

# **Radiocrafts**

**Embedded Wireless Solutions**

## **RF WIRELESS REGULATION & CERTIFICATION OVERVIEW**

**We Make Embedded Wireless  
Easy to Use**

## Reliable and Secure Wireless Connection Using Licence Free ISM Radio Bands



No licence and operation fee, unlike cell-phone bands



Regulations help to share the band among many users



Some frequency bands are available globally



Most regulations are national, or made national law

### EUROPEAN REGULATIONS



Available in Europe, not only EU. CEPT ERC Recommendation 70-03



169, 433, 862-876, 915-921 MHz, 2.45 GHz for – short range devices



Some bands are for specific applications:

- Metering (169 MHz, 10% D/C)
- Alarms (sub-bands at 868 MHz)



Not all bands are “harmonized”

- 169 MHz is not allowed in Belarus, Georgia, Russia and Ukraine
- Only a part of 868 MHz band allowed in Russia (868.7 – 869.2 MHz)
- Details in ERC Rec 70-03 Appendix 1



EU has regulations for CE compliance test and marking








- RED Directive (previously R&TTE Directive)
- Harmonized standards for harmonized frequency bands
- More details in EN 300 220

# WORLDWIDE OVERVIEW



## 2.4 GHz available worldwide (WiFi, BT, BLE, ZigBee)

ISM band frequencies where Radiocrafts has developed solutions:

-  **United States / Canada:**
  - 315 MHz (FCC CFR Title 47, Part 15.209, 15.231: VHF and UHF, limited output power)
  - 902 – 928 MHz, 2.45 GHz (Part 15.247: 1W, spread spectrum)
-  **Australia / New Zealand:**
  - 433 MHz (similar to EU)
  - 915 - 928 MHz, frequency hopping (similar to FCC)
-  **Brazil:**
  - 433 MHz (similar to EU, but stricter requirements on harmonics)
-  **China:**
  - 418 MHz
  - 470 - 510 MHz for metering, up to 17 dBm
-  **India:**
  - 865 -867 MHz (G.S.R.564(E) (G.S.R.168(E))).
-  **Japan:**
  - 315 MHz (ARIB STD - T93)
  - 426 / 429 and 1200 MHz (ARIB STD - T67)
  - 916 / 922 / 929 MHz (ARIB STD - T108)
-  **Korea:**
  - 424 / 447 MHz



✚ **Ireland** (additional national bands):  
- 457.5 – 458.5 MHz, 12.5 kHz channels  
- 463-464 MHz

✚ **United Kingdom** (additional national bands):  
- 458.5-459.0 MHz, 12.5 kHz channels (IR2030/2/6 )

✚ **Norway** (additional national bands):  
- 444.675, 444.700, 444.725 MHz: 25kHz/500mW, AMR

✚ **Sweden** (additional national bands):  
- 444.000, 444.050, 444.400 MHz: 25kHz/500mW, AMR  
- 429.450: 25kHz/500mW, Alarms  
- 439.700-439.975 (12 ch): 25kHz/500mW, Radio control, telemetry  
- 870.550, 870.600, 870.650 MHz: 25kHz/500mW, AMR

✚ **Denmark** (additional national bands):  
- 444.675, 444.700, 444.725 MHz: 25kHz/500mW, AMR

## MAKING A WORLDWIDE WIRELESS SOLUTION



### Alternative 1: Combination of 868 and 915 MHz

- A quarter wave antenna got wide enough BW to cover both
- Replace modules with the same footprint
- RC11xx, RC12xx, RC16xx and RC17xx series of modules

### Alternative 2: Using a global band 2.45 GHz

- Used by WiFi, Bluetooth.... And microwave ovens
- Shorter range, more noise, more direct line
- World wide frequency because its useless for satellite communication due to absorption in water in the atmosphere – same reason for using it for cooking!
- RC24xx and RC25xx series of modules

# RADIOCRAFTS CERTIFIED MODULES



Pre-assessed modules designed to meet local radio regulations



CE / RED: No real compliance test for modules, only for products

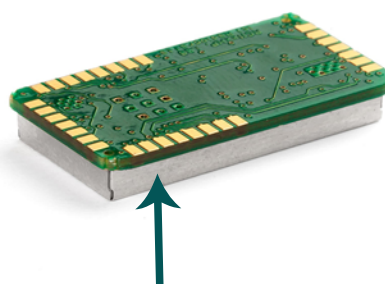
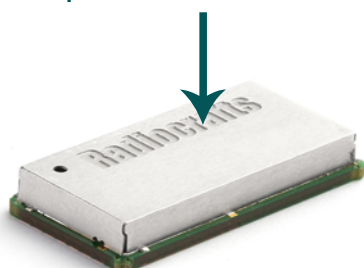
- RF module RED DoC: "The radio module will comply provided it is used as described in the Data Sheet"
- Essential requirements of RED must be met: RF, EMC, Safety
- With the RF module DoC the test for RF can be avoided



FCC / IC: Modular approval by an FCC certified body

- The module must be shielded, integrated antenna (or uncommon connector)
- An FCC ID is printed on the module, certificate is available

Compact and shielded module



Easy to Use UART interface

## DOCUMENTS AND REFERENCES

CEPT REC 70-03

FCC CFR 47, part 15

Republic of South Africa, Government Gazette no. 26193, March 2004

IR2030/2/6

Korean regulations for license-free bands (Ministry of Information and Communication, notification no 1999-46)

ARIB STD-T108 ; ARIB STD-T67; ARIB STD-T93

Chinese regulations for license-free bands (Regulation for low power (short range) devices, May 1998)

ANATEL, Anatel Resolution 506-2008

Radiocommunications Regulations (General User Radio License for Short Range Devices) Notice 2016 No. 2,

[www.fcc.gov](http://www.fcc.gov)

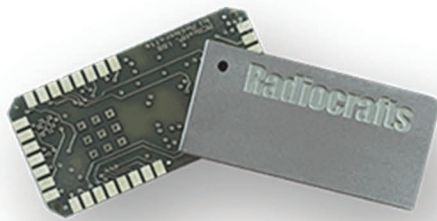
IC: Industry Canada, RSS 210

Radiocommunications (Short Range Devices) Standard 2014

Radiocommunications (Low Interference Potential Devices) Class License 2015

# Radiocrafts

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For More Information

[CONTACT US](#)

[www.radiocrafts.com](http://www.radiocrafts.com)

Email: [sales@radiocrafts.com](mailto:sales@radiocrafts.com)

Tel: +47 4000 5195