

# Installation Instruction

IFH-1910-01R  
Red/IR (L-864(L)) LED  
Beacon

Wind Turbine  
Obstruction  
Lighting System



## VENTUS



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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.

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.

Disconnect power at the circuit breaker panel and wait at least 30 seconds before servicing. Do not rely on interlock switches for removing power. Energy storage capacitors can maintain high voltage long after power has been disconnected. Verify that all high voltage warning lights are completely off. Measure all high voltage sources using a DC voltmeter to ensure that power is off and has been completely removed before servicing.

DISCLAIMER: System is not equipped with an interlock switch and is not field serviceable under any circumstances. Only attempt repairs in a lab setting.

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



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



## Table of Contents

The fastest way to find a specific topic is to use the detailed index in the back of the manual.

List of Illustrations and Tables .....	5
Introduction .....	6
Product Description.....	6
Specifications.....	7
Environment .....	7
Light Output.....	7
Mechanical .....	7
Electrical.....	7
Installation.....	8
Unpacking your Lighting System .....	8
Tools for Installation .....	8
Quick Installation Guide .....	8
Flash Head Mounting.....	10
Leveling.....	11
Grounding .....	12
System Overview .....	12
Wiring Diagram .....	14
Setup and Operation.....	15
Flash Inhibit Input.....	17
Maintenance / Trouble-Shooting .....	18
Maintenance.....	18
Recommended Tools .....	19
Troubleshooting.....	19
Spare Parts & Replacement Parts .....	21

**List of Illustrations and Tables**

Figure 1: IFH-1910-0IR Series Obstruction Lighting System .....6  
Figure 2: IFH-1910-0IR Cable/Wire Identification .....9  
Figure 3: IFH-1910-0IR Flash Head Dimensions and Mounting Detail ..... 10  
Figure 4: Flash Head Leveling - Axis 1 ..... 11  
Figure 5: Flash Head Leveling - Axis 2 ..... 11  
Figure 6: IFH-1910-0IR Grounding Using Mounting Bolt ..... 12  
Figure 7: IFH-1910-0IR Grounding Using External Ground Lug ..... 12  
Figure 8: IFH-1910-0IR Block Diagram..... 13  
Figure 9: IFH-1910-0IR Wiring Diagram ..... 14  
Figure 10: IFH-1910-0IR Controller Board DIP Switch Settings..... 15  
Figure 11: IFH-1910-0IR Controller Board LED Indicators..... 15  
Figure 12: Serial Connection Pinout ..... 16  
Figure 13: IFH-1910-0IR Replacement Parts Detail.....21  
Figure 14: IFH-1910-0IR Flash Head Parts List Table .....21

## Introduction

Congratulations, and thank you for choosing a VENTUS lighting system component.

We trust that our reputation for technical excellence, experience in product development, commitment to our customers and testing will ensure your complete satisfaction.

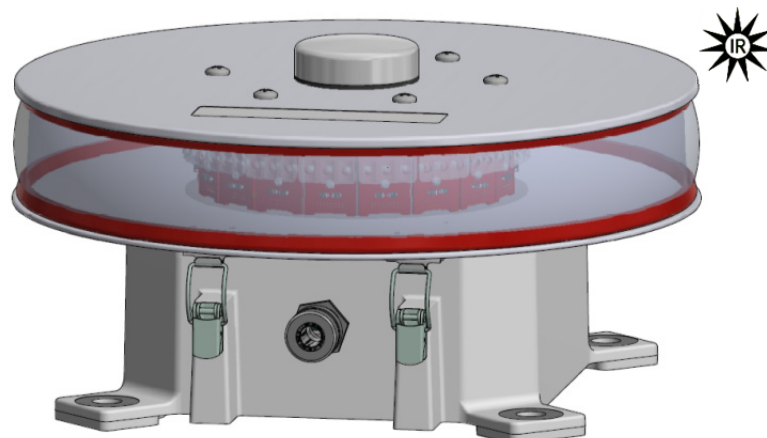
You have chosen one of the most technologically innovative lighting components available on the market today. This product is the result of many years of engineering with extensive input from field service personnel.

This manual covers the IFH-1910-0IR. Please take the time to read and familiarize yourself with this manual. It contains the information necessary to install, test and troubleshoot the flash head.

## Product Description

The ILS-1910-0IR, FAA type L-864(L) 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. For more information on those specifications, please refer directly to the FAA website [www.faa.gov/airports/resources/advisory\\_circulars](http://www.faa.gov/airports/resources/advisory_circulars).

