SLOVENSKI STANDARD
oSIST prEN IEC 62386-105:2023

01-oktober-2023

Digitalni naslovljivi vmesnik za razsvetljavo - 105. del: Posebne zahteve za krmilja in krmilne naprave - Prenos strojne programske opreme

Digital addressable lighting interface - Part 105: Particular requirements for control gear and control devices - Firmware transfer

Interface d'éclairage adressable numérique - Partie 105: Exigences particulières pour appareillages et dispositifs de commande - Transfert du microprogramme

Ta slovenski standard je istoveten z: **prEN IEC 62386-105:2023**

ICS:

29.140.50	Instalacijski sistemi za razsvetljavo	Lighting installation systems
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

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34/1062/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
IEC 62386-105 ED2	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
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IEC TC 34 : LIGHTING	
SECRETARIAT: United Kingdom	SECRETARY: Mr Petar Luzajic
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Digital addressable lighting interface - Part 105: Particular requirements for control gear and control devices - Firmware transfer

PROPOSED STABILITY DATE: 2029

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 105: Particular requirements for control gear and control devices – Firmware transfer

FOREWORD

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International Standard IEC 62386-105 has been prepared by IEC technical committee 34: Lighting.

This second edition cancels and replaces the first edition published in 2020. This edition constitutes a technical revision.

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

a) several commands have been modified, renamed and added;

b) variables have been modified and added;

c) recommendations for implementation within emergency control gear have been added;

d) requirements for block acceptance have been changed;

e) example process-flow diagrams have been added;

f) requirements for re-starting and power-on have been changed

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

FDIS	Report on voting
34/XX/FDIS	34/XX/RVD

128

129 Full information on the voting for its approval can be found in the report on voting indicated in
130 the above table.

131 The language used for the development of this International Standard is English.

132 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in
133 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement,
134 available at www.iec.ch/members_experts/refdocs. The main document types developed by
135 IEC are described in greater detail at www.iec.ch/standardsdev/publications.

136 This Part 105 of IEC 62386 is intended to be used in conjunction with:

137 • Part 101, which contains general requirements for system components;

138 • Part 102, which contains general requirements for the relevant product type (control gear),
139 and with the appropriate Parts 2xx (particular requirements for control gear);

140 • Part 103, which contains general requirements for the relevant product type (control
141 devices), and the appropriate Parts 3xx (particular requirements for control devices);

142 • Part 104, which contains general requirements for wireless and alternative wired system
143 components.

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

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

149 • reconfirmed,

150 • withdrawn,

151 • replaced by a revised edition, or

152 • amended.

153

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.

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INTRODUCTION

IEC 62386 contains several parts, referred to as series. The IEC 62386 series specifies a bus system for control by digital signals of electronic lighting equipment. The IEC 62386-1xx 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. Parts 104 and 105 can be applied to control gear or control devices. Part 104 gives requirements for wireless and alternative wired system components. Part 105 describes firmware transfer. Part 150 gives requirements for an auxiliary power supply which can be stand-alone, or built into control gear or control devices.

The IEC 62386-2xx series extends 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 IEC 62386-3xx series extends 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.

This second edition of IEC 62386-105 is intended to be used in conjunction with IEC 62386-101, IEC 62386-102 and the various parts that make up the IEC 62386-2xx series for control gear, together with IEC 62386-103 and the various parts that make up the IEC 62386-3xx series of particular requirements for control devices. The division 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.

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

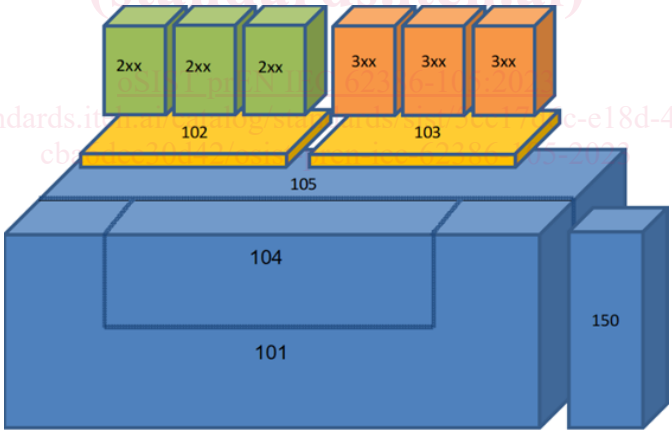

Figure 1 – IEC 62386 graphical overview

When this part of IEC 62386 refers to any of the clauses of the IEC 62386-1xx series, the extent to which such a clause is applicable is specified. The other parts also include additional requirements, as necessary.

