SLOVENSKI STANDARD
SIST I-ETS 300 330:1999

01-oktober-1999

Radijska oprema in sistemi (RES) - Naprave kratkega dosega (SRDs) - Tehniļne karakteristike in preskuġevalne metode za radijsko opremo v frekvenļnem obmoļju od 9 kHz do 25 MHz in sistemi z indukcijsko zanko v frekvenļnem obmoļju od 9 kHz do 30 MHz

Radio Equipment and Systems (RES); Short Range Devices (SRDs); Technical characteristics and test methods for radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz

Ta slovenski standard je istoveten z: **I-ETS 300 330 Edition 1**

ICS:

33.060.20	Sprejemna in oddajna oprema	Receiving and transmitting equipment

SIST I-ETS 300 330:1999 **en**

EUROPEAN TELECOMMUNICATION STANDARD

I-ETS 300 330

December 1994

Source: ETSI TC-RES

Reference: DI/RES-08-0104

ICS: 33.060, 33.060.20

Key words: Inductive systems, short range devices, testing

Radio Equipment and Systems (RES); Short Range Devices (SRDs) Technical characteristics and test methods for radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz

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Foreword

This Interim European Telecommunication Standard (I-ETS) has been prepared by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Annex A provides normative specifications concerning radiated measurements.

Annexes B through E are graphical representations of RF carrier current limits, H- and E-field strength carrier limits and spurious emission limits.

Annex F is normative describing the calculation for customised antennas.

Annexes G and H are informative annexes describing E-fields, and test fixtures.

Proposed announcement date	
Date of latest announcement of this I-ETS (doa):	31st March 1995

Introduction

This I-ETS is intended to specify the minimum performance and the methods of measurement of Short Range Devices (SRDs) as specified in the scope.

Included are methods of measurement for equipment, such as inductive loop systems, fitted with antenna connector and/or integral antennas. Equipment designed for use with an integral antenna may be supplied with a temporary or permanent internal connector for the purpose of testing, providing the characteristics being measured are not expected to be affected.

This I-ETS will be used by accredited test laboratories for the assessment of the performance of the equipment. Type test measurements will be performed in one of the accredited test laboratories, accepted by the various National Regulatory authorities in order to grant type testing, provided the National regulatory requirements are met. This is in compliance with CEPT Recommendation T/R 71-03 [1].

If equipment, which is available on the market, is required to be checked it should be tested in accordance with the methods of measurement specified in this I-ETS.

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1 Scope

This I-ETS is a general standard for the frequency band 9 kHz to 25 MHz for radio equipment and 9 kHz to 30 MHz for inductive loop systems, which may be superseded by specific standards covering specific applications.

This I-ETS covers the minimum characteristics considered necessary in order to make the best use of the available frequencies.

It does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable.

It applies to SRDs as follows:

- inductive loop systems;
- with an antenna connection and/or with an integral antenna;
- for alarms, identification systems, telecommand, telemetry, etc., applications;
- with or without speech.

All types of modulation for radio devices are covered by this I-ETS.

This I-ETS covers fixed stations, mobile stations and portable stations. If the system includes transponders, these will be measured together with the transmitter.

Two types of measuring methods are defined in this I-ETS due to the varied nature of the types of equipment used in this band. One method measures the RF carrier current, the other measures the H-field.

CEPT Recommendation T/R 01-04 [2], on Low Power Devices (LPDs) using an integral antenna, mentions in the frequency range 9 kHz to 25 MHz two frequency bands, 6,765 to 6,795 MHz and 13,553 to 13,567 MHz, with a field strength limit of 65 dBµV/m measured at 30 m (which is equivalent to 42 dBµA/m at 10 m).

On non-harmonized parameters, national administrations may impose conditions on the type of modulation, channel/frequency separations, maximum transmitter output power/effective radiated power, equipment marking and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of an individual or general licence, or as a condition for use under licence exemption.

Additional standards or specifications may be required for equipment such as that intended for connection to the Public Switched Telephone Network (PSTN).

This I-ETS covers requirements for radiated emissions below 30 MHz.

2 Normative references

This I-ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this I-ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] CEPT Recommendation T/R 71-03: "Procedures for type testing and approval for radio equipment intended for non-public systems".

[2] CEPT Recommendation T/R 01-04: "Use of Low Power Devices (LPD) using integral antennas and operating in harmonized frequency bands".

[3] CCITT Recommendation O.153 (1992): "Basic parameters for the R1 measurement of error performance at bit rates below the primary rate".

[4] CISPR 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus".

[5] ETR 028: "Radio equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".

3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of this I-ETS the following definitions apply:

Alarm: the use of radio communication for indicating an alarm condition at a distant location.

Artificial antenna: a tuned reduced-radiating dummy load equal to the nominal impedance specified by the applicant.

Assigned frequency band: the frequency band within which the device is authorised to operate.

Conducted measurements: measurements which are made using a direct connection to the equipment under test.

Fixed station: equipment intended for use in a fixed location.

H-field test antenna: an electrically screened loop or equivalent antenna, with which the magnetic component of the field can be measured.

Identification system: equipment consisting of a transmitter(s), receiver(s) (or a combination of the two) and an antenna(s) to identify a transponder.

Integral antenna: an antenna designed as an indispensable part of the equipment, with or without the use of an antenna connector.

Magnetic Moment: the product of (Number of coil turns) * (coil area) * (coil current). (Air coils only)

Mobile station: equipment normally installed in a vehicle.

Portable station: equipment intended to be carried.

Radiated measurements: measurements which involve the absolute measurement of a radiated field.

Telecommand: the use of radio communication for the transmission of signals to initiate, modify or terminate functions of equipment at a distance.

Telemetry: the use of radio communication for indicating or recording data at a distance.

Transponder: a device, that responds to an interrogation signal.

3.2 Abbreviations

For the purposes of this I-ETS, the following abbreviations apply:

EMC	Electro-Magnetic Compatibility
ETR	ETSI Technical Report
IF	Intermediate Frequency
ISM	Industrial, Scientific and Medical
RF	Radio Frequency
Rx	Receiver
Tx	Transmitter
VSWR	Voltage Standing Wave Ratio

3.3 Symbols

For the purposes of this I-ETS the following symbols apply:

E	Electrical field strength
Eo	Reference electrical field strength, (see annex A)
f	Frequency
H	Magnetic field strength
Ho	Reference magnetic field strength, (see annex A)
P	Power
R	Distance
Ro	Reference distance, (see annex A)
t	Time

4 General requirements

4.1 Mechanical and electrical design

4.1.1 General

The equipment submitted by the applicant, should be designed, constructed and manufactured in accordance with sound engineering practice and with the aim of minimising harmful interference to other equipment and services.

Transmitters and receivers may be individual or combination units, but shall operate with the correct power source.

4.1.2 Controls

Those controls which, if maladjusted, might increase the interfering potentialities of the equipment shall not be easily accessible to the user.

4.1.3 Transmitter shut-off facility

If the transmitter is equipped with an automatic transmitter shut-off facility, it should be made inoperative for the duration of the test.

4.1.4 Marking (equipment identification)

The equipment shall be marked in a visible place. This marking shall be legible and durable.

The marking shall be in accordance with the requirements of the National Regulatory Authority and should include as a minimum:

- the name of the manufacturer or his trade mark;

- the type designation.