

TECHNICAL INFORMATION MANUAL

Revision 3 – 15 June 2021

R1290I

Hex

Multipurpose RAIN RFID Reader with POE



Visit the [Hex R1290I 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 reader in a few clicks!

Scope of Manual

The goal of this manual is to provide the basic information to work with the Hex R1290I Multipurpose RAIN RFID Reader with POE

This manual refers to:

- **Distribution firmware release of the reader \geq 1.5.0.**
- **[SDK \(Software Development Kit\)](#) revision \geq 4.7.0**
- **[Easy Controller Software Windows](#) revision \geq 1.9.0**

Change Document Record

Date	Revision	Changes	Pages
20 Apr 2018	00	Preliminary Release	-
16 Oct 2018	01	Added information about available profiles	13, 18, 20,28
		Modified <i>Tab. 3.1: Hex R1290I Configuration Menu</i>	18
		Modified <i>DHCP</i> option in the <i>NETWORK</i> paragraph	19
		Added <i>Tag Count</i> option in the <i>Easy2Rd opt.</i> and <i>Easy2read</i> paragraphs	20, 29
		Added <i>HID opt.</i> paragraph in the <i>Configuration Menu via reader</i> chapter	22
		Modified <i>Introduction</i> paragraph in the <i>Configuration Using the Web Interface</i> chapter	24
		Added <i>Login User Name</i> and <i>Login Password</i> options in the <i>NETWORK</i> paragraph	26
		Modified <i>Package Upload</i> function in the <i>SYSTEM</i> paragraph	27
		Added <i>HID</i> and <i>Custom</i> paragraph in the <i>Configuration Using the Web Interface</i> chapter	31, 36
		Added <i>HID Profile</i> and <i>CUSTOM Profile</i> chapters	46÷48
		Added warning in the <i>Firmware Upgrade</i> chapter	50
		Modified <i>Introduction</i> paragraph in the <i>EASY2READ Profile</i> chapter	38
		Modified <i>GPIO Panel</i> paragraph	9
29 Apr 2019	02	Modified <i>Connecting to the Hex Reader using the Easy Controller via USB</i> paragraph	13
		Modified the <i>Introduction</i> paragraph of the <i>Configuration Menu via reader</i> chapter	17
		Added <i>Distro</i> release in the <i>INFO</i> paragraph	19, 37
		Added <i>Tag Filtering Time</i> option in the <i>HID</i> paragraph	31
		Added <i>Filter Time</i> option in the <i>HID opt.</i> paragraph	22
		Modified <i>Trigger Button option</i> in the <i>HID</i> paragraph	31
		Modified <i>Trigger Button option</i> in the <i>HID opt.</i> paragraph	22
		Added <i>FCC Compliance</i> and <i>Hex R1290I FCC Grant</i> in the <i>Regulatory Compliance</i> chapter	57, 60
Added <i>CE Compliance</i> and <i>Hex R1290I CE Declaration of Conformity</i> in the <i>Regulatory Compliance</i> chapter	57, 59		
15 June 2021	03	Graphic Restyling	All pages
		Added warning in the <i>Interfaces Panel</i> and <i>Accessories</i> paragraphs	8, 12
		Modified <i>CE Compliance</i> paragraph and <i>Hex R1290I CE Declaration of Conformity</i> in the <i>Regulatory Compliance</i> chapter	57, 59
		Updated references to Easy Controller Software	13, 39, 42, 44
		Modified <i>Scope of Manual</i> paragraph	2

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).

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Federal Communications Commission (FCC) Notice

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.

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.



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1 INTRODUCTION

Description

The Hex (Model R1290IE, R1290IU), multipurpose reader of the easy2read[®] family, is a RAIN RFID reader with integrated circular polarized antenna for short to medium range applications.

Thanks to its versatile form factor, the Hex is well suited for both desktop/counter top applications and for fixed reading point installations. It offers the Ethernet (POE) and USB communication interface in order to simplify the installation both on large and single installations. The Power Over Ethernet capability permits to provide power and to communicate with the reader with a single cable when the POE infrastructure is available.

In addition to the internal circular polarized antenna, the Hex provides a connector for an external antenna in order to extend the reading area of the reader and a set of GPIO lines that permits to control external devices like lights or alarms or to get triggers via external sensors (buttons, light barriers).

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 Hex reader in a powerful and versatile identification platform.

The reader has an easy to use display and keypad interface for local configuration; the behaviour of the keypad and display can be customized under customer specifications.



Fig. 1.1: Hex reader (Model R1290I)

The Hex reader is available both for European and US regions allowing installations in various countries worldwide as needed by retailers, forwarders, warehouses and other global organizations (see § *Ordering Options* page 12):

- 865.600÷867.600 MHz (ETSI EN 302 208 v3.1.1) (Mod. R1290IE)
- 902÷928 MHz (FCC part 15.247) (Mod. R1290IU)

External Interface

Top Panel

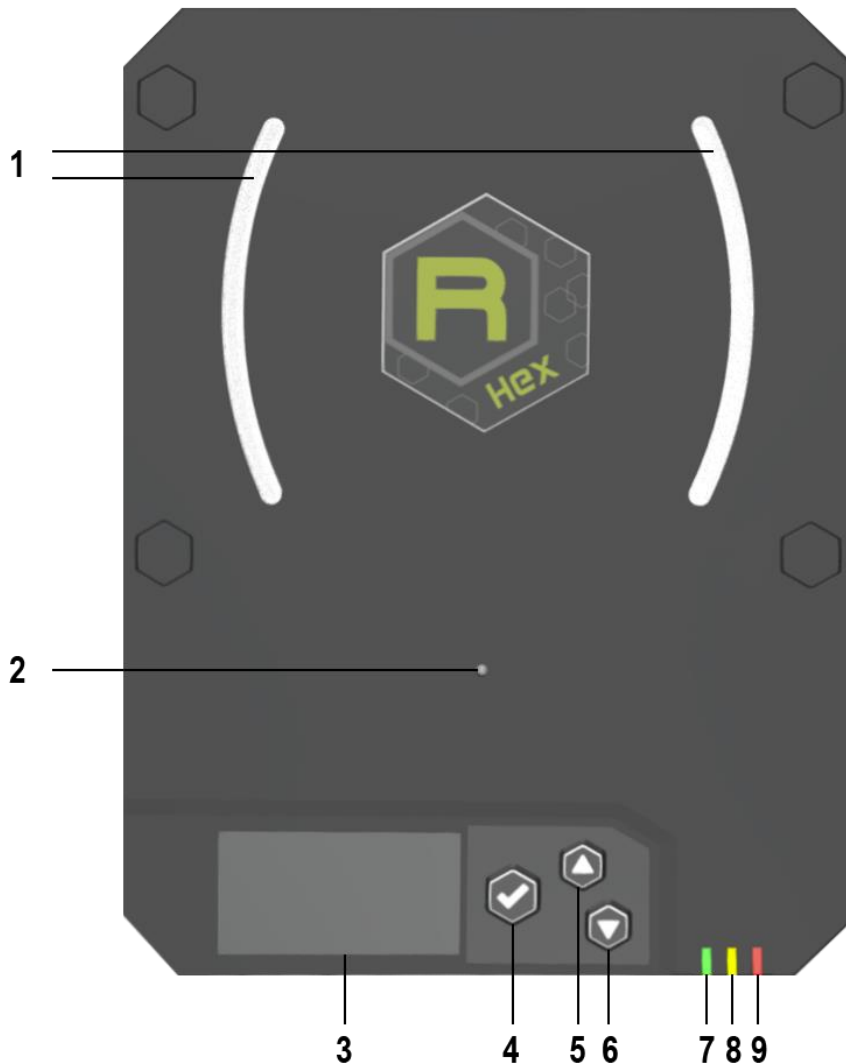


Fig. 1.2: Hex R1290I Top Panel

No.	Name	Description
1	Lights	Tag Detection – Blinking White LED
2	Proximity Sensor	Trigger
3	Display	OLED 2.42" monochromatic white
4	Trigger button	OK / Trigger
5	Up button	Scroll up
6	Down button	Scroll down
7	Power LED	Power On – Green LED
8	Communication LED	Communication activity – Blinking Yellow LED
9	Tag-ID LED	Tag Detection – Blinking Red LED

Tab. 1.1: Hex R1290I Top Panel LEDs and Buttons

Interfaces Panel



Fig. 1.3: Hex R1290I Interfaces Panel

No.	Name	Description
1	External Antenna	SMA jack connector
2	USB host	USB 2.0 Hi-speed Host port
3	Power	Power Jack – Negative Central Pin
4	Ethernet/POE	Ethernet 10/100/1000BASE-T (RJ45) / POE standard IEEE 802.3af
5	USB device	USB 2.0 Hi-Speed Device port

Tab. 1.2: Hex R1290I Interfaces Panel



Warning: Follow the instructions below to correctly connect the WALIM0000005 power supply to the Hex R1290I reader.



1.

Insert the WALIM0000005 power supply connector, paying attention to the locking mechanism.



2.

Rotate the WALIM0000005 power supply connector clockwise 90°.

Do not force a rotation greater than 90 °!



GPIO Panel

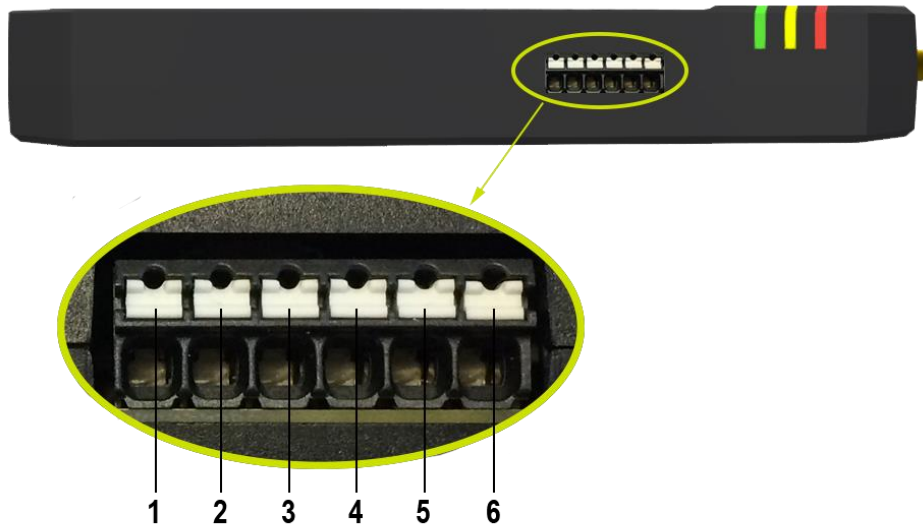


Fig. 1.4: Hex R1290I GPIO Panel

No.	Description
1	5Vout
2	GND
3	GPIO
4	RTN
5	RELE1I
6	RELE1O

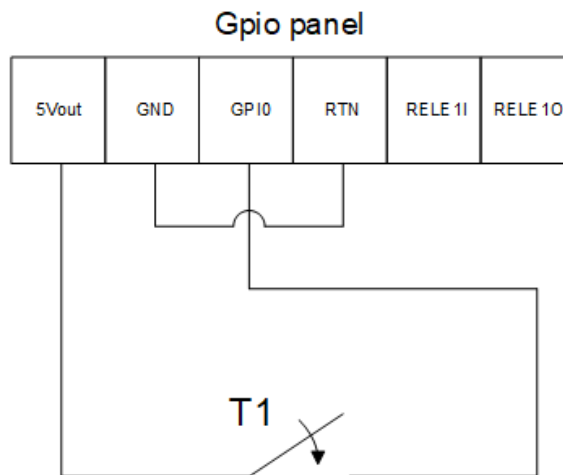
Tab. 1.3: Hex R1290I GPIO Panel

Input signal

To have a valid input signal, apply a voltage between 4V and 48V to the pin indicated by GPIO.

Using the signals on the panel you can connect the 5Vout pin to the GPIO pin through a switch that enables the input signal when closed.

A connection between GND ground and RTN signal is also required.



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:

GPIO Management — □ ×

	GPIO:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Directions:	<input type="text" value="0x0002"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
	In:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
	Out:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Values:	<input type="text" value="0x0003"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Status:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

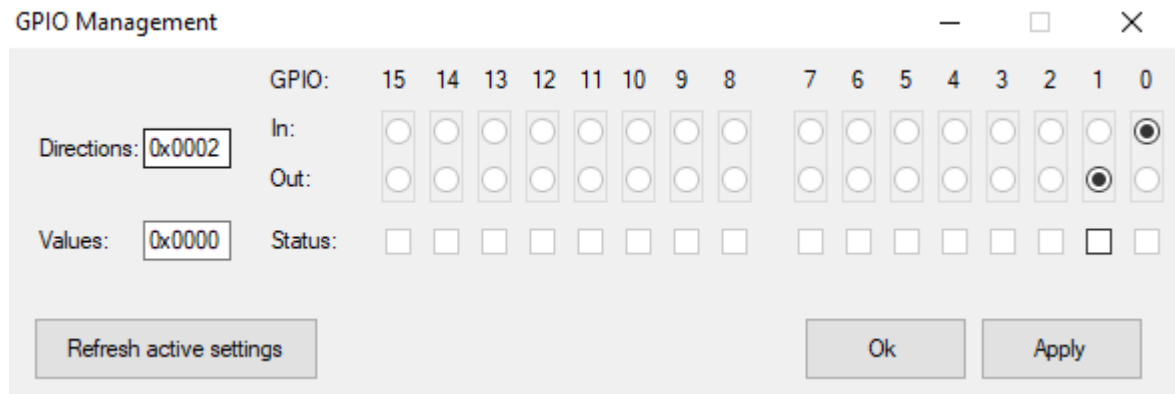
When a valid input is present, a check "V" appears in the Status box at the GPIO 0:

GPIO Management — □ ×

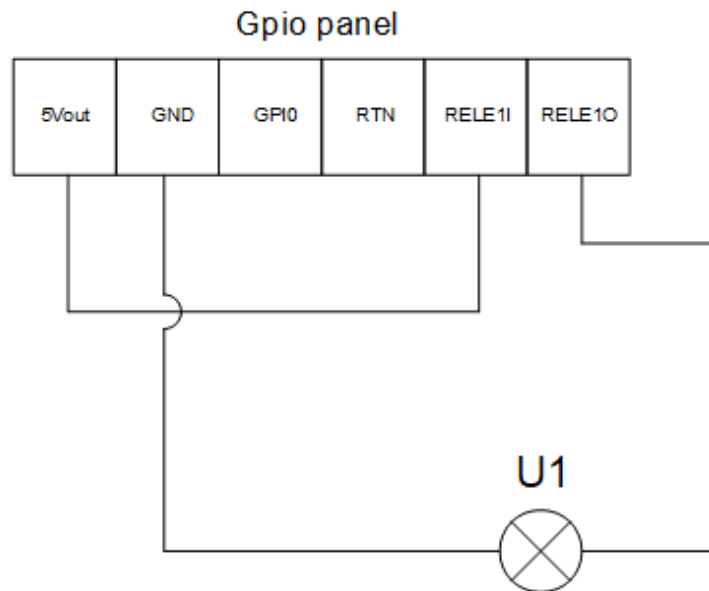
	GPIO:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Directions:	<input type="text" value="0x0002"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
	In:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
	Out:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Values:	<input type="text" value="0x0003"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Status:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Output signal

The RELE1I and RELE1O pins are the terminals of a normally open dry contact. 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 1 and then press the *Apply* button.



To supply a user U1 to 5V, make the connection as shown in the drawing below:



Accessories

Check for the supplied accessories below:



Fig. 1.5: Hex R1290I Accessories



Warning: Follow the instructions in § *Interfaces Panel* page 8 to correctly connect the WALIM0000005 power supply to the Hex R1290I reader.

Ordering Options

	Code	Description
Reader	WR1290IEXAAA	R1290IE - Hex - POE multipurpose UHF RFID Reader (ETSI)
	WR1290IUXAAA	R1290IU - Hex - POE multipurpose UHF RFID Reader (FCC)

2 GETTING STARTED

Introduction

This quickstart guide will help you to get started with your Hex (Model R1290I) reader.

The reader can be configured in three 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 EASY2READ profile please refer to this quickstart guide.
- **HID**: choosing this option you select the keyboard emulation protocol. For details on the use of the HID profile please refer to § *HID Profile* page 46.
- **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 48.

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 Hex Reader using the Easy Controller via USB

The Hex reader can be connected to a PC using the provided USB cable and it is detected by the PC as an emulated serial port.



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 [Hex R1290I web page, Downloads](#) section or from the [Software and Firmware download area](#).

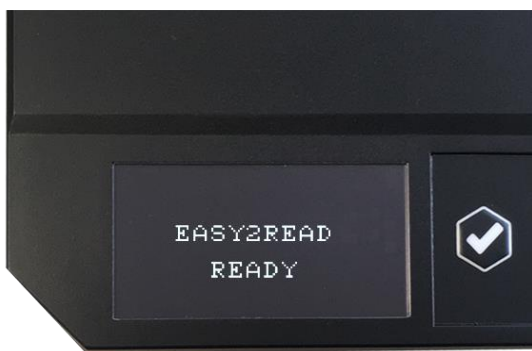
Warning: If your PC is running a Windows version older than Windows 10, in order to correctly operate with the reader, you need to install the *Gadget Serial USB driver*. You can download it for Windows based systems from the [Hex R1290I web page, Downloads](#) section or from the [Software and Firmware download area](#).

