

This is a preview - click here to buy the full publication



IEC 62386-304

Edition 1.1 2024-04
CONSOLIDATED VERSION

INTERNATIONAL STANDARD



**Digital addressable lighting interface –
Part 304: Particular requirements – Input devices – Light sensor**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.140.50; 29.140.99

ISBN 978-2-8322-8754-5

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
4 General	9
4.1 General.....	9
4.2 Version number	9
4.3 Insulation.....	9
5 Electrical specification.....	9
6 Interface power supply	9
7 Transmission protocol structure	10
8 Timing	10
9 Method of operation.....	10
9.1 General.....	10
9.2 Instance type	10
9.3 Input signal and value.....	10
9.4 Events	11
9.4.1 Priority use	11
9.4.2 Bus usage	11
9.4.3 Encoding	11
9.4.4 Event configuration.....	11
9.4.5 Event generation	12
9.5 Configuring the input device.....	14
9.5.1 Using the report timer	14
9.5.2 Using the deadtime timer	15
9.5.3 Setting the timers	15
9.5.4 Setting the hysteresis	16
9.5.5 Manual configuration	16
9.6 Exception handling.....	17
9.6.1 Physical sensor failure.....	17
9.6.2 Manufacturer specific errors	17
9.6.3 Error value.....	17
10 Declaration of variables	17
11 Definition of commands	19
11.1 General.....	19
11.2 Overview sheets	19
11.2.1 General	19
11.2.2 Standard commands	19
11.3 Event messages	19
11.3.1 INPUT NOTIFICATION (<i>device/instance, event</i>).....	19
11.3.2 POWER NOTIFICATION (<i>device</i>)	19
11.4 Device control instructions	19
11.5 Device configuration instructions.....	19
11.6 Device queries	20
11.7 Instance control instructions	20

11.8	Instance configuration instructions	20
11.8.1	General	20
11.8.2	SET EVENT FILTER (<i>DTR0</i>)	20
11.8.3	SET REPORT TIMER (<i>DTR0</i>).....	20
11.8.4	SET HYSTERESIS (<i>DTR0</i>).....	20
11.8.5	SET DEADTIME TIMER (<i>DTR0</i>)	20
11.8.6	SET HYSTERESIS MIN (<i>DTR0</i>).....	20
11.9	Instance queries	20
11.9.1	General	20
11.9.2	QUERY DEADTIME TIMER	20
11.9.3	QUERY INSTANCE ERROR.....	21
11.9.4	QUERY REPORT TIMER.....	21
11.9.5	QUERY HYSTERESIS	21
11.9.6	QUERY HYSTERESIS MIN.....	21
11.10	Special commands.....	21
	Bibliography.....	22
	Figure 1 – IEC 62386 graphical overview	6
	Figure 2 – Example of <i>inputValue</i> measured value changes and resultant hysteresis bands	14
	Table 1 – Illuminance level events	11
	Table 2 – Event filter.....	12
	Table 3 – Event timer setting	15
	Table 4 – Default and reset values for “ <i>hysteresisMin</i> ”	16
	Table 5 – “ <i>manualCapabilityInstance3xx</i> ” values	17
	Table 6 – “ <i>instanceErrorByte</i> ” values	17
	Table 7 – Declaration of device variables.....	18
	Table 8 – Restrictions to instance variables defined in IEC 62386-103:2014 and IEC 62386-103:2014/AMD1: IEC 62386-103:2022	18
	Table 9 – Declaration of instance variables.....	18
	Table 10 – Standard commands.....	19

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 304: Particular requirements – Input devices – Light sensor

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62386-304 edition 1.1 contains the first edition (2017-05) [documents 34C/1314/FDIS and 34C/1334/RVD] and its amendment 1 (2024-04) [documents 34/1014/CDV and 34/1079A/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62386-304 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

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

This Part 304 of IEC 62386 is intended to be used in conjunction with:

- Part 101, which contains general requirements for system components;
- Part 103, which contains general requirements for 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 and its amendment 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, or
- revised.

