TWN4 MULTITECH 2 M

INTEGRATION MANUAL
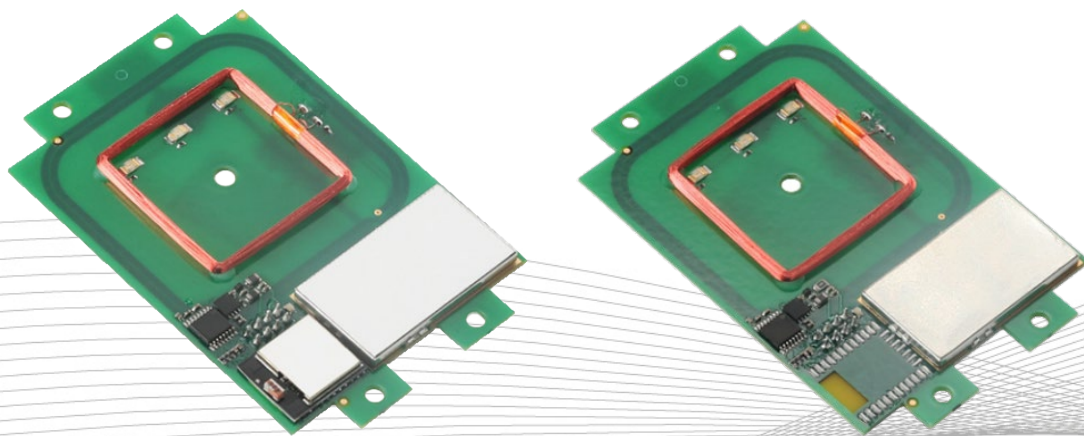
ELATEC
RFID Systems

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1 INTRODUCTION

1.1   ABOUT THIS MANUAL

This integration manual explains how to integrate ELATEC RFID reader/writer module TWN4 MultiTech 2 M into a host device and is mainly intended for integrators and host manufacturers. Before installing the product, the integrators should read and understand the content of this integration manual and other relevant installation documents.

The content of this integration manual is subject to changes without prior notice and printed versions might be obsolete. Integrators and host manufacturers are required to use the latest version of this integration 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 integration manual has been written in English. Wherever the integration 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   ABOUT TWN4 MULTITECH 2 M

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 installation 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 RFID module include a powerful SDK for writing apps that are executed directly on the module, the possibility to upgrade the firmware in the field, a direct chip-commands support and a powerful BLE module. 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.

1.3   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

2 SAFETY INFORMATION

- 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.

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

- Before installing the product into a host device, the integrator should also make sure that he/she has read and understood the ELATEC technical documentation related to the product, as well as the technical documentation related to the host device. In particular, the instructions and safety information given in the user manual of TWN4 MultiTech 2 M should be read carefully and listed in the technical documentation of the host manufacturer as well, as soon as these instructions and safety information are required for a safe and proper use of the host device containing TWN4 MultiTech 2 M.

- 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.

- ELATEC also recommends the integrators to follow general ESD protective measures during the installation of the product into a host device, e.g. the use of an antistatic wristband or special gloves.

- In case the product is equipped with a cable, do not twist or pull the cable.

- 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 integrator should not touch the antennas (if not shielded), printed circuit boards, connectors or other sensitive components on the product.

- Metallic materials on or in direct vicinity to the product might reduce the reading performance of the product. Refer to the installation instructions or contact ELATEC for more information.

Any failure to comply with the safety information given in this document and in the user manual, is considered improper use. ELATEC excludes any liability in case of improper use or faulty product installation.

3 INTEGRATION INSTRUCTIONS

3.1 GENERAL

TWN4 MultiTech 2 M may be installed in any host devices, as long as it is operated under the operational conditions stated in the user manual and other technical documents (e.g. data sheet). TWN4 MultiTech 2 M is equipped with 2 integrated antennas. Thus, no antenna installation is required.

3.2 LIST OF APPLICABLE RULES

Refer to the approval certificates, grants and declarations of conformity issued for TWN4 MultiTech 2 M, and to the following rules applicable to TWN4 MultiTech 2 M:

- 47 CFR 15.209
- 47 CFR 15.225
- 47 CFR 15.247
- RSS-Gen

- RSS-102
- RSS-210
- RSS-247

3.3 SPECIFIC OPERATIONAL USE CONDITIONS

There are no specific operational use conditions for TWN4 MultiTech 2 M other than the conditions mentioned in the user manual and data sheet of TWN4 MultiTech 2 M. The host manufacturer or integrator must ensure that these use conditions comply with the use conditions of the host device. In addition, these use conditions must be stated in the user manual of the host device.

3.4 LIMITED MODULE PROCEDURES

n/a

3.5 TRACE ANTENNA DESIGN

n/a

3.6 RF EXPOSURE CONSIDERATIONS

The module antenna(s) must be installed to meet the RF exposure compliance separation distance of 0 cm and any additional testing and authorization process as required.
Refer to Chapter "Compliance Statements" for detailed information about the radio frequency exposure conditions applicable to TWN4 MultiTech 2 M.
These RF exposure conditions must be stated in the end-product manual(s) of the host product manufacturer.

