

➤ Flash Technology



FTS 2301 DC RED LIGHT SYSTEM

Reference Manual
Part Number F7912301

SERIAL NUMBER

Flash Technology, 332 Nichol Mill Lane, Franklin, TN 37067
(615) 261-2000

Front Matter

Abstract

This manual contains information and instructions for installing, operating and maintaining the FTS 2301 System Components.

Copyright

Copyright © 2013, Flash Technology®, Franklin, TN, 37067, U.S.A.

All rights reserved. Reproduction or use of any portion of this manual is prohibited without express written permission from Flash Technology and/or its licensor.

Trademark Acknowledgements

Flash Technology® is a registered trademark name.

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

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 controller components, under normal operating conditions, for 1 year. LED Lighting components are warranted for 5 years.

Personnel Hazard Warning

Dangerous Voltages

Dangerous 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.

Dangerous Voltages Can Persist with Power Disconnected

Under certain conditions, dangerous voltages can be present because capacitors can retain charges even after the power has been disconnected.

Protect yourself — always turn off the input (primary) power and wait for one minute for storage capacitors to drain their charge. Then check the controller's output terminals (J01) with a voltmeter for any residual charge before touching any circuit element or component.

Do Not Depend on Interlocks

Never depend on interlocks alone to remove unsafe voltages. Always check circuits with a voltmeter. Under no circumstances remove or alter any safety interlock switch.

Table of Contents

Front Matter	ii
Abstract	ii
Copyright	ii
Trademark Acknowledgements	ii
Disclaimer	ii
Warranty	ii
Personnel Hazard Warning	iii
Dangerous Voltages	iii
Avoid Touching Live Circuits	iii
Dangerous Voltages Can Persist with Power Disconnected	iii
Do Not Depend on Interlocks	iii
Table of Contents	iv
List of Figures	v
List of Tables	v
Section 1 – Introduction	1
FTS 2301 System	1
Specifications	1
Operation	2
Controller	2
Beacon/Marker Connection	2
Manual Override Operation	2
Controller Board	2
Beacon / Marker Setpoint	5
Custom Setpoints	5
Checkout Procedure	6
Using the Photodiode	6
Using the Mode Override Switch	6
Quarterly Lighting Inspection	6
Section 2 – Outline, Mounting and Installation	7
Unpacking	7
Tools	7
Controller Access	7
Mounting	7
Location	7
Controller	7
Photodiode Sensor	7
Installation Wiring	8
Wiring	8
Lightning Protection	8
Installation Checklist	10
Section 3 – Maintenance and Troubleshooting	19
Safety	19
Maintenance	19
Troubleshooting	19
Component Removal and Replacement	20
FTC 2301	20

FH 3610-2DC LED Beacon.....	20
Section 4 – Major Replaceable Parts	22
Customer Service	22
Ordering Parts	22
Replacement Parts.....	22
Repackaging the Controller	22
Return Material Authorization (RMA) Policy.....	23

List of Figures

Figure 1-1 PCB1 Controller Board.....	2
Figure 1-2 Custom Configuration Switch Blocks.....	3
Figure 1-3 Configuration Channels	5
Figure 1-4 Custom Setpoints	5
Figure 1-5 Switch Block 2	5
Figure 1-5 QLI Mode.....	6
Figure 2-1 FTC 2301 Controller Mounting and Outline	11
Figure 2-2 Photodiode Sensor (PHD 512) Mounting and Outline	12
Figure 2-3 FH 3610-2DC LED Beacon Base Outline	13
Figure 2-4 Connection Diagram	14
Figure 2-5 FTC 2301 Typical Installation Wiring (4 Conductor)	15
Figure 2-6 Typical Installation Wiring (3 Conductor).....	16
Figure 2-7 FTC 2301& FTW 170 (GPS Sync.) Interface.....	17
Figure 2-8 FTC 2301 Recommended Alarm Wiring.....	18
Figure 3-1 – FH 3610 Dome Removal	21
Figure 3-2 – FH 3610 Opened Top 10°	21

List of Tables

Table 1-1 Custom Configuration Switch Block 1.....	3
Figure 1-2 Status LEDs.....	4
Table 1-2 Status LEDs	4
Table 3-1 Major Troubleshooting Symptoms.....	20
Table 4-1 Major Replaceable Parts.....	22

Section 1 – Introduction

FTS 2301 System

The FTS 2301 System is comprised of an FTC 2301 Controller and one or more DC powered L-810 / L-864 lighting fixtures.

The FTC 2301 Controller is a 12-48 VDC powered unit with two control channels. Each channel controls one L-864 LED Beacon¹ or up to eight L-810 LED marker

lights.² The FTC 2301 Controller directs beacon flashing and reports light operating status. It allows photodiode or manual override mode control. The auxiliary synchronization input/output allows for synchronization of multiple FTC 2301 Controllers with no separation limit between units.³

Specifications

Parameter	Specification
FTC 2301 Controller Physical Dimensions (H x W x Depth, Wt) (See Figure 2-2 for mounting dimensions) Operating Temperature Range DC Input Voltage Power Consumption Flash Rate Alarm Relay Contact Rating	9.51 x 7.32 x 4.92 in., 4 lbs. 241.5 x 185.9 x 125 mm., 1.81 kg -40 to +55 degrees Centigrade 12 – 48 VDC 4 Watts Steady / 20 fpm 10 Amp @ 250 VAC / 8 Amp @ 24 VDC, Isolated contacts
L-864 LED Beacon Physical Dimensions (H x Diameter, Wt) Flash Intensity (nominal) Beam Spread Power Requirement:	8.4 x 15.00 in., 20 lbs / 213 x 381, 12.7 kg Night (Red) 2,000 ± 25% ECD Horizontal: 360° / Vertical: 3° 22 Watts (Steady)
L-810 LED Marker (M type): Physical Dimensions (H x Diameter, Wt): OL-1 OL-2 Intensity (nominal): Beam Spread: Power Requirement:	5.25 x 5.3 in, 1.8 lbs / 133.4 x 134.6 mm, 0.82 kg 6.0 x 11 in, 4.0 lbs / 152.4 x 279.4 mm, 1.82 kg Night (Red) 32.5 ± 25% ECD Horizontal: 360° / Vertical: 10° 1.5 Watts (per fixture)

¹ L-864 LED Beacon minimum voltage is 24 VDC.

² Up to four L-810 LED markers can be controlled at 12 VDC. Up to eight L-810 LED markers can be controlled at 18 – 48 VDC.

³ An FTW 170-2 is required for separation greater than 500'.

Operation

Controller

The controller begins programmed operation as soon as power is applied. The controller is shipped preconfigured for your application. It is also field customizable.

Beacon/Marker Connection

The FTC 2301 controller has two connections for beacons and/or markers labeled Channel A and Channel B. Either channel can be configured as steady or flashing. The Channel A connections are at J1 terminals 4, 5 and 6. Connect the positive lead to J1 terminal 4 and the negative lead at J1 terminal 5. The ground connection is at terminal 6. The Channel B connections are at J1 terminals 7, 8 and 9

9. Connect the positive lead at J1 terminal 7, and the negative lead at J1 terminal 8. The ground connection is at terminal 9.

Manual Override Operation

Operation of the unit can be manually controlled by pressing the Manual Mode button. Press the button once for night mode and twice for day mode. The unit will stay in the selected mode for 30 minutes. The Manual Mode LED will be lit and the corresponding mode LED (Day or Night) will blink.

Controller Board

PCB1 has switches, connectors, and LEDs whose functions are described in the following headings. Figure 1-1 provides a pictorial of the standard PCB1 Controller Board.

