MC-1200
Multi-Function Calibrator

The Martel MC-1200 Multi-Function Calibrator provides a feature set unmatched in high accuracy, hand-held calibrators in its price range. The MC-1200 Calibrator provides the functions and accuracy associated with fixed-installation, laboratory instruments, and has everything needed for virtually any calibration task. Measure and source thermocouples, RTDs, current, voltage, and frequency, and source pulse trains. A communications port compatible with Fluke® 700 Series, Mensor®, and Martel pressure modules is provided, as is an isolated mA/V read-back circuit. Arrow keys, direct numeric keypad entry, and three software-driven function buttons, plus a large backlit, menu-driven graphics display combine to provide a highly intuitive, simple yet powerful operator interface. Built-in 250 Ohm resistor for Hart™ compatibility, compatibility with smart transmitters and PLCs, full fuseless protection, and a serial communications port for full control with ASCII commands, are just some of the additional features that make the MC-1200 the single, most indispensable tool available for virtually any calibration task. The MC-1200 is supplied in a tough, rubber boot; a carrying case is also available as an option.

Features:

▲ Measure and source T/Cs (13 types), RTDs (13 types), Ohms, current, voltage, frequency; source pulse trains

▲ Isolated mA/V read-back circuit for complete transmitter calibration

▲ Pressure module communication port compatible with Fluke 700 Series, Mensor, and Martel pressure modules

▲ Built-in 24 V supply can drive 4 – 20 mA loops up to 1000 Ohms

▲ Direct entry of custom RTD coefficients (R_O, A, B, C)

▲ All source modes can be programmed with dedicated setpoints to speed calibration and linearity tests

▲ Highest accuracy in class to 0.015% of reading

▲ Meets CE requirements and is designed to IEC 1010 safety standards

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READ-BACK DISPLAY
The top half of the display is dedicated to read-back from the device-under-test, or a pressure module.

MAIN DISPLAY
The lower half of the display is for all input and output combinations.

FUNCTION KEYS
Three software-controlled function keys; functions displayed over each button at bottom of display.

POWER ON/OFF
Turns power on/off. Auto shut-off function.

HOME KEY
HOME key displays main operating screen.

CLEAR ENTRY KEY
Allows clearing of entry.

NUMERIC KEYPAD
Rapid numeric entry of data values.

ENTER KEY
Accepts entries into memory and updates outputs.

CURRENT (mA)
Input/output for current.

PRESSURE MODULE COMMUNICATIONS PORT
Pressure module connector; compatible with Fluke, Mensor, and Martel pressure modules (not shown). Pressure measurements from 1" H$_2$O to 10,000 PSI, module dependent.

ARROW KEYS
Arrow keys allow rapid movement of cursor and setting of output values.

COMPUTER COMMUNICATION CONNECTION
Mini-jack (stereo) serial communcations connection. Allows full remote control.

VOLTAGE/OHMS/HERTZ
Input/output for voltage, Ohms, and frequency.

THERMOCOUPLE
Input/output for thermocouple.

ISOLATED READ-BACK JACKS
Volts, mA, and mA with loop power.

Specifcations (23 °C ±5 °C unless otherwise noted)

Voltage Read and Source

Source	0.000 to 20.000 VDC
Read	
Isolated	0.000 to 30.000 VDC
Non-isolated	0.000 to 20.000 VDC

Thermocouple mV

Read and Source	-10.000 to +75.000 mV

Current (mA)

Source	0.000 to 24.000 mA
Read	
Isolated	0.000 to 24.000 mA
Non-isolated	0.000 to 24.000 mA

Frequency (1 to 20 V selectable amplitude)

CPM Source and Read	2.0 to 600.0 CPM
Hz Source and Read	1.0 to 1000.0 Hz
kHz Source and Read	1.0 to 10.00 kHz

Pulse (Source only; 1 to 20V selectable amplitude)

