 ZONEWORKS
The word "ZONEWORKS" is written in a large, bold, black, sans-serif font. A black sine wave is superimposed over the text, starting above the 'Z', peaking over the 'E', crossing the 'W', and ending below the 'S'.

Quick Design & Install Guide

Computerised Emergency Evacuation System
LONWORKS™ Powerline Technology

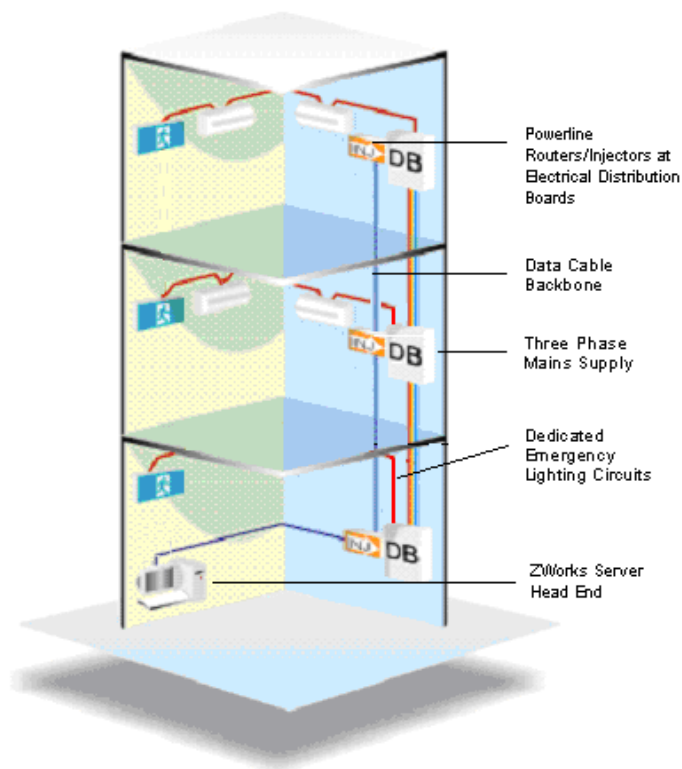
The Quick Design and Install Guide

This Zoneworks guide is designed as a quick reference or basic overview for system designers and installers. It summarises the main requirements for a typical Zoneworks installation, and can be used as an instruction tool for electrical contractors. This document does not cover every detail such as configuring for off-site or integrated network installations, but following this guide will ensure a successful installation which can then be configured for other options if required.

1. Design and installation summary

Zoneworks uses a combination of data cable and power line signalling to communicate with devices on the network. Zoneworks Power Line Routers are installed at each electrical distribution board where emergency lighting is present. The Powerline Routers are connected via a “daisy chained” data cable back to the head-end location to form the system “backbone”. The Zoneworks Powerline Routers couple the data cable signal to a Power Line signal for transmission on the emergency lighting circuits.

TYPICAL TOPOLOGY



The Zoneworks Server is the intelligence hub of the system. It holds the database, group testing schedules and network communications hardware. The Zoneworks Server is located on site. Scheduled test results and real time status updates are stored and processed by the Zoneworks Server for compliance, maintenance and log book reports. Manual or automatic tests can be initiated from the Zoneworks Server, as well as system maintenance such as uploading firmware updates and configuration information.

2. Example Topology:

- Typically, the Zoneworks Server is connected to the data cable backbone by a Lonworks™ USB Network Interface.
- From the Network Interface a data cable is Daisy Chained to all Distribution Boards that supply Emergency Lights to form the 'backbone' of the system.
- At these distribution boards, 3-Phase Powerline Routers/Injectors are installed to communicate with each emergency luminaire over the Mains Supply wiring. The backbone data cable is connected to this Powerline Router.

3. System Design

A PC Server is permanently connected to the Lonworks network and provides a means of significantly enhancing the capabilities of the system.

The network consists of the Zoneworks Server connected to a network of routers and the luminaires are connected to the routers, typically via power line.

There is a strong focus on extended and remote connectivity. Where extended connectivity is required the Zoneworks System can utilise data cable, fibre optic and LAN/WAN facilities for interconnection between buildings and remote control/monitoring is achieved via the **Zoneworks WEB Service**.

4. System backbone

- a) A "daisy chained" data cable must be run from the Server location to each Powerline Router.

