

AS/NZS IEC 62386.202:2024
IEC 62386-202:2022



STANDARDS
Australia



Australian/New Zealand Standard™

Digital addressable lighting interface

Part 202: Particular requirements for control gear — Self-contained emergency lighting (device type 1)



AS/NZS IEC 62386.202:2024

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- Better Regulation Division (Fair Trading, SafeWork NSW, TestSafe)
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- Consumers Federation of Australia
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- Electrical Compliance Testing Association of Australia
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- Lighting Council Australia
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Digital addressable lighting interface

Part 202: Particular requirements for control gear — Self-contained emergency lighting (device type 1)

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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EL-041, Lighting to supersede AS/NZS 62386.202:2020, *Digital addressable lighting interface, Part 202: Particular requirements for control gear — Self-contained emergency lighting (device type 1) (IEC 62386-202:2009 (ED. 1.0) MOD)*.

The objective of this document is to specify requirements for control gear for control by digital signals of electronic lighting equipment which is associated with self-contained emergency lighting as described in IEC 61347-2-7 with additional control interface for configuring emergency operation.

This document is only applicable to control gear complying with IEC 62386-102.

This document does not apply to centrally supplied emergency lighting control gear, which is specified in IEC 62386-220.

This document is identical with, and has been reproduced from, IEC 62386-202:2022, *Digital addressable lighting interface — Part 202: Particular requirements for control gear — Self-contained emergency lighting (device type 1)*.

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FOREWORD

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IEC 62386–202 has been prepared by IEC technical committee 34: Lighting. It is an International Standard.

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) scope updated,
- b) hardwired switch operation can be disabled,
- c) installation inhibit feature added,

- d) memory bank added,
- e) modes of operation clarified, with some changes and additions,
- f) command added to enter extended emergency mode,
- g) command added to extend time in duration test mode.

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

Draft	Report on voting
34/986/FDIS	34/1000/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 202 of IEC 62386 is intended to be used in conjunction with:

- Part 101, which contains general requirements for system components;
- Part 102, which contains general requirements for control gear.

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. Part 104 and Part 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 62386–202 is intended to be used in conjunction with IEC 62386–101 and IEC 62386–102 and with the various parts that make up the IEC 62386–2xx series for control gear, and can be used 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 recognised.

The setup of the standards is graphically represented in [Figure 1](#) below.

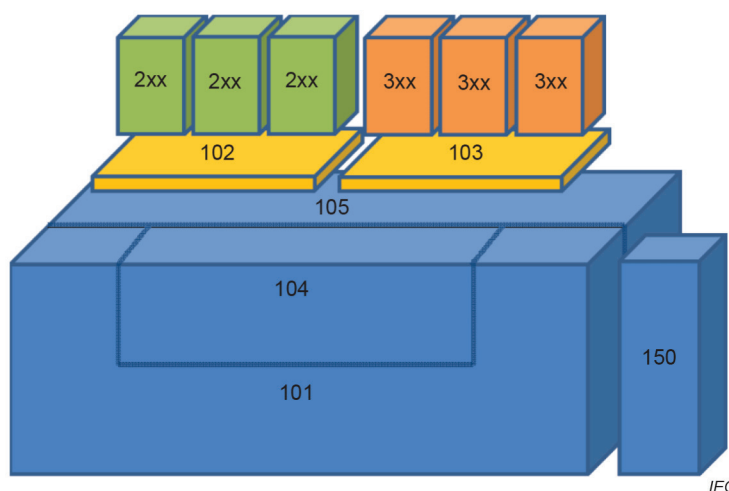


Figure 1 — IEC 62386 graphical overview

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 and "x" in binary numbers means "don't care". Where a variable is referred by a bit number, bit 0 is the least significant bit.

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".

NOTES

Australian/New Zealand Standard

Digital addressable lighting interface

Part 202: Particular requirements for control gear — Self-contained emergency lighting (device type 1)

1 Scope

This part of IEC 62386 is applicable to control gear for control by digital signals of electronic lighting equipment which is associated with self-contained emergency lighting as described in IEC 61347-2-7 with additional control interface for configuring emergency operation.

This document is only applicable to control gear complying with IEC 62386-102.

This document does not apply to centrally supplied emergency lighting control gear, which is specified in IEC 62386-220.

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62386-101 and IEC 62386-102 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

battery cut-off

mode of operation in which the normal supply is disconnected and the battery voltage is below the battery cut-off voltage

Note 1 to entry: Reaching this point can trigger the device to protect against extensive discharge as defined in IEC 61347-2-7:2011, 3.4 and IEC 61347-2-7:2011/AMD2:2021, 3.4.

