

Instrument Datasheet

Tilt Beam Sensors

DESCRIPTION

Tilt Beam (TB) sensor consists of a MEMS Tiltmeter mounted on a rigid aluminium beam with a defined gauge length, typically 1, 2 or 3 meters. Beams should be fixed to the structure in chains or in stand alone installations.

Tilt Beams are available in digital version, with uniaxial sensor integrated into the beam body, or with analogue tilt meter mounted on the aluminium beam.

Digital TB are typically installed in horizontal chains on structures in order to monitor differential settlements or heaves.

The analogue version, having uniaxial or biaxial sensor, can be installed horizontally, vertically or inclined: thanks to the fixing and adjustment plate, analogue tilt beam could be utilised to monitor every tilting or displacement in a large number of applications.

APPLICATIONS

- ✓ Structures
- ✓ Diaphragm walls
- ✓ Dams
- ✓ Tunnelling
- ✓ Deep excavations
- ✓ Unstable slopes

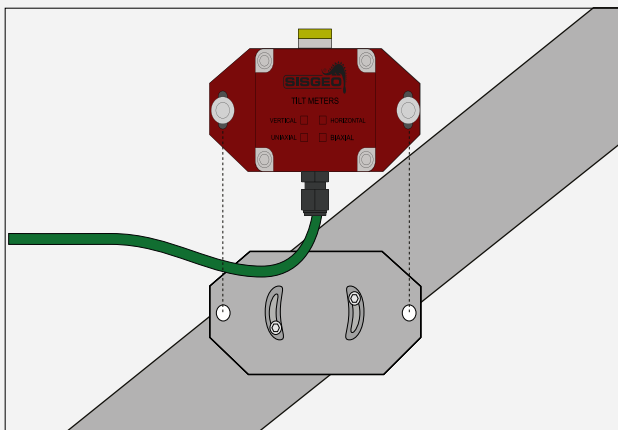
FEATURES

- ✓ Removable and modular system for multiple installation
- ✓ Simple and fast installation thanks to the installed-at factory connectors (digital version)
- ✓ Inclined installation allowed (analogue model)
- ✓ Real-time monitoring with a dataloggere

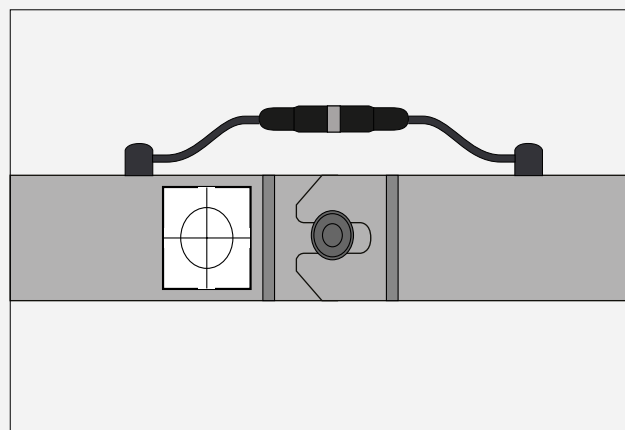
TECHNICAL SPECIFICATIONS

	0S541MA0000	0S542MA0000	0S71DTL10H0
Model	analogue		digital
Application	horizontal, vertical or inclined		horizontal chain
Sensor type	self-compensated MEMS inclinometer		digital self-compensated MEMS inclinometer
Axis	uniaxial	biaxial	uniaxial
Measuring range	$\pm 5^\circ, \pm 10^\circ$		$\pm 10^\circ$
Sensor sensitivity	0.0013° (4.68 arc-sec)		0.0013° (4.68 arc-sec)
Gauge linearity	$\pm 0.15\%$ FS for $\pm 5^\circ$ $\pm 0.10\%$ FS for $\pm 10^\circ$		$\pm 0.020\%$ FS
Gauge total accuracy (linearity+ hysteresis + repeatability with 3 rd degree polynomial)	$\pm 0.07\%$ FS for $\pm 2.5^\circ, \pm 5^\circ$ $\pm 0.05\%$ FS for $\pm 10^\circ$		$\pm 0.010\%$ FS
Thermal drift	$\pm 0.005\%$ FS / °C		$\pm 0.005\%$ FS / °C
Excitation voltage	from 18 to 30 Vdc		from 12 to 24 Vdc
Signal output	4-20 mA (current loop)		RS-485, Modbus RTU protocol (sin α)
Temperature operating range	from -30°C to +70°C		from -30°C to +70°C
Built-in temperature sensor -range -accuracy	thermistor from -50°C to +150°C $\pm 0.5^\circ$ C		Temperature sensor of electronic board from -30°C to +60°C $\pm 1^\circ$ C
Protection	IP67		IP67
Cable	0WE104SG0ZH	0WE106IP0ZH	0WE104SG0ZH
Max cable length to logger	1000 m		1000 m

