



UGANDA
COMMUNICATIONS
COMMISSION

Guidelines for the use of Short Range Devices in Uganda

1. Introduction

These guidelines outline the operational requirement for Short range devices to which harmonized spectrum has been allocated and is aligned to the regional and international agreements to which Uganda was party.

A Short Range Device (SRD) is a radio device that offers a low risk of interference with other radio services, mainly because they are designed to operate at low transmit power, usually less than a watt and over short range/distance, mostly limited well below 1 kilometer. SRDs may be used in a large variety of applications where low power transmission of data is needed over short distances. Data rates can vary considerably, ranging from rates in the region of 100 bits per second (bps) to as high as 1 Giga bits per second (Gbps) and more. These levels of functionality are ideal for many applications where short ranges are needed along with proprietary radio technology.

The SRDs mainly operate in frequency bands already allocated to other services and are not expected to interfere or claim protection from interference from these already existing services in those bands. The SRDs may be fixed, mobile or portable stations that come with a radio frequency output connector and dedicated or integral antenna. These devices are intended for communication in confined areas like buildings as well as for localized onsite operations. Much as SRD play an important role in our daily lives, if they are misused, they could cause harmful interference to other primary services.

Such devices are permitted to operate on secondary basis on non-interference and non-protected basis subject to operational regulations and relevant technical standards. Therefore, only duly authorised equipment, operating in the specifically defined frequency bands for a specified range shall be used for such applications.

There are many applications for which short-range devices are used. Areas of applications include the following:

- Garage door and gate controls
- Alarms and movement/motion detectors
- Industrial control
- Industrial monitoring
- Anti-theft devices
- Wireless microphones
- Model remote controls
- Low-power radio installations
- Medical implants
- Low rate data transmission

- Radio Frequency Identification (RFID)
- High rate data transmissions over WigiG (broadband)
- Futuristic deployment in the Internet of things (IoT) arena
- Satellite Machine to Machine (M2M), telemetry and telecommand operations.
- Inductive applications.
- Wireless audio applications

Uganda Communications Commission (UCC), through its spectrum policy guidelines, has a provision to allow for the use of short-range devices in Uganda on a non-harmful interference basis (this is bound to be revised in accordance to industrial trends).

These guidelines define the minimum technical considerations, parameters and regulatory considerations that will govern the operation of short-range devices in the allocated frequency bands in accordance with the Uganda Table of Frequency Allocation.

2. Operation, requirements, Considerations and Parameters.

2.1 General requirements

- i. SRDs operate on unprotected basis subject to not causing interference to other authorized radio communication services.
- ii. Short-range device vendors shall be required to be registered and in possession of relevant trading documents.
- iii. All SRD devices shall have to be type approved and registered with the Commission.
- iv. SRDs are required to operate in the designated spectrum segment on a shared basis and are subject to the same conditions of operation within the band.
- v. The device shall not be constructed with any external or readily accessible control, which permits the adjustments of its operation parameters in a manner that is inconsistent with guidelines.

2.2 Marking/labelling requirement.

The equipment shall be marked with the following information;

- i. Supplier/manufacturer's name or identification mark;
- ii. The equipment's trade name, model name and serial number;
- iii. Other markings such as type approval and compliance label for equipment as required by the relevant standards. The markings shall be

legible, indelible and readily visible. All information on the marking shall be in English Language.

2.3 Technical Requirements

2.3.1 General Requirements

- i. In order to ensure co-existence with other services in the authorized bands, SRDs shall comply with the maximum Effective Isotropic Radiated Power (EIRP) and Transmitter & Receiver Spurious Emissions prescribed, refer to the tables specifying power limits below.
- ii. The authorized EIRP powers are expected to self-limit the transmission coverage of SRDs, and where necessary, will be reviewed to ensure that SRDs operate as expected.
- iii. The bandwidth of SRDs operating in frequency ranges between 70 MHz and 900 MHz should not be wider than 0.25% of the fundamental frequency.
- iv. For operating frequencies higher than 900 MHz, the occupied bandwidth should not exceed 0.5% of the fundamental frequency.
- v. SRD may be AC powered or DC powered. For AC powered equipment, the technical requirements shall be complied with when operating from an AC mains supply of voltage, 240+/-10% and frequency 50Hz+/-2%.
- vi. SRD operating with mains power supply shall comply with internationally accepted electrical safety standards (Ref: EN60950).
- vii. SRD shall comply with internationally accepted Electromagnetic Compatibility Requirements EMC standards such as but not limited to EN 301 489-1 and EN 301 489-3.

