

# FLASH TECHNOLOGY



## VANGUARD® FTS 370i LED Integrated Beacon

Red LED Obstruction Lighting System  
Reference Manual  
Part Number F7913701

SERIAL NUMBER



Flash Technology, 332 Nichol Mill Lane, Franklin, TN 37067  
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FLASH TECHNOLOGY  
332 Nichol Mill Lane  
Franklin, TN 37067

**AIRPORT LIGHTING  
EQUIPMENT  
CERTIFICATION PROGRAM**

**CERTIFICATE OF  
CONFORMANCE**

The product described below is hereby approved for listing in the next issue of the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5345-53, Appendix 3 Addendum "Airport Lighting Equipment Certification Program. The approval is based on successful completion of tests in accordance with the specifications listed in, and the requirements for approval described in the Advisory Circular, and the reporting to the Program Administrator the results of such tests, accompanied by related documents by an Intertek recognized testing laboratory. This Certificate is only confirmable in conjunction with equipment being listed in AC 150/5345-53, Appendix 3, Addendum, as currently published by the FAA. The certification is not valid for a product modified with non-OEM replacement parts or non-production components.

L-864(L) – Lights, Obstruction, Red, 20-40 FPM (AC 150/5345-43G)	
Manufacturer	Manufacturer's Catalog Number
Flash Technology	FTS 370i (595) FTS 370i IR (595)
NOTE: (595) 1370175 LED	
Equipment meets the requirements of FAA Engineering Brief No. 67D additional requirements for "Light Sources Other Than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures" dated March 6, 2012.	

1. This Equipment requires continuing validation in accordance with the requirements of AC 150/5345-53, and the Intertek Airport Lighting Equipment Certification Program.
2. Product tested and Report issued by: Intertek

(A) Report No: 100836421CRT-001; 100856769CRT-001; 101527708CRT-001; 101527708MIN-008 (B) Date of Report: 10/2012; 9/2012; 4/2014; 4/2014

NOTE: PLEASE REVIEW, AND ADVISE ADMINISTRATOR AT INTERTEK IMMEDIATELY IF DATA, AS SHOWN, NEED TO BE CORRECTED.

Approved for Certification by:

Jeremy N Downs, P.E., Program Administrator  
Date: June 13, 2014

# >Flash Technology

## DECLARATION OF CONFORMITY

We, Flash Technology, 332 Nichol Mill Lane, Franklin, TN 37067, United States of America, declare that the product listed below is in conformity with the relevant provision(s) of the directive(s), as well as pertinent clause(s) of the standard(s) and other normative document(s) mentioned on this page.

**Product:**

FTS 370i

**Council Directive(s):**

Electromagnetic Compatibility Directive (EMC) 2004/108/EC

**Report Number:**

100837713BOX-001c

**Standards:**

CENELEC EN 61547: 1995

CENELEC EN 55015:2006;+A1:2007

**Tests:**

Radiated Emissions 30 MHz to 300 MHz	CENELEC EN 55015:2006;+A1:2007
Radiated Emissions 9 kHz to 30 MHz	CENELEC EN 55015:2006;+A1:2007
AC Mains Conducted Emissions	CENELEC EN 55015:2006;+A1:2007
Electro-Static Discharge Immunity Test	CENELEC EN61000-4-2:1995;+A1:1998;+A2:2001
Radiated, Radio-Frequency, Electromagnetic Immunity	CENELEC EN61000-4-3:2002
Electrical Fast Transient/Burst Immunity Test	CENELEC EN61000-4-4:2004
Immunity to Surges	CENELEC EN61000-4-5:1995;+A1:2001
Conducted, Radio-Frequency, Electromagnetic Immunity Test	CENELEC EN61000-4-6:1996;+A1:2001
Power Frequency Magnetic Field Immunity Test	CENELEC EN61000-4-8:1993;+A1:2001
Voltage Dips/Interruptions Immunity Test	CENELEC EN61000-4-11:2004

(Signature)



Name: David Duryea

Date: September 4, 2012

Title: Lighting Development Manager

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Rev. 1



# Certificate of Compliance

**Certificate:** 2389886

**Master Contract:** 170198

**Project:** 2557762

**Date Issued:** September 4, 2012

**Issued to:** Flash Technology Division of  
SPX Corporation  
332 Nichol Mill Ln  
Franklin, TN 37067  
USA  
Attention: David Duryea

*The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.*



*Sovan Bun*

**Issued by:** Sovan Bun

## **PRODUCTS**

**CLASS 3425 85** - LUMINAIRES - Luminaires - Miscellaneous - Certified to US Standards

**CLASS 3425 05** - LUMINAIRES - Luminaires - Miscellaneous

LED Beacon, model FTB 360i-2, rated 120V-240V, 50-60Hz, 28W

LED Beacon, model FTS 370i, rated 120V-240V, 50-60Hz, 3W

## **APPLICABLE REQUIREMENTS**

CSA C22.2 No. 250.0-08 – Luminaires

UL 1598, 3rd Ed. – Luminaires

UL 8750, 1st Ed. – Light Emitting Diode (LED) Equipment for use in Lighting Products

CSA C22.2 No. 250.13-12 – Light emitting diode (LED) equipment for lighting applications

UL 1638, 4th Ed. – Visual Signaling Appliances – Private Mode Emergency and General Utility Signaling (Used as a Guide)

## Test Verification of Conformity

On the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

<b>Applicant Name &amp; Address</b>	: Flash Technology 332 Nichol Mill Lane Franklin, TN 37067
<b>Product(s) Tested</b>	: Medium-intensity, Type B Obstacle Light (Red)
<b>Ratings and principal characteristics</b>	: 120-240Vac, Red, LED, 20 FPM
<b>Model(s)</b>	: FTS370i and FTS 370i IR
<b>Brand name</b>	: Flash Technology Vanguard LED Series
<b>Relevant Standard(s)/Specification(s)</b>	: International Civil Aviation Organization (ICAO), Aerodromes, Annex 14, Volume 1, Sixth Edition, dated July 2013  Photometric – : Table 6-1 and Table 6-3 (requirements, not recommendations)  Chromaticity – Appendix 1 Sec. 2.1.1
<b>Verification Issuing Office Name &amp; Address</b>	: Intertek Cortland – Lighting 3933 US Route 11 Cortland, NY 13045
<b>Date of Test(s)</b>	: April 4, 2014 through April 8, 2014
<b>Verification/Report Number(s)</b>	: 101527708CRT-001

**NOTE :** This verification is part of the full test report(s) and should be read in conjunction with it.



---

**Signature**  
**Name: Jeremy N. Downs P.E**  
**Position: Staff Engineer**  
**Original Issue Date: July 30, 2014**

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## **Front Matter**

### ***Abstract***

This manual contains information and instructions for installing, operating and maintaining the FTS 370i, FTS 370i IR, FTS 370i ICAO, and FTS 370i IR ICAO LED Integrated Beacons.

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### ***Trademark Acknowledgements***

Flash Technology<sup>®</sup> and Vanguard<sup>®</sup> are registered trademark names.

All trademarks and product names mentioned are properties of their respective companies and are recognized and acknowledged as such by Flash Technology.

### ***Applicable Specifications***

The FTS 370i and FTS 370i IR beacons meet or exceed requirements for an FAA Type L-864 beacon. The FTS 370i ICAO and FTS 370i IR ICAO beacons meet or exceed requirements for an ICAO Annex 14, Volume 1, 6<sup>th</sup> Edition Low Intensity Type B Obstacle Light.

### ***Disclaimer***

While every effort has been made to ensure that the information in this manual is complete, accurate and up-to-date, Flash Technology assumes no liability for damages resulting from any errors or omissions in this manual, or from the use of the information contained herein. Flash Technology reserves the right to revise this manual without obligation to notify any person or organization of the revision.

In no event will Flash Technology be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of or the inability to use this manual.

### ***Warranty***

Flash Technology warrants all components, under normal operating conditions, for 5 years.

### ***Parts Replacement***

The use of parts or components, in this equipment, not manufactured or supplied by Flash Technology voids the warranty and invalidates the third party testing laboratory certification which ensures compliance with FAA Advisory Circulars 150/5345-43G, 150/5345-53D, and Engineering Brief No. 67D. The certification is valid as long as the system is maintained in accordance with FAA guidelines (FR doc. 04-13718 filed 6-16-04).

