



Installation and Operation Manual

ILS-1900-01R

L-864(L) / L-810(L)(F)
Red Obstruction Lighting System
For FAA Styles A0 to A6



Toll Free: +1 (866) 624-8309 • www.itl-llc.com



itl International
Tower Lighting, LLC™

Front Matter

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Safety Warning

This equipment uses lethal voltages which can cause serious injury and/or death. Do not attempt to service this equipment with line power applied. Only trained and qualified personnel should install, maintain or troubleshoot this equipment.

The LED lamps used in this equipment produce brilliant flashes of light and infrared (IR) radiation. Temporary or permanent eye damage may result from looking directly at the LED flash head while it is operating.

Do not rely on interlock switches to remove lethal voltages from the system. Measure for voltages using a voltmeter to ensure that power is off and has been completely removed.

Do not wear any jewelry. Gold and silver are excellent conductors of electricity.



This equipment emits near infrared radiation. Avoid direct eye exposure.



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Introduction

Congratulations! You have purchased one of the most advanced control solutions for red LED obstruction lighting systems available today. This product is the result of many years of engineering with extensive input from field service personnel.

Please take the time to read and familiarize yourself with this manual. It contains the information necessary to install, test and troubleshoot the ILS-1900-01R.

ILS-1900-01R System Configurations

ILS-1900-01R systems are available in different configurations to suit towers and other tall structures of various heights. The table below shows available models.

ITL Order Number	FAA Type & Style	L-864(L) Quantity	L-810(L) Quantity	DESCRIPTION
ILS-1900-01R-A0	L-810(L) Style A0	None	2	L-810(L) Obstruction Lighting System. One Double L-810(L), MKR-LTG2-01R (double obstruction light)
ILS-1900-01R-A0-n	L-810(L) Style A0	None	n (12 max)	L-810(L) Obstruction Lighting System. L-810(L), MKR-LTG1-01R, Qty n (4 per channel, 12 max)
ILS-1900-01R-A1	L-864(L), L-810(L)(F) Style A1	1	2 - 4	Flashing L-864(L)/L-810(L)(F) Obstruction Lighting System. One top L-864(L), Up to four mid-level flashing L-810(L)(F), MKR-LTG1-01R
ILS-1900-01R-A1X	L-864(L) Style A1	2	2 - 4	Flashing L-864(L)/L-810(L)(F) Obstruction Lighting System. Two top L-864(L), Up to four mid-level flashing L-810(L)(F)
ILS-1900-01R-A2	L-864(L) Style A2	3	None	Flashing L-864(L) Obstruction Lighting System. One top L-864(L), Two mid-level L-864(L)
ILS-1900-01R-A2X	L-864(L) Style A2	4	None	Flashing L-864(L) Obstruction Lighting System. Two top L-864(L), Two mid-level L-864(L)
ILS-1900-01R-A3	L-864(L) Style A3	5	None	Flashing L-864(L) Obstruction Lighting System. One top L-864(L), Two mid-level L-864(L), Two bottom-level L-864(L)
ILS-1900-01R-A3X	L-864(L) Style A3	6	None	Flashing L-864(L) Obstruction Lighting System. Two top L-864(L), Two mid-level L-864(L), Two bottom-level L-864(L)
ILS-1900-01R-A4*	L-864(L) Style A4	7	None	Flashing L-864(L) Obstruction Lighting System. One top L-864(L), Three lower levels of two L-864(L) each
ILS-1900-01R-A4X*	L-864(L) Style A4	8	None	Flashing L-864(L) Obstruction Lighting System. Two top L-864(L), Three lower levels of two L-864(L) each
ILS-1900-01R-A5*	L-864(L) Style A5	9	None	Flashing L-864(L) Obstruction Lighting System. One top L-864(L), Four lower levels of two L-864(L) each
ILS-1900-01R-A5X*	L-864(L) Style A5	10	None	Flashing L-864(L) Obstruction Lighting System. Two top L-864(L), Four lower levels of two L-864(L) each
ILS-1900-01R-A6*	L-864(L) Style A5	11	None	Flashing L-864(L) Obstruction Lighting System. One top L-864(L), Five lower levels of two L-864(L) each
ILS-1900-01R-A6X*	L-864(L) Style A5	12	None	Flashing L-864(L) Obstruction Lighting System. Two top L-864(L), Five lower levels of two L-864(L) each

*Note that two RLC-1903 controllers are required for FAA Styles A4, A5 and A6.

Figure 1: ILS-1900-01R Order Number Table

Product Description

The ILS-1900 is a medium intensity LED lighting system as defined by FAA Advisory Circular AC 150/5345-43 and Transport Canada's Canadian Aviation Regulations (CAR) 621. This lighting system meets or exceeds the specifications as defined in the advisory circular and CAR. This lighting system meets or exceeds the specifications as defined in the advisory circular. For more information please refer to the FAA website www.faa.gov/airports/resources/advisory_circulars.

This system flashes Red light and Infrared radiation at 30 flashes per minute (30 FPM) in Night Mode and turns off during Day Mode. See major component block diagram on the following page. The ILS-1900-0IR is available in different configurations to suit towers and other tall structures of various heights.

The RLC-1903 controller features a flexible architecture allowing any channel to control one or two flashing beacons (L-864) or a group of side lights (L-810). Note that L-864 and L-810 lights cannot be controlled by the same channel. Channel 1 should be used to control the lowest lights on the tower and higher channels for lights located higher on the tower. One Form-C Main Alarm Relay is available on the main panel in all configurations for the indication of any alarm condition. Standard models are equipped with a ten-relay dry-contact alarm board for indication of L-864 or L-810 failure alarms, power failure, photocell failure, and system mode. ITL's MON-2697 Monitoring System (sold separately) can replace the alarm relay board to provide wired or wireless Ethernet monitoring.

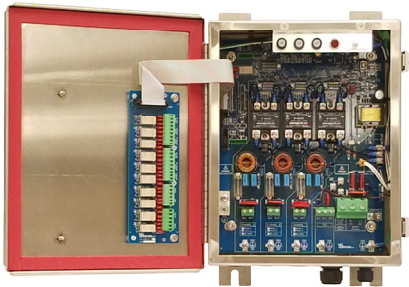


Figure 2: RLC-1903 Standard Controller with ten-relay dry-contact alarm board.

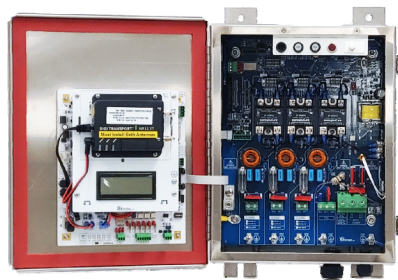


Figure 3: RLC-1903 with optional MON-2697 Ethernet Monitoring System (sold separately).



Figure 4: IFH-1900-0IR Flash Head.

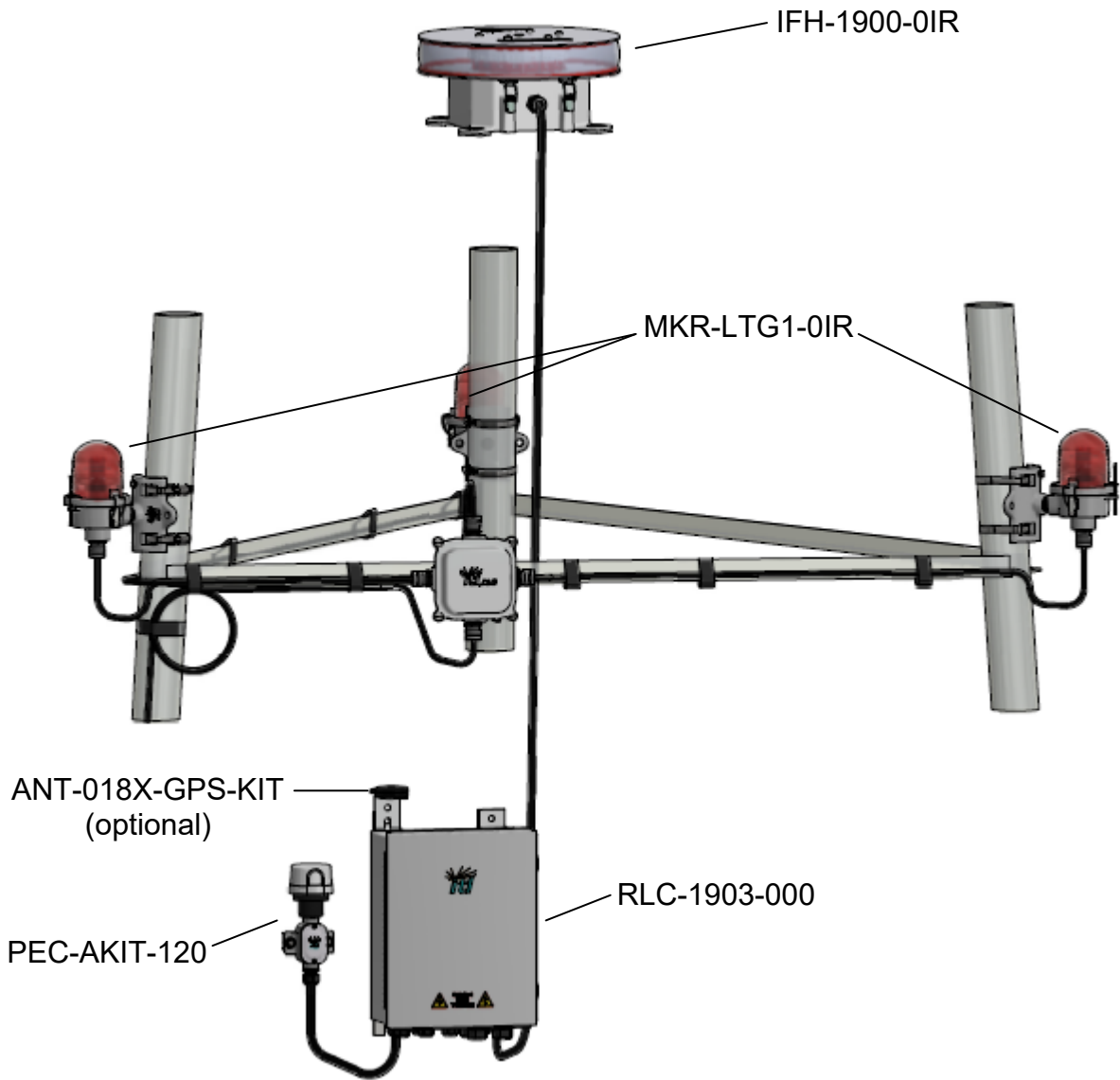


Figure 5: Typical ILS-1900-01R-A1 System

Theory of Operation

An ILS-1900-0IR Obstruction Lighting System consists of at least one RLC-1903 ground-based controller and one or more L-864(L) and/or L-810(L) obstruction lights. For certain FAA Styles a group of MKR-LTG1-0IR L-810(L) Obstruction Lights will be flashed in synchronization with one IFH-1900-0IR L-864(L) Flash Head. Other styles require only L-810(L) obstruction lights or only L-864(L) obstruction lights.

