

# TRX II

## Portable documenting calibrator

- Simulates and Reads RTD's and thermocouples
- Sources and reads Millivolts, Volts, Milliamps, Ohms and frequency
- Measures pressure -14.7 to 10,000 psi
- Dual readout: measure and source
- Data storage for field calibrations
- Data transfer via RS 232 or PCMCIA card



# TRX II

## Portable documenting calibrator

### A new standard for portable multifunction calibrators

The Druck TRX II portable documenting calibrator is the culmination of many years of combined field experience with the Druck and Unomat series of calibrators.

This one self-contained, battery powered package simulates and measures RTD's, thermocouples and resistance, as well as sourcing and reading milliamps, millivolts, volts and frequency. The rugged design includes an impact resistant enclosure which is fastened to the carrying case for convenience and safety. Dedicated alphanumeric and documenting keypads surround a large LCD panel with dual readout and backlight. Connectors for source and measure are kept separate and a 24V output is provided for loop power.

The TRX II's extensive measurement capabilities can include pressure measurement by connecting Druck pressure sensors which have been digitally characterized to give high accuracy.

This highly accurate and easy to use documenting calibrator provides improved data quality and quicker calibration time since data can be uploaded and downloaded via the PCMCIA card or the RS232 interface.

### High performance and multi-functional

|                          |  |
|--------------------------|--|
| Typical accuracies:      | 0.01% reading $\pm 0.01\%$ FS for mA measurement.<br>0.05% FS for pressure measurement |
| Measure:                 | mA, mV, volts, T/C's, RTD's, pressure, ohms, frequency and switch state.               |
| Source:                  | mA, mV, volts, T/C's, RTD's, ohms and frequency  |
| Remote pressure sensors: | 1 to 10,000 psi including gauge, absolute and differential                             |
| Loop power:              | 24 Vdc   |
| Data storage:            | 1 Mbyte and 2 Mbyte PCMCIA cards   |
| Data transfer:           | RS 232 or PCMCIA card  |

### Simple to operate

The combined Druck and Unomat knowledge of customer needs, and innovative design, results in a high performance, yet easy to operate, multi-function documenting calibrator.

The key to the simple operation of the TRX II is the structured menu. Input and output readings are displayed simultaneously for test modes such as T-I and P-I, allowing quick comparison of the values. Used in conjunction with Linkpak-W calibration software, or Intecal-W database software, the TRX II will perform automatic calibrations from pre-defined procedures, calculating and reporting errors to the operator and storing the results on a PCMCIA card. This intuitive approach, whether used manually or automatically, ensures correct set up for the job at hand and improves working efficiency and data accuracy.

The TRX II provides simple and flexible data transfer to fit in with most working practices. Information can be reviewed on screen or transferred to and from the TRX II using the RS 232 interface. Alternatively, without docking the instrument to a PC, data can be transferred by exchanging PCMCIA cards.

The operating system works in several languages and provides scaling, step and ramp features for calibration and maintenance. The TRX II, which includes extensive self-test routines, can be relied upon time and time again for field calibration in extreme conditions.

Connectors for external pressure sensor

Direct connection for T/C compensation wires

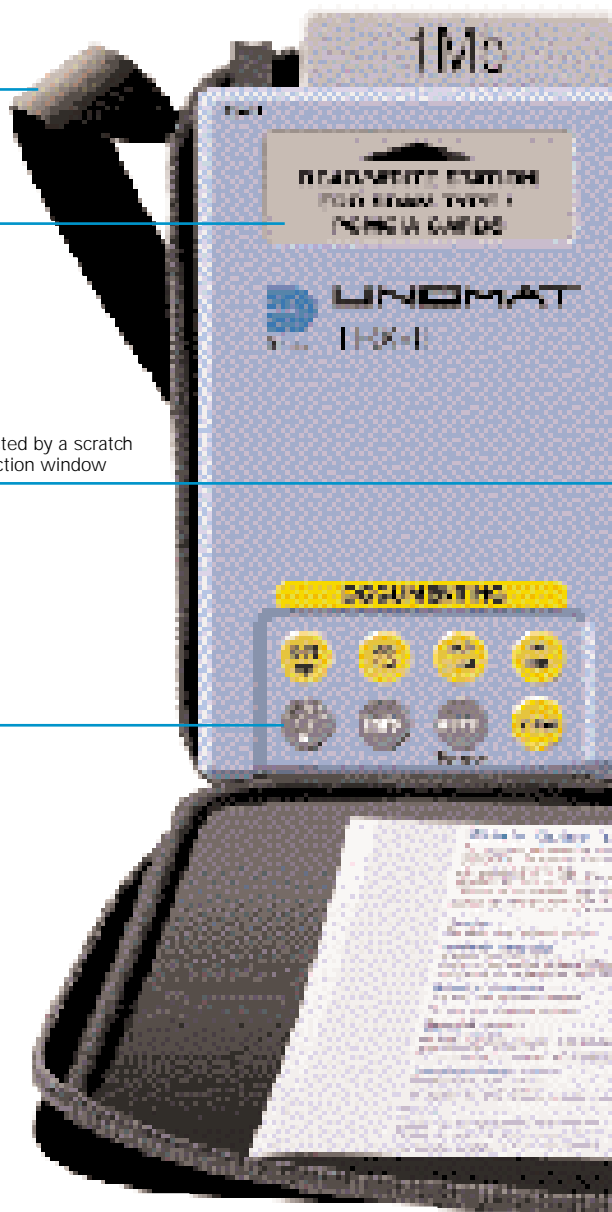
Cold junction compensation at point of contact

