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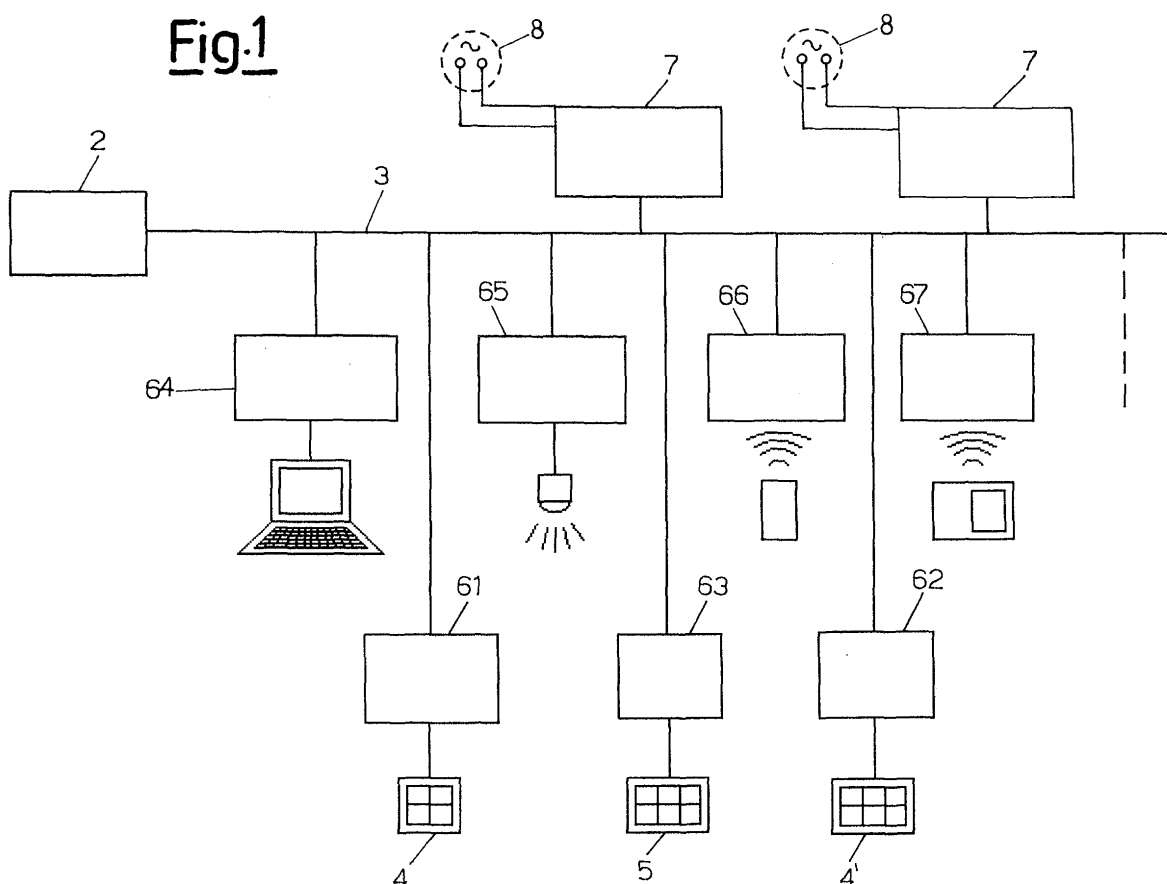
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(54) Method for programming and installing a lighting network

(57) Method for programming and installing a lighting network comprising a series of lighting modules commanded by a DALI system and fed by a supply line (8). Said DALI system comprises at least one control module

(7) connected to each lighting module, at least one DALI command module (2) for said lighting modules, an electric communication line (3) which connects said command modules (2) with said control modules (7).



Description

[0001] The present invention relates to a method for programming and installing a lighting network.

[0002] Lighting networks comprising a series of lighting modules connected to each other by a supply line, controlled by a DALI (digital addressable lighting interface) system, are known in the state of the art.