RLC-1903 ground-based controllers use a photoelectric cell to determine the appropriate lighting mode (day or night) based on ambient light level. In day mode all obstruction lights are tuned off. In night mode the RLC-1903 controller flashes L-864(L) Flash Heads and groups of L-810(L) Obstruction Lights using solid-state relays at 30 flashes per minute. The microprocessor-based RLC-1903 controller measures the AC current provided to each of three control channels using current sense transformers. If any channel fails to draw the correct current for the quantity and type of obstruction lights attached an alarm condition is reported.

IFH-1900-0IR L-864(L) Series flash heads consist of one string of Red Light Emitting Diodes (LEDs) and one string of Infrared Emitters. Infrared Emitters are used for increased conspicuity with night vision systems. A microprocessor controlled current source supplies power to the Red LED string and the Infrared Emitter string. The microprocessor measures the current through each string as well as the voltage of each string to determine if any malfunction requiring shut down exists. Upon detection of a malfunction the microprocessor turns off both the LED and Infrared strings to enter a low power mode allowing the ground-based RLC-1903 controller to detect and report an alarm condition.

MKR-LTG1-0IR L-810(L) Obstruction Lights consist of one string of Red Light Emitting Diodes (LEDs) and one string of Infrared Emitters. Infrared Emitters are used for increased conspicuity with night vision systems. A microprocessor controlled current source supplies power to the Red LED string and the Infrared Emitter string. The microprocessor measures the current through each string as well as the voltage of each string to determine if any malfunction requiring shut down exists. Upon detection of a malfunction the microprocessor turns off both the LED and Infrared strings to enter a low power mode allowing the ground-based RLC-1903 controller to detect and report an alarm condition.

Specifications

The models listed below are Verified by ETL to FAA Advisory Circular 150/5345-43 and TVOC Transport Canada CAR 621 as FAA Types listed

ILS-1900-0IR-A0	L-810(L)	Style A0
ILS-1900-0IR-A0-n	L-810(L) (qty n, n≤12)	Style A0
ILS-1900-0IR-A1	L-864(L) / L-810(L)(F)	Style A1
ILS-1900-0IR-A1X	L-864(L)	Style A1
ILS-1900-0IR-A2	L-864(L)	Style A2
ILS-1900-0IR-A2X	L-864(L)	Style A2
ILS-1900-0IR-A3	L-864(L)	Style A3
ILS-1900-0IR-A3X	L-864(L)	Style A3
ILS-1900-0IR-A4	L-864(L)	Style A4
ILS-1900-0IR-A4X	L-864(L)	Style A4
ILS-1900-0IR-A5	L-864(L)	Style A5
ILS-1900-0IR-A5X	L-864(L)	Style A5
ILS-1900-0IR-A6	L-864(L)	Style A6
ILS-1900-0IR-A6X	L-864(L)	Style A6

Environment

Temperature	-40°C to +55°C
Humidity	less than 95% relative humidity (non-condensing)

Obstruction Lights

IFH-1900-0IR	Up to Two L-864(L) IFH-1900-0IR per channel
Night Intensity	2,000±25% effective candelas, Red 264 mW/sr (min), 800-900nm, Infrared
Beam Pattern	360° horizontal, ≥3° vertical
MKR-LTG1-0IR	Up to Four L-810(L) MKR-LTG1-0IR per channel
Night Intensity	32.5 effective candelas (min), Red 4 mW/sr (min), 800-900nm, Infrared
Beam Pattern	360° horizontal, ≥10° vertical

Mechanical**IFH-1900-01R**

Dimensions	Height: 11" (28cm)
	Diameter: 16.5" (42cm)
Weight	28lbs (13Kg) each

MKR-LTG1-01R

Dimensions	Height: 7.5" (19.1cm)
	Width: 5.4" (13.7cm)
Weight	2lbs (0.9g) each

RLC-1903-000

Dimensions	Height: 16.63" (42.2cm)
	Width: 11.57" (29.4cm)
	Depth: 6.55" (16.6cm)
Weight	17lbs (7.7Kg)

Electrical

Input Power:	120 Vac, 60Hz,
Controller VA:	6 VA (each RLC-1903-000 controller)
Flash Head VA:	24 VA (each IFH-1900-01R flash head)
Side Light VA:	7 VA (each MKR-LTG1-01R side light)
Max VA:	46 VA (A1 configuration)
Total VA:	156 VA (max configuration, six IFH-1900-01R)
Alarm Relays:	120 or 240 Vac, 1 Amp
PEC:	120 Vac, 60 Hz, 1 VA
Suppression:	300 Joule, 275V, Power & Control Channels
	70 Joule, 275V, PEC
	45 Joule, 275V, All Dry-Contact Alarm Relays

Installation

The following section describes how to install the ILS-1900-0IR Obstruction Lighting System. Additional drawings and installation instructions are included with the lighting system and should be reviewed before installation begins.

Broadcast Tower Installations

Installations on AM, Hot AM and FM broadcast towers require additional installation steps that are beyond the scope of this manual. Please request *ITL Broadcast Tower Recommended Practices* (DOC-AMFM-MNL.pdf) via the contacts listed at end of this manual.

Hot AM towers require Tower Lighting Chokes to allow the RLC-1903 controller to be mounted on the ground. Proper operation of the RLC-1903 controller is not guaranteed if mounted on the tower structure of a hot AM tower. Tower Lighting Chokes may be procured from the manufacturers listed below.

LBA Group – www.lbagroup.com
Kintronic Labs – www.kintronic.com

Unpacking your ILS-1900-0IR System

Please examine the shipping containers and their content thoroughly upon receipt and report any potential shipping damage to the carrier.

Tools for Installation

The following tools are suggested for mounting of the ITL power supply and LED beacon.

- Digital multi-meter capable of reading 600VAC/DC (Fluke 177 or 179)
- Nut Drivers and Sockets
- #2 Phillips Screwdriver
- 5/16 Flat Head screwdriver
- 1/8 Flat Head screwdriver
- Crimp Tool
- Needle Nose Pliers

Quick Installation Guide

The quick start guide shows how to install the LED lighting system.

- Certain broadcast applications require special installation considerations due to the presence of high RF fields. See ITL document DOC-AMFM-MNL.pdf for further information.
- Remove RLC-1903 controller from packaging material.
- Mount the RLC-1903 enclosure. The enclosure must be mounted in the upright position. Pre-punched holes are provided in the bottom of the enclosure for all electrical connections. *Do not drill, punch or pierce the enclosure top, sides or door as this will void the warranty.*
- Using the mounting holes provided in the bottom of the cabinet ground the power supply cabinet to the site grounding system using an AWG 6 or larger copper conductor and a two-hole (5/8" centers) compression lug (see section *Enclosure Grounding*). There is also a ground lug provided inside the enclosure on the panel that can be used for grounding using an AWG 6 or larger copper conductor.
- Mount IFH-1900-0IR flash head(s) using the hardware supplied. Level each IFH-1900-0IR flash head using the procedure described in section *Flash Head Leveling*. Ensure the metal flash head base makes electrical contact with the tower structure. Remove paint from the tower structure as necessary. The flash head must be mounted in the upright position. Ground the flash head using the lug provided on the flash head base and an AWG 6 or larger copper conductor.
- Connect LED flash head cable (CBL-TC14-03S) from the power supply cabinet to the IFH-1900-0IR flash head(s) following the procedure described in section *Flash Head Cable Termination* in this manual. The flash head cable shield drain wires must be grounded in the Flash Head and in each junction box.
- Connect LED flash head cable (CBL-TC14-03S) to the correct channel(s) in the RLC-1903 controller. The flash head cable shield drain wires must be grounded in the RLC-1903 controller.
- If required install L-810 lights following all instructions, including leveling instructions, provided with the L-810 kit. L-810 cable shield drain wires must be grounded in each L-810 fixture and in each junction box. All L-810 lights and junction boxes must be mounted in the upright position.
- Connect L-810 cable (CBL-TC14-03S) to the correct channel(s) in the RLC-1903 controller. L-810 cable shield drain wires must be grounded in the RLC-1903 controller.
- Mount and wire the PEC using the procedure described in section *PEC Mounting and Wiring* in this manual. Consult the instructions provided with the PEC kit. The PEC must be mounted in the upright position.
- Mount and wire the GPS Antenna (optional) using the procedure described in section *GPS Mounting and Wiring* in this manual. Consult the instructions provided with the GPS kit.
- Set the Configuration DIP switches on the RLC-1903 to match the connected L-864 and L-810 lights.
- Attach primary power cable.
- Apply power to unit (pull interlock switch)
- Assuming day time ambient light levels, allow a few minutes for the system to read the photocell and set the operating mode to Day mode.

- Cover PEC and verify that the system switches from Day to Night mode
- Verify that there are no alarms while operating in Night mode.
- Verify that each IFH-1900-0IR flash head produces a red flash 2 seconds.
- Uncover PEC and verify that the systems switches back to Day mode
- Toggle manual mode switch from Day to Night and observe that unit's operation follows switch (PEC Alarm LED will be lit when switch is not in auto mode)
- Move manual toggle switch back to 'Auto' position
- Connect and test alarm monitoring and reporting equipment.
- Contact the tower owner or monitoring service responsible for FAA NOTAM management and verify that all alarm contacts are monitored and functioning properly.
- All fixtures, enclosures and junction boxes must be mounted in the upright position.

IFH-1900-01R Flash Head Leveling

The flash head must be leveled properly for correct vertical beam spread. The diagram below details how use a compact “torpedo” level on two axes to ensure that the flash head is mounted level. Use galvanized steel or stainless steel shims as necessary to achieve level mounting of the flash head. Do not compromise grounding of the flash head.

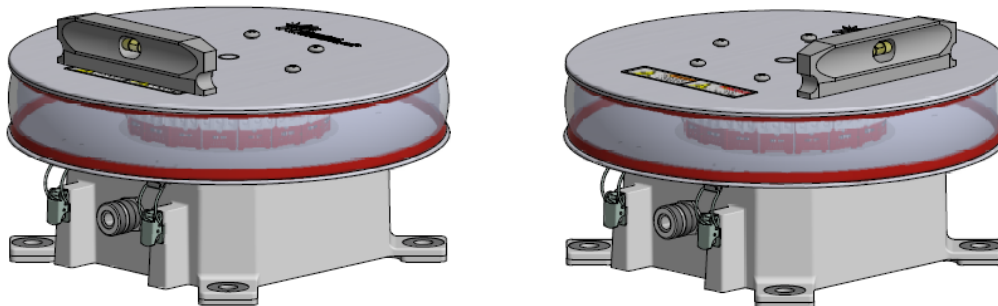
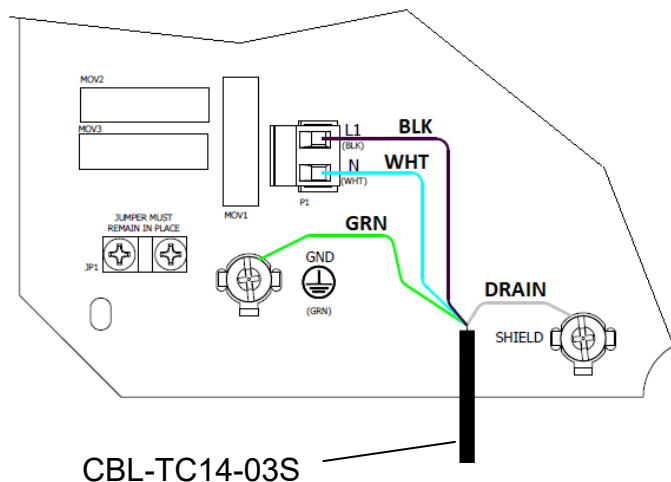


Figure 6: IFH-1900-01R Flash Head Leveling – Axis 1 and Axis 2

IFH-1900-01R Flash Head Cable Termination

Use only ITL cable, part number CBL-TC14-03S, for connecting the flash head to the controller. The cable contains three (3) color coded AWG14 conductors surrounded by a foil shield and a bare drain wire. Connect each color coded conductor to the corresponding terminal in the flash head as shown below. Secure all screw terminals firmly. When terminating the flash head cable in the power supply and in the flash head the drain wire must be grounded. Ground screws are provided in both the flash head and the power supply for grounding the drain wire. The length of the drain wire inside the power supply and flash head should be as short as possible.



