

## Hazardous Location Medium Intensity Controller Manual

READ AND FOLLOW ALL SAFETY INSTRUCTIONS



- *Refer to product labelling for applicable installation locations*
- *DO NOT let any supply cords touch hot surfaces higher than cord or fixture ratings.*
- *DO NOT mount near gas or electric heaters*
- *Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.*
- *The use of accessory equipment not recommended by the manufacturer may cause unsafe conditions.*
- *DO NOT use this equipment for other than intended use.*

**SAVE THESE INSTRUCTIONS!!**

- *The operation and maintenance must be carried out by authorized personnel.*
- *Repairs and Installation must only be carried out by a qualified electrician.*
- *Only genuine Dialight replacement parts must be used when unforeseen repairs are required.*
- *Observe the national safety rules and regulations during installation!*
- *Earth Grounding is required throughout the install process. Failure to do so could void all warranties!*
- *No alterations are allowed without the agreement from Dialight Corp. Alterations other than written in this manual will void all warranties.*

### **Introduction:**

This manual is for orientation and function of the Controller only. Individual manuals are supplied for each component of Dialight's Safesite® Medium Intensity L864/L865 Dual Strobe System.

**NOTE:** For Power Supply connections and wiring refer to its manual.

**NOTE:** For Flash Head connections refer to its manual.

**NOTE:** For Photocell connections refer to its manual.

### ***Included in this manual***

- WARNINGS
- Classifications for use
- System overview
- Installation Tips and requirements
- Navigating the LCD Display
  - Event and Alarm views and meanings
- Internal Controller Status LED's
- External Alarm and Indication LED's and Control
- Mechanical Dimensions of Controller Enclosure
- Controller Specifications & Electrical Parameters
- Display Events and Alarm Descriptions



**WARNINGS:****⚠ Warning:**

To avoid the risk of fire, explosion, or electric shock, this product should be installed, inspected, and maintained by a qualified electrician only, in accordance with all applicable National electrical codes.

**⚠ Warning:**

To avoid electric shock:

- Be certain electrical power is OFF before and during installation and maintenance.
- The Controller must only be connected to Dialight Corp approved products.

**⚠ Warning:**

To avoid explosion:

- Do not connect to equipment that the Controller is not intended for.
- Ensure the marked T Rating is less than the ignition temperature of the Hazardous Atmosphere.
- Do not operate in ambient temperatures above those indicated on the Product label.
- Do not operate if the fasteners are not properly tightened.
- Do not operate in Hazardous locations with the Enclosure cover open.

**⚠ Warning:**

To avoid explosion (Continued):

- EXPLOSION HAZARD- DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
- AVERTISSEMENT – RISQUE D’EXPLOSION – AVANT DE DECONNECTER L’EQUIPEMENT, COUPER LE COURANT OU S’ASSURER QUE L’EMPLACEMENT EST DESIGNE NON DANGEREUX.
- DO NOT REMOVE OR REPLACE WHILE CIRCUIT IS LIVE UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITIBLE CONCENTRATIONS.
- THIS EQUIPMENT IS SUITABLE FOR USE IN HAZARDOUS OR NON-HAZARDOUS LOCATIONS ONLY. REFER TO PRODUCT FOR RATINGS.
- EXPLOSIONS HAZARD – DO NOT DISCONNECT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRAITONS.
- WARNING – EXPLOSION HAZARD – DO NOT REPLACE ANY COMPONENTS UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

- AVERTISSEMENT – RISQUE D’EXPLOSION – NE PAS REMPLACER LES COMPOSANTES QUE L’ALIMENTATION EST COUPEE OU QUE LA ZONE EST CONNUE POUR ETRE NON DANGEREUX.
- WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 1.
- AVERTISSEMENT – RISQUE D’EXPLOSION – LA SUBSTITUTION D E COMPOSANTSP EUTR ENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMENTS DE CLASSE I, DIVISION 1.

**⚠ Warning:**

- DO NOT mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommend by the manufacture may cause an unsafe condition.
- DO NOT use this equipment for other than intended use.

**⚠ Warning:**

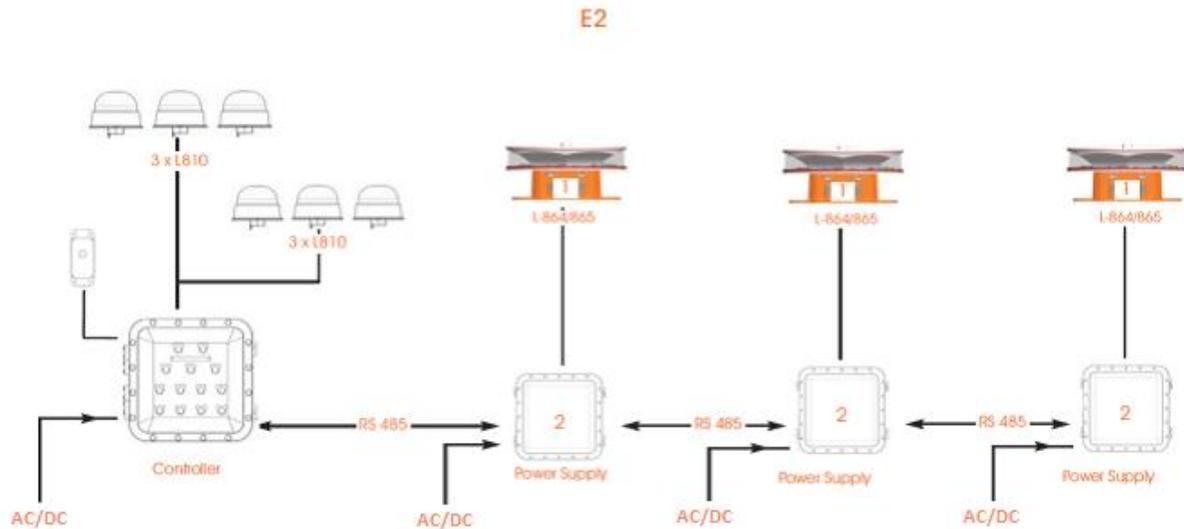
The technical data indicated on the product label is to be observed.

- Changes to the design and modifications of the Controller are not permitted.
- Only genuine Dialight replacement parts are to be used when unforeseen maintenance is required. Consult factory at [www.Dialight.com](http://www.Dialight.com) or authorized representative as required.

### **Classifications for use:**

- **HAZARDOUS LOCATIONS:**
  - **CLASS I DIV 1 & 2 GROUPS B,C, D**
  - **Max Ambient Temp: +40°C**
- **Outdoor Type:**
  - **NEMA 4X rated**
- **Ta – Ambient Temperature :**
  - **SEE PRODUCT LABEL**

## System Overview:



### **E2 SYSTEM OVERVIEW**

**Note - this is a typical installation example. It is possible feed the input voltage in and out of the controller box to the additional power supply boxes, i.e. “daisy-chaining” is acceptable.**

## Installation Tips and Requirements:

### Cable Requirements:

**All cabling must have a minimum of a 90°C temperature rating.**

For the **primary power cable**, it is recommended that the electrician or installer calculate the wire requirements based on the amount of Flash Heads being installed. It is required that no install utilizes less than 16AWG wire.

