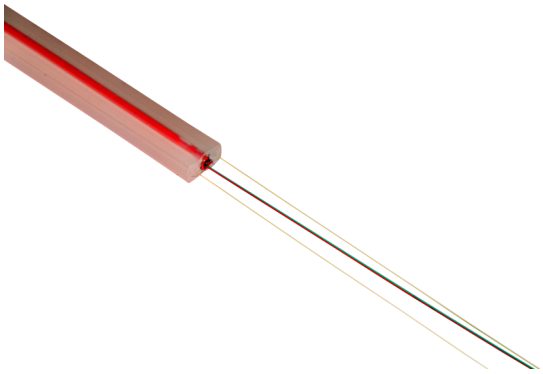
SMARTprofile II Strain Sensing cable

DiTeSt / DiTemp



DISTRIBUTED FIBER OPTIC SENSOR FOR CIVIL AND GEOTECHNICAL INTEGRITY MONITORING

High-accuracy distributed strain and temperature sensing.
Fully redundant configuration. For embedded or surface mounted installation.

Description

The SMARTprofile II combined strain and temperature sensor is designed for distributed deformation (average strain) and temperature monitoring (average temperature) over long distances, using BOTDR / BOTDA (Brillouin scattering) and ROTDR (Raman scattering) technologies.

The SMARTprofile II sensor consists of two bonded and two free single mode optical fibers (BOTDA / BOTDR) and two free multi mode fibers (ROTDR) embedded in a polyethylene thermoplastic profile. The bonded single mode fibers are used for strain monitoring with BOTDA / BOTDR system , while the free single mode fibers are used to create an optical loop for BOTDA measurement or for temperature measurements with BOTDA / BOTDR system (quantitative if sensor deformation < 0.2%, qualitative if sensor deformation > 0.2%) and to compensate temperature effects on the bonded fibers. The two additional multi mode fibers are insensitive to mechanical strain and used for temperature measurement to compensate temperature effects through Raman system. For redundancy, two fibers are included for both strain and temperature monitoring. The profile itself provides good mechanical, chemical and temperature resistance. The small size of the profile makes the sensor easy to transport and install by embedding in concrete or mortars, gluing or clamping. The SMARTprofile II sensor is designed for use in environmental conditions typically found in civil, geotechnical and oil & gas applications. However, this sensor cannot be used in extreme temperature environments, nor in environments with aggressive chemicals. It is not recommended for installation under permanent UV radiation (e.g. sunshine) without an additional cover or aluminum tape protection.

The SMARTprofile II sensing cable is delivered on spools with all the necessary accessories.

Key Features

- DiTeSt (BOTDA / BOTDR) compatible
- DiTemp (ROTDR) compatible
- Multi functional: strain and temperature
- Robust construction
- Easy handling
- Chemically resistant
- Easy and rapid installation
- Light weight and small dimensions

Applications

- Civil infrastructure
- Tunnel monitoring
- Settlement and sinkhole detection
- Concrete crack detection and localization
- Distributed pipeline strain monitoring

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DiTeSt / DiTemp

Temperature Range

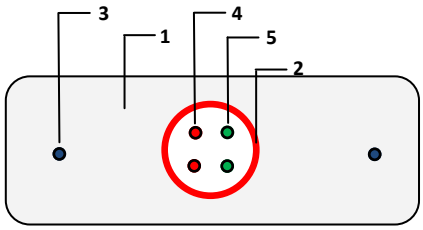
Operating temperature:	-40 °C to +60 °C
Storage temperature:	-5 °C to +40 °C
Installation temperature:	-5 °C to +50 °C
Pigtails and connectors:	-40°C to +60°C

Technical Data

Temperature compensation:	through single mode temperature fibers with DiTeSt BOTDA / BOTDR, if strain ≤ 0.2 % through multi mode temperature fibers with DiTemp ROTDR, insensitive to mechanical strain
Calibration:	during production
Strain range:	-1.5 % to +1.5 %
Maximal length:	700 m / reel, more upon request
Dimensions (W x H):	8.0 mm x 4.0 mm
Weight:	22 ± 0.5 kg/km
Max tensile strain:	1.5 %
Min bending radius:	400 mm (long term)
Hydrostatic pressure:	300 kPa (bar)

Fiber Types

Fiber support (strain):	2 SMF 9 / 125 um Polymide coated ITU-T G.652.D compliant
Fiber support (temperature):	2 SMF 9 / 125 um Acrylate coated ITU-T G.652.D compliant 2 MMF 50 / 125 um Acrylate coated ITU-T G.651 compliant
Fiber attenuation (cabled @ 20 °C):	≤ 1.2 dB @ 1310 nm - SMF strain ≤ 1.0 dB @ 1550 nm - SMF strain ≤ 0.4 dB @ 1310 nm - SMF temperature ≤ 0.3 dB @ 1550 nm - SMF temperature ≤ 3.0 dB @ 850 nm - MMF temperature ≤ 1.0 dB @ 1300 nm - MMF temperature
Number of fibers:	2 SMF strain fibers + 2 SMF temperature fibers + 2 MMF temperature fibers



1 LDPE matrix
2 PVC loose tube
3 Polymide coated SMF
4 Standard acrylate coated SMF
5 Standard acrylate coated MMF

Accessories and ordering information

11.1030 DiTeSt SMARTProfile II Sensor

Accessories:

- Cable termination with connectors
- Junction box
- Splice box

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