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 first edition of IEC 62386-304 is intended to be used in conjunction with ~~IEC 62386-101:2014, IEC 62386-101:2014/AMD1:~~ IEC 62386-101:2022, ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:~~ IEC 62386-103:2022. 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.

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

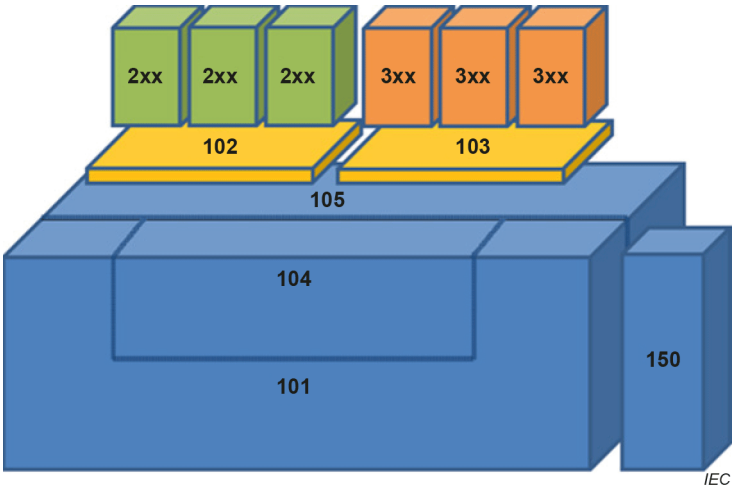
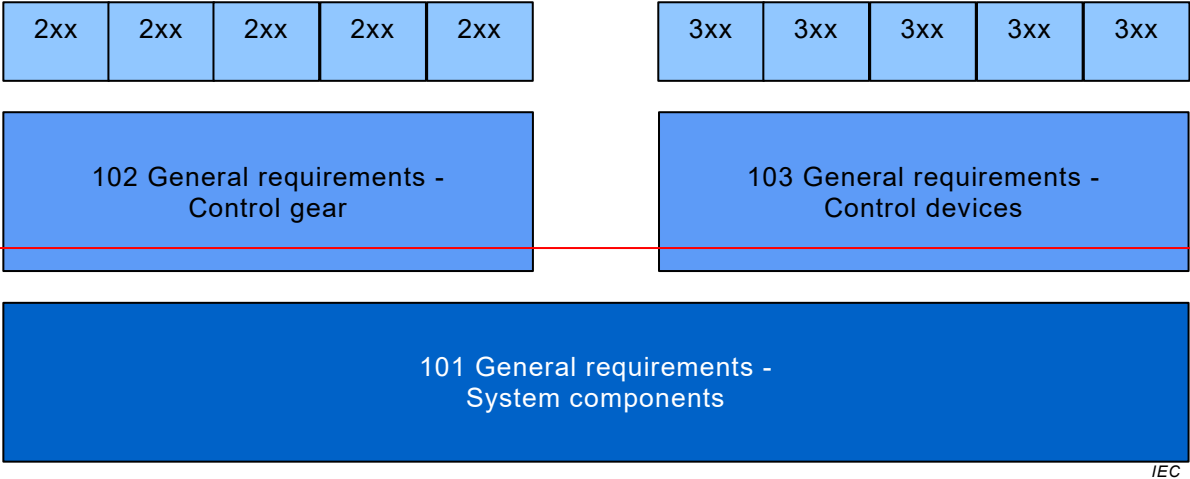


Figure 1 – IEC 62386 graphical overview

This document, and the other parts that make up the IEC 62386-300 series, in referring to any of the clauses of IEC 62386-1XX, specifies 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.

Where the requirements of any of the clauses of IEC 62386-1XX are referred to in this document by the sentence “The requirements of IEC 62386-1XX, Clause “n” apply”, this sentence is to be interpreted as meaning that all requirements of the clause in question of Part 1XX apply, except any which are clearly inapplicable.

The standardization of the control interface for control devices is intended to achieve compatible co-existence and multi-master operation between electronic control gear and lighting control devices, below the level of building management systems. This document describes a method of implementing light sensors.

