

I-Monitor

System User Guide

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Introduction

The Channel I-Monitor is a comprehensive DALI based scalable emergency light testing system. I-Monitor has been designed to provide a flexible, powerful and user-friendly emergency lighting testing and reporting system.

Whilst the I-Monitor 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 I-Monitor test system comprises of one or more Touch Screens, each supporting up to 10 Channel 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 I-Monitor system that can accommodate potentially, up to a massive 10,240 Dali emergency devices.

For the configuration and operation, the Channel I-Monitor test and monitoring system utilises a standard Apple iPad™ device, with a specific Channel "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.

DALI devices do not need to be physically in the same DALI field network to function as part of a control group.

System Topology

The Channel I-Monitor system is connected 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 I-Monitor, 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 I-Monitor can 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 mean 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 specification of a project. A simple installation might consist of a private network using unmanaged network switches allowing all 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 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.

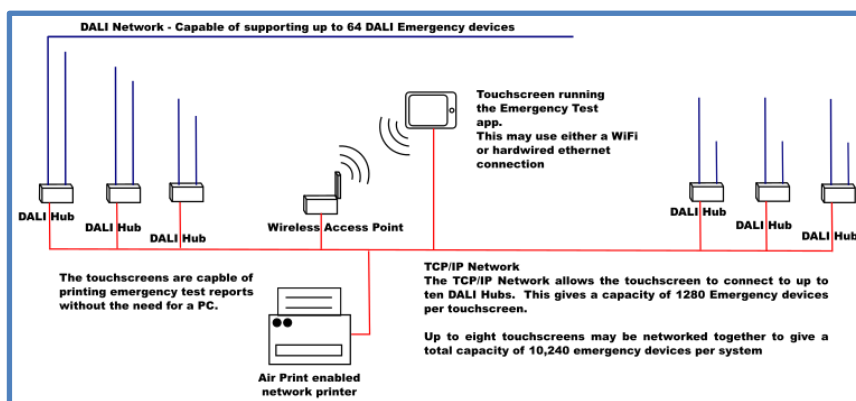
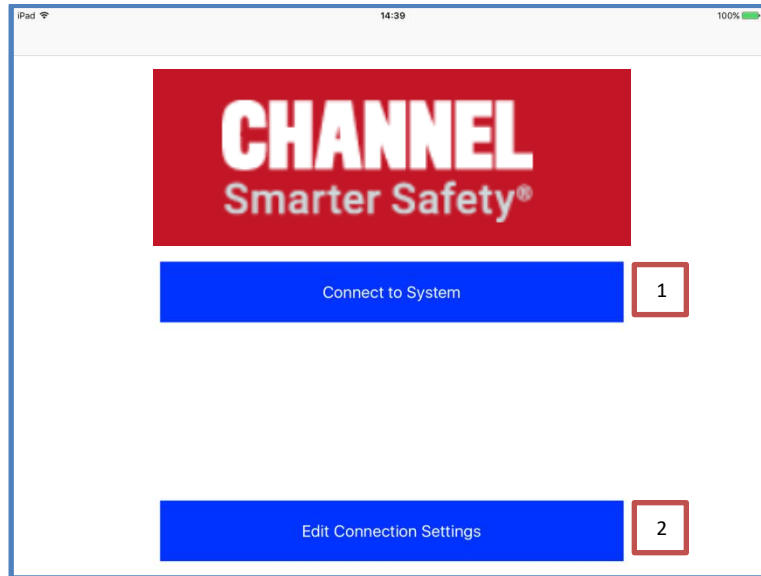


