An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Fixed Radio Links Licensing Guidelines

Guidelines Document

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1 Introduction

1.1 The Commission for Communications Regulation ("ComReg") is the statutory body responsible for the regulation of the electronic communications (telecommunications, radiocommunication and broadcasting networks), postal and premium rate sectors in Ireland in accordance with European Union ("EU") and Irish law. ComReg also manages Ireland's radio frequency spectrum ("radio spectrum" or "spectrum") and national numbering resource.

1.2 Under the Wireless Telegraphy Act 1926 as amended ("the 1926 Act"), all apparatus for wireless telegraphy ("apparatus") requires a licence, unless that apparatus has been specifically exempted from licensing under Irish legislation by means of an exemption order.

1.3 Fixed radio link licences are governed by the Wireless Telegraphy (Fixed Radio Link Licence) Regulations 2023 (S.I. 593 of 2023) (the "Regulations").

1.4 This document sets out ComReg's revised guidelines for applicants for fixed radio link licences, replacing ComReg Document 09/89R2[1].

1.5 Fixed radio links are commonly used for providing high bandwidth connections between two fixed points and in some circumstances fixed radio links can provide an economic alternative to optical fibre and leased lines. There is a large variety of fixed radio link users in Ireland, including fixed and mobile operators, broadcasters, public utilities, and the emergency services. Generally, these licensees use fixed radio links to provide connections between two points in their network.

1.6 These guidelines provide information to the applicant on ComReg's fixed radio link licensing scheme. Among other things, these guidelines provide information on:

(i) the frequency bands available;

(ii) the technical licensing requirements;

(iii) the application process; and

(iv) the licence itself.

1.7 Applicants must read these guidelines carefully prior to applying for a fixed radio link licence. Queries regarding these guidelines or the licensing process can be directed to ComReg's Radio Spectrum Licensing Team by e-mail at licensing@comreg.ie.

[1] ComReg Document 09/89R2 - Guidelines to Applicants for Radio Links Licences - published 6 July 2017.

2 Fixed radio links

2.1 This section sets out the minimum technical requirements that must be met when applying for a fixed radio link licence.

2.1 Frequency spectrum bands

2.2 The following frequency bands are available for fixed radio link licensing.

Table 1: Frequency bands which are available for fixed radio link licensing

Frequency Bands
Upper 1.3 GHz, Lower 1.4 GHz, 2 GHz, Lower 6 GHz, Upper 6 GHz, 7 GHz, Lower 8 GHz, Upper 8 GHz, 11 GHz, 13 GHz, 15 GHz, 18 GHz, 23 GHz, 26 GHz, 28 GHz, 38 GHz, 42 GHz, 80 GHz

2.3 Annex 1 of this document sets out the full list of available frequency bands for fixed radio link licensing and the technical requirements associated with each band. From time to time, ComReg may be required to make changes to the frequency bands and/or their technical conditions. Such changes may arise for several reasons, including:

- changes in spectrum allocations in accordance with the requirements of international treaties or regionally negotiated agreements;
- changes necessitated by EU legislation;
- changes to meet national requirements; and
- changes in the interest of efficient use of spectrum.

2.4 Arising from any such changes, existing licensees may be required to modify or cease their radio link operations to comply with the revised frequency bands and technical conditions. ComReg will endeavour to provide as much notice as possible to existing licensees if any such changes are required.

2.2 Cross-border and international coordination

2.5 It is possible to apply for a cross-border fixed radio link (i.e., a fixed radio link which crosses the Republic of Ireland/Northern Ireland border). ComReg can facilitate the licensing of that part of the link which operates up to the border, while Ofcom (UK's Office of Communications[2]) licenses that part of the link which operates on the Northern Ireland side of the border. Applicants must applications to both ComReg and Ofcom.

[2] https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/fixed-terrestrial-links

2.6 In some cases, it may be necessary for ComReg to undertake international coordination and registration procedures, particularly where there is a possibility of interference to/from the terrestrial and/or satellite services. As this may take some time, radio links are licensed subject to a condition that the licence may have to be amended, or withdrawn, if successful coordination is not achieved. Where changes arising from international coordination are required to be made to a licence, the licensee will be advised of the necessary changes. In this event, all expenses must be borne by the licensee.

2.3 General fixed radio link planning

2.7 In the interests of efficient use of radio spectrum, ComReg does not permit the use of frequency diversity or the assignment of separate frequencies for standby purposes, except in the most exceptional of circumstances.

2.8 Licensees are encouraged to use radio network resilience techniques to improve the reliability of transmission networks. Such techniques include:

- space diversity;
- 'hot-standby' radio equipment redundancy based on one frequency channel; and
- routing diversity, which involves the construction of networks with ring or mesh architectures.

2.9 The following practices are discouraged as they can result in poor spectrum efficiency and excessive interference to other users or services:

- use of unnecessarily high transmit powers;
- inadequate network planning;
- lack of network resilience; and
- excessive use of star networks requiring a number of frequency channels.

2.4 Path length planning

2.10 In the interests of efficient and orderly use of spectrum, ComReg operates a path length policy. This policy specifies the minimum fixed radio link path length permissible for a frequency band along with necessary transmission capacity. Details of minimum path lengths per frequency band are contained in Annex 1 of this document.

2.11 It is only in the most exceptional of circumstances (e.g., High/Low conflicts, see Section 2.5), that ComReg will consider licensing a fixed radio link with a path length which is less than the specified minimum path length.

2.5 High / Low database

2.12 When planning a fixed radio link, the applicant must have regard to the compatibility of the proposed fixed radio link with other existing radio users at the same general location. Specific sites and the immediate surrounding area may be designated “transmit high” or “transmit low” in specific frequency bands, depending on the sub-band in which existing links on that site are transmitting.

2.13 Prior to submitting a fixed radio link application, the applicant must consult the high/low database on ComReg's website[3] to ensure that their application does not have a high/low designation conflict. A high/low designation conflict arises when site designation in the application conflicts with the existing site designation in ComReg's database. For example, a *High* designation is requested in the application for a site that has an existing *Low* designation.