See electrical parameters.

**RS485 cabling:** 3 cores of 18AWG, a drain wire plus a shield for adequate grounding and signals are required.

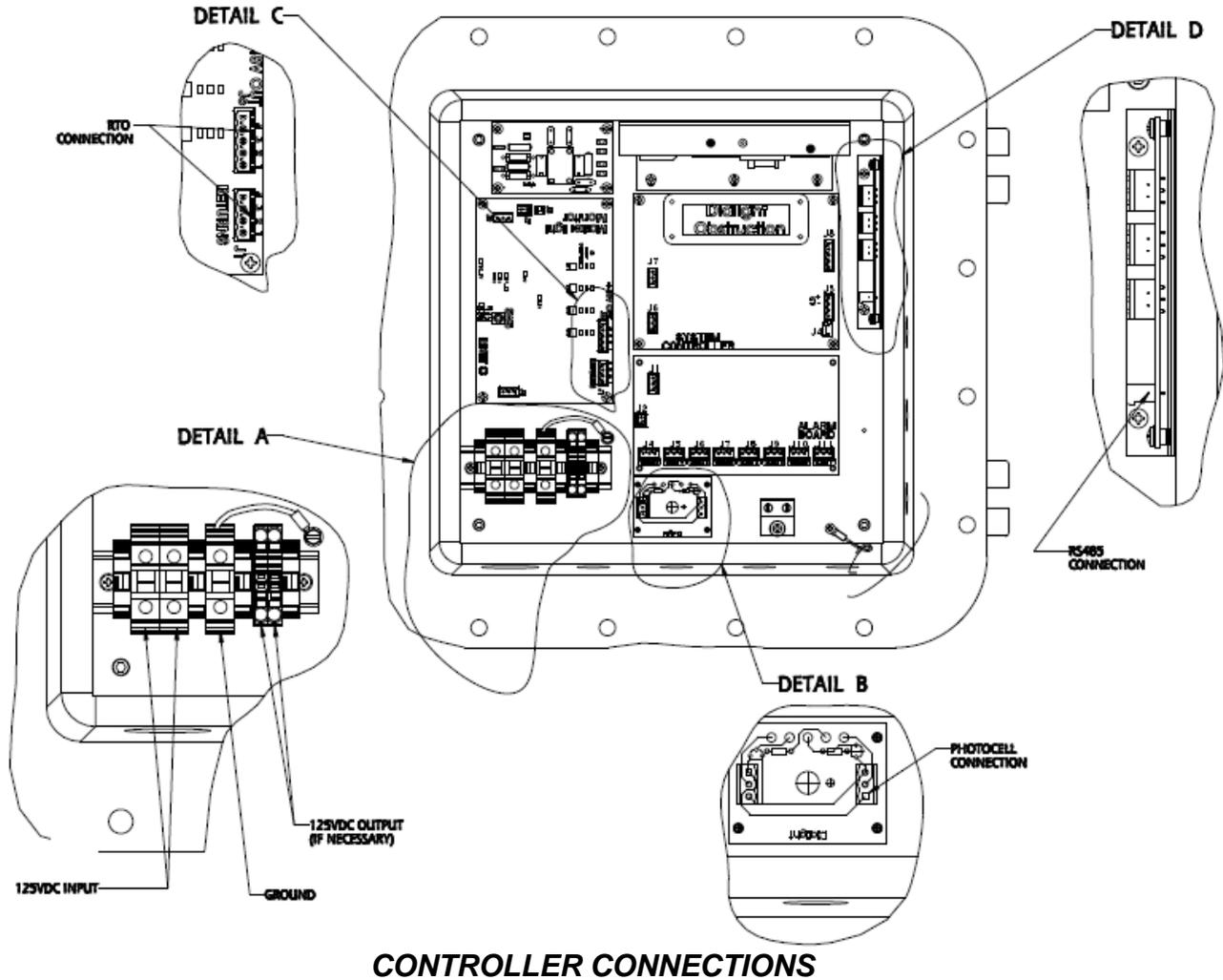
**Photocell Cable:** 3 conductors of a minimum of 18AWG are required. Use of a conduit is recommended. If a cable without conduit is used in a hazardous location installation then the cable at minimum **MUST** have either a shield or braid that is properly connected to body of the photocell and to the enclosure of the controller it is being installed to.

**Side Lights (810):** 3 conductors of 18AWG are required.

**NOTE:** Failure to do any of the above could void all factory warranties. If in doubt please contact your sales agent or representative.

During installing on the tower proper grounding techniques should be utilized. The system has built in Lightning and RF immunity at each section, but for it to be effective proper ground connection techniques must be used. For more details contact your local sales rep.

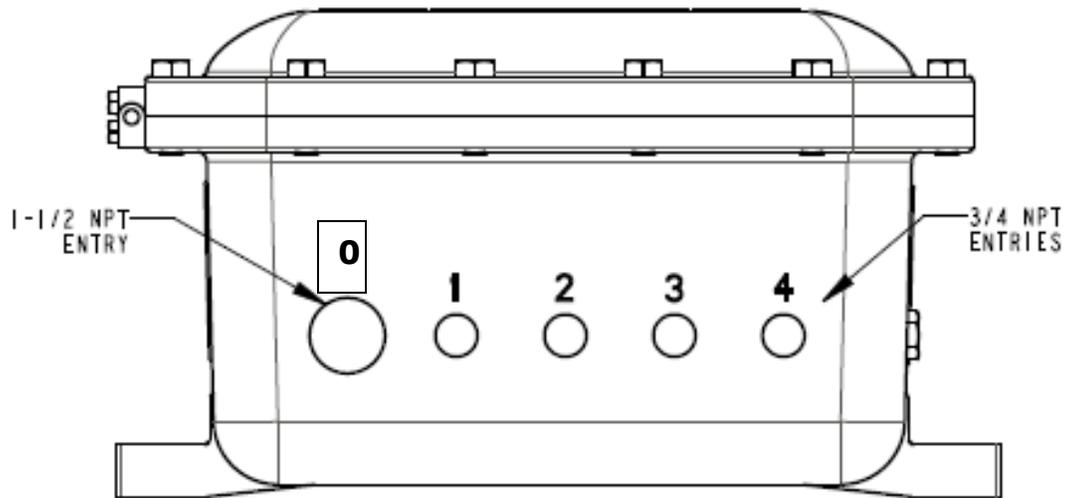
**Controller Connections:**



The Enclosure has holes drilled and tapped for all wiring connections.

**WARNING:** No additional holes can be added to the enclosure.

**NOTE:** Multiple grounding points are provided in the enclosure for protective and functional Earth/Ground connections.

