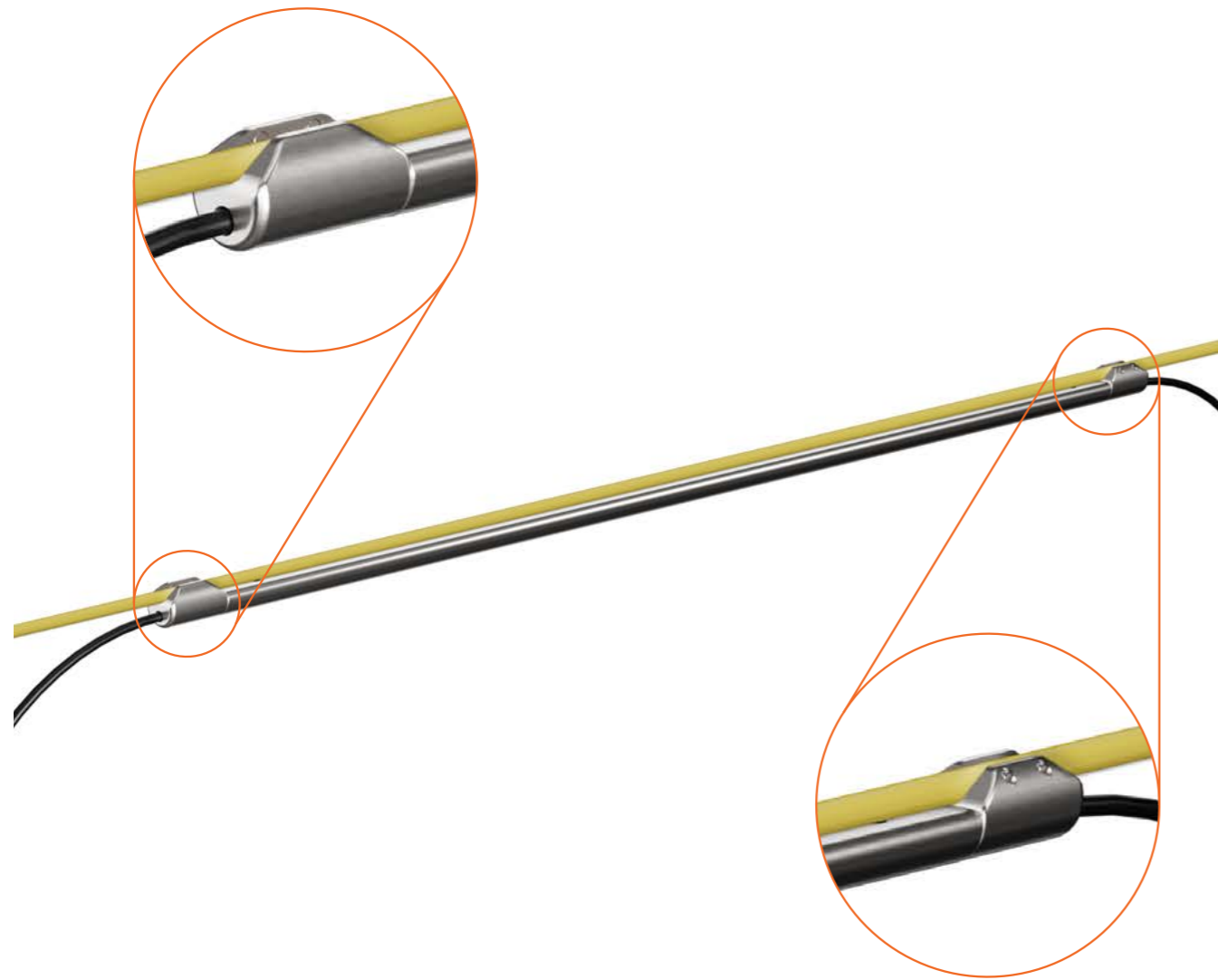




## In-Place Extensometer (IPX) Product Data Sheet

High precision, cost effective settlement monitoring



## In-Place Extensometer (IPX)

### DESCRIPTION

The Osprey Measurement Systems In-Place Extensometer (IPX) automates new or existing magnetic extensometer installations to provide high precision vertical displacement measurements in near-real time.

The IPX has been designed to enhance the many benefits of traditional magnetic extensometers such as offering a high capacity for number of measurement points in a single borehole, a large measurement range, and the flexibility to adapt the system with construction activities such as embankment raises or excavation.

The system is simple to install and adapt with our unique side mounted rod support system and single cable RS485 bus. It is integrated as standard on most geotechnical data loggers and is low power enough to be supported by a data logger's internal battery.

