

INTERNATIONAL STANDARD



**Digital addressable lighting interface –
Part 201: Particular requirements for control gear – Fluorescent lamps
(device type 0)**

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DIGITAL ADDRESSABLE LIGHTING INTERFACE –**Part 201: Particular requirements for control gear –
Fluorescent lamps (device type 0)****FOREWORD**

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International Standard IEC 62386-201 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 and constitutes a technical revision. The essential changes with respect to the first edition are:

- references to subclauses in IEC 62386-101 and IEC 62386-102 updated to the new structure of the standard;
- test sequence reworked and description of the test sequences in form of a pseudo code instead of flow charts.

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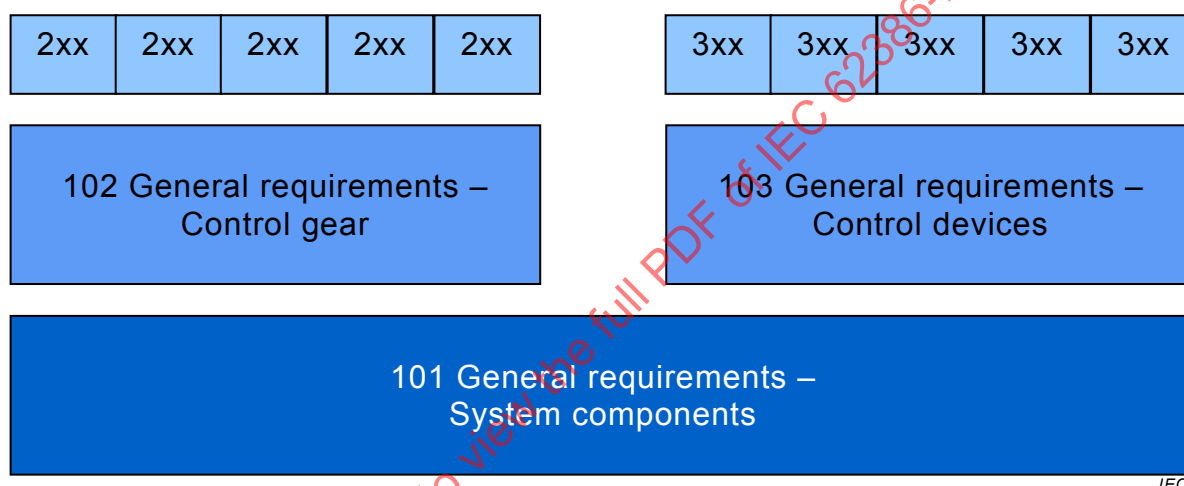
INTRODUCTION

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 standard is graphically represented in Figure 1 below.



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Figure 1 – IEC 62386 graphical overview

This second edition of IEC 62386-201 is published in conjunction with the second edition of IEC 62386-101 and the second edition of IEC 62386-102. 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 International Standard, and the other parts that make up the IEC 62386-200 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 parts that make up the IEC 62386-200 series are self-contained and therefore do not include references to each other.~~

Where the requirements of any of the clauses of IEC 62386-101 or IEC 62386-102 are referred to in this International Standard by the sentence "The requirements of fluorescent lamp control gear (device type 0) shall conform to IEC 62386-1xx, Clause "n", this sentence is to be interpreted as meaning that all requirements of the clause in question of Part 101 or Part 102 apply, except any which are inapplicable to the specific type of lamp control gear covered by Part 201.

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 201: Particular requirements for control gear – Fluorescent lamps (device type 0)

1 Scope

This part of IEC 62386 specifies a ~~protocol and methods of test~~ bus system for control by digital signals of electronic ~~control gear for use on a.c. or d.c. supplies, associated with fluorescent lamps~~ lighting equipment. This electronic lighting equipment should be in line with the requirements of IEC 61347.

This document is applicable to control gear associated with fluorescent lamps.

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 control gear*

IEC 62386-101:2009 2014, *Digital addressable lighting interface – Part 101: General requirements – System components*

IEC 62386-102:2009 2014, *Digital addressable lighting interface – Part 102: General requirements – Control gear*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in Clause 3 of IEC 62386-101:2009 2014 and Clause 3 of IEC 62386-102:2009 2014 apply.

