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# LED Flashing System

## APPROACH SEQUENTIAL FLASH
## RUNWAY THRESHOLD IDENTIFICATION
## CIRCLING GUIDANCE

## COMPLIANCES

**ICAO:** Annex 14, Volume I, Aerodrome Design Manual Part 4-5-6
**EASA:** CS-ADR-DSN Book1
**IEC:** TS 61827
**STANAG:** 3316
**CASA:** MOS 139 (AUS)

## APPLICATIONS

Flashing light system for Approach Sequential Flash Light (SFL), Runway Threshold Identification Light (RTIL) and Circling Guidance Light (CGL).

## BENEFITS

- Variable number of synchronized flashing lights
- Variable flash duration ($T_{ON}$): typically between 16.67ms and 133.3ms
- Two standard flashing frequencies (1-2Hz). Customizable flashing periods also supported.
- Different flashing modes supported, such as sequenced flashing, contemporary flashing, clustered flashing
- Three Configurable Luminance Levels: High (100%), Medium (10%), Low (3%)
- Single light monitoring function in any state
- Local Control with Industrial Grade Touch Screen
- Remote Control Integrated in Ocem Airport Lighting Control and Monitoring System (ALCMS) or easily interfaceable with other platforms.

## FEATURES

**Flash Master Control Unit (FMCU)**
Power supply: Single Phase, 230 VAC (+/-10%), 50-60 Hz
IP Class: IP43
Electrical Protection: Input and Output Circuit Breaker
Environment Temperature: -10°C to +50°C
Installation: Metal Housing Wall Mounted
Humidity (not condensed): 20-90%
Max Altitude: 2500 m
Dimensions: 50 x 30 x 25 cm
Weight: 15 kg

**Flash Field Unit (FFU)**
Power supply (from FMCU): Single Phase, 230 VAC(+/-10%), 50-60 Hz
IP Class: IP67
Environment Temperature: -40°C to +55°C
Max Altitude: 2500 m
Dimensions: 22 x 25 x 12 cm

**Flashing Lights**
**LEFL**: elevated fixture
IP Class: IP67
Environment Temperature: -55°C to +55°C
Dimensions: 15.7 x 14.4 x 31 cm

**LIFL**: inset fixture
IP Class: IP68
Environment Temperature: -55°C to +55°C
Dimensions: ø12” protrusion 6.35mm

| Power Consumption | |
|---|---|
| FMCU | 25W |
| LEFL (incl. FFU) | 52W |
| LIFL-I (x2 lights, incl. FFUs) | 104W |
| LIFL-L (incl. FFU) | 52W |

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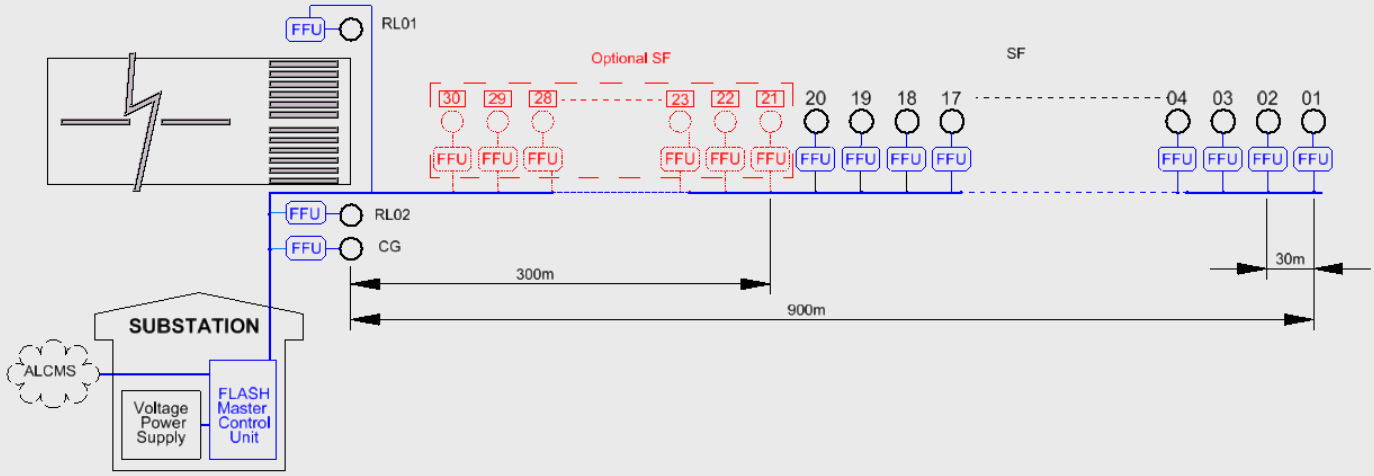


