Version 1.0

RTT Europe

Personal Tag
PROD TAG 210

Operating manual

2022

CONTENTS

This User Manual provides information about the purpose of Personal Tag PROD TAG 210 and the information required to understand its functions and proper operation.

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Neither the whole nor any part of the information may be disclosed, loaned, copied or used for any purposes without Manufacturer's consent.

The illustrations, descriptions or specifications in this document are not binding and can be modified by the Manufacturer without notice.

The Manufacturer reserves the right to make changes not impairing the quality of the product without a prior notice.

Disclaimer

Any object with installed RealTrac System should be used in the same safe manner as if RealTrac System was not installed. RealTrac System is not a substitute for conventional practices and cannot be the sole source of information for decision making.

RealTrac Systems should not be used in any applications where failure of the Systems could result in personal injury or property damage.

In no case shall RTT Europe or any of its authorized representatives be liable for loss of profits, damages, consequential damages, costs of substitute goods or any damages whatsoever arising out of the use, maintenance or installation of RealTrac System, whether such damages arise out of contract, whether from fault, negligence or direct liability, or whether RTT Europe has been advised in advance of the potential damages.

Customers agree to indemnify and hold RTT Europe, its subsidiaries and affiliates, and their successors and assigns harmless from all third-party claims, demands, losses, damages, expenses or any other liabilities that may arise with respect to any of RTT Europe products.

Before installation, handling, use or maintenance of RealTrac System, read and understand the operating documentation (operation manual, data sheet and installation instructions). Failure to comply with these documents can result in personal injury or death.

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The illustrations, descriptions or specifications in this document are not binding and can be modified without notice.

The manufacturer is continuously improving RealTrac System to increase its reliability and performance; therefore, changes can be made to RealTrac System and documentation.

The allocation of radio band frequencies and licensing conditions may vary depending on the country. The Buyer is solely responsible for ensuring that the Product is operated in accordance with the applicable telecommunications laws.

RealTrac System shall not be used in the United States or Canada unless the Buyer has received a written authorization from RTT Europe.

1 DESCRIPTION AND OPERATION

1.1 Purpose and scope

PROD TAG 210 (tag) –are personal wearable devices designed to locate personnel and transfer data to the Positioning server or the Collision Awareness System/

The tag applications include:

- open pit and underground mining facilities;
- logistics centers, open storage warehouses and sea ports;
- processing industry facilities, plants, factories and other manufacturing sites, etc.

Operating conditions:

Ambient temperatures -40° to +45°C, RH up to 85%.

1.2 Specifications

Parametr	Value		
Positioning type	Precise, zonal		
Positioning accuracy, meter	1		
Supported technologies	UHF	BLE	UWB
Band, MHz	922	2402-2480	6489.6
Standarts	IEEE 802.15.1, ISM, IEEE 802.15.4a		
Signal encoding method	FSK, GFSK, BPM/BPSK		
Rate, Mbps	ISM 200 , UWB 6,8		
Accelerometer	Available		
Gyroscope	Available		
Power cell	Built-in rechargeable Li-ion battery, from 560 mA/h		
Supply voltage range, V	5		
Operating time, NLT, hrs	14		
Time of full battery charge, NMT, hrs -	2		
Ingress protection rating	IP67		
Light indication	Available		
Overall dimensions not more than, mm	90x45x15		
Weight, g, max	100		

