

Photonics

Sensing Cables



Sensing cables for SHM (structural health monitoring) and related applications. The cables can be used for strain and temperature sensing. They are characterized by robust and rugged design, suitable for embedding directly in concrete or similar medium, for attaching them with epoxies or for direct burial. Once embedded into concrete, FRP or soil structures, they are used to monitor strain, aging, temperature distribution, cracks formation and propagation or structure movement. To ensure robustness, the cables are typically connectorized with outdoor IP67 connectors, so that they can be left in the field unsupervised and then easily connected to a portable measuring instrument by the technician. The other end, depending on the measurement technique used, can be furnished with the no-reflection or high-reflection termination. For cost optimization, the actual sensing part of the cable (“active” length) can be extended with a non-sensing cable (“passive” length), providing the same robustness and acting as a launch cable.

APPLICATIONS

- ✓ Temperature measurements:
 - Monitoring
 - Sensing technologies: Raman, Brillouin, FBG
 - Harsh environment, outdoor and underwater measurements
- ✓ Strain measurements:
 - Pipe, structure, and soil monitoring
 - Brillouin and FBG sensing technologies
 - Structural Health Monitoring
 - Harsh environment, outdoor and underwater measurements
 - Precise measurements (up to 1%)

ADVANTAGES & FEATURES

- ✓ Rugged and robust design
- ✓ High tensile strength and crush resistance
- ✓ Any IP67 connector available
- ✓ Lightweight
- ✓ Customized length of both the sensing (“active”) and launch (“passive”) parts
- ✓ Connectorization directly on the active sensing cable possible
- ✓ Available with high-reflection or no-reflection termination

TECHNICAL SPECIFICATIONS:

Temperature sensors:

Parameter	Value
Cable diameter [mm]	4.6
Mass [kg/km]	27
Temperature of operation [°C]	-40 - +85
Temperature of storage [°C]	-40 - +85
Temperature of installation [°C]	-10 - +50
Max temperature (3 min) [°C]	+150
Max tensile strength, installation [N]	1500
Max tensile strength, operation [N]	1000
Max crush resistance [N/cm]	500
Min. bending radius without tensile [mm]	70 (15xD)
Min bending radius with tensile [mm]	90 (20xD)

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Strain sensors:

Parameter	Value
Cable diameter [mm]	3.2
Mass [kg/km]	10.5
Temperature sensitivity df_B/dT [MHz/°C]	1.1
Strain sensitivity $df_B/dT\epsilon$ [MHz/°C]	450
Central Brillouin frequency [GHz]	10.6
Max tensile strength, installation [N]	260
Max crush resistance [N/cm]	250
Min. bending radius without tensile [mm]	48 (15xD)
Min bending radius with tensile [mm]	64 (20xD)

Ordering information:

Series	Fiber type, passive part	Fiber type, active part	Length of passive part	Length of active part	Passive cable type	Sensing cable type	Connector type	Termination type
SENS	1 – G.652D	1 – G.652D	01.0 – 1 m	01.0 – 1 m	DAC – DAC BURRY	T – temperature	LC	NRT – no reflection
	2 – G.657A1/A2	2 – G.657A1/A2	01.5 – 1.5 m	01.5 – 1.5 m	XXX – none	S – strain	LCA	HRT – high reflection
	3 – G.657B2/B3	3 – G.657B2/B3			FC	X – no termination
							FCA	
							X – other	

Example:

SENS-2-2-0.00-14.5-XXX-T-LCA-NRT – Fibrain temperature sensing cable, G.657A1/A2 fiber in the active part, no passive part, 14.5 m active part, LCA connector, no reflection termination.

Important notice

Buyer and/or user of this product has to make sure before using this product that it is suitable for the intended use. All questions of liability relating to this product are subject – in accordance with the prevailing – to the Term of Sale of the selling Fibrain subsidiary.