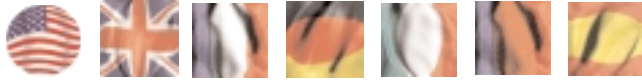
Shoulder strap

PCMCIA slot for card types 1 or 2

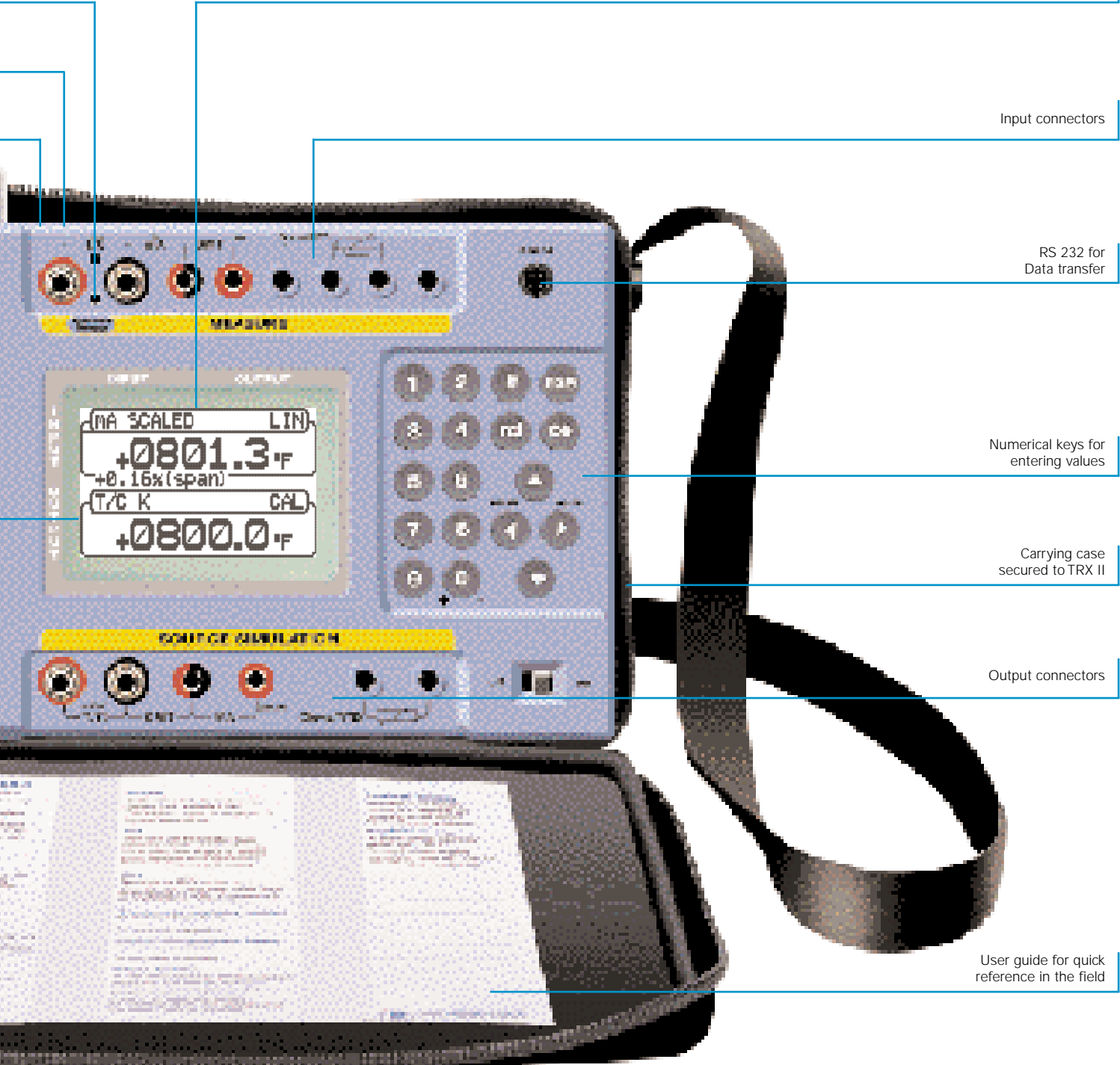
LCD screen protected by a scratch resistant anti-reflection window

Backlight key





Multilingual firmware supported by Linkpak-W calibration software.



Input connectors

RS 232 for Data transfer

Numerical keys for entering values

Carrying case secured to TRX II

Output connectors

User guide for quick reference in the field

# TRX II

## Applications

### MULTIFUNCTION PORTABLE CALIBRATOR

The TRX II has been designed for ease of use while meeting a wide range of application needs including calibration, maintenance and commissioning. The dual parameter display shows the measured and sourced values in large clear digits with all applicable information such as the units of measurement and range. With safety in mind, construction of the shoulder strap allows hands free operation while maintaining display visibility.