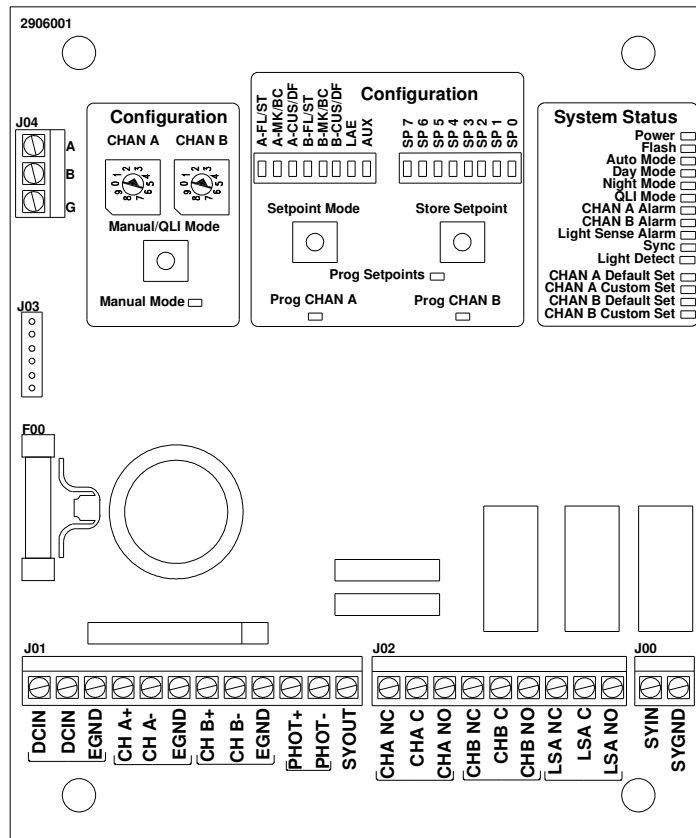


Figure 1-1 PCB1 Controller Board

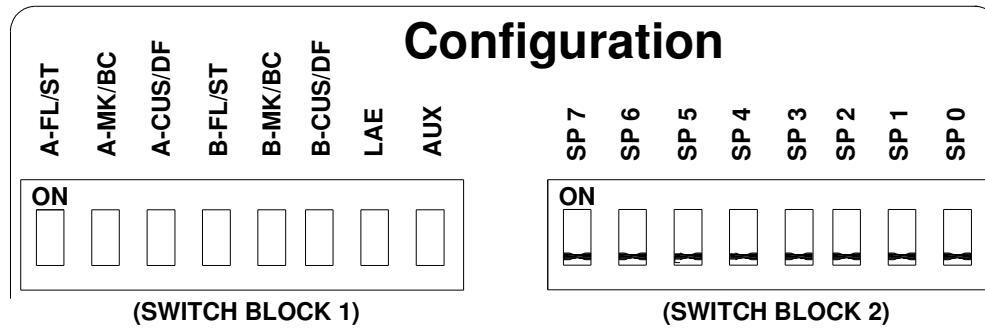


Figure 1-2 Custom Configuration Switch Blocks

Table 1-1 Custom Configuration Switch Block 1
(Left block)

Switch	On (Up)	Off (Down)
A-FL/ST	Channel A Steady	Channel A Flash
A-MK/BC	Channel A is configured for LED Beacon	Channel A is configured for LED Marker
A-CUS/DF	Channel A is configured for default programming.	Channel A is configured for custom setpoints. <i>Note: Switch "A-MK/BC" is ignored if Switch "A-CUS/DF" is "On".</i>
B-FL/ST	Channel B Steady	Channel B Flash
B-MK/BC	Channel B is configured for LED Beacon	Channel B is configured for LED Marker
B-CUS/DF	Channel B is configured for default programming.	Channel B is configured for custom setpoints. <i>Note: Switch "B-MK/BC" is ignored if Switch "B-CUS/DF" is "On".</i>
LAE	Light sense alarm is enabled. System will alarm if the photodiode does not trigger a mode change for 19 hours.	Light sense alarm is disabled. Switch "LAE" should be set to the "Off" position if a photodiode is not installed.
AUX	L-810 marker default programmed for 1.5W markers.	L-810 marker default programmed for 3.5W markers.

Note: Switch Block 2 (Right block) is reserved for future applications. Currently, all switches should be in the "Off" (down) position.

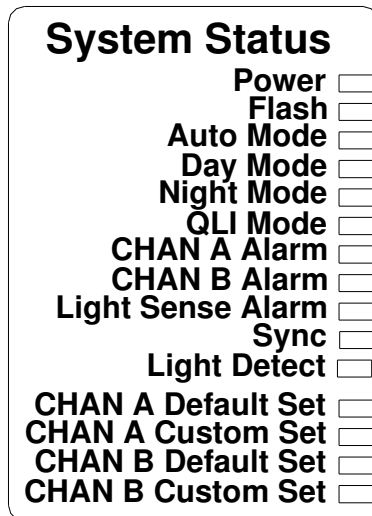


Figure 1-2 Status LEDs

Table 1-2 Status LEDs

LED	Function
Power	Input power is applied
Flash	Blinks in sync with the flash output to Channel A and Channel B.
Auto Mode	The unit is being controlled by the Light Sense Input.
Day Mode	The unit is operating in Day Mode. Steady for automatic operation and blinking for manual operation.
Night Mode	The unit is operating in Night Mode. Steady for automatic operation and blinking for manual operation.
QLI Mode	Indicates that a QLI is being performed.
ChA Alarm	An alarm is present on Channel A.
ChB Alarm	An alarm is present on Channel B.
Light Sense Alarm	The unit has failed to change modes for more than 19 hours via the Photodiode sensor.
Sync	Blinking indicates that a Sync signal has been received from an external source.
Light Detect	Indicates that a photodiode is connected to the unit.
ChA Default Set	Indicates that Switch "A-CUS/DF" is "Off" and Channel A is operating with factory default setpoints.
ChA Custom Set	Indicates that Switch "A-CUS/DF" is "On" and Channel A is operating with custom setpoints.
ChB Default Set	Indicates that Switch "B-CUS/DF" is "Off" and Channel B is operating with factory default setpoints.
ChB Custom Set	Indicates that Switch "B-CUS/DF" is "On" and Channel B is operating with custom setpoints.

Beacon / Marker Setpoint

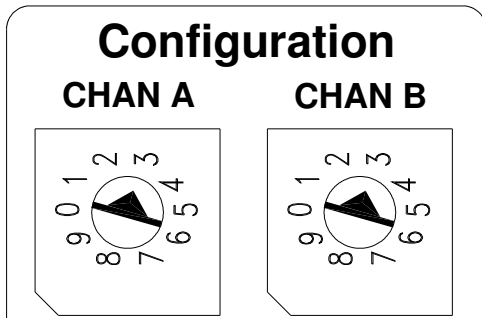


Figure 1-3 Configuration Channels

Channel A

Set the rotary switch to match the total number of markers installed. Set the rotary switch to 1 if a beacon is connected to Channel A. The unit will alarm when the current falls below the number selected.

Channel B

Set the rotary switch to match the total number of markers installed. Set the rotary switch to 1 if a beacon is connected to Channel B. The unit will alarm when the current falls below the number selected.

Custom Setpoints

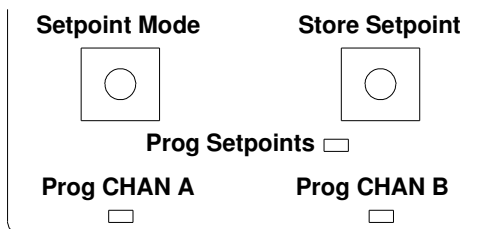


Figure 1-4 Custom Setpoints

The FTC 2301 can be configured to work with various LED markers and beacons. The following steps describe how to change the setpoints for each channel.

1. Set all switches in Switch Block 2 to the “Off” (down) position.

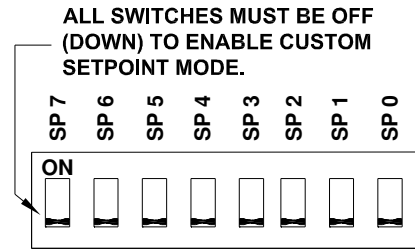


Figure 1-5 Switch Block 2

2. Set the rotary configuration dials to match the number of fixtures connected to each channel.
3. Press and hold the “Setpoint Mode” button for 5 seconds.
4. The “Prog Setpoints” LED will be illuminated.
 - Channel A program mode is activated.
 - Manual mode “Night” is activated.
5. Press and hold the “Store Setpoint” button for 5 seconds to set new Channel A parameters.
 - “Prog Setpoints” LED blinks while the button is pressed and goes solid when the new setpoint is confirmed.
6. Press “Setpoint Mode” button (briefly) to program Channel B.
7. Press and hold the “Store Setpoint” button for 5 seconds to set new Channel B parameters.
 - “Prog Setpoints” LED blinks while the button is pressed and goes solid when the new setpoint is confirmed.
8. Press “Setpoint Mode” button (briefly) to return to normal operation.

