LightBox *Emergency* System Overview

Introduction

The MultiControls LightBox *Emergency* is a comprehensive DALI based scalable emergency light testing system. LightBox *Emergency* has been designed to provide a flexible, powerful and user friendly emergency lighting testing and reporting system. Whilst the LightBox *Emergency* system is aimed primarily at commercial applications such as Offices, Schools, Universities, Hospitals and Airports etc., the system can be applied wherever emergency lighting and testing is required. Featuring an intuitive graphic user interface and commissioning tool, coupled with a very powerful database engine, the system provides an intuitive and simple way to initially set-up the system, as well as presentation of live real time status. Results from routine tests are available to view, print and/or email (Internet connectivity required for email), thus assisting the building operator in maintaining his emergency lighting with timely repairs to reported faults, as well as maintaining records of testing for demonstration of compliance with regulations.

System Architecture

A LightBox *Emergency* emergency lighting test system comprises of one or more Touch Screens, each supporting up to 10 MultiControls DALI Emergency Hubs. DALI Emergency Hubs each have two separate DALI field networks supporting up to 64 DALI devices each. Therefore each Touch Screen and associated DALI Emergency Hub's has the capacity to manage up to 1,280 DALI emergency devices. These devices can then be allocated to one of 16 testing groups.

Further, up to 8 Touch Screens may be networked together to form a LightBox *Emergency* system that can accommodate potentially, up to a massive 10,240 Dali emergency devices.

For the configuration and operation, the MultiControls LightBox *Emergency* test and monitoring system utilises a standard Apple iPad™ device, with a specific MultiControls "App" which has been written in house for this application.

The "App" is an Apple Enterprise App, and is provided as part of the Touch Screen and Security Mount Package. The "App" is also available separately if a user wishes to use, or purchase their own iPad device (Contact MultiControls for details).

The LightBox *Emergency* software "App" is intuitive and very easy to use for both the commissioning engineer as well as the user. The "App" is used to configure all the connected DALI emergency devices to form local monitoring groups. DALI devices do not need to be physically in the same DALI field network to function as part of a control group.

DALI *Emergency* Hub

The DALI *Emergency* Hub is the second of a series of Hub units to be developed by MultiControls. The Hub topology has been specifically designed to allow the flexibility to develop new Hubs to cater for the next generation of lighting network protocols as they emerge, without having to redesign the entire system.

The DALI *Emergency* Hub has two DALI networks, each capable of supporting 64 emergency lighting devices as specified by the DALI standard, for a total of 128 devices per Hub. The DALI *Emergency* Hub is capable of controlling and monitoring all DALI emergency lighting control gear irrespective of manufacturer, providing they are fully compliant with the DALI standard for Type 1 (Emergency) devices.

The DALI *Emergency* Hub also features an Auto-Heal facility enabling the replacement of a single failed DALI emergency device on a particular DALI network automatically, without the need for any reprogramming.

The standard Hub has triple connections for mains power allowing the simple connection of multiple Hubs using loop in/out. Each terminal can accommodate cables up to 2.5mm CSA. It should be noted that the mains power supply to the DALI Hubs must be

protected by a 6A Max fused spur unit (by others) Each of the two DALI networks has double connections to allow for flexibility of connection.

MultiControls can provide pre-assembled and tested control panels which can house the local DALI *Emergency* Hubs as well as Ethernet network switches etc. (See below).
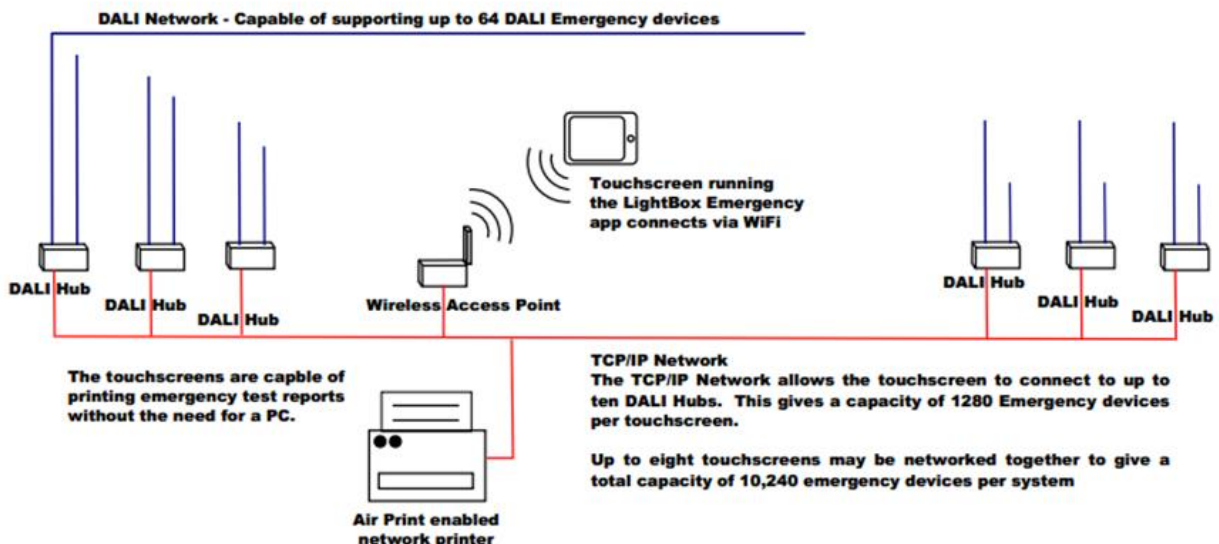
System Topology

The MultiControls LightBox *Emergency* system is connected together using global standard Ethernet TCP/IP network connections. This can either be a fully private network or the system can be incorporated in to an existing building I.T. infrastructure with an appropriate range of I.P. addresses being provided by the I.T. department.