## **Personnel Hazard Warning**

### ***Dangerous Voltages***

Dangerous line voltages reside in certain locations in this equipment. Also, this equipment may generate dangerous voltages. Although Flash Technology has incorporated every practical safety precaution, exercise extreme caution at all times when you expose circuits and components, and when you operate, maintain, or service this equipment.

### ***Avoid Touching Live Circuits***

Avoid touching any component or any part of the circuitry while the equipment is operating. Do not change components or make adjustments inside the equipment with power on.

### ***Do Not Depend on Interlocks***

Never depend on interlocks alone to remove unsafe voltages. Always check circuits with a voltmeter after turning the circuit breakers off. Under no circumstances remove or alter the wiring or interlock switches.

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## Section 1 - Overview

The FTS 370i LED Integrated FAA L-864 Flashing Red Beacon with Radar Compatible Interface as shown in Figure 1-1, (hereafter referred to as the beacon) is pre-wired with a power & alarm cable and operates from 120-240VAC 50/60 Hz. The only required customer connection is the AC line; as the beacon incorporates an integrated controller which flashes the beacon at night. The unit is equipped with an alarm contact and auxiliary control input for connection to a radar system interface. The fail-safe design of the interface allows for operation of the beacon if the radar system control wiring is interrupted. Also incorporated into the controller is a GPS receiver and antenna which allows synchronization to other beacons with no additional wiring. The beacon consists of 36 high-performance LEDs that provide the FAA required light output while consuming 99% less electrical power than an incandescent fixture.

The FTS 370i IR (Infrared) incorporates all features of the FTS 370i and adds 36 infrared LEDs. The addition of IR ensures visibility of the obstruction to pilots aided by night vision goggles (NVG). The combination of standard Red (620nm) LEDs and IR (850nm) LEDs ensures maximum visibility to pilots in all circumstances.

The FTS 370i ICAO and FTS 370i IR ICAO beacons provide the capabilities described above with ICAO Medium-intensity, Type B Obstacle Light (Red) compliance.

The beacon is designed for the lighting of wind turbines, towers, flare stacks, chimneys, offshore oil platforms, petrochemical facilities and other obstructions to aerial navigation, as specified by the FAA, FCC, ICAO and Transport Canada.

This manual provides guidance and recommendations for the installation and checkout of the beacon assembly. Please read this document in its entirety before installing the beacon.

### 1.1 Specifications

Type	FTS 370i: FAA L-864 Red Obstruction Light FTS 370i ICAO: Medium-intensity, Type B Obstacle Light			
Flash Rate	20/30/40 flashes per minute (FPM) (User Configurable)			
Intensity	2,000 ± 25% ECD			
AC Voltage	120 – 240V AC 50/60 Hz			
Night Power Consumption		Flash rate (200ms flash duration)		
		20 FPM	30 FPM	40 FPM
	FTS 370i *	7 Watts	9 Watts	11 Watts
	FTS 370i ICAO *	9 Watts	11 Watts	13 Watts
Operating Temperature	-40°F to +131°F (-40°C to +55°C)			
Aux Input Control Voltage	5 – 30 Volts AC/DC			
Height / Width	8.69" x 15.75" (220.7mm x 400 mm)			
Bolt Hold Down	Standard 13.25" (336.5 mm)			
Weight	26.3 lbs. (11.93 kg); With 50ft cable: 32.3 lbs. (14.7 kg)			

\* Wattage with or without IR. Power Consumption is 5 Watts in standby.

### **1.1.1 Regulatory Compliance and Certifications**

- ETL Certified to Federal Aviation Administration (FAA): AC No. (150/5345-43G). FAA Engineering Brief No. 67D
- Compliant to Canadian Aviation Regulation (CAR): CAR 621.19
- FTS 370i ICAO, FTS 370i IR ICAO: International Civil Aviation Organization (ICAO), Aerodromes, Annex 14, Volume 1, Sixth Edition, dated July 2013

