

SOLS LED Solar Obstruction Light System

Compliance with Standards

FAA: L-810 AC 150/5345-43 (Current Edition) and the FAA Engineering Brief No. 67 "Light Sources other than Incandescent and Xenon for Airport Lighting and Obstruction Lighting Fixtures." Solar equipment exceeds requirements of FAA Engineering Brief No. 76 "Using Solar Power for Airport Obstruction Lighting." L-810 is ETL Certified.

ICAO: Annex 14, Vol. I, para. 6.3

System Overview

The LED Solar Obstruction Lighting System (SOLS) is a FAA- and ICAO-compliant modular, stand-alone, self-contained solar-powered obstruction warning lighting system for towers and other structures. During the daytime, the solar panel charges the battery. At dusk, the photocell automatically activates the LED obstruction light until dawn. Dusk-to-dawn light control is activated by ambient solar lighting levels (Turn On at 35 foot candles / Turn Off at 52 foot candles) via a FAA-approved photocell.

- The system is designed to require very low maintenance for long periods, while operating in harsh environments.
- The system includes a steady burning red light fixture marking fixed obstructions to eliminate navigational hazards. See catalog sheet 2063 for more information about ADB's L-810 LED Obstruction Light.
- High-efficiency high-flux LED obstruction light
- Weather- and corrosion-resistant light assembly and housing
- 32.5 cd brightness
- FAA-approved photocell
- Minimum 5-year battery life

Operation

The LED Solar Obstruction Light operates as follows:

- The solar panel supplies DC current to charge the deep cycle battery operating at 12 V.
- Battery charging is regulated by the pre-installed and wired charge controller in the outdoor-rated battery and controller enclosure.
- The LED fixture is powered by the energy stored in the battery. System design is based on monthly site climate data such that the average solar panel output is greater than the average loading.

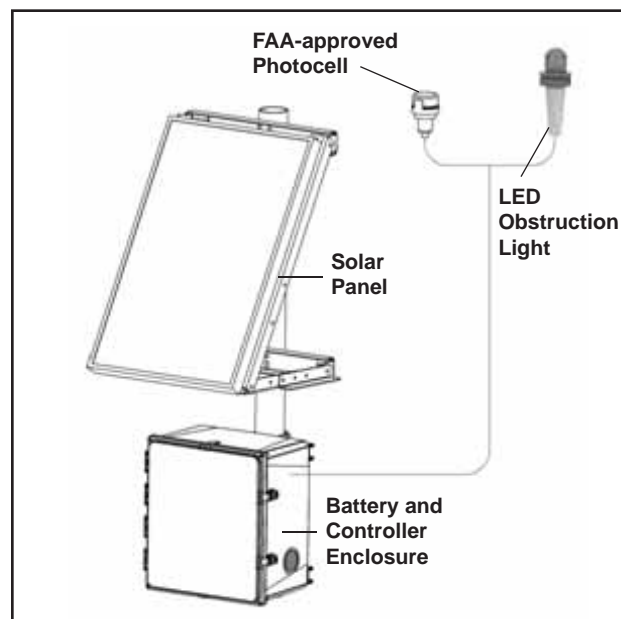


SOLAR
PRODUCT

| | |
|---|-----------------|
| Ordering Code | SPS-X000 |
| Solar Panel Size* | |
| 1 = 50W, 12V, 105 Ahr | ----- |
| 2 = 80W, 12V, 139 Ahr | |
| Note | |
| * See solar sizing map on the last page to determine the size of the solar panel required for specific locations. | |

| | |
|--|------------------|
| Ordering Code | SBOL-XXXX |
| Color | |
| 1 = Obstruction Light Red, FAA | ----- |
| 2 = Obstruction Light Red, ICAO, Type A ¹ | |
| Mounting | |
| 1 = Single, bottom mount 1 inch-11.5 inch NPT | ----- |
| Power | |
| 4 = 12V DC | ----- |
| Arctic Option | |
| 0 = Without arctic option | ----- |
| Note | |
| ¹ Not ETL Certified | |

Typical System Layout



Theory of Operation

The SOLS operates automatically with no need for operator interaction under normal conditions. With normal daylight illumination, the solar panel is capable of producing sufficient current to charge the battery. The charging light indicates the battery is being charged by the solar panel.

