REBAR STRAINMETERS AND "SISTER BARS" GEOKON®

MODEL 4911, 4911A



Model 4911 "Sister Bar" (front) and the Model 4911A Rebar Strainmeter (rear)

APPLICATIONS

Rebar Strainmeters are commonly used for measuring strains in:

- Concrete piles and caissons
- Slurry walls
- Cast-in-place concrete piles
- Concrete foundation slabs and footings
- Osterberg pile tests
- All concrete structures



Close-up of Model 4911 shown as in-stalled in concrete pile reinforcing cage.



GeoNet Single-Channel Vibrating Wire Data Logger.



GeoNet Eight-Channel Vibrating Wire Data Logger.

OPERATING PRINCIPLE

Rebar Strainmeters and "Sister Bars" are designed to be embedded in concrete for the purpose of measuring concrete strains due to imposed loads. The Rebar Strainmeter is designed to be welded into, and become an integral part of, the existing rebar cage, while the "Sister Bar" is installed by tying it alongside an existing length of rebar in the rebar cage.

The rebar extensions on either side of the central strain-gauged area are long enough to ensure adequate contact with the surrounding concrete so that the measured strains inside the steel are equal to the strains in the surrounding concrete.

In use, Rebar Strainmeters and "Sister Bars" are usually installed in pairs on either side of the neutral axis of the structural member being investigated. This is done so that bending moments may be analyzed in addition to axial loads.

A built-in thermistor enables the measurement of temperatures and aids in the evaluation of thermally induced strains.

Data acquisition can be performed manually via direct readout or autonomously using data loggers that provide automatic data collection at predetermined intervals and wireless data transmission.

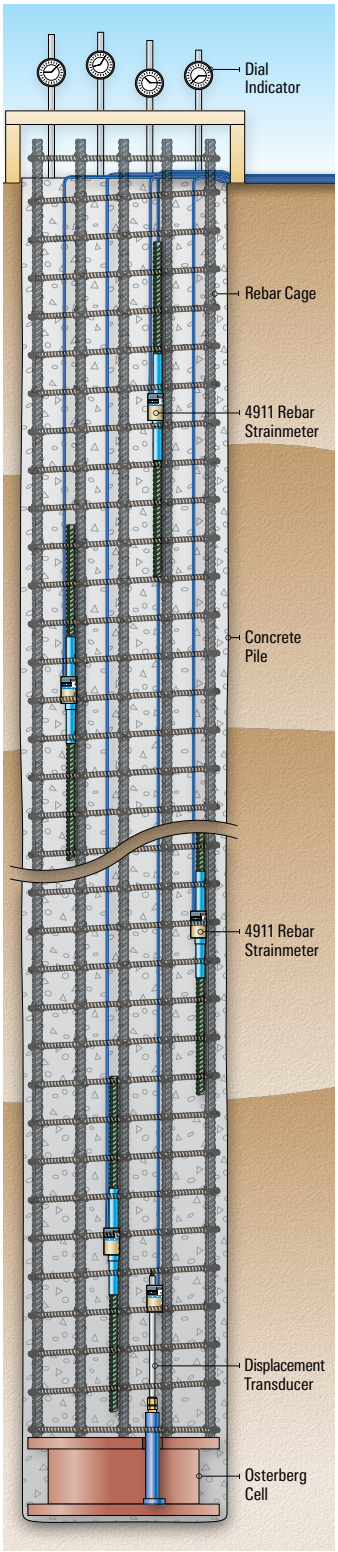
ADVANTAGES & LIMITATIONS

The main advantage of the Rebar Strainmeters and "Sister Bars" lies in their ruggedness. They are fully waterproof and virtually indestructible so that, if the cable is adequately protected, they are safe from damage during the concrete placement.

Each Rebar Strainmeter and "Sister Bar" is individually calibrated and tested for weld strength. The Rebar Strainmeter requires the services of an experienced welder who can guarantee full-strength welds, whereas the "Sister Bar" is very easy to install.

The single vibrating wire strain sensor, located along the axis of the strainmeter, is not affected by the bending of the strainmeter itself. It also has the advantage of all vibrating wire sensors, namely: long-term stability, it can be used with long cables and it's relatively unaffected by moisture intrusion into the cables.

Rebar Strainmeters can be custom-ized to meet your needs. Our staff will work with you throughout the process. Common customizations include gauge length, mounting options, rebar size, temperature range, etc.



Installation of the Model 4911 in an Osterberg Cell pile test.