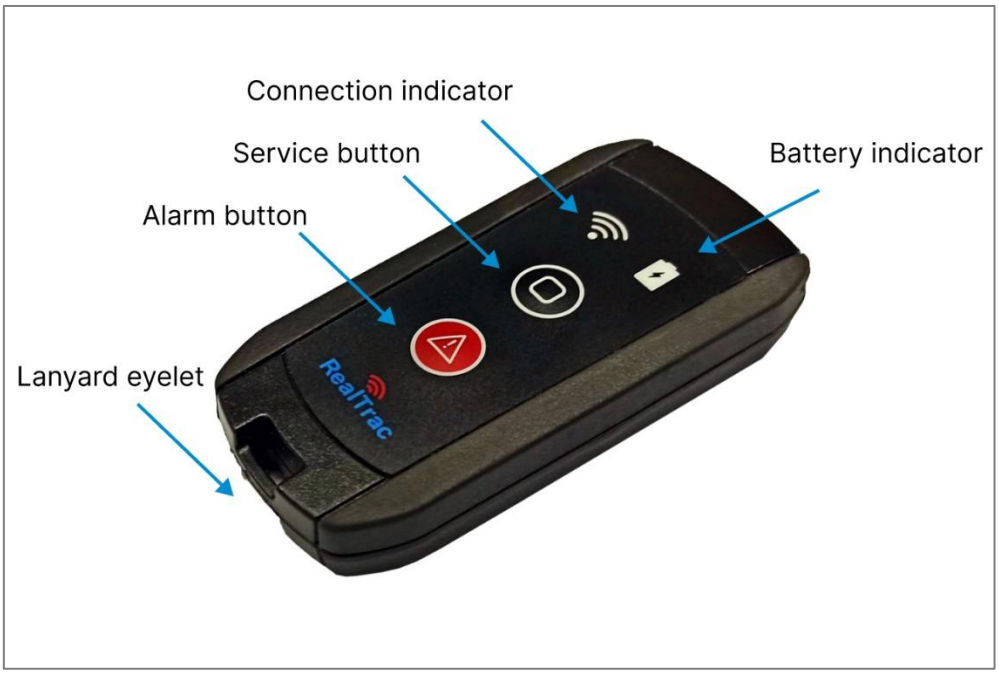
1.3 Functional principle and appearance

The tag location is determined by Ultra-Wide Band (UWB) wireless technology. The integrated UWB module sends signals to stationary elements of the Positioning System (access points) or receiving devices of the Collision Awareness System (antennas). Next:

– As part of the positioning system, the signal from the access points is transmitted to the RealTrac system server, which calculates the tag's location and sends the data to the RealTrac client-server application. The tag is displayed on a map in the web user interface.

– As part of the Collision Awareness System, the signal from the antenna is transmitted to the control device unit, which displays information about objects in different zones on the driver's display and activates light-graphic and/or audible warning signals. When the employee with the tag enters a dangerous zone, an alarm is initiated, and the tag informs the employee by flashing indicators, vibration and sound signals. The intensity of blinking and sound signal depends on the degree of approaching the danger zone

The tag is an electronic device in a dustproof plastic case. The tag has a built-in rechargeable battery that provides 14 hours of continuous operation. The tag is charged using a wireless charger.



Custom indication:

Indicator	Description	
Battery	Solid green	Charge [100-70]%
	Flashing green	Charging in progress
	Solid yellow	Charge [70-40]%
	Solid red	Charge [40-10]%
	Flashing red	Charge [10-0]%

Indicator	Description	
Connection	Flashing blue	Distance measurement in progress
	Flashing blue more often	Normal operating mode
Service button	Flashing yellow	The tag is in the "Alert" zone
	Single press - check the tag status by turning on the indicator (by default the indicators are not lit). Long press (7 seconds) - reboot the tag. After rebooting the tag is available for connection via BLE for 30 seconds.	
Alarm button	Flashing red	The tag is in the "Danger" zone
	Lights up red when an alarm is received. When pressed, sends an acknowledgement of alarm receipt to the server.	

1.4 Completeness

Name	Unit	Quantity
Personal tag PROD TAG 210	pcs.	As ordered
Operation Manual	pcs.	1*
Passport	pcs.	1*

* – Supplied one copy per batch of tags..

1.5 Labeling

The system's equipment labeling contains the nameplate marking includes trademark; product name; serial number; MAC-address; date; customs union mark; IP.

1.6 Packaging

The products are packaged in consumer packaging made of cardboard. Each product is preliminarily placed in a special cradle and/or covered with a layer of sealing material in order to prevent movement and potential damage to the product during transportation.

Packaging should provide protection of the product from external mechanical and environmental impacts during transportation and storage.

If it is necessary to return the product to the Manufacturer, the Customer shall pack the product using the retained original packaging materials or use packaging with similar protective properties.

2 INTENDED USE

2.1 Preparing for operation

If the product has been in sub-zero temperatures, it should be kept in normal climatic conditions for at least 4 hours before switching on.

2.2 Connecting the tag

Setting and connection of the tag is carried out by qualified specialists of the Manufacturer or specialists of the operating organization, who have been trained on the Manufacturer's premises and received a certificate of the established sample.

