 ZONEWORKS  
The word "ZONEWORKS" is written in a bold, black, sans-serif font. A black sine wave is superimposed over the text, starting at the top of the 'Z', peaking over the 'O', crossing the 'N', reaching a trough over the 'E', and ending at the bottom of the 'S'.

# Users Guide

**Computerised Emergency Evacuation System  
LONWORKS™ Powerline Technology**

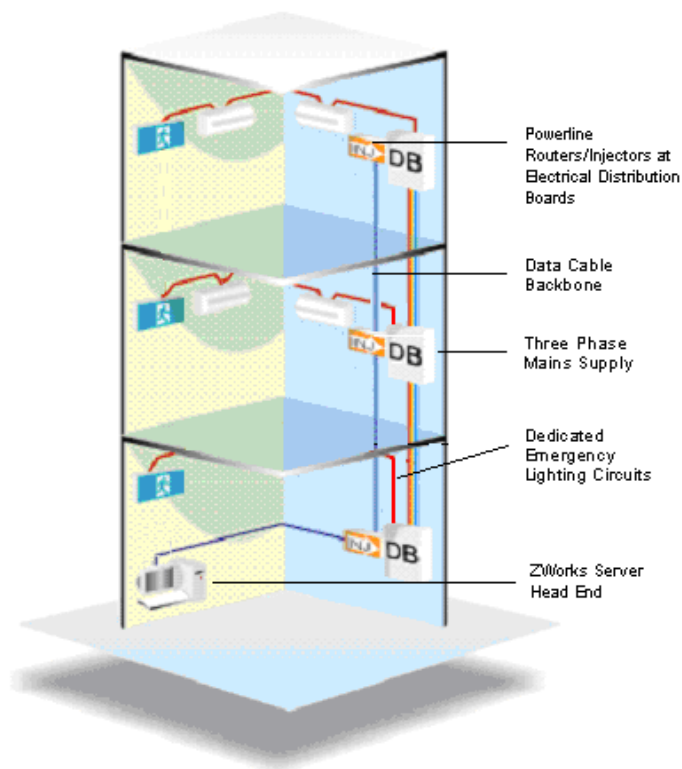
## Section 1 - Design and Installation Guide

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.

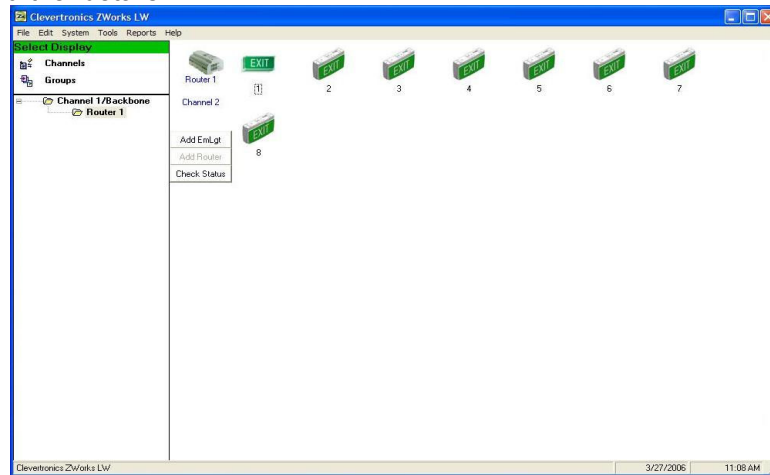
## 5. Software

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

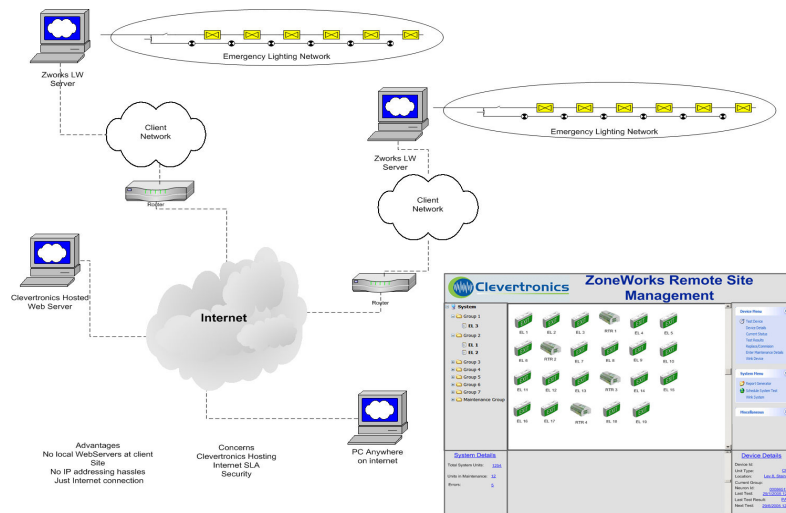
### Features:

- 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
- Visualization 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**



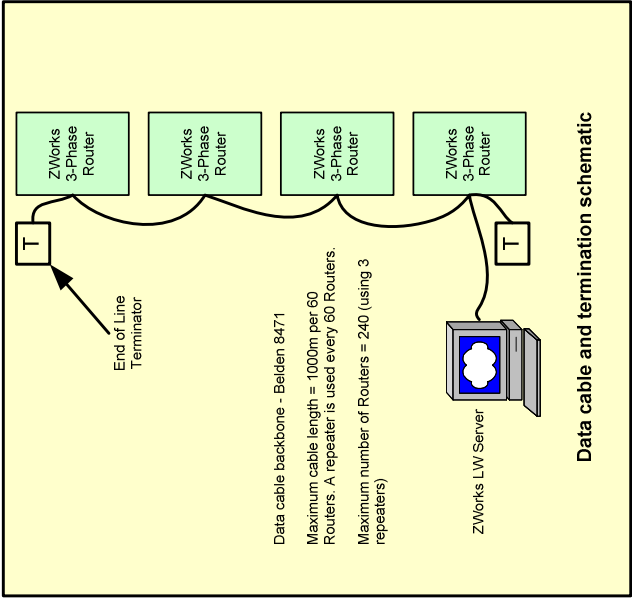
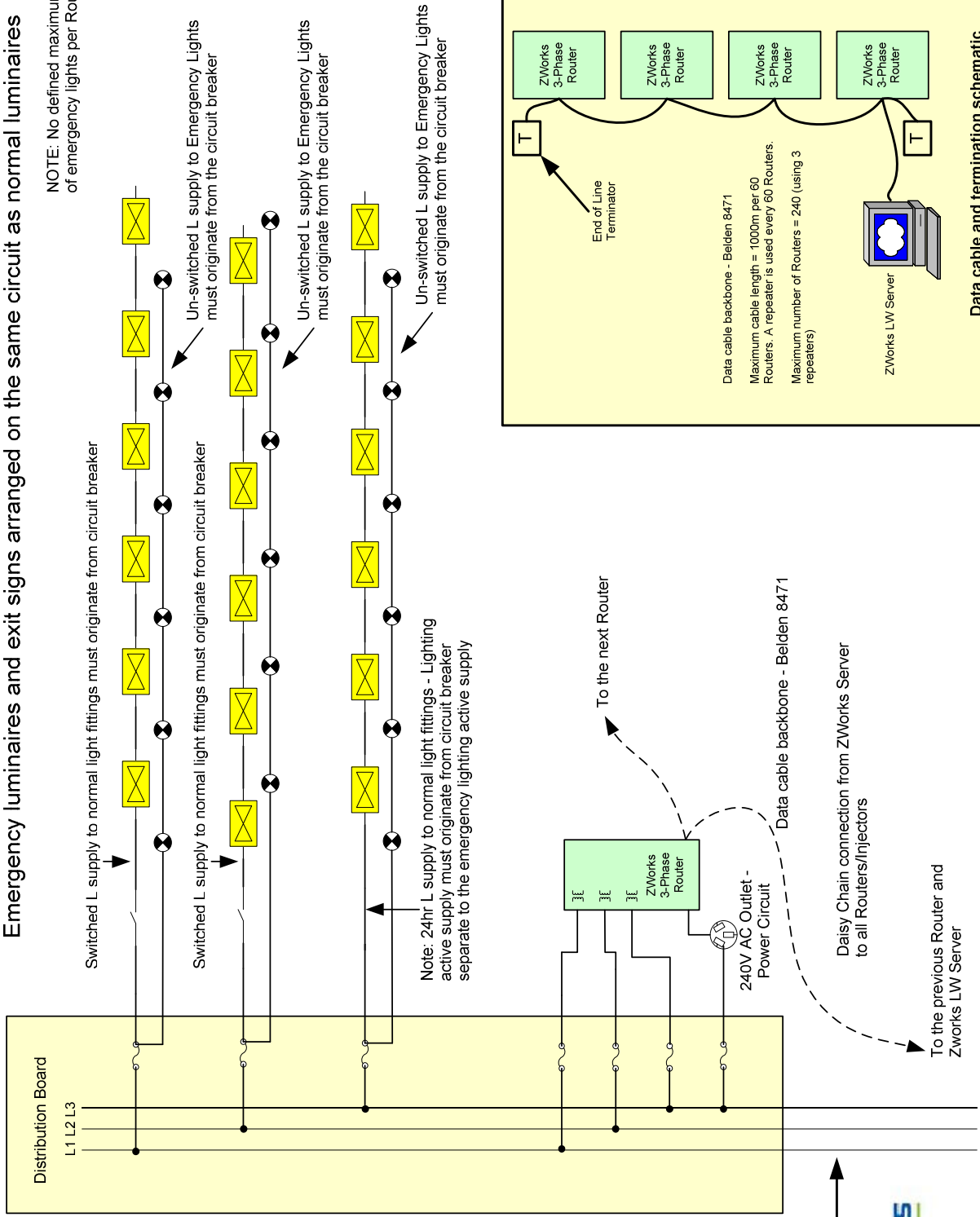
**Zoneworks Web Service and Interface**



