

UNITED REPUBLIC OF TANZANIA  
TANZANIA COMMUNICATIONS REGULATORY AUTHORITY  
ISO 9001: 2015 CERTIFIED



## **MINIMUM TECHNICAL SPECIFICATIONS**

**FOR**

## **LAND MOBILE RADIO EQUIPMENT**

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## Table of Contents

PART 1: Introduction .....	3
PART 2: Scope and Purpose.....	3
PART 3: Terms and Definitions .....	4
PART 4: References.....	4
PART 5: General Requirements and Technical Specifications.....	6
PART 6: Technical Requirements .....	6
PART 7: Testing and Certification Requirements .....	6
PART 8: Document Administration .....	6
8.1 Amendment.....	6
8.3 Compliance .....	7
8.4 Publication.....	7

## **PART 1: Introduction**

Tanzania Communications Regulatory Authority (TCRA), established under the Tanzania Communications Regulatory Authority Act No.12 of 2003, is mandated among other duties, to license communications and broadcasting operators and type approve communication equipment for use in the United Republic of Tanzania

Pursuant to Regulation 4 of the Electronic and Postal Communications (Electronic Communications Equipment Standards and E-Waste Management) Regulations, 2020 the Authority is mandated to formulate technical standards for all the regulated services.

The Authority therefore wishes to notify all manufactures and importers of land mobile radio equipment, and the public the minimum technical requirements and specifications for land mobile radio equipment. Technical Specifications are guidelines for equipment manufacturers and/or suppliers who wish to sell land mobile radio equipment in Tanzania.

The specifications are predominantly from the European Telecommunications Standards Institute (ETSI) standards and the International Telecommunication Union (ITU) Recommendations.

## **PART 2: Scope and Purpose**

This specification defines the minimum technical requirements for radio equipment to be used in Land Mobile Radio (LMR) services. LMR equipment shall operate in one of the authorised frequency bands or frequencies, and transmit within the corresponding output power levels given in Table 1.

Land Mobile Radio (LMR) service is a push-to-talk two-way communication between radio transceivers (audio transmitter and receiver in one unit) which can be fixed (base station units), mobile (installed in vehicles), or portable (handheld walkie-talkies) stations that come with an external antenna or an integral antenna.

The applications of LMR may include speech and/or data communication, and may be using digital radio technologies such as the Integrated Digital Enhanced Network (iDEN), Terrestrial Trunked Radio (TETRA), Digital Mobile Radio (DMR) or NXDN technology

### PART 3: Terms and Definitions

For the purpose of this Technical Specification, the following abbreviation applies:-

#### Abbreviations

DMR	Digital Mobile Radio
ERM	Electromagnetic compatibility and Radio spectrum
ERP	Effective Radiated power
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
iDEN	Integrated Digital Enhanced Network
ICNIRP	International Commission on Non-Ionising Radiation Protection
ITU	International Telecommunication Union
LMR	Land Mobile Radio
NXDN	Next Generation Digital Narrowband
RF	Radio Frequency
TCRA	Tanzania Communications Regulatory Authority
TETRA	Terrestrial Trunked Radio

### PART 4: References

<b>ETSI EN 300 086-1</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment with an internal or external RF connector intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement
<b>ETSI EN 300 296-1</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement
<b>ETSI EN 300 113-1</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: Technical characteristics and methods of measurement
<b>ETSI EN 301 166-1</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment for analogue and/or digital communication (speech and/or data) and operating

	on narrow band channels and having an antenna connector; Part 1: Technical characteristics and methods of measurement
<b>ETSI EN 300 390-1</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment intended for the transmission of data (and/or speech) and using an integral antenna; Part 1: Technical characteristics and methods of measurement
<b>ETSI EN 300 394-1</b>	Terrestrial Trunked Radio (TETRA); Conformance Testing Specification; Part 1: Radio
<b>ETSI EN 300 396-2</b>	Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 2: Radio aspect
<b>ETSI EN 300 396-2</b>	Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)
<b>ETSI EN 303 035-1</b>	Terrestrial Trunked Radio (TETRA); Harmonised EN for TETRA equipment covering essential requirements under article 3.2 of the R&TTE Directive; Part 1: Voice plus Data (V+D)
<b>ETSI EN 303 035-2</b>	Terrestrial Trunked Radio (TETRA); Harmonised EN for TETRA equipment covering essential requirements under article 3.2 of the R&TTE Directive; Part 2: Direct Mode Operation (DMO)
<b>ETSI TS 102 361-1</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Digital Mobile Radio (DMR) Systems; Part 1: DMR Air Interface (AI) protocol
<b>ETSI TS 102 361-2</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Digital Mobile Radio (DMR) Systems; Part 2: DMR voice and generic services and facilities.
<b>ETSI TS 102 361-3</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Digital Mobile Radio (DMR) Systems; Part 3: DMR data protocol
<b>ETSI TS 102 361-4</b>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Digital Mobile Radio (DMR) Systems; Part 4: DMR trunking protocol

