IEC 62386-101

Edition 2.0 2014-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Digital addressable lighting interface – Part 101: General requirements – System components

Interface d'éclairage adressable numérique – Partie 101: Exigences générales – Composants de système

IEC 62386-101:2014-11(en-fr)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX XC

ICS 29.140, 29.140.50

ISBN 978-2-8322-1910-2

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 101: General requirements – System components

FOREWORD

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International Standard IEC 62386-101 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

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

a) collection of all bus timing requirements defined in IEC 62386-101:2009 and IEC 62386-102:2009 and rework of the timing requirements to facilitate the preparation of a future control devices standard, taking particular account of the requirements for multi-master systems. The 10 % tolerances have been replaced by minimum and maximum timing values;

b) integration of multi-master timing requirements;

c) extension of the defined forward frames;

d) addition of wiring requirements;

e) improvement of the bus power supply requirements;

f) improvement of test sequences and description of the test sequences in the form of pseudo code instead of flow charts.

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

FDIS	Report on voting
34C/1098/FDIS	34C/1111/RVD

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 Part 101 is intended to be used in conjunction with:

- Part 102, which contains general requirements for the relevant product type (control gear), and with the appropriate Part 2xx (particular requirements for control gear);
- Part 103, which contains general requirements for the relevant product type (control devices), and the appropriate Part 3xx (particular requirements for control devices).

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

A list of all parts of the IEC 62386 series, under the general title: *Digital addressable lighting interface*, 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.

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.

This second edition of IEC 62386-101 is published in conjunction with IEC 62386-102:2014 and with the various parts that make up the IEC 62386-2xx series for control gear, together with IEC 62386-103:2014 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 recognised.

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

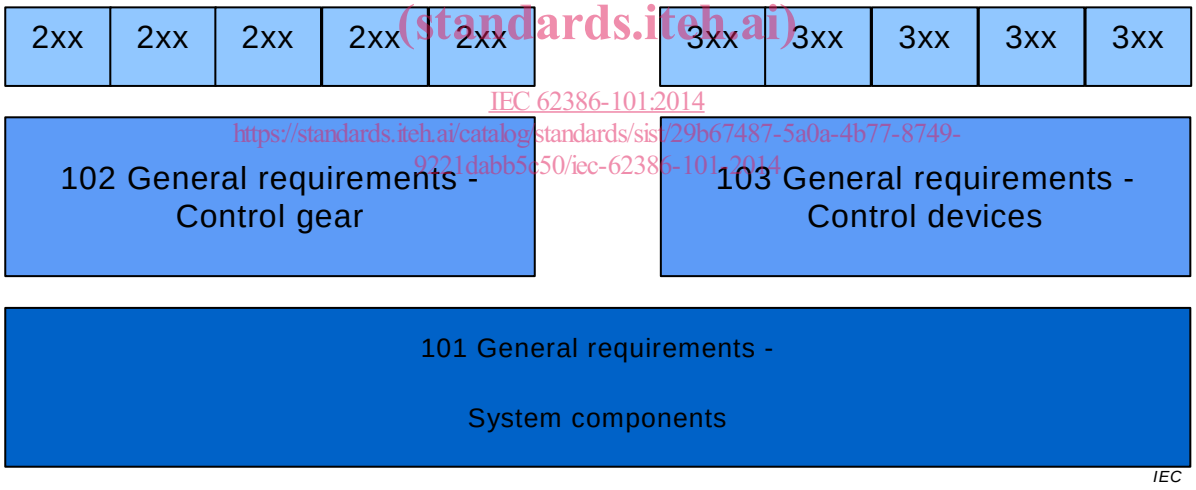

Figure 1 – IEC 62386 graphical overview

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

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, w here X is 0 or 1, "x" in binary numbers means "don't care".

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 101: General requirements – System components

1 Scope

This part of IEC 62386 is applicable to system components in a bus system for control by digital signals of electronic lighting equipment. This electronic lighting equipment should be in line with the requirements of IEC 61347, with the addition of d.c. supplies.

NOTE Tests in this standard are type tests. Requirements for testing individual bus units during production are not included.

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 61347 (all parts), *Lamp controlgear*

IEC 61347-1, *Lamp controlgear – Part 1: General and safety requirements*

IEC 62386-102:2014, *Digital addressable lighting interface – Part 102: General requirements – Control gear*

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

IEC 61000-4-11, *Electromagnetic compatibility (EMC) – Part 4-11:Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

3 Terms and definitions

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

3.1
active state
phase of low level voltage during a transmission

Note 1 to entry: Noise and short pulses may be ignored and therefore do not change the state.