# 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



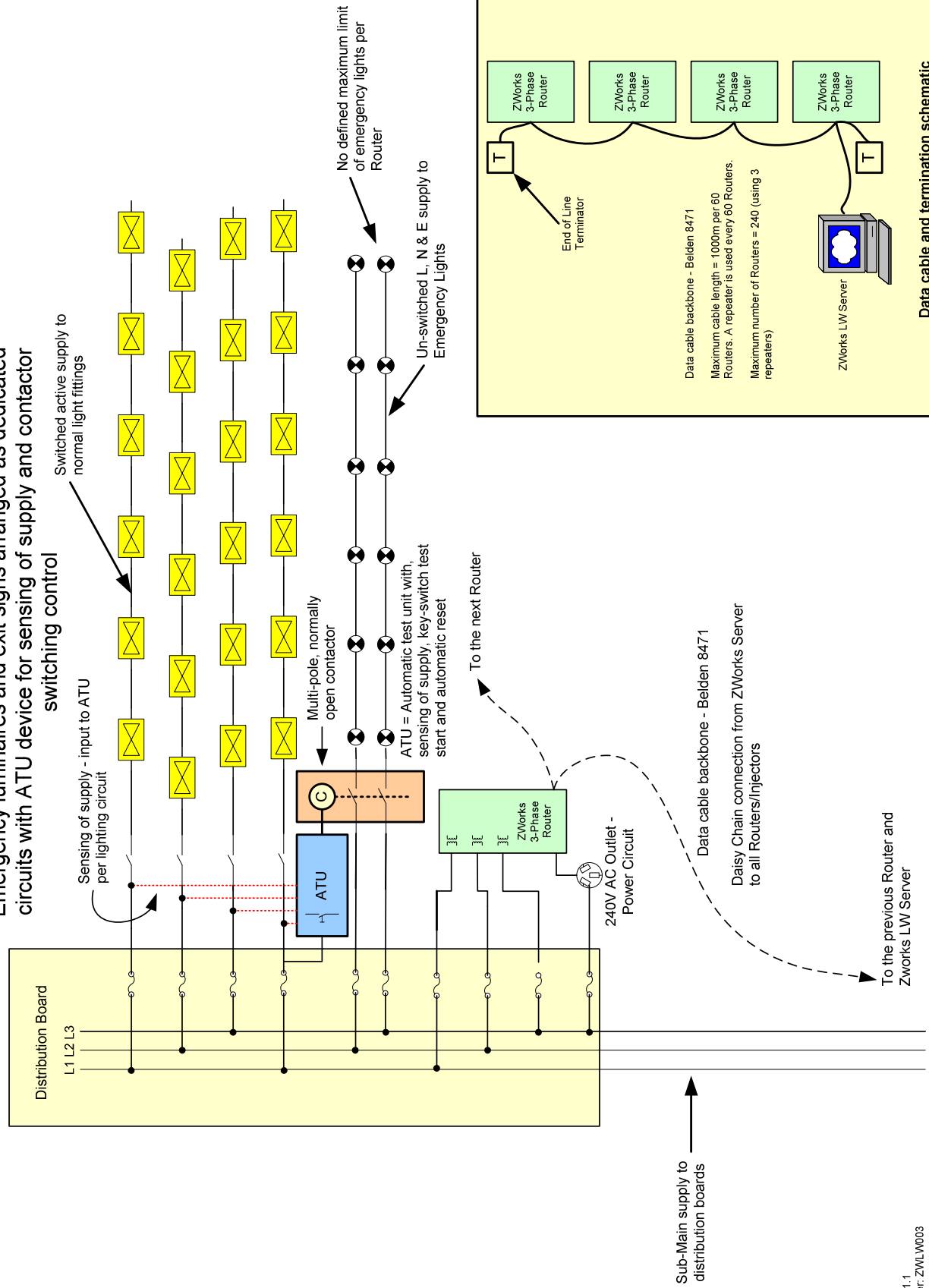
Sub-Main supply to distribution boards



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## Clevertronics ZWorks 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

240V AC Outlet - Power Circuit

ZWorks 3-Phase Router

Data cable backbone - Belden 8471  
 Maximum cable length = 1000m per 60 Routers. A repeater is used every 60 Routers.  
 Maximum number of Routers = 240 (using 3 repeaters)

ZWorks LW Server

Data cable and termination schematic

## Section 2 - PC Server and Software Users Guide

### 1. PC Server

The Zoneworks PC Server has been pre-configured with The Zoneworks LW Software, LNS Server and Lonworks Interface Card for connection to the network. For Server support please contact Clevertronics for assistance.

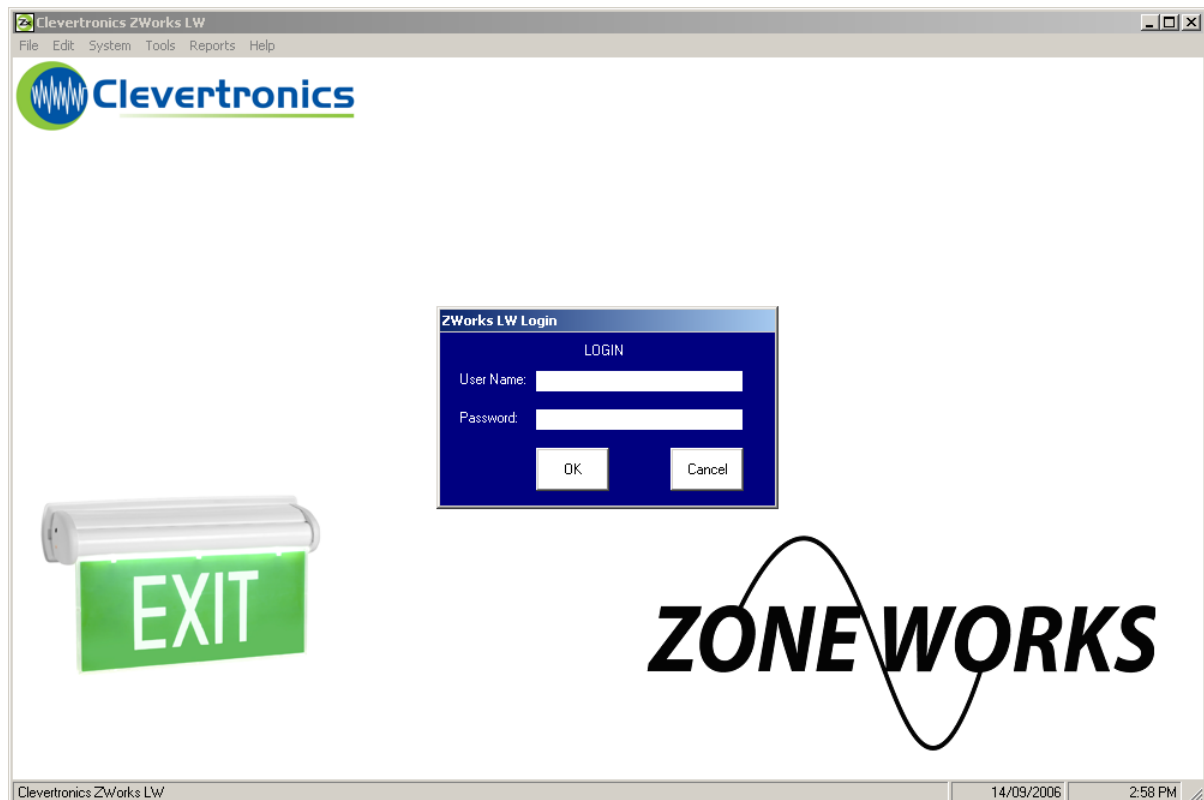
### 2. The Zoneworks LW Software

The Zoneworks LW software is made up of 2 parts, a Server component and a Client component. The Server Component (ZWorksMonitor.exe) is configured to run at startup (whenever the Server is switched on) and is always online with the Zoneworks Network of Devices. If the Server is on then all real time monitoring and automatic testing functions are carried out even if there is no Zoneworks Client window open at the time.

The user interface application is ZWorksGUI.exe and is started by double clicking the icon on the desktop or through the Start Menu. The ZWorksGUI can be configured to run on another machine other than the Server as long as the Server and the target machine are part of a local or wide area network. Please contact Clevertronics regarding the application and setup of this feature.

### 3. Running the Zoneworks LW Software

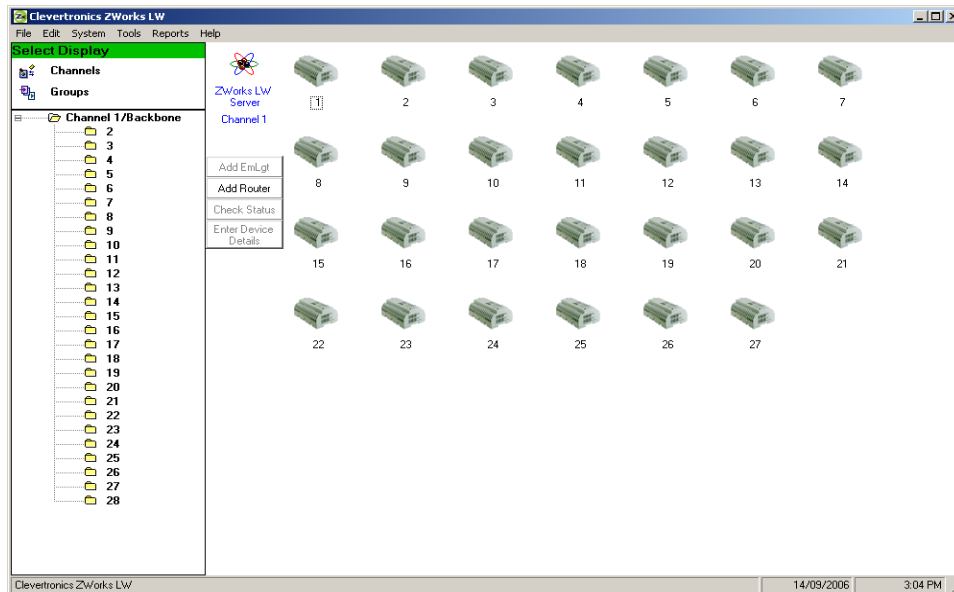
To access the System run the ZWorksGUI as described above. You will be presented with a Login Screen.