(1) including linearity, hysteresis and repeatability



Connection detail of analogue tilt sensor on beam through the fixing and adjustment plate.

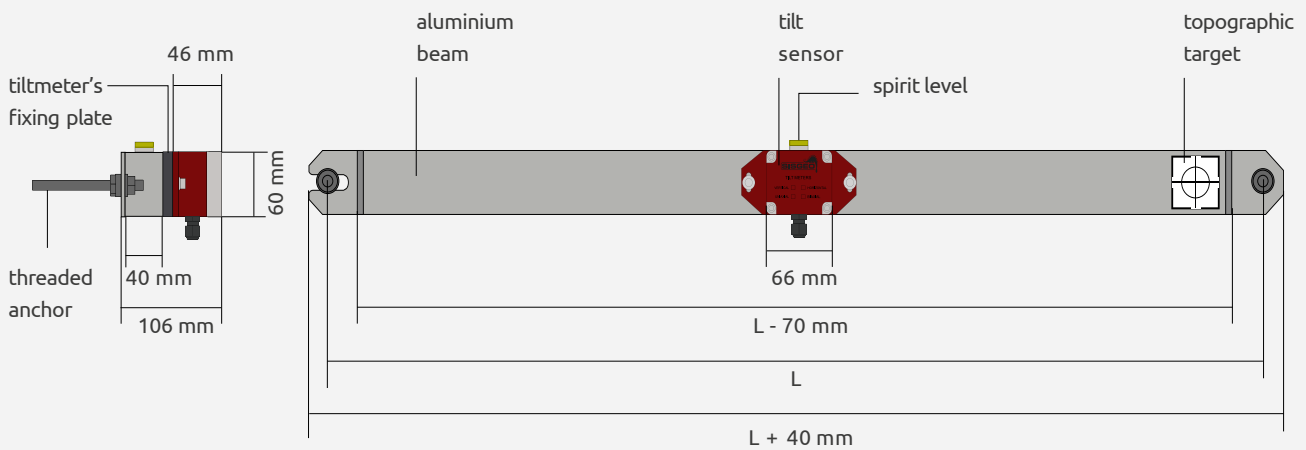


Mechanical and signal connection's detail of digital tilt beam

PHYSICAL FEATURES

ANALOGUE VERSION

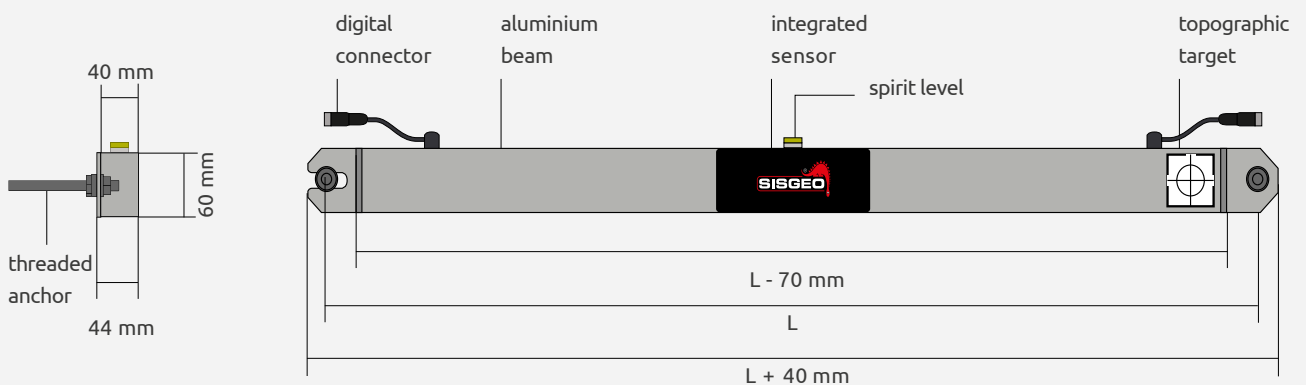
	BEAM	TILT SENSOR
Product code	0S7BM000000	0S540MA0000
Length	1000, 2000 or 3000 mm (L)	66 mm
Width	44 mm	46 mm
Height	60 mm	60 mm
Material	aluminium	aluminium
Protection	IP67	IP67