In the development of LightBox *Emergency*, we have focussed our protocols on the use of TCP/IP messaging as this is considerably more robust than its counterpart UDP/IP. TCP/IP ensures that LightBox *Emergency* is able to take full advantage of industry standard network technologies such as data switches and Wi-Fi wireless networking etc. We have also ensured that all of our devices use fully compliant network addressing, and do not cause restrictions on the network (this can be a significant limiting factor with some other systems).

The flexibility and worldwide standard of Ethernet means that the full range of networking tools and equipment may be used to create a network that is as simple or complex as required for the particular specifications of a project. A simple installation might consist of a private network using unmanaged network switches allowing all of the devices to communicate. A more demanding project might utilise fully managed network switches, enabling the creation of Virtual Local Area Networks (VLANs) which manages the traffic around the network and allows the creation of redundant links which are only bought in to life if the primary connection fails for any reason. This enables the creation of a bespoke solution that balances the demands of cost versus functionality.

The DALI Emergency hubs can be located in convenient locations within a building to ensure that the DALI network limits are adhered too. Generally, there are one or more Hubs at each location which can operate as stand-alone local systems, or they can be networked together as described above to create a building wide system with central monitoring.

DALI Network - Capable of supporting up to 64 DALI Emergency devices

DALI Hub

DALI Hub

DALI Hub

Wireless Access Point

Touchscreen running the LightBox Emergency app connects via WiFi

DALI Hub

DALI Hub

DALI Hub

The touchscreens are capble of printing emergency test reports without the need for a PC.

Air Print enabled network printer

TCP/IP Network
The TCP/IP Network allows the touchscreen to connect to up to ten DALI Hubs. This gives a capacity of 1280 Emergency devices per touchscreen.

Up to eight touchscreens may be networked together to give a total capacity of 10,240 emergency devices per system

Lighting Control Panels

At MultiControls we are well aware that providing an installer with a carton full of DALI Hubs and other electronic devices, can sometimes be a daunting and problematic prospect. This is also exacerbated by the fast track nature of modern construction programmes. We have found that offering a panel manufacturing service takes the worry of finding suitable enclosures to house the sensitive electronic components, connection of power supplies, and terminating DALI field networks. This is particularly true when it comes to the Ethernet connections for devices such as MultiControllers, Hubs, Wireless Access Points and Network Switches.

To overcome these real life problems, MultiControls can manufacture lighting control panels which are designed specifically for the project. All internal assembly and wiring is completed and tested at our works. This approach means that for each control panel location, the correct equipment is pre-installed within the panel and internal wiring for power supplies etc. are all completed prior to shipping to site.

Once on site, all that is required is to mount the panel on the wall of the electrical riser / cupboard, connect the control panel mains power, outgoing DALI networks and Ethernet data cables.

Mains incoming power cables are brought to terminals for ease of connection. This means that the installer does not need to worry about the

interconnection of the individual components, or risk damaging them making up their own panels. The external wiring is simply connected at the panel terminal rail.

MultiControls panels are based on the high quality ABB IP65 Mistral Range of plastic enclosures designed to accommodate DIN Rail mounted components. Alternatively, MultiControls can supply panels in traditional metal enclosures if required. Metal panels are high quality IP65 powder coated steel enclosures with hinged locking doors and removable gland plates as standard.

All internal wiring is over rated for the loads involved, and the ends of the cables are terminated with Bootlace ferrules.

Cable management is by loomed cable runs, or contained in finger trunking as appropriate.

Where multiple Hubs and Power over Ethernet (POE) and/or Wireless Access Points (WAP) are to be fitted in a panel, a network switch would normally be provided for the Ethernet Data connections.

LightBox *Emergency* iPad Application

Traditionally, Users of lighting control and lighting emergency testing systems have struggled with a lack of an intuitive user interface, resulting in systems being difficult to visualise, harder to access, and often requiring additional paper drawings and grouping tables to be maintained to keep the system up to date and allow changes to be made.

After speaking with our customers, MultiControls have developed the new LightBox *Emergency* iPad™ application (App) which provides an intuitive User Interface (UI), designed to provide clear and simple "at a glance" visualisation, commissioning and management of a MultiControls Emergency Lighting testing system.

