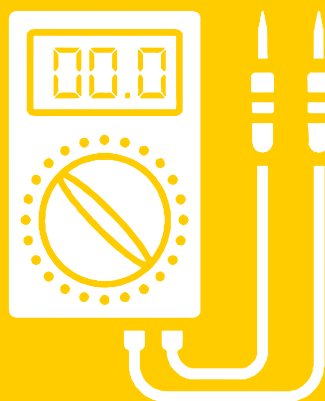


4.9



MULTIFUNCTION CALIBRATORS



TEST-4

PORTABLE SIGNAL GENERATOR / MEASUREMENT DEVICE FOR ANALOG SIGNALS

TECHNICAL DATA

GENERAL DATA

Power Supply	2 NiMh AA batteries, 2650 mAh Autonomy: 8 hours (minimum with max load), 20 hours (average) From 220 Vac network via dedicated charger/battery charger
Protection class	IP 20
Operating temperature	0..50°C (recommended)
Humidity	30..90% non-condensing
Dimensions	140 x 75 x 33 mm
Weight	250 g
Isolation	Battery-powered device, intrinsically isolated
Rejection	50-60 Hz
Max frequency Sampling	10 Hz
Input/Output signals	Measurement/Generation voltage: 0..11 V Measurement/Generation current: 0..21 mA Protection ± 30 V
Accuracy	0.1% for each input/output type
Resolution	0,002 mA 0,001 V
Standards	EN61000-6-4; EN61000-6-2; EN61010-1

OPERATIONAL DATA

Function buttons	ESC key for ESC / ON/OFF functions and reset from screensaver after 7 minutes of inactivity Knob: Increase/decrease current/voltage value (by rotating); change of "weight" with value*10N, N=0, 1, 2, 3 (by pressing)
Available languages	Italian, English, German, French, Spanish
Contrast	15 levels
Screensaver	Vertical scroll of display content after 7 minutes of inactivity. Restoration by pressing ESC / ON/OFF key
Function menu	General setup (select operation type, signal type, language, display contrast, encoder sensitivity) Generation (select voltage/current/passive current) Measurement (select voltage/current) Ramp mode for generating currents and voltages
Error signals	Overvoltage: Reading voltage higher than 11 V Undervoltage: Reading voltage lower than -0.2 V Overcurrent: Reading current higher than 21 mA Undercurrent: Reading current lower than -0.1 mA Flashing value: Voltage/Current generation failed

CONNECTIONS

Input/Output	2 mm diameter test leads
Power Supply	Battery charger socket, battery compartment on the back, under protective rubber cover
Micro USB	For future updates

EXAMPLES

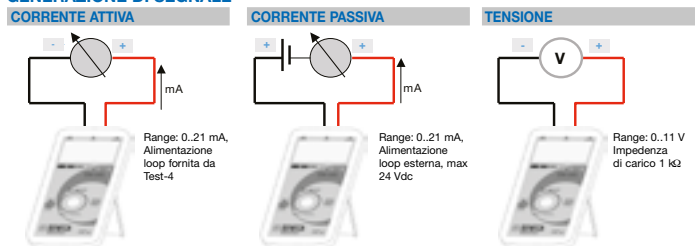


- (1) Portable case
- (2) Test-4 complete with NiMh 2650 mAh batteries
- (3) Charger, (4) Test leads
- (5) Operating manual

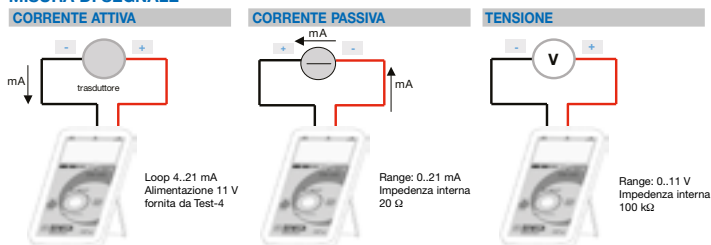
Test-4 is an essential tool for calibration sessions, laboratory tests, and the simulation of analog measurements controlled by industrial devices (PLCs, regulators, data acquisition systems, etc.). With a total precision of less than 0.1% and a resolution of 1 μ A / 1 mV, Test-4 guarantees optimal calibration results. It allows for the simulation of both voltage and current ramps (active or passive). It is equipped with a low-power OLED display, multi-turn trimmer knob, and a non-slip shell. Test-4 can be powered by a 220 Vac network through a dedicated power adapter or by 2 NiMh batteries, providing an average autonomy of 20 hours.

