

RESONETICS



Using Optical Sensors in Medical Devices: Why?

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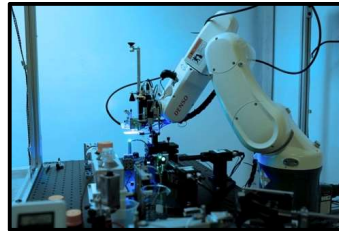


2022-04-11

EPIC Online Technology Meeting on Medical Fiber Sensing

We are World Leader in Fiber Optic Point-Sensing

- Based in Québec, Canada
- **Design, manufacture & market FOS** since almost **30 years**
- *FISO* acquired recently by *Resonetics* (2021)
- 4 cleanrooms (*MOMS* foundry, automated lines, *OEM* medical assembly, prototyping...)
- Main markets & Technologies:
 - **80% Medical** (F-P, GaAs)
 - **20% Energy** (GaAs, Raman)
- ISO certified



EPIC Online Technology Meeting on Medical Fiber Sensing (2022-04-11)

Some Advantages of Optical Sensors



Unaffected by RF
EMI or Microwaves



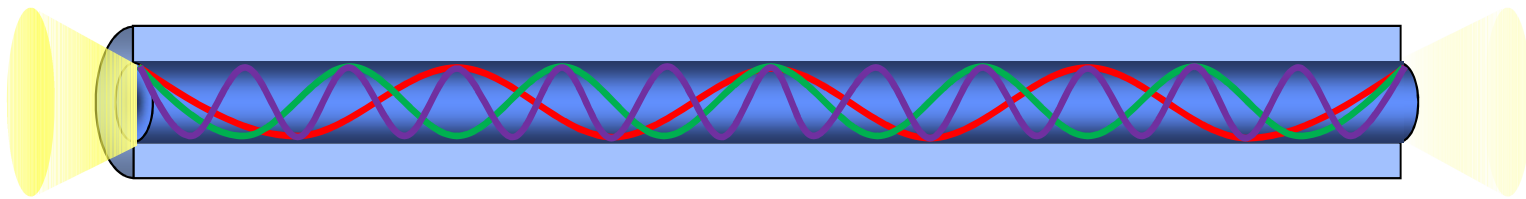
Immune to
High Voltage



Transparent to
Magnetic Field



Tolerant to
Radiations



Intrinsically
Safe



Inert
Chemically



Biocompatible



Small
Size



Advantages of our F-P Technology



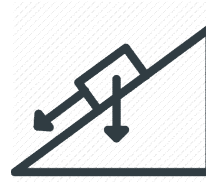
Pressure



Temperature



Strain



Force



Displacement

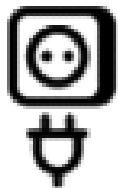


Refractive Index

**Multiple Parameters
on Single Module**



Absolute
Measurement



High
Accuracy



Wide
Dynamic
Range



Low
Drift



Simple to Use
(Smart-Connect)



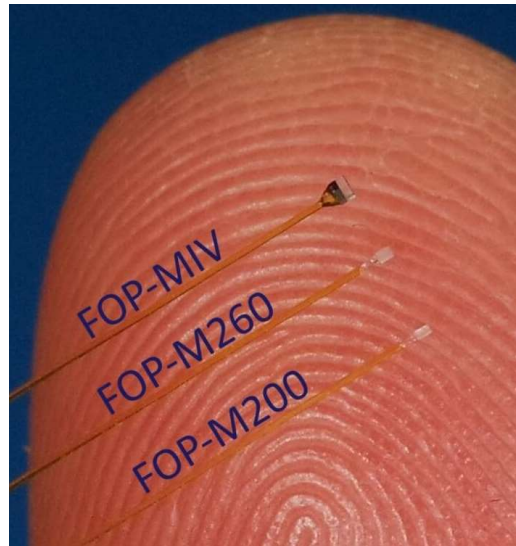
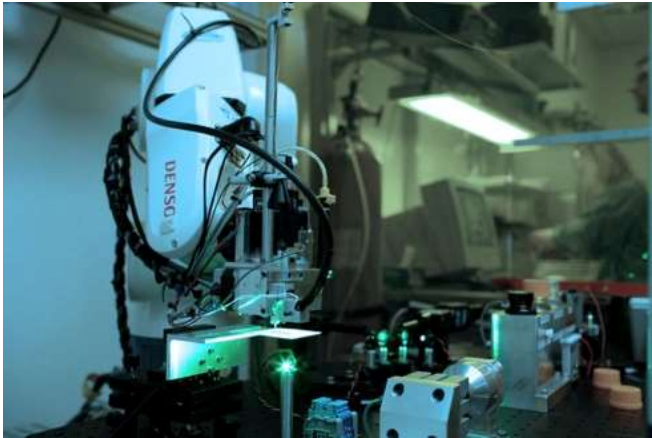
Easy to
Upgrade