IFH-1900-01R Flash Head Mounting

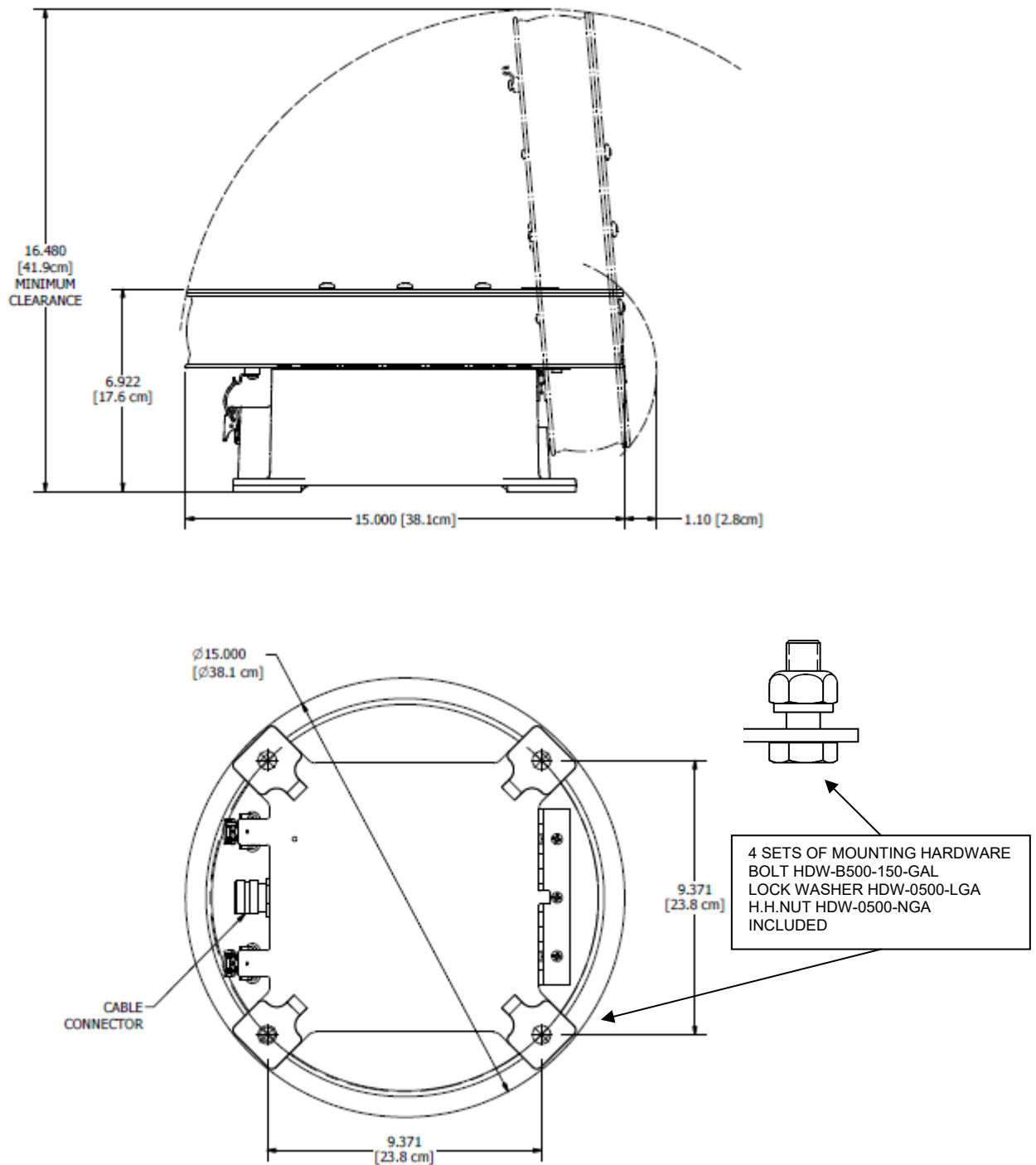


Figure 7: IFH-1900-01R Flash Head Dimensions and Mounting Detail

RLC-1903 Controller Mounting

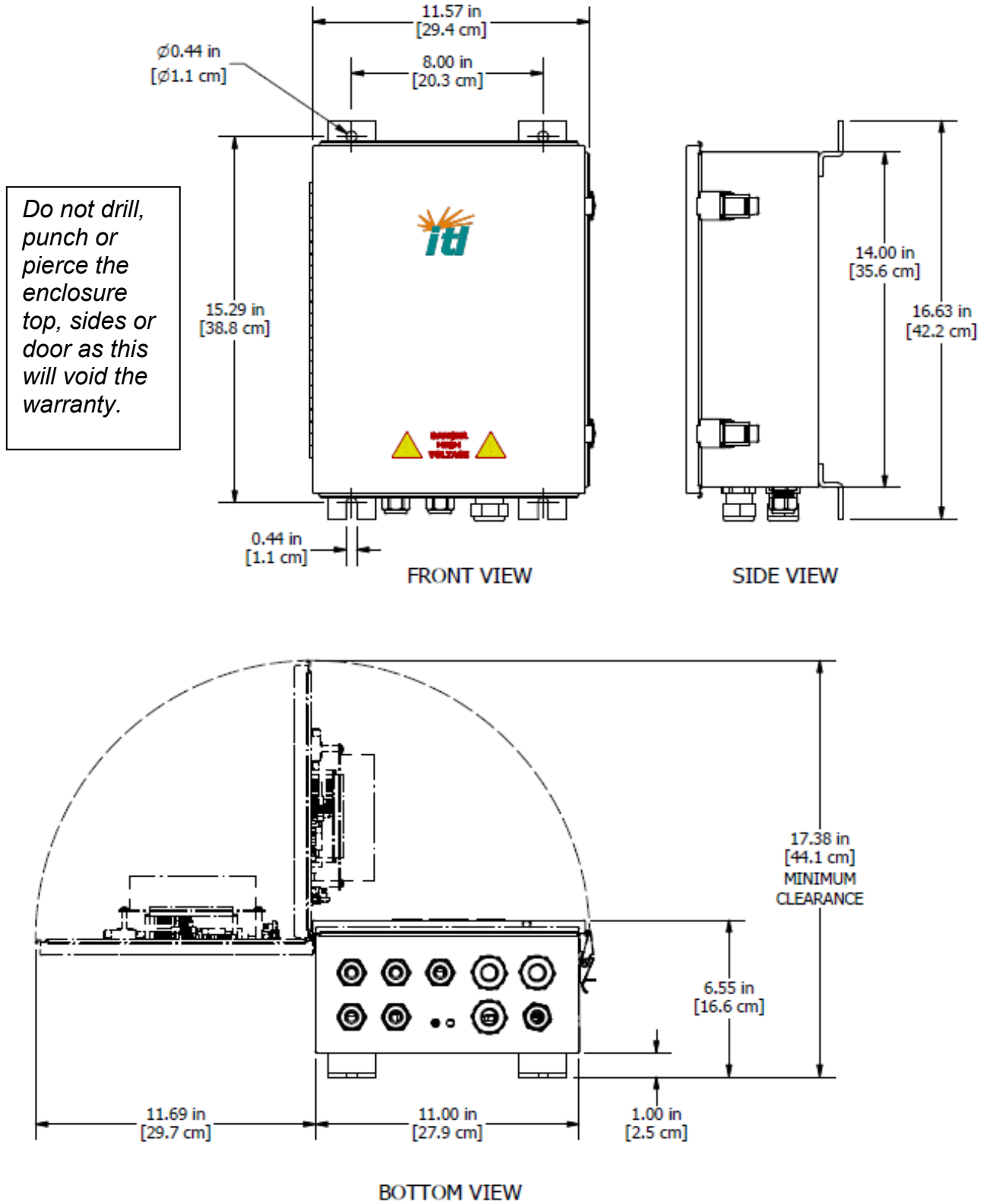
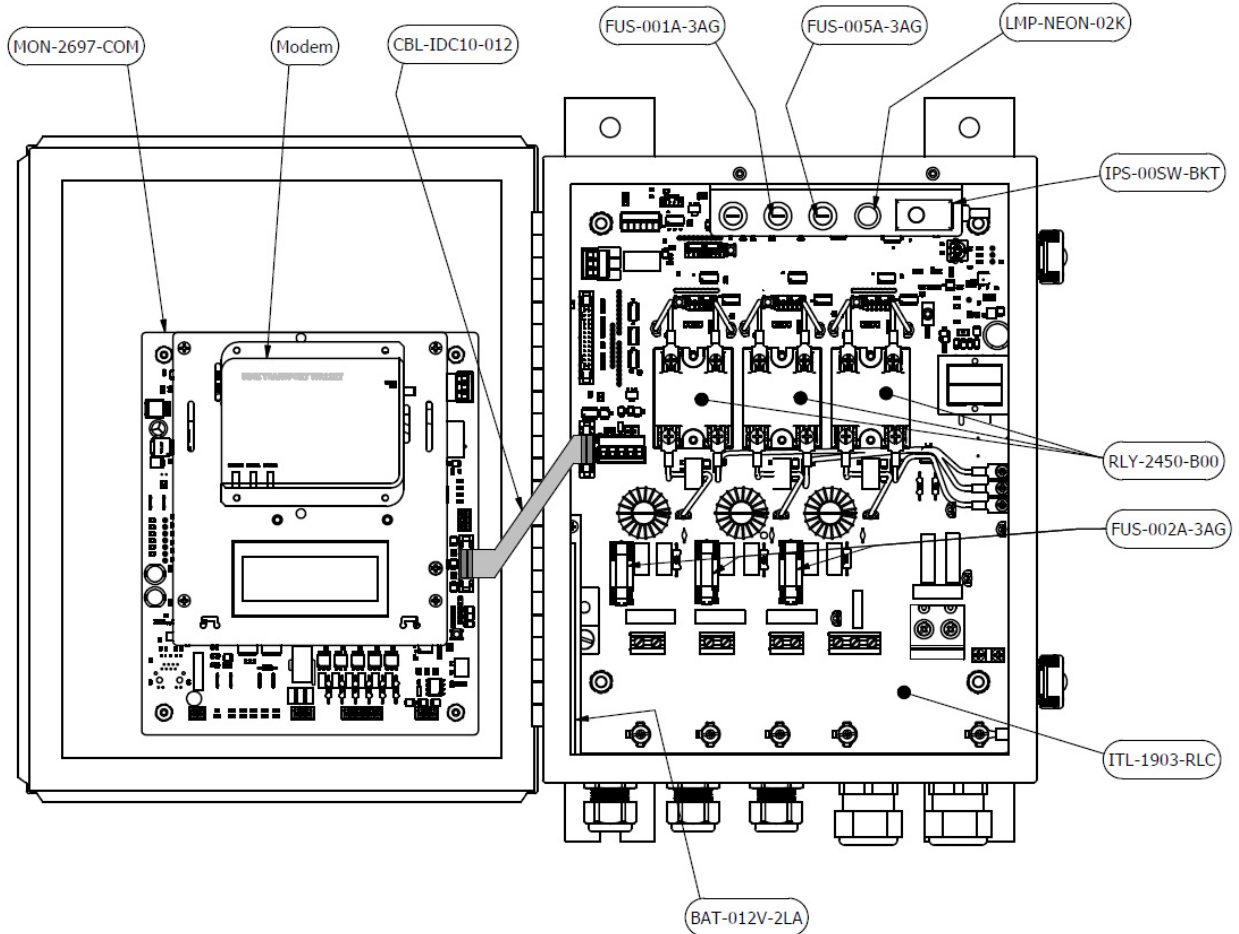


