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TURCK

UHF RFID Demo Tools
Read Me

Technical Support Document

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1 About These Instructions

These instructions describe the use of the UHF Demo Tools software for the TBEN-…RFID… block modules and UHF readers. Read the instructions carefully prior to using the software. This will prevent the risk of personal injury and damage to property. Keep these instructions safe during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

These instructions are aimed at qualified personal and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

1.2 Explanation of symbols used

The following symbols are used in these instructions:

	DANGER DANGER indicates a dangerous situation with high risk of death or severe injury if not avoided.
	WARNING WARNING indicates a dangerous situation with medium risk of death or severe injury if not avoided.
	CAUTION CAUTION indicates a dangerous situation of medium risk which may result in minor or moderate injury if not avoided.
	NOTICE NOTICE indicates a situation which may lead to property damage if not avoided.
	NOTE NOTE indicates tips, recommendations and useful information on specific actions and facts. The notes simplify your work and help you to avoid additional work.
▶	**CALL TO ACTION** This symbol denotes actions that the user must carry out.
⇨	**RESULTS OF ACTION** This symbol denotes relevant results of actions.

1.3 Other documents

Besides this document the following material can be found on the Internet at www.turck.com:

- Instructions for use
- Data sheet
- Approvals
- Configuration manual

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to techdoc@turck.com.

1.5 Turck service

Turck supports you with your projects, from initial analysis to the commissioning of your application. The Turck product database under **www.turck.com** contains software tools for programming, configuration or commissioning, data sheets and CAD files in numerous export formats.

The contact details of Turck subsidiaries worldwide can be found on p. [▷ 20].

2 Commissioning

2.1 Supported hardware

The UHF Demo Tools software is supported by the following devices:

RFID interface	Firmware
TBEN-S2-2RFID-4DXP	≥ 3.6.0.0
TBEN-L…-4RFID-8DXP	≥ 1.1.0.0

UHF readers	Firmware
TN-UHF-Q300-…-CDS	≥ 1.4.5.0
TN…-Q…L…-H1147 (connected to one of the above RFID interfaces)	≥ 1.45

2.2 Installing the software

The UHF Demo Tools software can be downloaded free of charge from www.turck.com.

- Download the software.
- Unpack the zip file.
- Click **UhfDemoTools-v1.1.22.0.exe**

Fig. 1: Running the .exe file

- Double-click the Turck icon in the taskbar.

Fig. 2: Clicking the Turck icon

- Open the web server with a web browser or the Turck Service Tool.
- Click the **Refresh List** in the web server to find all compatible devices.
- Click **Open**.
- Alternatively: Enter the IP address of the device directly.

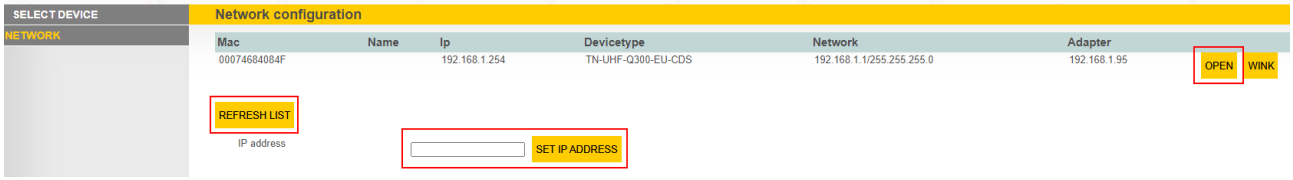

Fig. 3: Web server – clicking Refresh or entering an IP address

⇨ The device is displayed in the web server.

A login is required in order to edit settings via the web server. The default password is “password”.

NOTE
To ensure greater security, Turck recommends changing the password after the first login.

- ▶ Enter the password in the Login field on the start page of the web server.
- ▶ Click **Login**.