## 1.2 Beacon Component Identification

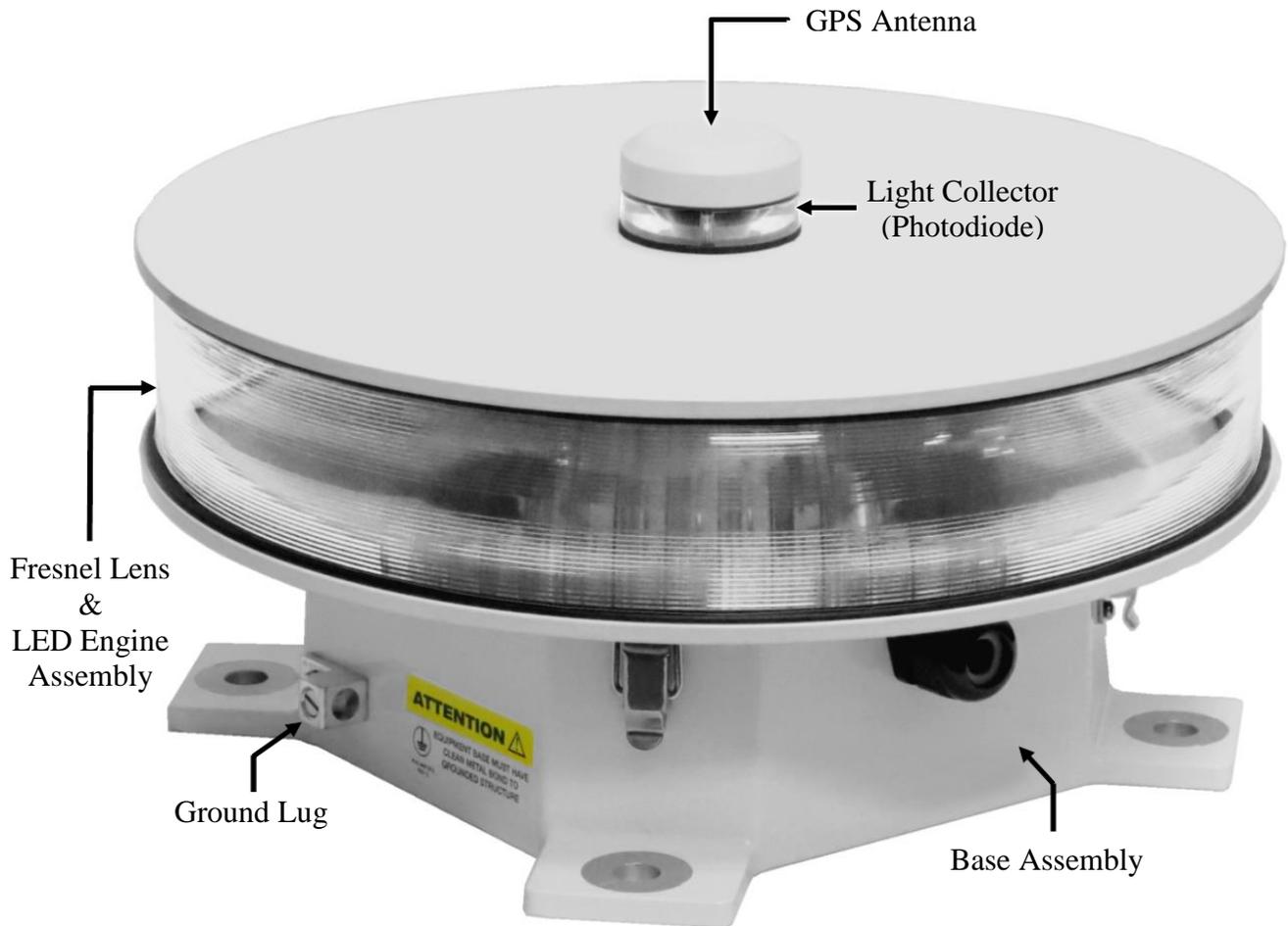


Figure 1-1 – Beacon - External View

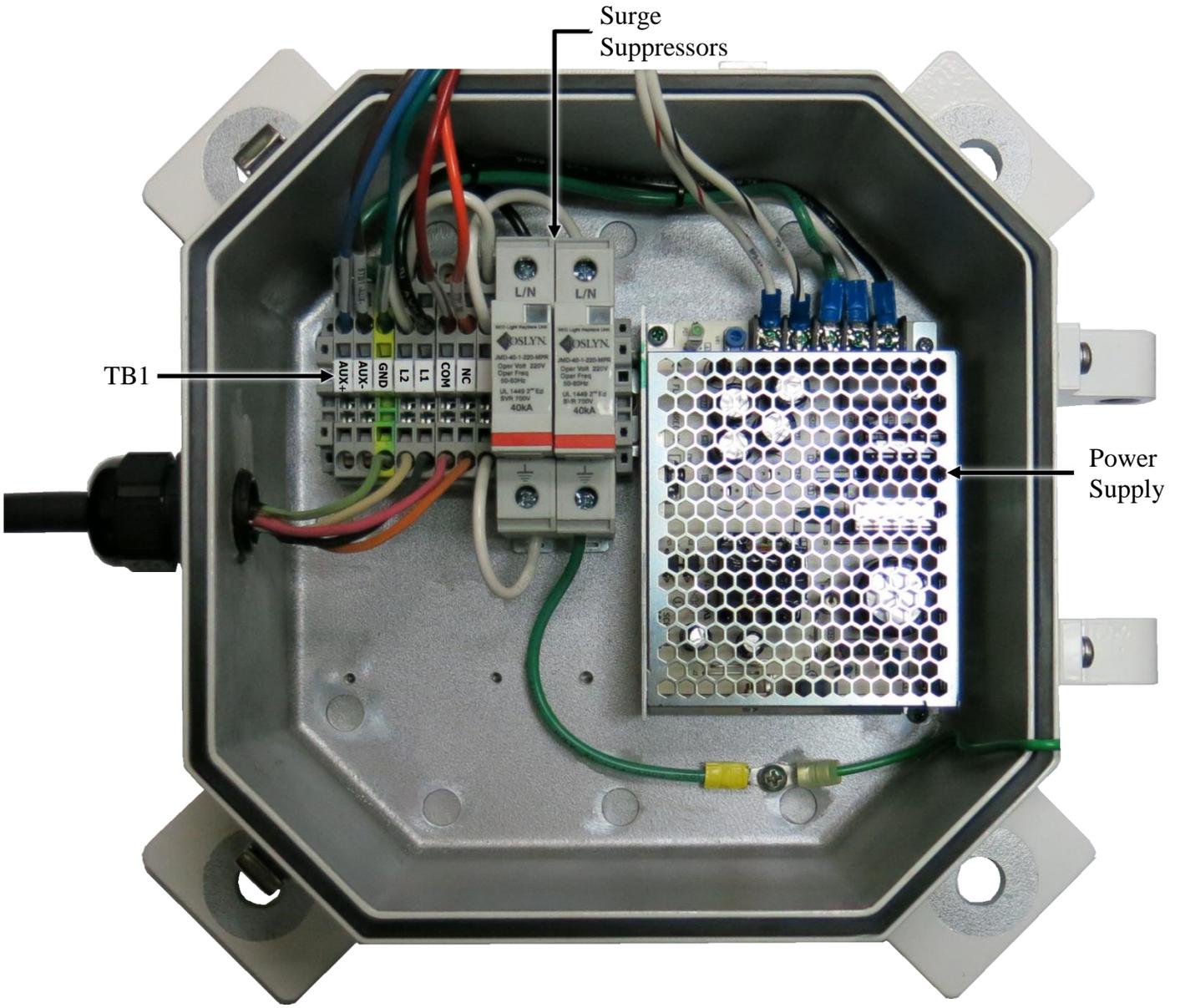
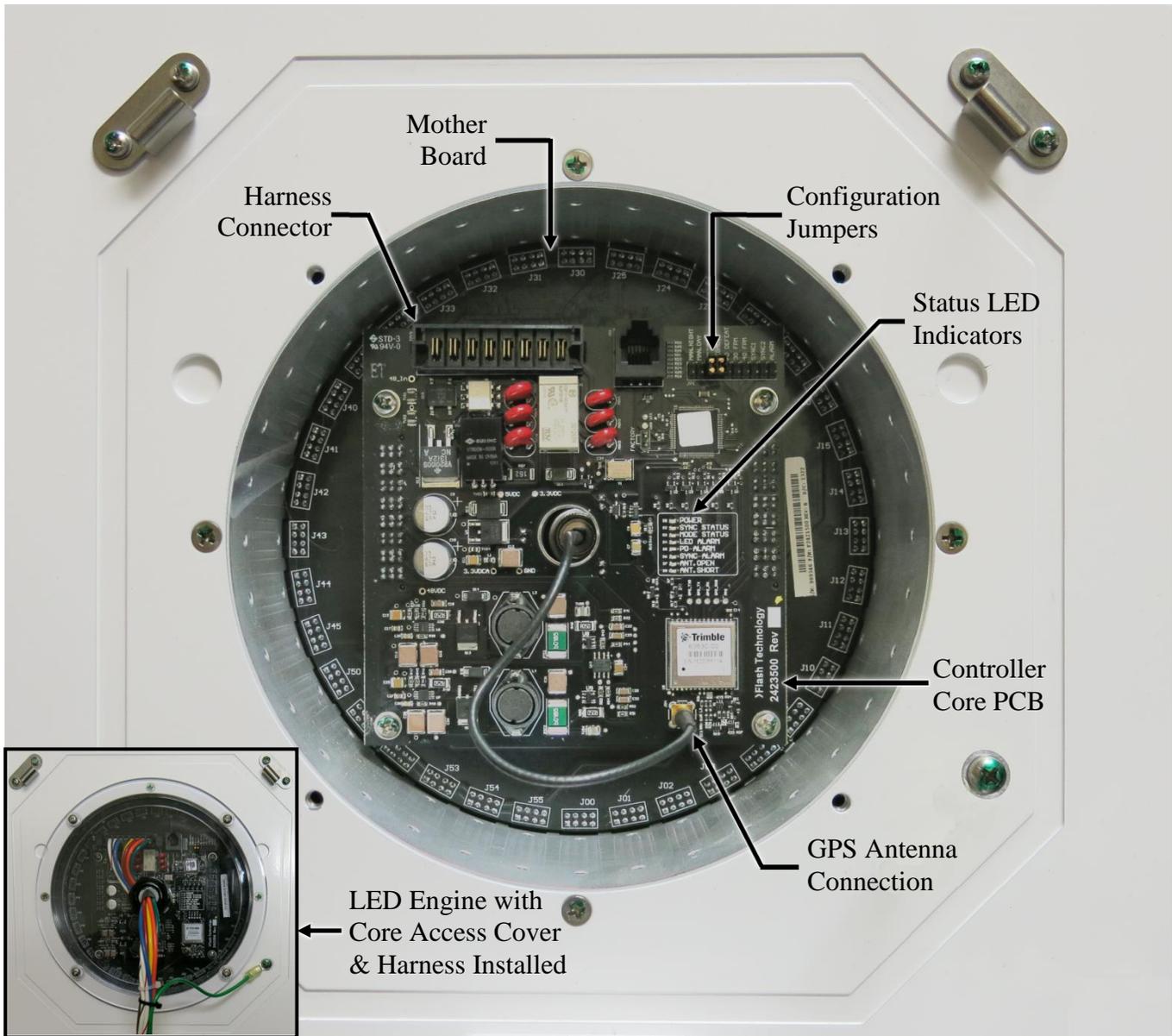


Figure 1-2 – Beacon Base Assembly



Note: FTS 370i shown.

Figure 1-3 – Beacon & Controller Assembly

## Section 2 – Installation – Mounting, Wiring, and Checkout

### Warning

Read the warning on page ix now. Remove power from all wiring and circuitry before installing or performing work on the beacon. It is the responsibility of the installer to comply with all applicable electrical codes.

