Contents [hide]

ELATEC

ELATEC TWN4F23 Transponder Reader and Writer

INTRODUCTION

ABOUT THIS MANUAL

This user manual is intended for the user and enables 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 manual. For the sake of better understanding and readability, this 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 manual has been written in English. Wherever the 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.

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

SAFETY INFORMATION

Transport and storage

- Carefully observe 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 manual and all relevant installation instructions must be read carefully and understood.
- 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.
- After unpacking the product, check that all components have been delivered according to your order and delivery note.
- Contact ELATEC if your order is not complete.
- In case the product is equipped with a cable, do not twist or pull the cable excessively.
- 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.
- The product is an electronic device whose installation requires specific skills and expertise.
- The installation of the product should be done by trained and qualified personnel only.

Handling

Warning

Powering the product with more than one power source at the same time or using the product as a power supply for other devices may lead to injuries or property damage.

- Do not power the product via more than one power source at the same time.
- Do not use the product as a power supply for other devices.
- To comply with the applicable RF exposure requirements, the product should be installed and operated with a minimum distance of 20 cm to any user's/nearby person's body at all times. Refer to Chapter "Compliance statements" for further information about RF exposure compliance.
- 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 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 devices 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.
- The RFID modules of the TWN4 MultiTech Nano family fulfill general radio and EMC requirements. However, users with a pacemaker or any other medical device should use the modules carefully and refer to the information given by the manufacturer of their medical devices before using the modules or any host device containing the modules.
- The RFID modules of the TWN4 MultiTech Nano family have been designed to operate with the antenna type listed in Chapter “Product family”. Antenna types not included in this list are strictly prohibited for use with this device. In case the product is used with another antenna than the one listed in Chapter “Product family”, additional testing and/or approval are required.
- Do not use the product with an antenna other than the one listed in this document. Otherwise, damage may occur.

Maintenance and cleaning

- Any repair or maintenance work should be done by 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 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.

PRODUCT DESCRIPTION

INTENDED USE

The RFID modules of the TWN4 MultiTech Nano family allow users to read and write RFID media in the 125 kHz (LF) and 13.56 MHz (HF) frequency bands for identification purposes. In addition, some models also operate in the 134.2 kHz (LF) frequency or support the BLE (2.4 GHz) technology. The modules are intended to be integrated into a host device. All products must be used in environmental conditions according to the respective product data sheets and installation instructions related to the products. All products are for professional use only.

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.

PRODUCT FAMILY

The TWN4 MultiTech Nano family contains the following RFID modules:

TWN4 MultiTech Nano LEGIC 42 M

TWN4 MultiTech Nano LEGIC 42 M		
 	Frequencies	125 kHz (LF) / 13.56 MHz (HF)
	Antenna[1]	Externally, 50 Ohm for 13.56 MHz – 490 µH ± 5% for 125 kHz
	Dimensions (L x W x H)	C0 version: approx. 31.00 x 17.80 x 2.70 mm / 1.22 x 0.70 x 0.11 inch C1 version: approx. 31.00 x 17.80 x 8.11 mm / 1.22 x 0.70 x 0.32 inch
	Power	Direct power supply: 3.3 V ± 5% On-board voltage regulator: 4.3 V – 5.5 V ES1/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 ranges	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
	MTBF	500,000 hours
	Weight	Approx. 7 g / 0.25 oz

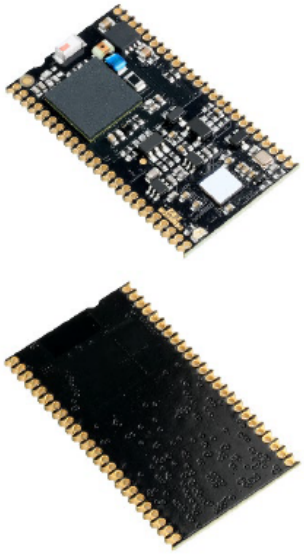
1 The RFID modules of the TWN4 MultiTech Nano family have been tested with an external printed circuit board equipped with the following antennas:

HF antenna (13.56 MHz)	**LF antenna (125 kHz/134.2 kHz*)**
Outer dimensions: 32 x 29.4 mm / 1.26 x 1.16 inch ± 1% Number of turns: 4 Inductance: 950 nH ± 5% Width of wire: 0.6 mm / 0.02 inch	Outer diameter: max. 16.3 mm / 0.64 inch Number of turns: about 144 (max. 150) In ductance: 490 µH ± 5% Wire diameter: 0.10 mm / 0.0039 inch Lead free, coil fixed by using backed wire

*134.2 kHz for TWN4 MultiTech Nano Plus M only

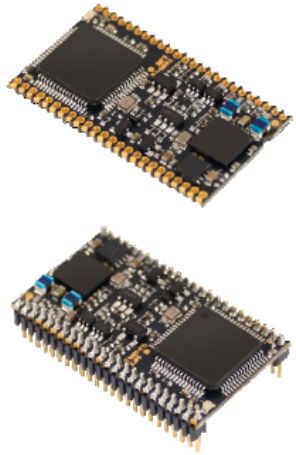
Please note that the use of an RFID module of the TWN4 MultiTech Nano family with other antennas than the ones described above is not part of the approvals granted to the modules. In case the RFID modules are used with other antennas, a separate approval, additional testing or new authorization for a use with these specific antennas is required.

TWN4 MultiTech Nano LEGIC 63 M

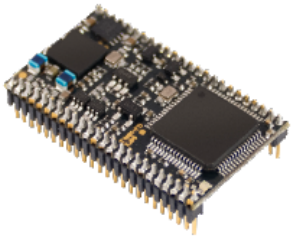


Frequencies	125 kHz (LF) / 13.56 MHz (HF) / 2.4 GHz (BLE)
Antenna[1]	Externally, 50 Ohm for 13.56 MHz – 490 µH ± 5% for 125 kHz Integrated BLE module
Dimensions (L x W x H)	C0 version: approx. 31.00 x 17.80 x 2.70 mm / 1.22 x 0.70 x 0.11 inch C1 version: approx. 31.00 x 17.80 x 8.11 mm / 1.22 x 0.70 x 0.32 inch
Power	Direct power supply: 3.3 V ± 5% On-board voltage regulator: 4.3 V – 5.5 V ES1/PS2 classified power source according to IEC 62368-1, short-circuit current < 8 A
Current consumption	RF field on: 160 mA typically / Sleep: 500 µA typ. / Cyclic operation: 130 mA typ.
Temperature ranges	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
MTBF	500,000 hours
Weight	Approx. 8 g / 0.28 oz

TWN4 MultiTech Nano M



Frequencies	125 kHz (LF) / 13.56 MHz (HF)
Antenna[1]	Externally, direct matched for 13.56 MHz – 490 µH ± 5% for 125 kHz
Dimensions (L x W x H)	C0 version: approx. 31.00 x 17.80 x 2.70 mm / 1.22 x 0.70 x 0.11 inch C1 version: approx. 31.00 x 17.80 x 8.11 mm / 1.22 x 0.70 x 0.32 inch
Power	Direct power supply: 3.3 V ± 5% On-board voltage regulator: 4.3 V – 5.5 V ES1/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 ranges	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
MTBF	500,000 hours
Weight	Approx. 7 g / 0.25 oz

TWN4 MultiTech Nano Plus M		
 	Frequencies	125 kHz, 134.2 kHz (LF) / 13.56 MHz (HF)
	Antenna[1]	Externally, direct matched for 13.56 MHz – 490 µH ± 5% for 125 kHz/134.2 kHz
	Dimensions (L x W x H)	C0 version: approx. 31.00 x 17.80 x 2.70 mm / 1.22 x 0.70 x 0.11 inch C1 version: approx. 31.00 x 17.80 x 8.11 mm / 1.22 x 0.70 x 0.32 inch
	Power	Direct power supply: 3.3 V ± 5% On-board voltage regulator: 4.3 V – 5.5 V ES1/PS2 classified power source according to IEC 62368-1, short-circuit current < 8 A
	Current consumption	RF field on: 160 mA typically / Sleep: 500 µA typ.
	Temperature ranges	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
	MTBF	500,000 hours
	Weight	Approx. 7 g / 0.25 oz

Refer to the data sheet of your product for additional technical specifications.

FIRMWARE

The product is delivered ex-works with a specific firmware version, which is displayed on the product label on the packaging (Fig. 1).

