

BROAD RANGE OF APPLICATIONS.

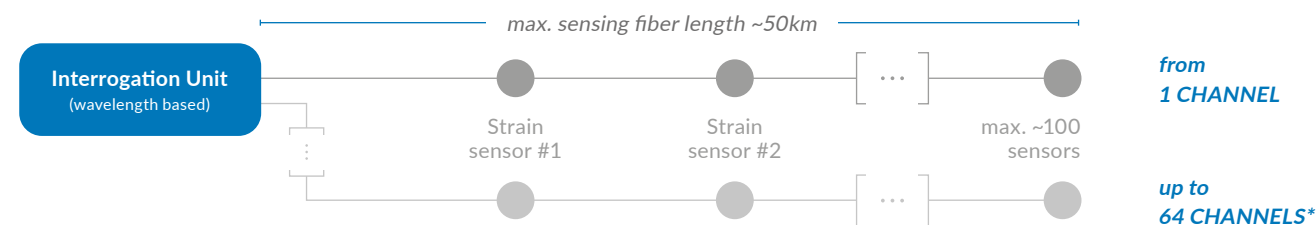
Our Fiber Bragg Grating sensors are used in an incredibly broad and growing range of applications such as:

- High temperature sensing in stainless steel manufacturing, industrial process control, aerospace or oil and gas exploration
- Asset integrity monitoring of wind power plants and conventional power turbines
- Structural health monitoring of civil structures, such as bridges, dams and tunnels
- Temperature and structural health monitoring in nuclear environments
- Data acquisition during for example minimal-invasive surgery

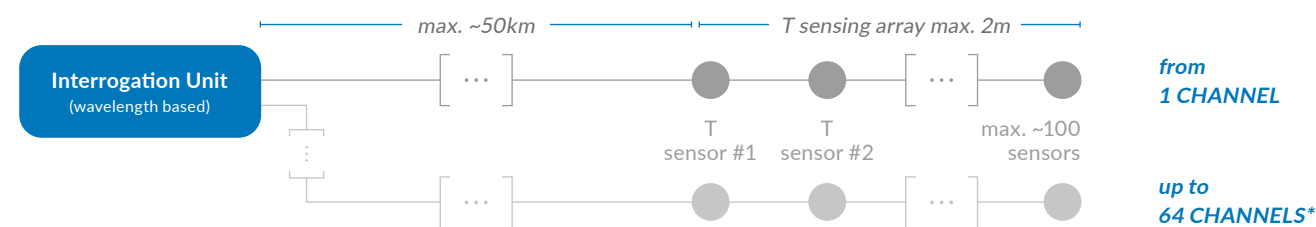


EXEMPLARY SENSOR SYSTEM DESIGNS.

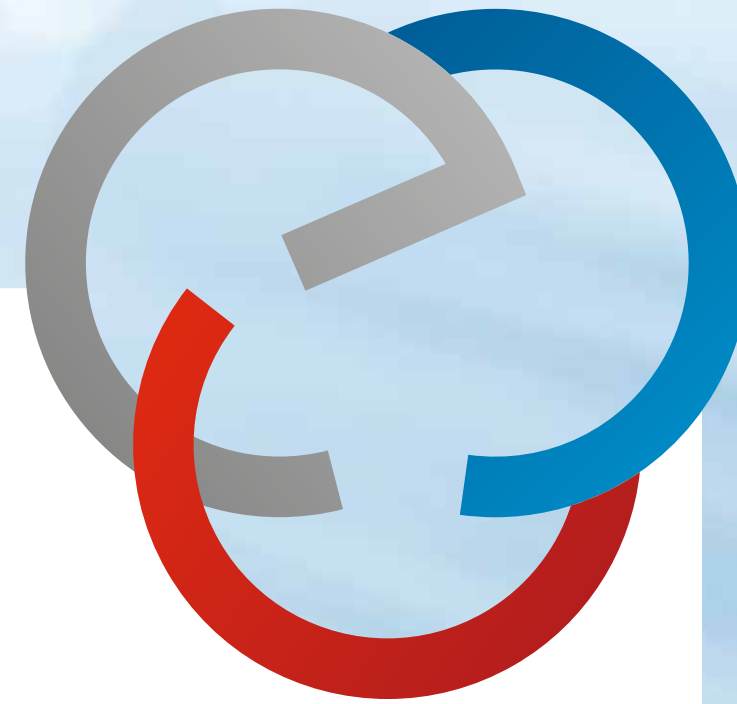
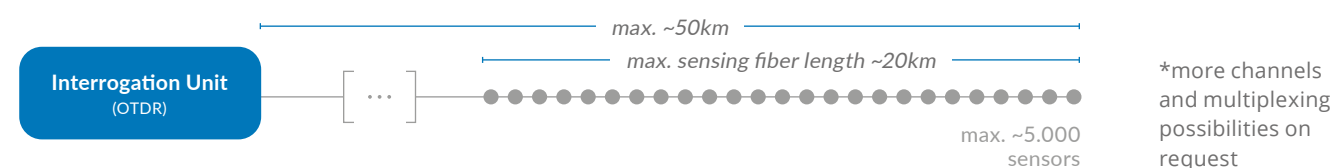
Structural health monitoring



