

Whelen

Whelen Orion 650E Embedded Wingtip Light User Manual

Model: OR6502GE / 01-0790701-11

1. INTRODUCTION

The Whelen Orion 650E Series LED aviation lighting system represents advanced technology in aircraft illumination. Designed for FAA/TSO approval, this unit integrates anti-collision and position lighting into a single, compact package, eliminating the need for external flasher units. Its flush-mountable design allows for versatile integration into various aircraft types, serving as a direct retrofit for previous Whelen strobe products. The Orion 650E provides high-intensity LED illumination for enhanced visibility.



Figure 1: The Whelen Orion 650E Embedded Wingtip Light. This image displays the compact, integrated design of the LED aviation light, featuring both white anti-collision LEDs and green position LEDs.

2. SAFETY INFORMATION

Important Safety Instructions:

- Installation must be performed by qualified aviation maintenance personnel in accordance with all applicable aviation regulations and manufacturer's instructions.

- Always disconnect aircraft power before beginning any installation, maintenance, or troubleshooting procedures to prevent electrical shock or damage to the unit.
- Ensure proper grounding and wiring connections as specified in the installation manual to prevent electrical hazards and ensure optimal performance.
- Do not look directly into the light source when it is active, as the high intensity LEDs can cause eye damage.
- Verify that the unit is compatible with the aircraft's electrical system (28V) before installation.

3. PRODUCT FEATURES

The Whelen Orion 650E is engineered with several key features:

- **Integrated Design:** Combines anti-collision and position lighting into a single unit, eliminating the need for external flasher boxes.
- **LED Technology:** Utilizes state-of-the-art LED technology for superior brightness and longevity.
- **Flush Mountable:** Designed for minimal integration and a clean aerodynamic profile.
- **Retrofit Capability:** Easily retrofitable to existing Whelen legacy strobe product installations.
- **High Visibility:** Provides the brightest form of LED anti-collision and position lighting available.
- **Waterproof:** Engineered to withstand environmental conditions.

4. INSTALLATION AND SETUP

Installation of the Whelen Orion 650E should only be performed by certified aviation technicians. Refer to the detailed installation manual provided with the product for specific wiring diagrams, mounting instructions, and airworthiness directives.

General Steps (Consult official manual for specifics):

1. **Pre-Installation Check:** Verify all components are present and undamaged. Confirm the unit's voltage (28V) matches the aircraft's electrical system.
2. **Power Disconnection:** Ensure all aircraft power is disconnected before commencing work.
3. **Mounting Location:** Identify the appropriate wingtip location for flush mounting. Ensure adequate clearance and structural integrity.
4. **Wiring:** Connect the unit to the aircraft's electrical system following the provided wiring schematic. Pay close attention to positive, negative, and control wire connections. Ensure all connections are secure and insulated.
5. **Securing the Unit:** Mount the Orion 650E securely using the specified hardware. Ensure a tight fit to maintain the waterproof seal and aerodynamic profile.
6. **Post-Installation Test:** Reconnect aircraft power and perform a functional test of the anti-collision and position lights. Verify correct operation and intensity.
7. **Documentation:** Update aircraft logbooks with the installation details.



Figure 2: The Whelen Orion 650E light installed on an aircraft wingtip. This image demonstrates the flush-mounted integration of the light into the wing structure, highlighting its low-profile design.

5. OPERATION

The Whelen Orion 650E operates as an integrated anti-collision and position light. Once properly installed and powered, the unit will function according to the aircraft's lighting control system.

- **Position Light Function:** The green LED segment provides continuous illumination as a navigation/position light, indicating the aircraft's presence and direction.
- **Anti-Collision Light Function:** The white LED segment provides high-intensity flashes, serving as an anti-collision light to enhance aircraft visibility, particularly during takeoff, landing, and in congested airspace.

Refer to your aircraft's flight manual for specific procedures regarding the use of navigation and anti-collision lights during various phases of flight.

6. MAINTENANCE

The Whelen Orion 650E LED light is designed for minimal maintenance. However, periodic inspections are recommended to ensure optimal performance and compliance with airworthiness standards.

- **Visual Inspection:** Regularly inspect the lens for cracks, hazing, or discoloration. Clean the lens with a soft cloth and mild, non-abrasive cleaner suitable for aircraft plastics.
- **Mounting Security:** Check the mounting screws and surrounding structure for looseness or damage. Ensure the unit remains securely flush-mounted.
- **Wiring Integrity:** Periodically inspect wiring for fraying, corrosion, or loose connections. Any issues should be addressed by qualified personnel.
- **Functionality Test:** Conduct routine functional checks to ensure both position and anti-collision lights illuminate correctly and with proper intensity.

Do not attempt to open or repair the sealed unit. If the unit is damaged or malfunctions, it should be replaced by qualified personnel.

7. TROUBLESHOOTING

This section provides guidance for common issues. For complex problems, consult a certified aviation technician.

Problem	Possible Cause	Solution
Light does not illuminate.	No power, faulty wiring, blown fuse/circuit breaker, unit malfunction.	Check aircraft power supply. Inspect wiring for loose connections or damage. Verify fuse/circuit breaker. If all checks fail, unit may require replacement.
Light flickers or is dim.	Insufficient power, loose connection, voltage drop, internal fault.	Verify stable 28V power supply. Check all electrical connections. Consult a technician for voltage drop diagnosis or internal fault.
Only position light or anti-collision light works.	Specific wiring issue, internal component failure.	Review wiring diagram for correct connections to each light function. If wiring is correct, the unit may have an internal fault and require replacement.

8. SPECIFICATIONS

Key specifications for the Whelen Orion 650E Embedded Wingtip Light:

- **Model:** Orion 650E
- **Part Numbers:** OR6502GE / 01-0790701-11
- **Brand:** Whelen
- **Light Source Type:** LED
- **Voltage:** 28V
- **Special Feature:** Waterproof
- **UPC:** 725264117607
- **First Available:** October 5, 2020

9. WARRANTY AND SUPPORT

For detailed warranty information, please refer to the official warranty statement provided by Whelen or the authorized dealer from whom the product was purchased. Warranty terms typically cover defects in materials and workmanship under normal use.

For technical support, service, or to inquire about replacement parts, please contact Whelen customer service or an authorized Whelen service center. Contact information can typically be found on the manufacturer's official website or through your product supplier.

Note: Unauthorized modifications or repairs will void the product warranty and may compromise aircraft safety.