4 General

The requirements of ~~Clause 4 of IEC 62386-101:2009 and of~~ IEC 62386-102:2009 2014, Clause 4 apply, with the following exception:

Replace Subclause 4.2 by the following:

4.2 Extended version number

The extended version number of this document shall be in the format "x.y", where the major extended version number x is in the range of 0 to 62 and the minor extended version number y is in the range of 0 to 2. When the extended version number is encoded into a byte, the major extended version number x shall be placed in bits 7 to 2 and the minor extended version number y shall be placed in bits 1 to 0.

At each amendment to an edition of IEC 62386-201, the minor extended version number shall be incremented by one.

At a new edition of IEC 62386-201, the major extended version number shall be incremented by one and the minor extended version number shall be set to 0.

The current extended version number is "2.0" and is encoded in *extendedVersionNumber*.

NOTE IEC allows normally for 2 amendments before a new edition is created.

5 Electrical specification

The requirements of IEC 62386-101:2009 2014, Clause 5, ~~and Clause 5 of IEC 62386-102:2009~~ apply.

6 Interface power supply

If a power supply is integrated ~~with~~ into a control gear, the requirements of IEC 62386-101:2009 2014, Clause 6, ~~and Clause 6 of IEC 62386-102:2009~~ apply.

7 Transmission protocol structure

~~The requirements of Clause 7 of IEC 62386-101:2009 and Clause 7 of IEC 62386-102:2009 apply.~~

7.1 General

The requirements of Subclause 7.1 of IEC 62386-101:2014 apply.

7.2 Bit encoding

The requirements of Subclause 7.2 of IEC 62386-101:2014 apply.

7.3 Frame description

The requirements of Subclause 7.3 of IEC 62386-101:2014 apply.

7.4 Frame types

The requirements of Subclause 7.4 of IEC 62386-101:2014 apply.

7.5 16 bit forward frame encoding

The requirements of Subclause 7.2 of IEC 62386-102:2014 apply.

8 Timing

The requirements of IEC 62386-101:2009 2014, Clause 8, ~~and Clause 8 of IEC 62386-102~~ apply.

9 Method of operation

The requirements of ~~Clause 9 of IEC 62386-101:2009 and of~~ IEC 62386-102:2009 2014, Clause 9, apply.

10 Declaration of variables

The requirements of ~~Clause 10 of IEC 62386-101:2009 and of~~ IEC 62386-102:2009, Clause 10, apply, with the following additional variables for this device type, as indicated in Table 1.

Table 1 – Declaration of **additional variables**

Variable	Default value (factory)	Reset value	Power-on value	Range of validity	Memory type *
"extendedVersionNumber"	4 2.0	no change	no change	0—255 00001000b	1 byte ROM
"deviceType"	0	no change	no change	0—254, 255 (mask) 0	1 byte ROM

*-Persistent memory (storage time indefinite) if not stated otherwise.

11 Definition of commands

The requirements of ~~Clause 11 of IEC 62386-101:2009 and of~~ IEC 62386-102:2009 2014, Clause 11, ~~shall~~ apply, with the following exceptions:

Amendment of Subclause 11.6 of IEC 62386-102:2009 2014 as follows:

~~11.3.1 Queries related to status information~~

Amendment:

Command 153: ~~YAAA AAA1 1001 1001 "QUERY DEVICE TYPE"~~

~~The answer shall be 0.~~

~~11.3.4 Application extended commands~~

Replacement:

~~Application extended commands shall be preceded by command 272, "ENABLE DEVICE TYPE 0". For device types other than 0, these commands may be used in a different way.~~

~~A fluorescent lamp control gear shall not react to application extended commands preceded by command 272 "ENABLE DEVICE TYPE X" with X ≠ 0.~~

Commands 224 – 239: ~~YAAA AAA1 1110 XXXX~~

~~Reserved for future needs. The fluorescent lamp control gear shall not react in any way.~~

Commands 240 – 247: ~~YAAA AAA1 1111 0XXX~~

~~Reserved for future needs. The fluorescent lamp control gear shall not react in any way.~~

Commands 248 – 251: ~~YAAA AAA1 1111 10XX~~

~~Reserved for future needs. The fluorescent lamp control gear shall not react in any way.~~

