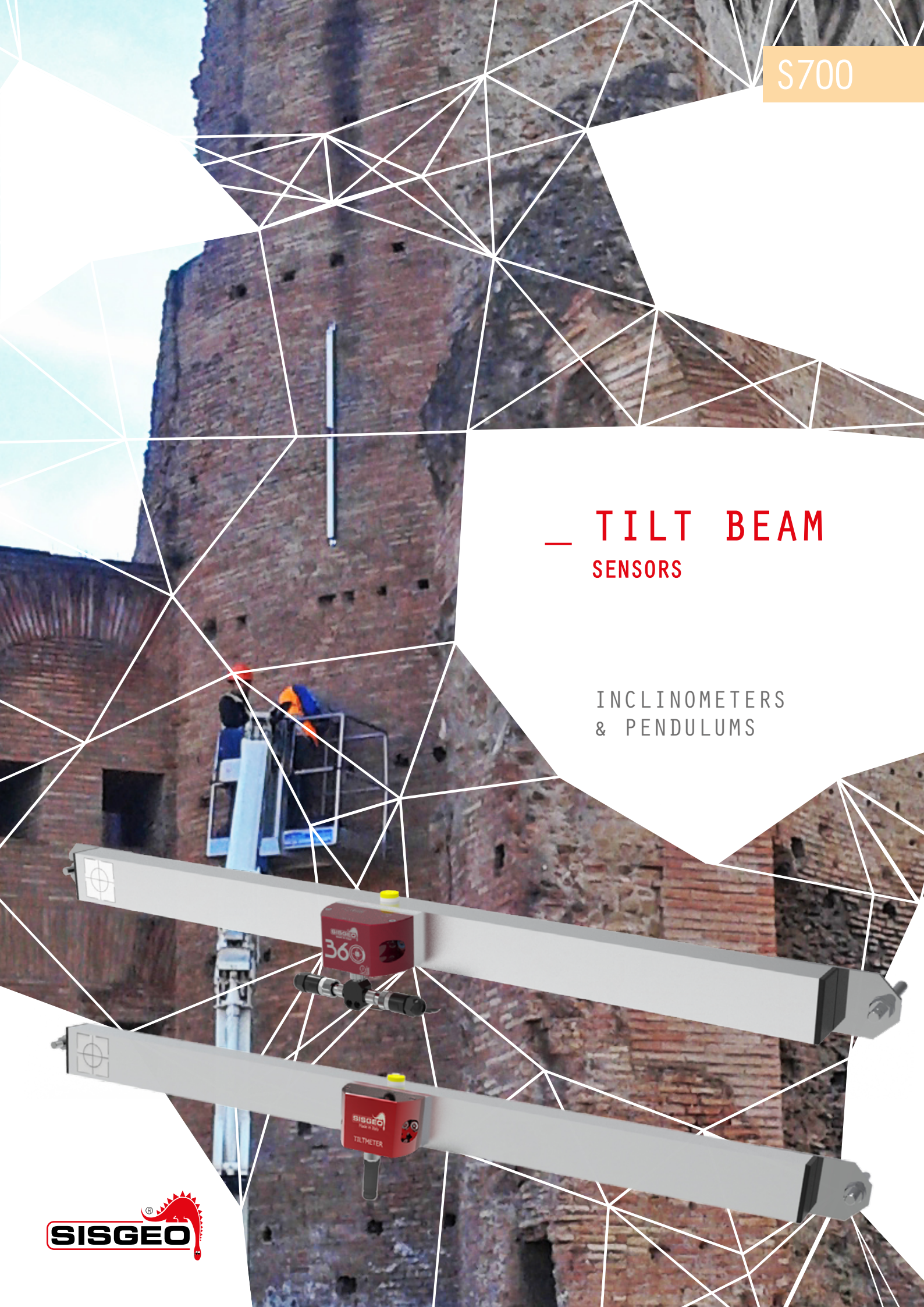
S700

_ TILT BEAM

SENSORS

INCLINOMETERS
& PENDULUMS



SISGEO®

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TILT BEAM

SENSORS

Tilt Beam (TB) sensor consists of a MEMS tiltmeter mounted on a rigid aluminium beam with a defined gauge length, tipically 1, 2 or 3 meters. Tilt meters shall be mounted on the beams at site and are available in 360° digital version and analogue with 4-20mA output.