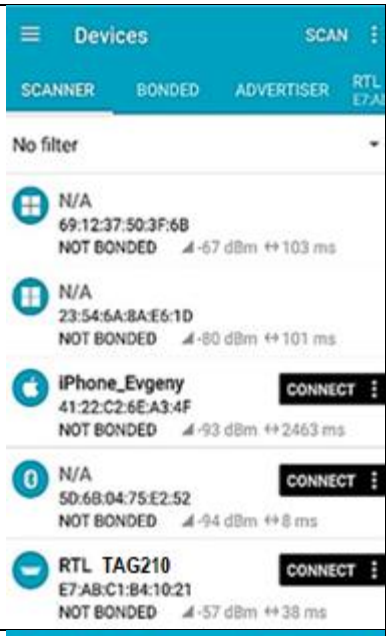
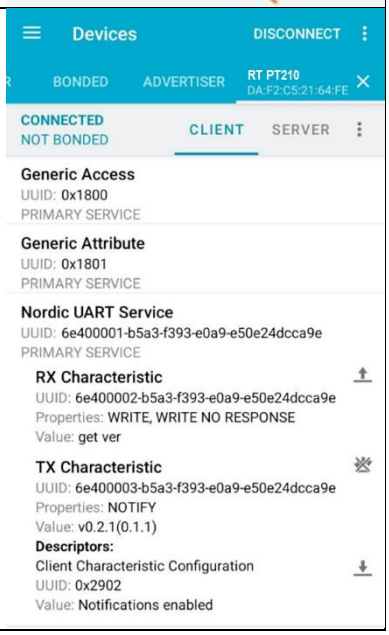
2.3 Firmware information and update procedure

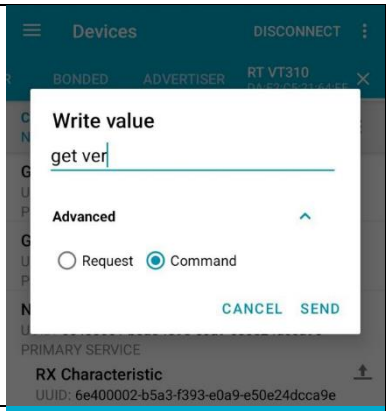
Access points are supplied with pre-installed firmware (software). The information about the need to update the firmware can be received only from the Product Manufacturer. Firmware updates should only be performed by qualified specialists of the Manufacturer or specialists of the operating company who are trained at the Manufacturer's site and have a certificate of an established form. Updating with an incorrect firmware version may damage the tag and void the warranty.

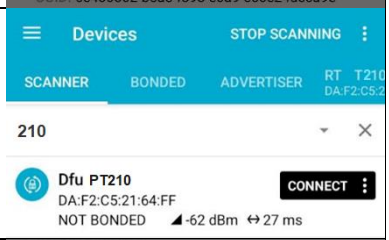
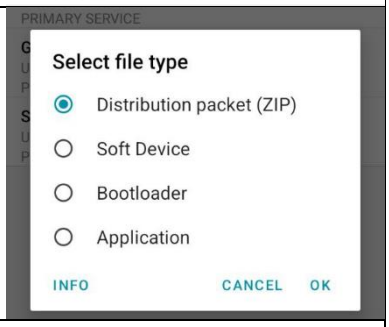
2.3.1 Firmware update procedure

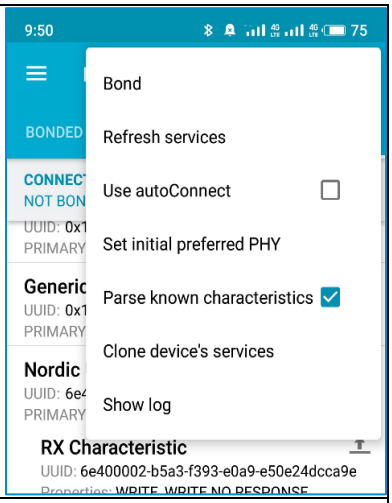
The updates are performed using a smartphone with the Android operating system via a Bluetooth connection.