Reliability
(>25 years)



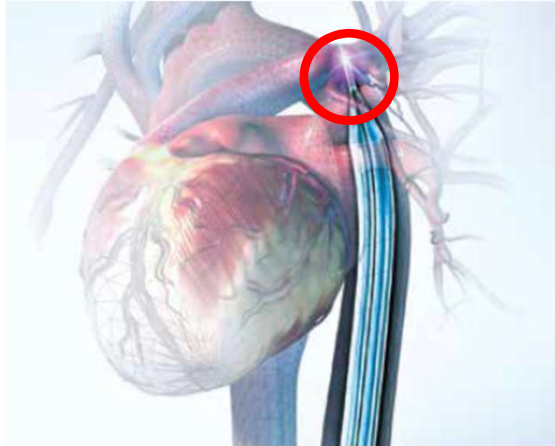
Small & Reliable Optical Pressure Sensors



- **Smallest form factor** on the market (\varnothing 200 μm)
- High accuracy ($\pm 3\text{mmHg}$ absolute) and low drift
- Many integration options (customization)
- Used in several already **approved Medical Devices**
- High-volume production with automated assembly lines (**> 300 000 units / year**)

Therapy Catheters with Optical Sensors

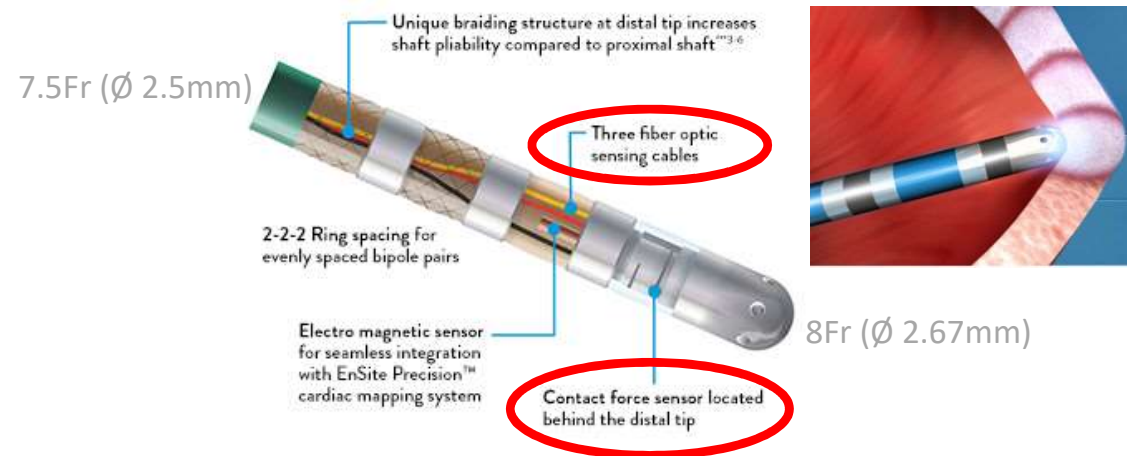
Sensation® 7Fr IAB Catheter from *Getinge*



- Counter pulsation balloon pumping therapy
- **Optical sensor** provides *in situ* **crisp arterial P waveform** not affected by electrosurgical interference
- Compared to fluid-filled column:
 - Reduced signal transfer delay
 - Maximum lumen for He gas shuttle
 - Not affected by patient movement and positioning

