TWN3 MIFARE M

USER MANUAL
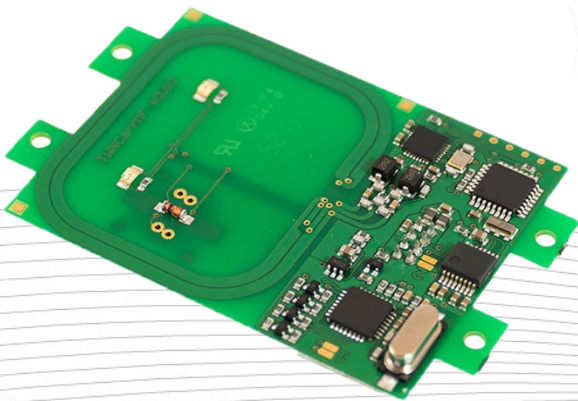
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1 INTRODUCTION

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.

1.2 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 or if you wish additional copies of this user manual, contact your Sales representative or ELATEC customer service at:

info-rfid@elatec.com

1.3 REVISION HISTORY

VERSION	CHANGE DESCRIPTION	EDITION
02	Editorial changes, chapters "Safety Information", "Technical Data" and "Compliance Statements" updated	09/2021
01	First edition	02/2021

2 INTENDED USE

The TWN3 MIFARE M RFID reader module is designed for easy integration into various applications. This device supports either USB or RS-232 communication just in dependence on the connection cable and is available as an OEM board (PCB) without housing for direct integration into embedded applications. The reader module can be programmed with a scripting language for autonomous execution of even complex commands like login procedures, increment/decrement functions and many more.

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 observe the safety information listed in this document, will be considered misuse and will void the warranty. ELATEC is not responsible for any damage or injuries resulting from any misuse of the product.

3 SAFETY INFORMATION

Installation

- The installation of the product should be done by a trained and qualified personnel only.
  Do not install the product by yourself.

- Metallic materials on or in direct vicinity to the product might reduce the reading performance of the product. In some circumstances, plastic screws should be preferred to metallic screws when installing the product. Refer to the installation instructions or integration manual of the product for more information.

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 following conditions:
  o Temperature range: -25 °C – 80 °C (operating conditions)
  o Relative humidity: 5% – 95% (non-condensing)
  o Integration into a host device.

  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 is not responsible for any damage 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 pacemaker or any other medical device should use TWN3 MIFARE M carefully and refer to the information given by the manufacturer of their medical devices before using TWN3 MIFARE M or any host device containing TWN3 MIFARE M.

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 other applicable local regulations.

Product modifications

- The product has been designed, manufactured and certified as defined by ELATEC.

Any product modifications not expressly approved by ELATEC, including – but not limited to – modifications of antennas or other radio-related components, is not allowed and will void the warranty and all approvals granted to the product.

If you are unsure about any part of the safety information above, contact ELATEC support.

Any failure to observe the safety information above will be considered misuse and will void the warranty. ELATEC is not responsible for any damage or injuries resulting from any misuse of the product.
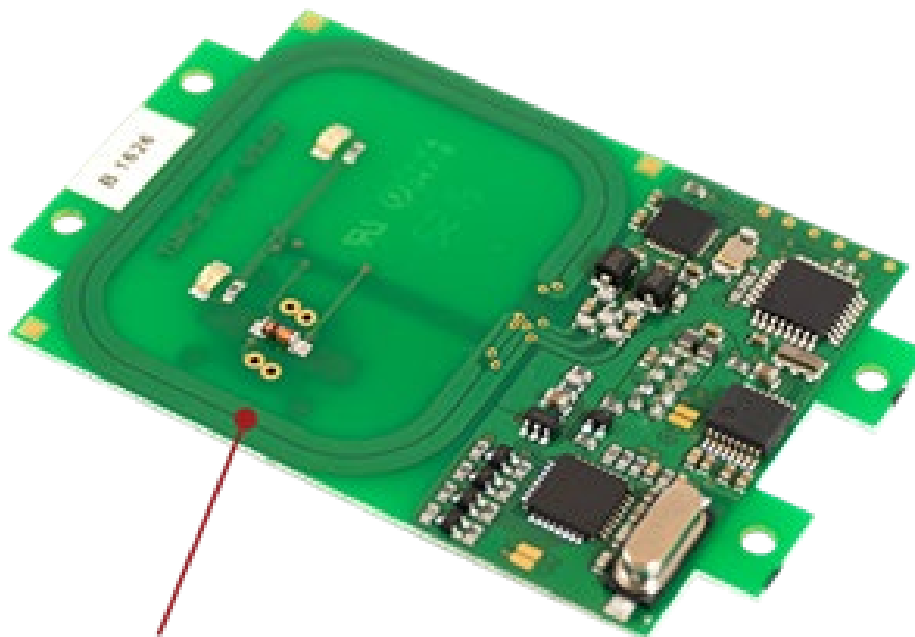
4 TECHNICAL DATA

Power supply

5.0 V ± 10% via communication cable (USB); serial version requires external power supply

Current consumption

55 mA typ. (USB, normal operation); 120 mA peak

Antenna

The reader module is equipped with the following antenna:

TWN3 MIFARE M – HF antenna (PCB air coil, integrated)

HF antenna (13.56 MHz)

Dimensions: 39.5 mm x 48 mm / 1.56 inch x 1.89 inch
Number of turns: 4

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

5 MODE OF OPERATION

5.1   OPERATING MODE

In order to start operating TWN3 MIFARE M, it simply has to be connected directly to a host device.

5.2   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 norms listed in the respective declaration of conformity
- Short-circuit current < 8 A

Once a TWN3 MIFARE M reader module is connected to the host, it detects the type of communication cable (USB or RS-232), with which it is connected to the host. The result of this detection is signaled via the two LEDs:
- USB cable: red LED flashes once.
- RS-232 cable: green LED flashes once. This flash is hidden by the directly following permanent one of the green LED.

In case of RS-232: Additionally, the RS-232 is sending a version string via RS-232 to the host.

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 its 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, which is similar to a "plug & play" sound.

5.5   NORMAL OPERATION

As soon as the reader module has completed the initialization, it is entering normal operation. During normal operation, the reader 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, then 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

TWN3 MIFARE M is in compliance with the EU directives and regulations as listed in the respective declaration of conformity.

6.2 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.

APPENDIX

A – TERMS AND ABBREVIATIONS

TERM	EXPLANATION
HF	high frequency
LED	light-emitting diode
PCB	printed circuit board
RFID	radio frequency identification
WEEE	Waste of electrical and electronic equipment. Refers to Directive 2011/65/EU of the European Parliament and of the Council of the European Union

B – RELEVANT DOCUMENTATION

ELATEC documentation

- ELATEC quick start guide
- Transponder Reader TWN3 Technical Manual
- TWN3 MIFARE M data sheet
- TWN3 MIFARE M integration manual

ELATEC

RFID Systems

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