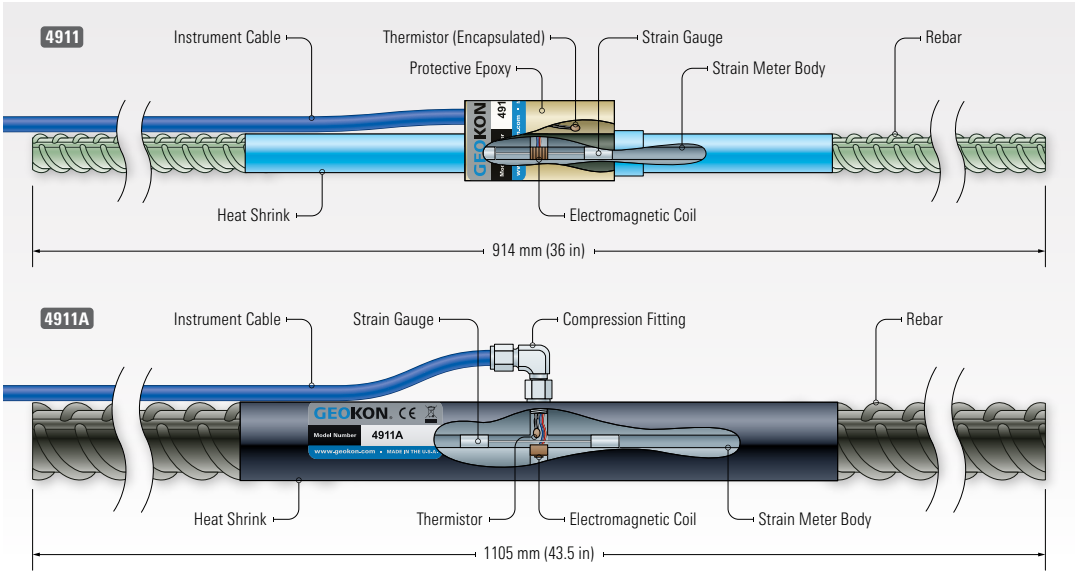


Illustration of the Model 4911 "Sister Bar" and Model 4911A Rebar Strainmeters and their various components.

SYSTEM COMPONENTS

A vibrating wire strain gauge sensor is fixed axially inside a short, central length of round steel bar. This central section is de-bonded from the surrounding concrete by means of a plastic coating, and is extended by welding a length of rebar to each end. The Model 4911A Rebar Strainmeter is available in various sizes to match the size of the rebar cage into which it is to be welded, whereas the Model 4911 "Sister Bar" comes in one size only (#4 rebar, at approximately 12.7 mm in diameter).

A thermistor to measure temperature changes can be included in the 4911 and 4911A sensors.

TECHNICAL SPECIFICATIONS

	4911	4911A
Standard Range	3000 με	3000 με
Resolution	0.4 με	0.4 με
Accuracy[1]	±0.25% F.S.	±0.25% F.S.
Nonlinearity	< 0.5% F.S.	< 0.5% F.S.
Temperature Range[2]	–20°C to +80°C	–20°C to +80°C
Rebar Sizes	#4 (Sister Bar)	#6, 7, 8, 9, 10, 11, 14
Length	914 mm	1105 mm

[1]Accuracy established under laboratory conditions.
[2]Other ranges available on request.

ORDERING INFORMATION

4911-4: Vibrating Wire Rebar Strainmeter "Sister Bar" for direct embedment in concrete, #4 rebar. Individual calibration.

4911-4BC: Vibrating Wire Rebar Strainmeter "Sister Bar" for direct embedment in concrete, #4 rebar. Batch calibration.

4911A-#: Vibrating Wire Rebar Strainmeter for welding into rebar system. Specify rebar size: #5, #6, #7, #8, #9, #10, #11 or #14.

02-250V6: Blue PVC Cable, 6.35 mm (±0.25 mm) [0.25"] Ø, 2 twisted pairs, for the above.

COMPATIBLE READOUTS AND DATA LOGGERS

GK-404: Handheld Readout

GK-406: Vibrating Wire Analyzer

8800 and 8900 Series: GeoNet Wireless Mesh Data Acquisition System

8910 Series: GeoNet Wireless LoRa® Data Acquisition System

8920 and 8921 Series: GeoNet Cellular Data Loggers

8930 Series: GeoNet Wi-Fi Data Loggers

8940 Series: GeoNet Local Data Loggers

8600 Series: Data Loggers

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