

**Fiber Optic Sensors**  
Innovation. Precision. Solutions.

**op**Sen<sup>••</sup>s



## Oil and Gas

Opsens' outstanding all-Sapphire downhole pressure and temperature sensors for extreme Oil & Gas harsh environments.

- High operating temperature: up to 300 °C (400 °C in development)
- Optimized for long lifetime in Hydrogen rich environment
- Ideal P/T sensors for SAGD, CSS, Thermal wells and Intelligent wells applications
- Cost Competitive turn-key solution: P/T sensors + multi-fiber cable + multi-channel surface interrogation unit



## Medical

Opsens MEMS based fiber optic pressure and temperature sensors deliver high fidelity and artefact-free pressure and temperature measurement for minimally invasive applications.

- Highest temperature accuracy of  $\pm 0.1^{\circ}\text{C}$ ; resolution of  $0.01^{\circ}\text{C}$
- Pressure sensor 400 $\mu\text{m}$  OD and smaller
- Pressure sensor with minimal temperature shift and moisture-induced drifting problems
- Immune to RF, MR, ultrasound and EM interferences

## Laboratory

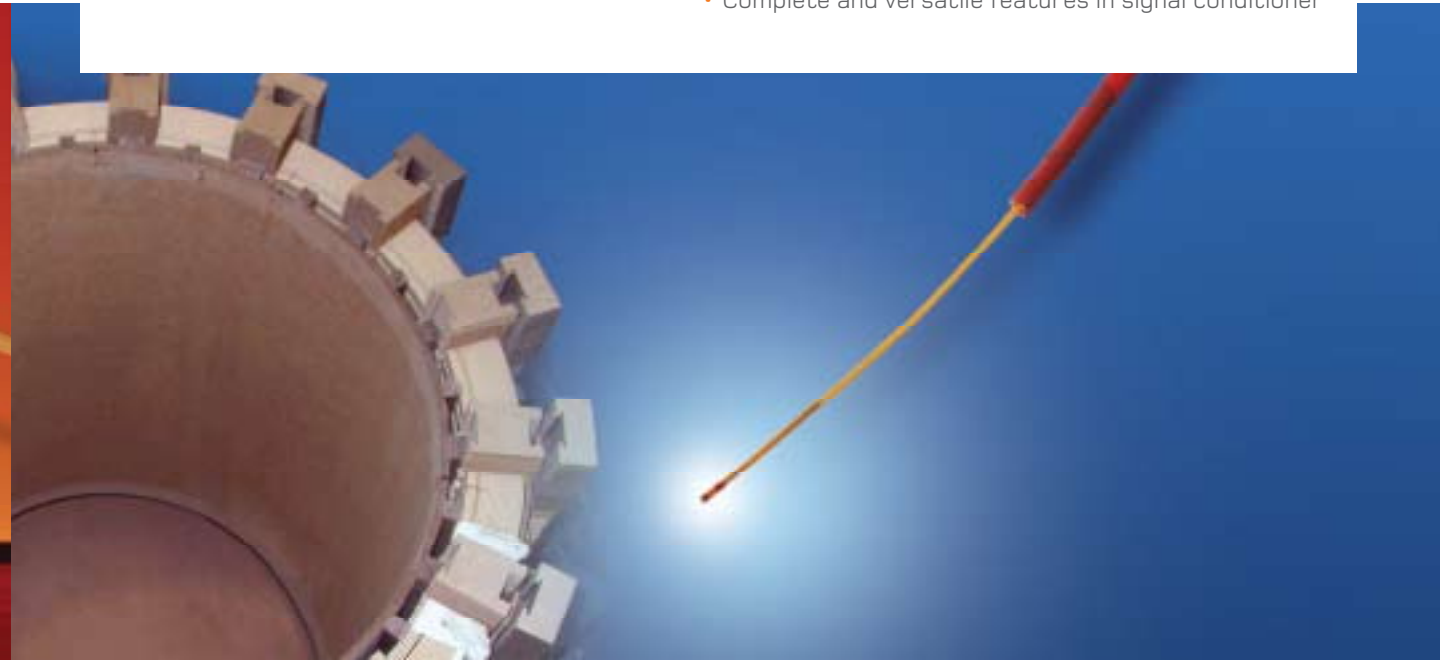
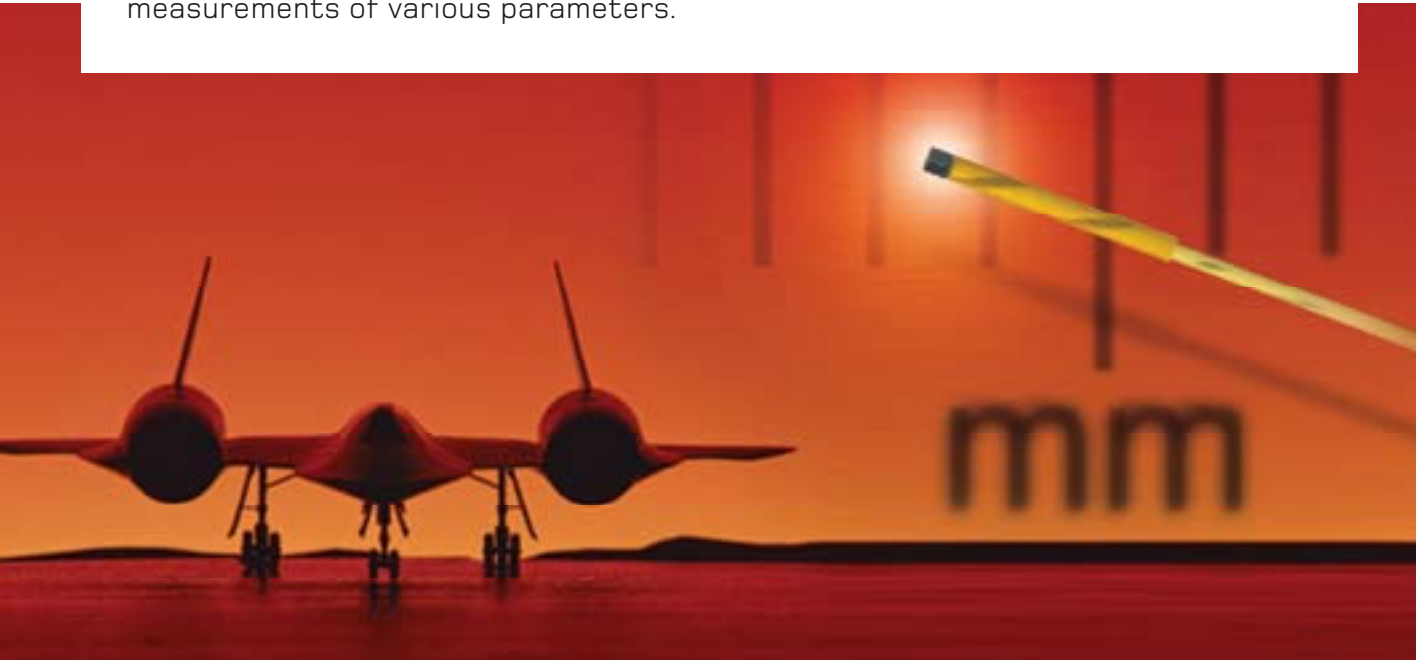
Opsens offers a wide range of cost competitive fiber optic sensor/system best suited for the most demanding applications in EMI and RFI environments. Among Opsens product family, the ProSens, delivers high speed simultaneous measurements of various parameters.

- High speed system of 1KHz
- Extended friendly user interface
- Stable and highly reliable system
- Robust sensor design and packaging

## Transformer

Opsens PowerSens solution addresses all critical issues for winding temperature measurement in a transformer.