## **PART 5: General Requirements and Technical Specifications**

### **Design of LMR Equipment**

This specification shall apply to all producers, manufacturers, importers and retailers who wish to sell land mobile radios in the United Republic of Tanzania. It shall be used to assess the eligibility of LMR devices to be used in country.

The document details the requirements for a base station (fixed unit), mobile station (installed in vehicles) and portable (handheld walkie-talkie) devices.

LMR device shall be marked with the supplier/manufacturer's name or identification mark, and the supplier/manufacturer's model or type reference. The markings shall be legible, indelible and readily visible.

### **Safety and Health**

The LMR equipment shall comply with the International Commission on Non-Ionising Radiation Protection (ICNIRP) guidelines for limiting exposure to time-varying EMFs in the frequency range up to 300 GHz. It should be noted that compliance with any radiation safety standard does not by itself confer immunity from legal obligations and requirements imposed by national health or safety authorities.

## **PART 6: Technical Requirements**

The LMR equipment shall conform to the RF output power and spurious emissions given in Table 1 and shall operate in its intended frequency band or frequencies.

## **PART 7: Testing and Certification Requirements**

LMR equipment shall comply with this minimum technical specification and other national and international standards accepted and adopted in the country. The equipment shall be certified with the type approval certificate from TCRA prior to importation into the United Republic of Tanzania.

## **PART 8: Document Administration**

### **8.1 Amendment**

TCRA may from time-to-time, review, and update or modify this document to ensure its continued service and to meet the international and/or national performance requirements as necessary.

### **8.3 Compliance**

Appropriate provisions of the TCRA Act, 2003, the Electronic and Postal Communications Act, 2010 and the Electronic and Postal Communications (Electronic Communications Equipment Standards and E-Waste Management) Regulations, 2020, shall be used for compliance of this document and effective from the date it has been published.

### **8.4 Publication**

This document shall be published on the TCRA website <https://www.tcra.go.tz> for public information, compliance and reference purposes.

**Table 1: Technical Requirements for Radio Equipment to be used in Land Mobile Radio Services**

S/N	Operating Frequencies	Channel Spacing	Max RF Power Output	Spurious Emissions	Reference	Applications
1	80MHz 150MHz	12.5KHz	Base/Mobile: 25 W ERP Portable: 5 W ERP	< 2.0 nW	ETSI EN 300 086-1 ETSI EN 300 296-1	Base, mobile or portable equipment for analogue speech
2	Mobile Tx: 415 – 417 MHz Base Tx: 425 – 427 MHz	12.5 kHz/ 25 kHz	Base: 25 W ERP Mobile: 25 W ERP Portable: 5 W ERP	< 2.0 nW	ETSI EN 300 113-1 ETSI EN 300 390-1	Base, mobile or portable equipment for data
3	477.00 – 477.25 MHz	12.5kHz	500 mW ERP	< 2.0 nW	ETSI EN 300 296-1	Multi-channel portable radio equipment for analogue speech (localised use)
4	446.00 – 446.10 MHz	12.5kHz	500 mW ERP	< 2.0 nW	ETSI EN 300 296-1	Portable radio equipment for analogue speech (localised use)
5	380 – 400 MHz	25 kHz	25 W ERP	-36 dBm in 100 kHz bandwidth in Frequency range 9 kHz to 1 GHz -30 dBm in 1MHz bandwidth in frequency range 1 to 4 GHz	ETSI EN 300 394-1 ETSI EN 300 396-2 ETSI EN 300 392-2 ETSI EN 303 035-1 ETSI EN 303 035-2	Base and mobile stations for digital radio mobile system such as TETRA trunked mobile radio
6	136 – 174 MHz 400 – 410 MHz 430 – 450 MHz	6.25 kHz or equivalent/ 12.5 kHz	Base/Mobile: 25 W ERP Portable: 5 W ERP	< 2.0 nW	ETSI EN 300 113-1 ETSI EN 301-166-1 ETSI EN 300 390-1	Base, mobile and portable equipment for digital conventional or trunked mobile radio system such as DMR, NXDN or equivalent