Figure 8: Enclosure Dimensions

RLC-1903 Replacement Parts



QTY	PART NUMBER	DESCRIPTION
1	ITL-1903-RLC	MAIN CONTROL BOARD
1	ITL-1923-RLY	ALARM RELAY BOARD
1	MON-2697-COM	MONITORING BOARD
1	SW0-ASSY-INT	INTERLOCK SWITCH
1	LMP-NEON-02K	NEON LAMP, RED, 120V
1	FUS-001A-3AG	FUSE 1A, 3AG, SLO-BLO
1	FUS-002A-3AG	FUSE 2A, 3AG, SLO-BLO
1	FUS-005A-3AG	FUSE 5A, 3AG, SLO-BLO
1	IPS-00SW-BKT	SWITCH, FUSE AND PILOT LIGHT BRACKET
1	BAT-012V-2LA	BATTERY (FOR USE WITH MON-2697)

Figure 9: RLC-1903 Parts List Table

Electrical Connections

All electrical control connections are made on P1, P2, P3, P4 and P5 located at the bottom of the controller. Connections for alarm relays are made on P9 and on the optional extended alarms relay board (ITL P/N ITL-1923-RLY). Typical connections for various FAA Styles are shown in the following pages.

It is the responsibility of the installer to comply with all applicable local, state, and federal regulations for installation and operation of this device.