2.3.2 Spectrum Allocations

The frequency bands designated for short range devices are indicated in the Annex of this guideline. However, it should be noted that short-range radio-communication devices may generally not be permitted to use bands allocated to the following services namely, passive services and those ensuring safety of life, search and rescue operations. Such services may include, according to relevant RR provisions:

- Radio astronomy;
- Aeronautical mobile;
- Safety of life services including radio navigation;

2.3.3 Emission masks for the Short-Range Devices

Short-range devices shall conform to the spurious domain emission limits given in RR Appendix 3. Specifically, Table II of RR Appendix 3 lists the attenuation values used to calculate maximum permitted spurious domain emission power levels for use with radio equipment. For example, low power radio device

equipment intended for short-range communication or control purposes and operating at output power less than 100 mW, must meet an attenuation level of $56 + 10 \log(P)$, or 40 dBc, whichever is less stringent.

2.3.4 Antenna requirements

All SRD to be operated in Uganda shall conform to the below requirements. They shall either be;

- Integral (no external antenna socket),
- dedicated (type approved with the equipment)
- Or external (equipment type approved with specific external antenna antenna).

The UCC shall only allow (type approve) short-range radiocommunication transmitters that are designed in such way that no other type of antenna can be used other than one which has been designed and type approved by the manufacturer to show conformity with the appropriate emission level. This would help in preventing the interference problems to the authorized radiocommunication services.

2.3.5 Interference Mitigation

The SRDs shall not cause interferences to other radio communications services. Upon notification by the UCC, the SRDs suspected of causing interference shall cease all transmissions until the interference is eliminated. SRDs users are required to comply with this guideline and shall take reasonable measures to ensure that no interference is caused to other users within or outside the designated band for use by SRDs.

The SRDs shall not be accorded any protection from interferences by other authorized radio communications services and the UCC shall not be obligated to investigate complaints of interferences logged by SRD operations apart from those designated otherwise.

Should the use of a particular Short Range Device cause harmful interference to other licensed services within and outside their operational band or should the use of a given SRD be a threat to human life and property, the Commission by law, Communications Act 2013 law Sec 6(2)(3) reserves the right to:

1. Confiscate the gadgets in stock
2. Cancel the Dealers' Authorization
3. Blacklist a given product on market

3. Regulatory Considerations

3.1 Authorization

The approval and use of the SRDs shall be subject to the following terms and conditions:

1. All SRD radio apparatus like other radio apparatus must be type-approved by the Commission.
2. The use of SRDs shall be license free without operational or frequency fees payable, on condition that the devices are type approved. However, specific authorization should be sought for SRDs operating in the frequency bands marked ¹ specified in the table i) below.
3. The Commission shall generate and publish a database for all type approved SRDs.
4. The frequencies, transmitting power and external high-gain antenna of these SRD devices must not be altered without a new type approval certificate being issued.
5. The SRD devices must be operated within and must not exceed the technical parameters set out with respect to the frequency band, maximum radiated power or field strength limits and channel spacing, relevant standard and duty cycles and antennas to be used.
6. The antenna of the SRD device must not be higher above average ground level than the lowest point of the place where they operate effectively.
7. The SRD devices must not cause interference to any authorized network issued with a radio frequency spectrum license.
8. The use of SRD devices in the license-exempt frequency spectrum shall be on a non-interference and non-protective basis from interference.

The following information should be provided for SRD type approval application;

- a. Certificate of registration or Incorporation of a company
- b. Company trading License
- c. Complete specifications of the device including.
 - Manufacturing Country (Origin)
 - Manufacturing Company
 - Model /Batch No.
 - Operational Frequency Range
 - Maximum Radiated Power
 - Application details / Usability
- d. Copies of manufacturer's technical specifications of the SRD equipment.

- e. Dully paid type approval fees.
- f. Description and declaration of conformity of the measurement facilities where conformity tests were performed and relevant technical documentation in English language must accompany the application for certification. (**See type approval guidelines for details**)

When all the above requirements are satisfied, the particular device type will be issued a type approval certificate. For SRDs operating in the bands marked ¹, individual authorization with strict licensing conditions and location details shall be issued.

