

# PROVA<sup>®</sup>

## PROVA 133

### Documenting Multifunction Calibrator and an Arbitrary Function Generator



# MetroTik

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## PROVA 133

### Documenting Multifunction Calibrator and an Arbitrary Function Generator

#### Features:

1. **Source** 4~20 mA loop Current
2. **Simulate** 4~20 mA transmitter
3. **Simulate** electronic load (Max. 30V, 20mA)
4. **Test** LED brightness (0~24mA)
5. **Source** 0~70mV and 0~15V
6. **Calibrate** temperature with selection of 11 types of thermocouples
7. **Source** frequency (0.3 to 20KHz) of many waveforms
8. **Source:** mA, V, Hz, sine wave, square wave, triangular wave, truncated sine wave, user programmable waveform and temperature.
9. Generate arbitrary waveform
10. Generate single pulse (3μS to 999.99mS)
11. Map 4~20 mA into engineering units
12. **Measure:** Current (mA), Voltage (mV, V), and temperature (°C, °F)
13. **Measure** 4~20 mA with 24V loop supply simultaneously
14. Selectable 250Ω HART resistor to facilitate use with **HART communication** device
15. Programmable cold junction compensation for temperature measurement
16. **Auto step** and auto ramp for sourcing mA, V, and temperature
17. Dot matrix LCD with backlight
18. Rechargeable lithium battery (1600mAh)
19. **Data logging** function for source and measurement
20. Program calibrator through PC USB port
21. Programmable 0% and 100% value for easy 25% step function
22. **DTMF** (Dual Tone Multi-Frequency) can perform professional testing for telephone line and audio product (MP3 or MD)

#### Electrical Specifications:

(23±5°C, 10 minutes after turning on the power)

**mA (source)** (Vopen > 24V)

Range	Resolution	Accuracy of Reading
0.005mA to 4mA	1μA	+/-0.03% +/-5dgts
4mA to 20mA		+/-0.03% +/-3dgts
20mA to 24mA		+/-0.03% +/-5dgts

**V (source)** (maximum load 1mA, short circuit protection < 100mA)

Range	Resolution	Accuracy of Reading
0.005V to 10V	0.001V	+/-0.03% +/-5dpts
10V to 15V		

**mA (measure)**

Range	Resolution	Accuracy of Reading
-4mA to -0.005mA	1uA	+/-0.03% +/-10dpts
0.005mA to 4mA		+/-0.03% +/-5dpts
4mA to 20mA		+/-0.03% +/-3dpts
20mA to 24mA		+/-0.03% +/-5dpts

If reading of mA (measure) is less than 5 digits, it is displayed as 0.

**V (measure)**

Range	Resolution	Accuracy of Reading
-3V to -0.005V	0.001V	+/-0.03% +/-10dpts
0.005V to 10V		+/-0.03% +/-5dpts
10V to 24V		+/-0.03% +/-5dpts

If reading of V (measure) is less than 5 digits, it is displayed as 0.

**Frequency** (source, 10 Vpp, 0V offset, square wave, duty cycle = 50%)

Range (Hz)	Input Resolution	Accuracy
0.3 to 99.999	0.1Hz	0.002Hz
10.00 to 999.99	0.1Hz	0.02Hz
1000.0 to 9999.9	0.1Hz	0.2Hz
10000 to 20000	1Hz	2Hz

**Voltage Peak to Peak for Sine Wave**

(Vpp, 0.3~20KHz, 50% duty cycle, sine wave, 0V offset)

Range (V)	Resolution	Accuracy of Reading
0.1 to 20V	0.001V	5% +/- 0.3V

**Voltage Peak to Peak for Non-Sine Wave** (Vpp, 0.3~20KHz, 0V offset)

Range (V)	Resolution	Accuracy of Reading
0.1 to 20V	0.001V	6% +/- 0.4V

**Voltage Peak to Peak** (Vpp, 0.3~20KHz, 50% duty cycle, square wave, 0V offset)

Range (V)	Resolution	Accuracy of Reading
1 to 20V	0.001V	6% +/- 0.4V

**Voltage of Offset** (Maximum Vpp < 20V)

Range	Resolution	Accuracy of Reading
-5V to 5V	0.001V	5% +/-0.5V +/-5%xVpp

## Temperature, Thermocouples

(source and measure, 0.1°C & 0.1°F Resolution, Internal Cold Junction Compensation, thermocouple accuracy not included, 3 minutes after plugging in thermocouples.)