Checkout Procedure

Using the Photodiode

Note: Verify that Switch “LAE” on Switch Block #1 is not in the “Off” position.

1. Cover the photodiode to block it from all light. With no alarms or errors and after a 60 second delay:
 - The system is now in NIGHT mode.
 - The beacon/marker(s) connected to Channel A should be on and operating as programmed.
 - The beacon/marker(s) connected to Channel B should be on and operating as programmed.
2. Uncover the photodiode so as to allow light to strike it, or shine a light on it. With no alarms or errors:
 - The system is now in DAY mode.
 - The beacon(s)/marker(s) connected to both channels should turn off.

Using the Mode Override Switch

1. Press the “Manual Mode” switch.

With no alarms or errors:

- The system is now in NIGHT mode.
 - The beacon(s) and/or marker(s) should turn on and operate as programmed. See Table 1-1.
2. Press the “Manual Mode” switch again.

With no alarms or errors:

- The system is now in DAY mode.
- The beacon(s)/marker(s) should be off.

If the operation is not as described, go to Troubleshooting in Section 3.

Quarterly Lighting Inspection

The FTC 2301 has a built in test procedure to aid in performing Quarterly Lighting Inspections (QLI). Manual/QLI Mode button is located in the “Configuration” box just below the “Chan A” and “Chan B” rotary switches. The procedure described below will eliminate the need to disconnect any wires from the unit to test alarm points.

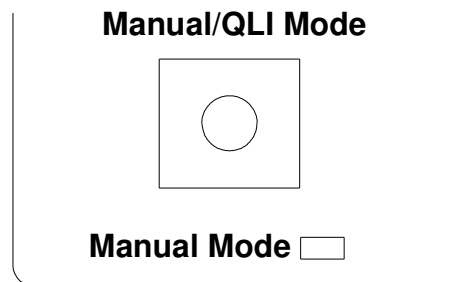


Figure 1-5 QLI Mode

1. Press and hold the Manual/QLI button for 5 seconds to enter the QLI mode.
 - Night mode operation will be activated.
 - The “QLI Mode” System Status LED will be lit.
2. Press the Manual/QLI button to inhibit the operation of the lighting equipment connected to Channel A.
3. Press the Manual/QLI button to restore Channel A.
4. Press the Manual/QLI button to inhibit the operation of the lighting equipment connected to Channel B.
5. Press the Manual/QLI button to restore Channel B.
6. Press the Manual/QLI button to test the Light Sense Alarm (LSA).
7. Press the Manual/QLI button to restore the LSA and return to normal operation.

Note: Normal operation will resume after 15 minutes if the test procedure is not completed.

Section 2 – Outline, Mounting and Installation

Unpacking

Inspect shipping cartons for signs of damage before opening. Check package contents against the packing list and inspect each item for visible damage. Promptly report damage claims to the freight handler.

Tools

- 1/8" non-flared flat blade screw driver
- Digital volt-ohm meter
- Wire strippers
- Tools required to mount the controller

Controller Access

A quick-release latch secures the enclosure's door. Release the latch to open the door for internal access.

Mounting

Outline and mounting dimensions for the controller are shown in Figure 2-1 and those for the photodiode are shown in Figure 2-2.

Location

Locate the FTC 2301 Controller in an area with restricted access. You can place the controller any practical distance from the beacon(s) / marker(s). Do not allow the voltage drop at the fixture to exceed 3% of the supply voltage due to line loss.

Controller

Use the following guidelines for mounting the controller:

- Ensure that adequate space exists around the equipment for access during installation, maintenance and servicing.
- Allow space for air flow around the controller.

Flash Technology does not furnish mounting hardware unless it is ordered as part of an installation kit.

Photodiode Sensor

Use the following guidelines for installing the photodiode:

- Locate the photodiode where it has an unobstructed view of the polar sky.
- It must not view direct or reflected artificial light.
- The photodiode may be supported directly by electrical conduit.
- Mount the photodiode vertically on the top end of a vertical length of conduit to prevent damage by water intrusion.

Installation Wiring

Refer to Figures 2-4 through 2-8 for general system wiring diagrams.

Wiring

Note: Wiring diagrams provided in this manual define only minimum requirements for satisfactory equipment operation in a typical installation. If installation drawings prepared specifically for your site disagree with information provided in this manual, the site installation drawings should take precedence.

It is the responsibility of the installer to comply with all applicable electrical codes.

All installation wiring should have an insulation rating of 600 volts.

Wire size for the lights on each wire run is calculated from the number of beacons and/or marker lights, and the length of the wire on that run. Wire for the lights should be sized so that the voltage drop does not exceed 3%. Total power required is the sum of all lights plus 4 watts additional for the FTC 2301 Controller. Consult power requirements for each type of light in the Specifications table in Section 1.

Figures 2-5 and 2-6 show the FTC 2301 Controller wiring in a typical beacon/marker installation.

Make electrical connections to J01 at the following terminals:

- Main power DCIN Terminals 1 & 2
- Ground at Terminal 3.
- Channel A (CHA+ & -) at Terminals 4 & 5.
- Channel A (EGND) Ground at Terminal 6.

- Channel B (CHB+ & -) at Terminals 7 & 8.
- Channel B (EGND) Ground at Terminal 9.
- Photodiode (PHOT + & -) Terminals 10 & 11.
- Auxiliary Sync Output (SYOUT) at Terminals 12 & 23.

The PHD 512 is supplied with an attached cable. Use #16 AWG stranded wire (minimum) if additional wire is needed.

Note: Ground the wire shield around the photodiode wires, if one is present, at J01 Terminal 3. Do not ground the shield to the photodiode.

Alarm monitoring connections for Channel A, Channel B and the Photodiode are provided at J02 Terminals 1 – 9. Each alarm point offers both NO and NC alarm connections.

Note: The alarm relay contacts are labeled to represent their state with the unit powered on and with no alarms present.

To ensure proper alarm monitoring, Flash Technology recommends monitoring contacts that are open in an alarm condition (example: J02 terminals 1 & 2).

Lightning Protection

All Flash Technology equipment is designed to withstand severe transient over-voltages. However, a lightning arresting system should be installed to prevent eventual damage by lightning. Transient suppressors from line-to-line and line-to-neutral are recommended at the primary power load center.

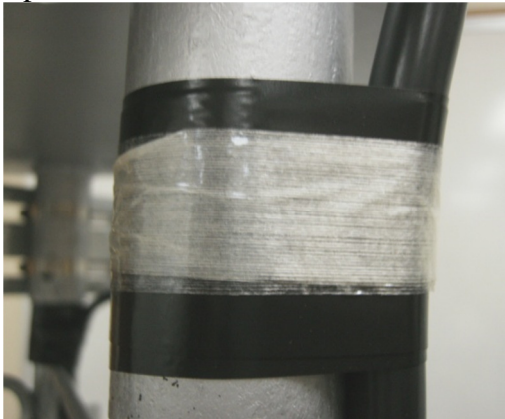
Securing the Cable

Flash Technology recommends the following method for securing the beacon and marker cable to a skeletal structure:

1. Run the cable along one of the tower legs and wrap two full turns of two-inch Scotchwrap™ #50 tape, or the equivalent, around the cable and tower leg at regular intervals of about 5 feet (1.5 meters).



2. Wrap three full turns of one-inch Scotchwrap Filament #890 tape, or the equivalent, over the Scotchwrap #50 tape.



3. Wrap four full turns of two-inch Scotchwrap #50 tape, or the equivalent, over the Scotchwrap Filament #890 tape.



4. Perform steps 1 through 4 directly above and below any tower leg flanges that the cable may cross. The cable should be spaced approximately 1 inch from the edge of each flange to provide stress relief from vibration that may damage the jacket of the cable. A 5 foot service loop should be located near the beacon and the controller.

