

TECHNICAL AGREEMENT

**between the telecommunications administrations
of the Federal Republic of Germany and the Republic of Poland**

**concerning the use of the frequency band 3400-3800 MHz for terrestrial
Mobile/Fixed Communications Networks (MFCN) in border areas**

Preamble

According to Article 6 of the ITU Radio Regulations, representatives of the telecommunications administrations of the Federal Republic of Germany and the Republic of Poland (hereinafter referred to as the Parties) have concluded this Technical Agreement concerning the use of the 3400-3800 MHz frequency band for terrestrial mobile/fixed communications networks (MFCN)¹ in border² areas (hereinafter referred to as the Technical Agreement) with the aim of optimizing the use of this frequency band and avoiding mutual interference on a mutually coordinated basis.

This Technical Agreement cancels and replaces the “Technical Agreement between the telecommunications administrations of the Federal Republic of Germany and the Republic of Poland concerning the use of the frequency band 3400-3800 MHz for terrestrial Mobile/Fixed Communications Networks (MFCN) in border areas, done by correspondence, November 2019”.

1. Principles

- 1.1. This Technical Agreement is based on the concept of coordination field strength levels for base stations as described in ECC Recommendation (15)01 of 13 February 2015 (latest amended on 10 June 2022) “Cross-border coordination for mobile/fixed communications networks (MFCN) in the frequency bands: 694-790 MHz, 1452-1492 MHz, 3400-3800 MHz” (hereinafter referred to as ECC/REC/(15)01), on the principle of the equal access to spectrum by both Parties and preferential and non-preferential Physical-layer Cell Identities³ (PCI) for LTE and NR systems.
- 1.2. The frequency arrangement for terrestrial MFCN systems presumes Time Division Duplex (TDD) mode is used in the frequency band 3400-3800 MHz. This arrangement confirms to ECC Decision (11)06 of 9 December 2011 (amended on 26 October 2018) “Harmonised frequency arrangements and least restrictive technical conditions (LRTC) for mobile/fixed communications networks (MFCN) operating in the band 3400-3800 MHz”.
- 1.3. In Germany the frequency band 3400-3800 MHz is split into the sub-bands 3400-3700 MHz for operators of countrywide public mobile networks (MNOs) and the sub-band 3700-3800 MHz for operators of local private networks (verticals). In Poland the whole frequency range 3400-3800 MHz is used for MNOs.
- 1.4. The applicable TDD frame structures are described in ECC Recommendation (20)03 of 23 October 2020 “Frame structures to facilitate cross-border coordination of TDD MFCN in the frequency band 3400-3800 MHz”. The bilateral TDD synchronization framework is described in Annex 1 to this Technical Agreement.
- 1.5. Field strength values in this Technical Agreement are based on a receiving antenna height of 3 m above ground for 10 % of time and 50 % of locations.

¹ Mobile/fixed communications networks (MFCN) includes IMT and other communications networks in the mobile and fixed services.

² In the context of this Technical Agreement the term “border” is understood as the international borderline between the countries of the Parties. In the Baltic Sea the borderline is the division line of the Exclusive Economic Zone (EEZ).

³ Coordination of the Physical-layer Cell Identities (PCI) is only needed in case of use of the LTE and NR systems by both Parties when the channel centre frequencies are aligned independently of the channel bandwidth.

- 1.6. This Technical Agreement covers coordination of base stations. Parties agree that coordination is not required for terminal stations in mobile and fixed services since that is covered by coordination of base stations.

2. Use of frequencies and PCI

- 2.1. Each Party may use the 3400-3800 MHz frequency band for MFCN systems without coordination with the other Party if the predicted mean field strength produced by the cell (all transmitters within the base station sector) does not exceed field strength levels given in Annex 2 to this Technical Agreement.
- 2.2. For LTE and NR systems in border areas each Party shall use PCI sets according to the Annex 3 to this Technical Agreement.
- 2.3. If frequency block size is other than 5 MHz, a correction value, calculated by the formula $10 \times \log(\text{frequency block size [MHz]} / 5 \text{ MHz})$ [dB] shall be added to the field strength values indicated in item 2.1.

