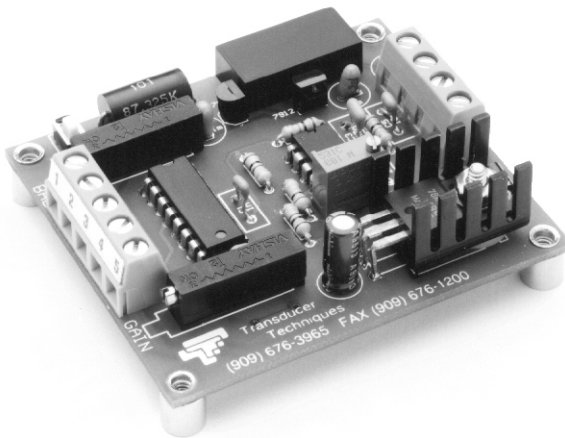


TM0-1

AMPLIFIER / CONDITIONER MODULE

OPERATORS MANUAL



**Transducer
Techniques®**

42480 RIO NEDO, TEMECULA, CA 92590
(909) 719-3965 FAX (909) 719-3900
URL: <http://www.ttloadcells.com>
E-mail: tti@ttloadcells.com

DESCRIPTION

The TM0-1 Module provides low cost dedicated conditioning for one bridge type load or pressure sensor. The unit can be placed near the sensor for high level signal transmission. Several units can be powered from a common supply. Balance and span potentiometers are low tempco metal film for long term stability and good resolution.

SET UP PROCEDURE

METHOD 1 Shunt calibration with TTI transducers

1. Connect transducer to the 5 pin terminal block as shown in Fig. 2.
2. Connect a digital voltmeter to the 4 pin terminal block as shown in Fig. 2.
3. Connect 12 VDC power supply to the 4 pin terminal block on pins 1 and 2 as shown in Fig.2.
4. Allow 15 minutes warm up.
5. With zero load applied to the transducer, rotate balance potentiometer towards + or - in order to obtain 0.000 on the digital voltmeter.
6. Refer to the sample calibration certificate Fig.1 , Example 1 (typical to the calibration certificate supplied with TTI transducers. Multiply the percent of load value (PCT LOAD) for a 87.325 Kohms resistor by the desired full scale voltage output. Note that +/- 8 VDC is the maximum output voltage range.

Example: $8 \text{ VDC} \times 50.2\% = 4.016 \text{ VDC}$.

7. Depress calibration button (calibration button to remain depressed through out step 7). Adjust the gain potentiometer to display the engineering units calculated in step 6, Example 1 (4.016 VDC). Release calibration button.
8. Repeat step 5 and 7 if necessary.

METHOD 2 Using a known load (Dead weight calibration)

1. Follow method 1, steps 1 thru 4.
2. Apply a known load (dead weight) to the transducer.
3. Adjust the gain potentiometer to display engineering unit equivalent to known load (dead weight).
4. Remove known load (dead weight) and readjust balance potentiometer, if necessary.

Fig. 1

```

<<<  CERTIFICATE OF CALIBRATION  >>>

SERIAL NUMBER:          SAMPLE CERTIFICATE      DATE OF CALIBRATION:  11/11/1993
SENSOR MODEL:          HSW-20K                 DATE OF RECALIBRATION: 11/11/1994
JOB NUMBER:            0
TECHNICIAN:           AE

      TENSION          MV/V          MV/V
      LOAD            INC.          DEC.
      LBS.

      0                0              0
10000                1.0026          1.0031
20000                2.0051

NON-LINEARITY          .03          PCT FS
NON-REPEATABILITY     .02          PCT FS
HYSTERESIS            .03          PCT FS

      <<  SHUNT CALIBRATION  >>

      PCT          LOAD          SIGNAL          SHUNT          SHUNT
      LOAD        LBS          MV/V          K OHMS         PINS
      50.2        10034.4      1.0060        87.325         (-E,-S)
100.3           20068.8      2.0120        43.575         (-E,-S)
  
```

Example 1

```

<< DIGITAL PANEL METER MODEL DPM-2 SCALE FACTOR >>
DPM-2 SCALE FACTOR .0000

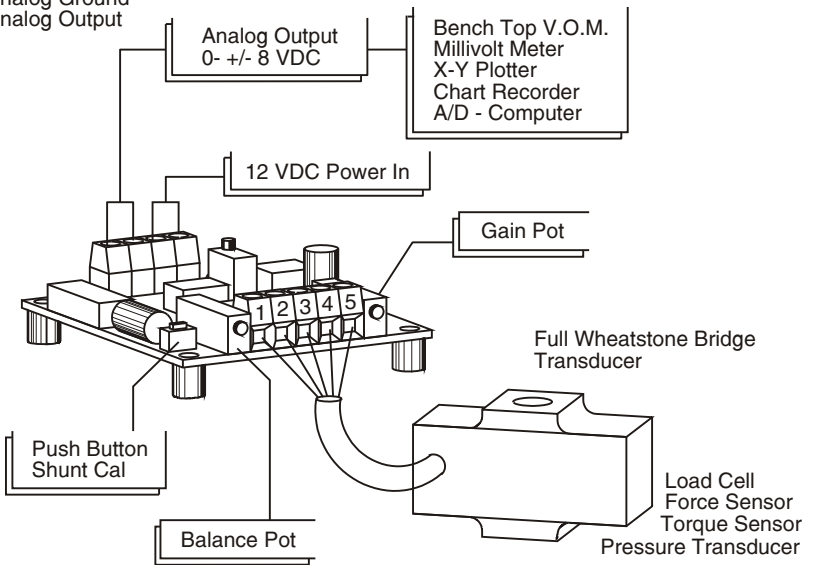
* CALIBRATION COMPUTED FROM THREE (3) RUNS INCREASING AND DECREASING.
* TRACEABLE TO NIST TEST # 57914
* CALIBRATION PERFORMED AT 10 VDC
* MAXIMUM BRIDGE EXCITATION 12 VDC

      WIRING
      COLOR CODE
=====
RED  +EXCITATION
BLK  -EXCITATION
GRN  +SIGNAL
WHT  -SIGN
  
