

Dynamic Strain Transducer

Applications

The Model ST-350 Dynamic Strain Transducer is used for structural testing and recording strains on...

- Steel structures
- Post-tensioned and pre-stressed concrete structures
- Reinforced concrete structures
- Timber structures
- Fiber reinforced polymer structures
- Any structure in which a short-term live-load can be applied



• Model ST-350, with cover, on girder.



• Model ST-350 attached to steel truss.

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• Model ST-350 Dynamic Strain Transducer.

Operating Principle

The most direct approach to quantifying live-load stresses in a structural member is to record the induced strains, which are typically measured using foil strain gauges. However, the installation of these gauges is often a tedious process since careful surface preparation and soldering is usually required.

The Model ST-350 Dynamic Strain Transducer offers a much simpler, more effective solution; it is delivered pre-wired in a rugged housing that is easy and quick to install in any weather.

Advantages & Limitations

The Model ST-350 is easily installed and may be attached to steel, pre-stressed and reinforced concrete, and timber members in about 5 minutes, making it possible to instrument and test a structure with 64 strain channels in one day.

The gauge length can be increased to provide "average" strains on reinforced concrete that may have cracks or are otherwise non-homogenous.

The Model ST-350's output is approximately 3 times higher than the typical quarter bridge foil gauge installation. This allows for an improved signal-to-noise ratio, which makes higher-resolution measurements possible.

The Model ST-350 Dynamic Strain Transducers provide a very cost-effective solution due to their long lifespan, reusability and ease of installation.

These transducers are field-proven and have been used for more than 20 years recording strain measurements on all types of structures, often in harsh field conditions.

Because they are susceptible to temperature variations, the Model ST-350 is best suited to capturing live-load responses applied to structures during periods where there is little or no temperature change. However, the ST-350 can be re-zeroed where monitoring is required over longer periods of time.

Periodic recalibration of the sensors is recommended for repeated use. All calibrations are traceable to NIST.



● ST3-WiFi node.



● Rugged, aluminum cover plate (optional).



● Mounting tabs and tab jig.



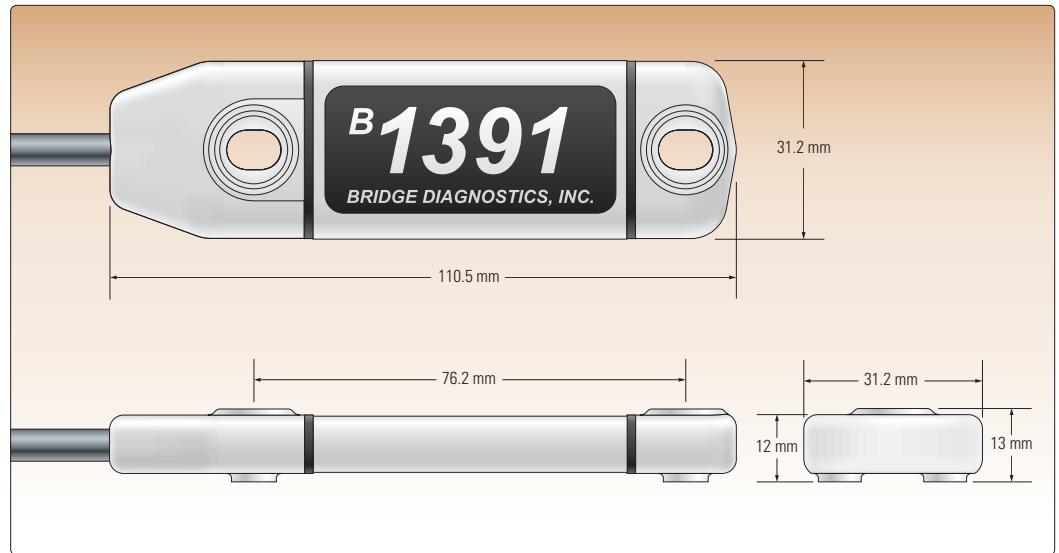
● Extension jig.



● Transducer extension for R/C structures.



● Tab removal tool.



● Model ST-350 dimensions.

System Components

The ST-350 Dynamic Strain Transducers can be used with data acquisition systems that support full wheatstone bridge sensors such as the range of Campbell Scientific Dataloggers, the BDI Wireless Structural Testing System (ST3 WiFi), the **GEOKON**® Model 8021 and 8025, and many of National Instruments data recording systems.

C-Clamps or threaded mounting tabs and a quick-setting adhesive are used to attach the Model ST-350.

The Model ST-350 is fully waterproof, with a heavy-duty cable and, where required, a quick-lock connector.

Technical Specifications

Effective Gauge Length	76.2 mm (3.0"). Extensions available for use on R/C structures
Overall Size	110.5 × 31.2 × 13 mm (4.375" × 1.25" × 0.5")
Cable Length	3 m (10 ft), specify required length
Material	Aluminum
Circuit	Full Wheatstone Bridge with 4 active 350 ohm foil gauges, 4-wire hookup
Accuracy	±2%, individually calibrated to NIST standards
Strain Range	±4000 µε (Calibrated to ±2000 µε)
Force required for 1000 µε	Approximately 76 N (17 lbs.)
Sensitivity	Approximately 500 µε/mV/V
Weight	Approximately 85 g (3 oz.)
Environmental	Built-in protective cover, water resistant
Temperature Range	-50 °C to +120 °C (-60 °F to +250 °F)
Cable	BDI RC-187: 22 gauge, two individually-shielded pairs with drain
Options	Fully waterproofed, Heavy-duty cable, Special quick-lock connector
Attachment Methods	Mounting tabs and adhesive, C-Clamps masonry or wood screws