2.14 ComReg may not license a link with a high/low designation conflict.

2.15 In consulting the high/low database, the applicant should enter accurate site co-ordinates which are based upon measurements taken from a GPS device at the specific mast location. Inaccurate site co-ordinates may lead to licence invalidation. Table 2 (below) sets out the high/low search radii for the fixed radio links frequency bands.

Table 2: High/low search radius for given frequency band

Frequency Band (GHz)	Hi/Lo search radius (metres)
1.3 / 1.4	500
1.3 / 1.5	500
2	500
L6	500
U6	500
7	500
L8	500
U8	500
11	500
13	500
15	400
18	300
23	100
26	100
28	100
38	100
42	100
80	0

[3] https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/radio-links/high-low-database/

2.6 Equipment requirements & reference databases

2.16 ComReg will only grant licences for radio equipment that meets the minimum mandatory technical requirements as set out Annex 1 of this document.

2.17 The minimum equipment requirements relate to the:

- transmission capacity requirement;
- minimum antenna requirement; and
- mandatory equipment class.

2.18 ComReg maintains three separate equipment reference databases which are available on ComReg's website[4]:

- Antenna Reference Codes ("AREF")
- Radio Transmitter Reference Codes ("EREF"); and
- Feeder Reference Codes.

2.19 Before applying for a fixed radio link licence, the equipment must be registered on ComReg's Equipment Reference Code Database. You can check if a specific radio or antenna has already been registered by going to – https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/radio-links/equipment-database/.

2.20 Depending on the equipment to be registered at https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/radio-links/microwave-equipment/., use method A or B below as applicable:

- If the **Antenna or Feeder** is not registered, please complete the relevant sections of Equipment Reference Code Registration Form and send to ComReg at refcode@comreg.ie along with the relevant antenna RPE data files. Where the registration of multiple antenna or feeder models is required, the information should be submitted using the following sample excel format; Multiple Antenna & Feeder Ref Codes.xlsx
- If the **Radio Equipment (Transmitter)** is not registered on ComReg's database, an XML file containing the equipment details can be uploaded directly to the Reference Code Database. Multiple radios can be registered using the one xml file. Please follow the instructions on https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/radio-links/microwave-equipment/.

[4] https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/radio-links/equipment-database/

2.7 Radio Equipment Compliance and Requirements

2.21 The Radio Equipment (RE) Directive[5] ensures a single market for radio equipment by setting essential requirements for safety and health, electromagnetic compatibility, and the efficient use of the radio spectrum. It applies to all products using the radio frequency spectrum. The RE Directive was transposed into Irish Law as S.I. No. 248/2017 - European Union (Radio Equipment) Regulations 2017.[6]

2.22 All radio and telecommunications terminal equipment must comply with the essential requirements and other relevant provisions of S.I. No. 248/2017 before being placed on the market or put into service in Ireland.

2.8 Requested radio propagation availability & power

2.23 ComReg aims to licence a fixed radio link in the most appropriate frequency band with an assigned bandwidth and transmitter EIRP (Equivalent Isotropic Radiated Power) that are consistent with the minimum capacity and availability requirements for that link.

2.24 In applying to ComReg, the applicant should request the minimum transmitter EIRP that is required for the propagation availability and capacity of the link as set out in Annex 2. The channel that is eventually licensed, and the transmitter power, may be different from those requested that were originally requested by the applicant.

2.25 To determine the minimum transmitter EIRP (i.e., maximum permissible transmitted power) for a fixed radio link, the applicant must carry out a path calculation (link budget). This path calculation should be based on the same technical parameters as used by ComReg (see Table 3 below) and take account of the transmitter output power levels, antenna gains, feeder losses and receiver sensitivity levels.

Table 3: Summary of frequency bands are available for fixed radio link licensing

Radio Factor	ITU-R Recommendation	Equation No. (or Table/Figure)
Free Space Loss	P.525-4	4
Gaseous Absorption	P.676-13	Annex 1 and 2
	P.530-18	1
	P.836-6	Annex 1 and 2
Rain Attenuation	P.838-3	1, 2, 3, Table 1

[5] Directive 2014/53/EU, https://ec.europa.eu/growth/sectors/electrical-engineering/red-directive_en
[6] http://www.irishstatutebook.ie/eli/2017/si/248/made/en/print

	P.837-7	32mm/hr, Figure 1
	P.841-7	5, 6, 7 with Q1 and Beta user adjustable.
	P.530-14	35, 36, 37, 38
Multipath Fading	P.530-14	Section 2.3
	P.530-14	5 or 39, 40
	P.453-14	Figure 9 (pl user adjustable)

2.9 Multi-Band aggregation

2.26 Fixed radio links using Multi-Band Aggregation of two separate frequency bands require separate interference analysis of both frequency bands to ensure there is no potential harmful interference. It is currently not possible to undertake an interference analysis of a single fixed radio link using two separate frequency bands, therefore applications for separate licences must be submitted for each band to ensure a proper analysis is undertaken.

2.10 Automatic Transmit Power Control

2.27 The use of Automatic Transmit Power Control ("ATPC") is permitted on licensed fixed radio links, however the maximum EIRP shall not be greater than the value stipulated in the licence. ATPC adjusts transmitter output power based on the varying signal level at the receiver. ATPC automatically increases the transmit power during "fade" conditions such as heavy rainfall. When the "fade" conditions end, the ATPC system reduces the transmit power again. This reduces the stress on the microwave power amplifiers, which reduces power consumption, heat generation and increases equipment lifetime.

2.11 Adaptive modulation[7]

2.28 Operators are encouraged to use the latest technology and higher order modulation schemes in line with ensuring the efficient use of spectrum. ComReg encourages the use of equipment which utilises Adaptive Coding and Modulation ("ACM") in all terrestrial microwave fixed radio link bands.

2.29 ETSI standard (ETSI EN 302 217-2-2)[8] sets out the way ACM should be deployed. In line with this ETSI standard, ComReg requires that a reference mode for a fixed radio link be defined by the applicant. This reference mode should be capable of

[7] ComReg Document 09/87 - Use of Adaptive Coding and Modulation in Terrestrial Fixed Link Bands - published 18 November 2009
[8] http://www.etsi.org

delivering the core bit rate (high availability traffic), and utilise the fade margin when possible to increase the data rate (for lower priority traffic). An application for a fixed radio link using ACM must be for the minimum modulation scheme it will use on the fixed radio link.