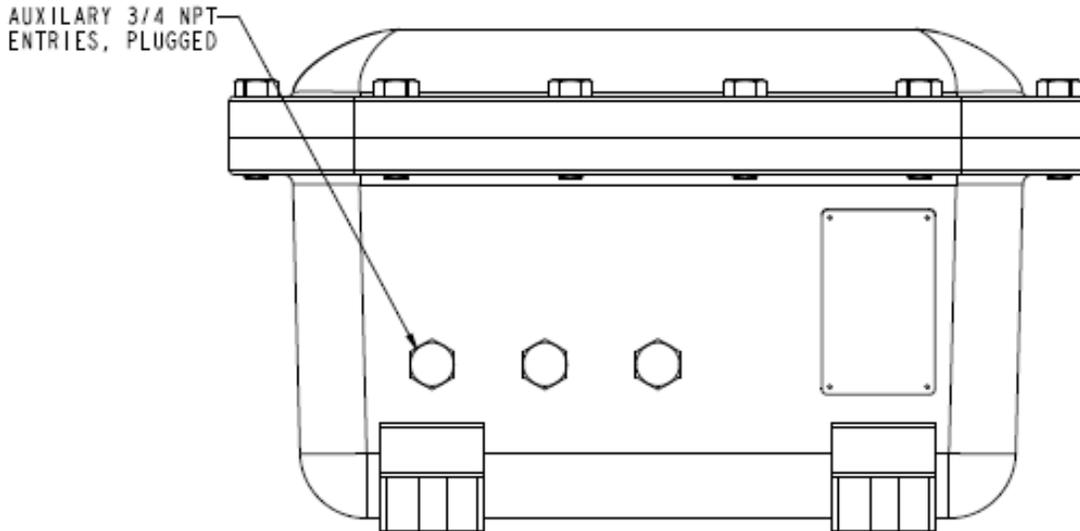


**FRONT VIEW OF THE CONTROLLER ENCLOSURE**

<b>Entry Number</b>	<b>Size</b>	<b>For</b>
0	1-1/2 NPT	AC or DC Input and, if needed, output (from source)*
1	3/4 NPT	AC or DC Output (to next Enclosure)
2	3/4 NPT	Photocell
3	3/4 NPT	RS485 output
4	3/4 NPT	Side Lights (as required)

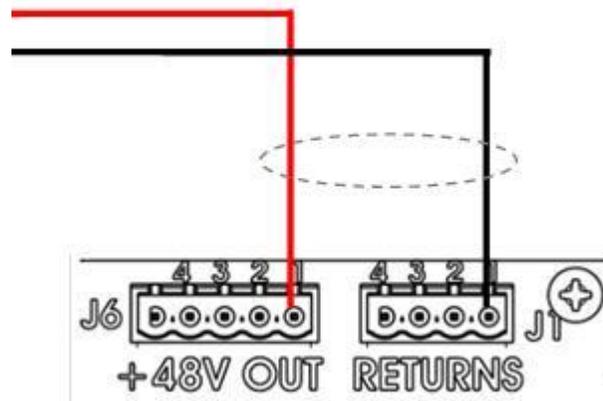
\* A conduit "T" can be used at entry 0, for additional mains output or input





**SIDE VIEW OF THE CONTROLLER ENCLOSURE**

**Connection of the Marker Lights (L810's) to the Monitor Board:**



**CONNECTION OF RTO's TO MARKER LIGHT MONITOR BOARD IN MAIN CONTROLLER**

Connect the side markers to the Marker Light Monitor Board in the Controller as shown in the diagram above. Connections are made to J6 (+48V OUT) and J1 (RETURNS) of the Marker Light Monitor Board.

**WARNING:** Low Voltage L810's are to be used for connecting to these ports.



**WARNING:** Green earth ground wires **MUST** be connected and typically all connected together.

***J6 Connections***

Pin 1	+48Vdc	Voltage to L810 or Level
Pin 2	+48Vdc	Voltage to L810 or Level
Pin 3	+48Vdc	Voltage to L810 or Level
Pin 4	+48Vdc	Voltage to L810 or Level
Pin 5	+48Vdc	Spare +48Vdc

**NOTE:** A single Pin connection can power all L810's.

***J1 Connections***

Pin 1	-48Vdc	For Monitoring	Level 1 or individual 810
Pin 2	-48Vdc	For Monitoring	Level 2 or individual 810
Pin 3	-48Vdc	For Monitoring	Level 3 or individual 810
Pin 4	-48Vdc	For Monitoring	Level 4 or individual 810

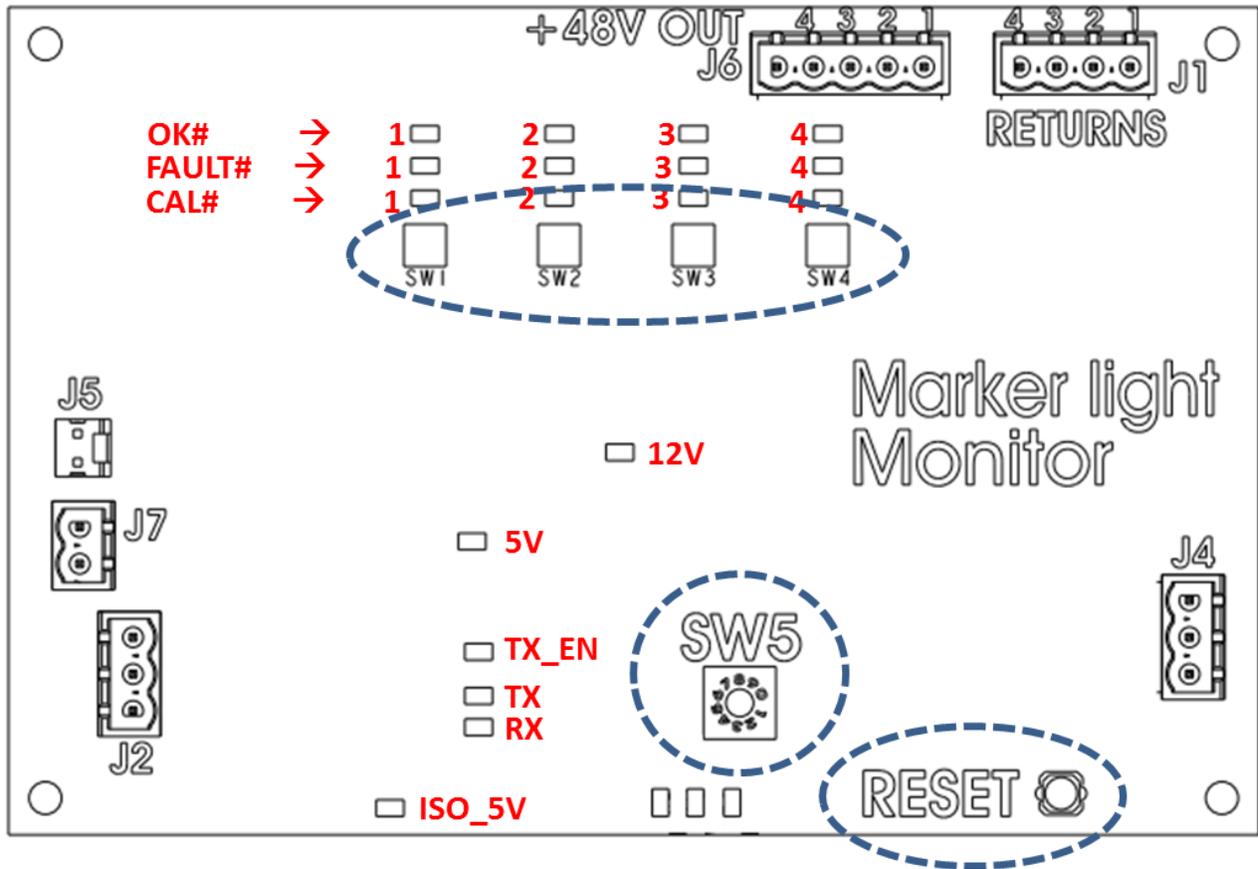
**NOTE:** A maximum of 1.2 amps can be monitored through each pin connection.