1. Check for the supplied accessories (see § *Accessories* page 12). Plug the USB cable into your computer and connect the other end of the USB cable to the reader.

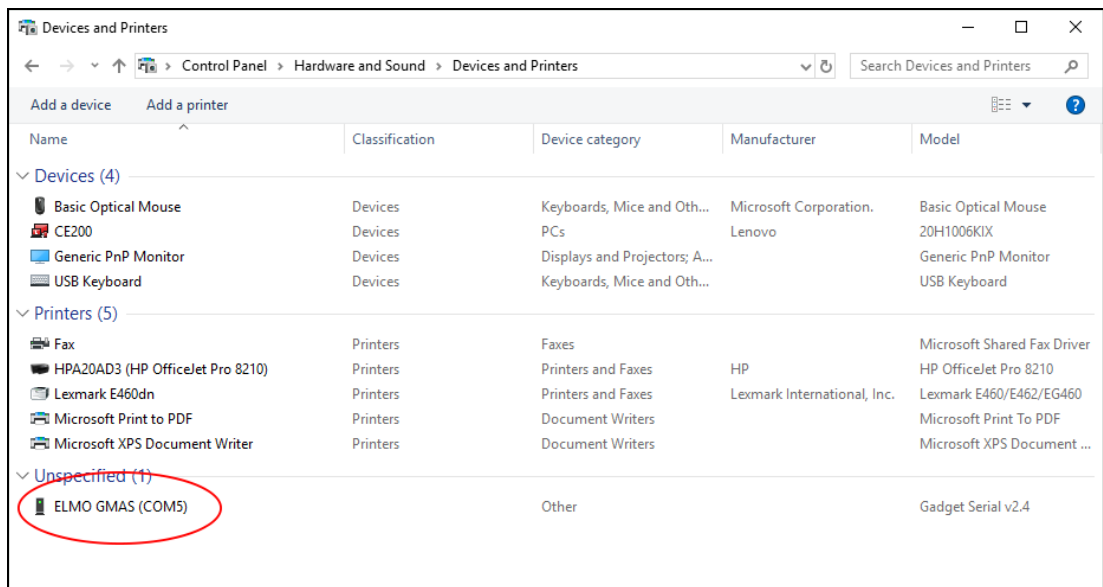
2. Connect the Hex to the power supply, the power LED will turn on, wait about 25 seconds until you hear a beep, a message appears on the screen:



3. Wait 15 seconds again until the screen will inform you that the reader is ready to work with the *easy2read* profile:

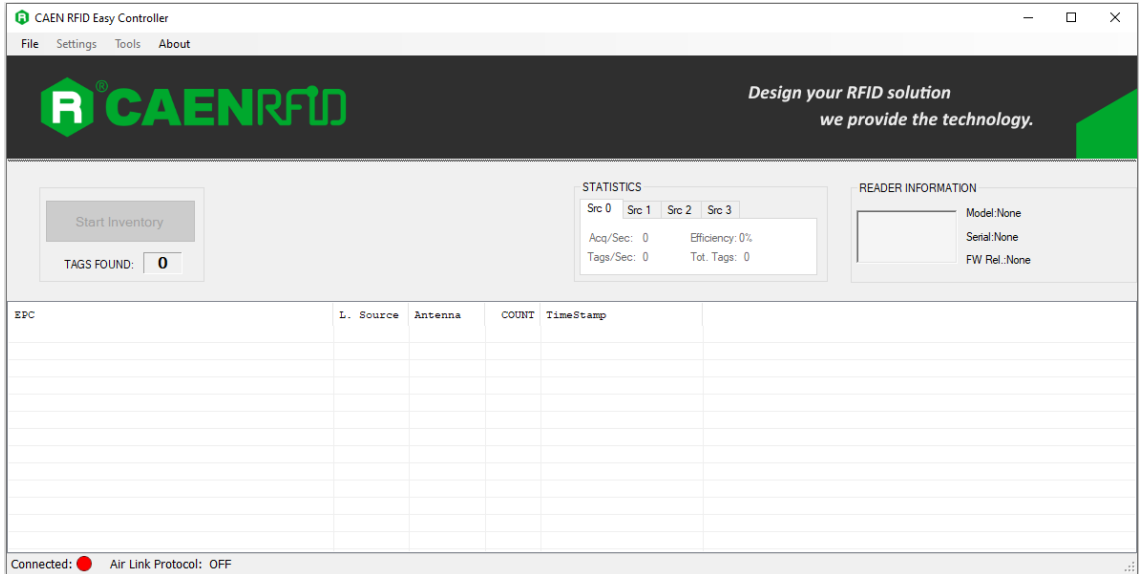


4. In your PC, go to *Control Panel* → *Hardware and Sound* → *Devices and Printers*. After having installed the driver (if your PC is running a Windows version older than Windows 10, otherwise the installation of the driver is not necessary), the reader is detected by the PC as an *ELMO GMAS* (Gadget Serial) device. Look at the COM port number (COM5 in this example):

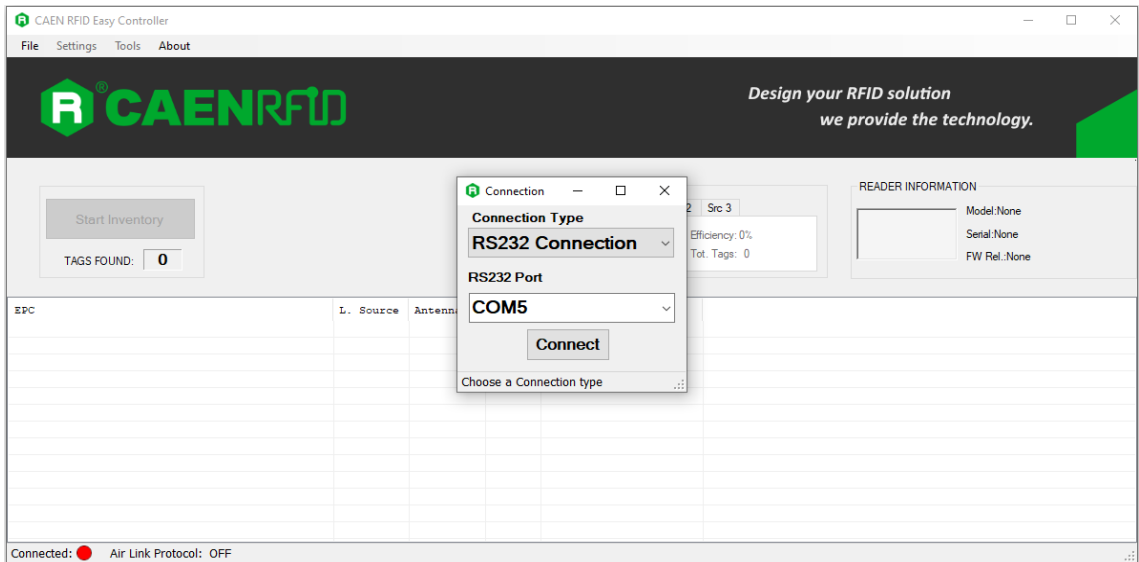


5. Download the latest version of the *Easy Controller software* from the [Hex R1290I web page](#), *Downloads* section and install it.

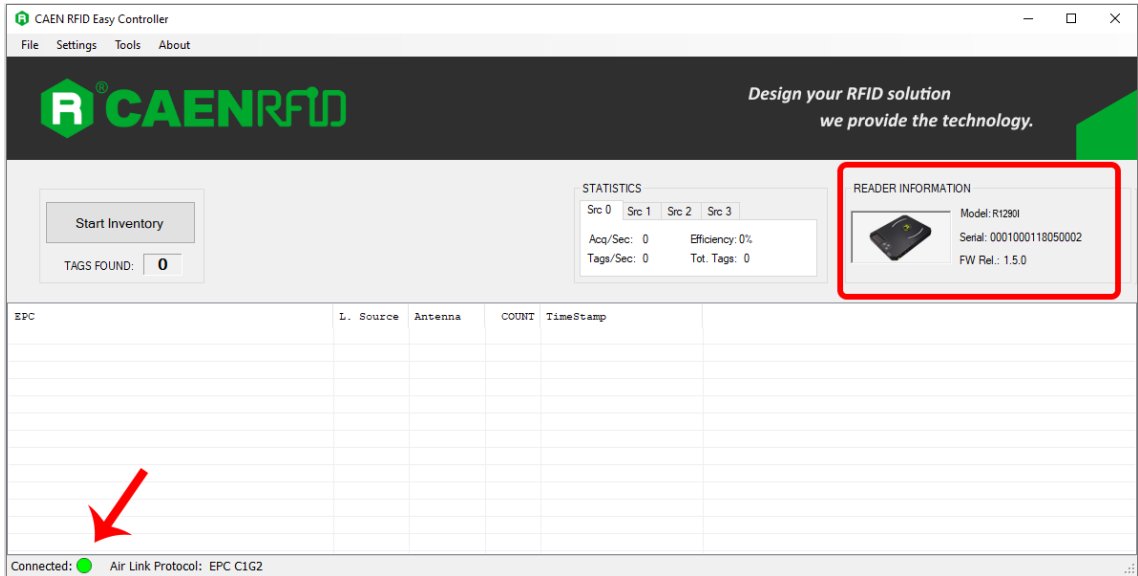
6. Launch the *Easy Controller* by double clicking on its icon:



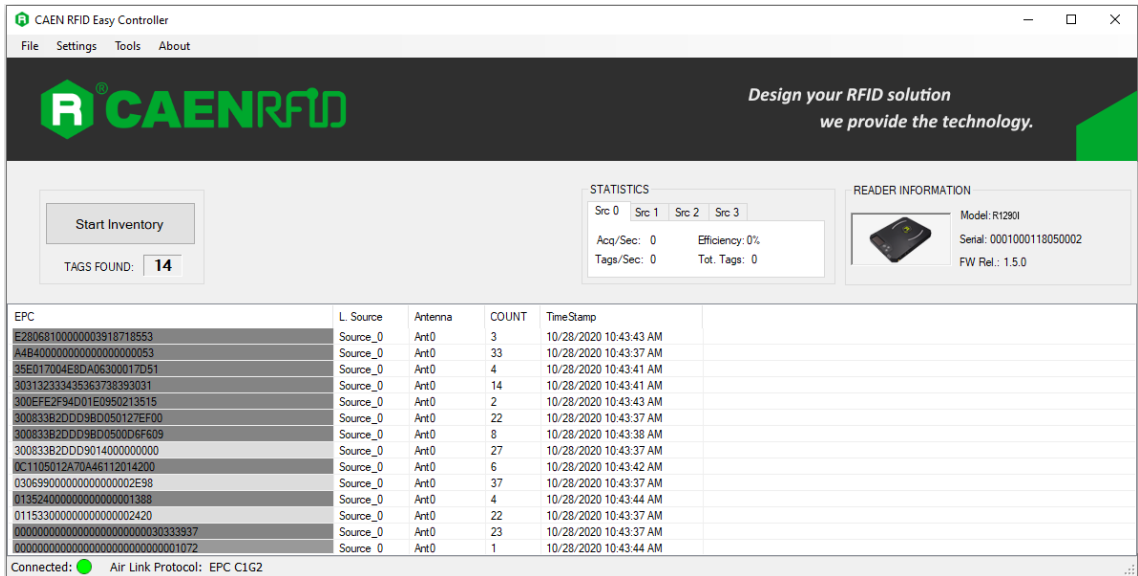
7. On the main screen click on *File—Connect*. A Connection window will open.
8. Select the connection type (RS232) and specify the serial port (COM5 in this example):



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



- Place a tag on the reader, click on *Start Inventory* and see the tag information displayed in the main window:



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 [Hex R1290i web page](#), *Downloads* section or in the [Manual and Documents](#) web area.

3 CONFIGURATION MENU VIA READER

Introduction

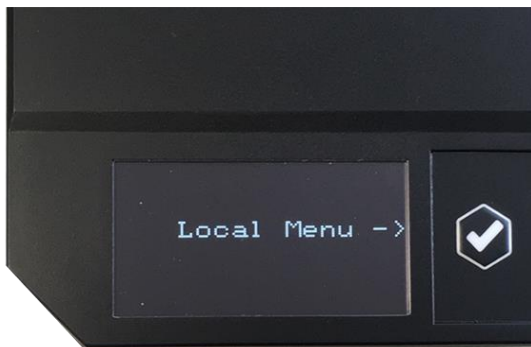
The reader can be configured via reader menu or using the web interface.

This chapter helps you to configure the Hex reader using the reader configuration menu.

For information on the configuration using the web interface, please refer to the chapter *§ Configuration Using the Web Interface* page 24.

Connect the Hex to the power supply, the power LED will turn on, wait about 25 seconds until you hear a beep.

When the message “Local Menu” appears on the screen, hold down the *trigger* button to access the main configuration menu of the reader:



Note that if the trigger button is not pressed in few seconds, the reader starts with the current active profile.

When access the main configuration menu, to scroll through the menu options, press the *up* and *down* buttons.

The Hex R1290I menu options are the following:

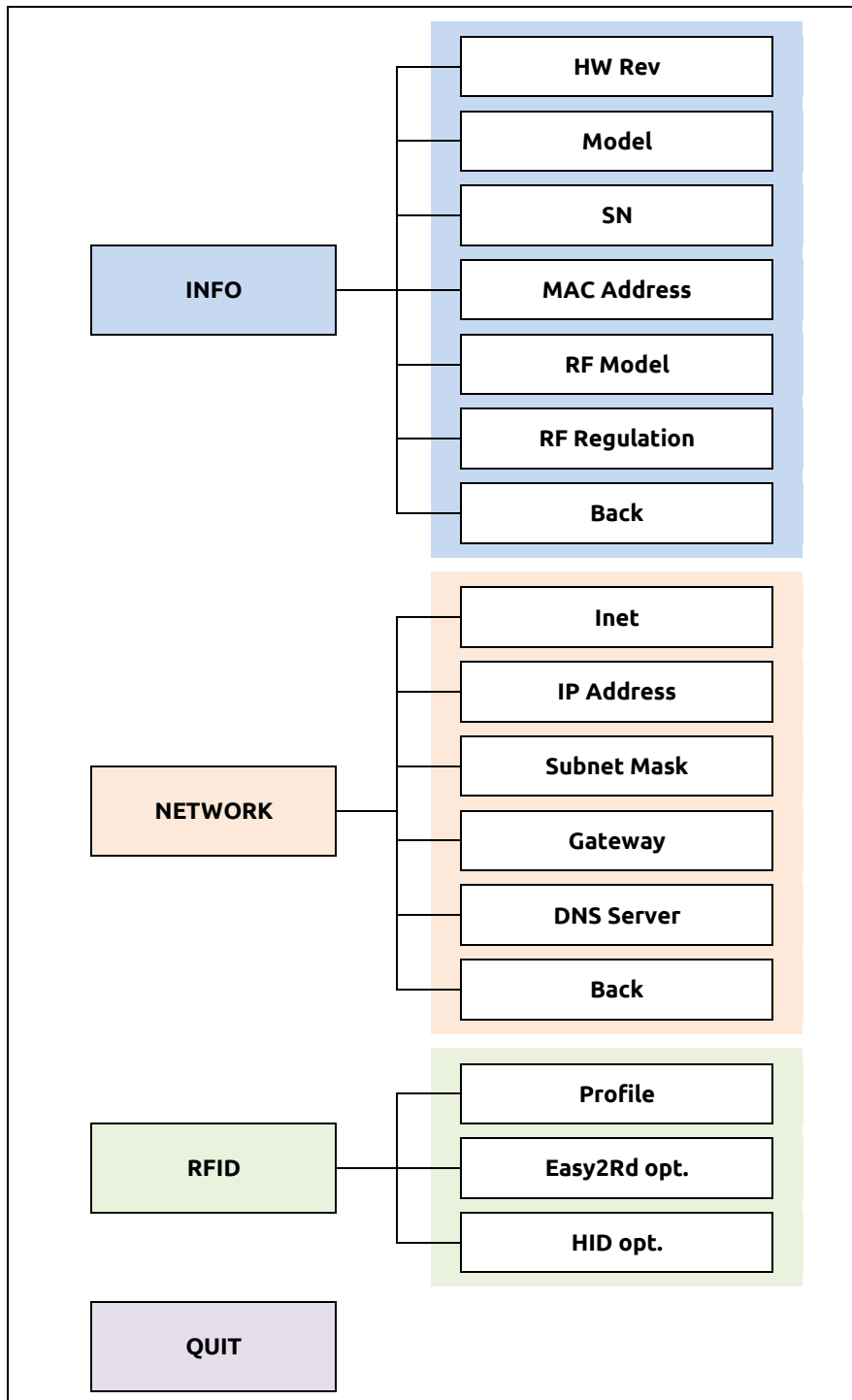
- **INFO**
- **NETWORK**
- **RFID**
- **QUIT**

To select a menu option, press the *trigger* button.



Warning: If your reader is powered on and you want to access the configuration menu, you must first turn off the reader (disconnect the power supply), **wait about 10 seconds**, turn on the reader again (connect the power supply) and follow the procedure described above.

