

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

In order to sell final products within the European market, OEM manufacturer's final products have to be compliant to all application-specific EU directives and standards. Dolphin radio modules are components which are delivered to OEM manufacturers for their use in final/combined products.

The Radio Equipment Directive (2014/53/EU), RED, replaces the old R&TTE directive from 1999. All products sold to final customers after 12th of June, 2017 have to be compliant to RED. In order to support its customers, EnOcean provides at least following documents for download at product website: data sheet, user manual, product safety information and Declaration of Conformity (DoC).

Additionally, EnOcean supports customers by pre-testing its radio modules. Detailed test reports and test software are available on request via our support team: support@enocean.com

It is the responsibility of the OEM manufacturer to demonstrate compliance to all applicable EU directives and standards. Specifically within the new RED framework, all OEM manufacturers have for instance to fulfil the following additional requirements:

- Provide product branding (on the product) clearly identifying company name or brand and product name as well as type, charge or serial number for market surveillance
- Include (with the product) documentation containing full postal address of the manufacturer as well as radio frequency band and max. transmitting power
- Include (with the product) user manual, safety information and a declaration of conformity for the final product in local language
- Provide product development and test documentation upon request

Please contact an accredited test house for detailed guidance.

Links to further documents:

- Blue Guide: <http://eur-lex.europa.eu/legal-content/DE/TXT/?uri=OJ:C:2016:272:TOC>
- Radio Equipment Directive: <http://data.europa.eu/eli/dir/2014/53/oj>
- RED Guide: <http://ec.europa.eu/docsroom/documents/23321>
- ETSI radio standards: http://www.etsi.org/deliver/etsi_en/30
- ETSI Guide combined devices:
http://www.etsi.org/deliver/etsi_eq/203300_203399/203367/01.01.00_50/eq_203367v010100m.pdf

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

Frequently Asked Questions:

1. When does the new Radio Equipment Directive (RED) came into force?

The one-year transition phase ended June 12, 2017, after this, all sold products must conform to the new RED directive. Unfortunately the corresponding standards have been published very late by the European Union in the first quarter 2017.

2. What are the major changes to the former R&TTE directive?

Among other things, there are the following changes:

- New requirements for the efficiency of radio receivers (3.2)
- Additional interoperability requirements for radio equipment (3.3a)
- New Requirements for software-hardware combinations (3.3i)
- Introduction of an optional system for the central registration of radio products (5)
- Additional product (label) information on occupied frequency bands and maximum transmission power on the product

3. Which products are applicable to the Directive?

The Directive applies to all end products which emit radio waves (radio equipment); it does not apply to electronic components delivered to manufacturers of end products or evaluation boards for customers.

4. What is conformity assessment?

The manufacturer of a final product must ensure by a conformity assessment that his products comply to all applicable EU directives and standards. The conformity assessment can be carried out by the manufacturer or by an external service provider.

The conformity assessment must be carried out by the manufacturer for each final product before the first placing on the market. At the end of the conformity assessment, the manufacturer has to issue a Declaration of Conformity (DoC) for its product stating that the product complies with the requirements of the relevant Directive (s). The manufacturer then affixes the CE marking to the product.

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

EnOcean GmbH supports manufacturers / OEM customers who integrate Dolphin radio modules with technical support and the following documents:

- Data Sheet and user Manual (technical specification)
- Attestation of Conformity or Declaration of Conformity with a list of EnOcean approved directives and harmonized standards
- Test lab reports and test software provided on request.

4. Where can I find Declarations of Conformity (DoC) for Dolphin radio modules?

DoCs can be downloaded from the product details website:

https://www.enocean.com/en/enocean_modules/

For example the DoC for PTM 210 can be found at:

https://www.enocean.com/en/enocean_modules/ptm-210/

5. What does the affixing of the CE mark mean?

By labeling the finished product with "CE", the final manufacturer declares that the product complies with all applicable EU requirements and that appropriate conformity assessment procedures have been successfully carried out.

The CE marking is to be displayed clearly, legibly and permanently on the product. If the nature of the product does not allow it or does not give rise to it, it will be placed on the packaging (if any) and / or accompanying documents. The CE marking may not be applied until the conformity assessment procedure has been completed, which ensures that the product complies with all the requirements of the relevant harmonization legislation of the European Union. As a rule, this is the case at the end of the production phase.

