### Description

The Vibrating Wire Embedment Strain Gauge is used for measuring strain in mass concrete.

The 150mm long gauge, which is made from Stainless Steel, may be pre-attached to rebar or by attachment to a 2, 3 or 4 directional rosette, thereby measuring strain in several directions.

The gauge comprises a sealed tube containing a wire held in tension between two circular stainless steel pads, one at each end.

Deformation to these pads alters the tension of the wire and the resulting readings are used to measure strain. The changes in strain are monitored by the coil assembly mounted on the gauge. The gauges can also read temperature if required.

The gauges can be read individually or remotely/automatically as part of a data collection system.

### Features

- Located within concrete
- Uses proven Vibrating Wire technology
- Suitable for manual or remote monitoring
- Fully waterproof
- Fitted with thermistor for temperature monitoring

### Benefits

- Accurate, repeatable readings over long cable lengths
- Long working life, long-term stability and reliability
- Over-voltage surge arrestor protects against electrical damage
- Connecting cable is screened and flexible

Comprehensive information about this product and our full range is available at [www.soil.co.uk](http://www.soil.co.uk)

If you would like to speak with someone directly please call +44 (0)1825 765044 or email sales@soil.co.uk
The Vibrating Wire Embedment Strain Gauge is designed to measure strain in concrete members on buildings, bridges, dams, pipelines, or any concrete structure. Typical applications include:

- Concrete members and struts
- Bridges and dams
- Piles and mass concrete
- Strains in reinforcing bars during construction, pile testing and service life

The gauge is installed prior to concrete pour and protected during the pour to prevent damage. The gauge may also be pre-cast into a concrete briquette for subsequent casting into the structure, or embedded into holes drilled into an existing structure.

The pickup coil is fitted over a flattened section in the centre of the gauge tube and held in place using a securing clamp; this can be installed on site immediately prior to installation. The sensor is then installed by placing the gauge at a location in the structure suitable for accurately passing microdeformation from the surrounding cured concrete to the gauge.

Cables from the gauges are run to a readout, a terminal box, or a data logging point.

The sensor can be read with any commercially available Vibrating Wire readout (or a data logger) and the incorporated thermistor allows for temperature data to be recorded.

**Applications**

**Strain Gauge to Adjacent Rebars**

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**Associated products**

<table>
<thead>
<tr>
<th>For details on:</th>
<th>Catalogue code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VWnote</td>
<td>RO-1-VW-NOTE</td>
</tr>
<tr>
<td>Dataloggers</td>
<td>D1</td>
</tr>
<tr>
<td>Terminal and Junction Boxes</td>
<td>RO-TB/JB/TJ</td>
</tr>
</tbody>
</table>

View our full product range on [www.soil.co.uk](http://www.soil.co.uk)

**THE TECHNICAL RATING FOR THIS PRODUCT:**

- **INTERMEDIATE**:
  - The installer is trained and experienced in the installation of this type of instrument or systems, and is ideally a specialist Instrumentation and Monitoring contractor.

- **ADVANCED**:
  - The installer already has previous experience and/or training in the installation of this instrument or system.

- **INTERMEDIATE**:
  - As a minimum the installer has read and fully comprehends the manual, and if possible has observed these instruments or systems being installed by others.

- **BASIC**:
  - We offer installation and monitoring services to support this system. For more information please email sales@soil.co.uk or call +44 (0) 1825 765044
## Specifications

### Sensor
- **Range**: 3000 microstrain
- **Resolution**<sup>1</sup>: 1 microstrain
- **Accuracy**<sup>2</sup>: ±0.1% full scale
- **Temperature range**: -20 to +80°C
- **Active gauge length**: 150mm
- **Excitation method**: Pluck or sweep
- **Material**: Stainless Steel
- **Weight**: 58g
- **Dimensions**: 157mm x Ø19mm

### Cable
- **Type**: Standard
- **Construction**: 4 core, PUR sheath, foil screen & drain wire
- **Diameter**: 4mm
- **Weight/m**: 30g

### Coil Housing
- **Type**: Encapsulated, detachable with thermistor
- **Standard cable lengths**<sup>3</sup>: 3m | 10m | 25m
- **Thermistor type**: NTC 3k Ω
- **Thermistor accuracy**: ±0.5°C
- **Thermistor resolution**<sup>3</sup>: ±0.1°C
- **Weight (coil only)**: 29g
- **Cable weight/m**: 30g
- **Cable type**: 4 core PUR sheath, foil screen and drain wire

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<sup>1</sup> Dependent on readout

<sup>2</sup> ±0.1% full scale with individual calibration; ±0.5% full scale with standard batch calibration

<sup>3</sup> Other lengths available
### Ordering Information

#### Vibrating Wire Embedment Strain Gauge

- **ST4-1.1**: Set for mid-range. Sensor with specified cable length CA-3.1-4-IC fitted
- **ST4-1.3**: Set for mid-range. Sensor with 3m cable length
- **ST4-1.4**: Set for mid-range. Sensor with 10m cable length
- **ST4-1.5**: Set for mid-range. Sensor with 25m cable length
- **ST4-1.2**: Set for compression. Sensor with specified cable length CA-3.1-4-IC fitted
- **ST4-1.6**: Set for compression. Sensor with 3m cable length
- **ST4-1.7**: Set for compression. Sensor with 10m cable length
- **ST4-1.8**: Set for compression. Sensor with 25m cable length

#### Connecting Cable and Fittings

- **CA-3.1-4-IC**: Instrument cable 4 core, 7/0.20; screened, priced per metre
- **CA-4.1**: Joint sealing kit
- **CA-4.2**: Coloured adhesive tapes; pack of 10
- **CA-4.3**: Crimping tool
- **CA-4.4**: Crimping sleeves; pack of 100
- **W6-6.1**: Nylon ties; 150mm x 3.5mm; pack of 100
- **ST1-3.5**: Nylon ties; 370mm x 4.7mm; pack of 100

#### Manual

- **MAN-142**: Vibrating Wire Embedment Strain Gauge

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**Soil Instruments Ltd.**

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