## SYSTEM ARCHITECTURE

- 1 Flash Master Control Unit (FMCU), typically placed in a substation
- N Flash Field Units (FFU), one for each elevated/inset light
- Max distance between FMCU and FFU: 5 km (approx)
- Max distance between FFU and light fixture: 50 m
- FFU power supply: from FMCU

## CONTROL AND MONITORING

- Monitoring and control functions from both local interface and remote system (ALCMS)
- Communication ALCMS <==> FMCU
  - Modbus TCP
- Communication FMCU => FFU
  - Powerline communications through power cables
  - Synchronization messages
  - Control messages
  - FW update (optional)
- Communication FFU => FMCU
  - Powerline communications through power cables
  - LED status information
  - Diagnostic information (state, faults, etc.)
- LED status monitored by each FFU

## DIAGNOSTICS

- The diagnostic algorithm is always ON to detect possible malfunctions.
- The system is designed to be very fast at start-up and in the recovery phase after a potential power shortage.

## Flash Master Control Unit

**LSFL - 0 - 1**

**Basic P/N:**

**Configuration:**
0 No WEB Server

**HMI:**
1 Touch Screen

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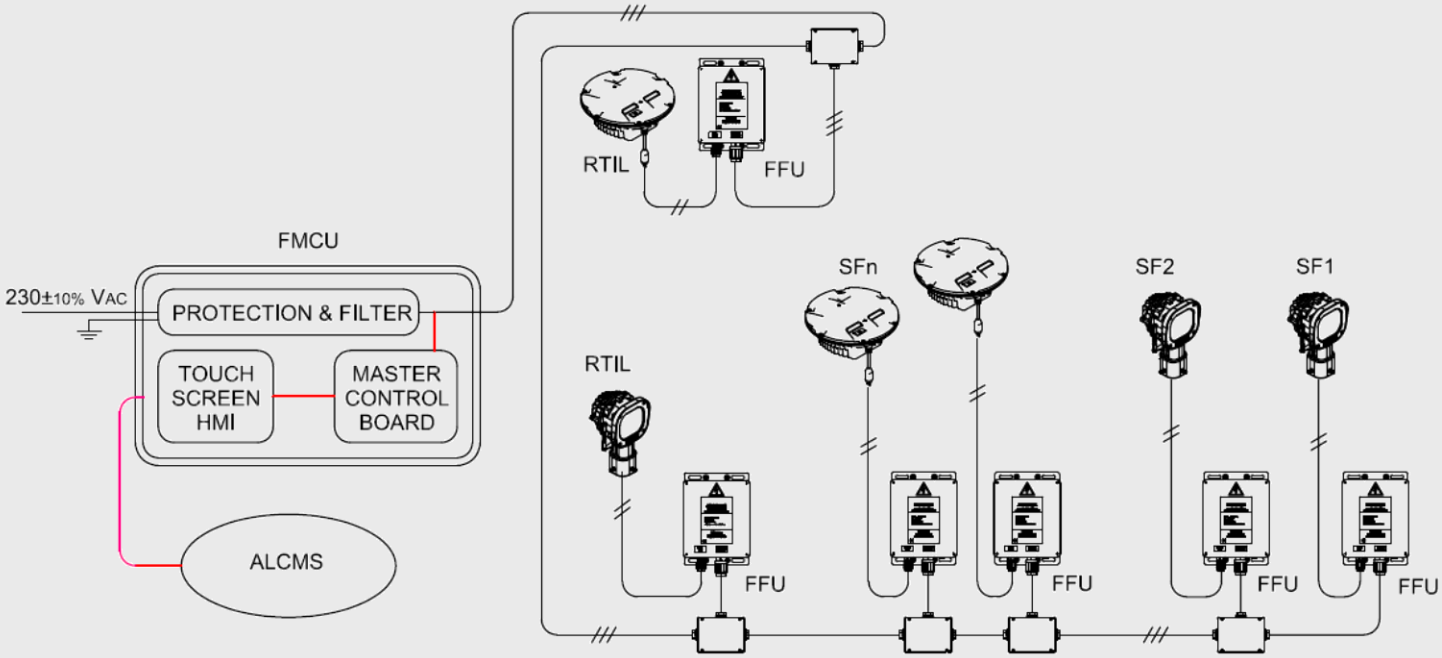
## INTERFACE TO ALCMS

