

# > Flash Technology



## **FTS 361X-3**

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**Red LED Obstruction Lighting System  
Reference Manual  
Part Number F7913613**

SERIAL NUMBER



1.

## ITEMS INCLUDED IN THIS SYSTEM

- Quick Start Guide/Manual
- Controller
- Beacon(s) & mounting hardware
- Cable Installation Tape
- PEC w/pigtail
- 1/8" Flathead screwdriver
- Marker kit with Flash brand tray cable, no conduit required
- Optional: Universal adapter plate & hardware

## RECOMMENED ITEMS FOR INSTALLATION

- 9" or 12" #2 flathead screwdriver
- Level
- Long-nose pliers
- Nut drivers: 1/4", 5/16", 3/8"
- Combination wrenches to include 3/4"
- Digital volt-ohm meter
- Wire strippers
- #2 Phillips® head screwdriver
- Optional: 1/2" & 3/4" flex conduit & connectors

2.

## GENERAL INSTALLATION NOTES

- Photocell referred to as PEC, uppermost flashhead referred to as AOL
- Controller operates from a universal input power (120 or 240VAC 50/60Hz) without configuration.
- (1) 15 amp breaker is recommended for typical FAA approved red LED system up to an A2 tower type.
- Controller should be grounded with #2 Copper into the site grounding system utilizing the preinstalled grounding lug inside the enclosure.
- Incoming power connection, L2 on terminal block can also be Neutral. Refer to page 14.
- Refer to pages a & b for installation checklist and punch-down.
- Flash Technical support available 800-821-5825 M-F, 7am – 7pm CST. Monitoring support available 24/7/365.
- It is the installer's responsibility to comply with all electrical codes and the guidelines outlined in the FAA Advisory Circulars.

3.

## COMPONENT CONNECTIONS

- Mount controller at eye-level for ease of operating Eagle 3.0 user interface. See step 7.
- Optional: A universal adapter plate is available for mounting controller and FTW 174 to existing uni-strut. Refer to page 21 or call Flash for details.
- Mount resistive PEC in upright position with unobstructed view of polar sky in accordance with FAA requirements.
- Utilize #2 Phillips head and 1/8" flathead screwdrivers to connect beacon and marker cables to controller. Refer to page 14 for detailed connections.
- Refer to diagram on page 28 for efficient cable routing.
- Apply power to controller only after marker and beacon cables are connected at both ends.

4.

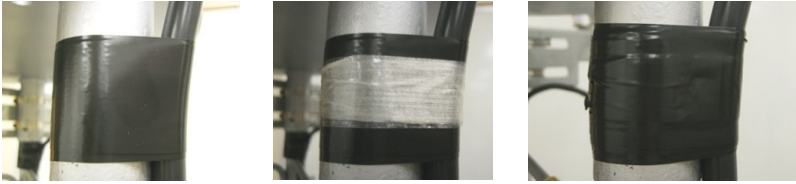
## BEACON



- Hoist flashhead only by mounting holes in flashhead base.
- There should be no obstructions in horizontal path of light in accordance with FAA requirements
- Mount on level surface to ensure light output in accordance with FAA requirements.
- Ensure flashhead is electrically bonded to tower by installing on clean metal surface and utilizing stainless or galvanized hardware provided
- Provide 5' flashhead cable service loop next to each beacon and controller.
- Copper lighting rods should extend a minimum of 36" above top of beacon. Beacon should be located underneath protective halo 18" horizontally from rod.

5.

## CABLE

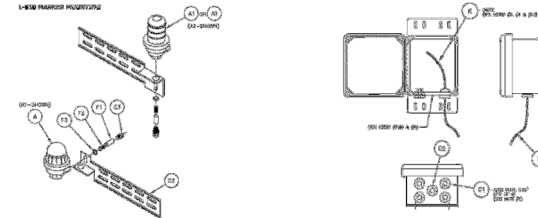


- Attach marker and flashhead cables with special tape provided. Use of wire ties is not recommended.
- Apply tape per 2-3-4 method.
- NEC specifies tape intervals are not to exceed 5'.
- Allow 1" excess cable around tower leg flanges to avoid abrasion.
- Service loops are recommended as a precaution for future maintenance or diagnostics.

Refer to page 17 for detailed instructions.

6.

## MARKER KIT



- New marker kit design eliminates need for conduit.
- Install sections of marker cable and mount fixtures to universal brackets prior to climb.
- Universal bracket accommodates side and bottom mount fixtures. Note universal bracket secures side mount fixtures to maintain upright position.
- Punch small hole in center of applicable cord grips in junction box for marker cable install.
- Wire nuts are provided in marker kit for marker cable connections in junction box and marker bases.
- Install drip loop for each cable near the junction box and at each marker fixture.
- Confirm controller programming matches number of markers installed.

Refer to instructions provided in marker kit for detailed information.

7.

## EAGLE 3.0 INTERFACE



- After initial power up, interface will display the factory-set system configuration. Confirm the configuration matches the system installed.
- "Sys OK" followed by "Auto" should display next. This confirms there are no alarms detected and the PEC is set to "Auto" mode.
- Refer to pages 6 - **Error! Bookmark not defined.** to run **Diagnostics**, change the system **Configuration** or perform an automated or manual **Lighting Inspection**.

8.

## MONITORING/ALARMING



- For Flash monitoring customers: Connect FTW 174 to RS485 communication located in controller. This connection is necessary for Quarterly Lighting Inspection (QLI) waiver. Refer to FTW manual for detailed interface connections.
- Dry contact alarms are configured to alarm when the state is "open". For discrete alarming, a single common connection is provided in controller.
- Dry contact alarms for markers, input power and PEC are located in the controller. **Flash's 19 hour fail-safe feature is associated with the PEC contact and must be utilized to capture a mode related alarm.**

Refer to pages 17, 31, 32 & 33 for detailed instructions.

# Installation Check List

## CONTROLLERS

- The controller is mounted away from radio frequency interference (RFI).
- The controller is mounted upright, water tight and lightning bonded to the site grounding system. The mounting adapter panels are optional for outdoor installations mounted to H-Frames.
  - # 2 AWG wire (min.) is used to secure to the grounding lug inside the enclosure to the lightning ground system (tested for 25 ohms or less).
  - There are no holes punched or drilled in the top or sides of the enclosure.
    - All unused controller entry holes are capped or sealed with NEMA 4 connectors to maintain the rating of the enclosure.
  - Airflow can circulate around the enclosures. Allow 8 to 10" on all sides.
  - The top of the enclosure should be approximately eye level to facilitate easy access and troubleshooting.
- The incoming service voltage and frequency ranges between 120-240 VAC 50 or 60 Hz from a 20-amp breaker dedicated to the lighting circuit.
- If using a generator, 5,000 Volt Amps (5 KVA) as a minimum for a single beacon and 7,000 Volt Amps (7 KVA) as a minimum for up to 3 beacons. The electrical supply frequency must be between 47 and 63 Hz.
- All electrical connections and inside cabinet hardware mounts have been double-checked for tightness before powering up.
  - All wire connections are installed correctly into the Terminal Blocks not resting on the insulation of conductors.
  - All PCB connectors are plugged in securely; wires properly inserted and screws tight in the controller.
- The **AOL** designated MOD 1 RLC board is connected to the top (AOL) LED beacon cable.
  - The beacon cable wire conductors are connected properly and correspond to the system drawing wiring instructions and are consistent through the junction boxes (if used) on the structure to the LED beacon
- The photocell is connected to the **controller** at PCB 1 J4 connector pins 4 & 5.
- The top tier of markers is connected to the **controller MOD 1 PCB on MKR output of the controller.**
  - The bottom tier of markers is connected to **MOD 2 PCB on the MKR output (if multiple tiers exist on the structure).**
  - The Address Switch is confirmed as 1 on the uppermost beacon MOD 1 and MOD 2 should be confirmed as 2.
- The **Intensity Select** switch (Manual Override) is in **Auto** on the **Controller**.

## LED BEACON and CABLE

- LED beacon and marker cable has outer (black) insulation jacket removed after a 1 inch entrance into the controller housing.
  - The cord connectors are tight
- The LED beacon cable insulation and marker cable insulation have not been nicked.
- A service loop for the LED beacon cable is placed at the base of the tower near the controller.

The LED beacon cable is properly secured to tower so the insulation won't become worn or cut with wind and over time.

Using Flash Technology's two supplied tapes and the 2-3-4-layer method, secure the cable to the tower not exceeding 5' in between.

A service loop is placed just below the beacon.

The LED beacon cable is not pulled tight against sharp edges.

On each side of every tower leg joint a flange is secured allowing 1 inch of slack around the joint.

The LED beacon is wired correctly.

The dome nut on the cable strain relief is tight.

The LED beacon is securely closed with both latches in place.

The top of the tower has a lightning rod(s) made of copper positioned at least 36" above the top of the beacon.

The LED beacon is level.

The LED beacon is grounded to the tower using the Stainless Steel or Galvanized hardware provided.

The LED beacon is mounted in an FAA approved location (no obstruction providing a 360° view).

### **MARKERS** (steady-burning LED sidelights, side-markers or obstruction lights L-810)

All markers are **LED 6.8 Watt Marker Fixtures** provided by Flash Technology.

The marker junction box screws are secure and the box is watertight and mounted with the connector holes down.

The marker wires are sized sufficient so voltage drop to marker lights is 3% or less per FAA specifications and a drip loop is present at the junction box. Usually #12 AWG cable is sufficient.

### **PHOTOCELL (PEC)**

The photocell mounted vertically to prevent water entry.

The PEC is mounted to conduit and protected from damage.

The PEC is facing north and no artificial lights including security lights, street lights, lighted signs or direct sunlight will affect its operation.

### **ALARMS and ALARM WIRING**

There are NO Alarm LEDs lit on the PCB boards of the controller.

The controller user interface display panel is reading SYS OK and is displaying the correct configuration of the system installed on the structure. (RED with the correct number of beacons and markers if applicable.)

Perform a Diagnostic review and perform a Lighting Inspection with the user interface panel

Dry contact alarm wiring is connected to the alarm monitoring system as prescribed by the tower owner into the controller as recommended in Figures 2-14 - 2-16 of the product manual.

RS 485 monitoring conductors are installed if interfacing with an FTW 174 Wireless Monitoring Unit. Please refer to the FTW 174 product manual for detailed instructions.

***Call Flash Technology at 1-800-821-5825 if additional TECHNICAL ASSISTANCE is needed.***

# **Front Matter**

## ***Abstract***

This manual contains information and instructions for installing, operating and maintaining the FTS 361X-3 Red LED Obstruction Lighting System.

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## ***Applicable Specifications***

This equipment meets or exceeds requirements for an FAA Type L-864.

## ***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 of the LED lighting system, under normal operating conditions, for 5 years from the date of shipment from Flash Technology.

## ***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 150/5345-43F, 150/5345-51, 150/5345-53C, and Engineering Brief No. 67B. 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 – Introduction and Operation

## ***Introduction***

The FTS 361X-3 Red LED Obstruction Lighting System is designed to operate FAA type L-864 flashing LED beacons and L-810 steady burning side lights (markers). The FTS 361X-3 controller is available in two sizes: one designed to accommodate A0 – A2 systems and one designed to accommodate A3 – A6 systems. See Table 1-3 for a listing of models.

## ***System Overview***

The FTS 361X-3 LED Lighting System has been designed for long life, reducing the need for service. In the event that service is required, the need for climbing is reduced by locating all control electronics on the ground. Ease of installation and service is enhanced by simple wiring, setup, and diagnostics.

Each lighting system consists of one controller and one or more LED beacons and/or steady burning LED side lights.

The LED beacon is made up of one LED module, which lights when current passes through it. The LED Module contains its own internal power supply.

The controller provides mode control, synchronization of beacons, L-810 marker control and alarm interfaces. The controller operates on voltages ranging from 120 to 240 VAC 50/60 Hz without any modifications to the input power module. The FTS 361X-3 system is not phase sensitive relative to the input power.

This manual provides guidance and recommendations for the installation, operation, and troubleshooting of the lighting system. Please read this document in its entirety before installation.

## Specifications

Table 1-1 – Physical Specifications

Parameter	
FLC 361X-3 Controller (A0 – A2) Dimensions (H x W x D) Weight	15.32 x 12.76 x 6.60 in 12 lbs
FLC 361X-3 Controller (A3 – A6) Dimensions (H x W x D) Weight	19.31 x 17.32 x 9.58 in 22 lbs (Max.)
FH 3610-2 Beacon Dimensions (H x DIA) Weight	8.4 x 15.00 in 20 lbs
PEC 510 Photocell (H x W x Depth)	3.06 x 2.58 x 1.02 in

Table 1-2 – Performance Specifications

Parameter	
Application Flash Intensity (nominal)	L-864 2,000 ± 25% ECD
Flash Rate	20 flashes per min.
Primary Power	120-240VAC, 50/60 Hz
Controller Power Consumption (A0 – A2)	12 W
Controller Power Consumption (A3 – A6)	24 W
Power Consumption L-864 FH 3610-2 L-810 MKR 3601 L-810 MKR 3602	20 W (Steady) 6.8 W 13.6 W
Environmental	Complies with FAA specifications in AC 150/5345-43F.

Table 1-3 – FTS 361X-3 Red Lighting Systems

	System Model Number ( Fourth digit = # of Beacons)	Controller Model Number	Beacon Model Number	Marker Model Number	Number of Marker Tiers
<b>A-0</b>	FTS 3610	FLC 3611-3	N/A	MKR 3602	1 (Double)
<b>A-1</b>	FTS 3611	FLC 3611-3	FH 3610-2	MKR 3601	1
<b>A1 Double</b>	FTS 3612	FLC 3611-3	FH 3610-2	MKR 3601	1
<b>A-2</b>	FTS 3613	FLC 3612-3	FH 3610-2	MKR 3601	2
<b>A-2 Double</b>	FTS 3614	FLC 3612-3	FH 3610-2	MKR 3601	2
<b>A-3</b>	FTS 3615	FLC 3613-3	FH 3610-2	MKR 3601	3
<b>A-3 Double</b>	FTS 3616	FLC 3613-3	FH 3610-2	MKR 3601	3
<b>A-4</b>	FTS 3617	FLC 3614-3	FH 3610-2	MKR 3601	4
<b>A-4 Double</b>	FTS 3618	FLC 3614-3	FH 3610-2	MKR 3601	4
<b>A-5</b>	FTS 3619	FLC 3615-3	FH 3610-2	MKR 3601	5
<b>A-5 Double</b>	FTS 36110	FLC 3615-3	FH 3610-2	MKR 3601	5
<b>A-6</b>	FTS 36111	FLC 3616-3	FH 3610-2	MKR 3601	6
<b>A-6 Double</b>	FTS 36112	FLC 3616-3	FH 3610-2	MKR 3601	6
<b>A-6 3 Top</b>	FTS 36113	FLC 3617-3	FH 3610-2	MKR 3601	6
<b>A-6 4 Top</b>	FTS 36114	FLC 3617-3	FH 3610-2	MKR 3601	6
<b>A-6 5 Top</b>	FTS 36115	FLC 3617-3	FH 3610-2	MKR 3601	6

## Controller

### Operation Overview

The controller component layout is shown in Figures 4-1 & 4-2 and the wiring diagram is shown in Figures 2-12 & 2-13.

The incoming AC Line (120-240 VAC 50/60Hz) is connected to terminal strip TB1. Mounted on TB1 is a Metal Oxide Varistor (MOV1) which reduces line surges and transients. Input power fuses F1 and F2 are also mounted on TB1. Disconnect power from the controller before servicing the fuses or MOV. The fuse holders in the A0 – A2 controller are hinged on the upper side. Lift and open

side cover to access the fuse. The fuse holders in the A3 – A6 controller are hinged on the lower side. Pull down on the fuse holder to expose the fuse.

The Power Supply (PCB2) converts AC input power to 12VDC for the controller PCB (PCB1) and RLC Output PCB's MOD X.

The controller PCB (PCB1) supervises system operation. A user interface with alphanumeric display and pushbuttons provides system configuration and alarm notification.

## PCB1 Controller Board

PCB1 controls and monitors the operation of the FLC 361X-3 controller. Status indicators and setup options are shown below.

