
**Elektromagnetna združljivost (EMC) in zadeve v zvezi z radijskim spektrom (ERM) -
Elektromagnetna združljivost (EMC) za sprejemne mobilne zemeljske postaje
(ROMES), ki zagotavljajo podatkovne komunikacije in delujejo v pasu 1,5 GHz**

Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic
Compatibility (EMC) for Receive Only Mobile Earth Stations (ROMES) operating in the
1,5 GHz band providing data communications

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**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 83/189/EEC (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document, together with ETS 300 487, is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility ("the EMC Directive") (89/336/EEC as amended).

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Technical specifications relevant to the EMC Directive are given in annex A.

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1 Scope

The present document provides ElectroMagnetic Compatibility (EMC) specifications for the standardization of Receive Only Mobile Earth Stations (ROMES). Specifications relating to emissions from the antenna port and emissions from the enclosure port of the ROMES (figure 1) are not included in the present document. Specifications for emissions from the antenna port and from the enclosure port of the ROMESs are included in ETS 300 487 [15].

The present document applies to ROMESs which operate in the Land Mobile Satellite Service (LMSS) space to earth bands, 1 525 MHz to 1 544 MHz and 1 555 MHz to 1 559 MHz, allocated by the ITU Radio Regulations [1]. The ROMESs operate as part of a satellite system providing one way data communications.

ROMESs can have several configurations, including:

- portable equipment;
- fixed equipment;
- a number of modules including a display/control interface to the user.

The present document specifies the applicable EMC tests, their method of measurement, the limits and the minimum performance criteria for ROMESs. The performance criteria used in the present document requires that the satellite communications system of which the ROMES is a part provides reliable delivery of data or messages.

The environment classification used in the present document refers to the environment classification used in Generic Standards EN 50081-1 [2] and EN 50082-1 [3], except the vehicular environment class which refers to ISO 7637-1 [11] and ISO 7637-2 [12].

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus in residential, commercial and light industrial environments. The levels however do not cover extreme cases which may occur in any location but with a low probability of occurrence.

The present document may not cover those cases where a potential source of interference which is producing individually repeated transient phenomena or a continuous phenomena is permanently present, e.g. a radar or broadcast site in the near vicinity. In such a case it may be necessary to use special protection applied to either the source of interference or the interfered part or both.

Compliance of radio equipment to the requirements of the present document does not signify compliance to any requirements related to spectrum management.

Compliance to the present document does not signify compliance to any safety requirements. However, it is the responsibility of the assessor of the equipment to ensure that any observation regarding the equipment becoming dangerous or unsafe as a result of the application of the tests of the present document should be recorded.

In addition to the technical specifications of the present document, there may be published in the Official Journal of the European Community references to other Harmonized EMC standards that apply to the products covered by the present document in their own right.

The present document is based on the considerations and guidance given in ETR 238 [16].

2 References

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] ITU Radio Regulations.
- [2] EN 50081-1 (1992): "Electromagnetic compatibility - Generic emission standard - Part 1: Residential, commercial and light industry".
- [3] EN 50082-1 (1993): "Electromagnetic compatibility - Generic immunity standard - Part 1: Residential, commercial and light industry".
- [4] 89/336/EEC: "Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility".
- [5] EN 55022 (1994): "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".
- [6] CISPR Publication 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus".
- [7] EN 61000-4-3 (modified): "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test".
- [8] EN 61000-4-2: "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Electrostatic discharge immunity test".
- [9] EN 61000-4-4: "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test".
- [10] EN 61000-4-6: "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields".
- [11] ISO 7637-1 (1990): "Road vehicles - Electrical disturbance by conduction and coupling - Part 1: Passenger cars and light commercial vehicles with nominal 12 V supply voltage - Electrical transient conduction along supply lines only".
- [12] ISO 7637-2 (1990): "Road vehicles - Electrical disturbance by conduction and coupling - Part 2: Commercial vehicles with nominal 24 V supply voltage - Electrical transient conduction along supply lines only".
- [13] EN 61000-4-11: "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests".
- [14] EN 61000-4-5: "Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test".

