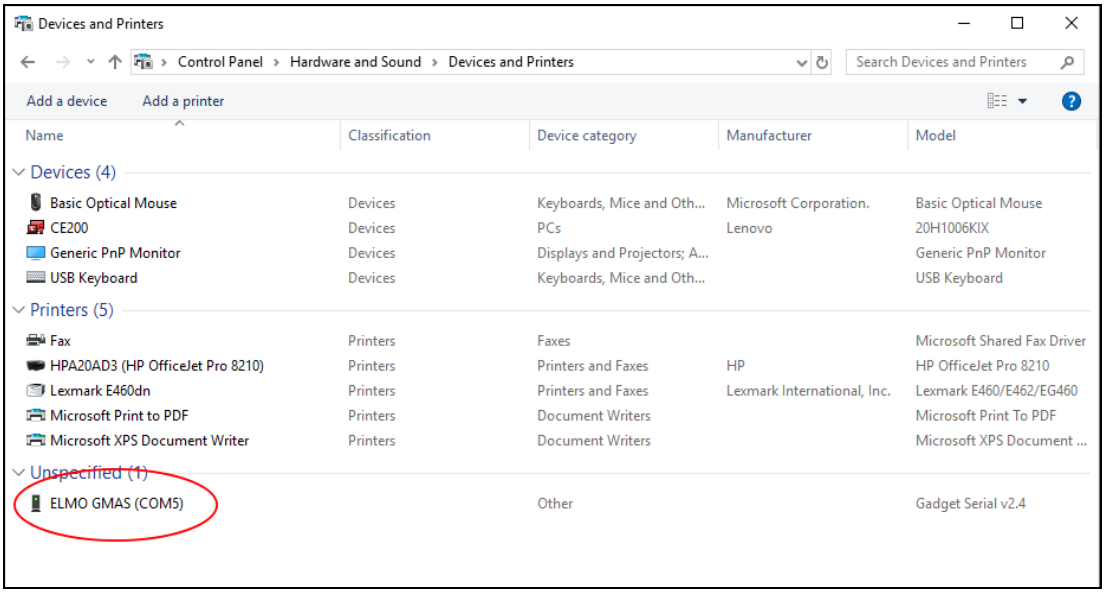
For more info on the use of the *Easy Controller*, please refer to the *CAEN RFID Easy Controller Software Technical Information Manual*, you can download it from the Quattro R4321P web page, *Downloads* section or in the Manual and Documents web area.

Connecting to the Quattro Reader using the USB port

USB Communication Setup

> **Warning:** If your PC is running a Windows version older than Windows 10, in order to correctly operate with the reader, you need to install the *Gadget Serial USB driver*. You can download it for Windows based systems from the Quattro R4321P web page, *Downloads* section or from the Software and Firmware download area.

1. Plug an USB cable (mini USB) into your computer and connect the other end of the USB cable to the reader.
2. Connect the Quattro to the power supply, the power LED will turn on, wait about 30 seconds until you hear a beep, wait 10 seconds again until the screen will inform you that the reader is ready to work with the *easy2read* profile active.
3. In your PC, go to *Control Panel → Hardware and Sound → Devices and Printers.* After having installed the driver (if your PC is running a Windows version older than Windows 10, otherwise the installation of the driver is not necessary), the reader is detected by the PC as an *ELMO GMAS* (Gadget Serial) device. Look at the COM port number (COM5 in this example):

