

Instrument Datasheet

# IPX In-Place Extensometer

## DESCRIPTION

The In-Place Extensometer (IPX) offers automated monitoring of standard magnetic extensometer installations. The system is designed for a simple, adaptable installation with a single cable connection at the top of the borehole. Its large measurement range accommodates large levels of settlement or heave, and ease of adjustment means they can be reconfigured for changed site conditions such as embankment filling or cutting.

The IPX can be installed in most standard magnetic extensometer installations. It is compatible with most leading digital geotechnical data loggers and

its low power consumption allows over 50 sensors to be connected to a single battery powered logger.

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.

A unique coiled cable system allows adjustment of the sensor spacing according to site conditions. The cable's coiled section allows 500mm of adjustment to the sensor's position within the borehole.

## FEATURES

- ✓ Single cable bus system allows easy, low-cost data logging and telemetry
- ✓ Fibreglass rod side mounting system for top or bottom supported installation to suit your application
- ✓ Small diameter sensor is compatible with most standard magnetic extensometer systems
- ✓ Retrofittable on existing magnetic extensometers
- ✓ Designed specifically for ease of extension with fill raises or shortening with excavation
- ✓ Output in engineering units – no data conversion necessary

## APPLICATIONS

Typical applications include:

- ✓ Monitoring consolidation of soft ground during filling
- ✓ Identifying consolidation zones
- ✓ Heave following excavation
- ✓ Subsidence above a tunnel or cavern
- ✓ Lateral displacement beneath an embankment or in a slope

# SPECIFICATIONS

## PERFORMANCE

Range	400mm
Resolution	0.1mm
Accuracy <sup>1</sup>	±0.5mm
Signal output	Digital RS-485
Power supply	4-30VDC
Power consumption (idle/ active)	229mW/ 87mW
Time per measurement (warm-up/ reading)	20.3 seconds/ 2 seconds
Temperature range	-40° to 80°
Max sensors per string <sup>3</sup>	27
Max length of string	100m