LightBox *Emergency* also provides the following functionality giving greater management of a system:

- At a glance system status information
- System diagnostic information
- Alert messages and colour coding of status graphics
- Configurable automatic testing schedule
- Logging of the last 11 Monthly Function Tests and 5 Annual Duration Tests
- Results sent to a printer for hard copy records (Apple AirPrint™ compatible)

- Results may also be emailed (Internet connectivity required)

Our aim is to give our customers a better solution for their lighting control and management by providing:

- Intuitive user interfaces
- User friendly tools for energy management, helping to reduce the energy consumed by a building's lighting
- Out of the box tools and reporting for functions such as routine emergency lighting tests
- Live remote reporting of faults and failures using email and automated work sheets
- High levels of customer focused technical support and site commissioning
- Ongoing routine maintenance and support packages for the life of the system

Innovation in Lighting Management

Connect to LightBox Express

Disconnect from LightBox Express

Return to Status Page

Edit Connection Settings

❮ Back

Hub 1	Hub 2	Hub 3	Hub 4	Hub 5
🟢 Enabled	🟢 Enabled	🟢 Enabled	🟢 Enabled	🟢 Enabled
I.P. Address	I.P. Address	I.P. Address	I.P. Address	I.P. Address
192.168.1.51	192.168.1.51	192.168.1.51	192.168.1.51	192.168.1.51

Hub 6	Hub 7	Hub 8	Hub 9	Hub 10
🟢 Enabled	🟢 Enabled	🟢 Enabled	🟢 Enabled	🟢 Enabled
I.P. Address	I.P. Address	I.P. Address	I.P. Address	I.P. Address
192.168.1.51	192.168.1.51	192.168.1.51	192.168.1.51	192.168.1.51

Save connection details

❮ Back

Manage Emergency Testing

View and Print Results

Hub 1	Hub 2	Hub 3	Hub 4	Hub 5
IP Address : 192.168.1.51	IP Address : 192.168.1.51	IP Address : 192.168.1.51	IP Address : 192.168.1.51	IP Address : 192.168.1.51
Connection Status :	Connection Status :	Connection Status :	Connection Status :	Connection Status :
Connected	**Connected**	**Connected**	**Connected**	**Connected**

Hub 1 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 2 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 3 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 4 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 5 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults

Hub 6	Hub 7	Hub 8	Hub 9	Hub 10
IP Address : 192.168.1.51	IP Address : 192.168.1.51	IP Address : 192.168.1.51	IP Address : 192.168.1.51	IP Address : 192.168.1.51
Connection Status :	Connection Status :	Connection Status :	Connection Status :	Connection Status :
Connected	**Connected**	**Connected**	**Connected**	**Connected**

Hub 6 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 7 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 8 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 9 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults
Hub 10 — DALI BUS 1: 64 Devices, 0 Faults | DALI BUS 2: 64 Devices, 0 Faults

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❮ Back

Hub 1 Details

IP Address : 192.168.1.51   Firmware Version : 55.7.200
MAC Address : C8 87 05 49 65 16   Hardware Revision : 1

DALI Bus 1 :	DALI Bus 2 :
Bus Status : **Normal**	Bus Status : **Bus Shorted, More than 64 Devices**
DALI Current (mA) : **128 mA**	DALI Current (mA) : **128 mA**
🔘 **Autoheal Enabled**	🔘 **Autoheal Enabled**
Devices : 64	**Devices :** 64
Emergencies : 64	Emergencies : 64
Other Device Types :	**Other Device Types :**
Lights : 0	Lights : 0
Relay Modules : 0	Relay Modules : 0
Dimmer Modules : 0	Dimmer Modules : 0
Input Units : 0	Input Units : 0
MultiSensors : 0	MultiSensors : 0
Edit Bus 1 Devices	Edit Bus 2 Devices

Manage Emergency Testing

Select the Emergency Testing Group :

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

Ungrouped Devices :

➕ Emergency Device
Hub 1, Bus 1 Device 6

➕ Emergency Device
Hub 1, Bus 1 Device 6

➕ Emergency Device
Hub 1, Bus 1 Device 7

➕ Emergency Device
Hub 1, Bus 1 Device 8

➕ Emergency Device
Hub 1, Bus 1 Device 10

➕ Emergency Device
Hub 1, Bus 1 Device 11

➕ Emergency Device
Hub 1, Bus 1 Device 12

➕ Emergency Device
Hub 1, Bus 1 Device 13

➕ Emergency Device
Hub 1, Bus 1 Device 14

➕ Emergency Device
Hub 1, Bus 1 Device 15

➕ Emergency Device

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Devices in Selected Group :

➕ Emergency Device
Hub 1, Bus 1 Device 0

➕ Emergency Device
Hub 1, Bus 1 Device 1

➕ Emergency Device
Hub 1, Bus 1 Device 2

➕ Emergency Device
Hub 1, Bus 1 Device 3

➕ Emergency Device
Hub 1, Bus 1 Device 4

➕ Emergency Device
Hub 1, Bus 1 Device 8

Manage Group Function Test Schedule

Manage Group Duration Test Schedule

Hubs

| All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

Groups

| All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

Bus

| Both | Bus 1 | Bus 2 |

Test Type

| Both | Function Test | Duration Test |

Report Type

| Full | Condensed |

Print Results