

**binay**  
**Medium Intensity LED Aviation Obstruction Light (AOL) Beacons**  
*(Covered under Patent)*

***Binay Medium Intensity LED (Light Emitting Diode) Aviation Obstruction Light Beacons are maintenance-free units which provide a “fit-and-forget” advantage and conform to ICAO norms for intensity in candela***

Medium Intensity Aviation Obstruction Light Beacons are required to be installed on structures having heights ranging from 45 meters and above, as per International Civil Aviation Organization (ICAO) Annexure 14. The flashing ‘**Effective Intensity**’ required is specified as 2000 candelas radially (in EACH and EVERY direction; NOT integrated all around) in red, flashing at the rate of 20-40 flashes per minute.



**BINAY MODEL DX-1200 MEDIUM INTENSITY LED AOL BEACON**



**BINAY MODEL ST-1200 MEDIUM INTENSITY LED AOL BEACON**

BINAY has developed LED-based Medium Intensity AOLs (patent pending) using special long-lasting, ultra high intensity InP Technology LEDs. These LED aviation lights conform to ICAO and DARA (Indian Directorate of Air Routes and Aerodromes) requirements, and are characterised by extremely long life (100,000 hours, or 11 years continuous burning), and low per consumption.

The solid-state LED construction utilises an omnidirectional matrix of extremely high brightness LEDs which provide light intensities comparable to the existing aviation lights. These LED units are maintenance free, and are a “fit-and-forget” solution since they never require replacement. While the initial capital cost of these LED Aviation Lights is lower than that of conventional xenon tube type medium intensity lights (which conform to ICAO requirements), their payback period is also extremely short.

The latest InP technology LEDs are used in the construction of these LED lights. InP technology LEDs are specified the world over for outdoor applications as they have greater ability to withstand high temperature and high humidity conditions, as well as ultraviolet radiation. The circuit design – coupled with the choice of the LEDs used— provides high reliability. Furthermore, the LEDs in the unit are configured in multiple series-parallel circuits, and as such one can consider that each unit is backed up by several standby units. Thus, fail-safe redundancy is built in; even if one circuit fails, the other circuits will still provide a visible indication.



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**I N V E N T I N G   N E W   T E C H N I Q U E S   O F   P R O D U C I N G   L I G H T**

These Medium Intensity LED AOL Beacons are available in two models.

- The **BINAY Model DX-1200 Medium Intensity LED AOL** is designed to provide a nominal directional flashing **Effective Intensity** of 4000 candela in flashing red. This unit utilises special superflux LEDs for high light output and greater reliability. These special LEDs can operate at higher currents and temperatures, and thus provide enhanced light intensity without compromising life.
- The **BINAY Model ST-1200 Medium Intensity LED AOL** is designed to provide a nominal directional flashing **Effective Intensity** of 3200 candela in flashing red. ICAO-compliant life of this model is estimated at 50,000 hours.

**NOTE: While both the above models meet the ICAO requirement of 1600cd minimum, it should be noted that the life of the LED is dependent on the inherent LED characteristic which dictates that all LEDs depreciate steadily in light output during the course of their life. Accordingly, as per industry standards, the life of an LED is considered ended when the light output depreciates to 50% of the initial value. As such, it is necessary to design the AOL unit with an initial flashing Effective Intensity which is much greater than the minimum requirement, so as to allow for normal LED intensity depreciation over its lifetime.**

**Consequently, our Model DX-1200 provides an adequate buffer to allow for normal depreciation down to 1600cd at the end of the 20-year normal operational life. Our Model ST-1200 has a lower designed initial flashing Effective Intensity, and while it will also have a working life of 20 years, the light output may go down below 1600cd earlier.**

Both models are provided with a separate flasher unit with a fuse, a switch, and a current sensor indicator light. The flashing rate can be adjusted by means of a control knob on the unit (by monitoring the sensor indicator light).

These units come with a free-replacement warranty of 5 years (3 years for Model ST-1200) against operational failure.