Pulses	1 to 30,000.0
	2 CPM to 10 kHz

Ohms

Source	5.0 to 4000 Ohms
Read	0.00 to 4000.0 Ohms

Thermocouple Read and Source

J Thermocouple	-200.0 to +1200.0 °C
K Thermocouple	-200.0 to +1370.0 °C
T Thermocouple	-200.0 to +400.0 °C
E Thermocouple	-200.0 to +950.0 °C
R Thermocouple	-20.0 to +1750.0 °C
S Thermocouple	-20.0 to +1750.0 °C
B Thermocouple	+600.0 to +1800.0 °C
C Thermocouple	0 to +2316.0 °C
XK Thermocouple	-200.0 to +800.0 °C
BP Thermocouple	0 to +2500.0 °C
L Thermocouple	-200.0 to +900.0 °C
U Thermocouple	-200.0 to +400.0 °C
N Thermocouple	-200.0 to +1300.0 °C

RTD Read and Source

Ni120 (672)	-80.0 to +260.0 °C
Pt100 (385)	-200.0 to +800.0 °C
Pt100 (3926)	-200.0 to +630.0 °C
Pt100 (3916)	-200.0 to +630.0 °C
Pt200 (385)	-200.0 to +630.0 °C
Pt500 (385)	-200.0 to +630.0 °C
Pt1000 (385)	-200.0 to +630.0 °C
Cu10	-100.0 to +260.0 °C
YSI400	+15.00 to +50.00 °C
Cu50	-180 to +200 °C
Cu100	-180 to +200 °C
Pt385-10	-200 to +800.0 °C
Pt385-50	-200 to +800.0 °C

Environmental

Operating Temperature	-10°C to +50°C
Storage Temperature	-20°C to +70°C
Stability	±0.005% of reading/°C outside of 23 °C ±5°C
Power Requirements	6 VDC;
Batteries	4x AA; alkaline or optional rechargeable
Physical (includes rubber boot)	
Dimensions	8.7"H x 4.2"W x 2.3"D (220.9 x 106.6 x 58.4 mm)
Weight	30.5 ounces (863 gms)
Accessories Included	Test leads, 4-AA alkaline batteries, NIST Certificate, and instruction manual
Optional Accessories	Carrying Case, Model CC572

Accuracy

Voltage	±0.015% of reading, ±2 mV
Thermocouple mV	±0.02% of reading, ±10 µV

Thermocouple Errors (in °C; add 0.2 for Cold Junction Compensation error)

Thermocouple	Error	RTD Read and Source	Error
Type J	0.2 °C	Ni120 (672)	0.2 °C
Type K	0.3 °C	Pt100 (385)	0.2 °C
Type T	0.2 °C	Pt100 (3926)	0.2 °C
Type E	0.2 °C	Pt100 (3916)	0.2 °C
Type R	1.2 °C	Pt200 (385)	0.8 °C
Type S	1.2 °C	Pt500 (385)	0.4 °C
Type B	1.2 °C	Pt1000 (385)	0.2 °C
Type C	0.6 °C	Cu10	1.4 °C
Type XK	0.2 °C	YSI400	0.1 °C
Type BP	0.9 °C	Cu50	0.4 °C
Type L	0.2 °C	Cu100	0.3 °C
Type U	0.25 °C	Pt385-10	1.4 °C
Type N	0.4 °C	Pt385-50	0.4 °C

	Read	Source
Current (mA)	±0.015% of reading, ±2 µA	±0.015% of reading, ±2 µA
CPM	±0.05% of reading, ±1 LSD	±0.05% of reading
Hz	±0.05% of reading, ±1 LSD	±0.05% of reading
kHz	±0.05% of reading, ±1 LSD	±0.125% of reading
Ohms	works with all pulsed transmitters down to 5 ms	
400 Ohm Range	±0.025% of reading, ±0.05 Ω	±0.025% of reading, ±0.05 Ω
4000 Ohm Range	±0.025% of reading, ±0.5 Ω	±0.025% of reading, ±0.5 Ω

Fluke, Mensor, and Martel Pressure Modules

The MC-1200 is compatible with Fluke®, Mensor®, and Martel pressure modules. Both Fluke and Martel pressure modules are available from Martel Electronics. Please refer to the separate Pressure Modules data sheet for ranges and model numbers. (Pressure modules require accessory Model 700MA Module Adapter.)