

**MPBX**  
MULTIPOINT  
BOREHOLE EXTENSOMETER

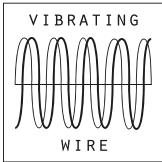
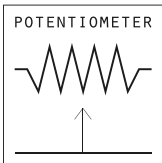
EXTENSOMETERS  
& JOINTMETERS





# MPBX

## MULTIPOINT BOREHOLE EXTENSOMETER



The MPBX (multipoint borehole extensometer) is designed to monitor changes in the distance between downhole anchors, each set at a specified depth in the borehole, and a measurement head at the surface. Rods extend upward from the anchors to the head, where measurements are made with a depth micrometer or displacement transducers.

MPBX heads are sized to accommodate measurement ranges up to 100 mm (3.9") or 200 mm (7.9"), the number of anchors (points) to be monitored, and the type of rod to be used. Anchors are included with the heads. MPBX rods are available in fiberglass or stainless steel. Both types include a nylon sleeve that breaks friction between the rods and the surrounding soil or grout.

MPBX measurements can be taken manually with a depth micrometer or remotely with vibrating wire or 4-20mA displacement transducers and a readout or datalogger.

### APPLICATIONS

- Tunneling
- Deep excavations
- Dams
- Foundations
- Settlement monitoring
- Rock displacements

### FEATURES

- MPBX with fiberglass rods arrive ready for installation
- Invar rods available on request
- 4-20mA sensors and vibrating wire sensors available
- Automated, remote readings possible

**CE** *Meet the essential requirements of the EMC Directive 2004/108/EC*

## MPBX 100 MM (3.9") RANGE

VERSION	MPBX WITH FIBERGLASS RODS	MPBX WITH STAINLESS STEEL RODS
PRODUCT CODES <sup>(1)</sup>	0D222FG01A0 (single point) <sup>(2)</sup> 0D222FG04A0 (4 points) 0D222FG01AE (single point) 0D222FG05A0 (5 points) 0D222FG02A0 (2 points) 0D222FG06A0 (6 points) 0D222FG03A0 (3 points) 0D222FG07A0 (7 points)	0D222AC01A0 (single point) <sup>(2)</sup> 0D222FG04A0 (4 points) 0D222AC01AE (single point) 0D222FG05A0 (5 points) 0D222FG02A0 (2 points) 0D222FG06A0 (6 points) 0D222FG03A0 (3 points) 0D222FG07A0 (7 points)
HEAD		
Materials	stainless steel, galvanized steel and ABS	stainless steel, galvanized steel and ABS
Displacement transducer compatibility (see specifications at page 5)	ODTE1A02500 (4-20 mA, 25 mm) ODTE1A05000 (4-20 mA, 50 mm) ODTE1A10000 (4-20 mA, 100 mm) ODTE010VV00 (VW+T, 10 mm) ODTE025VV00 (VW+T, 25 mm) ODTE050VV00 (VW+T, 50 mm) ODTE100VV00 (VW+T, 100 mm)	ODTE1A02500 (4-20 mA, 25 mm) ODTE1A05000 (4-20 mA, 50 mm) ODTE1A10000 (4-20 mA, 100 mm) ODTE010VV00 (VW+T, 10 mm) ODTE025VV00 (VW+T, 25 mm) ODTE050VV00 (VW+T, 50 mm) ODTE100VV00 (VW+T, 100 mm)
GROUTABLE ANCHORS		
Materials	galvanized steel rebar	galvanized steel rebar
Diameter / length	Ø 16 mm / 400 mm (0.625" / 16")	Ø 22 mm / 400 mm (0.9" / 16")
RODS AND SLEEVES		
Product code	0D221BMFG00 <sup>(3)</sup>	0D221BMAC00 <sup>(4)</sup>

