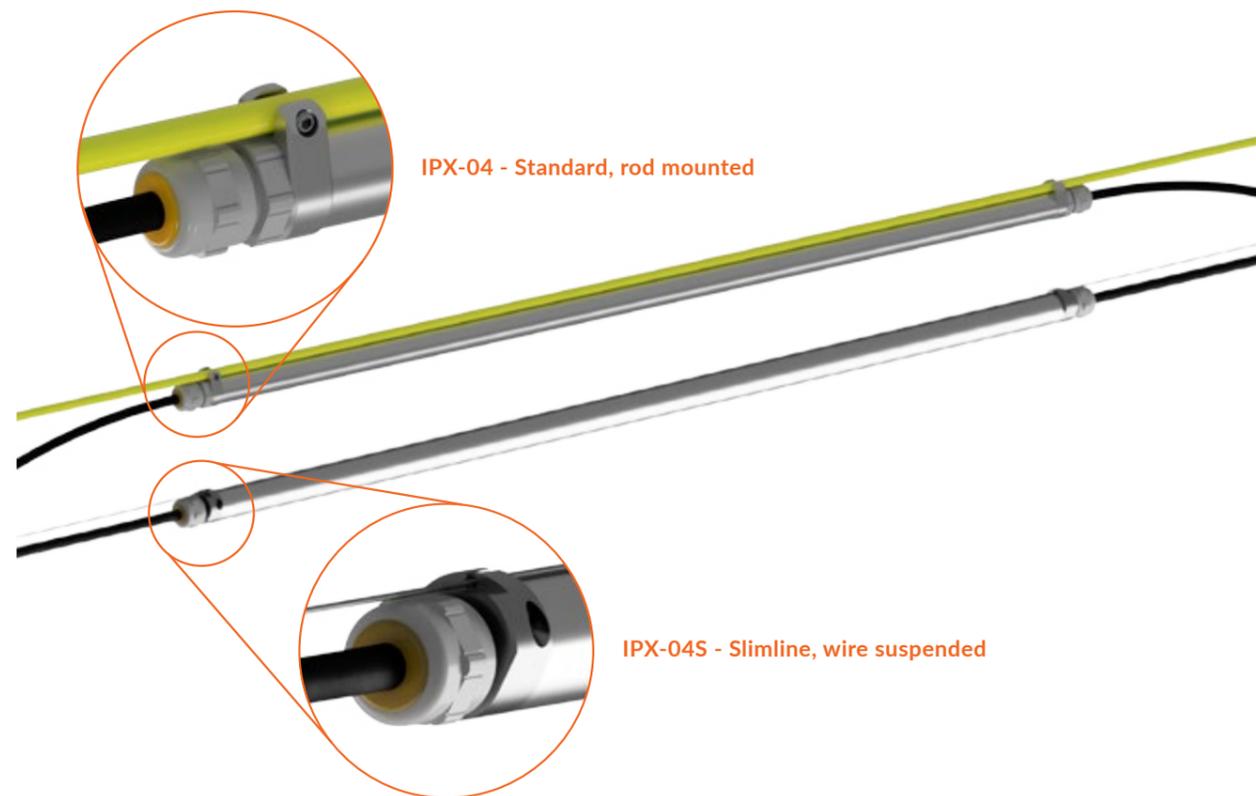




In-Place Extensometer (IPX) Product Data Sheet

Precision Settlement & Heave Monitoring for All Ground Conditions

- Establish trends in days, not weeks
- More data from fewer boreholes
- Adapt with construction for ultimate flexibility



In-Place Extensometer (IPX) Settlement & Heave Monitoring with Depth

DESCRIPTION

The Osprey Measurement Systems In-Place Extensometer (IPX) delivers high-precision, near **real-time data** on settlement or heave within subsurface strata or fill materials. This enables straightforward, automated monitoring of both the rate and magnitude of consolidation or swelling within targeted layers, as well as the distribution of deformation with depth.