Cable Type: Belden 8471, **Number of Pairs:** 1, **Total Number of Conductors:** 2, **AWG:** 16, **Stranding:** 19x29, **Conductor Material:** TC - Tinned Copper, **Insulation Material:** PVC - Polyvinyl Chloride, **Inner Shield Material:** Unshielded, **Outer Shield Material:** Unshielded, **Outer Jacket Material:** PVC - Polyvinyl Chloride, **Plenum (Y/N):** N, **Applications:** Control and Instrumentation Cable

- b) Allow enough space within each relevant electrical distribution board cupboard to install the Zoneworks 3-Phase Router. Each Router will require a standard 240V socket outlet in addition to a 3-Phase Coupling to the Distribution Board. Router installation details are found within the 3-Phase Powerline Router Installation Guide. Router Dimensions: 250mm W x 240mm H x 65mm D.

Please see the Clevertronics Zoneworks Systems Schematics on page 6 and 7 for comprehensive installation and wiring details.

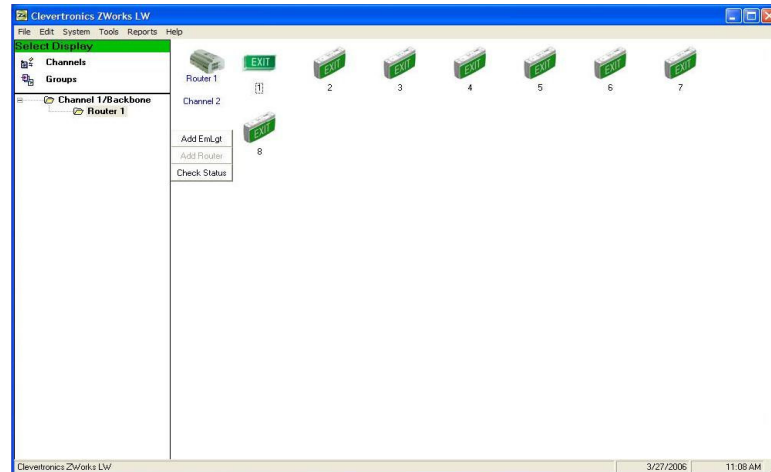
5. Software

The Zoneworks Software is designed to provide a simple but very powerful interface to the network of Zoneworks devices.

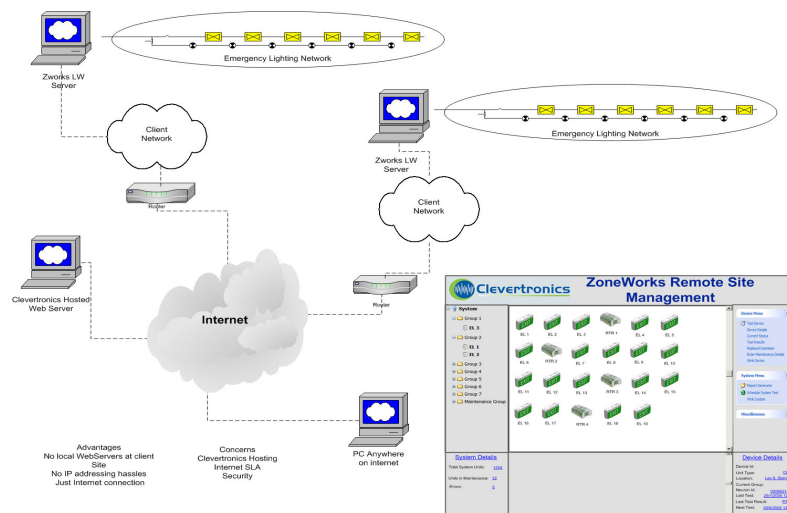
Features:

- Real Time Status information – this ensures that the latest information is available at all times and reduces the time spent “polling” the network.
- Group Test Scheduling
- “Drag and Drop” Group Allocation
- Visualisation of the Network Topology and Devices
- Automatic Database backup
- Windows Explorer based Tree View and List View Display
- Intuitive menu and command structure

The Zoneworks software runs on the Clevertronics Zoneworks Server equipped with remote control capability via telephone line, LAN/WAN or the Internet - **Zoneworks WEB Service**. Please contact Clevertronics for further details.



