

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



IEC 62386-103

Edition 2.0 2022-11
COMMENTED VERSION

INTERNATIONAL STANDARD



**Digital addressable lighting interface –
Part 103: General requirements – Control devices**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.140.50; 29.140.99

ISBN 978-2-8322-6104-0

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

CONTENTS

FOREWORD	8
INTRODUCTION	11
1 Scope	13
2 Normative references	13
3 Terms and definitions	13
4 General	16
4.1 General	16
4.2 Version number	16
5 Electrical specification	17
6 Interface Bus power supply	17
7 Transmission protocol structure	17
7.1 General	17
7.2 24-bit forward frame encoding	17
7.2.1 Frame format for instructions and queries	17
7.2.2 Frame format for event messages	19
8 Timing	20
9 Method of operation	20
9.1 General	20
9.2 Device features	20
9.3 Application controller	20
9.3.1 General	20
9.3.2 Single-master application controller	21
9.3.3 Multi-master application controller	21
9.4 Input device	22
9.5 Instances of input devices	22
9.5.1 General	22
9.5.2 Instance number	22
9.5.3 Instance type	22
9.5.4 Instance features	22
9.5.5 Instance groups	23
9.6 Commands excluding event messages	23
9.6.1 General	23
9.6.2 Device commands	24
9.6.3 Instance commands	24
9.6.4 Feature commands	24
9.7 Event messages	25
9.7.1 Response to event messages	25
9.7.2 Device power cycle event	25
9.7.3 Input notification event	25
9.7.4 Event message filter	26
9.8 Input signal and input , measured value and “ <i>inputValue</i> ”	26
9.8.1 General	26
9.8.2 Input resolution	26
9.8.3 Getting the input value	27
9.8.4 Notification of changes	28

9.9	System failure	28
9.10	Operating a control device	28
9.10.1	Enable/disable the application controller	28
9.10.2	Application controller always active.....	28
9.10.3	Enable/disable event messages	29
9.10.4	Quiescent mode	29
9.10.5	Modes of operation.....	29
9.11	Memory banks.....	30
9.11.1	General.....	30
9.11.2	Memory map	31
9.11.3	Selecting a memory bank location.....	32
9.11.4	Protectable memory locations	32
9.11.5	Memory bank reading	32
9.11.6	Memory bank writing.....	34
9.11.7	Memory bank 0.....	35
9.11.8	Memory bank 1 (optional)	38
9.11.9	Manufacturer-specific memory banks	39
9.11.10	Reserved memory banks	39
9.12	Reset	40
9.12.1	Reset operation.....	40
9.12.2	Reset memory bank operation.....	40
9.13	Power on behaviour.....	40
9.13.1	Power on.....	40
9.13.2	Power cycle notification	41
9.14	Priority use.....	41
9.14.1	General.....	41
9.14.2	Priority of input notifications.....	41
9.15	Assigning short addresses	42
9.15.1	General.....	42
9.15.2	Random address allocation.....	42
9.15.3	Identification of a device	42
9.16	Exception handling	43
9.17	Device capabilities and status information	43
9.17.1	Device capabilities.....	43
9.17.2	Device status	43
9.17.3	Instance status.....	44
9.18	Non-volatile memory.....	44
9.19	Instance types and configuration.....	44
9.20	Current bus unit configuration	45
10	Declaration of variables.....	45
11	Definition of commands	47
11.1	General.....	47
11.2	Overview sheets.....	47
11.3	Event messages	54
11.3.1	INPUT NOTIFICATION (<i>device/instance, event</i>).....	54
11.3.2	POWER NOTIFICATION (<i>device</i>).....	54
11.4	Device control instructions	54
11.4.1	General.....	54
11.4.2	IDENTIFY DEVICE	54

11.4.3	RESET POWER CYCLE SEEN	55
11.5	Device configuration instructions.....	55
11.5.1	General.....	55
11.5.2	RESET.....	55
11.5.3	RESET MEMORY BANK (<i>DTR0</i>).....	56
11.5.4	SET SHORT ADDRESS (<i>DTR0</i>).....	56
11.5.5	ENABLE WRITE MEMORY	56
11.5.6	ENABLE APPLICATION CONTROLLER	56
11.5.7	DISABLE APPLICATION CONTROLLER	56
11.5.8	SET OPERATING MODE (<i>DTR0</i>).....	56
11.5.9	ADD TO DEVICE GROUPS 0-15 (<i>DTR2:DTR1</i>)	57
11.5.10	ADD TO DEVICE GROUPS 16-31 (<i>DTR2:DTR1</i>).....	57
11.5.11	REMOVE FROM DEVICE GROUPS 0-15 (<i>DTR2:DTR1</i>).....	57
11.5.12	REMOVE FROM DEVICE GROUPS 16-31 (<i>DTR2:DTR1</i>).....	57
11.5.13	START QUIESCENT MODE.....	57
11.5.14	STOP QUIESCENT MODE.....	57
11.5.15	ENABLE POWER CYCLE NOTIFICATION.....	57
11.5.16	DISABLE POWER CYCLE NOTIFICATION.....	57
11.5.17	SAVE PERSISTENT VARIABLES.....	57
11.5.17	SET EVENT PRIORITY (<i>DTR0</i>)	57
11.6	Device queries	58
11.6.1	General.....	58
11.6.2	QUERY DEVICE CAPABILITIES	58
11.6.3	QUERY DEVICE STATUS.....	58
11.6.4	QUERY APPLICATION CONTROLLER ERROR.....	58
11.6.5	QUERY INPUT DEVICE ERROR.....	58
11.6.6	QUERY MISSING SHORT ADDRESS	59
11.6.7	QUERY VERSION NUMBER.....	59
11.6.8	QUERY CONTENT <i>DTR0</i>	59
11.6.9	QUERY NUMBER OF INSTANCES	59
11.6.10	QUERY CONTENT <i>DTR1</i>	59
11.6.11	QUERY CONTENT <i>DTR2</i>	59
11.6.12	QUERY RANDOM ADDRESS (H).....	59
11.6.13	QUERY RANDOM ADDRESS (M)	59
11.6.14	QUERY RANDOM ADDRESS (L)	59
11.6.15	READ MEMORY LOCATION (<i>DTR1, DTR0</i>).....	59
11.6.16	QUERY APPLICATION CONTROLLER ENABLED	60
11.6.17	QUERY OPERATING MODE.....	60
11.6.18	QUERY MANUFACTURER SPECIFIC MODE	60
11.6.19	QUERY QUIESCENT MODE.....	60
11.6.20	QUERY DEVICE GROUPS 0-7	60
11.6.21	QUERY DEVICE GROUPS 8-15.....	60
11.6.22	QUERY DEVICE GROUPS 16-23.....	60
11.6.23	QUERY DEVICE GROUPS 24-31.....	60
11.6.24	QUERY POWER CYCLE NOTIFICATION	60
11.6.25	QUERY EXTENDED VERSION NUMBER(<i>DTR0</i>).....	60
11.6.26	QUERY RESET STATE	61
11.6.27	QUERY APPLICATION CONTROLLER ALWAYS ACTIVE.....	61
11.6.28	QUERY FEATURE TYPE	61