Commands 252 – 253: ~~YAAA AAA1 1111 110X~~

~~Reserved for future needs. The fluorescent lamp control gear shall not react in any way.~~

Command 254: ~~YAAA AAA1 1111 1110~~

~~Reserved for future needs. The fluorescent lamp control gear shall not react in any way.~~

Command 255: ~~YAAA AAA1 1111 1111~~ "QUERY ~~EXTENDED~~ ~~VERSION~~ ~~NUMBER~~"

~~The answer shall be 1.~~

~~11.4.4 Extended special commands~~

~~Amendment:~~

Command 272: ~~1100 0001 0000 0000~~ "ENABLE DEVICE TYPE 0"

~~The device type for fluorescent lamp control gear is 0.~~

~~11.5 Summary of the command set~~

~~The commands listed in 11.5 of IEC 62386-101:2009 and 11.5 of IEC 62386-102:2009 apply with the following additional commands for device type 0 listed in Table 2.~~

Table 2 – Summary of the application extended command set

Command number	Command code	Command name
224 – 239	YAAA AAA1 1110 XXXX	^a
240 – 247	YAAA AAA1 1111 0XXX	^a
248 – 251	YAAA AAA1 1111 10XX	^a
252 – 253	YAAA AAA1 1111 110X	^a
254	YAAA AAA1 1111 1110	^a
255	YAAA AAA1 1111 1111	QUERY EXTENDED VERSION NUMBER
272	1100 0001 0000 0000	ENABLE DEVICE TYPE 0
^a Reserved for future needs. The fluorescent lamp control gear shall not react in any way.		

11.6 APPLICATION EXTENDED COMMANDS

11.6.1 General

~~Amendment:~~

Replace *data* by *deviceType*.

11.6.2 QUERY EXTENDED VERSION NUMBER

~~Replacement:~~

The answer shall be *extendedVersionNumber* when device type *deviceType* has been enabled.

Refer to Subclause 4.1 for further information.

Amendment of Subclause 11.7 of IEC 62386-102 as follows:

11.7 Special commands

11.7.14 ENABLE DEVICE TYPE (*data*)

Addition:

data shall be equal to *deviceType* to enable the command set as defined in this standard.

12 Test procedures

The requirements of IEC 62386-102:2009 2014, Clause 12, apply, with the following exceptions:

Additional subclause:

~~12.7 — Test sequences for "Application extended commands for device type 0"~~

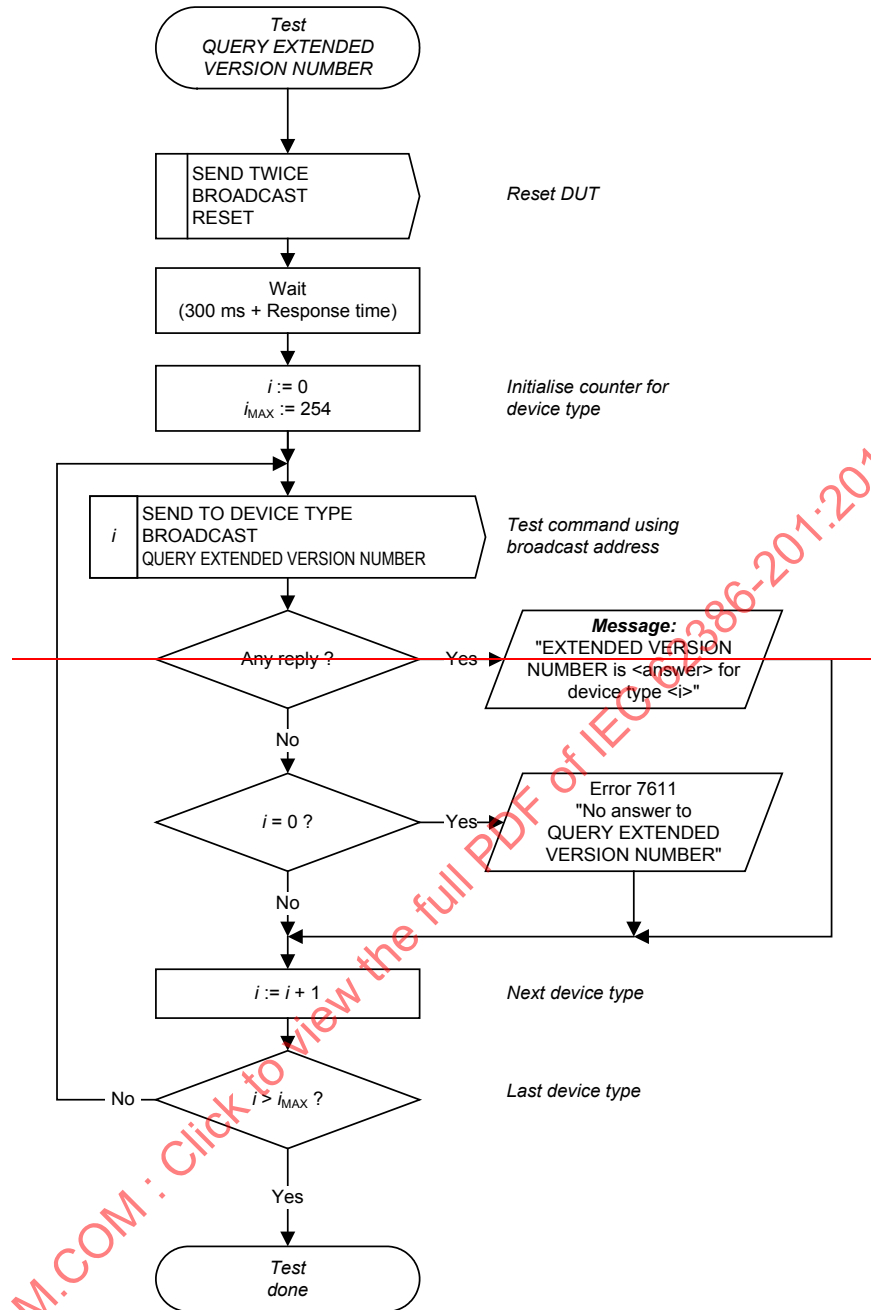
~~12.7.1 — Test sequences for standard application extended commands~~

~~12.7.1.1 — Test sequence for "QUERY EXTENDED VERSION NUMBER"~~

~~Command 255, "QUERY EXTENDED VERSION NUMBER", shall be tested for all possible values of X in command 272, "ENABLE DEVICE TYPE X". The test sequence "QUERY EXTENDED VERSION NUMBER" is shown in Figure 1.~~

~~NOTE — A fluorescent lamp control gear supporting more than one device type will also answer to the query for X not equal to 0.~~