3.2
advanced bus power supply
bus power supply capable of checking the bus for fault conditions before switching on its output continuously

Note 1 to entry: Examples of fault conditions are mains voltage connected to the bus or short circuit of the bus.

3.3
application controller
control device that is connected to the bus and sends commands in order to control input devices and/or control gear connected to the same bus

3.4
backward frame
frame used for backward transmission

3.5
backward transmission
transmission of data as a reply to and triggered by a forward transmission

3.6
bus
two-wire connection line carrying power and frames

3.7
bus powered
drawing the power for operation from the bus

3.8
bus power down
bus power interruption longer than 45 ms

3.9
bus power interruption
abnormal condition where the bus voltage is in the receiver low level voltage range, but not because of a transmitter being active

3.10
bus power supply
unit feeding defined energy to the bus

3.11
bus unit
logical unit or combination of logical units, containing one transmitter and optionally one receiver

Note 1 to entry: See 4.6.6.

3.12
charge overshoot
product of current overshoot time and current overshoot amplitude

Note 1 to entry: Within this standard the charge overshoot is a simple multiplication of the current overshoot time and the current overshoot amplitude.

3.13
collision
situation in which two or more transmitters are transmitting simultaneously

Note 1 to entry: Collisions can go unnoticed if the transmission timing is sufficiently similar and the transmitted frame content is identical.

3.14
command
forward transmission with appropriate information content, intended to cause a reaction in the receiver

Note 1 to entry: A receiver, having decoded a command can, when appropriate, decide to ignore the command.

Note 2 to entry: Refer to Parts 102, 103, 2xx, and 3xx of this standard for command definitions.

3.15
control device
device that is connected to the bus and sends commands to other devices (for example control gear) connected to the same bus

Note 1 to entry: Control devices can also receive commands and backward transmissions.

3.16
control gear
device that is connected to the bus and receives commands in order to control at least one output in a direct or indirect way

Note 1 to entry: The lamp controlgear of IEC 61347-1 can cover control gear.

3.17
current overshoot time
time per bit during which the current supplied by the bus power supply is above the allowed maximum of 250 mA after a transition from idle state to active state

Note 1 to entry: See 6.5.4.

3.18
destroy area

timeslot where a valid frame cannot be guaranteed and therefore the frame has to be invalidated

3.19

edge

change from active state to idle state or vice versa

3.20
event message
command sent by a control device in order to distribute information on the bus

3.21
externally powered
drawing the power for operation from a separate power supply

Note 1 to entry: The separate power supply can be mains power, DC power, etc.

3.22
forward frame
frame used for forward transmission

3.23
forward frame priority
property of a forward frame used to prioritise access to the bus

3.24
forward transmission
transmission of data initiated by a control device

Note 1 to entry: See also 3.5.

3.25
frame
set of consecutive bits followed by a stop condition

Note 1 to entry: See Clause 8 for the timing definition of a stop condition.

3.26
grey area
time slot containing the decision point separating adjacent time slots

Note 1 to entry: This means the decision is arbitrary. Typically the previous or next entry in a table should be used as an action. See Clause 8 for further information.

3.27
idle state
phase of high level voltage between and during transmissions

Note 1 to entry: Noise and short pulses may be ignored and therefore do not change the state.

3.28
input device
control device that is connected to the bus and sends commands using a multi-master transmitter in order to distribute information about user actions and/or sensor values

Note 1 to entry: Input devices do not transmit commands to control gear.

3.29
instance
signal processing unit of an input device

3.30
instruction
command transmitted to change one or more variables in a bus unit

3.31
integrated bus power supply
bus power supply integrated into a physical device also containing a bus unit

3.32
interface
terminals or wires for connection to the bus

3.33
logical unit
control gear or control device that conforms to IEC 62386-102 or IEC 62386-103

Note 1 to entry: See 4.6.6.

3.34
multi-master application controller
application controller that is intended to share the bus with other control devices and uses a multi-master transmitter

3.35
multi-master transmitter
transmitter following the multi-master timing and supporting collision detection, collision avoidance, and collision recovery methods

Note 1 to entry: Multi-master transmitters are used in control devices intended for multi-master control systems.

3.36
proprietary forward frame
frame other than a standard forward frame, reserved forward frame or backward frame