### Important!

**For proper operation and optimal protection from Lighting and EMI, ensure that the base is electrically bonded to the site grounding system using 8 AWG wire minimum connected to the supplied external ground lug.**

**Flash Technology recommends the installation of one or more lightning rods near the beacon. The copper lightning rod(s) should be located approximately 18 inches away from and extend a minimum of three feet above the height of the beacon.**

### Installation Procedure:

1. Mount the beacon (Section 2.1)
2. Wire the beacon power (Section 2.2)
3. Verify operation (Section 2.3)
4. Wire the beacon monitoring connections (Section 2.2)
5. Confirm monitoring status by disconnecting power to the beacon. This should create an alarm.

After all steps are completed successfully, the installation is complete.

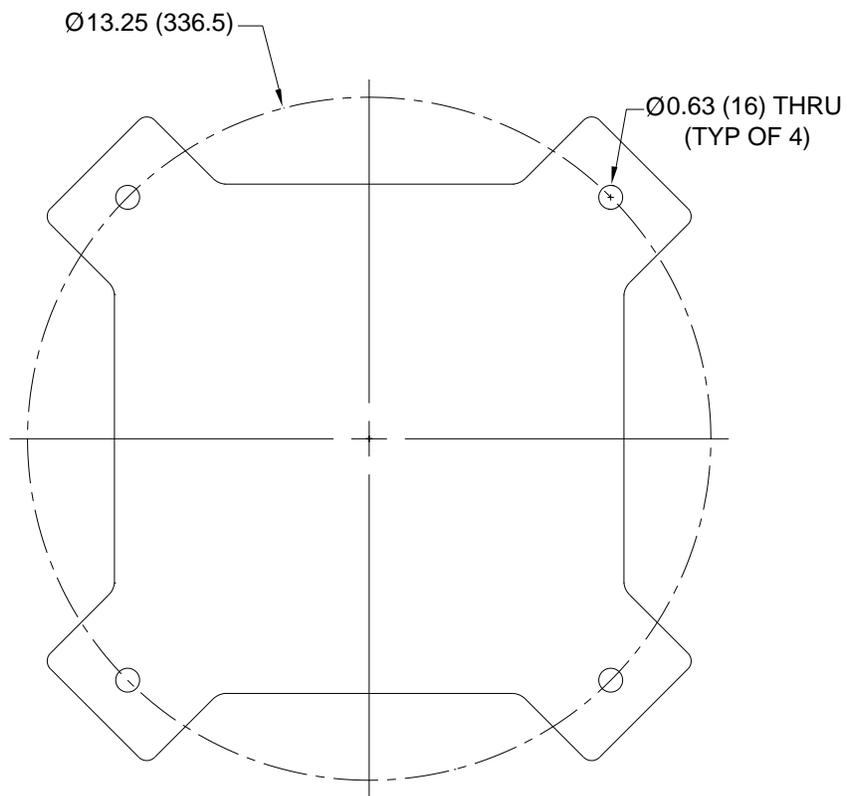
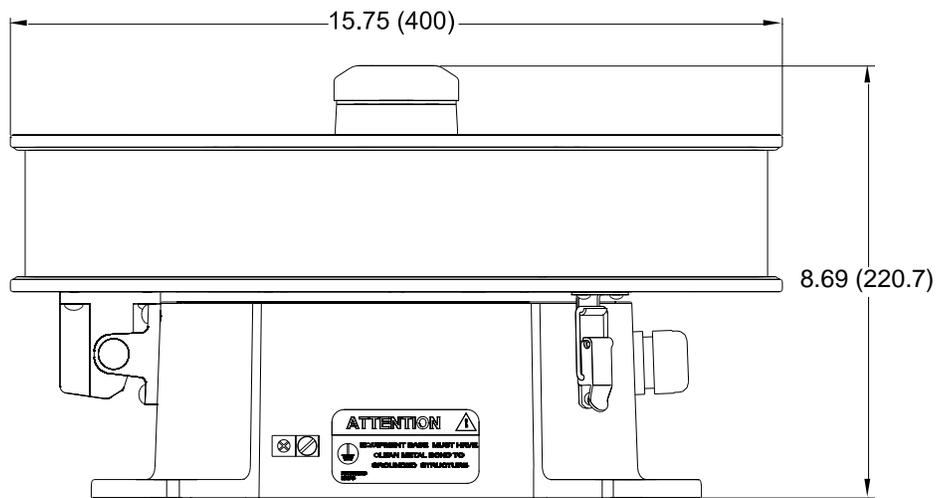
### **2.1 Mounting the Beacon**

Flash Technology recommends the installation of one or more lightning rods near the beacon. The copper lightning rod(s) should be located approximately 18 inches away from and extend a minimum of three feet above the height of the beacon.

The beacon should be positioned so that the light collector for the photodiode has an unobstructed view of the polar sky. Also, it must not view direct or reflected artificial light. The GPS antenna located on top of the beacon must have an unobstructed view of the sky for proper reception and synchronization.

The beacon is mounted to the tower pedestal or optional mounting bracket<sup>1</sup> utilizing supplied hardware. Four mounting holes are provided on the beacon base (Figure 2-1). These mounting holes will align with most tower pedestals. The beacon should be installed level to maintain light output in accordance with FAA/ICAO requirements.

1. An optional mounting bracket is available to accommodate various installation configurations and to facilitate leveling the beacon. See Section 5.5 for ordering information.



Note: All dimensions are in inches (millimeters).

Figure 2-1 – Flashhead Dimensions & Mounting Outline

## 2.2 Wiring the Beacon

The beacon is supplied with a 50 foot length of power & alarm cable pre-wired to the internal electronics to facilitate installation (see Table 2-1). The only connections required are power (120-240 VAC, 50/60 Hz) and ground. The ground wire must be connected for proper operation and protection of the beacon.

Optional dry contact monitoring connections permit monitoring of beacon operation. The contact is closed when the beacon is operating normally and no fault is detected.

The Auxiliary Control Input allows an external device, such as a radar system, to inhibit the flashing of the beacon (see Table 2-2). The acceptable input voltage range for the Control Input is 5 – 30 Volts AC/DC. The optional 10 conductor cable is required to utilize this feature.

Table 2-1 – Standard Power & Alarm Connections

5 Conductor Cable	Wire Color	Function	FTB 370i Beacon Internal Connections	External Connections
	Black	Input Power	TB1 - L1	(120 VAC) - Line (240 VAC) - L1
	White	Input Power	TB1 - L2	(120 VAC) - Neutral (240 VAC) - L2
	Green	Ground	TB1 - GND	Ground
	Red	Alarm Contact	TB1 - COM	Alarm Input <sup>1</sup>
	Orange	Alarm Contact	TB1 - NC	Alarm Input <sup>1</sup>

Table 2-2 – Power, Alarm & Radar Interface Connections

10 Conductor Cable (Optional)	Wire Color	Function	FTB 370i Beacon Internal Connections	External Connections
	Black	Input Power	TB1 - L1	(120 VAC) - Line (240 VAC) - L1
	White	Input Power	TB1 - L2	(120 VAC) - Neutral (240 VAC) - L2
	Green	Ground	TB1 - GND	Ground
	Red	Alarm Contact	TB1 - COM	Alarm Input <sup>1</sup>
	Orange	Alarm Contact	TB1 - NC	Alarm Input <sup>1</sup>
	Brown	Auxiliary Control Input	TB1 - AUX -	Control Output <sup>2</sup>
	Blue	Auxiliary Control Input	TB1 - AUX +	Control Output <sup>2</sup>
	Violet	Ground	Chassis GND	Ground
	Yellow	Ground	Chassis GND	Ground
	Gray	Ground	Chassis GND	Ground
	Drain	Ground	Chassis GND	Ground

1. Refer to the monitoring system manufacturer's installation manual for connection locations.
2. Refer to the radar system manufacturer's installation manual for connection locations.

## **2.3 Verifying Operation**

Apply power to the beacon and verify operation as indicated by the beacon and Status Indicator LEDs.

Note: See Section 3.1 for a description each Status Indicator LED,

### **2.3.1 Power up**

When powered up, all indicator LEDs are turned on for 10 seconds providing easy verification of operation. The beacon will begin flashing and will turn off after 40 seconds if the photodiode detects sufficient light. Otherwise, the beacon will remain on until the ambient light rises to a sufficient level.

