

CST Technical Specification

Specification for Low Power Wide Area Networks (LPWAN) Equipment operating in License-Exempt Frequency Bands

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This technical specification is issued by The Communications, Space and Technology Commission in the Kingdom of Saudi Arabia in accordance with the provisions of the Communications and Information Technology Act issued by Royal Decree No. (M/106) dated 02/11/1443 AH and its bylaw, and the Commission's regulation.

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Document History Table

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1- Scope

- 1-1 This specification applies to low power wide area networks (LPWAN) operating in License-Exempt Frequency Bands.

- 1-2 This document applies to any type of License-exempt LPWAN devices using license-exempt frequency bands, including all kinds of terminal nodes and network gateways/ stations.

2- Enforcement

- 2-1 This specification shall enter into force on from issue date.
- 2-2 Any previous version of this technical specification is withdrawn.

3- General Requirements

- 3-1 All equipment must comply with the requirement of CST specification GEN001, be safe and must not adversely affect other electrical equipment.
- 3-2 All telecommunications and radio terminal equipment must comply with the relevant technical specifications established by CST. In addition, such equipment may be subject to regulations for Declaration of Conformity or registration. Please visit CST website for details.
- 3-3 If more than one interface type is offered by a piece of equipment, each interface must meet the applicable technical specifications.
- 3-4 Further information on the characteristics and presentation of network interfaces can be obtained by coordinating with the mobile network operators.
- 3-5 It is mandatory that test reports are obtained from a laboratory that has been accredited by a body that is a member of the ILAC Mutual Recognition Arrangement.

4- Limits and conditions

Testing should be carried out to ensure compliance with the listed specifications.

Frequency band	Max Output Power or Magnetic Field	Usage	Standard	Comments
863 – 870 MHz	25 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	
865 – 868 MHz	500 mW ERP	LPWAN	EN 303 204 EN 301 489-3	Adaptive Power Control (APC) required. Duty cycle \leq 10% for network access points and \leq 2.5% otherwise Transmissions only permitted within the frequency ranges 865.6-865.8 MHz, 866.2-866.4 MHz, 866.8-867.0 MHz and 867.4-867.6 MHz.
868 – 868.6 MHz	25 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Duty cycle \leq 1%
868.7 – 869.2 MHz	25 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Duty cycle \leq 0.1%
869.4 – 869.65 MHz	500 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Duty cycle \leq 10%
869.7 – 870 MHz	5 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	

869.7 – 870 MHz	25 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Duty cycle <= 1%
870 – 875.8 MHz	25 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Duty cycle <= 1%
870 – 874.4 MHz	500 mW ERP	LPWAN	EN 303 204 EN 301 489-3	Adaptive Power Control (APC) required. Duty cycle <= 10% for network access points and <= 2.5% otherwise
915 – 921 MHz	25 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Duty cycle <= 0.1%
915.2 – 920.8 MHz	25 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Duty cycle <= 1%
917.3 – 918.9 MHz	500 mW ERP	LPWAN	EN 300 220-2 EN 301 489-3	Adaptive Power Control (APC) required. Duty cycle <= 10% for network access points and <= 2.5% otherwise Transmission only permitted within the frequency ranges 917.3-917.7 MHz and 918.5-918.9 MHz.

- 4-1 The LPWAN devices shall employ additional mitigation techniques prescribed in technology-specific standards including industry/multi-manufacturer specifications. Such techniques include Adaptive Power Control, Adaptive Data Rate, Listen Before Transmit/Adaptive Frequency Agility, etc.
- 4-2 LPWAN devices shall comply as relevant with existing and future technology-specific standards and specifications, including industry/multi-manufacturer standards and ETSI System Reference Documents (i.e. TR 103 435, TR 103 526, etc.)
- 4-3 Use of the band 866-869 MHz by LPWAN devices in KSA is currently allowed subject to band sharing with other primary users. LPWAN devices may therefore not claim protection from interference possibly caused by the primary users, and shall not cause any interference to the primary users.

5- Licensing Requirements

All the requirements and conditions of the Regulatory Framework for Internet of Things must be met.

6- Additional Requirements

The following additional requirements apply:

- 6-1 Deployment of LPWAN devices must be carried out by qualified personnel. Using of LPWAN networks for provision of services to third parties is subject to licensing from CST as per the Regulatory Framework for Internet of Things published on CST website.
- 6-2 In any case, service providers must inform end users prior to deploying and activating such LPWAN devices that their utilisation of unlicensed frequency bands carries the risk of interference from other users of shared bands, with possible detrimental effect on quality of service.
- 6-3 CST will not assume responsibility for investigating/resolving any cases of interference/service degradation for the users of shared unlicensed bands.

7- References

The following referenced documents are indispensable for the application of this document. If no issue or revision number is quoted along with the title of a technical specification or standard, the latest published version should be used.

EN 300 220-2

Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 2: Harmonised Standard for access to radio spectrum for non specific radio equipment

EN 300 220-1

Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 1: Technical characteristics and methods of measurement

EN 303 204

Fixed Short Range Devices (SRD) in data networks; Radio equipment to be used in the 870 MHz to 876 MHz frequency range with power levels ranging up to 500 mW; Harmonised Standard for access to the radio spectrum

EN 301 489-1

Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.

EN 301 489-3

Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz.