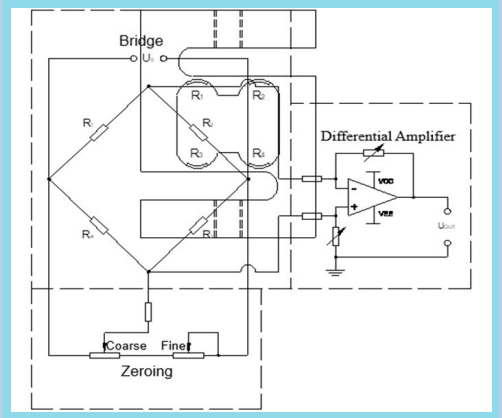
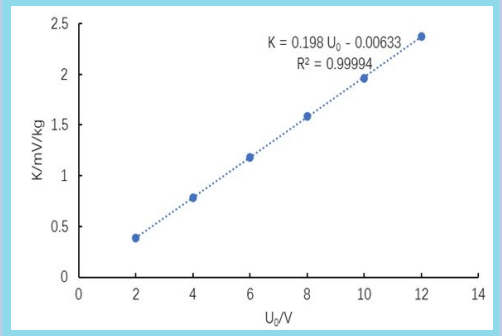
Construct, Conduct & Comprehend Physics Experiments

LEMI-70 Comprehensive Resistive Strain Gauge-Based Force Sensor Apparatus

- *Four individually accessible resistive strain gauges*
- *Adjustable bridge excitation voltage*
- *Simple structure and stable performance*
- *Hands-on experiments*



Schematic of an electronic scale circuit



Mass–voltage (*m*–*U*) curves under different bridge excitation voltages

The LEMI-70 Comprehensive Resistive Strain Gauge-Based Force Sensor Apparatus features a bidirectional (tension and compression) weighting sensor with four individually accessible strain gauges and an adjustable bridge excitation voltage. The apparatus allows users to measure and analyze the relationship between tensile/compressive forces and bridge output signals under quarter-bridge, half-bridge, and full-bridge configurations, and to calculate sensitivity.

Additionally, the system includes a built-in differential amplifier with adjustable gain, enabling amplification and calibration of bridge output signals. Users can construct and calibrate a functional electronic scale for force measurement purposes. Through hands-on experiments, students will gain a comprehensive understanding of the operating principles of resistive strain gauges and electronic weighing systems. Experimental objectives include:

1) Understand the working principles of resistive strain gauges and weighting sensors.
2) Measure and compare the performance and sensitivity of quarter-bridge, half-bridge, and full-bridge configurations.
3) Construct and calibrate an electronic weighing scale.

The included instruction manual offers everything you need for a successful lab experience:
- Clear explanations of principles
- Step-by-step procedural guides
- Sample experimental results for reference

Specifications

Description	Specifications
Adj. Regulated Power Supply	0–14V continuously adjustable, 3½-digit digital display, display precision of 0.01V, with short-circuit protection
Digital Voltmeter	3½-digit digital display with three selectable ranges: -19.99 mV to 19.99 mV, -199.9 mV to 199.9 mV and -1.999 V to 1.999 V
Diff. Amplifier Power Supply	Three sets of dual-output supplies: ±9V, ±12V, and ±15V
Weighting Sensor	Dual-purpose for tension and compression; contains four 350Ω strain gauges; maximum capacity: 5 kg
Weight Trays	Two trays (one for tension, one for compression), each with a diameter of 14 cm
Calibration Weights	One 100g, two 200g, one 500g, one 1kg, and one 2kg.
Support Stand	Triangular base, height: 33 cm

Part List

Description	Qty
Main Electric Unit	1
Mechanical Platform	1 (Includes stand, sensor, and 2 weight trays)
Calibration Weight	6 (100g x1, 200g x2, 500g x1, 1kg x1, 2kg x1)
Aviation Cable	1
Cable	1
Shielded Banana Plug Cable	2 (1 red, 1 black)
φ4 Banana Plug Cable	4 (2 red, 2 black)
φ3 Banana Plug Cable	14 (2 red, 2 black, 10 blue)
Power Cord	1
User Manual (CD)	1

Note: above product information is subject to change without notice.

Lambda Scientific Systems, Inc.
16300 SW 137th Ave, Unit 132
Miami, FL 33177, USA
Phone: 305.252.3838 Fax: 305.517.3739
E-mail: sales@lambdasys.com
Web: www.lambdasys.com