This Management Guide has been compiled to summarise the requirements for exporting Straightpoint products with regard to radio wave emission Standards and approvals.

The information within the guide is only believed to be correct as at the time of publication as global requirements are changing rapidly due to the growing mutual recognition of international Standards.

© Copyright 2018. The copyright of this Management Guide is the property of Straightpoint Limited.
## Contents

1. **Introduction** .................................................................................................................. 4  
   The Radio Spectrum ........................................................................................................ 4  
   Radio Equipment ........................................................................................................... 5  
   Straightpoint Wireless Products .................................................................................... 5  

2. **Global Radio Equipment Standards** ........................................................................... 6  
   General ............................................................................................................................. 6  
   Summary of Global Standards & Approvals .................................................................... 7  
   Mutual Recognition Standards ....................................................................................... 10  
   The International Accreditation Forum .......................................................................... 10  
   GCC Conformity Mark .................................................................................................... 10
1. Introduction
The Radio Spectrum

The Electromagnetic Spectrum is the range of frequencies from less than one Hertz (ELF produced by lightning and natural disturbances in the Earth’s magnetic field), up through super low (SLF) and ultra low (ULF) frequencies to radio & microwaves, and then through the visible spectrum to ionizing radiation (x-rays and gamma rays) above 3 PHz (Petahertz – 1 petahertz = 1,000,000 GHz)

Electromagnetic Spectrum

<table>
<thead>
<tr>
<th>Frequency</th>
<th>ELF</th>
<th>SLF</th>
<th>ULF</th>
<th>VLF</th>
<th>LF</th>
<th>MF</th>
<th>HF</th>
<th>VHF</th>
<th>UHF</th>
<th>SHF</th>
<th>EHF</th>
<th>EIR</th>
<th>MIR</th>
<th>NIR</th>
<th>NUV</th>
<th>EUV</th>
<th>SX</th>
<th>HX</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hz</td>
<td>3</td>
<td>30</td>
<td>300</td>
<td>3</td>
<td>30</td>
<td>300</td>
<td>3</td>
<td>30</td>
<td>300</td>
<td>3</td>
<td>300</td>
<td>3</td>
<td>300</td>
<td>3</td>
<td>300</td>
<td>3</td>
<td>300</td>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>KHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Radio Spectrum

The radio spectrum is the part of the electromagnetic spectrum from 3 Hz to 3000 GHz (3 THz). Different parts of the radio spectrum are allocated by the ITU (International Telecommunication Union - a specialized agency of the United Nations (UN) that is responsible for issues that concern information and communication technologies) for different radio transmission technologies and applications; some 40 radio communication services are defined in the ITU's Radio Regulations (RR).

In the UK, the United Kingdom Frequency Allocation Table (UKFAT) details the uses (referred to as ‘allocations’) to which various frequency bands are put to the UK. It also shows the internationally agreed spectrum allocations of the ITU. The ITU divided the world into three regions. The United Kingdom is within Region 1 which includes Europe, Scandinavia and Africa.

<table>
<thead>
<tr>
<th>BAND</th>
<th>ITU BAND</th>
<th>Frequency Range</th>
<th>Example Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELF</td>
<td>1</td>
<td>3-30Hz</td>
<td>Communication with submarines</td>
</tr>
<tr>
<td>SLF</td>
<td>2</td>
<td>30-300Hz</td>
<td>Communication with submarines</td>
</tr>
<tr>
<td>ULF</td>
<td>3</td>
<td>300Hz–3kHz</td>
<td>Communication with submarines and within mines</td>
</tr>
<tr>
<td>VLF</td>
<td>4</td>
<td>3-30kHz</td>
<td>Navigation, time signals, submarine communication, wireless heart rate monitors, geophysics</td>
</tr>
<tr>
<td>LF</td>
<td>5</td>
<td>30-300kHz</td>
<td>Navigation, time signals, AM longwave broadcasting (Europe and parts of Asia), RFID, amateur radio</td>
</tr>
<tr>
<td>MF</td>
<td>6</td>
<td>300kHz-3MHz</td>
<td>AM (medium-wave) broadcasts, amateur radio, avalanche beacons</td>
</tr>
<tr>
<td>HF</td>
<td>7</td>
<td>3-30MHz</td>
<td>Shortwave broadcasting, citizens band radio, amateur radio and over-the-horizon aviation communications, modern radars, communications satellites, cable and satellite television, broadcast services, television, CB radio, CB radio, radio relay, VHF, UHF, SHF, EHF, and THF, various frequency bands are put to the UK.</td>
</tr>
</tbody>
</table>
Radio Equipment