[0003] The DALI system is a digital addressing system which uses a DALI line, which is a specific line separate from the supply line of light modules, on which information can be transferred from DALI command modules to DALI controllers associated with each lighting module.

[0004] Each lighting module is equipped with said DALI controller and all the controllers of the lighting network are connected with each other by the command line known as DALI line. Furthermore, at least one DALI command module is connected on said DALI line, which allows the switching on, switching off and regulation of the light intensity of each lighting module.

[0005] The DALI system can have the following functions:

- activation of predefined lighting degrees in each lighting module;
- creation of "light scenarios";
- effecting accurate diagnostics of the lighting network;
- definition of maintenance periods for the lighting network;
- installation of command circuits constantly in relation to and activated by light sensors and/or presence sensors;
- transmitting of commands to the command modules by means of radio signals;
- programming of light fading events;
- creation of verification signals of the system through communication between said controllers and the central command units.

[0006] The central command modules can advantageously communicate with computers, by means of appropriate communication gates, for example personal computers, portable computers, palm-top computers, etc. through which it is possible to program said command modules to allow the DALI system to exert the above functions.

[0007] The DALI communication line is a low-power electric line, fed by a DALI supply feeder which supplies the electric current necessary for the controllers and command modules for transferring the information onto the line.

[0008] A DALI system is described as a whole in the IEC standard Nr. 60929 (IEC - International Electrotechnical Commission, International Standard and Assets).

[0009] In the installation phase, after effecting all the electric supply connections to the electric supply system of the lighting modules and after connecting the DALI line

to all the DALI components, the first activation of the DALI system is effected.

[0010] Said activation allows each lighting module to be identified with a univocal address, which is memorized in a suitable memory site of each DALI controller. In this way, all the lighting modules are identified and with the use of the command modules, it is possible to define programmable light scenarios by means, for example, of a personal computer connected to one of said command modules.

[0011] The Applicant has observed that this addressing system of lighting modules allows the lighting scenarios to be programmed, to be perfected only after all the lighting modules involved in a pre-established scenario, have been identified. The addresses of the lighting modules involved in a programmed lighting scenario can in fact only be inserted into the scenario program after the lighting network has been installed.

[0012] Furthermore, any possible modifications of the lighting programs to be inserted after installation, require a new addressing which can only be effected after the modified program has been inserted. This causes a further intervention on the modified program in order to make it compatible with the new address.

[0013] The Applicant has produced a pre-addressing method of a DALI system which avoids the above drawbacks by assigning a univocal address to each DALI module, in the programming phase, in particular upon the moment of installation of the lighting network.

[0014] An aspect of the present invention relates to a method for programming and installing a lighting network comprising a series of lighting modules commanded by a DALI system and fed by a supply line, said DALI system comprising at least one control module connected to each lighting module, at least one DALI command module for said lighting modules, an electric communication line which connects said command modules with said control modules, said method being characterized in that it comprises the following phases:

- connecting said control modules to the supply system,
- connecting each control module to the DALI communication line,
- connecting an addressing machine to said DALI line,
- establishing a pre-established univocal address for each lighting module,
- activating said addressing by sending commands to the DALI line, in order to fix the selected parameters,
- installing said lighting modules in pre-established positions of the lighting network.

[0015] Further objectives and advantages of the present invention will appear evident from the following description and enclosed drawings, provided for pure illustrative and non-limiting purposes, wherein:

- figure 1 schematically illustrates a lighting network controlled by a DALI system;
- figure 2 illustrates a connection scheme whereby the pre-addressing of the lighting modules is effected according to the present invention.

[0016] With reference to the above figures, the lighting network comprises a series of lighting modules connected to each other by a traditional supply line (for example a conventional 220 Volt line). Said lighting network is controlled by a DALI system which comprises an electric DALI line, separate from the supply line, with which said lighting modules are associated.

[0017] In particular, the DALI system comprises at least one DALI control panel 2 connected to a DALI communication line 3.