## MPBX 200 MM (7.9") RANGE

VERSION	MPBX WITH FIBERGLASS RODS	MPBX WITH STAINLESS STEEL RODS
PRODUCT CODES <sup>(1)</sup>	0D222FG01B0 (single point) <sup>(2)</sup> 0D222FG04B0 (4 points) 0D222FG01BE (single point) 0D222FG05B0 (5 points) 0D222FG02B0 (2 points) 0D222FG06B0 (6 points) 0D222FG03B0 (3 points) 0D222FG07B0 (7 points)	0D222AC01B0 (single point) <sup>(2)</sup> 0D222AC04B0 (4 points) 0D222AC01BE (single point) 0D222AC05B0 (5 points) 0D222AC02B0 (2 points) 0D222AC06B0 (6 points) 0D222AC03B0 (3 points) 0D222AC07B0 (7 points)
HEAD		
Materials	stainless steel, galvanized steel, and ABS	stainless steel, galvanized steel, and ABS
Displacement transducer compatibility (see specifications at page 5)	ODTE1A15000 (4-20 mA, 150 mm) ODTE1A20000 (4-20 mA, 200 mm) ODTE150VV00 (VW+T, 150 mm)	ODTE1A15000 (4-20 mA, 150 mm) ODTE1A20000 (4-20 mA, 200 mm) ODTE150VV00 (VW+T, 150 mm)
GROUTABLE ANCHORS		
Materials	galvanized steel rebar	galvanized steel rebar
Diameter / length	Ø 16 mm / 400 mm (0.625" / 16")	Ø 22 mm, 400 mm
RODS AND SLEEVES		
Product codes	0D221BMFG00 <sup>(3)</sup>	0D221BMAC00 <sup>(4)</sup>

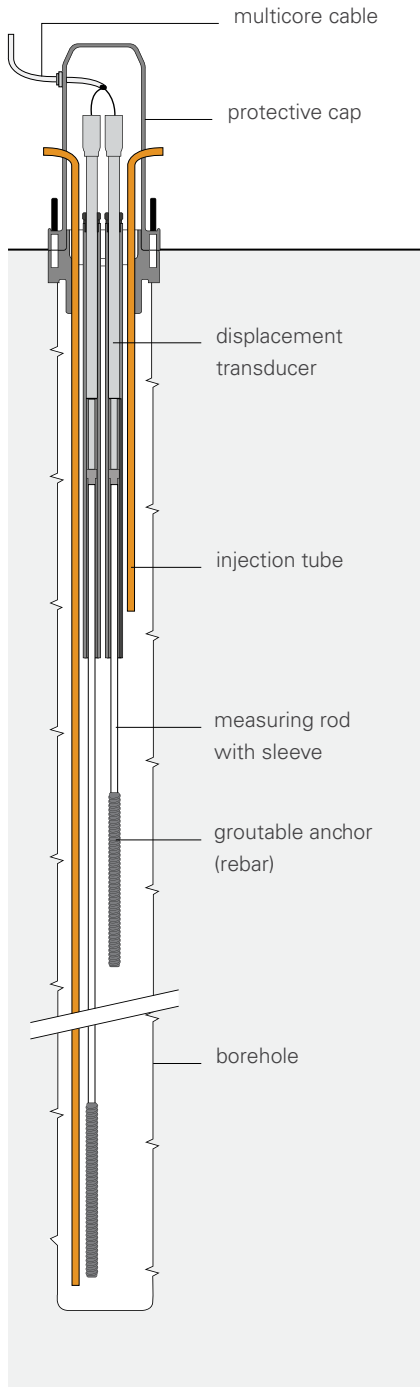
(1) MPBX product codes include an instrument head, a short top cap (0D222TOP100), and anchors. Rods, transducers, and protective caps for transducers are not included. Codes for these items are found on page 4 and 5.

(2) This MPBX is for manual readings only. It does not support displacement transducers.

(3) Fiberglass rods and sleeves are attached at factory. Specify depth for each anchor at order. See technical specifications, page 4.

(4) Stainless steel rods are supplied in 2m lengths and assembled on site. Specify depth for each anchor so that factory can supply the proper number of rods and sleeves length. See technical specifications, page 4.





