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- **Pereira, Eduardo**
6850 Dornbirn (AT)
- **Kistler, Roger**
6850 Dornbirn (AT)
- **Parkes, Stephen**
6850 Dornbirn (AT)
- **Shukla, Jagjitpati**
6850 Dornbirn (AT)
- **Wilson, Ian**
6850 Dornbirn (AT)

(71) Applicant: **Tridonic GmbH & Co. KG**
6851 Dornbirn (AT)

(74) Representative: **Rupp, Christian**
Mitscherlich PartmbB
Patent- und Rechtsanwälte
Sonnenstraße 33
80331 München (DE)

(72) Inventors:
• **Makwana, Deepak**
6850 Dornbirn (AT)

(54) **INTELLIGENT EMERGENCY LIGHTING SYSTEM AND LUMINAIRE**

(57) An emergency lighting system (1) is provided, having an emergency driver module (101) for powering an emergency lighting means (102) off a battery (103), terminals (104) for supplying the emergency lighting means (102), and a first communication interface (105) for communicating with one or more sensor modules

(106). The emergency lighting means (102) and the battery (103) are respectively connectable to the emergency lighting system (1). This evolves a simple mandatory emergency lighting functionality to an intelligent smart connected system.

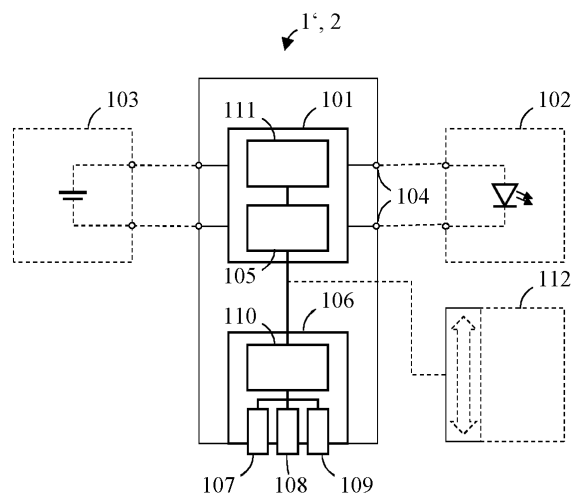


Fig. 2

Description

Technical Field

[0001] The present invention relates to an emergency lighting system and to a luminaire for use in building illumination.

Background Art

[0002] Being a mandatory requirement in building illumination, exemplary emergency lighting is typically designed for cost-efficiency and as an add-on to regular illumination functionality. This defines a plain role of emergency lighting in lighting systems, and precludes a smarter role thereof.

Summary of the Invention

[0003] The object of the present invention is thus to provide an emergency lighting system capable of solving this and other prior art issues.

[0004] The invention is defined by the appended independent claims. Preferred embodiments are set forth in the dependent claims and in the following description and drawings.

[0005] According to a first aspect of the present disclosure, an emergency lighting system is provided. The emergency lighting system comprises an emergency driver module for powering an emergency lighting means connectable to the emergency lighting system off a battery connectable to the emergency lighting system. The emergency lighting system further comprises terminals for supplying the emergency lighting means, and a first communication interface for communicating with one or more sensor modules.

[0006] The emergency lighting system may further comprise a sensor module, including a test switch and a status indicator; a sensor exposed to an ambiance of the sensor module in accordance with the test switch and the status indicator; and a second communication interface for communicating with the first communication interface of the emergency driver module.

[0007] The first and second communication interfaces may respectively be configured for wire-less communication.

[0008] Alternatively, the first and second communication interfaces may respectively be configured for wire-bound communication.

[0009] The first and second communication interfaces may respectively comprise a Digital Addressable Lighting Interface.

[0010] The emergency driver module may further comprise a control unit for controlling an operation of the emergency driver module in dependence of a reading of the sensor.

[0011] The control unit may be configured to log the reading of the sensor.

[0012] The control unit may be configured to activate the powering of the emergency lighting means off the battery in dependence of the reading of the sensor.

[0013] The control unit may be configured to activate a charging of the battery in dependence of the reading of the sensor.

[0014] The control unit may be configured to activate an actuator associated with the emergency lighting means in dependence of the reading of the sensor.

[0015] According to a second aspect of the present disclosure, a luminaire is provided. The luminaire comprises an emergency lighting system of the first aspect of the present disclosure or any of its embodiments; an emergency lighting means; and a battery.

[0016] The present disclosure provides an emergency lighting system which may integrate sensor(s) in combination with further components such as a test switch and a status indicator, into so-called sensor modules. This makes sense as said integrated components definitely require a respective exposure to an ambiance of the emergency lighting system. This may improve an accuracy of corresponding readings of the sensor(s), and evolve a simple mandatory emergency lighting functionality to an intelligent smart connected system, by controlling a behavior of the emergency lighting system in dependence of its sensor(s) readings.

Brief Description of the Drawings

[0017] Further aspects, advantages and objects of the invention will become evident for the skilled reader by means of the following detailed description of the embodiments of the invention, when taking into conjunction with the figures of the enclosed drawings.

