

PERFORMANCE SPECIFICATIONS

PLASI 2000 PULSE LIGHT APPROACH SLOPE INDICATOR FOR AIRPORTS

The PLASI, Pulse Light Approach Slope Indicator, is a ground-installed, self-contained device, which visually provides vertical glide path information including correct position and direction, as well as degree of deviation and rate of change of deviation from the correct glide path. The pilot receives this information with minimum need for analysis and interpretation. Minimum range of 4 miles (6.5 kilometers) is sufficient for any aircraft to adjust to a steady-state glide position for desired touch down.

The device generates and projects four horizontal bands of light, only the pilot at any given instant can see one of which. From the landing pilot's view, the center band is a steady white light (projected as a .35 degrees high angular wedge, 16 degrees wide with the apex at the upper band of white light pulsing from the PLASI Approach Aid). This center band defines the correct glide path. An upper band of white light pulsing at approximately 2 1/4 (2.25) pulses per second is a wedge approximately 2.5 degrees high by 16 degrees wide. This gives above-glide path indication. A similar lower band of pulsing red light provides the below-glide path information. An "In-between" path signal is a solid red sector of .175 degrees height by 16 degrees width, which is the slightly below glide path signal and advises the pilot that he is at 2.65 degrees (for 3 degrees approach) when at the lower edge of the steady red. The pulses of the white and red above and below lights vary in length from continuous at the edge of the glide path to zero length at the off glide path limit of visual contact. These variations in light pulse length (long near the path - shorter and shorter as deviation from glide path increases) give the pilot quantitative deviation information. Rate of change of pulse length provides rate of deviation from or closure with the glide path.

The visual presentation is accomplished through the use of optical components: a moveable shutter, and a red filter. One (1) tungsten Halogen Lamp is positioned behind the condenser lens. For reliability, an automatic lamp changer inserts a new lamp if the one in use fails.

Signal (Beam) Angles:

Width: 16 degrees minimum.

Height: Above glide path signal pulsing white light- 2.5 degrees

On glide path signal: steady white - .35 degrees.

Slightly below glide path signal: steady red light - .175 degrees.

Below glide path signal: pulsing red light - 2.5 degrees.

Glide path: The glide path is defined as the vertical angle established between the center plane of the steady white light and the landing surface. This glide path can be preset at any angle to accommodate the desired approach path considering obstructions, type of aircraft, and applicable regulations. (See Figure 1)

Range: The signal is visible from at least four miles (6.5 km) under day or night conditions.

Pulsing Frequency: The above-glide path white and below- glide path red lights pulse at approximately 2.25 pulses per second. These pulses vary in length from continuous at the edge of the on-glide path signal to zero at the edge of the 2.5 degrees off-glide path signal.

Environment: PLASI meets the environmental conditions as specified in FAA Advisory Circular 150/5345-52 dated June 21, 1988. The operating systems are enclosed in a sealed composite case.

Power Requirement:

Permanent Installations: The basic power supply required at the PLASI unit shall be a nominal 115VAC to 120VAC, with a frequency of 50 or 60 hertz, single phase alternating current. To improve the service life of the BVA lamps, a voltage limiter unit is used to provide stabilized voltage to the lamp. Maximum power required is 1567 Watts.

Temporary Installations: A portable generator of 2.5KVA minimum can be used for a power source when PLASI is set up as a temporary installation.

Display Panel: The alphanumeric display located on the control module inside the PLASI case will assist in trouble shooting operational problems by indicating what, if any, component has failed.

Night Dimming: A photo detector (used in conjunction with the control module, and a manually variable voltage control in the voltage limiter control unit) sets the desired night brightness. NOTE: The manual control sets the night voltage by visual trial. Once this has been established for the particular environmental location, the light sensor automatically controls the day-night voltage.

Automatic Lamp Changer: A rotating lamp changer containing four 900W-tungsten halogen lamps automatically moves a new lamp into operating position when the operating lamp fails. A current sensor in the control module controls the lamp changer operation.

Remote Control (Optional): wire or radio can accomplish Remote control. FAA-L-854 receiver and decoder connected to the controller can be used to control the “on-off” function. Radio control can be accomplished at a tower or operations office or can be controlled by keying the transmitter of the incoming aircraft.

Heater Kit: The heater system installed inside the PLASI housing maintains the components at operating temperature during periods of intermittent operation, or when the ambient temperature is near freezing. This permits the PLASI to operate immediately when turned on by remote control and eliminates any need for a “warm up” period for the unit.

Safety Devices: The PLASI is equipped with a **tilt switch** which will automatically turn off the unit should it be jolted in such a way as to move the beam vertically 0.5 degrees up or 0.5 degrees down. A time delay relay prevents the tilt switch from responding to short period transient disturbances of the unit or surrounding terrain. Three **temperature sensors** monitor PLASI temperatures. These sensors will turn off the unit if the temperature reaches above 180 degrees. The sensors also control the cooling fans, turning them off when not needed. The PLASI 2000 is a fail-safe design, which ensures that any malfunction of beam projection will not result in a hazardous situation for approaching aircraft. There are two possible failure modes for signal projection. The first is loss of power to the lamp, which will result in complete loss of signal with no hazard. The second is the loss of one or both pulse generator drive systems. If either shutter chain stops moving, a slotted sensor (**Missing Pulse Detector**) mounted on each chain will indicate that fact to the control module. The control module will then turn off the PLASI and put a “chain fault” message on the display panel. Since the Missing Pulse Detector signal must alternate between high and low states to be valid, any fault in the Missing Pulse Detector (either shorted or open) will be detected and noted by the “chain fault” message.

Lamp Saving Device: All units are manufactured with a voltage limiter, which allows the option of running the lamp at 108 or 100 volts. By operating at 100 volts, the lamp life will be approximately double that of the 108 volt setting. A PLASI operating at 100 volts should use approximately 6 to 8 lamps per year, in continual operation 24 hours, 7 days a week.

