

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

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

<https://standards.iteh.ai/catalog/standards/sist/e7363564-7d54-4450-a94f-d8ab22a5210b/iec-62386-101-2022>



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DIGITAL ADDRESSABLE LIGHTING INTERFACE –**Part 101: General requirements –
System components**

FOREWORD

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IEC 62386-101 has been prepared by IEC technical committee 34: Lighting. It is an International Standard.

This third edition cancels and replaces the second edition published in 2014 and Amendment 1:2018. This edition constitutes a technical revision.

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

- a) the scope has been updated;
- b) safety and earthing have been updated and extended;
- c) references have been updated;
- d) the use of bus-power and external-power has been clarified;
- e) polarity sensitivity for bus units including a bus power supply has been updated;

f) frame sizes of 32 bits are no longer reserved.

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

Draft	Report on voting
34/947/FDIS	34/988/RVD

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

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

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

This Part 101 of IEC 62386 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);
- Part 104, which contains general requirements for wireless and alternative wired system components;
- Part 105, which contains particular requirements for firmware transfer for control gear and control devices.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

IMPORTANT – The "colour inside" logo on the cover page of this document 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 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 third edition of IEC 62386-101 is intended to be used in conjunction with IEC 62386-102 and with 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.

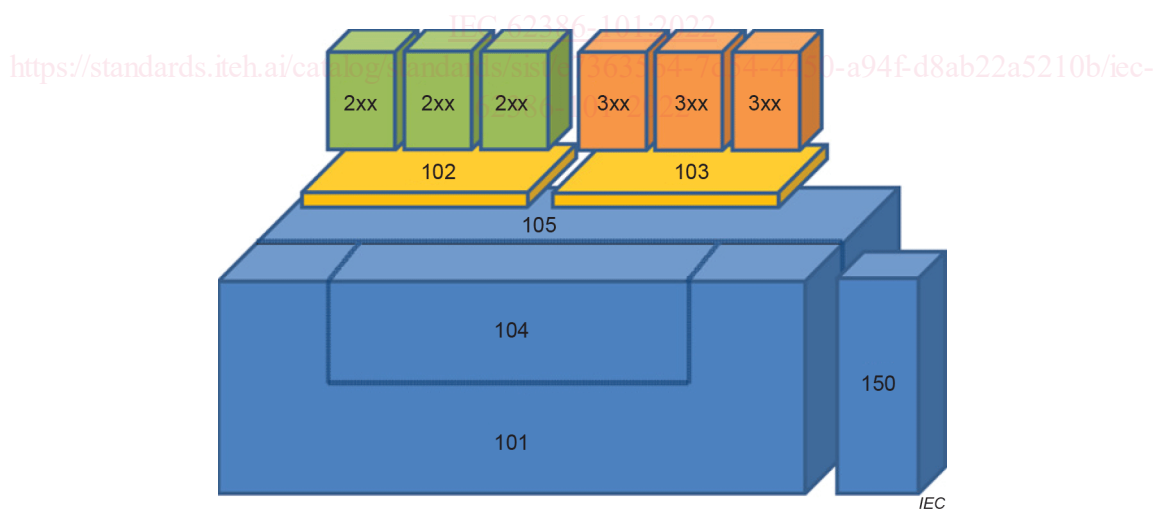


Figure 1 – IEC 62386 graphical overview

When this part of IEC 62386 refers to any of the clauses of the other parts 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".

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.

The control methods, algorithms and data exchange methods of application controllers used for lighting control are not within the scope of the IEC 62386 series. EMC requirements are not within the scope of the IEC 62386 series.

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 61347-1:2015, *Lamp controlgear – Part 1: General and safety requirements*
IEC 61347-1:2015/AMD1:2017

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*

IEC 62386-104, *Digital addressable lighting interface – Part 104: General requirements – Wireless and alternative wired system components*

IEC 62386-105, *Digital addressable lighting interface – Part 105: Particular requirements for control gear and control devices – Firmware Transfer*

IEC 62386-2xx (all parts), *Digital addressable lighting interface – Part 2xx: Particular requirements for control gear*

IEC 62386-3xx (all parts), *Digital addressable lighting interface – Part 3xx: Particular requirements for 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 for equipment with input current up to 16 A per phase*

IEC 60664-1, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*

IEC 61643-11, *Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems – Requirements and test methods*

3 Terms and definitions

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

ISO and IEC maintain terminology 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

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

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 IEC 62386-102, IEC 62386-103, IEC 62386-104, IEC 62386-105, the IEC 62386-2xx series and IEC 62386-3xx series for command definitions.

3.15**control device**

device that is connected to the bus and sends commands to other devices connected to the same bus

Note 1 to entry: Control devices can also receive commands and backward transmissions. Control devices can contain application controllers and/or input devices.

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 described in 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**

time slot where a valid frame cannot be ensured

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 prioritize 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: A grey area indicates that 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 the 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