Fig. 1 illustrates an emergency lighting system according to an embodiment of the present disclosure; and

Fig. 2 illustrates an emergency lighting system according to a further embodiment of the present disclosure.

Detailed Descriptions of Embodiments

[0018] The invention will now be described with respect to various embodiments. The features of these embodiments may be combined with each other unless specified otherwise.

[0019] Fig. 1 illustrates an emergency lighting system 1 according to an embodiment of the present disclosure.

[0020] The emergency lighting system 1 has an emergency driver module 101. The emergency driver module 101 is configured for powering an emergency lighting means 102 that is connectable to the emergency lighting system 1 off a battery 103 that is also connectable to the emergency lighting system 1. Fig. 1 suggests the emergency lighting means 102 and the battery 103 by light-

emitting diode (LED) and battery symbols, respectively.

[0021] Solid lines in Fig. 1 indicate the features of the emergency lighting system 1, whereas dashed lines suggest the additional features of a luminaire 2 comprising the emergency lighting system 1, i.e., the emergency lighting means 102 and the battery 103.

[0022] The emergency lighting system 1 further comprises terminals 104 for supplying the emergency lighting means 102, and a first communication interface 105 for communicating with one or more sensor modules 106.

[0023] In other words, the emergency lighting system 1 of Fig. 1 is configured for connectivity with field devices such as sensors and/or actuators, so as to form an intelligent emergency lighting system.

[0024] Fig. 2 illustrates an emergency lighting system 1' according to a further embodiment of the present disclosure.

[0025] The emergency lighting system 1' of Fig. 2 may include all the features of the emergency lighting system 1 of Fig. 1, and may further comprise a sensor module 106. In turn, the sensor module 106 may include a test switch 107; a status indicator 108; a sensor 109 exposed to an ambience of the sensor module 106 in accordance with the test switch 107 and the status indicator 108; and a second communication interface 110 for communicating with the first communication interface 105 of the emergency driver module 101.

[0026] Again, solid lines in Fig. 2 indicate the features of the emergency lighting system 1', whereas dashed lines suggest the additional features of a luminaire 2 comprising the emergency lighting system 1', i.e., the emergency lighting means 102, the battery 103, and optionally an actuator 112.

[0027] The sensor 109 may be integrated with further components such as the test switch 107 and the status indicator 108 into a sensor module 106. This makes particular sense if the concerned system components 107 - 109 require a respective exposure to an ambience of the emergency lighting system 1'. The test switch 107 needs to be accessible from an outside for functional testing of the emergency lighting system 1', and the status indicator 108 needs to be visible from the outside for indicating operational issues of the emergency lighting system 1'. Thus, the integration may be appropriate for temperature, humidity, or air quality sensors 109, for example.

[0028] This may improve an accuracy of corresponding readings of the sensor(s) due to less shielding of the exposed sensor 109, and evolve a simple mandatory emergency lighting functionality to an intelligent smart connected system by controlling a behavior of the emergency lighting system in dependence of sensor(s) readings.

[0029] By exposing the test switch 107 and the status indicator 108 of the emergency lighting system 1' on the sensor module 106, the emergency driver module 101 may require less terminals, and may be installed without any exposure to the ambience of the emergency lighting system 1'.

[0030] In an embodiment, the first and second communication interfaces 105, 110 may respectively be configured for wire-less communication. In particular, the first and second communication interfaces 105, 110 may respectively comprise wireless LAN, Bluetooth, or similar radio communication functionality. The deployed radio communication functionality may provide connectivity to further wireless-enabled terminals as well.

[0031] In an alternative embodiment, the first and second communication interfaces 105, 110 may respectively be configured for wire-bound communication. In particular, the first and second communication interfaces 105, 110 may respectively comprise a Digital Addressable Lighting Interface DALI. In such case, the first and second communication interfaces 105, 110 may be interconnected by a DALI bus configured to provide connectivity to a plurality of DALI-enabled terminals.

[0032] According to Fig. 2, the emergency driver module 101 may further comprise a control unit 111 for controlling an operation of the emergency driver module 101 in dependence of a reading of the sensor 109.

[0033] In an embodiment, the control unit 111 may be configured to log the reading of the sensor 109, e.g., for event logging and subsequent evaluation.

[0034] In an embodiment, the control unit 111 may be configured to activate the powering of the emergency lighting means 102 off the battery 103 in dependence of the reading of the sensor 109. For example, the reading of the sensor 109 may be used for adaptive light output. Exemplary applications comprise: increasing a brightness of an exit sign, indicating an adaptive escape path, and the like.

[0035] In an embodiment, the control unit 111 may be configured to activate a charging of the battery 103 in dependence of the reading of the sensor 109. For example, a battery lifetime may be predicted and optimized by a charging algorithm. Exemplary applications in connection with a daylight sensor 109 may comprise not draining the battery 103 at all, or adapting a brightness of the emergency lighting means 102, if there is sufficient daylight.

[0036] In an embodiment, the control unit 111 may be configured to activate an actuator 112 associated with the emergency lighting means 102 in dependence of the reading of the sensor 109. Exemplary applications in connection with fire, smoke, carbon monoxide or audio sensors 109 may comprise opening building exits, closing fire doors, starting smoke extractors, triggering sound alarms and the like, by issuing corresponding control signals.