2.30 The Received Signal Level ("RSL") will be determined by the RSL of the system in reference mode, and this RSL will be used in assigning an EIRP which in turn will determine level of availability allowable for the given link. The ratio of C/I used to protect the radio link will be determined by the C/I defined for the reference mode.

2.31 At all times, the EIRP assigned to the system must be consistent and must not vary from the value stipulated in its licence, even when there is a transition of modulation schemes and capacity. As stated in the ETSI standard: "*TX emission should not exceed that of the reference mode*". In doing so, currently licensed links and future links in bands, whether deploying ACM or fixed modulation technology, would not be adversely affected by a system deploying ACM in the same band.

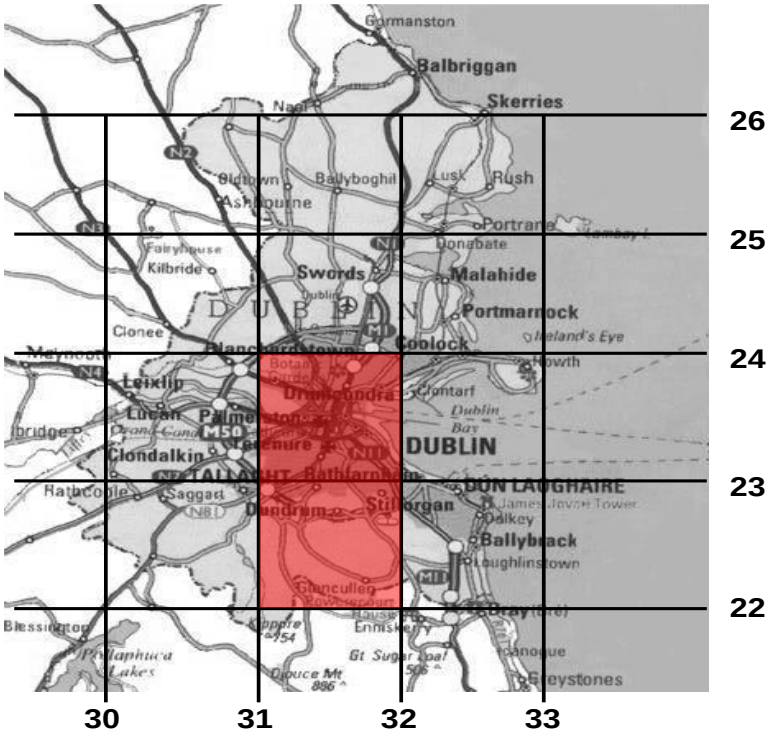
2.32 The licence which will be granted for an ACM system will include the modulation scheme and capacity of the reference system. These values will be indicative of the reference system nominated by the licensee, and these values are not descriptive of the range of capacity and modulation schemes the system can utilise.

2.12 Congested Area Links

2.33 Increasing congestion in certain frequency bands has prompted ComReg to introduce higher fees for certain spectrum within a specific geographical area, called the "congested area". Currently the congested area applies to links in Grid 3122 and 3123 in the 13 GHz, 15 GHz, 18 GHz, and 23 GHz frequency bands (See Figure 1 below).

2.34 Therefore, if either ends of a 13 GHz, 15 GHz, 18 GHz, or 23 GHz link falls within the range E310000 to E320000 and N220000 to N240000, then a congestion charge applies. The higher fee for links within this geographical area reflects the scarcity of spectrum within the area and in those bands. The applicable fees are set out in Section 4.8 below.

Figure 1: Location of the congested area for 13 GHz, 15 GHz, 18 GHz, and 23 GHz bands



2.13 Single Channel Dual Polarity Links (SCDP)

2.35 A single channel dual polarity link ("SCDP") is a link having both vertical and horizontal polarisation on the same path and same frequency channel. SCDP links are charged and licensed as a single link licence. This is intended to encourage the efficient use of spectrum and provide an incentive to licensees who have multiple links on the same path to consider using both H and V polarisation on the same frequency channel. Dual polarisation is mandatory for all new fixed radio link applications, where more than one link is required on the same path in the same frequency band.

2.14 High Usage Paths

2.36 ComReg's seeks to promote radio fixed radio links as a means of facilitating market entry and the rollout of alternative infrastructure. In high usage areas, established operators whose capacity requirements have grown to the extent that fibre would provide an effective alternative are therefore being encouraged to make this migration, where practicable, to release spectrum for new entrants.

2.37 A 'High Usage' charge will be incurred where a licensee has fixed radio links on the same fixed radio link path occupying 50% or greater of the available bandwidth within a frequency band. The High Usage Path fee will be calculated as per Section 4.8 below.

2.15 Planning a fixed radio link

2.38 The general aim of planning a fixed radio link is to identify the desired site locations, frequency band and channel spacing to meet the transmission and availability requirements of the fixed radio link. The following may assist the applicant in this process:

- when planning a fixed radio link or a network of radio links, the applicant must ensure optimal radio link spectrum efficiency, and repeat usage of the same frequency channel(s) throughout the network should be maximised;
- where the applicant already has existing radio link licences, any future applications should be based upon frequency channels already licensed to the applicant;
- the applicant should check that their desired radio link plan complies with the technical requirements as set out in Annex 1. For example, the radio link plan meets the minimum link length and transmission requirements for the specific frequency band;
- the applicant should check the planned site co-ordinates with reference to ComReg's on-line high/low database[9] to ensure that there are no high / low designation issues. This may eliminate certain site locations in particular frequency bands;
- the applicant should plan their radio link network based on the minimum Equivalent Isotropic Radiated Power (EIRP) necessary to achieve the required availability. Additionally, to minimise the risk of interference to others, the most directional antennas possible should be proposed;
- the applicant should engage with their equipment manufacturer to ensure that the desired radio link equipment (i.e., frequency band, transmission capacity etc.) is available, should a radio licence be granted by ComReg; and
- the applicant should ensure that there are no internal interference issues on their desired frequency channels, as ComReg does not take internal interference issues into consideration when evaluating a fixed radio link application.