TB most common application is horizontal chain on structures in order to monitor differential settlements or heaves. TB can be also installed horizontally, vertically or inclined, in chains or in stand alone installations.

Thanks to the sensor fixing and adjustement plate, they could be utilized to monitor every tilting or displacement in a large number of applications.

APPLICATIONS

- Structures
- Diaphragm walls
- Dams
- Tunneling
- Deep excavations
- Unstable slopes

FEATURES

- Removable and modular system for multiple installation
- Simple and fast installation through connectors (digital version)
- Inclined installation allowed
- Nearly real-time monitoring with OMNIAlog and miniOMNIAlog

CE *Meet the essential requirements of the EMC Directive 2014/30/UE*

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TILT METERS SPECIFICATIONS

PRODUCT CODES	0S541MA0000 Uniaxial	0S542MA0000 Biaxial	0S543HD3600 [1] Triaxial
Measurement principle	self-compensated MEMS inclinometer		MEMS accelerometer
Measuring range [2]	±2.5°, ±5°, ±10°		**360° (±180°) on all three axes with respect to g**
Sensor resolution (reading frequency 2 Hz)	0.001°		0.0001°
Sensor mechanical bandwidth	18 Hz		1 Hz
Sensitivity [3]	see Calibration Report		see Calibration Report
Accuracy: MPE[4]	±0.004° @ ±2.5° range ±0.006° @ ±5° range ±0.010° @ ±10° range		<±0.02° @360° range
Offset temperature dependency (from -20°C to +70°C)	±0.003° / °C		±0.002° / °C
Power supply	from 18 to 30 Vdc		from 8 to 28 Vdc
Signal output and protocol	4-20 mA current loop (inclination), Ohm (temperature)		RS485, Modbus RTU [5]
Average consumption	max 20 mA per Axis		3.7 mA @ 24 Vdc, 7.0 mA @ 12 Vdc
Temperature operating range	from -30°C to +70°C		from -30°C to +70°C
Internal temperature sensor: - measuring range - accuracy (resolution)	NTC 3 kΩ Thermistor from -50°C to +150°C ±0.5 °C (0 to +50°C)		Embedded on electronic board - 40°C to +125°C ±1°C with temperature range -10°C to +85°C (res. 0.01 °C)
Internal humidity sensor:[6] - measuring range - accuracy (resolution)	-		Embedded on electronic board 0 to 100% RH ±5% RH with humidity range 0 to 95% RH (res. 0.025% RH)
On-board supply voltage monitor:[6] - measuring range - accuracy (resolution)	-		Embedded on electronic board 0 to 36 V ±5% FS (res. 0.01 V)
Signal cable	0WE106IP0ZH		0WE106IP0ZH
Cabling	M12 male 8-pin connector on sensor body		M12 male connector on sensor body, 3 port T shaped splitter with 2 female and 1 male connectors
Max. cable length to logger	1000 m (for more information see FAQ #073) [7]		1000 m (for more information see FAQ #073) [7]

(1) Complete technical specifications of the digital tiltmeter and more details regarding the 360° technology can be found in the 360° digital tiltmeter data sheet, which can be downloaded from this page.
(2) For analogue tiltmeters, other ranges available on request
(3) Sensitivity is a specific paramenter different for every gauge. The sensitivity is calculated during gauge calibration test and inserted into the Calibration Report.
(4) MPE is the Maximum Permitted Error on the measuring range (FSR). In the Calibration Report, the accuracies of the gauge are calculated using the linear regression; the error reported is the maximum residual error on the FSR.
(5) RS485 not-optoisolated Modbus communication with RTU Protocol Default output is degree. Sisgeo Modbus protocol manual is available for download on Sisgeo web site.
(6) These sensors are installed on the internal electronic board to give information in the event of probe malfunction.
(7) Refer to FAQ section on Sisgeo website: www.sisgeo.com/faq

