DEWESoft®
measurement innovation

KRYPTON 8xFBG

OPTICAL MEASUREMENTS
HIGH VOLTAGE ENVIRONMENTS
HIGH TEMPERATURE ENVIRONMENTS

MEASURE TEMPERATURE OR STRAIN IN HARSH ENVIRONMENTS WITH HIGH TEMPERATURE, HIGH ELECTROMAGNETIC RADIATION OR HIGH VOLTAGES.

Automotive and power manufacturers pushing the limits of product performance can leverage the Krypton optical unit to advance product development.

The Krypton 8xFBG offers a unique optical sensing solution that can gather data previously unreachable. The Krypton 8xFBG with the Fibos Optical Gauge Sensor (OGS) allows static and dynamic strain and temperature measurements to be made continuously in environments up to 1,000°C (1,830°F). This extended temperature range enables pressure, vibration, and temperature transducers to be deployed in applications that were previously constrained by electrical technology.

The Krypton optical unit easily integrates optical measurements into Dewesoft X3 software and datasets along with existing electrical sensor data and allows the use off-the-shelf optical sensors, enabling quick plug and play measurements to be performed. Custom optical sensors can be developed and tailored for specific needs on request. The Krypton 8xFBG is rugged and ready for testing in-field or in the lab. Modules can be distributed with EtherCAT interface for analog and digital I/O.

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FUNCTIONALITY

Optical measurements are the solution to avoid compromised data in high electrical interference environments, and to ensure safe measurements in high voltage and intrinsically safe areas. The Krypton 8xFBG relies on a specific type of Fiber Bragg Grating (FBG) technology that unlocks key performance benefits. The FBG is inscribed into standard single-mode telecommunications fiber optic cable by periodically changing the index of refraction. This element can be considered a wavelength selectable mirror, and the wavelength set during manufacturing is the wavelength of light that is reflected at that physical location. This is known as the Bragg wavelength.

Applying strain or a temperature change to the fiber causes the grating periodicity to change , changing the Bragg wavelength, therefore reflecting a different spectrum of light. This change is proportional to the applied strain and/or temperature change and can be calibrated.

KEY FEATURES

- **Measurement Accuracy** : Krypton FBG offers the industry's best measurement uncertainty with +/-0.5°C over the entire temperature sensor operating range.
- **Measurement Speed** : In single channel mode, an optical sensor can be monitored with an industry leading 50ksps. Within Dewesoft X3 software, channels can be configured to achieve different rates depending on the measurement type.
- **Electrical Isolation** : Infinite electrical isolation can be achieved when using non-metallic temperature probes. Eliminate any concern about electrical safety for the measurement equipment in high voltage applications.
- **Electromagnetic Radiation Immunity** : Optical measurements are immune to electromagnetic interference. Noise-free data can be collected in environments like an electric motor, or power transformer.
- **Intrinsic Safety:** The optical sensors used to perform measurements are passive devices, and the laser power used to well below the limit. This enables spark free measurements to be performed.
- **Transmission Distance:** An optical sensor can be placed kilometers away from the Krypton module without any signal integrity impacts.
- **Multiple Sensor Types:** Optical temperature and pressure sensors will be the first commercially supported sensor type. In the near future, additional sensors such as tilt, vibration, strain and load will be added. No need to change any data acquisition hardware.

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HEADQUARTERS
Gabrsko 11A, 1420 Trbovlje, Slovenia
+386 356 25 300
www.dewesoft.com
support@dewesoft.com or sales@dewesoft.com

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APPLICATIONS

- Battery pack temperature measurements
- Electric motor temperature measurements
- Power transformer temperature and pressure measurements
- Gas turbine temperature measurements
- Marine diesel pressure measurements
- Structural health monitoring (bridges, buildings, etc.)
- Downhole Oil & Gas temperature and pressure monitoring
- Nuclear (ionizing radiation) environmental measurements
- Long transmission distance (up to 10km) measurements
- Corrosive environmental measurements

KRYPTON 8xFBG	
Number of channels	8
Currently supported Measurement types	Temperature
Future measurement types	Vibration, Pressure, Tilt, Displacement, Strain
Single channel sampling rate	50k samples per second
Multi-channel sampling rate	10Hz*
Communication Type	EtherCAT (Krypton standard)
Connectors	E2000 APC connector
Wavelength Range	1548nm - 1552nm
Wavelength Resolution	0.1pm
Uncertainty	+/-5pm
Repeatability	+/-1pm
Strain Range	3000 με
Strain Resolution	0.08 με
Drift over temperature (uncompensated)	0.5pm/°C
Operating temperature	0 to 50°C
Storage Temperature	-40 to 85°C
Input Voltage	9-48V DC
EMC Certification	IEC61326-1
Laser Specification	Class 1 laser

TEMPERATURE PROBE – Fibos PT	
Performance	
Sampling Frequency	DC to 50kS/sec
Operating Range [°C]	-50-200
Measurement Uncertainty [°C]	±0.2
Max Resolution [°C]	0.01
Terminal response time	Fast*
Environmental	
Probe Dimensions (L x Dia)	150 x 1.59 mm
Gauge Distance to Probe Tip	5 - 10 mm
Sensor Temperature	-50 to 200°C
Handle Temperature	<100°C
Optical Connector	E2000/LSH APC
Fiber Type	SMF28 compatible
Fiber Coating	Uncoated
Hazardous Certification	ATEX, IECe
Accessories	
Cabling (LSH APC to LSH APC connector, 2 mm OD OFNP cable jacket, 5 meters long)	
Foam storage tray	
Custom probe lengths available upon request	

*These parameters will be tested following industry standards and values will be confirmed.