[9] https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/radio-links/high-low-database/

3 The Application Process

3.1 Submitting an application

3.1 Applications for new or amended radio link licences must be submitted to ComReg together with the appropriate fees. All required details must be submitted in accordance with the requirements as set out in this document.

3.2 Prior to applying, the applicant must carry out the necessary checks as set out in Section 2 above to minimise the possibility of the application proving unsuccessful due to technical issues, such as high/low conflicts, intra- and inter-operator interference, etc.

3.3 Applications for new or amended radio link licences must be submitted using ComReg's web-based radio link application system at https://www.elicensing.comreg.ie/.

3.4 To make an application on-line the applicant must be an account holder. Accounts can be created via www.elicensing.comreg.ie. The applicant will be requested to provide a contact email address for correspondence regarding the application. The application data must be compiled into a data file (XML) prior to making the application.

3.5 In compiling the application data, the applicant should ensure that, among other things:

- the appropriate ComReg equipment and antenna reference (AREF and EREF – see section 2.6) codes are provided; and
- for amended licences; that the licence being amended is identified using the appropriate licence reference (LPP) number stated on the licence.

3.6 Details on the file format and how to compile the xml file is available on the eLicensing website; www.elicensing.comreg.ie in the area entitled: *"apply for a Fixed Link (PP or PM) Licence".* This file is then uploaded during the on-line application process and payment can only be made using either:

- credit card; or
- by arranging to have your account with ComReg, in credit to, at least the value of the application being made at the time of application.

3.7 Where an error does occur, applicants will be advised of the nature of the error via an on-line message. Applicants will receive an email notification of the ComReg application reference number which should be used for any further correspondence regarding the application.

3.2 Applications containing dual polarity links

3.8 As an amendment will apply to both the H and V sides of the dual polarity link, the applicant must provide details of both the V and H polarities in their amendment request.

3.9 It is not possible to convert a single polarity link to dual polarity. A new dual polarity link application must be submitted to "replace" the existing link. As full processing of both polarities is required, such applications are not considered as an amendment.

3.3 The evaluation process

3.10 All applications for a fixed radio link licence are evaluated on a "first come, first served" basis.

3.11 The applicant should note that while ComReg will endeavour to accommodate their needs, ComReg cannot guarantee that licences will be granted or that licences will be granted with the requested frequency band and channel.

3.12 Following conclusion of the evaluation phase, the applicant will be informed of the Commission's decision to grant or refuse a licence. In the event of refusal, the reasons for refusal will be specified.

3.13 While ComReg endeavours to minimise the potential for interference between users and services, no liability shall accrue to ComReg arising from interference to licensees of radio systems.

3.4 Provision of Further Information

3.14 ComReg reserves the right to request an applicant to submit further material, link budgets and documents in addition to the information already provided within such time and within such format as ComReg may stipulate.

3.5 FOI, AIE, and Data Protection[10]

FOI Publication Scheme

3.15 The Freedom of Information Act 2014[11] (FOI Act) establishes several important legal rights for those seeking access to official information.

3.16 Statutory rights under the FOI Act:

- A legal right for each person to access information held by public bodies.
- A legal right for each person to have official information relating to him/herself amended where it is incomplete, incorrect, or misleading.

[10] https://www.comreg.ie/about/foi-aie-info/
[11] https://www.irishstatutebook.ie/eli/2014/act/30/enacted/en/html

- A legal right to obtain reasons for decisions affecting oneself.

3.17 The FOI Act is designed to allow public access to information held by the Commission which is not routinely available through other sources. Access to information under FOI is subject to certain exemptions and involves specific procedures and time limit.

Access To Information on the Environment

3.18 .Subject to certain exceptions, information relating to the environment held by, or for, ComReg must be made available on request to any person.

3.19 The European Communities (Access to Information on the Environment) Regulations 2007[12], as amended, provide a definition of environmental information, and outline the way requests for information may be submitted to public authorities.

[12] https://www.irishstatutebook.ie/eli/2007/si/133/made/en/print

4 Licence Information

4.1 A fixed radio link licence granted under the Regulations permits the licensee to keep and operate radio apparatus in accordance with these regulations. The licence conditions pertaining to fixed radio links licences are contained in the Regulations and all licensees should familiarise themselves with same. It should be noted that ComReg reserves the right not to grant a licence.

4.1 Licensee

4.2 It is the responsibility of the licensee to ensure compliance with the licence conditions, and to ensure that their licence details as submitted to ComReg remain valid and updated.

4.2 The Licensed Frequency

4.3 A licence allows the licensee to install and operate a fixed radio link on a specified frequency band and channel spacing at identified sites. Licensees should be aware that ComReg licenses other users on the same frequency channels, provided that there is minimal interference potential.

4.4 A licence does not confer any right of ownership of the frequency spectrum. It allows the assigned frequency channel to be used during the term of the licence in accordance with the conditions of the licence.

4.3 Licence duration and renewal

4.5 The duration of the licence is one year. A licence may be renewed provided the renewal fee is paid in advance of the expiry of the licence, and subject to any renewal conditions being met.

4.6 In considering a renewal request, ComReg will have regard to whether, inter alia:

- the licence renewal fee or any applicable High Usage charges are paid in full;
- the Radio Link system is being operated in accordance with the terms and conditions of the licence; and
- there are changes being considered or implemented to the relevant frequency bands available in Ireland and/or their technical conditions. These changes may be due to national or international considerations.

4.7 As a consequence of any such changes, existing licensees may be required to modify or cease their radio link operations to comply with the revised frequency bands and technical conditions. ComReg will endeavour to provide as much notice as possible to existing licensees if any such changes are required.

4.8 Where renewal of a licence has not been affected prior to the licence expiry date that licence lapses automatically. Such radio link licences cannot be re-instated. New applications are required in all cases and, subject to spectrum availability, new licences may be granted.

4.4 Temporary licence duration

4.9 The maximum duration of a temporary radio link licence is eleven (11) months and cannot be renewed.

4.10 If the licence is granted for a period of less than one month, for the purposes of fee calculation only, the licence shall be considered as a licence granted for a period of one month.

