

Strain Indicator and Recorder

HARDWARE SPECIFICATIONS

All specifications nominal or typical at + 23°C unless noted.

Inputs:

Eccentric-lever-release terminal blocks accept up to four independent bridge inputs. Accommodates 16-28 AWG (1.3 to 0.35mm dia.)

Bridge Configurations:

Quarter-, half-, and full-bridge circuits. Internal bridge completion provided for 120Ω , 350Ω and 1000Ω quarter bridges, 60 to 2000Ω half or full bridge.

Display:

Full dot-matrix structure with 128 dots x 64 dots FSTN positive, gray transflective LCD with backlight. Display update is twice a second.

Data Conversion:

High-resolution sigma-delta converter. 60Hz or 50Hz noise rejection. User selectable.

Basic Range:

 \pm 31,000 microstrain (\pm 1 microstrain resolution) at Gage Factor = 2.000.

Accuracy:

 $\pm 0.1\%$ of reading ± 3 counts. (Normal mode operation at Gage Factor = 2.000)

Gage Factor Settings:

Range 0.500 to 9.900.

Balance:

Single key operation to initiate automatic software balance.

Bridge Excitation:

1.5Vdc nominal. Readings are fully ratiometric, and not degraded by variation in excitation voltage.

Communication Interface:

Universal Serial Bus with type B connector. Used for transferring stored data and firmware.

Data Storage:

Media: Removable Multimedia Card (16Mb supplied) Data Recording Rate: 1 reading per second maximum

Calibration:

Shunt calibration across each dummy resistor to simulate 5000 microstrain ($\pm 0.1\%$). Remote calibration supported via accessible switch contacts at input terminal block.

Analog Output:

BNC connector. 0 to 2.5V maximum output. Device impedance of 2000Ω or greater. 480 samples/second DAC output update rate.

Power:

Internal battery pack using two "D" cells. Battery life up to 600 hours (single channel, normal mode.) Can also be powered from USB or by external battery or other power source of 6 to 15Vdc. AC adapter optional.

Operational Environment:

Temperature 0 to + 50°C. Humidity up to 90% RH, noncondensing.



Vishay Micro-Measurements

Strain Indicator and Recorder

FIRMWARE FEATURES

Display Update Rate:

• 2 readings per second.

Recording Rates:

- Up to 64 data files.
- · Automatic recording:
 - 1 reading every 1 to 3600 seconds.
- individually selectable per channel.
- Manual Recording.
- Automatic date/time stamping.

Scaling:

P3

- Automatic scaling for microstrain, based upon gage factor, with nonlinearity correction based upon bridge type.
- Automatic calculation of mV/V.
- Linear scaling for other engineering units.

Units:

- µɛ
- mV/V
- psi
- ksi
- GPa
- MPa
- Pa
- g
- Ibf
- lb
- Kg
- in
- mm
- mil
- rpm
- m
- s
- A
- N • V
- Ohms
- hp
- deg
- rad
- oz
- mV
- m/s²
- ton

Bridge Types:

- Quarter bridge.
- · Half bridge, adjacent arms, equal and opposite strains.
- Half bridge opposite arms equal strains.
- Shear bridge, 2 active arms.
- · Poisson half bridge.
- · Full bridge 4 fully active arms.
- Shear bridge, 4 active arms.
- Full bridge, Poisson gages in opposite arms.
- Full bridge, Poisson gages in adjacent arms.
- Undefined full bridge.
- Undefined half bridge/quarter bridge.

Bridge Balance:

- Automatic
- · Manual offset adjust
- Disabled (Raw offset)

Backlight Control:

- Programmable on time while in run mode:
 - 5, 15 or 60 seconds.
 - Manual off/on.
- If illuminated, backlight will remain illuminated while operating menus.

Software Adjustable Contrast

Operating Modes:

- Normal mode.
- · Analog output (any one of four channels.)

Data Link:

- USB interface
- Windows-based P3 utility software provided for creating Excel and ASCII files from data stored on MMC.
- No device driver required (treated as an HID device).