3.2

battery cut-off voltage

battery voltage, below which the battery can no longer power the control gear or lamp(s)

3.3

duration test

DT

mode of operation in which a test is performed to check the capability of the battery to supply the control gear and lamp, within the limits of rated duration of emergency operation

[SOURCE: IEC 62034:2012, 3.7, modified – The definition has been revised to clarify that this is a mode of operation.]

3.4

emergency level

value representing the light output for emergency lamp operation

Note 1 to entry: In some control gear, the emergency level is configurable.

3.5

emergency mode

mode of operation in which the normal supply has failed and the control gear powers the lamp from the battery

[SOURCE: IEC 60598-2-22:2021, 22.3.17, modified – The definition has been revised to apply to the control gear.]

3.6

emergency physical maximum level

level corresponding to the maximum light output the control gear can operate at when in emergency mode

Note 1 to entry: The light level behaviour in normal mode is not affected by the emergency physical maximum level.

3.7

emergency physical minimum level

level corresponding to the minimum light output the control gear can operate at when in emergency mode

Note 1 to entry: The light level behaviour in normal mode is not affected by the emergency physical minimum level.

3.8

extended emergency mode

mode of operation in which the normal supply is present, with the control gear operating the lamp(s) at the emergency level and drawing power from either source

3.9

extended test duration

additional period of time for which the control gear operates the lamp during a duration test, before indicating a pass result

3.10

function test

FT

mode of operation in which a test is performed to check the integrity of the circuit, change over device, battery and function of the emergency lamp(s)

[SOURCE: IEC 62034:2012, 3.6, modified – The existing term "functional test" has been replaced with "function test" and the definition has been revised to clarify that this is a mode of operation.]

3.11

hardwired inhibit input

optional additional input of the control gear which prevents the control gear from going into the emergency mode while activated

Note 1 to entry: The hardwired inhibit input is specified by the manufacturer. The state of the input can be "active" or "inactive".

3.12

hardwired switch

optional additional input of type A, B and C control gear, that is used to switch the lamp on and off in normal or inhibit modes

Note 1 to entry: The hardwired switch input is specified by the manufacturer. The state of the switch can be "ON" or "OFF".

3.13

inhibit mode

mode of operation in which the control gear is powered from the normal supply but prevented from switching to emergency mode in the event of normal supply failure

[SOURCE: IEC 60598-2-22:2021, 22.3.21, modified – The definition of "remote inhibiting mode" has been modified to apply to the control gear.]

3.14

integral emergency control gear

lamp control gear which forms a non-replaceable part of an emergency luminaire and which cannot be tested separately from the luminaire

[SOURCE: IEC 61347-1:2015, 3.1.3, modified – In the term "lamp controlgear" has been replaced with "emergency control gear" and in the definition, "emergency" has been added.]

3.15

lamp cut-off voltage

battery voltage, below which the battery can no longer power the lamp(s), and which is higher than the battery cut-off voltage

3.16

normal mode

mode of operation in which the normal supply is available and powers the control gear

3.17

normal supply

external supply used for normal operation of the control gear that explicitly excludes the self-contained DC source

3.18

normal supply failure

condition in which the normal supply has failed

3.19

prolong time

time the extended emergency mode will last after restoration of normal supply, before switching to normal mode

3.20

rest mode

mode in which the lamp is intentionally extinguished whilst the normal supply is not available

[SOURCE: IEC 60598-2-22:2021, 22.3.18, modified – The definition has been revised to apply to the control gear.]

3.21

type A control gear

maintained, dimming controllable self-contained emergency control gear with PHM (physical minimum level) < 254 (100 %)

Note 1 to entry: If the normal supply is present, type A control gear acts like a standard dimmable device. Therefore, type A control gear supports the execution of level instructions.

3.22

type B control gear

maintained, on/off controllable self-contained emergency control gear with PHM (physical minimum level) equal to 254 (100 %)

Note 1 to entry: If the normal supply is present, type B control gear acts like a standard dimmable device with its minimum level set to 254. Therefore, type B control gear supports the execution of level instructions.

3.23

type C control gear

maintained, non-controllable self-contained emergency control gear which operates the lamp(s) in normal and inhibit modes, but does not support level instructions nor corresponding configuration commands

Note 1 to entry: The lamp can still be controlled by a hardwired switch or separate interface.

[SOURCE: IEC 60598-2-22:2021, 22.3.5, modified – The term "maintained emergency luminaire" has been replaced with "type C control gear"; the definition has been revised and the note to entry has been added.]