Capable of monitoring up to **50 positions** within a single borehole with **sub-millimetric accuracy**, the IPX provides an effective and economical way to gain a comprehensive understanding of ground behaviour in response to your project activities.

Featuring a unique bottom-supported design, the IPX **adapts easily to construction changes** – whether extending with fill or adjusting with excavation. It allows for the addition of **measurement points within fill material**, facilitating the assessment of engineered stabilization and compaction processes.

The IPX is offered with two mounting options: side-mounted rod support for on-site adaptability and wire suspension for straightforward, ready-to-install convenience.

FEATURES

Compatible

- Well suited to all soil types
- Compatible with most existing magnetic extensometer systems ¹
- Integrated with all major geotechnical data loggers ¹

Adaptable

- Up to 50 instruments in a single installation
- Easily target specific strata and stratigraphic boundaries
- Extend through fill or reduce with excavation
- Side mount system makes modifications easy

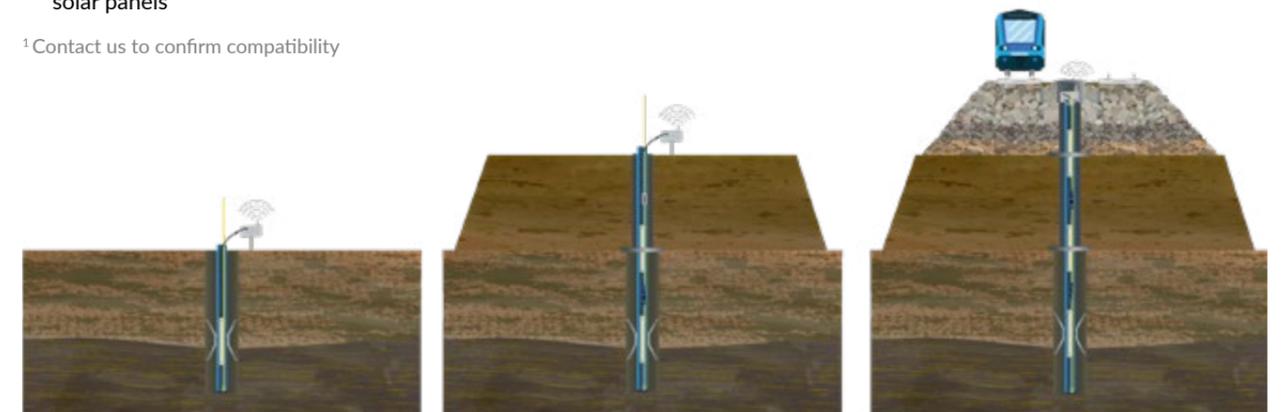
Simple

- Output in engineering units – no data conversion required
- Single cable bus for easy, low-cost data logging and telemetry options
- Low power – no need for external power supply or solar panels

¹Contact us to confirm compatibility

APPLICATIONS

- Consolidation of soil and fill during embankment construction
- Heave during and post-excavation
- Validation of ground improvement design
- Subsidence of tunnels or mines
- Tunnel subsidence and convergence
- Slope stability – cuttings, embankments or natural slopes
- Lateral displacement beneath or within an embankment or slope
- Tailings storage facilities - consolidation of tailings, stability of dams or dry stacks
- Install within borehole to monitor original ground – excellent performance in soft soil, sands, clays or even rock!
- Easily extended through fill to monitor engineered material
- Low profile headworks allows easy, lifetime monitoring of your asset.



MONITOR WITH DEPTH

Install in boreholes to monitor original ground, targeting up to 50 depths. Excellent performance in soft soil, clays or even rock!

ADAPT ON SITE

The IPX's unique bottom supported configuration allows easy extension or reduction without interfering with the existing sensors.

LIFETIME MONITORING

Low profile headworks and low power consumption allow easy, remote and unobtrusive lifetime monitoring of your asset.

The IPX was developed in collaboration with University College London. Osprey Measurement Systems products are manufactured in the United Kingdom in accordance with our UKAS accredited ISO 9001:2015 quality management system.

