



## 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

General				Physical			
Parameter	Range	Resolution	Accuracy	Dimensions (in mm)	39.5 (H) x 82.1 (W) x 161.7 (L)		
V	0-30.000 VDC	0.001 V	±0.02% of reading ± 2 mV	Housing Material	ABS Plastic		
mA	0-24.000 mA	0.001 mA	±0.02% of reading ± 2 µA	Electrical Terminals	Two nos. , 2 mm safety sockets		
Thermocouple/mV Measure and Source Range				Thermocouple Terminal	Thermocouple minijack socket(cu type)		
Refer Table - 1				Weight	<300 grams		
General Specifications				Protection	IP20		
Display Mode	mA/ V Measure + TC/ mV( Source or measure), mA/ V Measure Only, TC/ mV( Source or measure) only			Environmental			
Supported units for TC type	°C/ °F/ °K			Operating temperature	0 to 55 °C		
CJC error	≤ ±0.5 °C			Operating temperature while charging batteries	0 to 45 °C		
Max. input voltage	30 V DC			Storage temperature	-20 to 60°C		
Input Impedance Measure	TC/ mV/ V >1MΩ mA =10 Ω			Relative Humidity	30 to 90% non-condensing		
Response time	Input <100ms Output <100ms			Warm up time	5 minutes		
Load impedance	>4.7KΩ for TC/ mV O/P			Table-1: Display Range			
Display update	10 readings/ sec			Input	Range	Display Resolution	Accuracy
Isolation	500VDC between mA/ V Measure and TC/ mV( Source or measure)			E	-200.0 to 1000.0 °C	0.1 °C	0.3 °C
Data logging	Logged data is stored in a user defined file in internal memory Periodic logging: 150000 readings max			J	-200.0 to 1200.0 °C	0.1 °C	0.3 °C
Communication Interface	USB 2.0			K	-200.0 to 1372.0 °C	0.1 °C	0.3 °C
Display & Keys				T	-200.0 to 400.0 °C	0.1 °C	0.3 °C
Display	2.4" TFT LCD, 262K Color, Graphical, 42.72 mm x 60.26 mm, 240x320 pixels, White LED Backlight			B	450.0 to 1800.0 °C	0.1 °C	0.3 °C
Keys	6 Membrane Keys			R	0 to 1750.0 °C	0.1 °C	0.3 °C
Special Features				S	0 to 1750.0 °C	0.1 °C	0.3 °C
Loop Power Output	24V DC, ±10% (24mA maximum)			N	-200.0 to 1300.0°C	0.1 °C	0.3 °C
HART mA Loop resistor	250 Ω ± 20%			mV	-10 to 80 mV	0.001 mV	±0.02% of reading ± 2 µV
Special Function	Step/Ramp functions: Automatic/Manual. √x, x <sup>2</sup> : for mA/V measure				-10 to 250 mV	0.01 mV	±0.02% of reading ± 0.02 mV
Power Supply				Note: temperature standard ITS-90			
Battery Type	Rechargeable Li-ion battery pack, 2300mAh 3.7V			Accessories			
Charging Time	<5 hours max			Calibration Certificate			
Charger supply	100-240 VAC, 50/60 Hz; Output 5V DC@1A >18 hours for ET measure or TC source with minimum backlight brightness.			User Guide			
Battery Life on full charge	> 8 hours for 12mA(24V) measure mode with minimum backlight brightness			1 Sets of 2mm to 2mm test leads			
Battery Status Indication	Battery symbol displayed with % power remaining			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