- Interface: Ethernet (RJ45)
- Protocol: MODBUS over TCP





## COMMUNICATION BETWEEN FMCU AND FFU

- Powerline communications through Echelon Lonworks protocol
- Dual-carrier frequency, band CENELEC EN 50065-1 (A and C)
- Mo-Demodulation: CSMA, BPSK, FEC, DSP enhanced receiver
- Working temperature: -40 to +55 °C

## TOUCH-SCREEN INTERFACE

- Configuration options: installation of a new unit, replacement of an existing unit
- Visual representation of the flash system topology
- Mounted in the cabinet in which the FMCU unit is placed

## CHARACTERISTICS

- Suitable to install and configure the FFUs and the FMCU directly on field or remotely
- Remote interface to ALCMS with Modbus TCP communication protocol built-in
- Potentially interfaceable to any compatible control system

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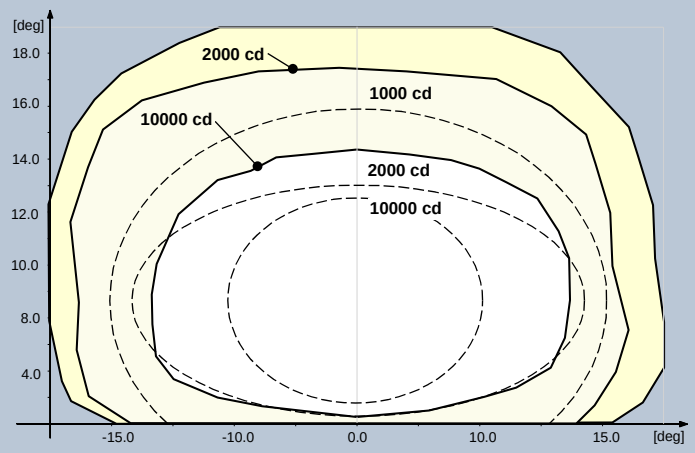
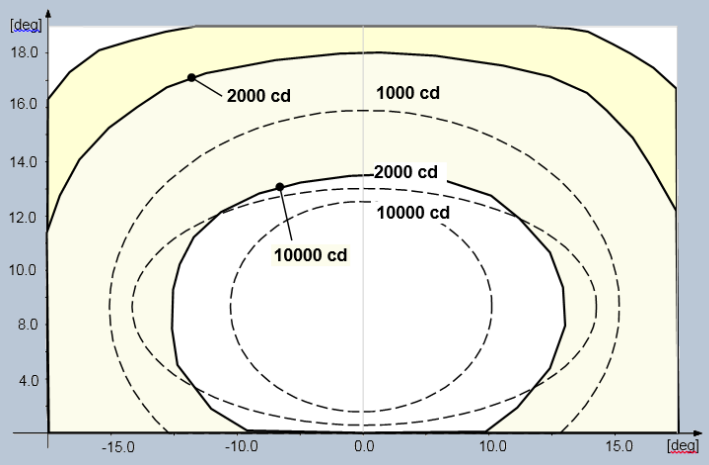
## PHOTOMETRIC PERFORMANCES




**LEFL** - ICAO Fig. A2-1 – White




**LIFL-I** - ICAO Fig. A2-1 – White
The reported photometric performance refers to the case of **two inset fixtures** used together.

