SLOVENSKI STANDARD
SIST ETS 300 630 E1:2003

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Prenos in multipleksiranje (TM) ï Digitalni radiorelejni sistemi (DRRS) ï DRRS z nizko in srednjo prenosno zmogljivostjo tipa toļ ka-toļ ka, ki delujejo v pasu 1,4 GHz

Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Low capacity point-to-point DRRS operating in the 1,4 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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Transmission and Multiplexing (TM); Low capacity point-to-point Digital Radio Relay Systems (DRRS) operating in the 1,4 GHz frequency band

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Foreword

This European Telecommunication Standard (ETS) has been prepared by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Transposition dates	
Date of adoption:	21 February 1997
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1 Scope

This ETS specifies the minimum performance parameters for terrestrial digital fixed service radio communications equipment operating in the 1,4 GHz frequency bands. The requirements and limits given in this ETS are relevant to all environmental conditions for the chosen climatic class. The test methods to be used are currently under study in ETSI STC TM4.

Digital systems are intended to be used for point-to-point connections in local and regional networks at data rates between 9,6 kbit/s and 4x2 Mbit/s. Other data rates may also be foreseen. Typical applications include:

a) customer connections;
b) Integrated Services Digital Network (ISDN) extension;
c) mobile base station connections;
d) telemetry and telecontrol, including transportable and off-shore use.

CCIR high, medium and local grade performance objectives, i.e. CCIR Recommendations F.634 [14], F.696 [4], F.697 [5], CCITT Recommendation G.821 [7] and the forthcoming performance objectives detailed in ITU-T Recommendation G.826 [8] should be realizable using systems considered in this ETS.

The parameters to be specified fall into two categories:

a) Those that are required to provide compatibility between channels from different sources of equipment on the same route, connected either to:

   - separate antennas; or to
   - separate polarizations of the same antenna.

b) Parameters defining the transmission quality of the proposed system.

The ETS deals with Intermediate Frequency (IF), Radio Frequency (RF) and baseband characteristics relevant to low capacity Plesiochronous Digital Hierarchy (PDH) transmission. Antenna/feeder system requirements are covered in EN 300 631 [12].

Due to the wide spread of applications and corresponding system rates, parameters such as RF spectrum masks and receiver sensitivity are related to standardized channel spacings rather than to minimum system rates. This allows individual countries to allocate a bandwidth and therefore a standard channel spacing in accordance with the foreseen services and their own frequency management and radio network planning.

As the maximum bit rate in a given bandwidth depends on the system spectral efficiency, different equipment classes are defined:

Class 1: equipment based on a minimum of 2-level modulation scheme (e.g. 2-FSK, GMSK with discriminator detection, or equivalent);

Class 2: equipment based on a minimum 4-level modulation scheme (e.g. 4-FSK, 4-QAM, or equivalent);

Class 3: equipment based on a minimum 16-level modulation scheme (e.g. 16-QAM, or equivalent).

Safety aspects are outside the mandate of ETSI and they will not be considered in this ETS.

2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate place 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] CEPT Recommendation T/R 13-01: "Preferred channel arrangements for fixed services in the range 1 - 3 GHz".

[2] ETS 300 019 Parts 1 and 2 (1994): "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment Part 1-1 to 1-7: Classification of environmental conditions, Part 2-1 to 2-7: Specification of environmental tests".

[3] CCITT Recommendation G.703 (1988): "Physical/electrical characteristics of hierarchical digital interfaces".

[4] CCIR Recommendation F.696 (1992): "Error performance and availability objectives for hypothetical reference digital sections utilizing digital radio-relay systems forming part or all of the medium grade portion of an ISDN connection".

[5] CCIR Recommendation F.697 (1992): "Error performance and availability objectives for the local grade portion at each end of an ISDN connection utilizing digital radio-relay systems".

[6] ITU-T Recommendation G.773 (1993): "Protocol suites for Q interfaces for management of transmission systems".

[7] CCITT Recommendation G.821 (1988): "Error performance of a digital international connection".

[8] ITU-T draft Recommendation G.826 (1993): "Error performance objectives for constant bit-rate digital paths".

[9] ETS 300 385: "Radio Equipment and Systems (RES); EMC standard for digital fixed radio links and ancillary equipment with data rates at around 2 Mbit/s and above".

[10] ITU-T Recommendation V.11 (1993): "Electrical characteristics for balanced double current interchange circuits operating at data signalling rates up to 10 Mbit/s".

[11] CCITT Recommendation G.712 (1992): "Transmission Performance Characteristics of Pulse Code Modulation".

[12] prEN 300 631: "Transmission and Multiplexing (TM); Radio relay equipment; Antennas for point-to-point radio links in bands 1 to 3 GHz Essential requirements on electrical characteristics".

[13] ITU-T Recommendation V.24 (1993): "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".

[14] CCIR Recommendation F.634 (1992): "Error performance objectives for real digital radio-relay links forming part of a high grade circuit within an ISDN network".

[15] ETS 300 132 Parts 1 and 2: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment interface".

[16] ETR 080: "Transmission and Multiplexing (TM); Integrated Services Digital Network (ISDN) basic rate access; Digital transmission system on metallic local lines".

[17] ITU-T Recommendation I.430 (1993): "Basic user-network interface - Layer 1 specification".

[18] CCITT Recommendation X.21 (1992): "Interface between data terminal equipment and data circuit-terminating equipment for synchronous operation on public data networks".

[19] prETS 300 339: "Radio Equipment and Systems (RES); General Electro-Magnetic Compatibility (EMC) for radio equipment".

3 Abbreviations and symbols

3.1 Abbreviations

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

AC	Alternating Current
BER	Bit Error Ratio
CEPT	Conférence des Administrations Européennes des Postes et Télécommunications
CW	Continuous Wave
DC	Direct Current
EMC	ElectroMagnetic Compatibility
FSK	Frequency Shift Keying
GMSK	Gaussian Minimum Shift Keying
IF	Intermediate Frequency
IF/RF	Intermediate Frequency/Radio Frequency
ISDN	Integrated Services Digital Network
NRZ	Non return to Zero
PDH	Plesiochronous Digital Hierarchy
QAM	Quadrature Amplitude Modulation
RF	Radio Frequency
RX	Receiver
S/I	Signal to Interference ratio
TMN	Telecommunications Management Network
TX	Transmitter
W/U	Wanted to Unwanted signal ratio

3.2 Symbols

For the purposes of this ETS, the following symbols apply:

dB	decibel
dBm	decibel relative to 1 mW
GHz	gigahertz
kHz	kilohertz
Hz	Hertz
kbit/s	kilobits per second
Mbit/s	megabits per second
MHz	megahertz