NSAI
Standards

Irish Standard
I.S. EN 61280-2-2:2012

Fibre optic communication subsystem test procedures - Part 2-2: Digital systems - Optical eye pattern, waveform and extinction ratio measurement

I.S. EN 61280-2-2:2012

Incorporating amendments/corrigenda/National Annexes issued since publication:

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This document is based on:	*Published:*
EN 61280-2-2:2012	2012-12-14

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2013-02-12	NOTE: If blank see CEN/CENELEC cover page

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National Foreword

I.S. EN 61280-2-2:2012 is the adopted Irish version of the European Document EN 61280-2-2:2012, Fibre optic communication subsystem test procedures - Part 2-2: Digital systems - Optical eye pattern, waveform and extinction ratio measurement

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61280-2-2

December 2012

ICS 33.180.01

Supersedes EN 61280-2-2:2008

English version

Fibre optic communication subsystem test procedures - Part 2-2: Digital systems - Optical eye pattern, waveform and extinction ratio measurement

(IEC 61280-2-2:2012)

Procédures d'essai des sous-systèmes de télécommunications à fibres optiques - Partie 2-2: Systèmes numériques - Mesure du diagramme de l'oeil optique, de la forme d'onde et du taux d'extinction (CEI 61280-2-2:2012)

Prüfverfahren für Lichtwellenleiter-Kommunikationsuntersysteme - Teil 2-2: Digitale Systeme - Messung des optischen Augendiagramms, der Wellenform und des Extinktionsverhältnisses (IEC 61280-2-2:2012)

This European Standard was approved by CENELEC on 2012-11-29. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 61280-2-2:2012 E

Foreword

The text of document 86C/1043/CDV, future edition 4 of IEC 61280-2-2, prepared by SC 86C "Fibre optic systems and active devices" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61280-2-2:2012.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-08-29
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-11-29

This document supersedes EN 61280-2-2:2008.

EN 61280-2-2:2012 includes the following significant technical changes with respect to EN 61280-2-2:2008:

- additional definitions;
- clarification of test procedures.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61280-2-2:2012 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60825-1	NOTE	Harmonised as EN 60825-1.
IEC 61281-1	NOTE	Harmonised as EN 61281-1.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 61280-2-3	-	Fibre optic communication subsystem test procedures - Part 2-3: Digital systems - Jitter and wander measurements	EN 61280-2-3	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC 61280-2-2
Edition 4.0 2012-10

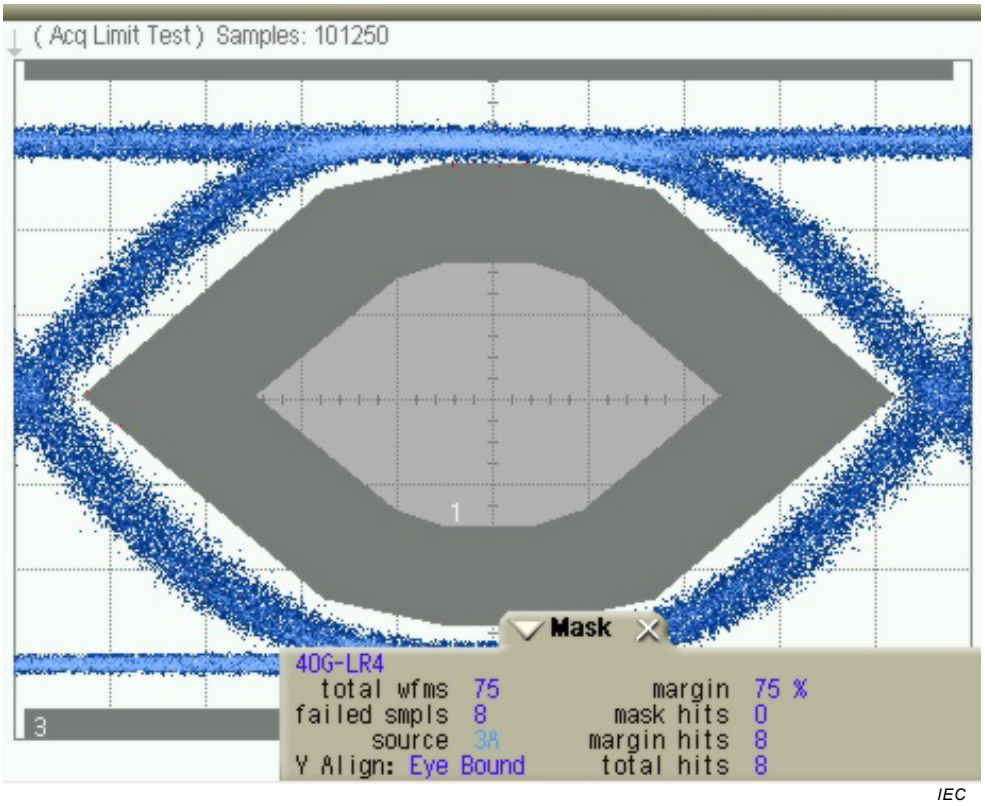
FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 2-2: Digital systems – Optical eye pattern, waveform and extinction ratio measurement