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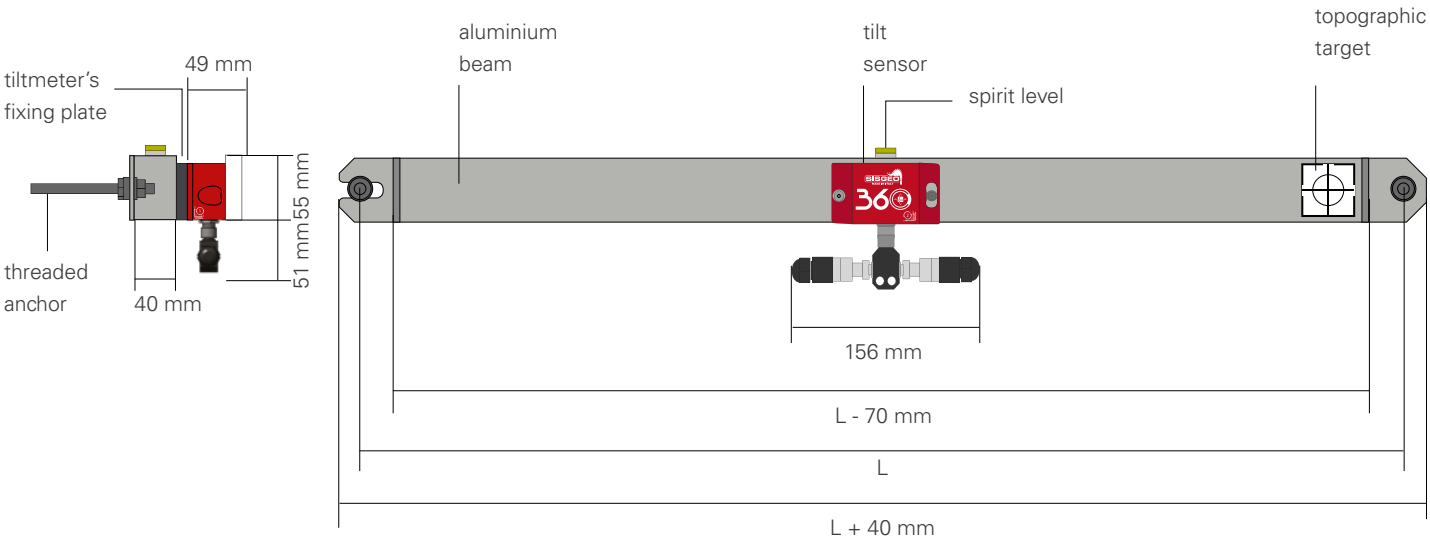
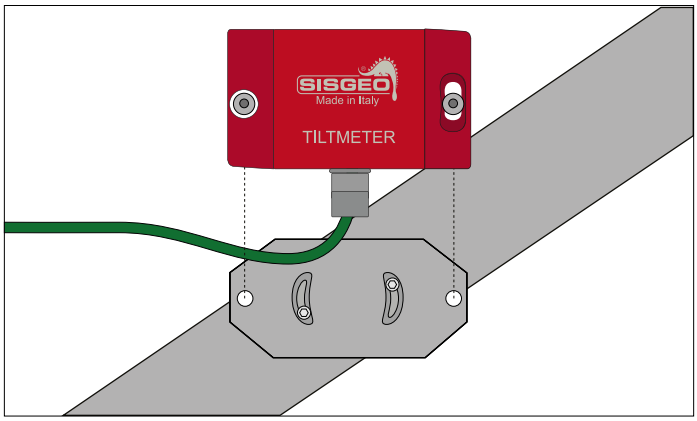
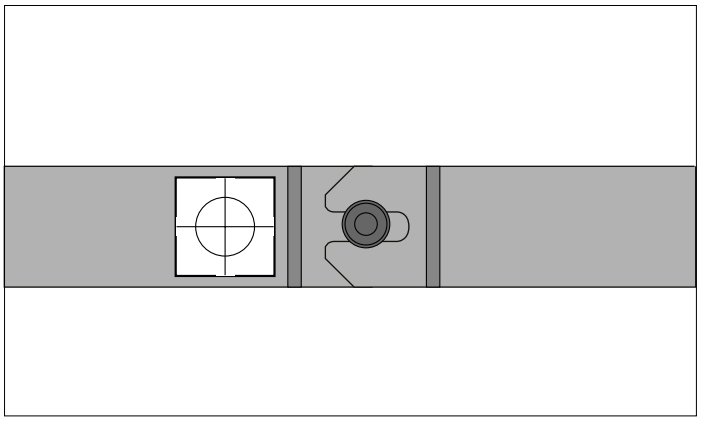
PHYSICAL FEATURES

	BEAM	TILT SENSOR
Length	1000, 2000 or 3000 mm (L)	99 mm
Width	44 mm	49 mm
Height	60 mm	55 mm (connector not included)
Material	aluminium	anodized aluminum





Connection detail of analogue tilt sensor on beam trough the fixing and adjustement plate.



