AirportLightingCompany
An ISO 9001:2015 Certified Company

OWNER'S MANUAL

RUNWAY ALIGNMENT INDICATOR LIGHTS (RAIL)

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RUNWAY ALIGNMENT INDICATOR LIGHTS (RAIL)

for

ALSF-I, ALSF-II
MALSF, MALSR, SSALR

Owner's Manual

Compliant to:
FAA AC 150/5345-51 and EB 67
ICAO: Annex 14, Volume 1 (Current Edition)
T/C: Transport Canada TP 312

Manufactured by:
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DATA SHEET

AirportLightingCompany
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Runway Alignment Indicator Lights (RAIL)

Compliances (Current Editions)

FAA: AC 150/5340-30, 150/5345-51
Canada: TP 312 5th Edition

Application

Use of sequential flashing lights provide pilots a visual transition from instrument flight to visual flight during landing. The RAIL (Runway Alignment Indicator Lights) are used within an ALSF, MALSF, MALSR or SSALR approach system help the pilot align with the center of the approaching runway threshold.

Key Features

- Low maintenance costs
- Long-life LED for years of service
- Three Intensities (Low, Medium, High)
- Field Programmable Sequence timing
- Flash Monitoring
- Elapsed Time Meter
- Current or Voltage Driven
- L830-4 100W Isolation Transformers

General Catalog Numbers

84-□-□-□-□

FAA Style
3 = MALSF, 3 Light
5 = MALSR/SSALR, 5 Light
15 = ALSF, 15 Light

Type
V= Voltage
I = Current

Legs
0 = Wall Mount
1 = 1 Leg
2 = 2 Legs

Options
A = Current Sense (Type V only)
S# = Separate Mount (specify qty)

Specifications

Physical Specifications

UNI Flashhead (84-90000)	Weight = 3.5lbs Dimensions = 7H x 5.25W x 6D
Type V Power Supply (84-00905)	Weight = 4lbs Dimensions = 1.75H x 10W x 3.5D
Type I Power Supply (C7-LVCV2)	Weight = 1lb Dimensions = 2.5H x 7.25W x 2.5D
UNI Co-Mount (Enclosure + 84-90000)	Weight = 25lbs Dimensions = 22H x 15.25W x 6.5D
Enclosure	Weight = 21lbs Dimensions = 16H x 12W x 6.5D

Specifications

Current-Powered

- 2.8 to 6.6 amperes
- Operates directly from 100W Isolation Transformers
- Current Sensing set-up at Primary Unit

Voltage-Powered

- 95-264VAC, 50-60Hz

Spare Components

Description	Part Number
UNI Directional Flashhead	84-90000
Universal Controller Card (UCC)	84-00013
Sequential Controller Board	84-00014
Type-V Power Supply, 95-264V - 48Vout	84-00905
Type-V Voltage Power Conditioning PCB	84-00904
Type-I Power Supply, 6.6A	C7-LVCV2
Type-I Diode Bridge	C7-BRG
Type-I Gas Discharge Tube	C7-GDTH
Interlock Switch	55-00201
Flashhead Cable, 50'	55-00800-050
Flashhead Cable, 100'	55-00800-100
Flashhead Cable, 200'	55-00800-200
Frangible Coupling, 2" EMT	59-E

Equipment Data

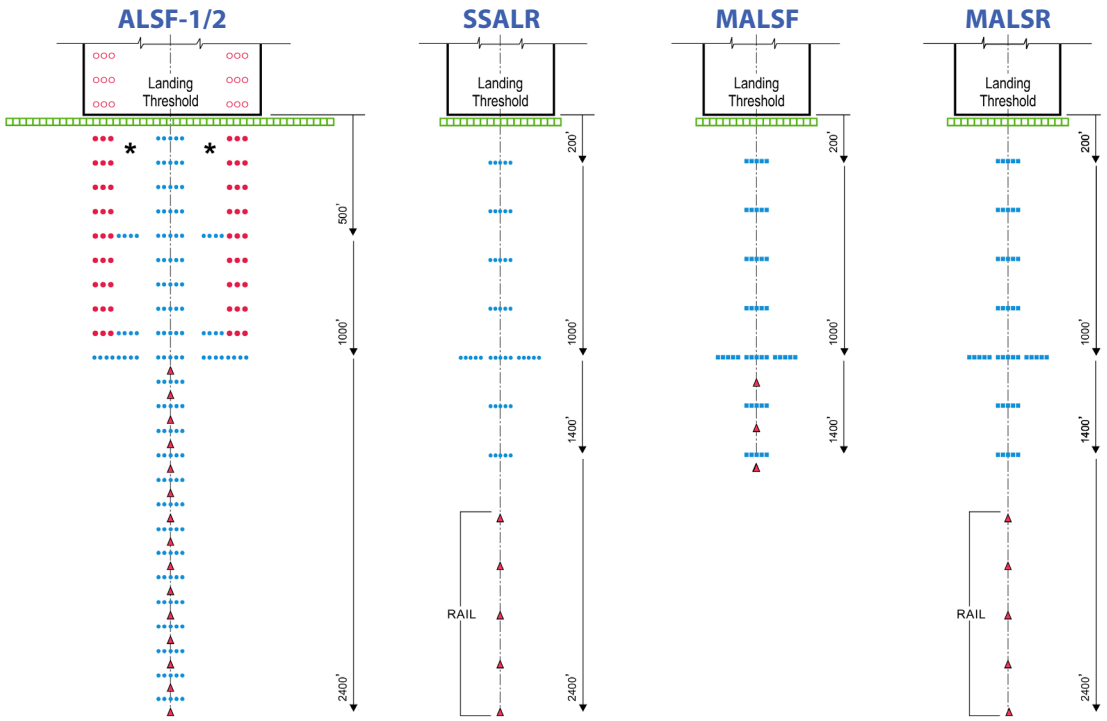
Control	Remote, local, or automatic
Flash Rate	120 fpm
Uni Nominal Intensity	High 15,000; Medium 1,500; Low 300
Uni Beam Spread	30° horizontal 10° vertical

RAIL Fixture Peak VA Ratings

RAIL	
Type I	157
Type V	289

RAIL Diagrams

Airport Lighting Company provides the L-849(L) Uni-directional system to operate within each Approach Lighting System as a RAIL (Runway Alignment Indicator Light). Each RAIL system will provide a sequence of flashing lights to create a clear visual guide to align with runway threshold.