Step	
1.	• Download **nRF Connect for mobile** app from the application store and install it on your mobile phone. • Download the update archive to your smartphone • Connect the device to the mains
2.	• Activate Bluetooth on your smartphone and launch **nRFConnectformobile** app • Activate a BluetoothLowEnergy (BLE) connection on the access point: • Deactivate and reactivate the device The device will stay in detection mode for 30 seconds 

3.	• In the app, click **Scan** and go to **Scanner** tab. • Find the access point in the list of devices; to simplify the search, filter the devices by name. If there are multiple devices with the same name, searching by MAC address would be more convenient Click **Connect**.	
4.	In the device tab, select **NordicUARTService.**	
5.	In the drop-down list, select **TxCharacteristic**, and then **RxCharacteristic**.	

6.	• In **Advanced** window that opens, select **Command** parameter
	• In the command window, enter the following command:
	  ○ get ver – to check the current firmware version
	  ○ boot – to switch the device to the boot mode.
		

7.	Then, find the device on **Scanner** tab in **DFU** mode, select it and click **Connect**. In the tab that opens, click **DFU**.	
8.	In the window that opens, select **Distributionpacket (ZIP)** and click **OK**	
9.	Go to the folder with the saved update file, select ("ota") file and click **open**..	
10.	If everything is done correctly, a download graph will appear on the screen; wait until the update is completed (100%). The process may take 2–3 minutes. The smartphone should always be near the tag during updating. When the download is complete, the application will close, and the device will reboot. This means the update is complete..	

11.	After installing the update, review the event log to ensure the update completed correctly. For this, click on the menu icon in the upper right corner of the screen (three vertical dots) and select **Showlog** from the drop-down list	
12.	After the upgrade, you may need to configure the tag to work in the system.	
13.	For RealTrac Positioning: select Advanced, set UWB channel by command set chUWB XXX (where XXX - channel number; check with the Manufacturer); get chuwb - check the set channel.	
14.	For RealTrac Collision Awareness - set frequency Sub GHz: set frSUB XXX (where XXX is the frequency; check with the Manufacturer); get cfgSUB - check the set frequency.	

3 SAFETY MEASURES

ATTENTION!

3.1 Before operation, make sure that the protective housing of the tag is intact. Do not operate the tag if the housing is damaged.

3.2 This manual must be kept readily available to all employees using the tag. The employee must read this manual before using the tag.

3.3 Failure to comply with the requirements of this manual may result in tag failure and endanger the employee using the tag.

3.4 Any detected breakages, discrepancies, defects and damages must be immediately notified to the Manufacturer to take timely measures for their elimination.

3.5 The employee using the tag needs to remain alert and vigilant, the use of the tag is not a substitute for proper compliance with the safety requirements of the operating organization.

3.6 Do not use the tag as an emergency stop device or in any other application where failure of the tag could result in personal injury.

3.7 Strong electromagnetic radiation, large metal structures, rain, snow and dust in the tag area can weaken radio signal strength and reduce positioning accuracy.

3.8 To increase the accuracy of pedestrian detection, wear your personal tag as high as possible by attaching it to your helmet, headgear or shoulder.

4 MAINTENANCE

4.1 General Provisions

Maintenance should be provided to ensure normal operation and to sustain equipment performance and specifications over the entire service life.

Qualified specialists of the Manufacturer, certified specialists of service centers, as well as specialists of the operating company, who have been trained at the Manufacturer's site and received a standard certificate, can perform maintenance activities which require opening of the enclosure.

Records of maintenance and serviceability checks should be kept in the appropriate section of the data sheet.

4.2 Functional Testing

The product performance test should be carried out at least once every six months in conditions corresponding to the actual operating conditions of the products.

Before carrying out the test, make sure that there are no possible sources of interference in the form of large metal structures or electromagnetic radiation from extraneous electrical equipment.

The method of performance testing depends on the type of system in which the tag is used.

4.2.1 В составе системы RealTrac® Позиционирование

To verify accurate positioning, you must develop a route for the employee to move with the tag and track that movement in the RealTrac client-server application. Under ideal conditions, the tag's positioning error should not exceed 0.5 meters.

A tag is considered good if the actual movement of the tag matches its display in the client-server application.

If a significant deviation from the route is observed on the screen, the tag is recognized as faulty. It is necessary to make a corresponding entry in the tag passport in the "Maintenance record" section and immediately inform the Manufacturer for timely organization of measures for repair and/or adjustment of the tag.

4.2.2 Collision Awareness System

Stationary on the stand (or on the machine) place the necessary equipment from the Collision Awareness System in the composition that is used at the facility. Mark the "Attention", "Danger" and "Accident" zones on the ground.