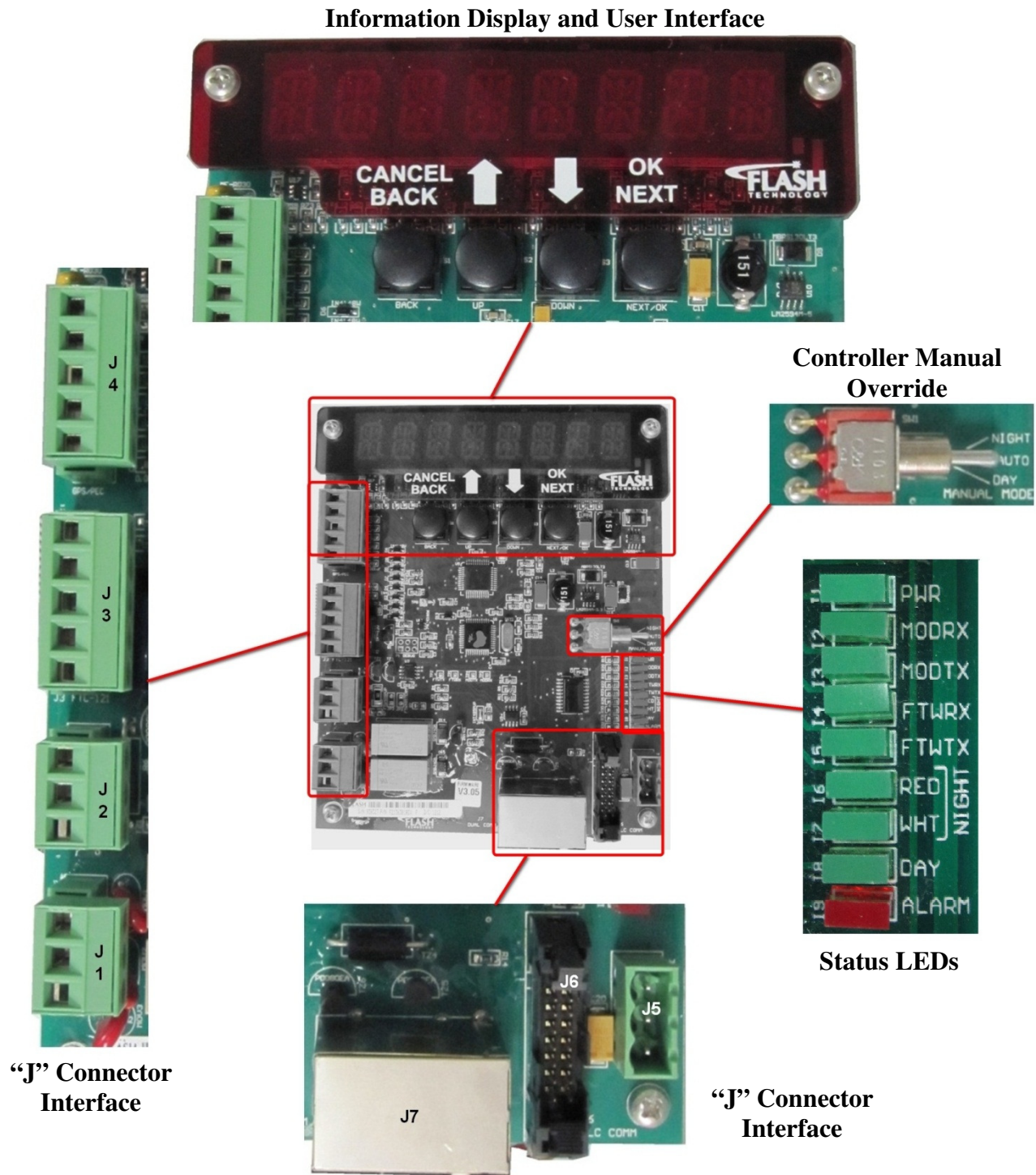
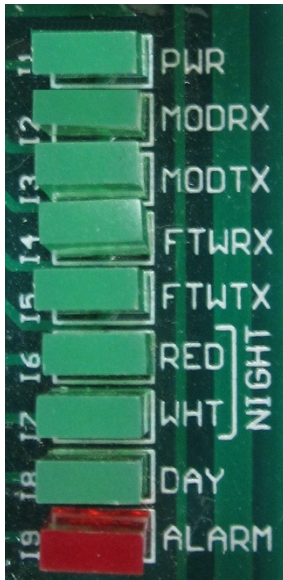


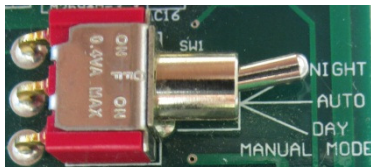
Figure 1-1 – PCB1 Controller Board

Table 1-4 – Status LEDs



LED	Indication
PWR (1)	Green when power is applied to the controller
MODRX (2)	Green blinking when controller is receiving data from RLC Output PCB(s)
MODTX (3)	Green blinking when controller is sending to RLC Output PCB(s)
FTWRX (4)	Green blinking when controller is receiving data from an attached FTW wireless unit
FTWTX (5)	Green blinking when controller is sending data to an attached FTW wireless unit
NIGHT RED (16)	Green continuous when controller is in RED NIGHT mode, blinking when controller is in manual RED NIGHT.
NIGHT WHT (17)	(Night White) Not used in this application.
DAY (18)	Green continuous when controller is day mode, blinking when controller is in manual day mode.
ALARM (19)	Red when controller has detected a fault

### Controller Manual Override



When the controller Manual Mode switch is moved to either Day or Night the display reads “MANUAL” and the corresponding Mode LED blinks. Manual mode on the system controller expires 30 minutes after initiating the mode override.

Each change to the manual mode switch restarts the 30 minute timeout. The Manual Mode switch must be moved after power up to activate mode override. The switch has no effect if it is set to Day or Night before power up.

Table 1-5 – J-Connector Interface  
(See Figure 1-1)

Connector	Function
J1	Dry Contact Alarm Outputs 1- Photocell – closed when photocell has changed modes (day/night) within the last 19 hours. 2- Power Fail – closed when power is applied 3- Alarm Common
J2	FTW 174 wireless monitoring unit connectivity only
J3	FTC 121 High Intensity interface / Mode relay connection. (See Figure 2-18)
J4	Resistive photocell input (See Figure 2-8) / FTW 170 wireless sync. (See Figure 2-17)
J5	12VDC power input
J6	RS-485 Communication and 12VDC power output to RLC interface PCB's
J7	Not used in this application.

## Controller PCB1 Information Display and User Interface



Figure 1-2 – Controller Display and User Interface

There is an 8 character display on the system controller board. See Figure 1-2. It defaults to a display of the status of the system and the current configuration. If no alarms are detected on the system, an example of the main screen will read “SYS OK”, “AUTO” or “MANUAL” (depending on the status of the controller Manual Override switch) and “CURRENT CONFIG- TYPE-RED-BEACONS 1 MKR TIERS 1 - MKR/TIERS 3”. If

present, alarms will be displayed instead of “SYS OK”. See Table 1-8 for a list of alarms and definitions. The display text can be stationary or in scrolling format.

**NOTE:** Pressing the “Cancel / Back” button will return the controller to the previous menu level. Pressing the “Cancel / Back” button at the main menu level will reset the main menu display and return to “SYS OK” or “ALARMS”.

Table 1-6 – Controller Display Buttons

Button	Function
CANCEL / BACK	Returns BACK to a previous screen or CANCELS a previous command.
UP ↑	Navigates UP through the active menu options.
DOWN ↓	Navigates DOWN through the active menu options.
OK / NEXT	OK Confirms your selection or Advance to the NEXT option.

Table 1-7 – DLC Menu Options

Menu Option	Description
DIAG	Displays diagnostic data on the current operating status of the system.
LIGHTING INSPECTION	User interface for completing Quarterly and Annual Lighting Inspections manually or automatically.
CONFIG	User interface for programming the controller to the existing system configuration.



Table 1-8 – Alarm Definitions

Alarm	Description
BCN(X) NITE	Indicates a beacon failure on the MOD X RLC output. The last digit will change reflecting the failed beacon.
MKRT(X)	Indicates a marker failure on a specific tier. If multiple tiers are installed the last digit will change to that designated tier number.
PEC ERR	Indicates an alarm on the photocell. The system has failed to change modes within 19 hours through the photocell or FTC 121 transition process.
COM ERR	Indicates a loss of communication between the controller and the MOD X RLC Output PCB's.
CFG ERR	Indicates too many devices have been added to the system based on the configuration of the controller or the addressing switch has been selected to the wrong position.

## Diagnostic

The diagnostic menu provides data detailing the system operation status and a more in depth description of alarms that may be active. The information is displayed in scrolling text format. The

diagnostic menu is broken down into three sections: beacons, markers, and controller. The steps below describe the procedure utilizing the controller display and user interface.

- From the Main Screen push the OK/NEXT button and “DIAG” will be displayed.
- Press OK/NEXT button again to enter the Diagnostic Menu.
- An example of displayed data may read “DIAGNOSTIC MENU – MODE RED NITE – CONTROL AUTO – CONTROL PHOTOCCELL – POWER 110-120V 60HZ”.
  - “MODE RED NITE” indicates the system’s current operating mode.
  - “CONTROL AUTO” indicates that the system is in Auto mode.
  - “CONTROL PHOTOCCELL” indicates that the system’s mode is controlled by a connected photocell.
  - “CONTROL MANUAL” indicates that the mode switch is placed in the day or night position. *See “Controller Manual Override” for important information regarding the operation of the Manual Override switch.*
  - “POWER 110-120V 60HZ” indicates the voltage and frequency of the input power.
- Press the OK/NEXT button to review diagnostics for each RLC Output Module.
- An example of displayed data may read “ BCN1 MOD1 OUT1 NO ALARM – VALUE 606 – MOD1 DATE CODE – RLC MAR 24 2011 – 13 50 21”
  - “BCN1 MOD1 OUT1 NO ALARMS” indicates that Beacon 1 connected to Output 1 on the RLC MOD1 board is being diagnosed and there are no alarms present.
  - “VALUE 600” is a number value displayed to indicate a current return is being received and is being interpreted through the firmware. This value should not be misinterpreted as actual amperage readings.
  - “RLC MAR 24 2011 – 13 50 21” indicates the date and time of the latest Firmware Revision of the MOD 1 RLC boards in hours, minutes and seconds format.
- Press the UP ↑ button to review the diagnostics for any additional beacons or to proceed to the side marker diagnostics.

- An example of displayed data for side markers may read “MKR T1 – MOD1 OUT3 - NO ALARMS – MKRS 3 – VALUE 0210 – MAY MOD1 DATE CODE – RLC MAR 24 2011 – 13 50 21”
  - “MKR T1” indicates which tier of marker data, if multiple exist on the structure, is being displayed.
  - “MKRS 3” indicates the number of markers that are operating on that tier.
  - “VALUE 0210” is a number value displayed which is calculated relative to the current draw multiplied by the number of markers per tier. This value does not represent actual current.
  - “RLC MAR 24 2011 – 13 50 21” indicates the date and time of the latest Firmware Revision of the MOD 1 RLC boards in hours, minutes and seconds format.
- Press the UP ↑ button to review the diagnostics on the next marker tier. If there are no other marker tiers are on the structure, the menu will advance to diagnostics on the PCB1 controller board.
- An example of displayed data on the PCB1 controller board may read “CONTROL – UP TIME – 123 13 45 – MODE TIME – 08 15 30 – STATUS 00000000 – ALA MASK 00000000 – MAR 24 2011 – 13 50 21”.
  - “CONTROL” indicates that the diagnostics being displayed are for the controller.
  - “UP TIME – 123 13 45” shows the elapsed time since the controller was power cycled (off/on) in days, hours and minutes format.
  - “MODE TIME – 08 15 30” shows the length of time that the controller has been in the current mode in hours, minutes and seconds format.
  - “STATUS 00000000” and “ALA MASK 00000000” are diagnostic Alarm Codes that can be useful for interfacing with Flash Technology’s Technical Support staff to provide a more detailed description of the faults that are displayed on the Main display.
  - “MAR 24 2011 – 13 50 21” indicates the date and time of the latest Firmware Revision of the controller PCB1 board in hours, minutes and seconds format.

## Lighting Inspections

The FLC 361X-3 Lighting Inspection feature allows the user to interface with the complete lighting system on the structure without any physical intrusion to the circuits in the controller. The Lighting

Inspection feature is available to run in an automatic mode or in a manual step by step progressive approach. The steps below describe the procedure utilizing the controller display and user interface.

- From the Main Screen push the OK/NEXT button and “DIAG” will display.
- Scroll through the options using the UP ↑ or DOWN ↓ button until “LIGHTING INSPECTION” is displayed. Press the OK/NEXT button.
- “AUTOMATIC” will be displayed. Press the OK/NEXT button if this option is desired. If “MANUAL” inspection mode is desired, press the UP ↑ button again and then press the OK/NEXT button to proceed.

### MANUAL INSPECTION TESTING:

- “PLACING SYSTEM IN NIGHT MODE – INHIBITTING NIGHT FLASH FOR BCN 1 – BCN 1 NIGHT ALARM PRESENT” will scroll. The alarm for beacon 1 is

now active on the controller. Press the OK/NEXT button when you are ready to restore the alarm.

- “RESTORING NIGHT FLASH FOR BCN 1 – BCN1 NIGHT ALARM CLEARED” This should clear the alarm unless there was an actual alarm present on the system. Press the OK/NEXT button to advance to the next beacon, if installed, in the system. Repeat the above steps until you have engaged all beacons in the system. “END OF NIGHT BEACON TEST” will scroll when all beacons have been tested.
- The process described above is repeated for each tier of markers. After all marker tiers have been tested, the controller will display “END OF MARKERS TESTS”.
- If the controller is configured with the PEC alarm enabled, “TESTING PHOTOCELL ALARM DRY CONTACT” will be displayed and the photocell alarm dry contact will be tested. The test results will be displayed as “PHOTOCELL TEST FAILED” or “PHOTOCELL ALARM CLEARED”. If the PEC alarm is not enabled, “PHOTOCELL ALARM DISABLED – SKIPPING TEST” will be displayed.
- Press CANCEL/BACK button to end the Lighting Inspection.

### **AUTOMATIC LIGHTING INSPECTION TESTING**

The AUTOMATIC LIGHTING INSPECTION option will display exactly as the MANUAL LIGHTING INSPECTION feature without the need for interaction from the user. Each beacon and tier of markers will be tested in the sequence previously described. At the conclusion of the tests, “ALL TESTS PASSED – PRESS BACK” will be displayed. The Automatic Lighting Inspection method provides a 10 second delay between each alarm. The Manual Lighting Inspection method should be utilized if additional time is required for alarm receipt by your monitoring company.

### **Configuring the System**

The RLC 361X-3 configuration is preset from the factory. The configuration should always be verified to assure that the tower has been placed in an FAA compliant status to match the tower’s FAA determination.

Configuring will be necessary if the

controller PCB1 board is replaced or other beacons are added to the existing system. The configuration steps below describe the process utilizing the controller display and user interface. Always power cycle the controller after any changes if the configuration has to be adjusted.

- From the Main Screen push the OK/NEXT button and “DIAG” will display
- Scroll through the options using the DOWN ↓ button until “CONFIG” is displayed.
- Press OK/NEXT
- The current configuration will be displayed. To change, press OK/NEXT button.
- “TYPE \_\_\_\_” (DUAL, WHITE or RED) will be displayed depending on present configuration. Press the DOWN ↓ button until RED is displayed and press OK/NEXT button.
- “BEACONS” will flash followed by a number (The number designates the number of beacons the controller should be monitoring) Press UP ↑ or DOWN ↓ until the desired number of beacons is displayed and press OK/NEXT.
- “MKR TIER” will flash followed by a number (The number designates the number of marker tiers the controller should be monitoring) Press UP ↑ or DOWN ↓ until the desired number of tiers is displayed and press OK/NEXT.

- “PER TIER” will flash followed by a number (The number designates the number of LED markers the controller should be monitoring on each tier) Press UP ↑ or DOWN ↓ until the desired number of markers is displayed and press OK/NEXT.
- “MKR MODE” will flash followed by “STEADY” or “FLASHING”. Press UP ↑ or DOWN ↓ until the desired setting is displayed and press OK/NEXT.
- “PEC ALRM” will flash followed by “ENABLED” or “DISABLED”. Press UP ↑ or DOWN ↓ until the desired setting is displayed and press OK/NEXT.
- “GPS SYNC” will flash followed by “ENABLED” or “DISABLED”. Press UP ↑ or DOWN ↓ until the desired setting is displayed and press OK/NEXT.
- “121 OPT” will flash followed by “FTC121” or “MODE RLY”. “FTC121” should only be selected if the FTS 361X-3 is interfaced with an external FTC 121 controller (Figure 2-18). “MODE RLY” (Mode Relay) will allow the “AOLFAIL” dry contact (PCB1 J3 terminals 4 & 5) to indicate the current mode of the system. When “MODE RLY” operation is selected, a closed contact indicates day mode operation and an open contact indicates night mode operation. Press UP ↑ or DOWN ↓ until the desired setting is displayed and press OK/NEXT.
- “CATENARY” will flash followed by “ENABLED” or “DISABLED”. Press UP ↑ or DOWN ↓ until “DISABLED” is displayed and press OK/NEXT.

