



# SLOVENSKI STANDARD

## SIST ETS 300 333 E1:2006

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Satellite Earth Stations and Systems (SES); Receive-only Very Small Aperture Terminals (VSATs) used for data distribution operating in the 4 GHz frequency band

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33.060.30 Radiorelejni in fiksni satelitski komunikacijski sistemi      Radio relay and fixed satellite communications systems

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operating in the 4 GHz frequency band**

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## Foreword

This European Telecommunication Standard (ETS) has been produced by the Satellite Earth Stations and Systems (SES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

<b>Proposed transposition dates</b>	
Date of latest announcement of this ETS (doa):	31st March 1995
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30th September 1995
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## 1 Scope

This European Telecommunication Standard (ETS) provides specifications for the standardisation of the characteristics of receive-only Very Small Aperture Terminals (VSATs) operating as part of a satellite network used for the distribution of data.

These VSATs have the following characteristics:

- operating in the shared part of the C band allocated to the Fixed Services (FS) and to the Fixed Satellite Services (FSS), 3,625 to 4,200 GHz (Space-Earth);
- in this frequency band circular polarisation is normally used and the system operates through satellites at 3° spacing;
- designed for unattended operation;
- limited to the reception of baseband digital signals;
- equipped with one or several terrestrial output ports;
- antenna diameter not exceeding normally 7,3 m, or equivalent corresponding aperture.

The equipment considered in this ETS comprises both the "outdoor unit", usually composed of the antenna subsystem with the associated Low Noise Block (LNB), and the "indoor unit" composed of the remaining part of the communication chain, including the cable between these two units.

This ETS does not contain any requirement, recommendation or information about the installation of the VSATs, nor is this ETS intended to apply to VSAT network hub stations.

This ETS deals with two types of specification:

- specifications defined in order to protect other users of the frequency spectrum, both satellite and terrestrial, from unacceptable interference. In addition, these specifications are specified for the purposes of electrical safety, structural safety and solar radiation protection as well as protection from harmful interference;
- specifications related to characteristics which contribute to the quality of reception by providing the VSAT with a minimum interference protection from other radio systems.

## 2 Normative references

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

- [1] IEC 950 (1991): "Safety of information technology equipment including electrical business equipment".
- [2] IEC 81 (Co) 6 (1981): "Standards for Lightning Protection of Structures".
- [3] CISPR Publication No. 22 (March 1992): "Limits and methods of measurement of radio interference characteristics of information technology equipment".
- [4] CISPR Publication No. 16 (1987): "Specifications for radio interference measuring apparatus and measurement methods".
- [5] EN 55011 (1986): "Limits and methods of measurements of radio interference characteristics of industrial, scientific and medical (ISM) radio-frequency equipment".
- [6] IEC 510-2-1 (1978): "Methods of measurement for radio equipment used in satellite earth stations Part 2".
- [7] IEC 801-3 (1984): "Electromagnetic compatibility for industrial process measurement and control equipment Part 3".
- [8] ITU-R 732 Recommendation (1992): "Method for statistical processing of Earth station antenna side-lobe peaks".

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of this ETS, the following definitions apply.

**outdoor unit:** Is the part of the terminal installed in a position within line of sight to the satellite(s) to be received, and it is intended to be operated in outdoor environmental conditions.

It usually comprises three main parts:

- a) the antenna sub-system which converts the incident radiation field into a guided wave;
- b) the LNB, which is a device that amplifies, with very low internal noise, the received signals in the Radio Frequency (RF) band and converts them to intermediate frequencies;
- c) the installation equipment.

**NOTE:** The installation equipment (means of attachment) is not included in this ETS. However, the antenna structures and other components directly mounted on the antenna and forming an integral part of it, are subject to the specifications of this ETS.

**indoor unit:** Is composed of the remaining part of the equipment. It is generally installed inside the buildings and is connected to the outdoor unit. The connection cable between the outdoor and indoor unit belongs to the indoor unit.

### 3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply.

CISPR	Comité International Spécial des Perturbations Radioélectriques
CSPDN	Circuit Switched Public Data Network
EIRP	Equivalent Isotropically Radiated Power
EUT	Equipment Under Test
FS	Fixed Service
FSS	Fixed Satellite Service
IEC	International Electrotechnical Commission
ITU	International Telecommunication Union
ITU-R	ITU Radiocommunication Sector
LNB	Low Noise Block (low noise amplifier and down converter)
RF	Radio Frequency
VSAT	Very Small Aperture Terminal

## 4 Test report

The test report shall contain the results of the tests.

## 5 Safety

### 5.1 Mechanical construction

#### Purpose:

Protection of operating personnel, the public and goods from insecure structures.

#### Specification:

This specification applies to the outdoor unit only.

The outdoor unit, including mounted and structural components, (but excluding the means of attachment) shall be designed to support the following main loads due to:

- the weight of the antenna and structural components;
- the wind speed.

Loading due to snow and ice is not considered.

At wind speeds up to 180 km/h, referred to standard atmosphere temperature and pressure (293 K and  $1,013 \times 10^5$  Pa (1 013 mbar)) none of the components shall be torn away.

#### Verification:

Two alternative methods are given for verification.

- a) Wind tunnel testing.

A wind tunnel shall be used for the purpose of conformance testing. The wind tunnel tests shall be performed on the outdoor unit, or alternatively on a scale-model of the outdoor unit. The data obtained for the scale-model shall be computed in order to obtain data for the true antenna size.

- b) Numerical analysis and simplified tests.

This method shall provide an alternative to the wind tunnel test. The effects of maximum wind load shall be first computed on the overall outdoor unit using a numerical analysis method, e.g. finite elements method by computer taking into account the intrinsic properties of the materials. In a second step, the computed loads shall be applied to the structure.