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”.

The following typographic expressions are used:

Variables: “*variableName*” or “*variableName*[3:0]”, giving only bits 3 to 0 of “*variableName*”.

Time value is expressed in minutes and seconds: mm:ss

Range of values: [lowest, highest]

Command: “COMMAND NAME”

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 304: Particular requirements – Input devices – Light sensor

1 Scope

~~This part of IEC 62386 specifies a bus system for control by digital signals of electronic lighting equipment which is in line with the requirements of IEC 61347, with the addition of DC supplies.~~

~~This document is only applicable to IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:— input devices that deliver illuminance level information to the lighting control system through light level sensing.~~

~~NOTE—Requirements for testing individual products during production are not included.~~

This part of IEC 62386 is applicable to input devices that provide illuminance level information to the lighting control system through light level sensing.

This document is only applicable to input devices complying with IEC 62386-103:2022.

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:~~2014~~2022, *Digital addressable lighting interface – Part 101: General requirements – System components*

~~IEC 62386-101:2014/AMD1:—¹~~

IEC 62386-103:~~2014~~2022, *Digital addressable lighting interface – Part 103: General requirements – Control devices*

~~IEC 62386-103:2014/AMD1:—²~~

IEC 62386-333:~~—³~~2018, *Digital addressable lighting interface – Part 333: Particular requirements for control devices – Manual configuration (feature type 33)*

¹~~—Under preparation. Stage at the time of publication: IEC ACDV 62386-101/AMD1:2017.~~

²~~—Under preparation. Stage at the time of publication: IEC ACDV 62386-103/AMD1:2017.~~

³~~—Under preparation. Stage at the time of publication: IEC CCDV 62386-333:2017.~~

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
4 General	9
4.1 General.....	9
4.2 Version number	9
4.3 Insulation.....	9
5 Electrical specification.....	9
6 Interface power supply	9
7 Transmission protocol structure	9
8 Timing	9
9 Method of operation.....	9
9.1 General.....	9
9.2 Instance type	9
9.3 Input signal and value.....	9
9.4 Events	10
9.4.1 Priority use	10
9.4.2 Bus usage	10
9.4.3 Encoding	10
9.4.4 Event configuration.....	11
9.4.5 Event generation	11
9.5 Configuring the input device.....	13
9.5.1 Using the report timer	13
9.5.2 Using the deadtime timer	13
9.5.3 Setting the timers	13
9.5.4 Setting the hysteresis	14
9.5.5 Manual configuration	15
9.6 Exception handling.....	15
9.6.1 Physical sensor failure.....	15
9.6.2 Manufacturer specific errors	15
9.6.3 Error value.....	15
10 Declaration of variables	16
11 Definition of commands	17
11.1 General.....	17
11.2 Overview sheets	17
11.2.1 General	17
11.2.2 Standard commands.....	17
11.3 Event messages	18
11.3.1 INPUT NOTIFICATION (<i>device/instance, event</i>).....	18
11.3.2 POWER NOTIFICATION (<i>device</i>)	18
11.4 Device control instructions	18
11.5 Device configuration instructions.....	18
11.6 Device queries	18
11.7 Instance control instructions	18

11.8	Instance configuration instructions	18
11.8.1	General	18
11.8.2	SET EVENT FILTER (<i>DTR0</i>)	18
11.8.3	SET REPORT TIMER (<i>DTR0</i>).....	18
11.8.4	SET HYSTERESIS (<i>DTR0</i>).....	18
11.8.5	SET DEADTIME TIMER (<i>DTR0</i>)	18
11.8.6	SET HYSTERESIS MIN (<i>DTR0</i>).....	19
11.9	Instance queries	19
11.9.1	General	19
11.9.2	QUERY DEADTIME TIMER	19
11.9.3	QUERY INSTANCE ERROR	19
11.9.4	QUERY REPORT TIMER.....	19
11.9.5	QUERY HYSTERESIS	19
11.9.6	QUERY HYSTERESIS MIN.....	19
11.10	Special commands.....	19
	Bibliography.....	20
	Figure 1 – IEC 62386 graphical overview	6
	Figure 2 – Example of measured value changes and resultant hysteresis bands.....	13
	Table 1 – Illuminance level events	11
	Table 2 – Event filter.....	11
	Table 3 – Event timer setting	14
	Table 4 – Default and reset values for “ <i>hysteresisMin</i> ”	15
	Table 5 – “ <i>manualCapabilityInstance3xx</i> ” values	15
	Table 6 – “ <i>instanceErrorByte</i> ” values	16
	Table 7 – Declaration of device variables.....	16
	Table 8 – Restrictions to instance variables defined in IEC 62386-103:2022	16
	Table 9 – Declaration of instance variables.....	17
	Table 10 – Standard commands.....	17