If the battery discharges to the pre-set load disconnect voltage due to long periods of poor weather, the low voltage disconnect (LVD) relay is activated, the controller's red LED turns on, and the solar obstruction LED fixture is disconnected. Disconnecting the LED fixture prevents battery damage associated with complete discharge of the battery. The controller's red LED will turn off when the battery recovers to about 50% of its rated capacity and the light fixture is automatically reconnected.

Solar Panel Orientation

Full solar exposure is critical to the performance of the LED obstruction light. Ensure that the solar panel installation location has year-round, unrestricted sun exposure throughout the day. If required, the solar panel may be attached remotely to the controller using an appropriately-sized transmission cable. The bottom edge of the solar panel should be installed at a minimum height to clear growing vegetation and snow at the site.

Note: Shading even a small portion of the solar panel will significantly reduce the output of the LED fixture.

The solar panel should be installed facing the equator – within 10° of due south in northern latitudes and within 10° of due north in southern latitudes (See Latitudes: North America below). The optimum inclination angle varies depending on the latitude. Most solar panels are installed at a fixed inclination angle. The inclination angle is the angle between the back of the solar panel and the horizon (See Inclination Table and Solar Panel Inclination Angle).



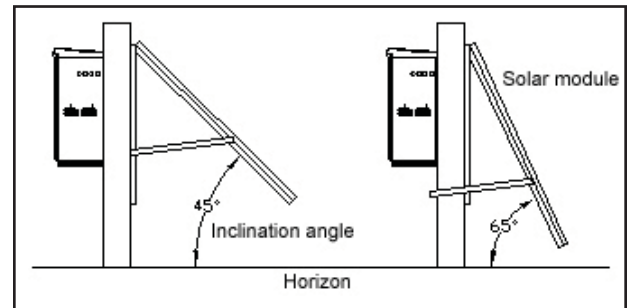
Latitudes: North America

Inclination

| Site Latitude | Near-Optimum Solar Panel Inclination Angle |
|---------------|--|
| 0 – 9° | 15° |
| 10 – 20° | Latitude + 5° |
| 21 – 45° | Latitude + 10° |
| 45 – 55° | Latitude + 15° |

Notes

- This table assumes the panel will remain at a fixed inclination angle throughout the year and is, therefore, optimized for winter. For further information, or if seasonal adjustment of the panel is desired, contact ADB.
- SOLS systems installed at a latitude greater than 55° are subject to special design considerations due to lower levels of solar radiation during the winter months.
- Do not use inclination angles below 15° unless you are able to inspect and wash the solar panels frequently. At high latitudes where snow or ice build-up is an issue, the solar panel should be installed at vertical or near vertical if winter performance is critical.



Solar Panel Inclination Angle

Installation

A solar panel mounting structure is provided for attaching the solar panel to an appropriate support structure or foundation. Instructions for assembling the mount and attaching the solar panel are provided in the mounting structure package.

The panel and enclosure mounting kits are both designed to a standard 4" pipe (outer diameter 4.5"/114 mm), having a wall thickness which is at least schedule 40 (0.237"/6 mm). A short section of pipe (not supplied) can be used to mount the panel and enclosure. The pipe can be attached to the obstruction structure or other location. The units can also be mounted to pipes with sizes as small as 3" (outer diameter 3.5"/89 mm), having a wall thickness which is at least schedule 40 (0.237"/6 mm). Additional fasteners (u-bolts) will be required. The solar panel may be mounted at whatever height is deemed safe.

