

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Interface d'éclairage adressable numérique –
Partie 101: Exigences générales – Système**

<https://standards.iteh.ai/catalog/standards/sist/6c48932-4987-4d67-8ed2-bdbd4a7d43b9/iec-62386-101-2009>



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

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 International Standard, together with IEC 62386-102 and IEC 62386-201, replaces Clause E.4, "Control by digital signals", and Annex G, "Test procedures for ballasts with digital control interface according to Clause E.4" of IEC 60929:2006.

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

FDIS	Report on voting
34C/860/FDIS	34C/873/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) containing clauses to supplement or modify the corresponding clauses in Parts 101 and 102 in order to provide the relevant requirements for each type of product.

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

A list of all parts of 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 publication will remain unchanged until the maintenance result 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

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- withdrawn,
- replaced by a revised edition, or
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INTRODUCTION

This first edition of IEC 62386-101 is published in conjunction with IEC 62386-102 and with the various parts that make up the IEC 62386-200 series for control gear. A further number of parts covering control devices (to be published as the general requirements standard IEC 62386-103 and the various parts that make up the IEC 62386-300 series of particular requirements for control devices) is under consideration. 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.

This International Standard, and the other parts that make up the IEC 62386-100 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 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".

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DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 101: General requirements – System

1 Scope

This International Standard specifies a protocol for control by digital signals of electronic lighting equipment used on a.c. or d.c. supplies.

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 60598-1, *Luminaires – Part 1: General requirements and tests*

IEC 60669-2-1:2002, *Switches for household and similar fixed electrical installations – Part 2-1: Particular requirements – Electronic switches*
Amendment 1 (2008)

IEC 61347-2-3:2000, *Lamp controlgear – Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps*

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 following terms and definitions apply.

3.1 control device

device that is connected to the interface and sends commands in order to control other devices (for example lamp control gear) connected to the same interface

3.2 control gear

one or more components between the supply and one or more lamps which may serve to transform the supply voltage, limit the current of the lamp(s) to the required value, provide starting voltage and preheating current, prevent cold starting, correct power factor or reduce radio interference

NOTE A control gear is also connected to the interface and receives commands in order to control at least one output in a direct or indirect way.

3.3 master

device that controls the data stream on the interface

3.4

slave

device that reacts to commands

NOTE A slave does not control the data stream on the interface.

3.5

forward transmission

transmission of data from a master to a slave

3.6

backward transmission

transmission of data from a slave back to the master

3.7

active state

phase of low level during a transmission

3.8

idle state

phase of high level between transmissions

3.9

interface

two-wire data bus with electrical characteristics

NOTE Description of electrical characteristics is given in Clause 5 of this document.

4 General

4.1 Purpose

The standardisation of the control interface for control by digital signals of electronic lighting equipment is intended to achieve interoperable multi-vendor operation between electronic control gear and lighting control devices, below the level of building management systems.

4.2 Master-slave structure

The control gear operates in slave mode only. Consequently, the control gear transmits information only on request and the control gear offers no features supporting collision avoidance or collision handling methods.

Any lighting control device other than a passive sensor may operate as a master.

4.3 Specification overview

The characteristics are given as follows:

- control gear shall not act as a master;
- maximum of 64 individually addressable control gear/devices on one interface;
- maximum of 16 groups addressable on one interface;
- changeable parameters stored in the control gear/devices;
- bi-phase coding for error detection;
- asynchronous start-stop transmission protocol;
- information rate: 1 200 bit/s;
- maximum voltage difference between transmitter and receiver: 2 V;

- isolation of the control interfaces shall be in accordance with 15.5 of IEC 61347-2-3, therefore no ground loops;
- tolerances of timing specifications $\pm 10\%$ if not otherwise specified;
- optional polarity insensitive control interface;
- optional over-voltage protection of the control interface.

5 Electrical specification

5.1 General

All voltages and currents refer to the interface terminals of the control gear/device.

5.2 Marking of the control input terminals

Both interface terminals shall be marked with "da" or "DA" for data. If the interface is polarity sensitive, the terminals shall be marked with "+" and "-" respectively.

5.3 Characteristics of the control interface

The impedance of the control interface measured at the control terminals is:

- $R_{in} \geq 8\text{ k}\Omega$ for control gear at typical high level input voltage
- $C_{in} \leq 1\text{ nF}$
- $L_{in} \leq 1\text{ mH}$

Figure 1 shows the equivalent circuit of the control interface.

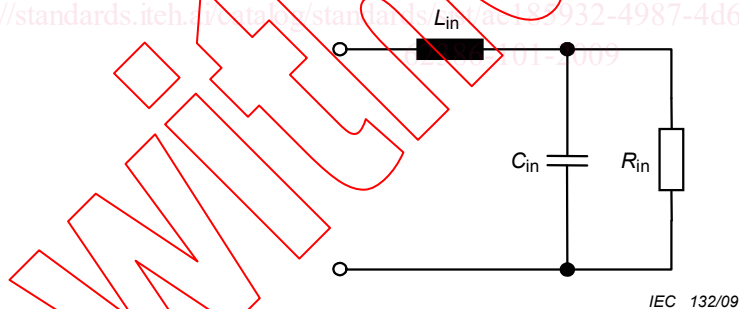


Figure 1 – Equivalent circuit of the control interface

If capacitors are connected from the interface circuit to any other part of the device, such as earth, these shall be connected from the negative side of the interface for polarity sensitive devices, or the negative side of the rectified interface signal for polarity insensitive devices.

