

Technical Documentation

for metraTec BraceID wearable RFID-Reader



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1. General Information / Security Advice

1.1. Notes on the use of this documentation

This user manual and integration guide uses different symbols to point out potentially dangerous situations. The following signs and symbols are used throughout the document.



ATTENTION

Declares a potentially hazardous situation. If this is not avoided, the product or something in its surrounding could be damaged.



NOTE

Declares notes for the user as well as other useful information, where no harmful or dangerous situations can be expected.

1.2. Security Advice

The BraceID wearable UHF RFID Reader was not designed for use in dangerous environments. Using this product in applications where a failure could directly result in severe injuries or death ("high risk activities") is not permitted. This includes but is not limited to applications in nuclear facilities, flight control systems, life support systems or weapon systems. The manufacturer denies the suitability of this device for such scenarios.

1.3. Export Restrictions

The BraceID wearable UHF RFID Reader contains components that underlie US Export restrictions. It is therefore forbidden to export the product to countries that are on the US trade embargo list. The same applies to any countries that are on the EU embargo list.

2. Product Description

The RFID wristband is a portable UHF RFID reader. The complete system consists of a bracelet with mounting plate and a mobile RFID reader unit with integrated antenna (antenna flap).

The captured transponder IDs are sent wirelessly via a gateway (connected via USB or Ethernet) for further processing to a host software. A read process is started by pressing a capacitive button on the top of the housing. If the RFID wristband is operated in continuous reading mode, the reading process is terminated by pressing the touch button once again.

To use an RFID wristband, at least one USB or Ethernet gateway and a software application that processes the data of the BraceID is needed.

The BraceID indicates the current status by means of three status LEDs (RGB), a vibration alarm and a beeper.

2.1. Intended Use

The device should be used exclusively to scan individual or few UHF RFID transponders in the vicinity of the user while the RFID wristband is worn on the forearm.

2.2. Technical Specification

Operating Principle	Wearable UHF RFID-Reader
Used Wireless Standards	ISO 18000-6C / EPC Class 1 Gen 2 (RFID) IEEE 802.15.4 (Communication)
Operating Frequency	RFID: 868 MHz (ETSI Version) / 921 MHz (FCC Version) Communication: 2.4 GHz
RF Output	0 – 15 dBm (configurable)
Power Source	Rechargeable battery, 3.7V, 860 mAh
Power Consumption	max. 350 mA

Temperature Range	0°C to +60°C
Dimensions	85 x 70 x 25 mm (main unit)
Protection Class	IP 54 (when closed)
Conformity	CE, eg. EN 60950-1, ETSI 302 208

2.3. Scope of Delivery

The product is delivered with the following components:

- RFID Main Unit
- Bracelet with mounting plate
- Rechargeable Battery, 3.7V, 860 mAh
- Battery Charger incl. USB Power Supply
- Java Software-Development-Kit (SDK)

3. User Preparations

3.1. Putting on the bracelet

The bracelet with mounting plates serves as personal carrier for the actual active main unit. The bracelet can be washed (hand washing). When doing this, please pay attention to the strong magnets and the Velcro fastener.

The bracelet is available in two sizes. A size M for a wrist circumference of 18-21 cm and a size L for a circumference of 21-26 cm. Other sizes are available on request.

The following sequence should be observed when putting on the bracelet. This is described below using the example of a righthanded user. For a lefthanded user the information is reversed accordingly.

3.2. Inserting and replacing the battery

After putting on the bracelet, the charged battery can be inserted into the battery compartment. Make sure that the contacts of the battery and the contact springs in the battery compartment face each other so that a galvanic contact is established.

Inserting the battery is easy. If the battery is not easy to insert, it is essential to check the correct orientation of the battery!

When the battery is inserted, the RFID bracelet starts automatically and then goes into standby mode (central LED lights red) after the internal start procedures have been completed.

3.3. Mounting the main unit

After the battery has been inserted, the main unit must be placed on the mounting plate of the bracelet. The mounting plate and the main unit housing include two strong magnets that hold the unit in place. For a better fit there is a small bump on the mounting plate which forces the optimal alignment of the reader unit on the plate. After attaching the reader unit, the antenna flap must be attached to the bracelet by pressing it against it. The BraceID RFID bracelet is now ready for use.

In this state, the RFID bracelet can be set to read mode to detect RFID transponders by touching the capacitive button on the top of the housing. The processing of the RFID scan result is done externally by a connected software application (e.g. by our BracelD demo software).

