

# qID R1240I

Fully integrated UHF RFID USB/Bluetooth Reader



easy2read®

**PRELIMINARY**



Technical Information Manual

Revision n. 01

13/09/2013

Visit [R1240I qID Web Page](#) and 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 qID R1240I UHF RFID USB/Bluetooth Reader.

## Change Document Record

Date	Revision	Changes	Pages
15 Nov 2012	00	Preliminary release	-
13 Sep 2013	01	Changed <i>Product Description</i> paragraph	6
		Added <i>Radiation Patterns</i> paragraph	22
		Added <i>qID R1240I Regulatory Compliance</i> chapter	23
		Modified <i>RF Power</i> and <i>Antenna Gain</i> in the <i>Technical Specifications Table</i>	20
		Added <i>Made for iPhone and iPad</i> logo	1
		Added information about <i>R1240I qID Web Page</i>	2
		Added <i>Fig. 1.2: qID R1240I UHF RFID USB/Bluetooth Reader with silicone cover</i>	6
		Modified <i>Ordering Options</i>	10
		Added <i>R1240I Development kit</i>	10
		Modified ETSI version in the <i>Technical Specifications Table</i>	20

## Reference Document

[RD1] EPCglobal: EPC Radio-Frequency Identity Protocols Class-1 Generation-2 UHF RFID Protocol for Communications at 860 MHz – 960 MHz, Version 1.1.0 (December 17, 2005).

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### **Preliminary Product Information**

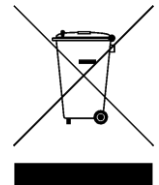
This document contains information for a new product. CAEN RFID reserves the right to modify this product without notice.

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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.



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# 1 Introduction

This Chapter gives general information about the **qID R1240I Reader**. It contains these topics:

- [Product Description](#)
- [Accessories](#)
- [Installation Notice](#)
- [Development kit](#)
- [Ordering Options](#)



## Product Description

The qID (Model R1240I), mobile reader of the easy2read© Family, is an UHF multiregional RFID reader with integrated antenna for short to medium range applications. It is compliant with ISO 18000-6C/EPC C1G2 standards.

The reader hosts an internal rechargeable battery and can operate both in wired mode, using a USB cable, or in wireless mode through the Bluetooth® interface.

Thanks to the Bluetooth® communication interface, the R1240I is a perfect add-on for any Bluetooth® enabled host such as a PC, a smartphone, a PDA or a tablet for UHF RFID readings. The reader is compatible with Windows XP/7, Windows CE/Mobile, Android, iPhone and iPad.

The reader can also operate in “Batch Mode”, allowing to store up to 500.000 EPC codes into the internal memory when the communication links (USB or Bluetooth®) are not available.

An optional 1D/2D barcode imager enables the qID to read most of the barcode standards. This enables the qID to be the perfect identification device in mixed barcode/RFID labels environment.

When paired to a smartphone or a tablet, the qID is a cost effective alternative to more expensive handheld devices.

Designed for mobile operators in indoor or outdoor areas, the qID is ideal for inventory management, field sales mobility, service and maintenance applications.



Fig. 1.1: qID R1240I UHF RFID USB/Bluetooth Reader



Fig. 1.2: qID R1240I UHF RFID USB/Bluetooth Reader with silicone cover

## Front panel

The qID R1240I front panel houses the following LEDs and buttons (see figure below):