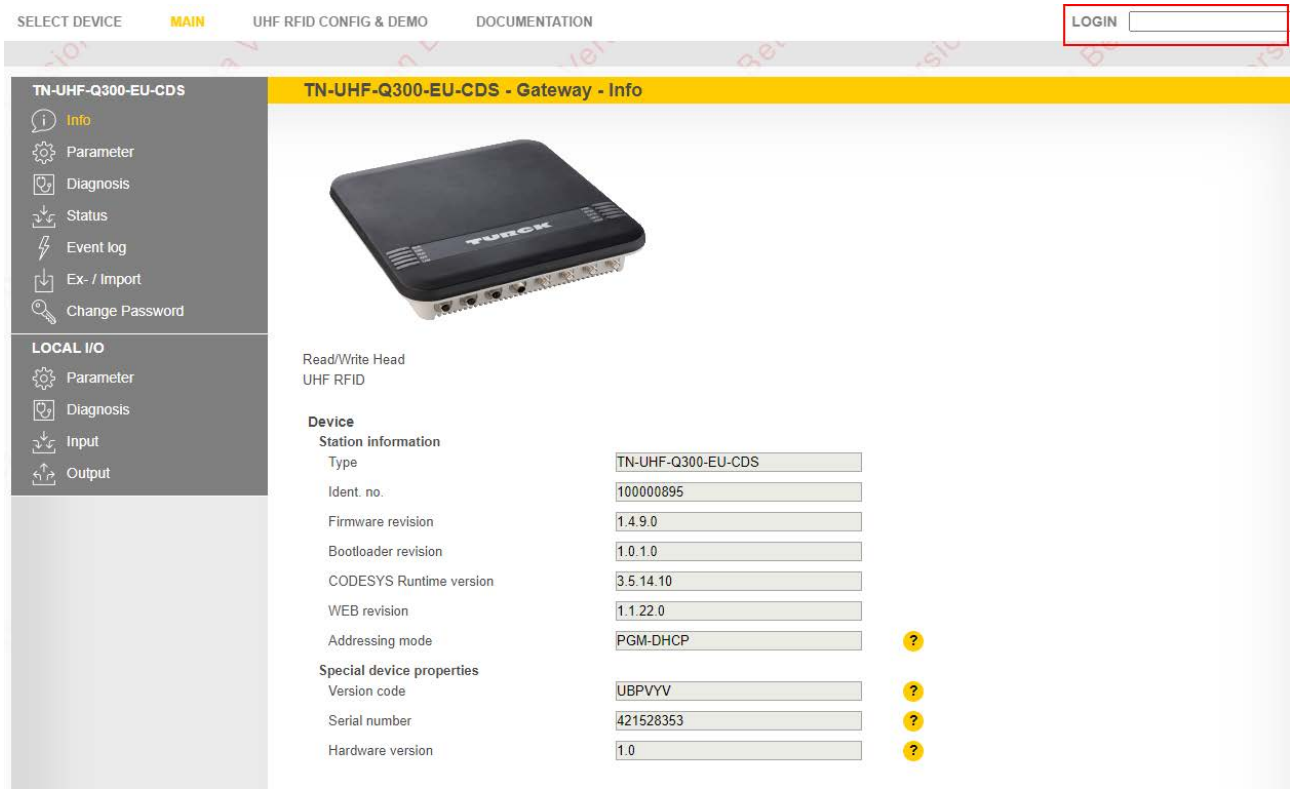

Fig. 4: Web server – login

▶ Change the password after the initial login.

