

Emergency Light Monitoring

Installation and User Guide

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Introduction

The Emergency Light Monitoring Solution addresses the need to test battery operated emergency lights and combination exit signs for compliance with NFPA 101 regulations. Periodic and annual tests can be scheduled, performed, and monitored while all results are archived for future reference.

This solution provides the following features:

- Emergency Light monitoring via new fixtures or retrofit existing equipment
- Remote/automated testing and monitoring for NFPA 101 compliance
- Floor map display of Emergency Light location
- Periodic or annual performance reports
- Communication over Wi-Fi 802.11 b/g or Ethernet network interfaces

Notices

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Before You Begin

Please read this document thoroughly before performing any installation or service procedures.



Warning!

TO REDUCE THE RISK OF ELECTRIC SHOCK, DISCONNECT POWER SOURCE BEFORE PERFORMING ANY INSTALLATION OR SERVICE ACTIVITIES!

PLEASE READ AND FOLLOW THE FOLLOWING SAFETY RECOMMENDATIONS:

- Installation and service procedure must be performed by qualified personnel
- Make sure all work performed is in accordance with the National Electrical Code and any other local regulations.
- This product is intended to be used in INDOOR applications only.

Scope of This Guide

This guide supports the SNS Emergency Light Controller (ELC), a component of the overall Emergency Light Monitoring solution. The ELC may be integrated with a customer's existing emergency light fixtures or alternatively be pre-integrated into a light fixture from Primex Wireless (ELC Integrated Fixture).

Installation of the ELC requires the expertise of a qualified electrician for wiring and mounting as well as a network technician for configuration of settings.

This user guide will focus on:

- ELC deployment into existing fixtures
- Installation of an ELC Integrated Fixture
- Network configuration of the ELC

Reference Documentation

During and after installation, please refer to the SNS Resource CD for complete SNS product documentation.

Installation Task	Document
Install/configure AMP software	<ul style="list-style-type: none"> • SNS System Installation and Network Admin Manual • Application Management Platform (AMP™) User Guide Version
Auto-configuration of ELC	<ul style="list-style-type: none"> • Emergency Light Monitoring Installation and User Guide
Install new or retrofit Emergency Light fixture with ELC integrated	
Manual testing of ELC	
Automated testing of ELC	<ul style="list-style-type: none"> • SNS AMP User Guide for Emergency Light Monitoring • Application Management Platform (AMP™) User Guide Version

Electrical Systems Supported

The Emergency Light Controller (ELC) and associated products are intended to be used with the following input voltages:

- 120 VAC
- 220 VAC
- 277 VAC

Materials Required

You need the following materials to perform procedures described in this document.

1. Pliers (Needle Nose/Side Cutting)
2. Wire strippers and cutters
3. Screwdriver-Standard
4. Screwdriver-Phillips
5. Adjustable wrench
6. Electrical tape
7. Wire Connection set (various wire connectors)
8. Multi-meter
9. Drill
10. Knock-out Set

Compatible Light Fixture

Note: Make sure any Emergency Lighting fixture is compatible with the ELC both electrically and in terms of space to accommodate wiring.

- Battery voltage between 4.5 VDC and 38 VDC
- Maximum current draw of 5 AMPS
- Fixture must use incandescent bulbs
- Adequate space for ELC shaft and associated wiring to complete installation

Planning the Installation

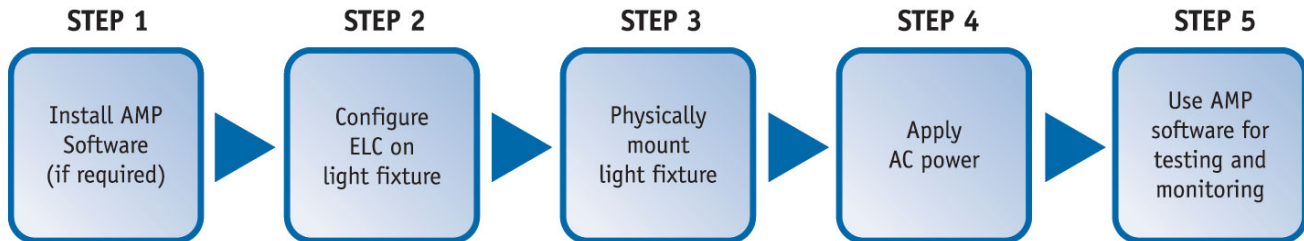
Planning the installation of Emergency Light installation must take into consideration several factors:

1. Installation of AMP software (covered in the “SNS System Install and Admin Manual”)
2. Configuration of Emergency Light Controllers (ELC)
3. Installation of new Emergency Light fixtures (if required)
4. Retrofitting of existing Emergency Light fixtures (if required)

Installation Phase	Process Step	Comments/Documentation
Planning	1. Complete Installation Planning Checklist	None
	2. Identify EM fixtures to be retro-fitted	Vendor documentation for specific EM fixtures
	3. Identify new ELC light fixtures to be installed.	<ul style="list-style-type: none"> • Emergency Light Monitoring Installation and User Guide
Installation of Hardware and Software	1. Install new AMP server designed specifically for the Alpha/Beta test.	<ol style="list-style-type: none"> 1. Install new AMP partition/VMware Virtual AMP 2. DO NOT use a customer’s existing AMP server for Alpha/Beta test.
	2. Major AMP installation tasks include: <ul style="list-style-type: none"> • Installing software • Configuring network parameters • Setting up Auto-Config 	<ul style="list-style-type: none"> • SNS System Installation and Network Admin Manual • Application Management Platform (AMP™) User Guide Version
Configure Emergency Light Fixtures	1. Use AMP software or wireless laptop	<ul style="list-style-type: none"> • Emergency Light Monitoring Installation and User Guide • Vendor documentation for specific EM fixtures
Test the System	1. Run Emergency Light tests: <ul style="list-style-type: none"> • Check operation of lights • Check operation on AMP 	<ul style="list-style-type: none"> • SNS AMP User Guide for Emergency Light Monitoring

New Fixture Installation Overview

The following is a basic workflow for new Emergency Light fixture installation.



AMP Software Installation

AMP software must be installed prior to retrofitting existing Emergency Light fixtures

ELC Configuration

It is highly recommended that you configure the ELC prior to physically mounting the fixture.

Physically Mount Emergency Light Fixture

Physically mount the Emergency Light fixture at its intended location.

Apply AC Power

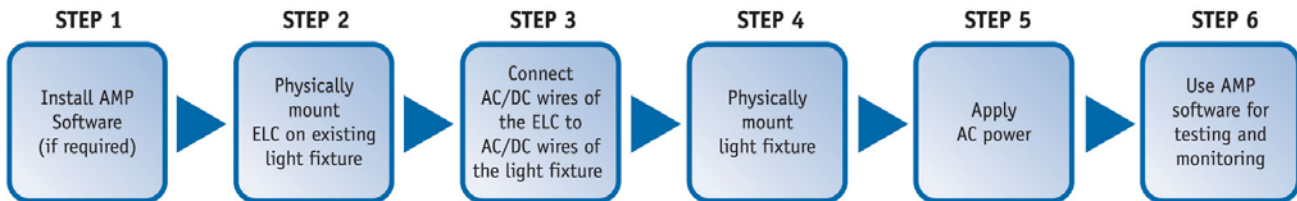
Apply AC power to the light fixture when all connections have been made

Setup Test and Monitoring on AMP Software

Setup AMP software for periodic/annual testing. The AMP software also monitoring the Emergency Light system for bulb failures, current, and other parameters.

Retrofit Installation Overview

The following is a basic workflow for retrofitting existing Emergency Light fixtures with the Emergency Light Controller (ELC).



AMP Software Installation

AMP software must be installed prior to retrofitting existing Emergency Light fixtures

ELC Configuration

It is highly recommended that you configure the ELC prior to physically mounting the fixture.

Physically Mount Emergency Light Fixture

Physically mount the Emergency Light fixture at its intended location.

Integrate ELC Into Existing Light Fixture

For retrofit scenarios, integrate the ELC into the existing light fixture.

Apply AC Power

Apply AC power to the light fixture when all connections are completed.

Setup Test and Monitoring on AMP Software

Setup AMP software for periodic/annual testing. The AMP software also monitoring the Emergency Light system for bulb failures, current, and other parameters.

Emergency Light Controller

The Emergency Light Controller is a major component of the overall Emergency Light Monitoring solution. The ELC may be integrated with a customer’s existing emergency light fixtures or alternatively be pre-integrated into a light fixture from Primex Wireless (ELC Integrated Fixture).

The Emergency Light Controller (ELC) is a device that is physically connected to an Emergency Light fixture.

