**RIS implementation of ECC/DEC/(20)02 on the harmonised use of the paired frequency bands 874.4-880.0 MHz and 919.4-925.0 MHz and of the unpaired frequency band 1900-1910 MHz for Railway Mobile Radio (RMR)**

Foreword

The ECC has decided that RIS implementations of ECC deliverables should be uploaded to the ECO website in order to help administrations fill out the EFIS database.

This RIS implementation is limited to harmonised frequency arrangements for RMR in the paired frequency bands 874.4-880.0 MHz and 919.4-925.0 MHz and in the unpaired frequency band 1900‑1910 MHz.

**RIS Implementation for the harmonised use of the paired frequency bands 874.4-880.0 MHz and 919.4-925.0 MHz and of the unpaired frequency band 1900-1910 MHz for Railway Mobile Radio (RMR)**

**Radio Interface Notification by an administration**

**Normative part (as per Commission Implementing Decision (EU) 2021/1730)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Nr** | **Parameter** | **Description** | **Comments** |
| **1** | **Radiocommunication Service** | Mobile |  |
| **2** | **Application** | RMR | Railway Mobile Radio (RMR) encompasses GSM-R and its successor(s), including the Future Railway Mobile Communication System (FRMCS). |
| **3** | **Frequency band** | 874.4-880.0 MHz  919.4-925.0 MHz  1900-1910 MHz | Paired Spectrum (FDD):   * 874.4-880.0 MHz (UL) / 919.4-925.0 MHz (DL)   Unpaired spectrum (TDD):   * 1900-1910 MHz |
| **4** | **Channelling** | For GSM-R in 874.4-880.0 MHz / 919.4-925.0 MHz:   * 200 kHz   For wideband RMR in 874.4-880.0 MHz / 919.4-925.0 MHz:   * 200 kHz (NBIoT) * 1.4 MHz, * 5 MHz, * 5.6 MHz * the lower edge of the lowest Resource Block shall be ≥ 919.6 MHz   For 1900-1910 MHz:   * one 10 MHz channel centered at 1905 MHz | For GSM-R, the following parameters apply:  GSM-R Downlink centre frequency fDL = 921 MHz + *n* × 0.2 MHz(1) where {n∈Z │ -7≤n≤19}  GSM-R Uplink centre frequency fUL = fDL – 45 MHz |
| **5** | **Modulation /  Occupied bandwidth** |  |  |
| **6** | **Direction /  Separation** | 874.4-880.0 MHz (FDD uplink) and 919.4-925.0 MHz (FDD downlink) with 45 MHz duplex separation  1900-1910 MHz (TDD) |  |
| **7** | **Transmit power / Power density** | **TECHNICAL CONDITIONS FOR GSM-R IN 874.4-880.0 MHz and 919.4-925.0 MHz BANDS** | |
| In-block requirements for GSM-R Base Stations in 919.4-921 MHz uncoordinated deployment = 70.5 dBm + (fDL – 921) × 40/3 dB e.i.r.p. | GSM-R channel bandwidth 200 kHz  fDL is the centre frequency in MHz  There is no e.i.r.p. restriction on GSM-R Base Stations transmitting in the 921-925 MHz frequency band. Formula applicable to fDL ≤ 921 MHz. To allow higher e.i.r.p, the implementation of a coordination procedure or other mitigation measures must be applied. |
| **TECHNICAL CONDITIONS FOR A SINGLE WIDEBAND RMR CARRIER IN 874.4-880,0 MHz and 919.4-925,0 MHz BANDS**  **Technical conditions for RMR Base Stations using wideband technologies** | |
| Specific in-block requirements for 5.6 MHz and 5 MHz channels mandatory for uncoordinated deployment  5.6 MHz = 62 dBm/5.6 MHz e.i.r.p.  5 MHz = 64.5 dBm/5 MHz + (fDL – 922,1) × 40/3 dB e.i.r.p. | fDL is the centre frequency in MHz.  NB-IoT in-band operation mode without power boost is allowed. NB-IoT guard-band operation mode and in-band operation mode with power boost are not allowed. |
| Specific in-block requirements for 1,4 MHz and 200 kHz channels mandatory for uncoordinated deployment  1.4 MHz = 56 dBm/1,4 MHz + (fDL – 920.2) × 40/3 dB (Note 1)  200 kHz = 70,5 dBm/200 kHz + (fDL – 921) × 40/3 dB (Note 2 and 3) | fDL is the centre frequency in MHz.  Note 1: Formula applicable to fDL ≤ 921.7 MHz. No specific e.i.r.p. restriction above.  Note 2: Applicable to NB-IoT standalone operation mode, which is made of one Resource Block.  Note 3: Formula applicable to fDL ≤ 921.0 MHz. No specific e.i.r.p. restriction above. |
| Baseline Requirement 880-915 MHz  -49 dBm/5 MHz e.i.r.p. | This requirement prevails over out-of-band requirements. |
| **TECHNICAL CONDITIONS FOR WIDEBAND RMR IN 1 900-1 910 MHz (TDD) BAND**  **Technical conditions for RMR Base Stations using wideband technologies** | |
| General in-block requirement mandatory for uncoordinated deployment = 65 dBm/10 MHz | 10 MHz RMR channel bandwidth  Member States may allow a higher e.i.r.p. level, subject to national coordination or other mitigation measures. |
| Baseline requirement 1 920 -1 980 MHz:  -43 dBm/5 MHz |  |
| **TECHNICAL CONDITIONS FOR RMR CAB-RADIO USING WIDEBAND TECHNOLOGIES** | |
| Maximum output power: 31 dBm;  Uplink power control is mandatory and shall be activated. | ACLR: 37 dB minimum;  Unwanted output power in 1 920-1 980 MHz:   * -25 dBm/MHz maximum in 1 920-1 925 MHz, * -30 dBm/MHz maximum in 1 925-1 980 MHz; |
| **TECHNICAL CONDITIONS FOR RMR TERMINALS OTHER THAN CAB-RADIOS, USING WIDEBAND TECHNOLOGIES** | |
| Maximum output power: 23 dBm;  Uplink power control is mandatory and shall be activated. | ACLR: 30 dB minimum; |
| **8** | **Channel access and occupation rules** | None |  |
| **9** | **Authorisation regime** | General authorisation | RMR terminals fulfil the criteria for individual licensing exemption listed in ERC Recommendation (01)07 and therefore RMR terminals are exempt from individual licensing either implicitly by the rights of use granted to the RMR network or by other national regulation. |
| **10** | **Additional essential requirements** | None |  |
| **11** | **Frequency planning assumptions** |  |  |

**Informative Part**

|  |  |  |  |
| --- | --- | --- | --- |
| **Nr** | **Parameter** | **Description** | **Comments** |
| **12** | **Planned changes** |  |  |
| **13** | **Reference** | Commission Implementing Decision (EU) 2021/1730  ECC/DEC/(20)02  ETSI EN 301 502 (GSM, BS)  ETSI EN 301 511 (GSM, MS) |  |
| **14** | **Notification number** |  |  |
| **15** | **Remarks** | *Abbreviations:*  *ACLR Adjacent Channel Leakage power Ratio*  *BS Base Station*  *e.i.r.p. equivalent isotropically radiated power*  *DL Downlink*  *FDD Frequency Division Duplex*  *GSM Global System for Mobile Communications*  *MS Mobile Station*  *RMR Railway Mobile Radio*  *TDD Time Division Duplex*  *UL Uplink* |  |