FBGS
Tailored Fiber Optic Sensing
Components & Solutions

Measurement Device FBGS InfinityScan®

Unity between high spatial precision and long-distance fiber sensing

INFO

We offer dynamic, high-precision measurement devices for Fiber Bragg Grating (FBG) sensors. Available with different numbers of optical channels it allows our customers to measure strain, force, temperature, pressure and shape.

Description

One measurement engine. One fiber. Over 2 000 sensing points.
The FBGS InfinityScan® enables long-distance monitoring by measuring a dense network of FBG sensors. This allows a dramatic increase in the total number of sensors that can be read-out.

The technology is based on our patented technology “Code Division Multiplexing” (CDM). The sensing network is composed of multiple sections using the same WDM-array that are measured simultaneously. This is made possible by a digital code that modulates the outgoing and incoming light as a function of time. Sections within the same fiber are measured sequentially but it is also possible to select a specific WDM section. Overlapping wavelengths are not an issue anymore.

The system is supplied with dedicated software, which is used to automatically configure the sensor network, visualize and process the FBG wavelengths and convert these data into engineered data such as temperature and strain data. The system can be accessed remotely using one of the Ethernet connections. The Ethernet ports can also be used for streaming out the measured data over a network or for sending API commands to the FBGS InfinityScan®.

Best suited for dynamic monitoring of long-distance applications with high sensor density / structures (e.g. roads, bridges, tunnels, pipelines, cables...).

Features

- Total number of sensors: > 2000
- Number of WDM sections: > 25
- Minimum space between identical wavelength: 2 m
- Long fiber lengths: > 1km
- 20-50Hz for 2000 sensors
- Precise: ± 3 pm wavelength precision

Preliminary specifications

Parameter	FBGS InfinityScan®
Optical	
Total number of sensors	> 2000
Sensor length range	25 m > 1000 m
Maximum number of WDM-sections	> 25
Minimum distance between WDM-sections	2 m
Wavelength range	1510 nm – 1590 nm
Wavelength precision (1δ)[1]	± 3 pm
Wavelength linearity	10 pm
Absolute wavelength accuracy[1]	40 pm
Minimum wavelength spacing	0,8 nm
Dynamic range	>30 dB (user selectable control)
Maximum sampling rate (all sections)	20 - 50 Hz
Degree of polarization light source	≤ 5 %
Optical connector	LC/APC
Laser class (IEC 60825-1)	1
Electrical	
Communication	1x Ethernet
Additional PC interface	4x USB3.1 – 2x HDMI – 2x Ethernet
Trigger signal	NA
Power supply	24VDC
Power consumption	< 60 W
Environmental	
Operating temperature	0 to 45°C
Operating humidity	0% to 80% RH, non-condensing
Mechanical	
Weight	5,4 kg
Dimensions (W x D x H)	43 x 37 x 4.4 cm (1U) (19 inch rack mountable)

Fiber configuration

Parameters	Bare fiber	Strain cable	Tempera-ture cable
Application	Strain Temperature	Strain	Temperature
Packaging	ORMOCER® / ORMOCER®-T	GFRP	Metal tubing

Spacing	Sensing points	Max. length
5 cm	2 000	100 m
10 cm	2 000	200 m
25 cm	2 000	500 m
50 cm	2 000	1 km
100 cm	2 000	2 km

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