**Note: The following two options are available only if the controller is programmed for “Catenary” mode. Display of these options indicates that the controller was programmed incorrectly in the previous step. Press the BACK button to return to the Main Menu and begin the programming sequence again.**

- “CAT AOL” will flash followed by “TOP BCN” or “ALL BCN”.
  - “BCN 1” will flash followed by “TOP”, “MIDDLE” or “BOTTOM”.
- “CFG DONE” will flash followed by the text “HIT BACK” prompting the user to return to the Main Screen. Press the Cancel/Back button.

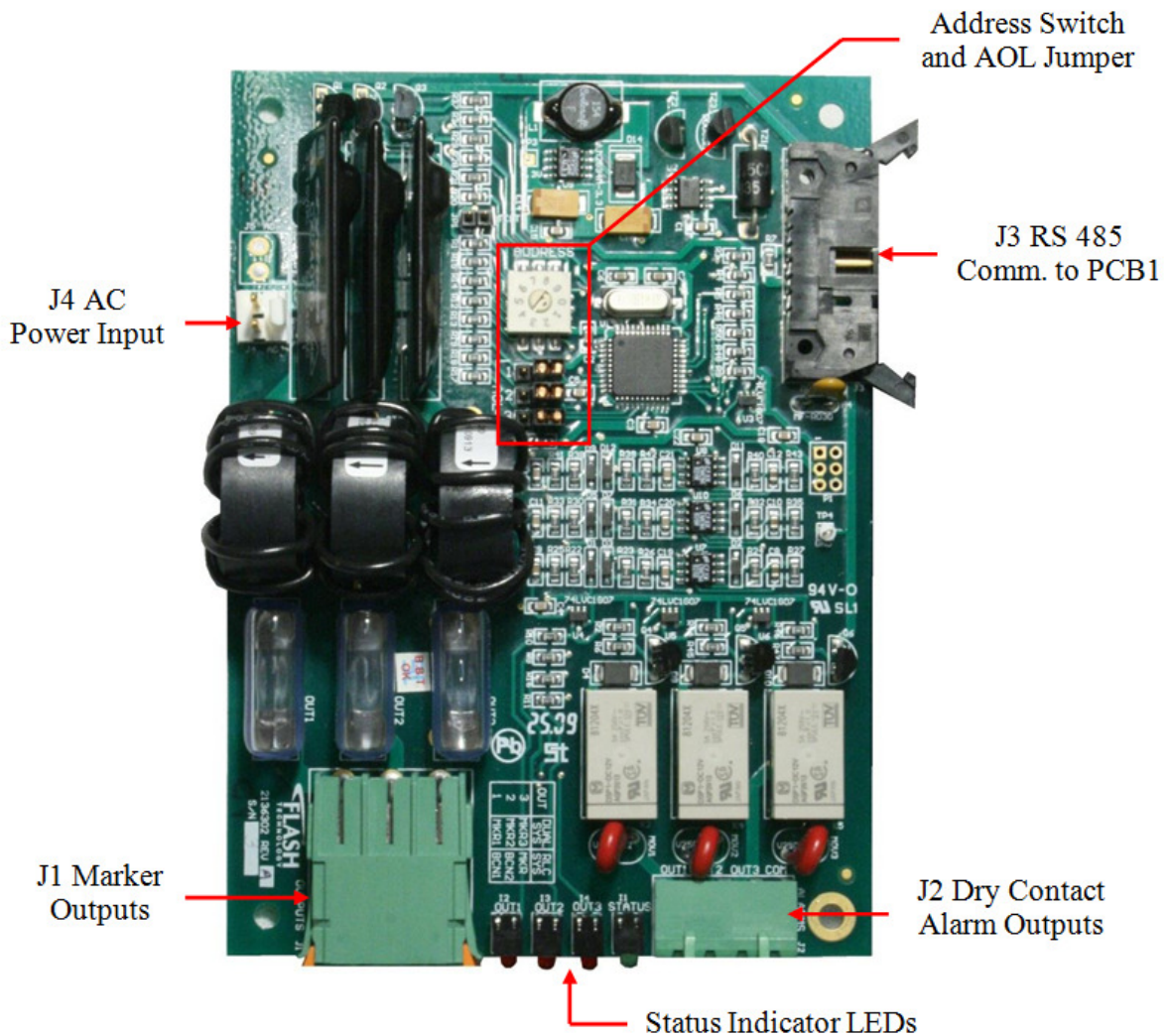


Figure 1-3 – PCB MOD X RLC Output Board

Table 1-9 – RLC Output PCB Connections

Connector	Function
J1	MOD X Outputs
	1- Beacon 1 (3,5,7,9,11,13)
	2- Beacon 2 (4,6,8,10,12,14)
J2	3- Marker Tier 1(2,3,4,5,6, Beacon 15)
	MOD X Dry Contact Alarm Outputs
	1- Beacon 1 (3,5,7,9,11,13)
	2- Beacon 2 (4,6,8,10,12,14)
	3- Beacon Alarm Common
4- Marker Tier 1(2,3,4,5,6, Beacon 15)	
5- Marker Alarm Common	
J3	RS-485 Communication and 12VDC power input from controller PCB
J4	AC Input

Table 1-10 – RLC Output PCB LED's

<b>LED</b>	<b>MOD X Indication</b>
OUT 1	Illuminated if the beacon connected to Output 1 is in alarm condition
OUT 2	Illuminated if the beacon connected to Output 2 is in alarm condition
OUT 3	Illuminated if the marker tier (or beacon 15) connected to Output 3 is in alarm condition
STATUS	Flashes once every 3 seconds if communicating with controller PCB1

## Section 2 – Mounting and Installation

### Unpacking

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

### Tools

Flash Technology suggests the following tools for installation and maintenance:

- 1/8" non-flared flat blade screw driver (included)
- 9 or 12 inch, flat blade #2 screwdriver
- #2 Phillips® head screwdriver
- Set of combination wrenches
- Long-nose pliers
- Assorted nut driver handles: 1/4", 5/16", 3/8" recommended
- Digital volt-ohm meter
- Wire strippers

### Controller Installation

See System Wiring Diagram Figures 2-7, 2-8 and 2-9 for additional installation requirements.

### Access WARNING

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

### Verifying the Installation

Upon completion of the system installation, verify the main menu display shows the correct configuration. Enter the Diagnostic Menu of the controller and confirm that no Alarms or Errors exist and the configuration matches the system requirements.

Enter the Lighting Inspection Menu at the end of every install and verify the system is responding correctly.

### Controller

Latches secure the cover. When you release these, you can swing open the cover for internal access.

### Mounting

Flash Technology does not furnish mounting hardware unless ordered as part of an installation kit. 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 airflow around the controller. See Figures 2-2 and 2-3 for controller enclosure dimensions and mounting feet.

### Mounting Adapter Panel (Optional)

The optional Mounting Adapter Panel allows for easier installation of the FTS 361X-3 system by removing the need for modifying the existing outdoor H-Frame to compensate for the size differences between the controller and power converter (See Figure 2-4). This should be installed when upgrading from previously installed Flash Technology products and new installations. The H-Frame may require adjustment on non-Flash Technology lighting products if the adapter panels are requested. Please contact the Flash Technology parts department at 1-800-821-5825 if this option is desired.

## Wiring

This manual may not contain all of the information about installation wiring required for your installation.

**NOTE:** If installation drawings prepared specifically for your site disagree with information provided in this manual, the installation drawings should take precedence. *Consult any site-specific installation wiring diagram supplied with your equipment.*

**NOTE:** Flash Technology wiring diagrams define only minimum requirements recommended for satisfactory equipment operation. *It is the responsibility of the installer to comply with all applicable electrical codes.* You can find conduit and other distribution wiring details on electrical installation diagrams provided by Flash Technology or others. *Installation instructions concerning red light marker fixtures are not part of this manual.* All installation wiring should have an insulation rating of 600 volts. Size the power service wiring to satisfy the load demand of the red light system. *Read the notes on the installation wiring diagrams supplied both in this manual and with the equipment.*

## AC Line

The AC Line connections are made to TB1 in the lower right of the cabinet. The controller operates from universal input power (120-240 VAC 50/60Hz) with no configuration. Using the supplied 1/8" non-flared flat blade screw driver, connect L1, L2, and Ground. AC input power conductor size depends on the service voltage, the distance from the source, number of L-864 LED beacons and L-810 LED marker lights served. Use 22 VA per

LED beacon plus 7.5 VA for each L-810 marker light.

***Important! For proper operation and optimal protection from Lighting and EMI, ensure that Earth Ground is wired to the Ground (Green) Terminal.***

## Photocell Wiring

The photocell input to the controller is on PCB1 J4. The photocell is supplied with pigtails for connection to wires that connect to the controller. It may be located any practical distance from the controller. The recommended minimum wire gauge is #16 AWG

## Photocell Mounting

Mounting and outline dimensions for the photocell are shown in Figure 2-6. The photocell uses a male 1/2" NPT for mounting. Use the following guidelines to mount the photocell:

- Locate the photocell where it has an unobstructed view of the polar sky.
- It must not view direct or reflected artificial light.
- The photocell may be supported directly by electrical conduit.
- Ensure that the installation is watertight.

## Beacon Outputs

Beacon connections are shown in Figures 2-8, 2-9 and Table 2-1. Multiple connection points for L2F (Neutral) are provided on the leftmost positions of terminal strip TB1. Only Flash Technology supplied LED FH 3610-2 (20 Watt) or FH 3610 (48 Watt) L-864 beacons may be installed with this controller.

**NOTE:** See FTS 361X Rev 2 Manual for specific details about the FH 3610 (48 Watt) beacon.



Table 2-1 – Beacon Connections

System Type	Beacon	L1	L2	Ground
A-1 – A-6	1	MOD 1 - J1 - Terminal 1	TB1- L2F Fused	Ground bus bar
A-1 Double – A-6	2	MOD 1 - J1 - Terminal 2	TB1- L2F Fused	Ground bus bar
A-2 – A-6	3	MOD 2 - J1 - Terminal 1	TB1- L2F Fused	Ground bus bar
A-2 Double – A-6	4	MOD 2 - J1 - Terminal 2	TB1- L2F Fused	Ground bus bar
A-3 – A-6	5	MOD 3 - J1 - Terminal 1	TB1- L2F Fused	Ground bus bar
A-3 Double – A-6	6	MOD 3 - J1 - Terminal 2	TB1- L2F Fused	Ground bus bar
A-4 – A-6	7	MOD 4 - J1 - Terminal 1	TB1- L2F Fused	Ground bus bar
A-4 Double – A-6	8	MOD 4 - J1 - Terminal 2	TB1- L2F Fused	Ground bus bar
A-5 – A-6	9	MOD 5 - J1 - Terminal 1	TB1- L2F Fused	Ground bus bar
A-5 Double – A-6	10	MOD 5 - J1 - Terminal 2	TB1- L2F Fused	Ground bus bar
A-6	11	MOD 6 - J1 - Terminal 1	TB1- L2F Fused	Ground bus bar
A-6 Double	12	MOD 6 - J1 - Terminal 2	TB1- L2F Fused	Ground bus bar
A-6 (3 Top)	13	MOD 7 - J1 - Terminal 1	TB1- L2F Fused	Ground bus bar
A-6 (4 Top)	14	MOD 7 - J1 - Terminal 2	TB1- L2F Fused	Ground bus bar
A-6 (5 Top)	15	MOD 7 - J1 - Terminal 3	TB1- L2F Fused	Ground bus bar

*Remove the MOD X J1 Connector from the RLC Marker Surge Protector PCB to install the conductor.*

### Beacon Mounting

Flash Technology recommends the installation of one or more lightning rods near the installed beacon. The lightning rods should extend a minimum of three feet above the height of the beacon.

The beacon is mounted to the tower pedestal utilizing 1/2” galvanized (Flash Technology part 5991740) or stainless steel hardware. Six mounting holes are provided on the beacon base as shown in Figure 2-5. These mounting holes will align with most tower pedestals. The beacon must be installed level to maintain

light output in accordance with FAA requirements.

Ensure the Flash Head is electrically bonded to the tower.

### Marker Outputs

Connections for markers on the MOD X RLC Marker Surge Protector board are shown in Figures 2-7, 2-8, 2-9 and Table 2-2. Multiple connection points for L2F (Neutral) are provided on the leftmost positions of terminal strip TB1. Flash Technology Supplied LED MKR 3601 6.8 Watt L-810 markers can only be installed with this controller.

Table 2-2 – Marker Connections

System Type	Marker Tier	L1	L2	Ground
A0 – A6	1	MOD 1 - J1 - Terminal 3	TB1- L2F Fused	Ground bus bar
A2 – A6	2	MOD 2 - J1 - Terminal 3	TB1- L2F Fused	Ground bus bar
A3 – A6	3	MOD 3 - J1 - Terminal 3	TB1- L2F Fused	Ground bus bar
A4 – A6	4	MOD 4 - J1 - Terminal 3	TB1- L2F Fused	Ground bus bar
A5 – A6	5	MOD 5 - J1 - Terminal 3	TB1- L2F Fused	Ground bus bar
A6	6	MOD 6 - J1 - Terminal 3	TB1- L2F Fused	Ground bus bar

*Remove the MOD X J1 Connector from the RLC Marker Surge Protector PCB to install the conductor.*

## Marker Mounting

The marker fixtures should be attached to the structure utilizing the marker mounting brackets provided in the marker kit with each system. Please refer to the supplied drawing in the marker kit for installation instructions.

## RLC MKR Surge Protector

The RLC Marker Surge Protector PCB is plugged directly into J1 of the RLC Output

PCB Mod 1 and is intended to provide additional protection for the marker output only. Connections to the beacon(s) and markers are made at the J1 connector of the RLC Marker Surge Protector PCB. The protection circuit is enabled by cutting the jumper(s) shown in Figure 2-1. **Only jumpers associated with marker outputs, typically JP3 in this application, should be cut.**

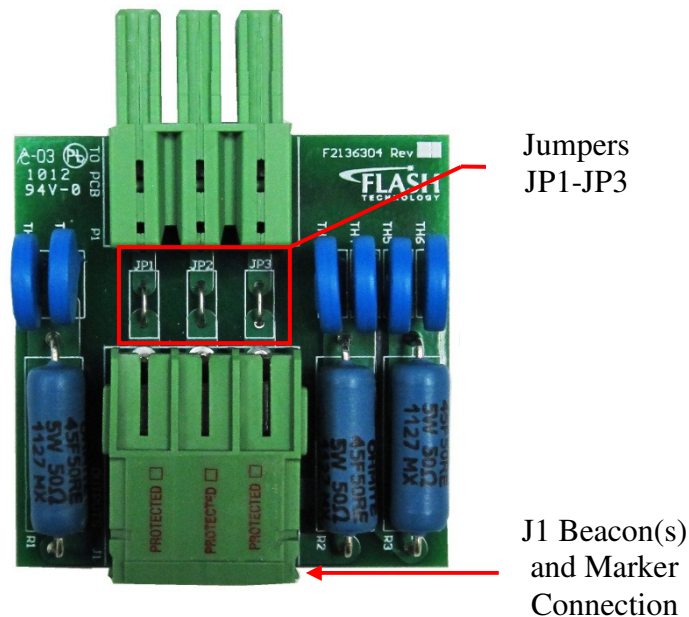


Figure 2-1 – PCB MOD1 Red Light Output Board

**Important:** The Marker Surge Protector PCB is intended to provide additional protection for marker output(s) only on the RLC Output PCB (Part No. 2136302). Each of three (3) outputs can be configured independently to match the configuration of the lighting system. The Marker Surge Protector PCB is **not** intended to provide additional protection for beacon output(s) on the RLC Output PCB. Improper operation of the beacon and / or damage to the marker surge protector PCB may occur if the protection circuit is enabled for beacon outputs.

## Address Switch and AOL Jumper

The Address switch on the MOD X RLC board must be set to the corresponding address. Please see Figures 4-1 and 4-2 for the MOD X board location. This should be preset from the factory but should be confirmed during installation. The uppermost beacon(s) is considered an AOL. The corresponding AOL Jumper must be installed on both posts of the jumper block. See Figure 1-3 for AOL Jumper location.

## Dry Contact Alarm Outputs

Dry contact alarm outputs for the controller are available if the system is not monitored through Flash Technology FTW 174 RS 485 communication.

The alarm outputs (Photocell Alarm, Power Fail) are available on PCB1 J1. A single common connection for the two alarm contacts is provided. Dry contact alarm outputs for each beacon tier and marker tier are provided on the RLC output PCB MOD X. A common connection is provided on each RLC output PCB for monitoring of 2 LED beacons and a separate common connection is provided for 1 tier of LED side markers. The alarm contacts are standard as Normally Closed equals no alarm. Figures 2-14, 2-15 and 2-16 provide the recommended dry contact interface connections into the FTW 172 and the FTW 174 interface connector.

