

Precision "10" Series Calibrators



Work better and get better work with Martel TEN series multifunction calibrators. This family of 5 models scale up to do any size job you need when calibrating process instrumentation.

Start at the top with the DMC-1410 documenting multifunction calibrator. It's versatile, providing access to a complete range of calibration functions while performing automated on the fly calibration data collection and storage.

A simple easy-to-use software package is included that allows the user to build a database of all assets that need calibration and download work orders to the calibrator.

Next in line is the MC-1210 multifunction calibrator. It's a rugged and reliable universal calibrator. Like all the others in this series, the MC-1210 is based on the proven reliable, accurate and stable MC-1200. It's dual display and isolated readback allows it to power a transmitter under test while reading its milliamp output. Truly an all-in-one calibrator.

The MC-1210 also has a wide range of switch test features for both pressure and temperature switches.

The MC-1010 provides a high level of functions and features at an easy to swallow price for the less demanding user who does not require the isolated read-back feature found on the DMC-1410 or MC-1210.

For those who need specialty temperature calibration with high accuracy, the PTC-8010 is the choice. Special display features show the cold junction temperature and millivolt equivalents at a glance for thermocouples.

Ohms equivalents are shown when using the RTD functions.

The PSC-4010 is a superior loop calibrator with voltage, current and frequency functions. With the best display in the business it makes the essentials of instrument calibration easier than ever. And, a bonus feature not found in other loop calibrators is frequency in and out.

This innovative series features the introduction of a new, high contrast ClearBrite™ graphic display. The display features a vivid white backlight that makes the display easy to read in all light conditions.

All of these models have Martel's easy to learn yet powerful 3 key menu structure. It's the same menu used in all of the company's BetaGauge pressure calibrators, too. Learn it once and you'll know how to use every significant calibrator Martel makes.

*By DAKKS according to DIN EN ISO / IEC 17025: 2005 accredited laboratory.
The accreditation is valid only for the certificate system D-K-15055-01-00
listed accreditation scope.*



General Features

- ClearBrite™ Graphic Display
- Auto Stepping
- Auto Ramping
- RS-232 Serial Interface
- NIST Calibration Certificate
- Rubber Boot
- Martel 3-Key User Interface
- Scroll/Step Output
- Numeric Input
- AC Charger/Adapter Option

Function	Documenting	Dual Display	Isolated Readback	Current In/Out	Voltage In/Out	Loop Power	Thermocouple In/Out	RTD/Ω In/Out	Frequency	Pressure+
Model										
DMC-1410	•	•	•	•	•	•	•	•	•	•
MC-1210		•	•	•	•	•	•	•	•	•
MC-1010				•	•	•	•	•	•	•
PTC-8010							•	•		
PSC-4010				•	•	•			•	

†with optional BPPA-100 pressure module adapter

General Specifications

(applies to all models)

Operating Temperature	-10 to 50°C
Storage Temperature	-20 to 70°C
Power	(4) AA Alkaline or optional rechargeable batteries
Low Battery Warning	Yes, on display
ClearBrite™ Display	High contrast 128 x 64 pixel addressable graphic LCD w/daylight backlight 2.4 x 1.8 in. • 63 x 44 mm
Serial Communications	Yes, ASCII, RS-232, requires optional Martel 1919069 serial cable or 1919896 USB cable
CE – EMC	EN50082-1 and EN55022: 1994 Class B
Safety	CSA C22.2 No. 1010-1: 1992
Weight (with batteries)	1.8 lb (0.82 kg)
Size	8.5 x 4.8 x 2.1 in. (22 x 12 x 5.3 cm)
Other	IP54 Protected against misconnection to 250 VAC/VDC