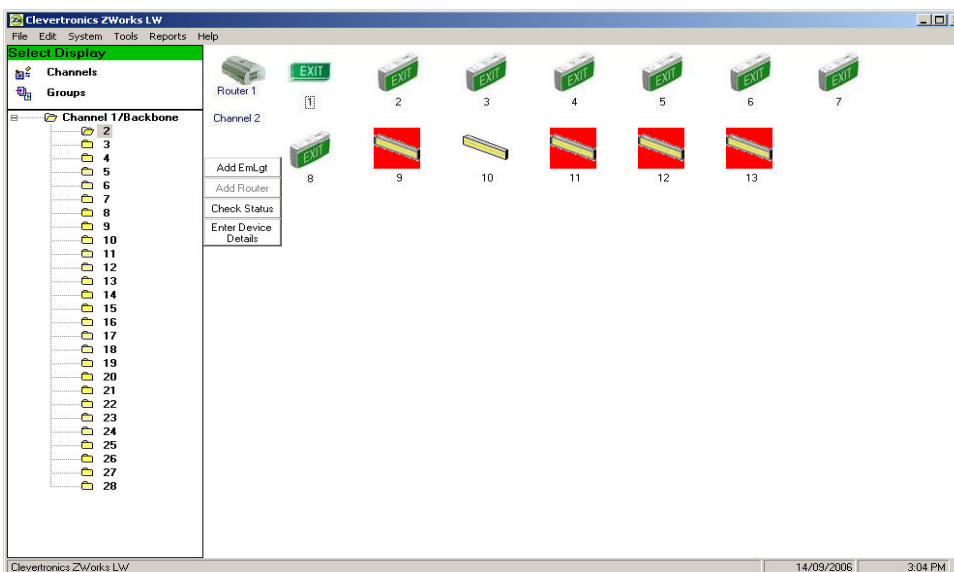
Enter the Username and Password as issued by Clevertronics and press the OK button. Alternatively, pressing the Cancel button will close the ZWorksGUI window.

#### 4. Router/Channel View

Once you have successfully logged in you will be presented with the main screen displaying the system backbone (Routers connected to the Server).



The display has been configured to view devices either via Router/Channel or by Test Groups. The screen above is the Router/Channel view. To view the contents of a Router/Channel single click a folder on the left hand side Tree View. The contents of the channel will open on the right hand side List View.

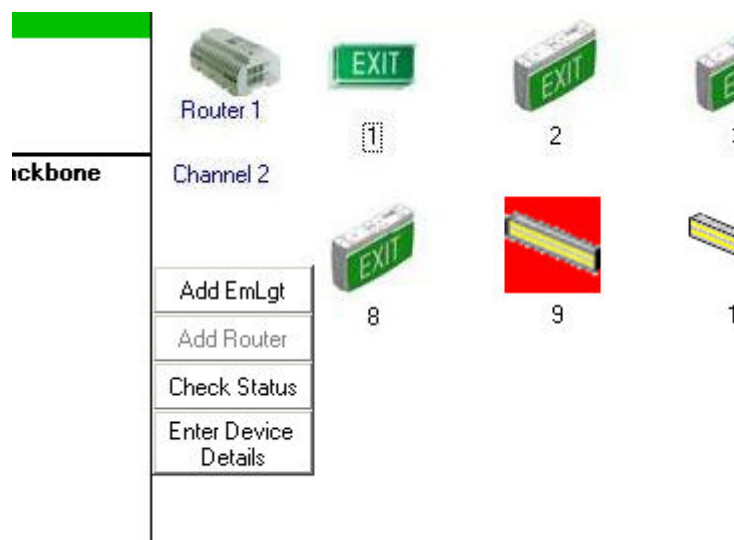


The devices pertaining to that channel are displayed as icons representing the actual luminaire type e.g. Cleverfit EXIT, Weatherproof EXIT, Batten, Starlite, Supalite Flood Unit, Swingblade, Ultrablade.

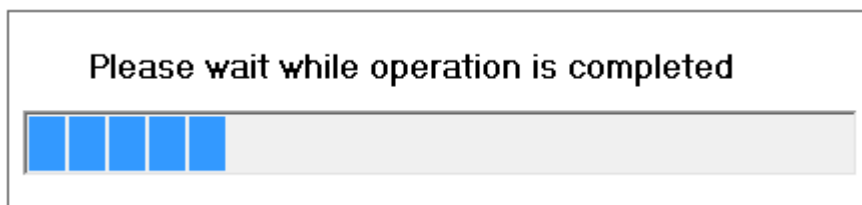
As mentioned earlier this display is “real time” and shows the devices and relevant status information. If a device is coloured with a RED BACKGROUND then it is faulty otherwise the device is OK. A faulty status may be a result of AC lamp out, battery not charging (power on faults) or the device failed its last 1m test or scheduled discharge test (emergency test).

### 5. Manual Status Update

A manual Status update can be performed by clicking the Check Status button as shown below.



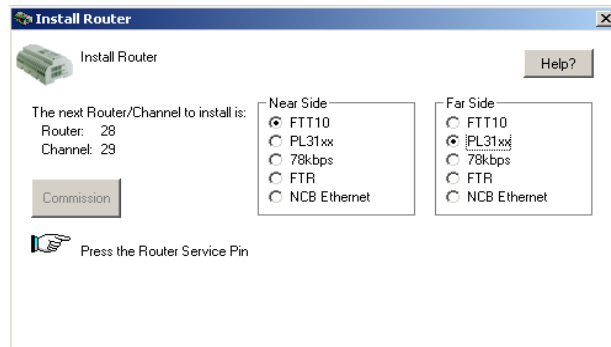
The mouse icon will display the hourglass and progress bar update as the status of each device is requested and processed. Please wait until the icon returns to the usual pointer before proceeding to the next task.



The status of an individual light can be check on the device Details page see **Section 8** later in document

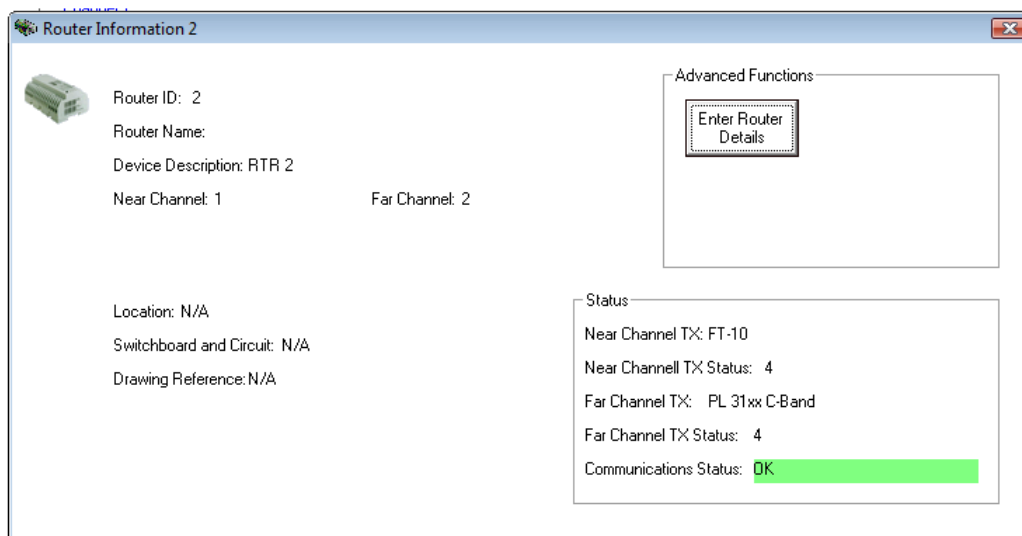
## 6. Adding a Router (Backbone/Trunk view only)

Routers can be added to the system backbone or trunk at any time. To add a router click the Add Router button on the Router Display – the following window will appear.

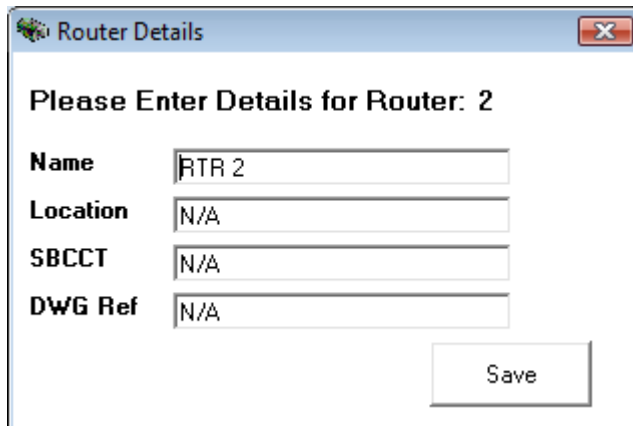


To add a router click the Commission button and you will be prompted to press the service pin on the router. Once the service button has been pressed the router installation will commence and commission the router.