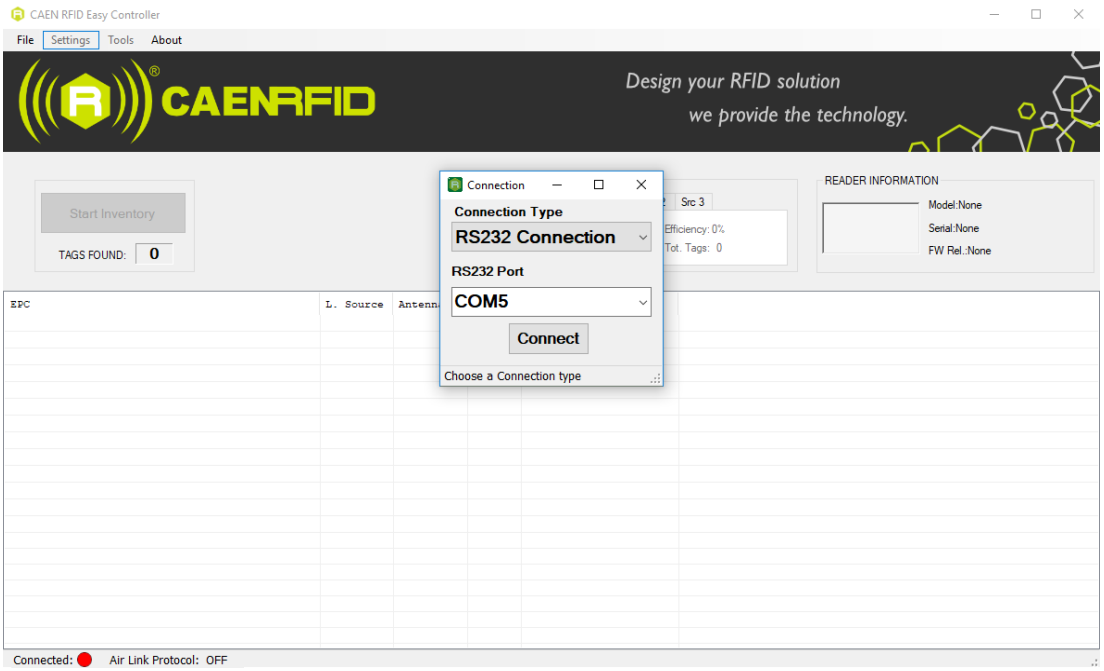


Easy Controller

Follow these steps to connect the Quattro using the *Easy Controller* application for Windows:

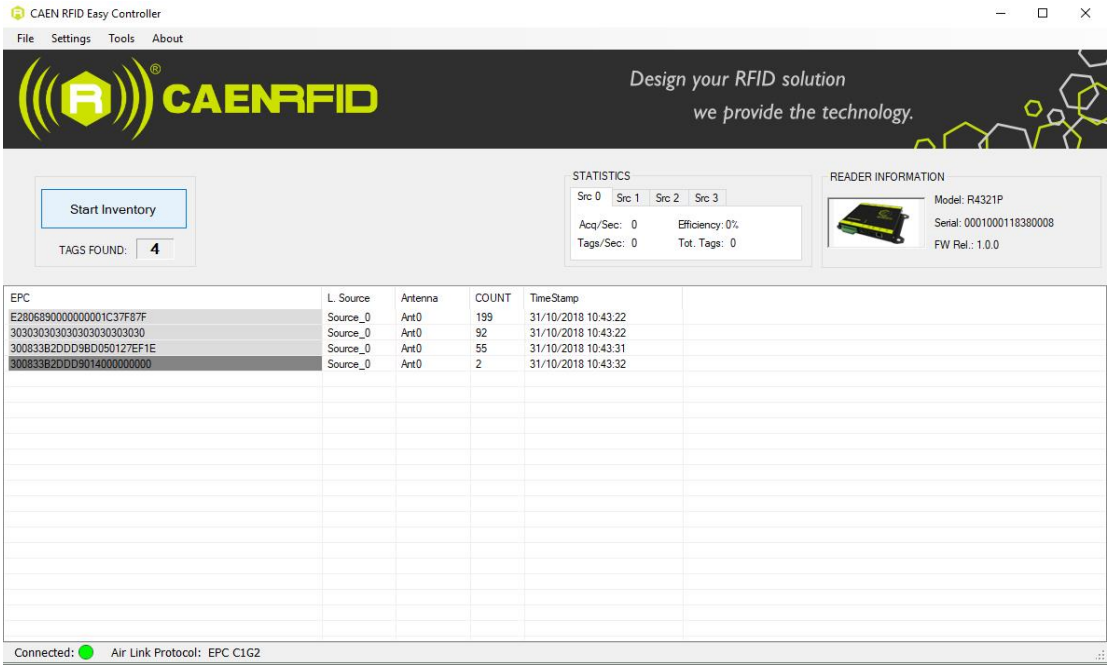
1. Download the latest version of the *Easy Controller software* from the Quattro R4321P web page, *Downloads* section and install it.
2. Launch the *Easy Controller* application:

3. On the main screen click on *File* → *Connect.* A Connection window will open. Select the *Connection Type* (RS232) and specify the RS232 port (COM 5 in this example):



4. To verify if the connection with the reader has been established, check the green dot on the bottom left side of the sidebar and on the *READER INFORMATION* box you can find information on reader model, serial number and firmware release:

5. Place a tag in the range of the reader, click on *start inventory* and see the tag information displayed on the main window:



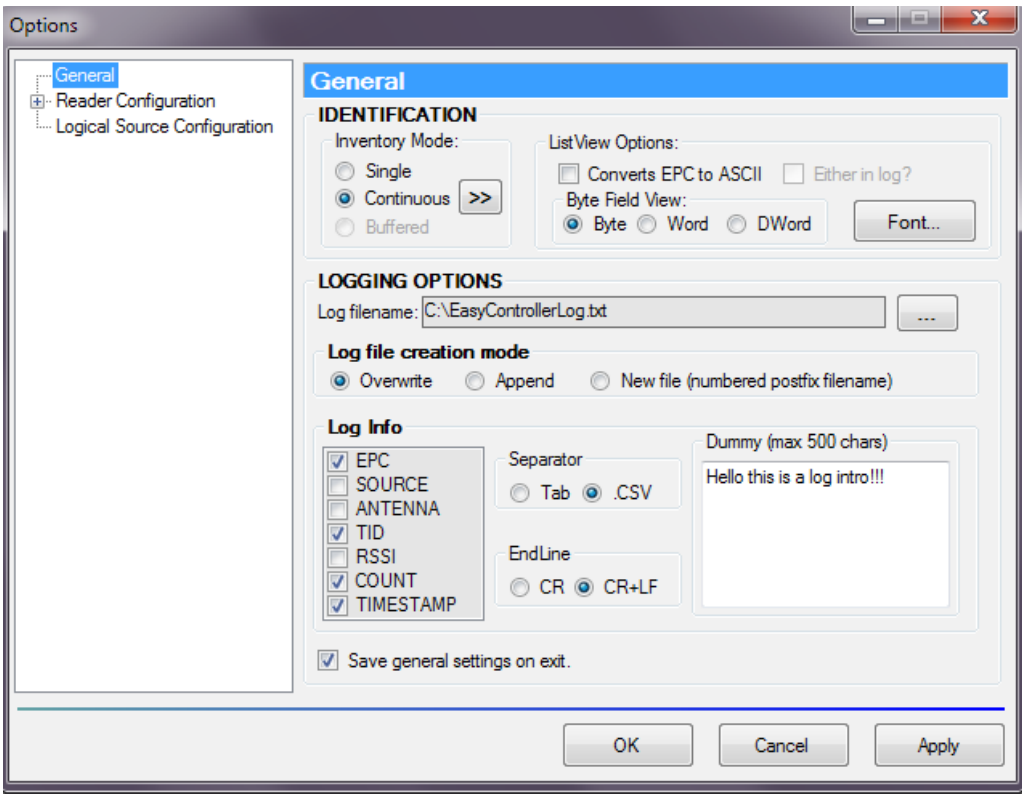
For more information on the CAEN RFID *Easy Controller for Windows* application usage, please refer to the relevant user manual: you can download it from the Quattro R4321P web page, *Downloads* section or in the Manual and Documents web area.

Inventory on GPIO state change

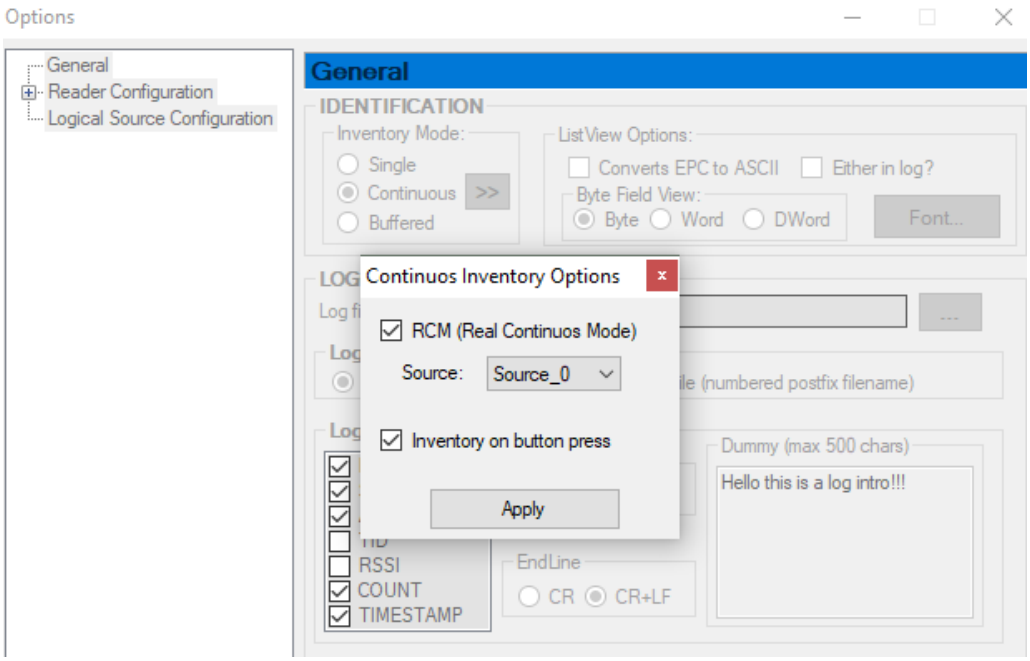
This mode has been designed to enable the inventory at the change of state of the GPIO0 and GPIO1 as illustrated in the paragraph *Input signal* page *13*. The inventory is executed until the state change persists.