Zoneworks Interface

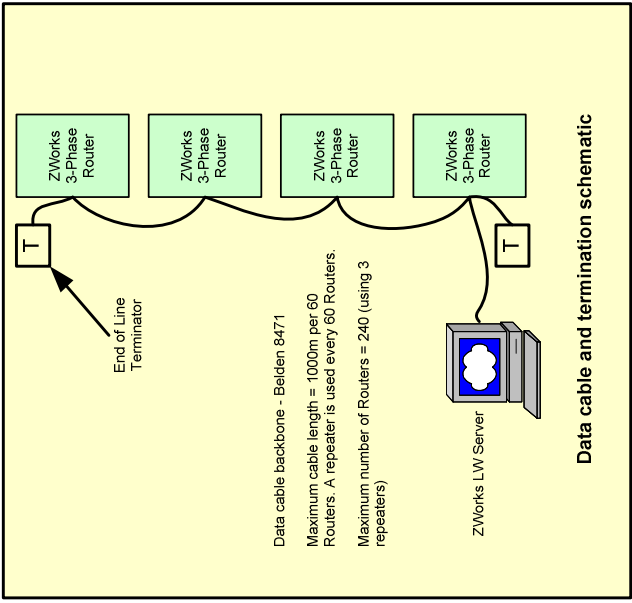
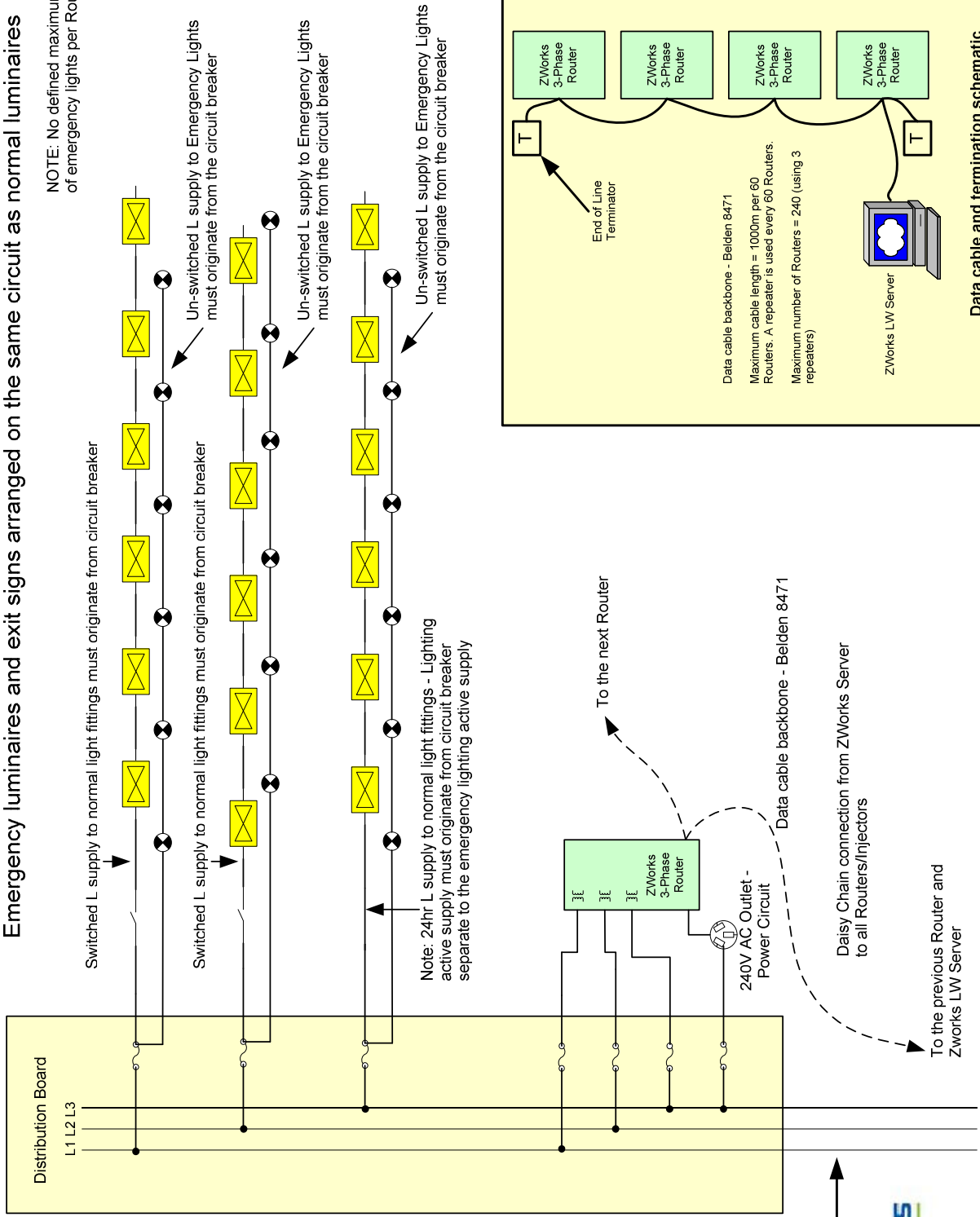


Zoneworks Web Service and Interface

Zoneworks LW Wiring Schematic - Option 1

Emergency luminaires and exit signs arranged on the same circuit as normal luminaires