The complete structure of the Hex R1290I configuration menu is the following:



Tab. 3.1: Hex R1290I Configuration Menu

INFO

The INFO menu is the first option of the main menu. To select it, press the *trigger* button.

To scroll through the INFO options, press the *up* and *down* buttons.

The INFO submenu options are the following:

- **HW rev.:** the hardware revision of the reader.
- **Model:** the model name (e.g. R1290IE).
- **SN:** the serial number of the reader (16 numbers displayed on 2 lines).
- **MAC Address:** the MAC address of the reader displayed on 2 lines.
- **Distro Rel.:** the distribution firmware release of the reader.
- **RF Model:** the internal RF module model, R1270C.
- **RF Regulation:** the reader regulation (e.g. FCCUS).
- **Back:** exit and return to the main menu.

NETWORK

The NETWORK menu is the second option of the configuration menu. To select it, press the *trigger* button.

To scroll through the NETWORK options, press the *up* and *down* buttons.

The NETWORK submenu options are the following:

- **DHCP:** Enable/Disable. By default the DHCP is set to *disable*. The display shows the active setting. To modify the value, press the *trigger* buttons until the desired value is shown, then press the *up or down* button to select "back" and the *trigger* button to return to the NETWORK submenu.
- **IP Address:** the display shows the default IP address: 192.168.000.002. If you are working in a different network, you can change the IP address of the reader to insert it into your network. Otherwise you can disconnect yourself from your network and connect your PC to the reader IP address. To modify the IP address, press the *trigger* button to change the first cipher of the IP Address value. Then press the *up or down* button to move to the second cipher, press the *trigger* button to change the second cipher and the *up or down* button to move to the next cipher and so on until the setting of the complete IP address. Select "back" with the *up or down* button and press the *trigger* button to return to the NETWORK submenu.
- **Subnet Mask:** the display shows the default subnet mask: 255.255.255.000. To modify the subnet mask, press the *trigger* button to change the first cipher of the Subnet Mask value. Then press the *up or down* button to move to the second cipher, press the *trigger* button to change the second cipher and the *up or down* button to move to the next cipher and so on until the setting of the complete subnet mask. Select "back" with the *up or down* button and press the *trigger* button to return to the NETWORK submenu.
- **Gateway:** the display shows the default gateway: 192.168.000.001. To modify the gateway, press the *trigger* button to change the first cipher of the Gateway value. Then press the *up or down* button to move to the second cipher, press the *trigger* button to change the second cipher and the *up or down* button to move to the next cipher and so on until the setting of the complete gateway. Select "back" with the *up or down* button and press the *trigger* button to return to the NETWORK submenu.
- **DNS Server:** the reader default DNS server is 008.008.008.008. To modify the DNS server, press the *trigger* button to change the first cipher of the DNS Server value. Then press the *up or down* button to move to the second value, press the *trigger* button to change the *second* value and the *up or down* button to move to the *next* value and so on until the setting of the complete gateway. Select "back" with the *up or down* button and press the *trigger* button to return to the NETWORK submenu.
- **Back:** select "back" with the *up or down* button and press the *trigger* button to return to the main menu.

RFID

The RFID menu is the third option of the configuration menu. To select it, hold down the trigger button.

To scroll through the RFID options, press the *up* and *down* buttons.

The RFID submenu options are the following:

- **Profile**
- **Easy2Rd opt.**
- **HID opt.**
- **Back:** select “back” with the *up* or *down* button and press the *trigger* button to return to the main menu.

Press the trigger button to select a submenu options.

Profile

The display shows the active profile. Press the trigger button to change the current profile. 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 38.

The configuration options using the easy2read profile are described in the § *Easy2Rd opt.* paragraph page 20.

- **HID:** choosing this option you select the keyboard emulation protocol. For details on the use of the HID profile please refer to § *HID Profile* chapter page 46.

The configuration options using the HID profile are described in the § *HID opt.* paragraph page 22.

- **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 48.

The configuration options using the CUSTOM profile are accessible only via Web Interface. For more information please refer to § *Custom* paragraph page 36.

Select “back” with the up or down button and press the trigger button to return to the RFID menu.

Easy2Rd opt.

Through the **Easy2Rd opt** submenu you can configure the reader when using the easy2read profile.

The Easy2Read options are the following:

- **RF Power:** through the *RF Power* submenu you can set the start-up power level emitted by the reader. The display shows the default RF Power. To scroll through the RF Power options, press the *trigger* button until the desired RF Power value is shown.

The RF Power value is expressed as a percentage value of the maximum RF output power:

- 5%
- 10%
- 20%
- 40%
- 60%
- 80%
- 100%


The correspondent values are:

Percentage	Conducted Power ¹ (mW)	Radiated Power ETSI (mW e.r.p.)	Radiated Power FCC (mW e.r.p.)
5%	25	16	18
10%	50	32	36
20%	100	64	72
40%	200	128	144
60%	300	192	215
80%	400	256	287
100%	500	320	359

Tab. 3.2: Conducted power- radiated 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.


- **Trigger Button:** through this option, you can enable/disable the tag inventory on trigger button press. By default, the Trigger Button is disabled. To modify the value, press the *trigger* button until the desired value is shown (enabled/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the RFID submenu. When the *Trigger Button* is enabled, to perform the tag inventory just hold down the trigger button and then release.



Note: In the easy2read profile, in order to enable the tag inventory on button press, it is necessary to perform a second activation via software:

- **Using the Easy controller Software:** for more details see § *Inventory on button press* page 44.
- 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 Hex R1290I web page, Documents](#) section or in the [Manual and Documents](#) web area.

- **Proximity:** through this option, you can enable/disable the proximity sensor (see § *Fig. 1.2: Hex R1290I Top Panel* page 7). By default, the *Proximity Sensor* is disabled. To modify the value, press the *trigger* button until the desired value is shown (enabled/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the RFID submenu. If the *Proximity Sensor* is enabled, the reader performs a tag inventory when he perceives a decrease in brightness due to the passage of a tag. Note that the sensor is also sensitive to the change in brightness due to the turning off of the light or the passage of a shadow.



Note: In the easy2read profile, in order to enable the proximity sensor, it is necessary to perform a second activation via software:

- **Using the Easy controller Software:** for more details see § *Inventory on button press* page 44.
- 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 [Hex R1290I web page, Documents](#) section or in the [Manual and Documents](#) web area.

- **Tag ID Beep:** by default, the *Tag ID beep* is disabled. To modify the value, press the *trigger* buttons until the desired value is shown (enabled/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the RFID submenu. If the *Tag ID beep* is enabled, the reader will beep when a tag is detected.
- **Tag ID Lights:** by default, the *Tag ID lights* are disabled. To modify the value, press the *trigger* buttons until the desired value is shown (enabled/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the RFID submenu. If the *Tag ID Lights* are enabled, the reader will lights up when a tag is detected.
- **Tag Count:** by default, the Tag ID Count is disabled. To modify the value, press the trigger buttons until the desired value is shown (enabled/disabled), then press the up or down button to

¹ On external antenna

select “back” and the trigger button to return to the RFID submenu. If the Tag Count is enabled, when the reader performs a tag inventory, the reader display shows the number of tags read.

- **Back:** select “back” with the *up or down* button and press the *trigger* button to return to the RFID menu.

HID opt.

Through the **HID opt** submenu you can configure the reader when using the HID profile.

The HID options are the following:

- **RF Power:** through the *RF Power* submenu you can set the start-up power level emitted by the reader. The display shows the default RF Power. To scroll through the RF Power options, press the *trigger* button until the desired RF Power value is shown.

The RF Power value is expressed as a percentage value of the maximum RF output power:

- 5%
- 10%
- 20%
- 40%
- 60%
- 80%
- 100%

The correspondent values are:

Percentage	Conducted Power ² (mW)	Radiated Power ETSI (mW e.r.p.)	Radiated Power FCC (mW e.r.p.)
5%	25	16	18
10%	50	32	36
20%	100	64	72
40%	200	128	144
60%	300	192	215
80%	400	256	287
100%	500	320	359

Tab. 3.3: Conducted power- radiated power

- **Trigger Button:** through this option, you can enable or disable the tag inventory on trigger button press. The *Trigger Button* options are the following:
 - Enable (one shot): enable the tag inventory at the trigger button press. When the *Trigger Button* is enabled (one shot), to perform the tag inventory just hold down the trigger button and then release. The reader performs a single inventory cycle.
 - Enable (start/stop): enable the tag inventory at the trigger button press. When the *Trigger Button* is enabled (start/stop), to perform the tag inventory just hold down the trigger button and then release. The reader performs inventory cycles until the trigger button is pressed for the second time (stop).
 - Disable: disable the tag inventory on trigger button press.

By default, the Trigger Button is disabled. To modify the value, press the *trigger* buttons until the desired value is shown (enabled one shot/enabled start stop/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the *HID opt*.

- **Proximity:** through this option, you can enable/disable the proximity sensor (see § Fig. 1.2: Hex R1290I Top Panel page 7). By default, the *Proximity Sensor* is disabled. To modify the value, press the *trigger* button until the desired value is shown (enabled/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the *HID opt*. If the *Proximity Sensor* is enabled, the reader performs a tag inventory when he perceives a decrease in brightness due to the passage of a tag. Note that the sensor is also sensitive to the change in brightness due to the turning off of the light or the passage of a shadow.

² On external antenna

- **Tag ID Beep:** by default, the *Tag ID beep* is disabled. To modify the value, press the *trigger* buttons until the desired value is shown (enabled/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the *HID opt.* If the *Tag ID beep* is enabled, the reader will beep when a tag is detected.
- **Tag ID Lights:** by default, the *Tag ID lights* are disabled. To modify the value, press the *trigger* buttons until the desired value is shown (enabled/disabled), then press the *up or down* button to select “back” and the *trigger* button to return to the *HID opt.* If the *Tag ID Lights* are enabled, the reader will light up when a tag is detected.
- **Keybd layout:** the Keyboard options are the following:
 - QWERTY: standard QWERTY keyboard
 - AZERTY: French keyboard

By default, the Keyboard is set to “QWERTY”. To modify the value, press the *trigger* buttons until the desired value is shown (QWERTY/AZERTY), then press the *up or down* button to select “back” and the *trigger* button to return to the *HID opt.*

- **Antenna src:** internal or external. By default, the Antenna src is set to “internal”. To modify the value, press the trigger buttons until the desired value is shown (internal/external), then press the up or down button to select “back” and the trigger button to return to the *HID opt.*

The external antenna is not supplied and can be attached to the reader using the *External Antenna Port* (see § Fig. 1.3: *Hex R1290I Interfaces Panel* and Tab. 1.2: *Hex R1290I Interfaces Panel* page 8).

- **Filter Time:** The value is expressed in seconds. This option is useful to avoid the retransmission of the same tag for a time equal to the *tag filtering time*. By default, the *Tag Filtering Time* is set to 000000 and the tag is transmitted at each reading. For example, if *tag filtering time* is set to 5s (000005) and a tag is read, it is transmitted the first time then it will be retransmitted after 5 seconds if read again. To modify the *Filter Time*, press the *trigger* button to change the first cipher of the Filter Time value. Then press the *up or down* button to move to the second cipher, press the *trigger* button to change the second cipher and the *up or down* button to move to the next cipher and so on until the setting of the complete *Filter Time*. Select “back” with the *up or down* button and press the *trigger* button to return to the *HID opt.*
- **Back:** select “back” with the *up or down* button and press the *trigger* button to return to the RFID menu.

4 CONFIGURATION USING THE WEB INTERFACE

Introduction

The reader can be configured via reader menu or using the web interface.

This chapter helps you to configure the Hex reader using the web interface.

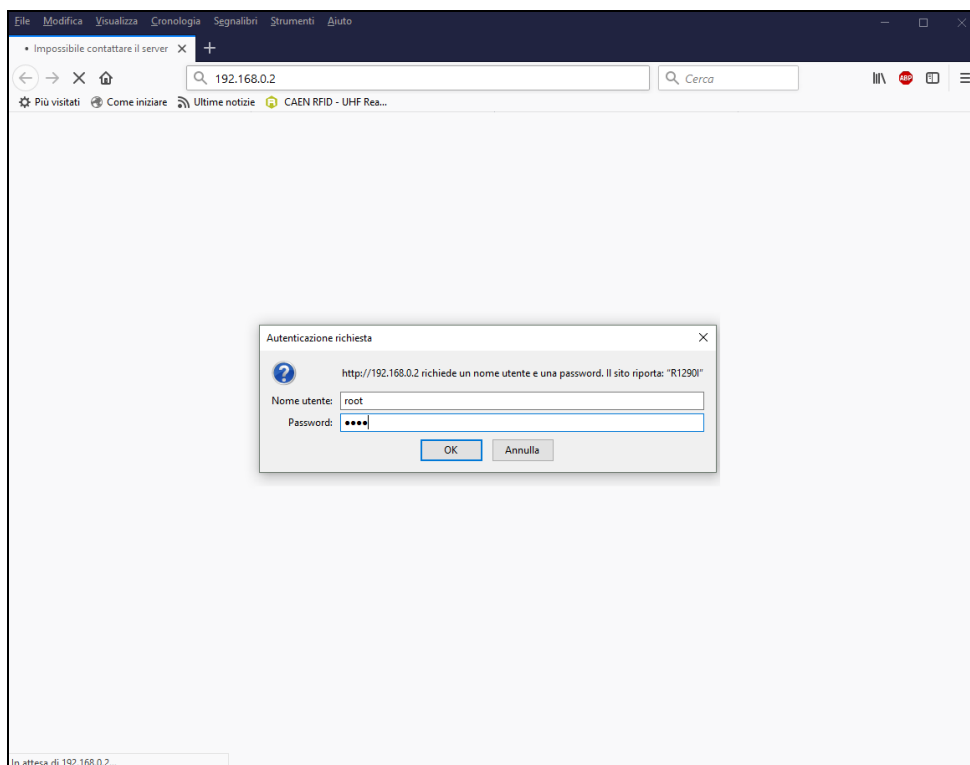
For information on the configuration using the reader configuration menu, please refer to the chapter *§ Configuration Menu via reader page 17*.

The Web Interface is accessible only via the Ethernet connection:

1. Connect the Hex to the power supply.
2. Plug an Ethernet cable (not provided) into your computer and connect the other end of the Ethernet cable to the reader. By default, the Hex R1290I is configured with the static IP address 192.168.0.2. If your private network matches the default network configuration of the reader you can connect to it. Otherwise you can either change the network configuration of the reader (see *§ NETWORK page 19*) to connect it to your network or disconnect your PC from your network and connect it to the network of the reader.

By factory default, the Hex web interface is reachable at the following URL: 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 27*.