This includes mobile (GSM or CDMA) handsets, wireless LAN (WLAN) equipment such as Wi-Fi devices, Bluetooth devices, Zigbee devices, WiMAX devices, RFID equipment, contactless card readers, and a whole host of other products that incorporate some kind of RF transmitter.

There are exceptions relating radio kits and equipment used by radio amateurs, as well as certain marine equipment and airborne products.

Straightpoint Wireless Products

Straightpoint wireless products currently incorporate 2.4 GHz direct sequence spread spectrum (DSSS) radio technology (IEEE 802.15.4) which offers high integrity, error free communications that can co-exist with other wireless technologies such as Wi-Fi, Bluetooth® and Zigbee®.

IEEE 802.15.4 is a technical standard which defines the operation of low-rate wireless personal area networks (LR-WPANs). It specifies the physical layer and media access control for LR-WPANs, and is maintained by the IEEE 802.15 working group, which defined the standard in 2003. It is the basis for the ZigBee, ISA100.11a, WirelessHART, MiWi, SNAP, and Thread specifications, each of which further extends the standard by developing the upper layers which are not defined in IEEE 802.15.4. Alternatively, it can be used with 6LoWPAN, the technology used to deliver the IPv6 version of the Internet Protocol (IP) over WPANs, to define the upper layers.

Radiolink Plus
Wireless Loadshackle
Wireless Compression Load Cell
Wireless Low Headroom Load Cell
StageSafe
Towcell
Wireless Linear Transducer
Wireless Transmitter SA700C
Running Line Tensiometer TIMH
2. Global Radio Equipment Standards

General

Dependent upon equipment specifications, i.e. operating voltage, frequency and transmission power, there may be differing global requirements for Straightpoint products to meet standards regarding:

- Low voltage safety;
- Electromagnetic Compatibility (EMC) – emission of unwanted electromagnetic pollution (interference) and immunity to interference;
- Radio wave emissions and susceptibility;
- Other safety requirements.

Requirements vary globally dependent upon country/region and the level of mutual recognition of Standards and the competence of national Certification Bodies.

For the European Union, currently including the UK, Straightpoint wireless products cannot be placed on the market in any EU member state without compliance the requirements of:

The EU Low Voltage Directive (LVD) 2014/35/EU
The LVD covers all health and safety risks of electrical equipment operating with a voltage between 50 and 1000 V for alternating current and between 75 and 1500 V for direct current. These voltage ratings refer to the voltage of the electrical input or output, not to voltages that may appear inside the equipment.

The EU Electromagnetic Directive (EMC) 2014/30/EU
The EMC Directive ensures that electrical and electronic equipment does not generate, or is not affected by, electromagnetic disturbance.

The Directive limits electromagnetic emissions from equipment in order to ensure that, when used as intended, such equipment does not disturb radio and telecommunication, as well as other equipment. The Directive also governs the immunity of such equipment to interference and seeks to ensure that this equipment is not disturbed by radio emissions, when used as intended.

Most communications apparatus is excluded from the scope of the EMC Directive, either wholly or in part, but instead comes under the scope of the Radio Equipment Directive.

The EU Radio Equipment Directive (RED) 2014/53/EU
The RED replaced the previous R&TTE Directive (1999/5/EC) fully from the 13th of June 2017. The Directive requires equipment to be constructed for efficient use of the radio spectrum, as well as electromagnetic compatibility, to avoid interference with terrestrial and orbital communications.