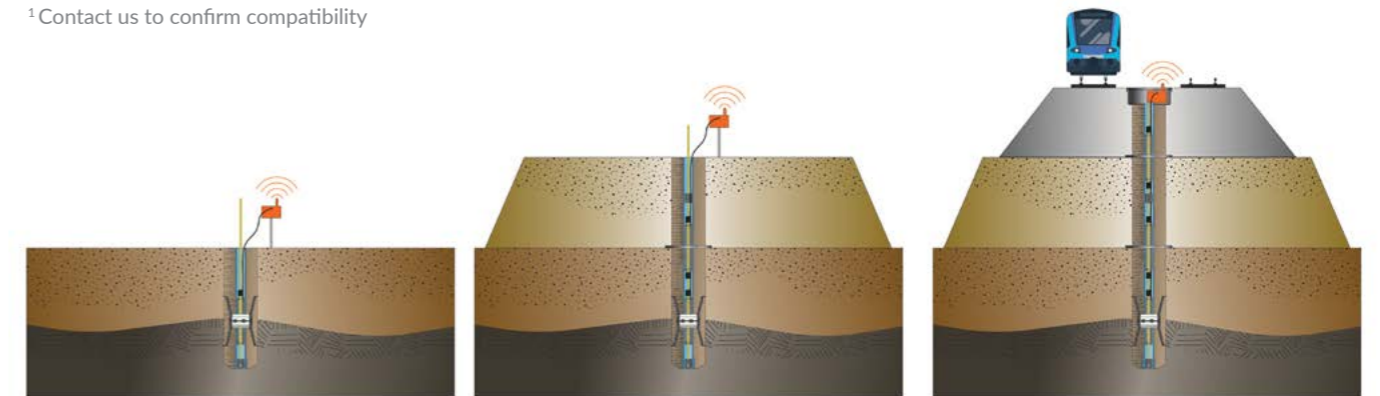
### FEATURES

- Low profile – can be installed in standard 33mm magnetic extensometer access tube
- High density – up to 40 instruments per borehole
- Single cable bus system allows easy, low-cost data logging and telemetry options
- Top or bottom supported installation to suit your application
- Low power – no external power supply or solar panels
- Compatible and retrofittable with most existing magnetic extensometers<sup>1</sup>
- Designed specifically for ease of extension with fill raises or shortening with excavation
- Output in engineering units – no data conversion necessary

<sup>1</sup>Contact us to confirm compatibility

### APPLICATIONS

- Consolidation of soil and fill during embankment construction
- Heave during and post excavation
- Subsidence of tunnels or mines
- Tunnel convergence
- Slope stability – cuttings, embankments or natural slopes
- Lateral displacement beneath an embankment or in a slope



### Compatible

Can be installed in most standard magnetic extensometers and with all leading geotechnical data loggers, with up to 40 sensors able to be connected to a single battery powered data logger.

### Adaptable

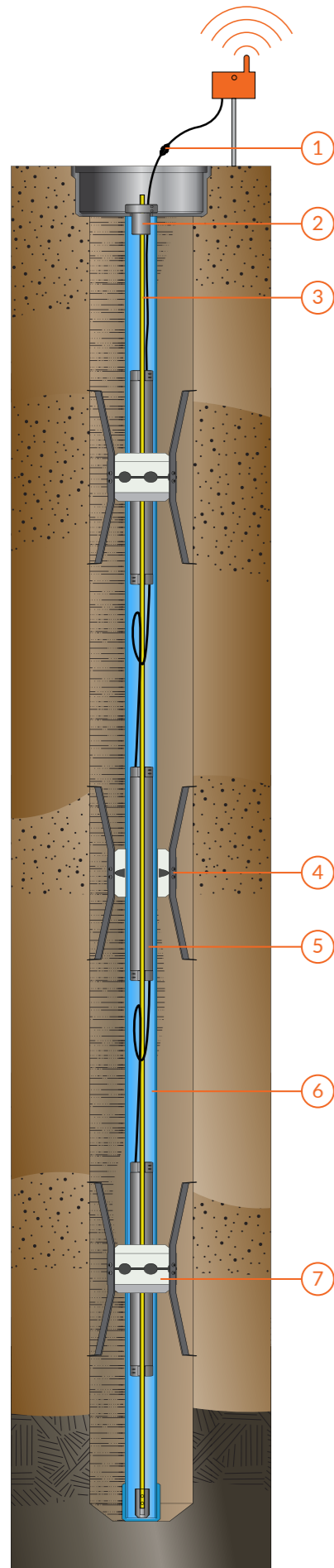
Easily raised through fill or reduced with cutting – the IPX's distinct bottom supported configuration allows easy extension or reduction without interfering with the existing sensors.