***Auto Calibration of Side Lights:***

Follow these steps to calibrate the Marker Light Monitor Board located in the Controller. These steps will allow the system to properly identify, power, and monitor the RTO side markers.

- STEP 1 – CLEAR the Marker Light Monitor Board by holding down buttons SW1-4 at same time.
- STEP 2 – FAULT LED's #1-4 will light up red.
- STEP 3 – Press "RESET" button (SW7).
- STEP 4 – Each output will auto configure within 15 seconds.
- STEP 5 – Verify Each output is correct:
  - Green "OK" LED will illuminate green if RTO output is present.
  - "OK", "FAULT", and "CAL" LED's will be off if RTO output is NOT present





**MARKER LIGHT MONITOR BOARD SHOWING BUTTONS AND SWITCH FOR CONFIGURATION AND CALIBRATION**

**NOTE:** If for some un-foreseen reason additional L810's are required contact [www.Dialight.com](http://www.Dialight.com).

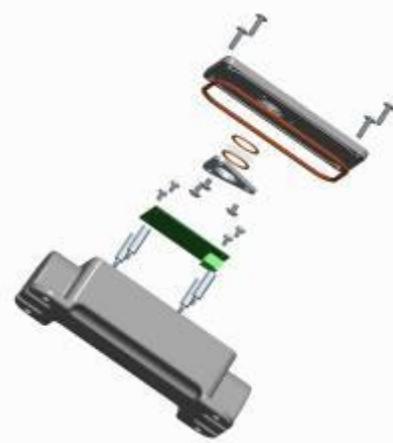
**Photocell Connections:**

**NOTE:** Refer to Hazardous Location Photocell Manual.

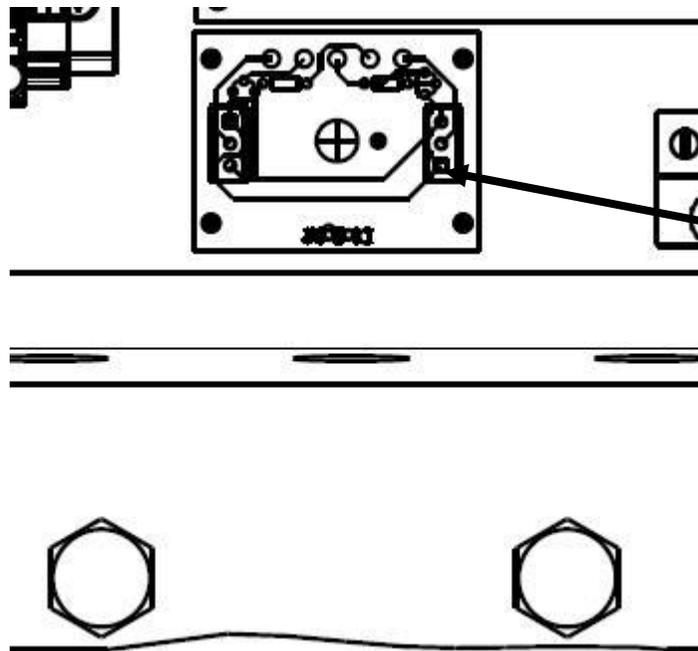
**NOTE:** Images for reference only.

The Photocell cable gets connected to J1 of Switch board only.





+V = 12Vdc (supplied from controller)  
 SIG. IN = Sense voltage relayed to controller  
 Return = Ground



J1 of Switch board located inside of controller

*View of Switch board located in the Controller enclosure*

**Navigating the LCD Display:**

**The Startup Screen displays:**

**Dialight Base Ctrl**  
**REV. x Build: xx**



**NOTE:** The Site manager and Installer should take a note of this screen if any troubleshooting is required.

***The Initializing Screen:***

This screen shows a countdown for the initial 15 flashes.

**NOTE:** If system is set to 'Tower Style A' initial flash will take 45 flashes. In some cases this screen will go back to Main screen if synchronization was faulty.

**Initial 15 Flashes  
In Process**

**Main Menu Screens:**

These screens allow the user or maintenance personnel to view or access the displays by pressing the "Ent" button.

**Configuration Type Screen 1: This must be completed for proper operation!**

A) To change configuration of controller go to 'Config Type' screen' and press enter.

**CONFIG TYPE X  
'Enter to change'**

B) Select External GPS using the up/down but, Yes/NO press enter.

**Ext GPS = NO  
u/d=chg, enter=done**

C) Use the up/down button to scroll and select tower style A or E. Then press enter.

**NOTE:** System will reset when tower style is changed.

**Tower style = E  
'enter' to change**

D) Use the up/down buttons to select if RTO's will be connected to the system, and then press enter.

**NOTE:** If 'NO' is selected proceed to step G.

**RTOs Present =Yes  
u/d=chg, enter=done**

E) Select the number of Tiers that are connected to the system, 0 through 4, and then press enter.

**NOTE:** Tiers are total number of Levels of Side lights.

**Number of TIERS=1  
u/d=chg, enter=done**

F) Select the number of RTO's that will be connected to P1; 0 through 4 and then press enter.

**NOTE:** Repeat for ports 2 through 4 if required.

**NUM RTO P1= 0  
u/d=chg, enter=done**

G) Select the number of beacons (Flash Heads) that will be a part of the system, 1 through 9, and the press enter.

**Number of BC=1  
u/d=chg, enter=done**

H) Select the number of side light monitor boards that are connected to the system, 1 through 9 and the press enter.

**Number of SD BDs=1  
u/d=chg, enter=done**

***Pressing ENT at this point returns the operator to main screens***

**NOTE:** It is normal during the configuration process for the system to re-start due to the configuration having changed. If no configurations are changed, then the system will not re-start on its own.

**Screen: Tower type E1 or E2:**

**NOTE:** The Base Controller auto detects what type tower is being installed. Only powered fixtures and fixtures connected to the RS485 will be detected.