Equipment that might have fallen outside the scope of the Low Voltage Directive because their operational voltage is less than 50 VAC or 75 VDC, now have to comply with the requirements of the Low Voltage Directive if they fall under scope of the Radio Equipment Directive.

Compliance with the EU Directives has to be demonstrated by EU Certificates of Conformity under the CE Marking Scheme.

In North America, requirements and Standards are regulated by the Federal Communications Commission (FCC). Electrical equipment marketed in the USA requires authorization. There are three main levels of evidence required according to the risk of interference that the type of equipment possesses. For Straightpoint products, Certificates of Conformity to FCC requirements are applicable to verify compliance with Part 15 of the FCC Rules regarding radio equipment.

Straightpoint wireless products use are currently approved to EU CE and FCC requirements as outlined above, as well as to Canadian ISED and Japanese SRE approvals. Radio approvals are currently adopted from the approvals of the third party RF modules and circuitry employed within the products.

At the time of publication of this document, there are a number of global regions and countries that require different approvals to differing standards before electronic products emitting radio waves are allowed to be imported. These Standards and approvals are summarised in the table on the following page. This is based upon best available information at the time of publication and may change due to the increasing mutual recognition arrangements and changes to national arrangements for product approvals.
### Summary of Global Standards & Approvals

<table>
<thead>
<tr>
<th>Region/Country</th>
<th>Standard(s)</th>
<th>Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (EU): Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.</td>
<td>The EU Radio Equipment Directive (RED) 2014/53/EU; The EU Electromagnetic Directive (EMC) 2014/30/EU; The EU Low Voltage Directive (LVD) 2014/35/EU; Restriction of Hazardous Substances Directive (RoHS) 2011/65/EU; Based upon applicable harmonised Standards</td>
<td>CE Type Approval</td>
</tr>
<tr>
<td>European Free Trade Association (EFTA): Iceland, Liechtenstein, Norway.</td>
<td>As for European Union</td>
<td>CE Type Approval</td>
</tr>
<tr>
<td>Turkey</td>
<td>As for European Union, subject to further clarification and confirmation – radio may need in country approval by ICTA (Information &amp; Communications Technologies Authority).</td>
<td>CE Type Approval for EMC and LVD. ICTA approval for radio</td>
</tr>
<tr>
<td>Canada</td>
<td>Canadian Radio Standards Specifications (RSS)</td>
<td>ISED (Innovation, Science &amp; Economic Development) Approval</td>
</tr>
<tr>
<td>Australia</td>
<td>ACMA AS/NZS Standards relating to RF equipment and EMC</td>
<td>RCM Approval</td>
</tr>
<tr>
<td>New Zealand</td>
<td>ACMA AS/NZS Standards relating to RF equipment and EMC</td>
<td>RCM Approval</td>
</tr>
<tr>
<td>China</td>
<td>Guobiao (GB) Standards relating to RF equipment and EMC</td>
<td>CCC Approval by CNCA</td>
</tr>
<tr>
<td>Japan</td>
<td>Japanese Radio Law (JRF) and Japanese Business Law (JPA)</td>
<td>SRE (Specialised Radio Equipment) Approval</td>
</tr>
<tr>
<td>Singapore</td>
<td>FCC and RED Standards</td>
<td>IDA Approval Infocom Development Authority of Singapore</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>HKCA (Hong Kong specifications)</td>
<td>Approval by OFTA (Office of the Telecommunications Authority of Hong Kong) accredited Body to HKCA specifications. Or foreign CBs designated by EU or FCC</td>
</tr>
<tr>
<td>India</td>
<td>Indian BIS Standards – identical to IEC Standards. (Bureau of Indian Standards). Local Representative required</td>
<td>Approval by the Wireless Planning and Coordination (WPC) wing of the Ministry of Communications of the government of India</td>
</tr>
<tr>
<td>Russia, Belarus and Kazakhstan</td>
<td>Federal Law - TR Regulations</td>
<td>RFC Statement (Radio Frequency Compliance) EAC Approval (Eurasian Customs Union)</td>
</tr>
<tr>
<td>Brazil</td>