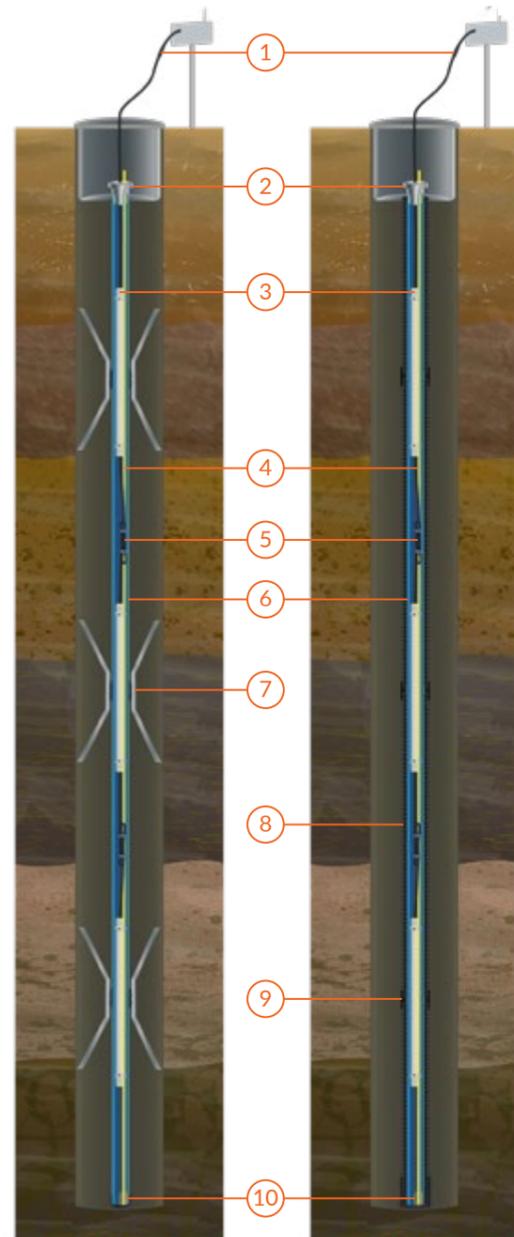
IPX-04 - STANDARD, ROD MOUNTED

Our unique rod-mounted support system allows the sensors to be bottom supported, providing a natural reference and offering easy adaptation during, and post-installation, including extension or reduction at the surface.

The plastic-coated GRP rod provides a robust, temperature stable support for the sensors. Alternatively, the string can be suspended from the top of the casing to allow survey control.

Ideal for

- Embankment Construction
- Cuttings
- Deep excavations
- Ground Remediation
- Tailings Dams



IPX Standard, rod supported, with 6 legged spider magnets

IPX Standard, rod supported, with flexible conduit and magnet target couplers



Field connections made easy. The in-line submersible connector allows you to quickly connect and disconnect data loggers or additional instruments. Dummy connectors available for connector protection. Locking Sleeves available for secure connection where cable tension is likely.



Standard IPX top support to fit 25mm or 35mm ID casing. Includes an M10 socket for secure fitting of survey markers or prisms.



High precision digital magnet displacement transducer to suit 1 1/4" (DN32) access tube. Saddle clamp for easy mounting on 6mm 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.

IPX-04 - SLIMLINE, WIRE SUSPENDED

Wire suspended systems come fully assembled for out-of-the-box deployment. Its slimline design makes it well suited to retro-fitting in traditional 33mm magnetic extensometer access tube to automate existing magnetic extensometers, instantly and significantly improving data quality and availability. Ideal for long-term monitoring, reducing costs and risk.

Ideal for

- Retro-fit with existing, manually monitored magnetic extensometers



Water Blocked 4 x 0.34mm² foil screen cable with drain wire. Black, 6.7mm PUR jacket.



Flush threaded PVC access tube allows cement bonding at joints for simple on-site assembly. 1 1/4" (DN32).