RAIL Runway Alignment Indicator Lights
ALSF-1 High Intensity Approach Lighting System with Sequenced Lights (CAT I Standard)
ALSF-2 High Intensity Approach Lighting System with Sequenced Lights (CAT II Standard)
SSALR Simplified Short Approach Lighting System with RAIL
MALSF Medium Intensity Approach Lighting System with Sequenced Flashing Lights
MALSR Medium Intensity Approach Lighting System with RAIL (CAT I Standard)

- Steady Burning Red Lights
- High Intensity Steady Burning White Lights
- Medium Intensity Steady Burning White Lights
- Sequenced Flashing Lights
- Threshold Lights
  ALSF - 49 on 5' centers
  SSALR - 18 on 10' centers
  MALSR - 18 on 10' centers

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AirportLightingCompany
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108 Fairgrounds Drive
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GUARANTEE

AirportLightingCompany
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Products manufactured by Airport Lighting Company (ALC) which use LEDs as a light source are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation per the applicable FAA Advisory Circular and against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years per FAA EB67D. ALC will correct such defects by repair or replacement, at its option, provided the products have been properly handled and stored prior to installation, properly installed and operated after installation, and provided further that the Buyer has notified ALC in writing within the warranty period and within a reasonable time after notice of such defects. Refer to handling, storage, installation and operational instructions for proper procedural guidance that must be followed to maintain warranty provisions.

This warranty is in effect for the specified term as long as the equipment, in ALC's judgment, has not been altered in such a way as to affect the equipment adversely, subject to accident, negligence, improper storage, and has been operated and maintained in accordance with accepted FAA guidelines as described in AC 150/5340-26 and ALC's published operational guidelines.

ALC reserves the right to examine products about which a claim has been made. Equipment must be presented in the same condition as when the defect was discovered. ALC also reserves the right to require the return of equipment to establish any claim.

Statement of Warranty

https://www.airportlightingcompany.com/terms-conditions/

Safety Precautions

- Read all instructions prior to installation of the system.
- All electrical connections must be to local codes.
- Do not remove or bypass any safety devices within the system.
- Ensure this manual is available to all personnel that may work on the system.
- Do not service or operate equipment while standing in water.

Failure to follow all instructions may result in injury or equipment failure.

Visual Guidance Approach Lighting Systems (VGLS) are used for Category I, II, and II landing operations. VGLS are critical systems for pilots upon approach to the runway by transitioning from instrument flight to visual flight.

There are eight different VGLS that are used:

1. PAPI – Precision Approach Path Indicator Lights *(detailed in separate manual)*
2. REIL – Runway End Identification Lights *(detailed in separate manual)*
3. ODAL – Omnidirectional Approach Lights *(detailed in separate manual)*
4. ALSF-I – High Intensity Approach Lighting System w/ Sequenced Flashing Lights (CAT I)
5. ALSF-II – High Intensity Approach Lighting System w/ Sequenced Flashing Lights (CAT II)
6. SSALR – Simplified Short Approach Lighting System w/ Runway Alignment Indicator Lights
7. MALSF – Medium Intensity Approach Lighting System w/ Sequenced Flashing Lights
8. MALSR – Medium Intensity Approach Lighting System w/ Runway Alignment Indicator Lights

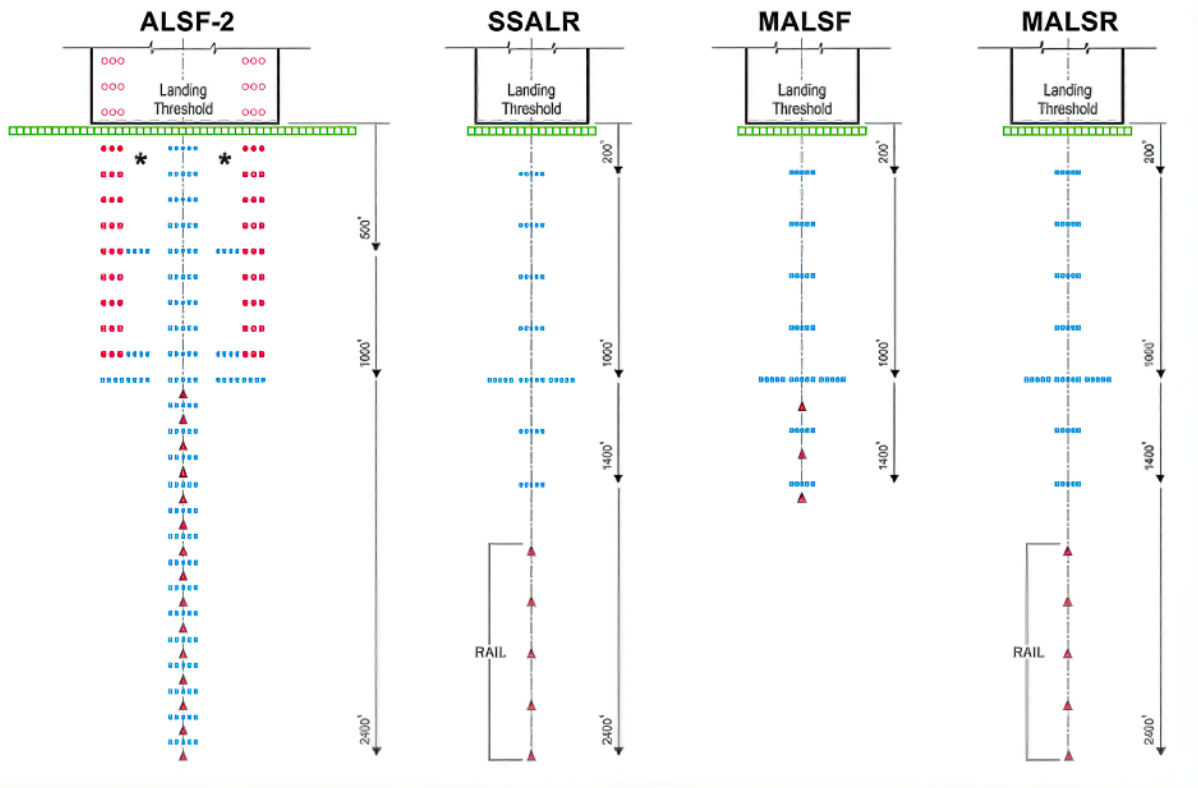
Systems 4 through 8 comprise of varies steady burn white and red lights, along with sequential flashing white lights. The Airport Lighting Company (ALC) L-849(L) RAIL (Runway Alignment Indicator Lights) will be used to provide the sequential flashing portion only of these VGLS.

For detailed information regarding the ALSF, MALSF, MALSR and SSALR; please review the FAA document titled: 'Approach Lighting Systems in the U.S. National Airspace System and Flight Performance During Low Visibility Instrument Approach and Landing Operations (DOT/FAA/AM-21/20)'.

Figure 1 on page 6 will provide a general guide to the layout and lighting used within each system.

Airport Lighting Company will only offer the required Sequenced Flashing Lights and/or RAIL fixtures for ALSF, MALSF, MALSR and SSALR systems and these will be described within this manual. All other equipment and lighting fixtures for the VGLS will be supplied by others.

General VGLS Layouts



- ● Steady Burn Red Lights
- ● Medium Intensity Steady Burn White Lights
- □ Runway Threshold Lights
- ▪ High Intensity Steady Burn White Lights
- Δ Sequenced Flashing White Lights (RAIL)
- * Red Side Row Lights Aligned w/Touchdown Zone

Figure 1 – Visual Guidance Approach Lighting Systems

The ALC LED RAIL is a microcontroller-based system. Each OFH consists of an optically enhanced, high performance, LEDs arranged withing a reflector cone for unidirectional systems or lensing for omnidirectional systems.

