



L-821 Airport Lighting Control Panel

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AC 150/5345-3

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Warranties

Products of ADB Airfield Solutions manufacture are guaranteed against mechanical, electrical, and physical defects (excluding lamps) for a period of one year from the date of installation or a maximum of two years from the date of shipment and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

ADB Airfield Solutions will correct by repair or replacement, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives ADB Airfield Solutions written notice of such defects after delivery of the goods to Buyer.

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Disclaimers

This manual could contain technical inaccuracies or typographical errors. ADB Airfield Solutions reserves the right to revise this manual from time to time in the contents thereof without obligation of ADB Airfield Solutions to notify any person of such revision or change.

Details and values given in this manual are average values and have been compiled with care. They are not binding, however, and ADB Airfield Solutions disclaims any liability for damages or detriments suffered as a result of reliance on the information given herein or the use of products, processes or equipment to which this manual refers. No warranty is made that the use of the information or of the products, processes or equipment to which this manual refers will not infringe any third party's patents or rights. The information given does not release the buyer from making their own experiments and tests.

L-821 Airport Lighting Control Panel

1. Safety

This section contains general safety instructions for using your ADB Airfield Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- refer to the FAA Advisory Circular AC 150/5340-26, *Maintenance of Airport Visual Aids Facilities*, for instructions on safety precautions.
- observe all safety regulations. To avoid injuries, always remove power prior to making any wire connections and touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.



WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.

Safety Symbols (*contd.*)

WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Wear safety goggles. Failure to observe may result in serious injury.



CAUTION: Failure to observe may result in equipment damage.

Qualified Personnel

The term *qualified personnel* is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating this equipment to see that its personnel meet these requirements.

Intended Use

WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

ADB Airfield Solutions cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB Airfield Solutions replacement parts
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your ADB Airfield Solutions equipment
- allowing unqualified personnel to perform any task

Installation

Read the installation section of all system component manuals before installing your equipment. A thorough understanding of system components and their requirements will help you install the system safely and efficiently.



WARNING: Failure to follow these safety procedures can result in personal injury or death.

- Allow only qualified personnel to install ADB Airfield Solutions and auxiliary equipment. Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.

Operation

Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.

Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.

Operation *(contd.)*

- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only persons who are properly trained and familiar with ADB Airfield Solutions equipment are permitted to service this equipment.

- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved ADB Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.

Maintenance and Repair*(contd.)*

- Check interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.

2. Description

This section describes the ADB Airfield Solutions L-821 airport lighting control panels.

On the L-821 panel are toggle, rotary, or pushbutton switches to turn on and off equipment such as airport lighting regulators, beacons, obstruction lights, apron lights, lighted wind indicators, emergency power generators, PAPIs, and REILs. It is also used to control lighting intensities. The L-821 control panel is manufactured in accordance with the latest version of FAA specification AC 150/5345-3.

Panels may have a backlit film overlay and illuminated indicator lights. Dimmers are supplied for illuminated indicators and the backlighting so that brightness during the nighttime hours can be adjusted. An optional interface can be supplied that provides positive indication that current is flowing in the runway/taxiway circuits. The interface is very important in visibility situations when the lighting systems cannot be viewed from the control tower.

**L-821 Airport Control Panel:
Required Equipment**

Refer to Table 1 for required equipment that is supplied.

Table 1. Required Equipment Supplied

Description	Quantity
L-821 control panel	1
Instruction manual	1 per order
Assembly and wiring diagrams	3

Specifications

This subsection provides specifications for the L-821 control panel.

Type

Refer to Table 2 for panel type.

Table 2. L-821 Panel Types

Type	Description
Type I	See Figure 1. The conventional panel has switches with the switch designations shown in characters, but no layout of the airport lighting system is shown on the panel
Type II	See Figure 2. The facsimile panel has the layout of the airport operating surfaces such as runways or taxiways engraved, painted, overlaid by decal or film, or shown by other approved method. Backlighted panel plates have sections of an imposed facsimile backlighted as the controlling switches are activated. This provides the controller with a correlation between the switching operation in the tower and the lighted paths on the airfield.