Available in 43mm ID - to suit Osprey 1 1/4" access tube - and 70mm ID - compatible with most flush coupled inclinometer casing. Magnetic targets are grouted within the borehole and move with the surrounding ground independently of the access tube. Available in 3 or 6 legged variants, without legs, or attached to a plate for surface installation.



Compressible, corrugated conduit can be grouted into borehole or within fill for embankment raises, allowing the made ground to settle around the extensometer system. Available in DN50 (for 43mm OD casing) or DN80 (for 70mm OD casing).



In-line magnetic couplers for flexible conduit. Available for DN50 or DN80.



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



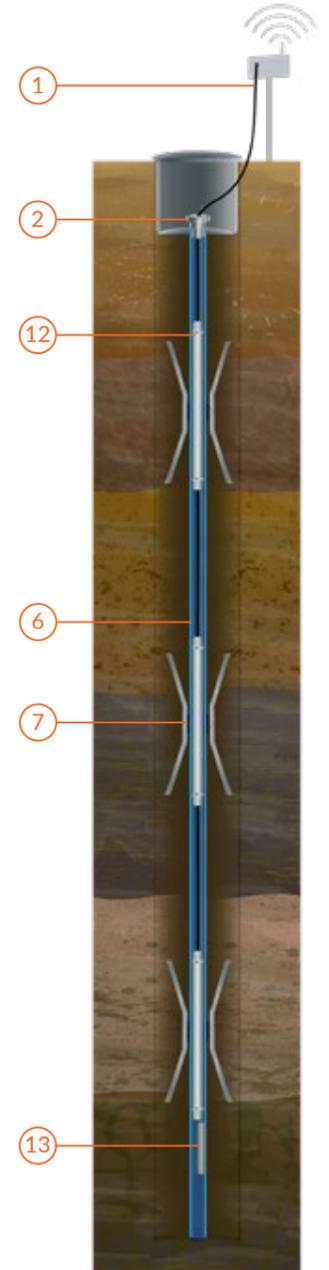
Collar and grub-screw for locking the IPX suspension wire.



High precision digital magnet displacement transducer to suit 1" (DN25) access tube. Wire suspended.



Stainless steel sinker weight for slimline IPX.



IPX Slimline, wire suspended, with 6 legged spider magnets

SPECIFICATIONS

IPX-04



IPX-04-S



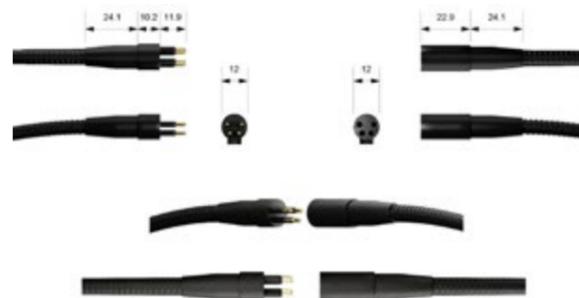
710mm

In-Place Extensometer

- IPX-04 – Standard design, ±200mm measurement range
- IPX-04-S – Slimline design, ±200mm measurement range

Cable and Connectors

- CTP-034-H – Cable, 4 x 22 AWG, 6.7mm OD, LSZH, PUR jacket, water blocked
- CON-S-4MP* – In-line submersible connector – male plug
- CON-S-4FS* – In-line submersible connector – female socket
- CON-SK – In-line splice kit



Bottom Support

- IPX-A-BS – Stainless steel bottom support, 20mm OD



Top Support

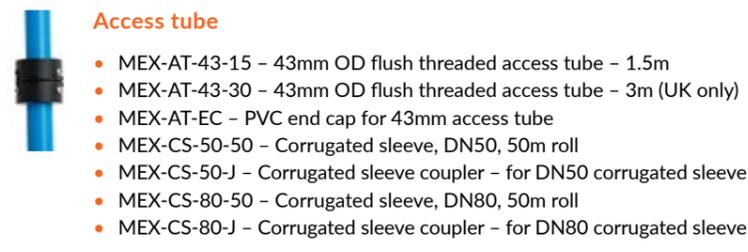
- IPX-A-TS – Stainless steel top support, suitable for 25mm or 35mm ID access pipe