Detail of beam mechanical connection

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ACCESSORIES AND SPARE PARTS

ALUMINIUM BEAM
OS7BM000002

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.

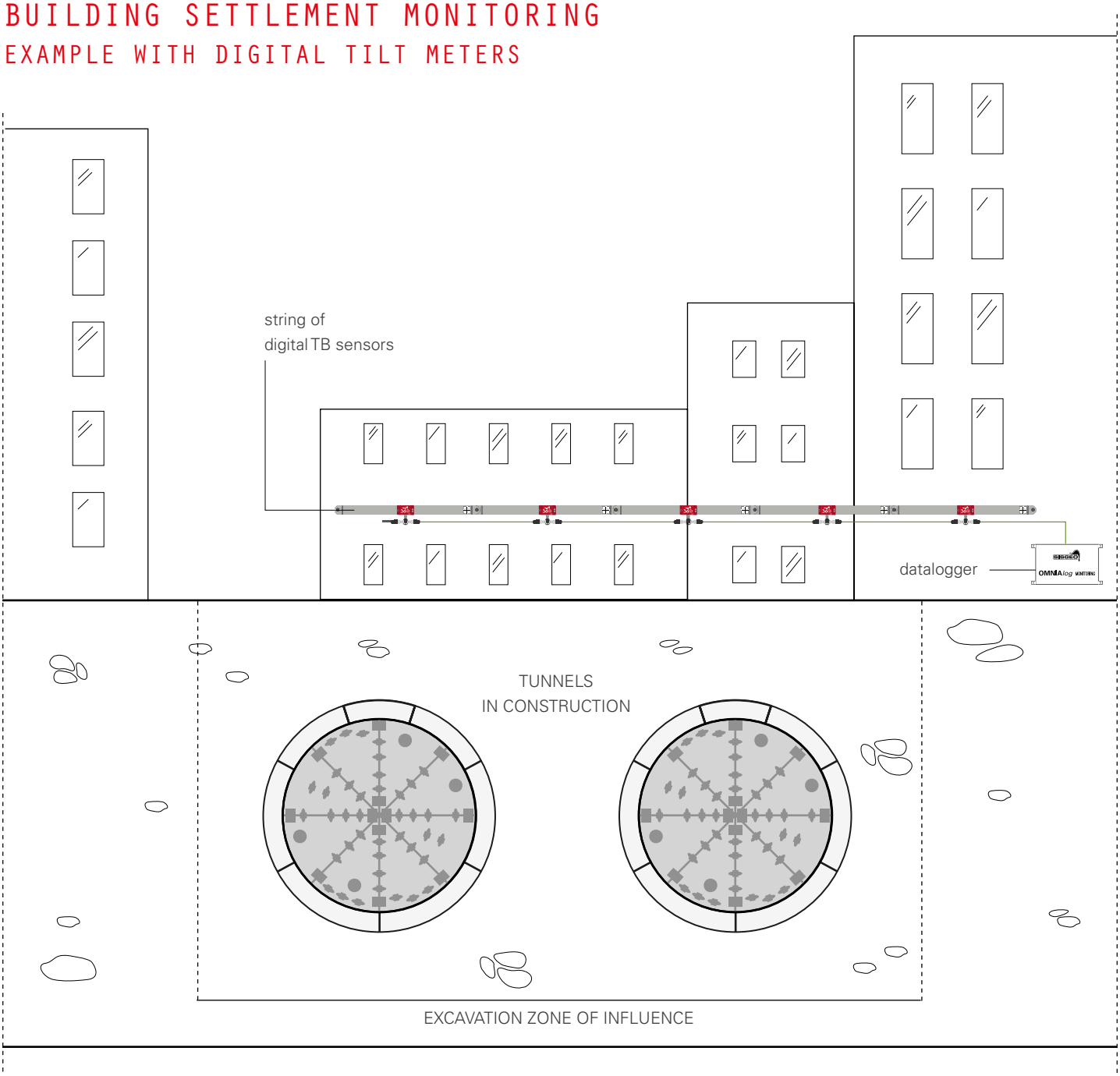
TERMINATION RESISTANCE
OETERMRESIO

Resistance ending device with connector, needed to close every digital tilt meter chain. The value of resistor depends on the layout of each monitoring system.
For more detail see FAQ#076.

