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CABLING GUIDELINES IN SUPPORT OF 10 GBASE-T

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Cabling guidelines in support of 10 GBASE-T

Guide de câblage pour supporter le 10 GBASE-T

Verkabelungsleitfaden zur Unterstützung von 10 GBASE-T

This Technical Report was approved by CENELEC on 2007-11-02.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

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Foreword

This Technical Report was prepared by the Technical Committee CENELEC TC 215, Electrotechnical aspects of telecommunication equipment.

The text of the draft was submitted to vote and was approved by CENELEC as CLC/TR 50173-99-1 on 2007-11-02.

This Technical Report provides guidance whether an installed generic cabling channel meeting the requirements of EN 50173-1:2007, Class E, will support 10 GBASE-T as specified by IEEE 802.3an. The Technical Report also provides mitigation procedures to improve the performance of Class E channels to the point where the application is supported. Generic cabling channels meeting the requirements of EN 50173-1:2007, Class F, will support IEEE 802.3an up to 100 m without mitigation.

The support of IEEE 802.3an includes additional parameters and an extended frequency range beyond Class E. Conformance of installed cabling beyond the original cabling specifications must be determined on a case-by-case basis, and is primarily needed due to new external noise requirements. Whether these requirements are met by a specific channel is influenced by the components and installation practices used. As IEEE 802.3an uses frequencies above those specified for Class E of EN 50173-1:2007, input from supplier and installer may be helpful to evaluate the performance of installed Class E channels.

This Technical Report takes into account the design goals for IEEE 802.3an (10 GBASE-T) equipment such as:

a) frequency signal range up to 500 MHz;

b) meet EMC limits specified for EN 55022:2006, Class A;

NOTE While IEEE 802.3an specifies an application to meet Class A on unshielded cabling, meeting Class B may require application specific equipment and/or cabling that exceeds the requirements of this TR respectively.

c) support a bit error rate of 10^{-12};

d) support operation over four-connector, four-pair balanced cabling.

It is expected that IEEE 802.3an will be supported by the following cabling channels specified in EN 50173-1:2007:

– Class F channels will support IEEE 802.3an to distances of at least 100 m;

– Class E channels using screened Category 6 components and assessed and mitigated according to the guidelines in this Technical Report will support IEEE 802.3an over distances up to 100 m;

– Class E channels assessed and mitigated according to the guidelines in this Technical Report are expected to support IEEE 802.3an over distances from 55 m up to 100 m using unscreened Category 6 components.

In order to provide normative cabling specifications in explicit support of IEEE 802.3an, an amendment to EN 50173-1:2007 is under consideration. This amendment will provide new channel specifications that will include all characteristics needed to meet and/or exceed the IEEE 802.3an requirements (Class E_A and Class F_A).

This Technical Report is derived from ISO/IEC TR 24750, which has been developed by ISO/IEC JTC 1/SC 25 as a Technical Report Type 2.

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