**Tower Style: X  
x 864/5, x 810 ,**

**NOTE:** x= total qty of beacons and 810's detected

**Screen: Mode of operation: Day, Night**

**NOTE:** These modes change according to the Photocell current operating state. There are no options for preprogramming select times.

Mode: Options are Day or Night

Active: Options are Wht or Red

**NOTE:** On this screen the controller can be forced in DAY or NIGHT (using the push buttons marked White and Red) with an approx. 10 sec time out.

**MODE: Night**  
**ACTIVE: RED 864**

**Status Screen of Alarms:**

**NOTE:** If an Alarm is found, the Status screen will change from "NORMAL" to "ALARM" to indicate there is an active Alarm.

By pressing "Ent" you will be able to view alarm logs. Time stamps are actual times that the alarm occurred. Refer to interpretation of the logs for further details.

**Status: Normal**  
**'Enter' to view Alm**

**Status: Alarm**  
**'Enter' to view Alm**

**Setting the Real Time Clock:**

By selecting "Ent" the user can set the actual time and date of the Base Controller.

**NOTE:** This may come pre set from the factory for either East or West Coast time.

**NOTE:** After setting the time the Micro board has a battery, so if for some reason the Base Controller needs to be powered down the time and date is kept.

**MMM DD, YY "Time"**  
**'Enter' to set Clock**

**Event Log:**

This screen allows the user to enter into the log screen that shows all the Error/Events that have occurred during a given time stamp. When entering the screen the highest or last log will be shown. By using the up or down keys the user can scroll back 127 entries before the screen rolls back to the latest entry.

**NOTE:** If for some reason the highest entry cannot be found press the “Clr” button to exit the log and then press the “Ent” key to return to highest log.

**Press ‘Enter’ Key  
to view event log.**

**Mains Power Resetting:**

Power on Resetting (i.e. switching power off then on again) is recommended when all Alarm and Error/Event logs have been cleared, the Power supplies have lost power, or communications have been shutdown.

This should and could be done when an alarm LED is lit and verification of the alarm is required. If the alarm clears then the system does not require any further action.

**Push Button Reset (located on Main Controller Assembly with LCD Display):**

The Reset Button is a firmware re-boot that causes the Controller to do a complete re-start. This reset is most often used when power is either lost or required to be shut down for a period of time. This reset will go through the full warm up and the initial 15 flash countdown menu.

**Internal Controller Status LED’s:**

**NOTE:** Actual colors shown may not match system being installed.

***Status LED’s (located on Main Controller Assembly with LCD Display :)***

### STATUS LED ASSIGNMENTS

S7	S6	S5	S4	S3	S2	S1
COMM	SYNC	25% LED	ALL 810 OFF	Photocell	EXT SYNC	Heartbeat
Failure	Failure	Failure	Failure	Failure	Failure	Flashes
RED	RED	RED	RED	Day/Night RED	AMBER	GREEN

### Relay Board #1 (Bottom) Alarm Dry Contact LED's:

#### STATUS LED/dry contact ASSIGNMENTS

AL8	AL7	AL6	AL5	AL4	AL3	AL2	AL1
Beacon 8	Beacon 7	Beacon 6	Beacon 5	Beacon 4	Beacon 3	Beacon 2	Beacon 1
Failure							

### Relay Board #2 (Top) Alarm Dry Contact LED's:

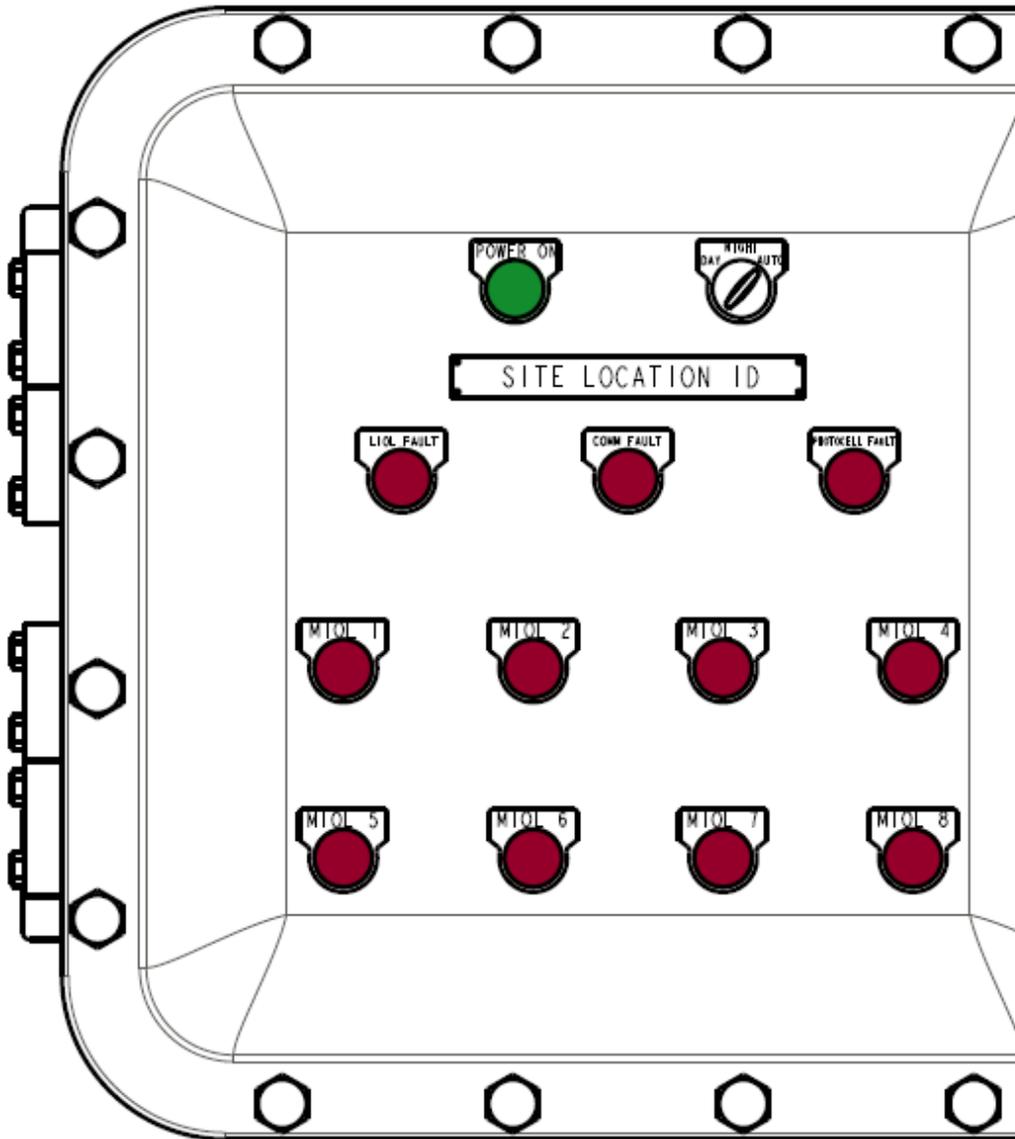
#### STATUS LED/dry contact ASSIGNMENTS

AL8	AL7	AL6	AL5	AL4	AL3	AL2	AL1
N/A	N/A	N/A	N/A	N/A	LIOL	Photocell	Comm.
					Failure	Failure	Failure