DC Voltage and Current

Model		DC Voltage Upper Isolated	DC Voltage Lower Non-Isolated		DC Current Upper Isolated	DC Current Lower Non-Isolated	
		Measurement	Measurement	Source	Measurement	Measurement	Source
DMC-1410	Range	0.000V - 30.000V	0.000V -20.000V	0.000V -20.000V	0.000 mA - 24.000 mA	0.000 mA - 24.000 mA	0.000 mA -24.000 mA
	Accuracy	0.01% ± 2 mV	0.01% ± 2 mV	0.01% ± 2 mV	0.01% ± 2 µA	0.01% ± 2 µA	0.01% ± 2 µA
MC-1210	Range	0.000V - 30.000V	0.000V - 20.000V	0.000V -20.000V	0.000mA -24.000mA	0.000mA -24.000mA	0.000mA - 24.000mA
	Accuracy	0.015% ± 2 mV	0.015% ± 2 mV	0.015% ± 2 mV	0.015% ±2 µA	0.015% ±2 µA	0.015% ±2 µA
MC1010	Range	NA	0.000V -20.000V	0.000V -20.000V	NA	0.000mA - 24.000mA	0.000mA - 24.000mA
	Accuracy	NA	0.015% ± 2 mV	0.015% ± 2 mV	NA	0.015% ±2 µA	0.015% ±2 µA
PSC-4010	Range	NA	0.000V -20,000V	0.000V -20,000V	NA	0.000mA - 24.000mA	0.000mA - 24.000mA
	Accuracy	NA	0.015% ± 2 mV	0.015% ± 2 mV	NA	0.015% ±2 µA	0.015% ±2 µA

Note: optional 50 mA range available

Frequency

Model		Measurement	Source	Measurement	Source	Measurement	Source
DMC-1410	Range	2.0 CPM - 600.0 CPM	2.0 CPM - 600.0 CPM	1.0 Hz - 1000.0 Hz	1.0 Hz -1000.0 Hz	1.00 kHz - 10.00 kHz	1.00 kHz - 10.00 kHz
	Accuracy	0.05% ± 0.1 CPM	0.05%	0.05% ± 0.1 Hz	0.05%	0.05% ± 0.01 kHz	0.125%
MC-1210	Range	2.0 CPM - 600.0 CPM	2.0 CPM - 600.0 CPM	1.0 Hz -1000.0 Hz	1.0 Hz - 1000.0 Hz	1.00 kHz -10.00 kHz	1.00 kHz - 10.00 kHz
	Accuracy	0.05% ± 0.1 CPM	0.05%	0.05% ± 0.1 Hz	0.05%	0.05% ± 0.01 kHz	0.125%
MC1010	Range	2.0 CPM - 600.0 CPM	2.0 CPM - 600.0 CPM	1.0 Hz - 1000.0 Hz	1.0 Hz - 1000.0 Hz	1.00 kHz -10.00 kHz	1.00 kHz - 10.00 kHz
	Accuracy	0.05% ± 0.1 CPM	0.05%	0.05% ± 0.1 Hz	0.05%	0.05% ± 0.01 kHz	0.125%
PSC-4010	Range	2.0 CPM - 600.0 CPM	2.0 CPM - 600.0 CPM	1.0 Hz -1000.0 Hz	1.0 Hz - 1000.0 Hz	1.00 kHz - 10.00 kHz	1.00 kHz - 10.00 kHz
	Accuracy	0.05% ± 0.1 CPM	0.05%	0.05% ± 0.1 Hz	0.05%	0.05% ± 0.01 kHz	0.125%

Resistance Measurement (AutoRanging)

Model		Ohms (Low)	Ohms (High)
DMC-1410	Range	0.00Ω - 400.00Ω	401.0Ω - 4000.0Ω
	Accuracy	0.015% ± 0.03Ω	0.015% ± 0.3Ω
MC-1210	Range	0.00Ω - 400.00Ω	401.0Ω - 4000.0Ω
	Accuracy	0.025% ± 0.05Ω	0.025% ± 0.5Ω
MC-1010	Range	0.00Ω - 400.00Ω	401.0Ω - 4000.0Ω
	Accuracy	0.025% ± 0.05Ω	0.025% ± 0.5Ω
PTC-8010	Range	0.00Ω - 400.00Ω	401.0Ω - 4000.0Ω
	Accuracy	0.025% ± 0.05Ω	0.025% ± 0.5Ω

PSC-4010 Millivolts Measurement/ Source

Function	Range	Accuracy
Read	0000 mV - 90.000 mV	0.02% ± 10 µV
Source	0.000 mV - 100.000 mV	0.02% ± 10 µV