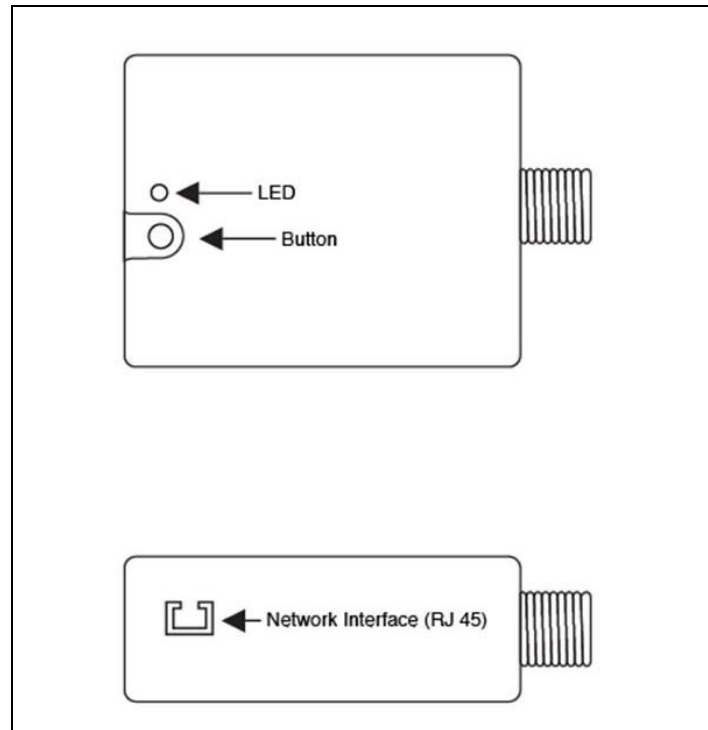


Figure 1: Emergency Light Controller

ELC ITEM	FUNCTION
LED	Visual indicator of ELC operating mode.
Button	Used to select ELC operating modes/test states. The button is used in conjunction with the LED to select modes/test states.
RJ-45 Connector	Ethernet network interface – used for interface to a wired network and device configuration.

Emergency Light Controller (ELC) Specifications

1. The physical dimensions of the ELC case are as follows

L = 4.0 inches W = 3.16 inches H = 1.37 inches Diameter of ELC Shaft = .75 inches