### External Alarm and Indication LED's and Control:



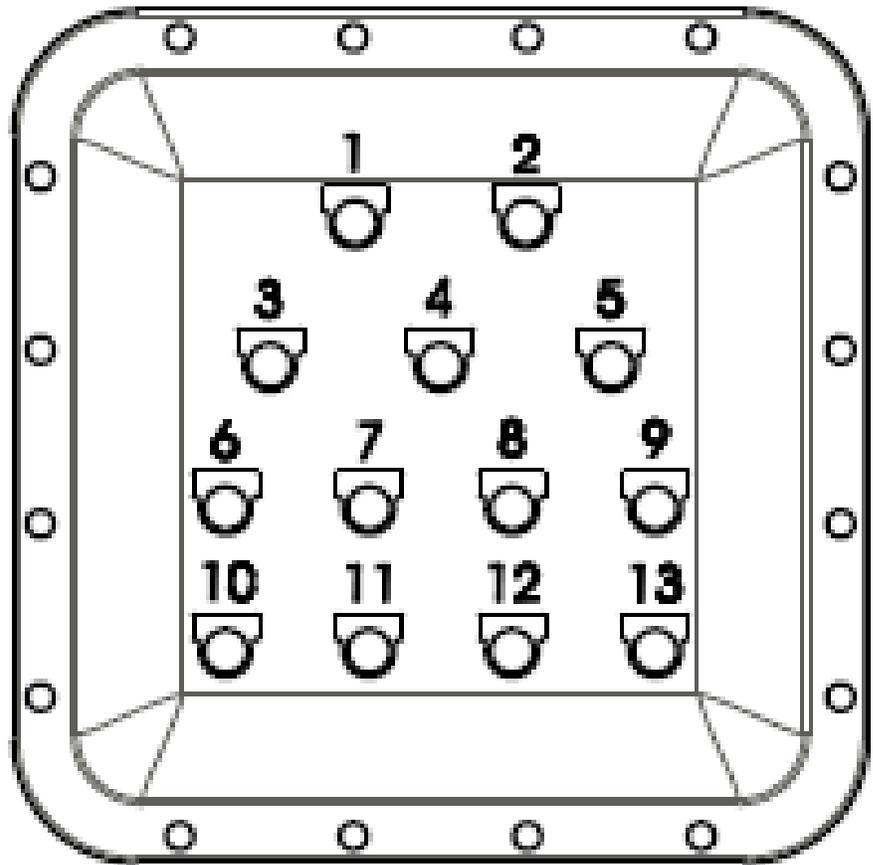
Location 1	Power On
Location 2	Day/Night/Auto



*Front View of Controller*



Location 3	LIOL Fault
Location 4	Comm Fault
Location 5	Photocell Fault
Location 6	MIOL1 Fault
Location 7	MIOL2 Fault
Location 8	MIOL3 Fault
Location 9	MIOL4 Fault
Location 10	MIOL5 Fault
Location 11	MIOL6 Fault
Location 12	MIOL7 Fault
Location 13	MIOL8 Fault



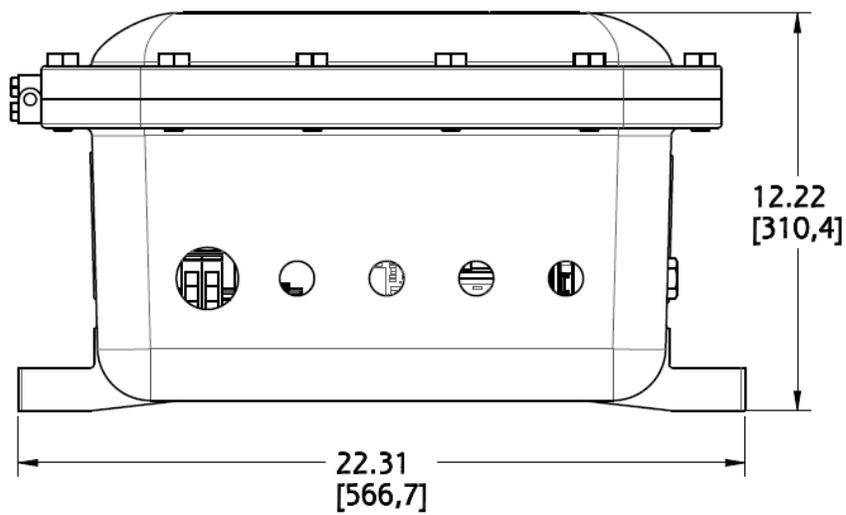
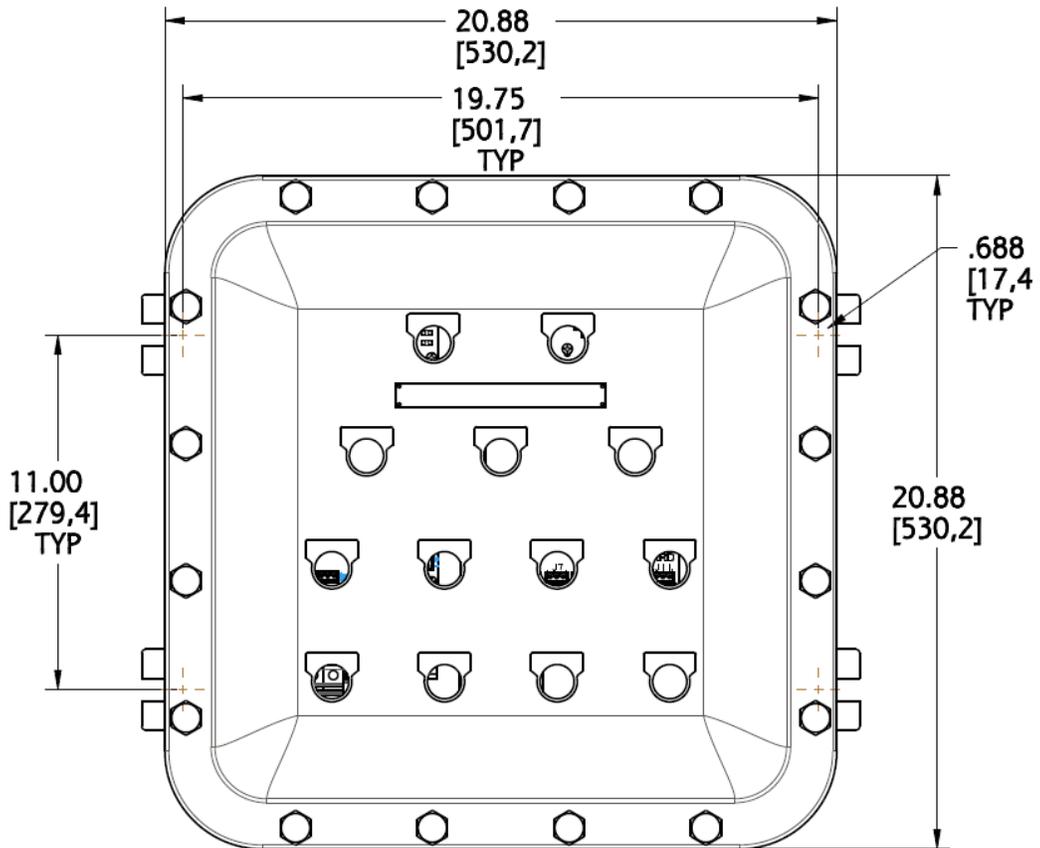
***Alarm Indicators Number and definitions***