Magnetic Target

For 43mm or 70mm OD access pipe

- MEX-S3 – Spider magnet, 3 legs
- MEX-S6 – Spider magnet, 6 legs
- MEX-PM – Plate magnet
- MEX-DM – Datum magnet
- MEX-MC – Magnetic coupler for corrugated pipe



Access tube

- MEX-AT-43-15 – 43mm OD flush threaded access tube – 1.5m
- MEX-AT-43-30 – 43mm OD flush threaded access tube – 3m (UK only)
- MEX-AT-EC – PVC end cap for 43mm access tube
- MEX-CS-50-50 – Corrugated sleeve, DN50, 50m roll
- MEX-CS-50-J – Corrugated sleeve coupler – for DN50 corrugated sleeve
- MEX-CS-80-50 – Corrugated sleeve, DN80, 50m roll
- MEX-CS-80-J – Corrugated sleeve coupler – for DN80 corrugated sleeve

GRP Support Rod – 6mm

- ROD-06A* – GRP rod with reel, 60m
- ROD-10A* – GRP rod with reel, 100m
- ROD-15A* – GRP rod with reel, 150m



Slimline In-Place Extensometer Suspension Kit

- IPX-A-SUS – includes top support, wire suspension clamp, 1mm stainless steel wire and sinker weight
- IPX-A-SW1 – Spare sinker weight for slimline IPX

PERFORMANCE SPECIFICATIONS

| | | | | |
|-------------------------|-----------------------|---------|------------|---------|
| Range ¹ | | 400mm | | |
| Resolution | | 0.01mm | | |
| Precision | | ±0.01mm | | |
| Repeatability | | ±0.03mm | | |
| Accuracy | Displacement | ±200mm | ±100mm | ±25mm |
| | Accuracy ¹ | ±0.2mm | ±0.1mm | ±0.05mm |
| Power supply | | 4-16VDC | | |
| Power Consumption (12V) | Boot | Idle | Measure | |
| | 100ms@50mA | 4mA | 500ms@20mA | |

All uncertainties stated to 2σ.

¹ May vary depending on magnetic target used

SPECIFICATIONS - PHYSICAL

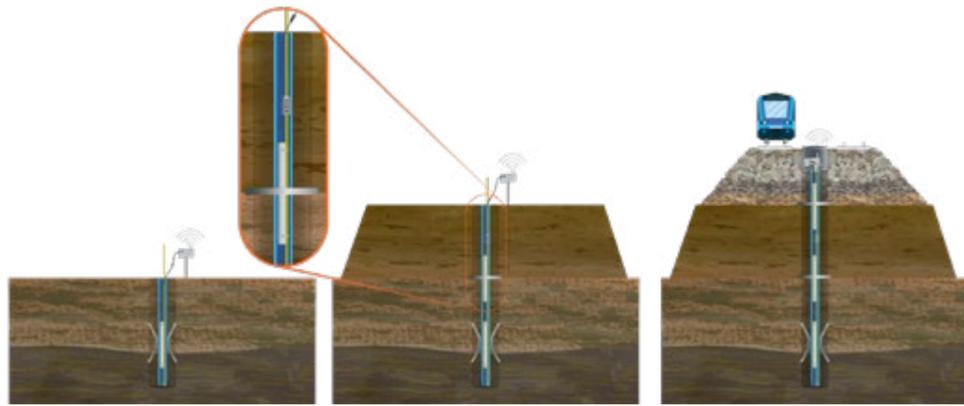
| | |
|------------|---------------------------|
| Material | Grade 316 Stainless Steel |
| Dimensions | 710mm x 26 / 21mm |
| Weight | 540g |

SPECIFICATIONS - ACCESSORIES

| | |
|-----------------------------|-----------------------------------|
| Cable | 4 x 22AWG, LSZH, 6.7mm 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