6. When is a product placed on the market?

A product is placed to the market when it is at the customer's premises or in the dealer's store. This applies to every single product. A more detailed product-specific regulation can be found in the Blue Guide.

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

7. What EU directives must a final product meet?

In addition to the RED, there are a variety of other directives and standards, e.g. RoHS and REACH. Directives and standards depend on the application (e.g. machinery, medical). The manufacturer of the end product is responsible for the appropriate conformity test and customer information.

8. What are harmonized standards?

Harmonized standards are unified, European standards for products. They are prepared by CEN, CENELEC and ETSI on behalf of the European Commission. They are a key element of the New Approach to the simple trading of goods within the European single market.

9. According to which European guidelines and standards were Dolphin modules developed and tested?

EU directives:

- Radio Equipment Directive (RED), including LVD and EMCD
- RoHS
- REACH

Harmonized standards:

- EN 301489: Electromagnetic compatibility and radio spectrum
- EN 55022: Limits and measuring methods for emitted interference
- EN 61000: Electromagnetic compatibility
- EN 62479: Evaluation of limits for electromagnetic fields
- EN 60950: General requirements for IT equipment
- EN 300328: 2.4GHz wireless modules
- EN 300220: 868.3MHz wireless modules

The WEEE Directive (Electronic Waste Disposal Regulations) of the European Union cover all manufacturers of electronic end products (B2C). The manufacturer of the final product has to implement according to national laws, directives and processes..

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

10. What about modular approval in Europe?

In the EU, there is currently a self-declaration from the manufacturer (EU declaration of conformity) of final products. This means he is obliged to comply with all directives and standards applicable to its end product.

Within the scope of R&TTE, the module was seen as an essential radio component. In practice, the self-declaration of the sensor module manufacturer was seen as sufficient in many cases.

In the RED the term radio component was deleted, there is only the scope of "radio system" as final product. EnOcean provides a Declaration of Conformity with a list of checked directives and standards for each module. DoCs can be downloaded from the product details website: https://www.enocean.com/en/enocean_modules/

The manufacturer must, within the framework of the EU conformity assessment, clarify which directives and standards are to be complied with for its final product and what measures are necessary for this.

11. What information must be provided on the final product?

- Product name
- Serial or batch number for traceability
- Manufacturer or brand name with a complete contact address

Further details and exceptions can be found in the Blue Guide.

12. What are the requirements for accompanied product documentation?

The manufacturer of a final product must supply at least the following documents to the end customer:

- User's guide in clear (local) language
- Safety instructions in understandable (local) language
- EU Declaration of Conformity

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

According to RED following additional information has to be provided:

- Operating Frequency: 868.300 MHz
- Maximum radiated power:

The following list provides an overview of the maximum radiated radio power and the antenna configuration according to the user manuals and test reports:

Module	Frequency	Antenna	Max. radiated power
TCM 515	868,3 MHz	Wire or 50 Ohm 0 dB gain	+10.8 dBm / 12 mW
TCM 300	868,3 MHz	Wire or 50 Ohm 0 dB gain	+1.4 dBm / 1,4 mW
TCM 310	868,3 MHz	Wire or 50 Ohm 0 dB gain	+1.4 dBm / 1,4 mW
TCM 320	868,3 MHz	Wire or 50 Ohm 0 dB gain	+3.0 dBm / 2 mW
TCM 330	868,3 MHz	Wire or 50 Ohm 0 dB gain	+1.4 dBm / 1,4 mW
STM 300	868,3 MHz	Wire or 50 Ohm 0 dB gain	+1.4 dBm / 1,4 mW
STM 312	868,3 MHz	Wire	+6.4 dBm / 4.4 mW
STM 320	868,3 MHz	Wire	+6.4 dBm / 4.4 mW
STM 329	868,3 MHz	Helix	+5 dBm / 3,2 mW
STM 330	868,3 MHz	Wire	+6.4 dBm / 4.4 mW
STM 331	868,3 MHz	Helix	+5 dBm / 3,2 mW
PTM 210	868,3 MHz	PCB antenna	-1.9 dBm / 0.7 mW
PTM 215	868,3 MHz	PCB antenna	-2.1 dBm / 0.6 mW
PTM 330	868,3 MHz	Wire	+5.3 dBm / 3.4 mW
PTM 335	868,3 MHz	Wire	+5.7 dBm / 3.7 mW
PTM 215ZE	2.4GHz	PCB antenna	+7 dBm / 5 mW
PTM 535Z	2.4GHz	Wire	+2.1 dBm / 1.6 mW
TCM 515Z	2.4GHz	Wire or 50 Ohm 0 dB gain	+2.9 dBm / 2 mW
PTM 215B	2.4GHz	PCB antenna	+0.4 dBm / 1.1 mW
TCM 515B	2.4GHz	Wire or 50 Ohm 0 dB gain	+2.9 dBm / 2.0 mW