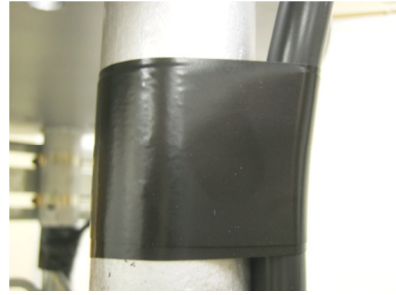
**NOTE:** Other manufacture's dry contact termination points should be verified on their monitoring equipment.

## Securing the Cable

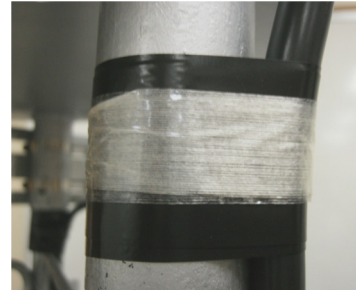
Flash Technology recommends the following method for securing the beacon and marker cable to a skeletal structure:

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.

### **FTW 174 Wireless Unit Communication**

The RS 485 connections for the FTW 174 Wireless Unit are on PCB1 J2. Previous versions of the FTW Monitoring units will not interface through RS 485. Refer to the FTW 174 Wireless manual for installation instructions.

### **FTW 170 Wireless GPS Sync Input**

The wireless sync input connection is on PCB1 J4. Refer to Figure 2-17 and the FTW 170 Wireless GPS manual for installation instructions.

### **FTC 121 System Controller Interface**

The connections for interfacing the FTS 361X-3 system with an FTC 121 System Controller are on J3. This interface will allow the FTC 121 to start or stop the operation of the FLC 361X-3 controller based on the ambient light level. It will also monitor operation of the uppermost red beacon(s) and set the system to white night mode in the event of a failure. The PEC 510 photocell should not be installed on the FLC 361X-3 controller when it is interfaced with an FTC 121 controller. Refer to Figure 2-18 and the FTC 121 System Controller manual for additional information.

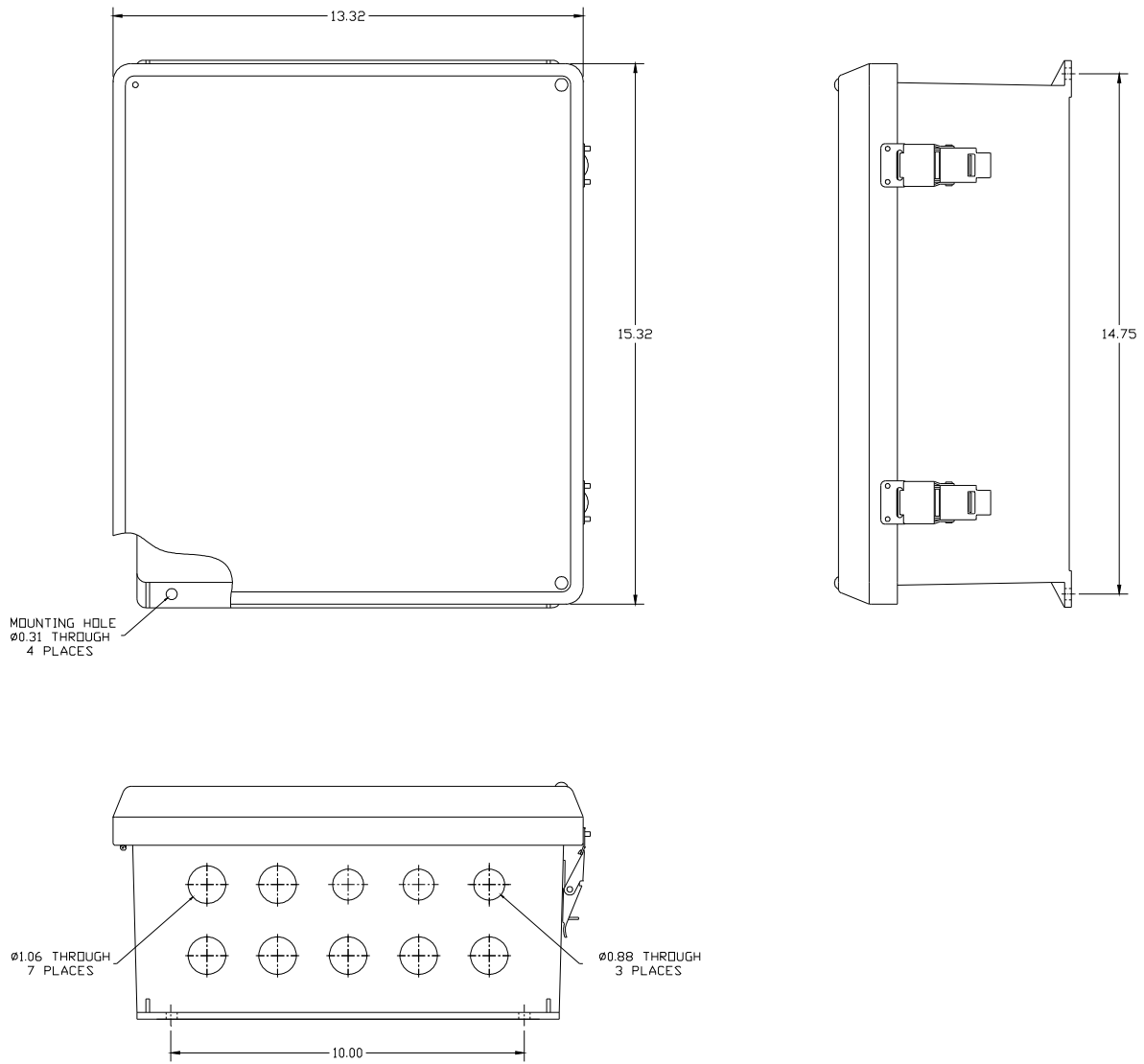


Figure 2-2 – A-0 – A-2 Controller Mounting and Outline

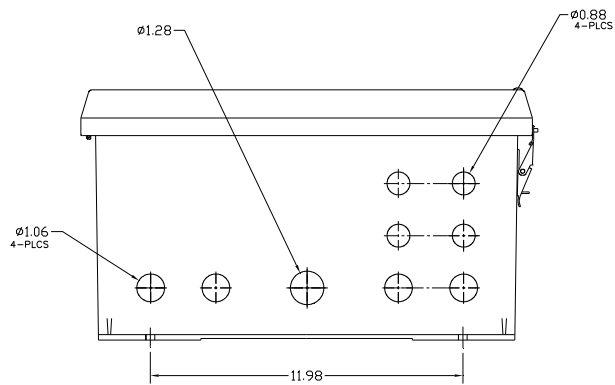
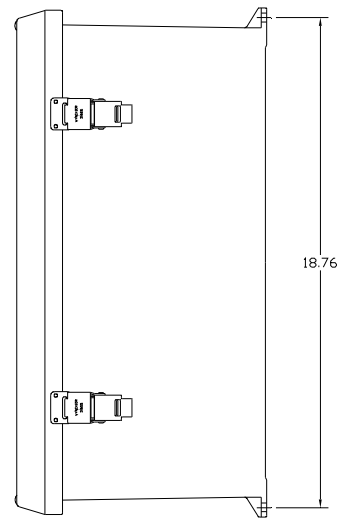
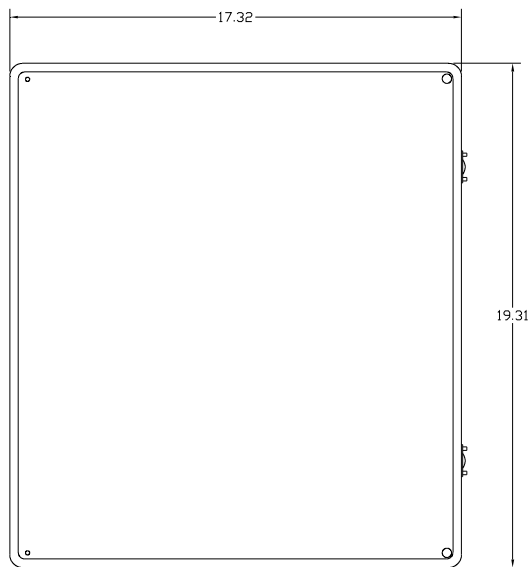
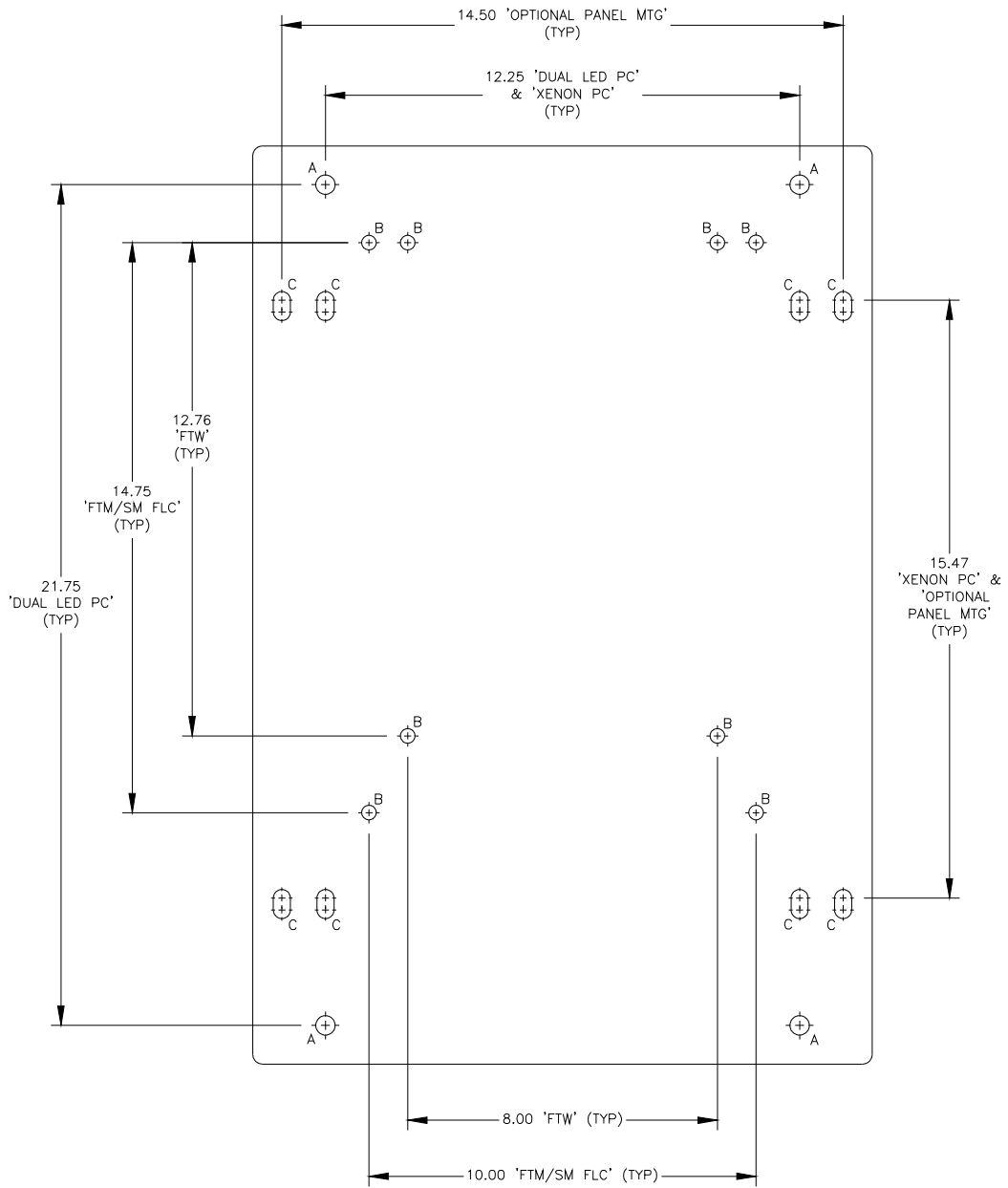
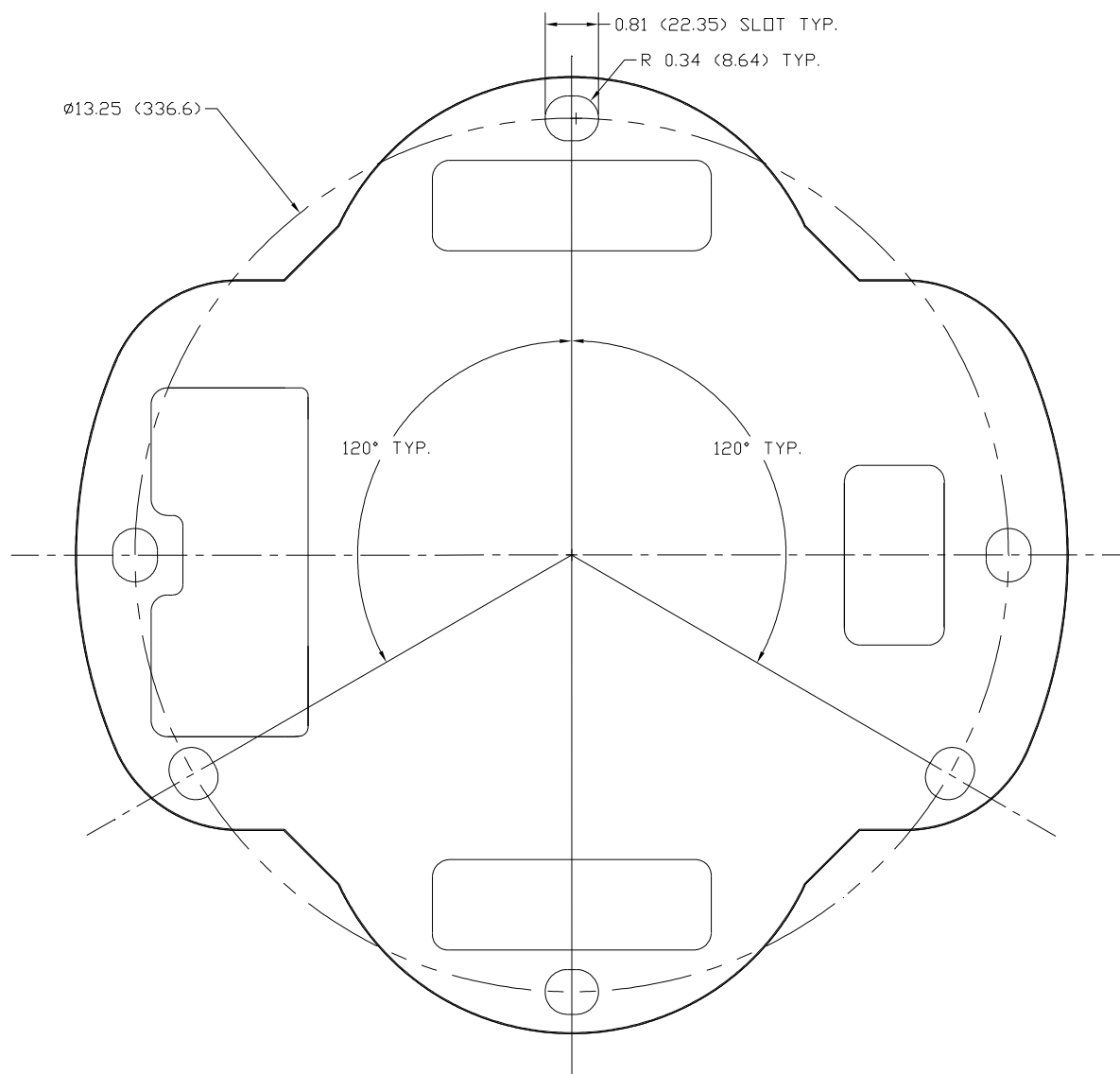


Figure 2-3 – A-3 – A-6 Controller Mounting and Outline



HOLE CHART		
LETTER	HOLE SIZE	QTY
A	0.50" DIA THRU	4
B	0.38" DIA THRU	8
C	ø0.44" X 0.75" LG SLOT THRU	8

Figure 2-4 – Adapter Mounting Panel Outline (optional item)



NOTE: ALL DIMENSIONS ARE IN INCHES (MILLIMETERS)