11.6.29	QUERY NEXT FEATURE TYPE	61
11.6.30	QUERY EVENT PRIORITY	61
11.7	Instance control instructions.....	61
11.8	Instance configuration instructions	61
11.8.1	General.....	61
11.8.2	ENABLE INSTANCE	62
11.8.3	DISABLE INSTANCE	62
11.8.4	SET PRIMARY INSTANCE GROUP (<i>DTR0</i>).....	62
11.8.5	SET INSTANCE GROUP 1 (<i>DTR0</i>)	62
11.8.6	SET INSTANCE GROUP 2 (<i>DTR0</i>)	62
11.8.7	SET EVENT SCHEME (<i>DTR0</i>).....	62
11.8.8	SET EVENT PRIORITY (<i>DTR0</i>)	63
11.8.9	SET EVENT FILTER (<i>DTR2:DTR1:DTR0</i>)	63
11.8.10	SET INSTANCE TYPE (<i>DTR0</i>).....	63
11.8.11	SET INSTANCE CONFIGURATION (<i>DTR0, DTR2:DTR1</i>).....	63
11.9	Instance queries	64
11.9.1	General.....	64
11.9.2	QUERY INSTANCE TYPE.....	64
11.9.3	QUERY RESOLUTION	64
11.9.4	QUERY INSTANCE ERROR	64
11.9.5	QUERY INSTANCE STATUS	64
11.9.6	QUERY INSTANCE ENABLED	64
11.9.7	QUERY PRIMARY INSTANCE GROUP	64
11.9.8	QUERY INSTANCE GROUP 1	65
11.9.9	QUERY INSTANCE GROUP 2	65
11.9.10	QUERY EVENT SCHEME.....	65
11.9.11	QUERY INPUT VALUE	65
11.9.12	QUERY INPUT VALUE LATCH	65
11.9.13	QUERY EVENT PRIORITY	65
11.9.14	QUERY FEATURE TYPE	65
11.9.15	QUERY NEXT FEATURE TYPE	66
11.9.16	QUERY EVENT FILTER 0-7.....	66
11.9.17	QUERY EVENT FILTER 8-15.....	66
11.9.18	QUERY EVENT FILTER 16-23.....	66
11.9.19	QUERY INSTANCE CONFIGURATION (<i>DTR0</i>)	66
11.9.20	QUERY AVAILABLE INSTANCE TYPES	67
11.10	Special commands.....	67
11.10.1	General.....	67
11.10.2	TERMINATE.....	67
11.10.3	INITIALISE (<i>device</i>).....	67
11.10.4	RANDOMISE	67
11.10.5	COMPARE	68
11.10.6	WITHDRAW	68
11.10.7	SEARCHADDRH (<i>data</i>).....	68
11.10.8	SEARCHADDRM (<i>data</i>).....	68
11.10.9	SEARCHADDRL (<i>data</i>)	69
11.10.10	PROGRAM SHORT ADDRESS (<i>data</i>).....	69
11.10.11	VERIFY SHORT ADDRESS (<i>data</i>).....	69
11.10.12	QUERY SHORT ADDRESS.....	69

11.10.13	WRITE MEMORY LOCATION (<i>DTR1, DTR0, data</i>)	69
11.10.14	WRITE MEMORY LOCATION – NO REPLY (<i>DTR1, DTR0, data</i>).....	70
11.10.15	DTR0 (<i>data</i>).....	70
11.10.16	DTR1 (<i>data</i>).....	70
11.10.17	DTR2 (<i>data</i>).....	70
11.10.18	DIRECT WRITE MEMORY (<i>DTR1, offset, data</i>)	70
11.10.19	DTR1:DTR0 (<i>data1, data0</i>).....	70
11.10.20	DTR2:DTR1 (<i>data2, data1</i>).....	71
11.10.21	SEND TESTFRAME (<i>data</i>)	71
12	Test procedures
12.1	General notes on test
12.2	Preamble.....
12.3	Physical operational parameters
12.4	Device configuration instructions.....
12.5	Device queries
12.6	Device Memory banks.....
12.7	Device Special commands.....
12.8	Logical unit cross contamination
12.9	Instance addressing.....
12.10	Instance configuration instructions
12.11	Instance queries
12.12	Instance cross contamination.....
12.13	Reserved Commands.....
12.14	General subsequences
	Bibliography.....	73
	List of comments.....	74
	Figure 1 – IEC 62386 graphical overview	12
	Figure 2 – Current rating test.....
	Table 1 – 24-bit command frame encoding.....	18
	Table 2 – Instance byte in a command frame	18
	Table 3 – 24-bit event message frame encoding.....	19
	Table 4 – Instance types	22
	Table 5 – Feature types.....	23
	Table 6 – Instance group variables	23
	Table 7 – Device address information in power cycle event	25
	Table 8 – Event addressing schemes.....	25
	Table 9 – Signal level (~50%) versus resolution and input value Measured value (≈ 50 %) versus resolution and “ <i>inputValue</i> ”.....	27
	Table 10 – Example of querying sequence to read a 4-byte input value.....	27
	Table 11 – Memory types	31
	Table 12 – Basic memory map of memory banks.....	31
	Table 13 – Memory map of memory bank 0	36
	Table 14 – Memory map of memory bank 1	38

Table 15 – Control device capabilities.....	43
Table 16 – Control device status.....	44
Table 17 – Instance status.....	44
Table 18 – Current bus unit configuration.....	45
Table 19 – Declaration of device variables.....	46
Table 20 – Declaration of instance variables.....	47
Table 21 – Instance event messages.....	47
Table 22 – Device event messages.....	48
Table 23 – Standard commands.....	49
Table 24 – Special commands (implemented by both application controller and input device).....	53
Table 25 – Device addressing with "INITIALISE (<i>device</i>)".....	67
Table 24 – Unexpected outcome.....
Table 25 – Parameters for test sequence Check Factory Default 103.....
Table 26 – Parameters for test sequence CheckFactoryDefault103PerLogicalUnit.....
Table 27 – Parameters for test sequence Transmitter bit timing.....
Table 28 – Parameters for test sequence Maximum and minimum system voltage.....
Table 29 – Parameters for test sequence Transmitter voltages.....
Table 30 – Parameters for test sequence Transmitter rising and falling edges.....
Table 31 – Parameters for test sequence Transmitter bit timing.....
Table 32 – Parameters for test sequence Receiver frame timing.....
Table 33 – Parameters for test sequence Receiver start-up behavior.....
Table 34 – Parameters for test sequence Receiver bit timing.....
Table 35 – Parameters for test sequence extended receiver bit timing.....
Table 36 – Parameters for test sequence Receiver frame violation and recovering after frame size violation.....
Table 37 – Parameters for test sequence Receiver frame timing.....
Table 38 – Parameters for test sequence transmitter collision avoidance by priority.....
Table 39 – Parameters for test sequence transmitter collision detection for truncated idle phase.....
Table 40 – Parameters for test sequence transmitter collision detection for extended active phase.....
Table 41 – Parameters for test sequence RESET instance groups.....
Table 42 – Parameters for test sequence Send twice timeout (device).....
Table 43 – Parameters for test sequence Send twice timeout (instance).....
Table 44 – Parameters for test sequence Commands in-between (device).....
Table 45 – Parameters for test sequence Commands in-between.....
Table 46 – Parameters for test sequence SET SHORT ADDRESS.....
Table 47 – Parameters for test sequence Reset/Power-on values (device).....
Table 48 – Parameters for test sequence Reset/Power-on values (instance).....
Table 49 – Parameters for test sequence DTR0 / DTR1 / DTR2.....
Table 50 – Parameters for test sequence DTR1:DTR0 and DTR2:DTR1.....
Table 51 – Parameters for test sequence READ MEMORY LOCATION on Memory Bank 0.....