Real-time Clock

System Calibration/Verification:

- Requires Model 1550A Strain Indicator calibrator or other compatible calibrator.
- · Calibration date stored in flash.

Firmware Upgradeable





Vishay Micro-Measurements

Wide Range Strain Indicator



A versatile high-performance laboratory-type instrument featuring wide-range operating controls for handling the most critical strain measuring tasks.

DESCRIPTION

EXCEPTIONAL RANGE • RESOLUTION • VERSATILITY NEVER BEFORE ACHIEVED IN A LABORATORY INSTRUMENT

The Model 3800 Wide Range Strain Indicator is a versatile, high-precision laboratory-type instrument designed for use with strain gages and strain gage based transducers.

Principal features of the Model 3800 are wide-range control of gage factor; excitation precisely settable over 1 - 15 volt range; and wide balance range with no bridge loading effect.

With these extended operating capabilities, the Model 3800 can be used for the most demanding measurement tasks which are not possible with conventional strain measuring instruments and general-purpose transducer indicators. Resolutions achievable with the Model 3800 are $0.10\mu\epsilon$ when used as a strain indicator, and 0.10μ //V when used as a transducer indicator (0.025μ V/V with suppressed zero).

In addition to the wide-range features, the Model 3800 incorporates simplified operating controls that minimize set-up time, and promote measurement accuracy. The operator follows a logical sequence of steps to configure the instrument for the desired measurement. Color-coded interlocked push-button controls minimize operator errors, and make the operating mode instantly recognizable.

Gage factor on the Model 3800 is settable by front-panel controls over a range of 0.0500 to 50.00, and is displayed by the LED readout when in the SET position. The instrument allows full range display (\pm 19 999 counts) over the complete gage factor range.

Excitation voltage is precisely settable over a range of 1 - 15 volts in 1-volt increments by a front-panel thumbwheel switch. The output display automatically tracks the excitation setting so that gage factor does not vary with bridge voltage.

FEATURES

- 4-1/2 Digit LED Display
- ANSI/SEM Color-coded bridge connection terminals
- Analog output
- Transducer connector with remote sense
- Direct reading of strain, pressure, torque, load, and other engineering variables
- · Convenient color-coded push-button controls
- Gage factor range from 0.0500 to 50.00 displayed on LED readout (to four significant digits)
- Bridge excitation range from 1.000 to 15.000Vdc
- Extremely wide balance range. Balance by voltage injection
- · Quarter-, half-, and full-bridge circuits
- Built-in 120/1000 Ω and 350 Ω bridge completion
- · Separate bridge excitation on/off control

The balance system in the Model 3800 has four ranges which are selected by the BALANCE RANGE push buttons. Each range is further divided into four sub ranges by the COARSE balance switch. The FINE balance control provides an additional adjustment range that overlaps the COARSE balance switch positions. This unique system provides a total of 32 overlapping ranges for achieving precise balance settings and resolution. All balance voltages are electronically injected into the input amplifier to eliminate bridge loading errors and preserve full measurement range.

The instrument will accept full-, half-, or quarter-bridge strain gage inputs; and all required bridge completion components for 120, 350, and 1000Ω gages are built in. Shunt-calibration resistors across the internal dummies are provided on the rear panel. Two remote calibration resistors, also mounted on the rear panel, are actuated by the front-panel calibration button.

Virtually all strain gage based transducers can be used with the Model 3800 via the rear-panel transducer connector. This connector provides precision remote sense capability, as well as access to the remote calibration resistors. Full-scale resolutions of 0.10μ V/V are routinely possible. By using the wide-range balance controls to suppress zero, resolutions to 0.025μ V/V can be achieved.

In addition to the digital LED display, the Model 3800 provides an analog output available at the rear panel. A separate analog level control totally independent of the digital display is also provided.

The Model 3800 Wide Range Strain Indicator is an exceptional, high-resolution instrument that will make a valuable contribution to any experimental stress analysis or transducer development laboratory.