FH 3610-2 L-864 LED FLASHHEAD

Figure 2-5 – Beacon Mounting Outline



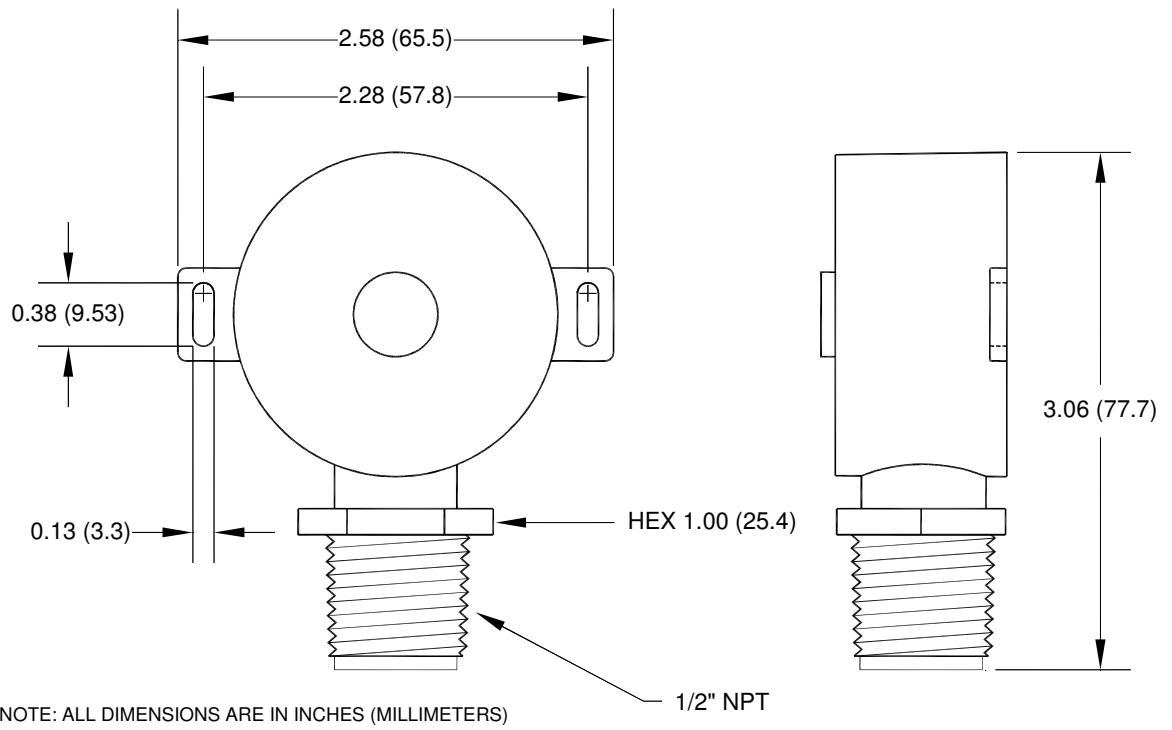


Figure 2-6 – Photocell Mounting and Outline

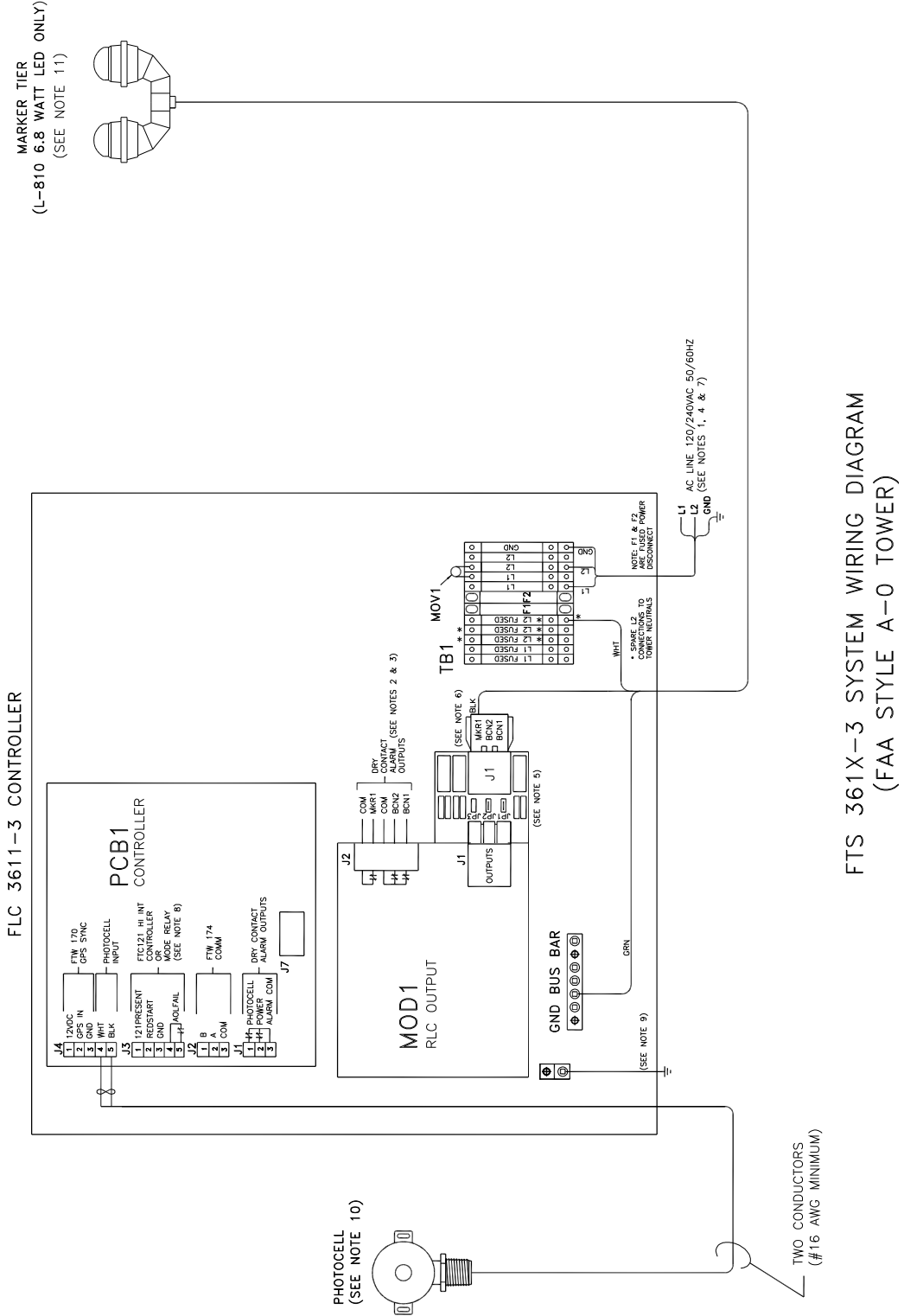
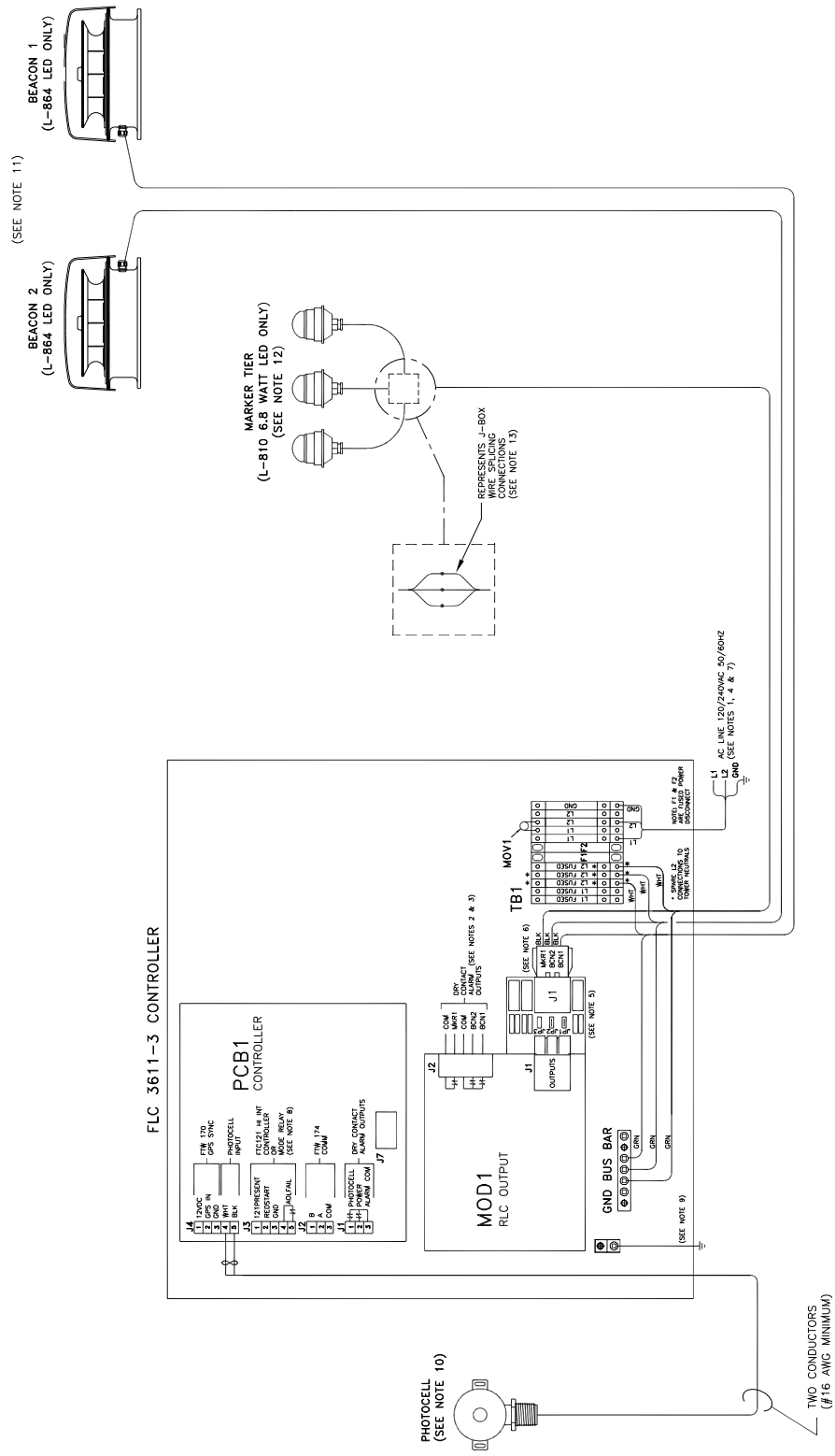
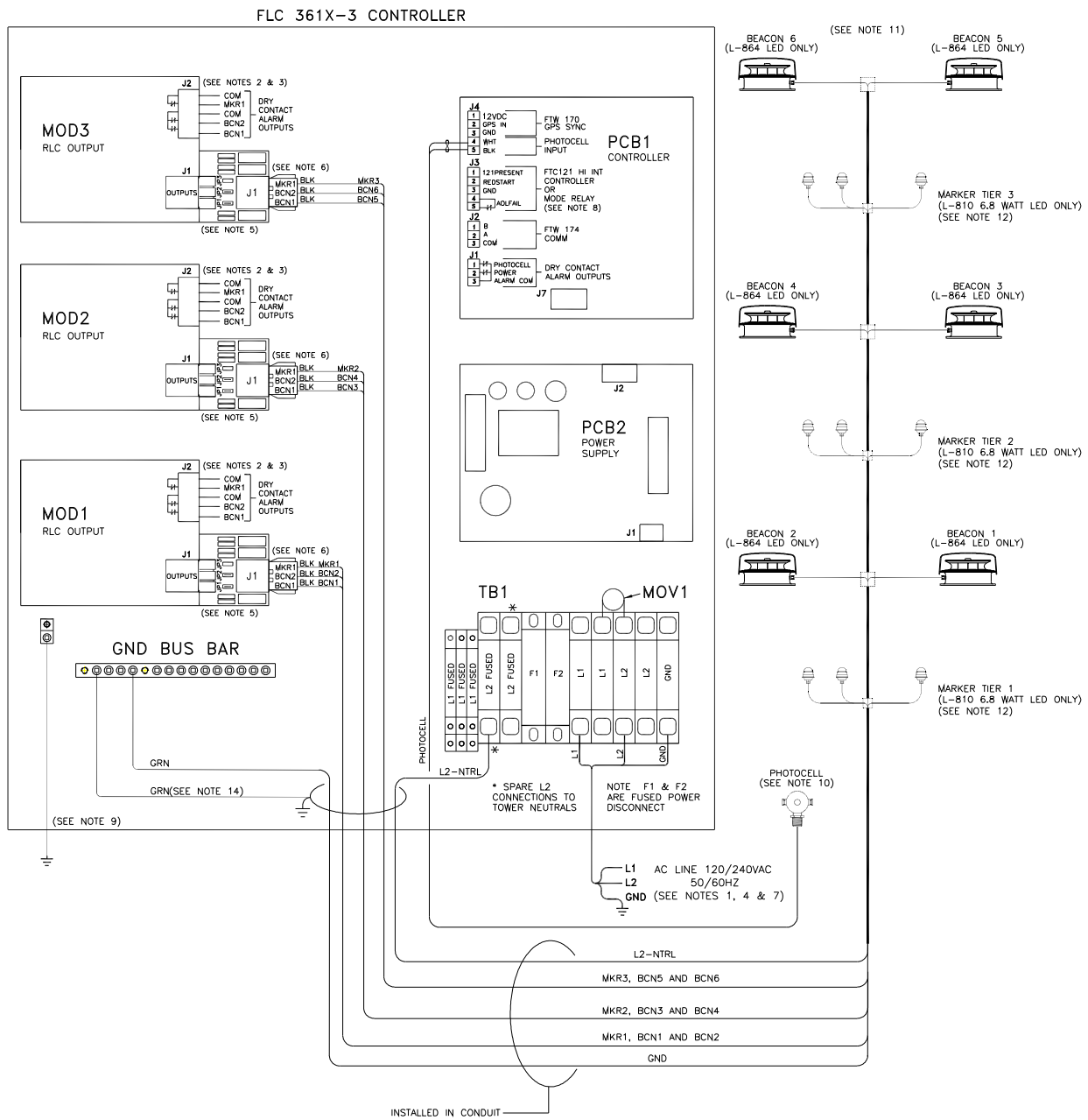


Figure 2-7 – A-0 System Wiring Diagram



FTS 361X-3 SYSTEM WIRING DIAGRAM  
(FAA STYLE A-1 TOWER)

Figure 2-8 – A-1 System Wiring Diagram



FTS 361X-3 SYSTEM WIRING DIAGRAM  
(FAA STYLE A-3 TOWER)

Figure 2-9 – A-3 System Wiring Diagram

### System Wiring Diagram Notes

1. AC input power conductor size depends on the service voltage, the distance from the source, the number of L-864 beacons and number of L-810 marker lights served. Use 22 VA per beacon plus 7.5 VA for each L-810 marker light. Also see Note 7.
2. Dry contact alarm outputs contact rating 1 ampere, 120 VAC. Contacts shown in normal operating state (no alarms or errors).
3. User's alarm circuit not shown.
4. The incoming AC Line Voltage (120-240 VAC 50/60Hz) is connected to the TB1 terminal strip of the FLC 361X-3 controller.
5. Only outputs connected to marker tiers should have the associated Jumper (JP1 – JP3) cut to enable the protection circuit on the MKR Surge Protector PCB.
6. Flash Technology recommends using 12 AWG as the maximum conductor size from MOD X-J1 to the junction box. Use larger conductors for the branch from the junction box to the marker fixtures, if required. See Note 7 to determine the branch conductor size.
7. The total line drop, including the input service wiring and branch lines to the L-864 beacons and L-810 marker lights, must not exceed 3% of the rated voltage.
8. “AOLFAIL” dry contact (PCB1 J3 terminals 4 & 5) is user configured in the “CONFIG” menu. “FTC121” should only be selected if the FTS 361X-3 is interfaced with an external FTC 121 controller (Figure 2-18). Otherwise, select “MODE RLY” (Mode Relay) to allow the “AOLFAIL” dry contact to indicate the current mode of the system. When “MODE RLY” operation is selected, a closed contact indicates day mode operation and an open contact indicates night mode operation. See “Configuring the System” in Section 1.
9. Ensure the controller enclosure is electrically bonded to the site grounding system into the grounding lug.
10. Mount the photocell vertically at the top end of a vertical length of conduit to prevent water from entering the photocell. Face it toward the polar sky (north). Photocell cable should be two conductors 16 AWG minimum.
11. Lightning rods should be present for protection of the top beacon.
12. Refer to Flash Technology supplied marker kit instructions for proper J-box mounting and installation standards.
13. Mount the enclosure vertically.
14. Use NEC approved grounding method.