3.7 ANTENNAS

TWN4 MultiTech 2 M is equipped with the following antennas:

HF antenna (13.56 MHz)
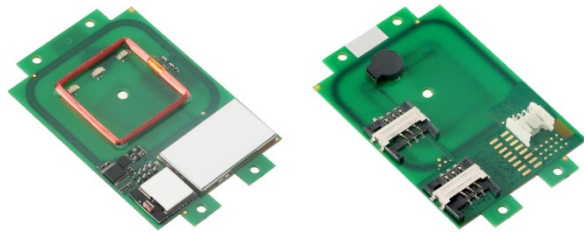> Dimensions: 42 x 44 mm / 1.65 x 1.73 inch
> Number of turns: 3

LF antenna (125 kHz)
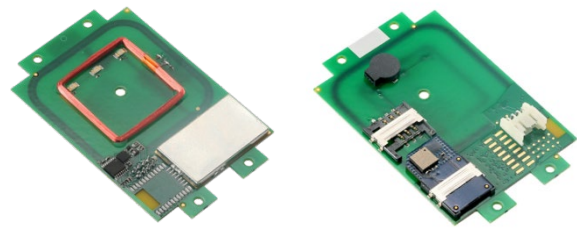> Dimensions: 28 x 28 mm / 1.10 x 1.10 inch
> Number of turns: 151

BLE (2.4 GHz)
> The reader modules of 1st generation contain an integrated BLE chip, whereas the reader modules of 2nd generation are equipped with a BLE SAM card*.

Reader modules of 1st generation	Reader modules of 2nd generation

* It is strictly prohibited to take the BLE SAM card out of the SAM slot of modules of 2nd generation. Removing the BLE SAM card is considered as an unauthorized product modification and improper use of the product, which may result in the loss of product certifications. ELATEC excludes any liability in case of unauthorized product modification or improper use of the product.

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

3.8 LABEL AND COMPLIANCE INFORMATION

Refer to Chapters "Compliance Statements" and "Integrator and Host Requirements" for detailed label and compliance information.

3.9 TEST MODES AND ADDITIONAL TESTING REQUIREMENTS

No specific testing method has been defined by ELATEC for TWN4 MultiTech 2 M.
TWN4 MultiTech 2 M has been tested and found in compliance with the specifications noted on the approval certificates and other relevant approval documents. However, the integrator is still responsible for any additional testing and authorization process required for the end product.
It is recommended that the host product manufacturer installing the modular transmitter perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions). Detailed information regarding test procedure are described in the relevant rule parts (refer to Chapter "List of applicable rules").

3.10 ADDITIONAL TESTING, PART 15 SUBPART B DISCLAIMER

TWN4 MultiTech 2 M is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. In addition, the final host product still requires Part 15 Subpart B compliance testing with TWN4 MultiTech 2 M installed.

3.11 MECHANICAL INSTALLATION

The module can be fixed with four screws M2.5.

3.12 ELECTRICAL CONNECTION

The module can be connected to the host with a DF11 connector*.

PIN	PIN NAME	FUNCTION
1	UGND	USB Ground. Fed to main Ground through noise-reduction circuit.
2	USB_D+	USB Data +
3	UVCC	USB VCC (5V). When using RS-232, connect this to external 5V supply.
4	USB_D-	USB Data -
5	V24_RXD	RS-232 RXD (Input)
6	GND	Ground
7	V24_TXD	RS-232 TXD (Output)
8	Hostsense	Active-low, enables RS-232 transceiver. Short to Pin 6 (GND) when using RS-232.

*Hirose DF11 series, 2mm pitch or type equivalent. In case the reader module is not connected with a cable delivered by ELATEC, the reader module can only be connected with a cable equipped with the following connector: Manufacturer: Shenzhen Le Qing Lin Hai Electronics Co., Ltd Part no.: A2002-H04X2

3.13   PROGRAMMATION/SOFTWARE INTEGRATION

n/a

4 COMPLIANCE STATEMENTS

4.1 EU

Hereby, ELATEC GmbH declares that TWN4 MultiTech 2 M 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

4.2 FCC

FCC ID: WP5TWN4F3

Contains FCC ID: QOQBGM111 (readers of 1st generation) / QOQ-BGM220S2 (readers of 2nd generation)

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)
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.

4.3 ISED CANADA

IC: 7948A-TWN4F3

Contains IC: 5123A-BGM111 (readers of 1st generation) / 5123A-BGM220S2 (readers of 2nd generation)

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.

4.4   TAIWAN

The end device must show the NCC ID of the integrated module, e.g.:

Contains CCAH21Y11060T0
or
Contains NCC ID: CCAH21Y11060T0

4.5   UNITED KINGDOM

TWN4 MultiTech 2 M 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:

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

4.6   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.

5 INTEGRATOR AND HOST REQUIREMENTS

Authorization requirements

TWN4 MultiTech 2 M has been certified as a module and does not need further approval, provided that the module is used in accordance with the FCC grant conditions and no limitations or usage conditions have been defined by ELATEC. However, the host manufacturer must ensure that the host device still complies with all applicable regulations after TWN4 MultiTech 2 M has been integrated.