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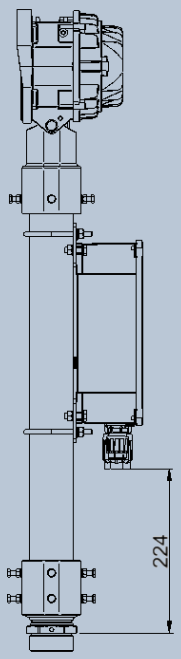
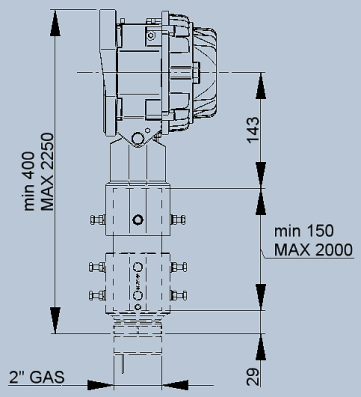
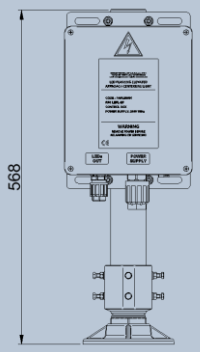



**Combined LEFL-FFU configuration**




**Separate LEFL configuration**




**Separate FFU configuration**

**LEFL - SF**

**Basic P/N**

**Function:**
See Table A.

TABLE A

| CODE | SEGMENT | COLOR |
|---|---|---|
| **SF** | SFL | WHITE |
| **RL** | RTIL | WHITE |
| **CG** | CGL | WHITE |

(*) Supporting pole and breakable coupling must be ordered separately

**NOTE: every ordered LEFL includes the corresponding FFU**

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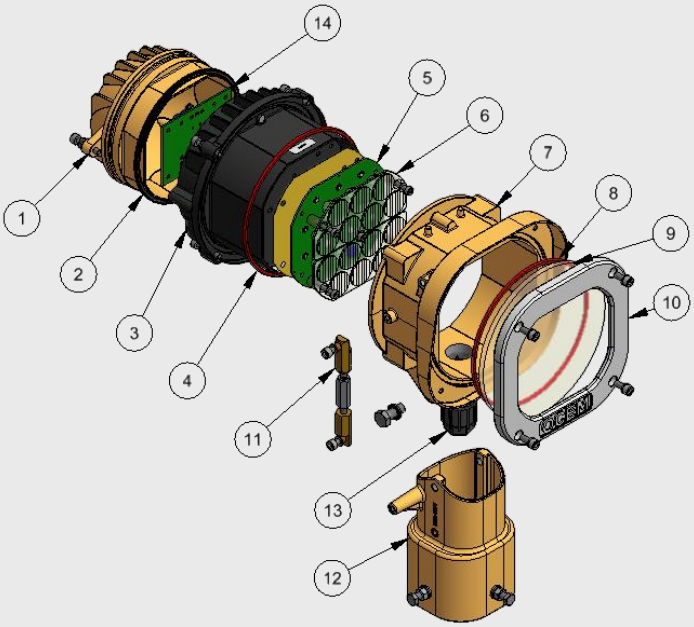
## RENEWAL PARTS FOR LIGHT UNIT

1 Cover with electronic
2 Cover gasket
3 LED module support
4 LED module support gasket
5 LED module
6 Lens array for LED module
7 Body
8 Transparent front protection gasket
9 Transparent front protection
10 Transparent front protection holder plate (painted white)
11 Vertical aiming adjusting device
12 Special support
13 Power connector (*)
14 Electronic interface
FFU Flash Field Unit
(*) Note: plug not included, to be connected directly to relevant FFU