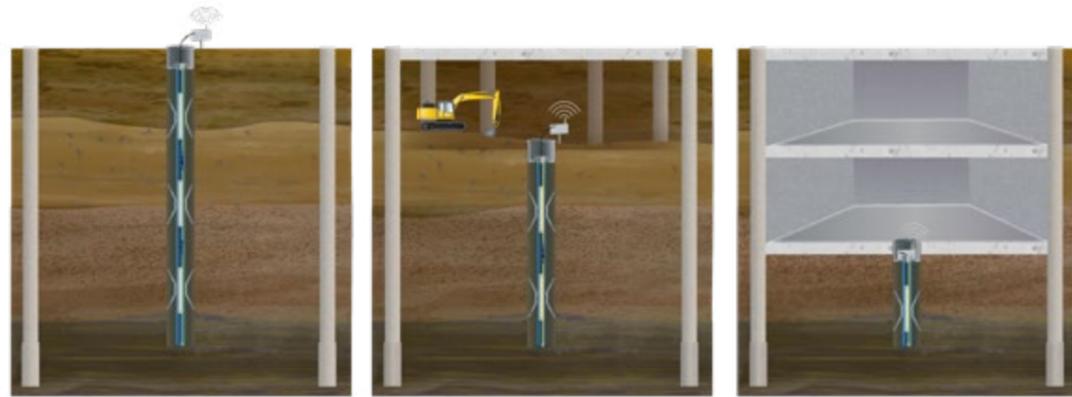


Consolidation

Road & Rail Embankments – Earthfill Dams – Tailings Dams – Pre-Load & Surcharging

Easily Extend through fill to accommodate embankment raises.

Well suited to all ground types thanks to high precision, contactless displacement transducer.

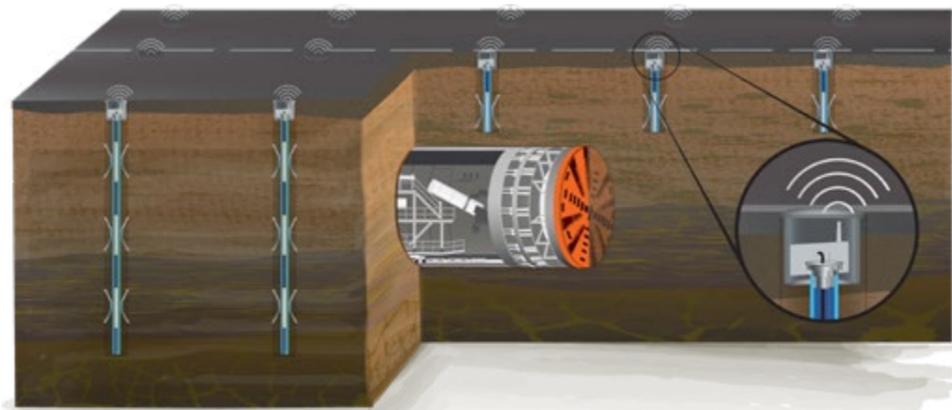


Heave

Top Down Construction – Road & Railing Cuttings – Cut and Cover Tunnels – Surcharge Removal

Bottom support allows monitoring continuity from pre-construction to asset operation.

Zero-drift sensor makes the IPX ideal for long term monitoring.

