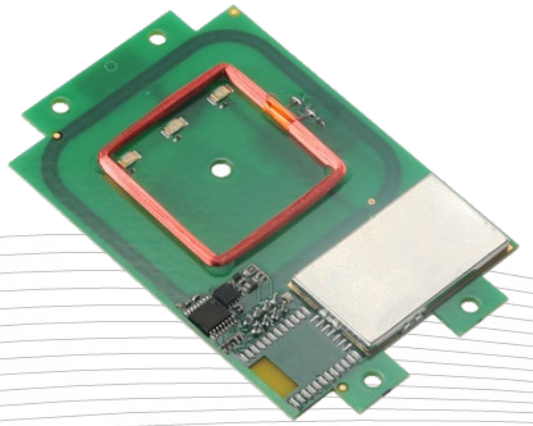
TWN4 MULTITECH 2 M LF HF

USER MANUAL



ELATEC
RFID Systems

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1 INTRODUCTION

1.1 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.

1.2 SCOPE OF DELIVERY

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.

1.3 ELATEC SUPPORT

In case of any technical questions or product malfunction, 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

2 INTENDED USE

The TWN4 MultiTech 2 family of contactless RFID readers and modules allows users to read and write to almost any LF and HF tags and labels. All products support NFC and, optionally, Bluetooth Low Energy (BLE). In addition, they are also compatible with the two most commonly used smartphone operating systems, Android and iOS, which gives the option to integrate them in mobile identification applications. The desktop readers are available as Plug & Play devices that can be easily customized (i.e. inlay and housing color), whereas the PCB modules offer a large amount of interfaces and a perfect form factor for an easy and quick integration in any host device. This broad range of product features makes the TWN4 MultiTech 2 family an excellent solution for almost every project.

Key features of the TWN4 MultiTech 2 M LF HF RFID module include a powerful SDK for writing apps that are executed directly on the reader, the possibility to upgrade the firmware in the field and a direct chip-commands support. Additionally, the module can simultaneously read more than 60 RFID technologies from low (LF) and high frequency (HF) bands, including NFC. This gives the option to select as many of the technologies required instead of being forced to select just a few ones.

The product is intended to be integrated into a host device.

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.

3 SAFETY INFORMATION

Transport and storage

- Observe carefully the transport and storage conditions described on the product packaging or other relevant product documents (e.g. data sheet).

Unpacking and installation

- Before unpacking and installing the product, this user manual and all relevant installation instructions must be read and understood carefully.

- The product might show sharp edges or corners and requires a particular attention during the unpacking and installation.
  Unpack the product carefully and do not touch any sharp edges or corners, or any sensitive components on the product. If necessary, wear safety gloves.

- 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 a trained and qualified personnel only.

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, e.g. in a specific temperature range (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.

- In case the product is equipped with a cable, the cable may not be replaced or extended.
  ELATEC excludes any liability for damages or injuries resulting from the use of the product with a cable extension or a replaced cable.

- 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.
  TWN4 MultiTech 2 M LF HF fulfills general radio and EMC requirements. However, users with a pacemaker or any other medical device should use TWN4 MultiTech 2 M LF HF carefully and refer to the information given by the manufacturer of their medical devices before using TWN4 MultiTech 2 M LF HF or any host device containing TWN4 MultiTech 2 M LF HF.

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.
  Do not use any detergents or other cleaning agents on the product.

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, contact 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.

4 TECHNICAL DATA

4.1 TECHNICAL SPECIFICATIONS

FREQUENCY	125 KHZ (LF) / 13.56 MHZ (HF)
ANTENNA(S)	Integrated
DIMENSIONS (L X W X H)	Approx. 76 x 49 x 9 mm / 3.0 x 1.9 x 0.4 inch
POWER	USB: 4.3 V - 5.5 V Generic interface (X1): 3.3 V ± 5% RS-232: requires 5 V external power supply PS2 classified power source according to IEC 62368-1, short-circuit current < 8 A
CURRENT CONSUMPTION	RF field on: 120 mA typically / Sleep: 500 µA typ.
TEMPERATURE RANGE	Operating: -25 °C up to +80 °C (-13 °F up to +176 °F) Storage: -40 °C up to +85 °C (-40 °F up to +185 °F)
RELATIVE HUMIDITY	5% to 95% non-condensing
READ/WRITE DISTANCE	LF and HF: Up to 100 mm / 4 inch, depending on environment and transponder
WEIGHT	Approx. 10 g / 0.35 oz (without cable)

4.2 FIRMWARE

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

4.3 ANTENNAS

The reader module is equipped with the following antenna(s):

HF antenna (13.56 MHz)

Dimensions: 42 x 44 mm / 1.65 x 1.73 inch
Number of turns: 3

LF antenna (125 kHz)

Dimensions: 28 x 28 mm / 1.10 x 1.10 inch
Number of turns: 151

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

5 MODE OF OPERATION

The mode of operation described in the following chapter is based on a standard ELATEC RFID reader module 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.