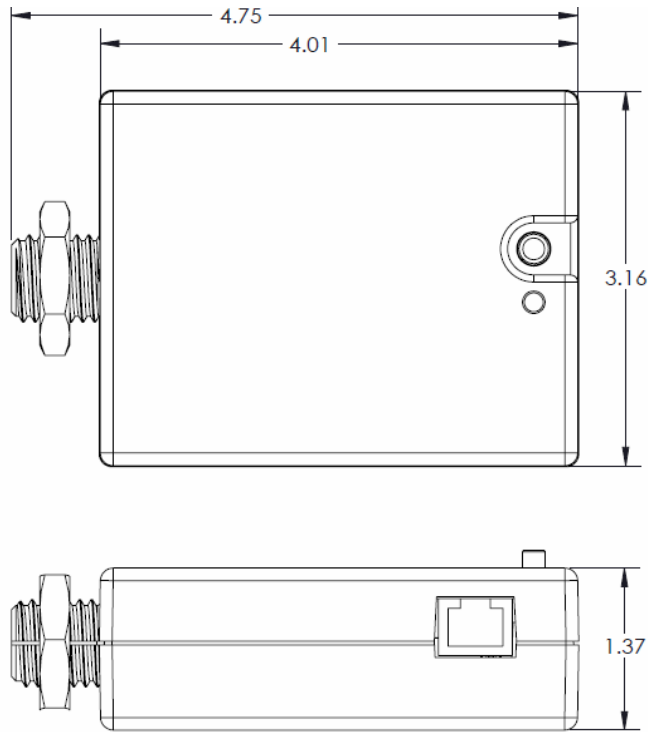


Figure 2: ELC Physical Dimension

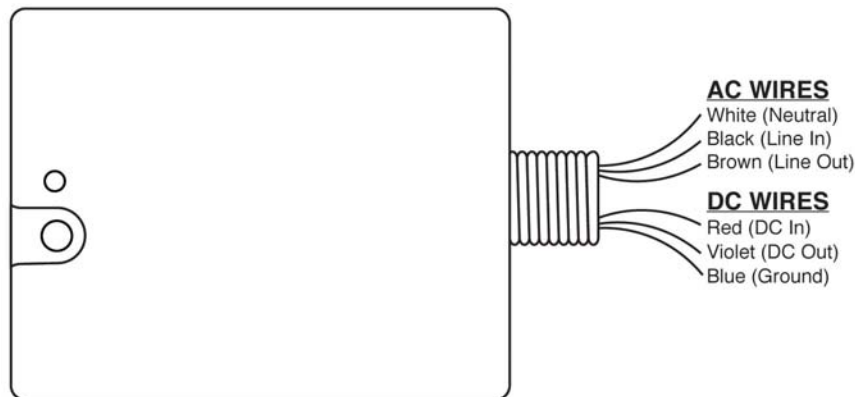


Figure 3: ELC Wires

Best Practices for Retrofitting an Emergency Light Fixture

The “ELC” (Emergency Light Controller) is positioned between emergency light power and emergency light fixtures. In many cases, it must be integrated by removing an existing fixture and wiring in the ELC.

Consider the following before attempting a retrofit of an existing Emergency Light fixture:

1. Determine the best location on the light fixture to mount the ELC.
(Refer to “Mounting the ELC onto an Existing Light Fixture”)
2. Correctly identify the AC and DC power wires of the ELC and fixture
3. Make sure the fixture is in good working condition.
4. Make sure the light fixture has sufficient space in its case to accommodate the shaft of the ELC and its associated wires.
5. Ensure that the installation of the ELC does not interfere with or obstruct wires or batteries in the light fixture case.
6. If a suitable knock-out is available, identify it and use whatever tools are necessary to remove it.



Warning!

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT DRILL INTO LIGHT FIXTURE WIRING OR BATTERY!

7. If drilling is required, use an appropriate drill bit, drill hole in the case if needed to insert the threaded end of the ELC unit. Note that the positioning of the device is critical if it is desired to have access to the button, as well as view of the LED.
8. After necessary hole is found, place the plastic washer on the threaded shaft of the ELC unit, insert ELC unit into the hole and use the plastic nut to secure into place.
9. The ELC should face forward from whatever mounting position you select. This is to ensure that the green power LED is visible for inspection.

Note: Order of operations – will need to actually find /create the hole and secure the ELC unit before making the electrical connections.

Mounting the ELC onto an Existing Light Fixture

The Emergency Light Controller (ELC) can be mounted on the side of an emergency light fixture or an exit sign.

Perform the following basic steps to mount an ELC to a light fixture or exit sign:

1. Disconnect AC power from the emergency light fixture or exit sign.
2. Open the unit to gain access to its inside compartment.
3. Either drill a hole or remove a knock-out for mounting the ELC.
4. Make sure the mounting of the ELC does not interfere with the unit's internal wiring or battery.
5. Place the threaded shaft into the hole and secure with provided hardware.

NOTE: The Emergency Light Controller (ELC) must face forward when mounted to an Emergency Light fixture (as shown in the figure below). The LED and button should face the same direction as the bulbs on the fixture.