### **2.3.2 Synchronization**

For synchronization to occur, the GPS antenna (located on top of the beacon) must have an unobstructed view of the sky. As much as 15 minutes may be required for the beacon to achieve a GPS signal lock. Following power up, the Sync Alarm and Sync Status LEDs will turn off. Once a GPS signal lock is achieved, the Sync Status LED will turn on. This is the normal operating condition.

Note: After one hour of operation, the Sync Alarm will turn on if a GPS signal lock has not been achieved. The alarm will turn off once a GPS signal is locked. Refer to Section 5 if the Sync Alarm remains on for more than 15 minutes.

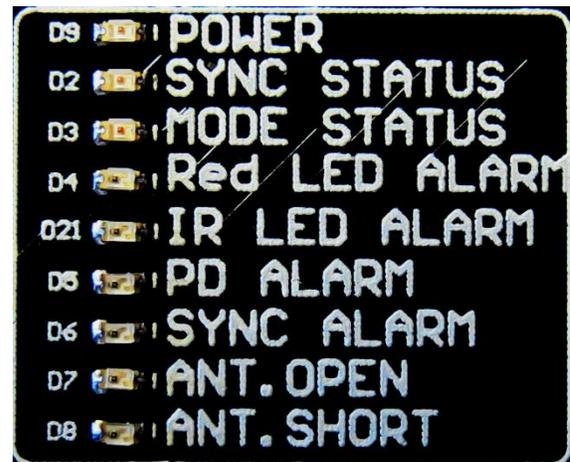
## Section 3 - Operation

### 3.1 Status Indicator LEDs

Status indicator LEDs are located on the Controller Core PCB inside the beacon. A description of each is provided below. See Section 2.3 for additional information regarding the Status Indicator LEDs.



FTS 370i, FTS 370i ICAO



FTS 370i IR, FTS 370i IR ICAO

Figure 3-1 – Status Indicator LEDs

Table 3-1 – Status Indicator LEDs

LED	Description	Function
D9	Power	Input power is present.
D2	Sync Status	Off during power up. Turns on after a GPS signal lock is achieved. Off when Sync alarm is present.
D3	Mode Status	Blinks in synchronization with the beacon flash.
D4	LED Alarm	Output from the beacon is below the minimum regulatory allowance.
D21	IR LED Alarm	(FTS 370i IR, FTS 370i IR ICAO only). Output from the IR LEDs has diminished by more than 25% of nominal.
D5	PD Alarm	More than 19 hours have passed since the unit transitioned modes via the photodiode.
D6	Sync Alarm	More than one hour has passed since the unit received a GPS Sync signal or an antenna fault is present.
D7	Ant. Open	The GPS antenna is disconnected or has failed. Sync Alarm will accompany the Ant. Open alarm.
D8	Ant. Short	The GPS antenna is shorted. Sync Alarm will accompany the Ant. Short alarm.

### 3.2 Configuration Jumpers

Configuration jumpers are located on the Controller Core PCB inside the beacon. A description of each is provided below. To configure a particular option, move the spare jumper shunt to the specified location.

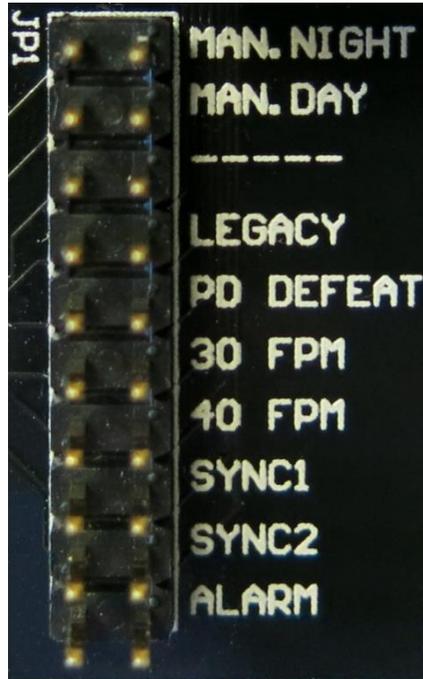


Figure 3-2 – Configuration Jumpers

Table 3-2 – Configuration Jumpers

Jumper	Description	Function
JP1 <sup>1</sup>	MAN. NIGHT	Forces the beacon into Manual Night mode for 30 minutes.
JP2 <sup>1</sup>	MAN. DAY	Forces the beacon into Manual Day mode for 30 minutes.
JP3	-----	Spare Jumper
JP4	LEGACY	Unit operates at ½ duty cycle.
JP5	PD DEFEAT	The PD Alarm is disabled when the PD Defeat jumper is installed.
JP6 <sup>2</sup>	30 FPM	Thirty (30) flashes per minute.
JP7 <sup>2</sup>	40 FPM	Forty (40) flashes per minute.
JP8	SYNC1	(Lighting Equipment by others) Closed: Orga Sync (Open SYNC 2)
JP9	SYNC2	(Lighting Equipment by others) Closed: Unimar Sync (Open SYNC 1)
JP10	ALARM	(Jumper Installed) Reduces LED output below minimum regulatory specification to test the system alarm circuitry.

1. To activate mode override, the jumper must be installed while power is applied to the beacon. The jumper has no effect if it is installed when the beacon is powered down.
2. Default flash rate is twenty (20) flashes per minute with no jumper installed on JP6 or JP7.

## **Section 4 - Beacon Theory of Operation**

### **4.1 System Overview**

The beacon wiring diagrams are shown in Figures 4-1 and 4-2. The standard five conductor power & alarm cable, shown in figure 4-1, provides connection of the AC line (3 wires) and alarm monitoring connections (2 wires). The optional ten conductor cable, shown in Figure 4-2, provides the same connections and adds connections for the auxiliary control input (2 wires). The remaining 3 conductors and drain wire are connected to chassis ground.

The AC line may be 120-240VAC 50/60Hz. The dry contact alarm connections are closed when the beacon is operating normally and no fault is detected. The voltage range for auxiliary control input is 5 – 30 Volts AC/DC. The beacon flash will be inhibited when voltage within the specified range is applied to the terminals labeled AUX + and AUX -.

The Controller Core PCB (370i 2423500 / 370i IR 2423600 / 370i ICAO 2423501 / 370i IR ICAO 2423601) senses ambient light focused by the light collector onto the photodiodes and at night flashes the LED beacon. A GPS antenna and integrated receiver permit synchronization to other beacons. The Controller Core PCB detects alarm conditions including beacon failure, photodiode alarm, and synchronization fault. A clear polycarbonate cover provides access to view the status and alarm LEDs to permit easy determination of proper operation and fault diagnosis.

The LED Engine assembly contains high-performance LEDs which illuminate when powered by the Controller Core PCB. The complete assembly (370i 1370180 / 370i IR 1370175 / 370i ICAO 1370280 / 370i IR ICAO 1370275) is easily replaced when field service is required.

The Power Supply (5150501) and the Surge Suppressors (11000010290) are located in the base of the beacon. The power supply generates the proper DC current to the Controller Core PCB when AC line voltage is applied at its input. The surge suppressors, wired in line with and directly across the AC Line, provide protection from incoming lightning and transient voltage induced surges.

