FIBER OPTIC SENSOR SYSTEMS

Overheat Detection System

Air / Avionics Systems
saab.com

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Robust and reliable detection – with precise fault isolation

Features

Technology:

- Saab is using Fiber Bragg Grating (FBG) sensor technology for measuring temperature along a fiber optic cable
- This technology allows for a large number of sensing points that can be located a few centimeters apart, each working as an individual temperature sensor
- The sensing fibers are distributed in the aircraft to meet the monitoring needs and will sustain high vibration and temperature levels
- Actual temperature measurements with ability to trace trends and introduce smart alarm functions – not only an alarm threshold

The Saab Experience:

- First in bringing a fiber optic based thermal sensor system to aerospace applications
- Knowledge in bleed air leak detection and integration of the optic parts into in-house developed avionics, computers and software
- Manufacturing and supply of aircraft optic OHDS system
- Established supply chain for optical fibers and interrogators

Saab's Fiber Optic Sensor System - Overheat Detection System (OHDS) provides real time monitoring of bleed air ducts to detect hot air leakage.

Saab is one of just a few companies globally with the expertise to develop entire aircraft systems, this ensures understanding of customer requirements, equipment architecture and integration.

Saab has the unique position to take inhouse developed technology – common technology, and adapt this for either military aircraft or for commercial use.

The Fiber Optic Sensor System OHDS is a result of this way of working.

Conventional OHDS vs Fibre Optic OHDS

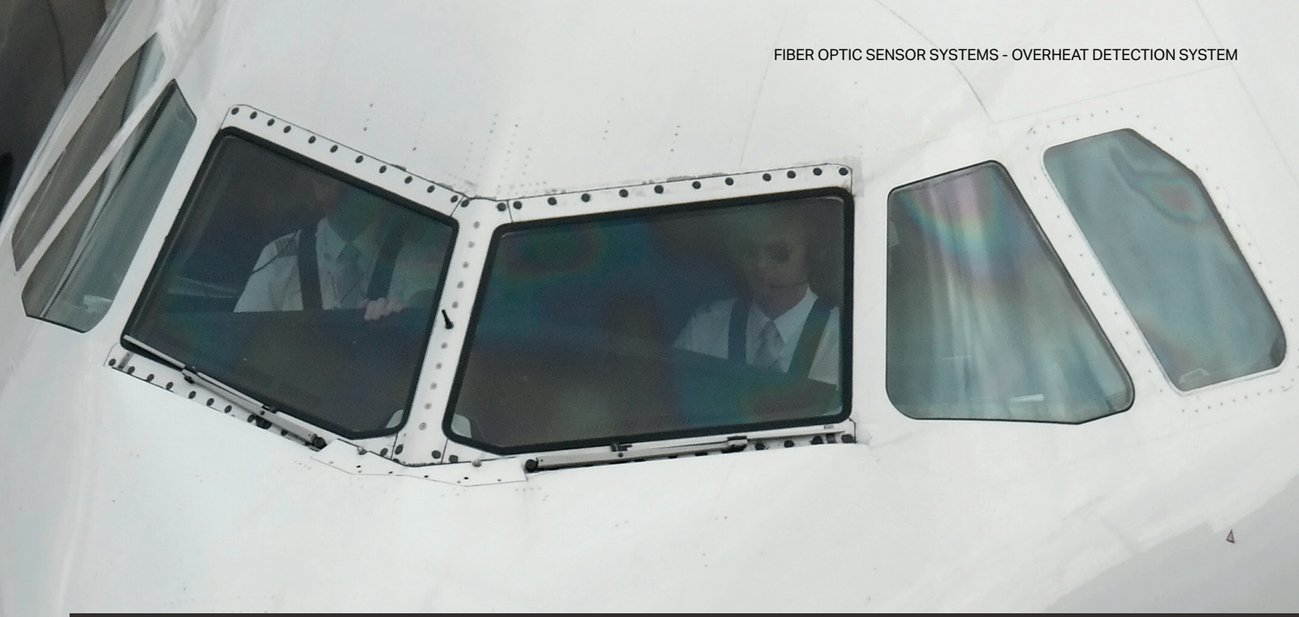
Compared to a conventional electric OHDS the fiber optic technology will provide a system that actually measures the temperature with a very high temperature and spatial resolution, not only react to a preset alarm threshold. The system allows for fault isolation to a high spatial accuracy as well as tracking trends.

The optic system also means dramatically reduced amount of hardware such as cables and connectors, improving reliability and lower weight.

Redundancy can be achieved with minimum of hardware through system architecture design.

The optical FBG technology can also be applied to fire detection as well as measuring strain and pressure which can open up for a very versatile sensor infrastructure in an aircraft.