Installation Checklist

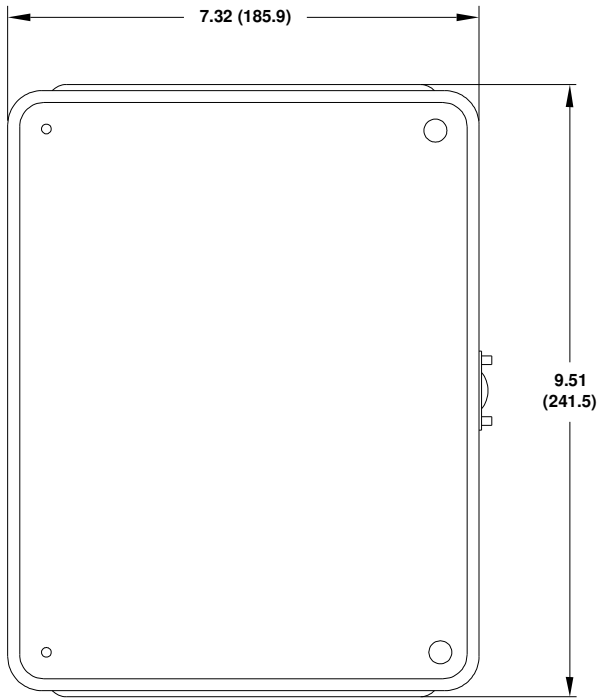
Use the following checklist when installing the system:

1. **Equipment Damage:**
Inspect all equipment for damage.
2. **Required Equipment:**
Verify the received equipment against the packing list to ensure completeness.
3. Consult site installation drawings for placement, mounting and wiring details.
4. Provide a power disconnect switch or a circuit breaker.
5. Check the lightning protection system.
6. Be sure that junction boxes will drain properly.
7. Position and mount the controller allowing adequate clearance to open the cover.
 - Ensure that the unit is mounted upright.
 - Check the internal hardware to ensure that all screws are tight.
 - Ensure that no holes are punched or drilled on the top surface of the enclosure.
 - Ensure that air can flow around the enclosure.

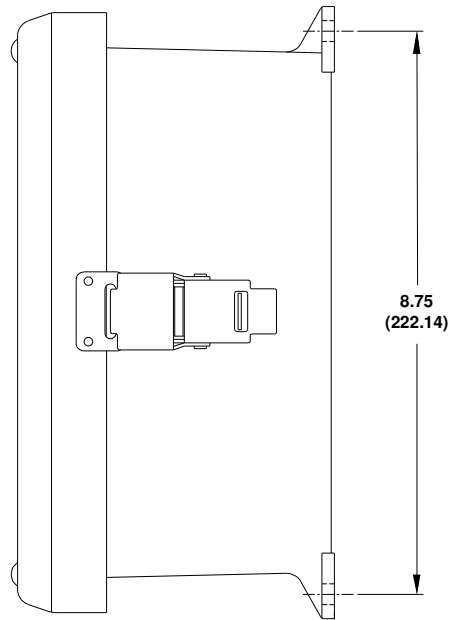
Complete the following steps before applying power:

8. Examine the installation drawings:
 - Check for proper incoming service voltage. Verify that primary power voltage is the value stated on the ID plate.
 - Wire each unit according to the instructions.
 - Check all electrical connections for tightness.
 - Check all terminal strip connections for tightness.
 - If external alarm detection circuit responds to closed contacts, ensure that they are wired to the contacts that close on alarm (C & NO).
 - If external alarm detection circuit responds to open contacts, ensure that they are wired to the contacts that open on alarm (C & NC).
 - Protect alarm wiring by using shielded wires, grounding the shield, and placing wires in a conduit.
 - Connect the photodiode to the controller: the white wire to 'PHOT +' Terminal 10 and the black wire to "PHOT -" Terminal 11.

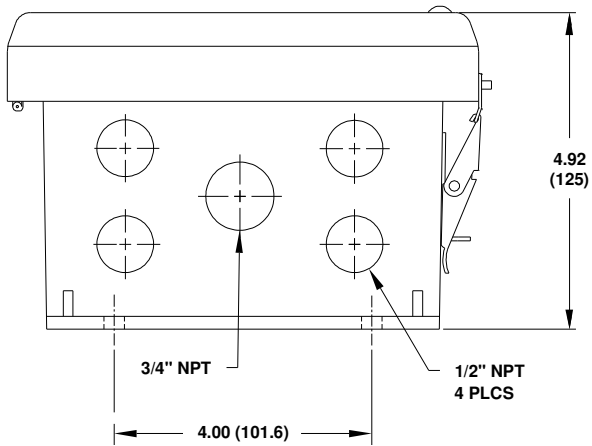
Important: After completing all steps listed in the Installation Checklist, apply power to the system and perform an operational checkout. Refer to Section 1 "Checkout Procedure".



