IEC 62386-332

Edition 1.0 2017-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Digital addressable lighting interface –
Part 332: Particular requirements – Input devices – Feedback

Interface d'éclairage adressable numérique –
Partie 332: Exigences particulières – Dispositifs d'entrée – Rétroaction

IEC 62386-332:2017-12(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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CONTENTS

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DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 332: Particular requirements – Input devices – Feedback

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 62386-332 has been prepared by IEC technical committee 34: Lamps and related equipment.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
34/430/FDIS	34/473/RVD

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

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

A list of all parts in the IEC 62386 series, published under the general title: *Digital addressable lighting interface* can be found on the IEC website.

This Part 332 of IEC 62386 is to be used in conjunction with:

- IEC 62386-101, which contains general requirements for system components;
- IEC 62386-103, which contains general requirements for control devices.

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

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- withdrawn,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

The contents of the corrigendum of October 2019 have been included in this copy.

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.

INTRODUCTION

IEC 62386 contains several parts, referred to as series. The 1xx series includes the basic specifications. Part 101 contains general requirements for system components, Part 102 extends this information with general requirements for control gear and Part 103 extends it further with general requirements for control devices.

The 2xx parts extend the general requirements for control gear with lamp specific extensions (mainly for backward compatibility with Edition 1 of IEC 62386) and with control gear specific features.

The 3xx parts extend the general requirements for control devices with input device specific extensions describing the instance types as well as some common features that can be combined with multiple instance types.

The setup of the standards is graphically represented in Figure 1 below.

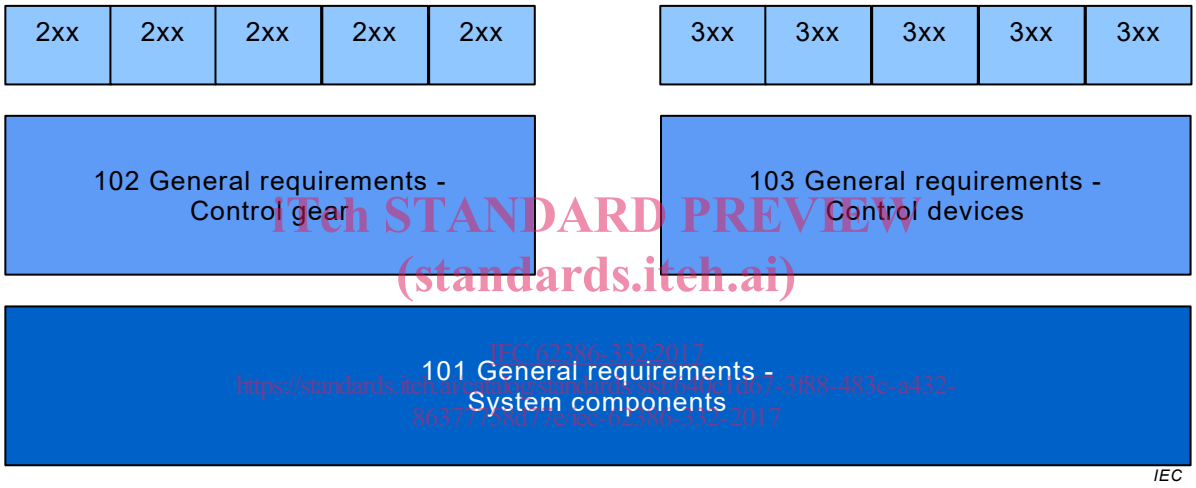

Figure 1 – IEC 62386 graphical overview

This first edition of IEC 62386-332 is intended to be used in conjunction with IEC 62386-101 and IEC 62386-103 and the parts for control gear IEC 62386-2XX as well as the parts for control devices IEC 62386-3XX. 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 document, and the other parts that make up IEC 62386, in referring to any of the clauses of IEC 62386-1XX, IEC 62386-2XX and IEC 62386-3XX, specifies 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.

Where the requirements of any of the clauses of IEC 62386-1XX are referred to in this document 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 1XX apply, except any which are clearly inapplicable.

The standardization of the control interface for control devices is intended to achieve compatible co-existence and multi-master operation between electronic control gear and lighting control devices, below the level of building management systems. This document describes a method of implementing control devices.

All numbers used in this document 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".

The following typographic expressions are used:

Variables: *"variableName"* or *"variableName[3:0]"*, giving only bits 3 to 0 of *"variableName"*.

Range of values: [lowest, highest]

Command: "COMMAND NAME"

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 332: Particular requirements – Input devices – Feedback

1 Scope

This part of IEC 62386 specifies a bus system for control by digital signals of electronic lighting equipment which is in line with the requirements of IEC 61347.

This document is applicable to control devices supporting feedback functionality.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 61347-1, *Lamp controlgear – Part 1: General and safety requirements*

IEC 62386-103:2014, *Digital addressable lighting interface – Part 103: General requirements – Control devices*

IEC 62386-103:2014/AMD1:—[1]

IEC 62386-333[2], *Digital addressable lighting interface – Part 333: Particular requirements for controls devices – Manual configuration (feature type 33)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62386-103 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
feedback
means of informing the user about the system state

3.2
visible feedback
feedback using optical signals

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[1] Under preparation. Stage at the time of publication: IEC TCDV 62386-103/AMD1:2017.

[2] Under preparation. Stage at the time of publication: IEC APUB 62386-333:2017.