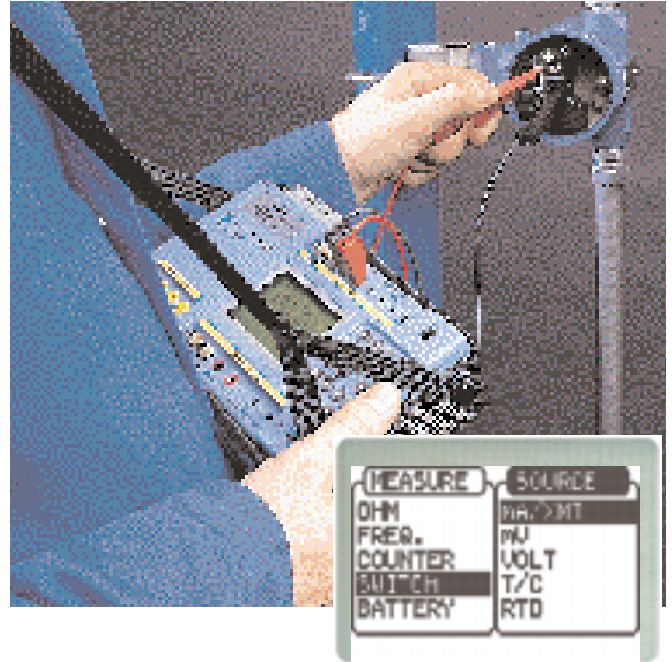
#### Some of the capabilities

- Measure/source mA
- Measure/simulate 12 types of T/C
- Measure/simulate 9 types of RTD
- Measure/source frequency and pulses
- Simulate transmitter input and measure transmitter output
- Measure/source mV/V
- Measure/source resistance
- Measure pressure: -14.7 to 10,000 psi
- Test switches: captures values on contact change

#### Easy to operate

The easy to operate menu driven software enables the calibrator to be set up very quickly. Simply scroll through the menus and select the appropriate parameters.

Operating and connection errors such as loop resistance mismatch and cold junction temperature sensor absence are reported. The KEYSTROKING memory enables instant recall of previously stored user tests.



### TEMPERATURE SENSOR SIMULATION AND LOOP CHECKING

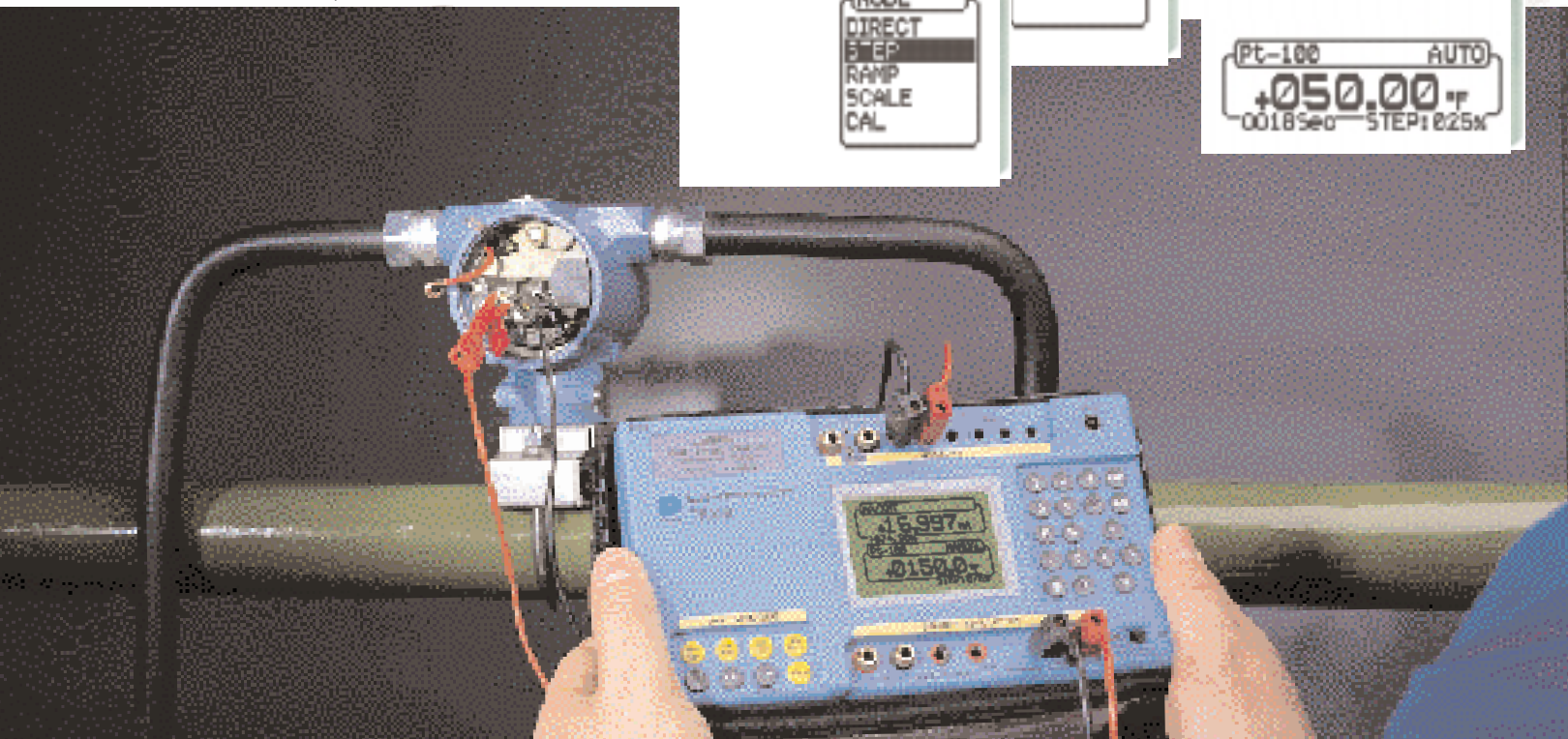
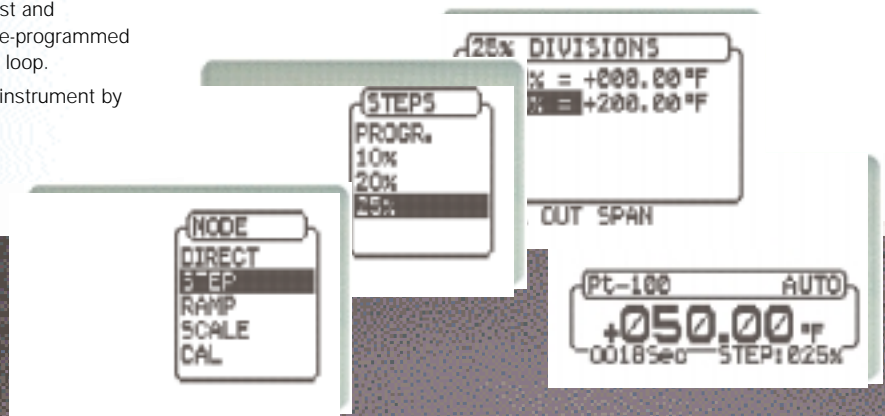
The auto step and ramp modes enable a single technician to test and commission control loops. The calibrator is left to generate a pre-programmed output, while the technician checks the signal further down the loop.