NOTE: No defined maximum limit of emergency lights per Router

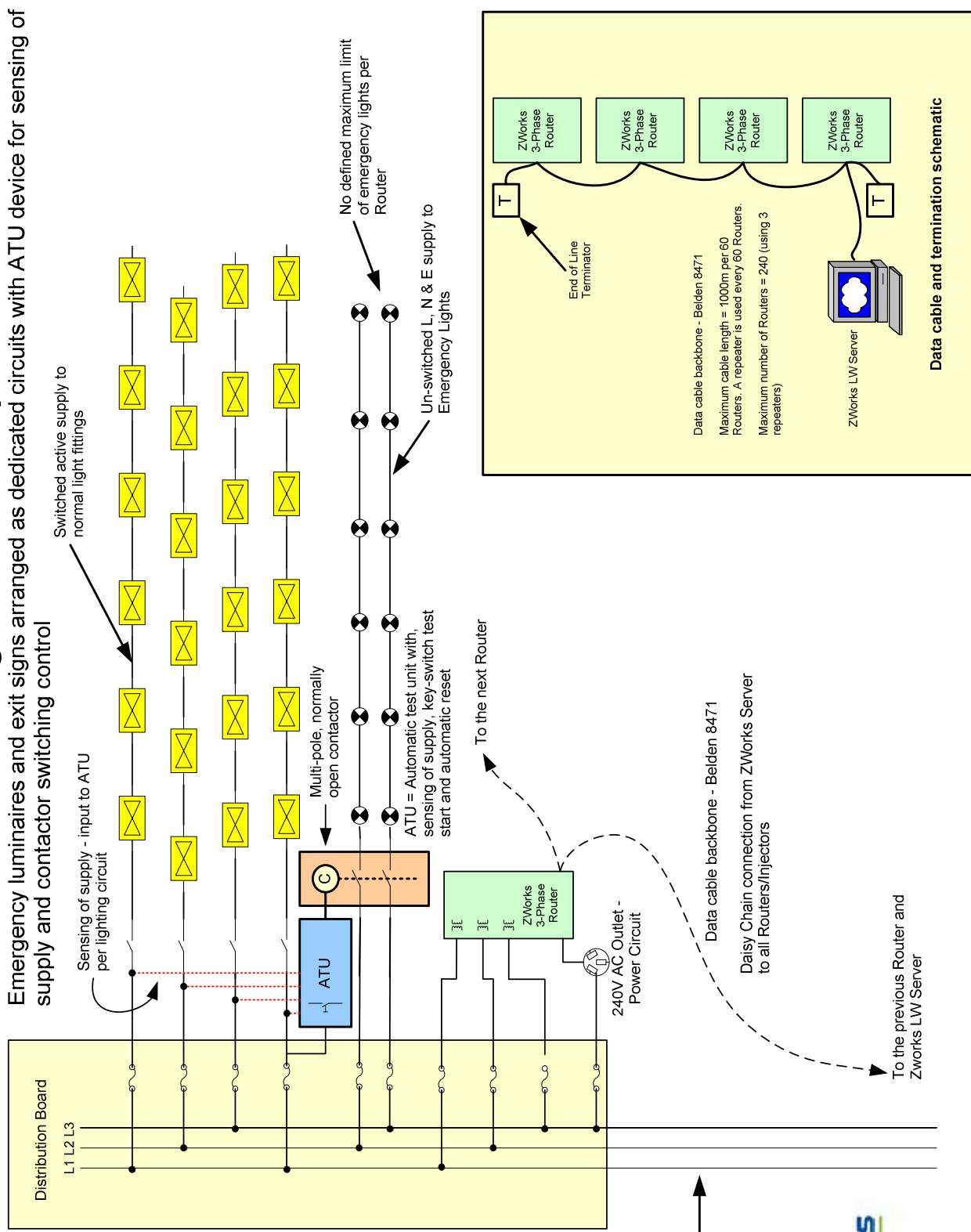


Sub-Main supply to distribution boards



Zoneworks LW Wiring Schematic - Option 2

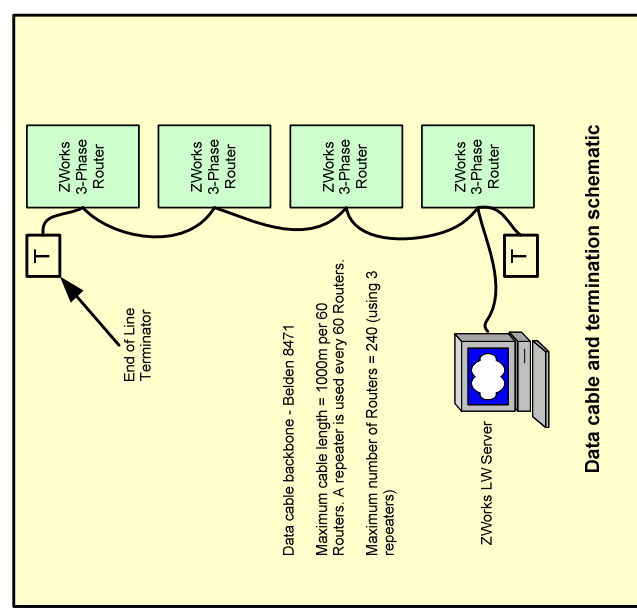
Emergency luminaires and exit signs arranged as dedicated circuits with ATU device for sensing of supply and contactor switching control



Sub-Main supply to distribution boards



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Data cable and termination schematic

7. Zoneworks System Specification

The Emergency Lighting System shall provide group luminaire testing and individual real time monitoring facilities in addition to a software based electronic logbook in accordance with the requirements of the AS2293 suite of standards.

The system shall be based upon Lonworks™ technology and utilize the power supply cables to the luminaires as the primary communication media. The system topology shall be such that a daisy chained data cable backbone connects a permanent system server to a network of Lonworks™ based FT(data cable) to powerline routers positioned at selected distribution boards around the site. These routers will couple the network information onto the 3-phase or single phase supply at the distribution board to facilitate communication to the luminaires. As a general rule an FT/powerline router will be required at each distribution board that supplies emergency lighting. The system server shall be specified by the manufacturer and the data cable must be Belden 8471 or approved equivalent.

Luminaires

All emergency luminaires within the system must be compatible with the system server and communication network. Luminaires shall use the Lonworks™ PL3120 Powerline transceiver to facilitate communication over the power cables and shall be capable of the following:

- Monitoring the battery voltage
- Monitoring the state of the emergency lamp in test
- Monitoring the state of the normal lamp (mains lamp)
- Storing the result of its last discharge test in non-volatile memory that is retained even after loss of both AC power and DC battery supply
- Support dynamic allocation of the network address - no pre-programming of network ID
- Support the LONMARK™ open systems object model and use standard network variables where available

Software and System Server

The System Software shall:

- Display graphical representations of the system server, routers and emergency luminaires
- Display Real time status information
- Provide the facility to create “groups” of emergency luminaires for testing and the ability to move devices between these different groups using “drag & drop”
- Provide reporting facilities capable of sorting by date, group and or device
- Provide the facility to replace of defective luminaires
- Provide the facility to program of multiple test groups to test at different times and dates