3.3
audible feedback
feedback using acoustic signals

3.4
monotonic
state of a function f defined on a subset of the real numbers with real values

Note 1 to entry: Function f is called monotonically non-decreasing, if for all x and y such that $x \leq y$ one has $f(x) \leq f(y)$, so f preserves the order. Likewise, a function is called monotonically non-increasing if, whenever $x \leq y$, then $f(x) \geq f(y)$, so it reverses the order. For this document monotonic is defined as either monotonically non-decreasing or monotonically non-increasing.

4 General

4.1 General

The requirements of IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—, Clause 4 apply, with the restrictions, changes and additions identified below.

4.2 Version number

In 4.2 of IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—, "103" shall be replaced by "332", “version number” shall be replaced by “extended version number” and the current version number shall be replaced by "2.0".

4.3 Insulation

According to IEC 61347-1 it might be required that the input device has at least supplementary insulation. This depends on the connected components. In case feedback accessible for the end user is used, the input device shall have at least supplementary insulation.

NOTE Part 101 requires system components to have at least basic insulation. Feedback is intended to be safely operable by end users.

5 Electrical specification

The requirements of IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—, Clause 5 apply.

6 Interface power supply

The requirements of IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—, Clause 6 apply.

7 Transmission protocol structure

The requirements of IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—, Clause 7 apply.

8 Timing

The requirements of IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—, Clause 8 apply.

9 Method of operation

9.1 General

The requirements of IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—, Clause 9 apply, with the following restrictions and additions.

9.2 Feature type

The feature type shall be equal to 32.

9.3 Feedback type

The supported type of feedback is given in *"feedbackCapability"* which can be queried. The encoding of *"feedbackCapability"* shall be as shown in Table 1.

Table 1 – *"feedbackCapability"* encoding

Bit	Description	Value
0	Visible feedback supported	1 = "Yes"
1	Feedback brightness supported [b]	1 = "Yes"
2	Feedback colour supported	1 = "Yes"
3	Audible feedback supported	1 = "Yes"
4	Feedback volume supported [c]	1 = "Yes"
5	Feedback pitch supported	1 = "Yes"
6	Reserved [a]	0 = default value
7	Reserved [a]	0 = default value

[a] Reserved for future needs.

[b] If visual feedback is supported the variables *"feedbackActiveBrightness"* and *"feedbackInactiveBrightness"* shall be implemented anyhow. The bit Feedback brightness supported from this table only indicates if the feedback has the capability to display other values than on or off.

[c] If audible feedback is supported the variable *"feedbackActiveVolume"* shall be implemented anyhow. The bit Feedback volume supported from this table only indicates if the feedback has the capability to generate other volumes than on or off.

Visible and audible feedback share the variables *"feedbackActive"* and *"feedbackTiming"*.

NOTE Typically a visible feedback is part of a certain instance, while audible feedback is part of the device as audible feedback cannot be spatialized by the user to a certain instance but only to the entire device. In such case the audible and visible feedback can be configured independently through the separate instance and device variables.

9.4 Feedback control

As long as *"feedbackActive"* is set to TRUE the feedback shall operate according to the configuration for active feedback. *"feedbackActive"* can be set to TRUE by means of the command ACTIVATE FEEDBACK.

When *"feedbackActive"* is set to FALSE the feedback shall operate according to the configuration for inactive feedback. *"feedbackActive"* can be set to FALSE by means of the command STOP FEEDBACK.

SELECT FEEDBACK (instanceGroup) shall be used to implement option button functionality. For all feedback features addressed by this command *"feedbackActive"* is set to FALSE except for the feedback features matching the instance group given in the command opcode.

9.5 Feedback configuration

9.5.1 Feedback timing

The variable *"feedbackTiming"* shall be encoded as shown in Table 2.

Table 2 – *"feedbackTiming"* encoding

Bit	Name	Description
0	duty cycle [b]	0 to 7 = active time in steps of 1/8 of the full period in the range of 1/8 to 8/8 of the full period 0 = 12 % to 13 % (1/8) 1 = 24 % to 26 % (2/8) 2 = 36 % to 39 % (3/8) 3 = 48 % to 53 % (4/8) 4 = 59 % to 66 % (5/8) 5 = 71 % to 79 % (6/8) 6 = 83 % to 92 % (7/8) 7 = 100 % (8/8)
1		
2		
3	period [c]	0 to 7 = period in steps of 0,5 s in the range of 0,5 s to 4,0 s 0 = 0,4 s to 0,6 s 1 = 0,9 s to 1,1 s 2 = 1,4 s to 1,6 s 3 = 1,9 s to 2,1 s 4 = 2,3 s to 2,7 s 5 = 2,8 s to 3,2 s 6 = 3,3 s to 3,7 s 7 = 3,8 s to 4,2 s
4		
5		
6	cycles [b]	0 = one cycle (one period) [a] 1 = two cycles (two periods) [a] 2 = three cycles (three periods) [a] 3 = endless
7		

[a] After execution of the selected number of cycles *"feedbackActive"* shall be set to FALSE automatically.

[b] If the duty cycle equals 7 (full period) and cycles equals 3 (endless) the feedback is controlled by brightness and colour respectively volume and pitch only.

[c] A period always starts with its active time.

Optical feedback:

In the active part of a period the visible feedback shall act according to *"feedbackActiveBrightness"* and *"feedbackActiveColour"*. In the remaining part of the period the feedback shall act according to *"feedbackInactiveBrightness"* and *"feedbackInactiveColour"*.