## RODS AND SLEEVES

PRODUCT CODES	0D221BMFG00	0D221BMAC00
Rod material	fiberglass	stainless steel
Coefficient of linear expansion	$5.0 \times 10^{-6} / ^\circ\text{C}$	$12.0 \times 10^{-6} / ^\circ\text{C}$
Rod type	pre-assembled	2m (6.5') section (assembled on site)
Rod junctions	continuous	threaded couplings (M/F)
Diameter	7 mm (0.28")	8 mm (0.31")
Weight	0.20 kg/m	0.40 kg/m
Protective antifriction sleeve	nylon 11 (riisan), OD 12 mm	nylon 11 (riisan), OD 12 mm
Rod-anchor connection	fitted at factory	quick joint

## PROTECTIVE CAPS

PRODUCT CODES	0D222TOP100 <sup>(1)</sup>	0D222TOP200
Length	100 mm (3.9")	200 mm (7.9")
Diameter	120 mm (4.7")	120 mm (4.7")
Material	ABS	ABS
Transducer compatibility	No transducer allowed (only for manual measurements with dial gauge)	0DTE010VW00 (VW+T, 10mm) 0DTE025VW00 (VW+T, 25mm) 0DTE050VW00 (VW+T, 50mm) 0DTE1A02500 (4-20 mA, 25mm)

PRODUCT CODES	0D222TOP320	0D222TOP520
Length	320 mm (12.6")	520 mm (20.5")
Diameter	120 mm (4.7")	126 mm (5.0")
Material	ABS	ABS
Transducer compatibility	0DTE100VW00 (VW+T, 100mm) 0DTE1A05000 (4-20 mA, 50mm) 0DTE1A10000 (4-20 mA, 100mm)	0DTE150VW00 (VW+T, 150mm) 0DTE1A15000 (4-20 mA, 150mm) 0DTE1A20000 (4-20 mA, 200mm)

(1) Short top cap is supplied as default with all the MPBX if a longer top cap to cover displacement transducer is not required.

## DIGITAL DEPTH GAUGE

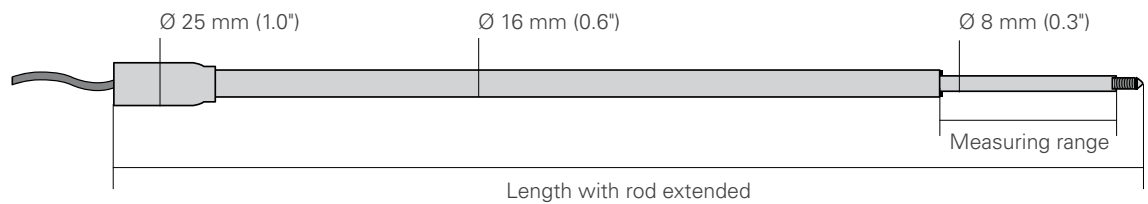
Digital depth gauge is used for manual readings. It includes " It includes gauge with LCD display in metric and imperial units, a 1.5V SR44 battery, a 200 mm extension rod, two 100 mm extension rods, a calibration device, and a carrying case.



PRODUCT CODE	0DIGD020000
Range	200 mm (7.9")
Resolution	0.01 mm (0.0004")
Temperature rating	0° C - 40° C
Humidity rating	≤ 80%