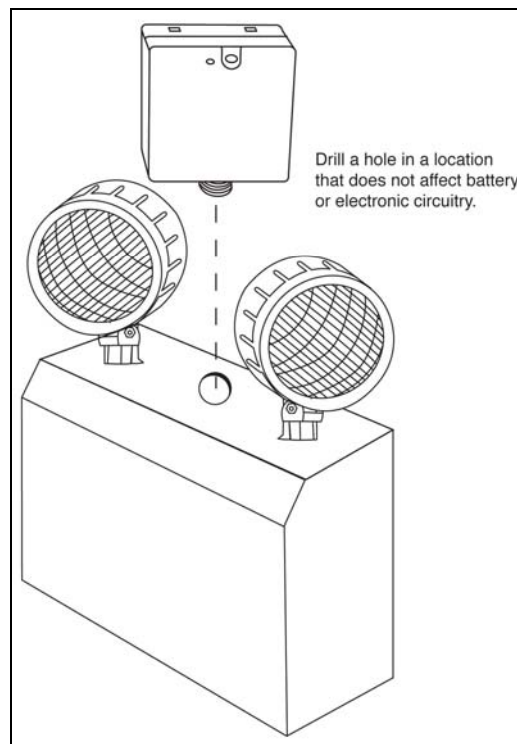


Figure 4: Top Mounting the ELC

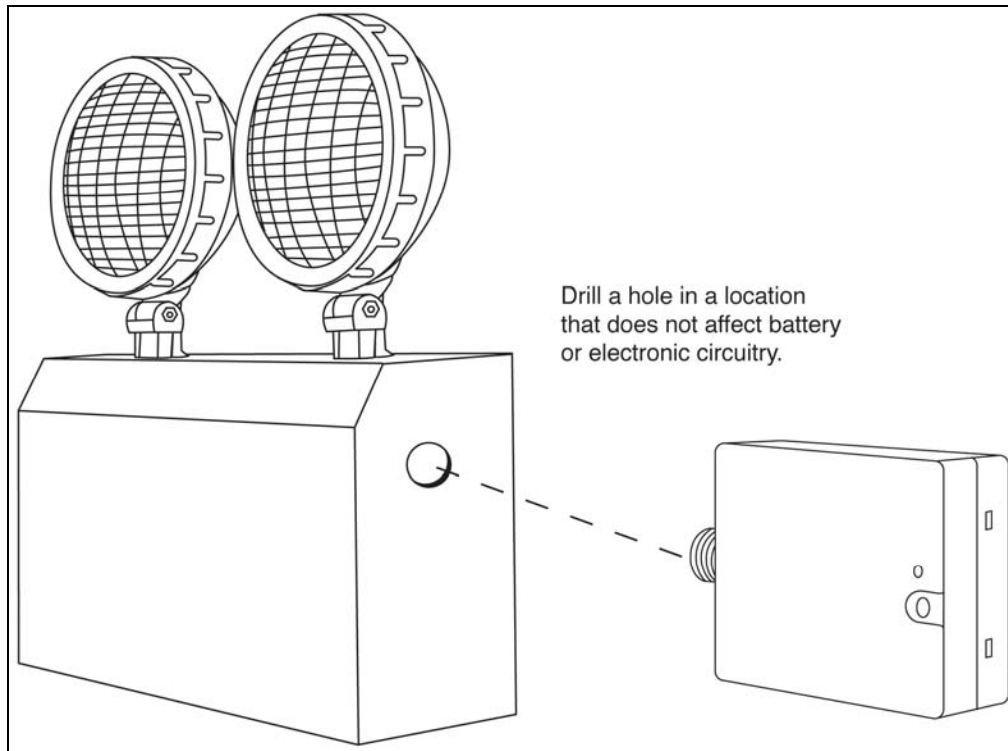


Figure 5: Side Mounting the ELC

Color Codes for AC/DC Power

The Emergency Light Controller (ELC) is wired between AC power and an Emergency Light fixture.

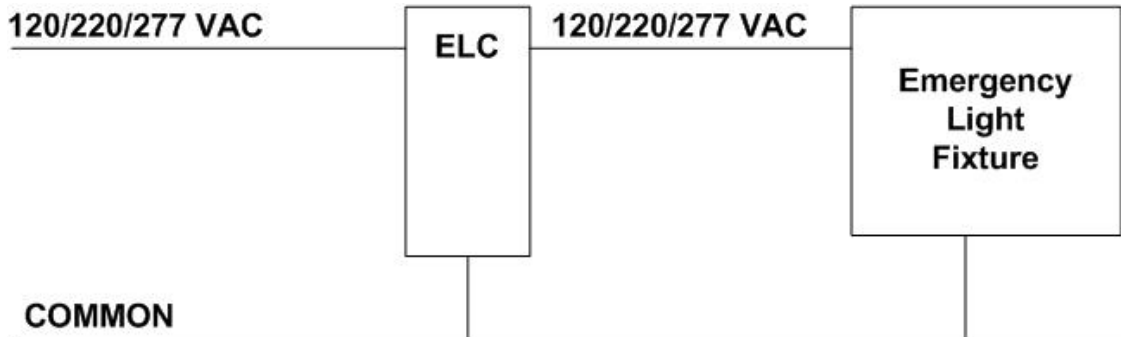


Figure 6: ELC Wiring

It is very important for the person performing the retrofit to understand the color coding of the wires and which ones are AC and DC.

Refer to the following table to gain an understanding of the color code of the ELC.

Emergency Light Controller (ELC) Wires	
AC Wire Color Code	
White	Neutral
Black	Line In
Brown	Line Out
DC Wire Color Code	
Red	DC In
Violet	DC Out
Blue	DC Ground

AC Power Connections from the ELC

Note: The AC connections from the ELC unit will not have connectors. They will need to be connected via wire nuts (or similar means) to provide necessary connection.