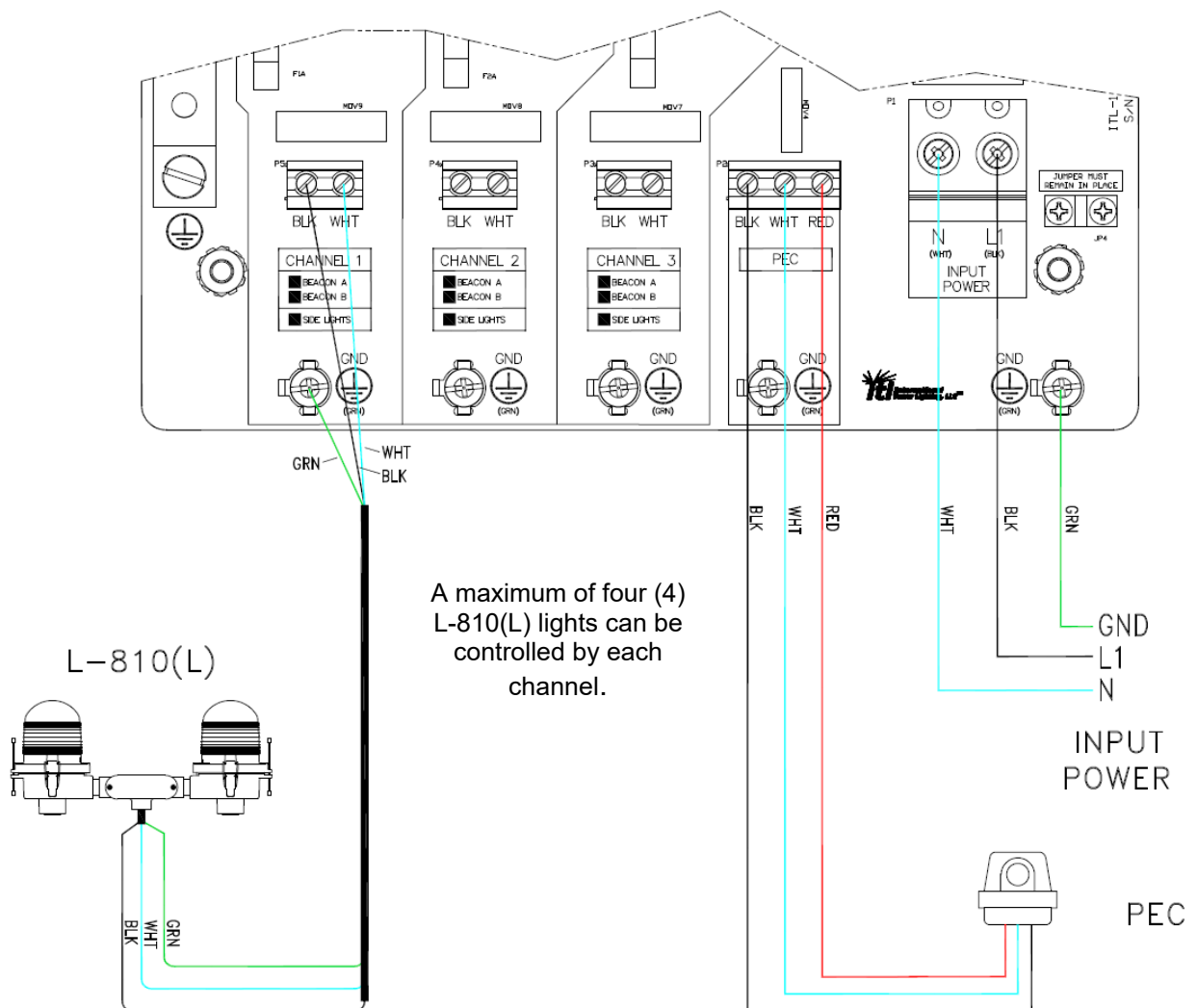


Figure 10: FAA Style A-0 Typical Electrical Connections

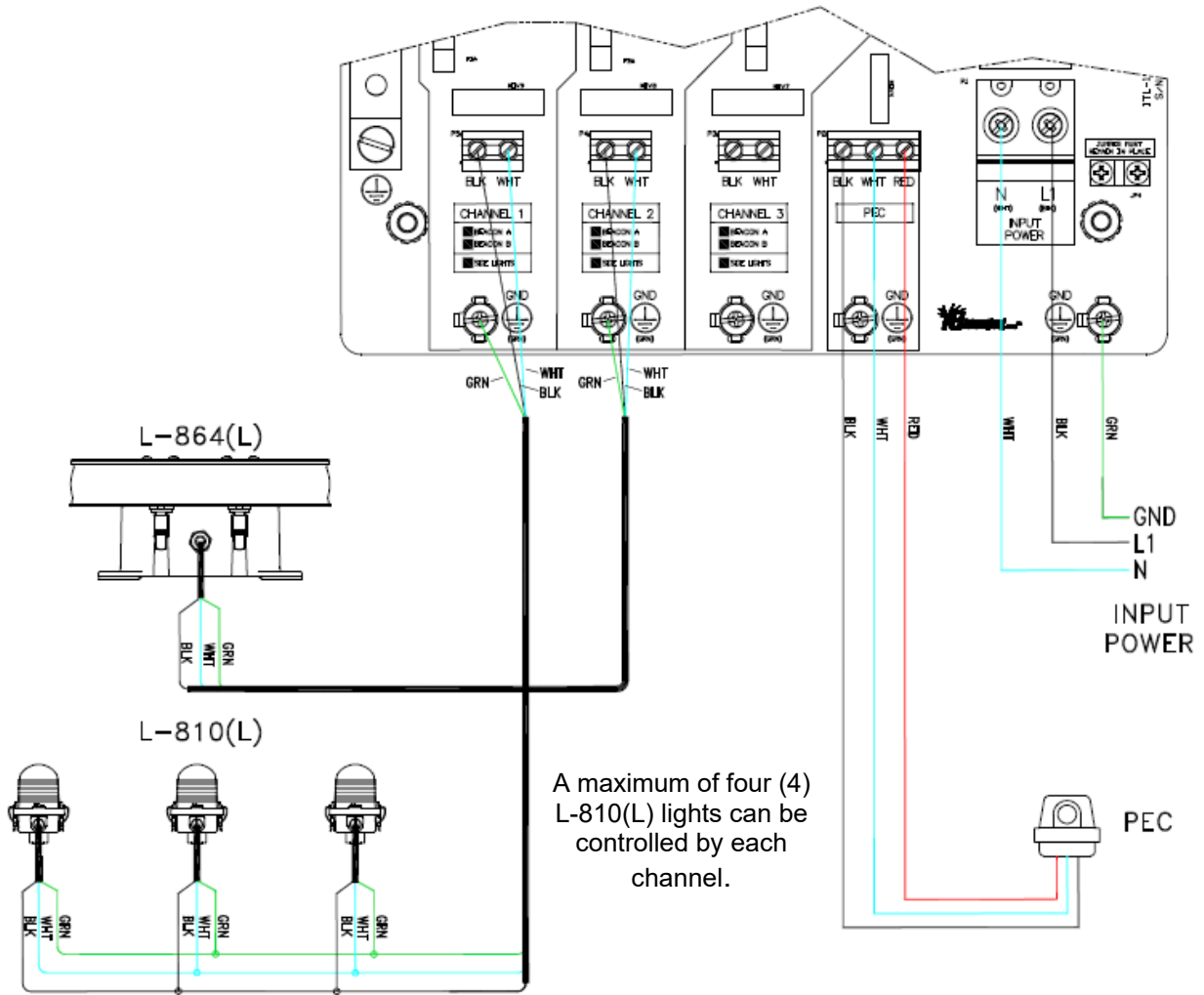


Figure 11: FAA Style A-1 Typical Electrical Connections

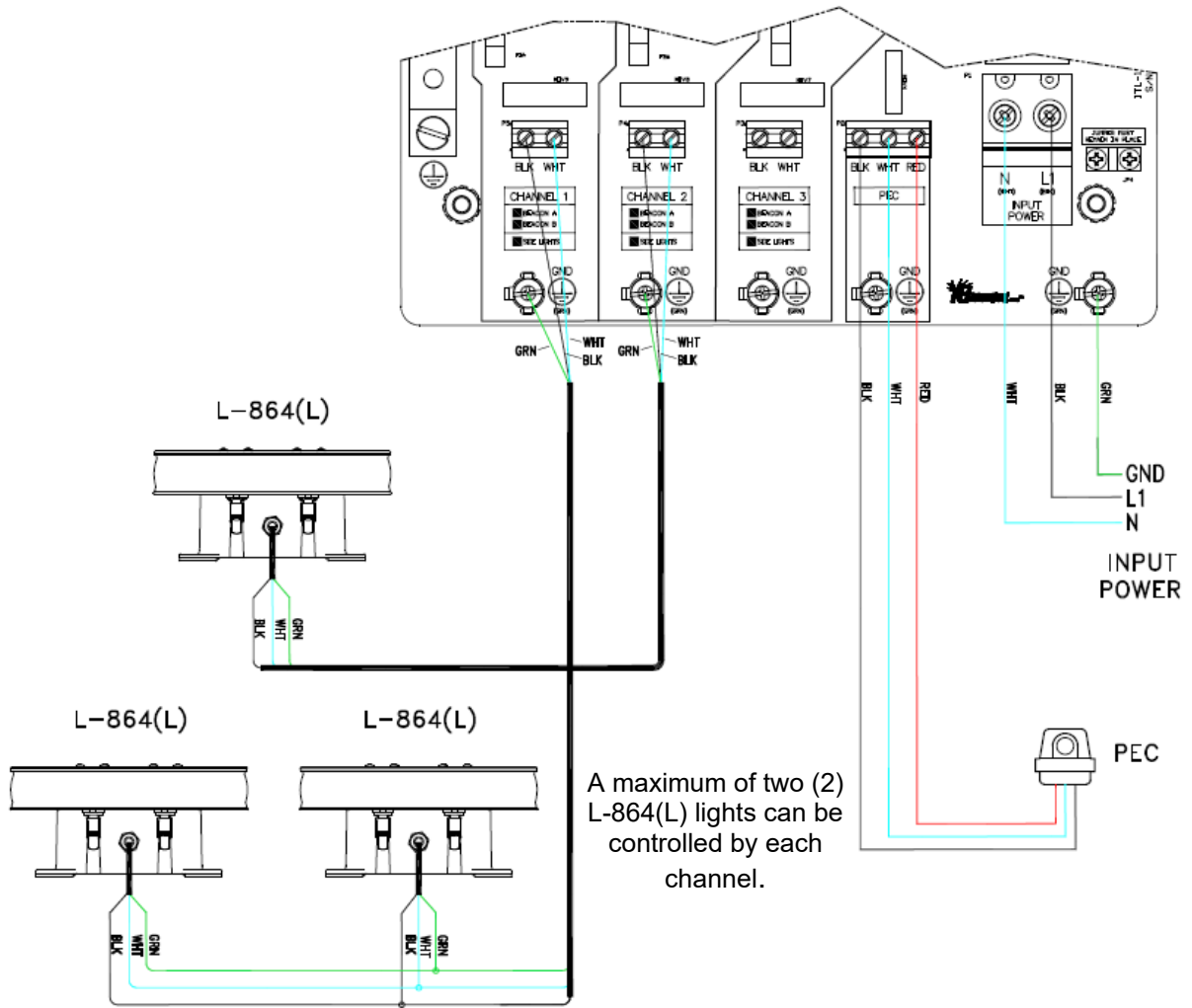


Figure 12: FAA Style A-2 System Typical Electrical Connections

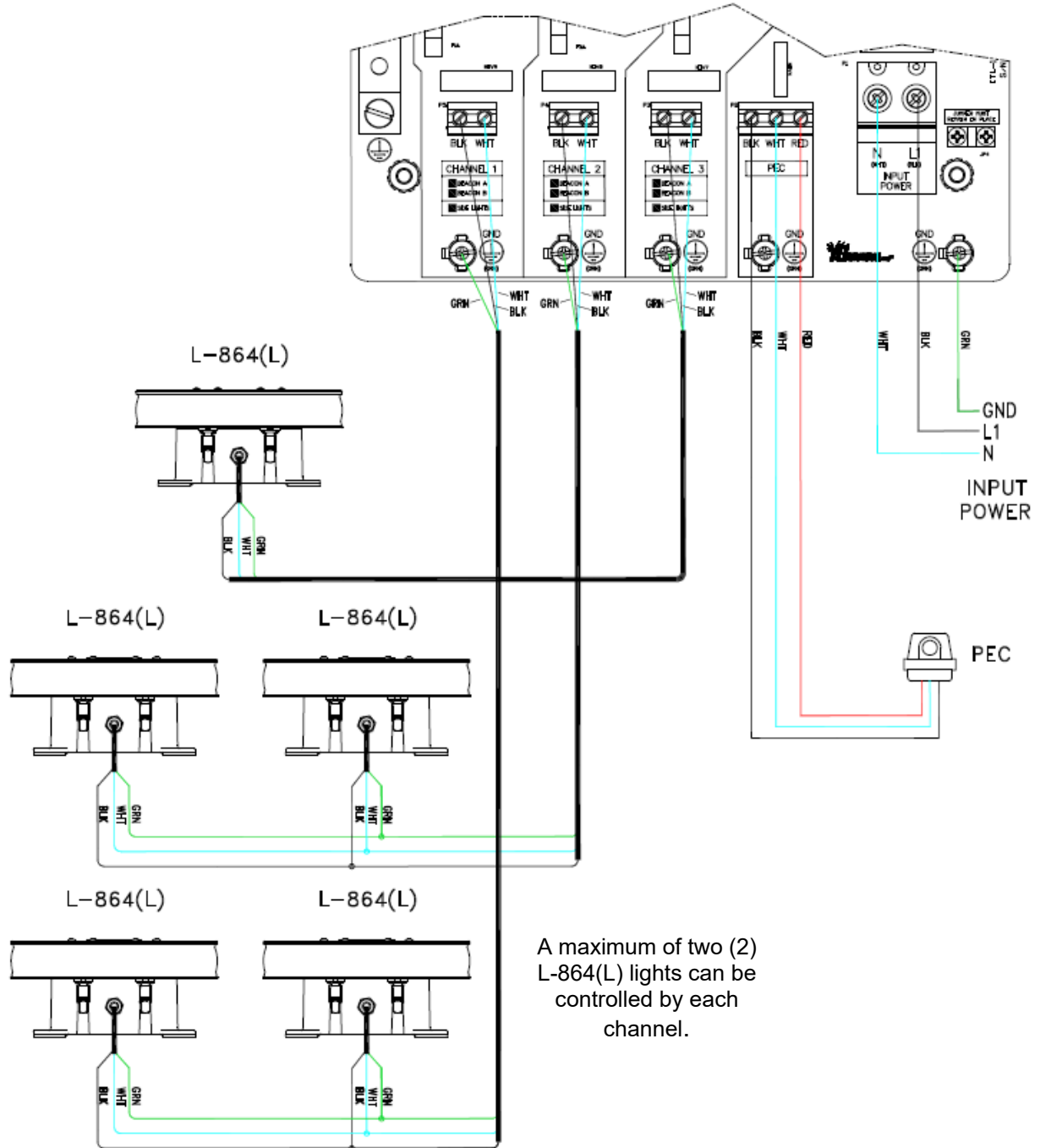


Figure 13: FAA Style A-3 System Typical Electrical Connections

Enclosure Grounding

- The power supply enclosure must be bonded to the site ground bus via a low impedance electrical connection. Mounting holes are provided on the bottom center of the enclosure for attachment of a two-hole (5/8" centers) compression lug for bonding to earth ground. AWG 6 or larger copper conductor should be used. There is also a ground lug provided inside the enclosure on the panel that can be used for grounding using an AWG 6 or larger copper conductor.

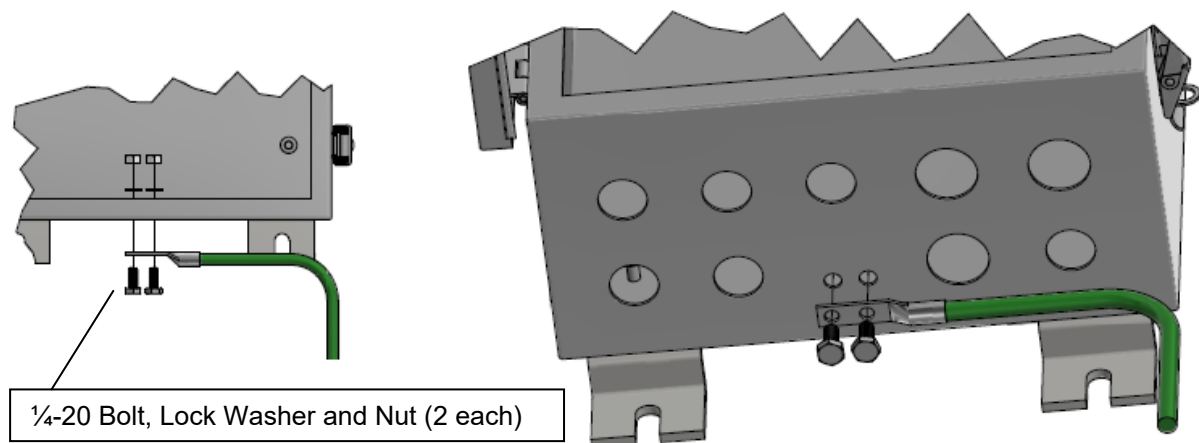


Figure 14: Enclosure Grounding

Flash Head Grounding

A lug is provided on the flash head base for grounding as shown below. AWG 6 copper conductor or larger should be used.

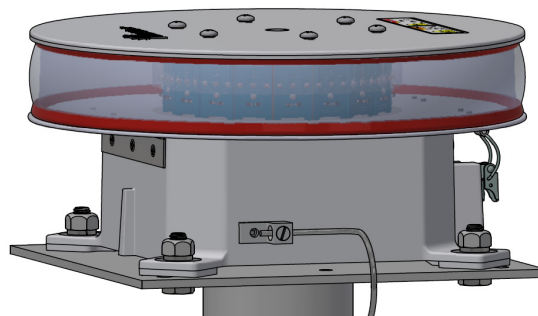


Figure 15: Flash Head Grounding

PEC Mounting and Wiring

ILS-1903 systems utilize a voltage type photoelectric cell, ITL part number PEC-1800-120. A PEC kit, part number PEC-AKIT-120-25, containing all parts necessary for mounting and wiring the photoelectric cell is shown in the diagrams that follow.

