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Metallic communication cables test methods - Part 4-2: Electromagnetic compatibility (EMC) - Screening and coupling attenuation - Injection clamp method (IEC 62153-4-2:2003)

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English version

Metallic communication cables test methods Part 4-2: Electromagnetic compatibility (EMC) – Screening and coupling attenuation – Injection clamp method
(IEC 62153-4-2:2003)

Méthodes d'essai des câbles métalliques de communication
Partie 4-2: Compatibilité électromagnétique (CEM) - Affaiblissement d'écran et de couplage - Méthode de la pince à injection
(CEI 62153-4-2:2003)

Prüfverfahren für metallische Kommunikationskabel
Teil 4-2: Elektromagnetische Verträglichkeit (EMV) – Schirm- und Kopplungsdämpfung - Verfahren mit gespeister Zange
(IEC 62153-4-2:2003)

This European Standard was approved by CENELEC on 2003-12-01. 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.

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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

Ref. No. EN 62153-4-2:2004 E

Foreword

The text of document 46A/560/FDIS, future edition 1 of IEC 62153-4-2, prepared by SC 46A, Coaxial cables, of IEC TC 46, Cables, wires, waveguides, r.f. connectors, r.f. and microwave passive components and accessories, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62153-4-2 on 2003-12-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-09-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-12-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62153-4-2:2003 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

Publication	Year	Title	EN/HD	Year
IEC 61000-4-6	- [1)]	Electromagnetic compatibility (EMC) Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	-	-
ITU-T Recommendation G.117	1996	Transmission aspects of unbalance about earth	-	-
ITU-T Recommendation O.9	1999	Measuring arrangements to assess the degree of unbalance about earth	-	-

1) Undated reference.

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Méthodes d'essai des câbles métalliques de communication –

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Metallic communication cables test methods –

Part 4-2: Electromagnetic compatibility (EMC) – Screening and coupling attenuation – Injection clamp method

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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METALLIC COMMUNICATION CABLE TEST METHODS –

Part 4-2: Electromagnetic compatibility (EMC) – Screening and coupling attenuation – Injection clamp method

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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International Standard IEC 62153-4-2 has been prepared by subcommittee 46A: Coaxial cables, of IEC technical committee 46: Cables, wires, waveguides, r.f. connectors, r.f. and microwave passive components and accessories.

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

FDIS	Report on voting
46A/560/FDIS	46A/578/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

METALLIC COMMUNICATION CABLE TEST METHODS –

Part 4-2: Electromagnetic compatibility (EMC) – Screening and coupling attenuation – Injection clamp method

1 Scope

This part of IEC 62153 describes the injection clamp test method which determines the screening attenuation (a_s) of coaxial cables and the coupling attenuation (a_c) of balanced shielded or unshielded data cables in a frequency range from 30 MHz up to 1 000 MHz and in a dynamic range up to 130 dB.

NOTE 1 Contrary to the absorbing clamp method, the method described here uses an injection clamp according to IEC 61000-4-6.

NOTE 2 Due to the low operational attenuation of the injection clamp, the coupling attenuation and the screening attenuation can be determined in a dynamic range up to 130 dB with common measuring equipment. Using an amplifier the dynamic range can be additionally improved.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61000-4-6: *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

ITU-T Recommendation G.117:1996, *Transmission aspects of unbalance about earth*

ITU-T Recommendation O.9:1999, *Measuring arrangements to assess the degree of unbalance about earth*

3 Terms, definitions and symbols

For the purposes of this document, the following terms, definitions and symbols apply.

3.1 Electrical symbols

Table 1 – Electrical symbols

a_{balun}	Operational attenuation of the balun transformer
$a_{cable12}$	Operational attenuation of the connecting coaxial cables
a_c	Coupling attenuation
a_s	Screening attenuation
a_{cal}	Operational attenuation of the test set-up
$a_{cal,far}$	Operational attenuation of the test set-up for far end
$a_{cal,near}$	Operational attenuation of the test set-up for near end
a_{clamp}	Operational attenuation of the clamp
$a_{clamp,ref}$	Reference attenuation of the clamp during calibration
$a_{ferrite}$	Ferrite common-mode rejection