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

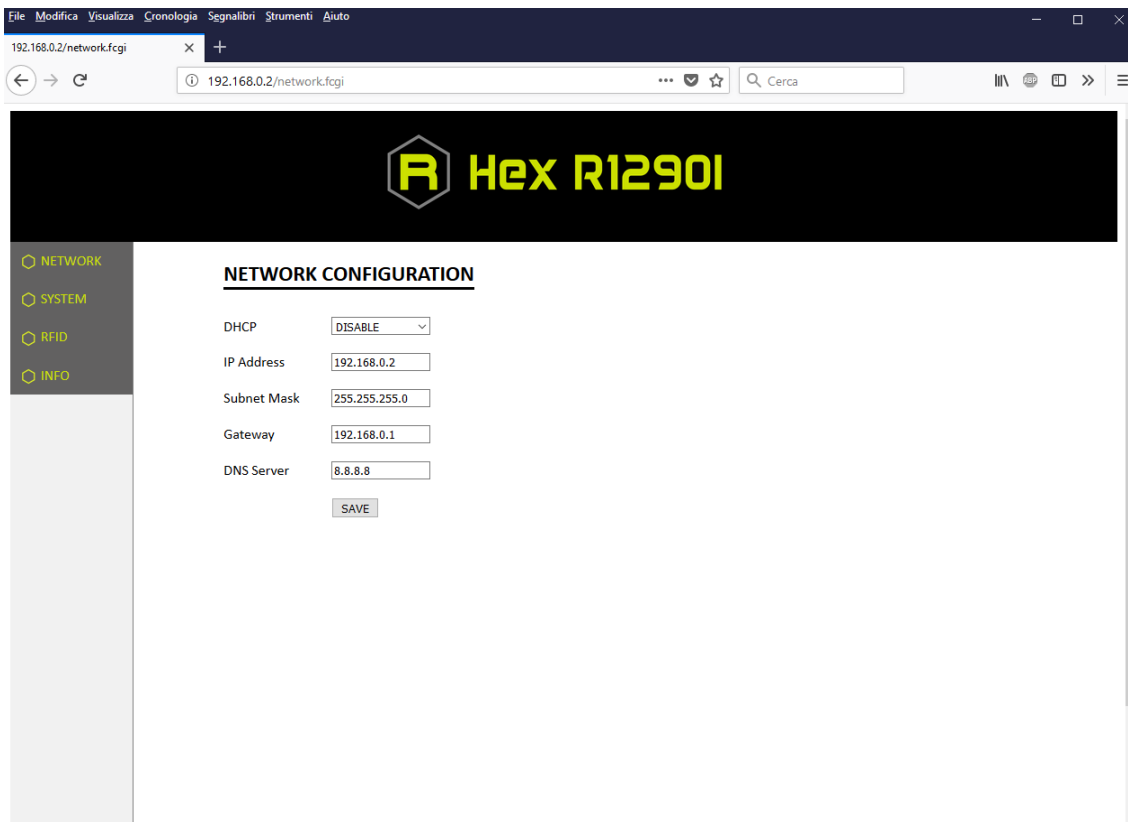
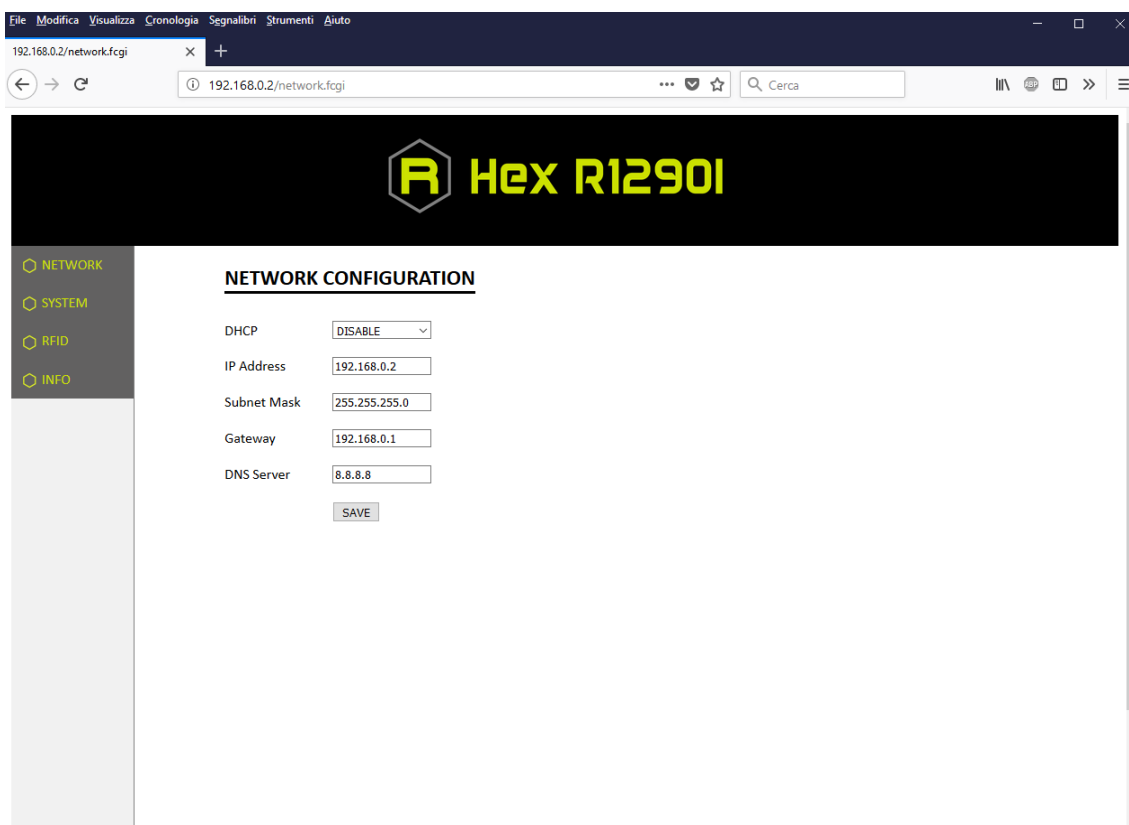


Fig. 4.1: Hex R1290I Web Interface

The Web Interface menu options are the following:

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

NETWORK



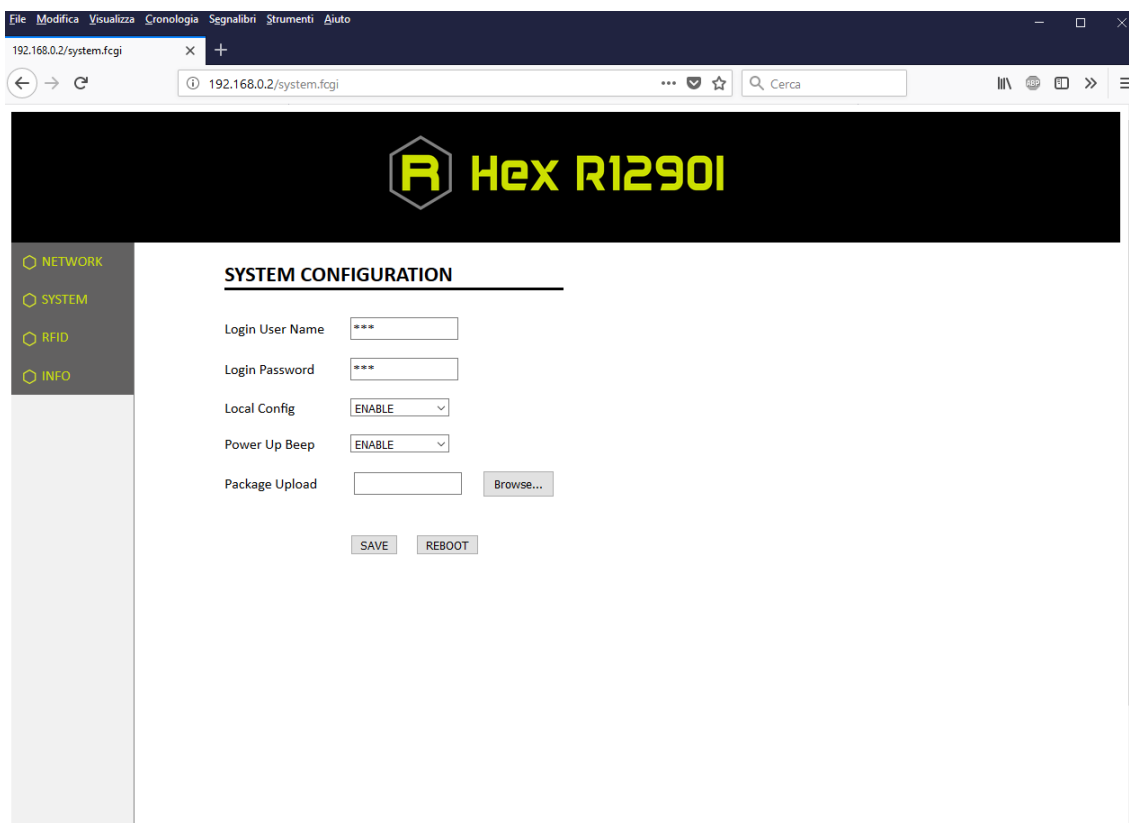
The NETWORK submenu options are the following:

- **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 Hex 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 38.
- **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 reboot of the reader. 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 50)

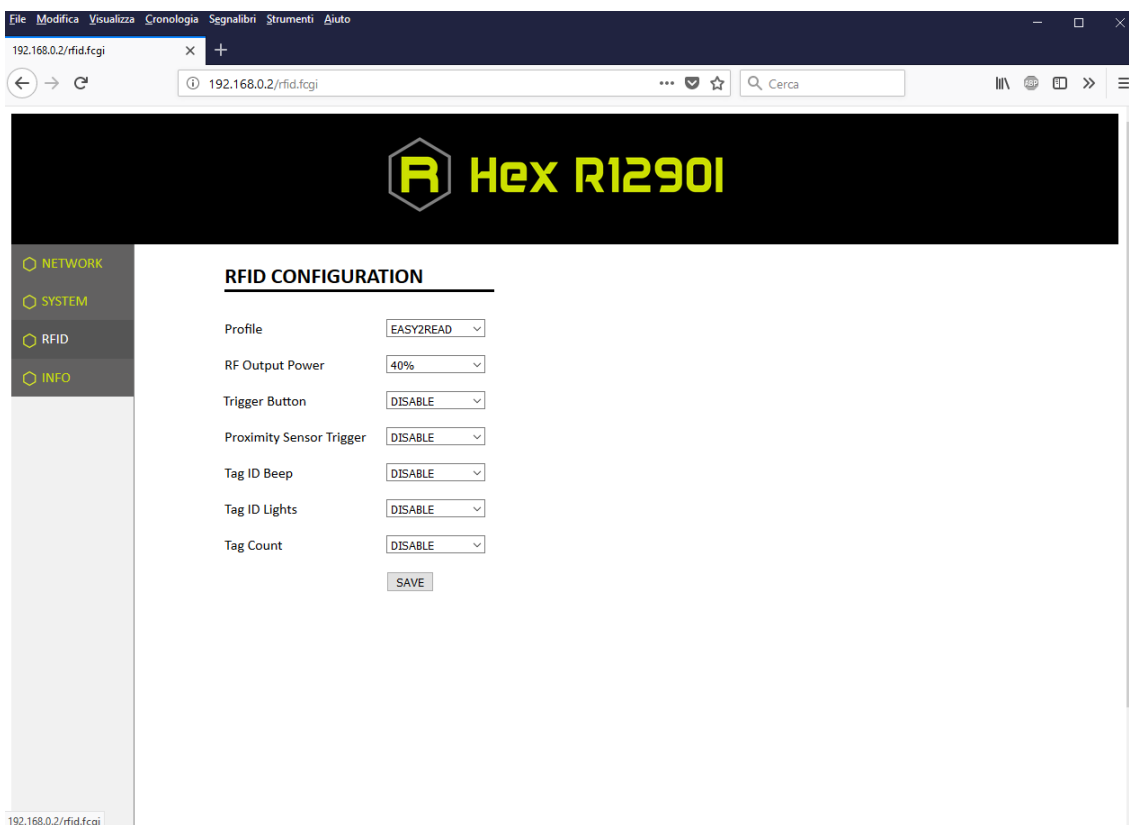
- **Login Password:** To access the web interface, the default password is “root”. Use this option to change the login password.

 If you forgot your password you must necessarily make a factory reset (see § *Firmware Upgrade* page 50)

- **Local Config:** enable or disable. By default the configuration menu via reader is enabled. Through this option you can enable or disable the local configuration in the reader: if you want to configure the reader only via web interface, disable the *Local Config* option.
- **Power Up Beep:** enable or disable. By default, the *Power Up Beep* is disabled. 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 R1290I 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 48.

 **Warning:** To save the changes click on the “SAVE” button. Note that all changes made via the web interface are active only after the reboot of the reader. 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 38.

For details on the easy2read configuration options, refer to § *Easy2read* page 29.

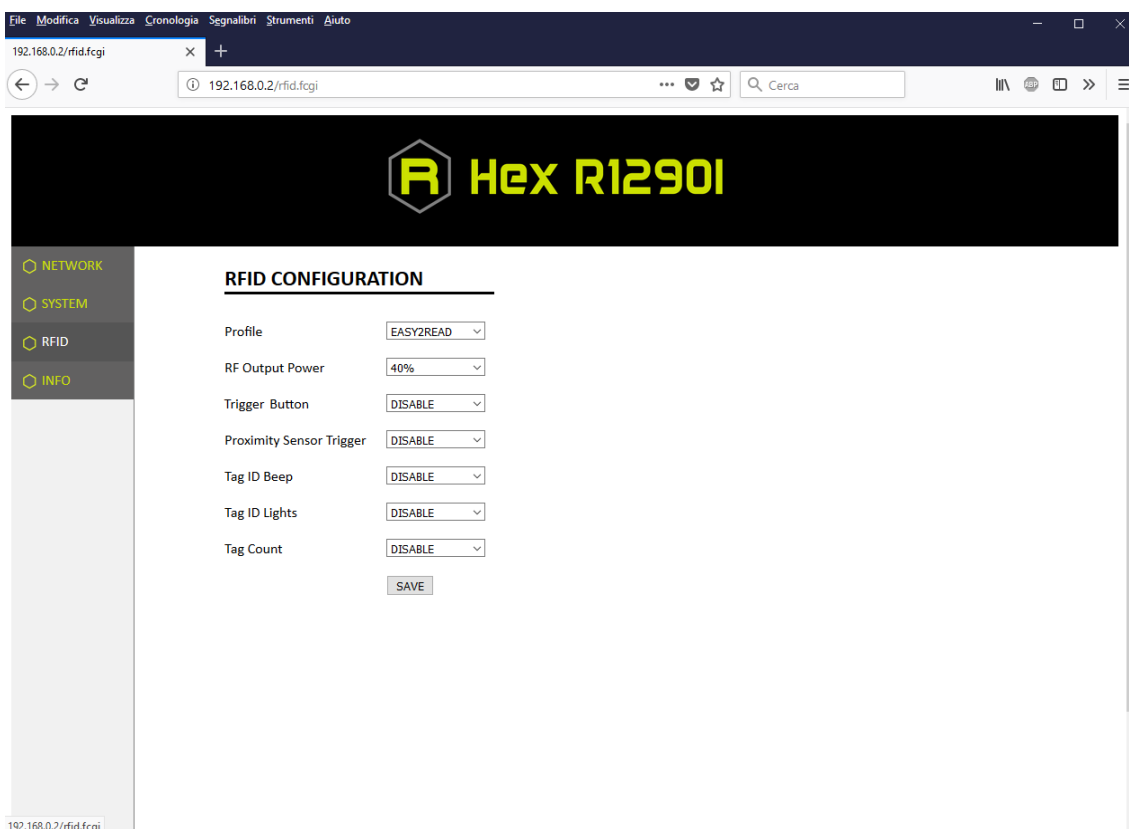
- **HID:** choosing this option you select the keyboard emulation protocol. For details on the use of the HID profile please refer to § *HID Profile* chapter page 46.

For details on the HID configuration options, refer to § *HID* page 31.

- **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 48.

For details on the Custom configuration options, refer to § *Custom* page 36.

Easy2read



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

- **RF Output Power:** the default RF Power is 40%. 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 (mW)	Radiated Power ETSI (mW e.r.p.)	Radiated Power FCC (mW e.r.p.)
5%	25	16	18
10%	50	32	36
20%	100	64	72
40%	200	128	144
60%	300	192	215
80%	400	256	287
100%	500	320	359

Tab. 4.1: Conducted power- radiated 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.


- **Trigger Button:** enable or disable. By default, the *Trigger Button* is disabled. You can change the default value using the drop-down menu. Through this option you can enable/disable the tag inventory at the press of the trigger button of the reader. When the *Trigger Button* is enabled, to perform the tag inventory just hold down the trigger button and then release.



Note: In the easy2read profile, in order to enable the tag inventory on button press, it is necessary to perform a second activation via software:

- **Using the Easy controller Software:** for more details see § *Inventory on button press* page 44.
- 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 [Hex R1290I web page](#), *Documents* section or in the [Manual and Documents](#) web area.


- **Proximity Sensor Trigger:** enable or disable. By default, the *Proximity Sensor Trigger* is disabled. You can change the default value using the drop-down menu. When the *Proximity Sensor* is enabled, the reader performs a tag inventory when he perceives a decrease in brightness due to the passage of a tag. Note that the sensor is also sensitive to the change in brightness due to the turning off of the light or the passage of a shadow.



Note: In the easy2read profile, in order to enable the proximity sensor, it is necessary to perform a second activation via software:

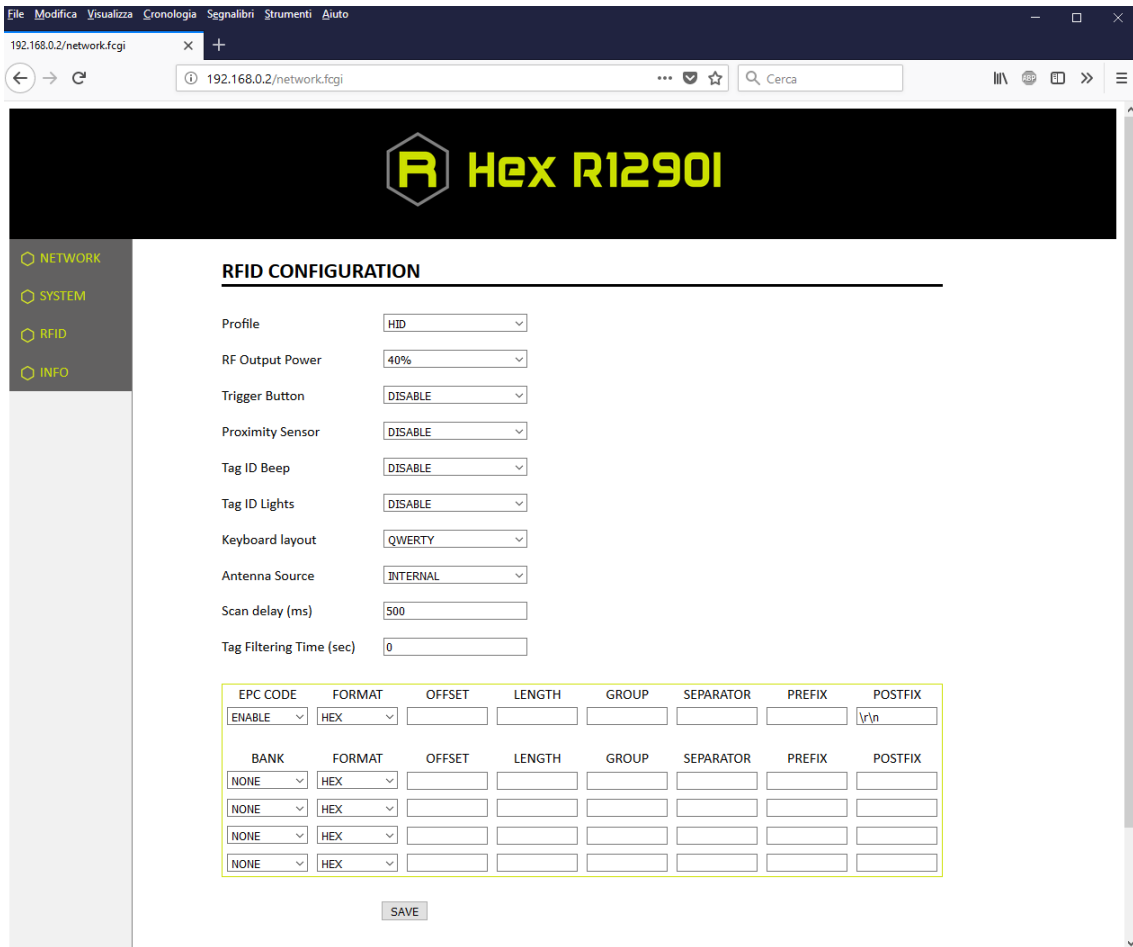
- **Using the Easy controller Software:** for more details see § *Inventory on button press* page 44.
- or
- **Using the API:** for more details see the *EventInventoryTag* Method (the *event trigger flag*, bit 5, set to 1) in the *CAEN RFID API Reference Manual* downloadable from [Hex R1290I web page](#), *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.
- **Tag ID Lights:** enable or disable. By default, the *Tag ID lights* are disabled. You can change the default value using the drop-down menu. If the *Tag ID Lights* are enabled, the reader will lights up when a tag is detected.
- **Tag Count:** enable or disable. By default, the *Tag Count* is disabled. You can change the default value using the drop-down menu. If the *Tag Count* is enabled, when the reader performs a tag inventory, the reader display shows the number of read tags.