~~Table 52—Parameters for test sequence READ MEMORY LOCATION on Memory Bank 1.....~~

~~Table 53—Parameters for test sequence Memory bank writing.....~~

~~Table 54—Parameters for test sequence ENABLE WRITE MEMORY: writeEnableState.....~~

~~Table 55—Parameters for test sequence ENABLE WRITE MEMORY: timeout / command in-between.....~~

~~Table 56—Parameters for test sequence RESET MEMORY BANK: timeout / command in-between.....~~

~~Table 57—Parameters for test sequence RESET MEMORY BANK.....~~

~~Table 58—Parameters for test sequence INITIALISE – device addressing.....~~

~~Table 59—Parameters for test sequence COMPARE.....~~

~~Table 60—Parameters for test sequence WITHDRAW.....~~

~~Table 61—Parameters for test sequence PROGRAM SHORT ADDRESS.....~~

~~Table 62—Parameters for test sequence VERIFY SHORT ADDRESS.....~~

~~Table 63—Parameters for test sequence QUERY SHORT ADDRESS.....~~

~~Table 64—Parameters for test sequence IDENTIFY DEVICE.....~~

~~Table 65—Parameters for test sequence Addressing 2.....~~

~~Table 66—Parameters for test sequence Reserved commands: standard device commands.....~~

~~Table 67—Parameters for test sequence Reserved instance commands (instance type 0).....~~

~~Table 68—Parameters for test sequence Reserved special commands.....~~

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 103: General requirements – Control devices

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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

This commented version (CMV) of the official standard IEC 62386-103:2022 edition 2.0 allows the user to identify the changes made to the previous IEC 62386-103:2014+AMD1:2018 CSV edition 1.1. Furthermore, comments from IEC TC 34 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 62386-103 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 2014 and Amendment 1:2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the scope has been updated;
- b) quiescent mode has been updated;
- c) non-volatile memory (NVM) save time has been added, and SAVE PERSISTENT VARIABLES command removed;
- d) memory bank 0 has been modified, and common memory bank requirements have been added;
- e) IDENTIFY DEVICE has been updated;
- f) version number has been changed;
- g) bus unit configuration has been added; and
- h) instance types and configuration have been added.

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

Draft	Report on voting
34/946/FDIS	34/990/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 103 of IEC 62386 is intended to be used in conjunction with Part 101, which contains general requirements for the relevant product type (system), and with the appropriate Parts 3xx (particular requirements for control devices) containing clauses to supplement or modify the corresponding clauses in Part 101 and Part 103 in order to provide the relevant requirements for each type of product.

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 ~~first~~ second edition of IEC 62386-103 is intended to be used in conjunction with IEC 62386-101:2014, ~~IEC 62386-101:2014/AMD1:2018,~~ ~~IEC 62386-102:2014,~~ ~~IEC 62386-102:2014/AMD1:2018~~ and ~~with the various parts that make up the IEC 62386-2xx series for control gear, together~~ with the various parts that make up the IEC 62386-3xx series of particular requirements for control devices, and can be used together with IEC 62386-102 and with the various parts that make up the IEC 62386-2xx series for control gear. 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.

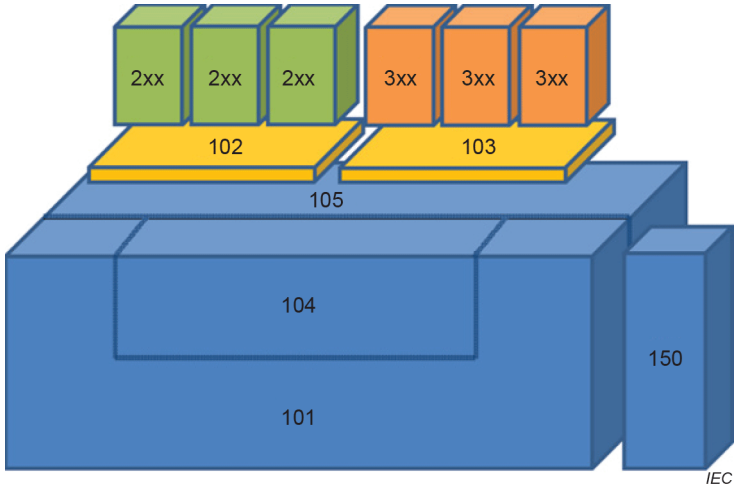
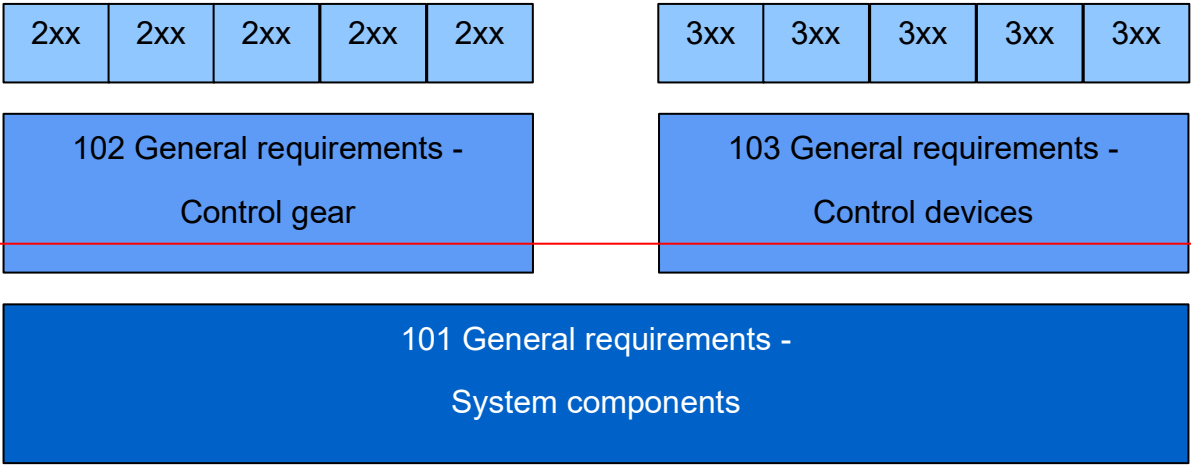


Figure 1 – IEC 62386 graphical overview 1

When this part of IEC 62386 refers to any of the clauses of the other ~~two~~ parts of the IEC 62386-1xx series, the extent to which such a clause is applicable ~~and the order in which the tests are to be performed are~~ 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, "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*;

Range of values: [lowest, highest];

Command: "COMMAND NAME".