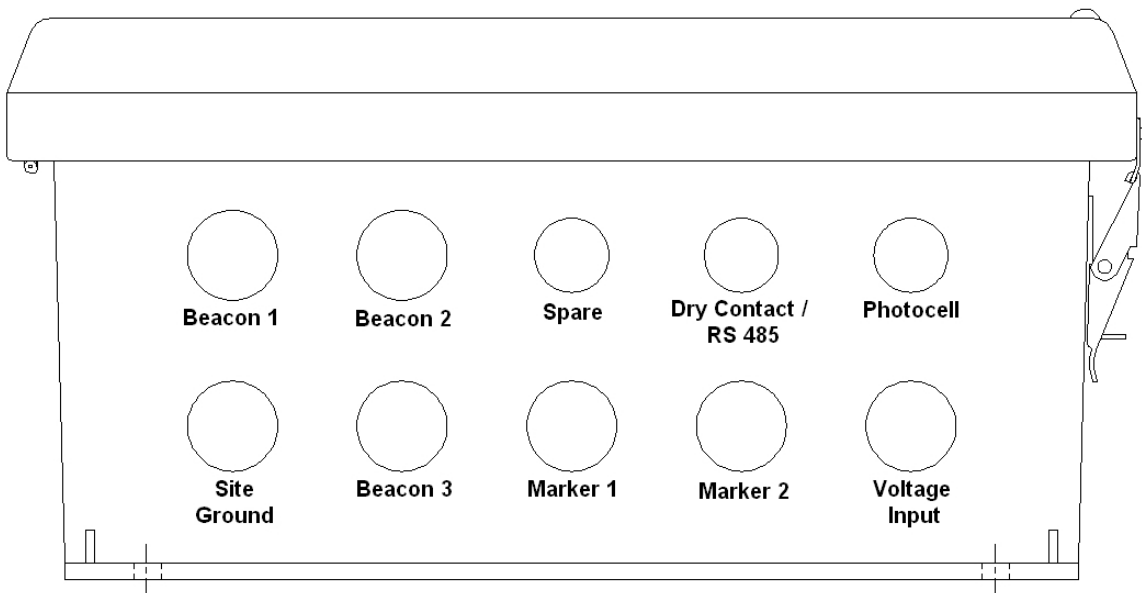


Figure 2-10 – A0 – A2 Suggested Controller Conductor Routing

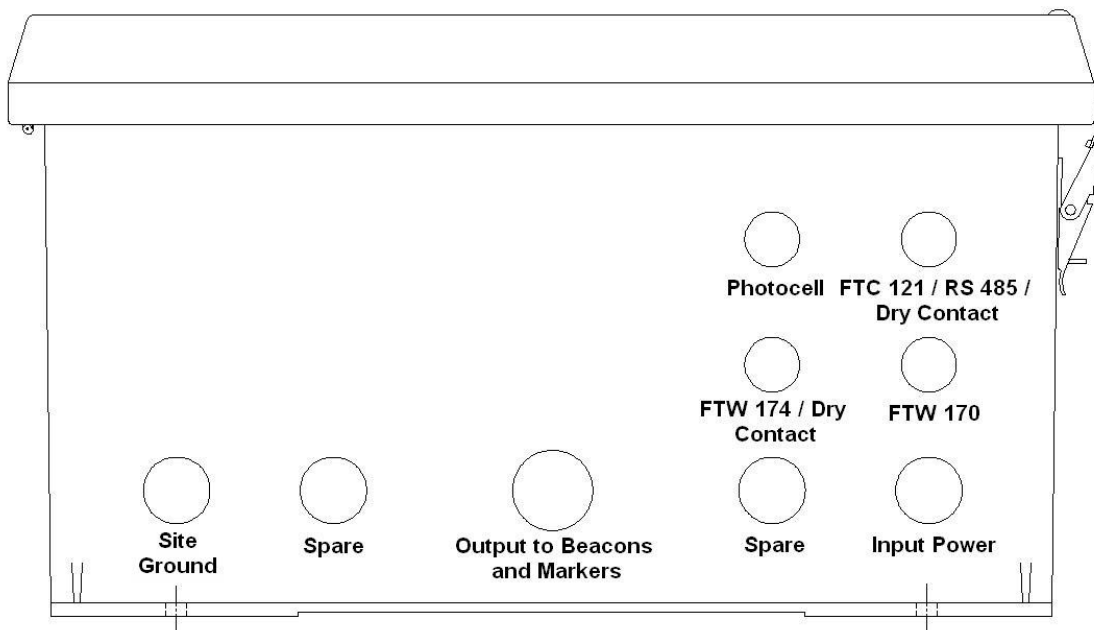
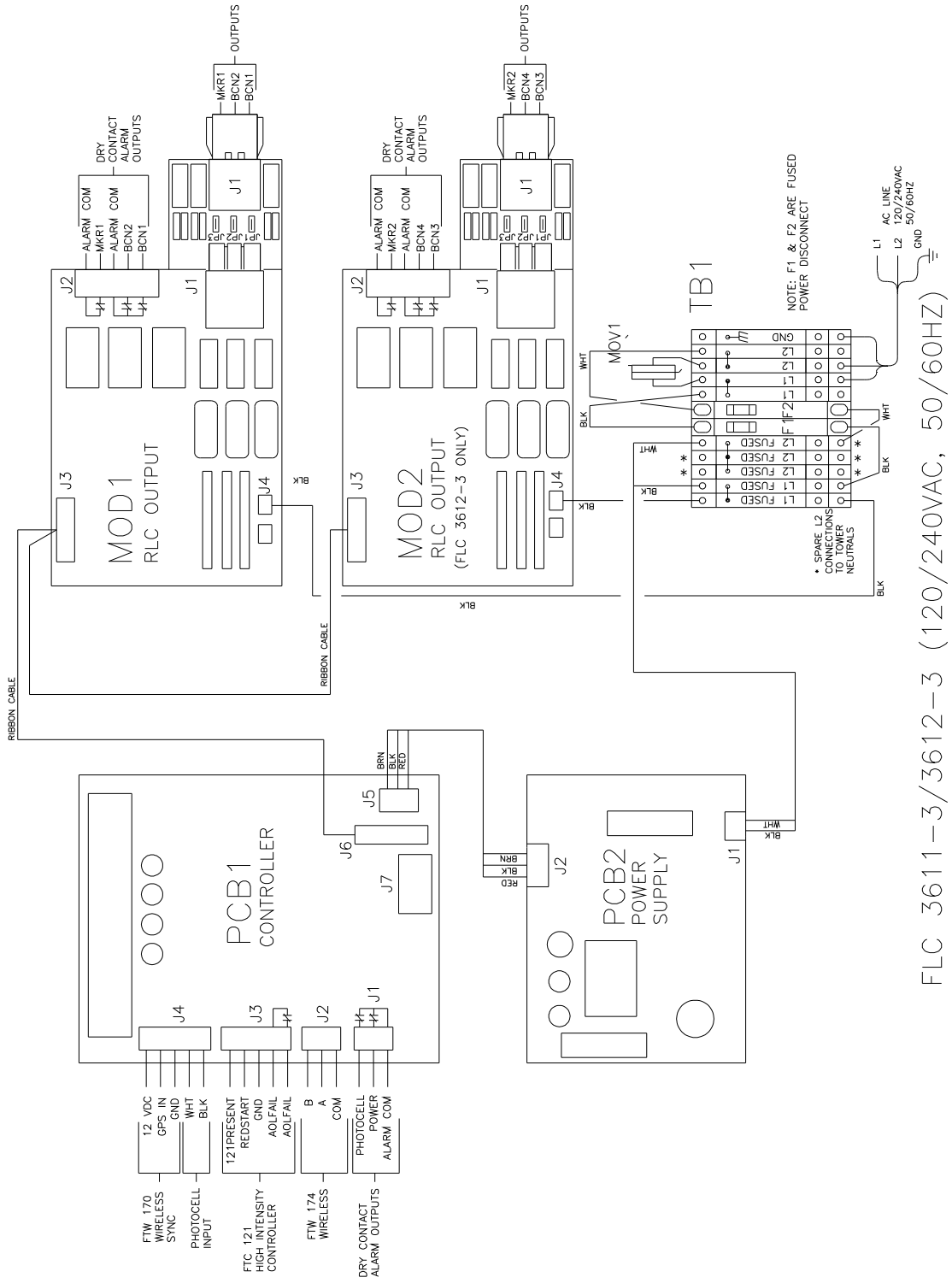


Figure 2-11 – A3 – A6 Suggested Controller Conductor Routing



FLC 3611-3/3612-3 (120/240VAC, 50/60HZ)  
RLC – INTERNAL WIRING

Figure 2-12 – A0 – A2 Controller Internal Wiring

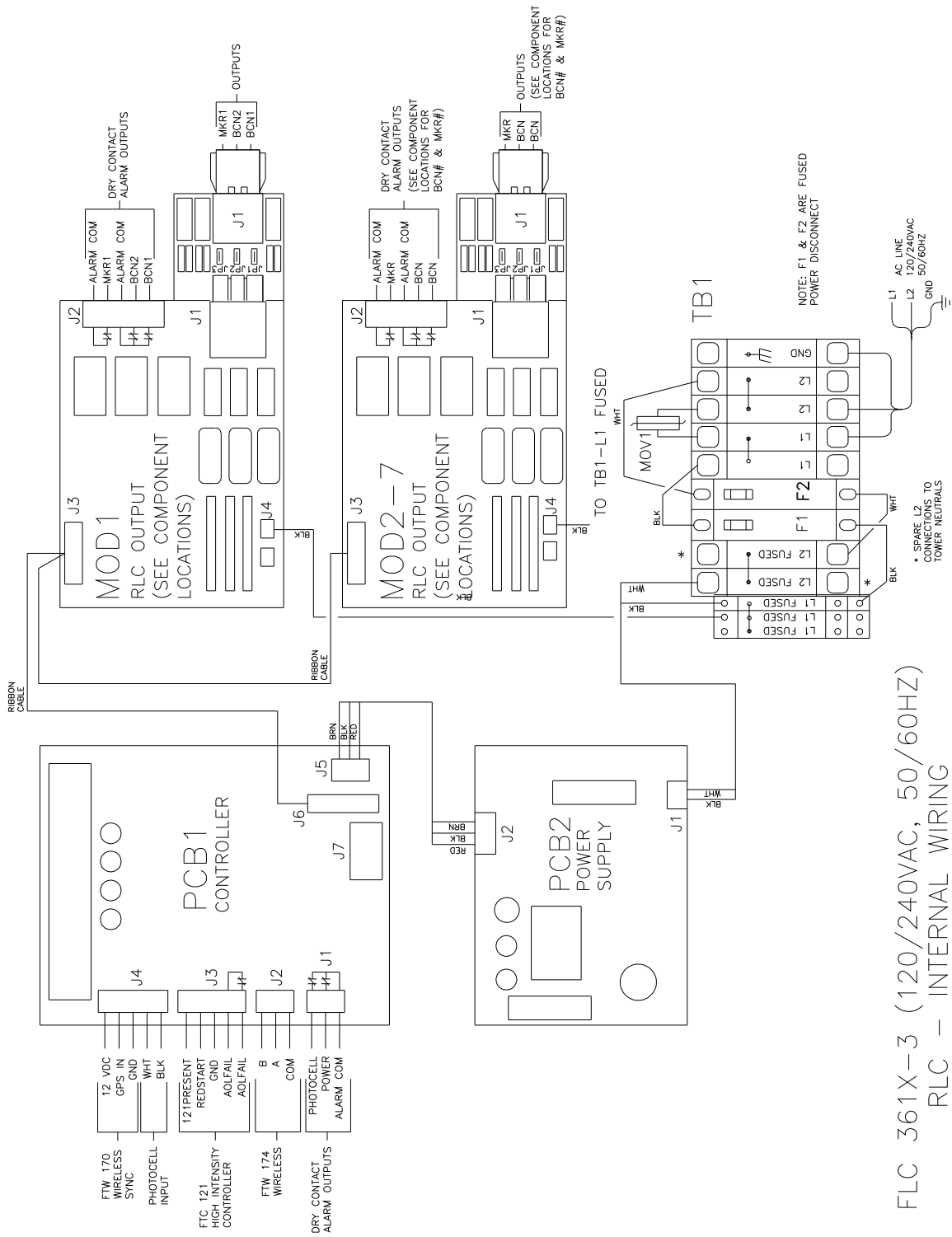


Figure 2-13 – A3 – A6 Controller Internal Wiring



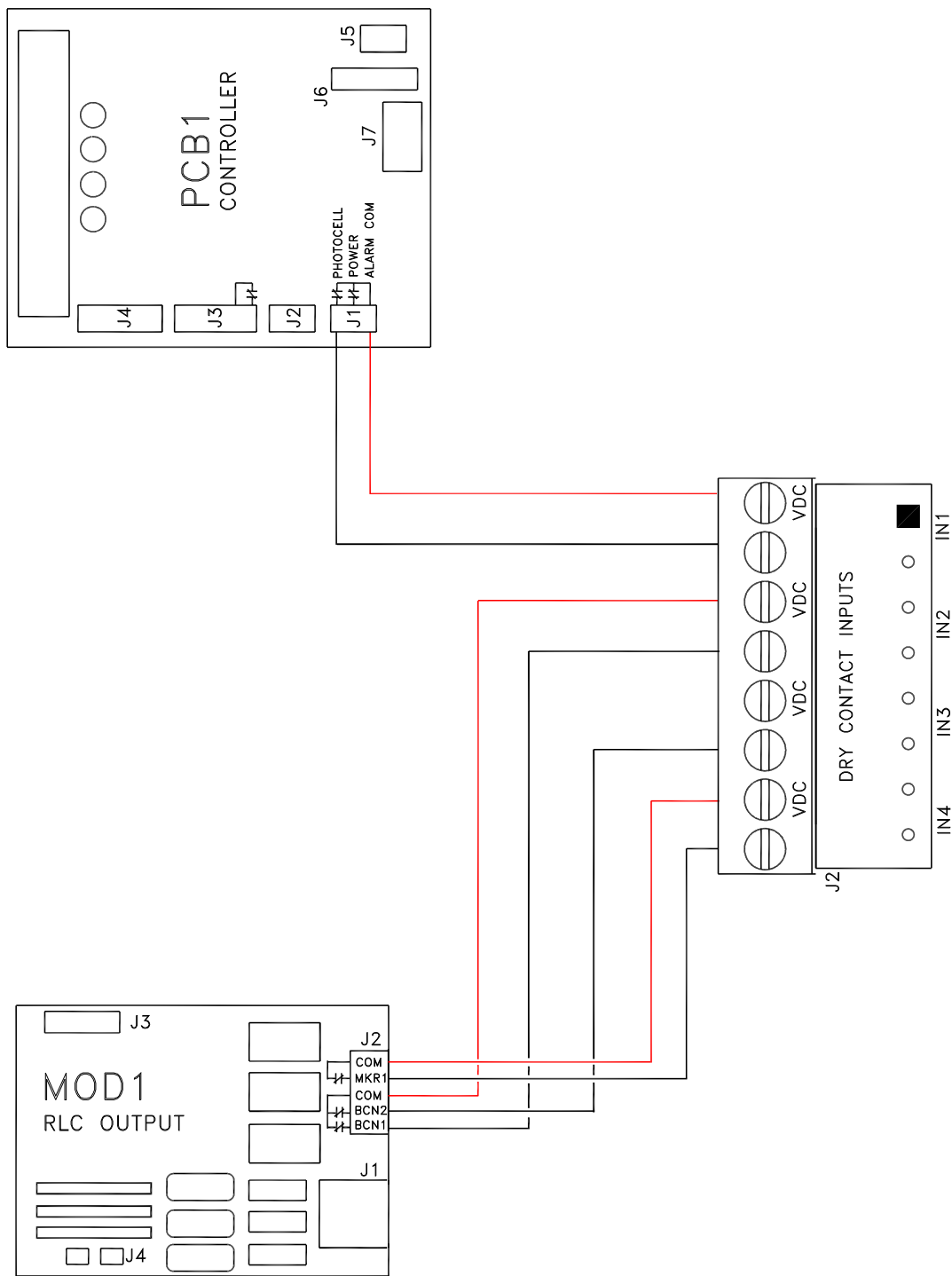


Figure 2-14 – Dry Contact Wiring Interface (Individual Alarm Points)

**NOTE:** J2 depicts the dry contact interface connections for a Flash Technology FTW17X series monitoring unit. Customer monitoring unit connections may vary.