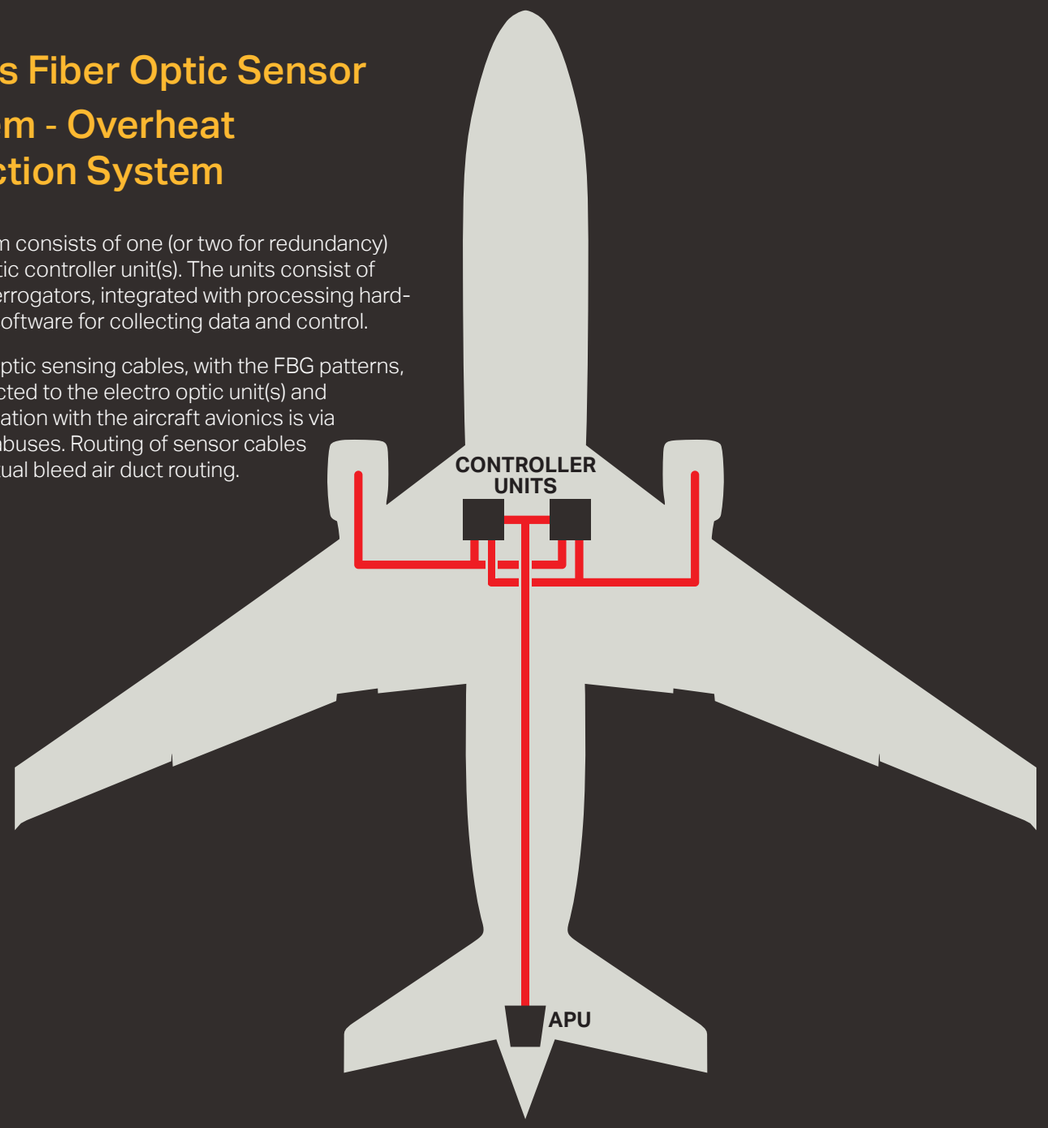
FIBER OPTIC SENSOR SYSTEMS - OVERHEAT DETECTION SYSTEM



Saab's Fiber Optic Sensor System - Overheat Detection System

The system consists of one (or two for redundancy) electro optic controller unit(s). The units consist of optical interrogators, integrated with processing hardware and software for collecting data and control.

The fibre optic sensing cables, with the FBG patterns, are connected to the electro optic unit(s) and communication with the aircraft avionics is via digital databuses. Routing of sensor cables follows actual bleed air duct routing.



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Fiber Optic Sensor System - Overheat Detection System

Technical data

ELECTRO OPTIC CONTROLLER UNIT

- Up to 6 optical channels
- CAN-bus interface
- 28VDC supply
- Capability of up to 10 000 sensing points
- < 500 ms loop time
- Temperatur accuracy +/– 5°C
- Weight < 1 kg
- Environment –40°C to + 70°C / DO-160 Cat C
- Designed to meet DO 178/254 DAL B
- No external calibration needed

FIBER OPTIC SENSING CABLE

- Up to 60 m sensing lines
- Standard measuring range up to 300°C
- Extended measuring range up to 600°C
- < 30 g/m excluding connectors

Specifications subject to change without notice

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