DIGITAL MODEL

	BEAM
Product code	0S7BM000000
Length	1000, 2000 or 3000 mm (L)
Width	44 mm
Height	60 mm
Material	aluminium
Protection	IP67

The tilt beam digital model integrates the uniaxial tilt sensor into the aluminium beam body. It allows to eliminate external cables and, thanks to the fixed-at-factory connectors, installation procedure will be easier and faster than ever.



ACCESSORIES AND SPARE PARTS

ALUMINIUM BEAM 0S7BM000000

Aluminium beam for both analogue or digital sensors, available in different length: 1000, 2000 or 3000 mm.

Supplied with topographic target, wall mounting supports at the ends and anchor bolts.

"L" MOUNTING PLATE 0S7BM80SUP0

"L" shaped, floor mounting bracket for horizontal digital beam installation, realized in galvanised steel.

Customised brackets for inclined analogue beam sensors available on request.

DIGITAL CONNECTOR 0ECON04MV00

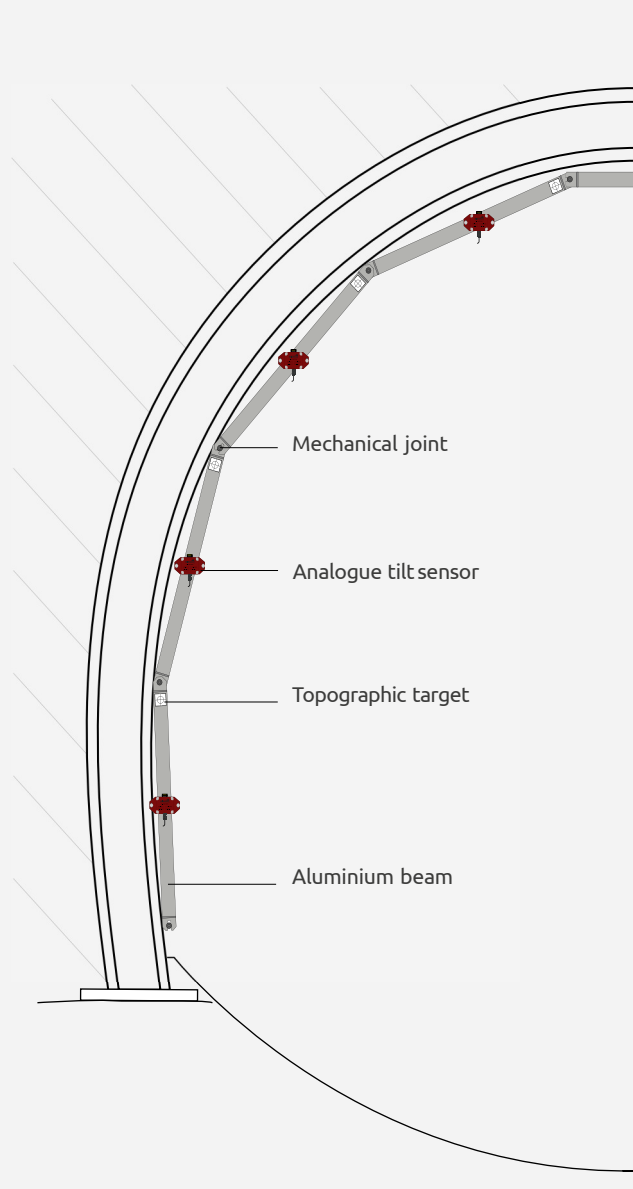
Connector fixed at factory on the digital signal cable (0WE606IPDZH) for linking the last digital beam sensor to the data logger.

