IEC 62386-304

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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AMENDMENT 1
AMENDEMENT 1

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

Interface d'éclairage adressable numérique – Partie 304: Exigences particulières – Dispositifs d'entrée – Capteur de luminosité

IEC 62386-304:2017-05/AMD1 :2024-03(en-fr)

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DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 304: Particular requirements – Input devices – Light sensor

AMENDMENT 1

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Amendment 1 to IEC 62386-304:2017 has been prepared by IEC technical committee 34: Lighting.

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

Draft	Report on voting
34/1014/CDV	34/1079A/RVC

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 Amendment 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/publications/.

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Throughout the document:

Delete all references to IEC 62386-101:2014/AMD1:—, including the footnote where applicable.

Delete all references to IEC 62386-103:2014/AMD1:—, including the footnote where applicable.

Replace all dated references to IEC 62386-101:2014 with IEC 62386-101:2022.

Replace all dated references to IEC 62386-103:2014 with IEC 62386-103:2022.

INTRODUCTION

Replace the existing Figure 1 with the following new Figure 1.

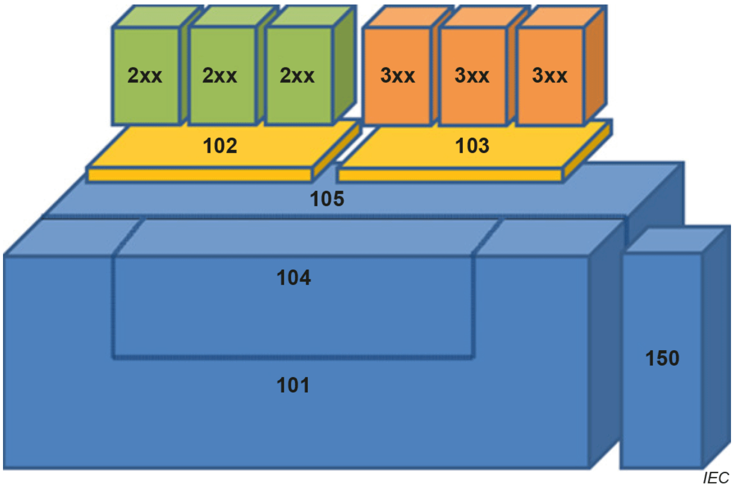

Figure 1 – IEC 62386 graphical overview

1 Scope

Replace the existing text, including the Note, with the following new text:

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

Replace the existing reference to IEC 62386-333:—, including the footnote, with the following reference:

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

3 Terms and definitions

3.2
strictly monotonic

Delete the Note 1 to entry.

4.3 Insulation

Replace the first paragraph, excluding the Note, with the following new paragraph:

According to applicable safety standards, it 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.

9.3 Input signal and value

Replace the existing paragraph and Note with the following new text:

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 measured value shall be a strictly monotonic function of the illuminance level.

NOTE The illuminance value is a relative value, 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 0xFFFFFF, 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 0xFFFFBF.

9.4.4 Event configuration

Replace the first paragraph, excluding the Note, with the following new paragraph:

Events shall be enabled or disabled according to the value of "*eventFilter*". For this document, "*eventFilter*" shall be reduced to one byte. No configuration of "*eventFilter*" shall prevent the periodic "INPUT NOTIFICATION" message triggered by the report timer (9.5.1).

9.4.5 Event generation

Replace, throughout 9.4.5, the text "“*inputValue*”" *with* "measured value", *as follows*:

The illuminance level event is a report of the measured value (see IEC 62386-103:2022, 9.8). In order to avoid flooding the system with too many events on small illuminance level changes, a hysteresis band is introduced. This hysteresis band is restricted by its upper (“*hysteresisBandHigh*”) and lower (“*hysteresisBandLow*”) boundaries. The height of the hysteresis band (“*hysteresisBand*”), has a direct impact on how sensitive the input device responds to changes of illuminance level and therefore event generation. The hysteresis band is not symmetrically arranged towards the measured value. Depending on the direction of the last change of measured value, the hysteresis band is spanned above or below the measured value.

The illuminance level event shall be generated

- each time the measured value becomes greater than “*hysteresisBandHigh*” or less than “*hysteresisBandLow*”, or;
- after a timeout of T_{report} since the previous illuminance level report, irrespective of the actual measured value.

The power on values of “*hysteresisBandLow*” and “*hysteresisBandHigh*” are 0, such that the first non-zero value of the measured value shall cause the illuminance level event to be generated according to the first condition shown above. See 9.5.4 for details.

In case a new event occurs before the current event has been sent, the new event shall replace the current event. This could be caused, for example, by bus unavailability or the deadtime timer.

Each time the illuminance level event is sent because the measured value is outside of the range [“*hysteresisBandLow”,* “*hysteresisBandHigh”*], then the values of “*hysteresisBandLow”* and “*hysteresisBandHigh*” shall be recalculated as follows:

- “*hysteresisBand*” is calculated as the maximum of:
  - “*hysteresis*” percentage of the measured value, and
  - “*hysteresisMin*”
- If the measured value is greater than “*hysteresisBandHigh*”, then:
  - “*hysteresisBandHigh*” is set to the measured value, and
  - “*hysteresisBandLow*” is set to max (measured value – “*hysteresisBand*”,0)
- If the measured value is less than “*hysteresisBandLow”*, then:
  - “*hysteresisBandLow”* is set to the measured value, and
  - “*hysteresisBandHigh”* is set to the measured value + “*hysteresisBand*”

NOTE It is possible for “*hysteresisBandHigh*” to exceed the maximum possible measured value in cases where the measured value is large and hysteresis is increased. Software developers can choose to limit “*hysteresisBandHigh*” to the maximum possible measured value.