The IFH-1910-0IR is a complete L-864(L) red lighting system containing an integral controller and photocell. The IFH-1910-0IR can be set for either 20 or 30 flashes per minute (FPM) using DIP switches on the controller board. The IFH-1910-0IR comes with a 50-foot flexible power cable installed.



*Figure 1: IFH-1910-0IR Series Obstruction Lighting System*

## Specifications

ETL Certified to FAA AC 150/5345-43J, Type L-864(L) and TVOC  
Transport Canada CAR 621

## Environment

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

## Light Output

Night Intensity	2,000 +/-25% effective candelas
Beam Pattern	360° horizontal, ≥3° vertical

## Mechanical

Dimension	Height: 11" (28cm)
	Diameter: 16.5" (42cm)
Weight	28lbs (13Kg) max

## Electrical

Input Power	120-240VAC, 50/60Hz
Average VA	30 VA @ 120VAC
Peak VA	56.7 VA

## Installation

The following section describes how to install the lighting system.

### Unpacking your Lighting 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 flash head.

- Digital multi-meter
- Nut Drivers and Sockets
- Compact “torpedo” level

### Quick Installation Guide

The quick start guide shows how to install the IFH-1910-0IR Series Obstruction Lighting System.

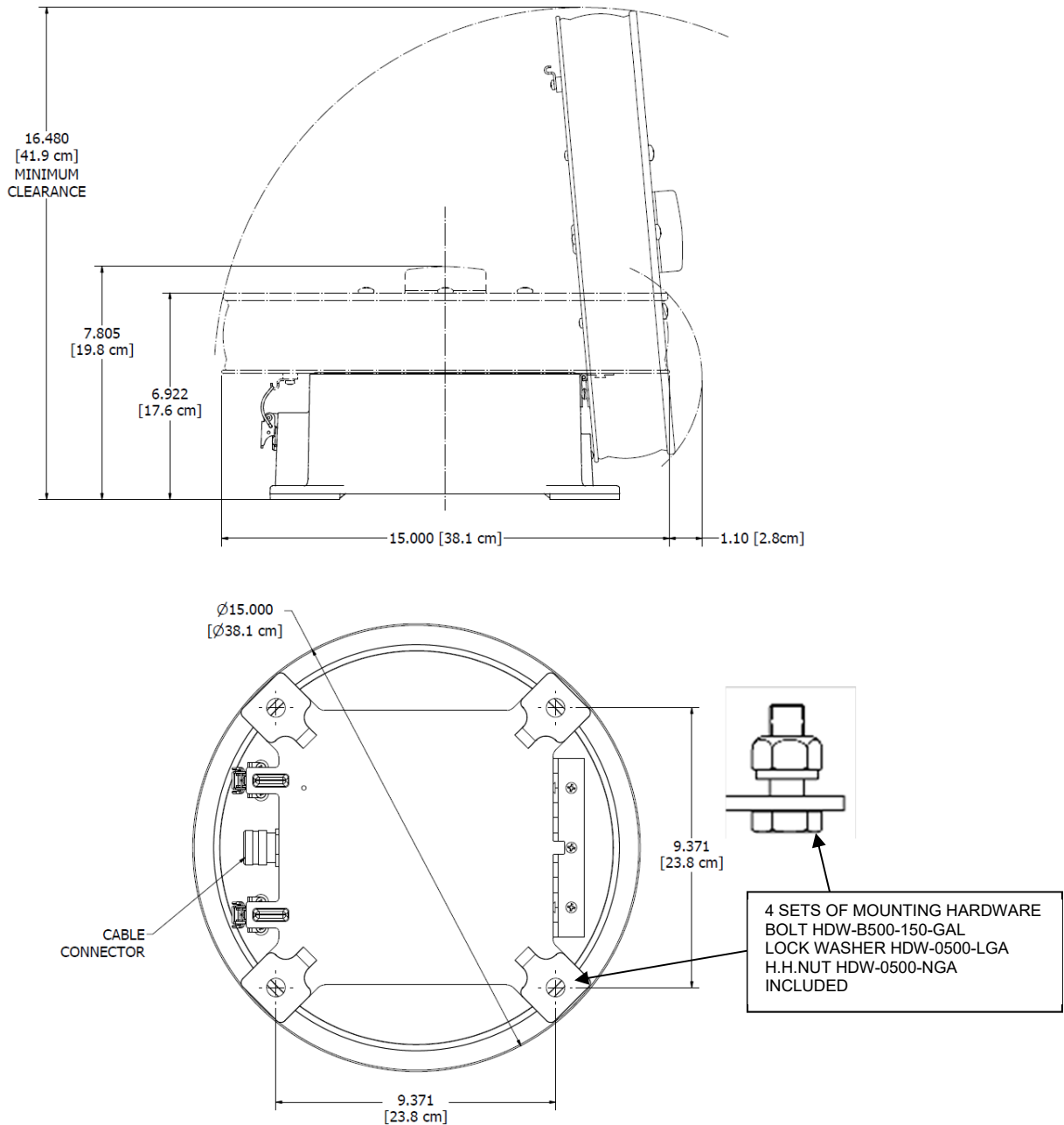
- Remove power to existing lighting system controller by turning off circuit breaker(s).
- Verify that power has been removed by measuring all input voltages using a multi-meter.
- Remove any packaging material from inside the flash head.
- Install flash head using supplied hardware following the Flash Head Leveling procedure in this manual. The IFH-1910-0IR must be mounted in the upright position.
- Ground the flash head using the lug provided on the outside of the flash head base or using the ring lug provided and mounting bolts as described in the grounding section of this manual
- Connect flash head power cable (see cable/wire identification table below).
- Apply power to obstruction lighting system.
- The IFH-1910 flash head contains a photodiode to measure ambient light level for automatic day/night mode control. If installing during the day time it will be necessary to cover the IFH-1910-0IR flash head until night mode operation begins.
- Verify that IFH-1910-0IR flashes red light at the appropriate rate.
- Verify that the IFH-1910-0IR does not alarm while operating in night mode.
- Uncover the IFH-1910-0IR flash head.