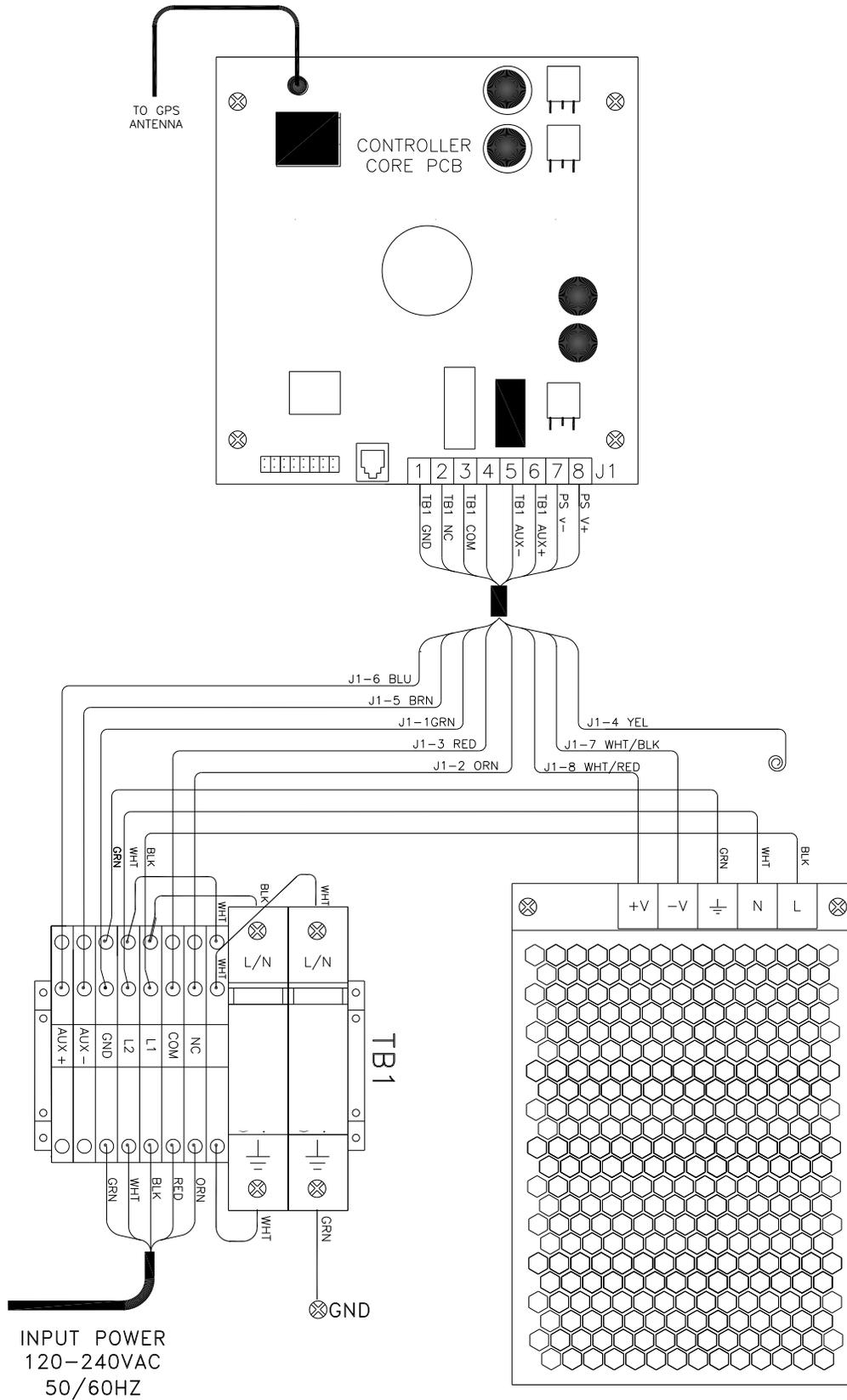


Figure 4-1 – Beacon Wiring Diagram (Standard)



## Section 5 - Maintenance and Troubleshooting

### 5.1 Maintenance

No regularly scheduled maintenance is required for the beacon.

- Flash Technology warranties the light output of the beacon to meet or exceed FAA/ICAO requirements for a 5 year period. LED module replacement after 5 years is recommended to ensure FAA/ICAO compliance. See Section 5.3.3.
- Periodically check the GPS antenna for tightness.
- Periodic cleaning of the lens is recommended with soapy water or any acrylic cleaning solution. No other cleaning solutions are recommended. Abrasive compounds will scratch the lens.
- Optional mounting brackets should be checked periodically for tightness.

### 5.2 Troubleshooting

Follow the troubleshooting steps in the tables below as applicable. Beacon repair procedures are provided in Section 5.3.

Table 5-1 – Troubleshooting - Beacon is in alarm

Step	Check/Test/Action		Action
1.a	Is beacon flashing at night?	Yes No	Go to Step 1.b Go to Step 2.a
1.b	Is beacon flashing in sync with other FTS 370i beacons? Check beacon <u>SYNC</u> Status and <u>SYNC</u> Alarm LEDs.	Yes No	Go to Step 1.c Go to Step 3
1.c	Is beacon <u>PD</u> Alarm LED on? Does beacon flash in daytime?	Yes No	Go to Step 4 Review sections 2.1, 3.1 and 3.2 to verify system operation.

Table 5-2 – Troubleshooting - Beacon does not flash at night

Step	Check/Test/Action		Action
2.a	Is AC power applied? Measure at TB1 terminals L1 & L2.	Yes No	Go to Step 2.b Correct problem.
2.b	Is beacon <u>PWR</u> Status LED on?	Yes No	Go to Step 2.c Replace the Power Supply (See Section 5.3.2)
2.c	<i>Proceed to Step 2.d if there are no wires connected at AUX+ and AUX-.</i> Disconnect the wires connected to AUX+ and AUX-. Did normal operation resume?	Yes No	Check operation/status of the external control device. Go to Step 2.d.
2.d	Is beacon <u>MODE</u> Status LED flashing?	Yes No	Go to Step 2.e Replace Controller Core PCB (See Section 5.3.1)
2.e	Is beacon <u>LED Alarm</u> LED on?	Yes No	Replace LED module (See Section 5.3.5) Replace Controller Core PCB (See Section 5.3.1)

Table 5-3 – Troubleshooting - Beacon flashes but not in sync

Step	Check/Test/Action		Action
3	Does GPS antenna (located in top of beacon) have an unobstructed view of sky? See Section 2.1	Yes	Go to Step 3.b
		No	Correct problem
3.b	Is the <u>ANT. OPEN</u> LED on?	Yes	Check the GPS antenna connection on the Controller Core PCB. Replace the GPS antenna if the connection is not at fault. (See Section 5.3.3)
		No	Go to Step 3.c
3.c	Is the <u>ANT. SHORT</u> LED on?	Yes	Replace the GPS antenna. (See Section 5.3.1)
		No	Replace the Controller Core PCB (See Section 5.3.3)

Table 5-4 – Troubleshooting - Beacon flashes in daytime

Step	Check/Test/Action		Action
4	Is the light collector (located on top of beacon) obstructed? Check for any foreign matter on top of beacon.	Yes	Correct problem
		No	Replace Controller Core PCB See Section 5.3.1

## 5.3 Beacon Repair Procedures

### Warning

Read the Personnel Hazard Warning on page ix now. Remove power from all wiring and circuitry before installing or performing work on the beacon. It is the responsibility of the installer to comply with all applicable electrical codes.

Note: While performing the following steps, check for any loose connections and other damaged components.

### 5.3.1 Replace the Controller Core PCB

FTS 370i Part Number: 2423500.

FTS 370i IR Part Number: 2423600. See Figure 5-1 for component location.

FTS 370i ICAO Part Number: 2423501.

FTS 370i IR ICAO Part Number: 2423601.

### Controller Core PCB Removal

Unfasten the two latches on the front of the base assembly. Lift the LED module to expose the Core Access Cover. Remove the four screws securing the cover and gently pull on the body of the cable grip to remove the cover. Press the latches located on each side of the harness connector and pull to remove it from J1 on the Controller Core PCB. Disconnect the GPS

antenna cable from the Controller Core PCB. Remove the four screws securing the Controller Core PCB and pull the board to release it from the mother board.

### **Controller Core PCB Replacement**

Carefully align the connectors on the back of the Controller Core PCB with the connectors on the mother board. Gently push the board from the sides into the connections on the mother board. Continue installation in the reverse order of the removal process. Apply power to the beacon and verify that it operates correctly. If not, recheck all connections.

### **5.3.2 Replace the Power Supply**

Part Number: 5150501. See Figure 5-2 for component location.

#### **Power Supply Removal**

Unfasten the two latches on the front of the base assembly. Lift the LED module to expose the power supply. Remove the black, white and green wires from the input power connections to the power supply. Remove the white/black and white/red wires from the output power connections of the power supply. Remove the four screws that attach the power supply to the base.