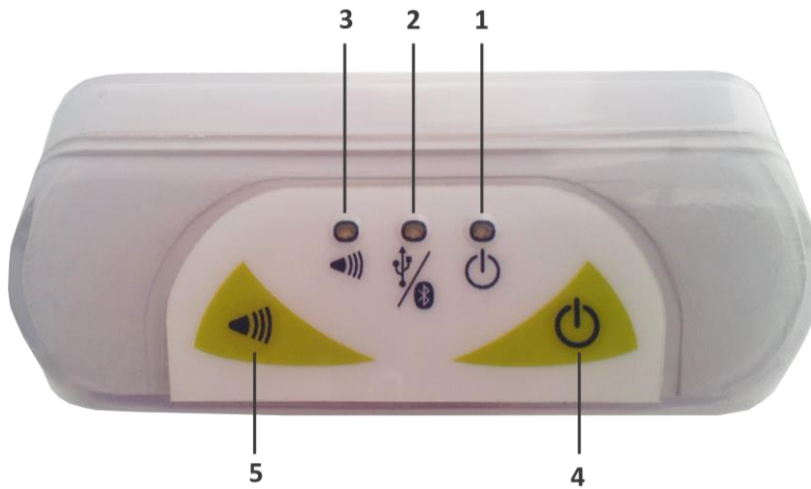


Fig. 1.3: qID R1240I Front Panel

No.	Name	Description
1	Power LED	Indicates the reader status and battery level (see § Tab. 1.2: qID R1240I Power LED Status Table)
2	Link LED	Indicates the USB/Bluetooth communication status (see § Tab. 1.3: qID R1240I USB/Bluetooth LED status table)
3	Trigger LED	A green blink indicates a successfully executed operation, a red blink a failure
4	Power button	Press the button to switch on the reader, press for at least 2 seconds to switch it off
5	Trigger button	A single press of the trigger button executes an inventory cycle, pressing for more than 1 second starts a continuous inventory process

Tab. 1.1: qID R1240I Front Panel LEDs and Buttons

Status	Description
Steady green	Reader is active and battery if fully charged
Blinking green	Reader is in std-by and battery is fully charged
Steady orange	Reader is active and battery is discharging
Blinking orange	Reader is in std-by and battery is discharging
Steady red	Reader is active and battery is almost empty
Blinking red	Reader is in std-by and battery is almost empty

Tab. 1.2: qID R1240I Power LED Status Table

Status	Description
OFF	No connection established
Steady orange	USB cable connected (both to a PC or to the AC power adapter)
Blinking orange	USB communication on going
Steady blue	Bluetooth connected
Blinking blue	Bluetooth communication on going

Tab. 1.3: qID R1240I USB/Bluetooth LED status table

## USB connector

A micro USB Type B socket connector is located in the bottom side of qID R1240I and can be used to connect the reader to an USB host port or to an AC/DC battery charger.

In case the reader is connected to a standard USB port the battery charge is performed at 500mA max. (slow charge mode), in case it is connected to the AC/DC adapter charge current is 1A max. (fast charge mode).

Please consider that when the reader is attached to a PC via USB cable, the battery recharge is active only with device in stand-by mode (power LED blinking orange).

## Accessories

Check for the supplied accessories below:



Fig. 1.4: qID R1240I Accessories



## Installation Notice

To insert the strap in the qID, please follow the instructions shown in the figures:

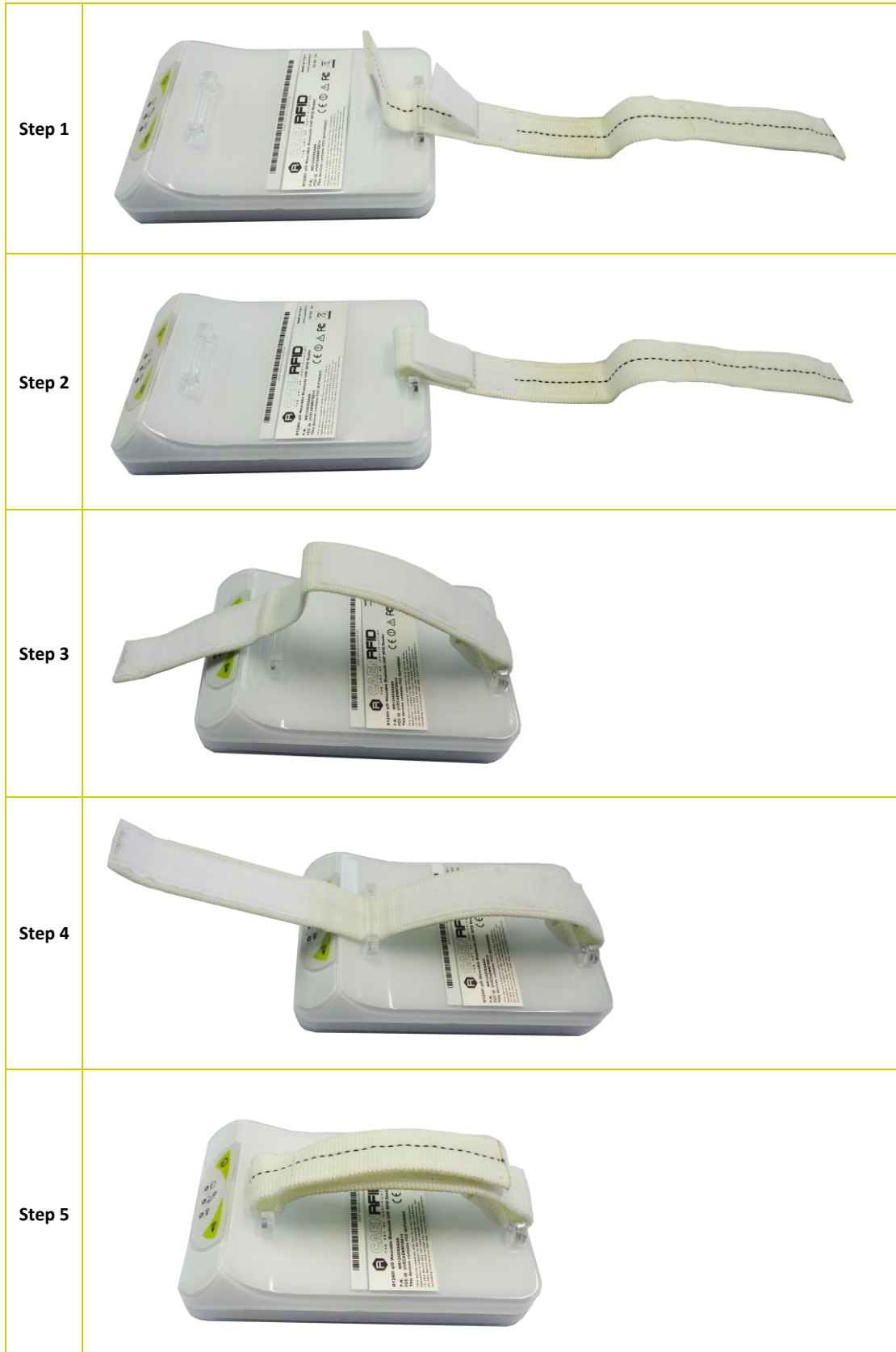


Fig. 1.5: qID R1240I – Inserting the strap

## Development kit

[R1240IDK – qID Fully integrated UHF RFID USB/Bluetooth Reader Development Kit](#) is available:



Fig. 1.6: R1240IDK – qID Fully integrated UHF RFID USB/Bluetooth Reader Development Kit

The R1240I qID reader development kit is a complete RFID set up, for a quick implementation of RFID solutions. It includes:

- n. 1 [R1240I \(qID\) Fully integrated UHF RFID USB/Bluetooth Reader](#)
- n. 1 [Set of Labels](#)
- n. 1 [A927Z Temperature Logger Tag](#)
- n. 1 [RT0005 Temperature Logger Tag](#)
- n. 1 [Silicone Cover](#)
- n. 1 Power supply
- n. 1 USB cable

## Ordering Options

	Code	Description
Reader	<a href="#">WR1240IXAAAA</a>	R1240I - qID – Wearable Bluetooth UHF RFID Reader
	<a href="#">WR1240IXBAAA</a>	R1240IB - qID – Wearable Bluetooth UHF RFID/BARCODE Reader
Accessories	<a href="#">EACCESCDRF06</a>	R1240I Silicone Cover
Development kit	<a href="#">WR1240IDKAAA</a>	R1240IDK - Development kit with R1240I reader, silicone cover and demo tags
	<a href="#">WR1240IDKBAA</a>	R1240IDKB - Development kit with R1240I Barcode reader, silicone cover and demo tags

Note: If you are interested on FCC module, please contact our sales office (e-mail: [info@caenrfid.com](mailto:info@caenrfid.com), phone number: +39.0584.388.398).

## 2 Getting Started

This chapter provides simple steps to quickly start using the **qID R1240I Reader**. It contains these topics:

- [Introduction](#)
- [Installing the USB Virtual COM port driver](#)
- [Bluetooth communication setup](#)
- [Connecting the qID reader](#)



## Introduction

This quickstart guide will help you to get started with your qID (Model R1240I/R1240IB) reader.

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

## Installing the USB Virtual COM port driver

The qID reader can be connected to a PC using the provided USB cable and it is detected by the PC as an emulated serial port. In order to correctly operate with the reader you need to install a device driver.

In order to connect the qID reader to the PC you need to install the VCP (Virtual Com Port) drivers for your operating system. You can download VCP drivers for Windows based systems from the CAEN RFID Web Site at the [Software and Firmware download area](#).

Please double click on the installation executable VCP\_V1.3.1\_Setup.exe or VCP\_V1.3.1\_Setup\_x64.exe (only for 64-bit Windows systems) and follow the guided procedure.