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 103: General requirements – Control devices

1 Scope

This part of IEC 62386 is applicable to control devices ~~in a bus system~~ for control by digital signals of electronic lighting equipment ~~which is in line with the requirements of IEC 61347 (all parts), with the addition of DC supplies.~~

~~NOTE—Tests in this standard are type tests. Requirements for testing individual products during production are not included.~~

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/AMD1:2018~~

IEC 62386-102:~~2014~~2022, *Digital addressable lighting interface – Part 102: General requirements – Control gear*
~~IEC 62386-102:2014/AMD1:2018~~

IEC 62386-3xx (*all parts*), *Digital addressable lighting interface – Part 3xx: Particular requirements for control devices*

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Digital addressable lighting interface –
Part 103: General requirements – Control devices**

**Interface d'éclairage adressable numérique –
Partie 103: Exigences générales – Dispositifs de commande**

CONTENTS

FOREWORD	7
INTRODUCTION	9
1 Scope	11
2 Normative references	11
3 Terms and definitions	11
4 General	14
4.1 General	14
4.2 Version number	14
5 Electrical specification	15
6 Bus power supply	15
7 Transmission protocol structure	15
7.1 General	15
7.2 24-bit forward frame encoding	15
7.2.1 Frame format for instructions and queries	15
7.2.2 Frame format for event messages	17
8 Timing	18
9 Method of operation	18
9.1 General	18
9.2 Device features	18
9.3 Application controller	18
9.3.1 General	18
9.3.2 Single-master application controller	19
9.3.3 Multi-master application controller	19
9.4 Input device	20
9.5 Instances of input devices	20
9.5.1 General	20
9.5.2 Instance number	20
9.5.3 Instance type	20
9.5.4 Instance features	20
9.5.5 Instance groups	21
9.6 Commands excluding event messages	21
9.6.1 General	21
9.6.2 Device commands	22
9.6.3 Instance commands	22
9.6.4 Feature commands	22
9.7 Event messages	23
9.7.1 Response to event messages	23
9.7.2 Device power cycle event	23
9.7.3 Input notification event	23
9.7.4 Event message filter	24
9.8 Input signal, measured value and “ <i>inputValue</i> ”	24
9.8.1 General	24
9.8.2 Input resolution	24
9.8.3 Getting the input value	25
9.8.4 Notification of changes	26

9.9	System failure.....	26
9.10	Operating a control device	26
9.10.1	Enable/disable the application controller.....	26
9.10.2	Application controller always active	26
9.10.3	Enable/disable event messages.....	27
9.10.4	Quiescent mode	27
9.10.5	Modes of operation	27
9.11	Memory banks	28
9.11.1	General	28
9.11.2	Memory map.....	29
9.11.3	Selecting a memory bank location	30
9.11.4	Protectable memory locations.....	30
9.11.5	Memory bank reading	30
9.11.6	Memory bank writing.....	32
9.11.7	Memory bank 0.....	33
9.11.8	Memory bank 1 (optional)	36
9.11.9	Manufacturer-specific memory banks.....	37
9.11.10	Reserved memory banks	37
9.12	Reset.....	38
9.12.1	Reset operation	38
9.12.2	Reset memory bank operation	38
9.13	Power on behaviour	38
9.13.1	Power on	38
9.13.2	Power cycle notification	39
9.14	Priority use	39
9.14.1	General	39
9.14.2	Priority of input notifications	39
9.15	Assigning short addresses	40
9.15.1	General	40
9.15.2	Random address allocation.....	40
9.15.3	Identification of a device.....	40
9.16	Exception handling	41
9.17	Device capabilities and status information	41
9.17.1	Device capabilities.....	41
9.17.2	Device status.....	41
9.17.3	Instance status	42
9.18	Non-volatile memory	42
9.19	Instance types and configuration.....	42
9.20	Current bus unit configuration	43
10	Declaration of variables	43
11	Definition of commands	45
11.1	General.....	45
11.2	Overview sheets	45
11.3	Event messages	52
11.3.1	INPUT NOTIFICATION (<i>device/instance, event</i>).....	52
11.3.2	POWER NOTIFICATION (<i>device</i>)	52
11.4	Device control instructions	52
11.4.1	General	52
11.4.2	IDENTIFY DEVICE	52

11.4.3	RESET POWER CYCLE SEEN	53
11.5	Device configuration instructions.....	53
11.5.1	General	53
11.5.2	RESET	53
11.5.3	RESET MEMORY BANK (<i>DTR0</i>)	54
11.5.4	SET SHORT ADDRESS (<i>DTR0</i>)	54
11.5.5	ENABLE WRITE MEMORY	54
11.5.6	ENABLE APPLICATION CONTROLLER	54
11.5.7	DISABLE APPLICATION CONTROLLER	54
11.5.8	SET OPERATING MODE (<i>DTR0</i>)	54
11.5.9	ADD TO DEVICE GROUPS 0-15 (<i>DTR2:DTR1</i>)	55
11.5.10	ADD TO DEVICE GROUPS 16-31 (<i>DTR2:DTR1</i>)	55
11.5.11	REMOVE FROM DEVICE GROUPS 0-15 (<i>DTR2:DTR1</i>).....	55
11.5.12	REMOVE FROM DEVICE GROUPS 16-31 (<i>DTR2:DTR1</i>).....	55
11.5.13	START QUIESCENT MODE	55
11.5.14	STOP QUIESCENT MODE	55
11.5.15	ENABLE POWER CYCLE NOTIFICATION.....	55
11.5.16	DISABLE POWER CYCLE NOTIFICATION.....	55
11.5.17	SET EVENT PRIORITY (<i>DTR0</i>).....	55
11.6	Device queries.....	56
11.6.1	General	56
11.6.2	QUERY DEVICE CAPABILITIES.....	56
11.6.3	QUERY DEVICE STATUS	56
11.6.4	QUERY APPLICATION CONTROLLER ERROR	56
11.6.5	QUERY INPUT DEVICE ERROR	56
11.6.6	QUERY MISSING SHORT ADDRESS.....	57
11.6.7	QUERY VERSION NUMBER.....	57
11.6.8	QUERY CONTENT <i>DTR0</i>	57
11.6.9	QUERY NUMBER OF INSTANCES.....	57
11.6.10	QUERY CONTENT <i>DTR1</i>	57
11.6.11	QUERY CONTENT <i>DTR2</i>	57
11.6.12	QUERY RANDOM ADDRESS (H)	57
11.6.13	QUERY RANDOM ADDRESS (M).....	57
11.6.14	QUERY RANDOM ADDRESS (L).....	57
11.6.15	READ MEMORY LOCATION (<i>DTR1, DTR0</i>).....	57
11.6.16	QUERY APPLICATION CONTROLLER ENABLED	58
11.6.17	QUERY OPERATING MODE	58
11.6.18	QUERY MANUFACTURER SPECIFIC MODE	58
11.6.19	QUERY QUIESCENT MODE.....	58
11.6.20	QUERY DEVICE GROUPS 0-7	58
11.6.21	QUERY DEVICE GROUPS 8-15	58
11.6.22	QUERY DEVICE GROUPS 16-23	58
11.6.23	QUERY DEVICE GROUPS 24-31	58
11.6.24	QUERY POWER CYCLE NOTIFICATION	58
11.6.25	QUERY EXTENDED VERSION NUMBER(<i>DTR0</i>)	58
11.6.26	QUERY RESET STATE	59
11.6.27	QUERY APPLICATION CONTROLLER ALWAYS ACTIVE	59
11.6.28	QUERY FEATURE TYPE.....	59
11.6.29	QUERY NEXT FEATURE TYPE.....	59

