ELATEC TWN4 Multi tech for LF-HF-NFC RFID Reader User Manual

ELATEC

RFID Systems

TWN4 MULTITECH
USER MANUAL

Contents

INTRODUCTION

ABOUT THIS MANUAL

This user manual is intended for the user and enables a safe and appropriate handling of the product. It gives a general overview, as well as important technical data and safety information about the product. Before using the product, the user should read and understand the content of this user manual.
For the sake of better understanding and readability, this user manual might contain exemplary pictures, drawings, and other illustrations. Depending on your product configuration, these pictures might differ from the actual design of your product.
The original version of this user manual has been written in English. Wherever the user manual is available in another language, it is considered as a translation of the original document for information purposes only. In case of discrepancy, the original version in English will prevail.

SCOPE OF DELIVERY

COMPONENTS AND ACCESSORIES

Depending on your product configuration, the product can be delivered alone or with different components and accessories, such as cables or wall holders, as part of a kit. For more information about the delivered components and accessories, refer to your delivery note, consult the ELATEC website, or contact ELATEC.

SOFTWARE

The product is delivered ex-works with a specific software version (firmware). Refer to the label attached to the product to find the software version installed ex-works.

ELATEC SUPPORT

In case of any technical questions, refer to the ELATEC website (www.elatec.com) or contact ELATEC technical support at **support-rfid@elatec.com**

In case of questions regarding your product order, contact your Sales representative or ELATEC customer service at **info-rfid@elatec.com**

REVISION HISTORY

VERSION	CHANGE DESCRIPTION	EDITION
7	Chapters “Introduction”, “Intended Use”, “Safety Information”, “Mode of Operation” and “Compliance Statements” updated	Feb-22
6	Chapter “Safety Information” updated, chapter “United Kingdom” under “Compliance Statements” added	Jul-21
5	Editorial changes (new template), product pictures updated, chapter “Firmware and App programming” removed and regulatory information updated	Jun-21
4	Document type updated (replaces previous versions of RFID Reader/Writer TWN4 MultiTech Technical Handbook)	Nov-21
3	First edition	Feb-19
2	Internal version	n/a
1	Internal version	n/a

INTENDED USE

The RFID reader/writer TWN4 MultiTech is a device for reading and writing RFID transponders. Different versions of TWN4 devices are available, which cover a large range of transponder types both in the frequency range of 125 kHz and 13.56 MHz.
The product is for indoor use and may not be used outdoor.
Any use other than the intended use described in this section, as well as any failure to comply with the safety information given in this document, is considered improper use. ELATEC excludes any liability in case of improper use or faulty product installation.

SAFETY INFORMATION

Unpacking and installation

- The product contains sensitive electronic components that require particular attention when unpacking and handling the product. Unpack the product carefully and do not touch any sensitive components on the product. In case the product is equipped with a cable, do not twist or pull the cable.
- The product is an electronic product whose installation requires specific skills and expertise. The installation of the product should be done by trained and qualified personnel only. Do not install the product by yourself.

Handling

- Depending on your product configuration, the product might be equipped with one or more light-emitting diodes (LED). Avoid direct eye contact with the blinking or steady light of the light-emitting diodes.
- The product has been designed for a use under specific conditions (refer to the product data-sheet). Any use of the product under different conditions might damage the product or alter its reading performance.
- The use of other RFID readers or reader modules in direct vicinity to the product, or in combination with the product might damage the product or alter its reading performance. In case of doubts, contact ELATEC for more information.
- The user is liable for the use of spare parts or accessories other than the ones sold or recommended by ELATEC. ELATEC excludes any liability for damages or injuries resulting from the use of spare parts or accessories other than the ones sold or recommended by ELATEC.
- Like most electronic devices, RFID systems generate electromagnetic waves that can vary in amplitude and frequency. It is generally known and accepted that some RFID devices might potentially interfere with personal medical devices, like pacemakers or hearing aids.
  Users with a acemaker or any other medical device should use TWN4 MultiTech carefully and refer to the information given by the manufacturer of their medical devices before using TWN4 MultiTech.

Maintenance and cleaning

- Any repair or maintenance work should be done by a trained and qualified personnel only. Do not try to repair or carry out any maintenance work on the product by yourself. Do not allow any repair or maintenance work on the product by an unqualified or unauthorized third party.
- The product does not need any special cleaning. However, the housing may be carefully cleaned up with a soft, dry cloth and a non-aggressive or non-halogenated cleaning agent on the outer surface only.
  Make sure that the used cloth and cleaning agent do not damage the product or its components (e.g. label(s)).

Disposal

- The product must be disposed of in accordance with the EU directive on waste electrical and electronic equipment (WEEE) or any applicable local regulations.

Product modifications

- The product has been designed, manufactured, and certified as defined by ELATEC.
  Any product modification without prior written approval from ELATEC is prohibited and considered improper use of the product. Unauthorized product modifications may also result in the loss of product certifications. If you are unsure about any part of the safety information above, ontact ELATEC support. Any failure to comply with the safety information given in this document is considered improper use. ELATEC excludes any liability in case of improper use or faulty product installation.

