

# Project Insights

Resonate Systems partner with clients to design and build measurement and test systems tailored to their project and application needs.

When project demands are not met by off-the-shelf systems, customers are often left to compromise on project outcomes.

Our integrated turn-key systems aim to bridge that gap and deliver exactly what the client requires.

Supported by a team of mechanical, electrical, and computer systems engineers, we guide our clients from initial requirements gathering, concept designs and prototypes, through to deployment and testing.

With an ever-growing list of deployed systems, our development team are able to leverage hardware and software designs from past projects to rapidly deliver systems built on tried and tested architectures.

Thanks to our philosophy and approach, every project we take on board results in a highly flexible, tailored and cost-effective system.

# FLINDERS UNIVERSITY

## Fibre Marking Rig

**Resonate Systems** developed a software application to automatically detect Fibre Bragg gratings in an optical fibre and mark the location.

Developed within the **NI** (National Instruments) **LabVIEW** programming language, the software included the interfacing to a Fibre Bragg gratings (FBGs) interrogator and Lastek marking and printing jig.

FBGs allow optic fibres to be used as extremely sensitive temperature and mechanical strain sensors.

The research team have incorporated these sensors into medical devices such as catheters to give practitioners a high level of feedback and information to assist with monitoring conditions and procedures.

In order to create the sensors, the FBGs must be located within the optical fibre. These are not visible and therefore have to be located by stimulating a change in their properties as the fibre is scanned. The existing software to control this process was written over many years of research and had become cumbersome to manage and maintain.

**Resonate Systems'** certified **LabVIEW** architect rewrote the software using best practices to achieve a clean modular architecture and greatly improve stability and testing speed.

This included wrapping various sections of a job into discrete, modular sections of code that allow for simple variations into the future and changes to particular pieces of equipment. **Resonate Systems** performed off-site testing prior to commissioning as well as spending appreciable time in the laboratory post installation to ensure that the implementation run smoothly.

**Resonate Systems** delivered an optical fibre marking device that accurately ( $\pm 0.1$  mm) identifies and marks the locations of specific perturbations in the core of optical fibres.

As a result of the development, the manufacturing time required to produce optical fibre based pressure, force and strain sensing devices was reduced by a factor of 8x, in some cases, to six minutes with the feasibility to further increase the operation speed in future.



## Resonate Systems

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