5.1 OPERATING MODE

In order to start operating TWN4 MultiTech 2 M LF HF, it simply has to be connected directly to a host device.

5.2 POWER UP

Once TWN4 MultiTech 2 M LF HF 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:

- A version string is sent via RS-232 to the host device.
- A 5 V external power supply is required and must meet the following conditions:
  - PS2 classified power source according to IEC 62368-1
  - Short-circuit current < 8 A

5.3 ENUMERATION

This is only applicable for the USB version: 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.

5.4 INITIALIZATION

After powering up and enumeration (in USB mode), the device is turning on the built-in transponder reader logic. The green LED is turned on permanently. Some RFID reader modules 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.

5.5 NORMAL OPERATION

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

5.6 DETECTION OF A TRANSPONDER

If a transponder is detected by the reader module, 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 module 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.

5.7 SUSPEND MODE

The USB version of the reader module supports the USB suspend mode. If the USB host is signaling suspend via the USB bus, the reader module 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 module will resume to normal operation too.

6 COMPLIANCE STATEMENTS

6.1 EU

Hereby, ELATEC GmbH declares that TWN4 MultiTech 2 M LF HF is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: elatec.com/approvals

6.2 FCC

FCC ID: WP5TWN4F3

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. (except receivers associated with operation of a licensed radio service and stand-alone devices).

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.

6.3 ISED CANADA

IC: 7948A-TWN4F3

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

6.4 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.

6.5 ARGENTINA

H-28225

6.6 BRAZIL / BRASIL

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

6.7 CHINA (PRC) / 中华人民共和国

Micropower scope of use declaration: **TWN4 MultiTech 2 M LF HF** 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: ≤ -2.25 dBµA/m (field strength at 10 meters, standard max value) 125 kHz: ≤ -9.95 dBµA/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;	**微功率使用规范声明：** **TWN4 MultiTech 2 M LF HF** 支持 13.56MHz 和 125kHz 发射频率，用户在使用过程中，需要遵守以下要求： （一） 符合"微功率短距离无线电发射设备目录和技术要求"的具体条款和使用场景，采用的天线类型和性能，控制、调整及开关等使用方法； 发射功率： 13.56MHz：≤-2.25dBµA/m (10 米处场强， 准峰值) 125kHz：≤-9.95dBµA/m (10 米处场强， 准峰值) 天线：内置天线（不可拆卸） 控制、调整及开关：用户不能控制、调制及开关此无线电发射功能 （二）不得擅自改变使用场景或使用条件、扩大发射频率范围、加大发射功率（包括额外加装射频功率放大器），不得擅自更改发射天线； （三）不得对其他合法的无线电台（站）产生有害干扰，也不得提出免受有害干扰保护； （四）应当承受辐射射频能量的工业、科学及医疗（ISM）应用设备的干扰或其他合法的无线电台（站）干扰；

(4) The product must be able to tolerate interference caused by industrial, scientific, and medical (ISM) devices which 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 2 M LF HF**: 4.3 V – 5.5 V (charging via USB), operating temperature: -25 °C – 80 °C, storage temperature: -40 °C – 85 °C. The user must strictly adhere to these temperature and voltage specifications when using the product.	（五）如对其他合法的无线电台（站）产生有害干扰时，应立即停止使用，并采取措施消除干扰后方可继续使用； （六）在航空器内和依据法律法规、国家有关规定、标准划设的射电天文台、气象雷达站、卫星地球站（含测控、测距、接收、导航站）等军民用无线电台（站）、机场等的电磁环境保护区域内使用微功率设备，应当遵守电磁环境保护及相关行业主管部门的规定； （七）禁止在以机场跑道中心点为圆心、半径 5000 米的区域内使用各类模型遥控器； （八）微功率设备使用时温度和电压的环境条件。 **TWN4 MultiTech 2 M LF HF** 的工作电压 4.3V-5.5V（USB 供电）， 工作温度-25℃~80℃， 储存温度-40℃~85℃。 用户需严格按照此温度和电压要求使用。

6.8 SINGAPORE

Complies with
IMDA Standard
[DA 103787]

6.9 TAIWAN / 臺灣

注意!