Specifications (contd.)

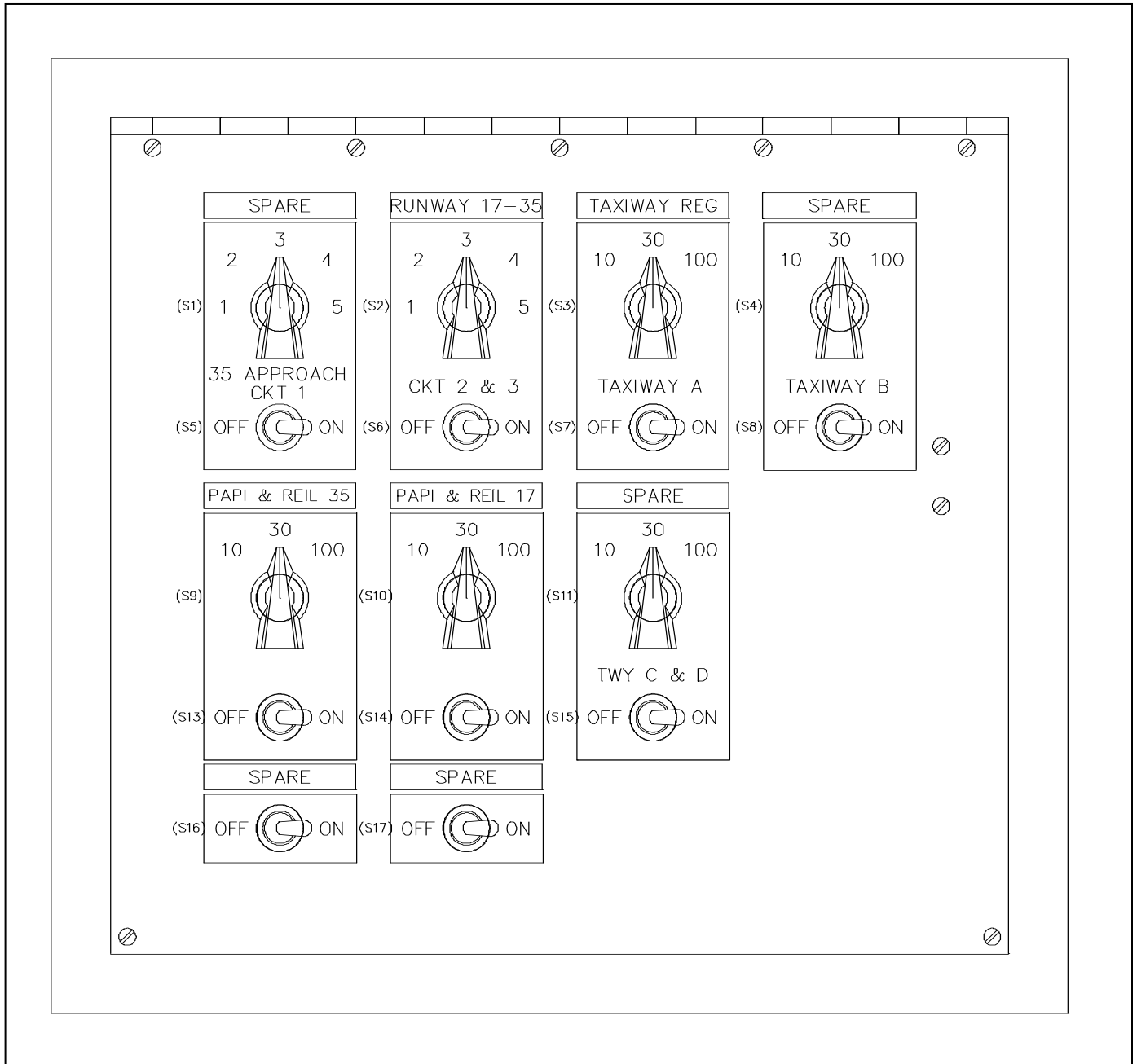


Figure 1. Type I L-821 Airport Lighting Control Panel

Specifications (contd.)