## LIGHT ACCESSORIES

| | |
|---|---|
| 013.0010 | Set of two ryton rings for receptacle support inside pipe elbow |
| 013.0008 | Galvanized steel pipe elbow with upper threaded end only (2" - 11 GAS thread) |
| 315.3210 | Galvanized steel pipe elbow with both threaded ends (2" - 11 GAS thread) |
| 315.1228 | Base L-867, Class IA, Size B, 24” Deep |
| 315.1062 | Baseplate for L-867 base with gasket (2” - 11 GAS thread) |
| 303.6060 | Breakable coupling for direct mounting |
| 155.7200 | Breakable coupling for pole |
| 315.3710 | Pole dia.60 mm, h 150 mm |
| 315.3711 | Pole dia.60 mm, h 500 mm |
| 315.3712 | Pole dia.60 mm, h 1000 mm |
| 315.3713 | Pole dia.60 mm, h 1500 mm |
| 315.3714 | Pole dia.60 mm, h 2000 mm |
| GMMMN0065 | Support for separate FFU configuration |
| 332.4560 | Levelling and alignment device for light on supporting pole |
| 332.3240 | Levelling and alignment device for light on frangible mast |
| 332.4571 | Support for device P/N 332.3240 |
| 798.0006 | Special tubolar wrench 22 mm for bulkhead connector (13) |
| 011.3520 | Secondary plug kit L-823 style 5 |
| 011.3523 | Secondary receptacle kit L-823 style 12 |
| 011.3542 | 3 pole secondary plug kit |
| 011.3545 | 3 pole secondary receptacle kit |
| 169.5340 | Double power electric coupling kit |
| DECVK0004 | L-823 plug kit and cable gland for 303.6060 breakable coupling |
| 011.3538 | Secondary receptacle ring FAA style 8 |

**FFU**
Flash Field Unit


| Shipping Weights and Volumes | | |
|---|---|---|
| | **Light Unit** | **FFU** |
| **Weight (Kg)** | 2.2 | 2.6 |
| **Volume ($m^3$)** | 0.006 | 0.007 |

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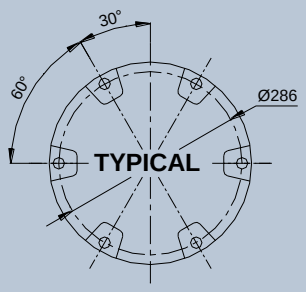
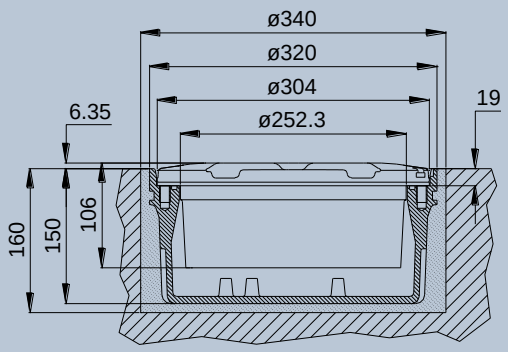
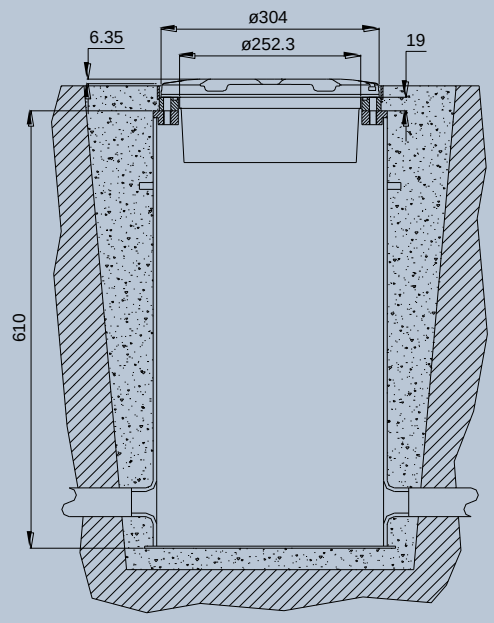



Light Fixture 12” dia.