[0018] A series of DALI modules are also connected to said DALI communication line, which command network devices. Figure 1 illustratively shows an interface module 61 of switches 4, an interface module 62 for lighting groups 5, an interface module 63 for the activation of scenarios 4'.

[0019] An interface module 64 for a personal computer, an interface module 65 for lighting network sensors, an interface module 66 for an infrared device, an interface module 67 for a radio transceiver device, are also connected to the DALI line.

[0020] Further DALI interface modules can also be envisaged within the scope of the present invention. The system comprises at least one control module 7 for each lighting module connected to said DALI line. Said control module, moreover, receives the supply line 8 with which it feeds said lighting modules with the procedures supplied by the DALI system.

[0021] Each component of the DALI system is fed at "low voltage", for example 12 Volts, by means of a DALI feeder (not shown in the figure).

[0022] The DALI system comprises a series of lighting programs, whereby the switches of the lighting network are associated with the lighting modules, for the switching on and off and the lighting degree of each lighting module. Furthermore, by activating a different program, it is possible to reprogram the DALI system to command the lighting modules and lighting degrees differently.

[0023] Each lighting module is identified by a univocal address, memorized in said control module 7 with which it is associated.

[0024] An example of a univocal address is a digital string of at least four bits.

[0025] During the installation of a lighting network supported by a DALI system, said univocal addresses are assigned according to a random procedure. If groups of lighting modules having mutual characteristics are to be created, it is therefore necessary to "reprogram" the DALI system by inserting the univocal addresses generated by the random procedure.

[0026] The Applicant has produced an identification procedure of lighting modules, which can be effected in

the installation phase previous to the connection phase of the DALI system to the lighting network. Furthermore, the identification procedure of the lighting modules can be effected before carrying out the whole installation phase of the lighting network, for example during the assembly of the lighting module.

[0027] This procedure can be effected by connecting a DALI line to all the lighting modules by means of the above-mentioned control modules 7, and assigning the address to each lighting module.

[0028] Figure 2 illustrates a connection scheme whereby the pre-addressing of the lighting modules is effected.

[0029] All the lighting modules to be addressed by means of the DALI control modules 7, are connected to the DALI line 3. An addressing machine 7, produced for example by means of a microprocessor processing unit, a user interface and an interfacing card with the DALI line. Said machine can, for example, be a personal computer (desktop or laptop or palm-top) and is connected with the DALI line and effects the addressing.

[0030] The phases of the addressing procedure are the following:

- connecting the control modules 7 to the supply line (230V) ;

- connecting the addressing machine to the DALI line (12V) ;

- establishing the desired addresses for each lighting module, and possibly other parameters of the lighting modules, such as, for example, the light-fading time, the switching-on time of said modules;

- activating the addressing by sending suitable commands onto the DALI line in order to set the selected parameters.

Claims

1. A method for programming and installing a lighting line comprising a series of lighting modules commanded by a DALI system and fed by a supply line, said DALI system comprising at least one control module connected to each lighting module, at least one DALI command module for said lighting modules, an electric communication line which connects said command modules with said control modules, said method being **characterized in that** it comprises the following phases:

- connecting said control modules to the supply system,
- connecting each control module to the DALI communication line,
- connecting an addressing machine to said

DALI line,

- establishing a pre-established univocal address for each lighting module,
- activating said addressing by sending commands to the DALI line, in order to fix the selected parameters,
- installing said lighting modules in pre-established positions of the lighting network.

