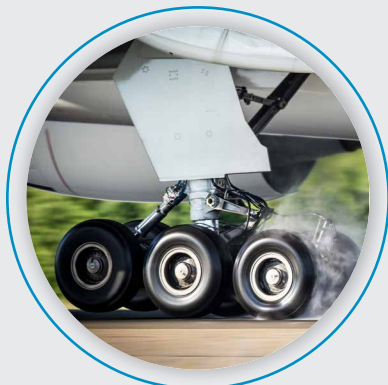
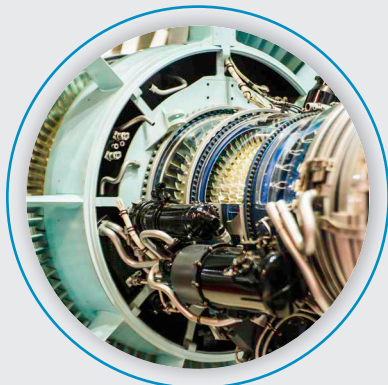


OPTICAL SENSORS IN AIRCRAFTS

Radiall Interconnect Solutions



Optical sensing is a proven technique used to measure environmental parameters within many industrial areas, such as power grids and civil engineering.

There are several benefits of optical sensing, including:

- EMI immunity
- ESD immunity
- Multi parameter capabilities
- Integration (embedded sensor)

These advantages make optical sensors very attractive for the aerospace market.

MAIN OPTICAL SENSOR TECHNOLOGIES

Fiber Optic Sensor (FOS) systems measure environmental parameters by analyzing the modification of light propagation in the fiber due to the sensor's environment.

Distributed FOS use the full length of the fiber as a sensor and rely on the evolution of its scattering behavior, which is measured via optical time-domain reflectometry. They are suitable for long distance and slow changing parameters.

Single-point Fabry-Perot, interferometry-based sensors follow the evolution of environmental parameters at hard to access locations with high sensitivity monitoring. A set of mirrors separated by a cavity detect any micro displacement induced by the environment as it changes the interferometry pattern.

Finally, **multi-point** Fiber Bragg Grating sensors are the most widely deployed technology. Intra-core fiber gratings can be made along the same fiber in several locations. Any change in the environment will impact the fiber, modifying the grating characteristics and the light propagation.

Optical sensing technology uses multi-mode and single-mode fibers. Angled-polished APC interfaces may be required for more reliable measurements. Optical sensors typically measure strain, temperature and pressure.

As they gain traction in the aerospace market, FOS and the corresponding interconnect solutions must be adapted to the specific requirements of the aircraft environment.

Radiall developed **ruggedized contacts** in order to successfully support optical sensor integration in aerospace applications.



LuxCis®

Flight-proven performance for 20 years

Radiall developed the LuxCis® contact product range to meet the aerospace industry's need for a reliable optical interconnect solution. The LuxCis® **ruggedized** contact features **high versatility** when it comes to accommodating various fibers or signals, which is key for integrating **single-mode** and **multi-mode** based Fiber Optical Sensors in aircrafts.



	MULTI-MODE	SINGLE-MODE APC
Type	LuxCis® single-key contact for loose or tight structure cables	
Fiber Size	50/125 µm 62,5/125 µm 100/140 µm 200/230 µm 400/430 µm	9/125 µm
Insertion Loss (IEC 61300-3-4 Method B)	0.10 dB	0.20 dB
Return Loss (IEC 61300-3-6)	>20 dB	>65 dB
Cable Retention	7N (900 µm cable) 68N (1.8 mm cable)	
Environmental	Aeronautics std range and high temperatures according to ARINC801 and EN4639-101	

Compatible with Radiall Rack & Panel, disconnect and I/O interconnect solutions:



EPX®-EN4644



QuickFusio™



Hermetic R9



R8-MIL-DTL-38999