## Bluetooth communication setup

The preferred communication interface of the qID reader is the Bluetooth link using the SPP profile (Serial Port Profile).

After powering on the reader, the Bluetooth interface is available to accept incoming connection requests (discoverable) from Bluetooth enabled hosts like PCs, PDAs, Tablets, Smartphones and so on.

When discovered by the host, the qID reader can be identified by its Bluetooth device name and paired using the pass-key; both parameters are provided below:

- Bluetooth device name: "qID-" + device serial number
- Pass-key: 0000

## Connecting the qID reader

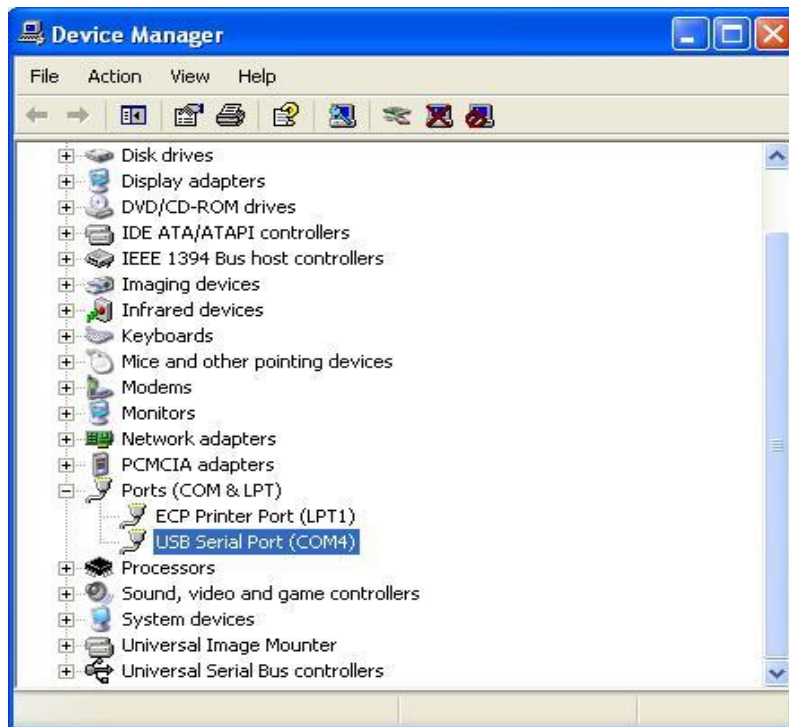
Both USB and Bluetooth interface creates virtual COM ports on the host PC that can be used to connect to the reader with the CAEN RFID Easy Controller application.

### Connecting the qID using the Easy Controller for Windows

1. Download from the CAEN RFID web site the latest version of the CAEN RFID [Easy Controller for Windows](#) software and install it.
2. Connect the qID reader to your pc using the either the USB or Bluetooth connection.
3. Open the System properties (right click on *My computer* icon) → *Hardware* → *Device Manager*.



4. Look for the emulated serial port in the "Ports (COM & LPT)": it can be "USB serial port (COM X)" or "BT Port (COMX)" depending on the interface used.



5. Launch the CAEN RFID Easy Controller application.
6. On the main application window click on *File* → *Connect*; the connection dialog box will appear.
7. Select *RS232* from the *Connection Type* combo box and the right COM port number from the *RS232 Port* combo box.
8. Click on *Connect*.
9. Place a tag in front of the reader and click on *Start Inventory* to 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 CAEN RFID [Easy Controller for Windows](#) web page or in the [Manual and Documents](#) web area.

A CAEN RFID *Easy Controller for Android* application is also available. For more information please refer to the CAEN RFID [Easy Controller for Android](#) web page.

# 3 qID R1240I Firmware Upgrade

This Chapter describes the **qID R1240I Reader** firmware upgrade procedure.