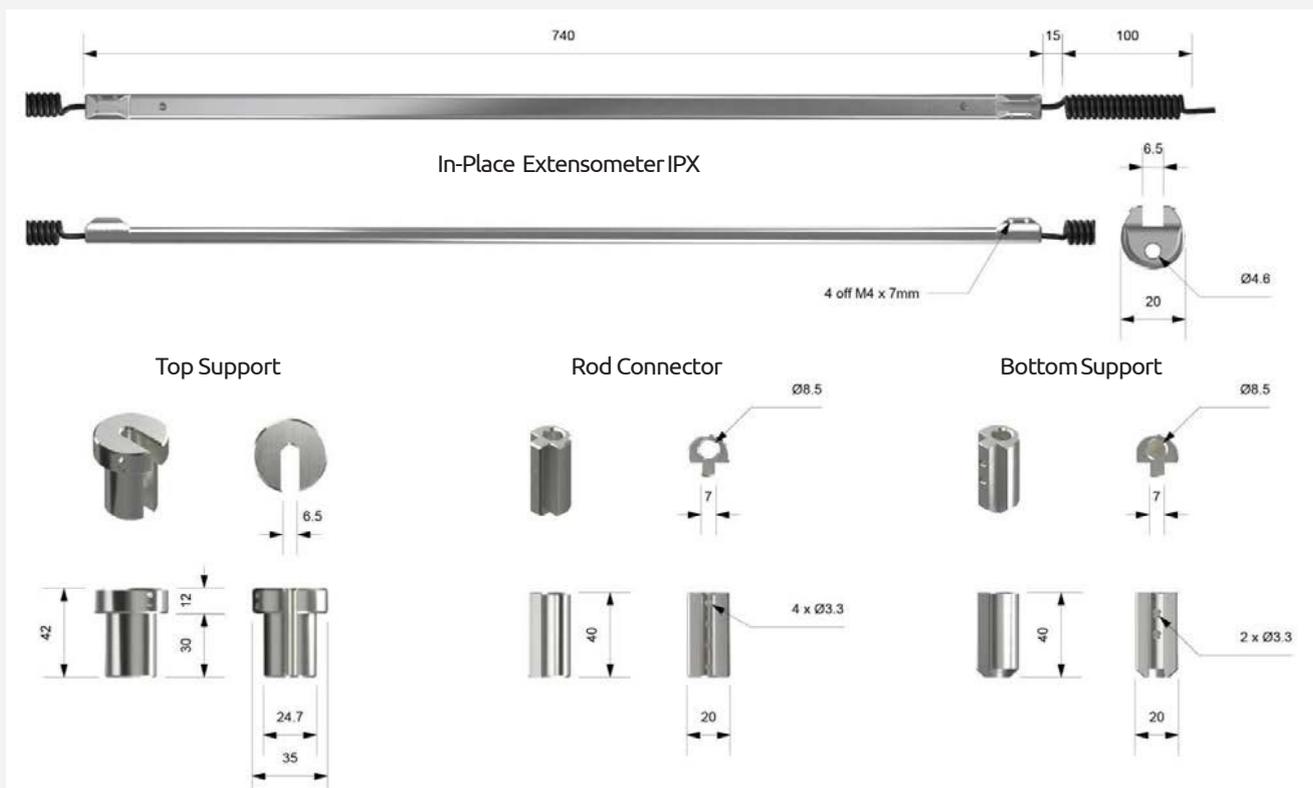
## PHYSICAL

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

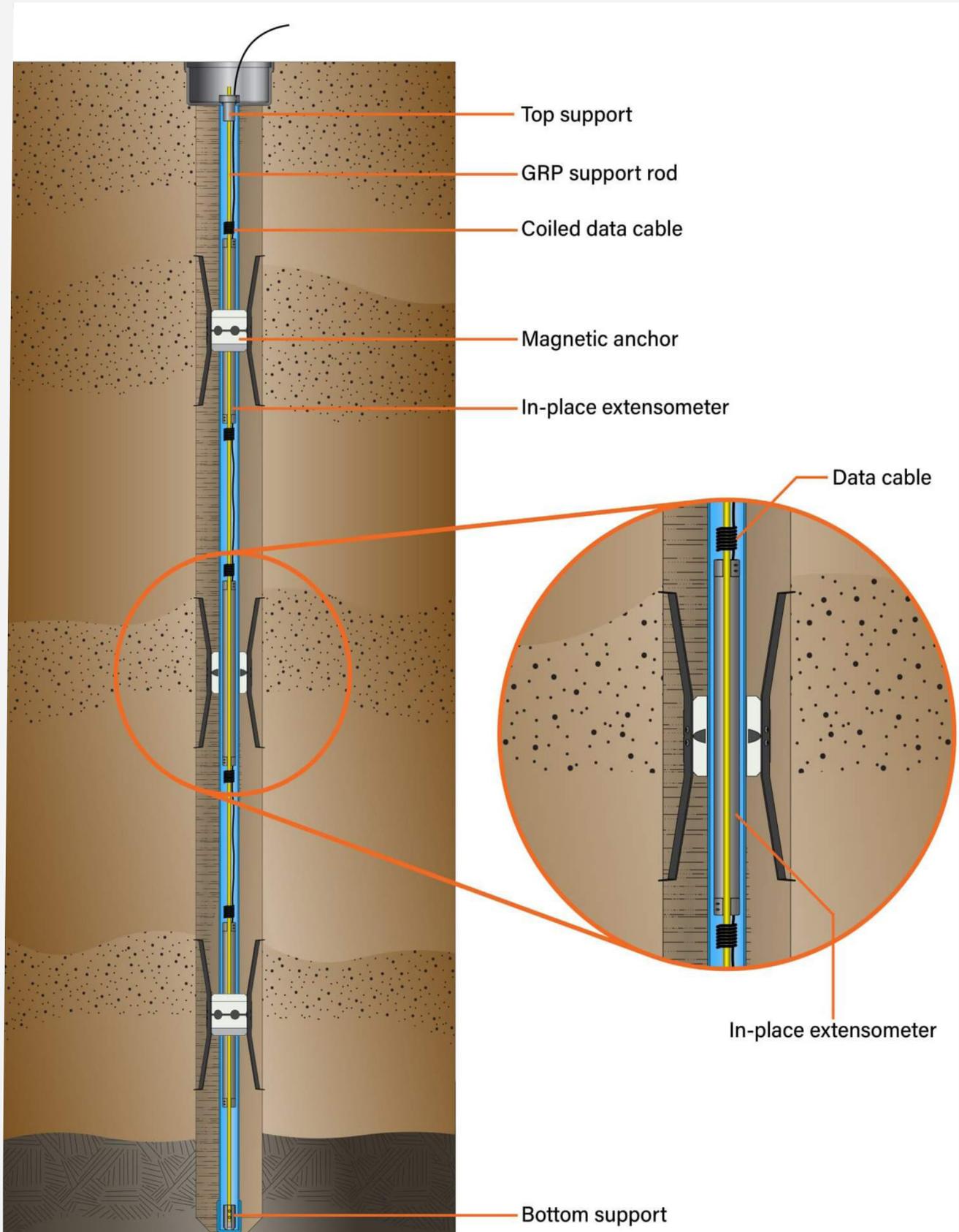
## ACCESSORIES

Cable	4 core, 22AWG, 4mm 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

<sup>1</sup>May vary depending on magnet used.