The PCU has a single Universal Controller Card (UCC) for all input and output functions. An RS-485 data bus provides communication between the PCU and the SCU. Each head communicates with the UCC, providing operational status information. Each head is identified by an address code for data tagging.

A low-capacitance data transmission line, suitable for RS-485 drivers and receivers, can support satisfactory communications at the baud rate of this system for up to 4000 feet. Recommend the use of a #18-AWG twisted pair shielded cable suitable for direct burial.

While the heads communicate only with the UCC, the UCC has connections outside of the system such as primary power, remote switching, and a remote alarm activating circuit. These external lines may be subjected to voltage surges or other electrical disturbances.

The internal electronics and flashhead are powered by either a voltage ranging from 95-264VAC, 50/ 60 Hz or a constant current ranging from 2.8A to 6.6A.

The OFH scans the LED collecting temperature, voltage, and flash information. An alarm signal is generated if either head develops an operating condition that falls below a prescribed safe level per FAA EB67D. Examples are (a) more than 25% failed LEDs per EB67 in a single head, (b) incomplete column of LEDs, or (c) incomplete row of LEDs. A fail-safe Alarm Relay (contacts close on fail) that can be used for remote alarm signaling is also activated.

The L-849(L) RAIL system will be mounted at specific points in line with the runway centerline as detailed in Figure 1. Each lighting fixture will require dedicated support structures. Detailed drawings, provided by others, will indicate exact placement and installation of each system.

Unpacking

Light units should be stored and transported in original ALC shipping containers. Inspect and verify the light nameplate to ensure it corresponds to the site location and input power for installation. Visually inspect the light for any damage. If any damage is noted, immediately contact ALC for possible warranty claim. Claims should also be filed with the freight/shipping company. Repackage lights into original shipping containers until installation at runway end.

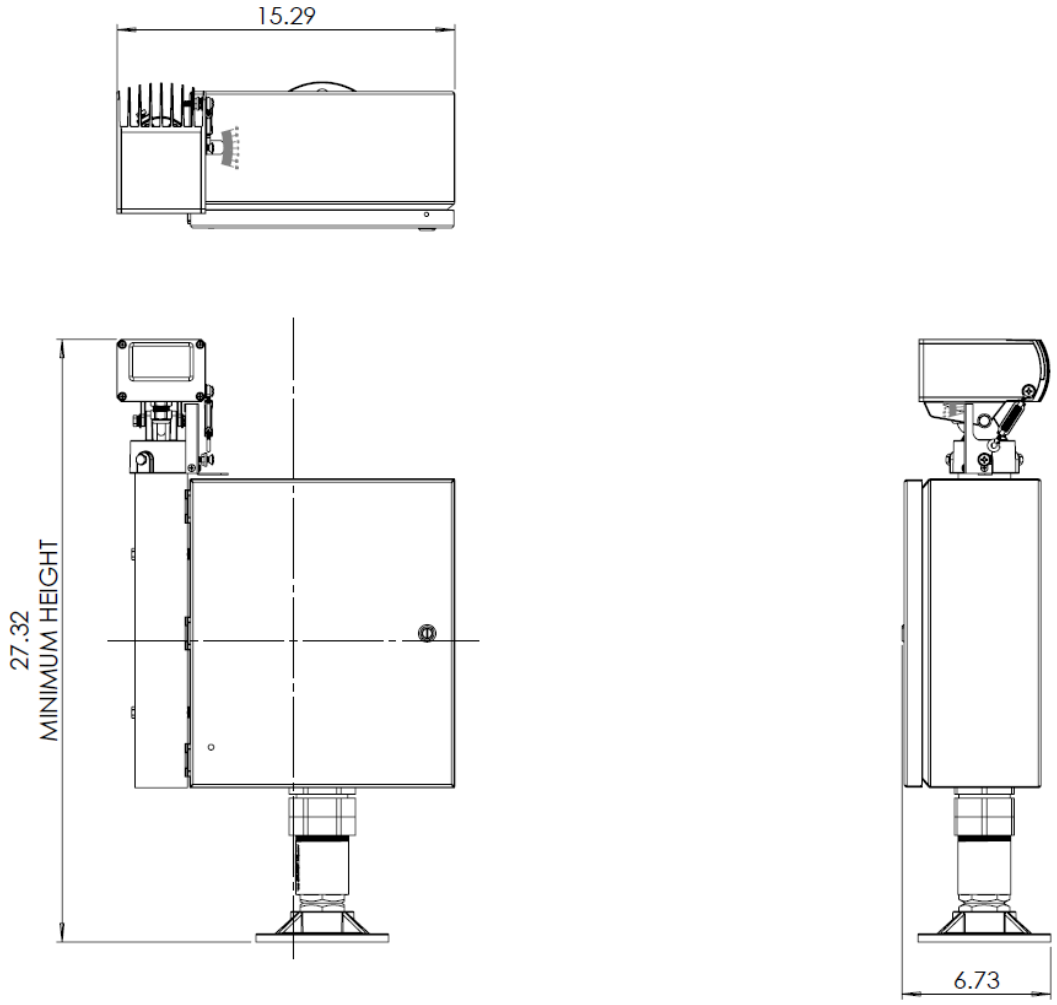
Tools Required

No special tools are required for installation of the system.

The following are the recommended tools for proper installation:

- **#2 Phillips screwdriver**
- **Flat blade screwdriver**
- **Micro flat blade screwdriver**
- **3/16 Allen Wrench**
- **3" Slip-joint pliers**
- **Wire Strippers**
- **Digital Multi-Meter (DMM)**

Dimensional Details

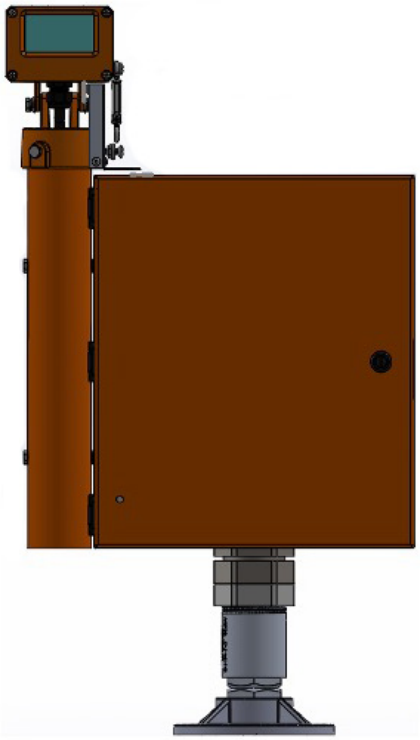


Primary & Secondary Units Installation

The PCU and SCU can be provided with a single or double bottom fed 2" EMT compression fitting or as a wall mount (no bottom entrance). Mounting options will be selected by the customer at time of ordering. A length of 2" EMT and a compatible compression fitting threaded at one end are required. The EMT and fittings are supplied by others based on the site requirements and conditions.