Turn on the tag, the employee with the tag should move outside the "Attention" zone and start moving towards the stand. As the employee passes the zones, the flashing frequency of the LEDs on the tag should change, and the illumination of the zones on the vehicle control unit should also change

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5 WARRANTY AND REPAIR

5.1 Warranty

The manufacturer guarantees conformity of the product with the requirements of specifications during the warranty period provided that the buyer complies with the conditions of operation, transportation, storage, intended use and regular maintenance in accordance with the requirements of this Operating Manual. The warranty operating life is specified in the product specific data sheet.

During the warranty period, the Manufacturer undertakes to correct defects of the Product free of charge by repairing it or replacing with a similar one, provided that the defect was caused by the Manufacturer. The Product provided for replacement may be new or refurbished, but in any case the Manufacturer warrants that its performance will not be worse than that of the Product being replaced.

The warranty on a repaired or replaced Product is limited to the remainder of the initial warranty period of the original Product.

The Manufacturer will not be liable for any defects and malfunctions of the product resulting from:

- Failure to comply with the conditions of operation, transportation and/or storage of the Product specified in the Product operating documentation;
- Misuse, unintended use of the Product;
- Changes to the factory settings of the Product without prior approval of the Manufacturer;
- Failure to comply with the requirements for maintenance and functional testing in accordance with the instructions of the operating documentation;
- Mechanical impact, unauthorized opening of the product enclosure, exposure to substances aggressive to the materials of the Product;
- Acts of God (such as fire, flood, earthquake, etc.).

Except for the warranties expressly set forth in this Operating Manual, the Manufacturer provides no additional warranties, express or implied, statutory or otherwise, with respect to the Product.

In no event shall the Manufacturer be liable for any damages whatsoever, including loss of data, loss of profits, and other incidental, consequential, or indirect damages arising out of improper installation, maintenance, operation, or related to the performance, failure, or temporary inoperability of the Product.

5.2 Repair

If there any signs of product malfunctioning, contact the Manufacturer for qualified advice and technical support.

User support is available at **support.real-trac.com.** When contacting the user support, sign up and create a ticket.

The product cannot be repaired in the operating conditions. The Product should be dismantled

and sent to the Manufacturer with a description of all circumstances of the malfunction for analysis and repair.

Repairs during the warranty period should be carried out only by the Manufacturer Unauthorized access to the product enclosure may result in loss of warranty service rights.

Repair of the product with expired warranty period should made upon prior agreement with the Manufacturer.

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6 PRODUCT TRANSPORTATION AND STORAGE

6.1 Transportation

The product in the Manufacturer's packaging can be transported to any distance by any type of covered vehicles in accordance with the cargo transportation rules applicable to each means of transportation.

During handling and transportation, the product should not be exposed to sharp shocks and atmospheric precipitation.

The method of product stowage on the transportation vehicle should prevent its displacement.

The product transportation conditions in terms of exposure to environmental factors should correspond to the following parameters: air temperature should be -50 °C to +50 °C, relative air humidity should be 80% (at plus 25 °C), the product should be protected against dust.

6.2 Storage

The product should be stored in the Manufacturer's packaging in a heated area at ambient air temperature 5 °C to 35 °C and relative humidity up to (80+3) % at 25 °C.

The guaranteed shelf life of the packaged product is 12 months. Storage area should be free of dust, acid and alkali vapors, corrosive gases and other harmful factors.

7 DISPOSAL

The product should be disposed after the end of its service life when it reaches its technical limit state and it is impossible to further extend the specified terms, as well as in case of significant damage, when repair is impossible or inexpedient.

All parts of the product should be disposed in accordance with the current legislation.

Precious material content: does not require any record keeping for storage, write-off or disposal..

8 CLAIMS

If there are any signs of malfunctioning of the product, immediately contact the Manufacturer:

RTT Europe DOO Novi Sad
Vase Stajica br.18, apartment 8,
Novi Sad, Republic of Serbia, 21000
E-mail: info@real-trac.com
Website: real-trac.com

9 HISTORY OF DOCUMENT CHANGES

Version	Date	Revisions	Originator

FCC Warning

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 modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: 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 or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

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

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

* RF warning for Portable device:
The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.