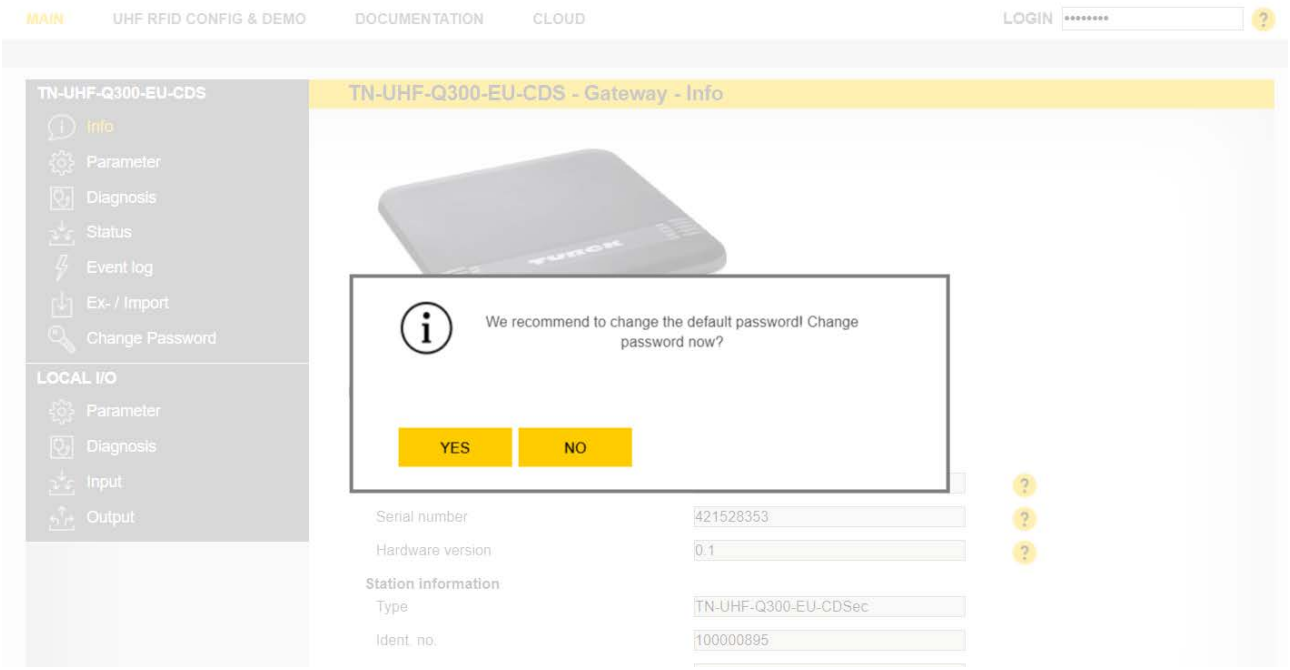

Fig. 5: Web server – changing the password

▶ Click **UHF RFID CONFIG & DEMO → GO ONLINE**.

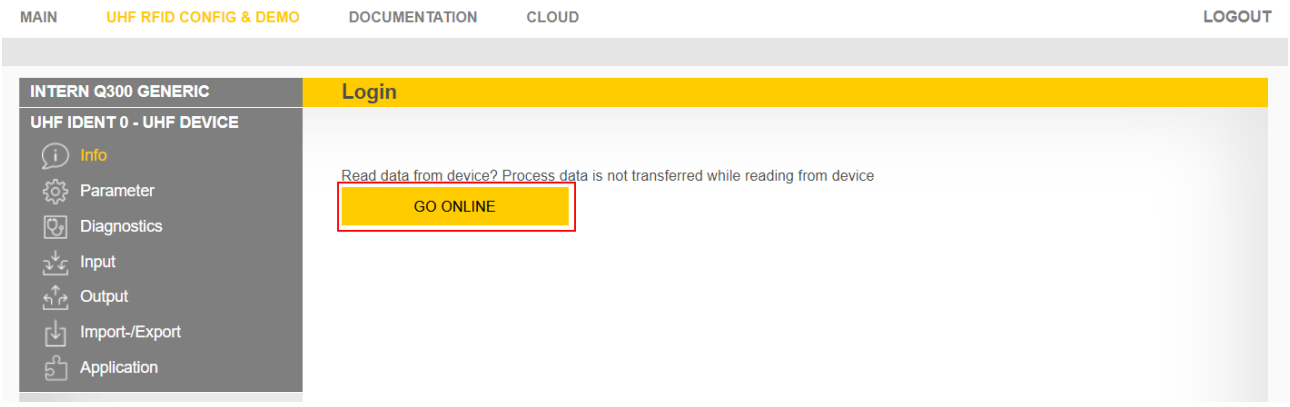

Fig. 6: Web server – Go online

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- ▶ Click **Application** at the bottom left of the screen in the navigation bar.
- ⇨ The **Tag Population**, **Tag Trace** and **Gate** functions are displayed and can be selected.