4.5 Amendments to a licence

4.11 A licence amendment occurs when the details on the licence are no longer correct and therefore need to be updated, for example, when the technical characteristics of the link need to be changed to facilitate an upgrade of equipment etc.

4.12 Any proposed amendments to a fixed radio link must be approved by ComReg in advance. Licensees must notify ComReg of any changes to licence contact details (for example, change of address) as soon as they occur.

4.13 A change in the site co-ordinates of the radio link licence is not an amendment. In such cases, the existing licence will be cancelled, and the licensee must apply for a new link with the new site co-ordinates.

4.14 Where amended technical characteristics of a licence are approved, ComReg will grant an amended licence to the licensee, subject to any fees that may arise due to increased bandwidth usage or change in frequency. An amendment fee is due when either/or both the bandwidth or frequency channel on which the link operates has changed such that the annual cost of the link increases. The amendment fee charged is the difference between the old and new fee.

4.15 There is no amendment fee where the annual cost of the link decreases on amendment.

4.6 Cancellation of a licence

4.16 A licence may be cancelled at the written request of the licensee.

4.17 If a licence is suspended or withdrawn, the licensee may be entitled to a refund on a pro rata monthly basis for the remaining period of the licence of the relevant licence fee.

4.18 Refunds will be in the form of a credit to a licensee's account, which will be processed on a quarterly basis.

4.7 Transfer of a Licence

4.19 A licensee may request that a fixed radio link licence be transferred to another undertaking. This request must be made in writing to licensing@comreg.ie and is subject to the approval of ComReg.

4.8 Licence fees

4.20 The fee associated for fixed radio links are set down in Statutory Instrument No. 593 of 2023 Wireless Telegraphy (Fixed Radio Link Licence) Regulations 2023. All applications for radio links must be accompanied by the full fee.

4.21 Until **30 September 2024**, the annual payable fees ("Initial Fees") for Point-to-Point Fixed Radio Link Licences are set as per Tables 4 and 5.

Table 4: Initial Fee schedule for Point-to-Point Fixed Radio Link licences

Frequency Band (F)	Annual Licence Fee BW ≤ 3.5 MHz	Annual Licence Fee 3.5 MHz < BW ≤ 20 MHz	Annual Licence Fee 20 MHz < BW ≤ 40 MHz	Annual Licence Fee BW > 40 MHz
1 GHz < F ≤ 17 GHz	€1,000	€1,100	€1,200	€1,500
17 GHz < F ≤ 37 GHz	€750	€825	€900	€1,125
37 GHz < F ≤ 39.5 GHz	€550	€605	€660	€825
F > 39.5 GHz	€100	€110	€120	€150

Table 5: Initial Fee schedule for Point-to-Point Fixed Radio Link Licences on a High Usage Path or in a Congestion Area

Frequency Band (F)	Annual Licence Fee BW ≤ 3.5 MHz	Annual Licence Fee 3.5 MHz < BW ≤ 20 MHz	Annual Licence Fee 20 MHz < BW ≤ 40 MHz	Annual Licence Fee BW > 40 MHz
1 GHz < F ≤ 17 GHz	€1,200	€1,320	€1,440	€1,800
17 GHz < F ≤ 37 GHz	€900	€990	€1,080	€1,350

37 GHz < F ≤ 39.5 GHz	€660	€726	€792	€990
F > 39.5 GHz	€120	€132	€144	€180

4.22 The Initial Fee for a Point to Multi-Point Fixed Radio Link is four (4) times the Annual Fees (€) for a Point-to-Point Fixed Radio Link.

4.23 From **1 October 2024 until 30 September 2026,** the annual Licence Fee payable for Point-to-Point Fixed Radio Link Licences is set by the following formula:

$$Fee\ Payable = \sum_{t}^{n} \frac{n-t}{n}\ InitialFees + \frac{t}{n}\ AnnualFees$$

4.24 *'t'* represents the number of years from 1 October 2023, therefore t=1 from 1 October 2024; and t=2 from 1 October 2025.

4.25 *'n'* represents the duration in years from 1 October 2023 until 30 September 2026, therefore n=3.

4.26 Initial Fees represents the fees as shown in Table 4 and Table 5 above.

4.27 Annual Fees represents the Licence Fees as calculated below.

Annual Fees

4.28 From **1 October 2026**, the annual fee payable on a Point-to-Point Fixed Radio Link **(Annual Fee)** is equal to the fee for that Point-to-Point Fixed Radio Link in the base year of 2023 (the "Base Fee"), indexed to the annual rate of inflation since 2023 using the Consumer Price Index. The inflation adjustment, is set out in the following formula as follows:

$$\text{Indexing Multiplier} = \frac{CPI_t}{CPI_{2023}} * 100$$

4.29 Where CPI_t represents the 12-month Consumer Price Index figures published by the Central Statistics Office, for year *t*, the year immediately preceding the indexation. CPI_{2023} represents the 12-month Consumer Price Index figures published by the Central Statistics Office for 2023. The first indexation shall take place on the 1st of October 2024 and shall occur annually thereafter on that same date.

4.30 The Base Fees are set out in Table 6, Table 7, Table 8, and Table 9 below, save for any adjustments outlined below for Radio Links in a Congestion Area and/or on a High Usage Path and/or Multi-Point Fixed Radio Link.

