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**Methods of measurement for equipment used in digital microwave radio transmission systems - Part 1: Measurements common to terrestrial radio-relay systems and satellite earth stations - Section 1: General (IEC 60835-1-1:1990)**

Methods of measurement for equipment used in digital microwave radio transmission systems -- Part 1: Measurements common to terrestrial radio-relay systems and satellite earth stations -- Section 1: General

Meßverfahren für Geräte in digitalen Mikrowellen-Funkübertragungssystemen -- Teil 1: Messungen an terrestrischen Richtfunkssystemen und Satelliten-Erdfunkstellen -- Hauptabschnitt 1: Allgemeines

Méthodes de mesure applicables au matériel utilisé pour les systèmes de transmission numérique en hyperfréquence -- Partie 1: Mesures communes aux faisceaux hertziens terrestres et aux stations terriennes de télécommunications par satellite -- Section 1: Généralités

**Ta slovenski standard je istoveten z: EN 60835-1-1:1992**

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**ICS:**

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

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### ENGLISH VERSION

Methods of measurement for equipment used in digital microwave radio transmission systems  
Part 1: Measurements common to terrestrial radio-relay systems and satellite earth stations  
Section One: General  
(IEC 835-1-1:1990)

Méthodes de mesure applicables au matériel utilisé pour les systèmes de transmission numérique en hyperfréquence

Première partie: Mesures communes aux faisceaux hertziens terrestres et aux stations terriennes de télécommunications par satellite

Section un: Généralités  
(CEI 835-1-1:1990)

Meßverfahren für

Geräte in digitalen

Mikrowellen-Übertragungssystemen

Teil 1: Messungen an

terrestrischen Richtfunkssystemen

und Satelliten-Erdfunkstellen

Hauptabschnitt eins: Allgemeines

(IEC 835-1-1:1990)

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This European Standard was approved by CENELEC on 1992-09-15.

CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

### CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

### FOREWORD

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 835-1-1:1990 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 60835-1-1 on 15 September 1992.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1993-09-01
- latest date of withdrawal of conflicting national standards (dow) 1993-09-01

Annexes designated "normative" are part of the body of the standard. In this standard, annex ZA is normative.

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The text of the International Standard IEC 835-1-1:1990 was approved by CENELEC as a European Standard without any modification.

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## ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD  
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication -----	Date ----	Title -----	EN/HD -----	Date ----
68		Environmental testing		
68-1	1988	Part 1: General and guidance	HD 323.1 S2	1988
		Part 2: Tests		
68-2-1	1974	Tests A: Cold	HD 323.2.1 S2*	1987
68-2-2	1974	Test B: Dry heat	HD 323.2.2 S1*	1988
68-2-3	1969	Test Ca: Damp heat, steady state	HD 323.2.3 S2*	1987
68-2-30	1980	Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)	HD 323.2.30 S3*	1988
76	1967	Power transformers	-	-
84	1957	Recommendations for mercury-arc convertors	-	-
119	1960	Recommendation for polycrystalline semiconductor rectifier stacks and equipment	-	-
215	1987	Safety requirements for radio	EN 60215	1989
A1	1990	transmitting equipment	EN 60215/A1	1992
CISPR 16	1987	C.I.S.P.R. specification for radio interference measuring apparatus and measurement methods	-	-

\* HD 323.2.1 S2 includes A1:1983 to IEC 68-2-1  
 HD 323.2.2 S1 includes IEC 68-2-2A  
 HD 323.2.3 S2 includes A1:1984 to IEC 68-2-3  
 HD 323.2 30 S3 includes A1:1985 to IEC 68-2-30

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**Méthodes de mesure applicables au matériel  
utilisé pour les systèmes de transmission  
numérique en hyperfréquence**

**Partie 1:**

**Mesures communes aux faisceaux hertziens  
terrestres et aux stations terriennes de  
télécommunications par satellite**