Shallow Base 12” dia.




L-868 Deep Base 12” dia.

**LIFL - I -SF**

**Basic P/N**

**Configuration:**

I = ICAO compliant (two inset fixtures and two field unit boxes are used, flashing synchronously) (*)

L = low intensity (a single inset fixture and a single field unit is used)

**Function:**

See Table A.

TABLE A

| CODE | SEGMENT | COLOR |
|---|---|---|
| **SF** | SFL | WHITE |
| **RL** | RTIL | WHITE |
| **CG** | CGL | WIHTE |

(*) Note that for Full Compliance with ICAO Requirements inset fixtures must be installed in pairs.

**NOTE: every ordered LIFL includes the corresponding FFU**

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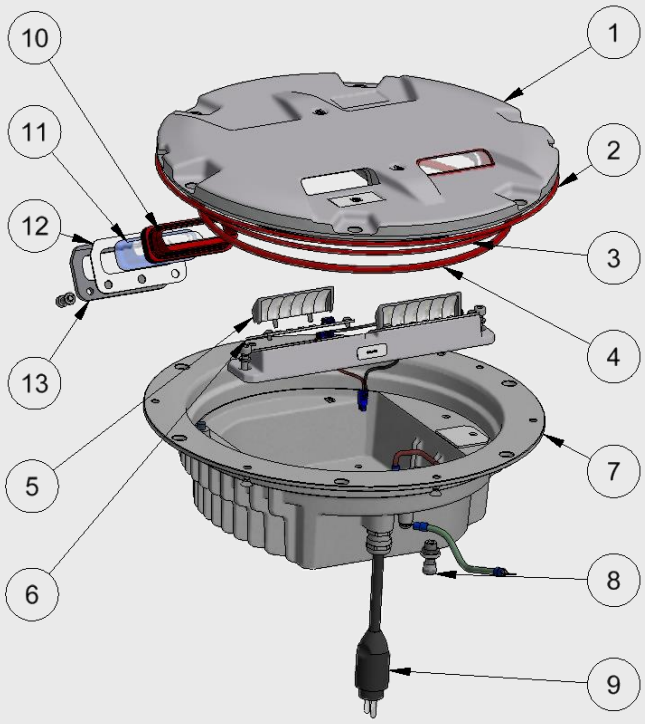
## RENEWAL PARTS FOR LIGHT UNIT

1 Dome with prisms and gaskets
2 O-Ring for dome (external)
3 O-Ring for dome (internal)
4 O-Ring for lower cover
5 Reflector
6 LED module
7 Lower cover with electronic, plug and valve
8 Valve for watertightness test
9 FAA L-823 plug
10 Prism Gasket
11 Prism
12 Prism holder gasket
13 Mounting plate
FFU Flash Field Unit




## LIGHT ACCESSORIES

| | |
|---|---|
| 315.1230 | Base L-868 type, class IA, size B, 24” deep * |
| 315.1420 | Flange ring with pavement dam for L-868 base, size B, with O-Ring and bolts |
| PABAJ0003 | Shallow base, 12" dia., with gasket and hardware, M25 Cable gland, 2,5 sqmm L-823 two-pole receptacle kit, internal ground cable, plywood cover |
| GMMMN0065 | Support for FFU |
| 712.1034 | Setting material for shallow base, 10 lt |
| 712.1035 | Quartz for shallow base, 25 kg |
| 332.4301 | Positioning jig for 8"-12" dia. shallow base, without optical device |
| 332.4351 | Optical device for positioning jig to allow a very precise light unit orientation |
| 332.4330 | Watertight/shockproof plastic case complete with positioning jig for base and optical device |
| 332.4140 | Lifting tool (2 pieces to work properly) |

* Sectional bases may be required depending upon the paving technique

**FFU**
Flash Field Unit

| Shipping Weights and Volumes | | |
|---|---|---|
| | **Light Unit** | **FFU** |
| **Weight (kg)** | 6.1 | 2.6 |
| **Volume ($m^3$)** | 0.006 | 0.007 |





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