**NOTE:** Controllers will have different amounts of MIOL Fault indicators.

**NOTE:** Locations 1-5 are Common to all Controllers.

**Mechanical Dimensions of Controller Enclosure:**

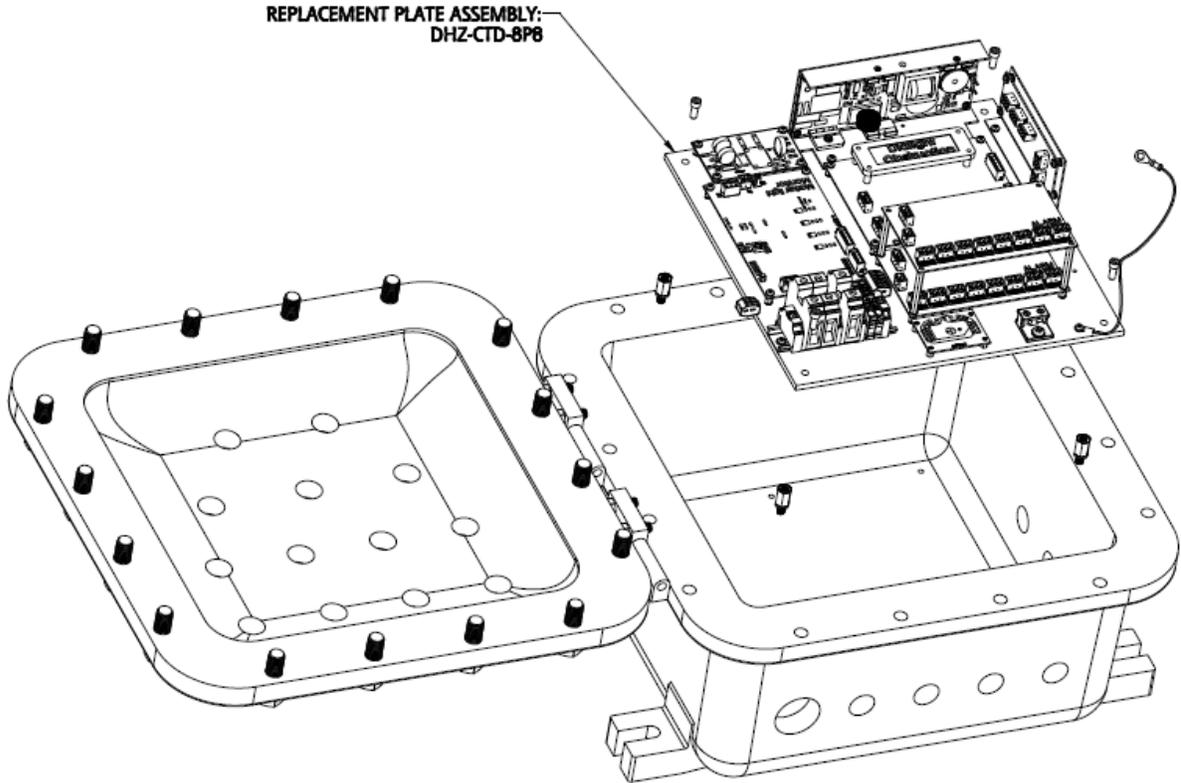




**Enclosure dimensions**



**Replacement Part Numbers:**



**NOTE:** Wiring not shown for clarity.

**Controller Specifications & Electrical Parameters:**

- Supply voltage: 125Vdc +/-15%, or 120-277Vac 50/60Hz
- Reverse polarity protected
- White Strobe power requirement nominally 90W
- White Flash rate: 40 Flashes per minute
- Red beacon power requirement nominally 25W
- Red Flash rate: 30 Flashes per minute
- Plate Dimensions: 14" x 14"
- Weight – 180lbs

***Electrical Parameters:***

Nominal Supply Voltage (VAC)	Conditions	Watts
125Vdc or 120-277Vac	No Flash Head connected	15Watts



