

FIBER OPTIC SENSING SOLUTIONS

PLUG AND FORGET SENSORS

COMPLETE TURNKEY SOLUTIONS TO MEET THE SPECIFIC
NEEDS OF WIND FARM APPLICATIONS



opSens
Solutions

Enlightenment through smart measurements

SMART AND FULLY INTEGRATED FIBER OPTIC SENSING SOLUTION FOR WIND POWER INDUSTRY

Located in remote areas, with difficult and challenging access, wind farms need reliable permanent instrumentation requiring no on-site maintenance or calibration.

The PLUG AND FORGET solution of Opsens Solutions represents a true maintenance free sensing system. Once installed, no intervention is ever required at sensor location.

With the QUICK CONNECT feature, instrumenting a full blade is now very fast and easy. The sensors can even be mounted without cable to facilitate installation in work zone where cable management could be an issue.



Well informed decisions with smart fiber optic sensing solutions for your industrial reality

KEY FEATURES

- » **PLUG & FORGET** - Maintenance free and no drift over time
- » **QUICK CONNECT** - Very fast installation and deployment
- » Strain sensor and extensometer not affected by transverse strain
- » Robust industrial design with field-proven long term reliability
- » Highly versatile (Temperature, Pressure, Displacement, Strain)
- » Intrinsically safe - Immune to lightning
- » **LOW COST** fiber optic technology

STRUCTURAL HEALTH MONITORING

SURVEILLANCE OF CRITICAL ASSETS

- STRAIN SENSOR NOT AFFECTED BY TRANSVERSE STRAIN NOR TEMPERATURE
- INSTANTANEOUS RETURN TO INITIAL STRAIN LEVEL (NO LAG - NO LATENCY)
- For both static and dynamic testing (kHz sampling rate)
- Sensors can be welded to surface of fixed with special adhesive for metallic surface
- Robust stainless steel cable to permanently sustain the harshest environment



STRAIN SENSOR



DISPLACEMENT SENSOR



WELDABLE
EXTENSOMETER

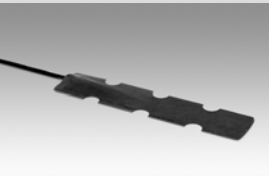
BLADE INSTRUMENTATION

RELIABLE LOAD AND STRAIN MONITORING SYSTEM

- NO TEMPERATURE COMPENSATION REQUIRED
- NO NEED TO PRE-TENSION THE STRAIN SENSOR (OUTSTANDING REPEATABILITY IN BOTH TRACTION AND COMPRESSION)
- FAST and EASY installation
- Sensors can be embedded in composite material, inside the hollow structure or on the blade directly
- Low profile sensors not affecting the blade aerodynamic
- Adjustable strain measuring range for optimal sensitivity (From $\pm 500 \mu\epsilon$ to 0-15,000 $\mu\epsilon$)



PRESSURE SENSOR



STRAIN SENSOR



TEMPERATURE SENSOR



SIGNAL CONDITIONER



INNOVATIVE FIBER OPTIC
QUICK CONNECT

FOUNDATION AND PILE MONITORING ASSESSMENT OF STRUCTURAL INTEGRITY

- No cable management during installation: sensors can be fixed on the pile surface without cable.
- Ultra-robust design able to sustain the harsh conditions related to driving pile in the ground
- Strain sensor can sustain a permanent pressure of 300 bars without any effects on strain measurements
- In-situ extensometer to be embedded in fresh concrete
- Pressure sensor for offshore structure or to monitor ground water level



LOAD CELL



STRAIN SENSOR



CONCRETE EMBEDDABLE
EXTENSOMETER

COMPLETE TURNKEY SENSING SOLUTION WITH UNIQUE ADVANTAGES

SENSORS	STRAIN	EXTENSOMETERS	PRESSURE	TEMPERATURE
Measuring Range	$\pm 500 \mu\epsilon$ to 0-15,000 $\mu\epsilon$	Up to 2,500 $\mu\epsilon$	0-2 bar to 0-70	-60 °C to 250 °C
Temperature Sensitivity	None	Less than 0.3 $\mu\epsilon/^{\circ}\text{C}$	minimal	Of course
Temperature Operating Range	-273 to 250 °C	-100 °C to 250 °C	-60 °C to 100 °C	-190 °C to 300 °C
Minimal size	0.2 mm OD 40 mm long	10 mm OD 100 mm long	0.3 mm OD 12 mm long	1 mm OD 12 mm long
EMI/RFI Immunity	Yes	Yes	Yes	Yes
Outstanding Repeatability	Yes	Yes	Yes	Yes
No Drift over Time	Yes	Yes	Yes	Yes
Not Affected by Transverse Strain	Yes	Yes	Not applicable	Not applicable
QUICK CONNECT Feature	Yes	Yes	Yes	Yes
Maximum Sampling Rate	1000 Hz	1000 Hz	1000 Hz	1000 Hz

OUTSTANDING FIBER OPTIC SENSING SOLUTIONS FOR STRUCTURAL HEALTH MONITORING

KEY FEATURES

- Low cost fiber optic sensing solutions
- Easy installation PLUG AND FORGET solution with no drift overtime (Do not require maintenance)
- Technology immune to lightning and EMI
- Strain sensor can be spot welded on the structure
- Fiber optic covered with stainless steel: perfect for harsh environment
- Quick connect feature, allow easy installation on site and is water proof (300bars)
- Sensor can be up to 3 km away from signal conditioner
- Dynamic monitoring (Up to 1000 Hz)

TO KNOW MORE

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