TECHNICAL DATA

Power supply

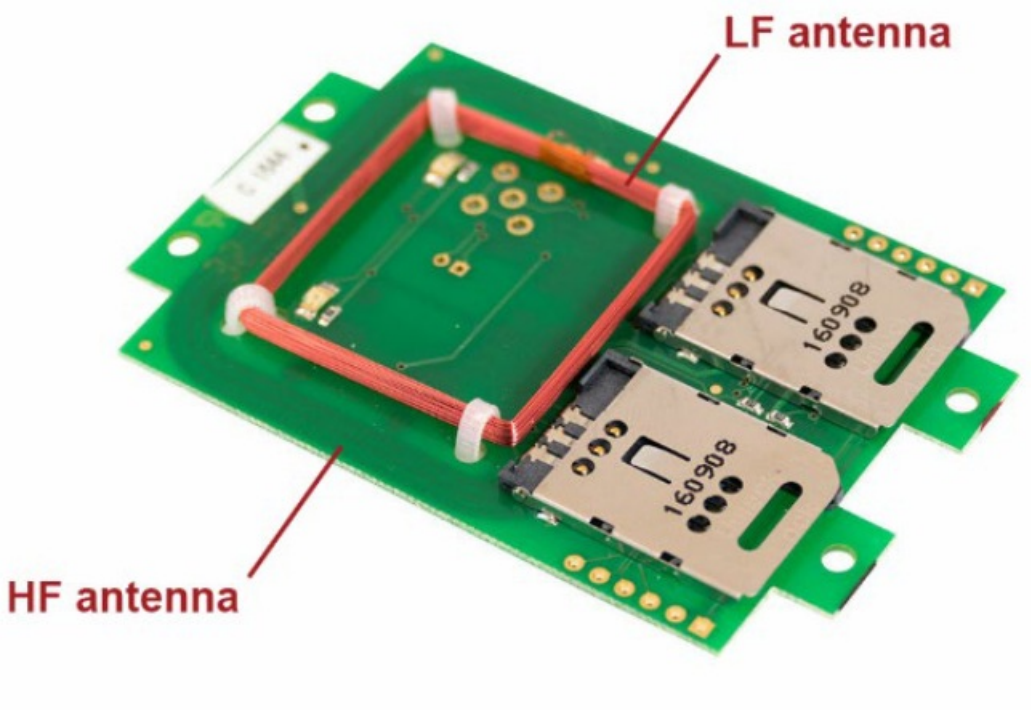
4.3 V – 5.5 V via USB or RS-232; RS-232 requires 5 V external power supply; via connector CNB 3.3 V ± 5%

Current consumption

RF field on: 120 mA typically / Sleep: 500 µA typ.

Antennas

The reader is equipped with the following antennas:



PCB contained in TWN4 MultiTech

HF antenna (13.56 MHz)
Dimensions: 44 x 46 mm / 1.73 x 1.81 inch Number of turns: 3

LF antenna (125 kHz)
Dimensions: 29 x 32 mm / 1.14 x 1.26 inch Number of turns: 164

For more information, refer to the related product data sheet or other technical documents.

MODE OF OPERATION

The mode of operation described in the following chapter is based on a standard ELATEC RFID reader equipped with two LEDs. Depending on your product (number of LEDs, installed firmware, etc.) and in case the product settings have been modified with the AppBlaster tool, the information below might differ from your product configuration when in operation. In particular, the color and sequence of the LEDs on your product might be different.

OPERATING MODE

In order to start operating TWN4 MultiTech, it simply has to be connected directly to a host device.

POWER UP

In case of an external power supply unit is used, the following requirements must be satisfied:

- Limited power source according to the safety standards listed in the respective declaration(s) of conformity
- Short-circuit current < 8 A

Once TWN4 MultiTech is connected to the host device, it detects the type of communications cable (e.g. USB or RS-232), with which it is connected to the host.
In case of RS-232: Additionally, the RS-232 is sending a version string via RS-232 to the host device.

ENUMERATION

Once the device has been powered up, it is waiting for completion of the enumeration by the USB host. As long as the device is not
enumerated, it is entering a minimum power consumption mode, where both LEDs are turned off.

INITIALIZATION

After powering up and enumeration, the device is turning on the built-in transponder reader logic. The green LED is turned on permanently. Some readers need some kind of initialization, which is performed in this step. After successful initialization, the device sounds a short sequence, which consists of a lower tone followed by a higher tone.

NORMAL OPERATION

As soon as the device has completed the initialization, it is entering normal operation. During normal operation, the device is searching for a transponder continuously.

DETECTION OF A TRANSPONDER

If a transponder is detected by the reader, following actions are performed:

- Send the ID to the host. By default, the USB device sends by emulating keystrokes of a keyboard. An RS-232 device sends the ASCII code of an ID.
- Sound a beep.
- Turn off the green LED.
- Blink the red LED for two seconds.
- Turn on the green LED.