Figure 1 - I-Monitor system topology diagram

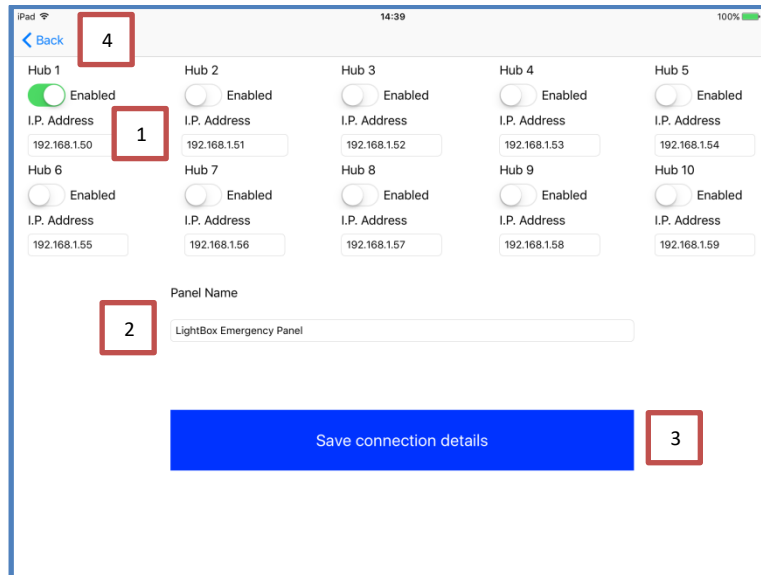
System Details

Launch Screen



1. **Connect to System**
Tapping this button will connect the application to the assigned DALI Hubs
2. **Edit Connection Settings**
Tapping this button will open the connection settings page where the DALI hub connection details can be edited.

Edit Connection Settings



- 1. Hub connection details**

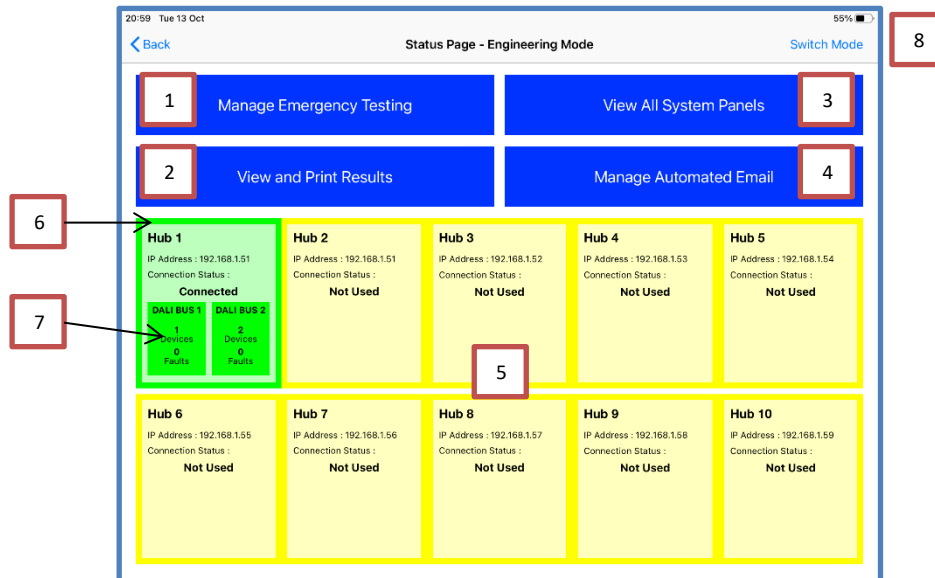
This section allows for up to 10 DALI Hubs to be allocated to the I-Monitor iPad. There is an option for each Hub to be enabled or disabled and for a unique I.P. address to be entered for each DALI Hub.
- 2. Panel Name**

The user can set a name for the I-Monitor iPad. This name will be used when generating emergency test reports by printing or emailing and when using the View All System Panels page.
- 3. Save connection details**

This will return the user to the launch screen whilst saving all DALI Hub connection settings to memory.
- 4. Back**

This will return the user to the launch screen without saving any changes to the DALI Hub connection settings.

Status Page



1. **Launch the Manage Emergency Testing screen**
The user can allocate the emergency devices to one of sixteen testing groups, adjust the testing schedules and manually launch tests for entire testing groups.
2. **Launch the View and Print Results screen**
The user can view all stored emergency testing details for the system. The information can be filtered for required details and exported by printing or email.
3. **View all System Panels**
The user can view up to eight iPads and view summary details of all emergency devices.
4. **Manage Automated Email**
The user can configure email settings and details users to receive automated emergency testing reports.
5. **Hub Summary Details**
This area provides a snapshot of the connected DALI Hubs showing the connection status and an overview of the connected emergency devices. Tapping a Hub section launches the Hub Details screen.
6. **Hub Connection Status**

The colour coded Hub section identifies the connection status of the hub. Green for OK, Yellow for Not Used and Red for Connection Faults.

7. DALI Bus Status

The colour coded bus section identifies the state of the DALI bus and the devices attached. Green for an operational bus with no device faults. Red for a DALI Bus that has a bus fault or one or more faulty devices.