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

**Part 304: Particular requirements – Input devices –
Light sensor**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62386-304 edition 1.1 contains the first edition (2017-05) [documents 34C/1314/FDIS and 34C/1334/RVD] and its amendment 1 (2024-04) [documents 34/1014/CDV and 34/1079A/RVC].

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

International Standard IEC 62386-304 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

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

This Part 304 of IEC 62386 is intended to be used in conjunction with:

- Part 101, which contains general requirements for system components;
- Part 103, which contains general requirements for 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 and its amendment 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, or
- revised.

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 first edition of IEC 62386-304 is intended to be used in conjunction with IEC 62386-101:2022, IEC 62386-103:2022. 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.

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

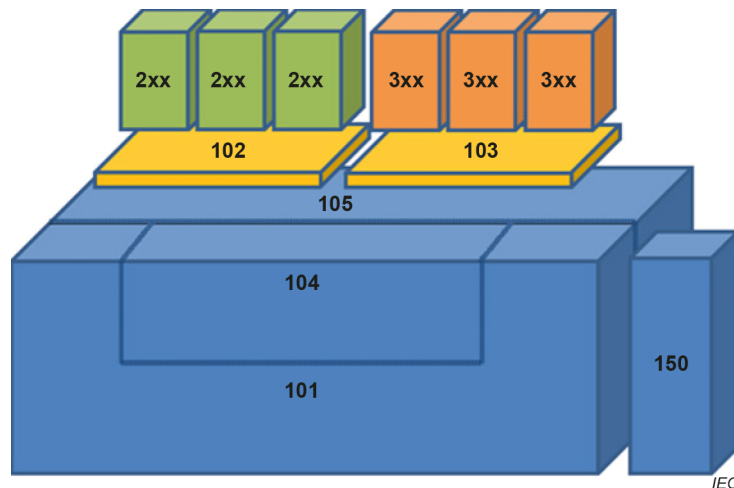


Figure 1 – IEC 62386 graphical overview

This document, and the other parts that make up the IEC 62386-300 series, in referring to any of the clauses of IEC 62386-1XX, specifies 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.

Where the requirements of any of the clauses of IEC 62386-1XX are referred to in this document by the sentence “The requirements of IEC 62386-1XX, Clause “n” apply”, this sentence is to be interpreted as meaning that all requirements of the clause in question of Part 1XX apply, except any which are clearly inapplicable.

The standardization of the control interface for control devices is intended to achieve compatible co-existence and multi-master operation between electronic control gear and lighting control devices, below the level of building management systems. This document describes a method of implementing light sensors.

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”.

The following typographic expressions are used:

Variables: “*variableName*” or “*variableName[3:0]*”, giving only bits 3 to 0 of “*variableName*”.

Time value is expressed in minutes and seconds: mm:ss

Range of values: [lowest, highest]

Command: “COMMAND NAME”

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 304: Particular requirements – Input devices – Light sensor

1 Scope

This part of IEC 62386 is applicable to input devices that provide illuminance level information to the lighting control system through light level sensing.

This document is only applicable to input devices complying with IEC 62386-103:2022.

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 62386-103:2022, *Digital addressable lighting interface – Part 103: General requirements – Control devices*

IEC 62386-333:2018, *Digital addressable lighting interface – Part 333: Particular requirements for control devices – Manual configuration (feature type 33)*