Once a router has been added details and information about it can be viewed by double clicking on the router in the channel view window.



The details can be edited by clicking on the “Enter Router Details” button on the Router Information window.



**Router Details**

Please Enter Details for Router: 2

**Name**      RTR 2

**Location**    N/A

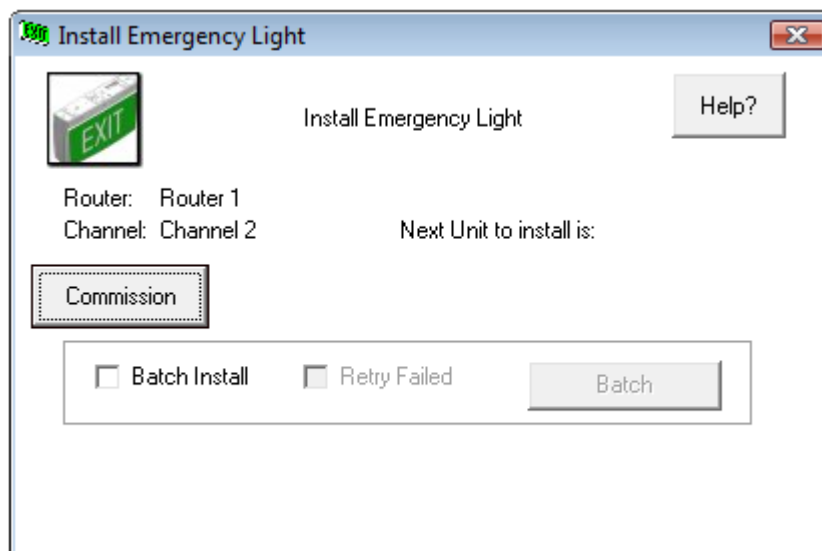
**SBCCT**        N/A

**DWG Ref**      N/A


Save

### 7. Adding a Device (Router/Channel view only)

Emergency Lights can be added to the system at any time. To add an emergency light make sure you are displaying the correct Router/Channel and click the Add EmLgt button on the Device Display – the following window will appear.



**Install Emergency Light**

      Install Emergency Light      Help?

Router: Router 1  
Channel: Channel 2      Next Unit to install is:

Commission

Batch Install     Retry Failed    Batch

There are two ways to add an emergency light. The first is click the Commission button and you will be prompted to press the service pin on the device. Once the service button has been pressed the device installation will commence and commission the emergency light. The device will “wink” flashing the LED and switching the lamp to indicate the service message was received at the ZWorksLW server. You will be updated about the progress of the install along the bottom of this window and you will be prompted when successful. You can then press the service pin of the next device as the software automatically prepares to receive the service pin of the next device.

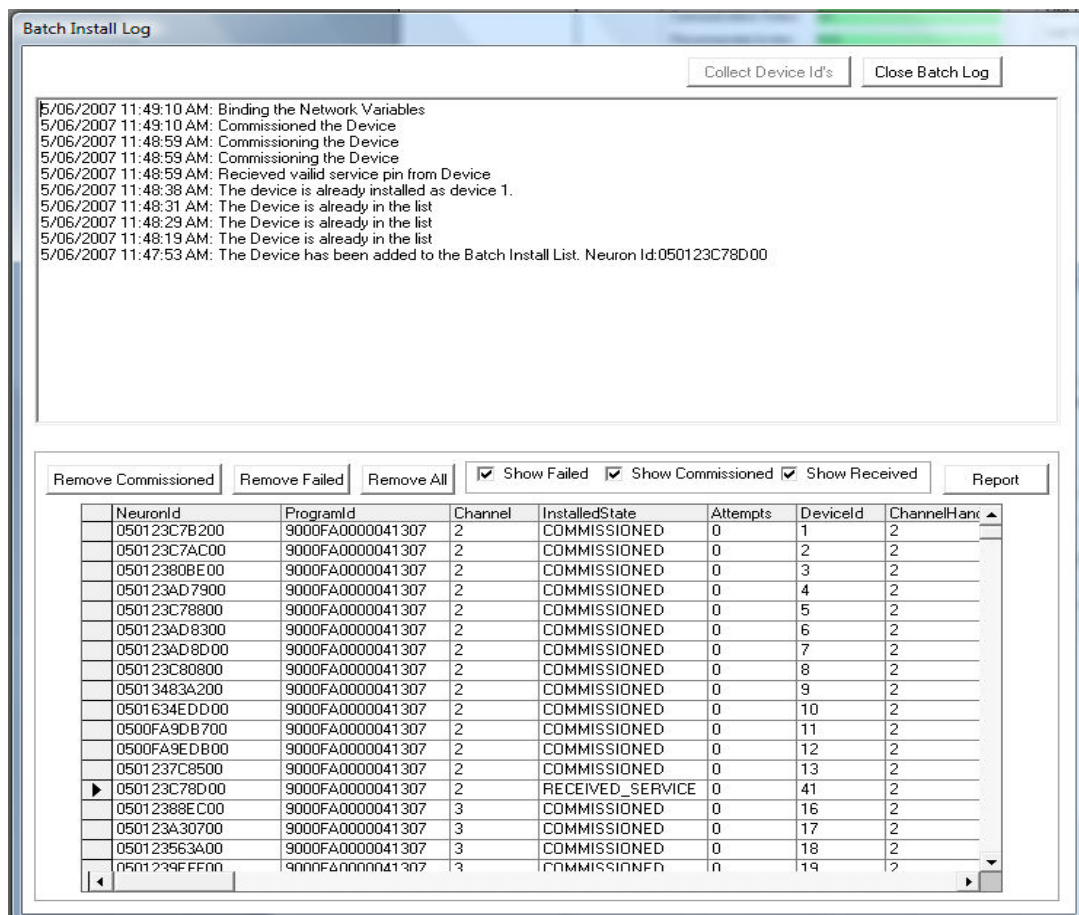
The second method is to “Batch Install”, using this method all device addresses are collected first and the commission done at a later stage.

### Batch Install Procedure

- Check the “Batch Install” Check box. The Batch Install Log will be displayed.
- Press the “Collect Device Id’s” button
- Press the service pin on the device. The LED and Lamp will Flash (Relays can be heard switching)
- The device will be added to the batch install list.
- Press service pin on next device and repeat through all devices on the current Channel/Router.

This process can be completed on all channels/Routers before continuing or done router by router.

- When ready to commission the devices click the “Batch” button on the “Install Emergency Light” window.
- This will start the installation process for all devices in the batch install list. The progress will be displayed in the log window on the Batch Install window.

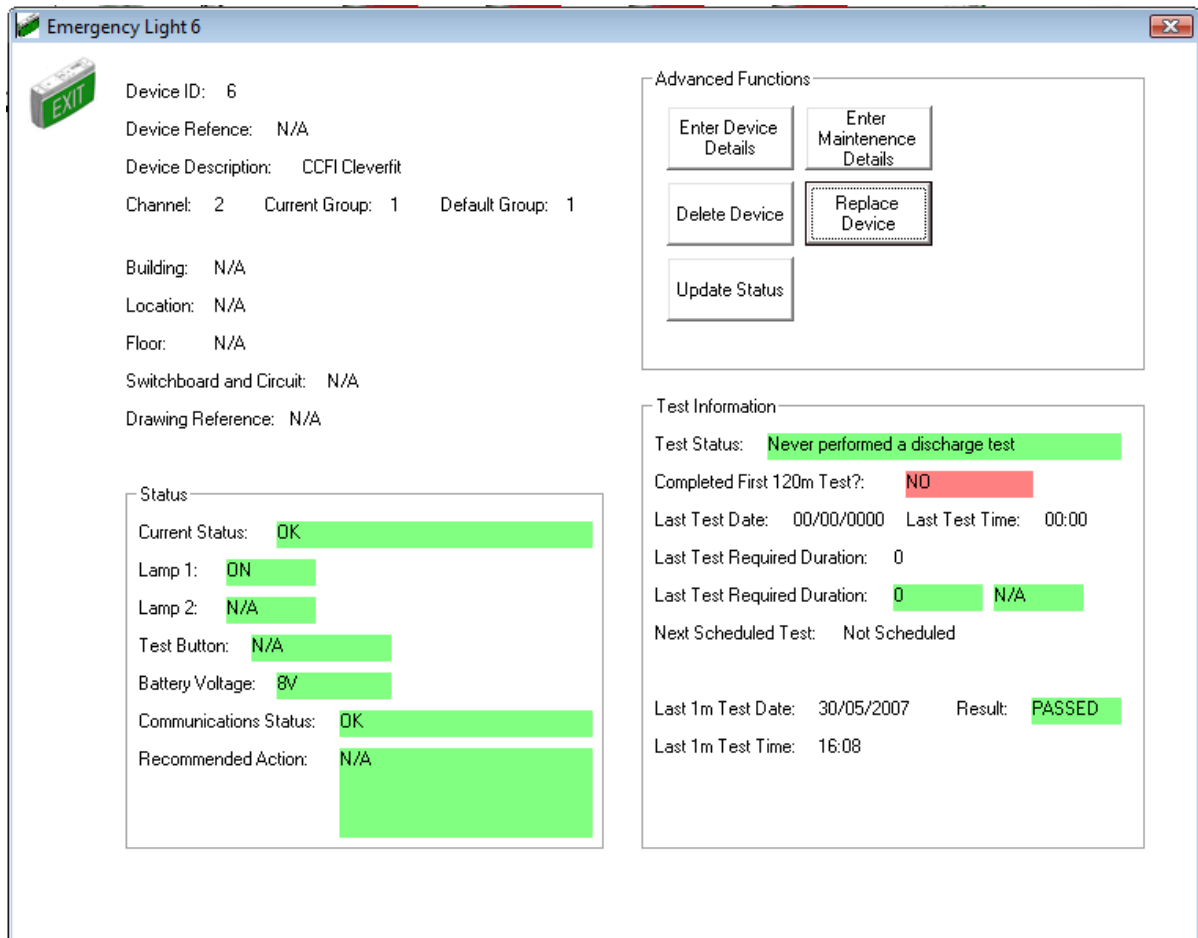


The screenshot shows the 'Batch Install Log' window with a log of events and a table of installed devices. The log includes timestamps and messages such as 'Binding the Network Variables', 'Commissioned the Device', and 'The Device has been added to the Batch Install List. Neuron Id:050123C78D00'. The table below shows the details of the devices.