Resistance Source (AutoRanging)

Model	Range	Ohms Source Low Excitation Current	Accuracy	Range	Ohms Source High Excitation Current	Accuracy	Range	Ohms Source High Excitation Current	Accuracy
DMC-1410	5.0Ω - 400.0Ω	0.1 - 0.5 mA	0.015% ± 0.1Ω	401Ω - 1500Ω	0.05 - 0.8 mA	0.015% ± 0.3Ω	1500Ω - 4000Ω	0.05 - 0.4 mA	0.015% ± 0.3Ω
	5.0Ω - 400.0Ω	0.5 - 3 mA	0.015% ± 0.03Ω						
MC-1210	5.0Ω - 400.0Ω	0.1 - 0.5 mA	0.025% ± 0.1Ω	401Ω - 1500Ω	0.05 - 0.8 mA	0.025% ± 0.5Ω	1500Ω - 4000Ω	0.05 - 0.4 mA	0.025% ± 0.5Ω
	5.0Ω - 400.0Ω	0.5 - 3 mA	0.025% ± 0.05Ω						
MC-1010	5.0Ω - 400.0Ω	0.1 - 0.5 mA	0.025% ± 0.1Ω	401Ω - 1500Ω	0.05 - 0.8 mA	0.025% ± 0.5Ω	1500Ω - 4000Ω	0.05 - 0.4 mA	0.025% ± 0.5Ω
	5.0Ω - 400.0Ω	0.5 - 3 mA	0.025% ± 0.05Ω						
PTC-8010	5.0Ω - 400.0Ω	0.1 - 0.5 mA	0.025% ± 0.1Ω	401Ω - 1500Ω	0.05 - 0.8 mA	0.025% ± 0.5Ω	1500Ω - 4000Ω	0.05 - 0.4 mA	0.025% ± 0.5Ω
	5.0Ω - 400.0Ω	0.5 - 3 mA	0.025% ± 0.05Ω						

mV/ Thermocouples

(DMC-1410, MC-1210, MC-1010 and PTC-8010 only)

		DMC-1410	MC-1210 MC-1010 PTC-8010
MilliVolts (mV)	Range	Accuracy	Accuracy
Measurement	-10.000 mV – 75.000 mV	0.015% ± 10 µV	0.02% ± 10 µV
Source	-10.000 mV – 75.000 mV	0.015% ± 10 µV	0.02% ± 10 µV

Maximum current output in voltage ranges is 1 mA with an output impedance of ≤ 1 Ω

TC Type	Range (°C)	Accuracy (°C)	
		With CJC ON	With CJC OFF
J	-210.0 - 0.0	0.4	0.6
	0.0 - 800.0	0.2	0.4
	800.0 - 1200.0	0.3	0.5
K	-200.0 - 0.0	0.6	0.8
	0.0 - 1000.0	0.3	0.5
	1000.0 - 1372.0	0.5	0.7
T	-250.0 - 0.0	0.6	0.8
	0.0 - 400.0	0.2	0.4
E	-250.0 - -100.0	0.6	0.8
	-100.0 - 1000.0	0.2	0.4
R	0 - 1767	1.2	1.4
S	0 - 1767	1.2	1.4
B	600 - 800	1.2	1
	800 - 1000	1.3	1.5
	1000 - 1820	1.5	1.7
C	0 - 1000	0.6	0.8
	1000 - 2316	2.3	2.5
XK	-200.0 - 800.0	0.2	0.4
BP	0.0 - 800.0	0.9	1.1
	800.0 - 2500.0	2.3	2.5
L	-200.0 - 0.0	0.3	0.5
	0.0 - 900.0	0.2	0.4

TC Type	Range (°C)	Accuracy (°C)	
		With CJC ON	With CJC OFF
U	-200.0 - 0.0	0.5	0.7
	0.0 - 600.0	0.3	0.5
N	-200.0 - 0.0	0.8	1.0
	0.0 - 1300.0	0.4	0.6

RTD Measurement/ Source

(DMC-1410, MC-1210, MC-1010 and PTC-8010 only)