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 105: Particular requirements for control gear and control devices – Firmware transfer

1 Scope

This part of IEC 62386 applies to control gear and control devices for control by digital signals of electronic lighting equipment.

Typically, a bus unit according to the IEC 62386 series contains firmware. There are circumstances where it might be necessary to change the firmware after production or shipping of the product. For example if the bus unit does not operate as intended. In such a case, a firmware update of a bus unit via the interface is beneficial.

This firmware update process is primarily designed to be a bug fix process, not a feature extension process. Nevertheless the firmware update process can be used for feature extensions. But it is important that the risk of negative effects to the complete system is considered in detail.

NOTE Annex D provides a “Firmware update management check sheet” to support risk estimation.

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 62386-101:2022, *Digital addressable lighting interface – Part 101: General requirements – System components*

IEC 62386-102:2022, *Digital addressable lighting interface – Part 102: General requirements – Control gear*

IEC 62386-103:2022, *Digital addressable lighting interface – Part 103: General requirements – Control devices*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62386-101, IEC 62386-102 and 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
FW
firmware
software programmed into a control gear or control device, which can be changed during an update

3.2
CRC
cyclic redundancy check
checksum used to prevent data corruption

Note 1 to entry: Annex B provides detailed information about CRC calculation.

3.3
block
unit of data containing firmware update information

Note 1 to entry: Firmware update information usually contains firmware content.

3.4
programming
writing firmware data to NVM

3.5
normal operation
operation according to IEC 62386-102 or IEC 62386-103

4 General

4.1 General

The requirements of IEC 62386-101:2022, Clause 4 apply, with the restrictions, changes and additions identified below.

NOTE Systems with a single-master application controller are unlikely to operate correctly when other master control devices, such as firmware update tools, are connected.

4.2 Logical units in a bus unit

If the firmware update process is started on a bus unit, all logical units inside the bus unit shall be affected. All variables defined in Table 5 shall be shared by all logical units of the bus unit. Commands addressed to one or more logical units within the bus unit shall be accepted by the bus unit according to the requirements of 9.2.

4.3 Updating control gear for emergency lighting

If IEC 62386-105 is implemented in control gear for emergency lighting, the product manual or data sheet should include guidance that the safety implications of a firmware update are to be considered.

5 Electrical specification

The requirements of IEC 62386-101:2022, Clause 5 apply.

6 Interface power supply

The requirements of IEC 62386-101:2022, Clause 6 apply.

7 Transmission protocol structure

7.1 General

The requirements of IEC 62386-101:2022, Clause 7 apply, with the following additions.

7.2 32-bit forward frame encoding

The forward frame format used for firmware update consists of n = 32 data bits as described in IEC 62386-101:2022, 7.4.3 (32-bit forward frame).

For commands, the 32-bit forward frame shall be encoded as shown in Table 1.

Table 1 – 32-bit command frame encoding

Bytes/Bits											Device addressing method
Address byte								Opcode byte			
								1	2	3	
31	30	29	28	27	26	25	24[a]	23…16	15…8	7…0	
0	64 short addresses						x				Short addressing
1	0	1	1	1	1	0	1				Data transfer command [b]
1	1	0	0	1	0	1	1				Data transfer command [b]
1	1	1	1	1	1	0	x				Broadcast unaddressed
1	1	1	1	1	1	1	x				Broadcast
All other address byte values.											Reserved

[a] Where bit 24 is shown as “x”, 0 indicates address space for control gear, 1 indicates address space for control devices.

[b] See Table 7 for data transfer commands.

8 Timing

The requirements of IEC 62386-101:2022, Clause 8 apply.

9 Method of operation

9.1 General

The requirements of IEC 62386-101:2022, clause 9 applies, with the exception that the total duration of a transaction may exceed 400 ms (clause 9.3).

9.2 Commands

A bus unit shall check the device addressing scheme to see if it is addressed by a command. The bus unit shall accept the command, unless any of the following conditions hold:

- The command is sent using short address, broadcast addressing or broadcast unaddressed addressing, and bit 24 of the command frame does not match the type of bus unit (control gear or control device).
- The command is sent using short addressing and the given short address is not equal to its short address.
- The command is sent using reserved addressing.
- The command is sent using broadcast unaddressed addressing and the short address is not MASK.
- The command is not defined (e.g. reserved command).

The following command groups can be identified:

- standard commands;
  - instructions;
  - queries;