NeuronId	ProgramId	Channel	InstalledState	Attempts	DeviceId	ChannelHanc
050123C7B200	9000FA0000041307	2	COMMISSIONED	0	1	2
050123C7AC00	9000FA0000041307	2	COMMISSIONED	0	2	2
05012380BE00	9000FA0000041307	2	COMMISSIONED	0	3	2
050123AD7900	9000FA0000041307	2	COMMISSIONED	0	4	2
050123C78800	9000FA0000041307	2	COMMISSIONED	0	5	2
050123AD8300	9000FA0000041307	2	COMMISSIONED	0	6	2
050123AD8D00	9000FA0000041307	2	COMMISSIONED	0	7	2
050123C80800	9000FA0000041307	2	COMMISSIONED	0	8	2
05013483A200	9000FA0000041307	2	COMMISSIONED	0	9	2
0501634EDD00	9000FA0000041307	2	COMMISSIONED	0	10	2
0500FA9DB700	9000FA0000041307	2	COMMISSIONED	0	11	2
0500FA9EDB00	9000FA0000041307	2	COMMISSIONED	0	12	2
0501237C8500	9000FA0000041307	2	COMMISSIONED	0	13	2
050123C78D00	9000FA0000041307	2	RECEIVED_SERVICE	0	41	2
05012388EC00	9000FA0000041307	3	COMMISSIONED	0	16	2
050123A30700	9000FA0000041307	3	COMMISSIONED	0	17	2
050123563A00	9000FA0000041307	3	COMMISSIONED	0	18	2
0501239FFF00	9000FA0000041307	3	COMMISSIONED	0	19	2

## 8. Adding Device Details

To add the location and logbook information for a device into the Zoneworks database double click an emergency light and the following window will appear. It displays the current device details, status and test results.



**Emergency Light 6**


 Device ID: 6  
 Device Reference: N/A  
 Device Description: CCFI Cleverfit  
 Channel: 2    Current Group: 1    Default Group: 1  
 Building: N/A  
 Location: N/A  
 Floor: N/A  
 Switchboard and Circuit: N/A  
 Drawing Reference: N/A

**Advanced Functions**

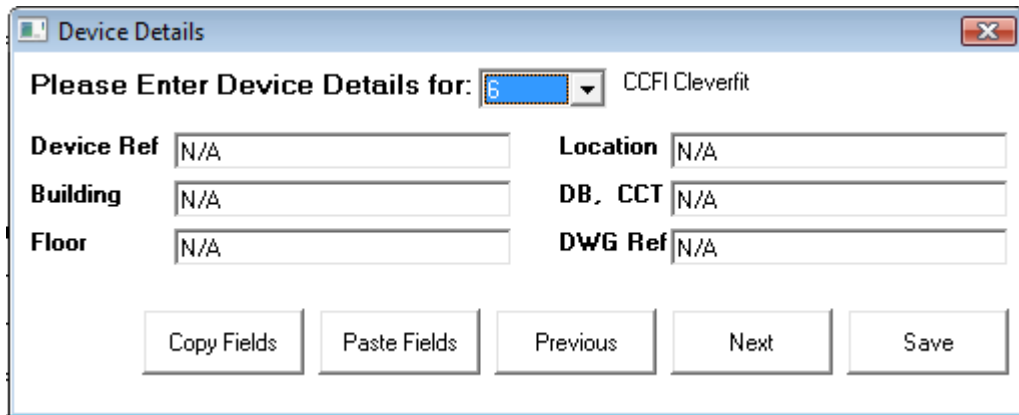
**Status**

Current Status: **OK**  
 Lamp 1: **ON**  
 Lamp 2: **N/A**  
 Test Button: **N/A**  
 Battery Voltage: **8V**  
 Communications Status: **OK**  
 Recommended Action: **N/A**

**Test Information**

Test Status: **Never performed a discharge test**  
 Completed First 120m Test?: **NO**  
 Last Test Date: 00/00/0000    Last Test Time: 00:00  
 Last Test Required Duration: 0  
 Last Test Required Duration: **0**    **N/A**  
 Next Scheduled Test: Not Scheduled  
 Last 1m Test Date: 30/05/2007    Result: **PASSED**  
 Last 1m Test Time: 16:08

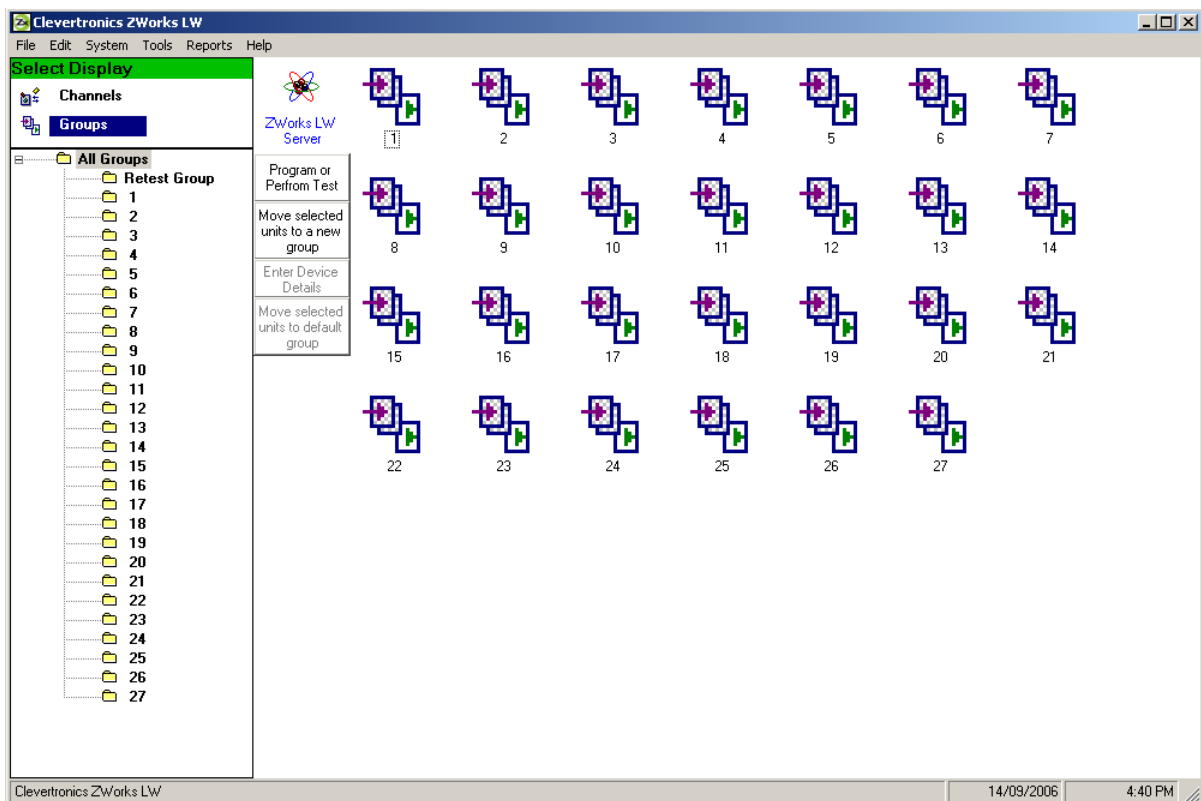
Click the button, enter Device Details and a data entry window will appear.