NAME	COLOR	DESCRIPTION
L1	Black	AC Power in
N	White	Neutral
GND	Green	Chassis Ground
N.C.	Orange	Alarm Normally Closed
COM	Red	Alarm Common
N.O.	Blue	Alarm Normally Open
INH+ (RS-485)	Brown	Flash Inhibit Input*
INH- (RS-485)	Yellow	Flash Inhibit Input*
RS-232+	Grey	Serial Connection
RS-232-	Purple	Serial Connection
*Flash Inhibit input for connection to Aircraft Detection System.		

*Figure 2: IFH-1910-0IR Cable/Wire Identification*

## Flash Head Mounting

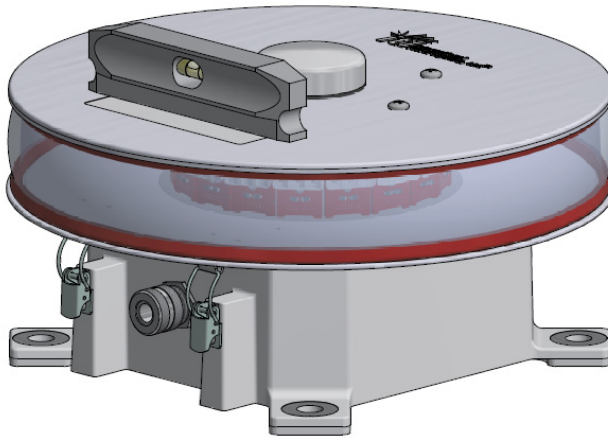
The IFH-1910-0IR must be mounted so as to provide an unobstructed 360 degree view for approaching aircraft. If is not possible to achieve this with a single IFH-1910-0IR then multiple flash heads may be required. Mount the IFH-1910-0IR using supplied hardware such that access to internal components via the hinged and latched top is not compromised.



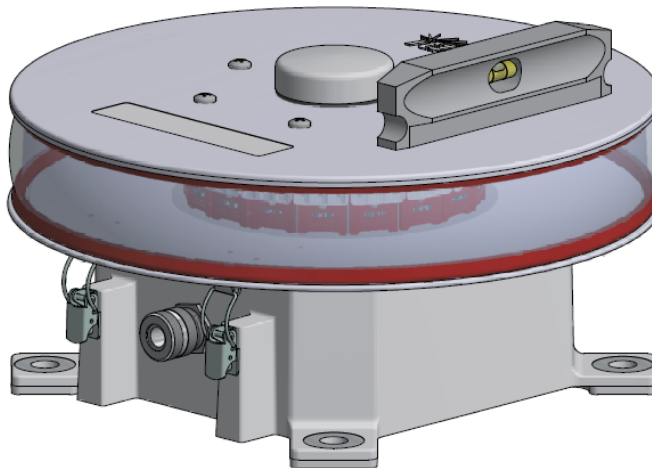
*Figure 3: IFH-1910-0IR Flash Head Dimensions and Mounting Detail*