```

Fig. 2

**Power Supply / Analog Output
4 Pin Terminal Block**

- 1: + 12 VDC
- 2: Power Ground
- 3: Analog Ground
- 4: Analog Output



**Transducer Input
5 Pin Terminal Block**

TM0-1	Transducer
1	+ Excitation (Red)
2	- Signal (White)
3	+ Signal (Green)
4	- Excitation (Black)
5	+ Shield

III. TROUBLESHOOTING

SYMPTOM / PROBLEM

Negative analog output voltage

Analog output is saturated

ACTION

Switch wire position 2 and 3
OR 1 and 4 on 5 pin terminal.

One (or more) of the transducer wires
is (are) disconnected. Check wire
continuity. Check 5 pins terminal
connections. Refer to Fig. 2

IV. SPECIFICATIONS

Amplifier Section

Gain: 75 to 1000
Input Sensitivity: 1mV/V minimum for 8V output
Output Voltage: 0 to +/-8VDC (linear to 9.5VDC)
Output Current: 0 to 10mA
Nonlinearity: 0.01% maximum
Compliance: 0.1% plus vs. minus full scale
Stability: +/-1% for 24 hours
Tempco: 0.01% full scale/C
Noise and Ripple: Less than 5mV P-P
at gain = 1000
Filter Type: 2 Poles Butterworth
Frequency Response: DC to 220 Hz
(2.2, 22, 2200 Hz available
in lots of 10, no charge)

Bridge Section

Excitation Voltage: 8VDC +/-0.25V
Sensor Resistance: 120 Ohms minimum
1000 Ohms maximum
Balance Range: +/-30% of output
(350 Ohms bridge)

General

Weight: Approx. 2 ounces
Size: 2.25 x 2.50 x .80 inches
Mounting: Corner standoffs, 4-40 thread
Input / Output: Via screw terminals
Operating Temp: 0 to 70 C
Power Required: 12 VDC +/-0.5 VDC at 65mA

WARRANTY / REPAIR POLICY

Limited Warranty on Products

Any of our products which, under normal operating conditions, proves defective in material or in workmanship within one (1) year from the date of shipment by Transducer Techniques, will be repaired or replaced free of charge provided that you obtain a return material authorization from Transducer Techniques and send the defective product, transportation charges prepaid with notice of the defect, and establish that the product has been properly installed, maintained, and operated within the limits of rated and normal usage.

Replacement product will be shipped F.O.B. our plant. The terms of this warranty do not extend to any product or part thereof which, under normal usage, has an inherently shorter useful life than one year. The replacement warranty detailed here is the Buyer's exclusive remedy, and will satisfy all obligations of Transducer Techniques, whether based on contract, negligence, or otherwise. Transducer Techniques is not responsible for any incidental or consequential loss or damage which might result from a failure of any Transducer Techniques product. This express warranty is made in lieu of any and all other warranties, express or implied, including implied warranty of merchantability or fitness for particular purpose. Any unauthorized disassembly or attempt to repair voids this warranty.

Obtaining Service Under Warranty

Advance authorization is required prior to the return to Transducer Techniques. Before returning the items either write to the Repair Department c/o Transducer Techniques, 42480 Rio Nedo, Temecula, CA 92590, or call (909) 719-3965 with: 1) a part number; 2) a serial number for the defective product; 3) a technical description of the defect; 4) a no-charge purchase order number (so products can be returned to you correctly); and, 5) ship to and bill to addresses. Shipment to Transducer Techniques shall be at Buyer's expense and repaired, or replacement items will be shipped F.O.B. our plant in Temecula, CA. Non-verified problems or defects may be subject to a \$75 evaluation charge. Please return the original calibration data with the unit.

Obtaining Non-Warranty Service

Advance authorization is required prior to the return to Transducer Techniques. Before returning the items, either write to the Repair Department c/o Transducer Techniques, 42480 Rio Nedo, Temecula, CA 92590, or call (909) 719-3965 with: 1) a model number; 2) a serial number for the defective product; 3) a technical description of the malfunction; 4) a purchase order number to cover Transducer Techniques' repair cost; and, 5) ship to and bill to addresses. After the product is evaluated by Transducer Techniques, we will contact you to provide the estimated repair costs before proceeding. The minimum evaluation charge is \$75. Shipment to Transducer Techniques shall be at Buyer's expense and repaired items will be shipped to you F.O.B. our plant in Temecula, CA. Please return the original calibration data with the unit.

Repair Warranty

All repairs of Transducer Techniques' products are warranted for a period of 90 days from the date of shipment. This warranty applies only to those items which were found defective and repaired; it does not apply to products in which no defect was found and returned as is, or merely recalibrated. Out of warranty products may not be capable of being returned to the exact original specifications or dimensions.

FOR TECHNICAL SUPPORT, CALL

(909)719-3965 / FAX (909)719-3900

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**(800) 344-3965
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