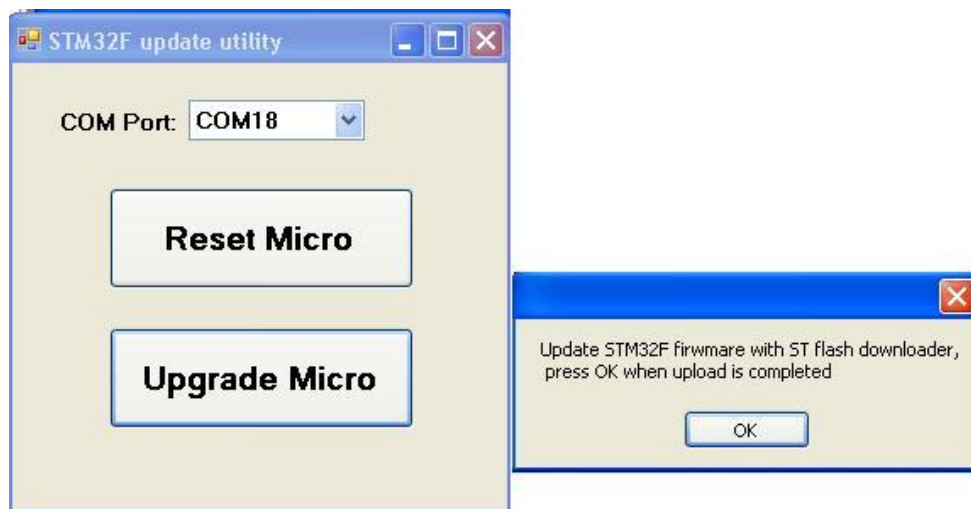
## Firmware Upgrade

The qID R1240I Upgrade Tool is available for free at [qID R1240I page](#) or in the [Software and Firmware Area](#) of the CAEN RFID Web Site (download the *R1240I Suit* zip file).

The qID R1240I firmware upgrade can be managed via Bluetooth.

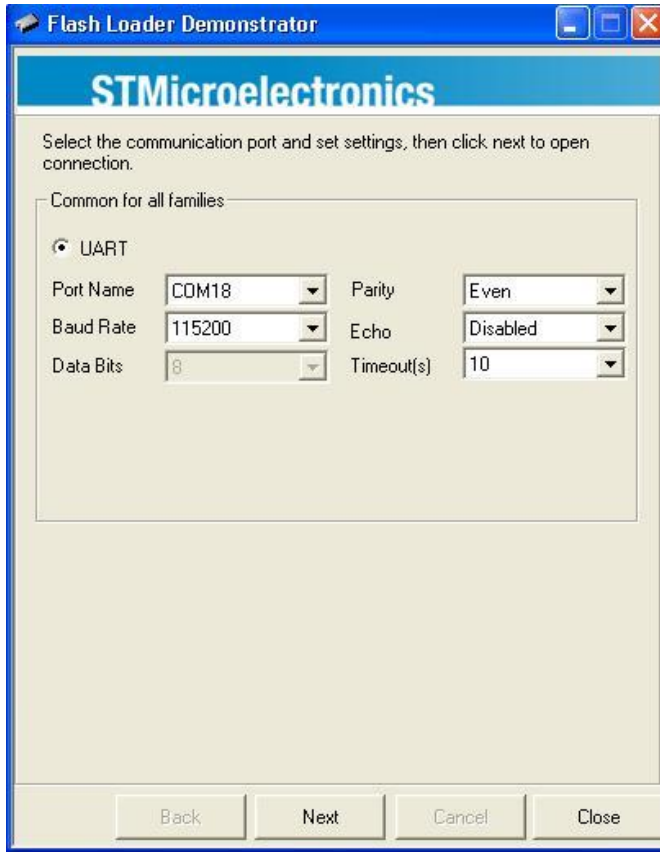
In order to upgrade the firmware, follow the steps below:

1. Download the *R1240I Suit* zip file from the [qID R1240I page](#) or in the [Software and Firmware Area](#) from CAEN RFID Web Site and unzip it. The zip file contents: the *Flash Loader Demonstrator*, the *R1240I\_Upgrade* tool and the .bin firmware upgrade image.
2. Install the *Flash Loader Demonstrator*.
3. Run the program *R1240I\_Upgrade*, select the reader port to be updated (COM Bluetooth) and press *Upgrade Micro*. Wait a few seconds for the appearance of the dialog box as in Figure STM32Fupdate. Please pay attention to the fact that *OK* at this stage must not be pressed (it is pressed only at the end of the entire procedure in step 8).