	°C		°F	
	Range	Accuracy	Range	Accuracy
K	-200 to -150	2.0	-382 to -238	3.6
	-150 to 0	1.2	-238 to 32	2.1
	0 to 1000	0.8	32 to 1832	1.4
	1000 to 1370	1.2	1832 to 2498	2.1
J	-200 to -150	2.0	-382 to -238	3.6
	-150 to 0	1.0	-238 to 32	1.8
	0 to 1050	0.7	32 to 1922	1.2
E	-200 to -150	1.5	-382 to -238	2.7
	-150 to 0	0.9	-238 to 32	1.6
	0 to 850	0.7	32 to 1562	1.2
T	-200 to -150	1.5	-382 to -238	2.7
	-150 to 0	1.2	-238 to 32	2.1
	0 to 400	0.8	32 to 752	1.4
R	0 to 500	1.8	32 to 932	3.2
	500 to 1760	1.5	932 to 3200	2.7
S	0 to 500	1.8	32 to 932	3.2
	500 to 1760	1.5	932 to 3200	2.7
N	-200 to 0	1.5	-328 to 32	2.7
	0 to 1300	0.9	32 to 2372	1.6
L	-200 to 0	0.9	-328 to 32	1.6
	0 to 900	0.7	32 to 1652	1.2
U	-200 to 0	1.1	-328 to 32	1.9
	0 to 600	0.7	32 to 1112	1.2
B	600 to 800	2.2	1112 to 1472	3.9
	800 to 1000	1.8	1472 to 1832	3.2
	1000 to 1820	1.4	1832 to 3308	2.5
C	0 to 1800	1.0	32 to 3272	1.8
	1800 to 2310	1.5	3272 to 4190	2.7
mV	-10mV to 70mV	0.05mV	-10mV to 70mV	0.05mV


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### Duty Cycle (% , square wave, 10 Vpp, 0.3~20KHz)

Range	Resolution	Rise Time of Vpp	Fall Time of Vpp
0 to 100%	1%	10μS max, 5μS typical	15μS max, 7.5μS typical

### Pulse (square wave, 10 Vpp, Offset -5V~+5V)

Range	Resolution	Rise Time of Vpp	Fall Time of Vpp
3.0μS to 9999.9μS	0.1μS	10μS max, 5μS typical	15μS max, 7.5μS typical
10.000mS to 99.999mS	0.001mS		
100.00mS to 999.99mS	0.01mS		

**DTMF (Hz)**

Range (Hz)	Resolution	Accuracy of Reading
0.3 to 99.999	0.1Hz	0.002Hz
10.00 to 999.99	0.1Hz	0.02Hz
1000.0 to 9999.9	0.1Hz	0.2Hz
10000 to 20000	1Hz	2Hz

**DTMF (%)**

Range (%)	Resolution	Accuracy of Reading
0% ~ 100%	1%	5%

**DTMF (Phase Angle)**

Range (°)	Resolution	Accuracy of Reading
0 ~ 360	1°	100 $\mu$ S+1°

**DTMF (Vpp, F1=F2, <1 KHz, %1=%2, Phase1=Phase2)**

Range	Resolution	Accuracy of Reading
5V ~ 20V	0.001V	10% +/-0.6V

**DTMF (Offset, F1=F2, <1 KHz, %1=%2, Phase1=Phase2)**

Range	Resolution	Accuracy of Reading
-5V ~ 5V	0.001V	10% +/-0.6V +/-5%xVpp

**General Specifications:**

AC Power Adaptor:	AC 110V or AC 220V, 50/60Hz input. DC 15V / 0.5A output
Dimension:	214.0 (L) x 98.7 (W) x 56.0 (H) mm 8.4" (L) x 3.9" (W) x 2.2" (H)
Weight:	650g / 22.9oz (Batteries included)
Operation Environment:	0°C ~ 50°C, 85% RH
Storage Environment:	-20°C ~ 60°C, 75% RH
Accessories:	Carrying case x 1, User manual x 1, AC power adaptor x 1, USB cable x 1, Software CD x 1, Software manual x 1, K-type thermocouple (dual plugs) x 1, Alligator clips x 2 (black and red), Test leads x 2 (black and red), Rechargeable lithium battery (11.1V/ 1600mAh) x 1

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