When the PCU or SCU is mounted on an in-ground base can, the EMT support is generally open to the can to allow wire passage. The units are shipped with a slotted foam plug to allow wire passage. T**he foam plug is essential to prevent moisture from the base can entering the units.**

NOTE: Failure to install the foam plug or provide other means of preventing free air passage will allow condensation to collect within the enclosure. Failure to install plug will void equipment warranty.



RAIL Optical Flashhead Installation

The RAIL Flashhead can be installed co-mounted to the PCU or SCU or as a separate mount. Standard ordering configuration is co-mounted. Specific flashhead quantity within the system can be ordered as separate mount, ordering option "S#". Flashhead mounting options will be selected by the customer at time of ordering. A length of 2" EMT or suitable piping will be required. The EMT and fittings are supplied by others based on the site requirements and conditions.

The flashhead can be mounted up to 200' (61m) away from the PCU or SCU. Flashhead cable can be purchased in the following lengths.

Flashhead Cable, 50'	55-00800-050
Flashhead Cable, 100'	55-00800-100
Flashhead Cable, 200'	55-00800-200

Connection between the factory cable and extension cable (55-00800) will be with 88-00024 watertight connector. The connector will be field installed on the end of the extension cable.

Slide the completed cable connector into the factory installed female connector. Tighten locking flange to ensure watertight seal.

RAIL Optical Flashhead Aiming

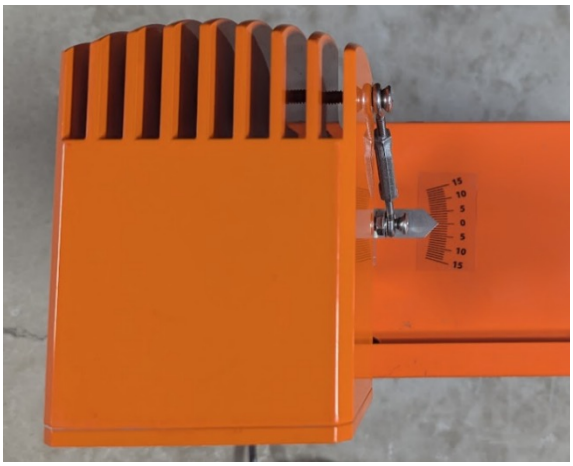
Using the horizontal scale located on the flashhead align with the runway centerline. The scale range is ±15° with 1° increments. A metal pointer is affixed to the flashhead hub and indicates the aiming direction. The flashhead must be properly aligned or zeroed so it is parallel to the runway.

Zero the OFH by aligning the flashhead face parallel to the runway end. Tighten the three hex bolts on the EMT mounting hub to lock in the alignment.

Using the vertical scale on the flashhead, the unit will be adjusted to match the emplacement angle. The adjustment will be accomplished with the turnbuckle located on the backside of the flashhead. Typical alignment will have the OFH pointing upwards.

The OFH vertical scale should be zeroed. Rotate the turnbuckle until the spirit level bubble lies symmetrically between the reference lines. Slightly loosen the vertical pointer screw to allow the pointer rest on 0°. Tighten the pointer screw. Slowly adjust the turnbuckle to set the vertical angle required for the emplacement.

Vertical Scale - 0° to 15°



Horizontal Scale - +15° to -15°

SPECIFICATIONS

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Property	Item	Specification
Environmental	Operating Temperature	-40°F - +130°F (-40°C - +55°C)
	Storage Temperature	-55°F - +130°F (-55°C - +55°C)
	Salt Fog	Per FAA AC 150/5345-51
	Temperature Shock	Per FAA AC 150/5345-51
Electrical	Input Mode	95-264VAC, 50/60Hz
	Power Consumption	Unidirectional – 163VA
	Isolation Transformer	L830-4, 100W Transformers
	Lamp Type	LED
	Lamp Life	> 50,000 Hours
Photometric (Nominal)	Light Color	White
	Main Beam Angle	Vertical: 10°, Horizontal 30°
	Intensity	High: 15,000cd Medium: 1500cd Low: 300cd
Mechanical	PCU Dimensions (h-w-d)	22" x 15.25" x 6.5" (559 x 387 x 165)
	PCU Weight	25 lbs. (11.4 kg)
	OFH Dimensions	7" x 5.25" x 6" (178 x 133 x 152)
	OFH Weight	3.5 lbs. (1.6 kg)

Wiring during installation consists of bringing primary power and remote-control wiring to the PCU and then communication cables from the PCU to the SCU. SCU will require a dedicated power cable. All connections are made at terminal blocks that accept bare-wire insertions under screw clamps. No special wire termination tools are required. Typically, up to fourteen (14) SCUs would be connected to the PCU within an ALSF system.

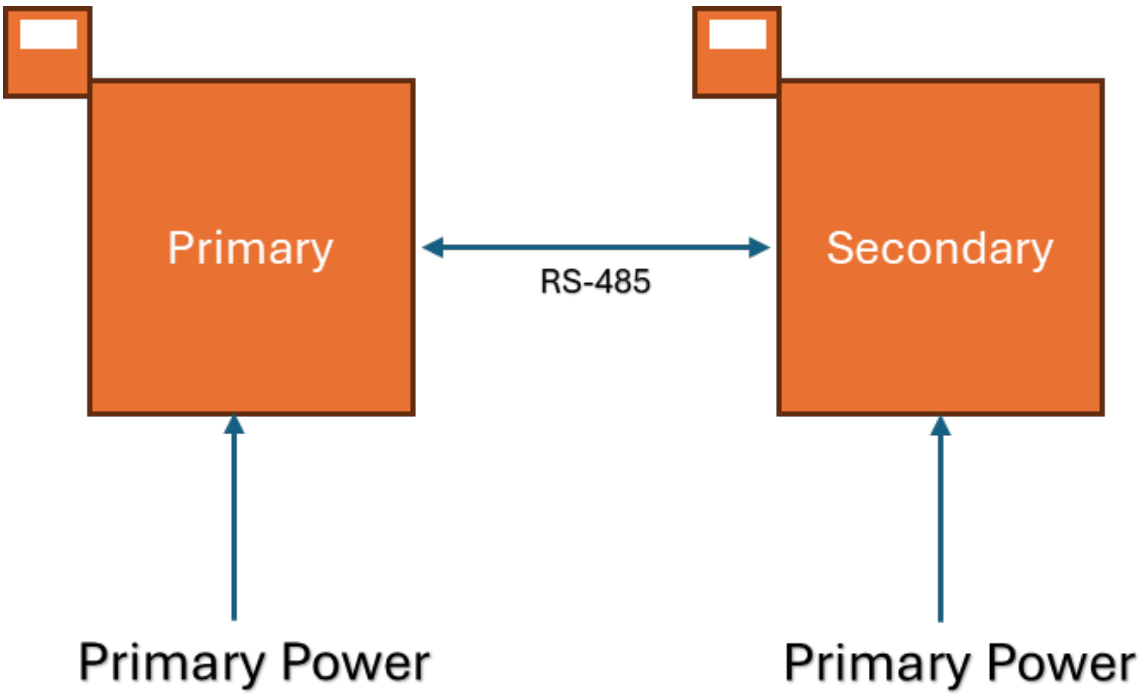
Voltage Driven systems wiring consists of three conductors. Two are required for 95-264VAC input and the third is for equipment ground. Conductor sizing based on site conditions.

