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EUROPEAN STANDARD

EN 50289-1-10

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2001

ICS 33.120.20

English version

**Communication cables -
Specifications for test methods
Part 1-10: Electrical test methods -
Crosstalk**

Câbles de communication -
Spécifications des méthodes d'essai
Partie 1-10: Méthodes d'essais électriques -
Affaiblissement diaphonique

Kommunikationskabel -
Spezifikationen für Prüfverfahren
Teil 1-10: Elektrische Prüfverfahren -
Nebensprechen

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This European Standard was approved by CENELEC on 2001-03-01. 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.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, 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

This European Standard was prepared by the Technical Committee CENELEC TC 46X, Communication cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50289-1-10 on 2001-03-01.

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) 2002-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-04-01

This European Standard has been prepared under the European Mandate M/212 given to CENELEC by the European Commission and the European Free Trade Association.

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6 Test procedure

6.1 Calibration procedure

6.1.1 Insertion loss of test set-up

The insertion loss of the transformers and test set-up shall be measured over the whole specified frequency range. The calibration data shall be saved, such that the results may be corrected.

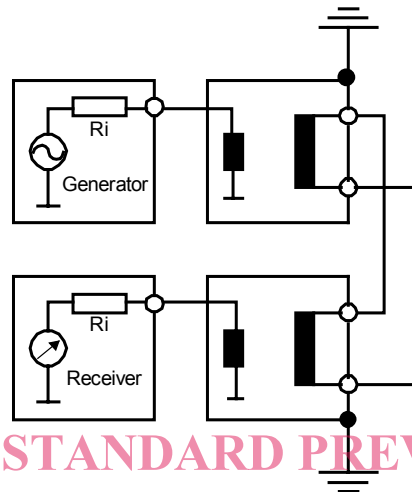


Figure 1 - Calibration set-up

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6.1.2 Crosstalk of test set-up

The crosstalk of the test set-up shall be measured in the following way: The symmetrical measuring ports of the generator and receiver shall be terminated with the nominal impedance of the CUT. The crosstalk shall be measured over the whole specified frequency range, and at the same frequency points as for the calibration procedure.

The crosstalk shall be corrected:

$$a_{\text{check}}(f)_C = a_{\text{cal}}(f) - a_{\text{check}}(f) \text{ (dB)} \quad (4)$$

where

- $a_{\text{cal}}(f)$ = insertion loss measured at calibration procedure
- $a_{\text{check}}(f)$ = crosstalk measured at checking procedure

The corrected crosstalk $a_{\text{check}}(f)_C$ shall be at least 10 dB better over the whole frequency range than the specified values of the cable. A lower margin would lead to inferior accuracy.

6.2 Measuring procedure

The test sample shall be connected to the symmetrical measuring ports. The set-up has to be optimised, so that the mismatch between the measuring ports and the sample is minimised. The pairs/quads which are connected to the measuring devices shall be matched with their nominal impedance at the other cable end. Any cable screens shall be grounded at both ends. For unscreened cables and for cables with an overall screen all quads/pairs in the cable under test shall be terminated. For cables with individually screened pairs, termination is only needed for pairs connected to the measurement equipment.

All terminations should provide termination of both the differential and common mode signal. The nominal value for the differential mode termination is equal to the characteristic impedance of the cable. The nominal value of the common mode termination is 50Ω . Values from 25Ω to 100Ω may be used.

The crosstalk shall be measured over the whole specified frequency range and at the same frequency points as for the calibration procedure.

All pairs/side of quads combinations shall be measured.

NOTE Due to localised couplings, NEXT measurement results are different from both ends of the CUT. FEXT and EL-FEXT measurement results are different when changing transmitting and receiving pairs.

6.2.1 NEXT

For the measurement of NEXT the generator and receiver are connected to the same end of the CUT, as shown in Figure 2.

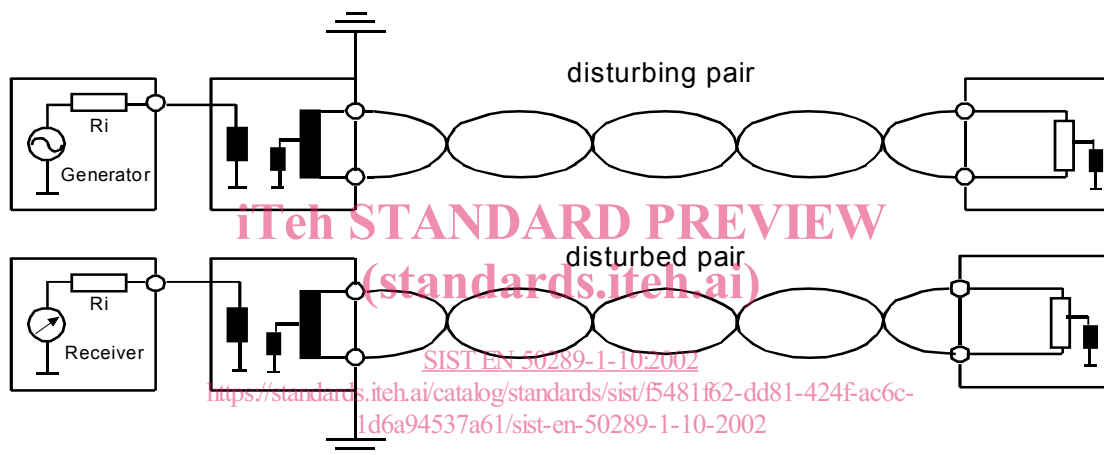


Figure 2 - NEXT set-up

6.2.2 FEXT

For the measurement of FEXT the generator and receiver are connected to the opposite ends of the CUT, as shown in Figure 3.

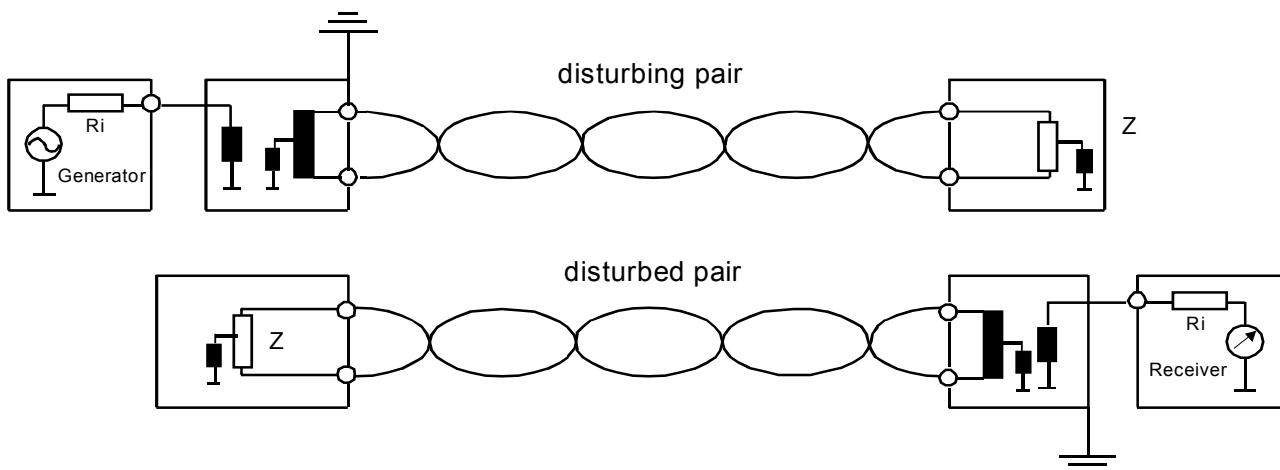


Figure 3 - FEXT set-up