



Pilot Activated Lighting provides remote or low use aerodromes with a reliable and flexible solar powered runway, taxiway and apron edge lighting.

The **WSSAVIATION** PAL system has been developed for airfield operators and owners whose critical requirements are independent pilot activation, long-term reliability and easy maintenance.

A major feature of the system is its coded lighting control, where the VHF signal from the aircraft is used only for timing activation. Switching of the runway lights is via coded radio data transmitters providing complete runway coverage and precise on/off timing. To underpin the signal reception reliability for pilot activation, two independent VHF receivers and data transmitters are provided at separate locations near the runway. This arrangement allows fitment of high sensitivity VHF receivers utilizing larger and more efficient antennas to provide better VHF reception range and coverage.

PAL OPERATION

One of the VHF receivers is housed in a small cabinet on, or near, the wind indicator (windsock). The other unit is typically located near mid-runway, out near the fence line. When activated by an aircraft, the received VHF signal is fed into a specialized micro-controller that will analyze the signal to ensure that correct signal sequence is used. The controller will start a digital 30-minute countdown timer and simultaneously pulse a coded data transmitter. This signal provides the "on" code for all lights and is transmitted from both VHF receivers.

After 20 minutes, the windsock lights will start to flash the lights at a 1-second rate for 10 minutes. During this period all the runway lights continue to remain steady. At the end of the complete 30-minute time interval, a further "lights off" coded transmission will cause all lights to shut down simultaneously.

At any time, the pilot can send another transmit sequence that will reset the digital timer to keep the lights on for another 30-minute period.

To protect the solar light batteries from going completely flat, if the "lights off" code is not received, each light unit also self-times for 35 minutes, after which it will switch itself off. Windsock lights do the same but automatically insert the final 10-minutes of flashing before turning off.

To provide additional data backup and protect against a VHF receiver failure, the two VHF controllers are also fitted with special receivers to monitor the data transmission frequency. If either receiver gets a signal from the other data transmitter, the micro-controller will assume that its own VHF receiver has failed and immediately cause its own data transmitter to send out a backup "lights-on" code.

SuperLux LED



Windsock Lights



LED Obstacle Light



PAL VHF Controller



IMPORTANT NOTICE

WSSAVIATION Pilot Activated Lighting systems are designed for operation at airfields where mains power is not available. As the system utilises low power lighting elements, the light output of the illuminated wind indicator and the runway edge and threshold lighting complies with the requirements of portable runway lighting (PRL) and does not exhibit the higher light intensity required for compliant airfield ground lighting, such as Low Intensity Runway Lighting (LIRL).

DESIGN FEATURES

- Designed to meet the requirements of CASA Manual of Standards Part 139-Aerodromes, Chapter 9, Section 9.3: "Pilot Activated Lighting Systems" or as described in the Compliance Statement.
- System provides relative received signal strength indication to confirm compliance of airborne transmission radius as per CASA Flight Test Checklist. VHF receiver sensitivity is adjustable.
- Dual VHF receivers and redundant data paths enhance operational reliability.
- Instant manual "all lights on" is provided by pushbutton on the windsock (does not require VHF from aircraft).
- Backup "lights on" of all lights via hand held transmitter or by individual magnetic switch on each light.
- Charge control and voltage monitoring is provided in each light for high battery reliability. Battery voltage is never allowed to exceed manufacturer's specified ratings for float charge.
- Multiple use of the lights each night is monitored. On any one night, a successive usage count will cause the lights to operate at a reduced intensity to prolong the operational availability of the light. The count is reset for the next night after the battery has had time to recharge during daylight.
- High quality, UV stabilised, fibreglass cones for long life. Cones vented to reduce internal condensation.
- Control electronics and battery are mounted in individually sealed enclosures for added protection.
- Solar panel mounted in protective, high impact shroud to minimise accidental damage and prolong panel life.
- A concealed magnetic switch in each runway light provides simple maintenance check of lamp and battery condition. During daylight, this switch activates the on-board data receiver to allow radio systems testing.
- Cone has been designed to meet the frangibility requirements of airport lighting fixtures. When correctly attached to the ground surface by the use of two short metal pegs (tent pegs), WSSAVIATION runway lights will demonstrate a high degree of frangibility as a result of the materials used in the construction and the low height profile (320mm) of the unit. If struck by aircraft attachments such as the undercarriage / wheels or rotating propeller, a runway light will yield and break apart. At its highest point, the largest mass (the battery) is only 170mm (6.5") above ground level, which is below the average propeller (tip to ground) clearance of light aircraft.
- Electronic design compliant with AS4251.1-2000 - EMC Emission.

PAL SPECIFICATIONS*

Component	Qty.	Specifications	Comments
Edge MarkerCone Threshold Marker Cone Runway End Marker Cone	Edge - 90m max spacing (nominal)	Fibreglass construction, UV stabilised, reinforced eyelets for pegging to ground. 560mm dia, 250mm high (without lens). Empty weight 1,0kg, Operational weight 3.5kg	Available fibreglass colours are White or Dun (Avocado). Colour will depend on runway width and surface.
Light Lens	1 per light	Moulded polycarbonate lens. UV stabilised. 105mm dia, 95mm high. Light output: >50cd, 0° to 7degrees° (clear lens)	Colours: Clear, red, yellow, blue, green and red/green (for runway threshold/end markers)
Photovoltaic (solar) power supply	1 per light	5 watt nominal power rating (12V DC @ 250mA) Internal regulator will float battery @13.6V when fully charged.	UV stabilised, impact resistant polycarbonate cover.
Battery (in cone)	1 per light	Sealed Lead Acid (SLA), weight 2kg. 12V 7AH rated. Housed in separate ABS plastic box. Protected via 2A, 3AG in-line fuse.	Battery voltage is internally monitored and used to control light output level to maximise battery life.
Radio Receiver	1 per VHF unit	Superheterodyne, crystal locked. VHF sensitivity set for 8uV (-93dBm) Codes available = 4096	Received signal indication shown by activity LED.
Radio Transmitter	1 per VHF unit	Crystal locked, 0.5W nominal output (27.145Mhz) Option: 433.92Mhz.	Complies to ACA requirements

* SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

PAL OPTIONS

Our systems can also use the latest generation of high-intensity LED (Light Emitting Diode) lights fitted within PAVELITE® inset pavement lights, mounted in a tough, compact and secure metal housing (suitable for Class 3 taxiways only).



Also available are above ground LED lighting fixtures for movement area clearance lighting (blue) or taxiway holding point marking (yellow).

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