**Leveling**

The IFH-1910-0IR must be leveled properly for correct vertical beam spread. The following diagrams detail how to use a compact “torpedo” level on two axes to ensure that the flash head is mounted level. If the flash head mounting surface is not level shims may be necessary to achieve a level installation.



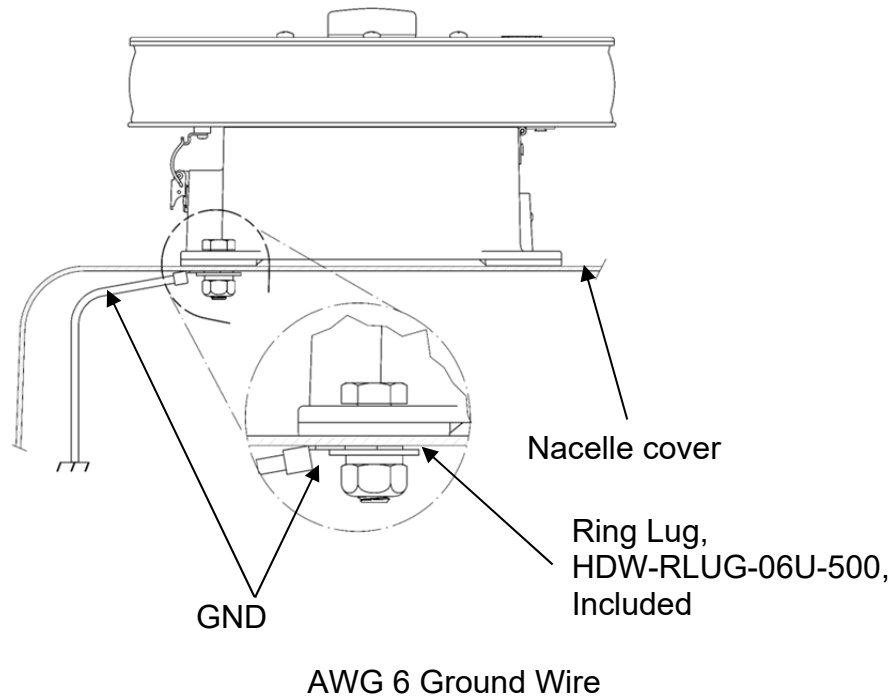
*Figure 4: Flash Head Leveling - Axis 1*



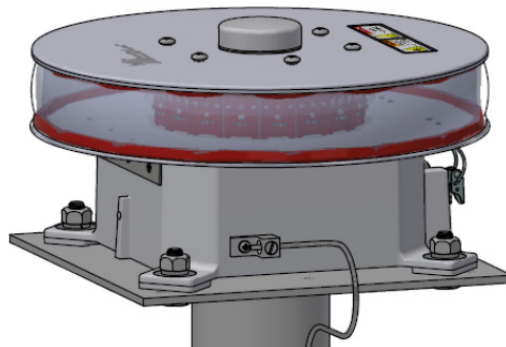
*Figure 5: Flash Head Leveling - Axis 2*

**Grounding**

The IFH-1910-0IR should be connected to the wind turbine grounding system using a minimum AWG 6 copper conductor. Fiberglass nacelle covers are non-conductive and do not provide a ground connection. Grounding may be achieved via the external ground lug or via a mounting bolt as shown below.



*Figure 6: IFH-1910-0IR Grounding Using Mounting Bolt*



*Figure 7: IFH-1910-0IR Grounding Using External Ground Lug*

## System Overview

The major components of the IFH-1910-0IR are shown in the block diagram below. A six-conductor flexible cable comes pre-installed to provide power and access to a Form-C alarm contact. The internal controller monitors an integrated photocell to determine the appropriate operating mode (day or night). In night mode the internal controller uses solid state electronics to alternate AC power to the IFH-1910-0IR power supply at appropriately timed intervals to create the selected flash rate. IFH-1910-0IR uses an integrated GPS receiver and antenna to determine the exact time and synchronizes the flash sequence with other IFH-1910-0IR units or competitor's units. The AC current to the power supply is monitored and an alarm generated if the current falls below the normal operating range or if the integrated flasher circuit fails. The IFH-1910-0IR power supply converts AC power into a controlled DC current. The controlled DC current flows through all 18 LED modules via two series LED strings causing the LEDs to produce light. Each LED module contains one high power LED and one IR emitter with a custom optic mounted in front of each module. The optic focuses the light from the LED and IR emitter into the required beam pattern.