Note: SRD users and vendors are strictly required to comply with this guideline. Any violation of the guideline shall result in regulatory measures.

i) Frequency Bands and typical application type for SRDs in Uganda

Typical Application Type	Frequency Bands	Type of devices
RFID [for: Automotive, Livestock ID, Item Management, Data carrier tooling, manufacturing automation, ticketing, EAS, passports and ID]	9 – 150 KHz 150 – 5000KHz 6765 – 6795 KHz 7400 – 8800 KHz 13.553 – 13.567 MHz 2446 – 2454 MHz 865.0 – 867.6 MHz ¹ 923 – 925 MHz ¹	Inductive loop system
Radio detection alarm system	0.016 – 0.150 MHz 13.553 – 13.567 MHz 240.15 – 240.30 MHz 300 – 300.30 MHz 312.0 – 316.0 MHz 444.40 – 444.80 MHz	Inductive loop system Doppler shift movement detectors, wireless microphones, garage door openers, Vehicle alarm systems Public Mobile Radio (PMR) in the channels ranges (446-461.1MHz)
Wireless microphone and assistive listening devices	0.51 – 1.60 MHz 29.7 – 47.0 MHz 36.26 – 37.24 MHz 88.0 – 108.0 MHz ¹ 470 – 742 MHz ¹ 863 – 865 MHz ¹ 1785 – 1800 MHz ¹	Wireless microphones
Remote control of Garage doors, cameras toys and miscellaneous devices	26.957 – 27.283 MHz 40.665 – 40.695 MHz 72.13 – 72.21 MHz 312 – 315 MHz 433.050 – 434.790 MHz	Inductive loop systems Surface Model Control Wireless microphones
Remote Controls of aircraft and glider models, telemetry, detection and alarm systems	26.96 – 27.28 MHz 29.70 – 30.00MHz	Surface Model Control
Medical and Biological telemetry	40.5 – 41.0 MHz 216.0 – 217 MHz 454.0 – 454.5 MHz 464.5-464.5875MHZ	Medical and Biological Implants systems. Nonspecific SRDs (464.5375-464.5875)
Wireless modem, data communication system	72.08 – 72.6 MHz	Wideband Wireless Systems. WAS/RLANs
Short range radar systems such as automatic cruise control and collision warning systems for vehicles	76 – 77 GHz	RTTT short range radar
Radio Telemetry, Telecomand system	433.05 – 434.79	Non-specific SRD
Wireless video transmitter	2.4 – 2.4835 GHz 10.5 – 10.55 GHz 24 – 24.25 GHz	Wideband Wireless Systems. WAS/RLANs
Bluetooth	2.4 – 2.4835 GHz	Wideband Wireless Systems.

		WAS/RLANs
Wireless LAN	5.725 – 5.85 GHz 2.446 – 2.454 GHz	
Active Medical Implants and their peripherals	9 – 315 KHz 315 – 600 KHz 12.5 – 20 MHz 30 – 37.5 MHz 401 – 405 MHz	Medical Implants
Codeless Phones	1627.5 – 1796.5 KHz 43.71 – 44.49 MHz	Wideband Wireless Systems. WAS/RLANs
Hearing Aids	3155 – 3400 KHz 169.4 – 174.0	Inductive Loop systems
Tracking, Tracing and data acquisition	456.9 – 457.1 KHz 169.4 – 169.475 MHz	Doppler shift movement detectors systems.
Wide Band Data Transmission Systems	2.4 – 2.4835 GHz 5.150 – 5.350 GHz 17.1 – 17.3 GHz 57 – 66 GHz	Wireless Access Systems/Radio Local Access Network (WAS & RLAN) indoor use only.
Railway Applications	2.446 – 2.454 MHz 7.3 – 23 MHz	Inductive loop systems
Road Transport and Traffic Telematics (RTTT)	5795 – 5815 MHz 63 – 64 GHz 76 – 77 GHz	RTTT short range radar
Radio determination Applications (Equipment and Motion Sensors)	2400 – 2483.5 MHz 9200 – 9975 MHz 10.5 – 10.6 GHz 13.4 – 14.0 GHz 24.05 – 24.25 GHz	Radio frequency identification (RFID) Non-specific SRD
Alarms	169.4 – 169.6 MHz 869.250 – 869.7 MHz ¹	