8. Switch Mode

This is the button used to toggle the system between viewer mode and engineering mode. The default password is "l1ght1ng" the word lighting all in lower case with the digit 1 instead of both i's.

Hub Details



- 1. Hub Details**

This section shows the current IP Address, MAC Address and Firmware Details for the Hub.
- 2. DALI Bus Details**

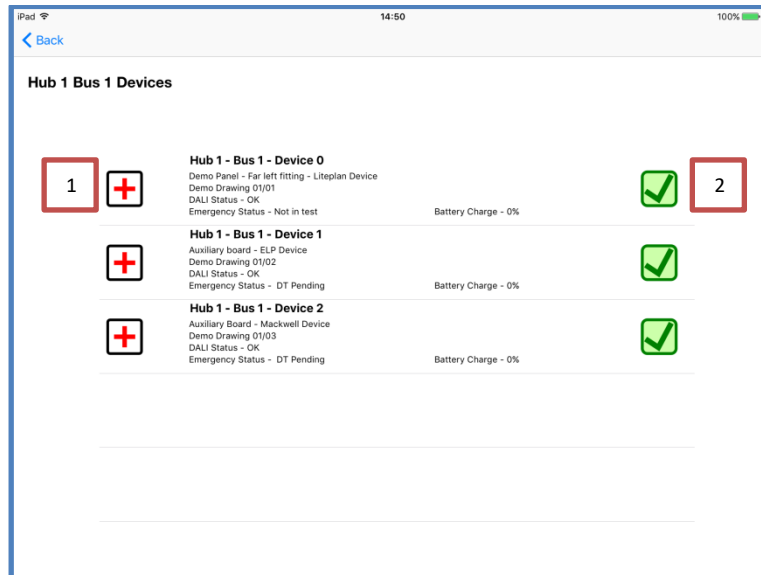
This section shows the current Bus Status, DALI current consumption and Autoheal Status. The rear panel is colour coded. Green if the bus status is Normal and Red if the bus has a fault.
- 3. Device Details**

This section breaks down the bus devices by DALI type. I-Monitor will only control Emergency Devices but other valid DALI devices can reside on the Bus without causing issues.
- 4. Identify All Bus 1 Devices**

This will cause all DALI devices attached to the Bus to enter identify mode. This is useful to identify Bus routing or to validate connection information.
- 5. Edit Bus Devices**

This will launch the Bus Devices Screen where a user can view all attached devices on a DALI Bus.

Bus Devices Screen



1. Hub Devices Table View

The devices for the selected DALI Bus will be shown in a scrolling table. The user can swiftly scroll through all devices on the bus and view summary device information including the device name, drawing reference, DALI Status, Emergency Status, and current battery charge.

Tapping a device on the list will launch the Edit Device page.

2. Device Status Icon

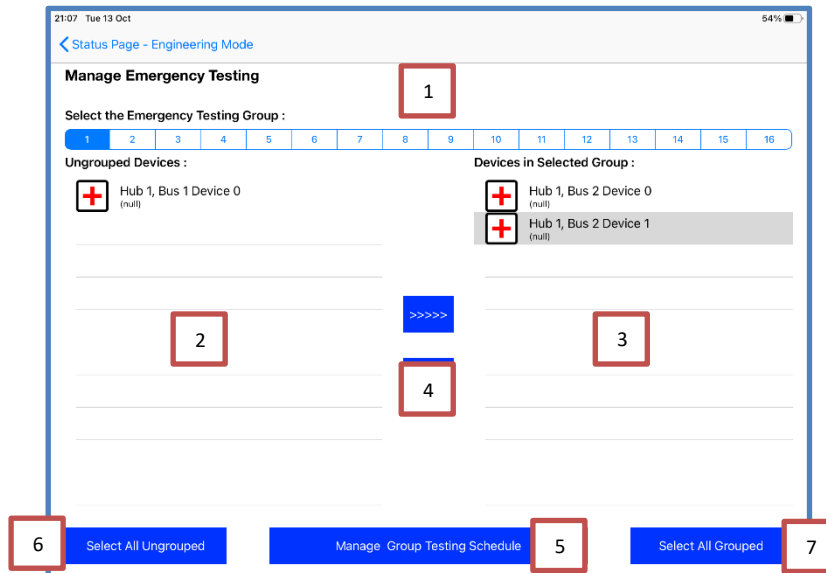
This icon shows the status of the DALI device at a glance. If the device is communicating correctly and has passed the most recent Function Test and Duration Test a green tick will be shown. If the device has a fault or has failed an emergency test a red cross will be shown.