### Adjustable

Our unique side mounted rod support system allows you to adjust sensor positions quickly and easily. In-line connectors simplify adding or removing sensors as construction work progresses.

The In-Place Extensometer was developed in collaboration with University College London's Department of Civil, Environmental and Geomatic Engineering.

Osprey Measurement Systems products are manufactured in the United Kingdom in accordance with our UKAS accredited ISO 9001:2015 quality management system.



## COMPONENTS

### In-Line Submersible Connector

Field connections made easy -the in-line submersible connector allows you to quickly connect and disconnect data loggers or additional instruments.



### Top Support

Can be used to suspend the string from the top of the casing in top supported installations. Includes an M12 socket for secure fitting of survey markers or prisms.



### GRP Support Rod

High quality plastic coated GRP rod - 6mm OD - comes with stand and reel with braking mechanism for safe and efficient installation. Refill lengths also available.



### Magnetic Target

(Supplied by others) The IPX is compatible with most standard magnetic targets. Magnetic targets are grouted within the borehole and move with the surrounding ground independently of the access tube.



### In-Place Extensometer

High precision digital magnet displacement sensor, 20mm OD, Digital Serial BUS, 2mm set screws for mounting on 6mm GRP Rod.



### Access tube

(Supplied by others) The IPX is compatible with standard 1"(25.4mm) ID access tube provided care is taken to ensure a straight installation. Osprey recommends the use of 35mm ID access tube where lateral deformation is likely.

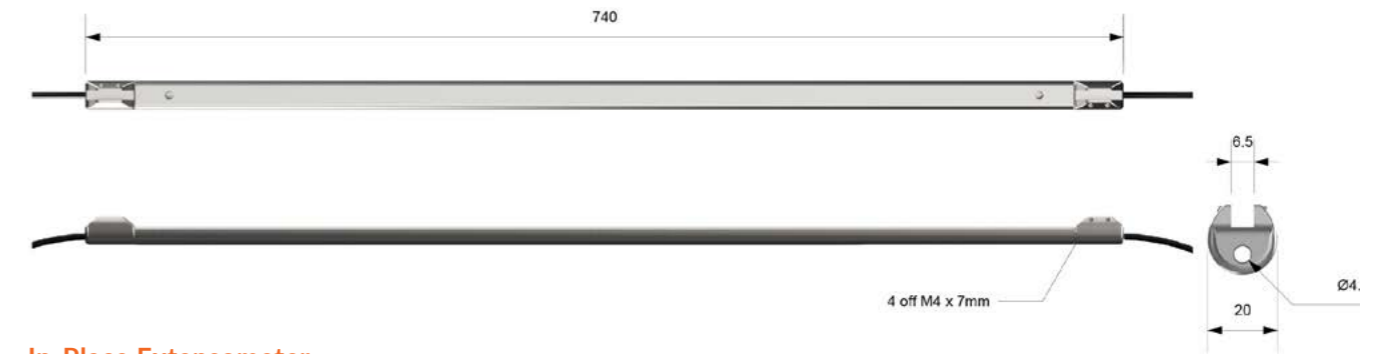


### Bottom Support

Protects GRP support rod during installation and throughout operational life. High quality stainless steel with two 2mm set screws for securing to the rod.



## SPECIFICATIONS

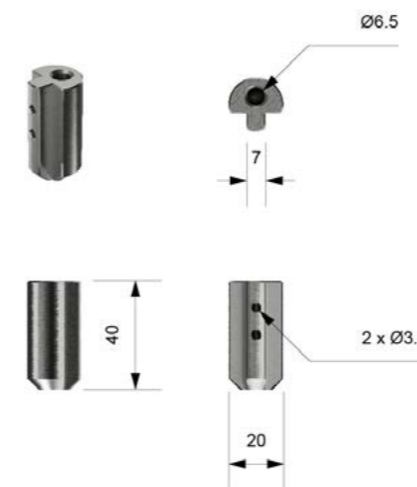
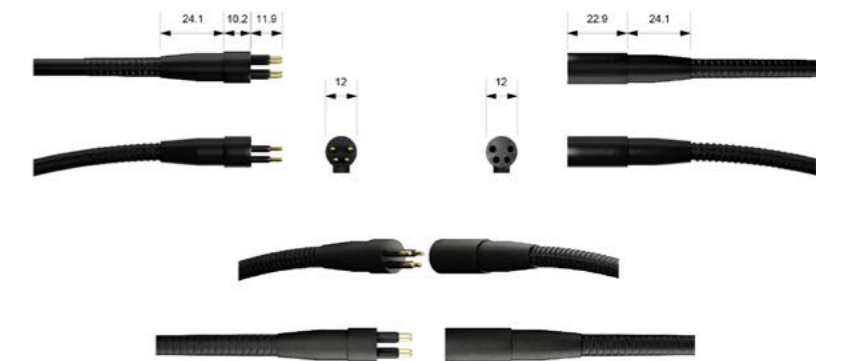