NOTE The capacitance C_{in} is affected by the capacitance to earth where a capacitor connected between the negative side of the interface and earth on one device is used with another device containing a capacitor connected between the positive side of the interface and earth.

5.4 Insulating system of the control input terminals

The information about the insulating system in relation to IEC 60598-1 with the classification of

- basic insulation,
- supplementary insulation,
- double or reinforced insulation,

for the control input terminal shall be available on the label and/or in the literature (manual) of the control gear.

5.5 Signal voltage rating

The voltage range shall be between 9,5 V and 22,5 V for “high level” and between – 6,5 V and + 6,5 V for “low level” respectively. Between 6,5 V and 9,5 V, the logic level is undefined. The typical high level voltage is 16 V, the typical low level voltage is 0 V and the typical threshold voltage is 8 V.

During transmission, the control gear/device shall keep the voltage below 4,5 V at “low level”.

The voltage levels are shown in Figure 2.

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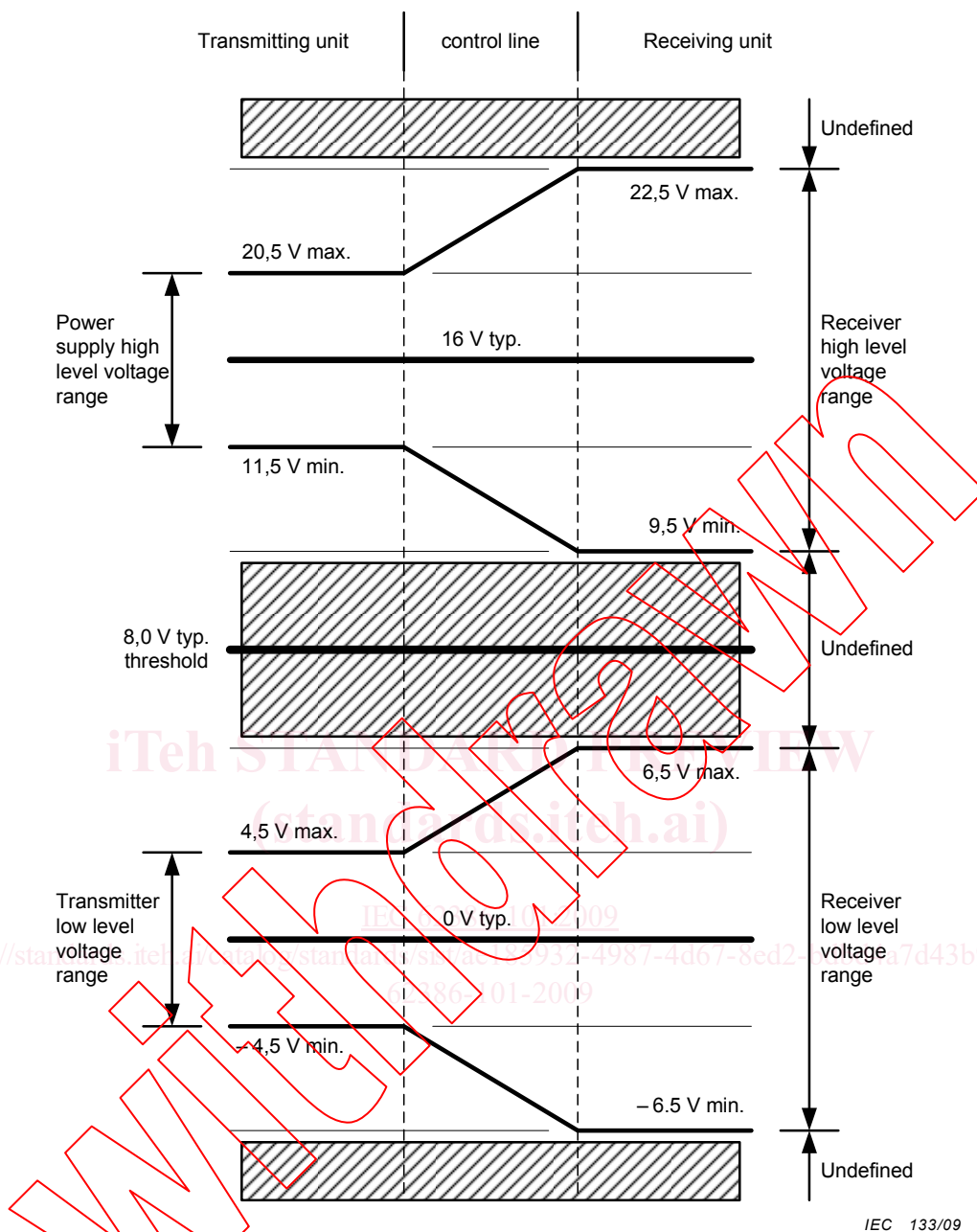


Figure 2 – Voltage levels

5.6 Signal current rating

When in non-active state, the control gear shall not consume more than 2 mA at $\leq 22,5$ V. The control gear/device without integrated power supply shall be able to sink at least 250 mA at $\leq 4,5$ V when in the active state.

Control gear/device with integrated power supply shall be able to sink at least $(250 \text{ mA} - I_{\text{out}})$ at $\leq 4,5$ V when in active state.

I_{out} : current supplied to the interface by the control gear/device.

Control devices may consume more than 2 mA when not in the active state.

The voltage and current levels for forward and backward transmission at a control gear are shown in Figure 3.