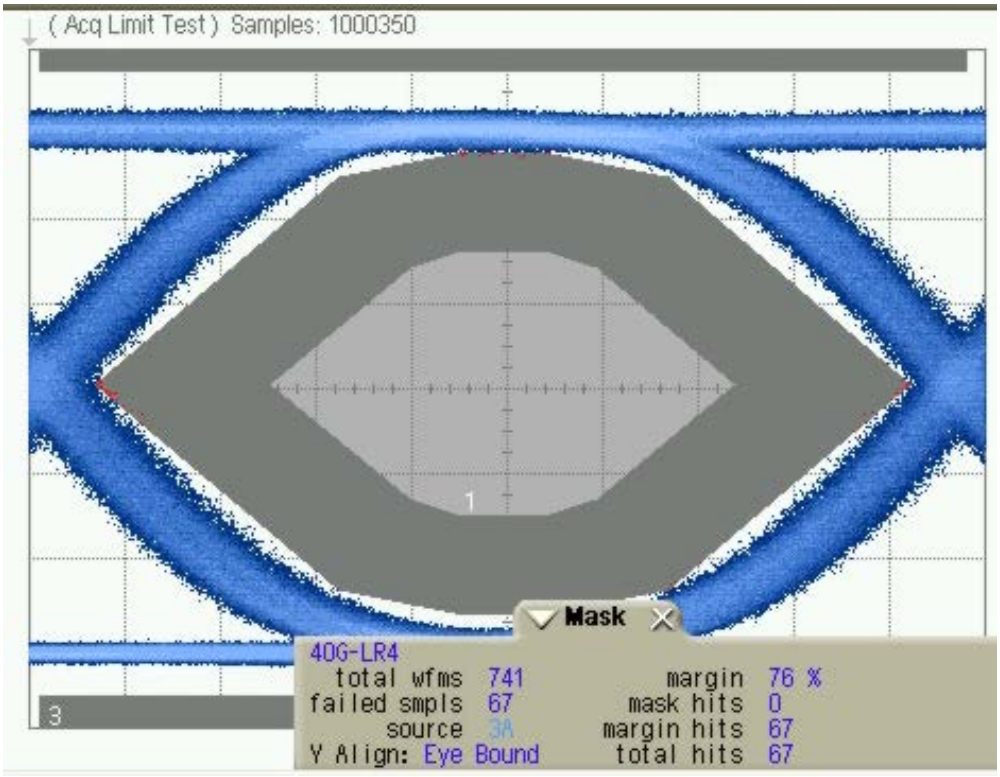
CORRIGENDUM 1

Figure 11 – Mask margins at different sample population sizes

Replace the existing Figure 11 with the following new Figure 11



(a) Mask margin with ~ 100 000 samples tested at a 1:10 000 hit ratio: 75 %



(b) Mask margin (76 %) with over 1 million samples and a 1:10 000 hit ratio

Figure 11 – Mask margins at different sample population sizes

IEC 61280-2-2

Edition 4.0 2012-10

INTERNATIONAL STANDARD

colour inside

Fibre optic communication subsystem test procedures – Part 2-2: Digital systems – Optical eye pattern, waveform and extinction ratio measurement

IEC 61280-2-2:2012(E)

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IEC 61280-2-2

Edition 4.0 2012-10

INTERNATIONAL STANDARD

Fibre optic communication subsystem test procedures – Part 2-2: Digital systems – Optical eye pattern, waveform and extinction ratio measurement

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE U

ICS 33.180.01

ISBN 978-2-83220-420-7

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 2-2: Digital systems – Optical eye pattern, waveform and extinction ratio measurement

FOREWORD

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 61280-2-2 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This fourth edition cancels and replaces the third edition published in 2008 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) additional definitions;

b) clarification of test procedures.

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

CDV	Report on voting
86C/1043/CDV	86C/1074/RVC

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.

A list of all parts in the IEC 61280 series, published under the general title *Fibre optic communication subsystem test procedures*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 2-2: Digital systems – Optical eye pattern, waveform and extinction ratio measurement

1 Scope

The purpose of this part of IEC 61280 is to describe a test procedure to verify compliance with a predetermined waveform mask and to measure the eye pattern and waveform parameters such as rise time, fall time, modulation amplitude and extinction ratio.

2 Normative references

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

IEC 61280-2-3, *Fibre optic communication subsystem test procedures – Part 2-3: Digital systems – Jitter and wander measurements*

3 Terms and definitions

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

3.1
amplitude histogram
graphical means to display the power or voltage population distribution of a waveform

3.2
contrast ratio
ratio of the nominal peak amplitude to the nominal minimum amplitude of two adjacent logical ‘1’s when using return-to-zero transmission

3.3
duty cycle distortion
DCD
measure of the balance of the time width of a logical 1 bit to the width of a logical 0 bit, indicated by the time between the eye diagram nominal rising edge at the average or 50 % level and the eye diagram nominal falling edge at the average or 50 % level

3.4
extinction ratio
ratio of the nominal 1 level to the nominal 0 level of the eye diagram

3.5
eye diagram
type of waveform display that exhibits the overall performance of a digital signal by superimposing all the acquired samples on a common time axis one unit interval in width