### In-Place Extensometer

- IPX-08-040 - 740mm long, 400mm nominal active measurement range

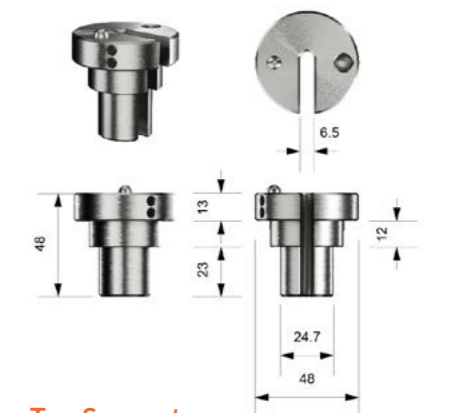
### In-Line Submersible Connector

- IPX-C-4FS - Female Socket
- IPX-C-4MP - Male Plug
- IPX-C-MD - Male Dummy
- IPX-C-FD - Female Dummy
- Twisted Pair Cable
- IPX-C-050 - Twisted pair cable, 4 x 0.5mm<sup>2</sup>



### Bottom Support

- IPX-A-BS



### Top Support

- IPX-A-TS-45 - Fits 25mm or 35mm ID access tube



### GRP Support Rod

- IPX-A-R06A - 60m rod with reel
- IPX-A-R10A - 100m rod with reel
- IPX-A-R15A - 150m rod with reel
- IPX-A-R06S - 60m rod refill
- IPX-A-R10S - 100m rod refill
- IPX-A-R15S - 150m rod refill



Magnetic Target



Access tube

## PERFORMANCE SPECIFICATIONS

Range <sup>1</sup>	400mm			
Resolution	0.001mm			
Precision	±0.05mm			
Repeatability	±0.06mm			
Accuracy	Displacement	±200mm	±100mm	±25mm
	Accuracy <sup>1</sup>	±0.25mm ±0.07%fs	±0.2mm ±0.1%fs	±0.15mm ±0.3%fs
Power supply	4-16VDC			
Power Consumption (12V)	Boot	Idle	Measure	
	100ms@50mA	4mA	500ms@20mA	

All uncertainties stated to 2σ.

<sup>1</sup> May vary depending on magnetic target used

<sup>2</sup> By Request

## SPECIFICATIONS - PHYSICAL

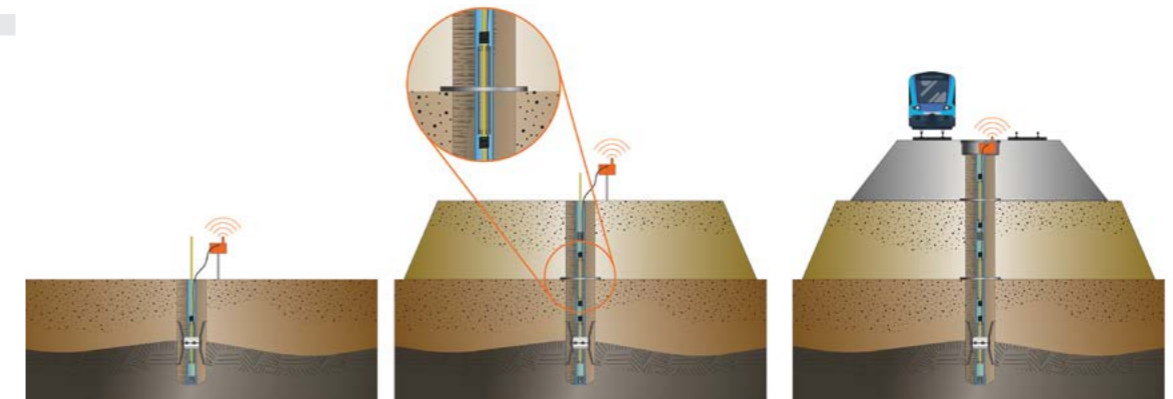
Material	316L Stainless Steel
Dimensions	740mm x 20mm
Weight	675g