End to end control loop performance can be checked with one instrument by simulating a temperature signal at the start of the loop.

When troubleshooting apply a three step approach.

#### Step one:

Measure the sensor output to confirm correct connection



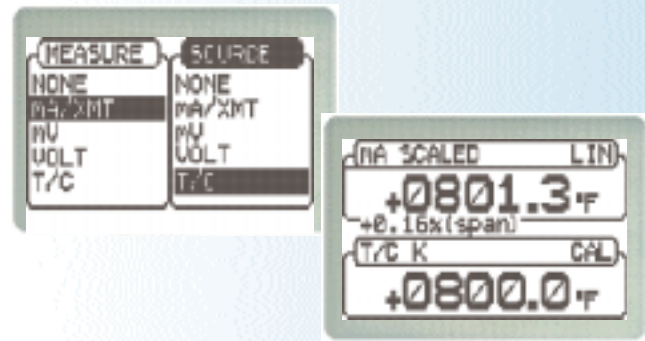
## TEMPERATURE TRANSMITTER SIMULATION AND CALIBRATION



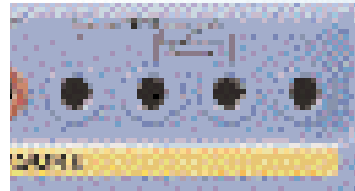
Direct connection of thermocouple compensation wires eliminates the need for special connectors and reduces additional cold junction errors. This is the most reliable and accurate method of monitoring cold junction temperatures in a portable field calibrator.

In calibration mode the display shows all the required information. Both mV and mA values are displayed in °F for easy comparison, along with the calculated error expressed as % of span or reading.

The TRX II will simulate the temperature signal to the transmitter to be calibrated and will simultaneously measure and display the output. A 24 volt power supply is provided for stand alone operation.



The connection of 2, 3 and 4 wire RTD's is detected automatically, a feature unique to Druck portable field calibrators.

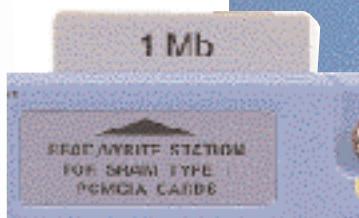
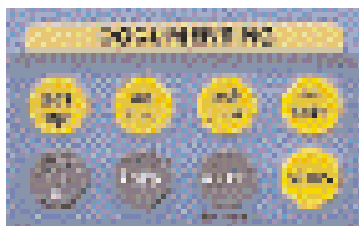