Perform the following steps to connect AC power from the ELC to an existing Emergency Light fixture:

1. Neutral (white in this example) – gets connected to the neutral AC connection that exists on the emergency light. Note that this is usually white in color; please refer to user manual provided with the emergency light to verify.
2. Line In (black in this example) – gets connected to the Line AC connection that exists on the emergency light (coming from the existing building electrical wiring). Note that this is usually black (US) in color; please refer to building electrician to verify.
3. Line Out (brown in this example) – gets connected to the line connection that exists on the emergency light. Note that this is commonly black in color (120V) or orange (if using 277V); please refer to user manual provided with the emergency light to verify.

DC Power Connections from the ELC

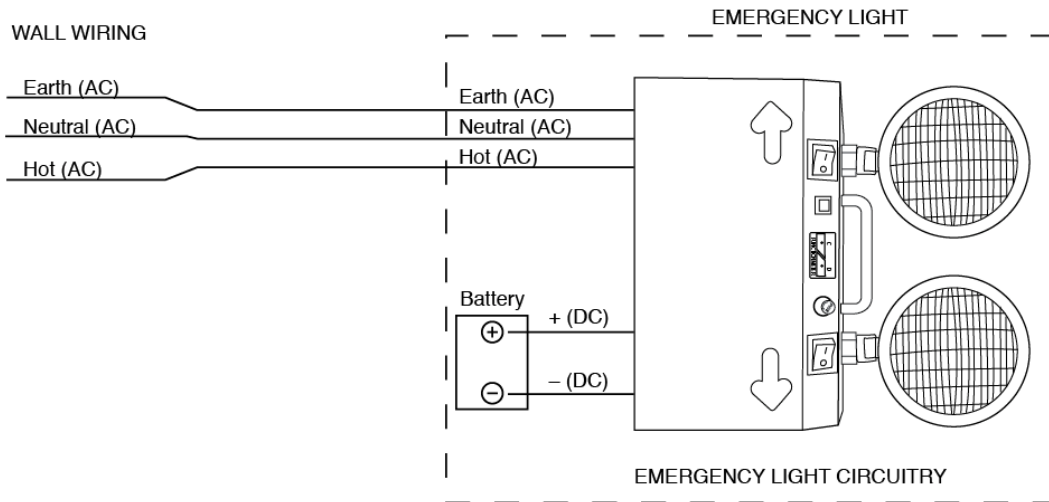
Perform the following steps to connect DC power from the ELC to an existing Emergency Light fixture:

1. DC In (red in this example) – gets connected to the positive battery connection in the existing emergency light.
2. DC Out (Violet in this example)-gets connected from the ELC to the Regulator Board on a light fixture.
3. DC Ground (Blue in this example) – gets connected to the ground side of a light fixture.