3. Procedure

- 3.1. If the predicted mean field strength value of any cell produced by the base station exceeds the levels indicated in item 2.1 the frequency assignment shall be coordinated with the other Party.
- 3.2. The period of coordination shall not exceed 45 days from the date of receiving the request and 20 days after the reminder. If no reply is received within 65 days the frequency assignment shall be considered as coordinated. The exchange of coordination information shall take place by e-mail or other electronic means.
- 3.3. Coordination requests shall be drawn up according to Annex 3 of ECC/REC/(15)01 in the HCM electronic format for mobile service.
- 3.4. Complaints of harmful interference shall be based on the median value of measurements of field strength, performed at a receiving antenna height of 3 m above ground at least in two different points over a distance of at least 100 m along the border.
- 3.5. Reports of harmful interference shall be presented in accordance to Appendix 10 of the ITU Radio Regulations and processed according to Article 15 of the ITU Radio Regulations. The Parties shall take all possible measures in order to eliminate harmful interference.
- 3.6. For the field strength calculations the official version of HCM Program for the Mobile Service based on ITU-R Recommendation P.1546 shall be applied (using appropriate calculation mode). The Parties may apply other calculation tools. In case of any differences in results of calculations the official version of HCM Program shall be used as a reference.

4. Operator arrangements

To further improve the compatibility of terrestrial systems capable of providing electronic communications services in border areas, operators may conclude additional arrangements such as:

- preferential frequency distribution arrangements,
- frequency carrier definitions,
- synchronisation of concerned networks.

Such operator arrangements:

- shall only be valid as long as all participating operators hold exclusive rights for concerned frequencies,
- shall not impose disadvantages on other operators,
- should consider field strength levels and provisions given by relevant documents (e.g. ECC recommendations) as guidelines,
- are subject to prior consent of the administrations concerned.

Further provisions are contained in the "Agreement between the administrations of the Czech Republic, Germany, Poland and the Slovak Republic concerning the approval of arrangements between operators of mobile radiocommunication networks (Mainz, 29.5.2002)".

5. Protection of satellite earth stations

- 5.1. Based on the protection criteria mentioned in ECC Report 100⁴, it must be ensured that a received power of -184 dB(W/4kHz) on an isotropic antenna, is not exceeded for 20 % of time at the receiving station Berlin-Wannsee (WGS-84 coordinates: 52°24'30"N/13°07'35"E), at 15 m above ground, in the frequency range 3600-3800 MHz.

6. Revision and cancellation

- 6.1. This Technical Agreement may be revised at any time on the initiative of any Party with the consent of the other Party.
- 6.1. This Technical Agreement may be cancelled by a mutual decision of both Parties on terms and conditions adopted by the Parties or by a decision of one Party notifying the other Party on its intention at least one year before.

⁴ Compatibility studies in the band 3400-3800 MHz between Broadband Wireless Access (BWA) systems and other services, Bern, February 2007, page 10

7. Entry into force

7.1. This Technical Agreement will come into force on the date of signing it by both Parties.

7.2. This Technical Agreement has been drawn in two identical copies, one for the Federal Republic of Germany and one for the Republic of Poland.


Done by correspondence

On behalf of the telecommunications
administration of the Federal Republic of
Germany

On behalf of the telecommunications
administration of the Republic of Poland

Wiesbaden, 15.04.2025

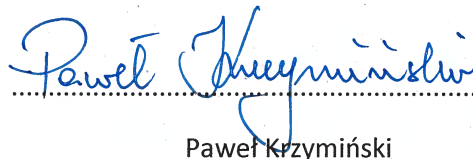
/Place, Date/



Jens Franke

Warszawa, 25.04.2025r.

/Place, Date/



Paweł Krzyński

TDD Synchronisation framework

In Germany the usage of the following TDD frame structure has not been prescribed by the administration but has been agreed among the MNOs in an national operators' arrangement:

- Type A frame according to ECC/REC(20)03.

MNOs selected the time reference UTC according to Recommendation ITU-R TF.460-6. The following systems or signals are agreed as usable external synchronisation sources: GNSS Galileo, GNSS GPS, any time source which could be traced back to UTC(k) according to BIPM (Bureau International des Poids et Mesures). The ITU-T G.827x.x recommendation series applies to establish phase and time synchronization and ensure the minimum requirement for synchronisation performance.