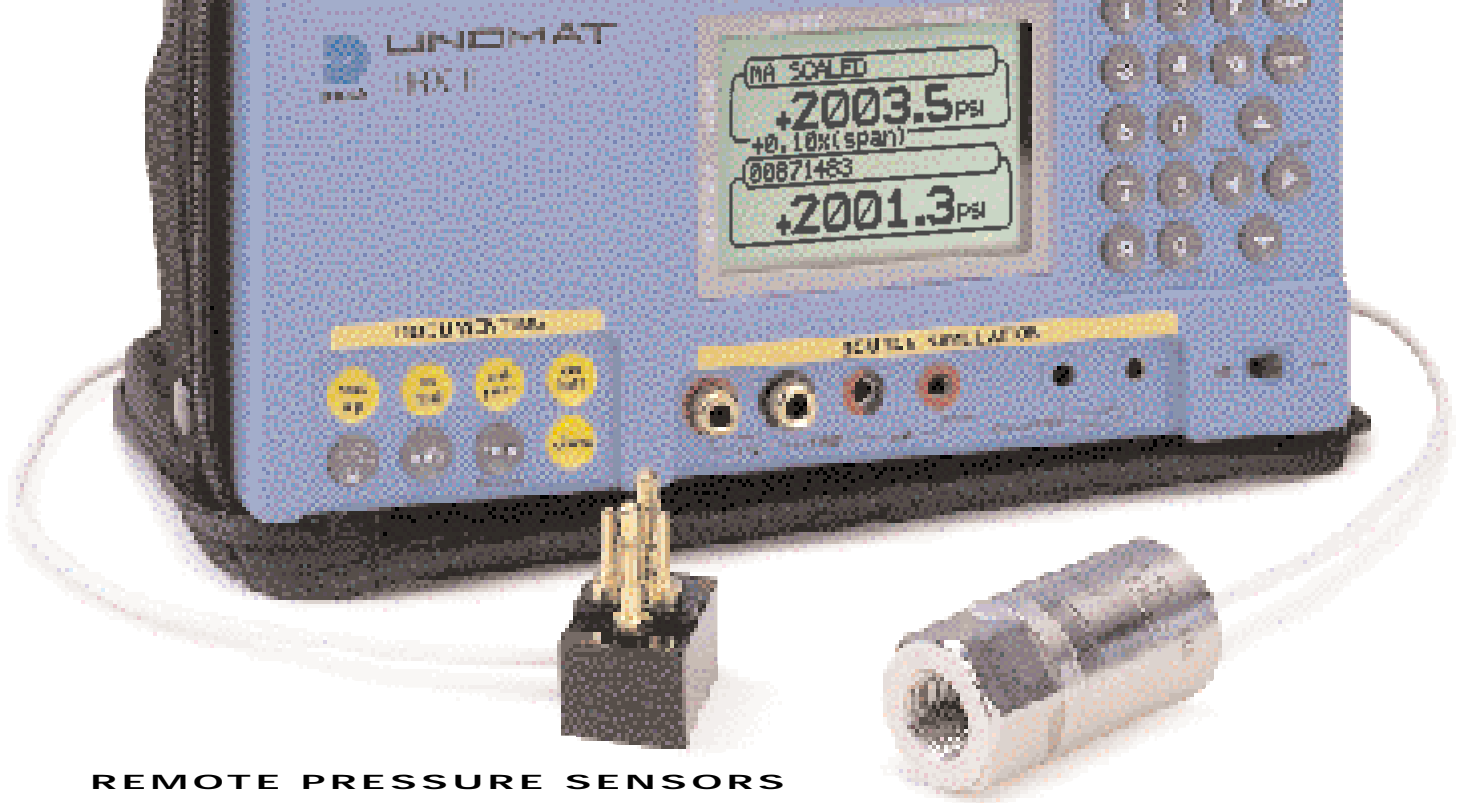
## CALIBRATION FOR ISO 9000

Dedicated keys for documenting field calibrations eliminate human errors and are available as standard. The 'AS FND' (as found) and 'AS LEFT' keys start the respective procedures for storing calibration data which can be recalled using the 'VIEW' key.

Optional PCMCIA cards represent the most efficient data transfer media. Docking of the calibrator with the PC is unnecessary as a card containing calibration data can be exchanged for another containing new procedures/work orders, enabling technicians and calibrators to spend more time in the field.

Data is transferred to the PC from the PCMCIA card or the RS 232 interface for analysis, certificate printing and archiving. Exporting facilities are provided for wordprocessor and spreadsheet applications or in-house maintenance systems.





## REMOTE PRESSURE SENSORS

Remote pressure sensors offer a cost effective means of expanding the capabilities of the TRX II, for example:

- n Calibration of pressure transmitters
- n Testing pressure switches
- n For differential pressure applications
- n For flow measurement calibrations

The capability of the TRX II can be extended by adding up to 8 external pressure sensors (connected one at a time). With ranges from 1 to 10,000 psi and all welded stainless steel and Hastelloy construction, sensors can be chosen to suit many applications. Remote pressure sensors require a mating cable approximately 4.5 feet in length. One end connection interfaces with the remote pressure sensor electrical input and one end mates with the TRX II remote pressure sensor electrical input (please refer to Option B2). Druck has applied the latest technology and production techniques to develop these sensors which are digitally corrected for non-linearity and temperature effects.

### Specifications

Over 50 sensor ranges are available including gauge, absolute and differential versions and with accuracy better than 0.05% FS, even the most up to date pressure instrumentation can be maintained and calibrated.