# COMPONENTS

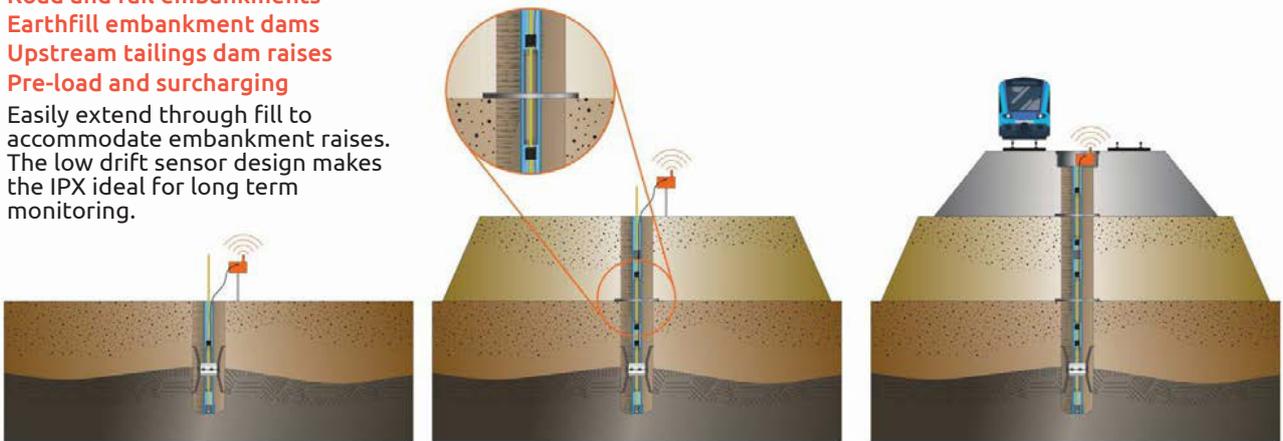


## APPLICATIONS

### SETTLEMENT

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

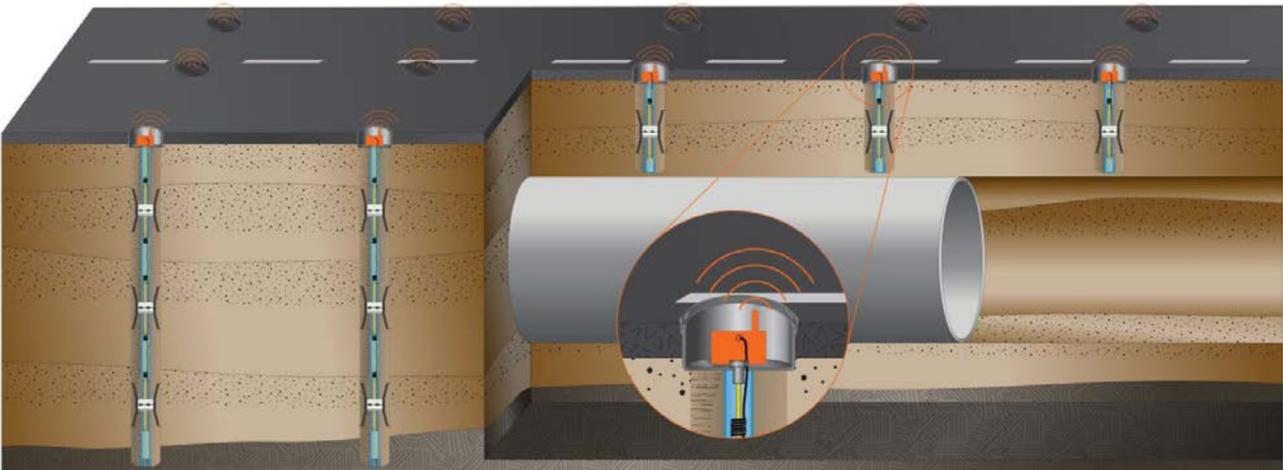
Easily extend through fill to accommodate embankment raises. The low drift sensor design makes the IPX ideal for long term monitoring.