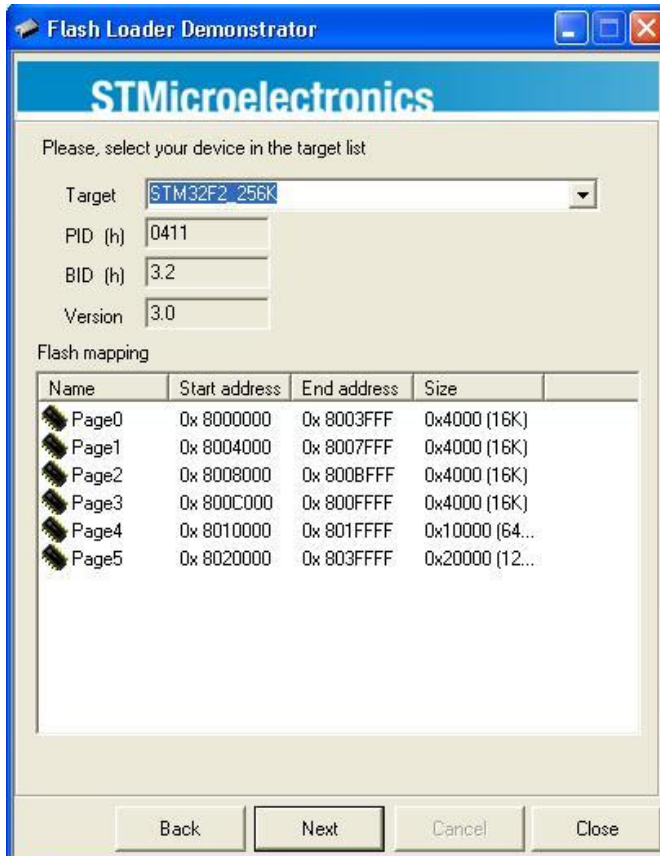




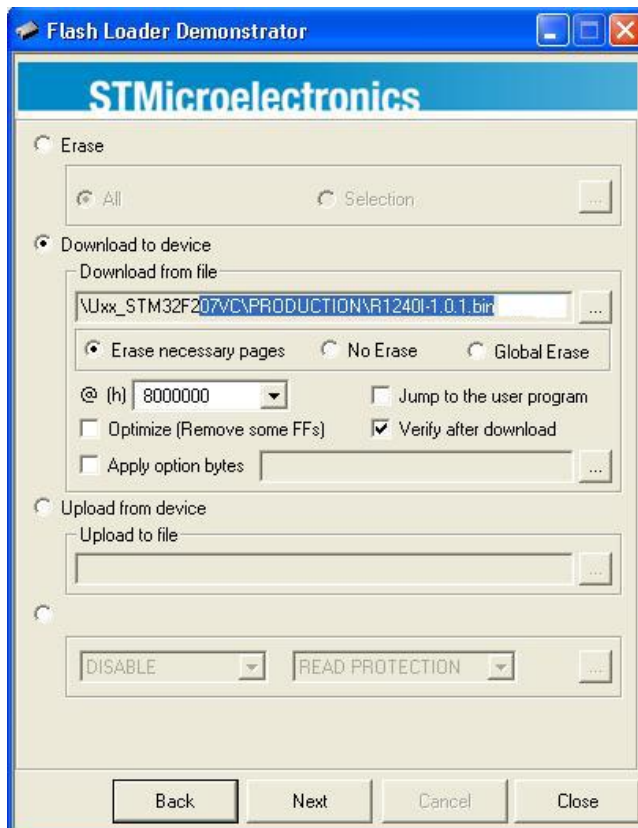
4. Launch the program *Flash Loader Demonstrator*; select once again the reader port to be updated, and press the *Next* button:



5. At the next screen, press on the *Next* button again.
6. Select as target the *STM32F2\_256K* item and press the *Next* button:



7. Select the firmware upgrade *image* and press on the *Next* button:



Wait until the programming and verification phases are complete.

8. Press the *Close* button.
9. Return to the R1240I Upgrade program and press the *OK* button.
10. Wait a few tens of seconds. A beep emitted by the reader notifies the reset of the device as a result that the upgrade process is successfully complete.

## 4 qID R1240I Technical Specifications

This Chapter introduces the technical specifications of the **qID R1240I Reader**. It contains these topics:

- [Technical Specifications Table](#)
- [Readable Barcodes](#)
- [Reader – Tag Link Profiles](#)
- [Radiation Patterns](#)



