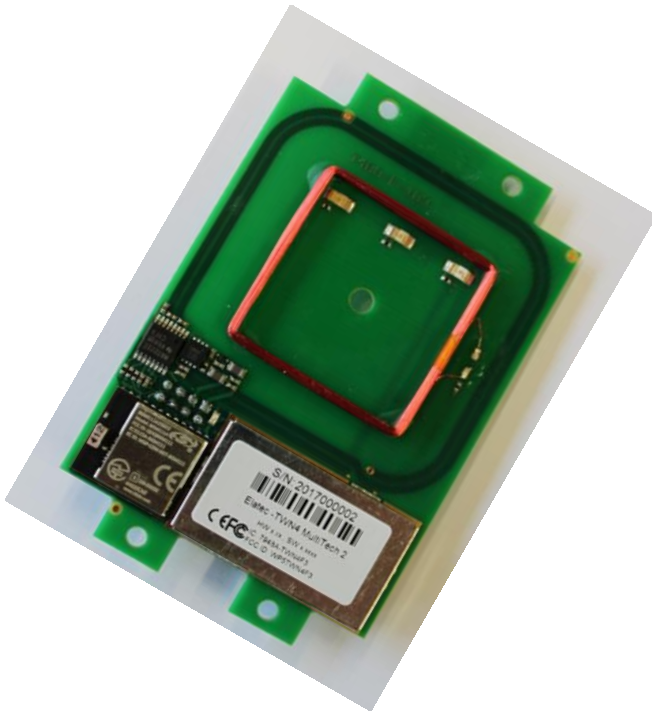# ELATEC

RFID Systems

Transponder Reader
TWN4 MultiTech 2

Quick Start Guide

Rev. 4

1. Introduction

The transponder reader TWN4 is a device for reading and writing RFID transponders. There are different versions of TWN4 devices available, which cover a large range of transponder types both in the frequency range of 125kHz and 13.56MHz.

2. Getting Started

2.1 Cable Connection

In order to start operating a TWN4 transponder reader, it simply has to be connected to a host.

2.2 Power Up

Once a TWN4 reader is connected to the host, it detects the type of communications cable (USB or RS232), with which it is connected to the host.

Additionally, the RS232 is sending a version string via RS232 to the host.

2.3 Enumeration (USB Only)

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.

2.4 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 transponder 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.

2.5 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.

2.6 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. A RS232 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.

2.7 Suspend Mode (USB Only)

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

3. List of Antennas
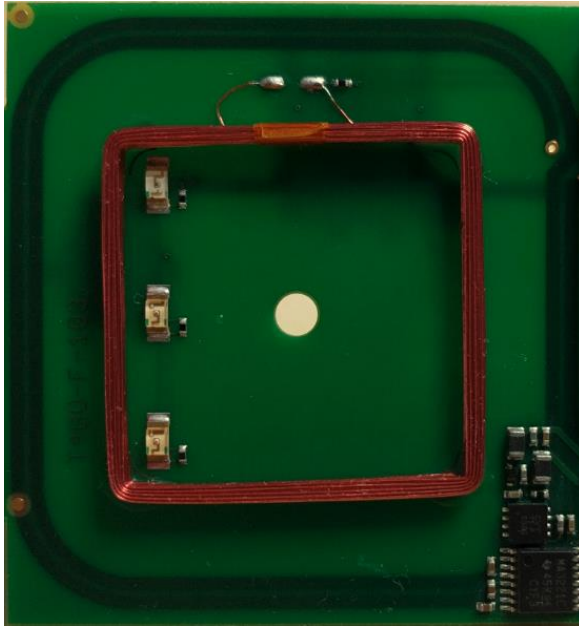
4. Compliance statements

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 reason-able 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 deter-mined 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.

RSS COMPLIANCE STATEMENT

This device complies with Industry Canada's licence-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

Le présent appareil est conforme aux CNR d'Industrie 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'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage

est susceptible d'en compromettre le fonctionnement.

3. End device labeling instructions

FCC notes for all hosts devices. The end device must be labeled with:

Contains FCC ID: WP5TWN4F3

Contains IC: 7948A-TWN4F3

Labelling Requirements (Verification)

In addition following statement shall be placed on the device:

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.

Labelling Requirements (Declaration of Conformity)

Where the product is so small or for such use that it is not practicable to place the statement on it, the statement can be placed in a prominent location in the instruction manual.

Information to the user

- For Class A devices the manual of the host shall include the following statement:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- For Class B devices the manual of the host shall include the following statement:

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 reason-able 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 deter-mined 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.

Modification of equipment

The instruction manual of the host shall include the following statement: Changes or modifications made to this equipment not expressly approved by the party responsible for compliance may void the FCC authorization to operate this equipment.

Special accessories

Where special accessories such as shielded cables and/or special connectors are required to comply with the emission limits, the instruction manual shall include appropriate instructions on the first page of the text describing the installation of the device.

Final Compliance of end product

The integrator is responsible for the final compliance of the end product including this certified transmitter module. CFR 47 §15.101 give guidance in terms of applicable equipment authorization procedures of different end-products. Typically compliance to subpart 15 B (§15.107 and 15.109) Class A or B including verification of the subpart 15 C compliance (field strength of fundamental and out-of-band emissions) of the transmitter parameters apply.

Simultaneous transmission

When the host product supports simultaneous-transmission operations the host manufacturer needs to check if there are additional RF exposure filing requirements due to the simultaneous transmissions. When additional application filing for RF exposure compliance demonstration is not required (e. g. if the TWN4 MultiTech2   module in combination with all simultaneously operating transmitters complies with the RF exposure simultaneous transmission SAR test exclusion requirements), the host manufacturer may do his own evaluation without any filing, using reasonable engineering judgment and testing for confirming compliance with out-of-band, restricted band, and spurious emission requirements in the simultaneous-transmission operating modes.

If additional filing is required please contact the person at GMMC GmbH responsible for certification of the TWN4 MultiTech2 module.

5. Service Address

In case of any technical questions, please contact:

Elatec GmbH
Zeppelinstr. 1
82178 Puchheim
Germany

Phone: +49 (0) 89 5529961 0
Fax: +49 (0) 89 5529961 129
Email: info-rfid@elatec.com