11.6.30	QUERY EVENT PRIORITY	59
11.7	Instance control instructions	59
11.8	Instance configuration instructions	59
11.8.1	General	59
11.8.2	ENABLE INSTANCE	60
11.8.3	DISABLE INSTANCE	60
11.8.4	SET PRIMARY INSTANCE GROUP (<i>DTR0</i>)	60
11.8.5	SET INSTANCE GROUP 1 (<i>DTR0</i>)	60
11.8.6	SET INSTANCE GROUP 2 (<i>DTR0</i>)	60
11.8.7	SET EVENT SCHEME (<i>DTR0</i>)	60
11.8.8	SET EVENT PRIORITY (<i>DTR0</i>)	61
11.8.9	SET EVENT FILTER (<i>DTR2:DTR1:DTR0</i>)	61
11.8.10	SET INSTANCE TYPE (<i>DTR0</i>)	61
11.8.11	SET INSTANCE CONFIGURATION (<i>DTR0, DTR2:DTR1</i>)	61
11.9	Instance queries	62
11.9.1	General	62
11.9.2	QUERY INSTANCE TYPE	62
11.9.3	QUERY RESOLUTION	62
11.9.4	QUERY INSTANCE ERROR	62
11.9.5	QUERY INSTANCE STATUS	62
11.9.6	QUERY INSTANCE ENABLED	62
11.9.7	QUERY PRIMARY INSTANCE GROUP	62
11.9.8	QUERY INSTANCE GROUP 1	63
11.9.9	QUERY INSTANCE GROUP 2	63
11.9.10	QUERY EVENT SCHEME	63
11.9.11	QUERY INPUT VALUE	63
11.9.12	QUERY INPUT VALUE LATCH	63
11.9.13	QUERY EVENT PRIORITY	63
11.9.14	QUERY FEATURE TYPE	63
11.9.15	QUERY NEXT FEATURE TYPE	64
11.9.16	QUERY EVENT FILTER 0-7	64
11.9.17	QUERY EVENT FILTER 8-15	64
11.9.18	QUERY EVENT FILTER 16-23	64
11.9.19	QUERY INSTANCE CONFIGURATION (<i>DTR0</i>)	64
11.9.20	QUERY AVAILABLE INSTANCE TYPES	65
11.10	Special commands	65
11.10.1	General	65
11.10.2	TERMINATE	65
11.10.3	INITIALISE (<i>device</i>)	65
11.10.4	RANDOMISE	65
11.10.5	COMPARE	66
11.10.6	WITHDRAW	66
11.10.7	SEARCHADDRH (<i>data</i>)	66
11.10.8	SEARCHADDRM (<i>data</i>)	66
11.10.9	SEARCHADDRL (<i>data</i>)	67
11.10.10	PROGRAM SHORT ADDRESS (<i>data</i>)	67
11.10.11	VERIFY SHORT ADDRESS (<i>data</i>)	67
11.10.12	QUERY SHORT ADDRESS	67
11.10.13	WRITE MEMORY LOCATION (<i>DTR1, DTR0, data</i>)	67

11.10.14	WRITE MEMORY LOCATION – NO REPLY (<i>DTR1, DTR0, data</i>)	68
11.10.15	DTR0 (<i>data</i>)	68
11.10.16	DTR1 (<i>data</i>)	68
11.10.17	DTR2 (<i>data</i>)	68
11.10.18	DIRECT WRITE MEMORY (<i>DTR1, offset, data</i>)	68
11.10.19	DTR1:DTR0 (<i>data1, data0</i>).....	68
11.10.20	DTR2:DTR1 (<i>data2, data1</i>).....	69
11.10.21	SEND TESTFRAME (<i>data</i>)	69
Bibliography.....		70
Figure 1 – IEC 62386 graphical overview		9
Table 1 – 24-bit command frame encoding.....		16
Table 2 – Instance byte in a command frame		16
Table 3 – 24-bit event message frame encoding		17
Table 4 – Instance types		20
Table 5 – Feature types		21
Table 6 – Instance group variables		21
Table 7 – Device address information in power cycle event		23
Table 8 – Event addressing schemes.....		23
Table 9 – Measured value ($\approx 50\%$) versus resolution and “ <i>inputValue</i> ”.....		25
Table 10 – Example of querying sequence to read a 4-byte input value		25
Table 11 – Memory types.....		29
Table 12 – Basic memory map of memory banks		29
Table 13 – Memory map of memory bank 0.....		34
Table 14 – Memory map of memory bank 1.....		36
Table 15 – Control device capabilities.....		41
Table 16 – Control device status.....		42
Table 17 – Instance status		42
Table 18 – Current bus unit configuration		43
Table 19 – Declaration of device variables.....		44
Table 20 – Declaration of instance variables.....		45
Table 21 – Instance event messages		45
Table 22 – Device event messages.....		46
Table 23 – Standard commands.....		47
Table 24 – Special commands (implemented by both application controller and input device).....		51
Table 25 – Device addressing with “INITIALISE (<i>device</i>)”		65

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 103: General requirements – Control devices

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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62386-103 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 2014 and Amendment 1:2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the scope has been updated;
- b) quiescent mode has been updated;
- c) non-volatile memory (NVM) save time has been added, and SAVE PERSISTENT VARIABLES command removed;
- d) memory bank 0 has been modified, and common memory bank requirements have been added;

- e) IDENTIFY DEVICE has been updated;
- f) version number has been changed;
- g) bus unit configuration has been added; and
- h) instance types and configuration have been added.

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

Draft	Report on voting
34/946/FDIS	34/990/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 103 of IEC 62386 is intended to be used in conjunction with Part 101, which contains general requirements for the relevant product type (system), and with the appropriate Parts 3xx (particular requirements for control devices) containing clauses to supplement or modify the corresponding clauses in Part 101 and Part 103 in order to provide the relevant requirements for each type of product.

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 62386-103 is intended to be used in conjunction with IEC 62386-101 and with the various parts that make up the IEC 62386-3xx series of particular requirements for control devices, and can be used together with IEC 62386-102 and with the various parts that make up the IEC 62386-2xx series for control gear. 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.

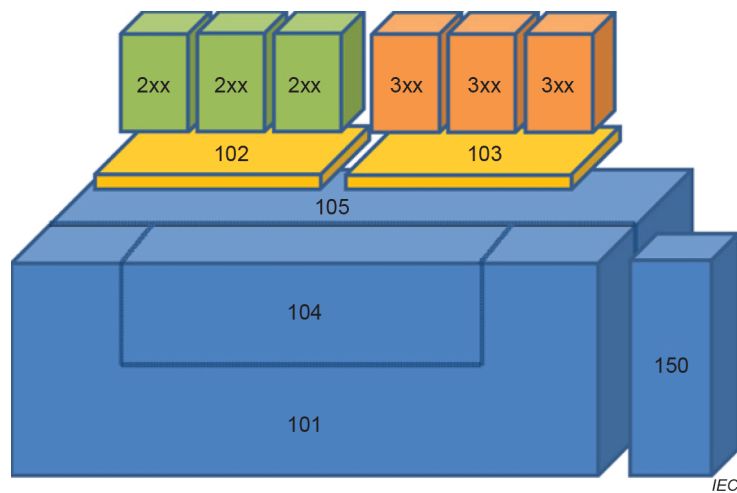


Figure 1 – IEC 62386 graphical overview

When this part of IEC 62386 refers to any of the clauses of the other parts 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, "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*;

Range of values: [lowest, highest];

Command: "COMMAND NAME".

