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Schneider Electric EBIOTPCWM TR Radio Module User Manual

EBIOTPCWM TR Radio Module
User Manual

Contents

EBIOTPCWM TR Radio Module

Date	Version	Editor	Status	Notes
21.10.2022	0.1	Tuomo Nikkila	Draft	Initial draft created, Electronics information added
25.10.2022	0.2	Timo Yli-Pietila	Draft	Integration guidelines and labelling chapter added
26.10.2022	0.3	Ella Raitio	Draft	Label and compliance information added
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2/12/2022	1.		Version	FCC and ISED statements added

Acronyms and abbreviations

EMC	Electromagnetic Compatibility
SoC	System on Chip
IC	Integrated Circuit
PMN	Product Marketing Name
HVIN	Hardware Version Identification Number

Introduction

1.1 General

EBIOTPCWM (also referred to as ,,TR Module'' to increase the readability of this document) is a BLE/Wirepas 2.4GHz radio module. In general, TR Module includes full 2.4 GHz radio functionality including radio SoC (System on Chip), power supply, crystals, antenna, and interface for variety of sensor modules.

TR Module is not sold separately, it is part of selected commercial products.

1.2 Certification information

The certification related information and naming of the EBIOTPCWM can be found below.

PMN: EBIOTPCWM

HVIN: EBIOTPCWM

FCC ID: DVE-EBIOTPCWM

IC ID: 24775-EBIOTPCWM

EBIOTPCWM will be used as a radio module inside selected Sensor Solutions for Building-IoT.

1.3 Functions

TR Module has two functions. It communicates to network using 2.4GHz ISM band and it has a boardto-board connector that can be used to connect to different peripheral PCBs. It also has an integrated PCB antenna and STSAFA security chip.

Operating conditions

The operating conditions of EBIOTPCWM can be found in the table below.

	Min	Max
Operating voltage V	1.7	3.6
Operating temperature °C	0	50
Current consumption	10uA	20mA

Maximum clock frequency is 32MHz and sleep clock is 32kHz.

Integration instructions for host product manufacturers

3.1 List of applicable FCC/ISED rules

FCC:	ISED:
47 CFR Part 15 Subpart C §15.247	RSS-247, Issue 2

3.2 Specific operational use conditions
To keep the antenna performance on tested level, antenna area of the TR Module is good to keep away from metal structures (10mm distance or more). Avoid attaching flexes, wires or floating metal structures directly on top of TR Module.

3.3 Limited module procedures
Limited module procedure is needed because TR Module does not have a separate shield on radio SoC IC. To meet test requirements with host products, it is good practice to avoid attaching flexes, wires or floating metal structures close TR Module or it's antenna.

3.4 Trace antenna designs
TR Module contains integrated monopole PCB trace antenna. Maximum tested antenna gain is 4.8dBi.

3.5 RF exposure considerations
RF Exposure Evaluation with SAR test exclusion for TR Module is available. For SAR test exclusion of 5mm separation distance was used giving results well below the limits.

RF Exposure Evaluation with SAR exclusion for TR Module (IoT Desk Occupancy Sensor Solution used as a test jig) is available. In SAR calculations 5mm separation distance was used giving results well below the limits.

3.6 Antennas
TR Module contains integrated monopole PCB trace antenna. TR Module's internal antenna peak gain is 4.8dBi. More details are available in separate antenna report (document name Antenna report for Desk and IAQ sensors).

3.7 Information on test modes and additional testing requirements
In TR Module Nordic Semiconductor low power nRF52840 SoC IC is used as radio modem. Size of the low power IC is such that extra shielding is not required in target usage on 2.4GHz band. TR Module has been successfully tested with different sensor form factors against immunity and emission official limits. The required FCC rules for TR Module has been fulfilled.

Host products using TR Module need to be tested against required EMC emission and immunity tests.

Separate test mode instruction document is available for the host product testing. Two test software versions are provided. In EMC test mode TR Module sends measurement data frequently to PC via Wirepas USB dongle. In RF test mode TR Module can be set to Direct Test Mode using provided debug interface cable. In Direct Test Mode RF TX/RX parameters can be set.

3.8 Additional testing, Part 15 Subpart B disclaimer
Host products using TR Module require Part 15 Subpart B compliance testing for FCC.

Label and compliance information

As the dimensions of the TR Module are small and thus it is not practical to place the label on the product, as it would not be readable, TR Module is not labelled with its FCC ID nor IC ID. Please also note, that TR Module is not used or sold separately, TR Module is part of the selected commercial end products.

Instead, the FCC ID and IC ID are placed on the label(s) of the end-product(s) (also referred to and known as "host products"). The label is placed on a prominent location on the end-product(s). The product code part, both in the FCC ID and IC ID, refers to the radio module: "XXX-EBIOTPCWM". The FCC and IC IDs are also provided in this document, in the chapter 1.2 Certification information. This user manual is provided for the manufacturer(s) of the end-product(s) using the TR Module.

Also, the labelling instructions, how the end-product containing the module must be labelled, are provided in this document in the following chapter 4.1.

4.1 Labelling instructions

The host product shall always be labelled with the FCC ID and the IC ID of the radio module, regardless of whether the module is visible in the host product or not, because due to the small size of the TR Module, the IDs cannot be shown on the module itself.