4.31 The fee for a TDD Fixed Radio Link is half the fee of a FDD Fixed Radio Link using the same Bandwidth.

Table 6: Base Fee for a Point-to-Point Fixed Radio Link in the 1.3/1.4 GHz and 1.3/1.5 GHz Bands, by Bandwidth (MHz)

BW (MHz)	Frequency Band (GHz)	
	1.3/1.5	1.3/1.4
0.25	€100	€100
0.5	€100	€100
1	€100	€100

Table 7: Base Fee for a Point-to-Point Fixed Radio Link in the 2 GHz, 6 GHz, 7 GHz, and 8 GHz Bands, by Bandwidth (MHz)

BW (MHz)	Frequency Band (GHz)						
	2.0/2.3	L6	L7	L8	U6	U7	U8
3.5	€170	-	-	-	-	-	€131
7	€310	-	-	-	-	€296	€210
14	€495	-	€434	-	-	€538	€420
20	-	-	-	-	€786	-	-
28	-	-	€868	-	-	€861	€841
29.65	-	€947	-	€901	-	-	-
40	-	-	-	-	€1,257	-	-
56	-	-	€1,736	-	-	€1,722	€1,682
59.3	-	€1,894	-	€1,802	-	-	-
80	-	-	-	-	€2,514	-	-

Table 8: Base Fee for a Point-to-Point Fixed Radio Link in the 11 – 42 GHz Bands, by Bandwidth (MHz)

BW (MHz)	Frequency Band (GHz)								
	11	13	15	18	23	26	28	38	42
3.5	-	€134	€102	-	€100	€100	€100	€100	-
7	-	€262	€201	-	€145	€145	€104	€100	€100
14	-	€502	€393	-	€285	€263	€203	€100	€100
27.5	-	-	-	€641	-	-	-	-	-
28	-	€913	€753	-	€544	€421	€389	€136	€100
40	€1,105	-	-	-	-	-	-	-	-
55	-	-	-	€1,166	-	-	-	-	-
56	-	€1,461	€1,368	-	€990	-	€706	€247	€100
80	€2,210	-	-	-	-	-	-	-	-
110	-	-	-	€1,865	-	-	-	-	-
112	-	-	€2,189	-	€1,584	-	€1,130	€396	€108
220	-	-	-	€3,730	-	-	-	-	-
224	-	-	-	-	€3,167	-	€2,261	€792	-

Table 9: Base Fee for a Point-to-Point Fixed Radio Link in the 80 GHz Band, by Bandwidth (MHz)

BW (MHz)	Frequency Band (GHz)
	80 GHz
125	€100
250	€100
375	€118
500	€150
625	€178
750	€203
875	€223
1000	€240
1250	€300
1500	€360
1750	€420
2000	€480
2250	€540

Congested Fixed Radio Links and High Usage Path Fixed Radio Links.

4.32 The fee for a fixed radio link is increased by:

- 200% where that Fixed Radio Link is a Congested Fixed Radio Link; and / or
- 20% where that Fixed Radio Link is a High Usage Path Fixed Link.

Fees for Point to Multi-Point Fixed Radio Links

4.33 The Fee is equal to the sum of the Annual Fees that would be payable for each equivalent Point-to-Point Fixed Link within the Point-to-MultiPoint system, up to the eighth link, and 25% of each link beyond the eighth link in the Point-to- MultiPoint system.

Temporary Licence Fees

4.34 In all periods, temporary Licence Fees are applied pro-rata to the relevant fees payable using the number of months for which the licence is granted. (i.e., if a licence is granted for a period of less than one month, then, for the purpose of these calculations only, the licence shall be considered as a licence granted for a period of one month).

Licence amendments

4.35 An amendment fee is due when either/or both the bandwidth or frequency band on which the link operates has changed such that the annual cost of the link increases. The amendment fee charged is the difference between the old and new fee.

4.9 Harmful Interference to other licensed users

4.36 Licensees are required to adhere to the guidelines in ETSI Technical Report ETR 053, "Radio Site Engineering for Radio Equipment and Systems in the Mobile Service"[13], to minimise the risk of interference between co-sited/adjacent radio systems.

4.10 Commissioning/site Inspections

4.37 ComReg reserves the right to inspect a fixed radio link station at any time to ensure that the system is configured and operating in accordance with the licence conditions. In addition, ComReg may attend the commissioning of sites and may carry out measurements on the system.

4.11 Interference to the radio links

4.38 While ComReg endeavours to minimise the potential for interference between users and services, no liability shall accrue to ComReg arising from interference to licensees of radio systems.

4.39 Licensees are required to manage any intra-network interference issues, as ComReg only carries out inter-operator interference checks.

[13] https://www.etsi.org/deliver/etsi_etr/001_099/053/01_60/etr_053e01p.pdf

Radio Interference Investigation[14]

4.40 ComReg's Spectrum Intelligence and Investigations unit investigates cases of radio interference. Interference can affect any radio service, including but not limited to, emergency services, air traffic control, mobile phone services, business radio, microwave links and broadcast services.

4.41 Unintentional interference can be caused by incorrectly or poorly installed radio systems and by faulty or non-compliant electrical or electronic equipment. Unlawful devices, such as mobile phone repeaters are a common source of interference. Any electrical or electronic device has the potential to be a source of radio interference given the right circumstances.

Radio Frequency Interference Reporting Protocol

4.42 To respond to complaints of RFI more effectively, ComReg has introduced a radio frequency interference (RFI) reporting protocol for all complainants. This protocol requires complainants to provide focused and in-depth information to assist ComReg in its triage and prioritisation of complaints.

4.43 This protocol makes clear that ComReg cannot investigate a report of RFI unless it is satisfied that the interference is 'harmful', outside of the complainant's control and that all reasonable steps have been taken by the complainant to minimise the effect.

4.44 Once a complainant is satisfied that the interference it is experiencing is, in its view, harmful, outside of its control and that the affected apparatus is functioning correctly, then a complaint can be submitted to interference@comreg.ie accompanied by the supporting material as required in this PDF document.

4.45 ComReg acknowledges all complaints received to interference@comreg.ie on the day of receipt. Complaints received outside of work hours are acknowledged on the next working day. Please note: ComReg's hours of work are 9:00 am to 5.30 pm, Monday to Friday. ComReg staff do not operate on an "on call basis".

[14] https://www.comreg.ie/industry/radio-spectrum/spectrum-compliance/radio-interference/

Annex 1: Frequency Bands & mandatory technical conditions

A 1.1 This annex sets out the necessary technical requirements for submitting a fixed radio link application per frequency band.