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 103: General requirements – Control devices

1 Scope

This part of IEC 62386 is applicable to control devices for control by digital signals of electronic lighting equipment.

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*

IEC 62386-3xx (all parts), *Digital addressable lighting interface – Part 3xx: Particular requirements for control devices*

SOMMAIRE

AVANT-PROPOS.....	77
INTRODUCTION.....	79
1 Domaine d'application	81
2 Références normatives	81
3 Termes et définitions	81
4 Généralités.....	85
4.1 Généralités	85
4.2 Numéro de version.....	85
5 Spécifications électriques	85
6 Alimentation électrique du bus.....	85
7 Structure du protocole de transmission.....	85
7.1 Généralités	85
7.2 Codage de trame en avant à 24 bits.....	86
7.2.1 Format de trames pour les instructions et requêtes.....	86
7.2.2 Format de trames pour les messages d'événement	88
8 Cadencement	89
9 Mode de fonctionnement	89
9.1 Généralités	89
9.2 Caractéristiques des dispositifs.....	89
9.3 Contrôleur d'application	89
9.3.1 Généralités	89
9.3.2 Contrôleur d'application à un seul maître	89
9.3.3 Contrôleur d'application à plusieurs maîtres	90
9.4 Dispositif d'entrée	90
9.5 Instances de dispositifs d'entrée	90
9.5.1 Généralités	90
9.5.2 Numéro d'instance	91
9.5.3 Type d'instance	91
9.5.4 Caractéristiques d'instance.....	91
9.5.5 Groupes d'instances	91
9.6 Commandes qui excluent les messages d'événement	92
9.6.1 Généralités	92
9.6.2 Commandes de dispositif.....	93
9.6.3 Commandes d'instance.....	93
9.6.4 Commandes de caractéristique.....	93
9.7 Messages d'événement.....	94
9.7.1 Réponse aux messages d'événement	94
9.7.2 Événement de cycle de mise sous tension de dispositif	94
9.7.3 Événement de notification d'entrée	94
9.7.4 Filtre de message d'événement	95
9.8 Signal d'entrée, valeur mesurée et " <i>inputValue</i> "	96
9.8.1 Généralités	96
9.8.2 Résolution d'entrée.....	96
9.8.3 Obtention de la valeur d'entrée	96
9.8.4 Notification des modifications	97

9.9	Défaillance système.....	97
9.10	Fonctionnement d'un dispositif de commande	98
9.10.1	Activer/désactiver le contrôleur d'application	98
9.10.2	Contrôleur d'application toujours actif.....	98
9.10.3	Activer/désactiver les messages d'événement	98
9.10.4	Mode repos	98
9.10.5	Modes de fonctionnement.....	99
9.11	Blocs de mémoire	100
9.11.1	Généralités.....	100
9.11.2	Carte de mémoire	101
9.11.3	Sélection d'un emplacement de bloc de mémoire.....	102
9.11.4	Emplacements de mémoire protégés.....	102
9.11.5	Lecture dans le bloc de mémoire	102
9.11.6	Écriture dans le bloc de mémoire.....	104
9.11.7	Bloc de mémoire 0.....	105
9.11.8	Bloc de mémoire 1 (facultatif)	108
9.11.9	Blocs de mémoire spécifiques au fabricant	110
9.11.10	Blocs de mémoire réservés.....	110
9.12	Réinitialisation	110
9.12.1	Opération de réinitialisation	110
9.12.2	Opération de réinitialisation des blocs de mémoire	110
9.13	Comportement lors de la mise sous tension	110
9.13.1	Mise sous tension.....	110
9.13.2	Notification du cycle de mise sous tension.....	111
9.14	Utilisation prioritaire.....	111
9.14.1	Généralités.....	111
9.14.2	Priorité des notifications d'entrée.....	112
9.15	Attribution d'adresses courtes	112
9.15.1	Généralités.....	112
9.15.2	Affectation d'adresses aléatoires	112
9.15.3	Identification d'un dispositif.....	113
9.16	Traitement des exceptions	113
9.17	Informations de capacités et d'état du dispositif	113
9.17.1	Capacités du dispositif.....	113
9.17.2	État du dispositif.....	114
9.17.3	État d'instance.....	115
9.18	Mémoire non volatile.....	115
9.19	Types et configuration d'instances	115
9.20	Configuration actuelle de l'unité de bus.....	116
10	Déclaration des variables	116
11	Définition des commandes.....	118
11.1	Généralités	118
11.2	Fiches de vue d'ensemble.....	118
11.3	Messages d'événement.....	126
11.3.1	INPUT NOTIFICATION (<i>device/instance, event</i>).....	126
11.3.2	POWER NOTIFICATION (<i>device</i>)	126
11.4	Instructions relatives à la commande de dispositif.....	126
11.4.1	Généralités.....	126
11.4.2	IDENTIFY DEVICE	126