Technical Details		
	Model ST-1200	Model DX-1200
LED type	AllnGaP	AllnGaP
Colour	Red	Red
Designed Initial flashing <b>Effective Intensity</b> in Candela	3200cd	4000cd
No. of circuits	15	20
Forward current	800mA	1400mA
Power factor	2.7 leading	3.8 leading
Typical power consumption	65W	75W
Input voltage variability	10%	10%
PIV protection	1KV Reverse Diode Protection	1KV Reverse Diode Protection
Insulation resistance	More than 10Mohms at 500VDC	More than 10Mohms at 500VDC
Dielectric strength	2.5KV	2.5KV
Weight (approx.)	4.5 kg	18 kg

*(In our effort towards continuous improvement, all specifications are subject to change without notice)*

## **Flasher Synchronisation Control and Monitoring Controller for Medium Intensity LED AOL Beacons** (Required for proper ICAO compliance as per ICAO Manual Clause 6.3.32)

Please note that while all our above models of Medium Intensity lights are supplied inclusive of individual flasher units, as per recommendation of ICAO all medium intensity aviation obstruction lights are to be of flashing red. Furthermore, **all the lights must flash together (i.e., synchronously)** (Refer to the clause as below):

*“6.3.32: Medium-intensity obstacle lights, Types A and B, located on an object shall flash simultaneously”*

This requirement of lights flashing simultaneously (i.e., synchronously) is necessary to allow the pilot of an oncoming aircraft to make out the outline of the structure, as lights mounted on a structure which are flashing in a random and haphazard manner are likely to create confusion in his mind.

Apart from the above, it is very essential to sense the current flow of each light and also guard against any light being operated in a steady condition (which may happen as a result of failure of the solid-state relay in the flasher unit). Such a failure in the flasher may result in either an open-circuit or a short-circuit condition. While the open circuit condition is not dangerous, failure in the short-circuit condition will result in steady (non-flashing) operation of the LED AOL unit, which will reduce the life of the LEDs considerably.

In view of the above, constant monitoring of the functioning of all the lights is necessary, and a Controller has to be suitably designed for each installation. As such, while each of our Medium Intensity AOLs as quoted for above are normally supplied with individual Flasher units, BINAY can supply a common Flasher Synchronisation Control and Monitoring Controller (suitable for **indoor** mounting) which will have the following features:

- Current sensor and indicator for each light, by means of an LED-based indicator
- Fuse for each light with corresponding MCB
- All the lights to be fed by a common flasher unit (which will supply a common pulse to a solid-state triac operated relay in the main power circuit) for synchronous flashing
- Standby flasher unit
- **Active Warning and Shut-Off Circuitry, with audio indicator and automatic shut-off of power feed to AOL units in case of Flasher failure**
- Flasher Diagnostic Bypass Switch
- Photoelectric switch unit with amplifier activating a solid state relay
- Mimic on front fascia for help in diagnostic purposes

All of the above will be fitted suitably in a 16 SWG MS sheet wall-mounting box with wall brackets, duly painted with one coat primer and two coats of grey paint. Cable glands will be provided for input and output cables.

This Controller is custom-built, and is designed on the basis of the number of lights on the installation.

Alternatively: Each Medium Intensity light can be supplied with an individual flasher (included in the cost of the light). Low Intensity lights can be powered directly from the power supply. However, this does not meet the ICAO requirement of synchronous flashing.



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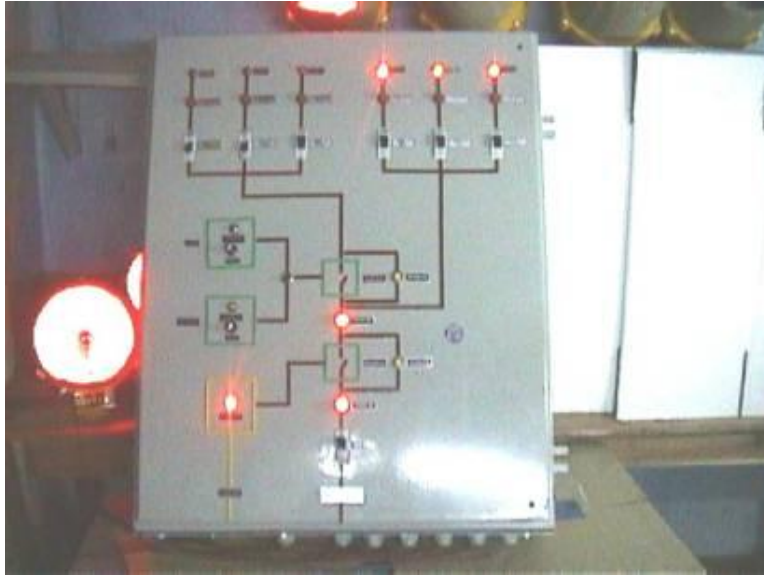
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*EXAMPLE OF A FLASHER SYNCHRONISATION CONTROL AND MONITORING UNIT FOR TWO LOW INTENSITY AND THREE MEDIUM INTENSITY AOLS*



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