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

HID



Choosing the **HID** profile option you select the keyboard emulation protocol.

The RFID Configuration submenu options are the following:

- RF Output Power:** the default RF Power is 40%. 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 (mW)	Radiated Power ETSI (mW e.r.p.)	Radiated Power FCC (mW e.r.p.)
5%	25	16	18
10%	50	32	36
20%	100	64	72
40%	200	128	144
60%	300	192	215
80%	400	256	287
100%	500	320	359

Tab. 4.2: Conducted power- radiated power

- **Trigger Button:** through this option, you can enable or disable the tag inventory on trigger button press. The *Trigger Button* options are the following:
 - Enable (one shot): enable the tag inventory at the trigger button press. When the *Trigger Button* is enabled (one shot), to perform the tag inventory just hold down the trigger button and then release. The reader performs a single inventory cycle.
 - Enable (start/stop): enable the tag inventory at the trigger button press. When the *Trigger Button* is enabled (start/stop), to perform the tag inventory just hold down the trigger button and then release. The reader performs inventory cycles until the trigger button is pressed for the second time (stop).
 - Disable: disable the tag inventory on trigger button press.

By default, the *Trigger Button* is disabled. You can change the default value using the drop-down menu. Through this option you can *enable(one shot)/enable (start-stop)/disabled* the tag inventory at the press of the trigger button of the reader.

- **Proximity Sensor Trigger:** enable or disable. By default, the *Proximity Sensor Trigger* is disabled. You can change the default value using the drop-down menu. When the *Proximity Sensor* is enabled, the reader performs a tag inventory when he perceives a decrease in brightness due to the passage of a tag. Note that the sensor is also sensitive to the change in brightness due to the turning off of the light or the passage of a shadow.
- **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.
- **Tag ID Lights:** enable or disable. By default, the *Tag ID lights* are disabled. You can change the default value using the drop-down menu. If the *Tag ID Lights* are enabled, the reader will lights up when a tag is detected.
- **Keyboard Layout:** The Keyboard options are the following:
 - QWERTY: standard QWERTY keyboard
 - AZERTY: French keyboard

By default the Keyboard is set to “QWERTY”. You can change the default value using the drop-down menu.

- **Antenna Source:** internal or external. By default, the *Antenna src* is set to “internal”. You can change the default value using the drop-down menu.

The external antenna is not supplied, the user can attached his own external antenna to the reader using the *External Antenna Port* (see § Fig. 1.3: *Hex R1290I Interfaces Panel* and Tab. 1.2: *Hex R1290I Interfaces Panel* page 8).

- **Scan delay (ms):** the scan delay is the time between two inventories (in case of continuous inventory mode with no triggers enabled). Note that if the trigger button and proximity sensor parameters are enabled, the scan delay is ignored.
- **Tag Filtering Time (sec):** this option is useful to avoid the retransmission of the same tag for a time equal to the *tag filtering time*. By default, the *Tag Filtering Time* is set to 0 and the tag is transmitted at each reading. For example, if *tag filtering time* is set to 5s and a tag is read, it is transmitted the first time then it will be retransmitted after 5 seconds if read again.

EPC code parameters

Using the table below you can customize the text of the code displayed on the screen:

EPC CODE	FORMAT	OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
ENABLE	HEX						\r\n
BANK	FORMAT	OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
NONE	HEX						
NONE	HEX						
NONE	HEX						
NONE	HEX						

SAVE

Tab. 4.3: EPC Code parameters

- **EPC Code:** enable or disable. By default, the *EPC Code* is enabled and the EPC code is displayed on the screen. You can change the default value using the drop-down menu.
- **FORMAT:** In the HID profile you can set different EPC formats:
 - HEX: The EPC code is represented as a hexadecimal number. For example, an EPC Code of 96 bits long corresponds to 24 hexadecimal digits ($96/4=24$).
 - ASCII: The EPC code is interpreted as 8 bits at a time, each byte being represented as ASCII character. For example, an EPC Code of 96 bits corresponds to a string of 12 ASCII characters ($96/8 = 12$).

By default the EPC HID format is set to "HEX". You can change the default value using the drop-down menu.

- **OFFSET:** optional. The "offset" indicates after how many characters start counting the "length" value. By default the offset string is empty.
- **LENGTH:** number of characters of the EPC code to be displayed counting from the "offset". If not set, all the EPC code is displayed. By default the length string is empty.
- **GROUP:** the EPC code characters are grouped according to the value set in "group". By default the group string is empty.
- **SEPARATOR:** separator used to distinguish groups. By default the separator string is empty.
- **PREFIX:** The PREFIX option permits to specify a string of maximum 7 characters to add before the EPC when a tag is read.

The following list shows the accepted characters for the prefix:

'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z', 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z', '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', '{', '|', '}', '!', '"', '#', '\$', '(', ')', '*', '+', ',', '-', '.', ':', ';', '=', '?', '@', '[', ']', '^', '_', '`', ' '.

By default the prefix string is empty.



Warning: if you are using a qwerty keyboard, pay attention that it is a **standard** qwerty keyboard because if not the conversion of symbols could create display problems.

- **POSTFIX:** The POSTFIX option permits to specify a string of maximum 7 characters to add after the EPC when a tag is read.

The following list shows the accepted characters for the postfix:

'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z', 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z', '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', '{', '|', '}', '!', '"', '#', '\$', '(', ')', '*', '+', ',', '-', '.', ':', ';', '=', '?', '@', '[', ']', '^', '_', '`', ' '.

By default the postfix string is \r\n (see the following table *Tab. 4.4: Escape Sequences supported* page 34).



Warning: if you are using a qwerty keyboard, pay attention that it is a **standard** qwerty keyboard because if not the conversion of symbols could create display problems.

Escape Sequences	Description
\n	Newline (Line Feed)
\r	Carriage Return
\t	Horizontal Tab
\v	Vertical Tab
\\	Backslash

Tab. 4.4: Escape Sequences supported

Using the second part of the *Tab. 4.3: EPC Code parameters* page 33, the same parameters (Format, Offset, Length, Group, Separator, Prefix, Postfix) can be set for individual memory banks (RESERVED, EPC, TID and USER).



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

EXAMPLES

Consider the following EPC MEMORY CONTENT (RAW):

0x41 0x42 0x43 0x44 0x45 0x46 0x47 0x48 0x49 0x4A 0x4B 0x4C

HEX FORMAT: 4142434445464748494A4B4C

OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
1	6	1	-		.

Result:

1-4-2-4-3-4.

OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
3	14	2	:	00	

Result:

0024:34:44:54:64:74:84

OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
4	20			CAEN	-

Result:

CAEN434445464748494A4B4C-

ASCII FORMAT: ABCDEFGHIJKL

OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
1	6	1	-	-	

Result:

-B-C-D-E-F-G

OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
3	6	2	:	-	-

Result:

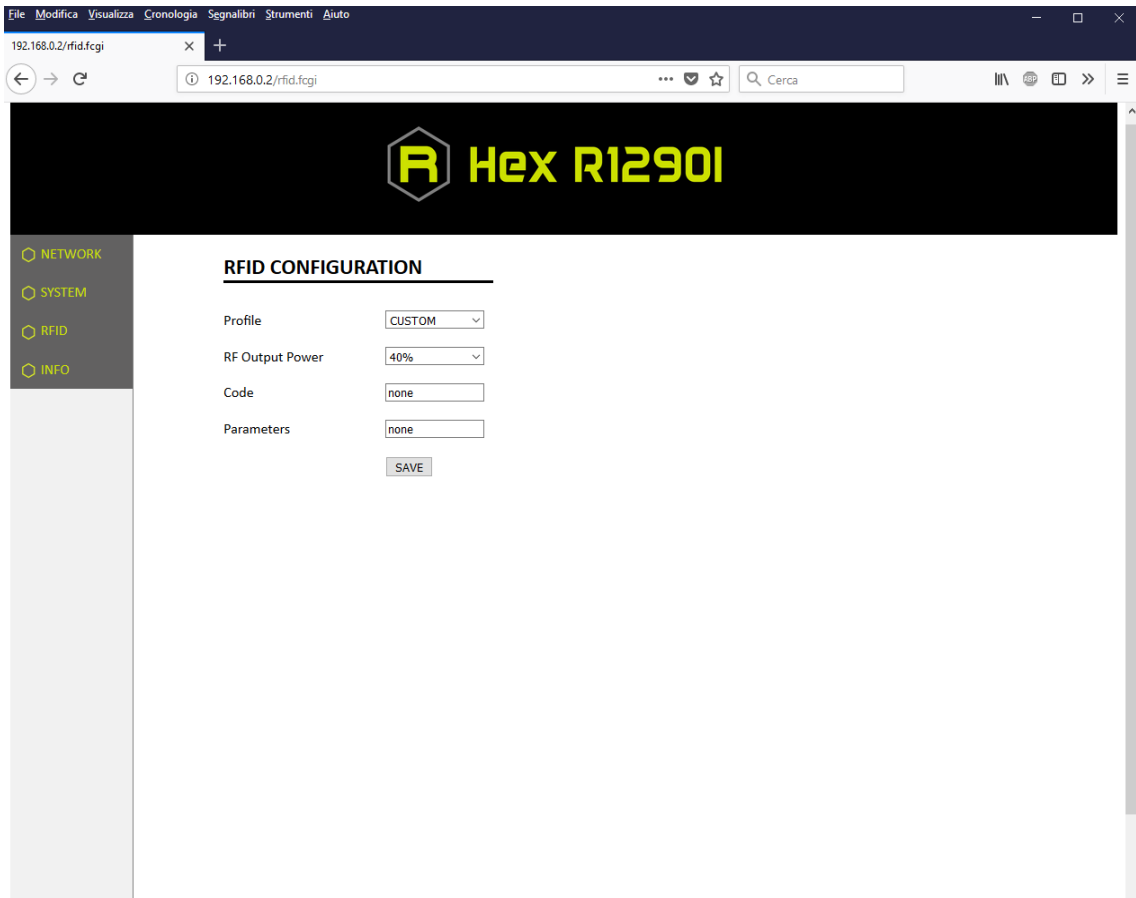
-DE:FG:HI-

OFFSET	LENGTH	GROUP	SEPARATOR	PREFIX	POSTFIX
				Tag	CAEN

Result:

TagABCDEFGHIJKLCAEN

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 40%. 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 (mW)	Radiated Power ETSI (mW e.r.p.)	Radiated Power FCC (mW e.r.p.)
5%	25	16	18
10%	50	32	36
20%	100	64	72
40%	200	128	144
60%	300	192	215
80%	400	256	287
100%	500	320	359

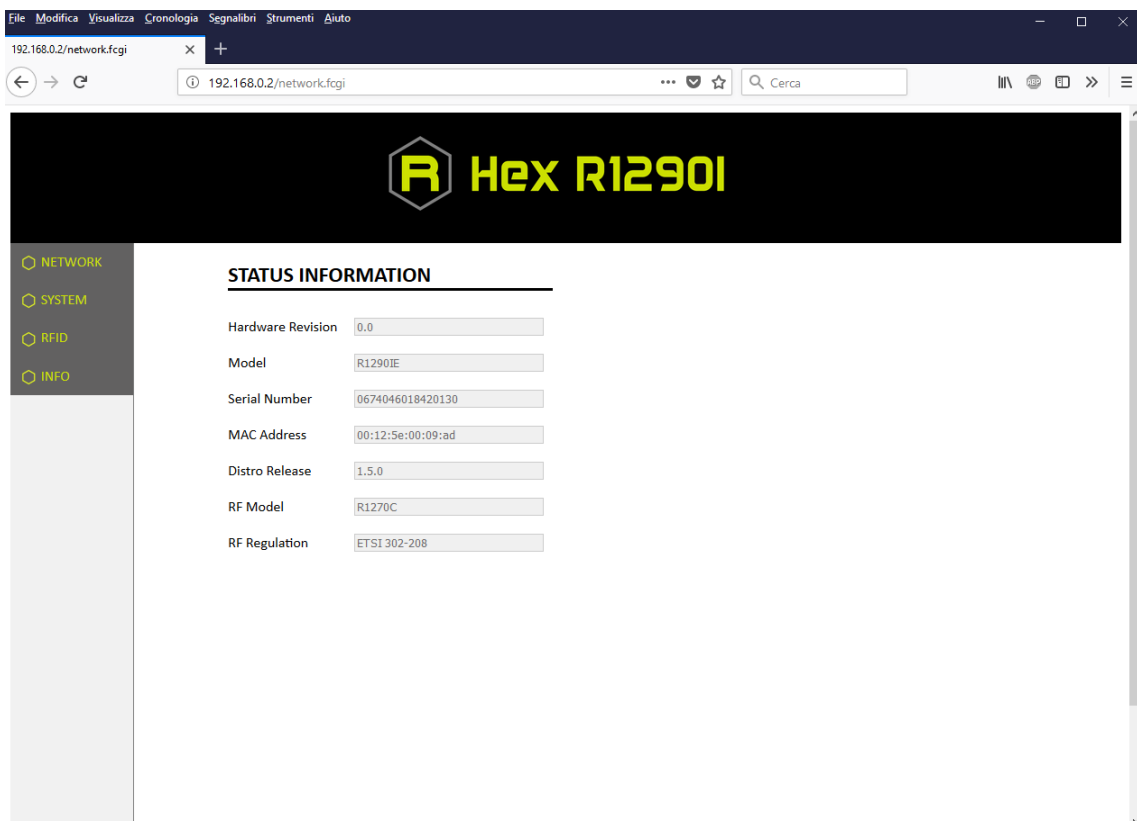
Tab. 4.5: Conducted power- radiated power

- **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 reboot of the reader. Click on *SYSTEM* option in the Web Interface panel and then click on the “Reboot” button. After reboot, the new settings are active.

INFO



STATUS INFORMATION	
Hardware Revision	0.0
Model	R1290IE
Serial Number	0674046018420130
MAC Address	00:12:5e:00:09:ad
Distro Release	1.5.0
RF Model	R1270C
RF Regulation	ETSI 302-208

The INFO submenu options are the following:

- **Hardware Revision:** the hardware revision of the reader
- **Model:** the model name (e.g. R1290IU)
- **Serial Number:** the reader serial number (16 numbers)
- **MAC Address:** the reader MAC address
- **Distro Release:** the distribution firmware release of the reader
- **RF Model:** the internal RF module model, R1270C
- **RF Regulation:** the reader regulation (e.g. FCCUS)

5 EASY2READ PROFILE

Introduction

By default, the reader profile is set to *easy2read*. 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 § *Easy2Rd opt.* paragraph page 20 (configuration via web interface), or to the § *Easy2Rd opt.* paragraph page 20 (configuration via reader).



Warning: By default the reader is in the *easy2read* profile.

If your reader is in the **HID** or **CUSTOM** profile active, in order to set the EASY2READ profile, please refer to § *RFID* paragraph page 20 (configuration via reader) or § *RFID* paragraph page 28 (configuration via web interface).

The Hex reader can be connected to a PC using an Ethernet cable or the USB port.