¹ Special Authorization is required for SRDs operating in these bands

ii) Maximum Radiated Power Vs Frequency Bands for SRDs in Uganda

Maximum Radiated Power	Frequency Bands
-20dB ($\mu\text{A}/\text{m}$) at 10m	5 – 30 MHz
-15dB ($\mu\text{A}/\text{m}$) at 10m	148.5 KHz – 5 MHz
-8dB ($\mu\text{A}/\text{m}$) at 10m	7.3 – 23 MHz
-7dB ($\mu\text{A}/\text{m}$) at 10m	400 – 600 MHz
-5dB ($\mu\text{A}/\text{m}$) at 10m	148.5 – 1600 KHz ; 315 – 600 KHz
7dB ($\mu\text{A}/\text{m}$) at 10m	456.9 – 457.1 KHz ; 516 – 8515 KHz
9dB ($\mu\text{A}/\text{m}$) at 10m	984 – 7484 KHz
13.5dB ($\mu\text{A}/\text{m}$) at 10m	3155 – 3400 KHz
30dB ($\mu\text{A}/\text{m}$) at 10m	9 – 315 KHz
37.7dB ($\mu\text{A}/\text{m}$) at 10m	140 – 148.5 KHz
42dB ($\mu\text{A}/\text{m}$) at 10m	90 – 119 KHz ; 135 – 140 KHz ; 6765 – 6795 KHz ; 13.553 – 13.567 MHz 26.957 – 27.283 MHz
66dB ($\mu\text{A}/\text{m}$) at 10m	119 – 135 MHz
60dB ($\mu\text{A}/\text{m}$) at 10m	13.553 – 13.567 MHz (RFID and EAS only)
72dB ($\mu\text{A}/\text{m}$) at 10m	
50nW ¹	87.5 – 108 MHz
25 μW ¹	401 – 402 MHz ; 402 – 405 MHz; 405 – 406 MHz
0.1mW	24.075 – 24.150 GHz
1mW ¹	30 – 37.5 MHz 433.050 – 434.790 MHz
2mW ¹	173.965 – 174.015 MHz
5mW ¹	869.7 – 870.0 MHz
10mW ¹	26.957 – 27.283 MHz ; 29.7 – 47.0 MHz ; 138.2 – 138.45 MHz ; 169.4 – 174.0 MHz ; 433.050 – 434.79 MHz ; 863 – 865 MHz 868.2 – 869.4 MHz ; 2400 – 2483.5 MHz
20mW ¹	1785 – 1800 MHz
25mW ¹	863 – 870 MHz ; 2400 – 2483.5 MHz ; 5725 – 5875 MHz 9200 – 9975 MHz ; 13.4 – 14 GHz
50mW ¹	174 – 216 MHz ; 470 – 862 MHz ; 1785 – 1800 MHz
100mW ¹	26.99 – 27.2 MHz ; 34.995 – 35.225 MHz (for flying models only) ; 40.660 – 40.700 MHz ; 865.0 – 865.6 MHz ² 2400 – 2483.5 MHz (for RLANS only) ; 17.1 – 17.3 GHz ; 24.050 – 24.250 GHz ; 61.0 – 61.5 GHz ; 122 – 123 GHz ; 244 – 246 GHz
200mW ¹	5150 – 5350 MHz (for indoor use only)

316mW ¹	57 – 66 GHz (Fixed outdoor installation devices are not allowed. The maximum mean eirp density is limited to -2dBm / MHz)
400mW ¹	
500mW ¹	169.4 MHz – 167.475 MHz ; 867.8 – 868.0 MHz ² ; 869.4 – 869.65 MHz 2446 – 2454 MHz (railway applications and RFID outdoor use) ; 10.5 – 10.6 GHz
1W ¹	5470 – 5725 MHz
2W ¹	865.6 – 867.6 MHz ² ; 5795 – 5815 MHz (for specific Licenses applications only)
4W ¹	2446 – 2454 MHz (for RFID indoor use only)
8W ¹	5795 – 5815 MHz (For specific licenses applications only)
4W ¹	2446 – 2454 MHz (For RFID indoor use only)
10W ¹	57 – 66 GHz (Restricted to indoor use. The max mean eirp density is limited to 13dBm / MHz)
24 dBm eirp ; 30 dBm eirp ; 43 dBm eirp ; 43 dBm eirp ; 43 dBm eirp	4.5 – 7.0 GHz ; 8.5 – 10.6 GHz ; 24.05 – 27.0 GHz 57.0 – 64.0 GHz ; 75.0 – 85.0 GHz (All the above bands are designated for use by tank level probing radar)
55dBm peak power ¹ 50 dBm average power ¹ 23.5 dBm average power ¹ (pulsed radar only)	76 – 77GHz

¹ The indicated power is e.r.p for band below 1 GHz and e.i.r.p for bands above 1 GHz