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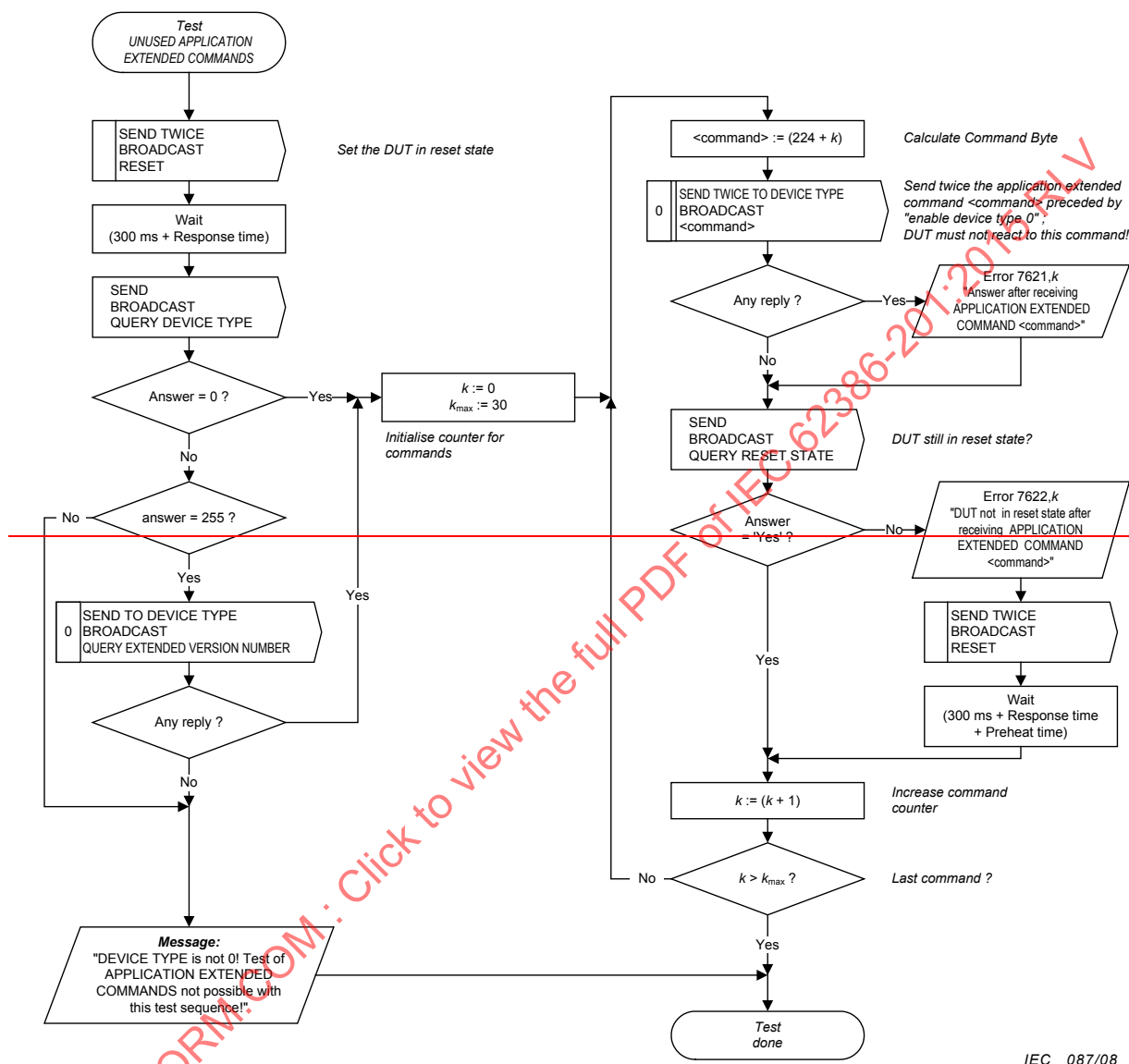


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Figure 1 — Test sequence "QUERY EXTENDED VERSION NUMBER"

~~12.7.1.2 Test sequence for "Unused application extended commands for device type 0"~~

~~A fluorescent lamp control gear of DEVICE TYPE = 0 shall not react on the commands 224 to 254. The sequence "Unused application extended commands for device type 0" is shown in Figure 2.~~



~~Figure 2— Test sequence "Unused application extended commands for device type 0"~~

12.1 Application extended commands tests

12.1.1 Check extended version number

The answer to QUERY EXTENDED VERSION NUMBER shall be checked. The correct answer is 8, which represents extended version number 2.0.

NOTE the principle mechanism of correct enabling different device types is checked by sequences defined in part 102 of this standard.

Test description:

```
// get extended version number using QUERY EXTENDED VERSION NUMBER
ENABLE DEVICE TYPE 0
answer = QUERY EXTENDED VERSION NUMBER
if (answer == NO)
    error 1 DUT did not answer QUERY EXTENDED VERSION NUMBER
else
    answerMajor = answer >> 2
    answerMinor = answer & 0x03
    if ((answerMajor == 2) AND (answerMinor == 0))
        report 1 Reported extended version number is
            answerMajor.answerMinor.
    else
        error 2 Incorrect extended version number.
            Actual: answerMajor.answerMinor. Expected: 2.0.
    endif
endif
```

12.1.2 Reserved application extended commands

The test sequence checks if the control gear answers to reserved application extended commands, which shall not be the case.

Test description:

```
// check reaction on reserved application extended commands
RESET
wait 300 ms
for (j = 0; j < 31; j++)
    // calculate opcode byte
    opcode = (224 + j)
    ENABLE DEVICE TYPE 0
    // send broadcast application extended command
    answer = COMMAND[0xFF, opcode]
    if (answer != NO)
        error 1 Answer to reserved application extended command opcode.
    endif
endfor
```


