



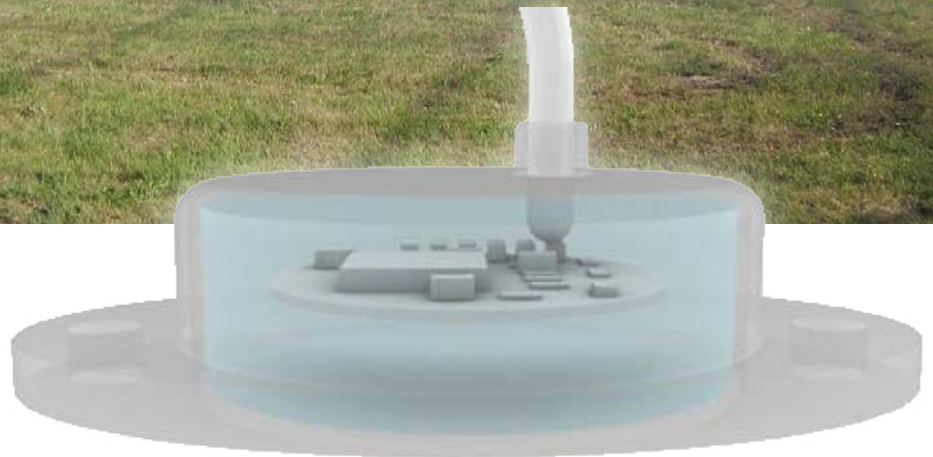
Electronics for Fibre-Powered Sensors

Low-power sensing for hazardous environments

“This capability of powering and communicating with devices over fibre uses far lower energy levels than common solutions. It opens the way for use in applications where energy levels and energy storage must be minimised.”

Steve Braithwaite,
Electronics Team
Leader

Powering and communicating with a remote sensor in a hazardous area where no wiring is allowed and energy storage is extremely limited. Suitable for High Voltage, ATEX environment applications.

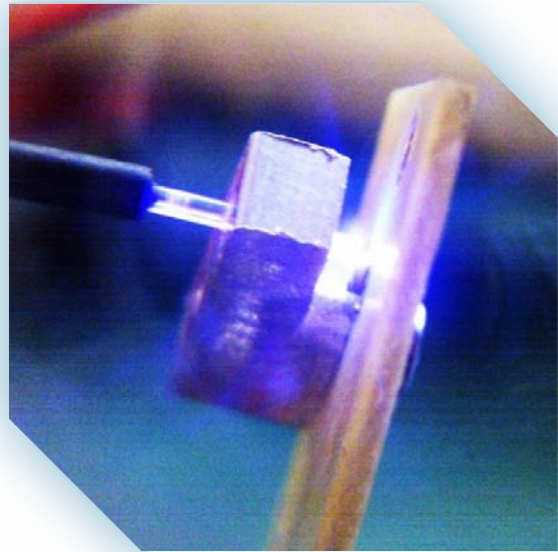


Requirements & Issues

- ▶ No wiring to sensor. No wireless path possible due to power limits and shielding
- ▶ Minimal energy storage, no batteries to be used in the design
- ▶ Required data communications in both directions
- ▶ Single optical fibre required for power and communications
- ▶ To be designed with small size sensor electronics (approx. 4cc)
- ▶ Lifespan of 30 years and an operational temperature range between -50°C to +85°C

The Solution

- ▶ Due to the operating environment, fibre-based LED light was used for powering transmission and communication
- ▶ Careful selection of processor and scheduling of start-up sequence to meet customer requirements
- ▶ Optimisation of wavelengths for power scavenging efficiency to maximise data transfer rates
- ▶ Adaptive data transmission with level of energy stored



The Outcome

- ▶ Prototype demonstrated to customer
- ▶ Production concept proposed
- ▶ Capability for design concept to be applied to other applications, including high voltage explosive environments



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