Band	Frequency	TX/RX spacing (duplex direction)	Band Plan	Channel Spacing	Maximum Transmit Power	Minimum path length (km)	Minimum Transmission Capacity	Minimum Antenna Requirement	Mandatory Equipment Class	Notes
1.3 GHz	1370-1375 MHz and 1512-1517 MHz	142MHz	CEPT Recommendation T/R 13-01 E, Annex A	0.25 MHz 0.5 MHz 1 MHz	Minimum required to obtain required availability level	n/a	-	Class 2 EN 302 217-4	Classes 1, 2, 3 EN 302 217-2	Open
1.4 GHz	1375-1385MHz and 1427-1437 MHz	52MHz	CEPT Recommendation T/R 13-01 E, Annex B	0.25 MHz 0.5 MHz 1 MHz	Minimum required to obtain required availability level	n/a	-	Class 2 EN 302 217-4	Classes 1, 2, 3 EN 302 217-2	Open
2 GHz	2025 - 2110 MHz and 2200 – 2290 MHz	175MHz	CEPT Recommendation T/R 13-01 E, Annex C	3.5 MHz 7 MHz 14 MHz	Minimum required to obtain required availability level	25 Km	4 Mbit/s	Class 3 EN 302 217-4	Classes 2, 3 EN 302 217-2	Open
L6 GHz	5.925 - 6.425 GHz	252.04 MHz	CEPT/ERC/REC 14-01 E, Annex 1	29.65 MHz 59.3 MHz	Minimum required to obtain required availability level	25 Km	140 Mbit/s 59.3 MHz - 310 Mbit/s	Class 3 EN 302 217-4	Class 3 EN 302 217-2	Open
U6 GHz	6.425 - 7.125 GHz	340 MHz	CEPT/ERC/REC 14-02 E, Annex 1	20 MHz 40 MHz 80 MHz	Minimum required to obtain required availability level	25 Km	140 Mbit/s 80 MHz - 310 Mbit/s	Class 3 EN 302 217-4	Class 3 EN 302 217-2	Open

Band	Frequency	TX/RX spacing (duplex direction)	Band Plan	Channel Spacing	Maximum Transmit Power	Minimum path length (km)	Minimum Transmission Capacity	Minimum Antenna Requirement	Mandatory Equipment Class	Notes
L7	7.125 – 7.425 GHz	154 MHz	CEPT/ECC/REC 02-06 Annex 1	14 MHz 28 MHz 56 MHz	Minimum required to obtain required availability level	25 Km	28 MHz - 140 Mbit/s 56 MHz - 310 Mbit/s	Class 3 EN 302 217-4	Class 3 EN 302 217-2	Open Note: Part of the L7 band (7.125 - 7.425 GHz) may be allocated towards unidirectional links such as ENG/OB
U7 GHz	7.425 – 7.725 GHz	154 MHz	CEPT/ECC/REC 02-06 Annex 1	7 MHz 14 MHz 28 MHz 56 MHz	Minimum required to obtain required availability level	25 Km	140 Mbit/s 56 MHz - 310 Mbit/s	Class 3 EN 302 217-4	Class 3 EN 302 217-2	Open
L8 GHz	7.725 – 8.275 GHz	311.32 MHz	ITU-R F. 386-8, Annex 6	29.65 MHz 59.3 MHz	Minimum required to obtain required availability level	25 Km	140 Mbit/s 59.3 MHz - 310 Mbit/s	Class 3 EN 302 217-4	Class 3 EN 302 217-2	Open
U8 GHz	8.275 – 8.5 GHz	126 MHz for 3.5 MHz, 7 MHz, 14 MHz & 56 MHz channel spacing and 119 MHz for 28 MHz channel spacing	ITU-R F. 386-9, Annex 2	3.5 MHz 7 MHz 14 MHz 28 MHz 56 MHz	Minimum required to obtain required availability level	25 Km	4 Mbit/s 56 MHz - 310 Mbit/s	Class 3 EN 302 217-4	Classes 1, 2, 3 applicable EN 302 217-2	Open
11 GHz	10.7 - 11.7 GHz	490 MHz	CEPT/ERC/REC 12-06 E	40 MHz 80 GHz	Minimum required to obtain required availability level	10 Km	140 Mbit/s	Class 3 EN 302 217-4	Class 3 EN 302 217-2	Open

Band	Frequency	TX/RX spacing (duplex direction)	Band Plan	Channel Spacing	Maximum Transmit Power	Minimum path length (km)	Minimum Transmission Capacity	Minimum Antenna Requirement	Mandatory Equipment Class	Notes
13 GHz	12.75 - 13.25 GHz	266 MHz	CEPT/ERC/REC 12-02 E	3.5 MHz 7 MHz 14 MHz 28 MHz 56 MHz	Minimum required to obtain required availability level	9 Km	4 Mbit/s 56 MHz - 310 Mbit/s	Class 3 EN 302 217-4	PDH: Classes 1 & 2 applicable EN 302 217-2 SDH Classes >4 Applicable EN 302 217-2	Open
15 GHz	14.5 - 15.35 GHz	420 MHz	ITU-R F. 636-5	3.5 MHz 7 MHz 14 MHz 28 MHz 56 MHz 112 MHz	Minimum required to obtain required availability level	9 Km	4 Mbit/s 56 MHz - 310 Mbit/s 112 MHz - 620 Mbit/s	Class 3 EN 302 217-4	PDH: Classes 1 & 2 applicable EN 302 217-2 SDH Classes >4 Applicable EN 302 217-2	Open
18 GHz	17.7 - 19.7 GHz	1010 MHz	CEPT/ERC/REC 12-03 E, Annex A	27.5 MHz 55 MHz 110 MHz 220 MHz	Minimum required to obtain required availability level	6 Km (≤34Mbit/s) 0 Km (> 34Mbit/s)	34 Mbit/s 55 MHz - 310 Mbit/s 110 MHz - 620 Mbit/s 220 MHz - 1240 Mbit/s	Class 3 EN 302 217-4	PDH: Classes 1 & 2 applicable EN 302 217-2 SDH Classes >4 Applicable EN 302 217-2	Open