## VIBRATING WIRE DISPLACEMENT TRANSDUCERS

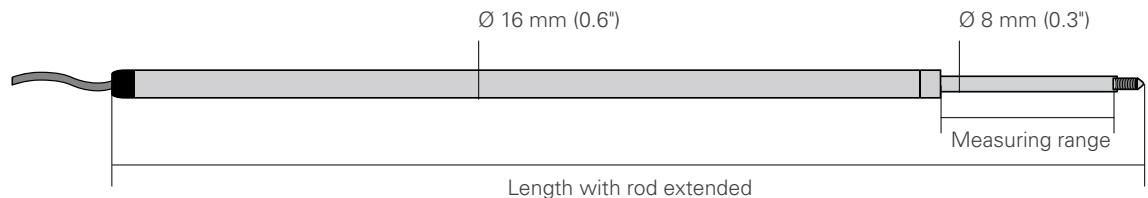
PRODUCT CODES	ODTE010VW00	ODTE025VW00	ODTE050VW00	ODTE100VW00	ODTE150VW00
Technology	vibrating wire with built-in thermistor				
Range	10 mm (0.4")	25 mm (1.0")	50 mm (2.0")	100 mm (3.9")	150 mm (5.9")
Total accuracy <sup>(1)</sup>	< ±0.50% FS	< ±0.50% FS	< ±0.30% FS	< ±0.30% FS	< ±0.30% FS
Output signal	frequency (displacement), Ohm (thermistor)				
Typical frequency range <sup>(2)</sup>	2250 - 3000 Hz				
Operating temperature	- 20°C +80°C				
Thermal coefficient of expansion	50 ppm / °C				
Length (compressed)	176 mm (6.9")	183 mm (7.2")	248 mm (9.8")	379 mm (14.9")	510 mm (20.1")
Length with rod extended	186 mm (7.3")	208 mm (8.2")	298 mm (11.8")	479 mm (18.8")	660 mm (26.0")
Weight	0.2 Kg	0.2 Kg	0.2 Kg	0.3 Kg	0.3 Kg
Protection	IP68 up to 1.0 MPa				
Max cable length to logger <sup>(3)</sup>	1000 m (for more information see <a href="#">FAQ#77</a> )				