In the easy2read profile it is necessary a **double** activation to perform the inventory on GPIO state change:

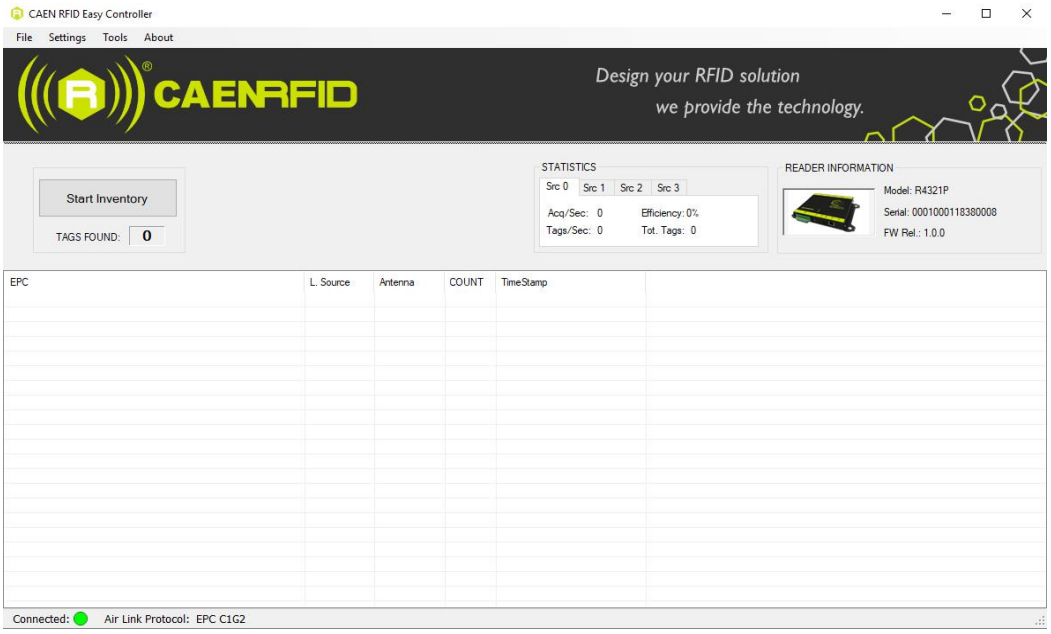
1. Activation **via web interface** (see § *Easy2read* page 21)
2. Activation **via Easy Controller Software**:
    a. Connect the reader to the Easy Controller software. On the main menu of the application, click on *Settings* → *Options*:



b. By clicking on [>>] button in the Identification box, you can access the Continuous Inventory Options window:



c. Select the *RCM (Real Continuous Mode)* to perform continuous mode (i.e., a continuous inventory via hardware on the source indicated by the RCM Source parameter) and the *Inventory on button press*. Click on *Apply*. Now click on *Start Inventory* on the main window:



d. Now the tag inventory is performed at the change of state of the GPIO0/1.

For more information on the CAEN RFID *Easy Controller for Windows* application usage, please refer to the relevant technical information manual: you can download it from the Quattro R4321P web page, *Downloads* section or in the Manuals and Documents web area.

6 CUSTOM PROFILE

Introduction

The use of the *Custom* profile allows the user to upload his own scripts to the reader.

For details on the available profiles and on the activation method, please refer to § *RFID* paragraph page 20 (configuration via web interface).