Current Driven systems wiring consists of two conductors from the L-830 100W Isolation Transformer.

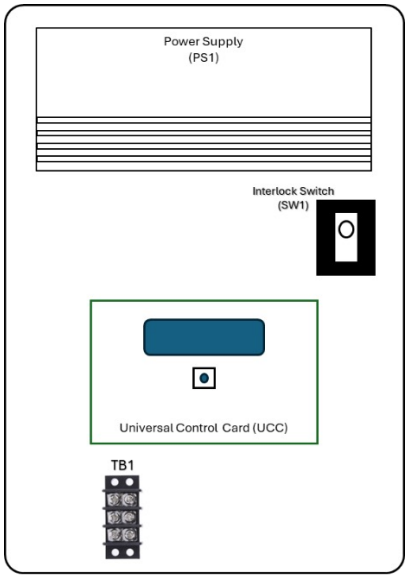
Communication wiring must satisfy the requirements for an EIA RS- 485 data bus. It must have three conductors: Two are for balanced-line data transmission (designated as 485-A and 485-B). The third is an isolated ground conductor (designated as GND) at the terminal blocks. Foil shielding should not be used as Ground connection.

Do not connect the GND conductor to chassis ground.

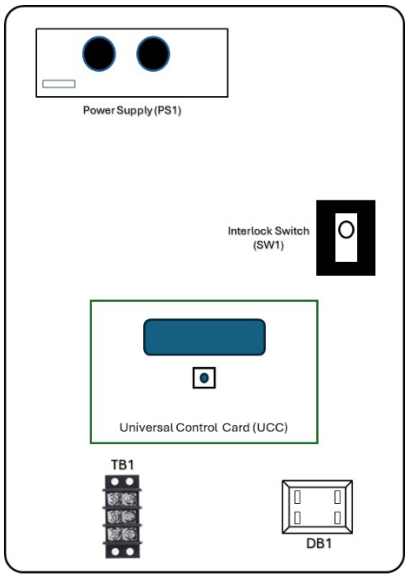
System alarm termination is provided for remote monitoring of the system. The dry contact alarm provides 'Close on Fail' or 'Open on Fail' contacts. Consult end user for proper wiring connections.



Primary Controller Unit Layouts



Voltage Driven



Current Driven

PS1 – Power Supply, 95-265VAC, 320W
SW1 – Interlock Switch & AC Surge Board
UCC – Universal Control Card with Display
TB1 – Input Voltage Terminal Block

PS1 – Low Voltage Power Module
SW1 – Interlock Switch
UCC – Universal Control Card with Display
TB1 – Input Voltage Terminal Block
DB1 – Bridge Rectifier

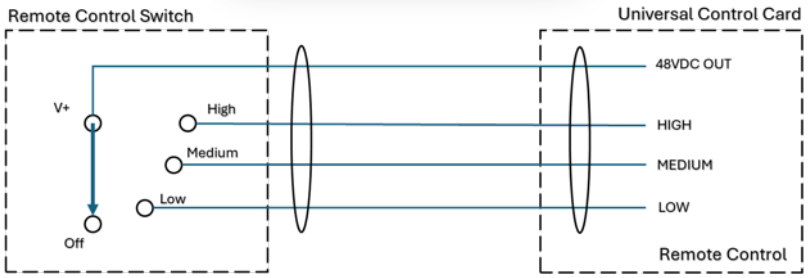
The UCC will provide all wiring connections for the primary RAIL flashhead, secondary RAIL flashhead, initial sequential flashhead, current sensing (voltage model only), remote control switching and alarm contact. Push button terminal blocks will be used for easy wire installation. The lever style terminal blocks will accept wire sizes between 24AWG to 12AWG.

PCU & Secondary Flashhead Input Wiring

TB1 is the input terminal block for Primary AC Power or Constant Current, located at the bottom of the panel. The voltage RAIL will accept any voltage between 95-264VAC 50/60Hz. The current driven RAIL will accept between 2.8A to 6.6A.

PCU Remote Control Wiring

Remote Control is compatible with an L-854 Radio Receiver or any switch that satisfies the function shown below. It consists of a four-wire circuit in which one of the conductors provides the switching voltage (V+, 48VDC). The other three are activated through a switch for Low, Medium, or High intensity. Remote Control terminations will be made on the UCC-J3 **REMOTE CONTROL** (upper left corner on UCC)



PCU Output Wiring to Sequential OFH

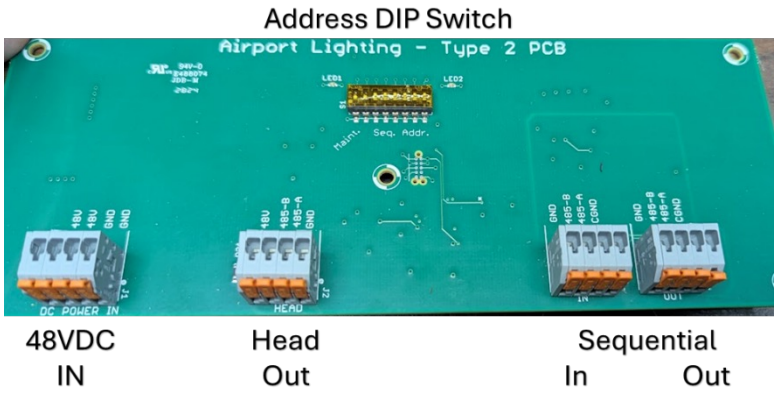
UCC-J4 HEAD B will NOT be used in VGAL systems.
UCC-J6 SEQUENTIAL is the output terminal for RS485 connection to the Sequential RAIL flashhead.
RS-485 Communication cable should contain two #18-AWG conductors and a bare shield. Applicable cables should be suitable for direct burial or water exposure/below-grade conduit. The data transmission is phase sensitive; therefore, 485-A in the PCU must connect to 485-A in the OFH. Bare shield will connect to CGND.

Do not connect the GND to chassis ground.

Secondary OFH Communications Wiring

Communication cable will match color code of first SCU at **IN** terminal block at CGND, 485-A and 485-B.

Communication to next SCU system will connect to **OUT** terminal block. This sequence will continue to all units within the system.



Secondary OFH Flashhead Addressing

Each SCU will require a specific Sequenced Address for proper flash pattern. S1 will be used to provide the proper address for each light.

Dip Position 1 will only be used on Light 1 for the RS-485 Terminating Resistor.

Position 2 will **NOT** be used for addressing the flashhead. It is only used to place the specific light unit into Maintenance Mode.

See Figure 2 on page 18 for specific addressing required for each VGLS.

Alarm Wiring

The system will provide a single dry contact alarm point for remote monitoring within the PCU. Alarm connections will be made at UCC-J7 **ALARM RELAY**. Option of wiring for Open on Failure or Close on Failure.