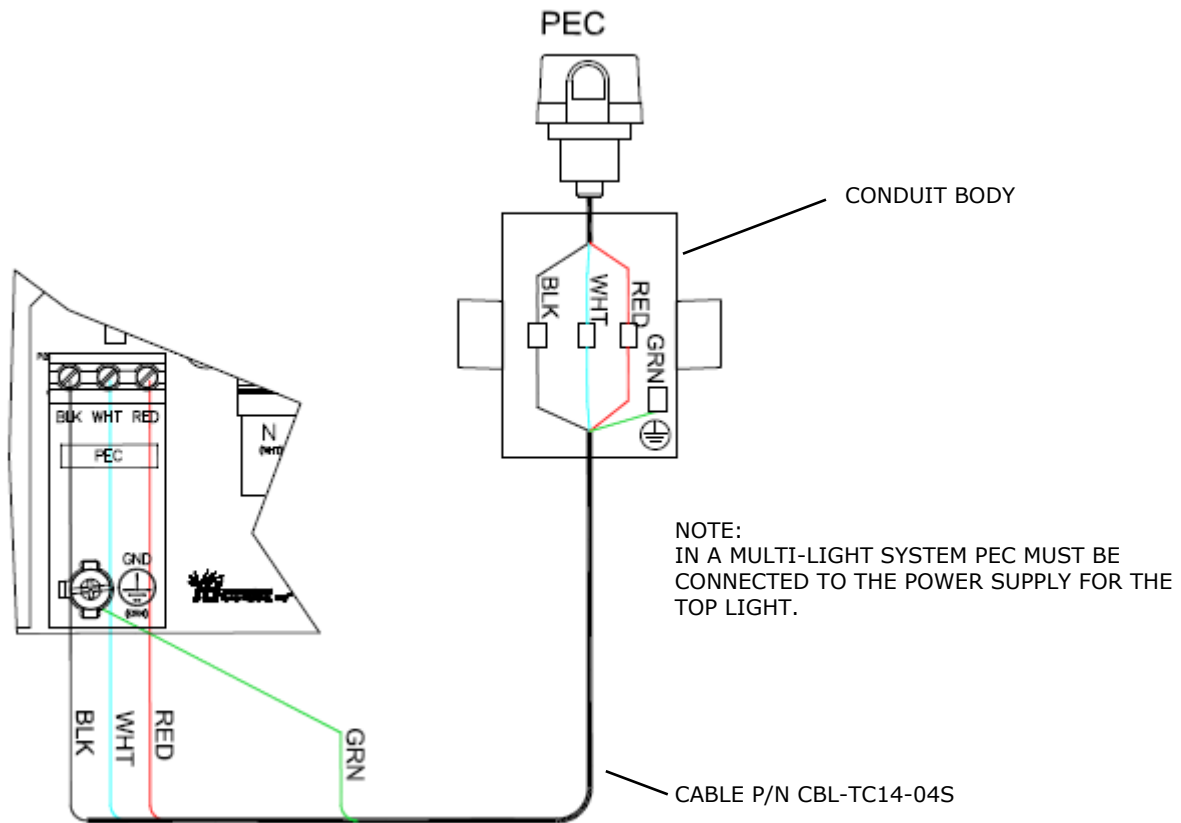


Figure 16: PEC Wiring Diagram

QTY	PART NUMBER	DESCRIPTION
1	HDW-COND-BDY-SM	CONDUIT BODY, STRUT MOUNT, ½" NPT, INCL. CORD CONNECTOR & MOUNTING HARDWARE
1	HDW-CDCN-500-NYL-BLK	CORD CONNECTOR ½" NPT, CBL. DIA. 0.39"-0.55"
1	HDW-ORNG-075	O-RING I.D. 0.75"
25ft	CBL-TC14-04S	TRAY CABLE 600V 14AWG 4 CONDUCTOR
1	PEC-1800-120	PHOTOELECTRIC CELL (PEC)
1	PEC-SOCK-000	SOCKET FOR PHOTOELECTRIC CELL

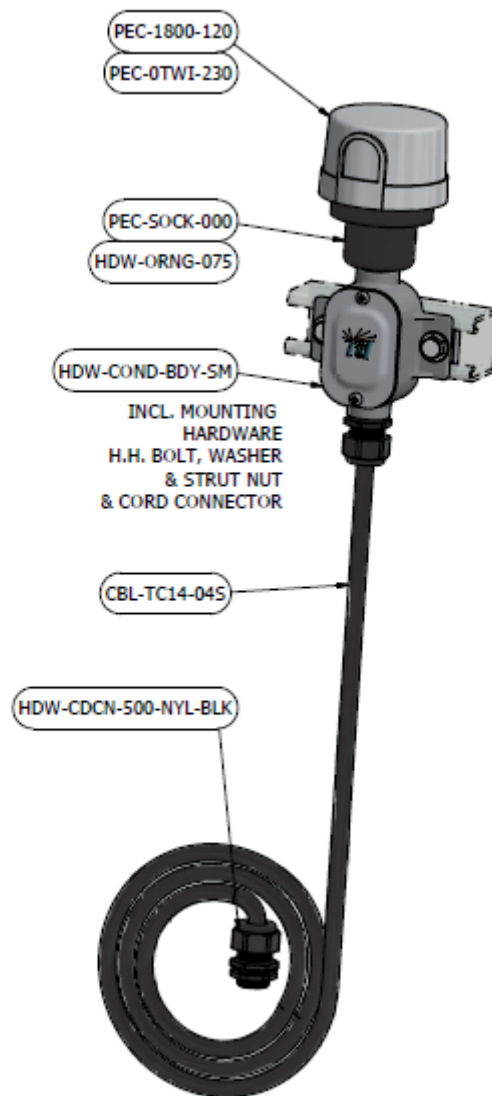


Figure 17: PEC-AKIT-120-25 KIT Assembly

GPS Mounting and Wiring

In applications where multiple lighting systems spread across a large area are required to flash in sync a GPS may be used. A GPS kit (ITL P/N ANT-018X-GPS-KIT) is available that includes the GPS and mounting hardware. For multi-light systems only the master system (the unit with the photocell connected) must have a GPS installed. The GPS kit comes with a connector for attachment to P10 in the upper left corner of main PCB shown below. For best performance the GPS should be mounted so as to have an unobstructed view of the sky.

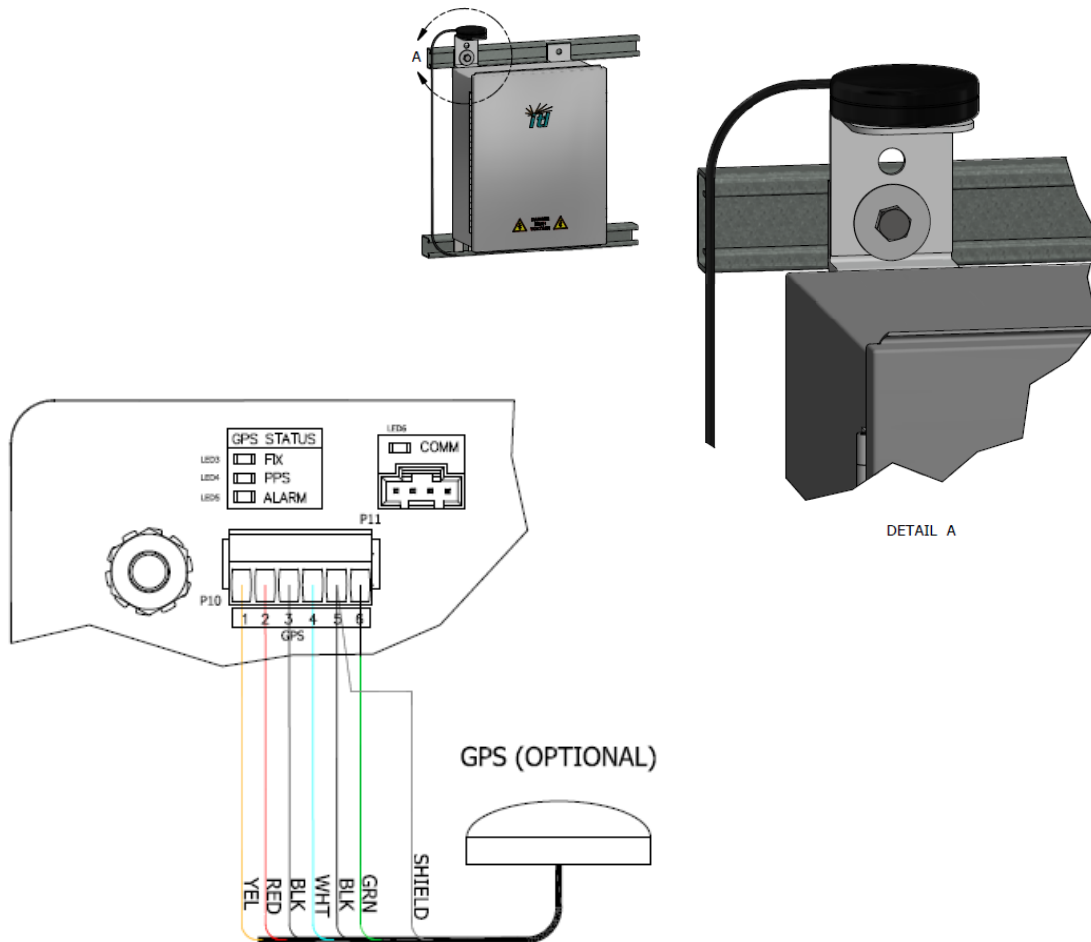


Figure 18: GPS Installation and Wiring

Sync Cable Wiring

Multiple RLC-1903 systems can be connected together for synchronized flashing and RS-485 monitoring using ITL sync cable, part number CBL-SYNC-22-4. The RED/BLK twisted pair are used for flash synchronization while the WHT/GRN twisted pair are used for RS-485 communication. Electrical connections between controllers are made on connector P7 as shown below.

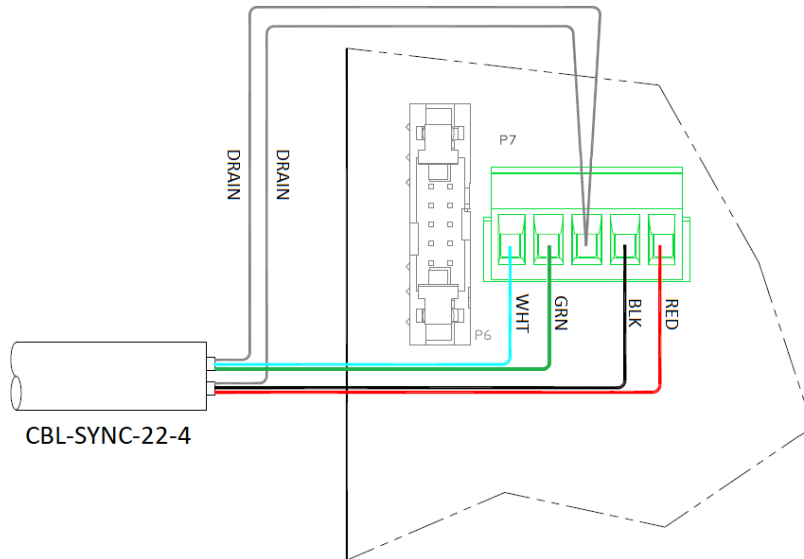


Figure 19: Sync Cable Wiring

Dry-Contact Alarms

The RLC-1903 has one Form-C Main Alarm Relay in the upper left corner of the main panel. The Main Alarm Relay will activate when any alarm condition exists. The RLC-1903 standard configuration has an ITL-1923-RLY Relay (shown below) mounted in the door. This board provides an additional 10 Form-C dry-contacts for use with an external monitoring system. Alternately an MON-2697 Monitoring System (sold separately) may be installed in this position for wired or wireless Ethernet monitoring.