FRONT VIEW



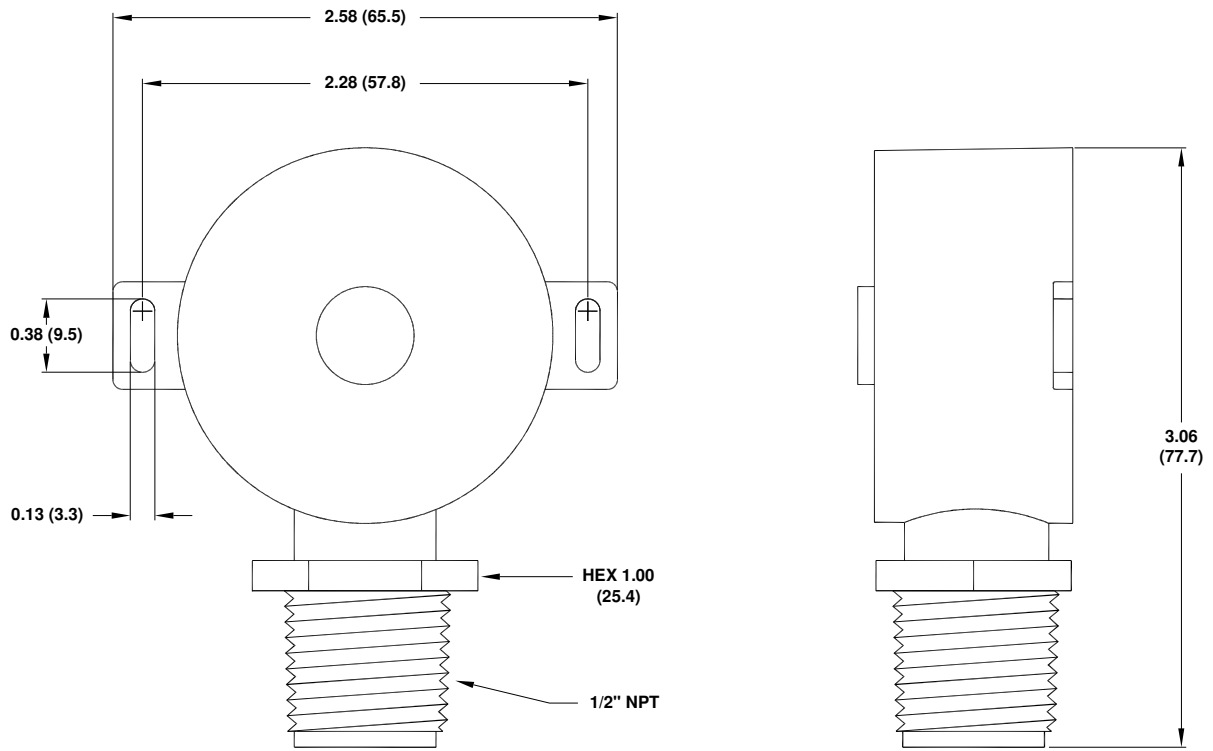
RIGHT SIDE VIEW



BOTTOM VIEW

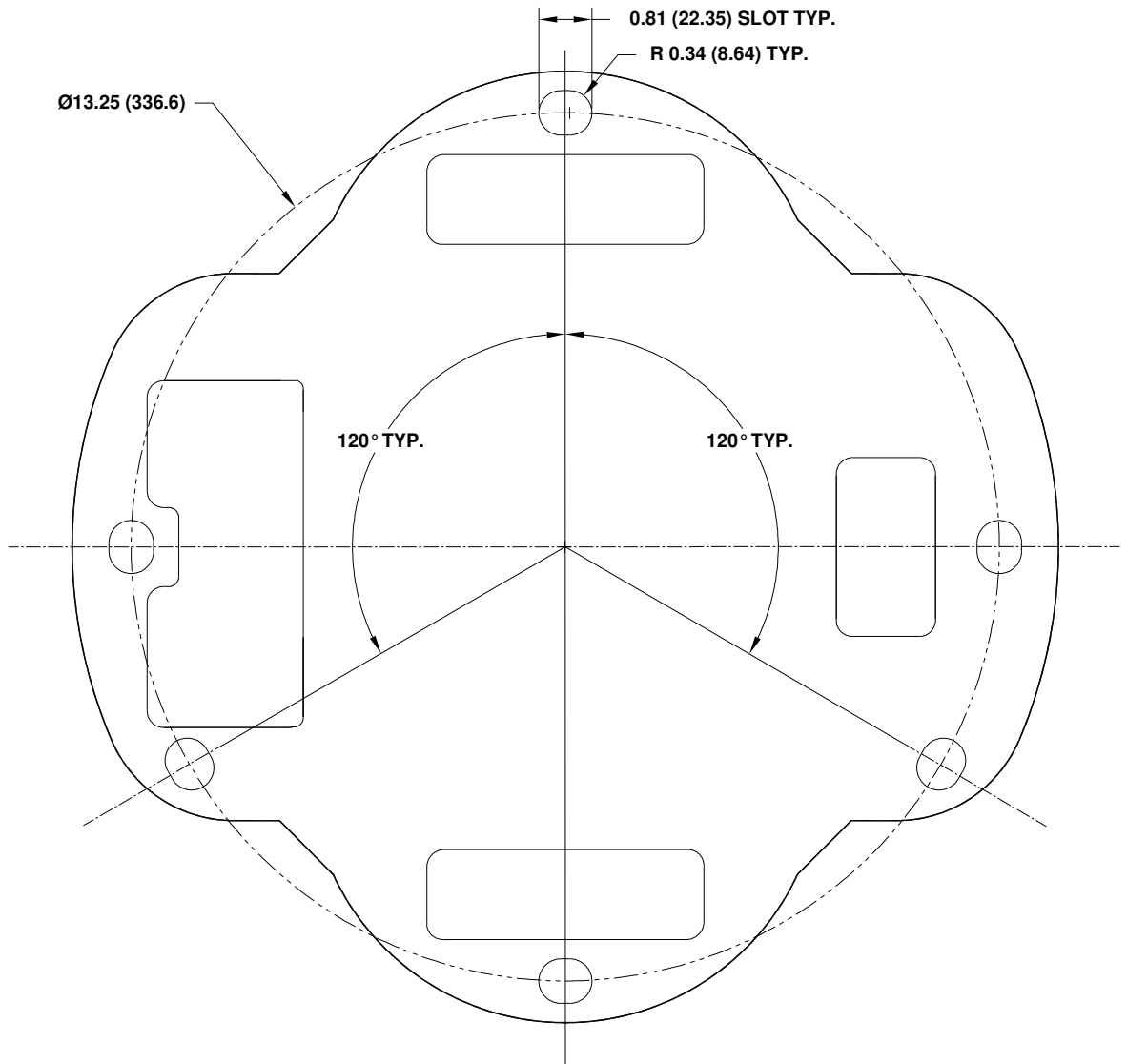
Note: All dimensions are in inches (millimeters).

Figure 2-1 FTC 2301 Controller Mounting and Outline



Note: All dimensions are in inches (millimeters).

Figure 2-2 Photodiode Sensor (PHD 512) Mounting and Outline



Note: All dimensions are in inches (millimeters).