Edit Device



- 1. Address and Status**
Shows the system address (Hub/Bus/Address) of the current device and the current DALI Status.
- 2. Device Tools**
Previous and Next device enable the user to toggle between devices on the DALI Bus. The Identify button toggles identify mode for the selected device enabling the user to locate the device.
- 3. Device Details**
Shows the device details including the short address, long address, battery charge and device type. The Device Name and Drawing Reference sections allow the user to specify device details to identify the emergency devices.
- 4. Latest Emergency Test Details**
This section details the last recorded Emergency Function and Duration Test for the device. Additional test details are logged for each device and can be accessed from the reports page.
- 5. Emergency Controls**
This section allows the user to run either a Function Test or Duration Test on an individual device. The user may also stop any currently running test. These controls are most often used to retest devices after service work to the lamps and batteries.

Manage Emergency Testing



1. **Emergency Test Group Selection**
The system supports 16 testing groups per I-Monitor iPad. Selecting the desired group will update the tables below.
2. **Ungrouped Devices**
This table shows any emergency devices on the system that are not currently assigned to a testing group.
3. **Grouped Devices**
This table shows any emergency device currently assigned to the selected testing group (1).
4. **Grouping Controls**
These controls allow the user to assign emergency devices to the testing groups. Selecting devices in the ungrouped table (2) followed by tapping the >>>> button will assign those devices to the currently selected testing group. Selecting device in the grouped table (3) followed by tapping the <<<< button will remove those devices from all testing groups.
5. **Manage Group Testing Schedule**
Launches the group schedule page to enable the user to configure the dates and times for the group to conduct Function and Duration tests.

6. **Select All Ungrouped Devices**

This will select all devices currently displayed in the ungrouped column so they can all be assigned to a group together.

7. **Select All Grouped Devices**

This will select all grouped devices currently displayed in the grouped devices column for the group currently selected. They can then be removed from the group together.

Manage Group Testing Schedule

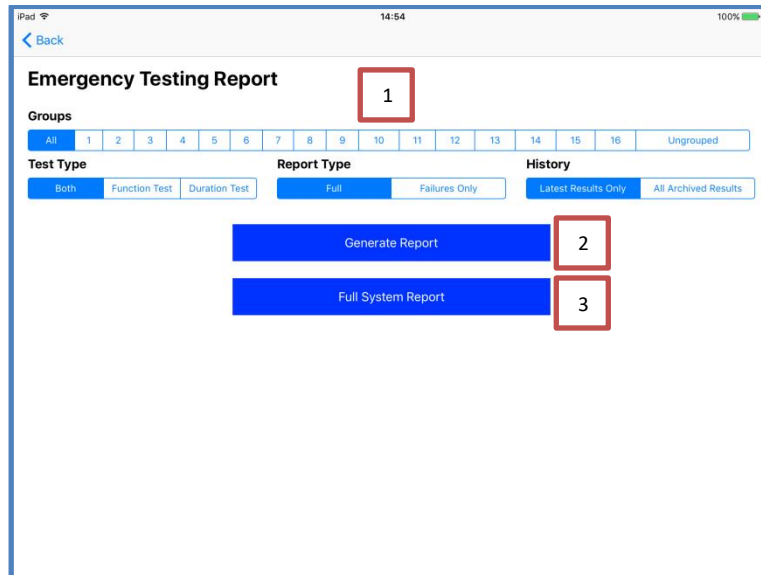


- 1. Schedule Enabled**
This allows the user to enable and disable the testing schedule for the selected testing group. A warning is displayed if the testing group is disabled.
- 2. Function Test**
This allows the user to select the day of the month (1st – 28th) and the time of day for the group to conduct an Emergency Function Test. The test is conducted every month.
- 3. Duration Test**
This allows the user to select the day of the month (1st to 31st), the month and the time of day for the group to conduct and Emergency Duration Test. The test is conducted only on the month selected.
- 4. Update Schedules**
This updates the testing group to the currently selected details (2) and (3).
- 5. Next Scheduled Test**
This section displays the time and date of the next schedules Function Test and Duration Test for the group.