Current Sense Wiring

The RAIL derives its flash level (low, medium, high) based upon the constant current level on the circuit. The RAIL must be field set via menu options on CCR step (3 or 5). This adjustment will be accomplished through the UCC. The constant current will be wired at UCC-J8 **CURR. SENSE** with wires non-polarized, see above picture.

Set up will be based upon:

a. REIL Intensity Levels (Single (H) or Three Level (L/M/H))
b. Style of CCR (3-step or 5-step).

Lightning Protection

A local ground is required at each device for protection against lightning damage. An external ground lug is provided on the PCU and Secondary Flashhead cabinet. Recommended ground wire is a #2-AWG copper wire. Do not ground equipment to a counterpoise. **Failure to properly ground each device will void the warranty.**

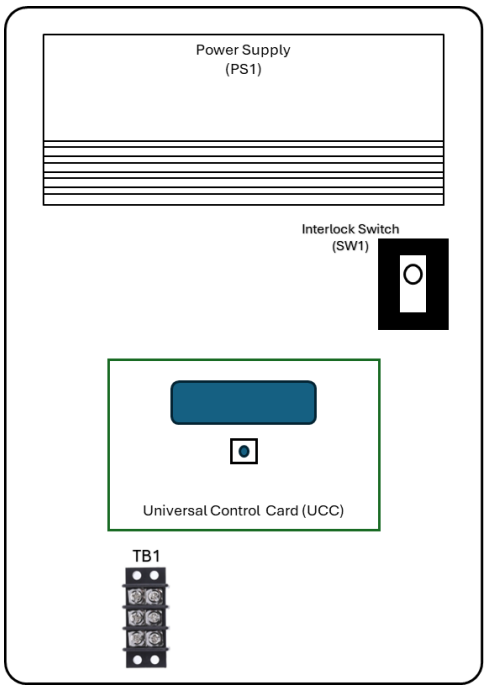
Foam Plug Installation

Use the FOAM PLUG when the supporting conduit opens directly to an IN-GROUND base can. Place any electrical conductors and/or cables into the provided slit as shown in Figure 1. Re-insert the foam plug into the conduit opening to make an environmental seal, Figure 2. Failure to use the conduit foam plug could lead to excessive formation of condensation during certain atmospheric conditions.

Warranty may be void if Foam Plug is not properly installed.

RAIL System Operation

The Primary Unit provides operational control of the entire lighting system.



SW1 is provided in each device to disable the unit when the cover is removed. The plunger can be pulled up in a locked position to energize the system. The voltage RAIL assembly will include a surge arrestor board mounted below the interlock switch.

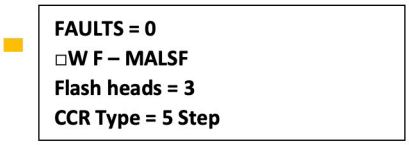
UCC is the only circuit card in the lighting system. It is used to provide local, remote or maintenance mode of the system, FAA Style operation, and provide visual display of system status. Setup and control of the system is done with the push button rotary dial at the center of the board and four-line OLED display.

PS1 is used to provide the 48VDC required for powering the UCC and LED flashhead. The SCU will also include a PS1.

RAIL System Setup

The system can be configured for multiple VGLS. The UCC utilizes a menu-based display and rotary dial to configure the system. The rotary dial will turn CW and CCW, as well as depressing for menu changes. The dial can rotate in either position (sitting or depressed). The four-line OLED display is used to provide visual details on systems operation, settings and faults.

Use the rotary dial to select the parameter that will be configured. Depressing the dial will allow modification of the selected parameter. The Yellow LED, left of the display, will illuminate if the parameter selected is able to be modified.



□ *Indicates selected menu line*

The menu will provide 13 dedicated parameters for configuration of the system. Some parameters will only be informational.

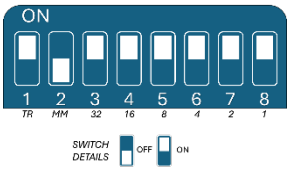
Parameter	Description	Configurations
Style	FAA Lighting Style	REIL Style A REIL Style B REIL Style C REIL Style D REIL Style E REIL Style F ODAL L859 Style F ALSF MALSR/SSALR MALSF
CCR Type	Intensity Levels	3 Step 5 Step
Control Source	Intensity Control	Manual Remote CCR
Fw Version	UCC Firmware Version	
Alarm Status	No Fault = 0; Fault = 1	
Flash HiHrs	Operational Hours at High Intensity	
Head Index	Selection of Installed OFHs	
DIP Address	Display of selected OFH DIP Switch	
Confirmed Flash Count	Confirmed Flashes of selected OFH	
Defrost Status	Display of Defroster of selected OFH	
LED Fault Status	Display Fault Status of selected OFH	
Number OFH	Display installed OFHs	
Control Mode	Display of current operational Mode (Off, Maintenance, Low, Medium, High)	

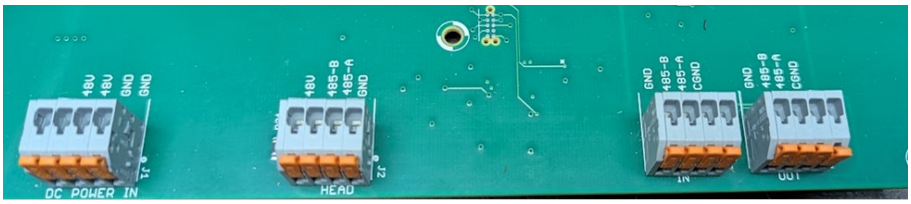
RAIL Flashhead Address Setting

After the UCC has been set to the proper Approach Lighting system, each Sequential Board within each SCU must be set to the corresponding number within the chart below. Note that a flashhead will not be connected to the PCU-UCC for the ALSF, MALSF, MALSR, and SSALR systems.

The Sequential Board will have an 8-position dip switch that will be used to set the location number of each unit. The first light (furthest away from runway) will always be set as LIGHT 1 with an address of 63. Position 2 will not be used for numbering, only to place specific light unit into Maintenance Mode.

Position 1 will be used on the furthest light for end-of-line resistor for RS485 signal.