## Technical Specifications Table

<b>Frequency Band</b>	865.600÷867.600 MHz (ETSI EN 302 208 v. 1.4.1.) 902÷928 MHz (FCC part 15.247)
<b>Number of Channels</b>	4 channels (compliant to ETSI EN 302 208 v. 1.4.1.) 50 hopping channels (compliant to FCC part 15.247)
<b>RF Power</b>	Programmable in 8 levels from 10dBm (10mW) e.r.p. to 27dBm (500mW) e.r.p.
<b>Antenna Gain</b>	2dBi (typical)
<b>Antenna Polarization</b>	Dual linear (horizontal and vertical)
<b>Standard Compliance</b>	ISO 180006-C/EPC C1G2
<b>Read Range</b>	up to 1.5m. (typical)
<b>USB Interface</b>	USB 2.0 Full Speed (12 Mbit/s) device port
<b>Bluetooth Interface</b>	Class 1 with output power 5dBm e.i.r.p. Virtual COM port parameters: - Baudrate: up to 921'600kbps - Databits: 8 - Stopbits: 1 - Parity: none - Flow control: none
<b>User Interface</b>	Button #1: ON/OFF Button #2: Trigger Led #1: power indication and battery status (green: high; red: low) Led #2: communication activity (blue: Bluetooth; orange: USB) Led #3: operation result (green: OK; red: not OK) Buzzer: bitonal for events signalling
<b>Internal Buffer Size</b>	5MByte (equivalent to 400000 EPC codes@96bit) (TBC)
<b>Barcode Reader</b>	1D and 2D imager (only in Mod. WR1240IXBAAA). For more details, see § <i>Readable Barcodes</i> pag. 21.
<b>Battery Type</b>	Li-Ion 3.7V, 2100mAh
<b>Battery Life</b>	Operating: > 8h Standby: > 7 days
<b>Battery Charging Time</b>	7h from USB port 3h with AC/DC adapter
<b>Operating Temperature</b>	-10 °C to +55 °C
<b>IP Rating</b>	IP54
<b>Dimensions</b>	140 x 90 x 35 mm <sup>3</sup> max. (5.5 x 3.6 x 1.4 in <sup>3</sup> )
<b>Weight</b>	180g max. (without barcode module installed) 191g max. (with barcode module installed)
<b>Length of USB cable</b>	1,5 m

Tab. 4.1: qID R1240I Technical Specifications Table

## Readable Barcodes

The following table shows the supported symbologies (only in Mod. WR1240IXBAAA):

	Symbologies
1D Codes	UPC
	UPC Add-on 2
	UPC Add-on 5
	EAN
	EAN Add-on 2
	EAN Add-on 5
	EAN-13
	EAN-13 Add-on 2
	EAN-13 Add-on 5
	EAN-8
	EAN-8 Add-on 2
	EAN-8 Add-on 5
	Code 39
	Tri-Optic
	Codabar
	Industrial 2 of 5
	Interleaved 2 of 5
	S-Code
	IATA
	MSI/Plessey
	Telepen
	UK/Plessey
	Code 128
	Code 93
	GS1 DataBar Omnidirectional
	GS1 DataBar Truncated
	GS1 DataBar Stacked
	GS1 DataBar Stacked Omnidirectional
GS1 DataBar Limited	
GS1 DataBar Expanded	
GS1 DataBar Expanded Stacked	
2D Codes	Data Matrix (ECC 200)
	Aztec Code
	QR Code
	Micro QR
	Maxi Code
	PDF417
Micro PDF417	

For other symbologies, please contact our support team at [support@caenrfid.it](mailto:support@caenrfid.it).

## Reader – Tag Link Profiles

qID R1240I reader supports different modulations and return link profiles according to EPC Class1 Gen2 protocol [RD1].

In the following table are reported all profiles that have been tested for the compliance with ETSI and FCC regulations.

Link profile #	Regulation	Modulation	Return Link
0	ETSI - FCC	DSB-ASK; f=40kHz	FM0; f = 40kHz
1	ETSI - FCC	PR-ASK; f=40kHz	Miller (M=4); f = 250kHz
2	ETSI	PR-ASK; f=40kHz	Miller (M=4); f = 300kHz
3	FCC	DSB-ASK; f=160kHz	FM0; f = 400kHz
4	FCC	PR-ASK; f=40kHz	Miller (M=2); f = 250kHz

Tab. 4.2: qID R1240I Reader to tag link profiles

# Radiation Patterns

The radiation patterns of qID R1240I are shown in the following figures.