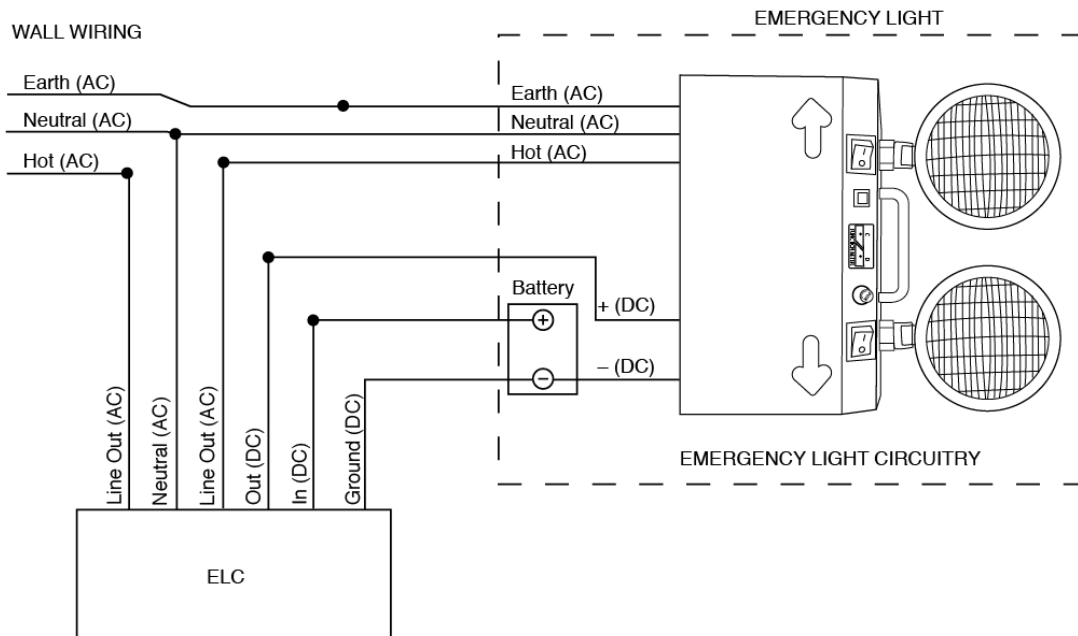
Wiring on the ELC

The following graphic depicts before and after AC/DC wiring of the Emergency Light Controller (ELC).

Before Integration of ELC in Light Fixture



After Integration of ELC in Light Fixture



The ELC Emergency Light Fixture

Primex Wireless offers a line of Emergency Light fixtures with the ELC pre-integrated and ready for installation. Available in standard fixture format and a combination emergency light / exit sign, these units require no modification prior to deployment.

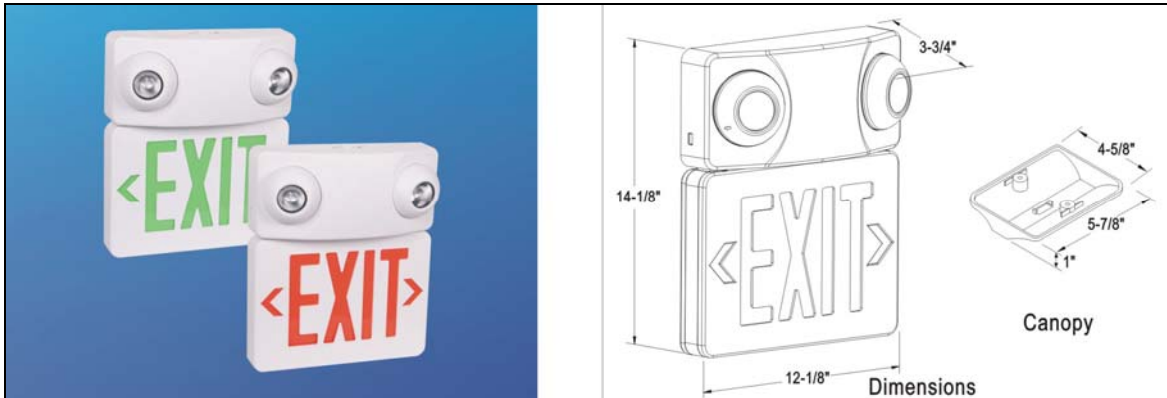


Figure 7: ELC Emergency Light Fixture

The ELC Emergency Light Fixture has the following specifications:

ELC Emergency Light Fixture Features			
Housing	Snap-Together design	Letters 6" high with 3/4 stroke	Eyeball shape light heads
Mounting	Wall, side, or ceiling mounting	Lightweight design	Housing snaps to canopy (for ceiling mount applications)
Electrical	120/277 VAC	Low power consumption: 2.3 watts	LED indicator light and push-button test switch
Battery	Lead-Calcium Battery	24 hours recharge after 90 minute discharge	Certain lights will disconnect from the battery when battery voltage falls below a specific threshold.

Installing the ELC Emergency Light Fixture

Perform the following steps to install the ELC Emergency Light Fixture:

1. Physically mount the ELC Emergency Light fixture
2. Apply AC power to the unit.
3. Remove case to gain access to the fixture's wiring.
4. The unit comes with the "red" lead disconnected from the battery.
5. Connect the "red" wire to the positive terminal of the battery on the ELC fixture.
6. Test light for functionality

