TR-100

TRANSDUCER READOUT

INDEX

INTRODUCTION

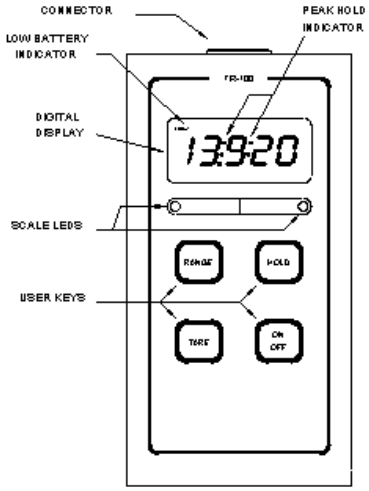
The TR-100 transducer readout is a microprocessor based portable instrument designed to read load cells or pressure transducers with full bridge outputs of between 0.60 and 7.5 mV/V for a full scale display of 19999. Bridge resistances from 85Ω upwards can be accepted by the unit.

Setting up (scaling, decimal points, least significant digit blanking, filtering, CAL checking) is achieved via the internal push buttons. These are accessed by first removing the battery cover, then removing the four fixing screws and carefully hinging the top panel, ensuring that the connector from the top panel keypad remains intact.

User functions (on/off, zero setting, scale selection, peak hold) are available from the front panel keypad. All values are retained in EEprom for permanent storage (typical life 500,000 write cycles).

The instrument is fitted with an alkaline non-rechargeable PP3 battery, giving at least 20hrs life when connected to a 350Ω bridge.

USER OPERATION



The unit is supplied calibrated to a particular load cell. All user functions are available via the front keypad. Do not open the enclosure to make any adjustments.

Pressing the **RANGE** key will toggle between the two available scales. The active scale with its corresponding units will be indicated by an illuminated led.

Pressing the **TARE** key will zero off any load on the load cell. This will be remembered on power down. Each scale should be tared off independently.

Pressing the **HOLD** key will activate the Peak Hold function. When Peak Hold is active, the 4 points shown on the display will flash. The peak capture time is independent of any display filtering. Press **HOLD** again to display the valley (minimum peak) during the same period (the 4 points will stop flashing). Press **HOLD** again to exit this function.

If during use the **LOBAT** warning appears in the display, either re-charge the battery with the charger provided or, if the battery is non-rechargeable, replace it.

QUICK SET-UP

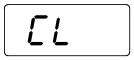
1. Connect the load cell or transducer to the TR-100

2. Press **ON/OFF** to switch instrument on

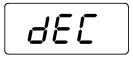
3. Select desired scale by pressing **RANGE**

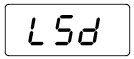
4. With no load on cell press **TARE** to zero the display

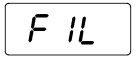
   Press **MEN** to check channel (set automatically by the **RANGE** key) and **MEN** again to move on.

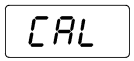
   

5. Continue to step through the menu by pressing **MEN** and set the following as required:

   Decimal point position 

   Least significant digit blanking 

   Filtering 

6. Move on to 

   Load up cell to nominally 80% of full range or simulate load **CAL**

   Set load on display with **INC** and **SEL**

   Ensure load is steady on cell and press **ACC** to accept new CAL value.

7. Repeat steps 3 to 6 for the other scale.

8. Press **ON/OFF** to switch the unit off.

CONNECTIONS & BATTERY STATE

The TR-100 instrument is fitted with a 5 pin socket which, when mated to its respective plug, is sealed to IP65.

Connections:

PIN 1 + EXCITATION
PIN 2 - EXCITATION
PIN 3 + SIGNAL
PIN 4 - SIGNAL

The state of the battery can be determined by pressing and holding the **MEN** key as the unit is switched on. The battery voltage will be displayed. (When the key is released, **100** will be displayed followed by the channel number that the unit was set to when last powered down).

If the displayed voltage is less than 6.00, either re-charge the battery with the charger provided or, if the battery is non-rechargeable, replace it. Take similar action if during use the **LOBAT** warning appears in the display.