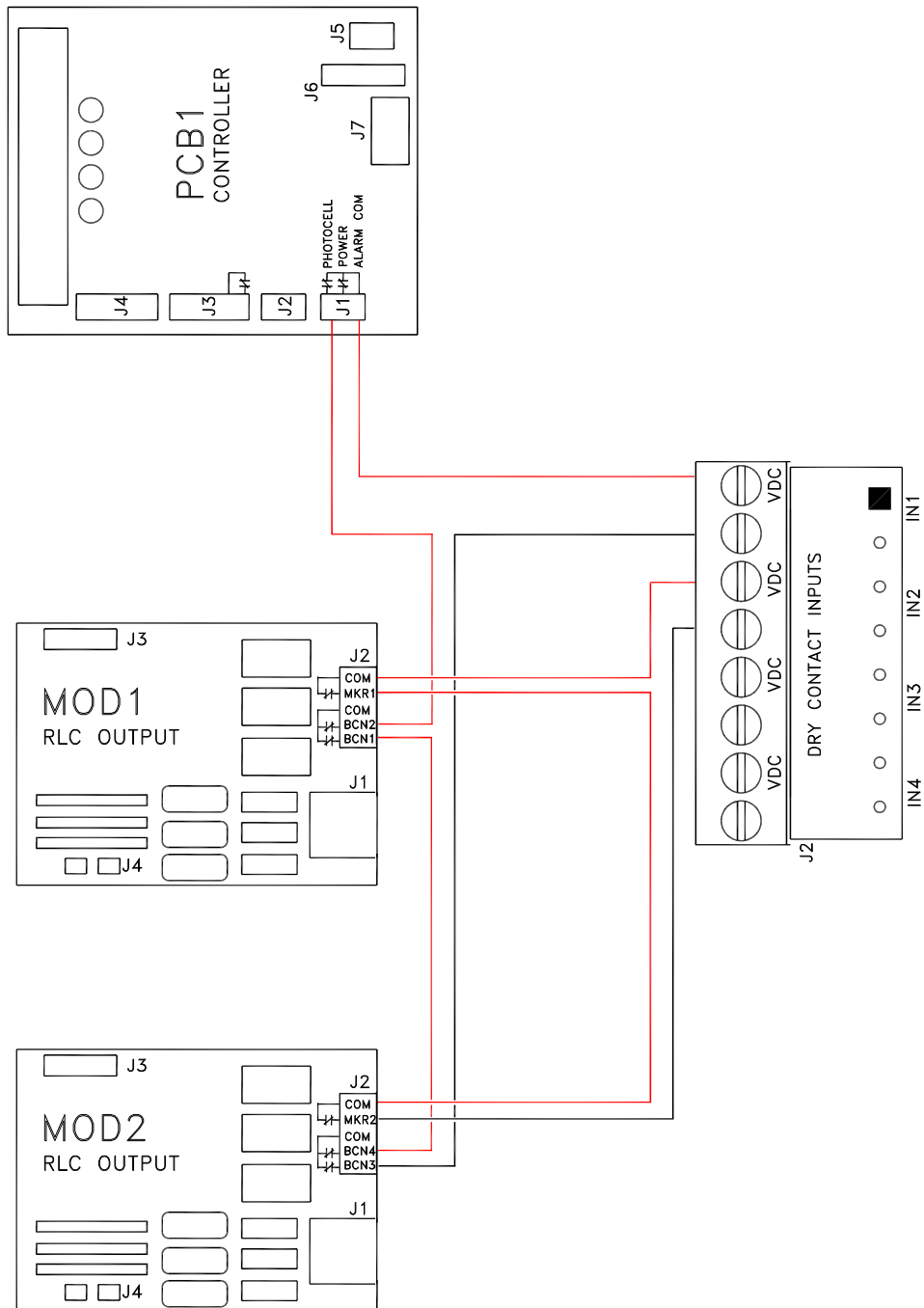


Figure 2-15 – Dry Contact Wiring Interface (Limited Alarm Points A0-A2)

**NOTE:** J2 depicts the dry contact interface connections for a Flash Technology FTW17X series monitoring unit. Customer monitoring unit connections may vary.

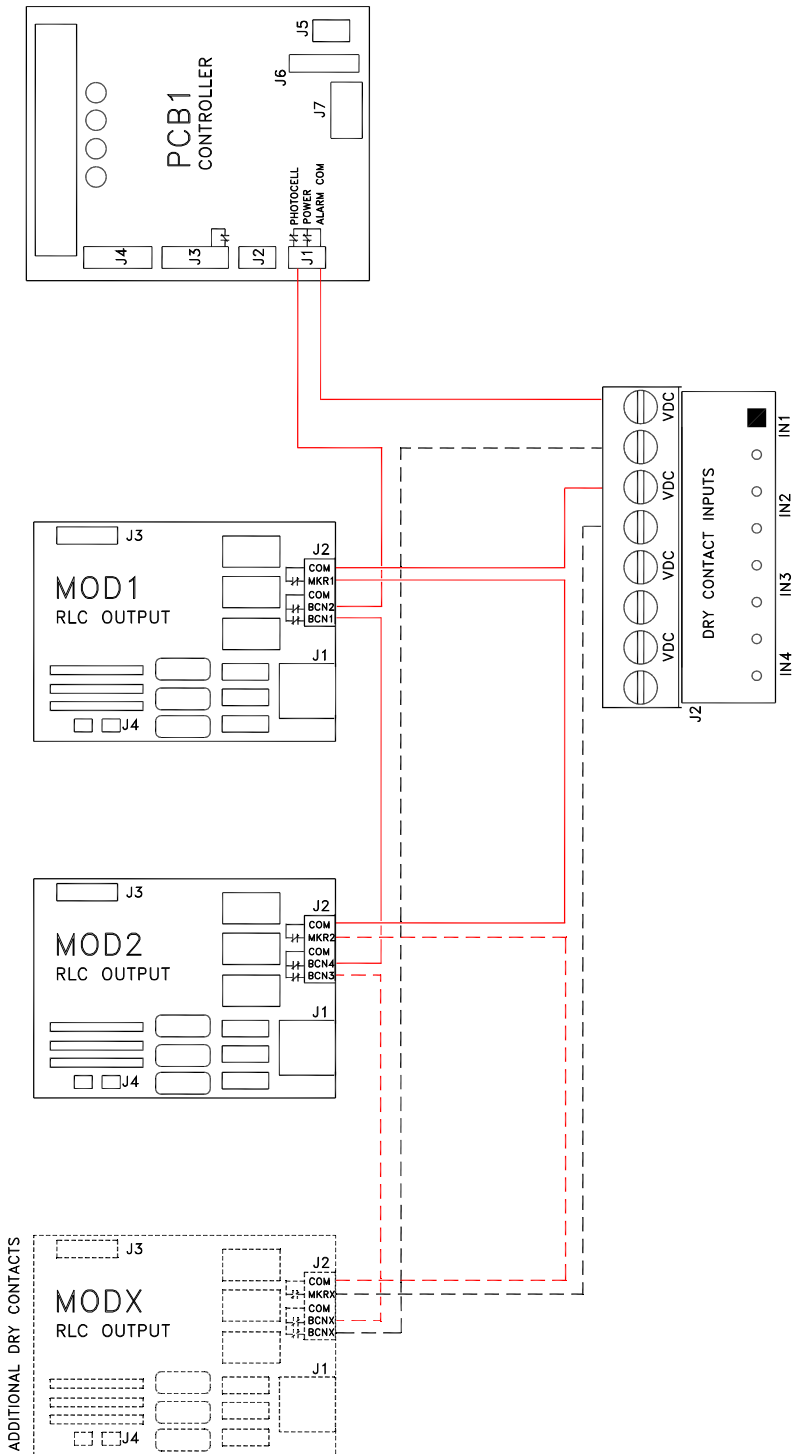


Figure 2-16 – Dry Contact Wiring Interface (Limited Alarm Points A3-A6)

**NOTE:** J2 depicts the dry contact interface connections for a Flash Technology FTW17X series monitoring unit. Customer monitoring unit connections may vary.

FLC 36XX-3

FTW 170

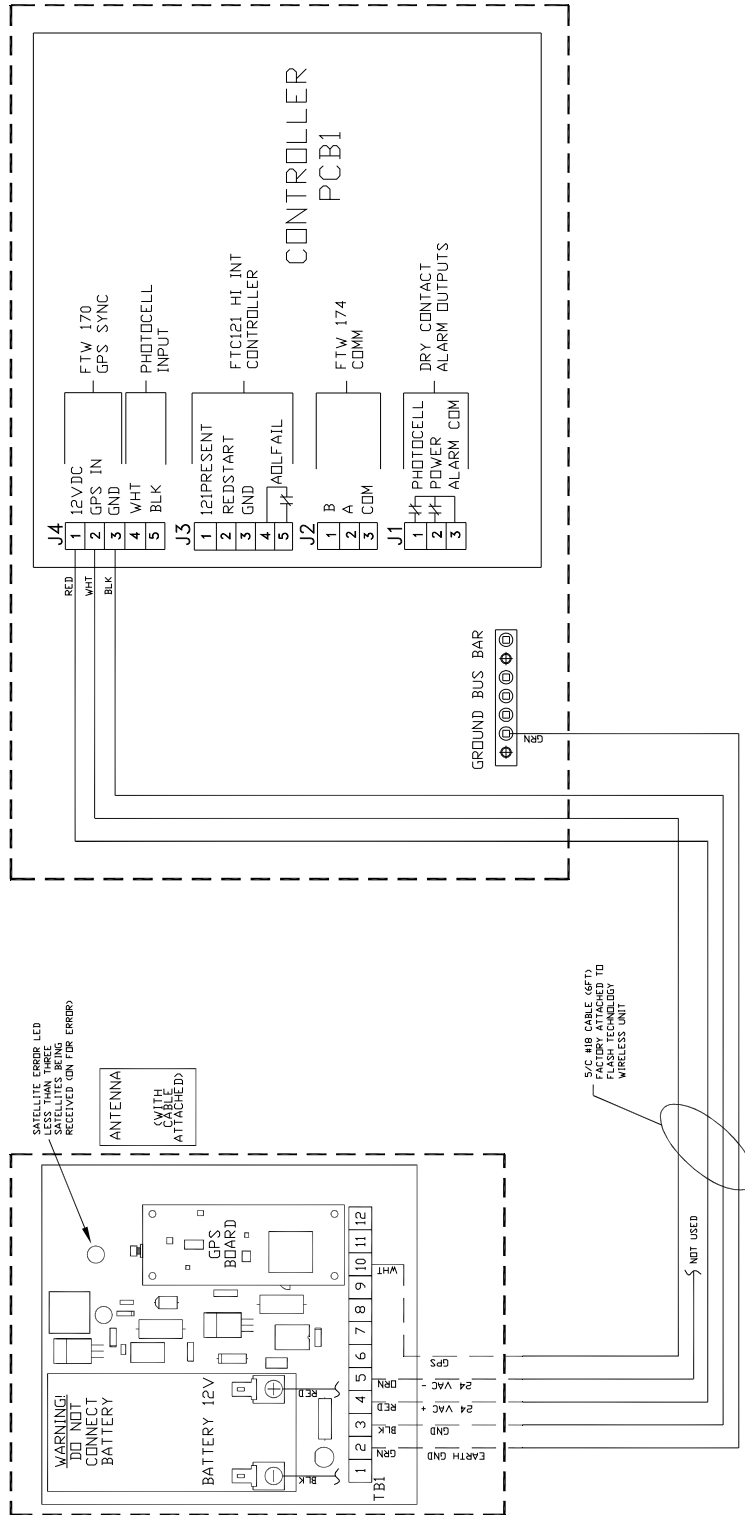


Figure 2-17 – FTW 170 Wireless GPS System Wiring Diagram

FLC 36XX-3

FTC 121

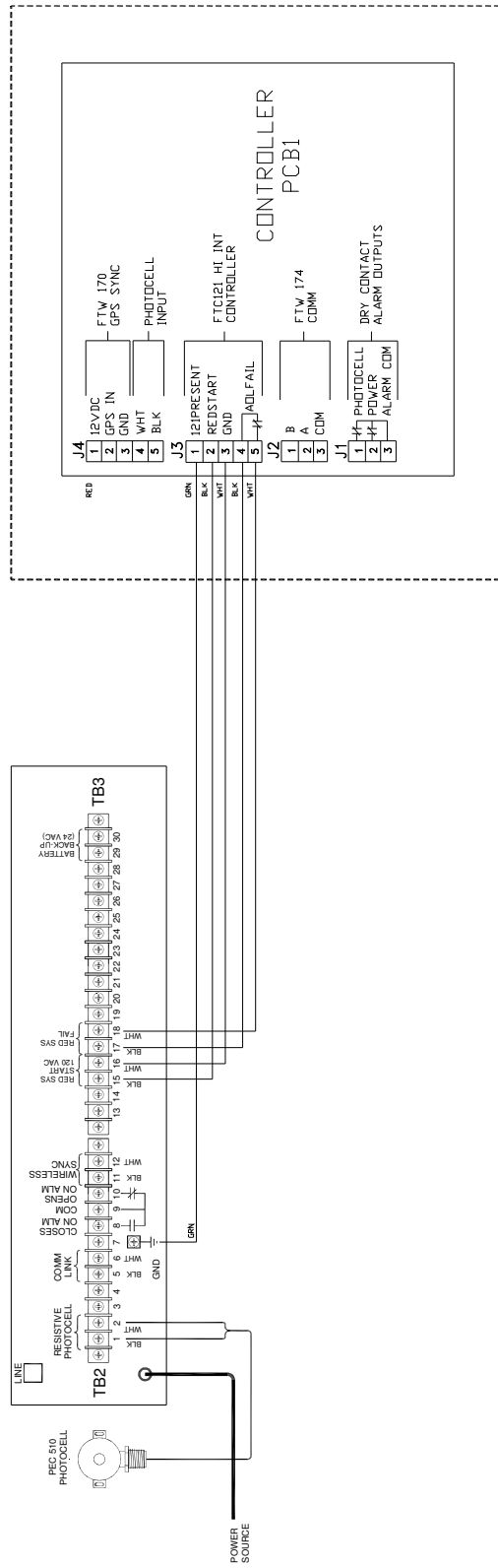


Figure 2-18 – FTC 121 System Interface

## Section 3 – Maintenance and Troubleshooting

### **Safety**

#### **WARNING**

STOP: Before proceeding read the warning on Page ii.

Work safely, as follows:

1. Remove rings and watches before opening the equipment.
2. Shut off power to the equipment.
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.

### **Preventive Maintenance**

Carry out the following inspection and cleaning procedures at least once a year:

1. Verify that moisture has not entered the equipment through gaskets or seals, or collected inside as condensation.
2. Verify that all drain holes are clear.
3. Check terminal blocks and relays for corrosion or arcing. Clean or replace any component that shows evidence of high-voltage damage.
4. Check all electrical connections for tightness and verify the absence of corrosion or electrical arcing.
5. Clean the outside surface of the lens with liquid detergent and water. Wipe it gently with a soft cloth or paper towel.

### **Storage**

Store equipment indoors when not in use. Circuit board, when not installed in the equipment, should be kept in antistatic bags or containers.

### **RFI Problems**

The presence of radio frequency interference (RFI) can burn out components, cause a light to flash intermittently, at the wrong rate, or intensity. RFI can enter the light by any wire to or from the unit. The circuits reject or bypass RFI, but Flash Technology cannot guarantee complete immunity beforehand. After installation, you may find it necessary to add external filters or use other methods to reduce RFI entering the equipment. To minimize interference, ensure proper installation in accordance with AC 70-7460, Appendix 1, Figure 2.

### **Component Testing**

The following procedures in Table 3-1 describe how to check most of the unit's major electrical components. Always make resistance measurements with the primary power turned off. However, you must make voltage measurements with power applied. Thus, for your safety, carry out all preliminary steps such as connecting test leads or circuit jumpers or disconnecting existing circuit connections with the power off.

Table 3-1 – Troubleshooting

<b>Symptom</b>	<b>Possible Causes</b>	<b>Corrective Action</b>
System is not operating and there are no indicators lit on the PCB1 controller board.	<ol style="list-style-type: none"> <li>1. Input power source.</li> <li>2. Fuses F1 &amp; F2</li> <li>3. MOV</li> </ol>	<ol style="list-style-type: none"> <li>1. Correct input power issues.</li> <li>2. Replace F1 &amp; F2</li> <li>3. Replace MOV.</li> </ol>
Beacons and markers are not lit. MOD X is lit.	<ol style="list-style-type: none"> <li>1. System setup is incorrect.</li> <li>2. Verify that the MKR Surge Protector PCB is correctly seated in MOD X J1 connector.</li> <li>3. Verify that the J1 connector is correctly seated in the MKR Surge Protector PCB.</li> <li>4. Verify that the output wires are clamped securely in J1.</li> <li>5. Output voltage from MOD X but no output from MKR Surge Protector PCB.</li> <li>6. No output voltage from MOD X.</li> </ol>	<ol style="list-style-type: none"> <li>1. Correct programming issues with PCB 1.</li> <li>2. Correct connection issues between MKR surge Protector PCB and MOD X J1.</li> <li>3. Correct wiring issues on J1.</li> <li>4. Check for 120 VAC out from J1 to beacons (pulsing voltage) and markers (steady).</li> <li>5. Replace MKR Surge Protector PCB.</li> <li>6. Check / replace MOD X fuses (2). Replace MOD X if the correct voltage is not observed.</li> </ol>
Output voltage to beacon and markers is correct. MOD X is operating correctly. Beacons / markers are not operating correctly.	<ol style="list-style-type: none"> <li>1. Faulty wiring between controller and beacons / markers.</li> <li>2. Failed beacon(s) or markers.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check output wiring from controller to beacons / markers. Pay special attention to any splice points.</li> <li>2. Replace beacons / markers.</li> </ol>

## Photocell Testing

Use the following procedure:

1. During daylight, completely block light from entering the photocell. At night, shine a light on the photocell. If the system does not transition from the current mode after a few minutes, begin the following troubleshooting steps.
2. First, disconnect the photocell from the controller. The system should go to night operation after approximately one minute.
3. If the system does not transition to night mode with the photocell disconnected, confirm 3.3 VDC is present on the photocell connections (J4 pins 4 and 5).
4. If 3.3 VDC is not present, replace PCB1.
5. If the controller changes mode correctly with the photocell removed, inspect the photocell wiring or replace the photocell. Reconnect all wires once photocell is replaced and test for proper operation.