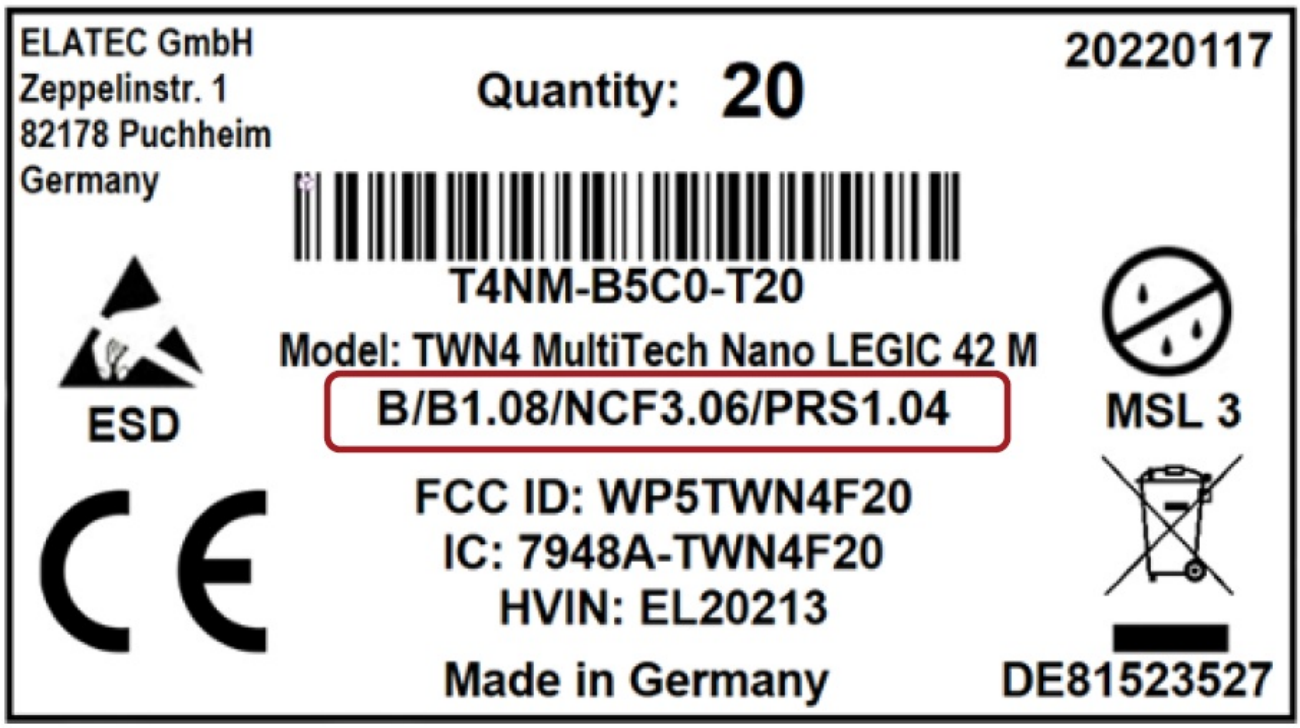


Fig. 1 - packaging label (exemplary)

FCC ID: WP5TWN4F23

IC : 7948A-TWN4F23

HVIN: EL20244

Fig. 2 – label on TWN4 MultiTech Nano Plus M

LABELING

The product is delivered ex-works with a label (Fig. 1) attached to the product packaging and a label attached directly on the rear side (Fig. 2). Both labels contain important product information (e.g. certification information) that must be visible on the host device containing the product. For more information about the specific requirements related to the labeling of the host device, refer to the integration manual of your product and to the documentation related to the host device.

ACCESSORIES

The product can be delivered with the following optional component:

Development board for interface testing

The development board provides ready-to-use interfaces (USB and UART) and peripherals (low-/high-frequency antennas, SAM card slots) needed to test the core functionalities of the TWN4 MultiTech Nano modules.

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 ELATEC 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

To start operating the reader module, it simply has to be connected directly to a host device.

POWER UP

Once the reader module is connected to the host device, it detects the type of communication cable (e.g. USB), with which it is connected to the host.

