

INTERNATIONAL STANDARD



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

<https://standards.iteh.ai>

Document Preview

[IEC 62386-304:2017](https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017)

<https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017>





THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2024 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

International
Standards
Document Preview
standards.iteh.ai

www.iec.ch
www.electropedia.org
www.products.iec.ch
www.advsearchform.iec.ch
www.justpublished.iec.ch
www.csc.iec.ch
www.iec.ch/62386-304-2017

<https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017>



IEC 62386-304

Edition 1.1 2024-04
CONSOLIDATED VERSION

INTERNATIONAL STANDARD



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

iteh Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 62386-304:2017](https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017)

<https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017>

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

<https://standards.iteh.ai/>
 ITC Standards
 Document Preview
<https://standards.iteh.ai/catalog/standards/scc/3e4e154d-a690-493d-bd12-e809010c3881/iec-62386-174-2017>

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.

(<https://standards.iteh.ai>)

Document Preview

[IEC 62386-304:2017](https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017)

<https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017>

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.

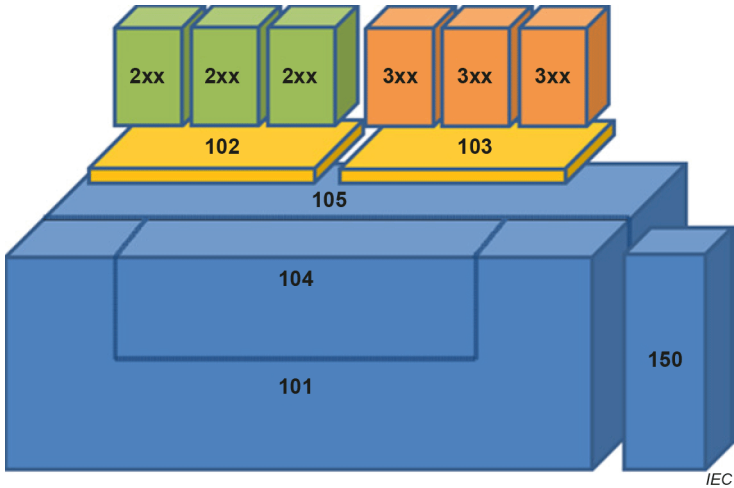
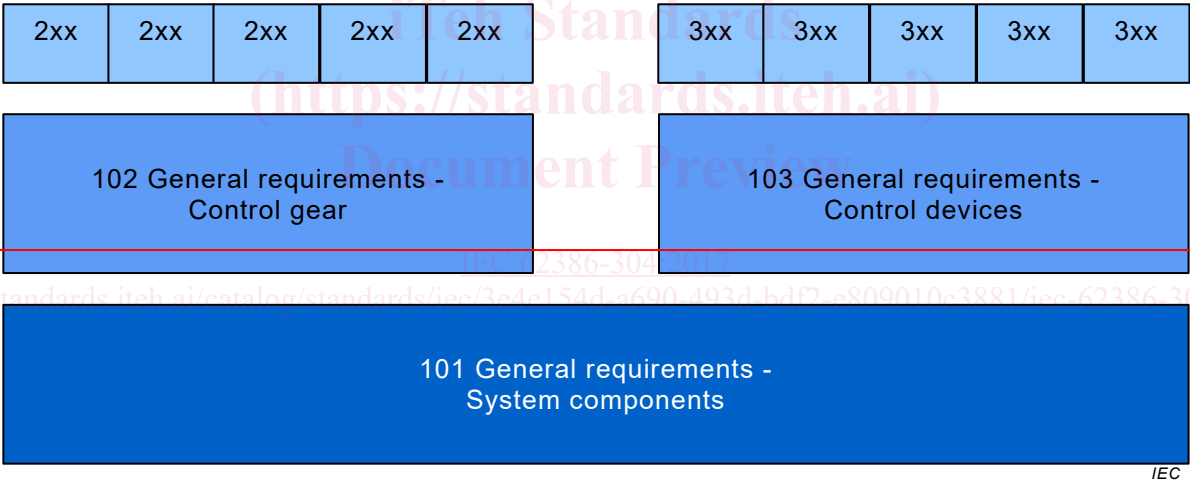


Figure 1 – IEC 62386 graphical overview

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”

[IEC 62386-304:2017](https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017)

<https://standards.iteh.ai/catalog/standards/iec/3e4e154d-a690-493d-bdf2-e809010c3881/iec-62386-304-2017>

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:~~—~~³2018, *Digital addressable lighting interface – Part 333: Particular requirements for control devices – Manual configuration (feature type 33)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62386-101 and IEC 62386-103 and the following apply.