## Component Removal and Replacement

### Controller

The controller component location diagram is provided in Figures 4-1 and 4-2. A controller internal wiring diagram is provided in Figures 2-12 and 2-13.

Note the location and color of all wires that you disconnect. When you replace the wiring after you replace the components, ensure that the wiring agrees with Figure 2-12 (A0 – A2 system) or 2-13 (A3 – A6 system).

The general procedure for removing components is as follows:

1. Obtain access to the component in question.
2. Completely remove or relocate these components.
3. Disconnect the wiring to the component that you want to replace.
4. Remove this component.
5. Replace everything in the reverse order: first the component, then the wiring. In some cases, you may have to place some wires on the component before you fasten it in place, then replace the remaining wires.

Most components are relatively easy to access for removal.

## 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.

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

**CAUTION:** When reinstalling the Dome it is important to hold it level and securely by the top outer edge. Make sure that the three locking 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.



### Power Supply (11000010303)

**Remove:** Unfasten the two latches on the front of the base assembly. Lift the top to expose the power supply. Remove the black and white 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.

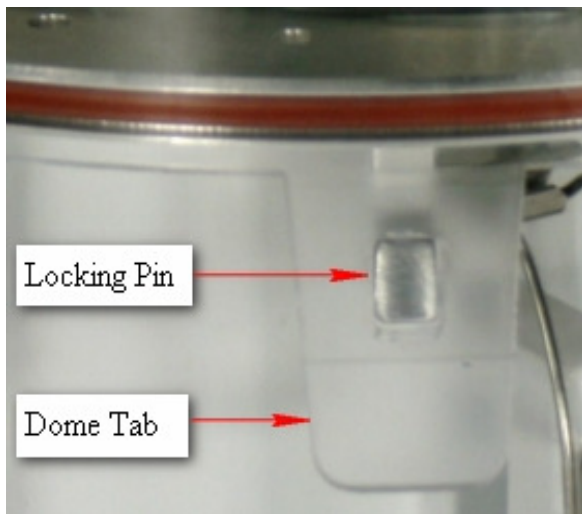


Figure 3-1 - Dome Removal

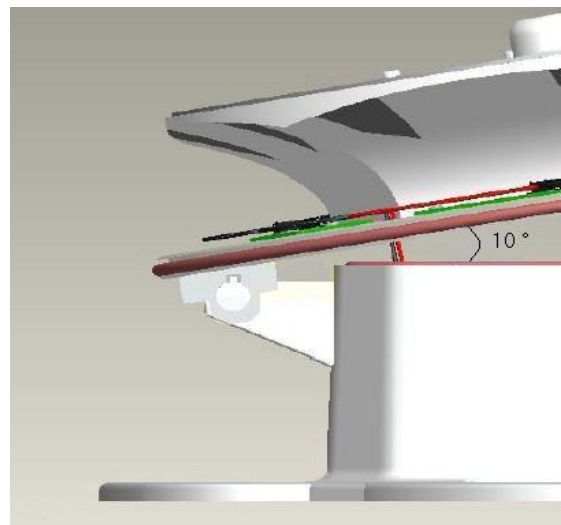


Figure 3-2 – Beacon Opened To 10°

## **Section 4 – Recommended Spare & Replaceable Parts**

### ***Customer Service***

Customer Service: 1-800-821-5825

Telephone: (615) 261-2000

Facsimile: (615) 261-2600

Shipping Address:

Flash Technology  
332 Nichol Mill Lane  
Franklin, TN 37067

### ***Ordering Parts***

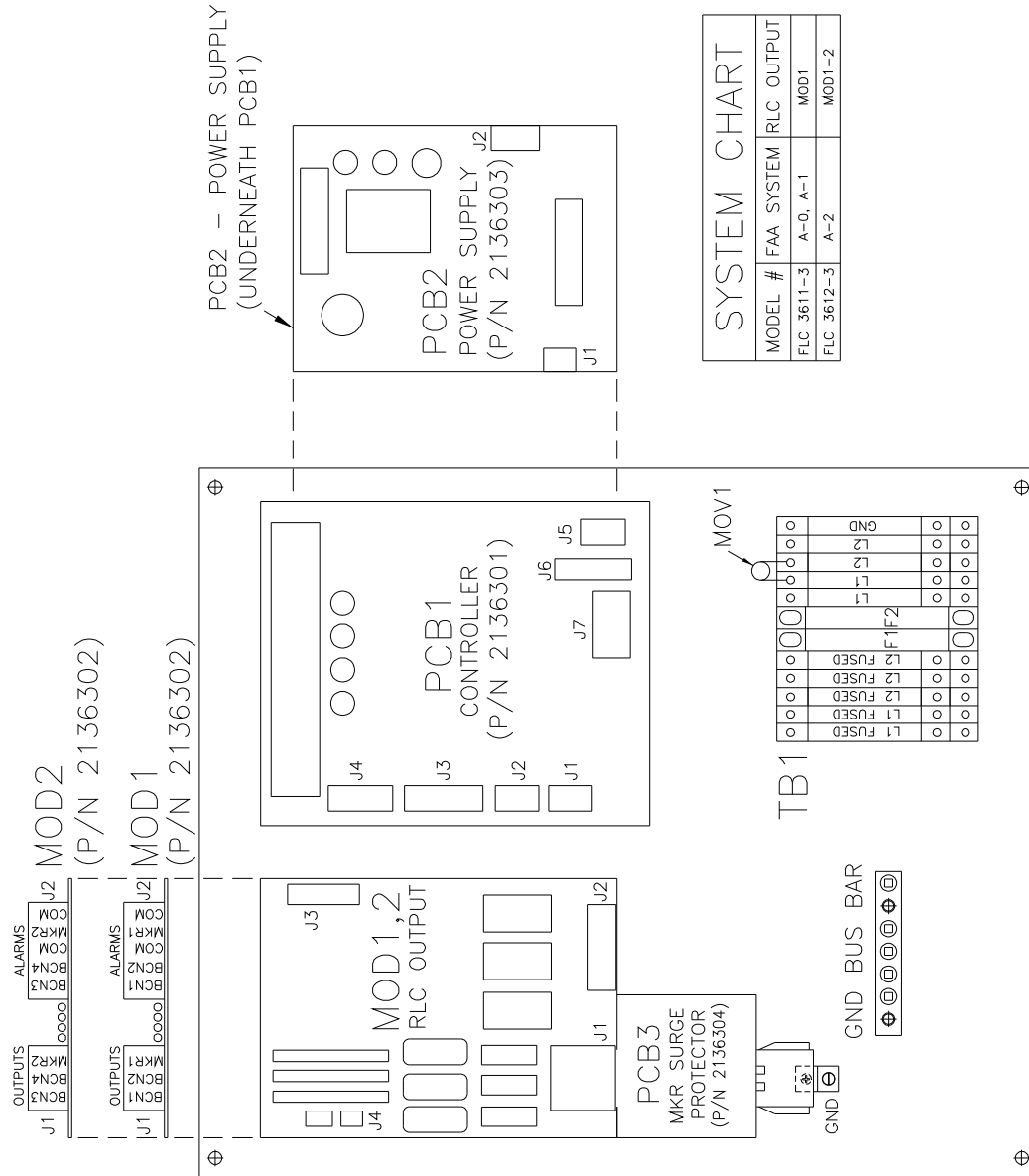
To order spare or replacement parts, contact customer service at 1-800-821-5825.

### ***Replaceable Parts***

Table 4-1 “Controller Replacement Parts” lists the major replaceable parts for the controller.

Table 4-2 “Beacon Replacement Parts” lists the major replaceable parts for the beacon.

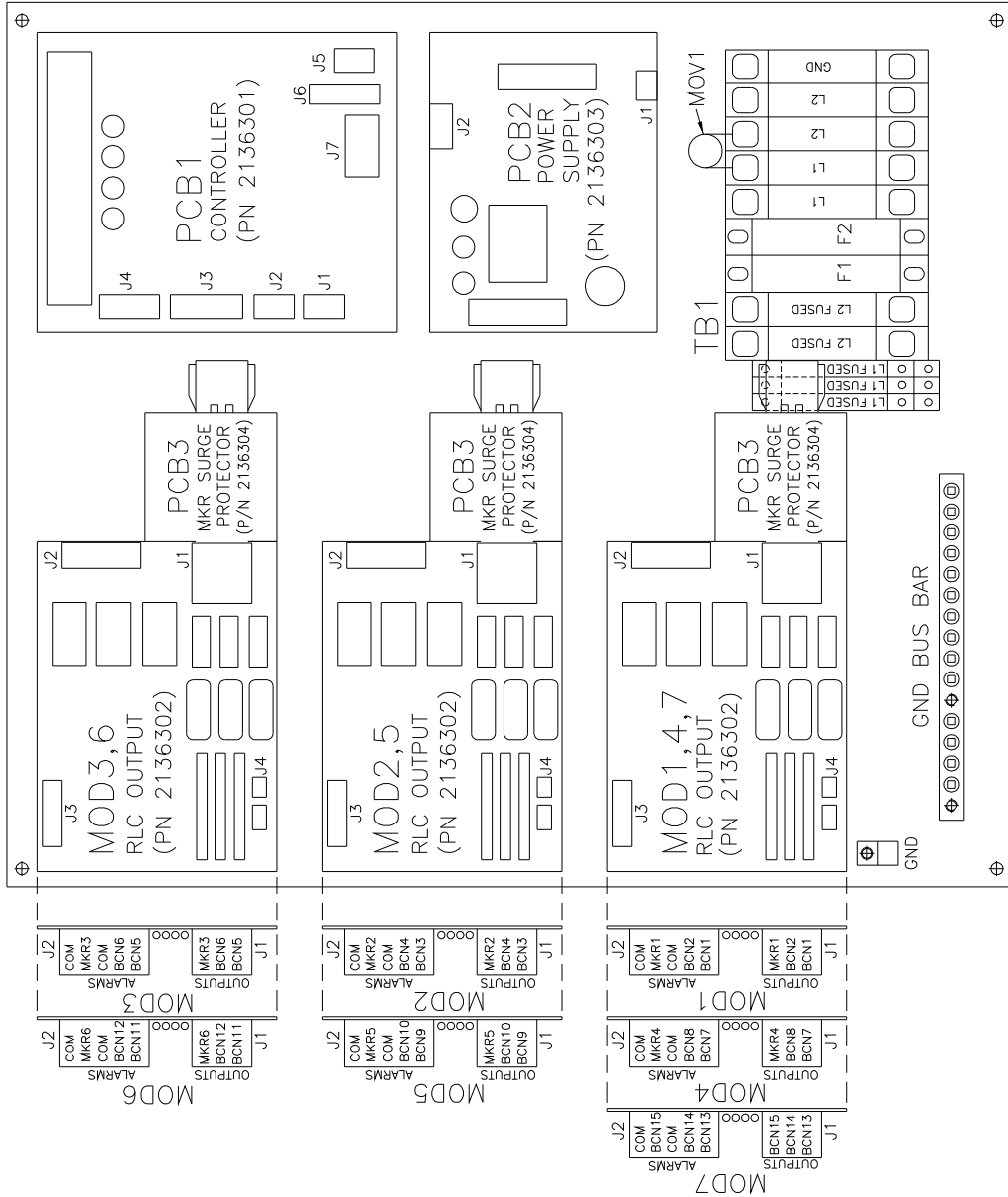
Table 4-3 “Optional Parts” lists optional parts for the system.



FLC 3611-3/3612-3 (120/240VAC, 50/60HZ)  
 RLC - COMPONENT LOCATIONS  
 (SEE SYSTEM CHART)

Figure 4-1 – A0 – A2 FLC Controller Component Locations

SYSTEM CHART			
MODEL #	FAA SYSTEM	RLC OUTPUT	
FLC 3613-3	A-3	MOD1-3	
FLC 3614-3	A-4	MOD1-4	
FLC 3615-3	A-5	MOD1-5	
FLC 3616-3	A-6	MOD1-6	
FLC 3617-3	A-6	MOD1-7	



FLC 361X-3 (120/240VAC, 50/60HZ)  
 RLC - COMPONENT LOCATIONS  
 (SEE SYSTEM CHART)

Figure 4-2 – A3 – A6 FLC Controller Component Locations

Table 4-1 – Controller Replaceable Parts

Reference	System	Description	Part Number
PCB1	ALL	PCB CONTROLLER FLC 361X – (UNCONFIGURED)	2136301
PCB1	ALL	PCB CONTROLLER FLC 361X – (CONFIGURED)	23624(XX) *
PCB2	ALL	PCB POWER SUPPLY FLC 361X	2136303
PCB3	ALL	PCB RLC MKR SURGE PROTECTOR	2136304
MOD X	ALL	PCB RLC OUTPUT FLC 361X	2136302
MOV1	ALL	▶ VARISTOR 230/240V METAL OXIDE	6901081
F1, F2	A0-A2	▶ FUSE 8A SLO-BLO	4362041
F1, F2	A3-A6	▶ FUSE 15A SLO-BLO	4362042
MOD X FUSE	ALL	▶ FUSE 2A SLO-BLO	11000008012
TB1	A0-A2	TERMINAL BLOCK ASSEMBLY	1362027
TB1	A3-A6	TERMINAL BLOCK ASSEMBLY	1362026
-	A0-A2	CABLE FLC 361X RIBBON 2 CARD	4362044
-	A3-A6	CABLE FLC 361X RIBBON 3 CARD	4362037
-	A3-A6	CABLE FLC 361X RIBBON 7 CARD	4362038
MOD X-J1	ALL	CONN 3POS PC5/3-STCL-7.62	11000008014
FLC 361X	ALL	PEC 510 PHOTOCCELL W/20' PIGTAIL	1855001
-	ALL	SCREWDRIVER SLOT, SMALL	1362087

▶ Recommended as a Spare Part

\* Part number varies according to system configuration

Table 4-2 – Beacon Replacement Parts

Description	Part Number
ASSY POWER SUPPLY FH 3610-2	11000010303
LED MODULE FH 3610-2 WITH DOME	11000010305
DOME FH 3610-2	11000010306
FH 3610-2 L864 LED BEACON	11000010307

Table 4-3 – Optional Parts

Description	Part Number
MOUNTING ADAPTER PANEL	3362047
CABLE TC-ER RATED 12AWG/3C	5991890

# 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 getting information on the product's progress.**

**Failure to follow the below procedure may result in additional charges and delays. Avoid unnecessary screening and evaluation charges by contacting Technical Support prior to returning material.**

**1. To initiate an RMA, customers should 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
- Purchase Order (if non-warranty repair)
- Shipping Address
- Bill To Address
- Any additional information to assist in resolving the issue or problem

**3. A P.O. is required in advance for the replacement of product that may be under warranty. Flash will then, at its discretion issue a credit once the validity of the warranty has been determined.**

**4. A purchase order (P.O.) is also required in advance for all non-warranty repairs. NOTE: the purchase order is required prior to the issuance of the RMA number.**

- If the P.O. number is available at the time of the call, an RMA number will be issued and the customer must then fax or email the P.O. with the RMA number as the reference, to ensure prompt processing.
- If the P.O. number is NOT available at the time of the call, a Service Notification Number will be given to the customer and should be referenced on the P.O. when faxed or emailed to RMA Rep.
- Flash will then, at its discretion repair or replace the defective product and return the product to the customer based on the shipping method selected.
- The customer may purchase a new product before sending in the existing product for repair. If Flash Technology determines the existing product is still covered under warranty a credit will be issued to the customer for the new product.

**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 may result in extra screening and delays.
- Must have all required information provided before an RMA number is assigned.

**RETURN TO STOCK POLICY**

- **Parts can be returned within 60 days of ship date and will be subject to a 25% restocking fee. Product must:**
  - Be in the original packaging
  - Not be damaged
- **After 60 days no parts can be returned**