### Pressure ranges (optional)

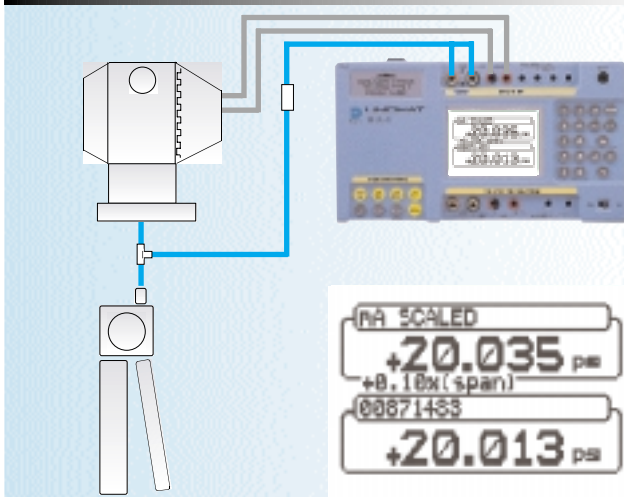
| Gauge            | Absolute       | Differential   |
|------------------|----------------|----------------|
| 1 psi            | 5 psi          | 5 psi          |
| <b>2.5 psi</b>   | <b>10 psi</b>  | <b>10 psi</b>  |
| 3 psi            | 15 psi         | 15 psi         |
| 5 psi            | 20 psi         | <b>30 psi</b>  |
| <b>10 psi</b>    | <b>30 psi</b>  | <b>50 psi</b>  |
| 15 psi           | 50 psi         | 75 psi         |
| 20 psi           | 75 psi         | <b>100 psi</b> |
| <b>30 psi</b>    | <b>100 psi</b> | 150 psi        |
| 50 psi           | 150 psi        | 200 psi        |
| 75 psi           | 200 psi        | 300 psi        |
| <b>100 psi</b>   | 300 psi        | <b>500 psi</b> |
| 150 psi          | 450 psi        |                |
| 200 psi          | 500 psi        |                |
| <b>300 psi</b>   | 600 psi        |                |
| 450 psi          | 1000 psi       |                |
| <b>500 psi</b>   |                |                |
| 600 psi          |                |                |
| <b>1000 psi</b>  |                |                |
| 1500 psi         |                |                |
| <b>2000 psi</b>  |                |                |
| 2500 psi         |                |                |
| <b>3000 psi</b>  |                |                |
| <b>5000 psi</b>  |                |                |
| 6000 psi         |                |                |
| <b>10000 psi</b> |                |                |

**Comments**  
 Maximum line pressure 500 psi  
 Differential ranges uni-directional use only

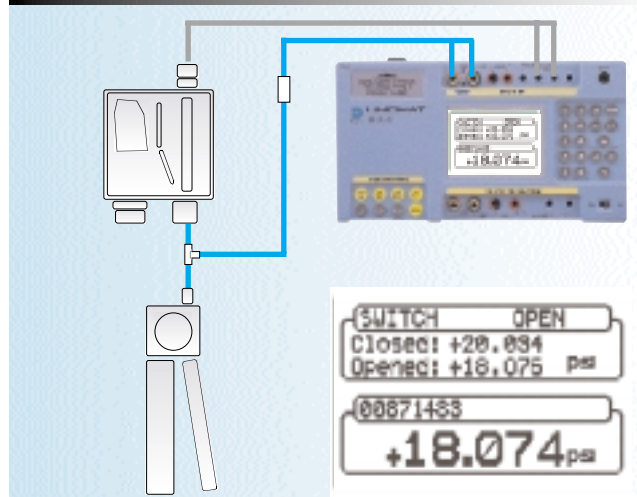
**Pressure connection:** 1/4 NPT female.

**Note 1:** Absolute up to 1000 psi.  
**Note 2:** All ranges shown in bold are in stock.

### APPLICATION: Pressure transmitter



### Pressure switch



### MEASURE

| Input              | Range                     | Accuracy        | Resolution | Remarks                 |
|--------------------|---------------------------|-----------------|------------|-------------------------|
| mV                 | 0 ... 100 mV              | 0.02% + 0.01%   | 0.001      | R - input > 20 M Ohm    |
|                    | 100 ... 600 mV            | 0.025% + 0.005% | 0.01       |                         |
| V                  | 0 ... 6 V                 | 0.025% + 0.005% | 0.0001     | R - input > 1 M Ohm     |
|                    | 6 ... 60 V                | 0.05% + 0.005%  | 0.001      |                         |
| mA                 | 0 ... 52 mA               | 0.01% + 0.01%   | 0.001      | R - input 2.5 Ohm fused |
| Ohms               | 0 ... 400 Ohm             | 0.005% + 0.02%  | 0.01       | at 0.9 mA excitation    |
|                    | 400 ... 2000 Ohm          | 0.02% + 0.015%  | 0.1        | at 0.9 mA excitation    |
| Frequency          | 0 ... 655 Hz              | 0.006%          | 0.01       | R - input > 300 k Ohm   |
|                    | 655 ... 1310 Hz           | 0.1 Hz          | 0.1        | R - input > 300 k Ohm   |
|                    | 1310 ... 20,000 Hz        | 1 Hz            | 1          | R - input > 300 k Ohm   |
| Counts/minute      | 0 ... 6 x 10 <sup>5</sup> | 2 c/min.        | 1          | R - input > 300 k Ohm   |
| Counts/hour        | 0 ... 10 <sup>7</sup> -1  | 2 c/hour        | 1          | R - input > 300 k Ohm   |
| Totalizing counter | 0 ... 10 <sup>8</sup> -1  | 2 counts        | infinite   | R - input > 300 k Ohm   |