WIRING DIAGRAMS

GENERAZIONE DI SEGNALE

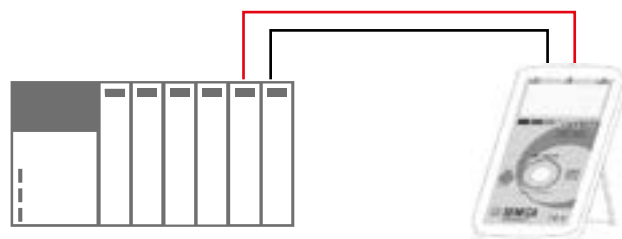


MISURA DI SEGNALE



EXAMPLES

FIELD SIGNAL SIMULATION



PROCESS CALIBRATION FOR SENSORS, ACTUATORS, POSITIONERS, PLCs, REGULATORS, ETC.



ORDER CODES

Code	Description
TEST-4	Signal generator, portable V-mA meter with ramp simulation
TEST-4-PK	Precision Kit (set of precision test leads and alligator clips) for Test-4
TEST-4-R	Set of precision test leads for Test-4
TEST-4-T	ISO 9001 calibration certificate for Test-4

**MSC****MULTIFUNCTION SMART CALIBRATOR****TECHNICAL DATA****GENERAL DATA**

Powered by mains	From 230 Vac network via standard USB charger
Battery-powered	1 Lithium Polymer (LiPo) battery, 3400 mAh; autonomy: 8 hours (minimum @ max load), 20 hours (max)
Protection class	IP20
Operating temperature	-20...50°C (not during charging), 0-45°C during charging
Storage temperature	0...35°C
Humidity	30...90% non-condensing
Isolation	Battery-powered device, intrinsically isolated No isolation from USB port
Overvoltage protection	230 Vac max without permanent damage
Rejection	50/60 Hz
Max frequency Sampling	10 Hz
Operating Modes	Measurement, Generation, Datalogger Ramp
Dimensions	88 x 147 x 25 mm
Weight	330 g
Included items	Connection cables (4), charger
Factory calibration certificate	included
Approval	CE
Standards	EN61326-1; EN61010-1

MEASUREMENT ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 μ A; 1 mV; 5 μ V; 0.1°C; 0.1 μ V/V

GENERATION ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 μ A; 1 mV; 5 μ V; 0.1°C; 0.02 Ohm; 0.1 μ V/V

INTERFACES AND SIGNALS

Buttons	On / Off / Pairing Power-on indicator LED Communication indicator LED Error indicator LED PAIRING BT indicator LED Datalogger on indicator LED (future) Battery status indicator LED
LED	Buzzer for overload signal and inability to simulate requested value
Buzzer	
Standard sockets	# 4 mm sockets
Thermocouple connection	Mini plug (7.9mm) for thermocouple measurement and simulation
Power Supply	Micro USB
Micro USB	For firmware update or modbus communication (virtual COM)
Wireless communication	Bluetooth Low Energy 4.1 to smartphone and Android or iOS tablet

MEASUREMENT FUNCTIONS

Current	0..24 mA active and passive; protection \pm 28 V
VOLTAGE (V)	0.0-27 V
VOLTAGE (mV)	-10mV-+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2, 3, 4 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Max counting frequency 1000 Hz
Frequency	0.1..1000 Hz

GENERATION FUNCTIONS

Current	0.1 to 24 mA active and passive; protection \pm 28 V
VOLTAGE (V)	0.1-26 V
VOLTAGE (mV)	-10mV-+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Min 0.5 ms (1 to 24V) adjustable number of pulses
Frequency	0.1..1000 Hz

DATALOGGER

Datalogger	Yes
Sampling Time	>500 ms

RAMP FUNCTION

Functions	Current/Voltage/TC/RTD/Load Cell
Type	Single or Loop Maximum 9 segments, ramp resolution 100 ms, minimum ramp time 1 second