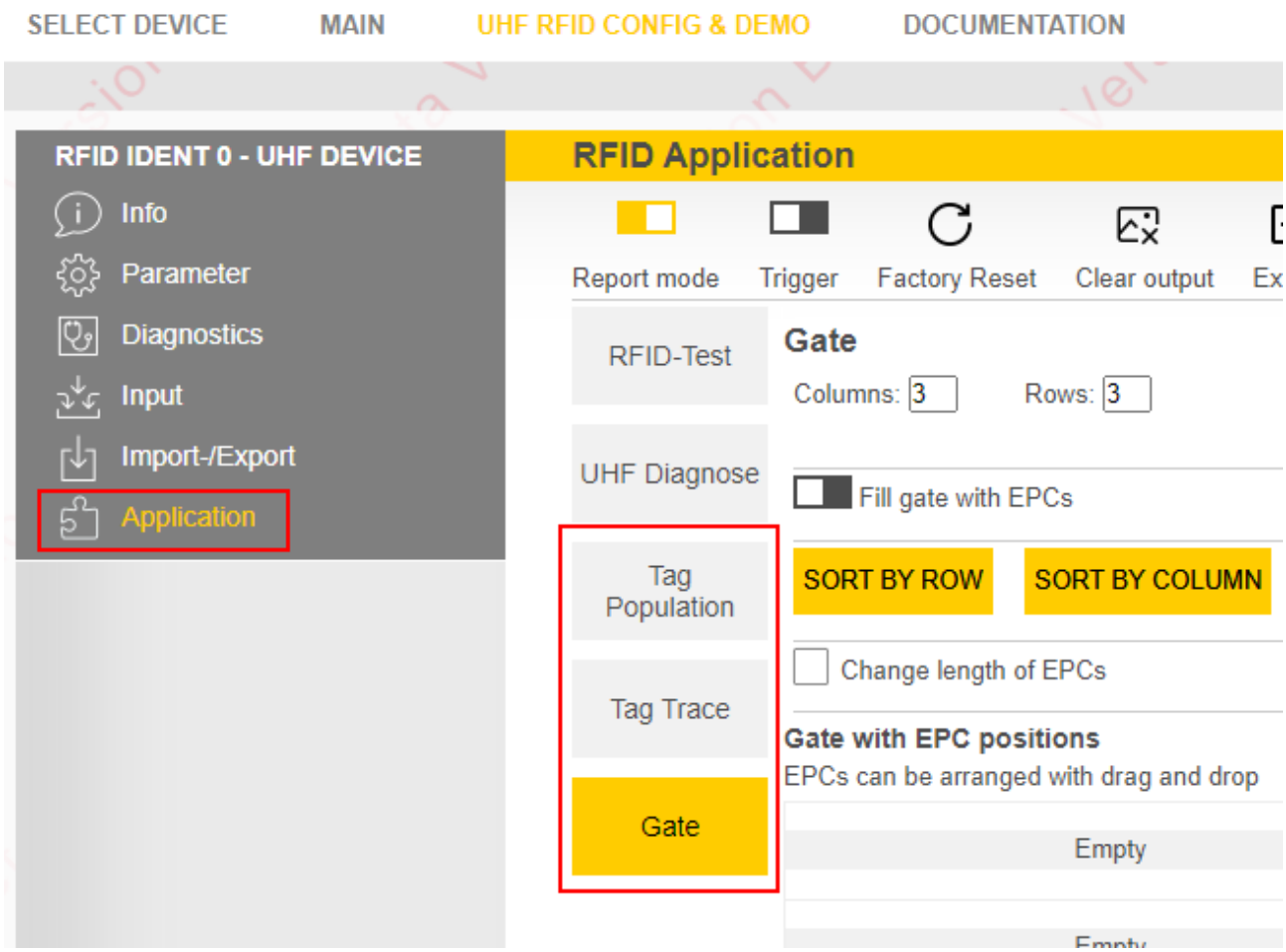

Fig. 7: Web server – RFID Application

3 Operation

3.1 Displaying the tag arrangement (Gate)

Example: gate application in logistics

Several tagged goods are read and identified by an UHF reader as they pass through an RFID gate. A feasibility study examines whether the RFID tags are identified reliably or whether environmental conditions or physical factors have a negative effect on the performance of UHF reader.

Fig. 8: Gate application in logistics: All tags on the pallet are identified as they pass through the gate

Fig. 9: Example: typical arrangement of packaging on a pallet