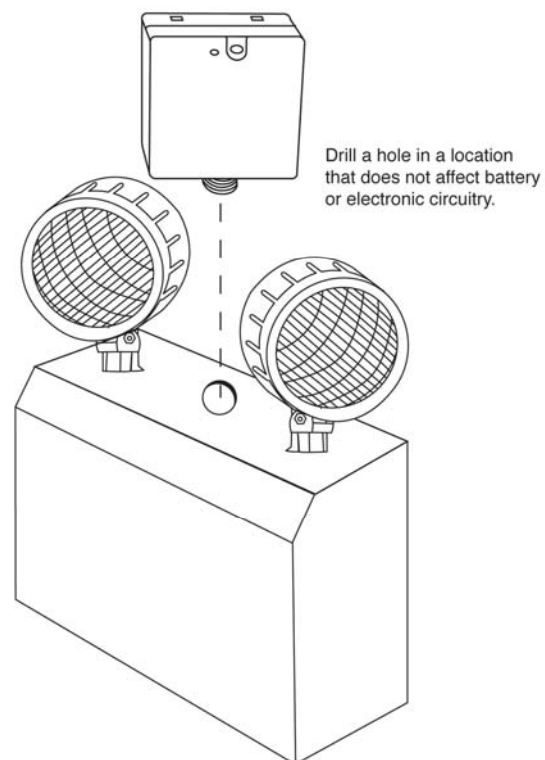


Figure 8: The ELC Emergency Light Fixture

Configuring the Emergency Light Controller (ELC)

There are several factors to consider when configuring the Emergency Light Controller (ELC):

Issue	Implications
Retro fit an existing light fixture	<ul style="list-style-type: none"> • Light fixture compatibility with ELC • Configure before you mount fixture
Installing new light fixture with ELC integrated	<ul style="list-style-type: none"> • Configure ELC before mounting • Wired or Wireless network
Interfacing to an Ethernet (wired) network	
Interfacing to a wireless network	
Configure ELC before or after physically mounting a light fixture	

Auto-Configuration:

- a) Connect to a network (wired Ethernet)
- b) Connect to a wireless network
- c) Discovery and Auto-Configuration
- d) Disconnect Power Supply

Manual Configuration:

- a) Connect ELC to laptop via cable
- b) Place ELC in Configuration mode
- c) Configure network settings (wired or wireless)
- d) Disconnect Power Supply

ELC Modes of Operation

The Emergency Light Controller (ELC) has several modes of operation. The following button sequences will manually control the ELC from the unit itself (without using SNS software). It will work with the LED to signify ELC modes of operation.

User presses the ELC button	Mode of Operation
Press the button (1X)	Check in with the AMP; LED = flash 1x then wait for a second, flash 1x .
Press the button (2X)	Periodic test; LED = flash 2x then wait for a second, flash 2x.
Press the button (3X)	Annual test; LED = flash 3x then wait for a second, flash 3x.
Press the button (4X)	Calibration (24 hour hang); LED = flash 4x then wait for a second, flash 4x.
Press and hold the button for 5 seconds	Configuration Mode

Important Notes

Make note of the following when manually configuring the Emergency Light Controller (ELC):

- If the user hits the button during any of these tests, the test will be cancelled. However, unit will check-in to the SNS AMP server.
- There is a 1 second timeout between button presses (so user has up to 1 second to press the button again) to advance in the selection menu. If that second elapses, start the state that is currently selected.
- If the user continues to try and cycle through the menu after all options are exhausted, the ELC returns to normal operation and gives user a visual indication that there was an issue (ran out of options, returning to normal operation).
- To enter configuration mode: press and hold for 5 seconds

Using the AMP for Emergency Light Testing and Monitoring

Once an Emergency Light fixture is on a network and recognized by AMP software, you can perform the following tasks:

- Add a new Emergency Light to the system
- Assign Emergency Lights to specific groups (5th floor lights, cafeteria lights etc).
- Configure tests for Emergency Lights
- View Emergency Lights status
- Generate Emergency Light test history
- View Emergency Light network connection history
- View Emergency Lights through a floor plan template

For additional information on testing and monitoring Emergency Lights, please refer to the “AMP User Guide for Emergency Lights”.

Troubleshooting the Installation

If you have issues during installation, please refer to the following table:

Troubleshooting Issue	Possible Resolution
Lamps on light fixture do not illuminate during test	<ol style="list-style-type: none">1. Improper wiring2. Bulb burned out
Cannot access the AMP server	<ol style="list-style-type: none">1. Check network interface (wired/wireless)
LED on ELC does not illuminate	<ol style="list-style-type: none">2. Check power to ELC
No test data/monitoring data on SNS AMP	<ol style="list-style-type: none">1. Check network interface (wired/wireless)2. Defective ELC
Light fixture provides less than 8 hours of emergency lighting during test.	<ol style="list-style-type: none">1. Improper charging of batteries2. Faulty batteries