MANAGEMENT APP

Available languages	App in language
O.S / Store	iOS 10.3 or higher (App Store) / Android 4.0.3 or higher (Play Store)
Function Menu	General setup (operation type selection, signal type, language) Measurement (voltage/current/passive current/thermocouple/resistance thermometers/load cell/impulses; average-min-max value, counter reset, measurement pause; value sharing; scale change) Generation (voltage/current/passive current/thermocouple/resistance thermometers/load cell/impulses; on-off; scale change)

Error Signals

Out of measurement scale
Overload generation warning
Low battery
Internal anomaly

LEGEND

1. Socket for thermocouple measurement/generation
2. Measurement/generation socket -EX
3. Measurement/generation socket -SN
4. Measurement/generation socket +SN
5. Measurement/generation socket +EX
6. Power ON/OFF button
7. Bluetooth RESET button
8. PWR power indicator LED
9. Bind connection indicator LED
10. Battery status indicator LED
11. Bluetooth/USB communication LED
12. Data recording LED
13. Error signaling LED
14. Micro USB connector for power/communication
15. RESET button
16. Battery charging status LED

INCLUDED ITEMS

- (1) Portable case, (2) MSC complete with batteries, (3) power plug, (4) USB data and charging cable, (5) calibration report, (6) operating manual, (7) test cables

MEASUREMENT RANGE

MAGNITUDE	Unit of Measure	GENERATION	MEASUREMENT
Voltage (high range)	[dc V]	0..26 V	0..26 V
Voltage (low range)	[dc mV]	-10..+90 mV	-10..+90 mV
Active current	[dc mA]	0.1..+24 mA	0..+24 mA
Passive current	[dc mA]	0.1..+24 mA (3..29 V)	0..+24 mA
Pt100	[°C]	-200..+859°C	-200..+850°C
Pt500	[°C]	-200..+859°C	-200..+850°C
Pt1000	[°C]	-200..+859°C	-200..+850°C
Cu50 / Cu100	[°C]	-180..+200°C	-180..+200°C
Ni100 / Ni120	[°C]	-80..+260°C	-60..+250°C
Thermocouple J	[°C]	-210..+1200°C	-210..+1200°C
Thermocouple K	[°C]	-270..+1372°C	-200..+1372°C
Thermocouple T	[°C]	-270..+400°C	-200..+400°C
Thermocouple E	[°C]	-270..+1000°C	-200..+1000°C
Thermocouple N	[°C]	-270..+1300°C	-200..+1300°C
Thermocouple R	[°C]	-50..+1768°C	-50..+1768°C
Thermocouple S	[°C]	-50..+1768°C	-50..+1768°C
Thermocouple B	[°C]	0..+1820°C	250..+1820°C
Thermocouple L	[°C]	-200..+800°C	-200..+800°C
Load Cell 350 Ohm	[mV/V]	-0.2..+2.4 mV/V	-0.2..+2.4 mV/V
Pulse / Frequency	[Hz]	0.1..1000 Hz (1..24 V)	0.1..1000 Hz (3..24 Vdc)

ORDER CODES

Code	Description
MSC	Multifunction Smart Calibrator - Signal generator / meter, Bluetooth app-based calibrator
MSC TOOL	Free Windows application for firmware updates and data extraction in .csv format
USB-ISO	PC-USB isolator (accessory)
MSC-POWER	1A / 5V power supply (replacement)



MSC-D

MULTIFUNCTION SMART CALIBRATOR WITH LCD DISPLAY

TECHNICAL DATA

GENERAL DATA

Powered by mains	From 230 Vac network via standard USB charger
Battery-powered	1 Lithium Polymer (LiPo) battery, 3400 mAh; autonomy: 8 hours (minimum @ max load), 20 hours (max)
Protection class	IP20
Operating temperature	-20...50°C (not during charging), 0-45°C during charging
Storage temperature	0...35°C
Humidity	30...90% non-condensing
Isolation	Device powered with LCD display No isolation from USB port
Overvoltage protection	230 Vac max without permanent damage
Rejection	50/ 60 Hz
Max frequency Sampling	10 Hz
Operating Modes	Measurement, Generation, Datalogger Ramp
Dimensions	88 x 147 x 25 mm
Weight	330 g
Included items	Connection cables (4), charger
Factory calibration certificate	included
Approval	CE
Standards	EN61326-1; EN61010-1