For verticals in the border area case-by-case solutions for the interference free co-existence with MNOs shall be found based on ECC/REC(15)01.

In Poland the administration has decided upon the TDD frame structure to be used by MNOs as follows:

- Until 31 January 2028: Type B frame according to ECC/REC(20)03,
- From 1 February 2028: Type A frame according to ECC/REC(20)03.

Operators are obliged to ensure synchronization of network operation in terms of frequency, phase and time through the use of a distributed synchronization scheme based on satellite systems, a centralized synchronization scheme based on the 1588v2 system, or any other synchronization system ensuring accuracy not worse than $\pm 1.5 \mu\text{s}$.

In the both countries operators are not obliged to activate the feature Downlink Symbol Blanking (DSB) but all operators declared that they intend to use DSB if in the neighboring country the different frame structure is used.

If the conditions for asymmetrical spectrum usage according to Table 1 of Annex 2 to this Technical Agreement are met, it is not to be expected that cross-border interference occur.

Nevertheless, if operators (MNOs or verticals) experience cross-border interference caused by asymmetrical spectrum usage, then in order to enable efficient and fair spectrum usage and effective operations of these networks in the border areas, the affected operators shall commonly find acceptable solutions based on the provisions of ECC/REC(20)03 and ECC/REC(15)01 to mitigate the interference.

Further details regarding the time reference, the TDD frame structure and the DSB feature shall be agreed in the framework of a multilateral operators' arrangement.

Table 1

Coordination field strength levels for unsynchronised operation based on ECC/REC(20)03 with DSB activated/not activated of MFCN base stations in the 3400-3800 MHz frequency band until 31 January 2028 between the Federal Republic of Germany and the Republic of Poland⁶

Predicted mean field strength level, dB μ V/m at the border	LTE/NR vs. LTE/NR case (channel bandwidth 5 MHz ⁵)	
	DSB feature activated**	according Table 2
	DSB feature not activated	15 (for all PCI's)

** This refers to both cases: 'symmetrical' usage (network operation modes across the border are the same) and 'asymmetrical' usage (network operation modes across the border are not the same). Asymmetrical usage is described in the Annex 5, point A5.3 of the ECC/REC (15)01 – *Examples of application of field strength levels when operation modes differ across the border* (for example, the case, when DSB feature is activated by operator (MNO or vertical) on one side of the border and operator (MNO or vertical) on the other side of the border does not have common clock with others (figure 4) or does not activate DSB feature (figure 3)).

Table 2

Coordination field strength levels for synchronised operation of MFCN base stations in the 3400-3800 MHz frequency band from 1 February 2028 between the Federal Republic of Germany and the Republic of Poland⁶

Predicted mean field strength level, dB μ V/m	LTE/NR vs. LTE/NR case (channel bandwidth 5 MHz ⁵)		
	Synchronisation signal centre frequencies aligned		Synchronisation signal centre frequencies not aligned
	Preferential PCI's	Non-preferential PCI's	All PCI's
at the border	79	61	79
at the 6 km line	61	-	61

⁵ If the bandwidth of the signal is other than 5 MHz the field strength should be corrected in accordance with item 2.3 of this Technical Agreement.

⁶ Threshold values for MFCN base stations have to be confirmed in operators arrangements concluded according to the Article 4 of this Technical Agreement. Operators may agree on different values than given in the table.

**Allocation of preferential Physical-layer Cell Identities (PCIs)
for LTE in the 3400-3800 MHz frequency band
to the Federal Republic of Germany and the Republic of Poland**

Set	A	B	C	D	E	F
PCI	0...83	84...167	168...251	252...335	336...419	420...503
Set preferential to	POL ⁷	D ⁸	D	D	POL	POL

**Allocation of preferential Physical-layer Cell Identities (PCIs)
for NR in the 3400-3800 MHz frequency band
to the Federal Republic of Germany and the Republic of Poland**

Set	A	B	C	D	E	F
PCI	0...83 504-587	84...167 588-671	168...251 672-755	252...335 756-839	336...419 840-923	420...503 924-1007
Set preferential to	POL	D	D	D	POL	POL

⁷ POL – Republic of Poland

⁸ D – Federal Republic of Germany