#### **Power Supply Reinstall**

Place the power supply in the base observing the correct orientation of the terminal blocks and secure with the four mounting screws. Attach the white/red wire to the output terminal labeled “V+”. Attach the white/black wire to the output terminal labeled “V-“. Attach the green wire to the terminal labeled “ $\perp$ ”. Attach the white wire to the terminal labeled “N”. Attach the black wire to the terminal labeled “L”. Apply power to the beacon and verify that it operates correctly. If not, recheck all connections.

### **5.3.3 Replace the GPS Antenna and Cable**

Part Number: 6903294. See Figure 1-1 for component location.

#### **GPS Antenna Removal**

Unfasten the two latches on the front of the base assembly. Lift the LED module to expose the Core Access Cover. Remove the four screws securing the cover and gently pull on the body of the cable grip to remove the cover. Disconnect the GPS antenna cable from the Controller Core PCB. Locate the GPS antenna on top of the beacon. Unscrew the GPS antenna from the light collector. Pull up gently on the antenna to expose the antenna cable and connector.

#### **GPS Antenna Reinstall**

Install the black seal on the base of the replacement antenna and attach the antenna cable. Guide the antenna cable back into the beacon through the light collector. Screw the antenna into the light collector until the seal is firmly against the light collector. Continue installation in the reverse order of the removal process. Apply power to the beacon and verify that it operates correctly. If not, recheck all connections.

### **5.3.4 Replace the Surge Suppressors**

Part Number: 11000010290. See Figure 5-2 for component location.

#### **Surge Suppressor Assembly Removal**

Unfasten the two latches on the front of the base assembly. Lift the LED module to expose the surge suppressors. Disconnect the wires at the L/N and the Ground positions. Insert a flat blade screwdriver into the slot below the Ground position and push the handle toward the terminal block to release the surge suppressor assembly.

Note: To replace only the surge suppressor, pull up on the surge suppressor module to remove it from the holder.

#### **Surge Suppressor Reinstall**

Position the L/N end of the surge suppressor over the DIN rail first. Insert a flat blade screwdriver into the slot below the Ground position and push the handle toward the terminal block. Push down on the surge suppressor assembly and remove the screwdriver. Verify that the surge suppressor is firmly attached to the DIN rail. Reconnect the wires to the surge suppressor. Lower the LED module to the closed position and secure both latches on the base assembly. Apply power to the beacon and verify that it operates correctly. If not, recheck all connections.

### **5.3.5 Replace the LED Engine Assembly**

FTS 370i Part Number: 1370180.

FTS 370i IR Part Number: 1370175. See Figure 1-1 for component location.

FTS 370i ICAO Part Number: 1370280.

FTS 370i IR ICAO Part Number: 1370275.

#### **LED Engine Assembly Removal**

Unfasten the two latches on the front of the base assembly. Lift the LED module to expose the Core Access Cover. Remove the four screws securing the cover and gently pull on the body of the cable grip to remove the cover. Press the latches located on each side of the harness connector and pull to remove it from J1 on the Controller Core PCB. Remove the green ground wire attached to the LED engine assembly. While securely grasping the LED engine assembly with one hand, locate the ring on the hinge pin and pull to remove the pin. Lift the LED engine assembly to remove it from the hinge.

#### **LED Engine Assembly Replacement**

Insert the LED engine assembly hinge into the base hinge and reinstall the hinge pin. Continue installation in the reverse order of the removal process. Apply power to the beacon and verify that it operates correctly. If not, recheck all connections.