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

- ES1/PS2 classified power source according to IEC 62368-1
- Short-circuit current < 8 A

ENUMERATION

Only applicable for USB version of reader modules:
Once the reader module has been powered up, it waits for completion of the enumeration by the USB host. As long as the reader module is not enumerated, it is in a minimum power consumption mode, where both LEDs are turned off.

INITIALIZATION

After powering up and enumeration (USB mode), the reader module turns on the built-in transponder reader logic. The green LED is turned on permanently. Some RFID modules need some kind of initialization, which is performed in this step. After successful initialization, the reader module sounds a short sequence, which consists of a lower tone followed by a higher tone.

NORMAL OPERATION

As soon as the reader module has completed the initialization, it enters the normal operation mode. During normal operation, the reader module searches for a transponder continuously.

DETECTION OF A TRANSPONDER

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

- Send the ID to the host. By default, the USB devices send by emulating keystrokes of a keyboard.
- 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.

SUSPEND MODE

Only applicable for USB version of reader modules:
The USB version of reader modules supports the USB suspend mode. If the USB host signals suspend via the USB bus, the reader module turns 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 resumes to normal operation mode, this is also signaled via the USB bus. Therefore, the reader module will resume to normal operation too.

COMPLIANCE STATEMENTS

UNITED KINGDOM

The RFID modules of the TWN4 MultiTech Nano family comply 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 to the packaging the importer

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

TWN4 MULTITECH NANO LEGIC 42 M

EU

Hereby, ELATEC GmbH declares that TWN4 MultiTech Nano LEGIC 42 M complies with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: elatec.com/approvals

TWN4 MultiTech Nano LEGIC 42 M complies with the RF exposure requirements for mobile devices (47 CFR 2.1091). However, the device shall be used in such a manner that the potential for human contact during normal operation is minimized.

FCC WARNING

FCC ID: WP5TWN4F20

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.

ISED / ISDE CANADA

IC: 7948A-TWN4F20

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:

TWN4 MULTITECH NANO LEGIC 63 M

EU

Hereby, ELATEC GmbH declares that TWN4 MultiTech Nano LEGIC 63 M complies with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: elatec.com/approvals

TWN4 MULTITECH NANO M

EU

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

FCC

TWN4 MultiTech Nano M complies with the RF exposure requirements for mobile devices (47 CFR 2.1091). However, the device shall be used in such a manner that the

potential for human contact during normal operation is minimized.

FCC ID: WP5TWN4F21

APPENDIX

A – RELEVANT DOCUMENTATION

ELATEC documentation

- TWN4 MultiTech Nano family, user manual/instructions for use
- TWN4 MultiTech Nano LEGIC 42 M data sheet
- TWN4 MultiTech Nano LEGIC 42 M integration manual
- TWN4 MultiTech Nano LEGIC 63 M data sheet
- TWN4 MultiTech Nano LEGIC 63 M integration manual
- TWN4 MultiTech Nano M data sheet
- TWN4 MultiTech Nano M integration manual
- TWN4 MultiTech Nano Plus M data sheet
- TWN4 MultiTech Nano Plus M integration manual
- TWN4 MultiTech Nano technical handbook

External documentation

- Technical documentation related to the host system

TERMS AND ABBREVIATIONS

TERM	EXPLANATION
EMC	electromagnetic compatibility
HF	high frequency
LF	low frequency
MTBF	mean time between failures

PCB	printed circuit board
RFID	radio frequency identification

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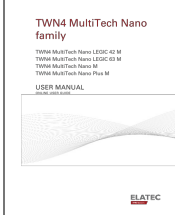
responsibility. Where application information is given, it is only advisory and does not form part of the specification. Disclaimer: All names used in this document are registered trademarks of their respective owners.

FAQ

- **Q: Where can I find additional product information?**
  A: Additional product information can be found on the Elatec website or by contacting Elatec technical support.
- **Q: Can I use spare parts not recommended by Elatec?**
  A: It is not recommended to use spare parts or accessories not approved by Elatec as it may lead to damages or injuries.

Documents / Resources

	ELATEC TWN4F23 Transponder Reader and Writer [pdf] User Manual TWN4F23, TWN4F23 Transponder Reader and Writer, Transponder Reader and Writer, Reader and Writer

References

- User Manual

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ELATEC, Reader and Writer, Transponder Reader and Writer, TWN4F23, TWN4F23 Transponder Reader and Writer

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