Temperature sensing



Quasi-distributed strain/temperature sensing



Members of engionic Group



engionic Fiber Optics GmbH has been designing and manufacturing tailor-made fiber optic light guide solutions and fiber optic sensors since 1992.



engionic Femto Gratings GmbH is the first commercial manufacturer of Fiber Bragg Gratings based on a complex and highly automated fs-laser inscription process.



engionic CNC GmbH looks back on more than 20 years of experience in the production of CNC components, made with an exceptionally high level of precision and quality.

Locations

HEADQUARTER

Ernst-Lau-Strasse 8
12489 Berlin
Germany

PRODUCTION GOSLAR

Am Stollen 19
38640 Goslar
Germany

CONTACT

Phone +49 30 62 88 73 40
E-Mail fiber-optics@engionic.de
www.engionic-fiber-optics.de

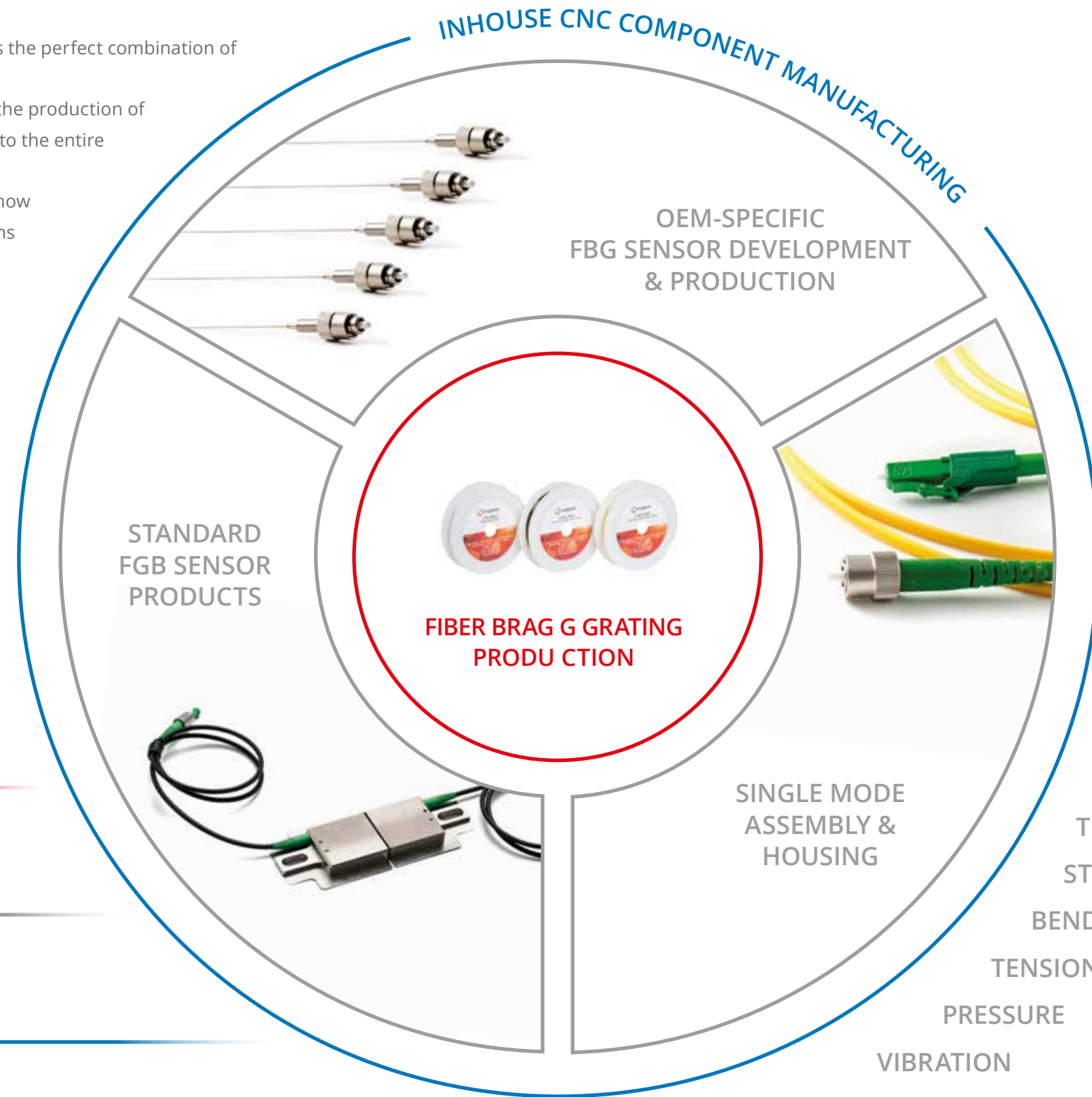
FIBER OPTIC SENSORS BASED ON FS-LASER-WRITTEN FIBER BRAGG GRATINGS

INTEGRATED PRODUCTION OF FIBER OPTIC SENSORS.

The engionic group of companies designs and produces tailor-made OEM products and services for the processing industry. The group's technological focus is on the manufacturing of fiber optic sensors and components – from single unit individual development up to large scale serial production.

Our Fiber Optic Sensor product portfolio reflects the perfect combination of

- A fully integrated internal value chain – from the production of Fiber Bragg Gratings (FBG) and CNC parts up to the entire sensor assembly, calibration and housing
- More than 25 years of experience and know-how in the realization of customer-specific solutions for all aspects of light guides and fiber optic system components
- Worldwide first commercial supplier of fs-laser-written FBGs based on an industry leading and most cost effective production process



ADVANTAGES OF FIBER OPTIC SENSORS.

- Immune to electromagnetic interference and suitable for explosive and nuclear environments
- Multiple parameter sensing per cable / channel (temperature, strain, bending, tension, pressure, vibration, acoustics)
- High sensitivity and fast measurement responsiveness
- Unrivalled high spatial sensing resolution
- Minimum cabling and space requirements
- Long-distance monitoring without amplification (>20km)