Using the gate function

The **Gate** function enables the physical arrangement of several tags in multi-tag applications to be transferred to a 2D matrix where they are displayed. Each EPC is provided with a separate field in the matrix. The field of the EPC turns green if a read operation is successful. In this way, unread tags can be identified.

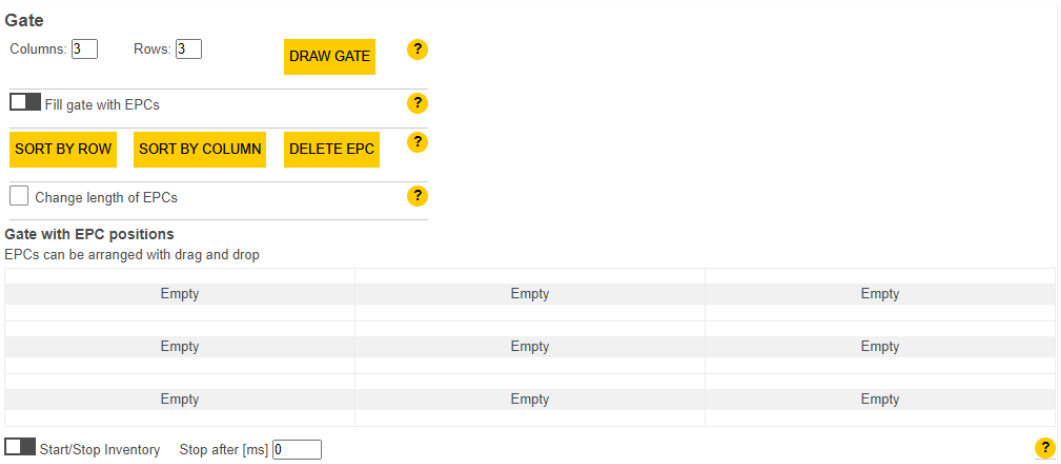

Fig. 10: User interface of the Gate function

Creating a matrix:

- ▶ Enter the required number of **Columns** and **Rows**.
- ▶ Click **DRAW GATE**.
- ⇨ The 2D matrix is created.