Connecting to the Hex Reader using the Ethernet port

Ethernet Communication Setup

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

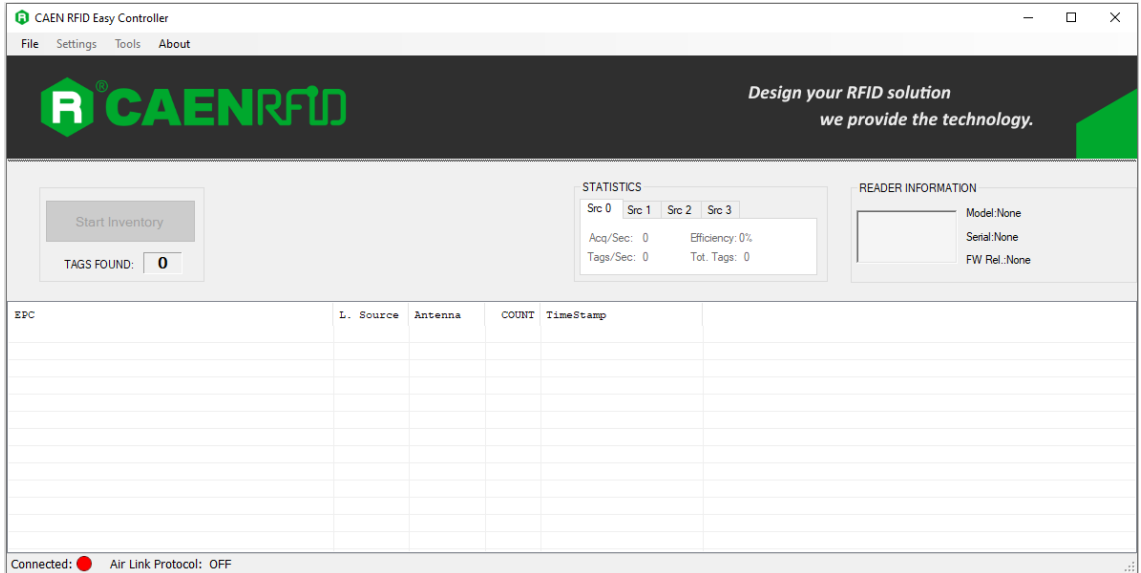
1. Connect the Hex to the power supply, the power LED will turn on, wait about 25 seconds until you hear a beep, wait 15 seconds again until the screen will inform you that the reader is ready to work with the *easy2read* profile active.
2. Plug an Ethernet cable (not provided) into your computer and connect the other end of the Ethernet cable to the reader. By default, the Hex R1290I is configured with the static IP address 192.168.0.2. If your private network matches the default network configuration of the reader you can connect to it. Otherwise you can either change the network configuration of the reader (see § *NETWORK* page 19) to connect it to your network or disconnect your PC from your network and connect it to the network of the reader.

Now you can use the [CAEN RFID Easy Controller](#) Application to control the reader. For details refer to § *Easy Controller* page 39.

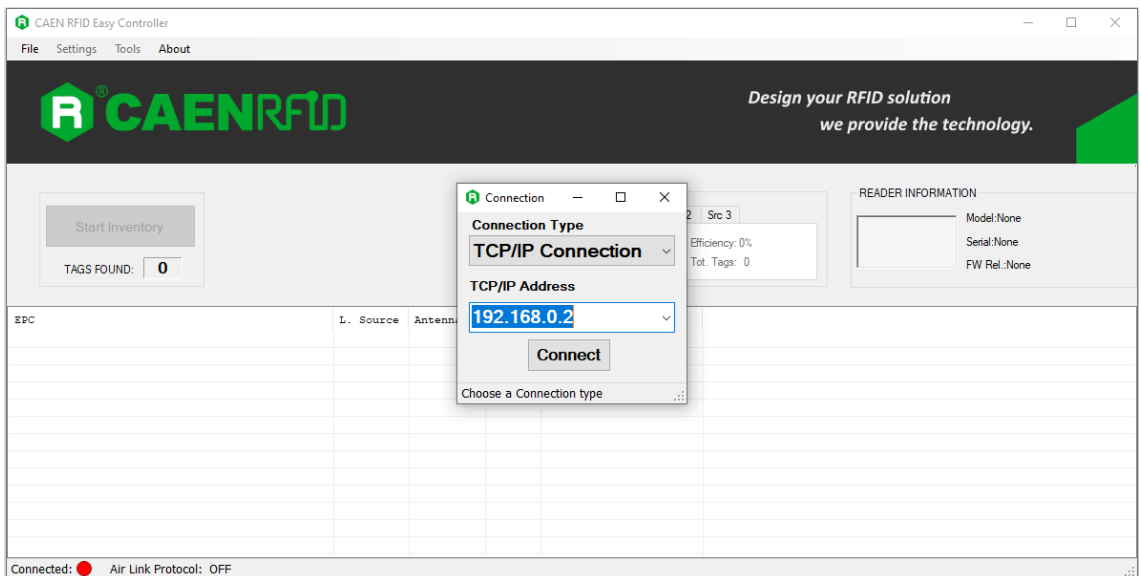
Easy Controller

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

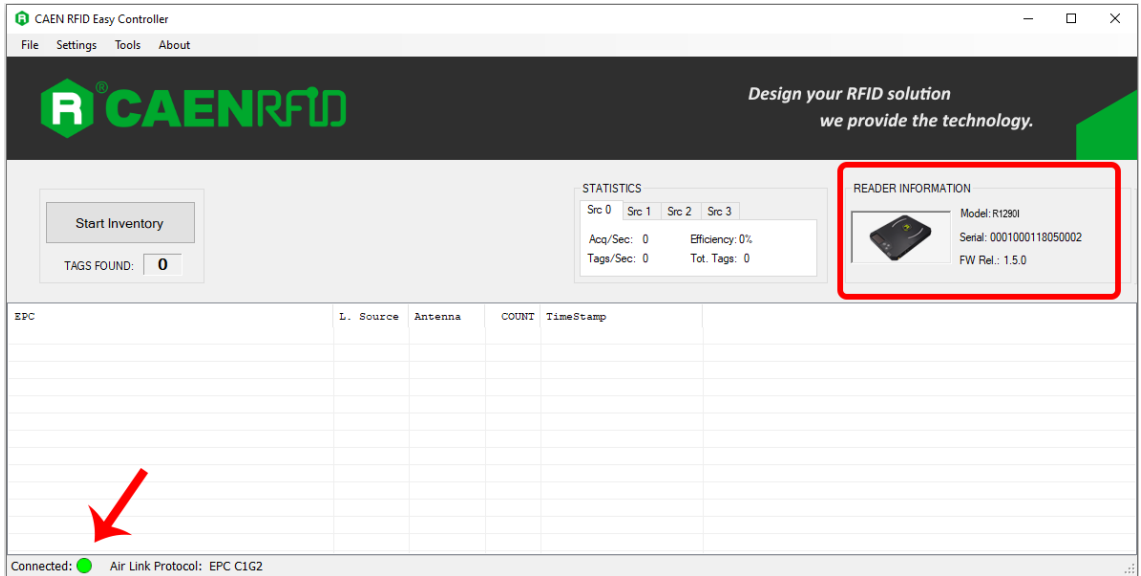
1. Download the latest version of the *Easy Controller software* from the [Hex R1290I web page](#), *Downloads* section and install it.
2. Launch the *Easy Controller* application:



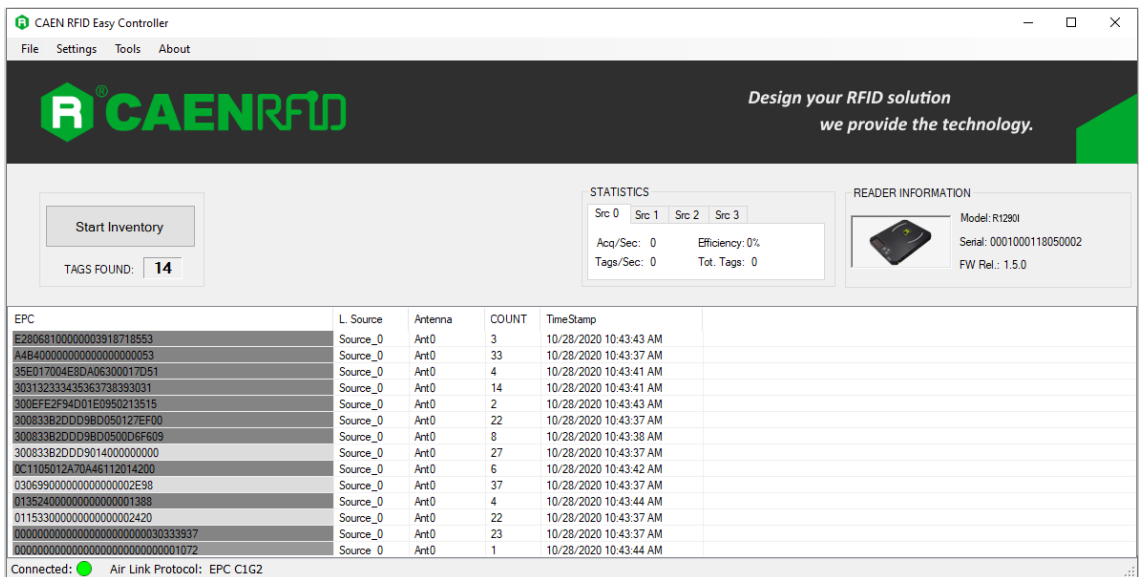
3. On the main screen click on *File* → *Connect*. A Connection windows will open. Select the *Connection Type* (TCP/IP Connection) and type the Hex IP address into the *TCP/IP Address* box (default value is 192.168.0.2). Then click on *Connect*:



- 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:



- Place a tag on 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 [Hex R1290I web page](#), *Downloads* section or in the [Manual and Documents](#) web area.

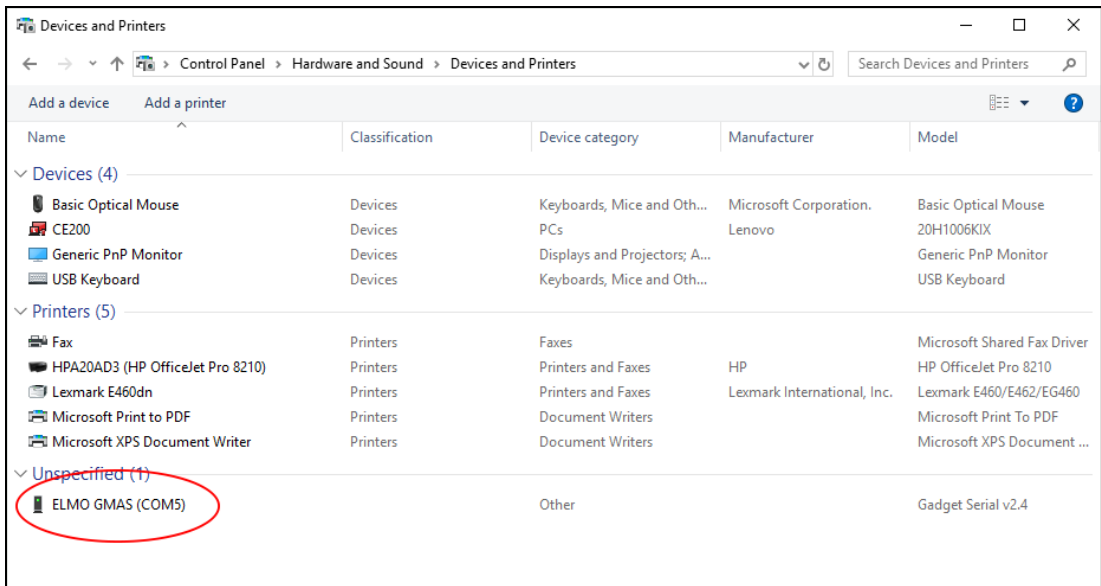
Connecting to the Hex Reader using the USB port

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 [Hex R1290I web page, Downloads](#) section or from the [Software and Firmware download area](#).

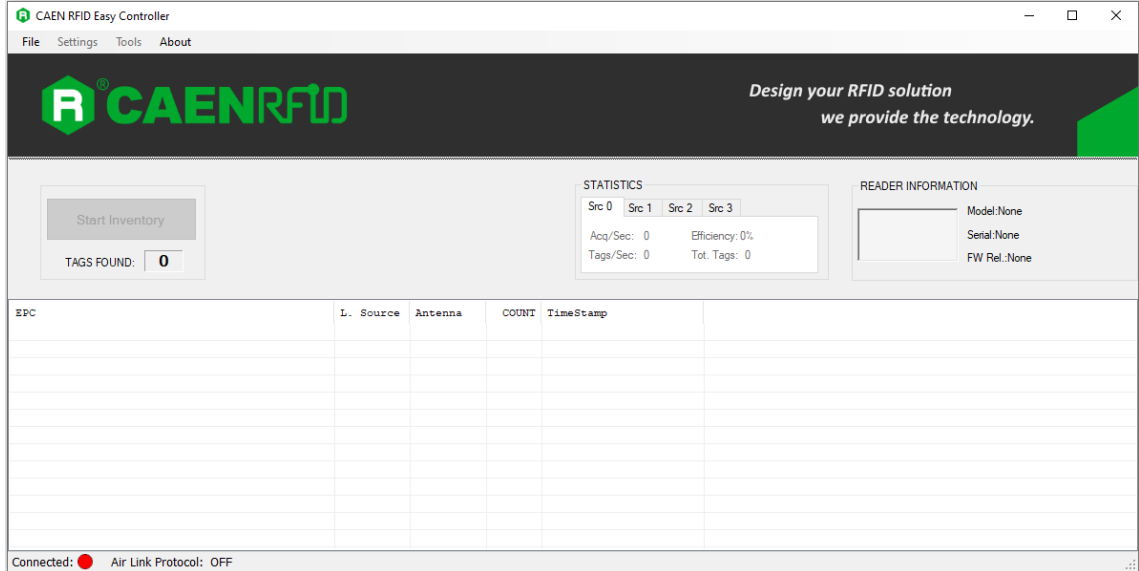
1. Check for the supplied accessories (see § *Accessories* page 12). Plug the USB cable into your computer and connect the other end of the USB cable to the reader.
2. Connect the Hex to the power supply, the power LED will turn on, wait about 25 seconds until you hear a beep, wait 15 seconds again until 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):



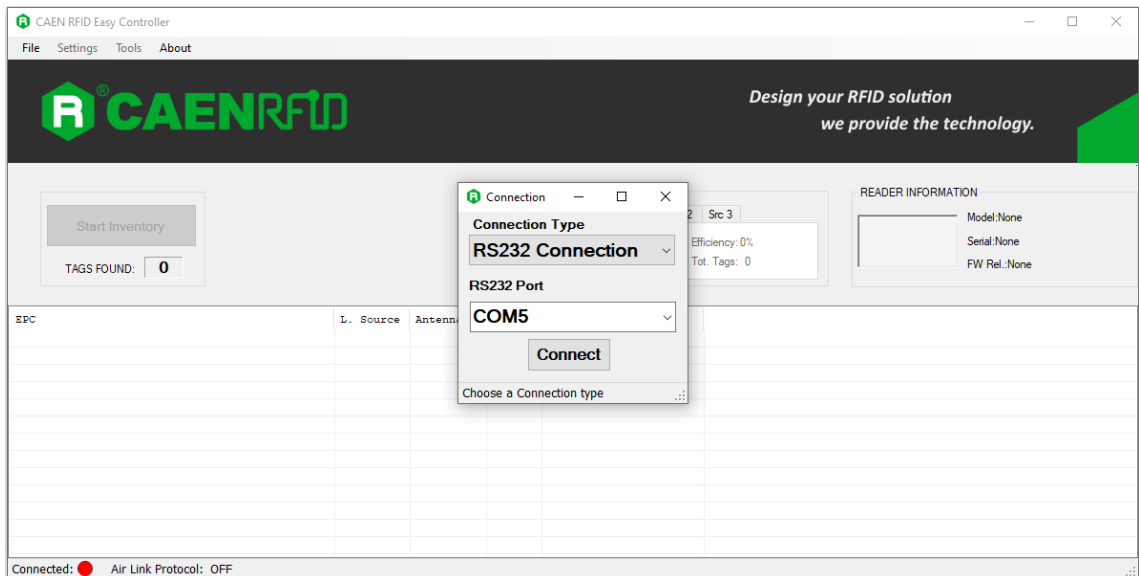
Easy Controller

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

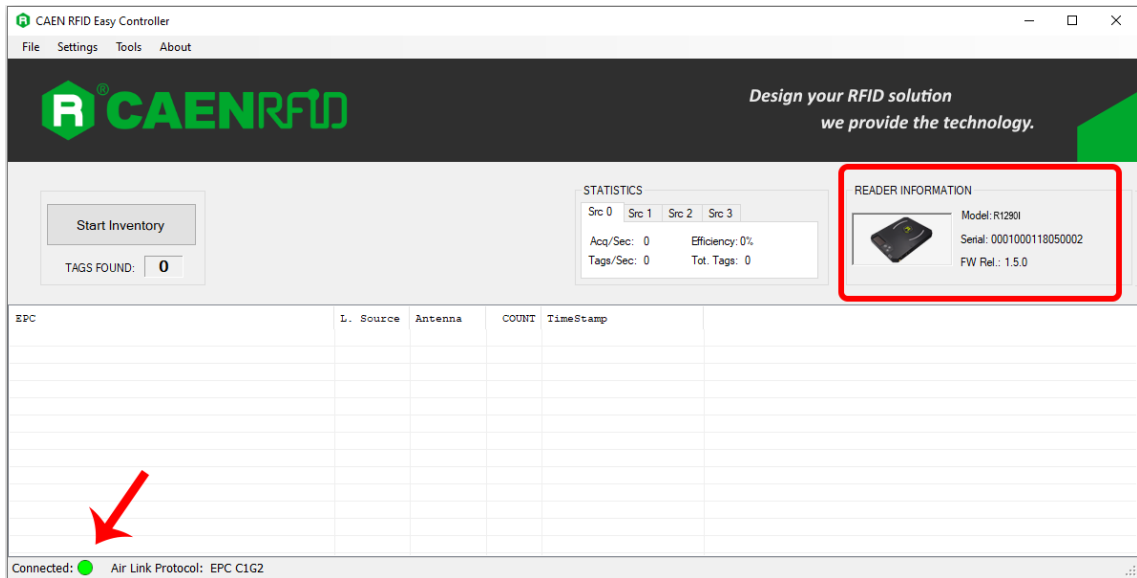
1. Download the latest version of the *Easy Controller software* from the [Hex R1290I web page](#), *Downloads* section and install it.
2. Launch the *Easy Controller* application:



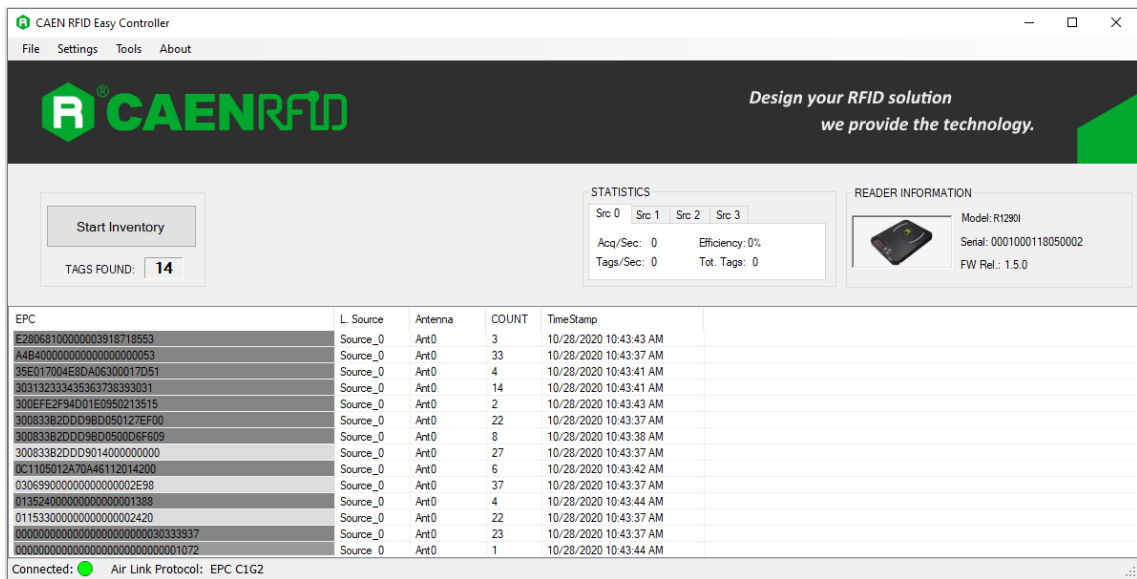
3. On the main screen click on *File* → *Connect*. A Connection window will open. Select the *Connection Type* (RS232) and specify the RS232 port (COM 5 in this example):



- 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:



- Place a tag on 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 [Hex R1290i web page](#), *Downloads* section or in the [Manual and Documents](#) web area.

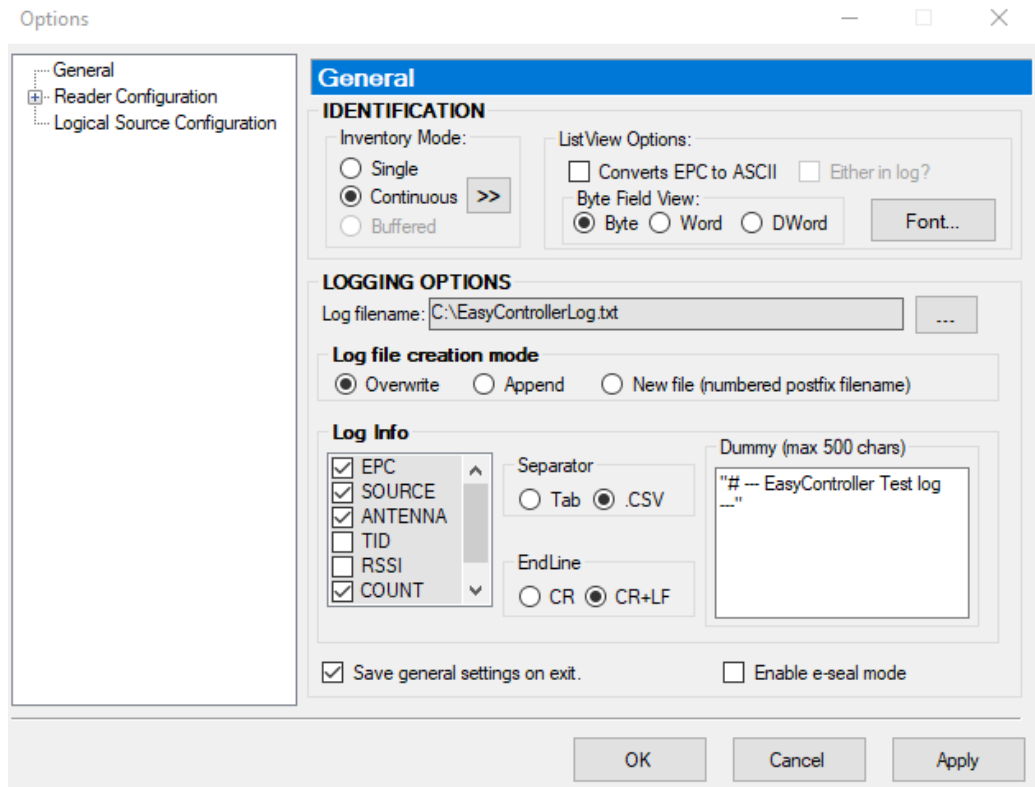
Inventory on button press

The inventory on button press can be enabled to perform the tag inventory just by pressing the trigger button of the reader.



In the easy2read profile it is necessary a **double** activation to perform the inventory on button press:

1. Activation **via reader Configuration Menu** (see § *RFID* paragraph page 20) or via Web Interface (see § *RFID* paragraph page 28).
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*:



Options

General

IDENTIFICATION

Inventory Mode:

Single

Continuous >>

Buffered

List View Options:

Converts EPC to ASCII Either in log?

Byte Field View:

Byte Word DWord

LOGGING OPTIONS

Log filename: C:\EasyControllerLog.txt

Log file creation mode

Overwrite Append New file (numbered postfix filename)

Log Info

EPC

SOURCE

ANTENNA

TID

RSSI

COUNT

Separator:

Tab .CSV


EndLine:

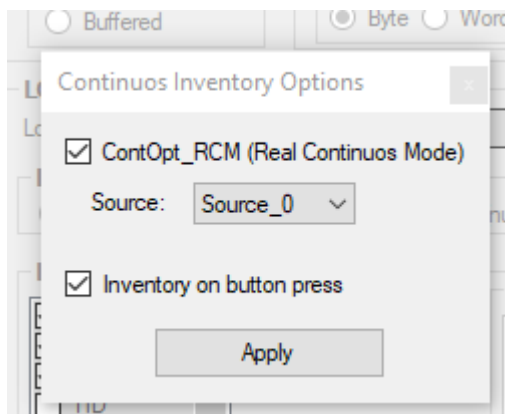
CR CR+LF

Dummy (max 500 chars)

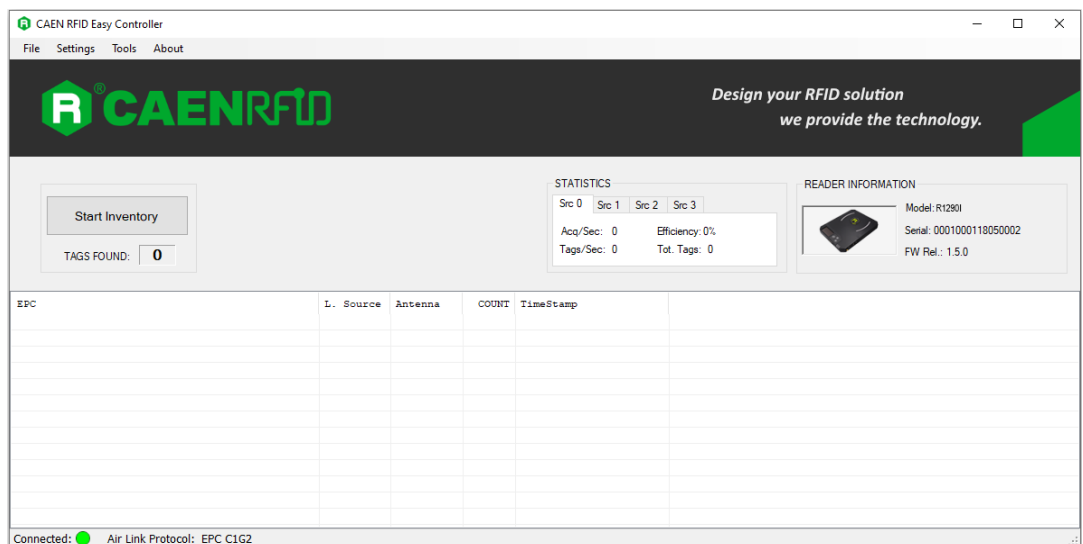
"# -- EasyController Test log
..."

Save general settings on exit. Enable e-seal mode

- 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*. Click on *Start Inventory* on the main window:



- d. Now you can press the trigger button to perform a tag inventory.

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 [Hex R1290I web page](#), *Downloads* section or in the [Manuals and Documents](#) web area.

6 HID PROFILE

Introduction

Warning: By default the reader is in the easy2read profile.



If your reader is in the **EASY2READ** or **CUSTOM** profile active, in order to set the HID profile, please refer to § *RFID* paragraph page 20 (configuration via reader) or § *RFID* paragraph page 28 (configuration via web interface).



Warning: Note that, when configured in the HID profile, the Hex R1290I reader cannot be controlled using the *CAEN RFID Easy Controller Application*.

To configure the reader when using the HID profile please refer to § *HID* paragraph page 31 (configuration via web interface), because the configuration via reader (§ *HID opt.* paragraph page 22) permits to access a restrict number of configuration parameters.

In the HID profile, the Hex reader can be connected to a PC **only** via USB.

USB Communication Setup

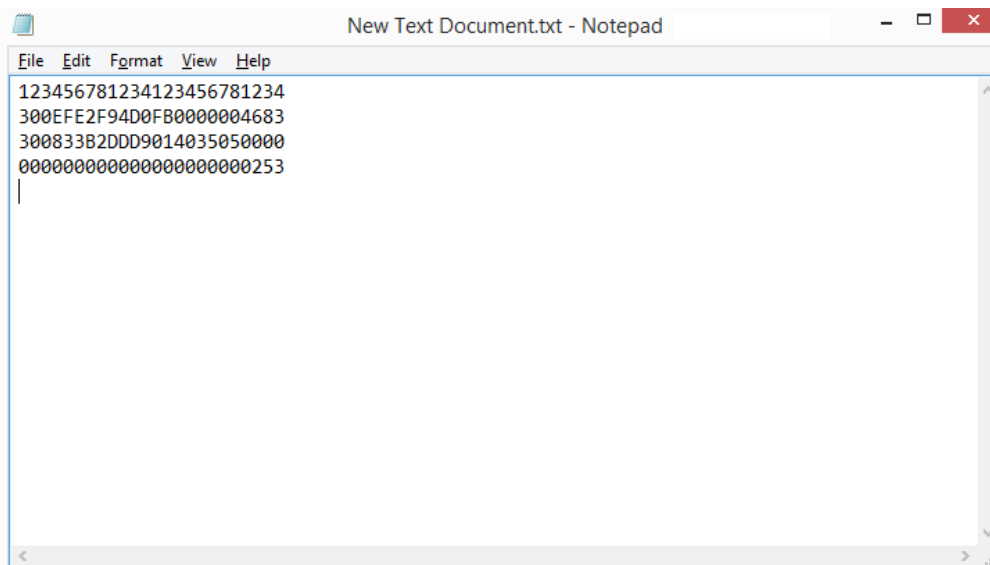
The Hex reader in the HID profile can be connected to a PC using the provided USB cable and it is detected by the PC as an emulated serial port.

1. Check for the supplied accessories (see § *Accessories* page 12). Plug the USB cable into your computer and connect the other end of the USB cable to the reader.
2. Connect the Hex to the power supply, the power LED will turn on, wait about 25 seconds until you hear a beep, wait 15 seconds again until the screen will inform you that the reader is ready to work with the *HID* profile.

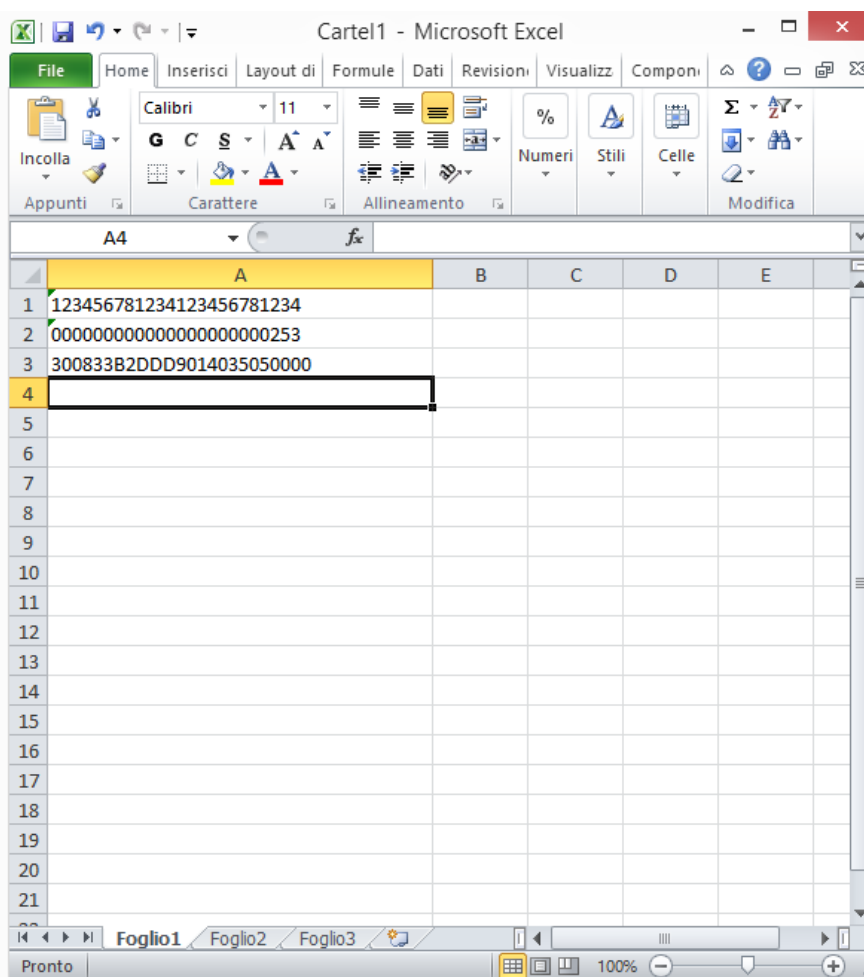
Making Inventory

1. Launch a text editing application (or any other application accepting keyboard input).
2. Put tags in the reader read range.
3. On the text editing window you will see the EPCs of the tags.

- Example with a .txt file:



- Example with Microsoft Excel:



- The EPCs of the tags are shown in the format defined in the § *HID* paragraph page 31 (configuration via web interface); using the *Tab. 4.3: EPC Code parameters* page 33 you can customize the text of the EPC code displayed on the screen.

7 CUSTOM PROFILE

Introduction

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



Warning: By default the reader is in the easy2read profile.

If your reader is in the **HID** or **EASY2READ** profile active, in order to set the CUSTOM profile, please refer to § *RFID* paragraph page 28 (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 36 (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 27 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.

8 READER RESET

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

1. Turn off the reader (disconnect the power supply), **wait about 10 seconds** then turn on the reader again (connect the power supply).
or
2. Connect the reader to the Web Interface (for more info see § *Configuration Using the Web Interface* page 24), select the *SYSTEM* option and then click on the "Reboot" button. Wait for the reboot to be completed.

9 FIRMWARE UPGRADE



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

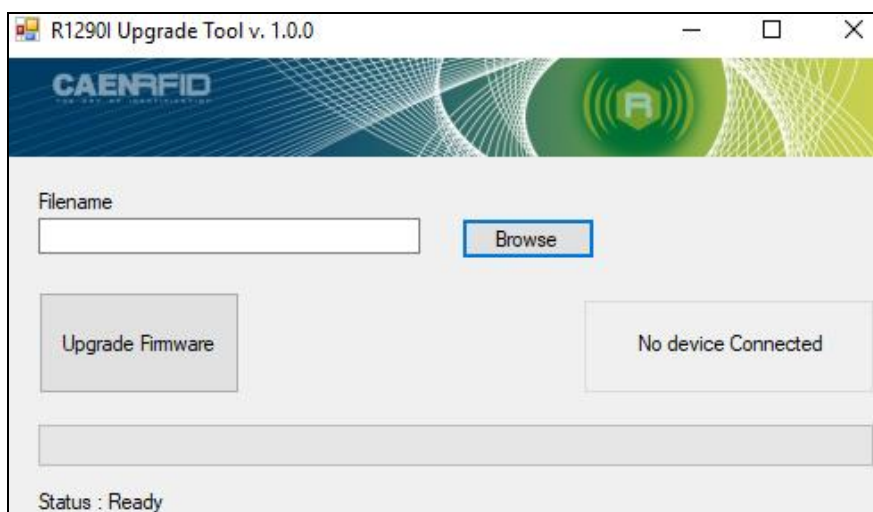
The Hex R1290I firmware upgrade can be performed only via USB.