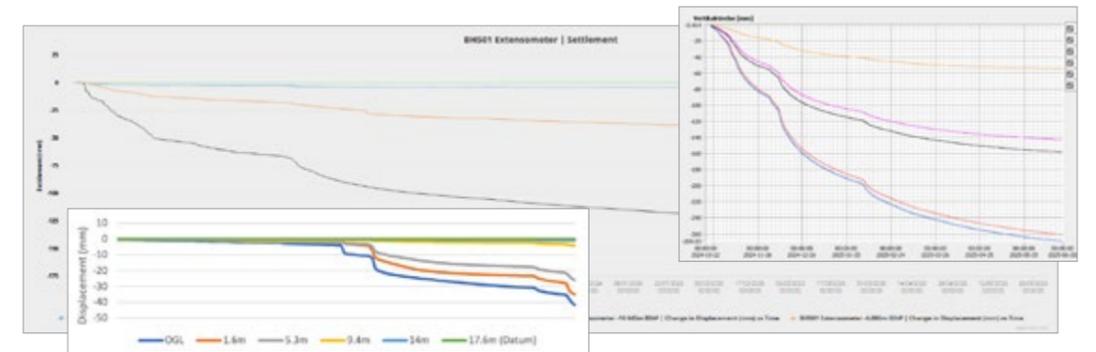


Subsidence

Tunnels – Mines – Caverns – Underground Structures

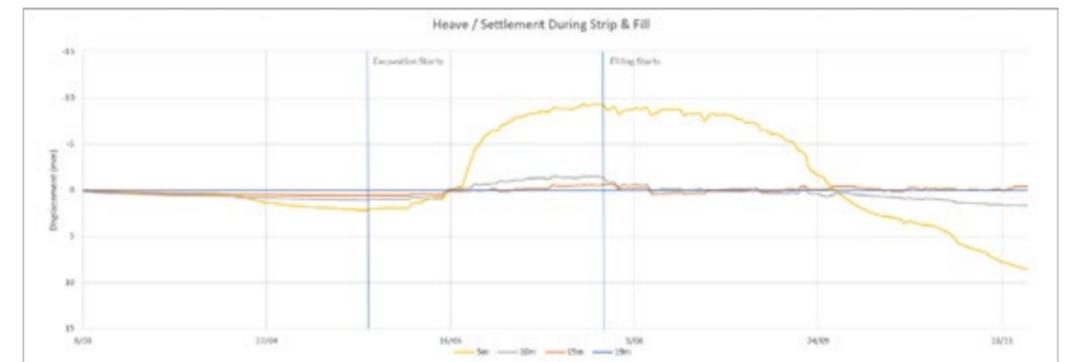
Top suspended system allows external referencing for absolute displacement monitoring.
The compact headworks fit easily within a monitoring well cover for low profile installations.

GRAPHS / DATA



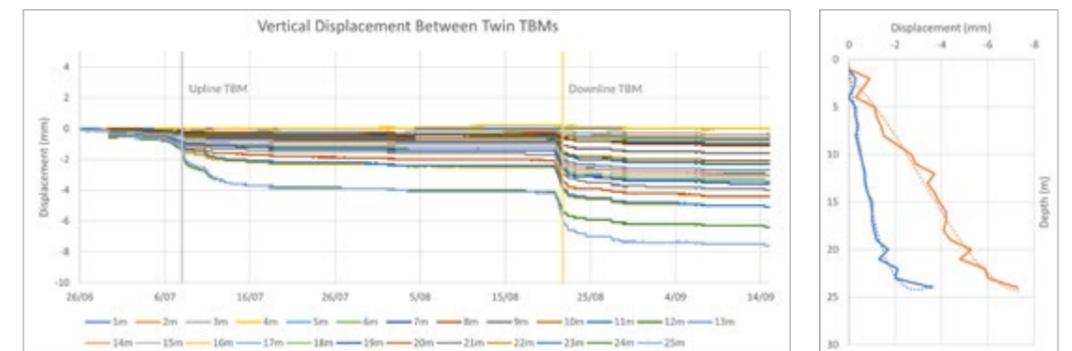
Targeted Consolidation Tracking

Promptly identify consolidation and heave trends to guide embankment construction and optimise fill rates.



Optimized Construction Control

Detailed movement trends help fine-tune excavation sequences, ground support designs, and construction timelines.



Unparalleled Deformation Insight

High-density, multi-point measurements provide a detailed displacement profile throughout the entire borehole length, validating designs, supporting smarter decisions, and protecting your team from the unexpected.





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Product Data Sheet

Osprey Measurement Systems International Ltd
6-11 Bluebell Business Estate,
Sheffield Park, East Sussex
TN22 3HQ
+44 (0) 20 3355 4447
info@ospreymeasurement.com