> Note that the *Custom* profile can be activate **only** via web interface.

To configure the reader when using the Custom profile please refer to the § *Custom* paragraph page 23 (configuration via web interface).

Java Virtual Machine

The user can write his own scripts in Java code and use the "Package Upload " function of the *SYSTEM* section page 19 of the web configuration to upload them on the reader. The selection of the script to be used among those loaded is done through the "*Code*" option of the § *Custom* section page 32.

To use the uploaded script, the user needs a Java Virtual Machine. Contact the CAEN RFID support to obtain the Virtual Machine and the guideline to its use.

7 RESET THE READER

It is possible to reset the reader in two different ways:

1. Turn off the reader (disconnect the power supply), **wait about 15 seconds** then turn on the reader again (connect the power supply). Wait for the reboot to be completed.

   or

2. Connect the reader to the Web Interface (for more info see § *CONFIGURATION USING THE WEB INTERFACE* page 16), select the *SYSTEM* option and then click on the “Reboot” button. Wait for the reboot to be completed.

8 FIRMWARE UPGRADE

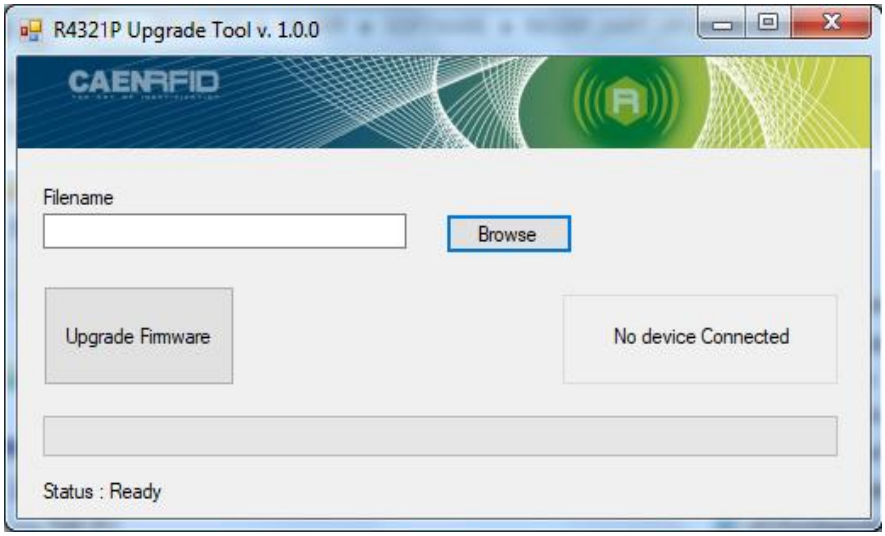
Warning! The firmware upgrade is a factory reset: any scripts uploaded to the reader are deleted.

The Quattro R4321P firmware upgrade can be performed only via USB.

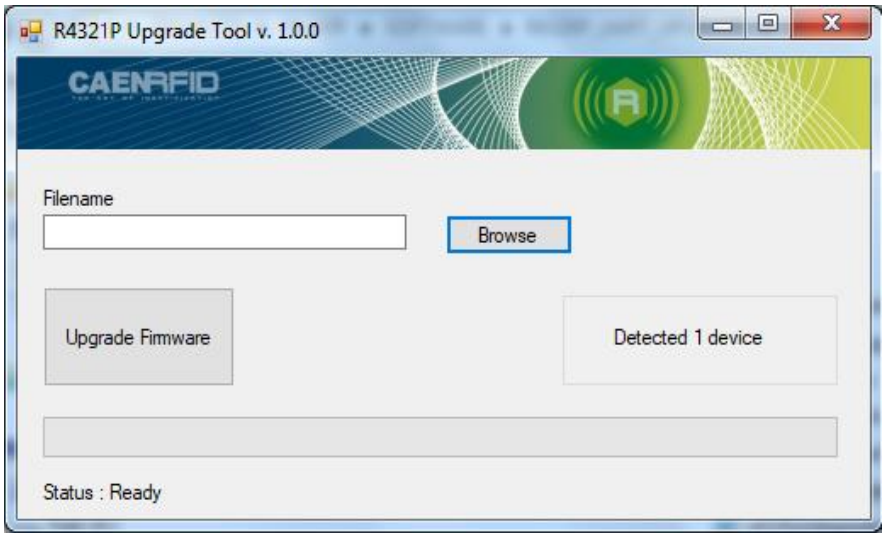
In order to upgrade the firmware follow the steps described below:

1. Download the *Quattro Upgrade Tool* and the *firmware image file* at the *Quattro R4321P web page* of the CAEN RFID Web Site, *Downloads* section.
2. Connect the Quattro reader to your PC using the USB port.
3. Open the FW upgrade program:

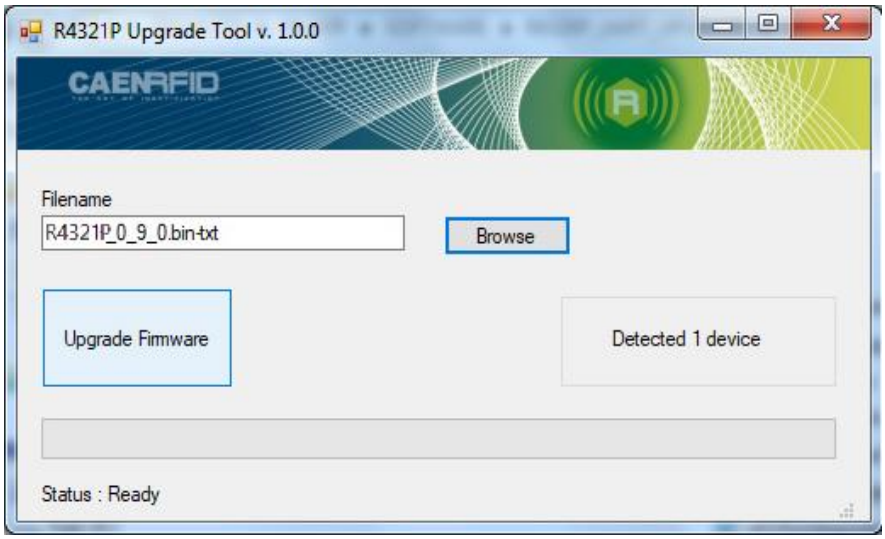
4. Click on *Next*. In the window you will see the message “No device Connected”:



5. To connect the reader, press the upgrade button (see § *Fig. 3.2: Interfaces Panel* page 12) for about 10 seconds. The “No device connected” box will turn into “Detected 1 device” and informs you that the reader is correctly connected to the upgrade program:

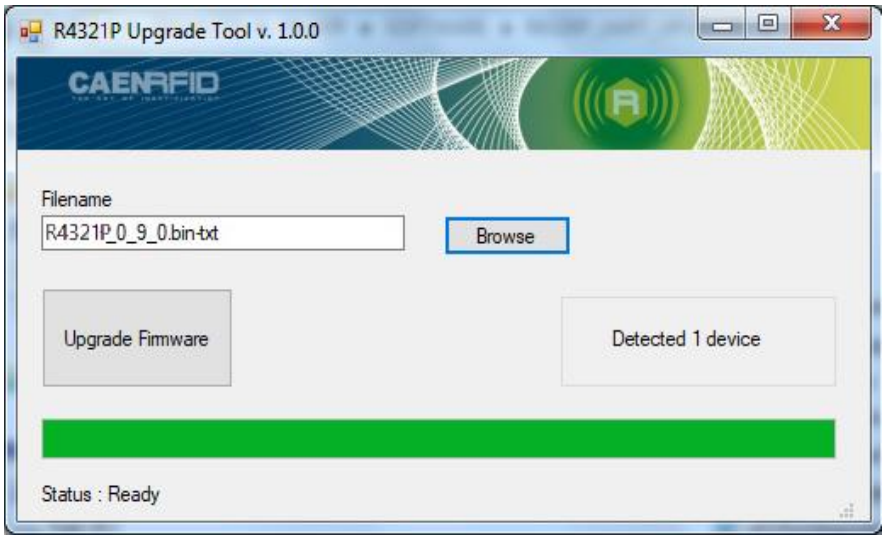


6. Select the FW image file by clicking on the “Browse” button:



7. Click on the “Upgrade Firmware” button and wait for the upgrade process to be completed. In the window you will see the message “Status: upgrading”.

8. At the end of procedure, if the upgrade has been successfully performed, you will see the message “Status: ready”:



9. Turn off the reader (disconnect the power supply), **wait about 15 seconds** and then turn on the reader again (connect the power supply). Now the reader is ready to work with the new firmware upgraded.