Band	Frequency	TX/RX spacing (duplex direction)	Band Plan	Channel Spacing	Maximum Transmit Power	Minimum path length (km)	Minimum Transmission Capacity	Minimum Antenna Requirement	Mandatory Equipment Class	Notes
23 GHz	22.0 - 22.6 GHz and 23.0 – 23.6 GHz	1008 MHz	CEPT Recommendation T/R 13-02 E, Annex A	3.5 MHz 7 MHz 14 MHz 28 MHz 56 MHz 112 MHz 224 MHz	Minimum required to obtain required availability level	3 Km (≤34Mbit/s) 0 Km(> 34Mbit/s or 34Mbit/s in 14MHz channel spacing)	4 Mbit/s 56 MHz - 310 Mbit/s 112 MHz - 620 Mbit/s 224 MHz - 1240 Mbit/s	Class 3 EN 302 217-4	PDH: Classes 1 & 2 applicable EN 302 217-2 SDH Classes >4 Applicable EN 302 217-2	Open
26 GHz	Part of 24.5 - 26.5 GHz band namely: 25.277 – 25.445 GHz and 26.285 – 26.453 GHz	1008 MHz	CEPT/ERC/REC 13-02 E, Annex B	3.5 MHz 7 MHz 14 MHz 28 MHz	Minimum required to obtain required availability level	3 Km (≤34Mbit/s) 0 Km (> 34Mbit/s or 34Mbit/s in 14MHz channel spacing)	4 Mbit/s	For Point-to-Point antennas : Class 3 EN 302 217-4 Note for Point to Multipoint antennas: EN 302 326-3	Class2 applicable to PDH. EN 302 217-2 Class3 applicable to SDH. EN 302 217-2 Class B equipment applicable (PDH and SDH) EN 302 326-1	Open
28 GHz	Part of 27.5 - 29.5 GHz band namely: 27.9405 - 28.4445 GHz paired with 28.9485 -29.4525 GHz	1008 MHz	CEPT/ERC/REC T/R 13 02 Annex C	3.5 MHz 7 MHz 14 MHz 28 MHz 56 MHz 112 MHz 224 MHz	Minimum required to obtain required availability level	3 Km (≤34Mbit/s) 0 Km (>34Mbit/s or 34Mbit/s in 14MHz channel spacing)	4 Mbit/s 56 MHz - 310 Mbit/s 112 MHz - 620 Mbit/s 224 MHz - 1240 Mbit/s	Class 3 EN 302 217-4 Note for Point to Multipoint antennas: EN 302 326-3	PDH: Classes 1 & 2 applicable EN 302 217-2 SDH Classes >4 Applicable EN 302 217-2	Open

Band	Frequency	TX/RX spacing (duplex direction)	Band Plan	Channel Spacing	Maximum Transmit Power	Minimum path length (km)	Minimum Transmission Capacity	Minimum Antenna Requirement	Mandatory Equipment Class	Notes
38 GHz	37 - 39.5 GHz	1260 MHz	CEPT Recommendation T/R 12-01 E, Annex A	3.5 MHz 7 MHz 14 MHz 28 MHz 56 MHz 112 MHz 224 MHz	Minimum required to obtain required availability level	0 Km	4 Mbit/s 56 MHz - 310 Mbit/s 112 MHz - 620 Mbit/s 224 MHz - 1240 Mbit/s	Class 3 EN 302 217-4	PDH: Class 2 applicable EN 302 217-2 SDH Classes >4 Applicable EN 302 217-2	Open
42 GHz	40.5 - 43.5 GHz	1500 MHz	CEPT Recommendation (01)04	7 MHz 14 MHz 28 MHz 56 MHz 112 MHz	Minimum required to obtain required availability level	0 Km	4 Mbit/s 56 MHz - 310 Mbit/s 112 MHz - 620 Mbit/s	Class 3 EN 302 217-4	Class 2 applicable to PDH. Class 3 applicable to SDH. EN 302 217-2	Open
80 GHz	71-76 GHz / 81-86 GHz	10 GHz, < 5 GHz.	ECC/REC/(05)07	250 MHz – 2.25 GHz	Minimum required to obtain required availability level	0 Km	150 Mbit/s	Class 3 EN 302 217-4	EN 302 217-3	These bands are open for both FDD and TDD systems.

Annex 2: Propagation Availability Requirements

A 1.2 ComReg licenses radio links with distinct levels of radio propagation availability. There are several requirements that must be met to be eligible to apply for a particular radio propagation availability category. These are set out below.

A 1.3 The applicant may be able to improve their overall network availability by using network resilience techniques such as hot-standby, space diversity, routing diversity, planned maintenance etc.

Target Radio Outage per year	Required Radio Propagation Availability	Requirements to be met to apply for required availability		
		High-capacity links in bands > 3 GHz	Low-Capacity links in bands > 3 GHz	Bands < 3 GHz
Approx. 263 Minutes	99.95%		Meets minimum technical requirements in these guidelines but antenna is not compliant with class 3 in ETSI standard EN 302 217 at either site	Meets minimum technical requirements in these guidelines but antenna is not compliant with class 3 in ETSI standard EN 302 217 at either site
Approx. 52.6 minutes	99.99%	Meets minimum technical requirements in these guidelines and antenna is compliant with at least class 3 in ETSI standard EN 302 217 at both sites	Meets minimum technical requirements in these guidelines and antenna is compliant with class 3* in ETSI standard EN 302 217 at both sites	Meets minimum technical requirements in these guidelines and antenna is compliant with class 3* in ETSI standard EN 302 217 at both sites

Approx. 26.3 minutes	99.995%	Meets requirements for 99.99% availability and (1 or 2 or 3) including equipment resilience at both sites Routing diversity using for e.g., network meshing, rings etc. on radio, fibre or coax or the use if an alternative infrastructure provider. Is site sharing at either mast with another licensee**	
Approx. 5.3 minutes.	99.999%	Meets requirements for 99.995% availability and (1 or 2) the applicant is allowing other licensees** to share the mast. Is site sharing at both masts with another licensee**	
Approx. 26.3 – 5.3 minutes	99.995% - 99.999%	Meets requirements for 99.995% availability and satisfies ComReg that the higher availability of 99.999% is necessary.	Meets requirements for 99.995% availability (or 99.99% in rural areas where there is no shortage of spectrum) and satisfies ComReg that the higher availability is necessary.

* In rare circumstances for example in rural areas where there is no spectrum congestion and where there is no alternative means of communication and where there is no possibility of providing adequate antenna support and where the links are access or low-capacity links, the use of Class 2 antenna may be permitted. However, these may have to be upgraded (at the licensee's own expense) if spectrum problems arise.