11.4.3	RESET POWER CYCLE SEEN	127
11.5	Instructions relatives à la configuration du dispositif	127
11.5.1	Généralités	127
11.5.2	RESET	127
11.5.3	RESET MEMORY BANK (<i>DTR0</i>)	128
11.5.4	SET SHORT ADDRESS (<i>DTR0</i>)	128
11.5.5	ENABLE WRITE MEMORY	128
11.5.6	ENABLE APPLICATION CONTROLLER	128
11.5.7	DISABLE APPLICATION CONTROLLER	128
11.5.8	SET OPERATING MODE (<i>DTR0</i>)	129
11.5.9	ADD TO DEVICE GROUPS 0-15 (<i>DTR2:DTR1</i>)	129
11.5.10	ADD TO DEVICE GROUPS 16-31 (<i>DTR2:DTR1</i>).....	129
11.5.11	REMOVE FROM DEVICE GROUPS 0-15 (<i>DTR2:DTR1</i>).....	129
11.5.12	REMOVE FROM DEVICE GROUPS 16-31 (<i>DTR2:DTR1</i>).....	129
11.5.13	START QUIESCENT MODE	129
11.5.14	STOP QUIESCENT MODE	129
11.5.15	ENABLE POWER CYCLE NOTIFICATION	129
11.5.16	DISABLE POWER CYCLE NOTIFICATION	129
11.5.17	SET EVENT PRIORITY (<i>DTR0</i>).....	129
11.6	Requêtes propres au dispositif.....	130
11.6.1	Généralités	130
11.6.2	QUERY DEVICE CAPABILITIES	130
11.6.3	QUERY DEVICE STATUS	130
11.6.4	QUERY APPLICATION CONTROLLER ERROR	130
11.6.5	QUERY INPUT DEVICE ERROR	130
11.6.6	QUERY MISSING SHORT ADDRESS	131
11.6.7	QUERY VERSION NUMBER.....	131
11.6.8	QUERY CONTENT <i>DTR0</i>	131
11.6.9	QUERY NUMBER OF INSTANCES.....	131
11.6.10	QUERY CONTENT <i>DTR1</i>	131
11.6.11	QUERY CONTENT <i>DTR2</i>	131
11.6.12	QUERY RANDOM ADDRESS (H)	131
11.6.13	QUERY RANDOM ADDRESS (M).....	131
11.6.14	QUERY RANDOM ADDRESS (L).....	131
11.6.15	READ MEMORY LOCATION (<i>DTR1, DTR0</i>).....	131
11.6.16	QUERY APPLICATION CONTROLLER ENABLED	132
11.6.17	QUERY OPERATING MODE	132
11.6.18	QUERY MANUFACTURER SPECIFIC MODE	132
11.6.19	QUERY QUIESCENT MODE.....	132
11.6.20	QUERY DEVICE GROUPS 0-7	132
11.6.21	QUERY DEVICE GROUPS 8-15	132
11.6.22	QUERY DEVICE GROUPS 16-23	132
11.6.23	QUERY DEVICE GROUPS 24-31	132
11.6.24	QUERY POWER CYCLE NOTIFICATION	133
11.6.25	QUERY EXTENDED VERSION NUMBER(<i>DTR0</i>)	133
11.6.26	QUERY RESET STATE	133
11.6.27	QUERY APPLICATION CONTROLLER ALWAYS ACTIVE	133
11.6.28	QUERY FEATURE TYPE.....	133
11.6.29	QUERY NEXT FEATURE TYPE.....	133

11.6.30	QUERY EVENT PRIORITY	133
11.7	Instructions relatives à la commande d'instance.....	133
11.8	Instructions relatives à la configuration d'instance	134
11.8.1	Généralités.....	134
11.8.2	ENABLE INSTANCE	134
11.8.3	DISABLE INSTANCE	134
11.8.4	SET PRIMARY INSTANCE GROUP (<i>DTR0</i>)	134
11.8.5	SET INSTANCE GROUP 1 (<i>DTR0</i>).....	134
11.8.6	SET INSTANCE GROUP 2 (<i>DTR0</i>).....	134
11.8.7	SET EVENT SCHEME (<i>DTR0</i>).....	135
11.8.8	SET EVENT PRIORITY (<i>DTR0</i>).....	135
11.8.9	SET EVENT FILTER (<i>DTR2:DTR1:DTR0</i>).....	135
11.8.10	SET INSTANCE TYPE (<i>DTR0</i>)	135
11.8.11	SET INSTANCE CONFIGURATION (<i>DTR0, DTR2:DTR1</i>)	135
11.9	Requêtes d'instance	136
11.9.1	Généralités.....	136
11.9.2	QUERY INSTANCE TYPE	136
11.9.3	QUERY RESOLUTION	136
11.9.4	QUERY INSTANCE ERROR	136
11.9.5	QUERY INSTANCE STATUS.....	137
11.9.6	QUERY INSTANCE ENABLED	137
11.9.7	QUERY PRIMARY INSTANCE GROUP	137
11.9.8	QUERY INSTANCE GROUP 1	137
11.9.9	QUERY INSTANCE GROUP 2.....	137
11.9.10	QUERY EVENT SCHEME.....	137
11.9.11	QUERY INPUT VALUE	137
11.9.12	QUERY INPUT VALUE LATCH.....	137
11.9.13	QUERY EVENT PRIORITY	138
11.9.14	QUERY FEATURE TYPE.....	138
11.9.15	QUERY NEXT FEATURE TYPE.....	138
11.9.16	QUERY EVENT FILTER 0-7	138
11.9.17	QUERY EVENT FILTER 8-15	138
11.9.18	QUERY EVENT FILTER 16-23.....	139
11.9.19	QUERY INSTANCE CONFIGURATION (<i>DTR0</i>)	139
11.9.20	QUERY AVAILABLE INSTANCE TYPES.....	139
11.10	Commandes spéciales	139
11.10.1	Généralités.....	139
11.10.2	TERMINATE	139
11.10.3	INITIALISE (<i>device</i>).....	140
11.10.4	RANDOMISE	140
11.10.5	COMPARE	140
11.10.6	WITHDRAW.....	141
11.10.7	SEARCHADDRH (<i>data</i>).....	141
11.10.8	SEARCHADDRM (<i>data</i>)	141
11.10.9	SEARCHADDRL (<i>data</i>)	141
11.10.10	PROGRAM SHORT ADDRESS (<i>data</i>)	141
11.10.11	VERIFY SHORT ADDRESS (<i>data</i>)	142
11.10.12	QUERY SHORT ADDRESS	142
11.10.13	WRITE MEMORY LOCATION (<i>DTR1, DTR0, data</i>)	142

11.10.14	WRITE MEMORY LOCATION – NO REPLY (<i>DTR1, DTR0, data</i>)	143
11.10.15	DTR0 (<i>data</i>)	143
11.10.16	DTR1 (<i>data</i>)	143
11.10.17	DTR2 (<i>data</i>)	143
11.10.18	DIRECT WRITE MEMORY (<i>DTR1, offset, data</i>)	143
11.10.19	DTR1:DTR0 (<i>data1, data0</i>).....	143
11.10.20	DTR2:DTR1 (<i>data2, data1</i>).....	143
11.10.21	SEND TESTFRAME (<i>data</i>)	143
Bibliographie.....		145
Figure 1 – Représentation graphique générale de l'IEC 62386		79
Tableau 1 – Codage de la trame de commande à 24 bits		86
Tableau 2 – Octet d'instance dans une trame de commande.....		86
Tableau 3 – Codage de la trame de message d'événement à 24 bits		88
Tableau 4 – Types d'instances.....		91
Tableau 5 – Types de caractéristiques.....		91
Tableau 6 – Variables de groupes d'instances		92
Tableau 7 – Information d'adresse de dispositif dans le cadre d'un événement de cycle de mise sous tension		94
Tableau 8 – Schémas d'adressage d'événements		95
Tableau 9 – Valeur mesurée ($\approx 50\%$) par rapport à la résolution et à " <i>inputValue</i> "		96
Tableau 10 – Exemple de séquence de requête pour lire une valeur d'entrée à 4 octets		97
Tableau 11 – Types de mémoires		100
Tableau 12 – Carte de mémoire de base des blocs de mémoire.....		101
Tableau 13 – Carte de la mémoire du bloc de mémoire 0.....		106
Tableau 14 – Carte de la mémoire du bloc de mémoire 1.....		108
Tableau 15 – Capacités du dispositif de commande.....		114
Tableau 16 – État du dispositif de commande		114
Tableau 17 – État d'instance.....		115
Tableau 18 – Configuration actuelle de l'unité de bus		116
Tableau 19 – Déclaration des variables de dispositif.....		117
Tableau 20 – Déclaration des variables d'instance.....		118
Tableau 21 – Messages d'événement d'instances		119
Tableau 22 – Messages d'événement de dispositif.....		119
Tableau 23 – Commandes normalisées.....		120
Tableau 24 – Commandes spéciales (mises en œuvre par le contrôleur d'application et le dispositif d'entrée).....		125
Tableau 25 – Adressage de dispositif avec " <i>INITIALISE (device)</i> "		140

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

INTERFACE D'ÉCLAIRAGE ADRESSABLE NUMÉRIQUE –

Partie 103: Exigences générales – Dispositifs de commande

AVANT-PROPOS

- 1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
- 2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
- 3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
- 4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
- 5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
- 6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
- 7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 62386-103 a été établie par le comité d'études 34 de l'IEC: Éclairage. Il s'agit d'une Norme internationale.