TERMINATION RESISTOR 0ETERMRESIO

Spare termination resistor needed in case of dismantling and new installation of digital instrument chains.

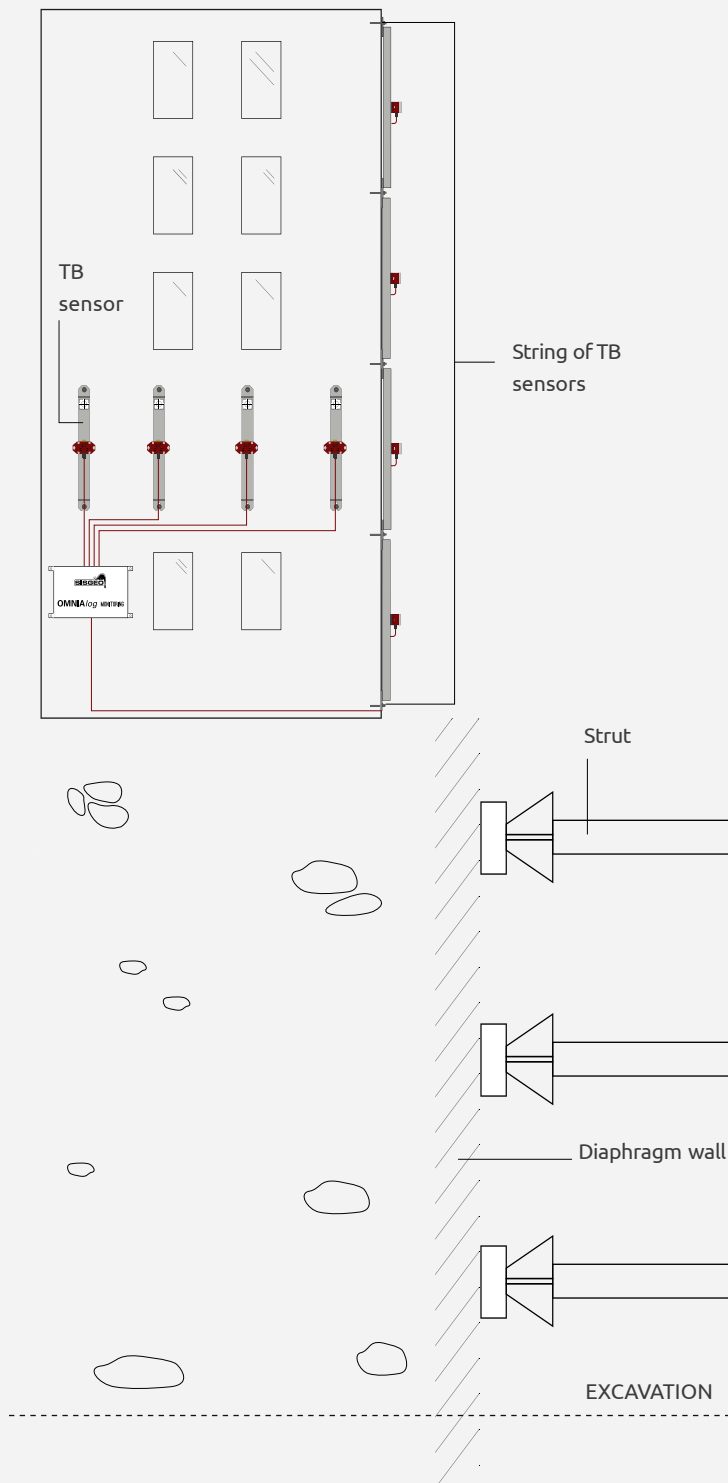
APPLICATION FOR TUNNEL CONVERGENCE MONITORING

