STATE-OF-THE-ART TURN-KEY FIBER OPTIC SENSING SOLUTION
FOR HIGH TEMPERATURE WELLS, UNCONVENTIONAL WELLS
AND INTELLIGENT WELLS

FIELD INSTALLATION

- Opsens Solutions offers an outstanding turn-key solution with the rugged OPP-W fiber optic P/T sensor, the WFC multi-fiber cable, the WellSens Gen II multi-channel surface controller unit, and full installation and field support services.
- Opsens Solutions high level technical resources will take care the design, the field deployment service and the field support of your total project.
- We are using various deployment methods: coiled tubing, production tubing and casing conveyed.

WELLSENS GEN II

The WellSens Gen II is a robust and reliable multi-channel signal conditioner. It can operate in a wide range of ambient temperatures from -20°C to +60 °C. The modular DIN rail design allows for seamless expansion with growing requirements. The high precision, small footprint, fast sampling rates and ease of use make it the solution of choice for oil field or industrial process applications.

OPP-W FIBER OPTIC P/T SENSOR

Opsens all-sapphire fiber optic pressure and temperature sensor operates under extreme downhole conditions. It delivers in-situ real-time monitoring of downhole pressure and temperature (up to 300°C) in hydrogen and steam rich environments. The OPP-W delivers long term accuracy, durability, low drift and high fidelity pressure and temperature measurements.

WFC FIBER CABLE

The WFC is a rugged heavy duty fiber cable with up to 8 optical fibers in a protective Stainless Steel 316 L or Incoloy 825 multi-tube metal structure. Opsens proprietary fiber cable design gives the WFC outstanding performance in extreme harsh conditions such as hydrogen and steam rich downhole environments.
Opsens all-sapphire fiber optic pressure and temperature sensor operates under extreme downhole conditions. It delivers in-situ real-time measurements for reservoir surveillance, process optimization or in production and injection wells allowing accurate real-time operational data. The sensors can be deployed on coiled or production tubing. Opsens sensing system is the ideal solution for monitoring downhole Thermal Recovery Processes.

### Unconventional and Intelligent Wells

Opsens’ White Light Polarization Interferometry (WLPI) technology provides a means for making accurate measurements. High sampling rates and ease of use make it the solution of choice for oil field or industrial process applications. The high precision, small foot print, fast modular DIN rail design allows for seamless expansion with growing requirements. The high precision, small foot print, fast modular DIN rail design allows for seamless expansion with growing requirements. The Opsens sensing solution is offered in both single and multiple-point configurations. Hence, it gives the operators a large choice of P/T real-time monitoring from monitoring downhole pumps to profiling a producing well.

### STEAM ASSISTED GRAVITY DRAINAGE (SAGD)

The OPP-W is a Fabry-Perot interferometer-based, fiber optic pressure and temperature sensor. The combination of its highly durable core sapphire cell and its rugged Inconel 718 housing makes it the sensor of choice for harsh oil & gas downhole environments such as SAGD, CSS and HT wells.

The OPP-W delivers long term accuracy, durability, low drift and high fidelity pressure and temperature measurements. It offers real time, time domain monitoring over long periods of the oil wells’ lifetime.

The OPP-W sensor is used in conjunction with Opsens’ WFC Fiber cable and Opsens’ WellSens signal conditioner surface unit.

For more information, see OPP-W datasheet.

### WFC Fiber Cable

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### WellSens Gen II

**Surface Read out & controller Unit**

The WellSens Gen II is a robust and reliable multi-channel signal conditioner. It is compatible with Opsens’ harsh environment interferometric fiber optic pressure and temperature sensor, the OPP-W. It can operate in a wide range of ambient temperatures from -20°C to +60 °C. The low power consumption, makes it ideal for remote applications operating on solar panels or generators. The modular DIN rail design allows for seamless expansion with growing requirements. The high precision, small foot print, fast sampling rates and ease of use make it the solution of choice for oil field or industrial process applications.

The WellSens Gen II is capable of a variety of interface and communications protocols which provides easy integration to DCS systems via RS-232, RS-485, TCP/IP on Modbus or SCPI. It is also offered with an optional LCD display, internal data storage, and can be used independently for direct automation control with programmable alarms, relay logic, and standard analog voltage and currents I/O.

### WELLSENS GEN II SPECIFICATIONS

- **Number of channels**: Up to 128 channels
- **Sensors compatibility**: OPP-W, OTP-W AND OEP fiber optic cable
- **Sampling rate**: Up to 20 Hz
- **Output interface**: RS-485, RS-232 and Ethernet (TCP/IP)
- **Communication protocol**: Modbus and SCPI
- **I/O and control option**: Various analog and digital outputs (4-20 mA, ±10 V, etc.)
- **Data storage**: Up to 8 GB (in option)
- **Display**: LCD screen display (in option)
- **Input power**: 24 VDC or 85-264 VAC
- **Consumption**: 10 W + 1 W x number of channels (Ex.: 16-CH unit = 26 W)
- **Operating temperature**: -20°C to 60°C (-40°C option available on request)
- **Humidity**: 95 % non-condensing

### OPP-W FIBER OPTIC P/T SENSOR

- **Pressure**
  - Range (absolute): 0 – 100000 KPa (0 - 1000 psi)
  - Other ranges available on request
- **Accuracy**: ±0.2 % F.S.
- **Resolution**: 0.002 % F.S.
- **Long term stability**: 0.5 % F.S. per annum at 300 °C
- **Prove pressure**: 200 % F.S.
- **Material**: Monocrystalline sapphire
- **Temperature Range**: -40 °C to 300 °C
- **Accuracy**: ±1.5 %
- **Resolution**: 0.1 °C at zero averaging (±0.01 °C at 10 minutes averaging)
- **Package**: Inconel 718

OPSSENS FIBER OPTIC P/T SENSING SOLUTION

Opsens offers an outstanding turn-key sensing solution with the OPP-W Fiber optic P/T sensor, the WFC multi-fiber cable, the WellSens Gen II multi-channel surface readout unit and a full installation and field support service.

**Benefits & Added Value**

In-situ and continuous monitoring of the pressure along the producing well helps operators better understand the reservoir condition, rapidly detect steam breakthrough and efficiently diagnose changes in the reservoir. Such optimization of the production process enhances the oil recovery rate and reduces the operating costs associated with steam injection and oil recovery.

Opsens sensing solution is offered both in single and multiple-point configurations. Hence, it gives the operators a large choice of P/T real-time monitoring from monitoring downhole pumps to profiling a producing well.
FIBER OPTIC PRESSURE AND TEMPERATURE SENSORS FOR OIL AND GAS APPLICATIONS

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