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

6.10 THAILAND / ประเทศไทย

6.11 UNITED KINGDOM

TWN4 MultiTech 2 M LF HF complies with the requirements of the UK legislations 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:

UKCA

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

APPENDIX

A – RELEVANT DOCUMENTATION

ELATEC documentation

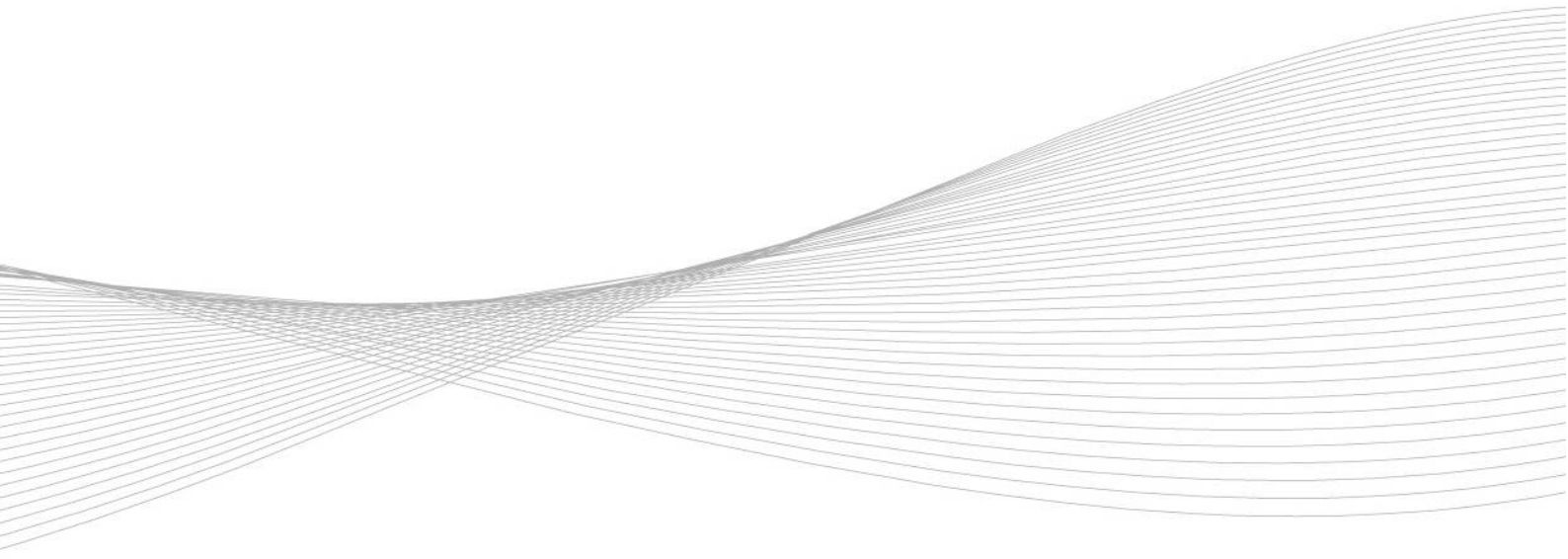
- ELATEC quick start guide
- TWN4 MultiTech 2 M LF HF data sheet
- TWN4 MultiTech 2 M LF HF functional description
- TWN4 MultiTech 2 M LF HF integration manual
- TWN4 MultiTech 2 technical handbook

B – TERMS AND ABBREVIATIONS

TERM	EXPLANATION
FCC	Federal Communications Commission
HF	high frequency
ISED	Innovation, Science and Economic Development Canada
LED	light-emitting diode
LF	low frequency
NFC	near field communication
PCB	printed circuit board
RFID	radio frequency identification
SDK	software development kit
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

C – REVISION HISTORY

VERSION	CHANGE DESCRIPTION	EDITION
06	Editorial changes, chapters “Intended Use”, “Safety Information”, “Technical Data”, “Mode of Operation” and “Compliance Statements” updated	07/2023
05	Chapter “Compliance Statements” updated	08/2022
04	Chapter “Compliance Statements” updated	02/2022
03	Chapters “Introduction”, “Intended Use”, “Safety Information”, “Mode of Operation” and “Compliance Statements” updated	01/2022
02	Chapter “Safety Information” updated, chapter “United Kingdom” under “Compliance Statements” added	07/2021
01	First edition	05/2021



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