ANALOGUE VERSION



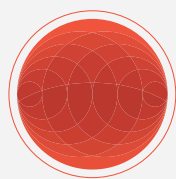
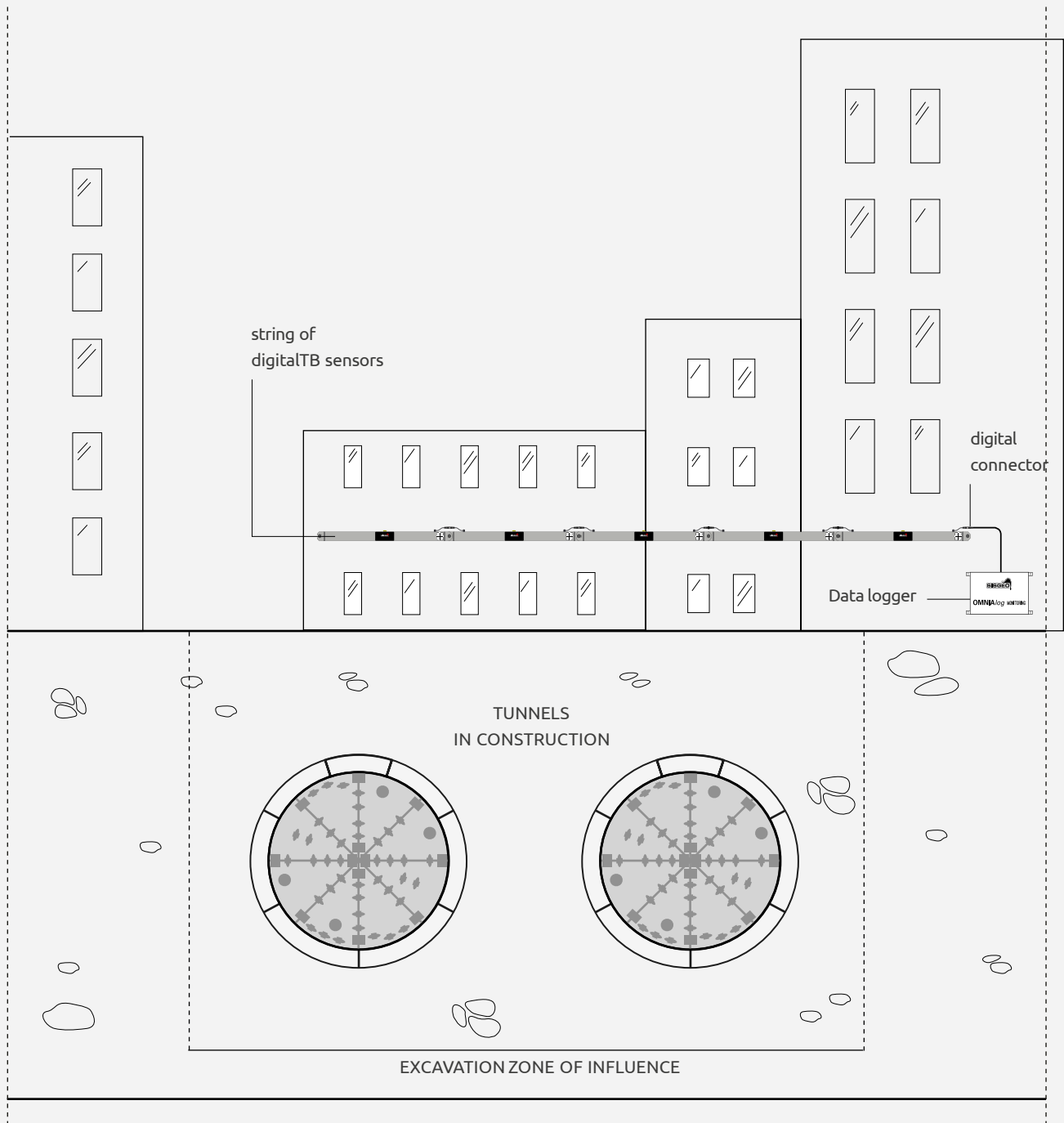
STRUCTURAL TILT/CANT MONITORING

ANALOGUE VERSION



BUILDING SETTLEMENT MONITORING

DIGITAL MODEL



Geomotion
AUSTRALIA