- Accurate, direct winding hot spots temperature measurement
- Innovative sensor-cable connectivity – eliminates cumbersome cable management
- Ruggedized sensor construction using 62 $\mu\text{m}$  core fiber (200 microns available)
- Complete and versatile features in signal conditioner



# TEMPERATURE

SCBG (GaAs)

	OTG-F	OTG-A	OTG-T	OTG-P	OTG-R	OTP-A	OTP-M
<b>SPECIFICATIONS</b>							
Range	-40 °C to +250 °C	-40 °C to +250 °C	-40 °C to +250 °C	-40 °C to +250 °C	-40 °C to +250 °C	-40 °C to +250 °C	0 °C to +85 °C
Resolution	0.01 °C	0.1 °C	0.1 °C	0.1 °C	0.1 °C	0.1 °C	0.01 °C
Precision	+/- 1 °C or better	+/- 1 °C	+/- 1.5 °C	+/- 1.5 °C	+/- 1.5 °C	+/- 1.0 °C	+/- 0.15 °C
Response time	0.007 s	0.5 s	0.5 s	N/A	0.007 s	1.5 s	< 1 s
Dimensions	0.150 mm O.D. and smaller	1.1 mm O.D.	3.0 mm / 1.1 mm O.D.	4.8 mm O.D.	0.150 mm O.D. and smaller	1.8 mm O.D.	1.2 mm O.D.
Cable sheathing	Acrylic, Polyimide	Teflon™	Spiral Teflon™ / Teflon™	Stainless steel or ceramic thermowell	Acrylate tight buffer or PVC	Teflon™	Teflon™ / PVC tight buffer
Signal conditioner compatibility	SCBG (GaAs)	SCBG (GaAs)	PowerSens	SCBG (GaAs)	RadSens	WLPI	AccuSens
Features / Applications	- Ultra miniature high accuracy and fast response time - Laboratory - Medical	- Excellent accuracy - General, Industrial, Cryogenic	- Reliable and robust design - Power Transformer winding temperature	- Ultra robust, thermowell design - General, Industrial	- High resolution - Electromagnetic radiation, Electronic-explosive device, Military	- Great accuracy - General, Industrial	- Highest accuracy - Robust - Medical

# PRESSURE

WLPI

	OPP-A&B	OPP-W	OPP-M
<b>SPECIFICATIONS</b>			
Range	From 0-1 bar to 0-350 bar (From 0-15 psia to 0-5000 psia)	0-5 MPa (0-750 psi)	-50 mmHg to +300 mmHg (relative to atmospheric pressure)
Resolution	< 0.01% F.S.	0.01% F.S.	0.5 mmHg
Precision	< 0.1% F.S.	< 0.1% F.S.	+/- 1 mmHg or +/- 1.5% F.S. whichever is greater
Response time	Readout unit dependent	Readout unit dependent	Readout unit dependent
Dimensions	A: 6.35 mm / B: 2.50 mm O.D.	19 mm diameter, 120mm length	0.400 mm O.D.
Cable sheathing	A: Teflon™ / B: Polyurethane	SST-316L; Incoloy 825	Customer specified
Signal conditioner compatibility	WLPI	WellSens	LifeSens
Features / Applications	- Robust design - General, Industrial	Oil & Gas downhole P/T Monitoring in: - Heavy Oil Thermal Wells - Intelligent & Unconventional Wells	- Miniature size - Medical
Operating temperature	Up to +250 °C	-40 °C to +300 °C	10 °C to 100 °C

# STRAIN

WLPI

	OSP
<b>SPECIFICATIONS</b>	
Range	A: +/-1000µε B: +/-2500µε C: +/-5000µε
Resolution	0.15µε
Precision	A: +/- 3% F.S. B: +/- 3% F.S. C: +/- 10% F.S.
Response time	Readout unit dependent
Dimensions	10 mm x 0.230 mm O.D.
Cable sheathing	Acrylate tight buffer, Braided fiberglass
Signal conditioner compatibility	WLPI
Features / Applications	- High accuracy, Miniature - General, Industrial - high temperature
Operating temperature	-40 °C to 250 °C