3.24

type D control gear

non-maintained, non-controllable self-contained emergency control gear which does not operate the lamp(s) in normal or inhibit modes, and does not support level instructions nor corresponding configuration commands

Note 1 to entry: Type D control gear can have a switched live (SL) input that can control companion gear on a "piggyback" type emergency control gear. For the purposes of this document this switched live input on type D control gear is not considered a hardwired switch.

[SOURCE: IEC 60598-2-22:2021, 22.3.6, modified – The term "non-maintained emergency luminaire" has been replaced with "type D control gear"; the definition has been revised and the note to entry has been added.]

4 General

4.1 General

The requirements of IEC 62386-102:2022, Clause 4 apply, with the restrictions, changes and additions identified below.

4.2 Version number

In 4.2 of IEC 62386-102:2022, "102" shall be replaced by "202", "version number" shall be replaced by "extended version number", "*versionNumber*" shall be replaced by "*extendedVersionNumber*" and "[Table 16](#)" shall be replaced by "[Table 20](#)".

4.3 Power supply of bus units

Control gear according to this document shall not be bus powered.

4.4 Power interruption at bus units

4.4.1 General

The requirements of IEC 62386-101:2022, 4.11 apply, with the following changes and additions.

4.4.2 Power interruptions of external power supply

Interruptions of the external power supply shall be defined as the period of time beginning with failure of the normal supply and ending when the normal supply has been re-established within the manufacturer-defined operating range. See IEC 62386-101:2022, 4.11.1.

For the case where the battery is connected and remains above the battery cut-off voltage, the short interruption time as specified in IEC 62386-101:2022, 4.11.1 shall apply, otherwise the short interruption time is modified to 2,5 cycles (AC supply) or 50 ms (DC supply).

4.4.3 Communication requirements in rest mode and emergency mode

During both rest and emergency modes, the control gear shall be capable of processing commands received via the interface. These commands are limited as per [9.2](#).

NOTE 1 It is the responsibility of the manufacturer to show that in case power is drawn from the battery, the additional amount of power required for communication during the rated emergency operation is considered when determining the battery capacity.

NOTE 2 It is considered that those commands in [9.2](#) are limited to those required for managing emergency lighting.

4.4.4 Endurance of REST MODE

With a fully-charged battery, if rest mode is entered from inhibit mode, or from execution of REST within 1 min of entering emergency mode, the power consumption whilst in rest mode shall be sufficiently low such that rest mode continues for at least twice the rated duration time without battery cut-off mode being entered.

It is recommended that the control gear and battery combination can operate in rest mode for a time equal to the rated duration or longer, after being in emergency mode for the rated duration or longer with "*emergencyLevel*" equal to "*emergencyPhMaxLevel*".

5 Electrical specification

The requirements of IEC 62386-102:2022, Clause 5 apply.

6 Interface power supply

The requirements of IEC 62386-102:2022, Clause 6 apply, with the following changes.

If a bus power supply is integrated, the maximum supply current specified in IEC 62386-101:2022, 6.5.1, shall be no more than 242 mA.

NOTE This allows for the possibility of an additional bus power supply in the system, such that the bus can still be powered even when the normal supply fails, allowing bus communications whilst in emergency mode or rest mode.

7 Transmission protocol structure

The requirements of IEC 62386-102:2022, Clause 7 apply.

8 Timing

The requirements of IEC 62386-102:2022, Clause 8 apply.

9 Method of operation

9.1 General

The requirements of IEC 62386-102:2022, Clause 9 apply, with the following restrictions, changes and additions. These restrictions, changes and additions apply to all types (A, B, C and D), unless specified otherwise.

9.2 Command execution

To ensure compliance with emergency lighting requirements, it is sometimes necessary for self-contained emergency control gear to deviate from the behaviour specified in IEC 62386-102. Whilst in any of the following modes:

- emergency mode,
- REST mode,

the following restrictions shall apply:

- The control gear shall discard all instructions, all special commands and all application extended instructions, including those defined in this document, those defined in IEC 62386-102, and those defined in other parts of the IEC 62386-2xx series, with the following exceptions (see IEC 62386-102:2022, 9.7):
 - "DTR0(*data*)", "DTR1(*data*)", "DTR2(*data*)";
 - "READ MEMORY LOCATION (*DTR1*, *DTR0*)";
 - "ENABLE DEVICE TYPE (*data*)";
 - any command marked in [Table 21](#) as 'Executed in mode' for the current mode.
- The control gear shall continue to process query commands. The contents of their answers shall be adapted according to [10.2](#).
- The control gear is not required to provide reliable responses to queries of other parts of the IEC 62386-2xx series related to light output.

NOTE The above requirements imply that as long as one of the mentioned modes of operation is active, only commands according to this document are executed where applicable. This also applies for all parts of the IEC 62386-2xx series.