In particular, the host integrator installing TWN4 MultiTech 2 M into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369.

Labeling requirements

Requirements for FCC and IC identification numbers:

Using a permanently affixed label, TWN4 MultiTech 2 M must be labeled with its own FCC and IC identification numbers. In case this label is not visible anymore after integration of TWN4 MultiTech 2 M in the host device, it is necessary to bring a label on the host device (on a visible and accessible place) stating the FCC and IC identification numbers of the integrated TWN4 MultiTech 2 M:

Contains FCC ID: WP5TWN4F3, QOQBGM111 (reader modules of 1st generation) or
Contains FCC ID: WP5TWN4F3, QOQBGM220S2 (reader modules of 2nd generation)

Contains IC: 7948A-TWN4F3, 5123A-BGM111 (reader modules of 1st generation) or
Contains IC: 7948A-TWN4F3, 5123A-BGM220S2 (reader modules of 2nd generation)

In case several modules have been integrated into the host device, the label should state all FCC and IC identification numbers of the integrated modules.

Example:
"Contains FCC IDs: XXX-XXXXXXX, YYY-YYYYYYY, ZZZ-ZZZZZZZ"
"Contains transmitter modules IC: XXXXX-XXXXXX, YYYYY-YYYYYY, ZZZZZ-ZZZZZZ"

Requirements for other countries and regions:

Refer to Chapter "Compliance Statements" for detailed information about the labeling requirements applying to the reader module or to the host device.

Compliance statements

All statements listed in Chapter "Compliance statements" of this integration manual must be also listed in the user manual of the host device.

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.

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. the RF 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 ELATEC GmbH responsible for certification of the RF module.

APPENDIX

A – TERMS AND ABBREVIATIONS

TERM	EXPLANATION
host device	Also "host" or "host product". Device in which an RFID module is intended to be installed for operation.
Integrator	Responsible party for the integration of an RFID module into a host device. The integrator might be the module manufacturer, the host manufacturer, the end user or any other third party.
KDB	Knowledge Database
modular type	Physical configuration in which a modular transmitter operates when installed within a host device. It can be a single-modular, a limited single-modular, a split-modular or a limited split-modular type.
n/a	Not applicable
RFID (reader/writer) module	Device intended to be used within another device or product. Depending on the equipment configuration and intended use, an RFID module has to meet different requirements to get a modular grant.

B – RELEVANT DOCUMENTATION

ELATEC documentation
- TWN4 MultiTech 2 M data sheet
- TWN4 MultiTech 2 M functional description
- TWN4 MultiTech 2 M user manual
- TWN4 MultiTech 2 technical handbook

External documentation

Document name	Document title/description	Source
n/a	Technical documentation related to the host product	Host product manufacturer
784748 D01 General labeling and Notification	General Guidelines for Labeling and Other Information Required to be Provided to Users	Federal Communications Commission Office of Engineering and Technology Laboratory Division
996369 D01 Module Equip Auth Guide	Transmitter Module Equipment Authorization Guide	Federal Communications Commission Office of Engineering and Technology Laboratory Division
996369 D02 Module Q and A	Frequently Asked Questions and Answers about Modules	Federal Communications Commission Office of Engineering and Technology Laboratory Division
996369 D03 OEM Manual	Guidance for Modular Transmitter Instruction Manuals and TCB Certification Application Reviews	Federal Communications Commission Office of Engineering and Technology Laboratory Division
996369 D04 Module Integration Guide	Modular Transmitter Integration Guide— Guidance for Host Product Manufacturers	Federal Communications Commission Office of Engineering and Technology Laboratory Division
RSS-Gen	General Requirements for Compliance of Radio Apparatus	Innovation, Science and Economic Development Canada
RSS-102	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)	Innovation, Science and Economic Development Canada
RSS-210	Licence-Exempt Radio Apparatus: Category I Equipment	Innovation, Science and Economic Development Canada
RSS-247	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	Innovation, Science and Economic Development Canada
Title 47 of the Code of Federal Regulations (CFR)	FCC's rules and regulations	Federal Communications Commission

For more information about this integration manual or TWN4 MultiTech 2 M, go to www.elatec.com or contact ELATEC.

C – REVISION HISTORY

VERSION	CHANGE DESCRIPTION	EDITION
05	Editorial changes, chapters "Introduction", "Safety Information", "Antennas", "Compliance Statements" and "Integrator and Host Requirements" updated	07/2023
04	Chapter "Electrical Connection" updated	03/2022
03	Chapters "About this Manual", "Safety Information" and "Compliance Statements" updated	02/2022
02	Chapters "Safety Information" and "Compliance Statements" updated	07/2021
01	First edition	05/2021

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ELATEC GMBH

Zeppelinstr. 1 • 82178 Puchheim • Germany
P +49 89 552 9961 0 • F +49 89 552 9961 129 • E-mail: info-rfid@elatec.com
elatec.com