CONTROL & MONITORING

RCE

Digital Radio Control

AIR-TO-GROUND (TYPE I) RADIO CONTROL

Compliance with Standards

FAA: L-854 AC 150/5345-49 (Current Edition). ETL Certified.

ICAO: Aerodrome Design Manual, Part 5 para. 3.4.6.

FCC: 47 CFR, Part 15:2007 (Class A).

T/C: Transport Canada TP 312 - Aerodromes Standards and Recommended Practices.

Uses

FAA L-854, ICAO, FCC & TP 312
Provides air-to-ground (Type I) radio control of airport lighting systems.

Features

- Unattended all-weather operation
- Simple installation, low cost
- Input power – 120 or 240 VAC, ±10%, 50/60 Hz or 12 or 48 VDC, ±20%
- Output – 3 A relay contact rating, optional 40 A rating available
- Operating temperature: -67 °F to +131 °F (-55 °C to +55 °C)
- Frequency – 118.0 to 136.0 MHz VHF. Digital control electronics allow operating frequency to be easily reprogrammed by the user. This eliminates the need — required by older analog units — to return the L-854 to the factory for operating frequency changes.
- Antenna – whip (standard) or remote
- Built-in speaker with volume control
- Optional Remote Maintenance Module (RMM) available to interface to FAA equipment
- For Canadian applications, the L-854 is configurable as a Type J or Type K ARCAL unit via DIP switch selection

Application

The primary function of the L-854 Radio Controller is to allow maximum utilization of airport runway lighting systems during times when the airport is unattended.

Runway or approach lighting systems may be activated and intensity controlled remotely by using the L-854 Radio Controller. This is accomplished by the simple process of keying the microphone button of the regular VHF communication transmitter in the approaching aircraft. No special airborne equipment or adapters are required. Two independent sets of output relays can be programmed for either individual or incremental operation.

The lights are activated remotely from the air and remain on for a period of 15 minutes and turn off automatically thereafter. Additional timer settings of 1, 30, 45 and 60 minutes are available. Selectable re-command enable/disable prevents setting outputs to a different state until the L-854 has timed out.

Selectable decoder enable/disable prevents multiple relay operation during the daytime when ATC normally controls the lights.

Runway edge lighting, MALSR, or REILs are prime candidates for radio control operation.

In Canada, ARCAL systems are generally available in two forms. Type J allows connected systems to be activated at a single intensity. Type K allows three selections of connected systems and are generally used to scale the light intensity selection on connected high and medium intensity lights.

Operating Conditions

Temperature:	-67 °F to +131 °F (-55 °C to +55 °C)
Humidity:	0 to 100%
Altitude:	0 to 6,600 ft (2,000 m)

Electrical

The Receiver is a single-conversion super-heterodyne design operating at a nominal radio frequency within the VHF band 118 to 136 MHz. The sensitivity is adjustable from 1 to 30 microvolts as desired by the user, permitting a control range of 1 to 20 miles. The receiver may be programmed to operate on any frequency in the specified VHF range. The Unicom channel, 122.8 MHz, is a frequent choice. Decoding is accomplished by solid-state digital circuitry, which is designed to sense the presence of three, five, or seven pulses within a five-second time period. The digital circuitry determines if any of these conditions exist and affect proper output relay closures. The L-854 Radio Control Equipment complies with FCC Part 15 rules and regulations.

RCE

Input Power Requirements

Voltage	Maximum VA
12 VDC	11[1]
48 VDC	13
120 VAC	15 [2]
240 VAC	18 [2]

Notes

[1] Typical standby power is 4 VA at 12 VDC for calculating solar power autonomy

[2] The optional 40 A relay will add 10 VA when energized

Theory of Operation

The system is activated upon receiving a series of pulses of radio frequency energy within a five-second period.

There are two independent sets of relays that can be programmed for individual or incremental operation. In incremental operation at the third pulse, the first relay closes, at the fifth pulse, the second relay closes, at the seventh pulse, the third relay closes. In individual operation only the relay for the selected step is closed at any time.

At any time in the sequence, the pilot has the option of sending three, five, or seven pulses to command the system to the desired intensity level. The system will remain at the intensity level of the last command received. The solid-state timer will continue to operate for 15-60 minutes (selectable) after which it will cause the system to revert to the original "off" condition. The timer is reset by the receipt of any command at any time, unless re-command is set to disable, which requires the L-854 controller to time out before a new command is accepted.

In the event of a power interruption while the relays are energized, the controller and associated relays will resume operation for the remainder of the period at the previously selected brightness setting.

An ideal application for series constant-current lighting systems is that of operating at a low power setting, using the L-854 controller to bring the lighting to full brilliancy, and if desired, simultaneously energizing the REILs. Maximum life and utility are thus achieved for both systems. Runway lighting and REIL/xenon flash lamp life is greatly increased. Since the L-854 controller is designed for outdoor, unattended, and continuous operation, it eliminates costly trenching and installation of control lines to remote facilities.

Packaging

Weight:	21 lb (9.5 kg)
Size:	12 × 10 × 8 in (30.48 × 25.4 × 20.32 cm)

Ordering Code

RCE - X X X X

Power

1 = 120 VAC, ±10%, 50/60 Hz
2 = 240 VAC, ±10%, 50/60 Hz[4]
3 = 12 VDC ±20%[4]
4 = 48 VDC ±20%[4]

Antenna

1 = Top Mount
2 = Remote Antenna (with standard antenna)[1]
3 = Remote Antenna (with heavy duty antenna) [1,2]
4 = Remote Mount (without antenna and coax)[3]

Enclosure Type

1 = NEMA 4 (indoor/outdoor)

Output

1 = 0 to 3 amps
2 = 3 to 40 amps (single step)

Notes

[1] The remote antenna is an omnidirectional ground -plane antenna with an additional 50 feet of cable for remote mounting.

[2] For use in locations with high wind or ice.

[3] For use in locations with an existing antenna and coax.

[4] Not ETL Certified.