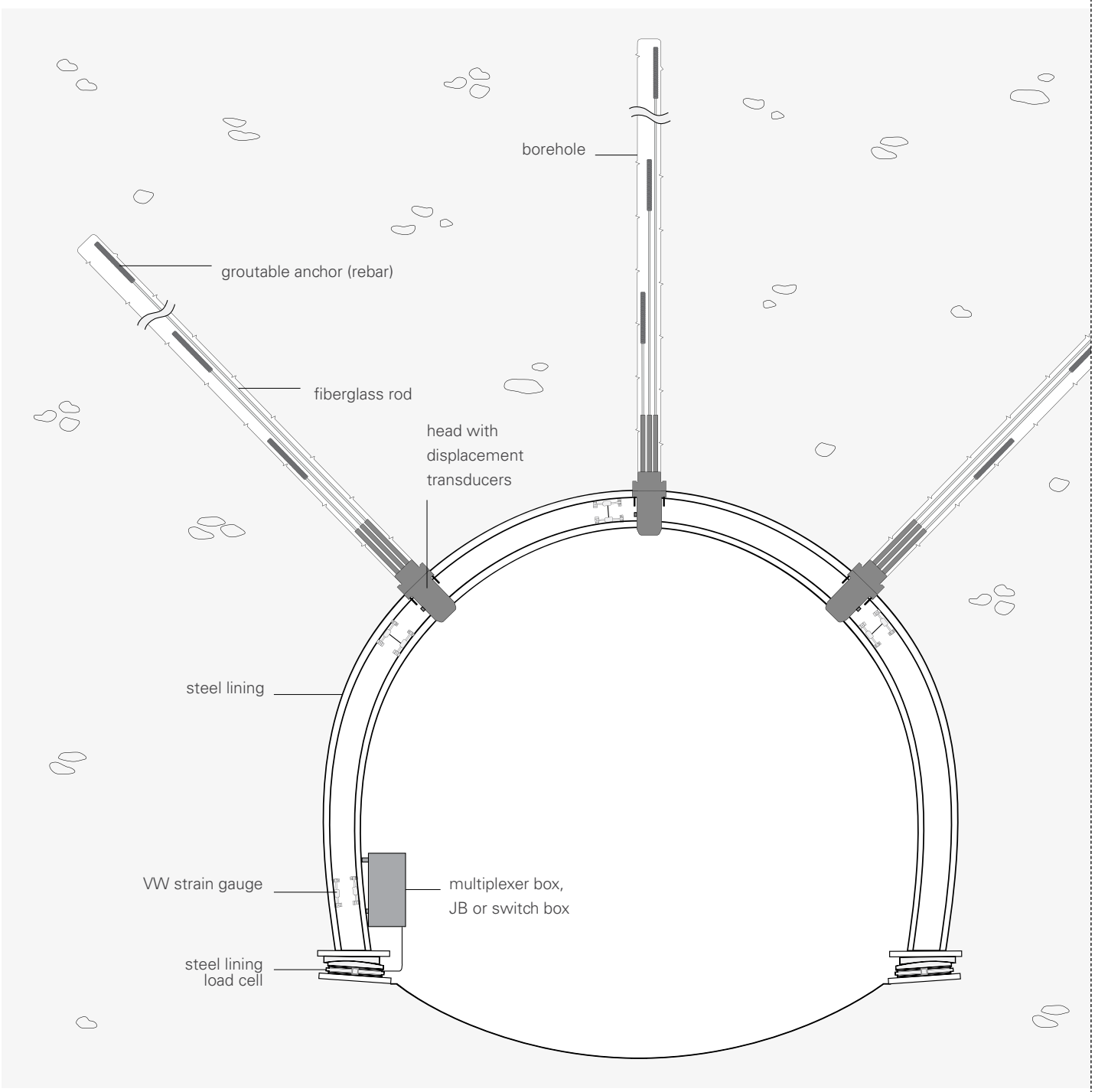
## ELECTRICAL DISPLACEMENT TRANSDUCERS

PRODUCT CODES	ODTE1A02500	ODTE1A05000	ODTE1A10000	ODTE1A15000	DTE1A20000
Technology	Linear potentiometer				
Range	25 mm (1")	50 mm (2")	100 mm (4")	150 mm (5.9")	200 mm (7.9")
Total accuracy <sup>(1)</sup>	< ±0.30% FS	< ±0.20% FS	< ±0.20% FS	< ±0.15% FS	< ±0.15% FS
Output signal	4-20 mA current loop (displacement)				
Power supply	12 - 24 V DC				
Operating temperature	- 20°C +80°C				
Thermal coefficient of expansion	50 ppm / °C				
Length (compressed)	272 mm (10.7")	322 mm (12.7")	422 mm (16.6")	522 mm (20.6")	622 mm (24.5")
Length (with rod extended)	297 mm (11.7")	372 mm (14.7")	522 mm (20.6")	672 mm (26.6")	822 mm (32.4")
Weight	0.2 Kg	0.2 Kg	0.3 Kg	0.4 Kg	0.5 Kg
Protection	IP68 up to 1.0 MPa				
Max cable length to logger <sup>(3)</sup>	1000 m (for more information see <a href="#">FAQ#77</a> )				