- Receiver category:

According to the new EN 300 220-1 V3.1.1 the receiver category has to be stated within the user manual. If not stated within the user manual, Dolphin radio modules fulfill receiver category 2 (standard performance level of receiver).

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

13. What do manufacturers need to consider regarding radio performance when integrating Dolphin modules?

EnOcean checks its radio modules carefully according to RED compliance. However, every customer specific adaptation or integration might affect radio performance. Within user manuals and application notes OEM manufacturer will find well documented and tested circuits and antennas.

- In the case of changes to the HF circuit or radio configuration, the conformity must be verified by the OEM manufacturer.
- Certain Dolphin radio modules (TCM 320, TCM 3x0, STM 300) are implemented for the use of external antennas as described in the specific user manual. Especially at a higher antenna gain or lower receiver sensitivity the OEM product has to be re-evaluated to check RED compliance.
- For customer-programmable radio modules (TCM 300/320 and STM 300) EnOcean provides a functional library (Dolphin API) and tested HF settings (chip parameter). These software components were tested to meet RED compliance.
- Application specific parameters (e.g. transmit interval, manufacturer ID) can be changed by OEM customers at configurable radio modules (TCM 310 and STM 3xy). Any modification of the radio module software requires a new assessment of RED conformity.

14. Can I demonstrate prototypes at trade fairs?

Prototypes may be shown at specialist trade fairs (not consumer trade fairs) and presented by technically trained personnel if they are marked accordingly.

15. What are the changes regarding receiver category?

Receiver categories have been redefined by the RED. The receiver category must now be mentioned in the user manual of the final product.

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

The receiver category of Dolphin radio modules can be found within the specific user manual.

The receiver category must correspond to the customer application. Impact of module changes and integration has to be considered. For the definition of receiver categories see EN 300 220 chapter 4.2.5

16. What documents must be kept by the terminal manufacturer?

- Development documents (specifications, conformity assessment, reviews, ...)
- The radio module is a component of the final product. EnOcean Provides radio module user manuals, application notes, list of tested directives / standards (Attestation of Conformity)
- Test reports and test software (on request)

17. What support does EnOcean provide for measurements in the test lab?

- Evaluation boards (e.g. piggy Boards, programmer boards)
- PC software (e.g. DolphinStudio, DolphinView)
- Special module software for a constant transmission of a radio test signal in the laboratory (CW software on request by FAE team)

18. Are there still harmonized standards which have not yet been implemented according to RED?

Several radio or electronic standards are still missing, but most are not relevant for Dolphin radio module applications. As far as we know, EMV standard EN 301489 has not yet been updated till now. The resulting consequences are in clarification.

19. What is about the EMC standard for combined products?

There is a new standard for combined radio products, EN 303 446. Relevance for OEM end products is being clarified.

The European Radio Equipment Directive (RED) - requirements for the integration of Dolphin radio modules

20. Where can I find more information?

- Blue Guide
- RED Guide
- RED national translations
- EN 300 220 V3.1.1
- EN 300 328 V2.1.1
- ERC Recommendation 70-03 (Band use for SRD devices)

21. Who checks the implementation of RED requirements?

The dealer which offers final products within the European Union and national market surveillance authorities will check implementation.

22. Is there an outlook on further requirements?

RED has an option for an approval database of final products with radio. It is expected that from 2018 the first product categories could be affected.