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2. The method according to claim 1, wherein said phase for fixing a pre-established univocal address comprises the additional phase of establishing the light fading time for each lighting module. 10
3. The method according to claim 1, wherein said phase for fixing a pre-established univocal address comprises the additional phase of establishing the switching-on time of said lighting modules. 15
4. The method according to claim 1, wherein said addressing machine comprises a microprocessor processing unit, a user interface and an interfacing card with the DALI line. 20
5. The method according to claim 1, wherein said addressing machine is a personal computer. 25

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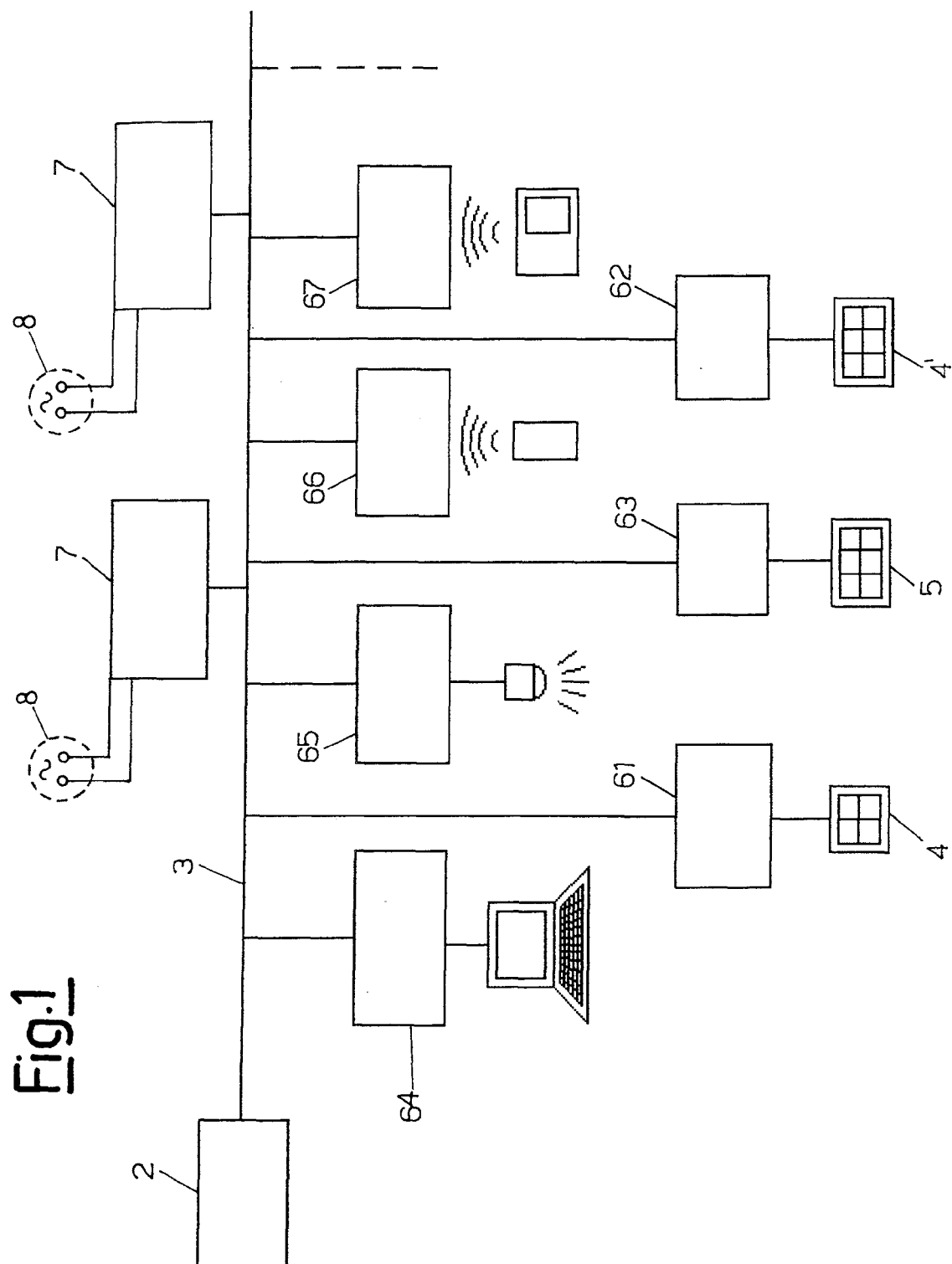
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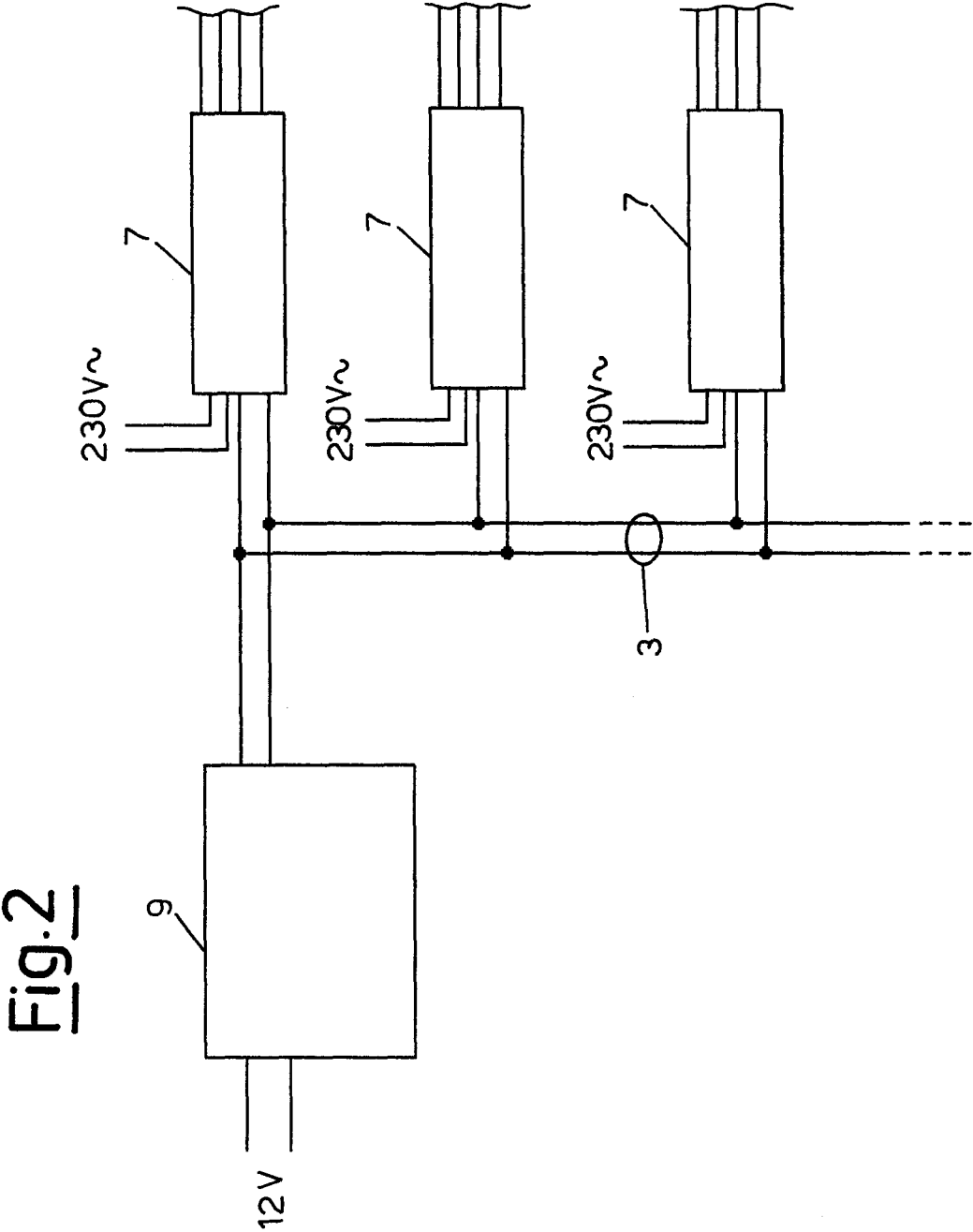
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European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 06 10 0591

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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 23 March 2006	Examiner Burchielli, M
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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EP 06 10 0591

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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23-03-2006

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