Bibliography

- [1] ~~IEC 60598-1, Luminaires – Part 1: General requirements and tests~~
 - [2] ~~IEC 60669-2-1, Switches for household and similar fixed electrical installations – Part 2-1: Particular requirements – Electronic switches~~
 - [3] ~~IEC 60921, Ballasts for tubular fluorescent lamps – Performance requirements~~
 - [4] ~~IEC 60923, Auxiliaries for lamps – Ballasts for discharge lamps (excluding tubular fluorescent lamps) – Performance requirements~~
 - [5] ~~IEC 60925, DC-supplied electronic ballasts for tubular fluorescent lamps – performance requirements~~
 - [6] ~~IEC 60929, AC-supplied electronic ballasts for tubular fluorescent lamps – Performance requirements~~
 - [7] ~~IEC 61347-1, Lamp controlgear – Part 1: General and safety requirements~~
 - [8] ~~IEC 61347-2-3, Lamp control gear – Part 2-3: Particular requirements for a.c.-supplied electronic ballasts for fluorescent lamps~~
 - [9] ~~IEC 61547, Equipment for general lighting purposes – EMC immunity requirements~~
 - [10] ~~CISPR 15, Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment~~
 - [11] ~~GS1, "General Specification: Global Trade Item Number", Version 7.0, published by the GS1, Avenue Louise 326, BE-1050 Brussels, Belgium; and GS1, 1009 Lenox Drive, Suite 202, Lawrenceville, New Jersey, 08648 USA.~~
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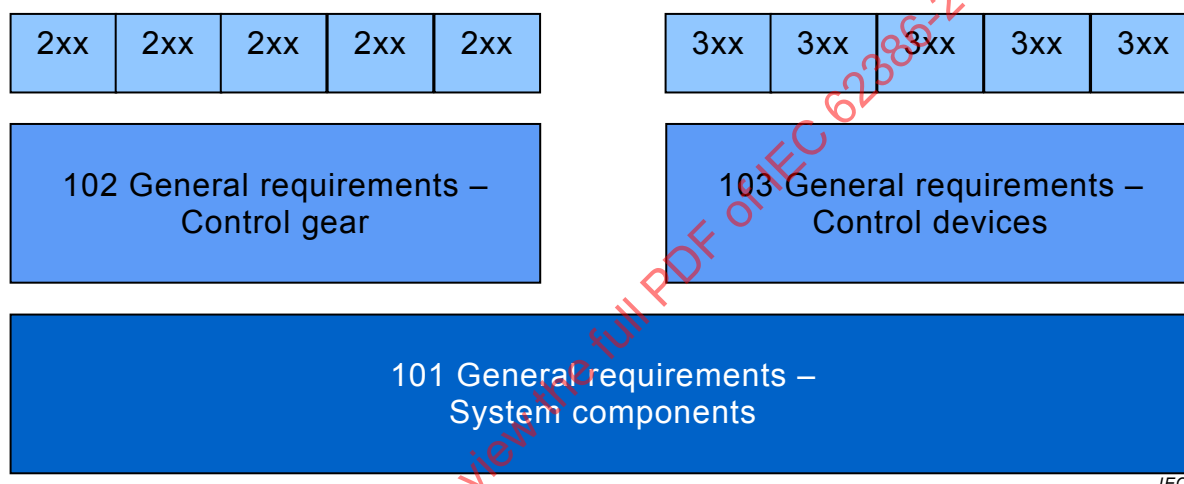


Figure 1 – IEC 62386 graphical overview

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DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 201: Particular requirements for control gear – Fluorescent lamps (device type 0)

1 Scope

This part of IEC 62386 specifies 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.

This document is applicable to control gear associated with fluorescent lamps.

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 control gear*

IEC 62386-101:2014, *Digital addressable lighting interface – Part 101: General requirements – System components*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in Clause 3 of IEC 62386-101:2014 and Clause 3 of IEC 62386-102:2014 apply.

4 General

The requirements of IEC 62386-102:2014, Clause 4 apply, with the following exception:

Replace Subclause 4.2 by the following:

4.2 Extended version number

The extended version number of this document shall be in the format "x.y", where the major extended version number x is in the range of 0 to 62 and the minor extended version number y is in the range of 0 to 2. When the extended version number is encoded into a byte, the major extended version number x shall be placed in bits 7 to 2 and the minor extended version number y shall be placed in bits 1 to 0.

At each amendment to an edition of IEC 62386-201, the minor extended version number shall be incremented by one.