## Display Events and Alarm Descriptions:

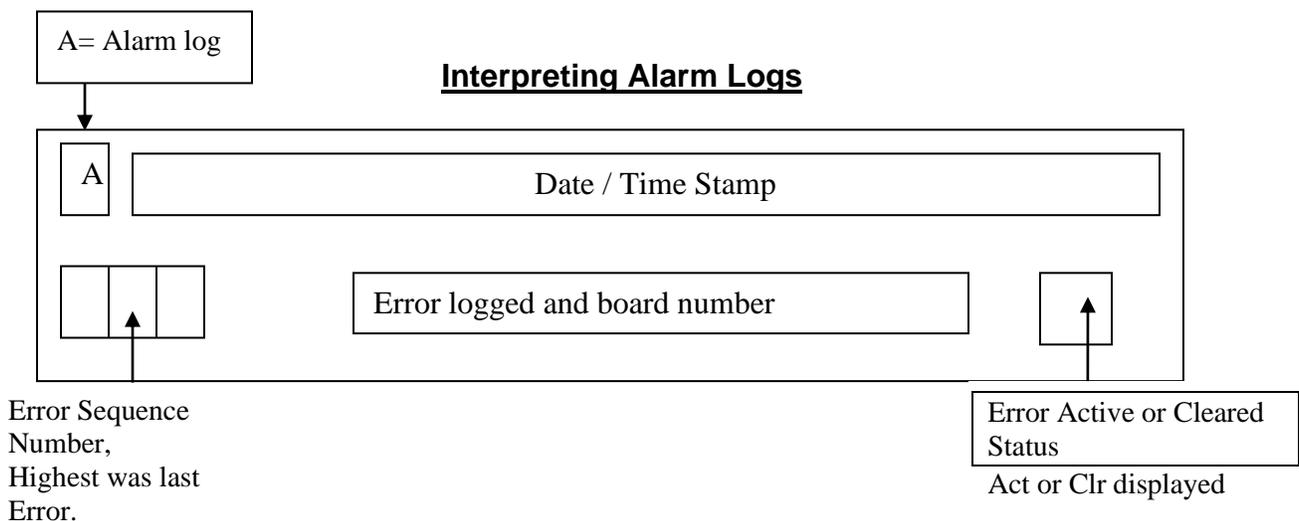
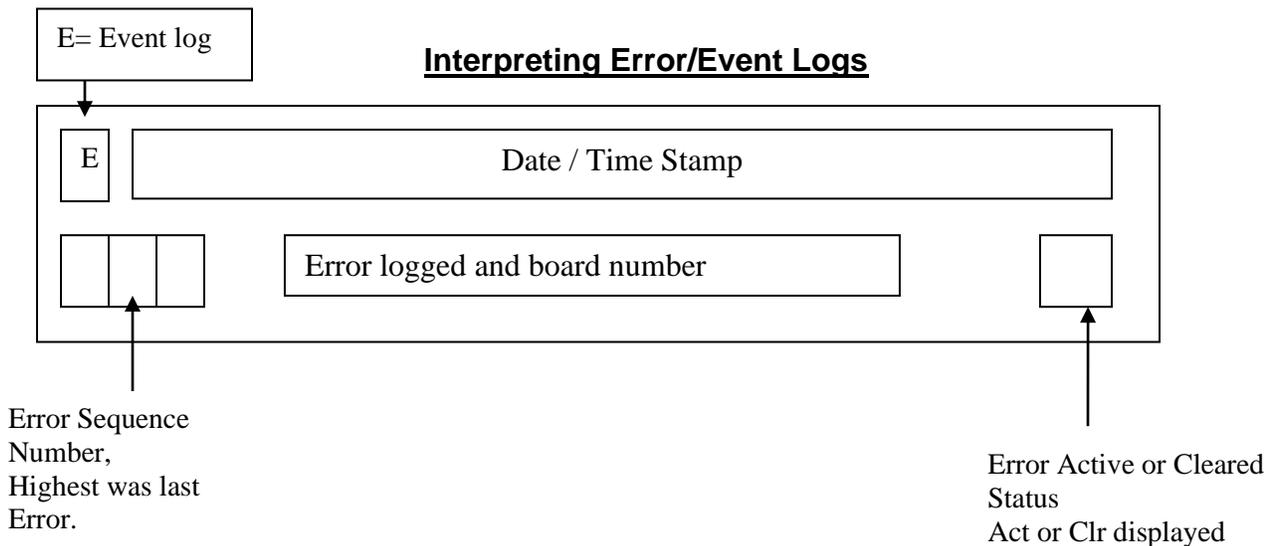
Navigating the Display

Up/Down: Buttons scroll through menu options, or Log entries

Enter: Selects a menu

Clear: Exits a menu and returns to previous screen  
Clears error/alarm registers

Holding the Clear button for 5 seconds when in the Event or Alarm log clears the given Log data. The first recording will be displayed as "Logs Cleared"



**NOTE:** The above are separate screens shown on the LCD, and are individually accessible

**Alarm List:**

Error	LCD Alarm display	Possible Cause	Corresponding Dry Contact	LED Lit on Main Enclosure
D1RW COMM	TRNS Comm X X=Beacon #	Remove J1 (RS485) from the translator board(8800-865-3150-00)	Relay Board1: AL1-AL8 Relay Board 2: AL1	LED Comm lights
Side Marker Communication	SDLT comm X X=Beacon #	Remove J2 (RS485) from the Side light board (8800-865-3160-00)	Relay Board 1: N/A Relay Board 2: AL1 & AL2	LED Side marker lights
No Photocell	PEC LOST	Remove J4 from Side light board "0" (8800-865-3160-00)	Relay Board 1: N/A Relay Board 2: AL2	LED PEC Lights
No Internal RS-485 COMM	RLY COMM 1 RLY COMM 2 TRNS COMM X PEC LOST SDLT COMM X	Remove J7 (RS485) from the main micro board (8800865400002)	Relay Board 1: All LEDs Relay Board 2: All LEDs	LED Comm Lights
Day to Night transition	Day to Nite	The system is in Day mode for more than 18 hours	Relay Board 1: N/A Relay Board 2: AL2	LED PEC Lights
Night to Day transition	Nite to Day	The system is in night mode for more than 18 hours	Relay Board 1: N/A Relay Board 2: AL2	LED PEC Lights
Side Markers out	ALL 810 TX	Remove the RTOs from J1 of the monitor board (8800-865-3160-00)	Relay Board 1: N/A Relay Board 2: AL3	LED Side Marker Lights
>25% White	X 865 W25% (1 or 2 or B) X= Beacon #	Disconnect J2 off of White driver 1 Or Disconnect J2 off of White driver 2	Relay Board 1: AL1-AL8 Relay Board 2: N/A	LED 25% Lights LED for Beacon X Lights
>25% Red	X 864 R25% X= Beacon #	Disconnect J2 off of Red driver	Relay Board 1: AL1-AL8 Relay Board 2: N/A	LED 25% Lights LED for Beacon X Lights
D1_RS232	TRNS RS232 X X= Beacon #	Disconnect the RS232 Cable (J4) from the Translator board (8800-865-3150-00)	Relay Board 1: AL1-AL8 Relay Board 2: AL1	LED Comm lights LED for Beacon Lights
Relay Board 1 Communication	RLY Comm 1	Remove J1 (RS485) from Relay Board 1 (8800-865-3200-00)	Relay Board 1: All dry contacts will all be tripped	LED Comm lights
Relay Board 2 Communication	RLY Comm 2	Remove J1 (RS485) from Relay Board 2 (8800-865-3200-00)	Relay Board 2: All dry contacts will all be tripped	LED Comm Lights
D1RW Sync Alarm	865/864 SYNC X X= Beacon #	Remove J5 from the Translator board (8800-865-3150-00)	Relay Board 1: AL1-AL8 Relay Board 2: N/A	LED for Beacon X lights
Side Marker 1 off	X 810 OFF TX (Event logged)	Remove 1 <sup>st</sup> RTO from J1 of the monitor board (8800-865-3160-00)	Relay Board 1: N/A Relay Board 2: AL3	LED for Side Marker Lights



Side Marker 2 off	1X 810 OFF TX (Event logged)	Remove 2 <sup>nd</sup> RTO from J1 of the monitor board (8800-865- 3160-00)	Relay Board 1: NA Relay Board 2: AL3	LED for Side Marker Lights
Side Marker 3 off	1X 810 OFF TX (Event logged)	Remove 3 <sup>rd</sup> RTO from J1 of the monitor board (8800-865- 3160-00)	Relay Board 1: NA Relay Board 2: AL3	LED for Side Marker Lights

**REVISION HISTORY**

<u>REV</u>	<u>ECO No.</u>	<u>DRN</u>	<u>CKD</u>	<u>APP</u>	<u>QA</u>	<u>CM</u>	<u>DATE</u>
A	14911	SA	DW	JLM	JP	JN	12-11-13
B	64575	TLD	AV	AR	YS	JN	11-27-19
C	71912	CV	AV	DW		JN	8-7-20

