

AGREEMENT

between the administrations of

**Belgium, France, Germany, Luxembourg,
the Netherlands and Switzerland**

**on frequency usage and frequency coordination in
border areas for terrestrial systems capable of
providing wireless broadband electronic
communications services in the frequency band
3400-3800 MHz**

By correspondence, July 2024

1 Introduction

The frequency band 3400-3800 MHz is designated for terrestrial systems capable of providing wireless broadband electronic communications services

- for Belgium, France, Germany, Luxembourg and The Netherlands according to the Commission Decision 2008/411/EC of 21 May 2008 *on the harmonisation of the 3 400-3 800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community*, as amended by the Commission Implementing Decision 2019/235/EU of 24 January 2019.
- for Switzerland according to the national frequency allocation plan as approved by the Federal Council.

The administrations of Belgium, France, Germany, Luxembourg, The Netherlands and Switzerland have agreed on the following frequency usage and cross-border frequency coordination procedures.

2 Principles of frequency usage and frequency coordination in border areas

The concept of equal access probability is a frequency planning principle enabling equitable coverage for two or more networks using the same frequency band with the same or different digital technologies in geographically adjacent areas without coordination. Operation of stations in the respective border area exceeding the specified field strength values after performing traditional frequency coordination would disturb the balance in the respective area and is therefore not desirable.

In addition to that, due to the inherent characteristics of TDD operation with simultaneous UL/DL in different networks, a synchronization framework (see 2.1) has been identified in order to allow equitable access and base stations coverage in border area. The application of the synchronization framework is triggered by the section 3 of the agreement.

It is recognized that the DSB (Downlink Symbol Blanking) feature in the context of Frame (A) and Frame (B) defined in section 2.1 which allows a more efficient use of the spectrum and helps the licensees to allow coverage in border areas without interferences.

Furthermore this agreement is based on the principles of frequency usage and frequency coordination according to Recommendation ECC/REC(15)01 (see www.erodocdb.dk).

Annex 1 provides the information related to the spectrum usage in the band for each country.

2.1 Synchronization framework

The following synchronisation parameters for the deployment have been identified:

2.1.1 Reference clock:

The time reference (t_0) of base stations deployed in the frequency band 3400-3800 MHz, is defined according to Coordinated Universal Time (UTC, according Recommendation ITU-R TF.460-6) $\pm 1.5 \mu\text{s}$.

2.1.2 Frame structures

The following two different frame structures (for detailed information see ECC/REC/(20)03) for the usage in the different countries have been identified:

a. Frame (A):

The corresponding NR frame structure (periodicity 2.5ms, with an SCS of 30 kHz):

- **DDDSU**

The slot format S identified is 10:2:2, (number of symbols, DL: GP: UL)

This frame structure is identified and used by Belgium, Luxembourg, Switzerland, the Netherlands and Germany.

b. Frame (B):

The corresponding NR frame structure (periodicity 5ms, with an SCS of 30 kHz):

- **DDDSUDDDD** or
- **DDDDDDDSUU** + 3ms time offset

The slot format S identified is 6:4:4, (number of symbols, DL: GP: UL)

This frame structure is identified and used by France

2.1.3 Optional frame

This frame¹ DDDS₁UUDDS₂U (periodicity 5ms, with an SCS of 30 kHz) is the result of the combination of the two frames DDDSUDDDD and DDDSU with the application of DSB, where the DL symbols blanked are replaced by a UL symbol. The slot format S₁ identified is 6:6:2 and S₂ identified is 10:2:2 (number of symbols, DL: GP: UL).

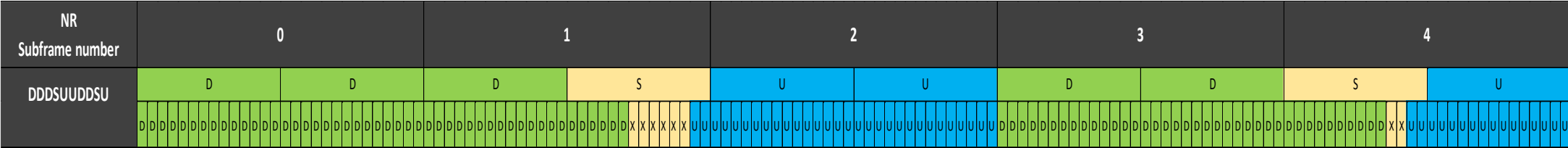


Figure 1: Optional frame

¹ Within the coordination area which is defined by an exceedance of the field strength value of 14 dB μV/m/5 MHz for an antenna height of 3 m above the ground at the border line, networks and applications may also make use of the compatible optional frame structure in Figure 1.