If leaving the instrument for a few weeks, it is advised to remove the battery to eliminate any long-term drain.

SET-UP OVERVIEW

The TR-100 has 2 independent channels that can be set up for different engineering units eg. **kg** and **lb**. Channel 0, the default channel, is active when the right hand led is illuminated. Channel 1 is indicated by the left hand led. The set-up values such as zero, gain, decimal point etc. for each channel will be held in non-volatile memory and will remain the same until such time as the user wishes them changed.

Access to the channels and their parameters is through the **MEN** key. The sequence of setting up of these parameters is as follows:

The digit flashing is the only one that can be changed. Values are scrolled round with the **INC** key, but 0 can be instantly set with the **TARE** key. Values greater than 9 can be shifted with the **SEL** key to build up the complete number.

Example: To enter 3450 as a calibration number

To Zero the display press the **TARE** key once	0000
To select the most significant digit press the **INC** key 3 times	0003
To shift the digits to the left press the **SEL** key once	0030
To set the next digit press the **INC** key 4 times	0034

Continue until correct, accepting the value with the **ACC** key which takes the new value and writes it to memory.

The **MEN** key accepts any default value as displayed and passes the user on through the menu.

The **CAL** key is not a software read key but just shunts one arm of the bridge with a precision resistor to simulate a known load.

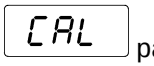
The signal which is generated by the **CAL** key is R * 2.5 mV/V where R is the resistance of the load cell bridge in kΩ.

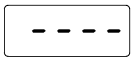
Thus, for a 350Ω bridge, a signal of 0.875 mV/V is generated.

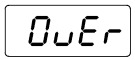
CALIBRATION

An input of known quantity has to be injected into the instrument in order to set the CAL value. This input can either be from a true load or pressure being physically applied to the transducer or simulated with the **CAL** key. This key shunts the -'ve supply to the -'ve signal arm of the bridge with a precision resistor to simulate a +'ve offset on the bridge.

Before entering into the menu first press **TARE** to set the display at 0000

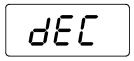
When in the  page of the menu enter the calibration value equivalent to the known quantity being applied either as a true load or pressure or via the **CAL** key. Enter this value as described on page 5. Ignore decimal points at this stage.

When the load is stable and is the same as the load keyed in and displayed, press the **ACC** key to accept the value and write it to memory. The instrument will now assume a linear relationship of input signal to displayed values from zero to full scale, based on this one calibration point and ZERO. The display will show  when calculating the instrument gain.

Error Message: When a calibration value has been entered but the instrument cannot achieve that value for the signal input, the display will show  and go back and await a new value to be entered or input signal to be increased.

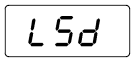
DECIMAL POINT, DIGIT BLANKING & FILTERING

DECIMAL POINT



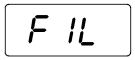
When in this page of the menu, the display can be set with either 0, 1, 2 or 3 decimal places eg. 12345, 1234.5, 123.45 or 12.345

LEAST SIGNIFICANT DIGIT



When in this page of the menu, the least significant digit of the display can be set to step up in either 1's, 5's or 10's as follows:
0 = step in 1's; 1 = step in 10's; 2 = step in 5's

FILTER



When in this page of the menu, the response time of the display can be filtered. Values from 0 through to 3 can be set where 0 provides the quickest response and 3 gives an update of approximately 1 every 5 seconds.

SPECIFICATION

Battery	9V PP3 type
Battery Life	20 hrs with alkaline battery & 350Ω bridge
Bridge excitation	5Vdc fixed
Bridge resistance	85Ω minimum
Span	0.6 to 7.5mV/V for full scale
Zero/tare	±100% of full range
Accuracy	±2 digits (±0.02% of full range)
Resolution	1:19999
Peak hold	500ms peak capture
Digital filtering	0.5 to 5 seconds
Operating temp.	-10°C to +50°C
Thermal drift	100ppm/°C max.
Protection	IP65