6. Group Testing Controls

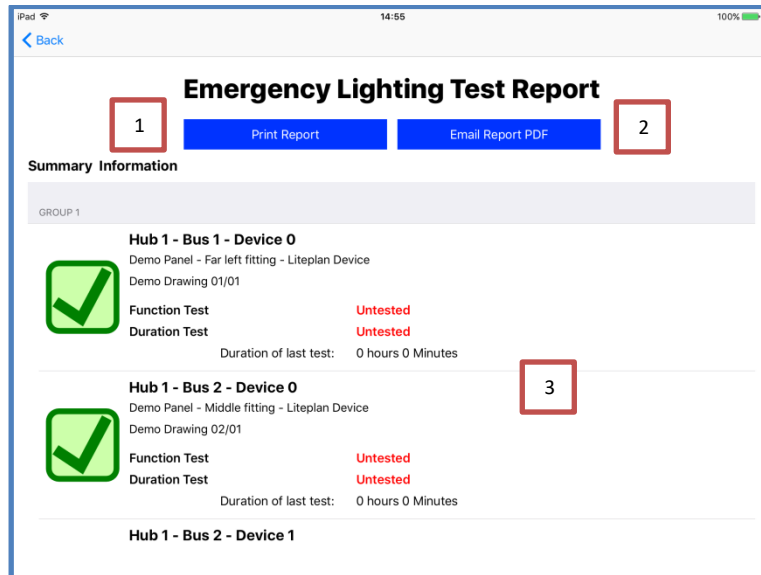
This section allows the user to conduct a Function Test or Duration Test on all currently assigned devices in the testing group. The user can also stop any currently running emergency test on all devices in the testing group.

View and Print Results



1. **Report Filter Options**
These allow the user to produce an emergency report for the devices on the system. The report can be filtered for Testing Group, Test Type, Report Type and History.
2. **Generate Report**
This will create the customised emergency report based on the filters selected (1).
3. **Full System Report**
This will generate a full system report regardless of the filter options selected (1). This will detail all devices currently attached to the system sorted by Hub and Bus. It will also include details of all assigned testing schedules.

Emergency Testing Report



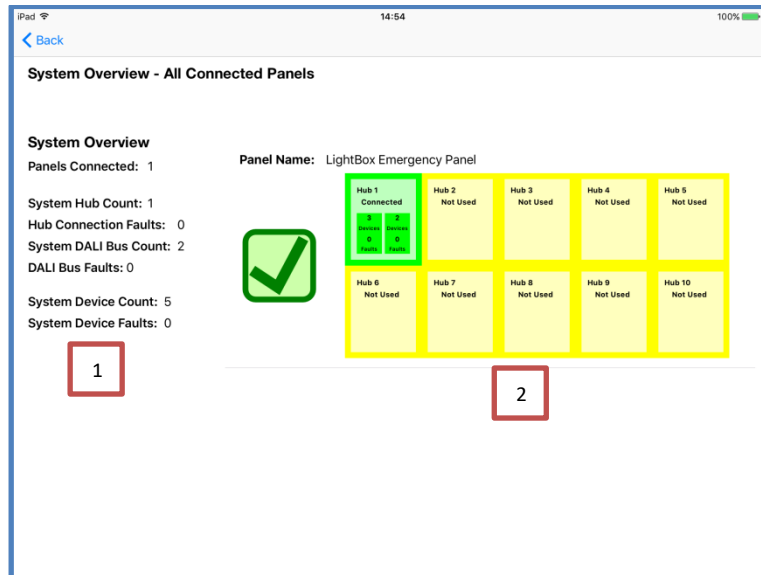
- 1. Print Report**

I-Monitor utilises Apple's AirPrint technology to enable printing of emergency reports directly from the iPad to any applicable printer attached to the Ethernet network. Tapping the print button will launch a preview window that enables the user to select any discoverable printers and print the document.
- 2. Email Report PDF**

This option creates a PDF document of the selected emergency test report. This uses any email account configured on the iPad (not the automated email settings). A window will launch to enable to user to specify email recipients.
- 3. Report Details**

This is a scrolling table detailing all of the devices in the currently selected report. The user can scroll through the device and view their current status at a glance thanks to a simple icon system that will show a green tick if the device passed the test(s) requested or a red cross if it failed the test(s) requested.

View All System Panels



1. System Overview

In this screen the iPad will search the network for any other I-Monitor iPads (up to 8 may be networked). Each discovered iPad will provide its panel name and summary details to be displayed.