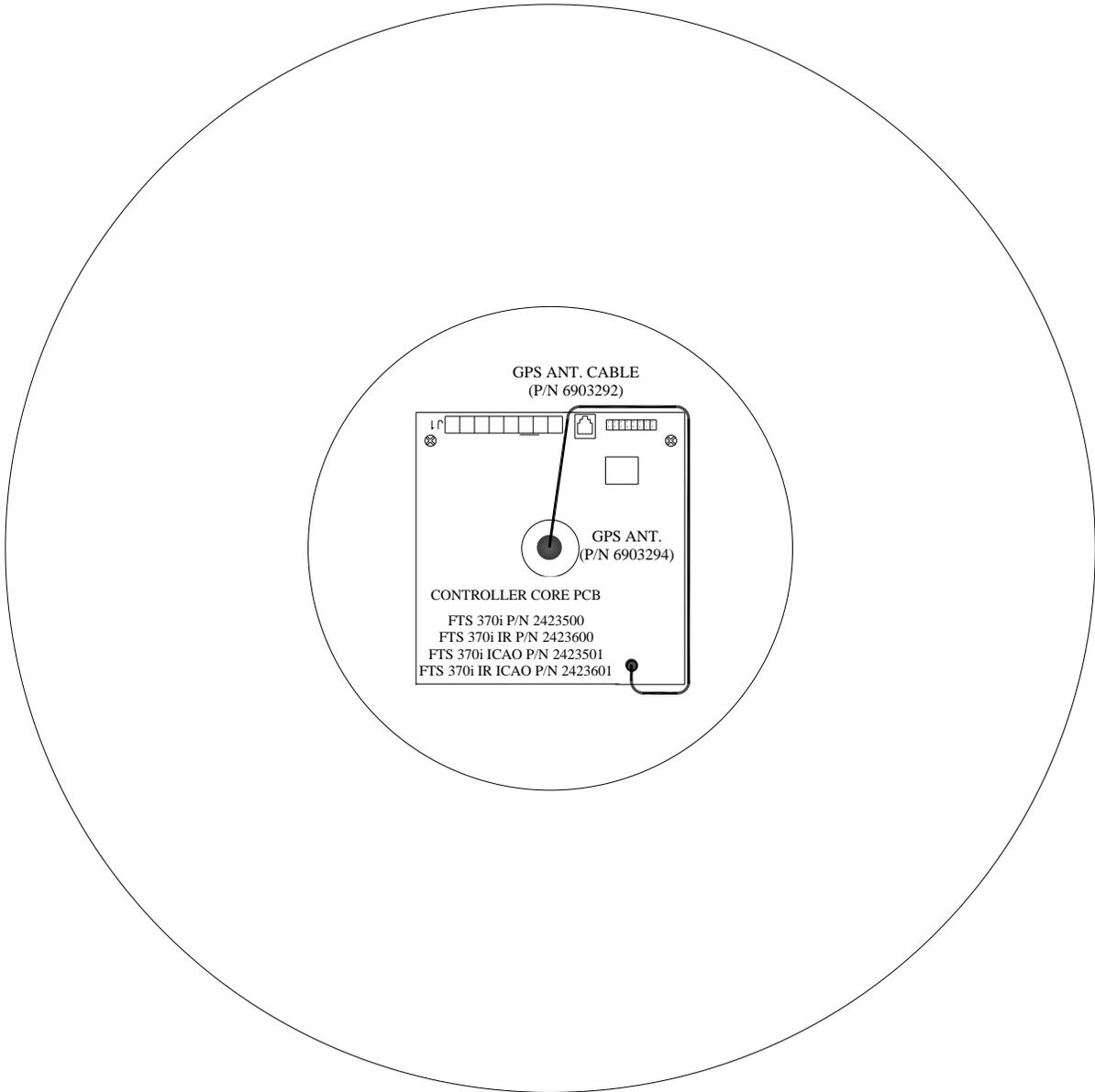


Figure 5-1 – Beacon Component Locations

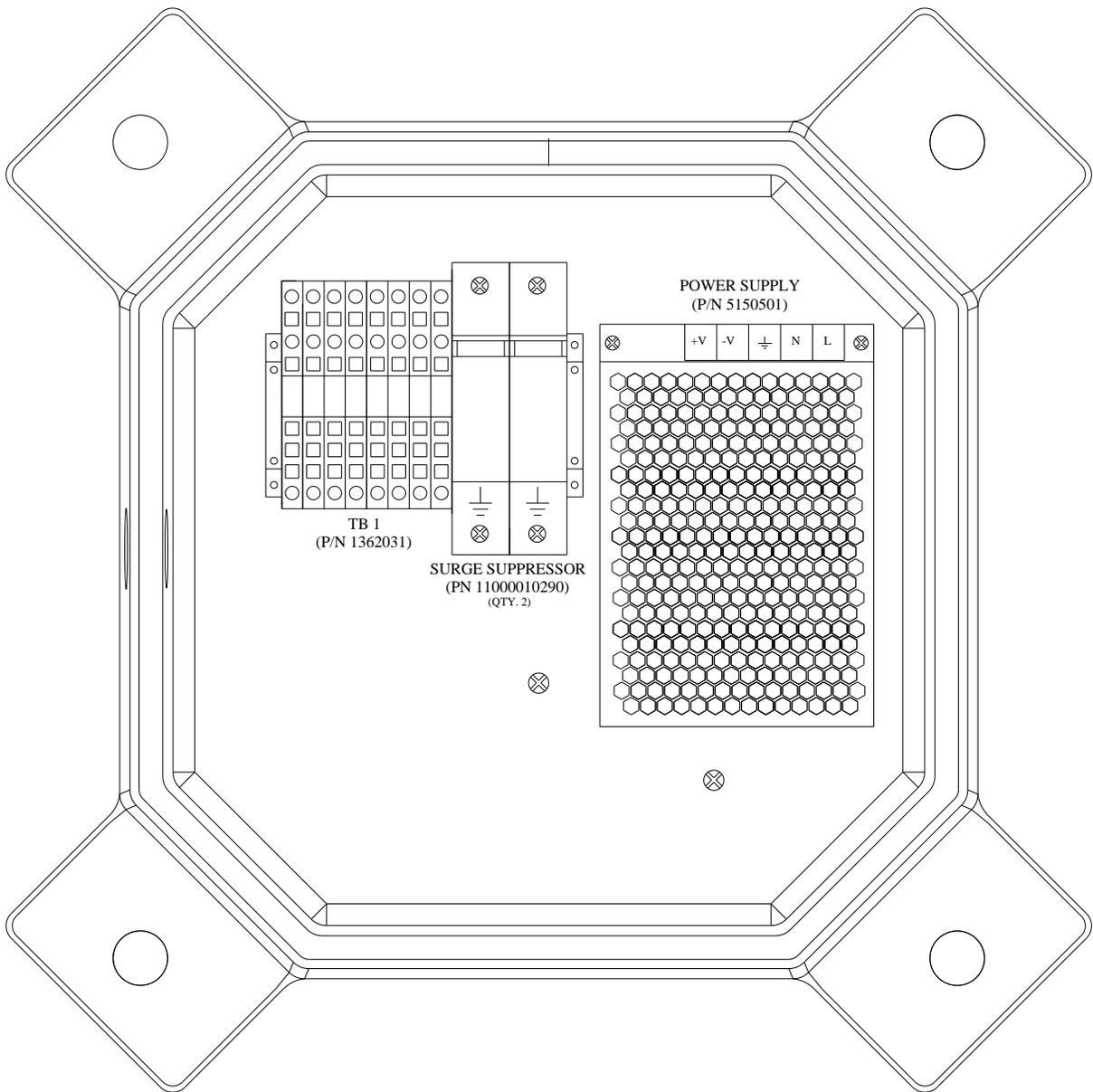


Figure 5-2 – Base Component Locations

## 5.4 Customer Service

Customer Service: (800) 821-5825

Telephone: (615) 261-2000

Facsimile: (615) 261-2600

Shipping Address:

Flash Technology  
332 Nichol Mill Lane  
Franklin, TN 37067

## 5.5 Ordering Parts

To order spare, replacement or optional parts contact Customer Service at 1-800-821-5825.

Table 5-5 – Optional Parts

Description	Part Number
Mounting Bracket Assembly Universal	3991210
Mounting Bracket Assembly (GE)	3991220
Mounting Bracket Assembly Standard	3991240

Table 5-6 – Spare/Replacement Parts

Description	System	Part Number
LIGHT ENGINE (REPLACEMENT)	FTS 370i	1370180
	FTS 370i IR	1370175
	FTS 370i ICAO	1370280
	FTS 370i IR ICAO	1370275
GPS Antenna with Gasket	All	6903294
GPS Antenna Cable	All	6903292
PCB CORE CONTROLLER	FTS 370i	2423500
	FTS 370i IR	2423600
	FTS 370i ICAO	2423501
	FTS 370i IR ICAO	2423601
Wiring Harness	All	4842101
Power Supply	All	5150501
Surge Suppressor Assembly 220V 40kVA (2 required)	All	11000010290
Terminal Block Assembly (TB1)	All	1362031

## Return Material Authorization (RMA) Policy

**IF A PRODUCT PURCHASED FROM FLASH TECHNOLOGY MUST BE RETURNED FOR ANY REASON (SUBJECT TO THE WARRANTY POLICY), PLEASE FOLLOW THE PROCEDURE BELOW:**

**Note: An RMA number must be requested from Flash Technology prior to shipment of any product. No returned product will be processed without an RMA number. This number will be the only reference necessary for returning and obtaining information on the product's progress. Failure to follow the below procedure may result in additional charges and delays. Avoid unnecessary screening and evaluation by contacting Technical Support prior to returning material.**

- 1. To initiate an RMA: Call Flash Technology's National Operations Center (NOC) at (800-821-5825) to receive technical assistance and a Service Notification number. The following information is required before a Service Notification number can be generated:**
  - Site Name/Number / FCC Registration number/ Call Letters or Airport Designator
  - Site Owner (provide all that apply – owner, agent or subcontractor)
  - Contractor Name
  - Contractor Company
  - Point of Contact Information: Name, Phone Number, Email Address, Fax Number and Cell Phone (or alternate phone number)
  - Product's Serial Number
  - Product's Model Number or part number
  - Service Notification Number (if previously given)
  - Reason for call, with a full description of the reported issue
  
- 2. The Service Notification number will then serve as a precursor to receiving an RMA number if it is determined that the product or equipment should be returned. To expedite the RMA process please provide:**
  - Return shipping method
  - Shipping Address
  - Bill to Address
  - Any additional information to assist in resolving the issue or problem
  
- 3. Product within the Warranty Time Period**
  - a. If to be returned for repair;
    - RMA # is generated
    - Once product is received and diagnosed;
      - Covered under warranty – product is repaired or replaced
      - Not covered under warranty – quote is sent to the customer for a bench fee of **\$350 plus parts** for repair
        - If the customer does not want the product repaired, a **\$50 test fee** is charged before being returned
  - b. If advance replacement;
    - Purchase order may be required before the advance replacement order is created
    - RMA # is generated and the advance replacement order is created
    - Once product is received and diagnosed;
      - Covered under warranty – credit given back if PO received
      - Not covered under warranty – credit **will not** be applied to PO

- Flash Technology has sole discretion in determining warranty claims. Flash Technology reserves the right to invoice for parts advanced if the associated failed parts are not returned within 15 days of issue or if product received is diagnosed to be non-warranty.
- Advance replacements will be shipped ground unless the customer provides alternative shipping methods.

#### 4. Product outside the Warranty Time Period

- a. For Xenon System board repair; a purchase order is required at time of request for a RMA # for a standard **\$350 repair bench fee**
  - RMA # is generated with the PO attached
  - If the board is deemed non-repairable after diagnosis, the customer is notified. If the customer purchases a new board, the repair bench fee is waived. If the customer does not buy a new board, a **\$50 test fee** is charged before being returned or scrapped.
- b. For all other products; no purchase order is required to return the product for diagnosis
  - RMA # is generated
  - Once product is diagnosed, quote is sent to the customer for a bench fee of **\$350 plus parts** for repair
  - Once the purchase order is received, the product will be repaired and returned
    - If the customer does not want the product repaired, a **\$50 test fee** is charged before being returned or scrapped.

#### 5. After receiving the Flash Technology RMA number, please adhere to the following packaging guidelines:

- All returned products should be packaged in a way to prevent damage in transit. Adequate packing should be provided taking into account the method of shipment.

**Note: Flash Technology will not be responsible for damaged items if product is not returned in appropriate packaging.**

#### 6. All packages should clearly display the RMA number on the outside of all RMA shipping containers. RMA products (exact items and quantity) should be returned to:

Flash Technology  
Attn: RMA #XXX  
332 Nichol Mill Lane  
Franklin, TN 37067

#### 7. All RMA numbers:

- Are valid for 30 days. Products received after 30 days may result in extra screening and delays.
- Must have all required information provided before an RMA number is assigned.