1. INTRODUCTION:

Emergency lighting system; is a secondary lighting mode which is immediately activated if the normal lighting system shuts down due to fire, earthquake, terrorist outrage and/or sabotage, etc., ensuring the safe evacuation of people.

The primary purpose of the emergency lighting system is to prevent a loss of life by providing a safe evacuation. Emergency lighting system should ensure that people are evacuated quickly and safely from the building without staggering, stumbling, getting tangled on to the obstacles, falling, getting injured, crushed, panicked, overcrowded and getting piled up; it should ensure that fire alarm and extinguishing equipment and first aid equipment are easily distinguished, and prevent accidents from happening at risky areas.

Emergency lighting is not a type of lighting that is normally in need. But in an emergency, it should work exactly as required. If it does not work in some way or the other, the risk is the human life. This is the most important feature that distinguishes emergency lighting from other types of lighting.

In our country, as per the Regulation on the Protection of Buildings from Fire and the Standard of 50172, users/owners of buildings should periodically test the emergency lighting system by themselves or have is tested, and in case of any negative situation experienced, they should keep all necessary documents ready to be submitted to public and legal authorities in their own interests. All operations must be carried out by authorized and trained persons/organizations expert in this field, and all the results should be recorded.

Periodic test records can be kept in a logbook or if the tests are performed automatically from a central point by means of an automation system, incident records and test results should be stored on the computer. In either case, copies of the relevant records should be kept in a separate environment by taking backups once a month. Measures should be taken to avoid damage to these documents in case of an emergency (e.g. backup on to the cloud system, storage in a place other than the building, etc.)

In terms of centrally monitoring of malfunctions in emergency lighting products such as lamp, charging, battery malfunctions, etc., even in terms of testing and/or checking these devices again from a center as desired, DALI (Digital Addressable Lighting Interface) system, now becoming a World Standard, stands out. The malfunction of the luminaires connected to the DALI network will be monitored from a center and intervened in a short time, and the system will be maintained in a smoothly working and sustainable manner in the building.

EEC ELECTRONICS emergency lighting products are comply to following standards;

- EN 62386 (DALI System)
- EN 61347-2-7 (Emergency Driver)
- EN 60598-2-22 (Emergency Luminaire)
- EN 61951 (Battery)
- EN 62384 (Photobiyological Safety)

2. OPERATION MODES

- **Operation Mode When Connected to DALI (Normal Operation)**

  When the devices are connected to the DALI line, they communicate with the system and operate compatibly. The status of the devices can be monitored from the center. Function and durations tests are initiated automatically, if desired, these tests can also be started manually or via the center. While visual warnings are given over local displays, in case of a malfunction, failure is also monitored from the center at the same time.

- **Operation Mode When Disconnected from DALI (Self-Test Mode, operation when DALI line is disconnected)**

  Devices that are no longer connected to the system due to a failure in the DALI data line are detected by the system as a connection malfunction. These devices automatically switch to Self-Test mode when they are not connected to the system, and they continue to operate independently. In this case, the function test and duration test are initiated automatically via the device, and if there is a malfunction, visual warnings are given via local displays.

3. LOCAL LED DISPLAYS

- **Double-colored LED (Red/Green)**

  To display the status of the device locally, there is a Red/Green dual color LED display located on the device. While LED is lit in green in normal situations, it will blink in red color with a continuous or short/fast interval in case of a problem, and locally informs the malfunction status of the device.


Continuous Green : Normal Standby Mode (blinks every 10 seconds)


Slow Flashing Green : Function Test


Slow Flashing Red: Battery Disconnected


Fast Flashing Red : Battery Failure


Continuous Red: Lamp Failure


Fast Flashing Red & Green : Addressing mode (startup)

4. TYPES OF TESTS

- **Function Test**

  It is a test performed in relatively short periods to see whether the light source works correctly with the power it receives from the battery. It is performed automatically in every 15 days and for 60 seconds. If desired, it can be done manually via the Test Button on the device or requested to be performed by the automation system.

- **Duration Test**

  In addition to being sure that the device is working properly, it is a test that measures the activation time with the power it receives from the battery. Performed automatically once a year. If desired, it can be done manually via the Test Button on the device or requested to be performed by the automation system.

- **Initiating Tests**

  Tests can be initiated in three ways;

  - Via the luminaire automatically: The DALI module in the luminaire starts automatically according to the internal time clock and the setting previously programmed.
  - Manually via the luminaire: It can be started manually via the luminaire.
  - Via DALI System: Tests can be started with DALI test commands sent from DALI system.

5. MALFUNCTIONS

System and Local LED Displays give warnings in case of malfunctions.

- **Lamp Malfunction**

  When a LAMP MALFUNCTION (short circuit/open circuit) is detected during the tests, the DALI system is informed and the local LED display lights up in red, sending a warning.

- **Battery Malfunction**

  When a BATTERY MALFUNCTION is detected during the tests, the DALI system is informed and the local LED display flashes in red at a fast tempo, and sends a warning.

- **Battery Not Connected**

  If the BATTERY is not connected, the DALI system is informed and the local LED display flashes in red at a slow tempo.

6. GROUPING

Devices can be grouped on the system and operations can be performed on them as a group. For example, several devices bundled as a group in a particular area can be tested at a certain time all together.

7. REMOTE MONITORING & CONTROLS

Following actions could be monitored & controls could be done from remote station

- Luminaire is working properly
- Related group of luminaire
- Lamp is ON
- Lamp fault
- Battery level (%)
- Battery fault
- Battery disconnected
- Starting addressing mode
- Starting “Function Test”
- Starting “Duration Test”
- Set up of the luminaire “Rest Mode”
- Set up of the luminaire “Inhibit Mode”

8. NETWORK CONNECTIONS

- Uninterrupted phase/neutral line must be drawn to the equipment for mains supply. A triple-core cable should be drawn for the devices that will be operational continuously (like EXIT signs) (1- Phase, 2-Neutral, 3-earth)

- For emergency lighting devices that can be switched on and off, quadruple-core cable should be drawn. (1- Switched phase 2- Continuous phase 3- Neutral 4- Earth) The switched phase and the continuous phase must be the same phase.

9. DATA LINE (DALI) CONNECTIONS

- DALI data cables that are connected to devices can be made as desired, with serial cable, star cable or both.

- A minimum of 2x1.5mm² cable must be drawn for the DALI data cable. The cable length should not exceed 300 meters. No (+) or (-) polarization is necessary for DALI data connection, can be connected as required.

- To a DALI intermediate supply and control unit, in some systems 64 devices and in some other systems128 devices can be connected.

- If the luminaire is to be controlled by DALI automation in normal lighting, two addresses are required, one address for normal lighting and one address for emergency lighting.

- For matters related to the scenario, installation and system capability of the automation, information should be obtained from the company performing the automation.

10. DATA KNX INTERCONNECTION

For a transition from DALI to KNX system, DALI-KNX Gateway module must be connected.

11. NOTE

Our company produces “Emergency Lighting” products compatible with DALI automation system due to its own expertise. DALI or KNX automation is another field of specialty. As in all over the world, we are not performing automation as a luminaire manufacturer. We recommend the integration of emergency lighting devices into the automation system to be performed by a dedicated Automation Company. Since DALI is already an international standard protocol, no matter which brand of luminaire or automation is being used, they will be compatible with each other. Please, do not hesitate to contact us for any questions.

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