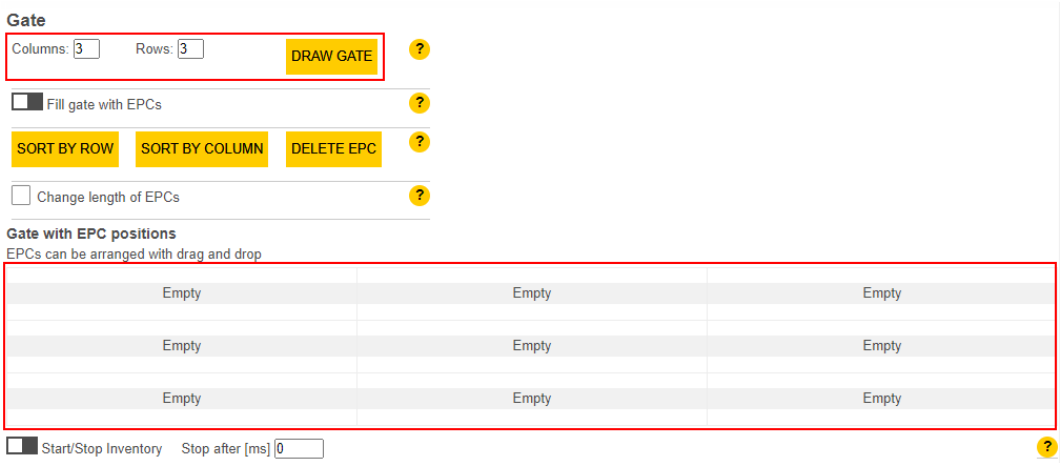

Fig. 11: Creating a matrix

Reading and sorting EPCs:

- ▶ Click **Fill gate with EPCs**.
- ⇨ The RF field is activated and all identified EPCs are inserted in the empty fields.
- ▶ Sorting EPCs: by row (**SORT BY ROW**), by column (**SORT BY COLUMN**) or manually by drag and drop
- ▶ Deleting an EPC: Select the EPC and click **DELETE EPC**.

Fig. 12: Adding, sorting and deleting EPCs

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Starting and stopping the read operation:

- ▶ Click **Start/Stop Inventory**.
- ⇨ The UHF reader is switched on and the Inventory operation is started.
- ⇨ If the UHF reader identifies an EPC, the corresponding field in the matrix is green. The read operation was successful.

Fig. 13: Read operation successful

- ▶ Click **Start/Stop Inventory**

or

- ▶ In the **Stop after [ms]** enter the time after which the operation is stopped automatically.
- ⇨ The read operation is stopped and the RF field is switched off.

Fig. 14: Start/stop Inventory

3.2 Identifying null spots and determining tag position (Tag Trace)

Example: guided single-tag application (dynamic)

The tagged goods on a conveyor pass read points and are identified by a UHF reader. Environmental factors can cause null spots in the read operation, thus preventing the reading of tags.

Fig. 15: Example: Identification of individual products on a conveyor belt

Using the Tag Trace function

The **Tag Trace** function enables the quality of read operations on the air interface to be determined. The received RSSI values (i.e. the received signal strength) of a tag are displayed graphically over time in a plot. Using the graph of signal strength over time, the user can determine whether the tag is reliably detected and whether the ideal time is possibly further left or right of the current position of the UHF reader. Up to four measurements can be recorded and displayed per tag. The plots are dimmed successively in stages. The lighter the plot the older the measurement.

- ▶ Click **Start/Stop Inventory** to start or stop the read operation.
- ⇨ The received RSSI values over time are displayed as a graph.