Figure 2-3 FH 3610-2DC LED Beacon Base Outline

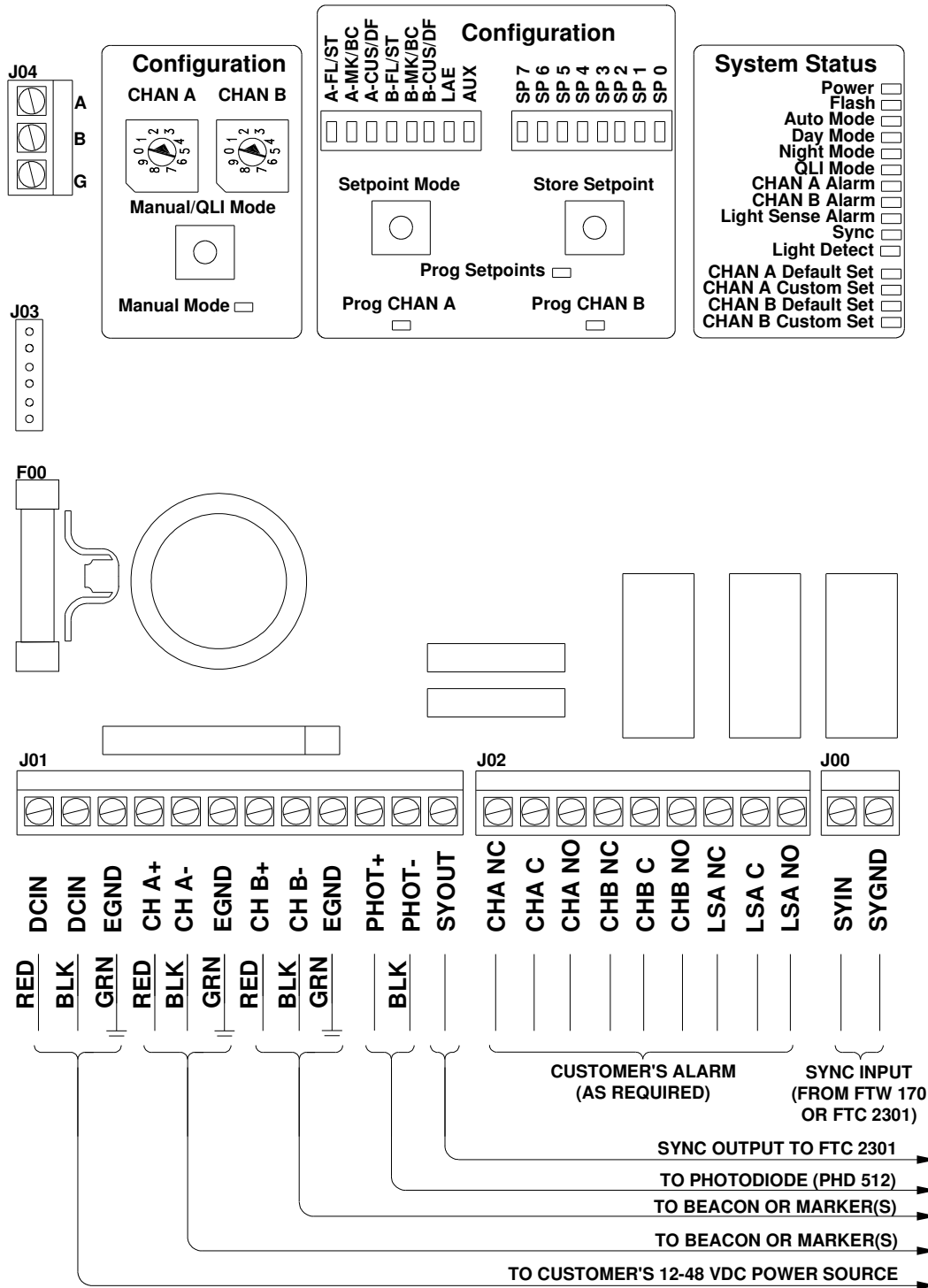


Figure 2-4 Connection Diagram

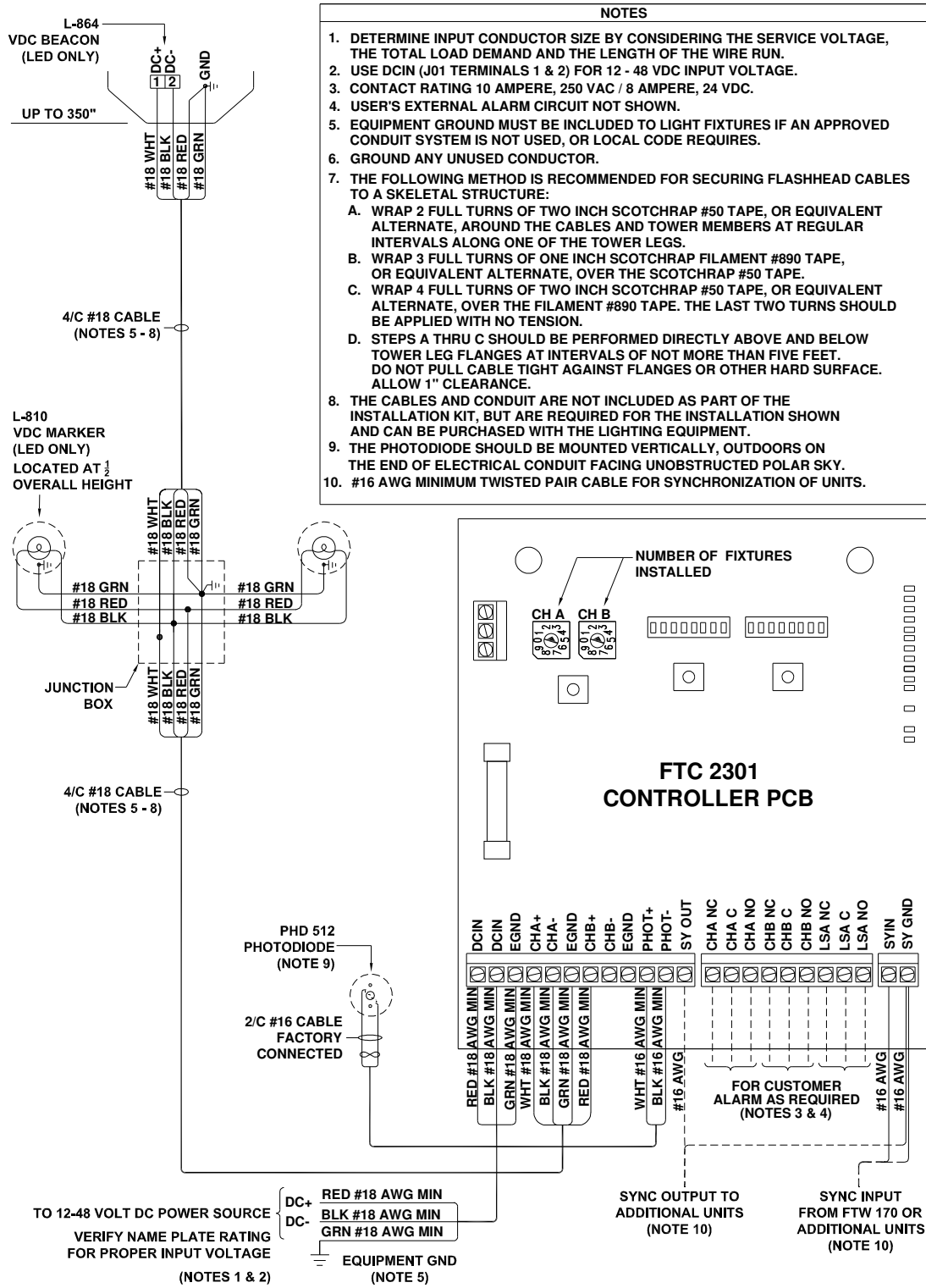


Figure 2-5 FTC 2301 Typical Installation Wiring (4 Conductor)

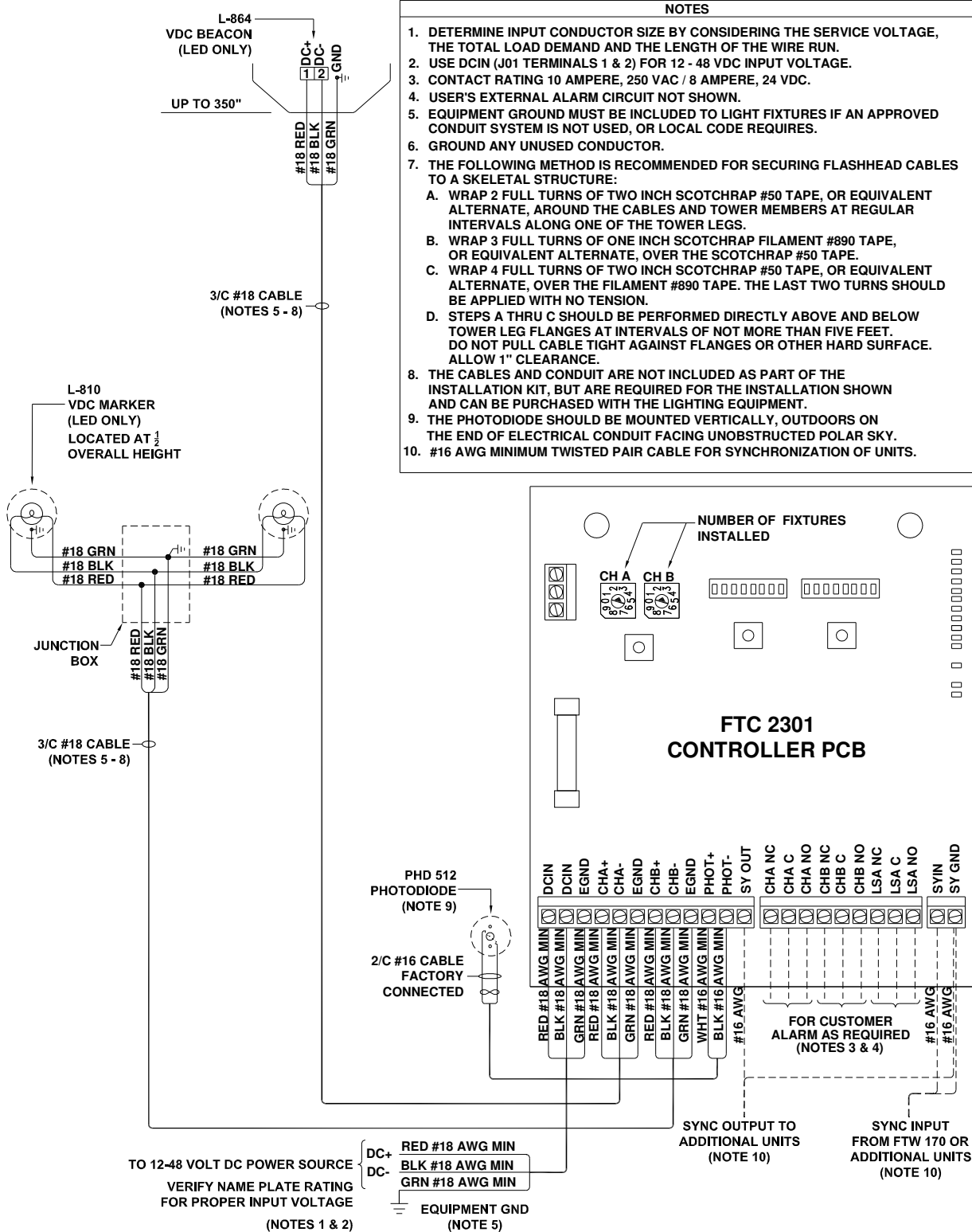


Figure 2-6 Typical Installation Wiring (3 Conductor)

