1 Introduction

IOTapproval.com guides and advices you in letting your product comply to the Radio Equipment Directive 2014/53/EU. You as responsible party for bringing the product into the European market a Technical Construction File (TCF) containing the essential required documents as mentioned in the directive should be filed for 10 years as regulated in the Directive.

When buying a pre-certified radio module, a misunderstanding for the integrator is that the wireless approvals will cover full compliance of the final product to be marketed. The Term of radio modules does not appear in the RED which results in a confusion in the assessment requirements. The Radio Module Guidance for RED provides information which steps need to be taken in several cases.

All information published in this document is retrieved from documentation published by the ***RED Compliance Association (REDCA).*** The REDCA is a working group consisting of European Notified Bodies and Manufacturers representing the industry. The REDCA holds 1 meeting per year. One of the outcomes is having a clearer view on not clarified topics in the Directive which are eventually published in a Technical Guidance Note (TGN). As this document is written for RED Notified Bodies a harmonized approach is used.

2 Guidance on incorporation Radio Modules

2.1 Radio Modules

2.1.1 Definitions

A radio module is the radio equipment, which is intended to be installed into a host product.

A host product is a device, product or equipment; into which the radio module will be installed.

A Final product is the combination of host product and radio module.

2.1.2 Types of Radio modules

- *Radio equipment which is also a plug-in device.*
  This is for example an internal mini PCI or a USB Dongle.
- *Radio equipment module which is intended for installation into a host product type 1:*
  - Contains all circuitry on the module, including integral antenna or antenna connector;
  - It may use the control and power supply of the host product;
  - Either soldered or plugged into the host (easy to identify).
- *Radio equipment module which is intended for installation into a host product type 2:*
  - All radio circuitry is contained on module; but does not include integral antenna or an antenna connector;
  - Pins or solder pads are used for connection to a circuit trace on the host product;
  - It may use the control and power supply of the host product;
  - It is soldered onto the host product and may take the appearance of an integrated circuit as part of the host product.

2.2 Radio Module Assessment

In all cases when choosing a radio module for integration into the host product, it is advised that the module is meeting the essential requirements (Safety, EMC and Radio performance) of the RED. Despite the possibility that the radio module's operation may be re-assessed later as part of the final product, this does not safeguard any module manufacturer from meeting the essential requirements.

If a radio module is meeting the essential requirements depends on the combination during testing. Aspects such as antenna type and gain, path configuration, type of operation of use, safety aspects shall be checked with the existing test reports, module installation instructions and the radio module's EU declaration of conformity during design by the integrator.

2.3 Final radio product introduction

The final radio product is effectively a new product. An assessment must be considered of any combined equipment of radio module and host.

CE + CE ≠ CE

2.4 Final radio product compliance

When installing a radio module into a host product, and if the host product was not used at the time of the original assessment of the module, still some assessment or testing will be required.

Many of test cases used to show compliance to the essential requirements (article 3) of the RED are specific to the host environment. This means EMC, Safety and any radio performance assessment which could be affected by a change to the relevant parameters.

In all cases, an assessment of the final radio product must be made to the essential requirements for the RED.

In general, there is a desire to avoid unnecessarily repeating the radio performance assessment at the final product level, if compliance can be justified by the radio module manufacturer by offering their technical documentation. However, if a meaningful and representative assessment of the radio performances on the radio module were not performed or are not available to the final radio product manufacturer, a complete testing and assessment is required which is the responsibility of the manufacturer of the final product.

The following paragraphs show testing and assessment required in case of integrating compliant radio modules.

2.4.1 Compliance to essential requirement article 3.1a health and safety

A full assessment is always required at the final radio product level. Health and Safety tests performed on the radio module do NOT provide confidence of safety compliance of the final radio product.

2.4.2 Compliance to essential requirement article 3.1b EMC

EMC applies to the final radio product according article 3.1b of the RED. In most cases this will mean full EMC testing. EMC tests performed on the radio module do not provide confidence of EMC compliance on the final product.

2.4.3 Compliance to essential requirement article 3.2 Radio

Radio performance according to Article 3.2 of the RED applies to the final radio product and a full assessment will be required at the final radio product level.

This does not necessarily mean full radio testing must be performed on the final products. Some radio test performed on the radio module may provide confidence.

Depending on the way the module is integrated in the final product (input voltage, driver software, environmental conditions), some radio performance test cases may be taken from the measurement of the radio module (bandwidth, transmitter timing, duty cycle, frequency hopping etc.).

Radiated test cases however, such as spurious emissions, e.i.r.p, critical receiver performances etc. may not be comparable from radio module to the final product and need to be re-tested. The reason is that installation of a radio module into a host product may cause reflections or shielding of radio signals.

2.5 Availability of Technical Documentation of the final radio product.

The economic operator, who is responsible for bringing the final product on the European market, should file the complete Technical Construction File as mentioned in the TCF Guidance document 2. Although module manufacturers will mostly not be willing to disclose copies of all the technical documentation due to confidentiality, it is for the economic operator mandatory to have directly access to these documents in case of a market surveillance by the European surveillance authority.

IOT approval.com can assist you in solving this issue in close cooperation with the module manufacturer.

3 How IOTapproval.com can assist

Although buying a compliant radio module and integrating this in your final product, there is no guarantee compliance to the essential requirements of the Radio Equipment Directive in most cases. Testing however can be limited.

IOTapproval.com is your outsource partner who will unburden you from the complex and time consuming approval procedure. Our service is one of its kind and starts already at the design table.

Consultancy (design, regulatory, technical), TCF guidance and generation, issuing a dedicated test plan, guiding the complete compliance testing (on-site), project management from start to the final applicable certificate or country approval is what we stand for.

Our 20 years' experience in this field means saving time and costs with maintained highest quality. We only do what we need to do.

Testing and certification outsourced by IOTapproval.com are always performed by partners who have the required accreditations (ISO 17025, ISO 17065) and country designations, to achieve the highest possible quality, and who are professionals in their field.

Feel free to ask more what IoTapproval.com can do for you at info@IoTapproval.com