Source https://www.getinge.com/siteassets/products-a-z/sensation-iab-catheter/ca_sensation_features-and-benefits_0868-rev-b_eng.pdf

TactiCath® from *Abbott*



- Contact force ablation catheter
- To treat cardiac **arrhythmias** with **RF ablation**
- Light interferometry technology sensors provide **force intensity & orientation**
- Highly accurate (0,3 g)

Source

<https://www.cardiovascular.abbott/us/en/hcp/products/electrophysiology/ablation-technology/tacticath-se-ablation-catheter/about.html>

Diagnostic Devices with Optical P Sensors

COMET™ II from *Boston Scientific*



0,014" guidewire ($\varnothing < 356\mu\text{m}$, 1.1Fr)

- Workhorse pressure GW with exceptional deliverability
- Accuracy for optimal performances to diagnose & treat
- **“Optical technology for superior drift performance and reliable signal connection”**

Source <https://www.bostonscientific.com/en-EU/products/imaging-systems/comet-II-pressure-guidewire.html>

Navvus® II from *ACIST*

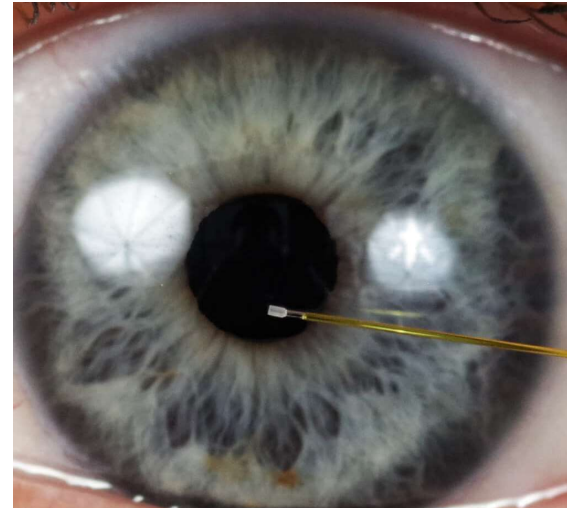
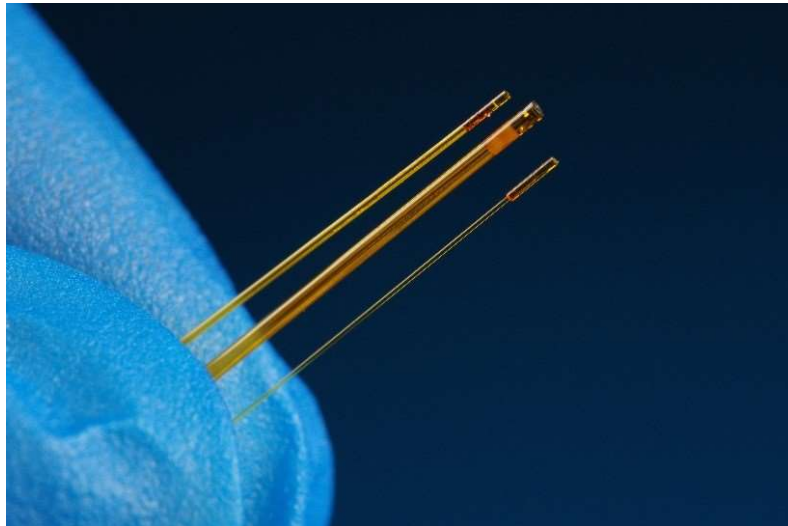


In-lesion profile 0,020"x0,025"
(0,51mm x 0,64mm, < 2Fr)

- Rapid Exchange FFR *MicroCatheter*
- Suitable for 0,014" guidewire ($\varnothing < 356\mu\text{m}$)
- **“Consistent & Accurate; Fiber-optic sensor technology may be less susceptible to drift when compared to traditional pressure wires”.**

Source <https://acist.com/int/products/acist-rxi/navvusii-catheter/>

Questions & Answers



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www.resonetics.com



World-Class Fiber Optic Sensing Solutions

www.fiso.com