

# Optical Fuel Pump Pressure Sensors

Optical sensors have several benefits in aerospace applications: they are passive components, immune to electromagnetic interference (EMI), lightweight and can measure multiple parameters at the same time (e.g. pressure, temperature and refractive index) [1]. As passive optical components, they simplify the intrinsic safety demonstration, especially in hazardous environments, such as fuel tanks/pumps. EMI immunity avoids interference with electronic devices and other sources of electric noise and it allows for lightning protection and thus use of composite materials in the airframe. Their low weight brings obvious cost savings and the multi-parameter sensing capability has clear cost/benefit advantages [2].

In another paper [3] we described the working principle of a Fuel Pump Pressure Sensor (FPPS), one of the optical sensors we have developed within the EU-funded ASHLEY project (Avionics Systems Hosted on a distributed modular electronics Large scale dEmonstrator for multiple tYpes of aircraft). Results from the internal verification tests with a pneumatic test rig were reported and demonstrated that the sensor can measure pressure and temperature accurately and reliably in a laboratory environment in a wide range of expected conditions, thus proving it at a Technology Readiness Level 4 (TRL 4).

In this paper we describe the results of the external validation tests performed on the same sensor in a real-world Fuel System Demonstrator at Airbus UK, based in Bristol, to bring this optical sensing technology up to TRL 5.

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