Below examples are shown how the information should be presented in the labelling of the end-product(s) and also how to place the label(s) to prominent location(s) on the end-product(s). Please note that the label example pictures in this document are not presenting the real size of the labels nor the end-products.
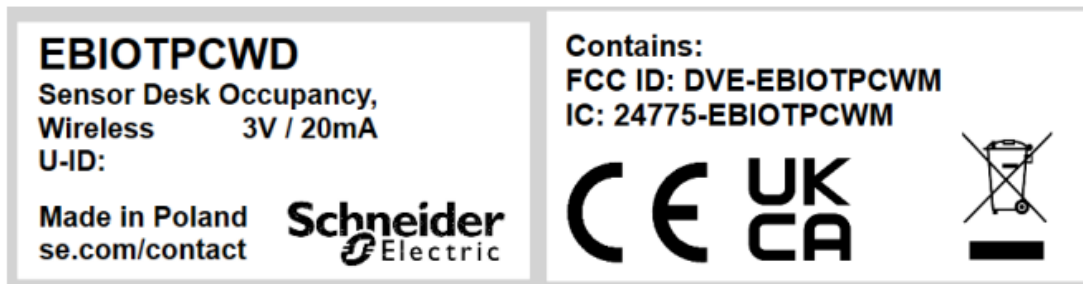

Figure 1. Label examples (Label 1 left, Label 2 right) of the end-product EBIOTPCWD.

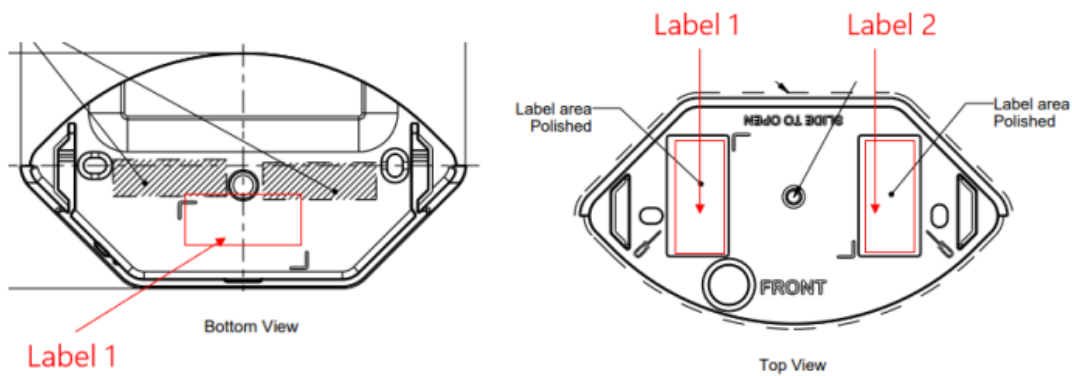Figure 2. Label example of the end-product EBIOTPCWE1.

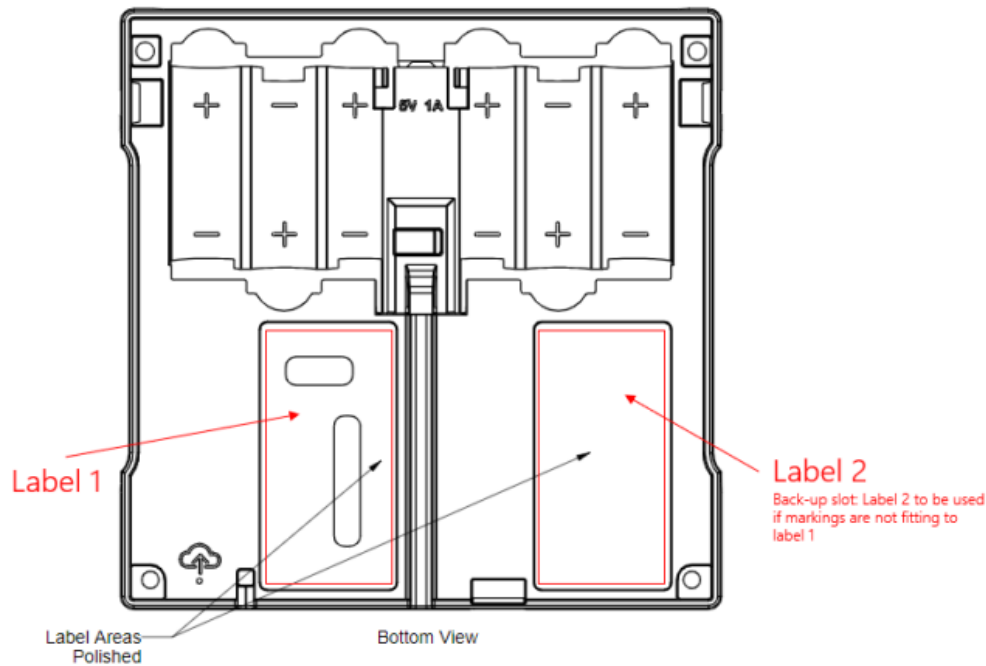Figure 3. Label placement example of the end-product EBIOTPCWD.

Figure 4. Label placement example of the end-product EBIOTPCWE1.

FCC and ISED statements

FCC
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.

Any changes or modifications made to the device not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

ISED
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.

Documents / Resources

EBIOTPCWM User Manual	**Schneider Electric EBIOTPCWM TR Radio Module** [pdf] User Manual EBIOTPCWM, DVE-EBIOTPCWM, DVEEBIOTPCWM, EBIOTPCWM TR Radio Module, TR Radio Module, Radio Module, Module

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