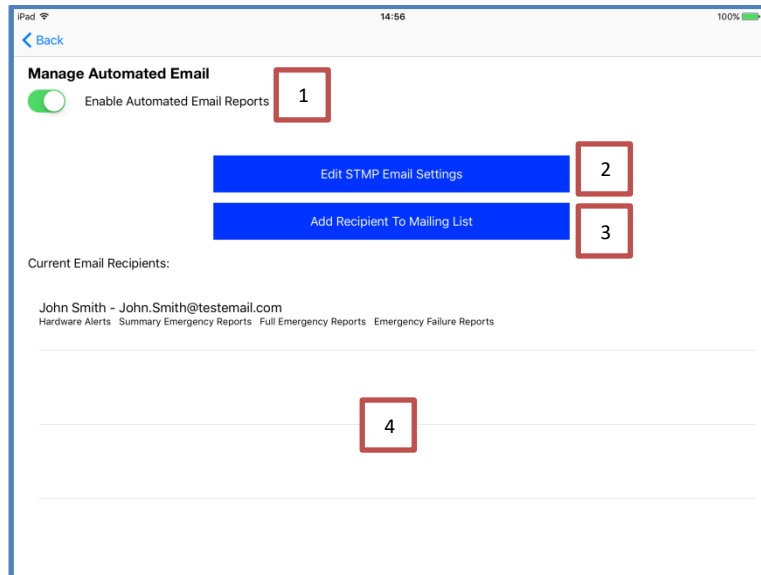
The system overview section will show the number of panels connect as well as Hub, Bus and Device summaries for the entire system.

2. System Panels Table

Each discovered I-Monitor iPad will be added to this scrolling table. The icon on the left details the overall status of that iPad showing a green tick if all Hubs, Busses and Devices are OK or a red cross if any faults are discovered.

The panel summary image will colour code each Hub and Bus in the same way as the Hub Status Page to provide an overview of the connection status of each hub and the operational status of each DALI Bus and its associated devices.

Manage Automated Email



- 1. Enable Automated Email**
Enables/Disables the automated email reporting for the I-Monitor iPad.
- 2. Edit SMTP Email Settings**
Launches the email settings page where the user can enter details of the SMTP email server to be used for automated reporting.
- 3. Add Recipient to Mailing List**
Launches the Add Recipient page where a new email recipient can be created.
- 4. Current Email Recipients**
This scrolling table will detail any currently assigned email recipient. The summary will show the recipient's name, email address and detail which report types they are assigned to receive.
Tapping any recipient in the table will open the Edit Recipient page where the details may be amended or the recipient deleted.

Edit SMTP Email Settings

- 1. SMTP Email Settings**

This section enables the user to enter the account details for the SMTP email server to be used for automated email reporting. For an account to function a User Name, Password, Host Name and Port Number must be specified.
- 2. Connection Type**

This allows the user to select the encryption setting for the email connection.

 - Clear – No Encryption
 - Start TLS – Will update an existing connection to TLS encryption
 - TLS – Utilises TLS encryption

Please consult your IT Administrator for the required connection settings for your SMTP Server.
- 3. Send Test Email**

Once the connection details have been entered, the user may enter a test recipient email address and then send a test email to validate the connection details. A dialogue box will inform the user if the test email succeeded or failed.
- 4. Save SMTP Details**

This will save all SMTP connection details for the system and return to the Manage Automated Email Page.

Add Email Recipient

The screenshot shows the 'Add Email Recipient' interface on an iPad. The form is titled 'Email Recipient' and has a 'Back' button in the top left. It contains two input fields: 'Name' with the value 'John Smith' and 'Email Address' with the value 'John.Smith@testemail.com'. Below these are four toggle switches for alert types: 'System Hardware Fault Alerts', 'Emergency Testing Alerts - Summary Information Only', 'Emergency Testing Alerts - Full Testing Report', and 'Emergency Testing Alerts - Failure Details Report'. At the bottom are two buttons: a red 'Delete Recipient' button and a blue 'Save Recipient Details' button. Red boxes with numbers 1 through 4 highlight the Name field, the Emergency Testing Alerts - Full Testing Report toggle, the Delete Recipient button, and the Save Recipient Details button respectively.

- 1. Email Recipient Details**
The user can enter a Name and Email Address for the new email recipient.
- 2. Emergency Test Report Subscriptions**
The user may select which emergency reports they wish to subscribe to the user.

System Hardware Fault Alerts will send out emails if Hub, Busses or Devices develop hardware or connection faults.