Figure 2 shows an example of measured value changes, together with the resultant hysteresis bands (vertical lines) for the case where “*hysteresis*” is 10 % and “*hysteresisMin*” is 50. At measurements 1, 2, 4, 5, 6, 8 and 10, the illuminance level event is generated due to the new measured value being outside of the previously calculated range of [“*hysteresisBandLow*”*,* “*hysteresisBandHigh*”]. Measurements 3, 7 and 9 do not generate the illuminance level event because the measured value is inside the previously calculated range of [“*hysteresisBandLow,* “*hysteresisBandHigh*”]. The initial values for “*hysteresisBandLow*” and “*hysteresisBandHigh*” are 0 due to power up of the device.

Figure 2

Replace the existing Figure 2, including its title, with the following new Figure 2 and new title:

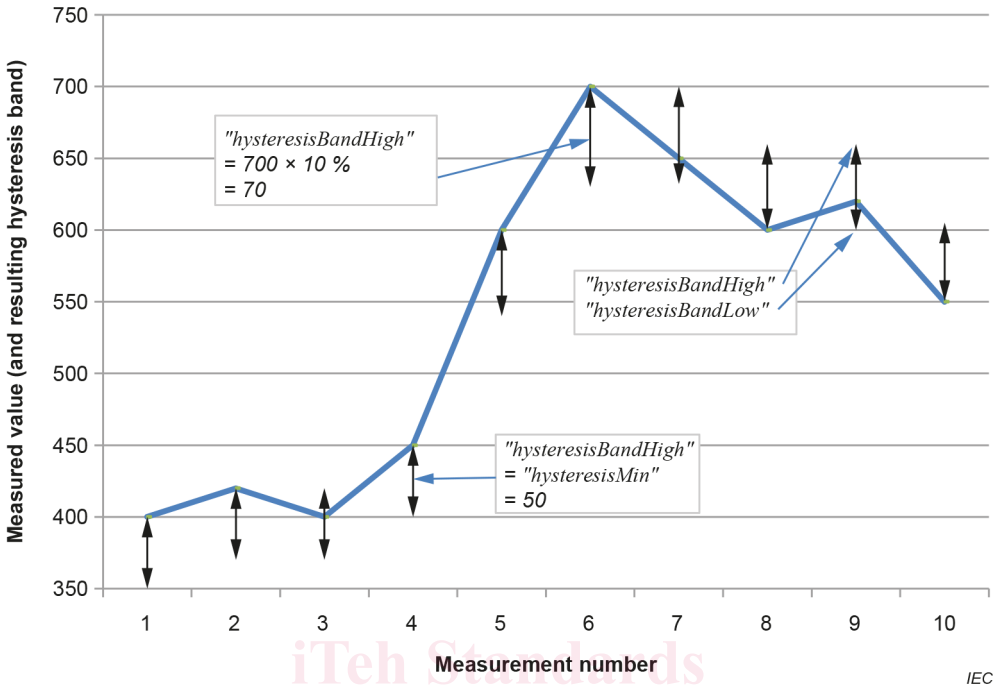

Figure 2 – Example of measured value changes and resultant hysteresis bands

9.5.1 Using the report timer

Replace the second paragraph with the following new text:

The report timer shall be started,

- at power-on: if enabled, immediately after both the receiver has started up and the illuminance level measurement has become valid, with the time to the first trigger recommended to be shortened to a random time between 0 s and T_{report} s;
- otherwise immediately after enablement.

This implies that the first "INPUT NOTIFICATION" message due to the report timer is sent at a maximum time of T_{report} after starting. This may be delayed by other "INPUT NOTIFICATION" messages, or by bus availability.

NOTE If multiple devices have the report timer enabled, they might send out conflicting data used by application controllers to control the same control gear. Application controllers can avoid this problem by enabling the report timer only when required.

9.5.3 Setting the timers

*Replace, in the first paragraph, "*event report timer*" with "*deadtime and report timers".

In the fourth paragraph, after Table 3, add, at the end of the first list bullet, the following new text:

to set or query "*tReport*"

Replace the existing fifth and sixth paragraphs with the following new paragraphs:

"SET REPORT TIMER (*DTR0*)" shall set "*tReport*" depending on "*DTR0*". If "*tReport*" is set to 0, the report timer shall be disabled immediately.

"SET DEADTIME TIMER (*DTR0*)" shall set "*tDeadtime*" depending on "*DTR0*". If "*tDeadtime*" is set to 0, the deadtime timer shall be disabled immediately, but shall not affect T_{report} until the report timer is (re-)started.

9.5.4 Setting the hysteresis

*Replace, in the first Note, ""inputValue"" with "*the measured value*".*

9.6.1 Physical sensor failure

Add, at the end of the last sentence of the paragraph, the following new text:

and "*inputValue*" shall be set to MASK as defined in 9.3

10 Declaration of variables

Table 8

Replace the existing title of Table 8, delete the reference to the table footnote "a" after "0000 000x", insert, between the last row "eventPriority" and the table footnote, the following new row and replace the existing table footnote "a" with a new table footnote "a", as shown:

Table 8 – Restrictions to instance variables defined in IEC 62386-103:2022

Variable	Default value (factory)	Reset value	Power on value	Range of validity	Memory type
…	…	…	…	…	…
"*instanceConfiguration[x]*" [a]	reserved	reserved	reserved	reserved	reserved
[a] Where *x* is in the range [0,190].					