- Provide the facility to install routers and emergency luminaires and dynamically allocate the network address
- Display a summary of the system status and produce a simple report containing only defective emergency luminaires including location details
- Provide an Emergency Lighting Electronic Logbook detailing relevant location information (unit description, floor, DWG, grid ref, distribution board and circuit number), test results and maintenance history
- Provide local, LAN, WAN and WEB access to the network of emergency luminaires with the facility to remotely monitor the system status and view/print reports

The System Server shall:

- Be connected to the device network at all times and shall be located in a suitable environment for computer based IT equipment.
- Be accessible at all times and must be used to install the routers and luminaires onto the network.
- Have access and be permanently connected to a broadband internet connection to facilitate the LAN, WAN and WEB control.
- Be specified and purchased from the Emergency Lighting System Manufacturer.

Commissioning

The system routers and emergency luminaires will be commissioned by pressing a momentary push-button at each device in conjunction with the installation module of the system software. Each router and emergency luminaire must be labeled with the network address assigned by the software but should also be labeled with a user reference that can be entered into the electronic logbook and used as the primary reference for the device.

Location information is to be entered into the electronic logbook by the installing contractor at the time of installation and will be retained by the system server. A complete set of “as installed” drawings must be provided by the installing contractor detailing the following:

- The location of the system server, routers and emergency luminaires
- The data cable route between the server and routers
- The network and user ID of each emergency luminaire and router

Further information

For more information, please contact your nearest Clevertronics office.

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Please note:

Clevertronics make every effort to ensure information supplied is accurate, however, the installing contractor or specifier should ensure that the installation is compliant with all relevant codes and standards and information such as provided here is accurate and up to date with any changes or revisions that may apply at the time of design and installation.

References (Text and Images):

1. Powerline Communication Technology Update (presentation), Echelon Corporation
2. Evaluating Power Line Environments Using the Echelon PLCA-22 Communication Analyzer (presentation), Echelon Corporation
3. Designing with the Power Line Smart Transceiver (presentation), Echelon Corporation