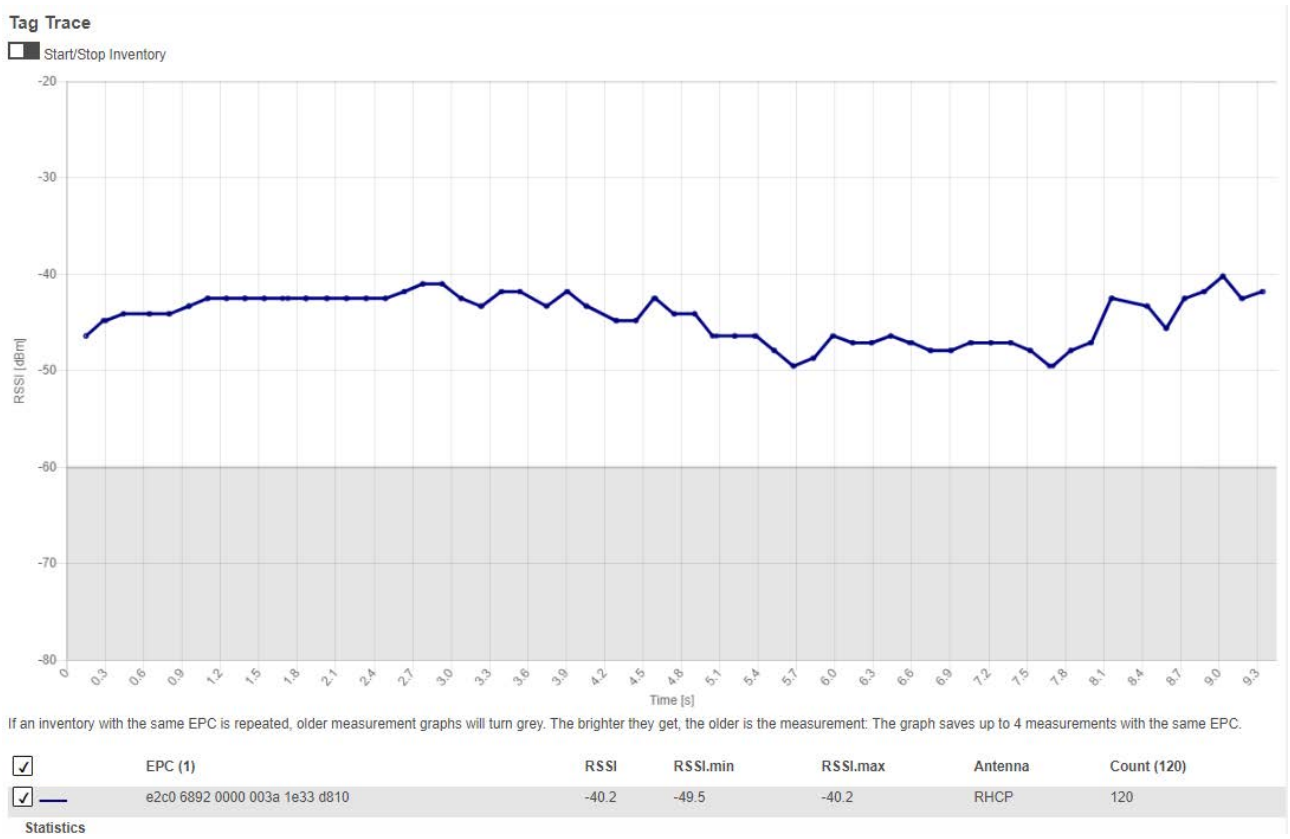

Fig. 16: RSSI signal strength of a tag over time

3.3 Assessing the readability of tags (Tag Population)

The constitution of the mounting surface and the immediate environment of the tag may so severely reduce the readability of a tag that detection is no longer possible even with a high output power. The **Tag Population** function makes it possible to assess the readability of a tag at a specific position and the minimum output power of the UHF reader required to read each tag.

- ▶ Enter the output powers of the UHF reader to be tested in the **Start power** and **End power** fields (here: **5** and **15** dBm).
- ▶ In the **Interval** drop-down list select how long the UHF reader searches for tags at each power value (here: **1000 ms**).
- ▶ Click **Start**.
- ⇨ The UHF reader increases the power in stages (power sweep) and displays the number of tags read for each output power.
- ⇨ The software displays the trace of recorded values with a gray progress bar.