In operating mode (whenever a battery is inserted), the BracelD cyclically sends a so-called "heartbeat pings" to the gateways even without user action. With this function, the software application on a PC or on a central server can check for running RFID bracelets in the vicinity of a gateway.

3.4. Removing the main unit and bracelets

To remove the BracelD, first remove the reader main unit. To do this, "pull" on the reader housing to separate it from the mounting plate. Afterwards, the Velcro fastener of the antenna flap can be removed from the bracelet. *Pulling directly at the antenna flap might cause to unnecessary stress of the antenna structure and can possibly lead to a destruction of the antenna.*

After removing the reader module, the bracelet can be easily removed from the forearm using the opened Velcro fastener.

3.5. Changing and charging the battery

To charge the batteries included with the BracelD, only use the charger that was delivered with the main unit.

After connecting the power supply unit, the LED on the charging slot lights up green. When an empty battery is inserted, the LED switches to red to signal the charging process. After charging is completed, the LED switches back to green and the battery can be removed.

4. Normal Usage

To scan one or more RFID transponders the following parameters can be configured via software:

- RF power (RFID reader power),
- Single or continuous reading mode,
- Reading time,
- Remote-controlled (disables its own logic in the RFID wristband) and
- Touch event

On delivery these parameters are already configured in the BraceID which allows the direct use of the RFID bracelet but an adaptation to the respective application is strongly recommended. The parameters are stored in the non-volatile memory of the RFID unit so that the configuration is retained even after a battery change.

To start scanning for transponders, the unit must be activated with the free hand (e.g. the left hand) or another part of your body. Depending on the configuration, the BraceID now operates in single read mode or continuous read mode. The single read mode sees various abort condition for the RFID scanning, whereas the continuous reading mode continuously tries to detect RFID transponders.

4.1. Single Read Mode

If the central touch button has been activated, the status LED changes from red to green and the RFID reader tries to scan transponders. If one or more transponder IDs are successfully read simultaneously, this is indicated by a short beep. Afterwards, the reading process is stopped and the transponder IDs are sent wirelessly to all accessible gateways.

In addition to the abort criterion, if one or more transponder IDs have been scanned, the inventory process can be actively terminated by pressing the central touch button again. In addition, the acquisition process is aborted after the "read time" has elapsed and a

corresponding message is sent to the software application that no transponder has been found.

Generally, no transponder IDs are stored in the BracelD unit. When there is no gateway present when a RFID transponder is found, this information will be lost.

4.2. Continuous Read Mode

As a second mode, the RFID wristband offers the "continuous reading" function. To use this, the "single read" parameter must be changed in the corresponding software application.

In this mode the continuous reading is activated by a touch of the central button, which is signaled by a central green LED. In this mode no beeping happens when reading a transponder successfully. Furthermore, all transponder IDs are sent directly to the gateway. The continuously collected RFID scan data has to be interpreted according to any process logic by the software side.

If the touch button is activated again, the bracelet switches off the continuous scanning mode and goes back to standby status.

5. Further Notes

5.1. Environmental Notes

Electronic devices like the BracelD RFID Bracelet are covered by the (German) ElektroG (electronic waste law) as well as the European WEEE directive and as such may not be disposed of by way of the normal household trash. Instead they have to be recycled properly. For you as our customer this is no additional burden, however, as you can send the device back to us for proper recycling. We assure you that the devices received back will be recycled properly and in an environmentally friendly way. Our WEEE Registration ID is DE 56060482.

When selecting electronic components we additionally made sure that all components are free of heavy metals and other harmful substances as required by the RoHS Directive for many industries. Hence, our products are produced in the most environmentally friendly way possible.



5.2. Conformity

The BracelD wearable RFID reader complies with all directives and regulations applicable in the European Union for this kind of device. This especially includes all laws regarding use of spectrum and EMC. The product therefore bears the CE sign, as required by Directive 1999/5/EC (Radio & Telecommunication Terminal Equipment Directive).

The product is currently not registered for use in the US or Canada. However, metraTec is registered as a manufacturer of electronics at the FCC and IC. A certification of this product is therefore possible, if required. Please ask us or your system integrator for further information.

6. Version History

<i>Version</i>	<i>Change</i>	<i>by</i>	<i>Date</i>
1.0	created	KD	15.06.2018

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