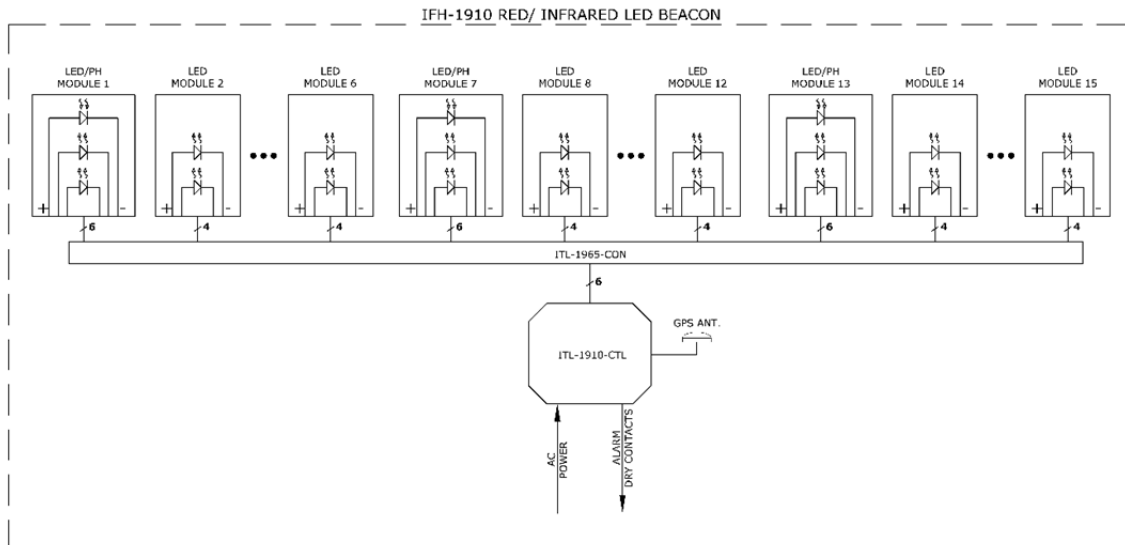


Figure 8: IFH-1910-0IR Block Diagram

Wiring Diagram

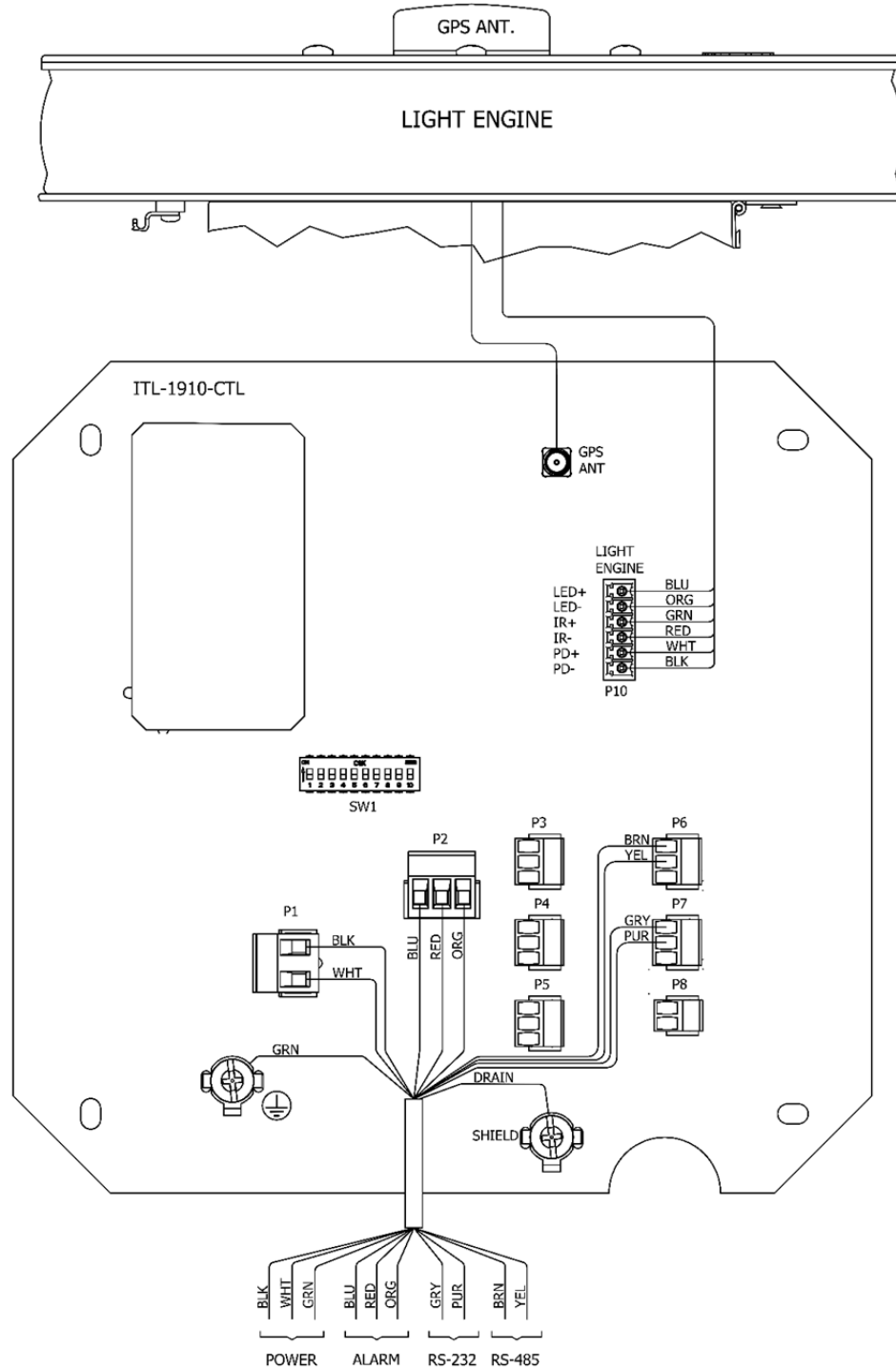


Figure 9: IFH-1910-0IR Wiring Diagram

## Setup and Operation

All setup functions are performed using the 12-position DIP switch, SW1, on the controller board. SW1 setup functions are described in the table below. The factory default position for all switches is OFF. Thirteen indicator LEDs show the status of the LED beacon and GPS, as well as the operating mode. LED Indicator functions are shown in the table below.

SW1	DESCRIPTION
1	20 FPM Enable*
2	Extended Duty Cycle Enable
3	GPS Alarm Disable
4	Infrared Disable
5	Analog Dimming Enable
6	Digital Dimming Enable
7	Local Inhibit Enable
8	N/A
9	Use UTC Time
10	Modbus Master
11	Modbus Address Bit 1
12	Modbus Address Bit 0
*FLASH RATE must be 30 FPM for Certified Operation	

Figure 10: IFH-1910-0IR Controller Board DIP Switch Settings

LED	DESCRIPTION
MODE	DAY – System Operating in Day Mode NIGHT – System Operating in Night Mode
INTENSITY	FAA – Full FAA Specified Intensity DIM1 – 30% Full FAA Specified Intensity DIM2 – 10 % Full FAA Specified Intensity
INHIBIT	ON indicates flash inhibit active
ALARMS	RED – Indicates issue with Red output IR – Indicates issue with IR output PEC – Indicates issue with PEC sensor GPS – Indicates issue with GPS sensor
PPS	GPS Pulse Per Second indicator
GPS FIX	ON indicates GPS link established
CONFIRM	Blinks after each flash to indicate correct flash energy measured
FLASH	ON indicates flash in progress

Figure 11: IFH-1910-0IR Controller Board LED Indicators

SERIAL CONNECTION	DESCRIPTION
RS-485	P6-1: 485A P6-2: 485B P6-3: GND
RS-232	P7-1: TXD P7-2: RXD P7-3: GND

*Figure 12: Serial Connection Pinout*

## Flash Inhibit Input

A Flash Inhibit Input is available for connection to an Aircraft Detection System (ADS). The input accepts 12 to 240 VAC or VDC (polarity insensitive) to inhibit flashing when no aircraft are detected by the ADS. The INHIBIT LED will flash to indicate flashing is inhibited. When no signal is present on the Flash Inhibit Input the IFH-1910-0IR will operate in the mode determined by the photocell. This function must be enabled via DIP switch SW1.

