

## 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

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The DiTeSt SMARTprofile combined strain and temperature sensors are designed for distributed deformation (average strain) and temperature monitoring over long distances, using BOTDR / BOTDA (Brillouin scattering) technologies.

The DiTeSt SMARTprofile sensor consists of two bonded and two free single mode optical fibers embedded in a polyethylene thermoplastic profile. The bonded fibers are used for strain monitoring, while the free fibers are used for temperature measurements (quantitative if sensor deformation  $<0.2\%$ , qualitative if sensor deformation  $>0.2\%$ ) and to compensate temperature effects on the bonded fibers. 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 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 sensing cable is delivered on spools with all the necessary accessories such termination and connectors (E2000, FC-PC or other).

### Key Features

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

### Applications

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

## Temperature Range

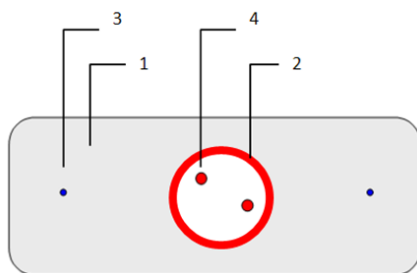
Operating temperature:	-40 °C to +60 °C
Storage temperature:	-5 °C to +40 °C
Installation temperature:	-5 °C to +50 °C
Pigtails and connectors:	-40°C to +60°C

## Technical Data

Temperature compensation:	through temperature fibers if strain $\leq$ 0.3 %
Calibration:	during production
Strain range:	-1.5 % to +1.5 %
Maximal length:	800 m / reel, more upon request
Dimensions (W x H):	8.0 mm x 4.0 mm
Weight:	22 $\pm$ 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 $\mu$ m Polyimide coated ITU-T G.652.D compliant
Fiber support (temperature):	2 SMF 9 / 125 $\mu$ m Acrylate coated ITU-T G.652.D compliant
Fiber attenuation (cabled @ 20 °C):	$\leq$ 1.2 dB @ 1310 nm - strain
	$\leq$ 1 dB @ 1550 nm – strain
	$\leq$ 0.4 dB @ 1310 nm - temperature
	$\leq$ 0.3 dB @ 1550 nm – temperature
Number of fibers:	2 strain fibers + 2 temperature fibers



- 1 LDPE matrix
- 2 PVC loose tube
- 3 Polyimide coated SMF
- 4 Standard acrylate coated SMF

## Accessories and ordering information

11.1030 DiTeSt SMARTProfile Sensor

Accessories:

- Cable termination with connectors
- Junction box
- Splice box

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Smartec SA reserves the right to make any changes in the specifications without prior notice