RTD Type	Range (°C)	DMC-1410	MC-1210 MC-1010 PTC-8010
		Accuracy (°C)	Accuracy (°C)
PT385, 10Ω	-200.0 - -80.0	0.76	1.3
	-80.0 - 0.0	0.78	1.3
	0.0 - 100.0	0.83	1.4
	100.0 - 300.0	0.92	1.5
	300.0 - 400.0	0.98	1.6
	400.0 - 630.0	1.05	1.8
PT385, 50Ω	-200.0 - -80.0	0.16	0.3
	-80.0 - 0.0	0.23	0.4
	0.0 - 100.0	0.23	0.4
	100.0 - 300.0	0.23	0.4
	300.0 - 400.0	0.27	0.5
	400.0 - 630.0	0.30	0.5
PT385, 100Ω	-200.0 - -80.0	0.08	0.1
	-80.0 - 0.0	0.13	0.2
	0.0 - 100.0	0.14	0.2
	100.0 - 300.0	0.15	0.2
	300.0 - 400.0	0.18	0.3
	400.0 - 630.0	0.21	0.3
PT3926, 100Ω	-200.0 - -80.0	0.07	0.1
	-80.0 - 0.0	0.10	0.2
	0.0 - 100.0	0.11	0.2
	100.0 - 300.0	0.13	0.2
	300.0 - 400.0	0.17	0.3
	400.0 - 630.0	0.19	0.3
PT3916, 100Ω	-200.0 - -80.0	0.07	0.1
	-80.0 - 0.0	0.10	0.2
	0.0 - 100.0	0.11	0.2
	100.0 - 260.0	0.13	0.2
	260.0 - 300.0	0.17	0.3
	300.0 - 400.0	0.17	0.3
PT385, 200Ω	-200.0 - -80.0	0.35	0.6
	-80.0 - 0.0	0.40	0.7
	0.0 - 100.0	0.42	0.7
	100.0 - 260.0	0.45	0.7
	260.0 - 300.0	0.45	0.7
	300.0 - 400.0	0.52	0.9
PT385, 500Ω	-200.0 - -80.0	0.15	0.2
	-80.0 - 0.0	0.18	0.3
	0.0 - 100.0	0.19	0.3
	100.0 - 260.0	0.21	0.4
	260.0 - 300.0	0.25	0.4
	300.0 - 400.0	0.26	0.4
PT385, 1000Ω	-200.0 - -80.0	0.15	0.2
	-80.0 - 0.0	0.18	0.3
	0.0 - 100.0	0.19	0.3
	100.0 - 260.0	0.21	0.4
	260.0 - 300.0	0.25	0.4
	300.0 - 400.0	0.26	0.4

		DMC-1410	MC-1210 MC-1010 PTC-8010
PT385, 1000Ω	-200.0 - -80.0	0.10	0.2
	-80.0 - 0.0	0.12	0.2
	0.0 - 100.0	0.14	0.2
	100.0 - 260.0	0.14	0.2
	260.0 - 300.0	0.17	0.3
	300.0 - 400.0	0.19	0.3
	400.0 - 630.0	0.22	0.4
NI120	-80.0 - 260.0	0.6	0.1
Cu10	-100.0 - 260.0	0.77	1.3
Cu50	-180.0 - 200.0	0.16	0.3
Cu100	-180.0 - 200.0	0.08	0.1
YSI400	15.0 - 50.0	0.05	0.1

Accuracy statements are based on 4W connections

Notes

All specifications apply at 23 °C ± 5°C unless otherwise stated.

Outside of this range add ±0.005% of reading/ °C.

Accuracy is % of reading ± floor spec.

Maximum current output in voltage ranges is 1 mA with an output impedance of ≤ 1Ω.

Maximum load on mA source is 1000Ω. Voltage input range on simulate mode 5 - 30 V.

Frequency input voltage amplitude range is 1 V to 20 V zero based square wave only. Output amplitude is adjustable from 1V to 20V and is a square wave with 50% duty cycle. For output frequency, a negative offset of approximately -0.1V is present to assure zero crossing.

In Ohms source and RTD source modes, units are compatible with smart transmitters and PLCs that use a strobing excitation current. Frequency response is 5 msec.