## SPECIFICATIONS - ACCESSORIES

Cable	4x0.5mm <sup>2</sup> , 5.5mm R-118 compliant PUR Jacket
Cable Weight	30g/m
Support rod	4mm GRP with 2mm plastic overwrap
Support rod weight	40g/m
Top/bottom support material	316L Stainless Steel



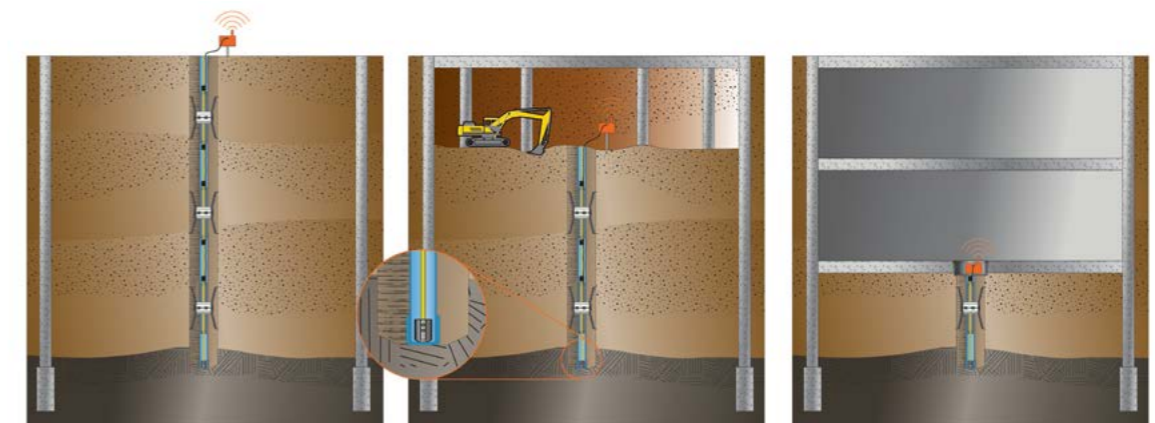
## APPLICATIONS



### Settlement

Road and rail embankments - Earthfill embankment dams - Upstream tailings dam raises - Pre-load and surcharging

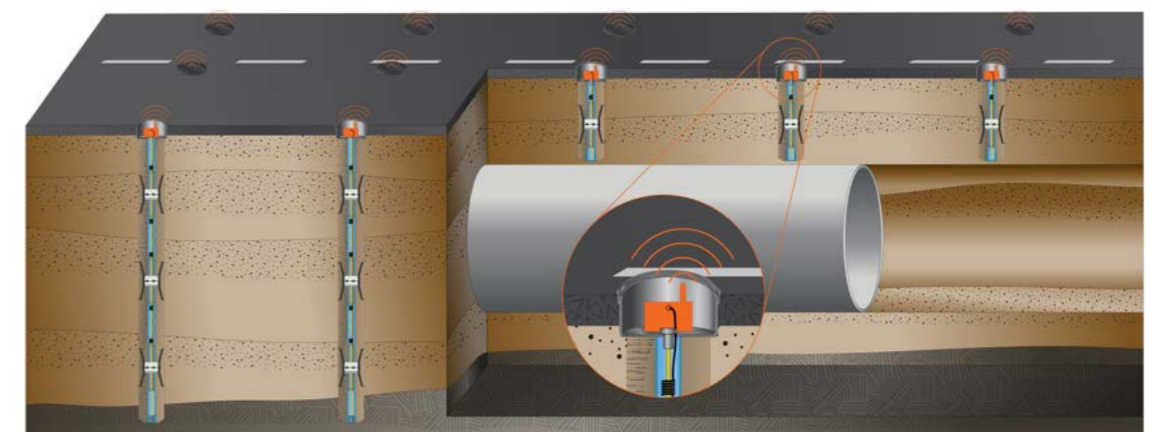
Easily extend through fill to accommodate embankment raises.  
The low drift sensor design makes the IPX ideal for long term monitoring.



### Heave

Top down construction - Road and rail cuttings - Cut and cover tunnels - Surcharge removal

The bottom support allows reduction of system height without interrupting monitoring.



### Subsidence

Tunnels - Mines - Caverns - Underground structures

Top suspended systems allow surface referenced monitoring.  
The compact headworks fit easily within a monitoring well cover.



In-Place Extensometer (IPX)  
Product Data Sheet

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