

Distributed Control & Monitoring Unit (DCMU)

System Application

The Freedom Series™ Distributed Control and Monitoring Unit (DCMU) brings intelligence and advanced capabilities to traditional airfield lighting power and control devices. By adding embedded processors, digital signal processing and redundant communications capabilities, the Freedom Series™ DCMU provides state-of-the-art distributed control and monitoring to existing equipment including constant current regulators (CCR), circuit selectors, non-regulated controls, approach systems, generators and transfer systems.

- Provides L827/L829 monitoring plus additional analog and digital monitoring to existing constant current regulators.
- Provides customizable inputs and outputs for any type of device to be controlled or monitored.
- Provides redundant communications, eliminating point to point I/O wiring to a centralized PLC or I/O panel. Standard industrial protocols provide direct communication to Liberty or third-party control systems.
- Provides ability to add additional monitoring and control features in a modular fashion without requiring additional centralized I/O or wiring.
- Provides latching failsafe capabilities ensuring that a control system or DCMU failure will not cause a sudden change in lighting patterns.
- Provides control and monitoring status information on a local display, on a centralized remote annunciator panel or through a control and monitoring system.
- Provides a redundant gateway between Serial (RS485) devices and 100MB Ethernet devices.



Fig. 1 DCMU Digital Display with auxiliary keypad for control of L-847 Circuit Selector Switches.



Fig. 2 DCMU Front Display with digital read-out and membrane control pushbuttons. Installed in a sloped console, the DCMU is designed for wall mounting or for mounting on top of or next to an existing CCR.

Standards Compliance

- FAA Advisory Circular 150/5345-56, Spec L-890 Available in all classification types L890-X-Y where:
 - X = A - Control Only
 - B - Basic Monitoring
 - C - Advanced Monitoring
 - D - SMGCS (Individual Lamps Out)
 - Y = A - Preset Failsafe
 - B - Last State - Latching Failsafe
- FAA Advisory Circular 150/5340-30, Design and Installation Details for Airport Visual Aids.
- ICAO Annex 14, Volume 1, Aerodrome Design and Operations.
- ICAO Aerodrome Design Manual Doc 9157, Part 5.
- Transport Canada Aerodrome Standards and Recommended Practices, Volume 1, TP-312E.



Fig. 3 DCMU adds L-827 Monitoring and IRMS capability to existing CCRs and a redundant RS485 Modbus communications interface to a new 3rd party ALCMS.

Control Capabilities

- Five brightness step control of CCR plus non-illuminating brightness step for SMGCS applications or PAPI warning (frost prevention).
- Ability to control up to 6 circuits or individually controlled lighting segments per DCMU.
- Support for 24VDC, 48VDC or 120VAC control supplied internally (from CCR) or externally (from control system).
- Programmable failsafe capabilities allows last state (latching) or preset brightness selection upon failure of control system or DCMU.

Monitoring Capabilities

- Current status including commanded and actual brightness, warning and fault conditions (door interlock, primary power, local switch position, fuse failure, overcurrent and open circuit trips).
- Analog monitoring of input and output current, voltage, VA, power, power factor, efficiency, brightness within specifications, number of failed lamps per circuit including warning and alarm indication.
- IRMS Insulation resistance to ground (automatic megger) and ground fault alarm indications.
- Elapsed time at each brightness and number of device operations.
- Monitoring and alarming of each DCMU power supply and communication channel.
- Monitoring of up to 6 circuits per CCR.

General Features

Designed as the preferred interface to the *Freedom Series™* ALCMS, the *Freedom Series™* DCMU provides reliable control and monitoring capabilities for critical airfield applications. Refer to Descriptive Bulletin LAS-DB-003 for additional information on control and monitoring systems. Features include:

- Industrial grade operating temperature range suitable for outdoor operation: -40°C to +60°C.
- Redundant wide range 24VDC power inputs.
- Isolated inputs and latching relay outputs.
- Small form factor allows mounting inside existing equipment.
- Full on-site configuration capabilities, including enabling of features, setting of operational parameters and alarm setpoints, and calibration.

Communication Capabilities

- Redundant 100MB Ethernet communication using Ethernet/IP, Modbus TCP, TCP/IP, and UDP.
- Redundant RS485 communication using DF1 or Modbus protocols.
- Locally re-configurable using serial port. Remotely re-configurable via dial-up modem or internet using VPN access.
- Custom protocols or interface gateways can be provided to site specific third party equipment using our extensive communication experience.



Liberty Airport Systems Inc.
C5 - 3375 North Service Road
Burlington ON, Canada L7N 3G2

Tel: 905.631.1597
Fax: 905.631.5387
info@libertyairportsystems.com