

**Digital addressable lighting Interface -- Part 208:
Particular requirements for control gear - Switching
function (device type 7)**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 62386-208:2009 sisaldb Euroopa standardi EN 62386-208:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 62386-208:2009 consists of the English text of the European standard EN 62386-208:2009.
Standard on kinnitatud Eesti Standardikeskuse 30.10.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 30.10.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kätesaadavaks tegemise kuupäev on 27.08.2009.	Date of Availability of the European standard text 27.08.2009.
Standard on kätesaadav Eesti standardiorganisatsionist.	The standard is available from Estonian standardisation organisation.

ICS 29.140.50, 29.140.99

Standardite reproduutseerimis- ja levitamisõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Estonia; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute Estonian Standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: +372 605 5050; E-mail: info@evs.ee

English version

**Digital addressable lighting interface -
Part 208: Particular requirements for control gear -
Switching function (device type 7)
(IEC 62386-208:2009)**

Interface d'éclairage
adressable numérique -
Partie 208: Exigences particulières
pour les appareillages de commande -
Fonction de commutation
(dispositifs de type 7)
(CEI 62386-208:2009)

Digital adressierbare Schnittstelle
für die Beleuchtung -
Teil 208: Besondere Anforderungen
an Betriebsgeräte -
Schaltfunktion (Gerätetyp 7)
(IEC 62386-208:2009)

This European Standard was approved by CENELEC on 2009-07-01. 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, 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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 34C/821/CDV, future edition 1 of IEC 62386-208, prepared by SC 34C, Auxiliaries for lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62386-208 on 2009-07-01.

This Part 208 is intended to be used in conjunction with EN 62386-101 and EN 62386-102, which contain general requirements for the relevant product type (control gear or control devices).

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) 2010-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-07-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62386-208:2009 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 60598-1	NOTE Harmonized as EN 60598-1:2008 (modified).
IEC 60669-2-1	NOTE Harmonized as EN 60669-2-1:2004 (modified).
IEC 60921	NOTE Harmonized as EN 60921:2004 (not modified).
IEC 60923	NOTE Harmonized as EN 60923:2005 (not modified).
IEC 60925	NOTE Harmonized as EN 60925:1991 (not modified).
IEC 60929	NOTE Harmonized as EN 60929:2006 (not modified).
IEC 61347-1	NOTE Harmonized as EN 61347-1:2008 (modified).
IEC 61347-2-3	NOTE Harmonized as EN 61347-2-3:2001 (not modified).
IEC 61547	NOTE Harmonized as EN 61547:2009 (not modified).
CISPR 15	NOTE Harmonized as EN 55015:2006 (not modified).

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62386-101	2009	Digital addressable lighting interface - Part 101: General requirements - System	EN 62386-101	2009
IEC 62386-102	2009	Digital addressable lighting interface - Part 102: General requirements - Control gear	EN 62386-102	2009

CONTENTS

FOREWORD	5
INTRODUCTION	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	8
4 General description	8
5 Electrical specification	9
6 Interface power supply	9
7 Transmission protocol structure	9
8 Timing	9
9 Method of operation	9
10 Declaration of variables	11
11 Definition of commands	12
12 Test procedures	18
Annex A (informative) Examples of algorithms	70
Bibliography	71
 Figure 1 – Example of a possible configuration	11
Figure 2 – Application extended configuration command sequence example	13
Figure 3 – Test sequence QUERY FEATURES	19
Figure 4 – Test sequence Reset State / Persistent Memory	20
Figure 5 – Test sequence QUERY LOAD ERROR	22
Figure 6 – Test sequence QUERY LOAD ERROR with HOLD-OFF TIME	23
Figure 7 – Test sequence QUERY LOAD ERROR with indefinitely HOLD-OFF TIME	24
Figure 8 – Test sequence QUERY Control Gear Information	25
Figure 9 – Test sequence REFERENCE SYSTEM POWER	26
Figure 10 – Test sequence REFERENCE SYSTEM POWER: 100 ms-timeout	27
Figure 11 – Test sequence REFERENCE SYSTEM POWER: Command in-between	28
Figure 12 – Test sequence REFERENCE SYSTEM POWER: 15 min timer	29
Figure 13 – Test sequence REFERENCE SYSTEM POWER: failed	30
Figure 14 – Test sequence THRESHOLDS: Configuration Sequence	31
Figure 15 – Test sequence ERROR HOLD-OFF TIME: Configuration Sequence	33
Figure 16 – Test sequence STORE DTR AS THRESHOLD X	34
Figure 17 – Test sequence STORE DTR AS MIN / MAX LEVEL	35
Figure 18 – Test sequence STORE DTR AS ERROR HOLD-OFF TIME	36
Figure 19 – Test sequence ENABLE DEVICE TYPE: Appl. extended query commands	37
Figure 20 – Test sequence ENABLE DEVICE TYPE: Reference System Power	38
Figure 21 – Test sequence ENABLE DEVICE TYPE: Other Application Extended Configuration Commands	39
Figure 22 – Test sequence ENABLE DEVICE TYPE: Error Hold-Off Time	41
Figure 23 – Test sequence ENABLE DEVICE TYPE: Application Extended Configuration Commands 2	42