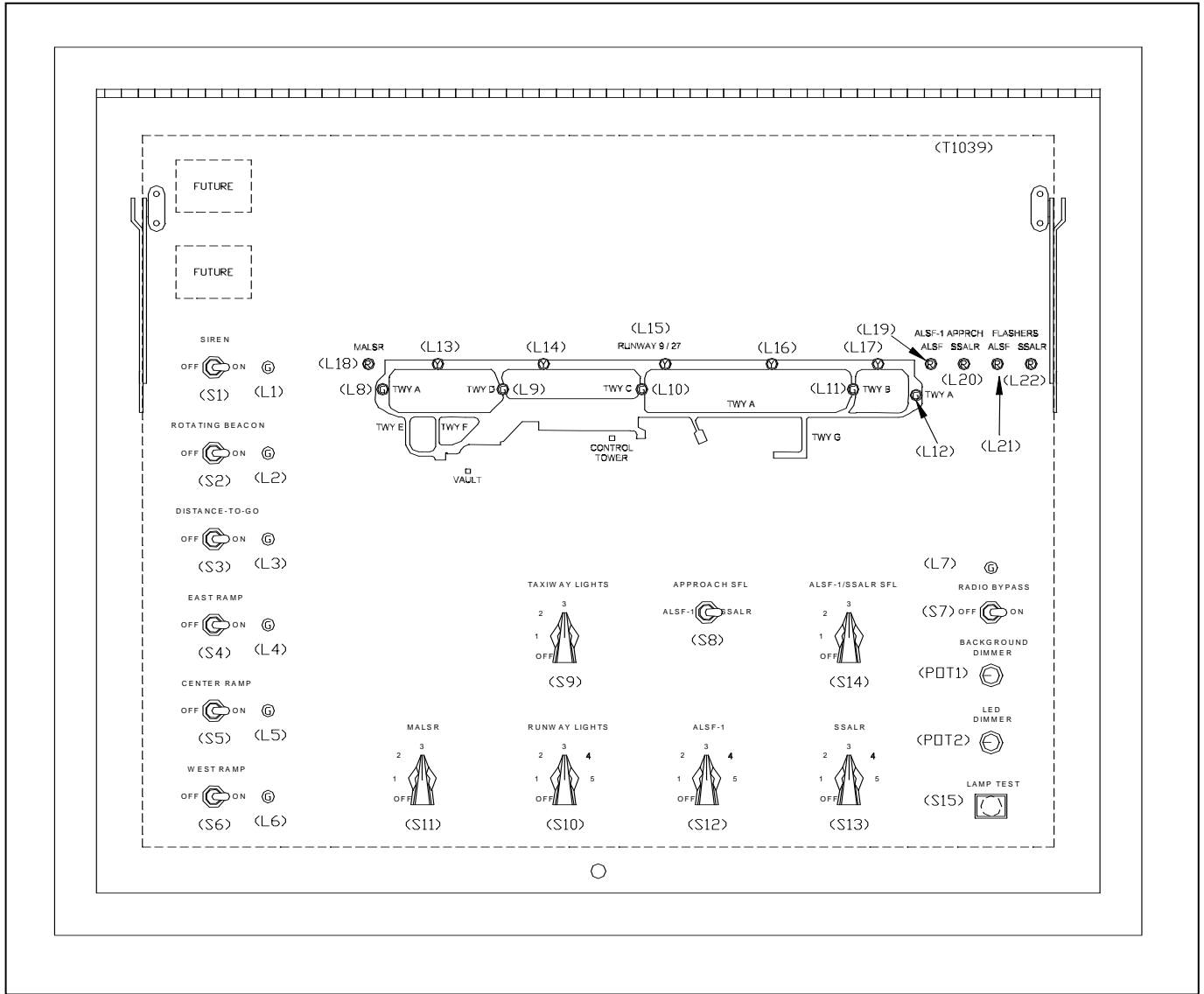


Figure 2. Type II L-821 Airport Lighting Control Panel

Class

Refer to Table 3 for panel Class.