2.1.4 Downlink Symbol Blanking²

In order to allow in border areas, the interference free coexistence between the two frame structures given in the section above, the downlink symbol blanking (DSB) feature may need to be activated³. The requirement for the activation/ implementation of this feature is laid down in the sections 3.1 and 3.2.

NR Subframe number	0	1	2	3	4					
DDDSUDDDD	D	D	D	S	U	U	D	D	D	D
S 6 4 4										
DDDSU	D	D	D	S	U	D	D	D	S	U
S 10 2 2										

Figure 2: Frame structures with the implementation of DSB (red symbols = blanked symbols)

² Blanking is referred to as “full blanking”, meaning that no transmissions occur during a blanked time period (not even traffic and control channels)
³ Depending on the deployment scenario, NR base station exceeding the field strength value of 14 dBμV/m/5MHz at a height of 3 m above the ground at the border line must activate the DSB feature.

3 Technical provisions

The field strength values refer to the field strength of each cell produced by the base station and are defined inside a reference frequency block of 5 MHz.

In cases of other frequency block sizes $10 \times \log_{10}$ (frequency block size / 5 MHz) should be added to the field strength values.

3.1 Synchronised operation

Base station compliant with the technical conditions below:

1. Using the common reference clock as specified in section 2.1.1 and using a compatible frame given in the section 2.1.2 (neighbouring countries are using frame (A) only or frame (B) only), or
2. Using the common reference clock as specified in section 2.1.1 and using the frames (A) and (B) given in the section 2.1.2 on their respective border side and implementing and activating DSB⁴ as specified in section 2.1.4, or
3. Using the common reference clock as specified in section 2.1.1 and using the optional frame⁵ as specified in section 2.1.3

may be operated without coordination with the neighbouring country if the produced field strength does not exceed:

- a. In case of preferential Physical-Layer Cell Identity (PCI)⁶ usage:
79 dB μ V/m/5 MHz at a height of 3 m above the ground at the border line,
and
61 dB μ V/m/5 MHz at a height of 3 m above the ground in a distance of 6 km beyond the border line
- b. In case of non-preferential PCI usage:
61 dB μ V/m/5 MHz at a height of 3 m above the ground at the border line

⁴ The downlink symbol blanking (DSB) feature must be activated when the field strength of the base station is exceeding 14 dB μ V/m/5 MHz at a height of 3 m above the ground at the border line. The DSB feature should only be activated when one neighbouring country is using frame (A) and the other one is using frame (B).

⁵ The base station using the optional frame in border area where DSB is not activated could be interfered

⁶ as defined in ECC/REC(15)01

3.2 Unsynchronised operation (common reference clock with the frame structures given in section 2.1)

3.2.1 without DSB on both sides of the border

If base stations are unsynchronised, having a common reference clock and the frame (A) is used in country A and the frame (B) in country B respectively given in the section 2.1.1 on Reference clock and section 2.1.2 on Frame structures, in border areas (without DSB on both sides of the border), they may be operated without coordination with the neighbouring country if the produced field strength does not exceed 31 dB μ V/m/5 MHz at a height of 3 m above the ground at the border line.

3.2.2 without DSB on one side of the border

If base stations are unsynchronised, having a common reference clock and the frame (A) is used in country A and the frame (B) in country B respectively given in the section 2.1.1 on Reference clock and section 2.1.2 on Frame structures, in border areas (without the DSB on one side of the border), the base station not implementing DSB may be operated without coordination with the neighbouring country if the produced field strength does not exceed 15 dB μ V/m/5 MHz at a height of 3 m above the ground at the border line.

The base station implementing DSB can operate according to the requirements of the section 3.1.

3.3 Unsynchronised operation (no common reference clock and/or other frame structure) on both sides of the border

If base stations are unsynchronised without a common reference clock or/and non-compatible frames in border areas, they may be operated without coordination with the neighbouring country if the produced field strength does not exceed 15 dB μ V/m/5 MHz at a height of 3 m above the ground at the border line.

3.4 Summary of operation modes in border areas

The following table provides a summary of the different operation modes in border areas based on section 3.