<td>Brazilian Resolutions based on the international CISPR 22 and CISPR 24 standards, with EMC requirements similar to the CE Mark in the EU.</td>
<td>Inmetro/Anatel Approval.</td>
</tr>
<tr>
<td>Region/Country</td>
<td>Standard(s)</td>
<td>Approval</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| Mexico | No EMC requirements  
IEC EMI/EMC Standards.  
Accepts FCC grants and test reports or EU RED Directive reports and CE CoCs | IFT Approval |
| Korea | Korean EMI and EMC KN Standards | KC(RF+EMC) Approval by CBs approved by the KSA (Korean Standards Association) |
| South Africa | IEC EMI/EMC Standards.  
Accepts FCC grants and test reports or EU RED Directive reports and CE CoCs  
Need local representative | Approval by SABS (South African Bureau of Standards) or ICASA (Independent Communications Authority of South Africa) |
No EMC requirement  
Accept EU CoCs | SONCAP/NCC Approval by an IAF  
(Standards Organisation of Nigeria Conformity Assessment Program)  
(International Accreditation Forum –see separate section) |
| Democratic Republic of the Congo: | Accepts FCC grants and test reports or EU RED Directive reports and CE CoCs | CPTA Approval  
(Congolese Post and Telecommunications Agency) |
| Kenya | No EMC requirement  
Accepts EU RED Directive reports for radio | CCK Approval  
(Communications Commission of Kenya) |
| Cameroon | No EMC requirements  
Need local representative | MPT in country approval for radio  
(Ministry of Post & Telecommunications) |
| Burkina Faso | No EMC Requirements | METC in country approval for radio  
(Ministere de L'Equipment, des Trabsorts et des communications) |
| Botswana | Uncertain | BOCRA Type Approval  
(Botswana Communications Regulatory Authority) |
| Egypt | Has compliance requirements for EMC, health and safety, wireless, and telecom. Accepts EU RED Directive reports and CE CoCs | NTRA Approval  
(National Telecommunication Regulatory Authority) |
| Ethiopia | Accepts FCC grants and test reports or EU RED Directive reports and CE CoCs | CoF by CB approved by Ethiopia Ministry of Trade |
| Israel | IEC Standards  
MOE (Ministry of Economy) Rules  
SII (Standards Institute of Israel) Standards  
EU EMC CoCs may be accepted. | SII Approval |
| Saudi Arabia | IEC Standards  
Accepts FCC grants and test reports or EU RED Directive reports and CE CoCs. | CITC Approval  
(Communications and Information Technology Commission)  
SASO Approval |
<table>
<thead>
<tr>
<th>Region/Country</th>
<th>Standard(s)</th>
<th>Approval</th>
</tr>
</thead>
</table>
| United Arab Emirates (UAE) | IEC Standards  
Accepts FCC grants and test reports or EU RED Directive reports and CE CoCs. | TRA Approval  
(Telecommunications Regulatory Authority) |
| Algeria                | Algerian IANOR Standards  
(Institut Algérien de Normalisation) | ARPT Approval  
(Algeria Regulation Authority of Post & Telecommunications) |
| Iraq                   | Accepts EU RED Directive reports and CE CoCs.                                | CMC Approval  
(Communications & Media Commission)             |
| Lebanon                | IEC Standards  
Accepts EU RED Directive reports and CE CoCs. | TRA Approval  
(Telecommunications Regulatory Authority) |
| Jordan                 | IEC Standards  
Accepts EU RED Directive reports and CE CoCs. | TRC Approval  
(Telecommunications Regulatory Commission) |
| Kuwait                  | IEC Standards  
Accepts EU RED Directive reports and CE CoCs. | MOC Approval through CITRA  
(Ministry of Communications) |
| Bahrain                | IEC Standards  
Accepts EU RED Directive reports and CE CoCs. | TRA Approval  
(Telecommunications Regulatory Authority) |
| Qatar                  | IEC Standards  
Accepts EU RED Directive reports and CE CoCs. | ICT Approval  
(Ministry of Information & Communications Technology) |
| Yemen                  | IEC Standards  
Accepts EU RED Directive reports and CE CoCs. | MTIT Approval  
(Ministry of Telecommunications & Information Technology) |
| Oman                   | IEC Standards  
Accepts EU RED Directive reports and CE CoCs. | TRA Approval  
(Telecommunications Regulatory Authority) |