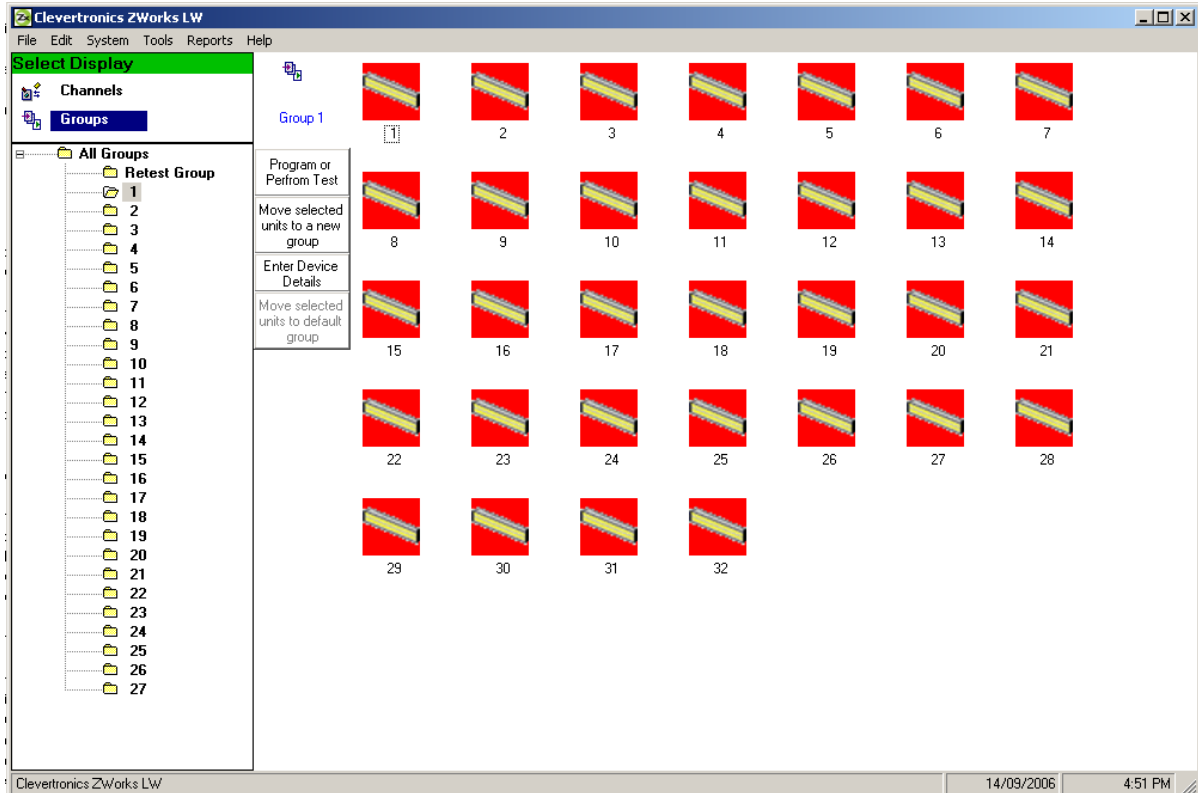
Type in the appropriate details and either move to the next device by pressing Next (automatically saves the current information) or press Save and Close the window. You can copy all the fields of the current device and then after moving to the next paste in these fields as a time saving function.

## 9. Group Display

Emergency Lights are tested in groups independent of the Router/Channel they are installed. To display the list of groups press the Groups Label in the top left window and the following window will appear.



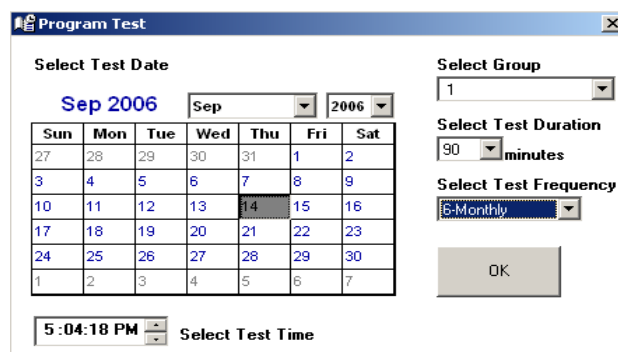
To display a group of devices single click a folder on the list view and the group of devices will display in the right hand list view.



## 10. Programming a Test

There are two types of tests the system can perform – scheduled and immediate. Scheduled tests recur according to a pre-determined schedule, the tests are performed by the Server and results are collected automatically. An immediate test is initiated at any time by the user and occurs immediately and results are collected after the test automatically. After any test the status of each device is updated accordingly.

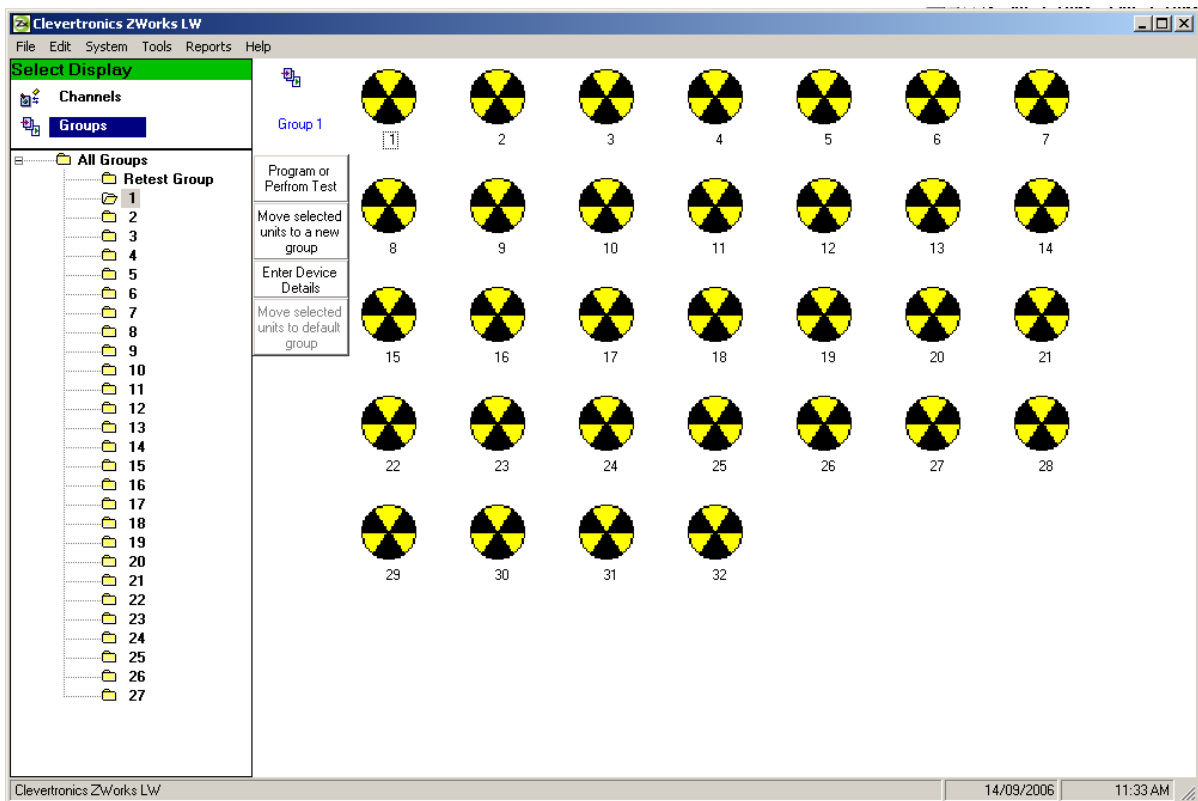
To program a scheduled test press the Perform or Program Test Button on the Group Display and the following window will appear.



Select the group to schedule, select the time (90m for each test after the first 120m test) and select the frequency (typically 6-monthly according to AS2293:1 2005). Select the date and time and press OK. This test will now occur at the prescribed date and time with the results collected automatically. Please note that although the required duration may be set at 90 or 120 minutes all discharges tests last for a 4-hour duration (240m) to fully cycle the batteries. This process can be repeated for multiple test groups and groups can be scheduled at different times.

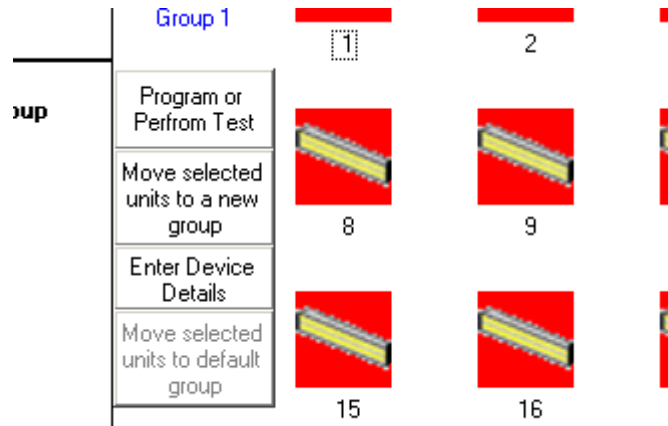
To perform an immediate test, select the group, duration and when selecting Test Frequency select Immediate. Press the OK and the test will commence within 5 seconds. The results will be automatically collected after the test.

When a group is in test the icons will flash between their icon view and a special symbol as shown below.

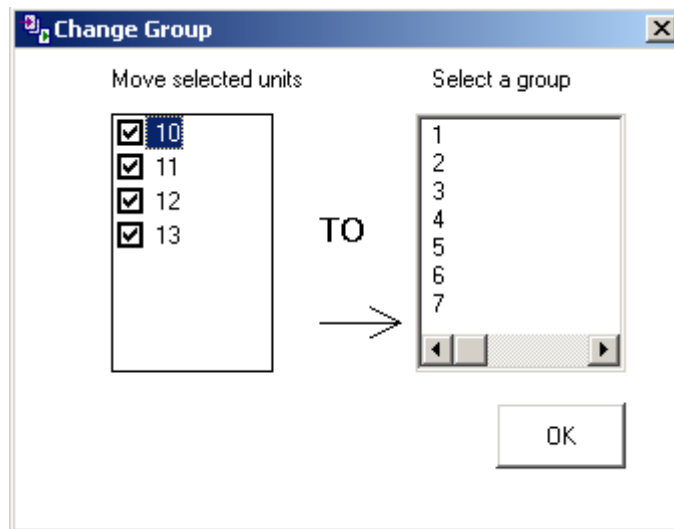


## 12. Moving Devices between Groups

Devices can be moved between groups independent of the router/channel they are connected. This can be useful when structuring groups for testing, especially for alternate device testing. To move selected units to a new group, press and hold the control key and click on devices to be moved in a particular group. Once devices have been selected click the Move Selected Units to a New Group button.



The following window will appear.