Accuracy (% of reading + % of range)

### SOURCE

| Output      | Range                    | Accuracy       | Resolution | Remarks                |
|-------------|--------------------------|----------------|------------|------------------------|
| mV          | -10 ... 100 mV           | 0.01% + 0.005% | 0.001      | R - output < 0.2 Ohm   |
| V           | 0 ... 12 V               | 0.01% + 0.005% | 0.0001     | R - output < 0.2 Ohm   |
| mA          | 0 ... 24 mA              | 0.01% + 0.02%  | 0.001      | R - max 900 Ohm        |
| Ohms        | 0 ... 400 Ohm            | 0.005% + 0.02% | 0.01       | at 1 mA excitation     |
|             | 0 ... 2000 Ohm           | 0.02% + 0.015% | 0.1        | at 1 mA excitation     |
| Pulse       | 0 ... 10 <sup>8</sup> -1 | infinite       | 1          | R - input > 300 k Ohm  |
| Frequency   | 0 ... 100 Hz             | 0.01 Hz        | 0.01       | 0 ... 24 V/ 34 mA max. |
|             | 0 ... 20,000 Hz          | 1 Hz           | 1          | 0 ... 24 V/ 34 mA max. |
| pulses/min  | 0 ... 6000               | 1 p/min        | 1          | 0 ... 24 V/ 34 mA max. |
| pulses/hour | 0 ... 99,999             | 1 p/hour       | 1          | 0 ... 24 V/ 34 mA max. |

Accuracy (% of reading + % of range)

### TEMPERATURE

| RTD      | Range        | Accuracy |        | Resolution |
|----------|--------------|----------|--------|------------|
|          |              | Measure  | Source |            |
| Pt1000 ① | -328/752 °F  | 0.4 °F   | 0.4 °F | 0.2 °F     |
| Pt500 ①  | -328/1562 °F | 0.7 °F   | 0.7 °F | 0.2 °F     |
| Pt200 ①  | -328/1562 °F | 1.1 °F   | 1.1 °F | 0.2 °F     |
| Pt100 ①  | -328/1562 °F | 0.6 °F   | 0.6 °F | 0.06 °F    |
| Pt50 ①   | -328/1562 °F | 0.9 °F   | 0.9 °F | 0.11 °F    |
| D-100 ②  | -328/1166 °F | 0.6 °F   | 0.6 °F | 0.06 °F    |
| Ni100 ③  | -76/482 °F   | 0.4 °F   | 0.4 °F | 0.2 °F     |
| Ni120 ④  | -112/500 °F  | 0.4 °F   | 0.4 °F | 0.2 °F     |
| Cu10 ⑤   | -328/500 °F  | 3.6 °F   | 3.6 °F | 0.6 °F     |

① = IEC 751, ② = JIS 1604-1989, ③ = DIN 43760, ④ = MINCO 7, ⑤ = MINCO 16-9

Best case, Mid Range accuracies

| T/C | Range        | Accuracy |        | Resolution |
|-----|--------------|----------|--------|------------|
|     |              | Measure  | Source |            |
| J ① | -346/2192 °F | 0.9 °F   | 0.6 °F | 0.2 °F     |
| L ② | -328/1652 °F | 0.6 °F   | 0.4 °F | 0.2 °F     |
| K ① | -418/2498 °F | 1.3 °F   | 0.6 °F | 0.2 °F     |
| T ① | -418/752 °F  | 0.6 °F   | 0.4 °F | 0.2 °F     |
| U ② | -328/1112 °F | 0.6 °F   | 0.4 °F | 0.2 °F     |
| B ① | 482/3308 °F  | 1.8 °F   | 1.3 °F | 0.2 °F     |
| R ① | -58/3214 °F  | 1.8 °F   | 1.3 °F | 0.2 °F     |
| S ① | -58/3214 °F  | 2.5 °F   | 1.3 °F | 0.2 °F     |
| E ① | -418/1832 °F | 0.7 °F   | 0.4 °F | 0.2 °F     |
| N ① | -328/2372 °F | 1.1 °F   | 0.6 °F | 0.2 °F     |
| C ① | 32/4208 °F   | 1.8 °F   | 0.9 °F | 0.2 °F     |
| D ① | 32/4523 °F   | 1.8 °F   | 0.9 °F | 0.2 °F     |

① = IEC 584, ② = DIN 43710

Best case, Mid Range accuracies

**Note:** Thermocouple accuracies do not include cold junction compensation errors

### SPECIAL FEATURES

**Temperature units**  
°F or °C

**Temperature scales**  
IPTS 68 or ITS 90 selectable

**Pressure units**  
15 units

**Step**  
10 programmable, 10%, 20%, 25%. Manual step or adjustable timer

**Ramp**  
Fully programmable travel time (up/down and dwell)

**Scaling**  
5 digits and sign on all electrical ranges

**Temperature transmitter calibration**  
Both input and output readings in temperature units  
Calibration feature extended for all output functions