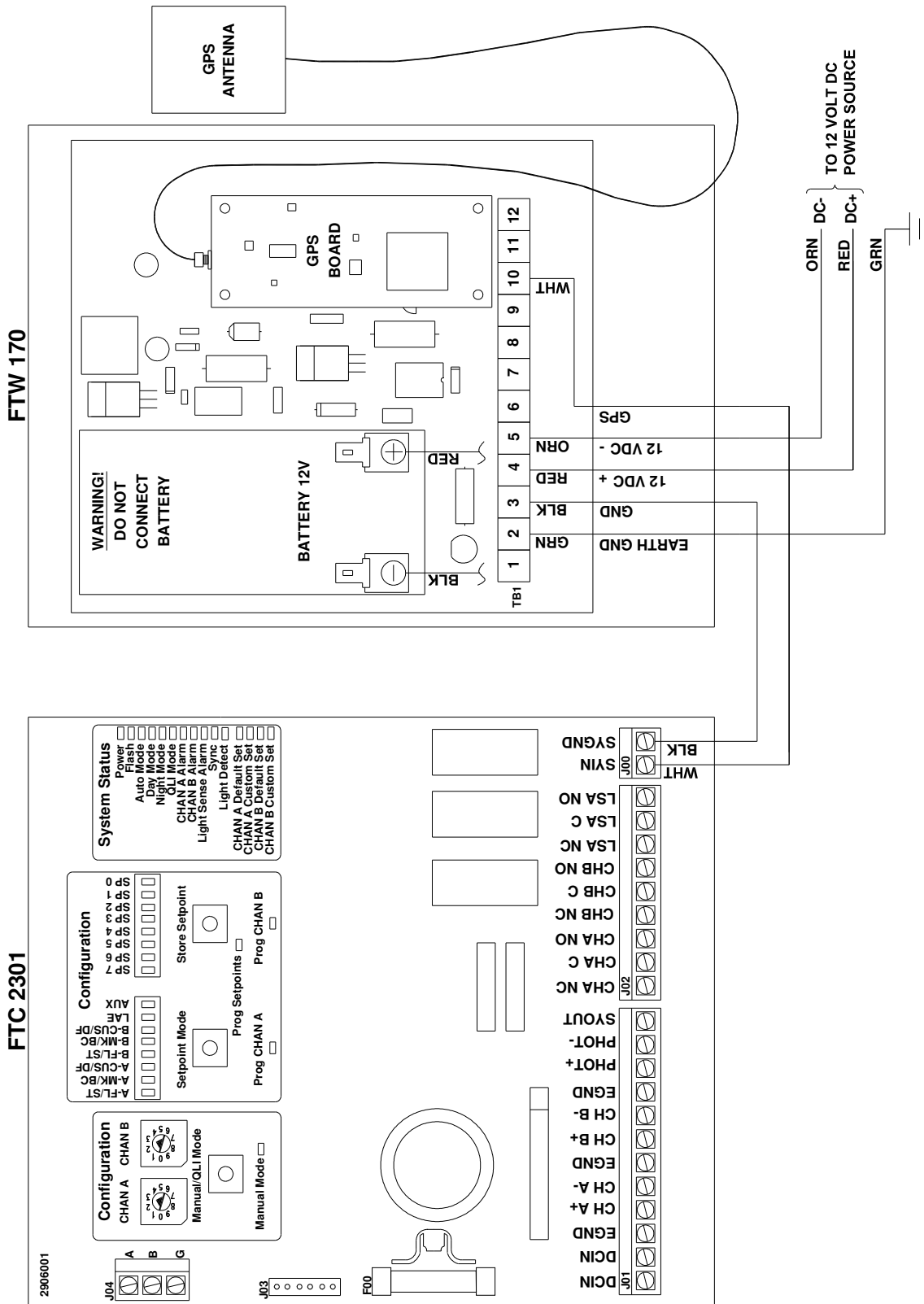
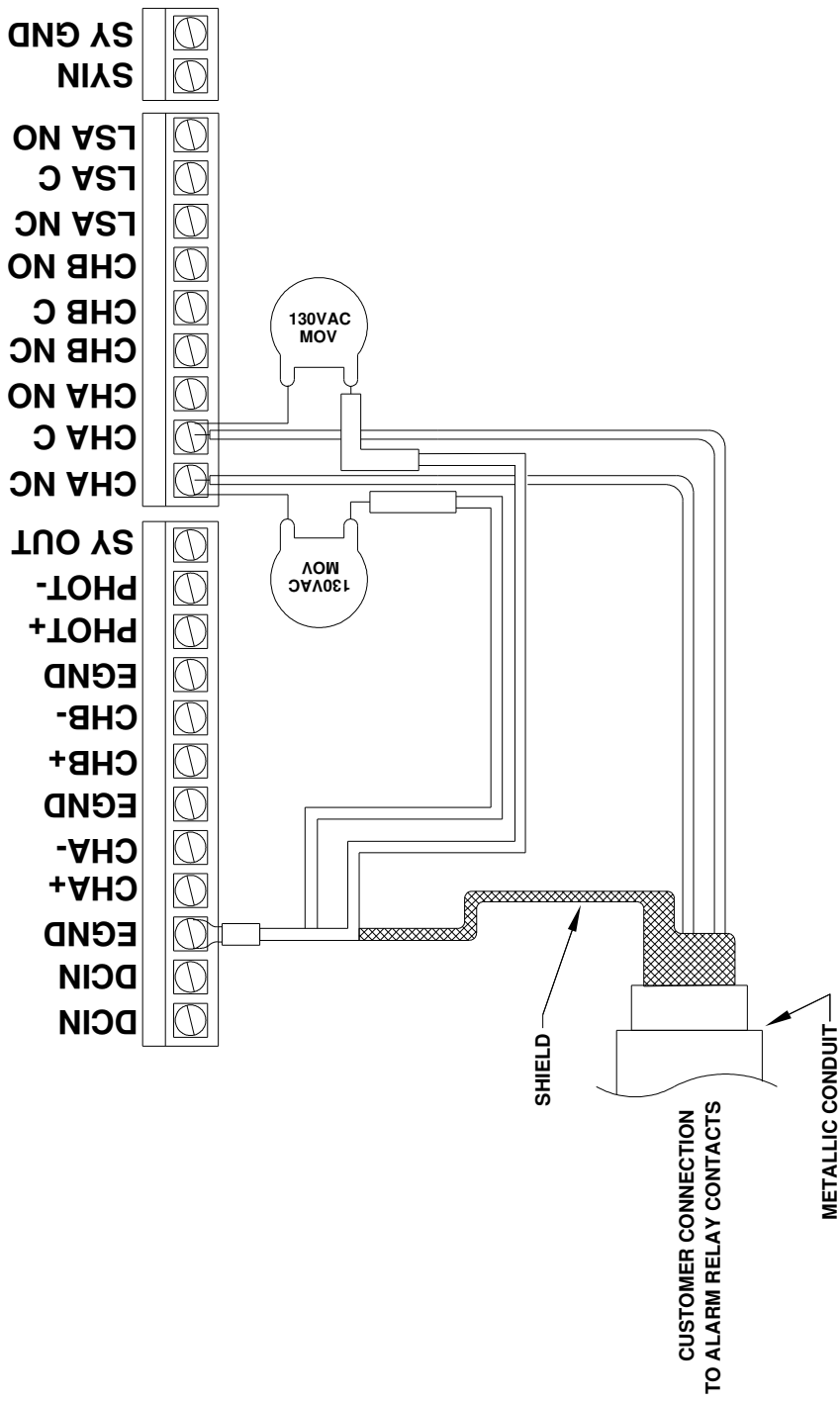


Figure 2-7 FTC 2301& FTW 170 (GPS Sync.) Interface



FLASH TECHNOLOGY ALARM RELAY CONTACTS ARE PROTECTED FROM VOLTAGE TRANSIENTS OF UP TO 1000 VOLTS. HOWEVER, WIRED ALARM CONTACTS CAN BE SUBJECTED TO VOLTAGES GREATER THAN 1000 VOLTS BECAUSE OF LIGHTNING. THE FOLLOWING RECOMMENDATIONS MINIMIZE THE POSSIBILITY OF DAMAGE CAUSED BY HIGH VOLTAGE TRANSIENTS ON THE ALARM RELAY CONTACTS OF FLASH TECHNOLOGY LIGHTING EQUIPMENT.

THE INSTALLER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE ELECTRICAL CODES.