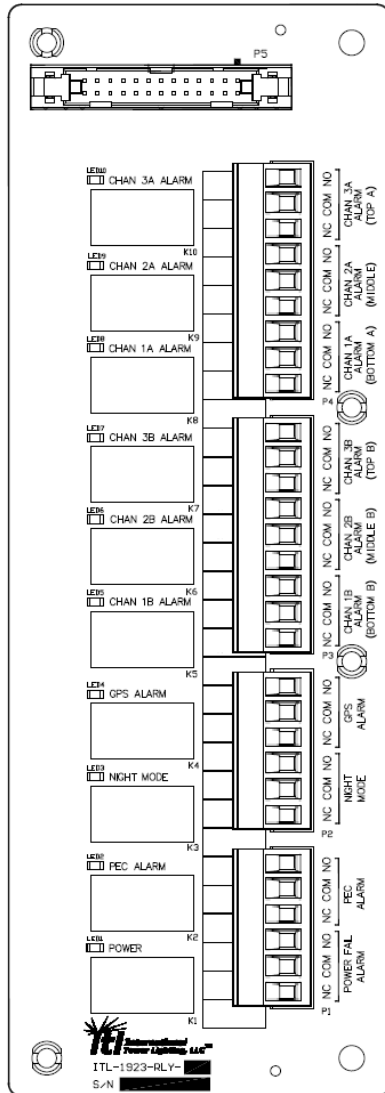


Figure 21: Alarm Relay Board

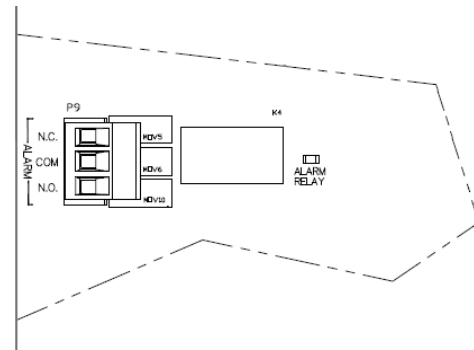


Figure 20: Main Alarm Relay

ITL-1903 Main Panel, Connector P9			
Pin	Name	Function	Notes
1	MAIN	N.C.	Indicates the presence of any alarm condition.
2	ALARM	COM	
3	RELAY	N.O.	

ITL-1923-RLY Relay Board , Connector P4			
Pin	Name	Function	Notes
9	CHAN 3A ALARM	N.O.	Top L-864 or Tier of L-810's. "A" – First L-864 on the channel.
8		COM	
7		N.C.	
6	CHAN 2A ALARM	N.O.	Mid-Level L-864 or Tier of L-810's. "A" – First L-864 on the channel.
5		COM	
4		N.C.	
3	CHAN 1A ALARM	N.O.	Bottom-Level L-864 or Tier of L-810's. "A" – First L-864 on the channel.
2		COM	
1		N.C.	

ITL-1923-RLY Relay Board , Connector P3			
Pin	Name	Function	Notes
9	CHAN 3B* ALARM	N.O.	Top L-864. "B" – Second L-864 on the channel.
8		COM	
7		N.C.	
6	CHAN 2B* ALARM	N.O.	Mid-Level L-864. "B" – Second L-864 on the channel.
5		COM	
4		N.C.	
3	CHAN 1B* ALARM	N.O.	Bottom-Level L-864. "B" – Second L-864 on the channel.
2		COM	
1		N.C.	

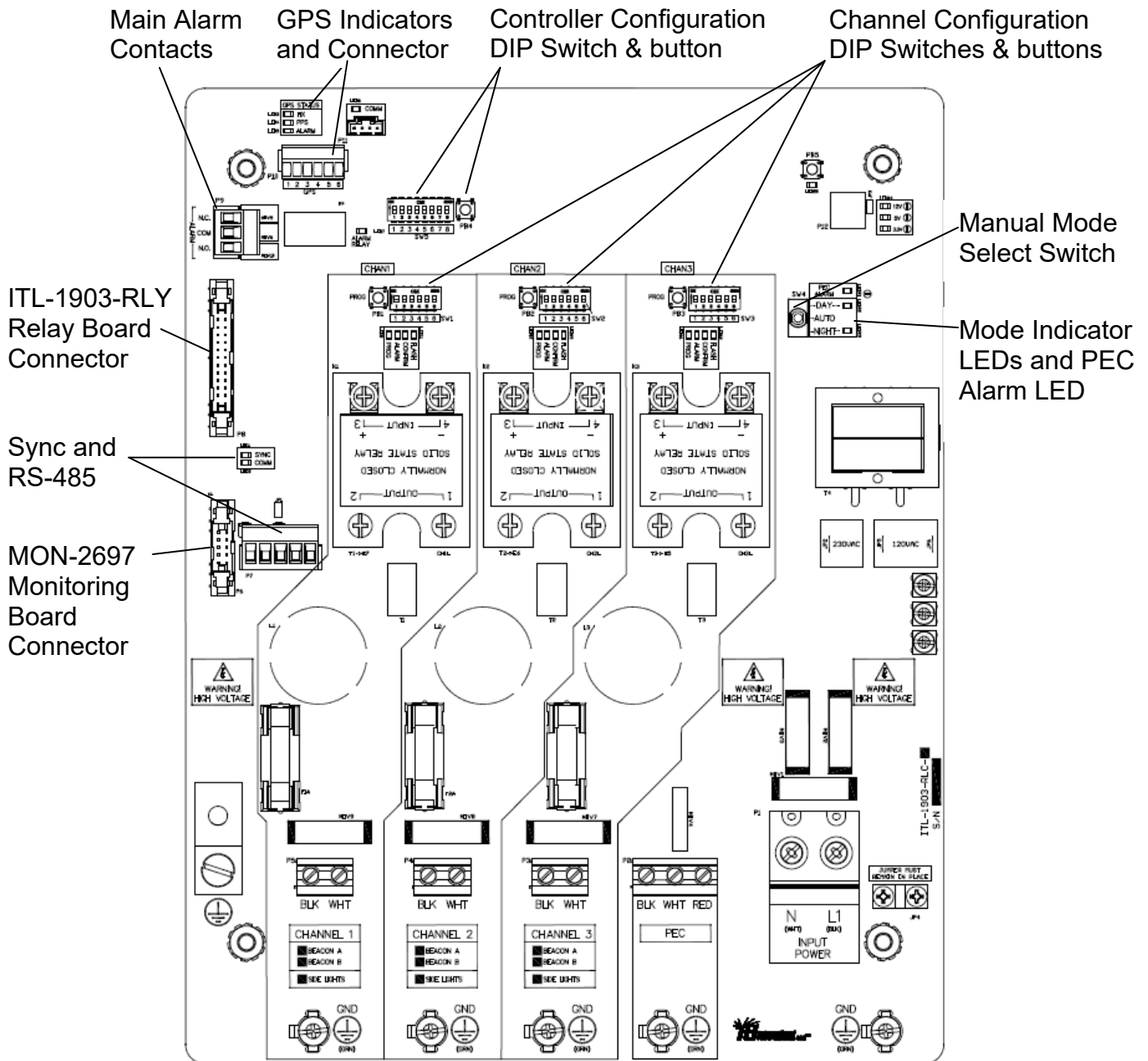
*When a second L-864 is not used the relay will be de-energized (alarm state) but the alarm indicator LED will not light.

ITL-1923-RLY Relay Board , Connector P2			
Pin	Name	Function	Notes
6	GPS ALARM	N.O.	Indicates the GPS is unable achieve a Fix.
5		COM	
4		N.C.	
3	NIGHT MODE	N.O.	Indicates night mode operation when energized
2		COM	
1		N.C.	

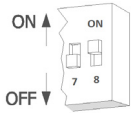
ITL-1923-RLY Relay Board , Connector P1			
Pin	Name	Function	Notes
6	PEC ALARM	N.O.	Indicates the photoelectric cell has not transitioned over a 24 hour period.
5		COM	
4		N.C.	
3	POWER FAIL	N.O.	Indicates a loss of input power.
2		COM	
1		N.C.	

RLC-1903 Controller Setup and Operation





































The RLC-1903 features a flexible architecture allowing any channel can be setup to control one or two flashing beacons (L-864) or a group of side lights (L-810). Channel 1 should be used to control the lowest lights on the tower and higher channels for lights located higher on the tower. Setup and operation of the RLC-1903 is performed using the Controller Configuration DIP switch, Channel Configuration DIP Switches, and the Manual Mode Select Switch.



Controller Configuration Switches, SW5

SW5 – Controller Configuration Switches		
Number	Description	Function
1	Program Enable	See section <i>Alarm Threshold Programming</i>
2	(Reserved)	MUST BE OFF
3	20 FPM	ON – 20 FPM Operation (Legacy) OFF* – 30 FPM Operation (Standard)
4	Extended Duty Cycle	ON – Extended Duty Cycle Enabled, 58% when 30FPM selected, 67% when 20FPM selected. OFF* – Extended Duty Cycle Disabled, Duty cycle is 50% (Standard)
5	GPS Enable	ON – GPS Sync ON OFF* – GPS Sync OFF
6	Catenary Enable	MUST BE OFF OFF* – Standard Operation ON – Catenary Operation Enabled (L-885)
7,8	 RS-485 ADDRESS	RS-485 Address: 7 OFF 8 OFF - 1 7 OFF 8 ON - 2 7 ON 8 OFF - 3 7 ON 8 ON - 4
*The factory default setting for all dip switches is OFF		

Channel Configuration Switches, SW1, SW2 & SW3

Channel Configuration Switches SW1 – Channel 1, SW2 – Channel 2, SW3 – Channel 3																				
Number	Description	Function																		
1,2	<table border="1"> <thead> <tr> <th colspan="2">TYPE</th> </tr> </thead> <tbody> <tr> <td></td> <td>IFH-1700</td> </tr> <tr> <td></td> <td>IFH-1900</td> </tr> <tr> <td></td> <td>(RESERVED)</td> </tr> <tr> <td></td> <td>SIDE LIGHTS</td> </tr> </tbody> </table>	TYPE			IFH-1700		IFH-1900		(RESERVED)		SIDE LIGHTS	<p>Type:</p> <p>1 OFF 2 OFF - IFH-1700-01R (L-864) 1 ON 2 OFF - IFH-1900-01R (L-864) 1 OFF 2 ON - (Reserved) 1 ON 2 ON - MKR-LTG1-01R (L-810) Side Lights</p>								
TYPE																				
	IFH-1700																			
	IFH-1900																			
	(RESERVED)																			
	SIDE LIGHTS																			
3	Flashing Side Lights	<p>OFF – Side Lights Flash ON – Side Lights Steady</p>																		
4,5,6	<table border="1"> <thead> <tr> <th colspan="2">QUANTITY</th> </tr> </thead> <tbody> <tr> <td></td> <td>0 CHANNEL DISABLED</td> </tr> <tr> <td></td> <td>1</td> </tr> <tr> <td></td> <td>2</td> </tr> <tr> <td></td> <td>3</td> </tr> <tr> <td></td> <td>4</td> </tr> <tr> <td></td> <td>5</td> </tr> <tr> <td></td> <td>6</td> </tr> <tr> <td></td> <td>7</td> </tr> </tbody> </table>	QUANTITY			0 CHANNEL DISABLED		1		2		3		4		5		6		7	<p>Quantity:</p> <p>4 OFF 5 OFF 6 OFF - 0 (CHANNEL DISABLED) 4 OFF 5 OFF 6 ON - 1 4 OFF 5 ON 6 OFF - 2 ⁽¹⁾ 4 OFF 5 ON 6 ON - 3 4 ON 5 OFF 6 OFF - 4 ⁽²⁾ 4 ON 5 OFF 6 ON - 5 4 ON 5 ON 6 OFF - 6 4 ON 5 ON 6 ON - 7</p> <p>(1) Maximum of 2 L-864 Flash Heads per channel. (2) Maximum of 4 L-810 Side Lights per channel.</p>
QUANTITY																				
	0 CHANNEL DISABLED																			
	1																			
	2																			
	3																			
	4																			
	5																			
	6																			
	7																			
*The factory default setting for all dip switches is OFF																				

Channel Indicator Lights

Channel Indicator Lights	
Description	Function
PROG (blue)	Steady – Channel is using field programmed alarm thresholds. Off – Channel is using factory default alarm thresholds. Flashing – See <i>Alarm Threshold Programming</i> section of manual.
ALARM (red)	On – Alarm present on channel. Off – Alarm not present on channel.
CONFIRM (green)	On when the RLC-1903 confirms that the channel is drawing the correct current.
FLASH (yellow)	On when the RLC-1903 channel is on.