48VDC IN | Head Out | Sequential In | Sequential Out

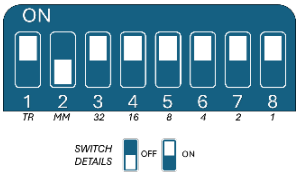
Approach Lighting Switch Settings

	Binary Switch Setting								Optic Flashhead Sequence			
	TR	*MM*	*32*	*16*	*8*	*4*	*2*	*1*				
Address Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**ALSF**	**MALSR/SSALR**	**MALSF**	**ODAL**
A									15(A)	5(A)	3(A)	6(A)
B									--	--	--	6(B)
47	0	0	X	0	X	X	X	X				5
50	0	0	X	X	0	0	X	0	14			
51	0	0	X	X	0	0	X	X	13			4
52	0	0	X	X	0	X	0	0	12			
53	0	0	X	X	0	X	0	X	11			
54	0	0	X	X	0	X	X	0	10			
55	0	0	X	X	0	X	X	X	9			3
56	0	0	X	X	X	0	0	0	8			
57	0	0	X	X	X	0	0	X	7	4		
58	0	0	X	X	X	0	X	0	6			
59	0	0	X	X	X	0	X	X	5	3	2	2
60	0	0	X	X	X	X	0	0	4			
61	0	0	X	X	X	X	0	X	3	2		
62	0	0	X	X	X	X	X	0	2			
63	X	0	X	X	X	X	X	X	1	1	1	1

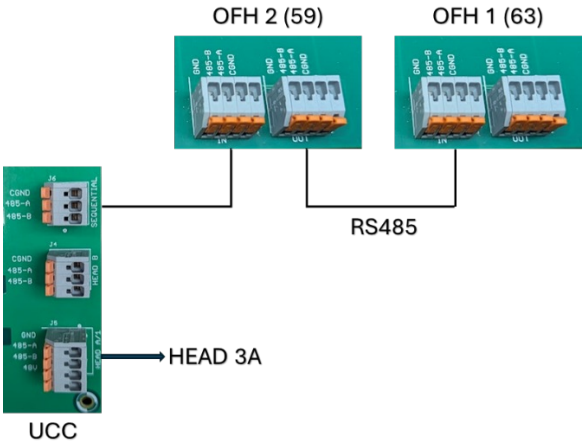
(X = ON, 0 = OFF)

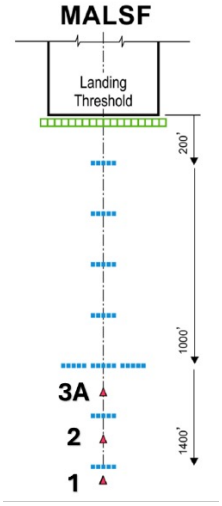
1 - First Light to Flash

MM = Maintenance Mode
TR = Terminating Resistor

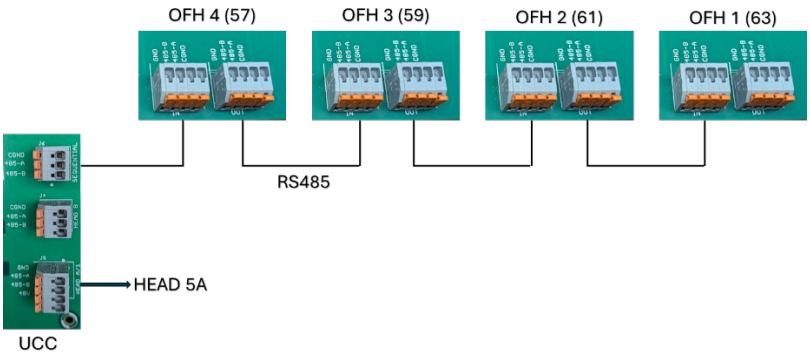


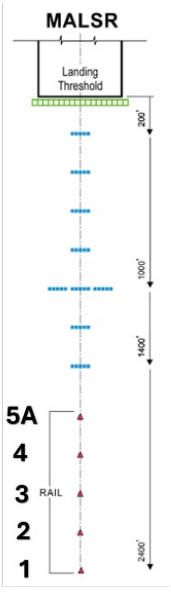
MALSF Interconnection Wiring



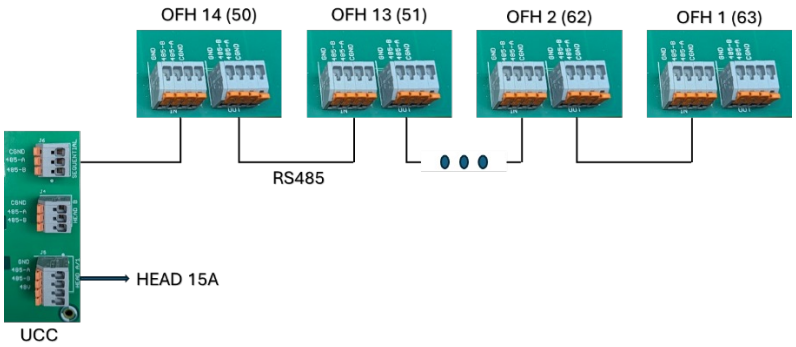


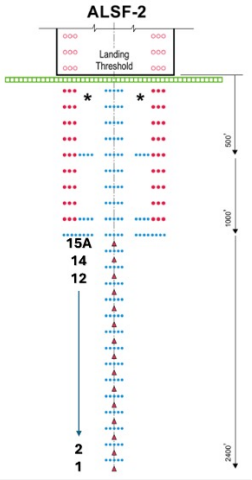
MALSR/SSALR Interconnection Wiring





ALSF Interconnection Wiring





RAIL Flashhead Switch Settings

Approach Lighting Switch Settings

	Binary Switch Setting								Optic Flashhead Sequence			
	TR	*MM*	*32*	*16*	*8*	*4*	*2*	*1*				
Address Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**ALSF**	**MALSR/SSALR**	**MALSF**	**ODAL**
A									15(A)	5(A)	3(A)	6(A)
B									--	--	--	6(B)
47	0	0	X	0	X	X	X	X				5
50	0	0	X	X	0	0	X	0	14			
51	0	0	X	X	0	0	X	X	13			4
52	0	0	X	X	0	X	0	0	12			
53	0	0	X	X	0	X	0	X	11			
54	0	0	X	X	0	X	X	0	10			
55	0	0	X	X	0	X	X	X	9			3
56	0	0	X	X	X	0	0	0	8			
57	0	0	X	X	X	0	0	X	7	4		
58	0	0	X	X	X	0	X	0	6			
59	0	0	X	X	X	0	X	X	5	3	2	2
60	0	0	X	X	X	X	0	0	4			
61	0	0	X	X	X	X	0	X	3	2		
62	0	0	X	X	X	X	X	0	2			
63	X	0	X	X	X	X	X	X	1	1	1	1

(X = ON, 0 = OFF)

1 - First Light to Flash

MM = Maintenance Mode

TR = Terminating Resistor

TROUBLESHOOTING

AirportLightingCompany
An ISO 9001:2015 Certified Company

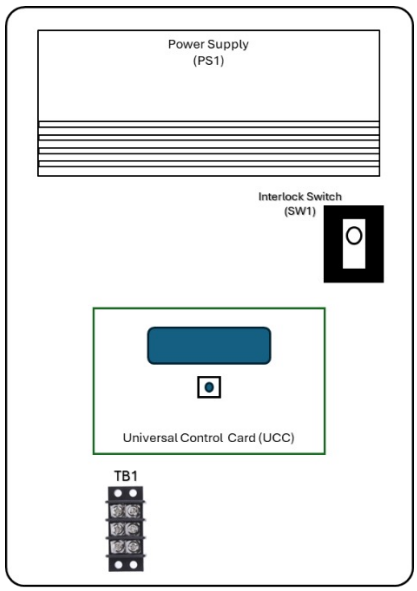
This section provides general troubleshooting information on the REIL system. Most common issues are shown in the chart. If the issue is not listed below, please contact Airport Lighting Co. technical support for additional assistance.