Where applicable, these requirements apply in addition to the restrictions given in [9.3.2](#).

9.3 Non-controllable control gear

9.3.1 General

Types C and D control gear are non-controllable and are not intended to be used for standard lighting purposes. Therefore, their interface serves purely for setting and querying emergency operation related variables and functionality. Light output in normal mode cannot be affected via the interface. The light output in normal mode of a type C control gear can be affected by the state of a hardwired input.

9.3.2 Command execution of non-controllable control gear

Types C and D control gear shall discard all commands described in IEC 62386-102:2022, Clause 11, except for the following:

- configuration instructions (IEC 62386-102:2022, 11.4) listed here:
 - "RESET";
 - "SET OPERATING MODE";
 - "RESET MEMORY BANK";
 - "IDENTIFY DEVICE";
 - "ADD TO GROUP (*group*)";
 - "REMOVE FROM GROUP (*group*)";
 - "SET SHORT ADDRESS (*DTR0*)";
 - "ENABLE WRITE MEMORY";
- queries (IEC 62386-102:2022, 11.5), also see [10.2](#);
- special commands (IEC 62386-102:2022, 11.7).

Types C and D control gear shall discard all level instructions and configuration commands related to the level described in other parts of the IEC 62386-2XX series.

9.3.3 Status bits of non-controllable control gear

For non-controllable control gear (types C and D), the following restrictions apply to the status bits as described in IEC 62386-102:2022, 9.16:

- Bit 2: "*lampOn*"
Shall be FALSE for type D if normal mode or inhibit mode is active.
- Bit 3: "*limitError*"
Shall be FALSE for types C and D in any case.
- Bit 4: "*fadeRunning*"
Shall be FALSE for types C and D in any case.
- Bit 7: "*powerCycleSeen*"
Shall be FALSE for types C and D in any case.

9.4 Emergency level

9.4.1 General

[Subclauses 9.4.2](#) to [9.4.5](#) contain information related to emergency level.

9.4.2 Emergency operation light output and emergency level

"*emergencyLevel*" shall comply with the dimming curve given in IEC 62386-102:2022, 9.3, where "*actualLevel*" is replaced by "*emergencyLevel*".

It is recommended that the light output at any level with emergency mode active is similar to the light output at the same level when in normal mode.

9.4.3 Emergency physical maximum and minimum level

While operating in emergency, extended emergency or test modes, it is possible that the control gear will not be able to provide the same dimming range as in normal mode.

Therefore *"emergencyPhMaxLevel"* and *"emergencyPhMinLevel"* shall restrict the usable range of *"emergencyLevel"*, as follows:

"emergencyPhMinLevel" ≤ *"emergencyLevel"* ≤ *"emergencyPhMaxLevel"*.

NOTE An example case where restricting light output via *"emergencyPhMaxLevel"* can be required is when there is a requirement for operation at higher ambient temperatures in emergency mode.

"emergencyPhMaxLevel" can be queried with "QUERY EMERGENCY PHYSICAL MAX LEVEL".

"emergencyPhMinLevel" can be queried with "QUERY EMERGENCY PHYSICAL MIN LEVEL".

If the control gear does not support a change of emergency level, then *"emergencyPhMinLevel"* shall equal *"emergencyPhMaxLevel"*.

9.4.4 Configuring emergency level

"emergencyLevel" shall be set using STORE EMERGENCY LEVEL (*DTR0*) and can be queried using QUERY EMERGENCY LEVEL.

9.4.5 Testing of emergency level

To facilitate testing of *"emergencyLevel"* it shall be possible to manually enter the extended emergency mode by using PERFORM SELECTED FUNCTION (*DTR1*, *DTR0*).

To ensure battery discharge is limited to an absolute minimum, the instruction shall be executed only if *"prolongTime"* equals 0x09 (4 min 30 s) or less, and shall be discarded otherwise.

The extended emergency mode shall be cancelled on reception of command REST, in accordance with 9.7.5.

NOTE 1 Use of this mode can affect the battery charge level, which can be considered by application controllers intending to use this feature.

NOTE 2 This method allows for adjustment and/or verification of emergency lighting levels without actively switching of the normal supply being necessary.

9.5 Mode transition timing and behaviour

There are two separate sources of supply. As a result, power-on and receiver start-up behaviour require special attention.

Table 1 describes the power-on and receiver start-up behaviour, according to the mode transition.

Table 1 — Mode transition behaviour

Initial mode	New mode	Behaviour related to IEC 62386-102 power-on	Behaviour related to IEC 62386-101 receiver start-up
Battery cut-off	Normal mode	Power-on behaviour according to IEC 62386-102:2022, 9.13	According to IEC 62386-101:2022, 4.11.6