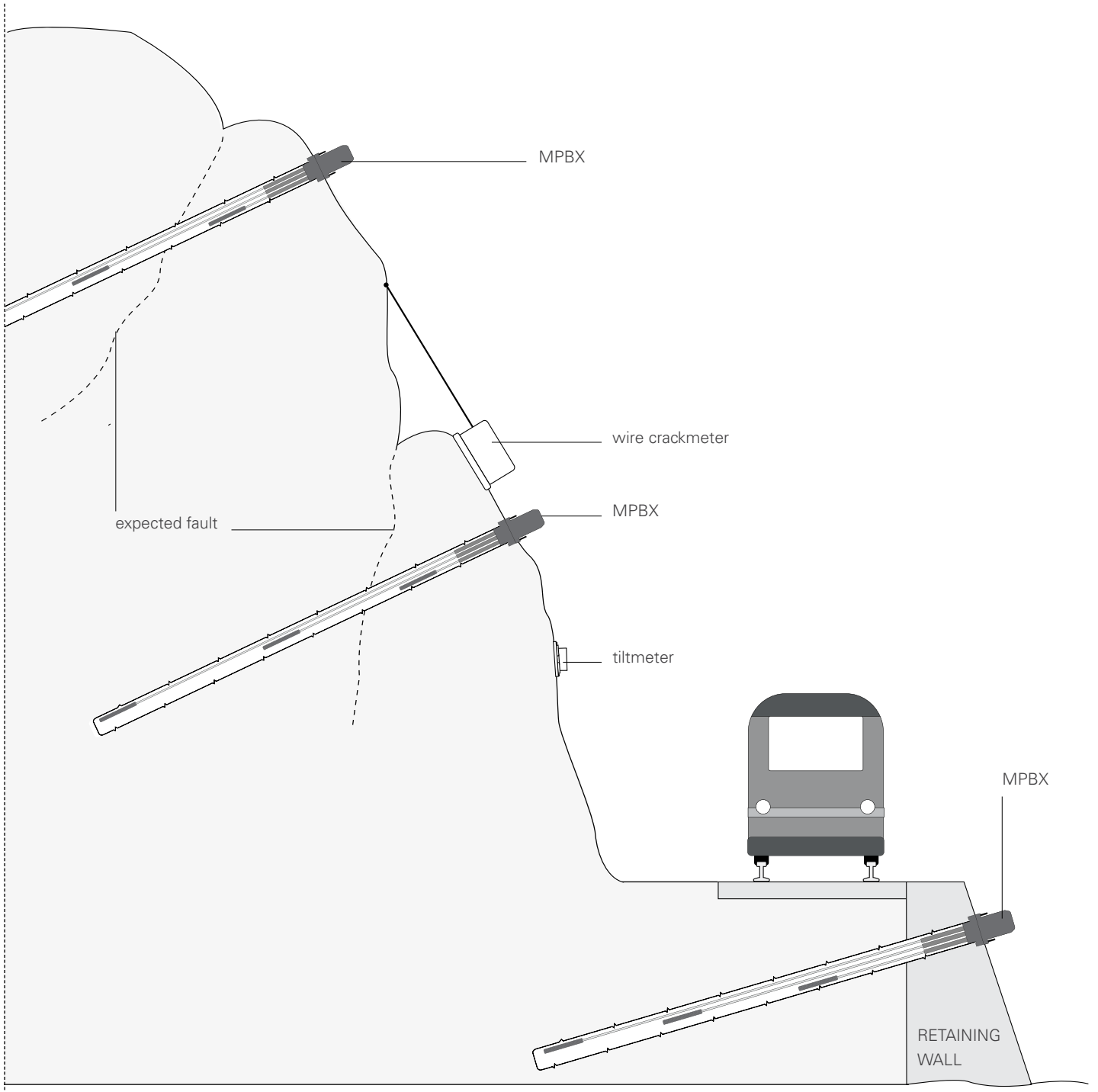
(1) including linearity, hysteresis and repeatability (2) The expressed frequency range could have a ±10% variation (3) refer to FAQ section of Sisgeo website: [www.sisgeo.com/faq](http://www.sisgeo.com/faq)



TYPICAL TUNNEL APPLICATION



# APPLICATION IN ROCKFALL OR TOPPLE LANDSLIDE



## ACCESSORIES AND SPARE PARTS

### FG INSTALLATION KIT OD222K6FG00

Kit for fiberglass MPBX. Useful for mounting sensors and for shortening rod length.

### AC INSTALLATION KIT OD222K7AC00

Kit for stainless steel MPBX. Useful for mounting sensors and for shortening rod length.

### SWITCH BOX OEPC0000S00

Various sizes to accommodate up to 24 displacement transducers.

### 16-WIRE SIGNAL CABLE OWE1160LSZH

Multicore cable with 8 pairs of 24 AWG wire, with LSZH jacket. Used to connect instruments to multiplexer, switch box, or datalogger.

### 32-WIRE SIGNAL CABLE OWE1320LSZH

Multicore cable with 16 pairs of 24 AWG wire, with LSZH jacket. Used to connect instruments to multiplexer, switch box, or datalogger.

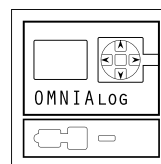
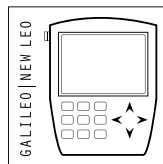
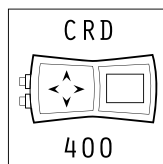
### MULTIPLEXER BOX 00MNO0MUX00

Multiplexer board with surge protection, housed in IP67 box. Local operation with New Leonardo readout; remote operation with datalogger connected by RS484 digital bus.



MPBX head with displacement transducers, installed on retaining wall

## READABLE BY



Refer to separate datasheets for further information.

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### TECHNICAL ASSISTANCE

SISGEO offers customers e-mail and phone assistance to ensure proper use of instruments and readout and to maximize performance of the system.

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