MEASUREMENT ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 µA; 1 mV; 5 µV; 0.1°C; 0.02 Ohm; 0.1 µV/V

GENERATION ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 µA; 1 mV; 5 µV; 0.1°C; 0.02 Ohm; 0.1 µV/V

INTERFACES AND SIGNALS

Display	Capacitive touch screen, TFT-LCD color 3.5" resolution 320x480, with backlight
Buttons	On / Off / Pairing Power-on indicator LED Communication indicator LED Error indicator LED
LED	PAIRING BT indicator LED Datalogger on indicator LED (future) Battery status indicator LED
Buzzer	Buzzer for overload signal and inability to simulate requested value
Standard sockets	# 4 4mm sockets
Thermocouple connection	Mini plug (7.9mm) for thermocouple measurement and simulation
Power Supply	Micro USB
Micro USB	For firmware update or modbus communication (virtual COM)
Communication	Ethernet

MEASUREMENT FUNCTIONS

Current	0...24 mA active and passive; protection ± 28 V
VOLTAGE (V)	0.0...27 V
VOLTAGE (mV)	-10mV...+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2, 3, 4 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Max counting frequency 1000 Hz
Frequency	0.1...1000 Hz

GENERATION FUNCTIONS

Current	0.1 to 24 mA active and passive; protection ± 28 V
VOLTAGE (V)	0.1...26 V
VOLTAGE (mV)	-10mV...+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Min 0.5 ms (1 to 24V) adjustable number of pulses
Frequency	0.1...1000 Hz

DATALOGGER

Datalogger	Yes
Sampling Time	>500 ms

RAMP FUNCTION

Functions	Current/Voltage/TC/RTD/Load Cell
Type	Single or Loop Maximum 9 segments, ramp resolution 100 ms, minimum ramp time 1 second

MANAGEMENT APP

Available languages	App in language
O.S / Store	iOS 10.3 or higher (App Store) / Android 4.0.3 or higher (Play Store)
Function Menu	General setup (operation type selection, signal type, language) Measurement (voltage/current/passive current/thermocouple/ resistance thermometers/load cell/impulses; average-min-max value, counter reset, measurement pause; value sharing; scale change) Generation (voltage/current/passive current/thermocouple/resistance thermometers/load cell/impulses; on-off; scale change)

Error Signals	Out of measurement scale Overload generation warning Low battery Internal anomaly
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MEASUREMENT RANGE

MAGNITUDE	Unit of Measure	GENERATION	MEASUREMENT
Voltage (high range)	[dc V]	0...26 V	0...26 V
Voltage (low range)	[dc mV]	-10...+90 mV	-10...+90 mV
Active current	[dc mA]	0.1...+24 mA	0...+24 mA
Passive current	[dc mA]	0,1...+24 mA (3...29 V)	0...+24 mA
Pt100	[°C]	-200...+859°C	-200...+850°C
Pt500	[°C]	-200...+859°C	-200...+850°C
Pt1000	[°C]	-200...+859°C	-200...+850°C
Cu50 / Cu100	[°C]	-180...+200°C	-180...+200°C
Ni100 / Ni120	[°C]	-80...+260°C	-60...+250°C
Thermocouple J	[°C]	-210...+1200°C	-210...+1200°C
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Thermocouple N	[°C]	-270...+1300°C	-200...+1300°C
Thermocouple R	[°C]	-50...+1768°C	-50...+1768°C
Thermocouple S	[°C]	-50...+1768°C	-50...+1768°C
Thermocouple B	[°C]	0...+1820°C	250...+1820°C
Thermocouple L	[°C]	-200...+800°C	-200...+800°C
Load Cell 350 Ohm	[mV/V]	-0.2...+2.4 mV/V	-0.2...+2.4 mV/V
Pulse / Frequency	[Hz]	0,1...+24 mA (1...24 V)	0,1...1000 Hz (3...24 Vdc)

ORDER CODES

Code	Description
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MSC TOOL	Free Windows application for firmware updates and data extraction in .csv format
USB-ISO	PC-USB isolator (accessory)
MSC-POWER	1A / 5V power supply (replacement)