**Section un – Généralités**

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**Methods of measurement for equipment used in  
digital microwave radio transmission systems**

**Part 1:**

**Measurements common to terrestrial radio-relay  
systems and satellite earth stations**

**Section One – General**

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International Electrotechnical Commission  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

METHODS OF MEASUREMENT FOR EQUIPMENT USED  
IN DIGITAL MICROWAVE RADIO TRANSMISSION SYSTEMSPart 1: Measurements common to terrestrial radio-relay systems  
and satellite earth stations

## Section One - General

## FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

## PREFACE

This standard has been prepared by Sub-Committee 12E: Radio relay and fixed satellite communications systems, of IEC Technical Committee No. 12: Radiocommunications.

The text of this standard is based upon the following documents:

Six Months' Rule	Report on Voting
12E(C0)118	12E(C0)126

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

## METHODS OF MEASUREMENT FOR EQUIPMENT USED IN DIGITAL MICROWAVE RADIO TRANSMISSION SYSTEMS

### Part 1: Measurements common to terrestrial radio-relay systems and satellite earth stations

#### Section One - General

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#### 1. Scope

The conditions of measurement and the methods of measuring the characteristics given in this part of the standard are common to terrestrial radio-relay and satellite earth station systems using digital modulation. These test methods are general and are applicable to systems of all capacities and the tests to be made should be agreed between the parties concerned.

The object of this standard is to describe the conditions and methods of measurement to be used to ascertain the performance of digital microwave radio transmission systems and of the equipment used in such systems, and to facilitate the comparison of the results of measurements made by different observers. It contains details of selected methods of making measurements recommended for assessing the essential properties of a digital microwave radio transmission system and of the equipment used in such systems. These methods are neither mandatory nor limiting; a choice of measurements can be made in each particular case. If necessary, additional measurements may be made but these should preferably be carried out in accordance with the standards laid down by other IEC Technical Committees or Sub-Committees or by other international bodies.

Limiting values of the various quantities for acceptable performance are not specified since these should be given in the detailed equipment specification.

The methods of measurement described in this standard are intended for "type" and "acceptance" tests under simulated conditions and they may also be used for factory tests.

#### 2. Normative references

*The following IEC publications are quoted in this standard:*

Publications Nos. 68: Environmental testing.

68-1 (1988): Part 1: General and guidance.

68-2-1 (1974): Part 2: Tests - Tests A: Cold.

- 68-2-2 (1974): Tests B: Dry heat.
- 68-2-3 (1969): Test Ca: Damp heat, steady state.
- 68-2-30 (1980): Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle).
- 76 (1967): Power transformers.
- 84 (1957): Recommendations for mercury-arc convertors.
- 119 (1960): Recommendations for polycrystalline semiconductor rectifier stacks and equipment.
- 215 (1987): Safety requirements for radio transmitting equipment.

and the following CISPR publication:

- 16 (1987): CISPR specification for radio interference measuring apparatus and measurement method.

### 3. Terms and definitions

The methods of measurement described in this part and in the other parts of this standard are preceded by the definition of the quantity to be measured, either in the relevant clause or in a separate clause in order to show the coherence between the various definitions.

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As far as practicable, the definitions are in conformity with those given in the IEC International Electrotechnical Vocabulary (IEV) or with those used by other Technical Committees of the IEC or other international bodies. Where deviations exist, they appeared necessary for a better understanding of this standard.

#### 3.1 Detailed equipment specification

Any document especially drawn up or provided, which describes the properties and the performance of an equipment under specified conditions of normal use, together with specified fault conditions which may arise.

*Note.*- For the general principles and the test methods to be followed to assess that the equipment conforms to the appropriate safety regulations under conditions of normal use and under specified conditions, reference should be made to IEC 215.

#### 3.2 Digital microwave radio transmission system

For the purpose of this standard the elements comprising a digital microwave radio transmission system are those shown in figures 1 and 2 for terrestrial radio-relay systems and satellite earth stations.