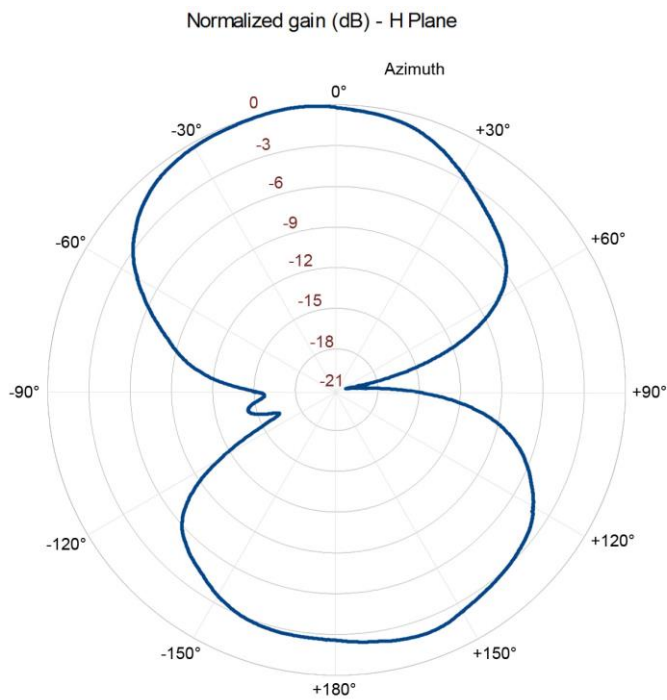


Fig. 4.1: qID R1240I Radiation pattern H plane

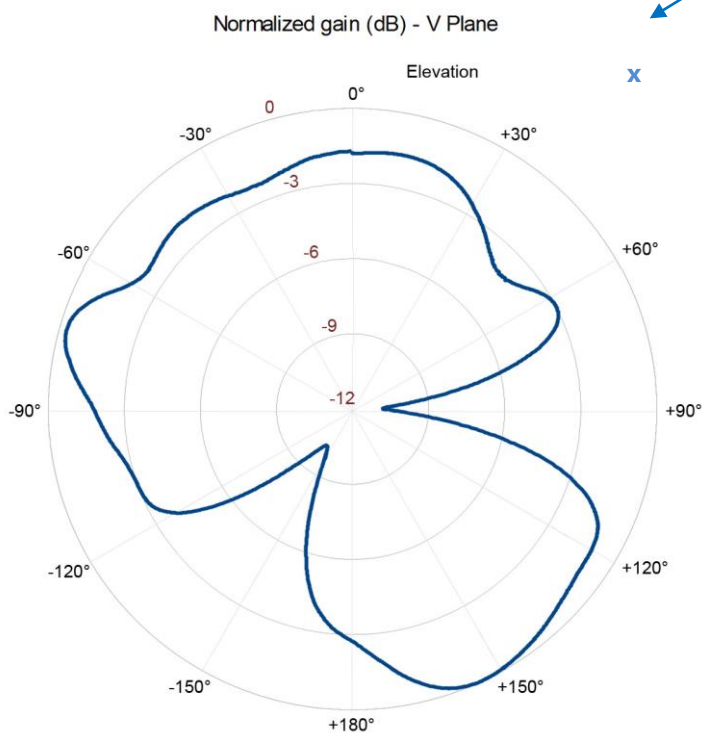
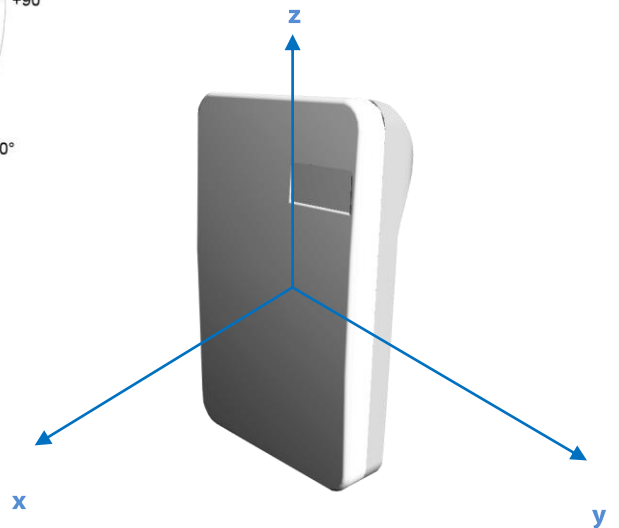


Fig. 4.2: qID R1240I Radiation pattern V plane

## 5 qID R1240I Regulatory Compliance

This Chapter gives information on the **qID R1240I Reader** Regulatory Compliance. It contains these topics:

- [FCC Compliance](#)
- [RoHS EU Directive](#)



## 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.

## RoHS EU Directive

qID R1240I Reader is compliant with the EU Directive 2002/95/EC on the Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).



Warning: please set up the correct RF regulation of your country following the CAEN RFID instructions.