- Intrinsically passive (no electrical power required)
- Accurate and distributed temperature profiles can be measured in real time

LEADING FS-LASER-WRITTEN FBG TECHNOLOGY.

The FBG is an optical filtering device that reflects light on a specific wavelength and is located within the core of an optical fiber waveguide. Due to the wavelength dependence on temperature and strain, FBGs are widely used for optical sensing.

The engionic Femto Gratings GmbH uses a special inscription technology for FBGs, based on infrared fs-laser technology. The laser is focused into the core of the fiber and induces local refractive index changes in a point-by-point writing process. The process is highly nonlinear and therefore basically independent of the fiber material, which means that doping the fiber is not required. The FBGs can be written in radiation insensitive fibers and special pure core fibers for harsh environments. The gratings are type II gratings that withstand temperatures of up to 1,000°C.

As the process is applied through the coating of the fiber, no stripping and recoating is required, resulting in superior tensile strength of the FBGs.

BENEFITS

compared to conventional FBGs

- + Type II gratings survive temperatures of up to 1,000°C, compared to UV-inscribed FBGs which fade-out at approx. 250°C
- + Highly cost efficient multipoint/ sensor array production
- + Immunity to humidity and radioactivity
- + Significantly higher tensile strength compared to strip and recoat technology
- + Low polarization (0-5pm) for high resolution measurements compared to draw tower gratings and very low scattering losses (< 0,2dB)
- + Significantly higher reflectivity and lower fiber cost compared to draw tower technology
- + Highest spatial resolution due to dense sensor spacing (minimum FBG distance 2mm)
- + Direct writing process into customer specific fibers possible
- + Industry leading specification variety



The fully automated manufacturing technology provides the highest possible flexibility in terms of customer individual FBG specifications and production volumes - from one up to thousands of units. Furthermore, customer orders are produced within shortest lead times in the industry.