Controller Indicator Lights

Indicator Lights	
Description	Function
ALARM RELAY (red)	Indicates that an alarm condition exists.
PEC ALARM (red)	Indicates that the photoelectric cell has failed to transition during the previous 24 hour period. The controller defaults to night mode operation when the PEC alarm is active.
DAY MODE (yellow)	Steady – Day mode operation via photoelectric cell. Flashing – Day mode operation via manual mode select switch.
NIGHT MODE (yellow)	Steady – Night mode operation via photoelectric cell. Flashing – Night mode operation via manual mode select switch.
SYNC (yellow)	Blinks when a sync signal is received.
COMM (green)	Blinks when RS-485 communication is active.

GPS Indicator Lights

The GPS indicator lights are located above the GPS connector, P10 in upper left corner of the main panel.

GPS Indicator Lights	
Description	Function
FIX (green)	Off – GPS has no fix or is disabled. Steady – GPS has a fix and flashing is synchronized. Flashing – GPS is communicating but does not have a fix.
ALARM (red)	On – GPS alarm present. Off – GPS alarm not present.
PPS (green)	Off – GPS has no fix or is disabled. Flashing – GPS Pulse Per Second signal is present.

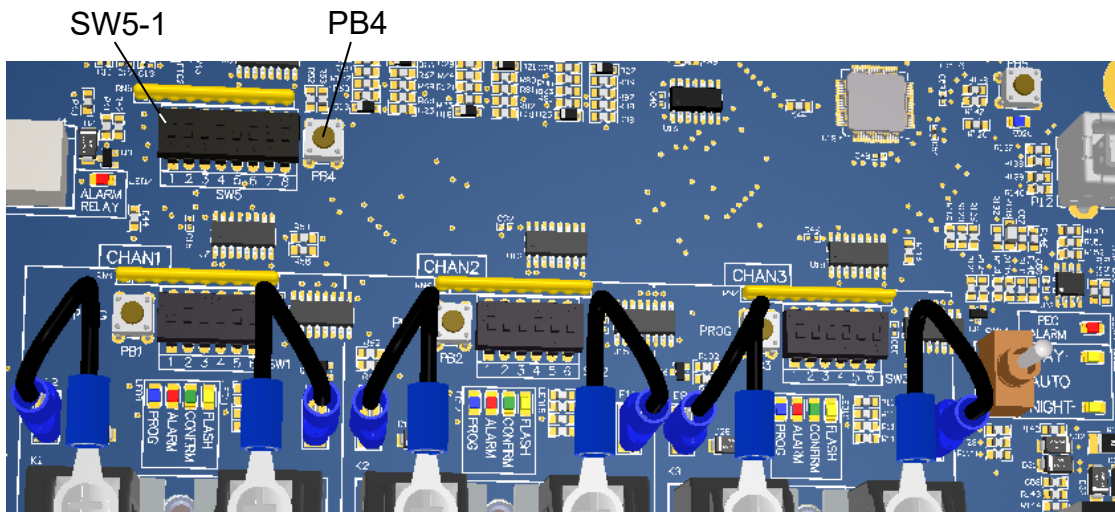
Manual Mode Select Switch, SW4

The Manual Mode Select Switch overrides the photoelectric cell (PEC) to allow selection of Day mode or Night Mode for test or troubleshooting purposes. The Day or Night Mode lights flash when in manual mode and the PEC alarm will activate. This switch should be left in the AUTO position for normal operation. In the AUTO position the operating mode is determined by the photoelectric cell. The switch has an 8 hour time limit for manual mode operation after which the controller will resume automatic operation determined by the PEC.

Alarm Threshold Programming

The RLC-1903 contains permanent factory set alarm thresholds for all models of L-864 and L-810 obstruction lights listed in the *Specifications* section. Only the model numbers listed should be used with this controller. Alarm threshold programming can be used to automatically make minor adjustments to the alarm thresholds to compensate for installation specific performance differences.

Before programming alarm thresholds all electrical connections to obstruction lights (L-864 and L-810) must be complete and the lights fully operational. Channel Configuration DIP switches (SW1, SW2 and SW3) must be set correctly for all channels. See section *Channel Configuration Switches*. The RLC-1903 must be operating in Night Mode in order to program the alarm thresholds.



To begin programming turn on DIP switch SW5-1 (SW5, Switch #1) and within 5 seconds press button PB4. All blue channel PROG indicator LEDs will begin to fast blink. After several seconds the PROG indicator LEDs will slow blink to indicate that programming may proceed. Press the PROG button (PB1, PB2 or PB3) for any channel you wish to program. If programming is successful the blue PROG indicator LED for the channel will turn on solid. When programming is complete press PB4.

Programming may be stopped at any time by pressing PB4. Programming will stop automatically after about 30 seconds. Channels using programmed alarm thresholds are indicated by the blue PROG indicator LEDs being on solid.

To stop using programmed alarm thresholds and return to factory defaults turn OFF DIP switch SW5-1. To erase all programmed alarm threshold data start the programming process (turn on SW5-1 then press PB4) then end programming (press PB4) without pressing any of the channel PROG buttons (PB1, PB2 or PB3) then turn OFF SW5-1. Factory default alarm thresholds cannot be erased.

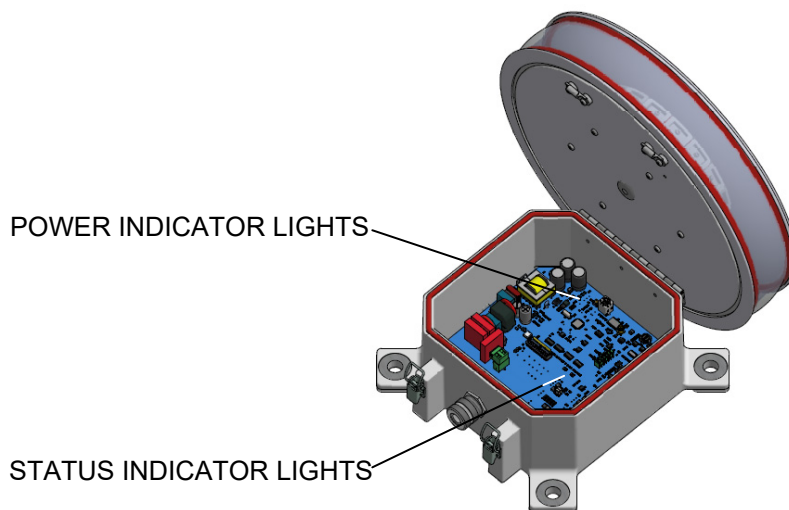
IFH-1900-0IR Operation

The IFH-1900-0IR flash head does not require any configuration. DIP switch SW1 should be left in the factory default positions.

IFH-1900-0IR Indicator Lights

The IFH-1900-0IR flash head contains several indicator lights that can be of assistance in determining the cause of a failure. The indicator lights are located on the main control board in the bottom of the flash head.

IFH-1900-0IR Indicator Lights	
Description	Function
24V (green)	On – Indicates 24VDC power present.
5V (green)	On – Indicates 5VDC power present.
3.3V (green)	On – Indicates 3.3VDC power present.
FLASH (yellow)	On – Indicates that AC power is applied to the input power connector P1.
CONFIRM (green)	On – Indicates that the correct current is present in both the Red LED string and the Infrared Emitter string.
RED ALARM (red)	On – Indicates a failure of the Red LED string.
IR ALARM (red)	On – Indicates a failure of the Infrared Emitter string.



Spare Parts & Replacement Parts

ITL Part Number	Description
ITL-1923-RLY	10-Relay Dry-Contact Alarm Board
ITL-1903-RLC	Controller Main Board
ITL-1900-CPS	Flash Head Main Board
RLY-2440-B00	Solid State Relay
FUS-002A-3AG	Fuse, 2A, Slow-blow
IFH-1900-0IR	L-864(L) Flash Head
MKR-LTG1-0IR	L-810(L) Obstruction Light, (LED with Infrared)
ANT-018X-GPS-KIT	GPS Antenna Kit
PEC-1800-120	Photoelectric Cell (PEC)
PEC-SOCK-000	Socket For Photoelectric Cell

Technical Support and Contact Info

Contact Info

For information on the ILS-1900-0IR Obstruction Lighting System's basic functions, refer to this manual. For additional help with the installation or operation of any ITL products, please contact ITL, LLC at one of the following below.

Web and Internet Sites

Corporate home page: <http://www.itl-llc.com>



Customer Support Technicians

8:00 AM - 5:00 PM Central Time

US and Canada call: +1-615-256-6030

Toll Free: +1-866-624-8309

Email: support@itl-llc.com

RMA

Please contact ITL, LLC before returning equipment for repair and obtain a Return Material Authorization (RMA) number.

Revision	Description of Change	Date	Preparer / Approval
0	Initial Release	3/13/2019	Prepared By: Ryan Gregory Approved By: Andy Rudolph
1	Adjusted power consumption specifications. Revised figures for removal of Filter RTN terminal. Edited Theory of Operation for clarity.	12/19/2019	Prepared By: Ryan Gregory Approved By: Andy Rudolph
2	Revised notes for broadcast tower installation	9/3/2020	Prepared By: Ryan Gregory Approved By: Andy Rudolph
3	Electrical Connection, showing Dual Side Light	12/18/2020	Prepared By: Ryan Gregory Approved By: Andy Rudolph
4	Added Max VA information to electrical specifications	1/21/2021	Prepared By: Ryan Gregory Approved By: Andy Rudolph
5	Updated Info for Channel Configuration Switches "Maximum ... per Channel.)	2/11/2021	Prepared By: Elke Hinson Approved By: Andy Rudolph
6	Added Info for Transport Canada.	3/4/2021	Prepared By: Elke Hinson Approved By: Josh Crown
7	Changed from "complied" to "verified" ETL. Added Flash Head Grounding information.	6/2/2021	Prepared By: Elke Hinson Approved By: Andy Rudolph