Specifications Central Light control system

Status: Concept

1. Light management system

1.1. System

The building must have a flexible light management system.

The system must allow the lighting to be controlled in specific parts of zones using software with the desired functionalities and the possibility to change these zones or functionalities without any changes being necessary to the electro-technical installation. This has to be on the basis of a user interface based on the building ground plans.
The system must also facilitate the management of emergency lighting with ESM communication (ESM = ETAP Safety Management).

The light management system must comprise controllers with DALI outputs and accompanying software, which are connected in a network (standard TCP/IP).
The DALI communication must meet DALI protocol – IEC 62386-2014.

The light management system must be modular so that it can grow with the user's requirements, without having to replace parts of the installation. It must also be possible to add functionalities using software updates without anyone having to come on site for this; more specifically via a (temporary) remote connection.

The light management system must at least contain the following functionalities:

- full graphic real-time visualisation of the status of the lighting/luminaires (on, off and dim value) on ground plans of the building;
- daylight linking system using a light sensor or multi-sensor mounted in the space. The artificial lighting is dimmed as a function of the incoming daylight with preservation of the reference light level on the work surface. And it must be possible to set the minimum, automatic dimming levels of every single one (to prevent the light from switching off if you don't want it to).
- movement detection (both occupancy and absence detection) with adjustable delay time; and this per zone set on movement. It must be possible to link the sensors to different zones.
- the functionality of each of the sensor functions of a multi-sensor (daylight linking system and movement detection) can be assigned and set regardless of each other;
- zone linking (switching the lighting on and off as a function of the status of the neighbouring zone);
- scenario setting is available in every lighting zone;
- controlling outdoor lighting using an external light sensor;

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- timer programmes to be set using a handy visual interface and repetitions to be chosen freely. It must be possible to set in minutes which scenario is started when and how long.
- operation (on/off, dimming and/or launch scenarios) using push-buttons, PC, touch screen, tablets and/or smart phones.
- simple maintenance by monitoring burning hours, detection of errors (lamp, communication, and battery errors).
- generate reports and analyses to monitor the energy savings, or to request the status history
- allow the possibility for a simple software upgrade to newer versions with new functions without having to replace controllers.

Working closely with the customer, the supplier of the light management system draws up a functionality description for each type of space (e.g. individual office, open-plan office, corridor, store room…). This description is used to configure all the parameters in the software. The physical connections need to be independent from these software settings.

The lighting control system is delivered with pre-programmed software in which all luminaires, sensors and push-buttons are assigned to control zones based on a plan with the graphic location of all these components.
In addition the user must be able to easily adapt the predefined functionalities (via drag & drop actions) or change the parameters.

1.2. Configuration, commissioning and training

The installer must configure the light management system in accordance with the specified requirements, as well as the full commissioning of the system.
A training for the end-user also needs to be provided.

1.3. System components

1.3.1. DALI controller

A DALI controller is a compact Din-rail component (157x90x58mm) suitable for mounting in an electric cabinet or a switchboard. It has 4 DALI-outputs. The DALI power supply (of 250mA per DALI bus) needs to be integrated in the controller.

The controller also offers the possibility to switch one of four DALI outputs to the ESM-bus (via software) on which a maximum of 100 emergency lighting luminaires (equipped with ESM module) can be connected for monitoring by the lighting control system.

Every DALI controller is included in the network of controllers and has two network ports to build this network without additional network switches or routers.

The software and the full configuration of the system run on the DALI controller so that it can work autonomously in case the network is interrupted.

1.3.2. Cabling

The following needs to be used for the light management system:

- Ethernet cables for linking controllers
- DALI cabling (in accordance with the DALI protocol) that can also be integrated in the power cables (e.g. 5G1.5) polarity insensitive.
- ESM cabling 2 x 1.5mm² polarity sensitive

1.3.3. DALI Relay module

The relay module is suitable for Din-rail mounting which allows static luminaires to be controlled via DALI by translating the DALI signal to the switching of a relay. It must meet the DALI standard (DALI logo has to be on the device) and requires one DALI address per relay contact. The module has 4 relays of 10A and it uses less than 2mA on the DALI line.

1.3.4. DALI Multi-sensor

The DALI multi-sensor is a combination of two sensors: a light sensor and a movement detector. Every function of the multi-sensor must be separately adjustable via the software.
The sensor only needs to be connected to the DALI bus (no separate power supply or interface needed) and uses maximum 6mA. There is a version that can be integrated in the luminaires or the false ceiling.

1.3.5. DALI Push-button interface

The DALI push-button interface is a compact component suitable for mounting behind the push-button in a standard mounting box (for recessed mounting in a wall of a push-button/switch.
It has a DALI-input (no separate power supply) and uses maximum 6mA. In addition it has 4 contacts to connect the push-button panel, which makes it suitable to connect 4 push-buttons.

Moreover, the DALI push-button interface can be used to link other contacts (potential free NO or NC contacts) to the system to allow extra integration (e.g. link with external sensors, switches, burglar alarm, access check, door contacts …).