Figure 24 – Test sequence DEFAULT ON AND OFF	44
Figure 25 – Test sequence DEFAULT OFF WITH FADING	45
Figure 26 – Test sequence SWITCHING ON AND OFF – FULL RANGE.....	47
Figure 27 – Test sequence SWITCHING ON AND OFF – LIMITED RANGE	51
Figure 28 – Test sequence VIRTUAL DIMMING – FADE TIME.....	54
Figure 29 – Test sequence VIRTUAL DIMMING – FADE RATE.....	56
Figure 30 – Test sequence SWITCHING ON AND OFF – IAPC	57
Figure 31 – Test sequence SWITCHING ON AND OFF – ADJUSTING THRESHOLDS	58
Figure 32 – Test sequence SWITCHING ON AND OFF – ADJUSTING MIN/MAX	60
Figure 33 – Test sequence SWITCHING ON AND OFF – DEFAULT POL/SYS	62
Figure 34 – Test sequence SWITCHING ON AND OFF – POWER ON	64
Figure 35 – Test sequence SWITCHING ON AND OFF – SYSTEM FAILURE.....	66
Figure 36 – Test sequence QUERY EXTENDED VERSION NUMBER.....	68
Figure 37 – Test sequence RESERVED APPLICATION EXTENDED COMMANDS.....	69
Figure A.1 – Examples of switching characteristics	70

Table 1 – virtual arc power level (VAPL)	11
Table 2 – Declaration of variables	12
Table 3 – Summary of the application extended command set	18
Table 4 – Parameters for the test sequence State / Persistent Memory.....	21
Table 5 – Test step QUERY LOAD ERROR with HOLD-OFF TIME.....	23
Table 6 – Test steps REFERENCE SYSTEM POWER: Command in-between.....	28
Table 7 – Test parameter and test steps 1 THRESHOLDS: Configuration Sequence.....	31
Table 8 – Test parameter and test steps 2 THRESHOLDS: Configuration Sequence.....	32
Table 9 – Test parameter and test steps 3 THRESHOLDS: Configuration Sequence.....	32
Table 10 – Test steps ERROR HOLD-OFF TIME: Configuration Sequence	33
Table 11 – Test steps STORE DTR AS THRESHOLD X	34
Table 12 – Test steps STORE DTR AS MIN / MAX LEVEL.....	35
Table 13 – Test steps STORE DTR AS ERROR HOLD-OFF TIME	36
Table 14 – Test steps ENABLE DEVICE TYPE: Appl. extended query commands	37
Table 15 – Test steps ENABLE DEVICE TYPE: Reference System Power	38
Table 16 – Test steps 1 ENABLE DEVICE TYPE: Other Application Extended Configuration Commands.....	40
Table 17 – Test steps 2 ENABLE DEVICE TYPE: Other Application Extended Configuration Commands.....	40
Table 18 – Test steps 3 ENABLE DEVICE TYPE: Other Application Extended Configuration Commands.....	40
Table 19 – Test steps ENABLE DEVICE TYPE: Error Hold-Off Time	41
Table 20 – Test steps 1 ENABLE DEVICE TYPE: Application Extended Configuration Commands 2	43
Table 21 – Test steps 2 ENABLE DEVICE TYPE: Application Extended Configuration Commands 2	43
Table 22 – Test steps DEFAULT ON AND OFF	44
Table 23 – Test steps 1 DEFAULT OFF WITH FADING	45