Claims

1. An emergency lighting system (1) having an emergency driver module (101) for powering an emergency lighting means (102) connectable to the emergency lighting system (1) off a battery (103)

- connectable to the emergency lighting system (1),
the emergency lighting system (1) comprising
- terminals (104) for supplying the emergency
lighting means (102); and
a first communication interface (105) for com-
municating with one or more sensor modules
(106).
2. The emergency lighting system (1) of claim 1, further
comprising
a sensor module (106), including
- a test switch (107) and a status indicator (108);
a sensor (109) exposed to an ambiance of the
sensor module (106) in accordance with the test
switch (107) and the status indicator (108); and
a second communication interface (110) for
communicating with the first communication in-
terface (105) of the emergency driver module
(101).
3. The emergency lighting system (1) of any of the pre-
ceding claims,
the first and second communication interfaces (105,
110) respectively configured for wire-less communi-
cation.
4. The emergency lighting system (1) of any of the pre-
ceding claims,
the first and second communication interfaces (105,
110) respectively configured for wire-bound commu-
nication.
5. The emergency lighting system (1) of claim 4,
the first and second communication interfaces (105,
110) respectively comprising a Digital Addressable
Lighting Interface (DALI).
6. The emergency lighting system (1) of any of the pre-
ceding claims,
the emergency driver module (101) further compris-
ing
a control unit (111) for controlling an operation of the
emergency driver module (101) in dependence of a
reading of the sensor (109).
7. The emergency lighting system (1) of claim 6,
the control unit (111) configured to log the reading
of the sensor (109).
8. The emergency lighting system (1) of claim 6 or claim
7,
the control unit (111) configured to activate the pow-
ering of the emergency lighting means (102) off the
battery (103) in dependence of the reading of the
sensor (109).
9. The emergency lighting system (1) of any of the
claims 6 to 8,
the control unit (111) configured to activate a charg-
ing of the battery (103) in dependence of the reading
of the sensor (109).
10. The emergency lighting system (1) of any of the
claims 6 to 9,
the control unit (111) configured to activate an actu-
ator (112) associated with the emergency lighting
means (102) in dependence of the reading of the
sensor (109).
11. A luminaire (2), comprising
- an emergency lighting system (1) of any of the
preceding claims;
an emergency lighting means (102); and
a battery (103).

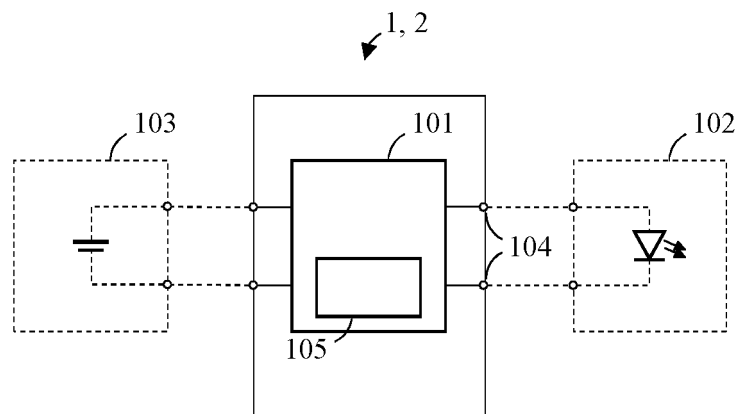


Fig. 1

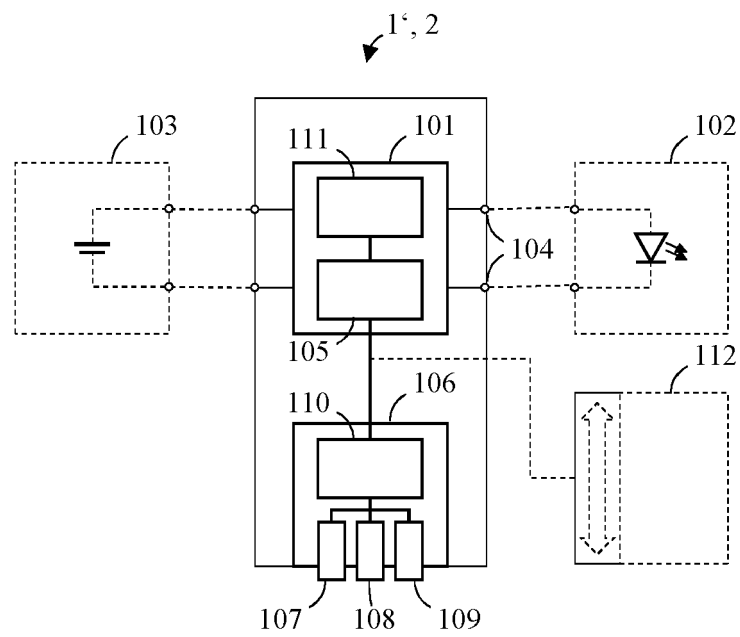


Fig. 2



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Application Number
EP 21 15 3136

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 June 2021	Examiner Henderson, Richard
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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