

Consultant Specification

Specification of addressable Emergency Lighting

Scope of Works

To design, supply, install and commission an addressable emergency light testing system in accordance with the details specified in accordance with supplied drawings.

Introduction

The system shall include all materials, equipment and wiring required to install the complete addressable emergency lighting testing system. The system shall include but not be limited to one or more control panels and addressable luminaires. The system design may also include the use of central batteries or a static inverter.

The installation shall include the laying of all cables required for connection of the emergency luminaires along with connections to the power supply as appropriate to the design. All cabling shall conform to the requirements and recommendations of the 17th Edition of the IET wiring regulations.

The system shall be designed such that no more than 80% of the available capacity is employed to allow for future change in requirements or expansion.

This document is intended to provide consulting engineers and system specifiers with reference information for inclusion in System Procurement and Installation Specification documents.

Standards & References

BS 5266-1:2016	Emergency lighting. Code of practice for the emergency escape lighting of premises
BS EN 50172:2004	Emergency escape lighting systems
BS EN 60598-2-22:2014	Luminaires. Particular requirements. Luminaires for emergency lighting
ICEL 1004:2004	The requirements for the re-engineering of luminaires for emergency lighting use

System

An emergency lighting system is to be provided that enables regular and automatic testing of emergency lighting luminaires from a central control system to be carried out and the results recorded for later inspection. The system should conform to the requirements of BS 5266 and EN 50172.

The emergency lighting system comprises of several functional blocks. In the simplest These are:

Emergency Lighting Testing Panel

The control panel can be either the central controller for the installation, or be one of many such panels forming a much larger networked emergency lighting testing installation. An emergency lighting system is to be provided that enables regular and automatic testing of emergency lighting luminaires to be carried out and the results recorded for later inspection either locally or from a remote location.

The panel should provide a user interface from which; controls can be operated, manual operations can be carried out, indications are visible and system information can be obtained. It shall also be capable of providing indication of fault conditions as well as displaying the outcomes of previous testing.

The panel should be able to communicate suitable PC tools operating under the Windows™ operating system. This is to allow access either directly or remotely to the panel. This communication should allow the passing of data between the PC tool and the panel in the form history logs from the panel. This link should allow remote virtual operation of the panel. This link should ideally be achieved by connecting the emergency lighting test panel(s) to the local area network to allow access from anywhere across the network, even even from permitted IP addresses outside of the local area network.

The control panel shall have the following minimum features:

- Be simple and easy to operate and indicate fault or failures in plain English on and LCD together with unique point location (26 characters) and zone text (32 characters), covering up to 1000 definable zones
- The emergency lighting testing system should be capable of linking at least 100 such panels
- Be fully configurable by the end user
- Provide a capability for battery back-up operation for a minimum of 24 hours
- Provide control and connection of up to 996 addressable luminaires via two wire communications circuits. Each circuit shall be capable of been at least 1.5km in length and communicate with 249 luminaires.
- Provide flexibility for expansion and maintenance of the installed luminaires
- Provide 400 individual programmable tests to enable a flexible testing scheme the required

daily, monthly and annual tests

- Provide 50 test groups shared across the whole panel for the group testing of luminaires
- Provide the capability to print test reports via an A4 sheet printer for ease of record keeping
- Provide automatic and operator instigated testing and reports
- Provide a non-volatile event log with a minimum of 1000 records for the recording of faults and warnings along with records of all luminaire tests
- Provide a local fault relay at the panel to facilitate an indication of faults to third party equipment, for example a buildings BMS system
- Provide constant monitoring each luminaires status, including light level, battery voltage (if applicable) and AC mains (if applicable)

In addition to the above requirements, if the system to be implemented is based on a central battery or static inverter design, the central control system must be capable of communicating and controlling such components through the use of addressable interface units.

An addressable interface unit shall incorporate a fault monitoring input and test changeover relay. The interface unit shall connect to the same two-wire communications circuit as the lighting control module. It shall be possible to assign the interface unit to any one of the 50 test groups on the central control system. In the event that a test is either manually or automatically invoked in the relevant test group, the test relay should energise for the duration of the test.

It should be possible to monitor the panels in a number of different ways to allow the transfer of information. These methods should include:

- Direct connection to the panel from PC to panel using a simple RS-232 serial connection lead
- Across an installation's local area network using a serial to Ethernet converter. This should allow access to the panel from anywhere on the network and for up to 100 panels to be installed and monitored this way
- Where a number of panels are installed but access to them via a local area network is not possible, the panels should be capable of being networked together in a fault tolerant loop. The size of the network should be greater than 100 panels

Luminaires

An addressable lighting control module shall be provided that has the capability of being installed in any standard commercially available luminaire. This control module shall have the following minimum features.

- Provide monitoring of the emergency lamp true light level output via the optical fibre as opposed to basing the performance on current discharged from batteries.
- Provide a mechanism for configuring and setting a unique address for each luminaire

without the need for special tools

- Provide the ability to uniquely be configured to the specific parameters for matching the particular luminaire it is interfaced to
- A standard control module can be configured as either maintained or non-maintained
- All luminaires must meet the requirements of BS EN 60598-2-22
- Any re-engineering of standard luminaires must be completed by an ICEL 1004 registered company

In addition to the above, if the system to be implemented is based on a central battery or static inverter design, the luminaires should be appropriate to the supply provided, with the ability to work in conjunction with such devices as hold-off relays and isolation switches.

In conjunction with the above mentioned luminaire type and Emergency Lighting Testing Panel, emergency luminaires and exit signage capable of drawing power directly from the data cable (32V) may be used, either solely or as a hybrid system of mains/central battery/static inverter luminaires and low voltage, loop-powered devices.

PC Tools

A Windows™ based PC tool shall be provided with the capability of being directly connected to the central control system or of being remotely connected to the central control system via a local area network connection, a PSTN telephone network or a GSM mobile telephone network. It shall provide the capability for remote logging and printing of every test schedule result, remote diagnostics and provide a complete history of every luminaire on the system.

A further Windows™ based tool shall be provided for the purpose of allowing the configuration of the central control system and as a means of providing a back-up of that configuration.

A final PC tool will be provided to facilitate the uploading of any testing/fault data to a medium that will allow the sharing of such data, i.e. cloud storage.

Management of Emergency Lighting Test Results

All emergency lighting status and testing data should be available to view and share in real time. This will be achieved via the PC tools uploading all of the data they have collected to a secure cloud service. The cloud service will store all historic and real time system data. This information will be available for interrogation and sharing, from anywhere in the world.

Access to this information is achieved through the use of Smartphones and tablets. The reporting schemes offered should be:

- A traffic light status monitor showing at a glance, the entire emergency lighting network
- Ability to show current status issues by type, i.e. low light output, low/high battery. Lost communications, no mains
- Luminaires can be viewed per panel, loop or zone
- Generation of test reports, maintenance reports and advisory reports from groups of

sites down to individual panels

- All reports can be shared instantly via email
- Advisory reports should make the monitoring party aware of potential upcoming failures, for example nearly 12 months since last three hour test the light output approaching a failure level on a particular luminaire
- It will also be reported if there are any issues with the monitoring PC or connections to the panels
- Cloud data is regularly backed up
- The system should be secure with an account requiring a name and password to provide access
- A user should be allowed to share information on installations or just panels with other account holding members