Table 3. Panel Class

Class	Description
F	A flush-mounted panel for mounting in a console panel or cabinet.
S	A surface-mounted panel for installation on top of a desk or other suitable surface.
W	A wall-mounted panel used in conjunction with a commercial utility or outlet box.

Style

Refer to Table 4 for panel Style.

Table 4. Panel Style

Style	Description
1	Unlighted (with conventional or facsimile panel) (Type I or Type II)
2	Backlighted (with conventional panel) (Type I)
3	Backlighted (facsimile panel) (Type II)

Mode

Refer to Table 5 for panel mode.

Table 5. Panel Mode

Mode	Description
1	Generic panel
2	Land and Hold Short Operations (LAHSO) control panel
3	Stop bar control panel

Construction

Refer to Table 6 for panel construction.

Table 6. Panel Construction

Panel Type	Description
Class F	The Class F panel is made of a 0.094-inch (minimum) steel or aluminum or 0.40-inch thick Plexiglas if backlighted. The plate is attached to the case by means of a continuous hinge along its top edge. Either one or two latches are mounted inside the case to support the panel plate, when open, at a near vertical position. No part of the plate or its attachments project behind the plane of the back of the case during opening and closing. The case is made of 0.078-inch (2-mm) minimum sheet of steel or aluminum of equal rigidity. The color and gloss of the case and panel plate conforms to Federal Standard 595, brown No. 30373 with a hard, paint finish having a smooth texture. A grounding lug capable of handling at least AWG #12 conductor is supplied in each case or box.
Class S	Refer to Class F panel in this table for panel construction.
Class W	The Class W panel plate may be a commercially available utility or outlet box cover that is usually attached to the case or box by screws. Therefore, no latch or hinge is used on Class W panels. A grounding lug is supplied in the box or case that is capable of handling AWG #12 conductor.
Backlighted (Style 2)	Backlighted panels are normally facsimile panels consisting of a ¼ inch translucent white Plexiglas bottom sheet and a 1/8 inch nonglare clear Plexiglas face sheet with a color fast film of the airport layout sandwiched between the two Plexiglas sheets. The complete panel is backlighted except for lights embedded in the plastic panel that are controlled by their functional switches, or by feedback relays from the controlled equipment.

Switches

Control panel switches have the features listed below.

- All switches have a contact rating of 125% of the load current and voltage requirements.
- All switches are rated 25,000 cycles or more at rated load.
- Rotary switches have a minimum angular throw of 30 degrees.
- All switches are mounted using a hexagonal nut above and below the plate, along with an external tooth and split lockwashers.
- All switch designation characters are not less than 3/16 inch and not more than 5/16 inch.

Terminal Blocks

Terminal blocks have the features listed below.

- Pressure type
- Rated equal to or greater than the rating of the wiring
- Each individual terminal must be identified with permanent marks in accordance with the furnished wiring diagram
- Not required in Class W panels

Wire

All wiring is to be stranded copper conductors with 90 °C rated insulation suitable for 120 volts.

Backlighted Panels

Backlighted panels have the features listed below.

- Provides control to reduce brightness up to 90%
- Provides minimum 10,000 hours light source life expectancy

Optional Emergency Generator Control

Each emergency generator control may consist of a switch and red pilot light for generator control. This option is provided only when requested by the customer.

Dimensions

Customized to meet user requirements

3. Installation



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Introduction

This section provides instructions for installing the L-821 airport lighting control panel. Refer to the airport project plans and specifications for the specific installation instructions.

Unpacking

The equipment is shipped ready for installation. Handle equipment very carefully to prevent component damage. Unpack the carton upon receipt and check the contents and their condition. Note any exterior damage to the carton that might lead to detection of equipment damage.

If you note any damage to any equipment, file a claim with the carrier immediately. The carrier may need to inspect the equipment.

Installing L-821 Control Panel

Install the L-821 control panel according to the guidelines below.

- Prior to installation of the panel, cut a hole in the case for the entrances and/or exits of interconnect wires.
- Determine the location for the cable entrance/exit hole(s). Drill a pilot hole at the location(s), then using a knock-out punch, enlarge the hole(s) to the appropriate size.
- If the control wires are enclosed in the conduit, terminate the conduit in the control box using a conduit nut and plastic bushing.