### HEAVE

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

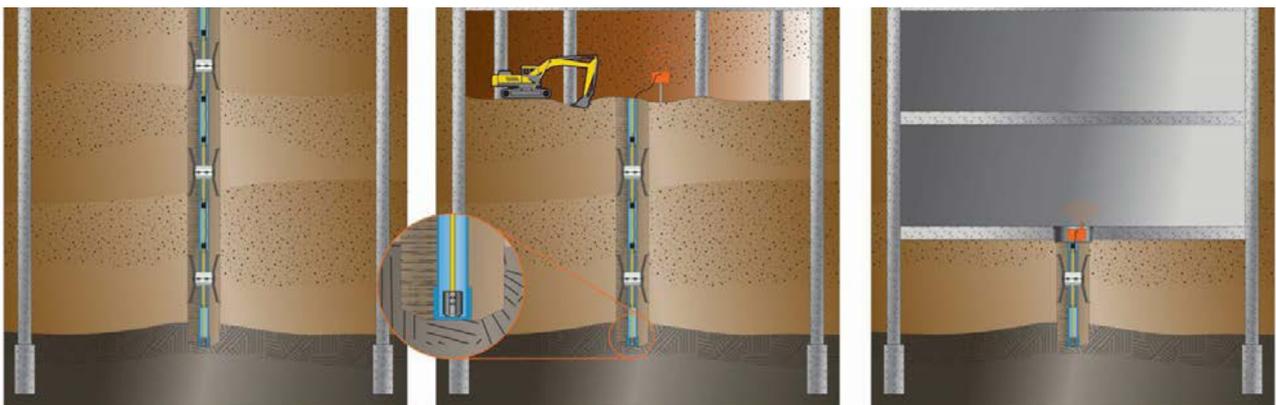
The bottom support allows reduction of system height without interrupting monitoring.



### SUBSIDENCE

Tunnels - Mines - Caverns - Underground structures

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



## SYSTEM COMPONENTS

The following items are used in a typical IPX system.

### REED SWITCH PROBE 1

Used to confirm manually the location of magnetic sensors during installation of the IPX.

### ACCESS TUBE 2

33mm or 42mm access tubing which allows the Reed Switch Probe to be lowered down to identify the position of the magnetic targets. Once installed, the borehole is backfilled with grout.

### DATUM MAGNET 2

The datum magnet, shown on the access tubing, is fixed directly to the bottom section of access pipe to serve as a reference. It is used when the bottom of the pipe is anchored in stable ground.

### TELESCOPIC SECTIONS 3

Telescopic sections are installed when settlement or heave is expected to exceed 3%.

### SPIDER MAGNETS 4 & 5

Spider magnets are used to locate the magnetic target at specific positions along the access casing/tube. They are available with three legs or six legs. In the six-leg version, the spider magnet is attached to the access casing/tube and the legs compressed for installation using a chain and pin. They are released when the magnet is positioned at the specified depth. The three-leg version can be pushed down from the surface after the pipe is installed.

### PLATE MAGNET 6

Plate magnets are used in soil or fill when adding further sections of tubing. They are positioned at the specified elevation and then covered with fill material compacted to the same specifications as the surrounding fill.

### INSTALLATION TOOLS

A range of tools is available for installation of the 3 leg spider magnet.

Note: The spider legs are only used to maintain the position of the magnetic target until it is grouted.