NOTES:

1. USE SHIELDED CABLE TO ATTACH FLASH TECHNOLOGY ALARM RELAY CONTACTS TO EXTERNAL EQUIPMENT.
2. ATTACH THE SHIELD WIRE TO A GND (GROUND) TERMINAL ON THE FLASH TECHNOLOGY EQUIPMENT AS SHOWN.
3. WHEN POSSIBLE, ROUTE ALARM CONTACT WIRING IN METALLIC, GROUNDED CONDUIT.
4. FOR ADDITIONAL PROTECTION, ADD MOVs (VARISTORS) FROM EACH ALARM RELAY CONTACT TERMINAL TO A GND TERMINAL AT THE FLASH TECHNOLOGY LIGHTING EQUIPMENT.

Figure 2-8 FTC 2301 Recommended Alarm Wiring

Section 3 – Maintenance and Troubleshooting

Safety

Warning!

Read the warning on Page iii now. Disconnect primary power before opening enclosures.

Work safely, as follows:

1. Remove rings and watches before opening the equipment.
2. Shut off the equipment and wait one minute before proceeding.
3. Remove the component or connect the test instruments.
4. Replace the component.
5. Turn on the power and test the system.
6. Turn off the power and disconnect the test equipment.

Maintenance

The circuit boards should be kept free of accumulated dust. Brush and vacuum as necessary.

Note: Do not use compressed air to clean this equipment.

Troubleshooting

The most effective troubleshooting procedure begins with observing the behavior of the system. This often leads directly to a faulty component or other abnormal condition.

Table 3-1 contains information to help locate the cause of a problem.

Table 3-1 Major Troubleshooting Symptoms

Symptom	Possible Cause in Likely Order of Frequency
All lights fail	- Main power failure - External circuit breaker - PCB1 failure
Single light fails	- Check wiring for short or open in that line - Failure of individual lighting fixture
Erratic operation	- Loose connections - PCB1
Alarm	- Normal if a light or tier is out - PCB1 is configured incorrectly for the connected lighting equipment. <i>See Table 1-1 and Beacon/ Marker Setpoint.</i>
False alarm	- Check for correct alarm connections: normally open (NO) contacts close on alarm, normally closed (NC) contacts open on alarm. * - PCB1 failure
Lights do not flash	- Switch "A-FL/ST" and/or Switch "B-FL/ST" are set to the "On" position. - PCB1 failure.
Lights operate continuously	- A photodiode is not connected at J01 terminals 10 & 11. - Photodiode failure. - PCB1 failure.
Light Sense alarm will not reset	-Alarm can only be reset by a mode transition controlled by the photodiode. -Check the photodiode connections.

* The alarm relay contacts are labeled to represent their state with the unit powered on and with no alarms present. To ensure proper alarm monitoring, Flash Technology recommends monitoring contacts that are open in an alarm condition (example: J02 terminals 1 & 2.

Component Removal and Replacement

Note the wiring connections and wire colors when you remove wires from their connections. These must be replaced exactly as they were.

FTC 2301

PCB1 (2906001)

Remove: Unplug wire connectors at positions J01, J02, J00 and J04. Remove four Phillips-head screws located near the corners of PCB1. Lift the board out of the enclosure.

Replace: Reverse the removal procedure.

FH 3610-2DC LED Beacon

Dome (11000010306)

Remove: The Dome Assembly is secured to the beacon base by three tabs as shown in Figure 3-1. Gently pull out and up on the base of the tab to clear the locking pin. The dome assembly lanyard is secured to the beacon Base support bolt. The dome may be carefully lifted off the top of the beacon by gently pulling outward on the lanyard hole tab and letting air enter.

Note: When reinstalling the Dome it is important to hold it level and securely by the top outer edge. Make sure that the three dome tabs are lined up with the locking pins. With even pressure gently lower the dome over the O-ring seal until the tabs latch on the locking pins. Push in on each of the tabs to ensure that it is securely locked in place.

Replace: Refit the dome making sure that the O-ring is in place to insure a proper seal and prevent water intrusion.

Power Supply (11000014892)

Remove: Unfasten the two latches on the front of the base assembly. Lift the top to expose the power supply. Remove the red and black wires from the input power connector to the power supply. Disconnect the two position connector (black and red

wires) on the output of the power supply. Remove the screw attaching the ground wire to the top of the power supply. Remove the four screws that attach the power supply to the base.

Replace: Reinstall in reverse order.

LED Module (11000010305)

Remove: Unfasten the two latches on the front of the base assembly. Lift the top to expose the power supply. Disconnect the two position connector (black and red wires) on the output of the power supply. Lower the lid to approximately 10 ° and slide the entire LED module off the hinge pins as shown in Figure 3-2.

Replace: Reinstall in reverse order.

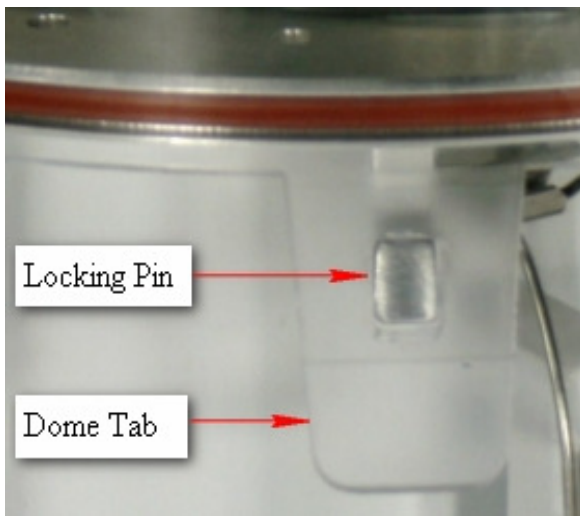


Figure 3-1 – FH 3610 Dome Removal

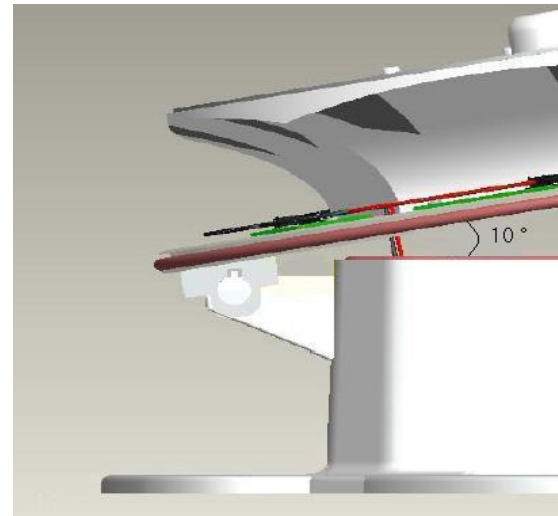


Figure 3-2 – FH 3610 Opened Top 10°

Section 4 – Major Replaceable Parts

Customer Service

Customer Service: 1-800-821-5825
 Telephone: (615) 261-2000
 Facsimile: (615) 261-2600
 Internet Address:
www.spix.com/en/flash-technology/

Shipping Address:
 Flash Technology
 332 Nichol Mill Lane
 Franklin, TN 37067

Ordering Parts

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

Replacement Parts

Table 4-1 lists the major replaceable parts for the system.

Repackaging the Controller

Equipment must be returned in a container that provides maximum protection during shipping and handling.

If the original cartons and packaging material are no longer available, package the Controller in a strong double corrugated carton using a double thickness cardboard container and adequate padding. Do not drop. Use appropriate warning labels on the outside of the container.

Table 4-1 Major Replaceable Parts

Item	Description	Part Number
F1	†Fuse, 20A	11000011529
PCB1	*Controller Board	2906001
Photodiode	†PHD 512	1855512
Cable	18 AWG/4C Cable (for Beacon, Marker & Input Power)	5991990
FH 3610-2DC	L-864 24-48VDC LED Beacon	11000010811
Power Supply	FH 3610-2DC 24-48VDC Power Supply	11000014892
Dome	FH 3610-2	11000010306
MKR 3801 (Single)	L-810 OL1 LED 1.5W DC Marker	1118000
MKR 3802 (Double)	L-810 OL2 LED 3W DC Marker	1118800
MKR 3701 (Single)	L-810 OL1 LED 3.5W DC Marker	1116000
MKR 3702 (Double)	L-810 OL2 LED 7W DC Marker	1116600

† Recommended as a spare part.

* Varies by configuration ordered.

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.

- 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 45 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.