Installing L-821 Control Panel *(contd.)*

- Mount the panel according to the guidelines below.
 - Secure surface panels to a table top or other suitable surface. Drill holes, if necessary, in the bottom of the case to accommodate the screws, washers and nuts needed to hold the case in place.
 - Use flush-mounted panels for mounting in a console or cabinet. Make a cutout, if necessary or remove an existing panel in the console, as required. Drill holes in the flange of the control panel to secure the panel to the console. Install the panel with 10–24 X 3/4-inch oval head rack and cabinet screws, with cup type metal finishing washers, nuts, and lockwashers.
 - Use the four mounting tabs on the Class W panel enclosure to mount the panel box on a wall or other appropriate surface in an electrical vault or other convenient control point. Secure the panel box to the mounting surface using four long lag screws and flat washers, or other suitable fasteners appropriate for mounting the panel to the surface.

Wiring

Refer to supplied L-821 control panel wiring diagrams for details. Make sure all wiring meets the National Electrical Code and any state and/or local codes that may prevail.

Refer to the guidelines below when wiring the L-821 control panel.

- When making wiring connections, make sure the power is disconnected.
- Attach an earth ground (minimum AWG #12) to the ground lug on the panel enclosure.
- Make the wiring connections on the control panel according to wiring schematics sent with the L-821 and as called for in the airport runway/taxiway lighting plans and specifications.

4. Operation

This section provides the general functions and features of L-821 airport lighting panel controls. Refer to Table 7.

Table 7. Panel Controls

Panel Controls	Function	Features
Toggle switches	When the switch is in the far left position, turns the lighting system either off or on with the intensity set to the lowest available intensity.	<ul style="list-style-type: none"> • Have either two or three positions operating left to right and are detented to provide positive-feel switching. • Are mounted on the panel plate with a hexagonal nut above and below the panel plate using an internal-tooth lockwasher and a locking ring or keyed punched panel to ensure permanent mounting.
Rotary switches	Used to control lighting systems.	<ul style="list-style-type: none"> • Have three to six distinct positions with the appropriate number of poles to control the lighting system intensity. • May include a pole to turn off the systems, if required by the user. • Have a minimum angular throw of 30 degrees between detents and are equipped with a stop to prevent rotation past the last button. • Rotate between detents in either direction without stopping.
Pushbutton switches	May be used to control any or all functions of airport lighting and auxiliary systems.	<ul style="list-style-type: none"> • If used for intensity controls, include auxiliary relays or nonradio interference solid state circuitry. • Are wired so that when initially energized, the intensity setting of an intensity controlled lighting system is the lowest available intensity. • When an intensity controlled lighting system is de-energizing, the intensity setting automatically returns to the lowest intensity available. • Have illuminated push buttons that are softly backlit in the off position and glow noticeably brighter in the on position.
Optional emergency generator control	Transfers the power load from the main power supply to the emergency generator.	When the power load has switched to the emergency generator, red pilot light illuminates.

5. Maintenance

This section provides maintenance information for the L-821 airport lighting control panel.

To keep the L-821 control panel operating efficiently, follow a preventive maintenance schedule. Refer to Table 8.

Table 8. L-821 Control Panel Maintenance

Interval	Maintenance Task	Action
Daily	Check control panel operation for burned out indicator lights.	Replace indicator lights.
Bi-Monthly	Check general panel cleanliness.	Use a damp cloth and mild detergent solution to clean the cabinet and panel.
Semi-Annually	Check auxiliary control panel operation.	Clean all contacts. Make sure electrical connections are in good condition. Replace any cracked or deteriorated wires.
	Check condition of paint on cabinet exterior.	Repaint as necessary.
	Check condition of panel interior.	Clean interior of panel carefully.

6. Parts

This subsection provides information about L-821 control panel parts.

Introduction

The L-821 parts lists are specific for each L-821 control panel. Please refer to your assembly drawing for part numbers and quantities. Contact ADB Airfield Solutions if drawings are not available.