# DISPLACEMENT

WLPI

	ODP
<b>SPECIFICATIONS</b>	
Range	0-25 mm
Resolution	25 microns
Precision	0.2% F.S. (@25 °C) Repeatability 0.05% F.S.
Response time	Readout unit dependent
Dimensions	11.1 mm
Cable sheathing	Acrylate tight buffer, Braided fiberglass
Signal conditioner compatibility	WLPI
Features / Applications	- Intrinsically safe - EMI/RFI immunity - Civil engineering, Nuclear
Operating temperature	-40 °C to 85 °C

	PicoPowerSens	TempSens	PowerSens	RadSens
<b>SPECIFICATIONS</b>				
Number of channels	1	4 or 8	3 to 18	1 to 8
Sampling rate	50 Hz	50 Hz	50 Hz	1000 Hz per module
Output - Interface	Display Memory RS-232 AO: +/- 5 V	Display Memory RS-232 AO: +/- 5 V	Display Memory RS-232 RS-485 AO: +/- 5 V, 4-20mA Relays	Display Memory AO: +/- 5 V Ethernet
Applications	Handheld - Battery operated	Lab	Power Transformer	Industrial, Lab EED assessment
Sensor compatibility	SCBG (GaAs)	SCBG (GaAs)	OTG-T	OTG-R

	PicoSens	MultiSens	FieldSens	WellSens	LifeSens
<b>SPECIFICATIONS</b>					
Number of channels	1	4 or 8	4 to 32	2 to 16	1
Sampling rate	20 Hz	20 Hz	20 Hz	20 Hz	250 Hz
Output - Interface	Display Memory RS-232 AO: +/- 5 V	Display Memory RS-232 AO: +/- 5 V	Display Memory RS-232 RS-485 AO: +/- 5 V	Display Memory RS-232 RS-485 AO: +/- 5 V ModBus	Display Memory RS-232 AO: +/- 5 V
Applications	Handheld - Battery operated	Lab	Industrial, civil engineering	Field deployment Oil and Gas OPP-W	Lab, Physiological pressure measurement OPP-M
Sensor compatibility	WLPI	WLPI	WLPI	OPP-W	OPP-M

	ProSens	OEM-Sens
<b>SPECIFICATIONS</b>		
Number of channels	From 1 to 8 modules	1, 2 or 4
Sampling rate	1000 Hz per module	From 20 to 250 Hz
Output - Interface	Display Memory AO: +/- 5 V Ethernet	RS-232 RS-485 AO: +/- 5 V CAN BUS
Applications	Industrial, Lab, Medical dynamic measurement	OEM integration
Sensor compatibility	WLPI and SCBG (GaAs)	WLPI and SCBG (GaAs)

## The White-Light Interferometry Technology (WLPI)

Opsens' White-Light Interferometry Technology series offer multi-parameter and multi-purpose fiber-optic sensor systems including fiber optic pressure, temperature sensors, strain sensors and displacement sensors. The WLPI series offers the user the ability to measure multiple parameters with just one system.

## The Semi-Conductor BandGap Technology (GaAs)

Opsens' Semi-Conductor BandGap Technology (also known as GaAs) fiber-optic temperature sensor systems are ideal for industrial applications, hot spot monitoring in power transformer windings, and electrical current monitoring of electro-explosive devices (EED). These systems offer great user interface features with no gauge factor entering.

### FEATURES OF OPSENS FIBER OPTIC SENSORS:

- Discrete and miniature size (100µm OD and up)
- Robust sensor and cable constructions
- Intrinsically safe
- Immune to EMI, RFI, MRI, electrical interferences
- Withstands nuclear, high temperature, high voltage and other harsh environments
- High accuracy and system reliability
- Low cost OEM solution

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about the latest advancement  
in Opsens systems  
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