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.~~

ISO and IEC maintain terminological 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

instance

illuminance level input signal processing unit of an input device

[SOURCE: IEC 62386-101:2014/AMD1:2022, 3.29, modified — addition of "illuminance level input"]

3.2

strictly monotonic

either entirely increasing or decreasing without repeating values

~~Note 1 to entry:— Function f defined on a subset of the real numbers with real values is called monotonically increasing, if for all x and y such that $x < y$ one has $f(x) < f(y)$, so f preserves the order. Likewise, a function is called monotonically decreasing if, whenever $x < y$, then $f(x) > f(y)$, so it reverses the order. For this document strictly monotonic is defined as monotonically increasing.~~

4 General

4.1 General

The requirements of ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—~~ IEC 62386-103:2022, Clause 4 apply, with the restrictions, changes and additions identified below.

4.2 Version number

In 4.2 of ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—~~ IEC 62386-103:2022, "103" shall be replaced by "304", "version number" shall be replaced by "extended version number" and "*versionNumber*" shall be replaced by "*extendedVersionNumber*".

4.3 Insulation

According to ~~IEC 61347-1~~ applicable safety standards, it ~~might~~ can be required that the input device has at least supplementary insulation to accessible parts. This depends on the connected components. In this case special attention should be paid with respect to the sensor(s) being used.

NOTE ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—~~ IEC 62386-103:2022 requires system components to have at least basic insulation.

5 Electrical specification

The requirements of ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—~~ IEC 62386-103:2022, Clause 5 apply.

6 Interface power supply

The requirements of ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:—~~ IEC 62386-103:2022, Clause 6 apply.

7 Transmission protocol structure

The requirements of ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:~~ IEC 62386-103:2022, Clause 7 apply.

NOTE Subclause 9.4 provides detailed event information applicable to instances.

8 Timing

The requirements of ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:~~ IEC 62386-103:2022, Clause 8 apply.

9 Method of operation

9.1 General

The requirements of ~~IEC 62386-103:2014 and IEC 62386-103:2014/AMD1:~~ IEC 62386-103:2022, Clause 9 apply, with the following restrictions and additions.

9.2 Instance type

The instance type ("*instanceType*") shall be equal to 4.

9.3 Input signal and value

~~The "*inputValue*" shall indicate the illuminance of the light at the sensor surface. The measured value shall contain the measured illuminance with a precision of "*resolution*" bits and shall be encoded in "*inputValue*" as described in IEC 62386-103:2022, 9.8.2. The **resulting** "*inputValue*" measured value shall be a strictly monotonic function of the illuminance level.~~

NOTE The illuminance value is a relative value, ~~and is~~ not representing absolute lux values.

After receiver start-up, it can take the sensor some time before valid illuminance level measurements are obtained. During this time, "*inputValue*" shall be MASK. After the first valid illuminance level measurement is obtained, "*inputValue*" shall not be MASK, except in the case of physical sensor failure (see 9.6.1).

Examples of "*inputValue*" MASK values and highest valid values, for several values of "*resolution*":

- "*resolution*" = 4: "*inputValue*" is a 1-byte value
 - MASK is 0xFF, resulting in a QUERY INPUT VALUE reply of 0xFF.
 - For a valid illuminance level measurement, the highest possible measured value is 0xE, which results in the 1-byte "*inputValue*" of 0xEE.
- "*resolution*" = 9: "*inputValue*" is a 2-byte value
 - MASK is 0xFFFF, resulting in a QUERY INPUT VALUE reply of 0xFF and a QUERY INPUT VALUE LATCH reply of 0xFF.
 - For a valid illuminance level measurement, the highest possible measured value is 0x1FE, which results in the 2-byte "*inputValue*" of 0xFF7F.
- "*resolution*" = 18: "*inputValue*" is a 3-byte value
 - MASK is 0FFFFFFF, resulting in a QUERY INPUT VALUE reply of 0xFF and replies of 0xFF for each of the two QUERY INPUT VALUE LATCH commands sent after QUERY INPUT VALUE.
 - For a valid illuminance level measurement, the highest possible measured value is 0x3FFFE, which results in the 3-byte "*inputValue*" of 0FFFFFFB.