9 TECHNICAL SPECIFICATIONS

Technical Specification Table

Frequency Range	865.600÷867.600 MHz (ETSI EN 302 208 v3.1.1) 902÷928 MHz (FCC part 15.247)
RF Power	Up to 31.5 dBm (1.4W) conducted (ETSI) Up to 30 dBm (1W) conducted (FCC)
Number of Channels	4 channels (compliant to ETSI EN 302 208 v3.1.1) 50 hopping channels (compliant to FCC part 15.247)
Standard Compliance	EPC C1G2/ISO 18000-63
CPU	ARM9 @ 400Mhz on Atmel AT91SAM9G25
Operating system	Linux
Receiving Capability	Gen 2 Dense Reader Mode Management Data rate up to 400 Kb/s
Connectivity	USB 2.0 Hi-Speed (480 Mbit/s) device port (USB mini connector) Virtual COM port parameters: – Baudrate: up to 115200 kbps – Databits: 8 – Stopbits: 1 – Parity: none – Flow control: none Ethernet 10/100/1000BASE-T (RJ45) POE standard IEEE 802.3af
I/O Interface	10 Poles Terminal Block with screw connection 2 digital inputs optically isolated 2 solid state photorelay outputs optically isolated (500mA max)
Antenna Connectors	4 TNC Reverse Polarity
Electrical Power	5 VDC power supply (12W) POE standard IEEE 802.3af (12,95W)
Visual Status Indicators	Multicolor LEDs: Power, Activity, Status and Applications
Operating Temperature	-10°C to +55°C
IP Rating	IP30
Dimensions	(W)210 x(L)140 x (H)27 mm^3 (8.27 x 5.51 x 1.06 $inch^3$)
Weight	740 g

Tab. 9.1: Technical Specifications

Warning: The RF settings must match the country/region of operating to comply with local laws and regulations.

The usage of the reader in different countries/regions from the one in which the device has been sold is not allowed.

10 REGULATORY COMPLIANCE

CE Compliance

Reference standard:

ETSI EN 301 489-1 V2.2.3

ETSI EN 301 489-3 V2.1.1

ETSI EN 302 208 V3.1.1

EN 55032:2015

EN 61000-3-2:2019

EN 61000-3-3:2013+A1:2019

EN 55035:2017+/AC:2019

EN 62368-1:2014+/AC:2015+/A11:2017

Reference document:

Test report n. 19517 [RD2].

See § *Quattro R4321P CE Declaration of Conformity* page 42 for the Quattro R4321P CE Compliance Certificate.

The compliance is guaranteed only if the reader is used as described in this manual.

RoHS EU Directive

The Quattro R4321P RAIN RFID reader is compliant with the EU Directive 2011/65/CE on the Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS2).

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

a. Reorient or relocate the receiving antenna.

b. Increase the separation between the equipment and receiver.

c. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

d. Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. 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.

Any changes or modification not approved by CAEN RFID could void the user's authority to operate the equipment.

The device shall be used with CAEN RFID antenna Mod. WANTENNAX020 Circular polarized antenna FCC with 5.5dBi gain.

The device shall be used such that a minimum separation distance of 25cm is maintained between the reader and user's/nearby people's body.

Quattro R4321P
CE DECLARATION OF CONFORMITY

We

CAEN RFID Srl
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Italy
Tel.: +39.0584.388.398 Fax: +39.0584.388.959
Mail: info@caenrfid.com
Web site: www.caenrfid.com

herewith declare under our own responsibility that the product:

Code: **WR4321PXAAAA**

Description: **R4321P Quattro - Compact 4 - port UHF RFID Reader**

corresponds in the submitted version to the following standards:

ETSI EN 301 489-1 V2.2.3

ETSI EN 301 489-3 V2.1.1

ETSI EN 302 208 V3.1.1

EN 55032:2015

EN 61000-3-2:2019

EN 61000-3-3:2013+A1:2019

EN 55035:2017+/AC:2019

EN 62368-1:2014+/AC:2015+/A11:2017

and declare under our sole responsibility that the specified product meets the principle requirements and other applicable regulations of directives 2014/53/EU (RED) and 2011/65/EU (RoHS2)

Date: 03/02/2020

CAEN RFID Srl
Via Vetraia, 11
55049 VIAREGGIO - ITALY
VAT IT 02032050466

Adriano Bigongiari (Chief Executive Officer)

On the basis of this declaration, this product will bear the following mark: CE

The compliance is guaranteed only if the reader is used as described in this manual.