Within the two seconds timeout, where the red LED is blinking, the transponder, which just has been recognized will not be accepted again. This prevents the reader from sending identical IDs more than one time to the host.
If during the two seconds timeout of the red LED a different transponder is detected, the complete sequence restarts immediately.

SUSPEND MODE

TWN4 MultiTech supports the USB suspend mode. If the USB host is signaling suspend via the USB bus, the reader is turning off most of its power-consuming peripherals. During this operation mode, no detection of transponders is possible and all LEDs are turned off. Once the host is resuming to normal operation mode, this is also signaled via the USB bus. Therefore, the reader will resume to normal operation too.

COMPLIANCE STATEMENTS

EU

TWN4 MultiTech is in compliance with the EU directives and regulations as listed in the respective declaration of conformity.

FCC

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.

Caution
The Federal Communications Commission (FCC) warns the users that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC §15.105 (b)
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.

FCC ID: WP5TWN4F1

IC

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

IC: 7948A-TWN4F1

RF EXPOSURE COMPLIANCE

RF exposure statement (mobile and fixed devices)
This device complies with the RF exposure requirements for mobile and fixed devices. However, the device shall

be used in such a manner that the potential for human contact during normal operation is minimized.

CHINA (PRC)

Micropower scope of use declaration:

TWN4 MultiTech supports transmission frequencies of 13.56 MHz and 125 kHz. The user needs to adhere to the following specifications when using the product:

1. The specific provisions listed in the “catalog and the technical specifications for micropower short-range radio transmission equipment” as well as the usage scenarios for the antenna type used, the functions, and the customary use of the control system, regulation, and switches must be complied with;
   Transmission power: 13.56 MHz: ≤ 1.12 dBµA/m (field strength at 10 meters, standard max value)
   125 kHz: ≤ -8.43dBµA/m (field strength at 10 meters, standard max value)
   Antenna: built-in antenna (cannot be removed) Control system, regulation, and switches: The user cannot control, regulate, or switch over the radio transmission function of the antenna.
2. The unauthorized modification of usage scenarios or the conditions of use, expansion of the transmission frequency range, or increase of the transmission power (including installing additional transmission power amplifiers), as well as the unauthorized modification of the transmission antenna, are not allowed;
3. The product may not interfere in any way with any legal radio transmitters (stations) and may not offer any shielding from harmful interference;
4. The product must be able to tolerate interference caused by industrial, scientific, and medical (ISM) devices that radiate high frequency energy or other legal interference from radio transmitters (stations);
5. Should the product cause harmful interference on other legal radio transmitters (stations), product use must be discontinued immediately and suitable measures must be taken prior to using the product again in order to eliminate said interference;
6. When using micropower devices inside of an aircraft or radiometric observatories, or when using such devices in meteorological radar stations, satellite ground stations (including measuring and control stations, distance measuring stations, receiving stations, or navigation stations), as well as in radio transmitters (stations) used by the military and electromagnetic environment protections zones at airports, all applicable provisions of the competent authorities as well as statutory provisions, national regulations, and national standards must be complied with;
7. Remote controls of any kind may not be used within 5000 meters of airport runways, measured from the middle of the runway;
8. Ambient conditions such as temperature and voltage when using micropower devices: operating voltage of TWN4 MultiTech: 4.3 V – 5.5 V (charging via USB),
   operating temperature: -25 °C – 70 °C,
   storage temperature: -40 °C – 75 °C.
   The user must strictly adhere to these temperature and voltage specifications when using the product.

UNITED KINGDOM

TWN4 MultiTech complies with the requirements of the UK legislation and other regulations as listed in the respective UK declaration of conformity. The importer is responsible for applying the following information to the packaging of the product:

- the importer company’s details, including the company’s name and a contact address in the United Kingdom.
- UKCA marking

FURTHER STATEMENTS

Should the device be certified and installed in the following countries or regions, the corresponding statements (see below) must be contained in the user manual.

APPENDIX

A – TERMS AND ABBREVIATIONS

TERM	EXPLANATION
FCC	Federal Communications Commission
HF	high frequency
IC	Industry Canada
LED	light-emitting diode
LF	low frequency
NFC	near field communication
PCB	printed circuit board
RFID	radio frequency identification
UKCA	UK conformity assessed
WEEE	Waste of electrical and electronic equipment. Refers to Directive 2012/19/EU of the European Parliament and of the Council of the European Union

B – RELEVANT DOCUMENTATION

ELATEC documentation

- ELATEC quick start guide
- TWN4 MultiTech datasheet
- TWN4 MultiTech OEM PCBs handbook

ELATEC

RFID Systems

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Documents / Resources

	ELATEC TWN4 Multi tech for LF-HF-NFC RFID Reader [pdf] User Manual TWN4, Multi tech for LF-HF-NFC RFID Reader