- [15] ETS 300 487: "Satellite Earth Stations and Systems (SES); Receive-Only Mobile Earth Stations (ROMESs) operating in the 1,5 GHz band providing data communications; Radio Frequency (RF) specifications".
- [16] ETR 238: "ETSI/CENELEC standardization programme for the development of Harmonized Standards related to Electro-Magnetic Compatibility (EMC) in the field of telecommunications".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply:

ancillary equipment: Equipment (apparatus) used in connection with a ROMES is considered as an ancillary equipment (apparatus):

- if the equipment is intended for use in conjunction with a ROMES to provide additional operational and/or control features to the ROMES, (e.g. to extend control to another position or location); and
- if the equipment cannot be used on a stand alone basis to provide user functions independently of a ROMES; and
- if the ROMES to which it is connected is capable of providing some intended operation such as receiving without the ancillary equipment (i.e. it is not a sub unit of the main equipment essential to the main equipment basic functions).

enclosure port: The physical boundary of the apparatus through which electromagnetic fields may radiate or impinge (see figure 1).

manufacturer: The legal entity responsible under the terms of the Council Directive, 89/336/EEC [4], for placing the product on the market.

mobile equipment: A ROMES capable of being powered by the main battery of a vehicle for intended use attached to a vehicle either temporarily or permanently.

port: A particular interface of the specified equipment (apparatus) with the electromagnetic environment (see figure 1).

portable equipment: A ROMES with internal power supplies which is intended to be carried by the user.

standby mode: Mode of operation in which the receiver is capable of receiving calls.

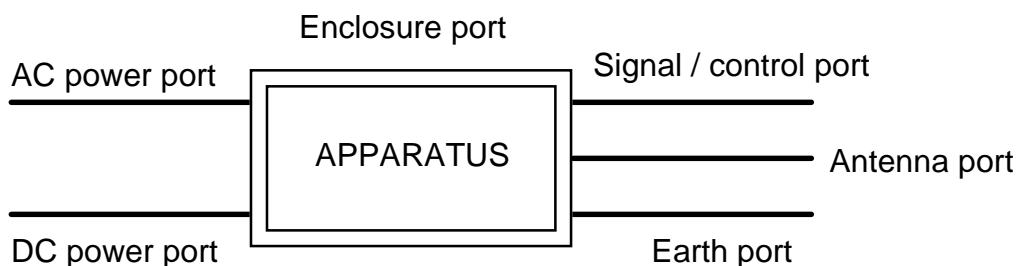


Figure 1: Examples of ports

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CR	Continuous phenomena applied to ROMES
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
LISN	Line Impedance Stabilizing Network
LMSS	Land Mobile Satellite Service
RF	Radio Frequency
ROMES	Receive Only Mobile Earth Station
TR	Transient phenomena applied to ROMES

4 Test conditions

4.1 General

The ROMES shall be tested under conditions contained in the relevant product and basic standards and in the information accompanying the equipment. The tests shall be carried out at a point within the specified normal operating environmental range and at the rated supply voltage for the equipment.

The test conditions and configuration shall be as close to normal intended use as possible and shall be recorded in the test report.

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4.2 Normal test modulation

The test modulation signal to be used for the calling function shall be a signal representing selective messages generated by a signal generator. The signal generator may be supplied by the manufacturer.

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4.3 Arrangements for test signals at the input of a ROMES

The manufacturer may, at the time of submitting the ROMES for testing, supply, if necessary, a test fixture and a message generator to generate the wanted input signal.

The source of the wanted input signal, modulated with normal test modulation (subclause 4.2), shall be located outside the test environment and the signal level used shall be chosen to be a value significantly above the threshold sensitivity but below the overload characteristics of the ROMES (the threshold sensitivity and overload characteristic shall be specified by the manufacturer). Adequate measures shall be taken to protect the measuring equipment from the effect of the test environment.

Where the receiver incorporates a Radio Frequency (RF) antenna connector, the RF signal source shall be coupled to the input of the ROMES via a shielded transmission line such as a coaxial cable.

Where the ROMES does not incorporate an RF connector, the RF signal source shall be presented to the ROMES from another antenna located within the test environment. This antenna shall be coupled to the RF signal source via an appropriate attenuate.

4.4 Arrangements for test signals at the output of the ROMES

For the performance check before and after the test it shall be possible to assess the performance of the ROMES from the presented messages and/or the call received alert signal(s) of the ROMES.

During the spot frequency test of the radio frequency immunity test (subclause 9.2) the call received alert signal output of the ROMES shall be coupled to the outside of the test environment and it shall be possible to assess the performance of the equipment from the call received alert signal(s) of the ROMES.