Frame used in country 1	Frame used in country 2					
	Frame (A) with DSB	Frame (A) without DSB	Frame (B) with DSB	Frame (B) without DSB	Optional frame	Other frame and/or no common reference clock
Frame (A) with DSB	3.1(1)	3.1(1)	3.1(2)	3.1(2)/ 3.2.2	3.1(2)/3.1(3)	3.1(2)/3.3
Frame (A) without DSB		3.1(1)	3.2.2/3.1(2)	3.2.1	3.1(2)/3.1(3)	3.1(2)/3.3
Frame (B) with DSB			3.1(1)	3.1(1)	3.1(2)/3.1(3)	3.1(2)/3.3
Frame (B) without DSB				3.1(1)	3.1(2)/3.1(3)	3.1(2)/3.3
Optional frame					3.1(3)	3.1(3)/3.3
Other frame and/or no common reference clock						3.3

The operation modes in the table above referring to Frame (A), Frame (B) and the optional Frame are using the reference clock as defined under 2.1.1.

3.5 PCI coordination

In order to improve performance between LTE- or NR-systems deployed in border areas the administration shall encourage operators to apply PCI coordination in accordance with the relevant annexes of ECC/REC(15)01 especially in the case where synchronisation signal centre frequencies of LTE/NR signals in border areas are aligned.

4 Operators arrangements

The conclusion of arrangements between operators shall be allowed to the extent possible, according to the provisions laid down in the “Agreement between the administrations of Belgium, France, Germany, Luxembourg, The Netherlands and Switzerland concerning the approval of arrangements between operators of terrestrial systems capable of providing electronic communications services” done at Brussels on 11th October 2011. Operators arrangements could contain provisions for the cross-border synchronisation. If operators’ arrangements are concluded before entry in force of this agreement, and approved by the concerning administrations, they stay in force and are assumed to fall under the provision of this agreement after the entry into force of this agreement.

5 Prediction of propagation

For field strength calculations the tool of the latest version of the HCM-Agreement shall be

applied. Time probability for all calculations is 10 %.

6 Revision of the agreement

This agreement may be modified at a request of any of the signatory administrations where such a modification becomes necessary in the light of administrative, regulatory or technical development.

7 Withdrawal from the agreement

Any signatory administration may withdraw from this agreement subject to six months' notice.

8 Language of the agreement

This agreement has been concluded in English language.

One original version of this agreement is handed over to each signatory administration.

9 Abrogation of the Agreements

The following agreements are now abrogated:

- The Agreement between the administrations of Belgium, France, Germany, Luxembourg and The Netherlands and Switzerland on frequency usage and frequency coordination in border areas for terrestrial systems capable of providing electronic communications services in the frequency band 3400-3800 MHz of 22 November 2017 is abrogated.
- The Agreement between the administrations of Belgium, France, Germany, Luxembourg and The Netherlands on the frequency co-ordination for systems for fixed wireless access (FWA) in the bands 3410-3500 MHz and 3500-3600 MHz of 14 December 2001 is abrogated.

10 Date of entry into force

The date of entry into is the date of signature by the relevant administrations.

Administrations may need to conclude bilateral agreements, additional or transitional, to ensure the compatibility between mobile and other radiocommunication services.

11 Signature of the agreement

Done by correspondence.

For BELGIUM

Date:

Belgian Institute for Postal
services and Telecommunications

On behalf of the BIPT Council
Michael VANDROOGENBROEK

For FRANCE

Date:

Agence Nationale des Fréquences

Keite DYVRANDE

For GERMANY

Date:

Federal Network Agency

Jens FRANKE

For LUXEMBOURG

Date:

For the Institut Luxembourgeois
de Régulation

Claude RISCHETTE

For THE NETHERLANDS

Date:

Authority for Digital Infrastructure

Ties DAMMERS

For SWITZERLAND

Date:

Federal Office of Communications

Konrad VONLANTHEN

Annex 1 – Frequency use

This annex provides information regarding the current frequency use in the band 3400 MHz to 3800 MHz for each signatory country:

Belgium:

3400-3410 MHz guard band
3410-3800 MHz MNO

France:

3400-3410 MHz guard band
3410-3490 MHz FWA until 25/07/2026
3490-3800 MHz MNO

Germany:

3400-3700 MHz MNO
3700-3800 MHz verticals

Luxembourg:

3400-3420 MHz guard band
3420-3750 MHz MNO
3750-3800 MHz guard band

Switzerland:

3400-3500 MHz verticals
3500-3800 MHz MNO

The Netherlands:

3400-3450 MHz verticals/(FWA/BWA until September 2026)
3450-3750 MHz MNO
3750-3800 MHz verticals/(FWA/BWA until September 2026)