**NOTE:**
Where countries and their regulators are indicated as accepting FCC grants/test reports and or CE Reports/CofCs, this does not necessarily mean that there is no additional approval process or testing of samples. Therefore, there may be time and cost implications in order to gain the necessary approvals and import qualifications.

It is recommended that further investigation is carried out prior to marketing/exporting to specific countries in order to clarify the most up to date requirements.
Mutual Recognition Agreements

A mutual recognition agreement (MRA) is an international agreement by which two or more countries agree to recognize one another's conformity assessments. A mutual recognition arrangement is an international arrangement based on such an agreement.

The purpose of the MRA is to expedite the trade of telecommunications equipment. Most countries used to, and some still do, required imported or locally produced electronic radio equipment to be tested and certified within their own territories. With the globalization of trade in this type of equipment, exporters consider it redundant to conduct conformity assessment in the importing country since these assessments have already been done in the exporting country as part of the testing and production processes. The WTO considers the requirement for conformity assessment in both the importing and exporting country to be a technical barrier to trade.

MRAs address this problem by enabling the participating countries to mutually recognize the competence of each other's testing laboratories and certification bodies and subsequently, mutually accept the conformity assessment results (test reports and certification). This expedites the approval process and results in faster times to market and savings to the manufacturer in regulatory compliance costs.

Mutual recognition agreements lay down the conditions under which one Party (non-member country) will accept conformity assessment results (e.g. testing or certification) performed by the other's Party (the EU) designated conformity assessment bodies (CABs) to show compliance with the first Party's (non-member country) requirements and vice versa. This allows EU CABs to become CBs for other country schemes.

MRAs include relevant lists of designated laboratories, inspection bodies and conformity assessment bodies in both the EU and the rest of the world. There are MRAs in place with Australia, Canada, Japan, New Zealand, North America, and Israel.

The International Accreditation Forum (IAF)

The International Accreditation Forum (IAF) is the world association of Conformity Assessment Accreditation Bodies. Its main function is to develop a world-wide program of conformity assessment which will promote the elimination of non-tariff barriers to trade. IAF membership includes accreditation bodies from all parts of the world, industry representatives and accredited certification bodies.

IAF’s objectives include facilitating trade and commerce, in accordance with World Trade Organisation policies, by establishing a Multilateral Mutual Recognition Arrangement (MLA) based on the equivalence of accreditation programmes operated by accreditation body members, verified through peer review among those accreditation body members.

UKAS is a signatory to the following main scopes:
- Management system certification - ISO/IEC 17021
- Product certification - ISO/IEC 17065 - 09 Oct 2004
- Certification of Persons - ISO/IEC 17024

GCC Conformity Mark (G-Mark)

G Mark is now a requirement for a number of low voltage electrical products and children’s toys being exported to Gulf Standardization Organization (GSO) member countries as defined within the Low Voltage Technical Regulation, BD142004-01.

The G-Mark is a specific marking of the GCC countries which is affixed on the product to indicate that the product is in conformity with the requirements set out in the applicable Gulf Technical Regulations.

The countries, currently part of the scheme, include:
- Kuwait
- Bahrain
- Oman
- Qatar
- Saudi Arabia (KSA)
- Yemen
- United Arab Emirates (UAE).

G-marking includes requirements for EMC but these maybe overridden by radio requirements. Further investigation is recommended regarding Straightpoint products for export to these areas.