**Temperature transmitter simulation**  
mA output reads in temperature units

**Signal converter**  
Converts any input into any output, fully isolated

**Keystroking**  
Storage for 9 user defined test configurations

**Switch test**  
Display freezes on open and closed with Switch resistance measurement

**Data log**  
1 Mbyte up to 8 Mbyte of data storage

**Computer interface**  
RS 232 and PCMCIA card (RS 232 cable and PCMCIA card are supplied with Option A or PCMCIA release card kit referenced on price list.)

**PCMCIA station**  
PCMCIA card type 1 or 2

**Language**  
English, French, German, Italian, Portuguese and Spanish

**Power management**  
Auto backlight OFF, battery low indicator and status from menu.

### DISPLAY

**Panel**  
2.6 x 1.6 inch Graphic LCD with backlight

**Readout**  
Typically 5 readings/ second

### ENVIRONMENTAL

**Calibration reference**  
72 °F ± 2°F, R.H. 45% ± 15%

**Accuracies**  
Accuracies true for 60 °F to 80 °F. Outside these limits add 0.0003%/°F typically

**Temperature**  
Operation: 15 °F to 120 °F

**Humidity:**  
0 - 90% non condensing

**Sealing**  
Generally to NEMA 12 (IP53)

**Conformity**  
EN50081-1, EN50082-1, CE Marked

**Physical**  
2.65 lb, 8.25 x 4.75 x 2.0 inch

**Power supply**  
4 x 1.5 V alkaline "C" cells or 4 x 1.2 V Ni-Cad "C" cells

## Options and related products

### OPTIONS

#### (A1) Linkpak-W calibration software (P/N LINKW)

Linkpak-W calibration software has been developed to help meet the growing demand on industry to comply with quality systems and calibration documentation. Test procedures are created in a Windows based application and devices due for calibration are reported and grouped into work orders for transfer to one of three calibrators, the DPI 605, TRX-II and the MCX. Calibration results, including files from the DPI 610, are uploaded to the PC via the RS 232 interface or PCMCIA card, for analysis and to print calibration certificates.



#### (A2) Intecal-W calibration database software (P/N INTEW)

Intecal-W Windows based software builds on the basic concept of Linkpak-W supporting both portable field calibrators and on-line workshop calibrators. Manual data entry is also a key feature for recording data. Intecal-W is an easy to learn and easy to use calibration management software for process plants, workshops, contractors, manufacturers and service companies. It offers high productivity of calibration scheduling, calibration work and documentation. Device information, calibration procedures and calibration results are stored in an instrument database and multiple databases can be created for organizing client accounts, processes or areas. Extensive management features are provided including a database search engine, time based calibration due queries and standard reports.



#### (B1) Remote pressure sensors (refer to pressure range table)

Sensors from 1 to 10,000 psi are available for use with the TRX II. The calibrator has a single remote channel which can be configured for use with up to 8 sensors (one at a time). At least one mating cable is required per TRX II when ordering remote pressure sensors - see Option (B2)

#### (B2) Mating cable for remote sensors P/N TAS-5-A074

A 4.5 ft. mating cable for connecting remote sensors to the TRX II. At least one cable per TRX II should be ordered when ordering Option (B1).

#### (C) Charger/power supply P/N 13603 state 110 or 220v

This adapter has been designed with two functions. It can either power the TRX II from line voltage or it can recharge Ni-cad batteries. The charger and adapter circuits are separate, allowing the user to recharge and operate the unit simultaneously.

### ACCESSORIES

The TRX II is supplied with carrying case, test leads, user guide, handbook and calibration certificate as standard.

### CALIBRATION STANDARDS

Calibrators manufactured by Druck are calibrated against precision equipment traceable to the National Institute of Standards and Technology (NIST). Druck is an ISO 9001 registered company.

### RELATED PRODUCTS

#### Intecal calibration management software

Intecal Windows® based software builds on the basic concept of Linkpak W supporting laboratory and field calibrations with extensive management and analysis features. Intecal interfaces with a range of instruments and offers a complete solution to calibration management.

#### Portable field calibrators

Druck manufactures a wide range of portable pressure, temperature and electrical field calibrators. A selection of these are shown below.



#### Laboratory and workshop instruments

Druck also manufactures a comprehensive range of pressure indicators and controllers. Included in this range are the Pressurements industrial deadweight testers and the Ruska high precision controllers and primary standard piston gauges.

#### Pressure transducers and transmitters

Druck instruments complement an extensive range of pressure transducers and transmitters, utilized in a variety of aerospace, automotive, depth level and process applications.

Please refer to manufacturer for further information on related products.

### ORDERING INFORMATION

Please state the following (where applicable):

1. TRX II type number.
2. Options, including part numbers. For remote pressure sensors please also state the pressure range required.

**Note:** Options should be ordered as separate items.

**Continuing development sometimes necessitates specification changes without notice.**