When flashing is inhibited, in order to verify continuing operational readiness, the IFH-1910-0IR will perform a Readiness Test beginning around midnight Pacific Time each day. The Readiness Test will cause the IFH-1910-0IR to operate in night mode (flashing) for approximately one minute. Should the IFH-1910-0IR detect a malfunction during the Readiness Test, the alarm relay will activate and remain activated after the test period ends. The alarm will clear upon the next test cycle where no malfunction is detected. The alarm will also clear if the Flash Inhibit Input is de-activated or if power to IFH-1910-0IR is cycled.

The ADS must deactivate the Flash Inhibit Input for at a minimum of one second every 24 hours. Failure of the ADS to deactivate the Flash Inhibit Input will result in the IFH-1910-0IR resuming normal operation with the mode determined by the photodiode.

- DIP Switch SW1-7 must be ON to enable the Flash Inhibit Input.
- Flash Inhibit Input electrical connections are made using the Brown & Yellow wires in the flash head cable.
- The Flash Inhibit Input accepts 12 to 240 VAC or VDC to inhibit flashing.
- The INHIBIT LED flashes when the beacon is inhibited.
- A Readiness Test is automatically performed once every 24 hours.
- The ADS must deactivate the Flash Enable Input once every 24 hours.

## Maintenance / Trouble-Shooting

Please read section *Safety Warning* in this manual before servicing this equipment. Disconnect power to the tower lighting controller at the circuit breaker(s) before attempting maintenance/trouble-shooting.

### Maintenance

The maintenance outlined below should be performed at least once annually. After 5 years of normal operation is recommended that the light engine be replaced. Periodic cleaning of the clear cover with a standard glass or acrylic cleaner is recommended

- Verify that the fixture is functional in all operating modes with no indication of an alarm condition on alarm indicator lights, alarm dry contacts, or digital monitoring interfaces.
- Verify that the photodiode control operates the system in the correction operating mode (day/night), light color (white/red) and intensity (day/night intensity) when exposed to light and dark ambient lighting conditions.
- Inspect the fixture for any type of obstruction that could block light output at any point along the 360 degree horizontal output of the fixture. Note that multiple fixtures may be used to achieve 360 degree coverage.
- Inspect lenses and transparent covers for damage.
- Clean the fixture lens or transparent cover using a mild detergent and soft nonabrasive cloth.
- Inspect all electrical wiring connections for corrosion, arcing, damage, insulation degradation or loosening of the connection. Correct, replace or secure as needed.
- Inspect all interconnecting cables and power supply cables and conduits for damage.
- Verify the all cables are fastened securely at appropriate intervals to prevent damage.
- Inspect all electrical components for evidence of damage caused by lightning or power line induced electrical surges. Replace any components showing evidence of damage.

- Inspect fixtures and enclosures for water infiltration and insect infiltration. Replace any damaged gaskets or seals. Install plugs to close any unused conduit ports that may allow insect infiltration.
- Verify that all breathers and drain holes are clear of blockages.

### Recommended Tools

The following is a list of recommended electrical equipment for troubleshooting the IFH-1910-0IR Series Obstruction Lighting Systems.

- Digital multi-meter
- ITL-0705-TST LED Module Tester (supplied with KIT-1910-LED-IR)
- #2 Phillips Screwdriver (8" or longer blade length)
- Small tip (<0.1") slotted screw driver
- Needle Nose Pliers

### Troubleshooting

Should the IFH-1910-0IR fail to produce light, perform the following steps:

Verify that AC power is being supplied to IFH-1910-0IR.

Press and hold the TEST button on the controller board for two seconds. Using a digital voltmeter measure the AC voltage on controller board from P1-1 to P1-2 (black to white). For 10 flash cycles after pressing TEST the controller should enter night mode operation. The MODE indicator LED should flash during this time. The controller board should produce a pulsing AC voltage on P3. If this fails to happen replace the controller board.

Using a digital multi-meter measure the DC voltage from P10-6 to P10-5 (blue to orange) on the power supply board. Normal operating voltage is 33 to 36VDC.