Cette deuxième édition annule et remplace la première édition parue en 2014 et l'Amendement 1:2018. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) le domaine d'application a été mis à jour;
- b) le mode repos a été mis à jour;
- c) la durée de sauvegarde de la mémoire non volatile (NVM) a été ajoutée, et la commande SAVE PERSISTENT VARIABLES a été supprimée;

- d) le bloc de mémoire 0 a été modifié, et les exigences communes pour les blocs de mémoire ont été ajoutées;
- e) IDENTIFY DEVICE a été mise à jour;
- f) le numéro de version a été modifié;
- g) la configuration de l'unité de bus a été ajoutée; et
- h) les types d'instances et leur configuration ont été ajoutés.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
34/946/FDIS	34/990/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

La présente Partie 103 de l'IEC 62386 est destinée à être utilisée avec la Partie 101, qui comporte les exigences générales relatives au type de produit adapté (système), et avec les Parties 3xx applicables (exigences particulières pour les dispositifs de commande) qui comportent des articles destinés à compléter ou modifier les articles correspondants de la Partie 101 et de la Partie 103, afin de spécifier les exigences applicables pour chaque type de produit.

Une liste de toutes les parties de la série IEC 62386, publiées sous le titre général *Interface d'éclairage adressable numérique*, se trouve sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

IMPORTANT – Le logo "colour inside" qui se trouve sur la page de couverture de cette publication indique qu'elle contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer cette publication en utilisant une imprimante couleur.

INTRODUCTION

L'IEC 62386 est composée de plusieurs parties, appelées séries. La série IEC 62386 spécifie un réseau de bus pour la commande par des signaux numériques des appareils d'éclairage électroniques. La série IEC 62386-1xx inclut les spécifications de base. La Partie 101 contient les exigences générales relatives aux composants de système, la Partie 102 complète ces informations avec les exigences générales relatives aux appareillages de commande et la Partie 103 complète ces informations avec les exigences générales relatives aux dispositifs de commande. La Partie 104 et la Partie 105 peuvent s'appliquer à l'appareillage de commande ou aux dispositifs de commande. La Partie 104 fournit les exigences relatives aux composants de système à connexion alternative ou sans fil. La Partie 105 décrit le transfert du microprogramme. La Partie 150 fournit les exigences concernant une alimentation électrique auxiliaire qui peut être autonome ou intégrée aux appareillages de commande ou aux dispositifs de commande.

La série IEC 62386-2xx étend les exigences générales relatives aux appareillages de commande aux extensions spécifiques aux lampes (principalement pour la rétrocompatibilité avec l'Édition 1 de l'IEC 62386) et aux caractéristiques spécifiques aux appareillages de commande.

La série IEC 62386-3xx étend les exigences générales relatives aux dispositifs de commande aux extensions spécifiques aux dispositifs d'entrée qui décrivent les types d'instances ainsi que certaines caractéristiques communes qui peuvent être combinées à plusieurs types d'instances.

Cette deuxième édition de l'IEC 62386-103 est destinée à être utilisée conjointement avec l'IEC 62386-101 et avec les différentes parties qui composent la série IEC 62386-3xx qui spécifie les exigences particulières relatives aux dispositifs de commande, et peut être utilisée conjointement avec l'IEC 62386-102 et avec les différentes parties qui composent la série IEC 62386-2xx relative aux appareillages de commande. La présentation en parties publiées séparément facilitera les futurs amendements et révisions. Des exigences supplémentaires seront ajoutées en fonction des besoins identifiés.

La structure des normes est représentée sous forme de graphique à la Figure 1 ci-dessous.

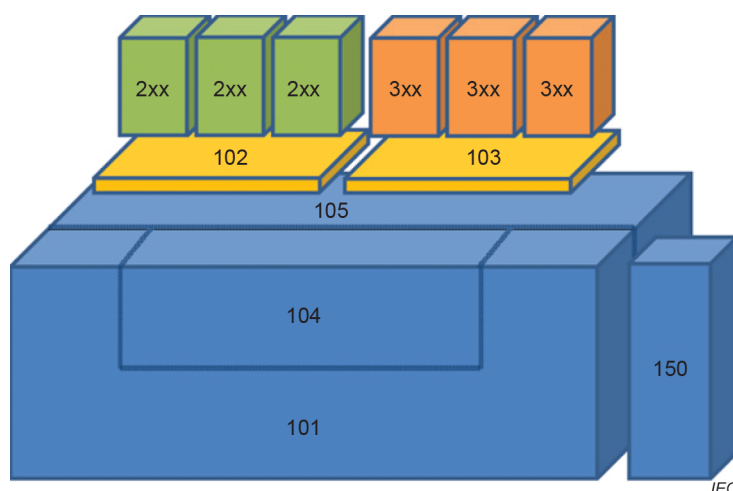


Figure 1 – Représentation graphique générale de l'IEC 62386

La présente partie de l'IEC 62386, tout en faisant référence à un article quelconque des autres parties de la série IEC 62386-1xx, spécifie la mesure dans laquelle un article s'applique. Les autres parties contiennent également des exigences supplémentaires, s'il y a lieu.

Tous les nombres utilisés dans le présent document sont des nombres décimaux, sauf indication contraire. Les nombres hexadécimaux sont donnés dans le format 0xVV, où VV est la valeur. Les nombres binaires sont donnés dans le format XXXXXXb ou dans le format XXXX XXXX, où X est 0 ou 1; "x" dans les nombres binaires signifie que "la valeur n'a pas d'influence".

Les expressions typographiques suivantes sont utilisées:

Variables: *variableName* ou *variableName[3:0]*, qui donne uniquement les bits 3 à 0 de *variableName*;

Plage de valeurs: [valeur minimale, valeur maximale];

Commande: "NOM DE LA COMMANDE".

INTERFACE D'ÉCLAIRAGE ADRESSABLE NUMÉRIQUE –

Partie 103: Exigences générales – Dispositifs de commande

1 Domaine d'application

La présente partie de l'IEC 62386 s'applique aux dispositifs de commande par signaux numériques des équipements d'éclairage électroniques.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 62386-101:2022, *Interface d'éclairage adressable numérique – Partie 101: Exigences générales – Composants de système*

IEC 62386-102:2022, *Interface d'éclairage adressable numérique – Partie 102: Exigences générales – Appareillages de commande*

IEC 62386-3xx (toutes les parties), *Interface d'éclairage adressable numérique – Partie 3xx: Exigences particulières pour les dispositifs de commande*