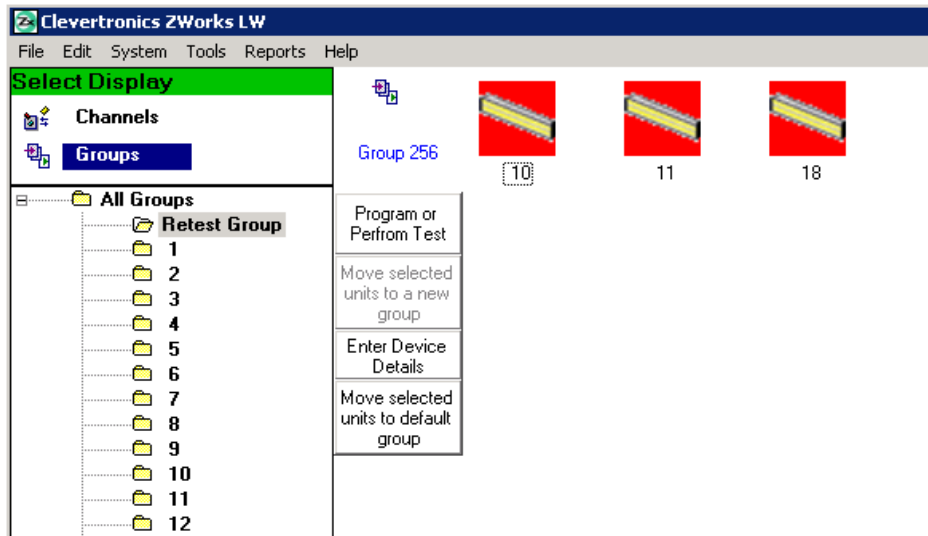


Select the new destination group in the right hand list and press OK. The operation will usually take some time and a progress bar will appear at the bottom of the window along with the hourglass icon. Once the operation is complete the units will appear in the new group.

### 13. The Re-Test Group (Group 256)

As a result of the time required to change a device between groups, Zoneworks LW includes the facility to place devices quickly into the Re-Test Group to allow for re-testing after maintenance operations.

To place units in the retest group, follow the instructions in section 12 and select the destination group as Re-Test (Also listed as Group 256). Once testing operations are complete for selected devices, they can be easily moved back to their original group by pressing the Move Selected Units to Default Group – you must select devices to move first.

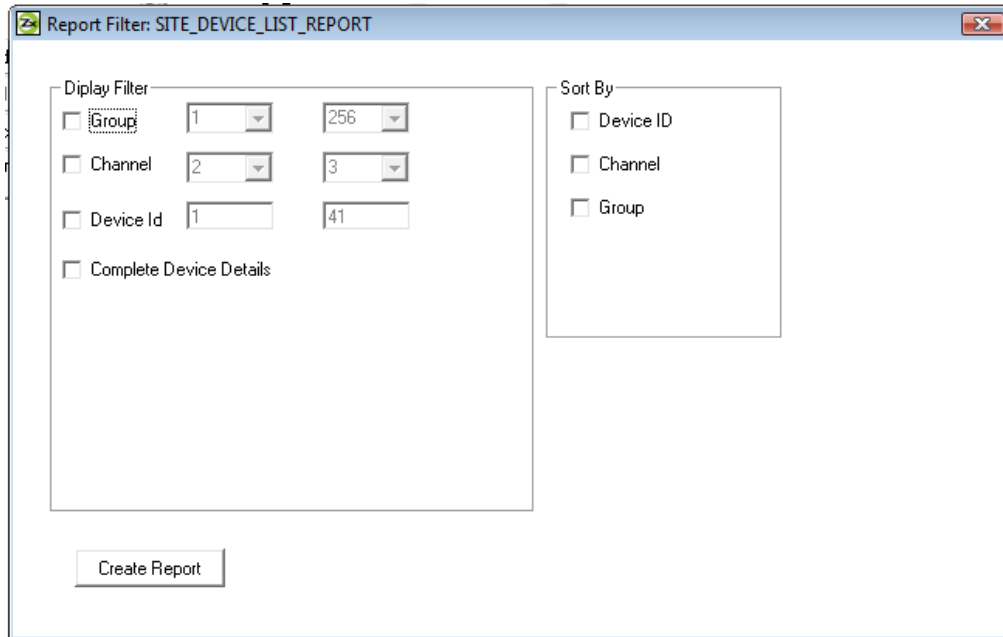


### 14. Reports

Reports can be generated to allow for saving to file (pdf) or printing for permanent paper records. The available test reports are:

- Device Details
- Test Results
- Faulty Units
- Maintenance Logbook
- Scheduled Test
- Router Details

To access/generate a report, select Reports on the main menu and select the appropriate report. A report filter window will display, allowing filters such as Group, channel, Device Id and Date to be selected. The options available vary depending on the report requested.



Report Filter: SITE\_DEVICE\_LIST\_REPORT

Display Filter

Group 1 256

Channel 2 3

Device Id 1 41

Complete Device Details

Sort By

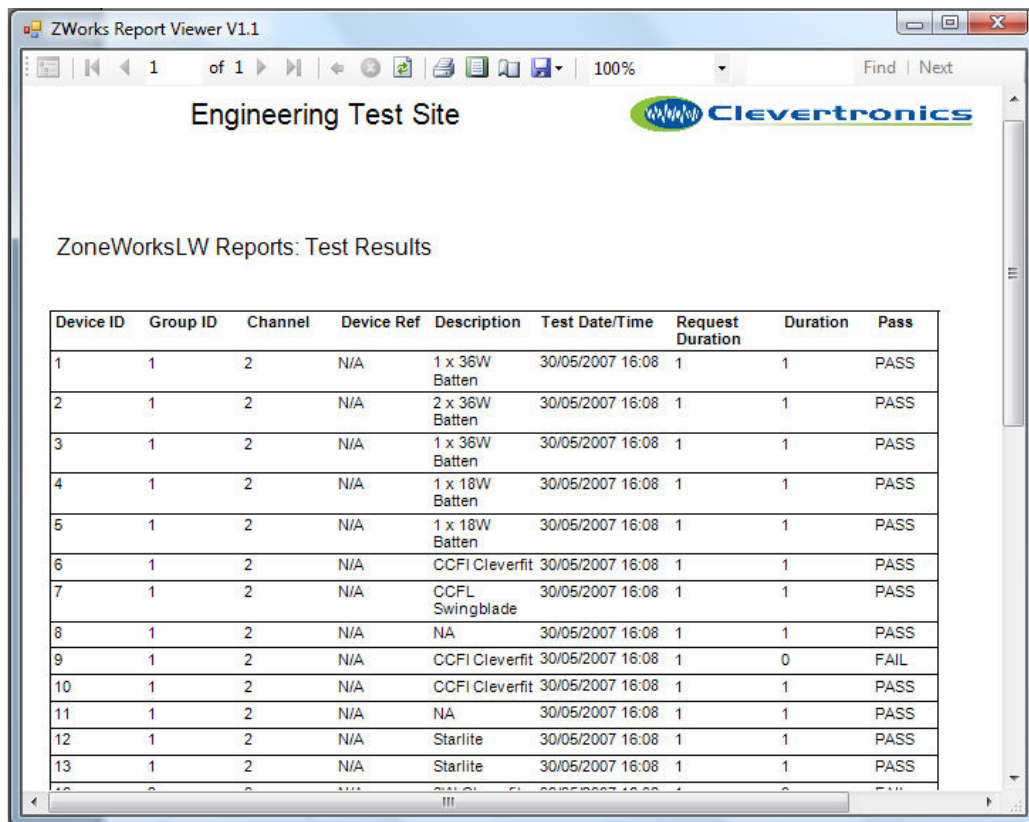
Device ID

Channel

Group

Create Report

Press the “Create Report” button and the report window will be generated and displayed as a separate floating window and therefore the report window can remain open whilst accessing other functions of the Zoneworks GUI. Multiple reports can be generated simultaneously.



ZWorks Report Viewer V1.1

Engineering Test Site

ZoneWorksLW Reports: Test Results

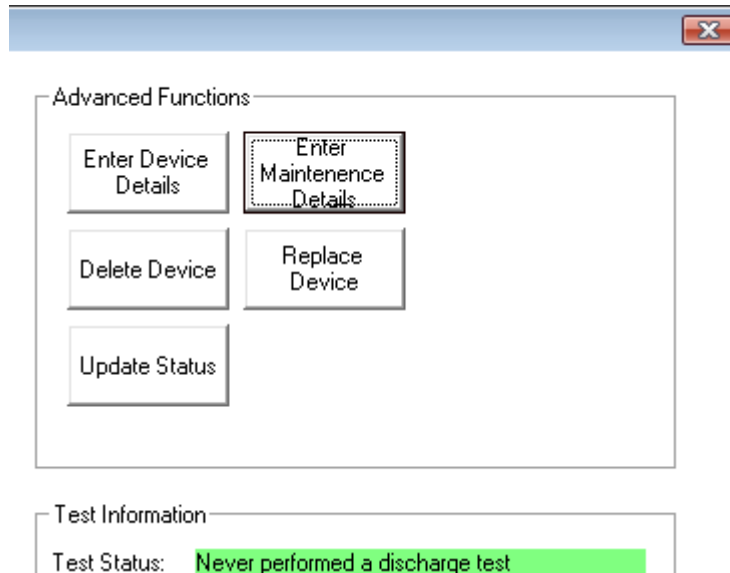
Device ID	Group ID	Channel	Device Ref	Description	Test Date/Time	Request Duration	Duration	Pass
1	1	2	N/A	1 x 36W Batten	30/05/2007 16:08	1	1	PASS
2	1	2	N/A	2 x 36W Batten	30/05/2007 16:08	1	1	PASS
3	1	2	N/A	1 x 36W Batten	30/05/2007 16:08	1	1	PASS
4	1	2	N/A	1 x 18W Batten	30/05/2007 16:08	1	1	PASS
5	1	2	N/A	1 x 18W Batten	30/05/2007 16:08	1	1	PASS
6	1	2	N/A	CCFI Cleverfit	30/05/2007 16:08	1	1	PASS
7	1	2	N/A	CCFL Swingblade	30/05/2007 16:08	1	1	PASS
8	1	2	N/A	NA	30/05/2007 16:08	1	1	PASS
9	1	2	N/A	CCFI Cleverfit	30/05/2007 16:08	1	0	FAIL
10	1	2	N/A	CCFI Cleverfit	30/05/2007 16:08	1	1	PASS
11	1	2	N/A	NA	30/05/2007 16:08	1	1	PASS
12	1	2	N/A	Starlite	30/05/2007 16:08	1	1	PASS
13	1	2	N/A	Starlite	30/05/2007 16:08	1	1	PASS

The report can be exported to pdf or excel format by pressing the floppy disk button.