- On P10-6 to P10-5 a voltage near 45V indicates that one of the eighteen LED modules may have failed. Use an ITL-0705-TST Tester to check each LED and replace as necessary. If an LED module has failed, check for and replace any damaged optics on that module. Be sure that the optics snap into the alignment holes on the LED modules during replacement.

Using a digital multi-meter measure the DC voltage from P10-4 to P10-3 (green to red) on the power supply board. Normal operating voltage is 18 to 21VDC.

- On P10-4 to P10-3 a voltage near 32V indicates that one of the eighteen LED module's IR emitters has failed. Check each IR emitter by replacing the LED module and measuring the voltage from P10-4 to P10-3. When

the voltage is within the normal range the failed IR emitter has been found. If an IR emitter has failed, check for and replace any damaged optics on that LED module. Be sure that the optics snap into the alignment holes on the LED modules during replacement.

**Spare Parts & Replacement Parts**

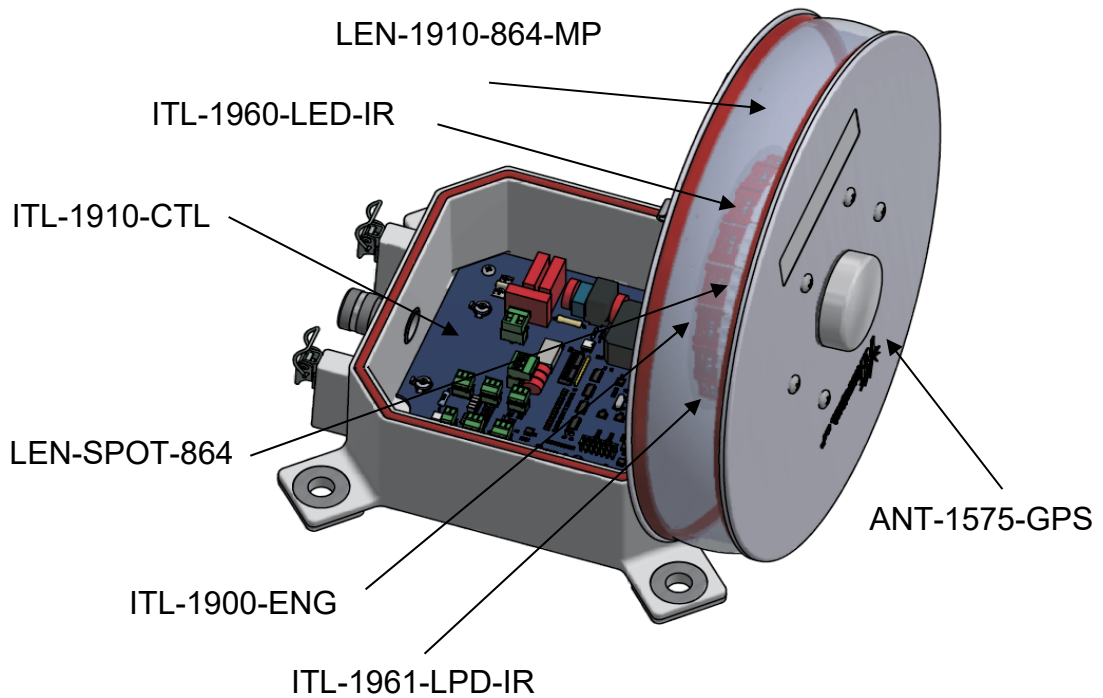


Figure 13: IFH-1910-0IR Replacement Parts Detail

PART NUMBER	DESCRIPTION
ITL-1910-CTL	CONTROL BOARD
ITL-1900-ENG	LIGHT ENGINE (Controller Board not included)
ITL-1960-LED-IR	LED MODULE WITH IR
ITL-1961-LPD-IR	LED MODULE WITH PD & IR
ITL-0705-TST	LED TESTER
ANT-1575-GPS	GPS ANTENNA
LEN-SPOT-864	LED OPTIC
LEN-1910-864-MP	CLEAR OUTER LENS
KIT-1910-LED-IR	REPAIR KIT. Kit includes one ITL-1960-LED-IR LED module, one LEN-SPOT-865 optic and one ITL-0705-TST LED module tester.
KIT-1910-LPD-IR	REPAIR KIT. Kit includes one ITL-1960-LED-IR LED module, one LEN-SPOT-865 optic and one ITL-0705-TST LED module tester.

Figure 14: IFH-1910-0IR Flash Head Parts List Table