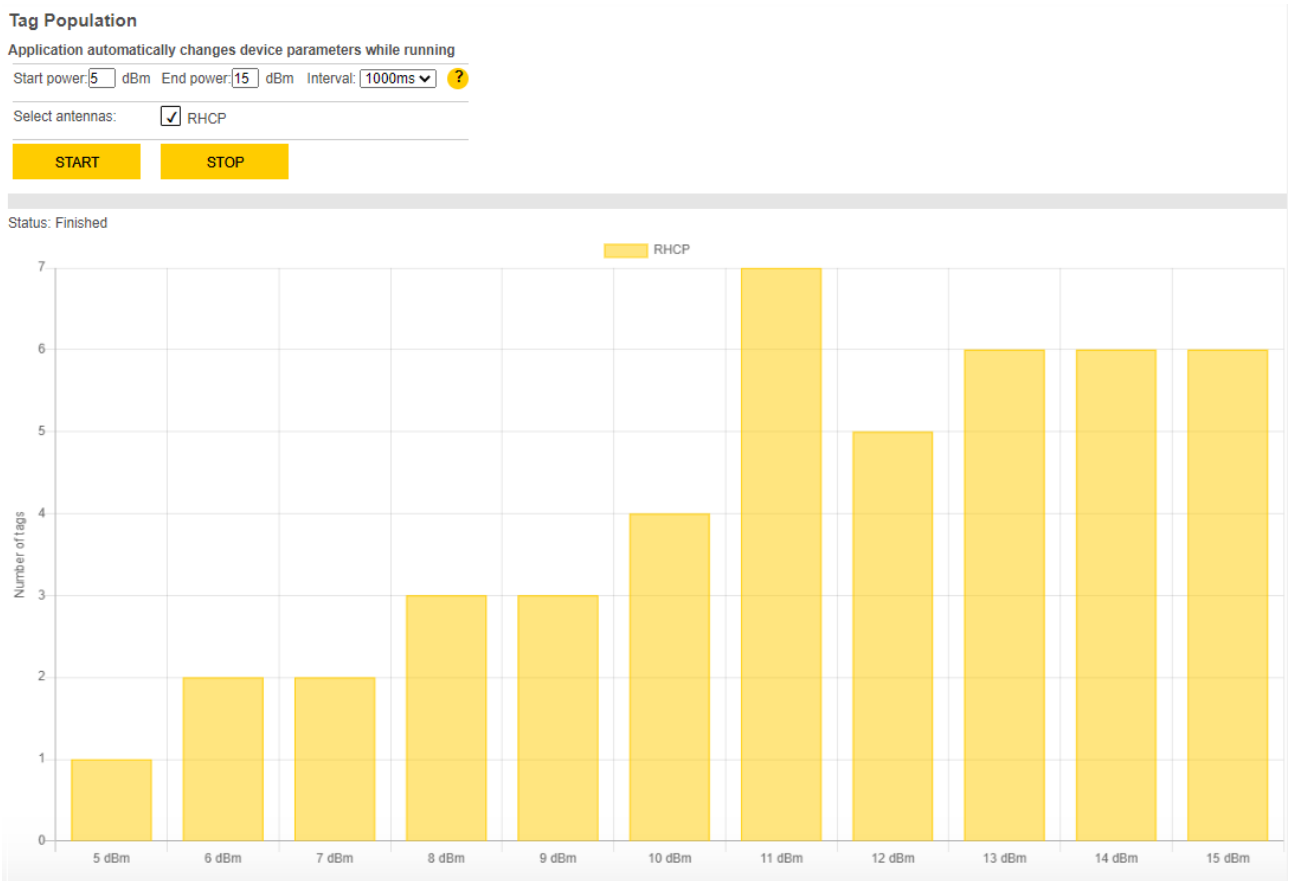

Fig. 17: Number of read tags per output power

The following information is displayed in a table:

- Minimum power required by the UHF reader to detect the tag
- RSSI over power: Change in signal strength (RSSI) in relation to increasing output power

EPC / Antenna (7)	min. required Power [dBm]	Count (81)
0000 0000 1234 5abc de10 2308 RHCP	11	3
0000 0000 1234 5abc de10 2309 RHCP	10	9
0000 0000 1234 5abc de10 2310 RHCP	6	19
0000 0000 1234 5abc de10 2311 RHCP	7	20
0000 0000 1234 5abc de10 2312 RHCP	8	16
0000 0000 1234 5abc de10 2313 RHCP	11	3
0000 0000 1234 5abc de10 2314 RHCP	5	11

Fig. 18: List of read tags

4 Turck Subsidiaries - Contact Information

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