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

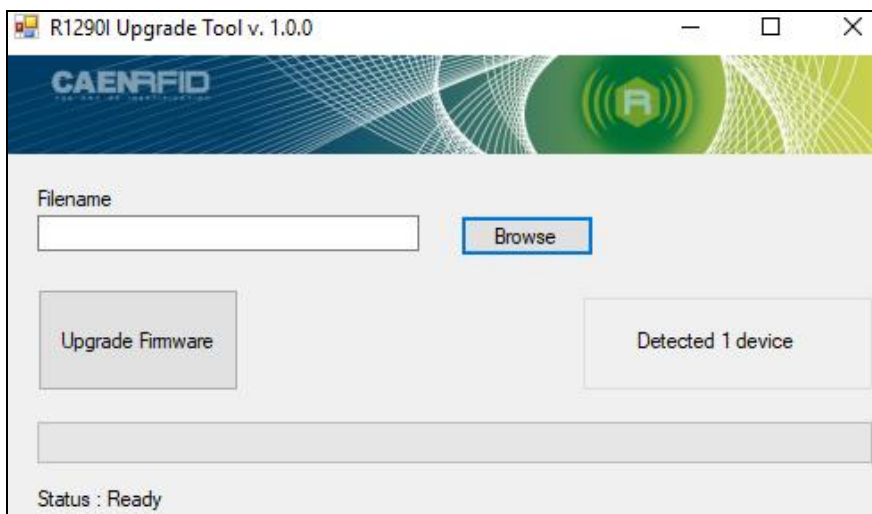
1. Download the *Hex Upgrade Tool* and the *firmware image file* at the [Hex R1290I web page](#) of the CAEN RFID Web Site, *Downloads* section.
2. Connect the Hex reader to your PC using the USB port.
3. Open the FW upgrade program:



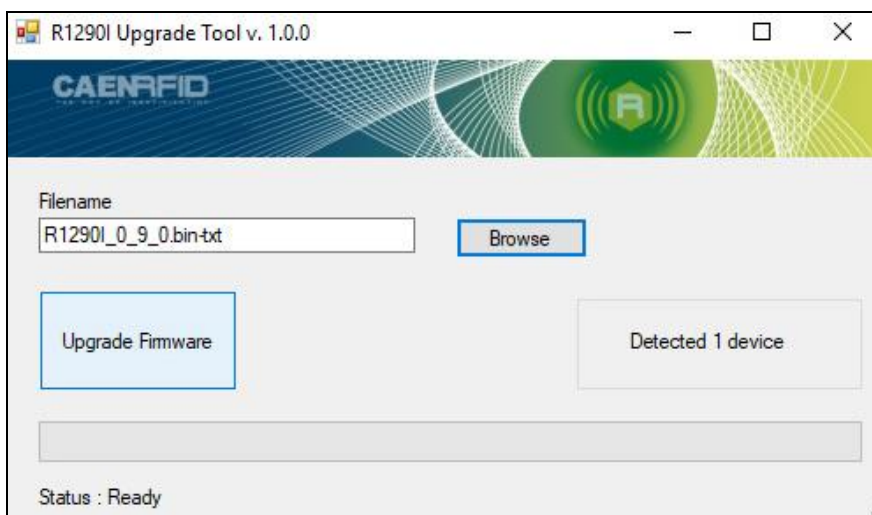
4. Click on *Next*. In the window you will see the message "No device Connected":



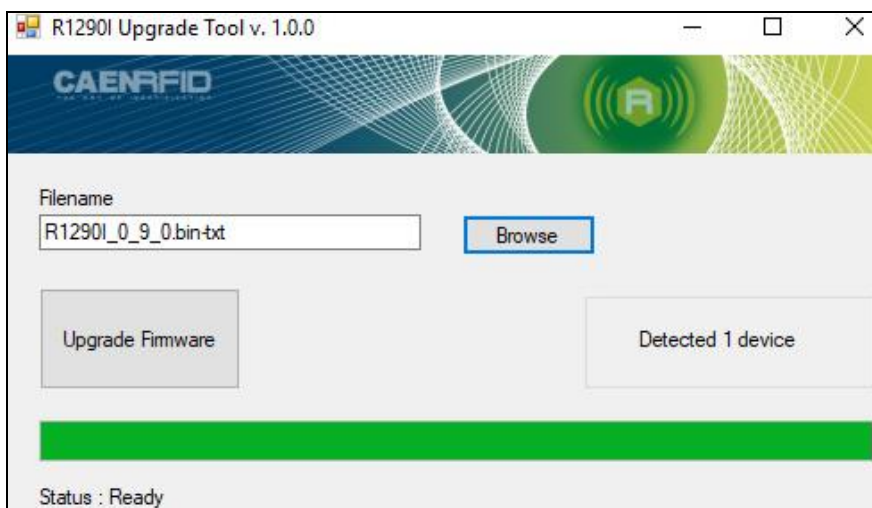
- To connect the reader, press simultaneously the *up* and the *down* button of the reader for about ten seconds. The “No device connected” box will turn into “Detected 1 device” and informs you that the reader is correctly connected to the upgrade program:



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



- 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”.
- 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 10 seconds** and then turn on the reader again (connect the power supply). Now the reader is ready to work with the new firmware upgraded.

10 TECHNICAL SPECIFICATIONS

Technical Specifications Table

Frequency Range	865.600÷867.600 MHz (ETSI EN 302 208 v3.1.1) (Mod: R1290IE) 902÷928 MHz (FCC part 15.247) (Mod: R1290IU)
RF Power (Integrated Antenna)	Programmable in 18 levels (1dB step) from 8 dBm ERP to 25 dBm ERP (Mod: R1290IE) Programmable in 18 levels (1dB step) from 8,5 dBm ERP to 25,5 dBm ERP (Mod: R1290IU)
RF Power (External Antenna Port)	Programmable in 18 levels (1dB step) from 10 dBm to 27 dBm
Number of Channels	4 channels (compliant to ETSI EN 302 208 v3.1.1) (Mod: R1290IE) 50 hopping channels (compliant to FCC part 15.247) (Mod: R1290IU)
Internal Antenna Gain	0,2dBi typ. (Mod: R1290IE) 0,7dBi typ. (Mod: R1290IU)
Internal Antenna Polarization	Circular
External Antenna Port Connector	SMA jack
Standard Compliance	EPC C1G2/ISO 18000-63
Read Range	Up to 100cm (typical)
CPU	ARM9 @ 400Mhz on Atmel AT91SAM9G25
User Device Interface	USB 2.0 Hi-Speed (480 Mbit/s) device port Virtual COM port parameters: – Baudrate: up to 115200 kbps – Databits: 8 – Stopbits: 1 – Parity: none – Flow control: none
Ethernet Interface	Ethernet 10/100/1000BASE-T (RJ45) POE standard IEEE 802.3af
User Interface	Button √ : OK / Trigger or other functions controlled by firmware Arrow up : scroll up or other functions controlled by firmware Arrow down : scroll down or other functions controlled by firmware Led #1: power indication (green : ON) Led#2: RF activity (yellow blinking: RF) Led#3: Tag-Identification (red blinking : TAG-ID) Led#Antenna: Tag-Identification (white blinking : TAG-ID) Buzzer: bitonal for events signaling Proximity sensor: trigger OLED display 2.42" monochromatic (white)
USB Host Interface	USB 2.0 High Speed Host Port max 500mA
I/O Interface	Push-in PCB terminals 1 digital Input 1 solid state photorelay output (500mA max)
Electrical Power	5V ± 5% – DC power supply (10W) POE standard IEEE 802.3af (12,95W)
IP Rating	IP30
Operating Temperature	-10 °C to +55 °C
Dimensions	(W)220 x (L)170 x (H)25mm ³ (8.66 x 6.69 x 0.98 inch ³)
Weight	475g

Tab. 10.1: Hex R1290I Technical Specifications



Warning: The RF settings must match the operating country/region 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.

Technical Drawings

The following drawings show the Hex R1290I reader from different points of view.

All dimensions are in millimeters.

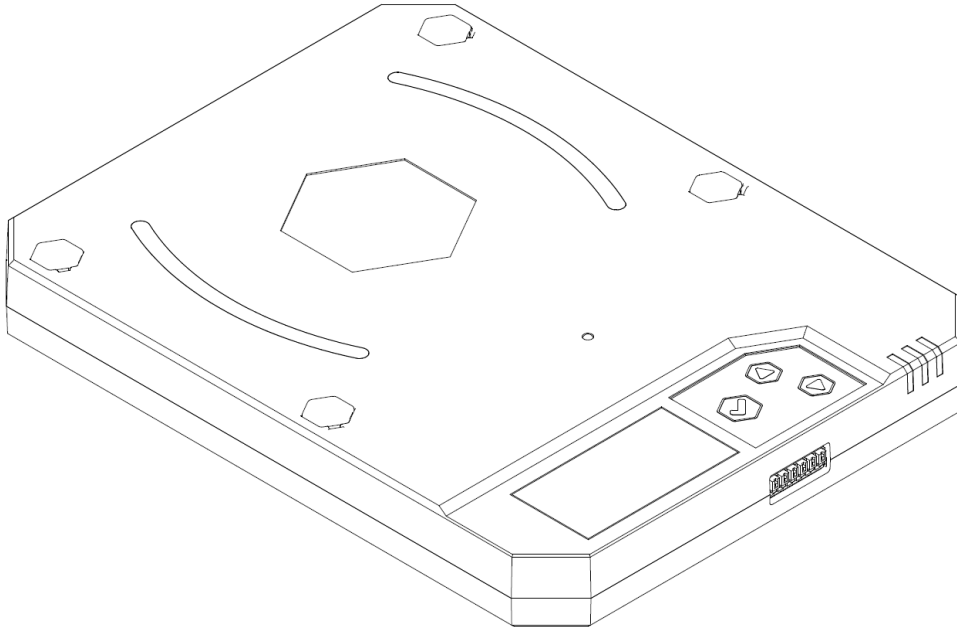


Fig. 10.1: Hex R1290I Technical Drawings – 3D view

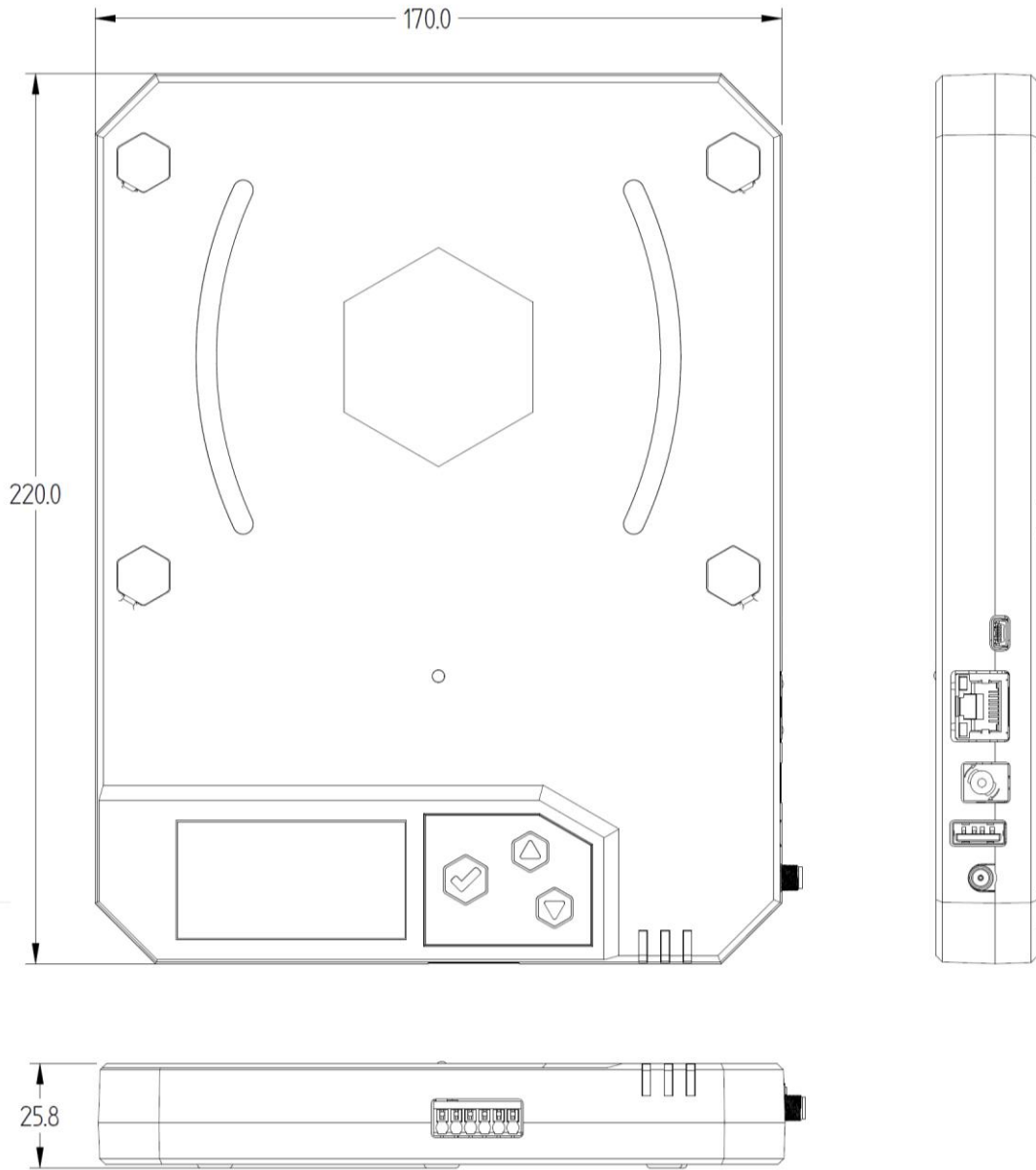


Fig. 10.2: Hex R1290I Technical Drawings

11 REGULATORY COMPLIANCE

CE Compliance

Reference standard:

ETSI EN 301 489-1 V2.2.3:2019

EN 55032:2015

ETSI EN 301 489-3 V2.1.1:2017

ETSI EN 302 208 V3.1.1:2017

EN 62368-1:2014 +/-AC:2015 +/-A11:2009 +/-A1:2010 +/-A2:2013 +/-A12:2011

CEI EN 50364:2011

See § **Hex R1290I CE DECLARATION OF CONFORMITY** page 59 for the Hex R1290I CE Compliance Certificate.



Warning: The CE compliance is guaranteed only if the reader is used as described in this manual

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 such that a minimum separation distance of 20cm is maintained between the reader and user's/nearby people's body.

See § **Hex R1290I FCC GRANT** page 60 for the Hex R1290I FCC Compliance Certificate.

RoHS EU Directive

The Hex R1290I RAIN RFID reader is compliant with the EU Directive 2015/863/EU on the Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS3).

HEX R1290I

CE DECLARATION OF CONFORMITY

We

CAEN RFID Srl
Via Vetraia, 11
55049 Viareggio (LU)
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: WR1290IEXAAA
Description: R1290IE - Hex - POE multipurpose UHF RFID Reader (ETSI)

corresponds in the submitted version to the following standards:

ETSI EN 301 489-1 V2.2.3:2019
EN 55032:2015
ETSI EN 301 489-3 V2.1.1:2017
ETSI EN 302 208 V3.1.1:2017
EN 62368-1:2014 +/AC:2015 +/A11:2009 +/A1:2010 +/A2:2013 +/A12:2011
CEI EN 50364:2011

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 2015/863/EU (RoHS3)

Date: 15/06/2021


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:



HEX R1290I FCC GRANT

TCB

**GRANT OF EQUIPMENT
AUTHORIZATION**

TCB

**Certification
Issued Under the Authority of the
Federal Communications Commission
By:**

EMCCert Dr. Rasek GmbH
Stoernhofer Berg 15
91364 Unterleinleiter,
Germany

Date of Grant: 11/28/2018
Application Dated: 11/28/2018

CAEN RFID srl
via Vetraia, 11 - 55049 Viareggio (LU) - ITALY
Viareggio, 55049
Italy

Attention: Adriano Bigongiari , CEO

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: UVECAENRFID025
Name of Grantee: CAEN RFID srl
Equipment Class: Part 15 Class B Computing Device Peripheral
Notes: R1290IU - Hex - Multipurpose RAIN RFID Reader

<u>Grant Notes</u>	<u>FCC Rule Parts</u>	<u>Frequency Range (MHZ)</u>	<u>Output Watts</u>	<u>Frequency Tolerance</u>	<u>Emission Designator</u>
	15B				