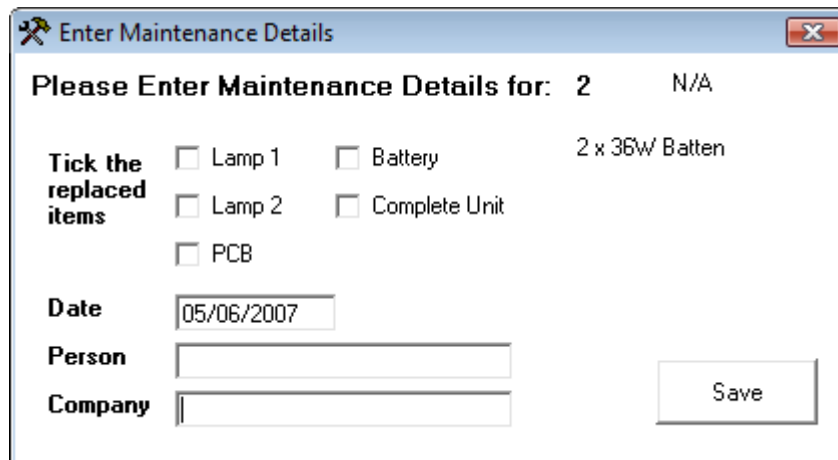
## 15. Maintenance Functions

### Entering Maintenance Details

A complete maintenance history can be stored for a device. To enter the maintenance details at the appropriate time click the button within the device details window titled Enter Maintenance Details (double click a device to bring up the Device window).



A data entry window will appear allowing the user to select the maintenance actions for the device and save the relevant personnel details.



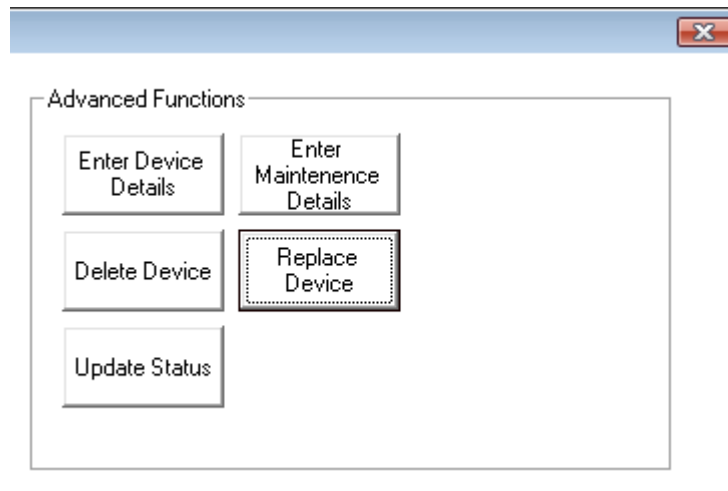
The 'Enter Maintenance Details' dialog box contains the following information and fields:

- Title: **Please Enter Maintenance Details for: 2 N/A**
- Items to be replaced:
  - Lamp 1
  - Lamp 2
  - PCB
  - Battery
  - Complete Unit
- Additional info: 2 x 36W Batten
- Date:
- Person:
- Company:
- Save button

Click Save before exiting. Multiple entries on different occasion can be entered for one device providing a facility to record a complete maintenance history for a device.

### **Replacing a Faulty Device**

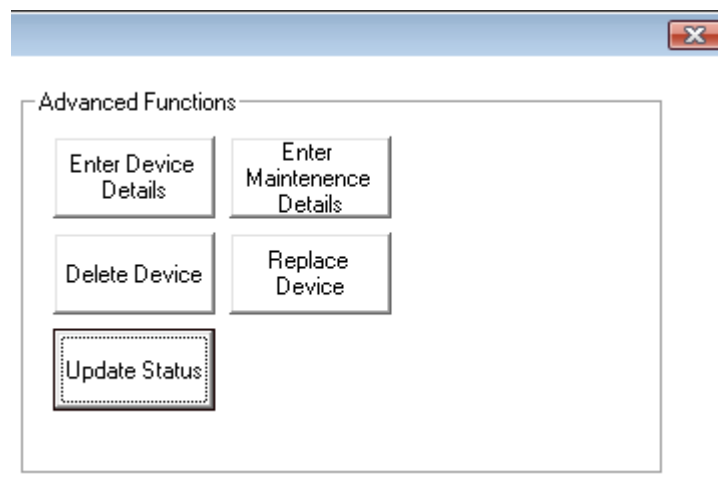
A faulty device can be replaced by clicking the button Replace Device in the Device Details window shown above. You will be asked to confirm this replace operation, once confirmed a caption will appear at the bottom of the window asking the user to press the service pin on the replacement device – YOU MUST REPLACE THE FAULTY DEVICE WITH A NEW UNIT BEFORE PROCEEDING WITH THE REPLACE OPERATION.



Press the service pin of the replacement device and the replace operation will commence. The user will be updated as to the progress of the operation and subsequent success or fail.

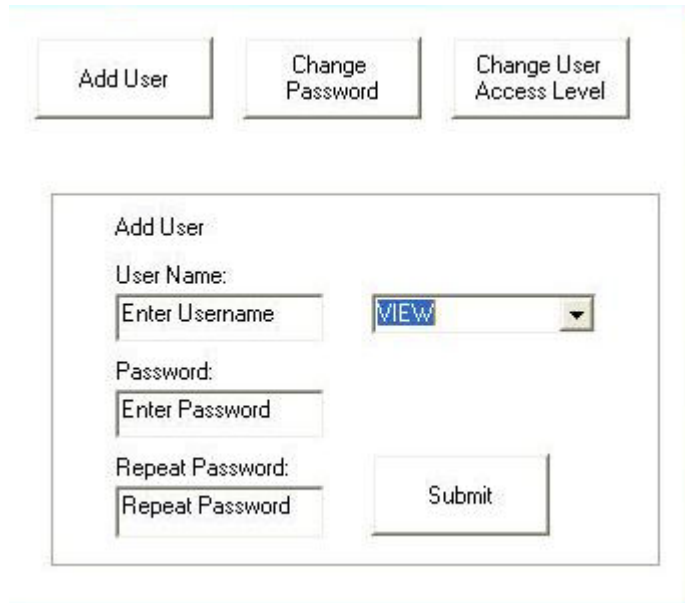
### **UPDATE STATUS**

The current status of a fitting can be retrieved using the "Update Status" button on the Device Details window. This will communicate with the fitting and update the status information.



## MANAGE USERS

To add a user or change details like password or access levels goto the “Manage Users” option in the Tools menu. Some operations will need an admin level of access.



The screenshot displays a web interface for managing users. At the top, there are three buttons: "Add User", "Change Password", and "Change User Access Level". Below these buttons is a detailed view of the "Add User" form. The form includes the following fields and controls:

- Add User** (Section Header)
- User Name:** A text input field with the placeholder "Enter Username" and a dropdown menu with the option "VIEW".
- Password:** A text input field with the placeholder "Enter Password".
- Repeat Password:** A text input field with the placeholder "Repeat Password".
- Submit** (Button)

## Further information

For more information, please contact your nearest Clevertronics office.

### Victoria/Tasmania

Ph: 03 9559 2700 Fax: 03 9559 2799  
[vicoffice@clevertronics.com.au](mailto:vicoffice@clevertronics.com.au)

### New South Wales

Ph: 02 8805 6400 Fax: 02 8805 6444  
[nswoffice@clevertronics.com.au](mailto:nswoffice@clevertronics.com.au)

### Queensland

Ph: 07 3342 9700 Fax: 07 3342 9777  
[qld@clevertronics.com.au](mailto:qld@clevertronics.com.au)

### South Australia/Northern Territory

Ph: 0 8 8339 1092 Fax: 08 8339 1091  
[admin.sa@clevertronics.com.au](mailto:admin.sa@clevertronics.com.au)

### Western Australia

Ph: 0 8 9248 3720 Fax: 08 0248 3725  
[admin.wa@clevertronics.com.au](mailto:admin.wa@clevertronics.com.au)

### New Zealand

Ph: +64 9 480 0057 Fax: +64 9 480 0058  
[support@safescape.co.nz](mailto:support@safescape.co.nz)  
[www.safescape.net.nz](http://www.safescape.net.nz)

[www.clevertronics.com.au](http://www.clevertronics.com.au)

#### **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

**Document Compatible with Software Version: 1.0.3 and later**