Summary alerts will send the recipient details of a completed test and a summary count of the devices that passed/failed.

Full Testing Reports will send the recipient a full PDF report detailing every device in the executed test and the respective results.

Failure Details Reports will send the recipient a PDF report of any device that failed the executed test.
- 3. Delete Recipient**
This is used to remove a previously assigned recipient.
- 4. Save Recipient Details**
This is used to save the details for a new or modified recipient.

System Operation

Adding a new device – Identification and Labelling

The first step to programming a new device is the identification and labelling of that device.

The I-Monitor DALI Hubs will automatically detect any new DALI Emergency devices added to a DALI Network. The Hub will automatically assign the device the next available short address and add the device to the system database. The device will then be available to edit on the I-Monitor Panel.

Please note if Auto-Heal is enabled, it may take up to 15 minutes from the device being connected and powered for the system to locate and program a new device. To speed up the process, disable Auto-Heal before adding the device.

To identify and label the device:

- Starting at the Main Status Page of the Panel
- Select the relevant DALI hub by tapping it. This will open the Hub Details page.
- Select the appropriate DALI Bus by tapping either “Edit Bus 1 Devices” or “Edit Bus 2 Devices”. This will open the BUS Devices Screen.
- Scroll through the BUS Devices table until you locate a device that does not have a device name or drawing reference listed below the device address. Tap that device to enter the Edit Device Screen.
- Select the “Start Identify Mode” button near the top of the screen. This will cause the emergency device to enter identification mode. In this mode the emergency device will flash its charging LED alternating between Green and Red to enable the user to locate the device.
- Find the device that is in identification mode and mark it on the building plan drawing.
- Return to the panel and select “Stop Identify Mode” to return the device to normal operation.
- Tap the Device Name section and type in a description of the device including type and location e.g. Library Area – Running Man Exit Sign
- Tap the Drawing Ref section and enter a unique reference that links the device to the building plan drawing e.g. Ground Floor 03/45 would be the Ground Floor DALI Bus 3 device 45.
- Return to the Status Screen.
- See the Adding a Device to an Emergency Testing Group section for further programming details.

Adding a Device to an Emergency Testing Group

Once a device has been identified and labelled, it needs to be added to a testing group to allow the I-Monitor system to automatically test the device.

- Starting at the Main Status Page of the Panel.
- Select “Manage Automated Testing”
- On the Manage Automated Testing screen select the testing group (1 – 16) that you wish to assign devices to.
- The tables will update with un-programmed devices on the left and any devices currently programmed to the selected group on the right.
- From the left-hand table, select the device(s) you wish to add to the testing group by tapping on each one until each is highlighted.
- Tap the “>>>>” button to add the devices to the testing group.
- The device will be added to the testing group and programmed for automatic emergency testing.
- If any devices have been added by mistake, select the device in the right hand table and use the “<<<<” button to remove the device from the testing group.
- See the Manage Group Testing Schedules section for details on viewing and editing the emergency testing schedule for a testing group.

Viewing testing results

The I-Monitor Panel allows the user to view current and archived emergency testing results directly on the screen. There are two types of report available:

1. Emergency Testing Report

This report is used to report on the emergency testing results for a user defined set of options. This enables the user to generate custom reports containing only the desired system information.

2. Full System Report

This report is used to provide a comprehensive report of all system devices across all testing groups. This report is primarily used as a system archive to maintain a hard copy backup of all of the system device and testing schedules.

Emergency Testing Report

- Starting at the Main Status Page of the Panel
- Select “View and Print Results”
- Use the selection options available to choose the desired Testing Group, Test Type, Report Type and History options for the report.
- Select the “Generate Report” button.
- This will launch the Emergency Testing Report Screen which will show all of the applicable devices and their selected result information.
- To print the report via a suitable enable AirPrint printer chose the “Print Report” option and select the desired printer from the pop up.
- If the panel is enabled for Email reporting the selecting the “Email Report PDF” option will open a pop up enabling the user to enter an email address to send the report to.

Full System Report

- Starting at the Main Status Page of the Panel
- Select “View and Print Results”
- Select “Full System Report”
- This will launch the Emergency Testing Report Screen which will show all of the devices and their result information.
- To print the report via a suitable enable AirPrint printer chose the “Print Report” option and select the desired printer from the pop up.
- If the panel is enabled for Email reporting the selecting the “Email Report PDF” option will open a pop up enabling the user to enter an email address to send the report to.