OfW557 - Guidance for fixed link assignment requests in the 1.4 GHz band from 29 May 2015

Please read this guidance note before you apply for a licence to operate a fixed point to point link in the 1356.5 MHz-1375MHz and 1498.5-1517 MHz band ("the 1.4 GHz fixed link band")

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About this document

This document offers guidance to applicants on the requirements that need be considered by the applicant when applying for a licence to operate fixed point to point links in the 1.4 GHz fixed link band.

Ofcom has made changes to the technical conditions in the adjacent 1452-1492 MHz band to enable optimal use of this spectrum for MFCN SDL (Mobile/Fixed Communication Network Supplemental Downlink) “SDL”. These changes are intended to enhance the mobile data services available to citizens in the UK.

As a consequence of these changes, the interference environment between the adjacent uses needs to be taken into account, to ensure that the fixed link receivers operating in the 1498.5 – 1517 MHz band do not receive undue interference. To address this, applicants for 1.4 GHz fixed links need to take into account the presence of base station transmissions in the adjacent 1452-1492 MHz band and the necessary action required to mitigate potential interference to their fixed link receivers prior to submitting their application.

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Section 1

Requirements for applicants of fixed link licenses in the 1.4 GHz fixed link band from 29 May 2015

1.1 The presence of a high power signal in the adjacent band requires fixed links intending to operate in the upper sub band of the 1.4 GHz fixed link band and that want to mitigate the possibility of interference to take necessary action as follows:

Filtering

1.2 Fixed links receiving in the upper sub band of the 1.4 GHz fixed link band will need to ensure that receivers are fitted with suitable filters to address the effect of blocking due to the high power transmissions in the adjacent 1452-1492 MHz band. The indicative receiver filtering requirements for current fixed link system types are given in the table below.

Table 1 Indicative receiver filtering required for current fixed link system

Fixed link system type (kbit/s in kHz)	Total fixed link receive filtering requirement over 1452 – 1492 MHz (dB)	Additional fixed link filtering required in addition to the minimum equipment performance calculated by ETSI TR 101 854 Annex F[1] (dB)
32 in 25	150.6	99.6
64 in 25	152.7	101.7
96 in 75	139.6	88.6
192 in 75	148.7	97.7
256 in 250	126.5	75.5
512 in 250	142.7	91.7
512 in 500	142.6	91.6
704 in 500	138.6	87.6
1024 in 500	140.7	89.7
2048 in 500	137.7	86.7

[1] The ETSI TR 101 854 Annex F minimum filtering requirement is approximately 51 dB

1024 in 1000	139.6	88.6
2048 in 1000	137.7	86.7
2048 in 2000	136.6	85.6
4096 in 2000	134.7	83.7
4500 in 3500	133.6	82.6
9100 in 3500	134.7	83.7

Minimum Clearance Distance

1.3 Applicants who wish to mitigate against the possibility of interference will also need to ensure that their planned fixed link path is clear of base stations in the main beam of the fixed link within a minimum distance. The minimum clearance distance between the main beam of a fixed link and SDL base station will depend of the fixed link antenna used. In practice, a fixed link operator will need to ensure that there is a clear path between the two ends of the link, as consistent with standard link planning practice. Indicative minimum clearance distances for current antenna types are given in the table below.

Table 2 Indicative minimum clearance distances for current antenna types are given in the table below.

Antenna Type	Antenna gain (dBi)	Indicative Minimum clearance distance (m)
A/01/O/06/005/JB	14	70.8
A/01/O/95/030/EU	14.3	73.3
A/01/O/96/046/JB	16	89.1
A/01/H/00/095/SK	16	89.1
A/01/O/97/034/JB	16	89.1
A/01/O/97/059/EU	16.6	95.5
A/01/O/97/035/JB	16.7	96.6
A/01/O/97/058/EU	17	100.0
A/1G5/O/83/009/JB	17	100.0
A/01/S/04/001/RF	17.3	103.5
A/01/O/08/021/GA	19	125.9

A/01/H/05/011/RF	20	141.3
A/01/S/04/043/RF	20	141.3
A/01/H/11/030/GR	22.1	179.9
A/01/H/97/032/AA	22.3	184.1
A/01/H/05/007/RF	22.5	188.4
A/01/H/10/002/GA	22.6	190.5
A/01/H/98/001/AA	22.9	197.2
A/01/H/06/070/RF	23.7	216.3
A/01/S/05/014/MR	25.1	254.1
A/01/H/09/014/RF	25.7	272.3
A/01/H/97/033/AA	25.8	275.4
A/01/H/98/002/DT	26.2	288.4
A/01/H/96/051/AA	28.7	384.6

1.4 The coexistence/clearance distance between a fixed link receiving antenna main-beam (or any offset angle that may also need to be considered) and an SDL base station antenna can be determined according to the equation below:

$$D_{clearance} = 1000 \times \sqrt{10^{(\frac{GFL\_Rx\ -37}{10})}}$$

Where:
GFL_Rx is the gain of the fixed link receiver in the main beam or at the relevant offset angle.

***Note**: the conditions contained in the above tables are not mandatory. However, the obligation on the holders of the licence in the adjacent 1452-1492 MHz band is only required to ensure that a fixed link is not interfered with to the extent that a fixed link Licensee operates that link in accordance with this guidance.*

Section 2

Technical Conditions applicable to SDL stations operating in the 1452-1492 MHz band

2.1 The detailed background to our policy development and implementation is given the following documents:

- Consultation - http://stakeholders.ofcom.org.uk/binaries/consultations/licence-variation-1.4ghz/summary/1.4ghz-consultation.pdf
- Statement - http://stakeholders.ofcom.org.uk/consultations/licence-variation-1.4ghz/statement/

2.2 In summary the following conditions now apply to SDL base stations operating in the adjacent band:

- A maximum base station EIRP limit in the 1452-1492 MHz band is 68dBm/5MHz
- The maximum mean out of band emission limits for SDL base stations operating in 1452-1492 MHz are as follows:

Table 3 The maximum mean out of band emission limits for SDL base stations

Frequency Range of out of band emissions	Maximum mean out of band EIRP (dBm)	Measurement bandwidth (MHz)
1427-1449 MHz	-20	1
1449-1452 MHz	14	3
1492-1495 MHz	14	3
1495-1498.5 MHz	-20	1
1498.5-1518 MHz	-62.5	1

Section 3

Legacy links operating in the 1.4 GHz fixed link band

3.1 Legacy links are those links that were licensed in the 1492-1517 MHz band prior to the 29th May 2015; the date of implementation of our policy change to the technical conditions to enable SDL use in 1452-1492 MHz band. Legacy links are not subject to this guidance and details of how legacy links are to be managed are provided in our policy statement.