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tCAL

TC 12

The Ultimate Thermocouple Calibrator

tCAL model **TC 12** is the Ultimate Thermocouple Calibrator for Precise source and measurement tool for calibrating Thermocouple instruments. Also use for measuring Loop current, mV and V. It is compact, rugged and easy to use hand held device with graphical user interface.

Masibus **TC 12** Thermocouple Calibrator is designed to provide best accuracy in all modes of operation. TC 12 has simultaneous Source or Measure (Thermocouple/mV) and (V/mA/mA (loop powered supply)) capability.
V/mA/mA (loop powered supply) Measure and Thermocouple/mV (Source or measure) are isolated from each other.

TC 12 has been designed to give maximum Battery life on full charge, 20 hours for measure or source and 8 hours for 12mA (24V) measure mode, the backlight is adjustable for power saving and the display can be programmed to automatically switch off when not in use

Step/ramp output with Auto/Man selection, data logging, Max/Min/Average values, scaling to Engineering units and filter settings enhances the use of TC 12 and makes it multifunctional.

TC 12 comes with a Mini USB connector for charging, logged data retrieval and firmware upgrade, standard accessories provided patch cables, charger, USB cable, instruction manual, logged data retrieval software CD and calibration certificate, all in a attractive carrying case.

Features

- Easy to read Color Graphical TFT LCD display
- Rechargeable lithium Ion battery with enhanced power control for prolonged battery life
- Simultaneously Source or measure (Thermocouple/mV) and V/mA/mA(24V) measure.
- 24 VDC Loop power Supply to power transmitters and loops
- All thermocouple type measure and simulate.
- Step/Ramp functions with Auto/Man selection
- Universal Serial Bus (USB) communication port for charging, data retrieve and firmware upgrade
- Data Logging to measure long time drift
- Other Features: Max/Min/Average, filter settings, tare facility, adjustable backlight, alarm annunciation (on display and buzzer), automatic Display off.

Applications

- Measure and simulate for thermocouple
- Calibration of Transmitters and Transducers
- Drift test of Transmitters and Transducers

Technical Specifications

Electrical Measurement Range

Parameter	Range	Resolution	Accuracy
V	0-30.000 VDC	0.001 V	±0.02% of reading ± 2 mV
mA	0-24.000 mA	0.001 mA	±0.02% of reading ± 2 µA

Thermocouple/mV Measure and Source Range

Refer Table - 1

General Specifications

Display Mode	mA/V Measure + TC/mV(Source or measure), mA/V Measure Only, TC/mV(Source or measure) only
Supported units for TC type	°C/°F/°K
CJC error	≤ ±0.5 °C
Max. input voltage	30 V DC
Temperature Coefficient	≤30 ppm
Input Impedance Measure	TC/mV/V >1MΩ mA =10 Ω
Response time	Input <100ms Output <100ms
Load impedance	>4.7KΩ for TC/mV O/P
Display update	10 readings / sec
Isolation	500VDC between mA/V Measure and TC/mV(Source or measure)
Data logging	Logged data is stored in a user defined file in internal memory Periodic logging: 150000 readings max
Communication Interface	USB 2.0

Display & Keys

Display	2.4" TFT LCD, 262K Color, Graphical, 42.72 mm x 60.26 mm, 240x320 pixels, White LED Backlight
Keys	6 Membrane Keys

Special Features

Loop Power Output	24V DC, ±10% (24mA maximum)
HART mA Loop resistor	250 Ω ± 20%
Special Function	Step/Ramp functions: Automatic/Manual. $\sqrt{x}$, x^2: for mA/V measure

Power Supply

Battery Type	Rechargeable Li-ion battery pack, 2300mAh 3.7V
Charging Time	<5 hours max
Charger supply	100-240 VAC, 50/60 Hz; Output 5V DC@1A
Battery Life on full charge	>18 hours for ET measure or TC source with minimum backlight brightness. > 8 hours for 12mA(24V) measure mode with minimum backlight brightness
Battery Status Indication	Battery symbol displayed with % power remaining

Physical

Dimensions (in mm)	39.5 (H) x 82.1 (W) x 161.7 (L)
Housing Material	ABS Plastic
Electrical Terminals	Two nos. , 2 mm safety sockets
Thermocouple Terminal	Thermocouple minijack socket(cu type)
Weight	<300 grams
Protection	IP20

Environmental

Operating temperature	0 to 55 °C
Operating temperature while charging batteries	0 to 45 °C
Storage temperature	-20 to 60°C
Relative Humidity	30 to 90% non-condensing
Warm up time	5 minutes

Table-1: Display Range

Input Type	Range	Display Resolution	Accuracy
E	-200.0 to 1000.0 °C	0.1 °C	0.3 °C
J	-200.0 to 1200.0 °C	0.1 °C	0.3 °C
K	-200.0 to 1372.0 °C	0.1 °C	0.3 °C
T	-200.0 to 400.0 °C	0.1 °C	0.3 °C
B	450.0 to 1800.0 °C	0.1 °C	0.3 °C
R	0 to 1750.0 °C	0.1 °C	0.3 °C
S	0 to 1750.0 °C	0.1 °C	0.3 °C
N	-200.0 to 1300.0°C	0.1 °C	0.3 °C
mV	-10 to 80 mV	0.001 mV	±0.02% of reading ± 2 µV
	-10 to 250 mV	0.01 mV	±0.02% of reading ± 0.02 mV

Note: temperature standard ITS-90

Accessories

- Calibration Certificate
- User Guide
- 1 Sets of 2mm to 2mm test leads
- 1 Test lead Cu-Cu(Miniature TC Plug Cu type to 2mm test lead)
- 2 Sets of 2mm Crocodile cable
- 2 Sets of connecting plug 4mm to 2mm
- USB A Male to USB mini B Male cable for PC communication and charging
- 5 VDC Charging Adaptor
- Carrying Bag
- Data Logging Software CD - mCAL

Ordering code

TC 12

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