Problem	Possible Cause	Solution
No Light No Flash at either OFH	No Input Power	Verify proper input voltage of 95-265VAC 50/60Hz. Correct main input voltage source.
	Open/Bad Interlock Switch	Energize interlock by pulling up to lock into place. Verify voltage at Surge Board J2-L and J2-N.
	Bad Comm Cable	Replace Interlock Switch.
One OFH not Flashing	Open/Bad Interlock Switch	Verify Cover is closed. Verify voltage from Interlock Switch when engaged. Replace Interlock Switch.
	OFH Power Supply failed	Verify +48VDC on UCC-J2, +48V and GND. Replace Power Supply.
	OFH Fault Reported on UCC	Place PCU into MAINT mode and verify all OFH LEDs are lit. Replace faulty LED Module with shown bad LED(s). Replace faulty Control Board if LED array is out.
	OFH Fault Reported on UCC	OFH not communicating with UCC. Verify data comm connections. Verify ~4.5VDC between COMM A – COMM B in OFH. Correct Communication issue.
Brief Flash in One OFH (2-3 Flashes)	Bad Comm Cable	Verify proper communication cable connects.
Intermittent Flash Pattern	Bad OFH Control Board	Place UCC into MAINT mode and verify all OFH LEDs are lit. Replace faulty UCC.
	Bad LED Module	Replace faulty LED Module with shown bad LED(s).
Remote Control Issues	Selector Switch	Verify UCC is set to Remote
	Wiring Issue	Verify wiring between UCC-J3 and Remote Control device
	Open/Bad Interlock Switch	Energize interlock by pulling up to lock into place. Verify voltage at Surge Board J2-L and J2-N. Replace Interlock Switch.
	Bad Comm Cable	Verify COMM A & COMM B match between PCU and OFHs Verify ~4.5VDC between COMM A & COMM B in OFH

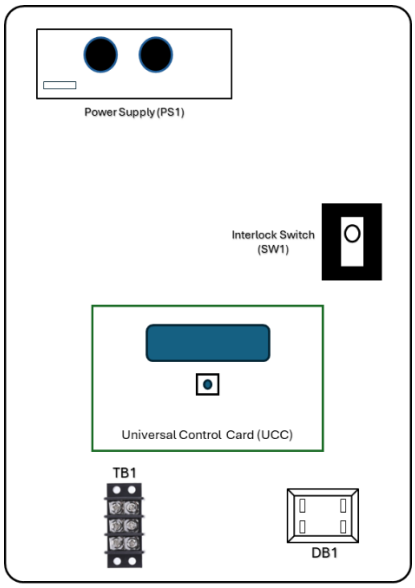
The LED REIL system should be properly maintained and inspected for reliable operation. The following chart will provide a guideline to follow to maintain the system.

Interval	Task	Action
Daily	Visual check of operation	Verify Operation Verify Flash Rate
Bi-Weekly	Visual check of lens	Clean Lens Check for cracks Check for condensation/moisture
	Check for vegetation growth	Remove any obstructions near system
Monthly	Verify OFH Alignment	Realign as required
	Verify Interlocks	Open PCU and SCU to verify safety devices
	Check for FOD within cabinets	Open cabinets and clean any debris
	Verify Manual Operation	Manually adjust mode of system
Yearly	Verify OFH Alignment	Realign as required
	Verify mounting columns	Align and tighten all EMT connections
	Check seals and foam plug	Verify all door seals and foam plug intact
	Check internally wiring	Verify all wires are seated and not damaged

Primary Control Units



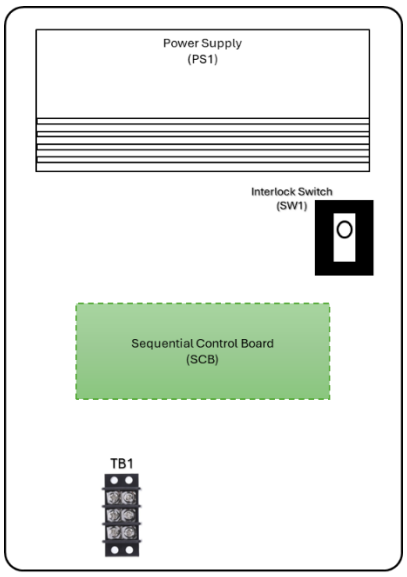
Voltage Driven



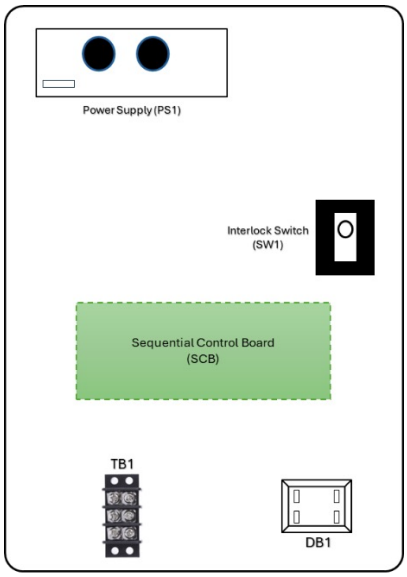
Current Driven

Item	Part Number	Description
OFH – UNI	84-90000	Unidirectional Optical Flashhead w/cable
OFH – OMNI	85-90000	Omnidirectional Optical Flashhead w/cable
PS1	84-00905	Power Supply, Voltage Driven
PS1	C7-LVCV2	Power Supply, Current Driven
UCC	84-00013	Universal Controller Card
DB1	C7-BRG	Diode Bridge
SW1	55-00201	Interlock Switch
SW1S	84-00904	Power Conditioning Board *(Voltage Driven only)*

Secondary Control Units



Voltage Driven



Current Driven

Item	Part Number	Description
OFH – UNI	84-90000	Unidirectional Optical Flashhead w/cable
OFH – OMNI	85-90000	Omnidirectional Optical Flashhead w/cable
PS1	84-00905	Power Supply, Voltage Driven
PS1	C7-LVCV2	Power Supply, Current Driven
DB1	C7-BRG	Diode Bridge
SCB	84-00014	Sequential Control Board
SW1	55-00201	Interlock Switch
SW1S	84-00904	Power Conditioning Board *(Voltage Driven only)*
FH Cable	55-00800-050	Flashhead Cable, 4C, 50’
FH Cable	55-00800-100	Flashhead Cable, 4C, 100’
FH Cable	55-00800-200	Flashhead Cable, 4C, 200’

RAIL System

General Catalog Numbers

84-□-□-□-□

FAA Style
3 = MALSF, 3 Light
5 = MALSR/SSALR, 5 Light
15 = ALSF, 15 Light

Type
V= Voltage
I = Current

Legs
0 = Wall Mount
1 = 1 Leg
2 = 2 Legs

Options
A = Current Sense (Type V only)
S# = Separate Mount (specify qty)