Table 24 – Test steps 2 DEFAULT OFF WITH FADING	46
Table 25 – Test steps and parameter 1 SWITCHING ON AND OFF – FULL RANGE.....	48
Table 26 – Test steps and parameter 2 SWITCHING ON AND OFF – FULL RANGE.....	48
Table 27 – Test steps and parameter 3 SWITCHING ON AND OFF – FULL RANGE.....	48
Table 28 – Test steps and parameter 4 SWITCHING ON AND OFF – FULL RANGE.....	49
Table 29 – Test steps and parameter 5 SWITCHING ON AND OFF – FULL RANGE.....	50
Table 30 – Test steps and parameter 1 SWITCHING ON AND OFF – LIMITED RANGE.....	52
Table 31 – Test steps and parameter 2 SWITCHING ON AND OFF – LIMITED RANGE.....	52
Table 32 – Test steps and parameter 3 SWITCHING ON AND OFF – LIMITED RANGE.....	52
Table 33 – Test steps and parameter 4 SWITCHING ON AND OFF – LIMITED RANGE.....	53
Table 34 – Test steps and parameter 5 SWITCHING ON AND OFF – LIMITED RANGE.....	53
Table 35 – Test steps and parameter 1 VIRTUAL DIMMING – FADE TIME	54
Table 36 – Test steps and parameter 2 VIRTUAL DIMMING – FADE TIME	55
Table 37 – Test steps and parameter 3 VIRTUAL DIMMING – FADE TIME	55
Table 38 – Test steps VIRTUAL DIMMING – FADE RATE.....	56
Table 39 – Test steps SWITCHING ON AND OFF – IAPC.....	57
Table 40 – Test steps and parameter 1 SWITCHING ON AND OFF – ADJUSTING THRESHOLDS.....	59
Table 41 – Test steps and parameter 2 SWITCHING ON AND OFF – ADJUSTING THRESHOLDS.....	59
Table 42 – Test steps and parameter 3 SWITCHING ON AND OFF – ADJUSTING THRESHOLDS.....	59
Table 43 – Test steps and parameter 1 SWITCHING ON AND OFF – ADJUSTING MIN/MAX	60
Table 44 – Test steps and parameter 2 SWITCHING ON AND OFF – ADJUSTING MIN/MAX	61
Table 45 – Test steps and parameter 3 SWITCHING ON AND OFF – ADJUSTING MIN/MAX	61
Table 46 – Test steps and parameter 1 SWITCHING ON AND OFF – DEFAULT POL/SYS	62
Table 47 – Test steps and parameter 2 SWITCHING ON AND OFF – DEFAULT POL/SYS	63
Table 48 – Test steps and parameter 1 SWITCHING ON AND OFF – POWER ON	64
Table 49 – Test steps and parameter 2 SWITCHING ON AND OFF – POWER ON	65
Table 50 – Test steps and parameter 1 SWITCHING ON AND OFF – SYSTEM FAILURE	66
Table 51 – Test steps and parameter 2 SWITCHING ON AND OFF – SYSTEM FAILURE	67
Table 52 – Test steps RESERVED APPLICATION EXTENDED COMMANDS	69

INTRODUCTION

This first edition of IEC 62386-208 is published in conjunction with IEC 62386-101 and IEC 62386-102. The division of IEC 62386 into separately published parts provides for ease of future amendments and revisions. Additional requirements will be added as and when a need for them is recognized.

This International Standard, and the other parts that make up the IEC 62386-200 series, in referring to any of the clauses of IEC 62386-101 or IEC 62386-102, specify the extent to which such a clause is applicable and the order in which the tests are to be performed. The parts also include additional requirements, as necessary. All parts that make up the IEC 62386-200 series are self-contained and therefore do not include references to each other.

Where the requirements of any of the clauses of IEC 62386-101 or IEC 62386-102 are referred to in this International Standard by the sentence "The requirements of IEC 62386-1XX, clause 'n' apply", this sentence is to be interpreted as meaning that all requirements of the clause in question of Part 101 or Part 102 apply, except any which are inapplicable to the specific type of lamp control gear covered by Part 208.

All numbers used in this International Standard are decimal numbers unless otherwise noted. Hexadecimal numbers are given in the format 0xVV, where VV is the value. Binary numbers are given in the format XXXXXXXXb or in the format XXXX XXXX, where X is 0 or 1; "x" in binary numbers means "don't care".

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 208: Particular requirements for control gear – Switching function (device type 7)

1 Scope

This International Standard specifies a protocol and test methods for the control by digital signals of electronic control gear that switches its output only on and off.

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 62386-101:2009, *Digital addressable lighting interface – Part 101: General requirements – System*

IEC 62386-102:2009, *Digital addressable lighting interface — Part 102: General requirements – Control gear*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in Clause 3 of IEC 62386-101:2009 and Clause 3 of IEC 62386-102:2009 shall apply, with the following additional definitions.

3.1

virtual arc power level

value calculated by the control gear during virtual dimming. It corresponds to the actual level of a dimmable control gear

3.2

virtual dimming

attribute of the control gear for treating arc power commands in the same way as a dimmable control gear. It provides virtual dimming by calculating a virtual arc power level in accordance with the appropriate fading definition, thus requiring the output state to change when the virtual arc power level reaches or passes a threshold

3.3

up switch-on threshold

value against which the virtual arc power level is continually compared, the output of the control gear being switched on whenever the virtual arc power level reaches or passes this level whilst increasing

3.4

up switch-off threshold

value against which the virtual arc power level is continually compared, the output of the control gear being switched off whenever the virtual arc power level reaches or passes this level whilst increasing