

## Commercial Aircraft Exterior Lighting Suite

**Technology Solution:** A leading manufacturer of executive jets chose Oxley as its partner to design, develop and manufacture a new generation of external lights to deliver the advantages of high specification LED technology to the commercial aerospace sector.

*“Oxley has huge experience and capability over many years meeting the needs of air platforms in the demanding military sector but has developed new areas of expertise to undertake the project.”*

There are 14 new lights in total, which have been completed jointly by Oxley Developments in the UK and Oxley Inc. in the USA. Comprising landing, taxi, winglet and tail assemblies which together meet navigation, anti-collision, and flood light requirements. Additionally ground recognition, pylon, wing ice inspection, wheel well, emergency, service panel and logo lights, combine to meet the requirements of all external lighting on the aircraft.

In addition to the inherent operational advantages of LEDs in delivering long term performance and resistance to shock and vibration damage, the Oxley lights also offer sophisticated health monitoring to ensure performance compliance throughout the operational life of the product. The integrated assembly incorporates both visible and discrete ‘End of Life’ feedback to provide usage and performance data. Oxley also has experience with data communication using ARINC interfaces and the CAN bus message-based protocol. The firmware used to control the feedback in these lights is designed and certified to RTCA/DO-178 Level C

The most challenging aspect was designing and delivering bespoke control software as an integral part of the project. Oxley capability now embraces producing aerospace software to specification RTCA-DO-178B – software considerations in airborne systems and equipment certification. This standard is required by EASA and the FAA for certification. Oxley carried out the full lifecycle of the software development in house, using the in house team of software engineers. This involves software planning, requirements, design, coding, verification, validation, through to production of the DO-178B certified documentation, and in house software QA. The project was coordinated by Oxley’s programme managers, who are trained to PRINCE 2® and deliver full reporting on project timescales, budget and resource usage.

Oxley has also extended its design and manufacturing to embrace the creation of complete LED fairing assemblies to integrate with the specified aircraft structures and systems for plug and play simplicity.

Oxley design service toolsets include Altium for electronic design and simulation, Solidworks and Inventor mechanical design and simulation packages, TracePro optical analysis software, FloEFD for 3D fluid flow heat transfer analysis, CATIA for aerospace file translation and transfer, and LDRA software test tools.

In house test facilities cover the full range of optical, environmental, vibration, mechanical, temperature altitude, waterproofing, humidity and salt spray, and include an anechoic chamber for EMC conformity testing prior to formal external approval, as part of a truly comprehensive capability.

The outcome of this lighting project has already been recognised with a key industry award and is setting the standard for the future external use of LEDs in commercial aviation