CONNECTORS KIT (SPARE)
OECONO5T3KO

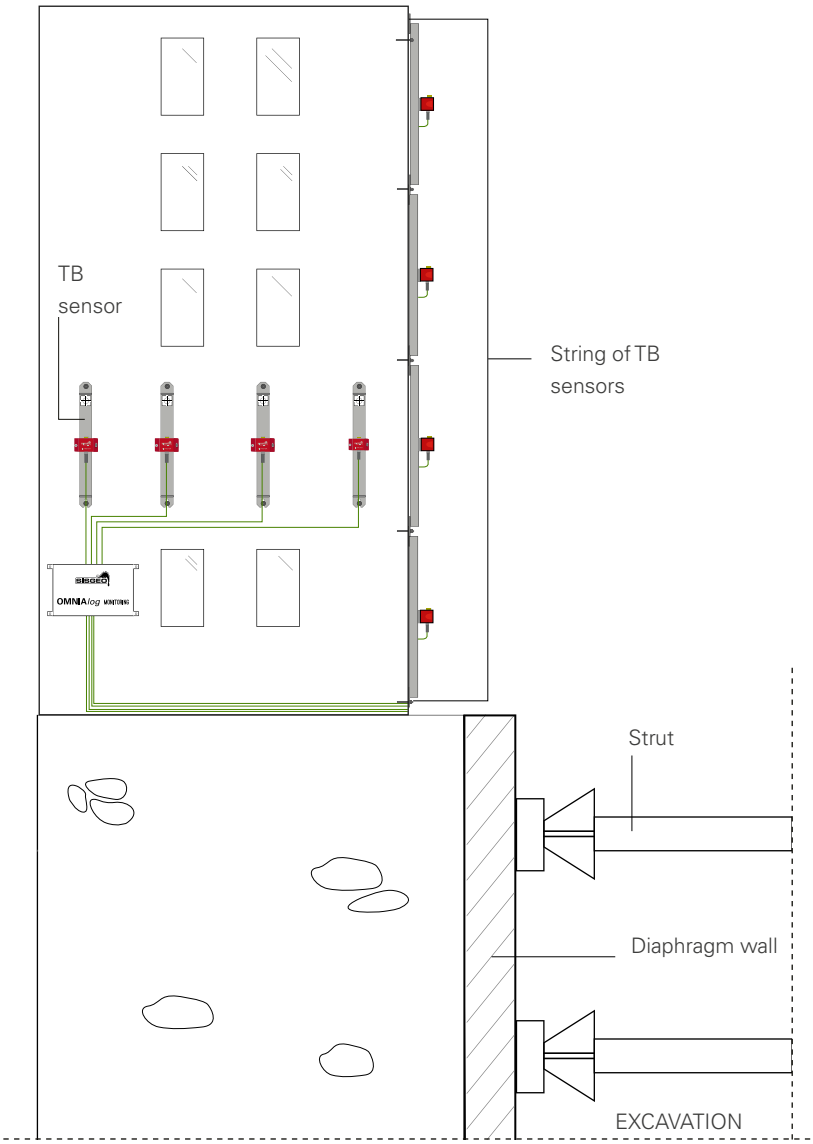
Spare connector kit for digitla tiltmeters. The kit consists of three 3-port T-shaped splitter, three female connectors and three male connectors.

BUILDING SETTLEMENT MONITORING
EXAMPLE WITH DIGITAL TILT METERS



STRUCTURAL TILT/CANT MONITORING

EXAMPLE WITH ANALOGUE TILT METERS



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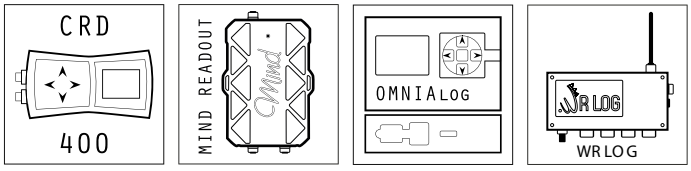
(1)



(1) Only for analogue version (mod. S541MA & S542MA)

For further information refer to their own datasheets

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ADDITIONAL SUPPORT

SISGEO offers on-line assistance service to the Customers in order to maximize the performance of the system and training on the correct use of the instrument/readout.

For more information contact mail: ***assistance@sisgeo.com***