

SONEL CMP-2000

index: WMXXCMP2000



- INRUSH CURRENT**
- CAT IV**
- 600 V**
- CAT III**
- 1000 V**
- IP20**

Standard accessories of the meter:

Set of test leads (CAT IV, S)	WAPRZCMM1
Temperature measurement probe (type K)	WASONTEMK
9 V battery	
Calibration certificate	

Product features

- » 12 measuring functions
- » True RMS AC voltage and current measurement for accurate and reliable readings of non-sinusoidal signals
- » INRUSH function for measuring current drawn by an electrical device when first turned on
- » large clamps allow the measurement of conductors up to 57 mm in diameter
- » current measurement up to 2000 A DC and 1500 A AC
- » temperature measurement in Fahrenheit and Celsius
- » automatic selection of measuring ranges
- » HOLD function, allowing for freezing the result on the display
- » holding of MAX/MIN results
- » Delta ZERO function, relative measurement mode for direct current - capability of zeroing the instrument at any time and returning to measurement in absolute mode
- » double LCD to display more than one value at the same time
- » auto-off function

Direct current measurement

Display range	Resolution	Accuracy (AC)
0.0...659.9 A	0.1 A	±(2.0% m.v. + 5 digits)
660...2000 A	1 A	(3.0% m.v. + 5 digits) for 660...1000 A ±(5.0% m.v. + 5 digits) for 1000...2000 A

Alternating (TRUE RMS) current measurement

Display range	Resolution	Accuracy
0.0...659.9 A	0.1 A	±(2.0% m.v. + 10 digits) for 50...60 Hz ±(3.0% m.v. + 10 digits) for 61...400 Hz
660...1500 A	1 A	±(2.5% m.v. + 10 digits) for 50...60 Hz and 660...1000 A ±(3.5% m.v. + 10 digits) for 61...400 Hz and 660...1000 A ±(5.0% m.v. + 10 digits) for 50...400 Hz and 1000...1500 A

Direct voltage measurement

Display range	Resolution	Accuracy
0.000...6.599 V	0.001 V	±(0.5% m.v. + 2 digits)
6.60...65.99 V	0.01 V	
66.0...659.9 V	0.1 V	
660...1000 V	1 V	

Alternating voltage measurement (True RMS)

Display range	Resolution	Accuracy
0.000...6.599 V	0.001 V	±(1.5% m.v. + 8 digits) for 50...500 Hz
6.60...65.99 V	0.01 V	
66.0...659.9 V	0.1 V	
660...750 V	1 V	

Resistance measurement

Display range	Resolution	Accuracy
0.0...659.9 Ω	0.1 Ω	±(1.0% m.v. + 5 digits)
0.660...6.599 kΩ	0.001 kΩ	
6.60...65.99 kΩ	0.01 kΩ	
66.0...659.9 kΩ	0.1 kΩ	
0.660...6.599 MΩ	0.001 MΩ	±(2.0% m.v. + 5 digits)
6.60...66.00 MΩ	0.01 MΩ	±(3.5% m.v. + 5 digits)

Capacitance measurement

Display range	Resolution	Accuracy
0.0...6.599 nF	0.001 nF	±(3.0% m.v. + 30 digits)
6.60...65.99 nF	0.01 nF	±(3.0% m.v. + 10 digits)
66.0...659.9 nF	0.1 nF	±(3.0% m.v. + 30 digits)
6.660...6.599 μF	0.001 μF	±(3.0% m.v. + 10 digits)
6.60...65.99 μF	0.01 μF	
66.0...659.9 μF	0.1 μF	
0.660...6.599 mF	0.001 mF	
0.660...6.599 mF	0.001 mF	±(5% m.v. + 10 digits)

Frequency measurement

Display range	Resolution	Accuracy
10.00...65.99 Hz	0.01 Hz	±(0.1% m.v. + 5 digits)
66.0...659.9 Hz	0.1 Hz	
0.660...6.599 kHz	0.001 kHz	
6.60...65.99 kHz	0.01 kHz	
66.0...659.9 kHz	0.1 kHz	
0.660...1.000 MHz	0.001 MHz	

Duty cycle measurement

Display range	Resolution	Accuracy
5...95%	0.1%	±(3.0% m.v. + 30 digits)

frequency range: 40 Hz...20 kHz.

"m.v." = "measured value"

Other technical specifications:

- » display segment LCD, readout of 6600 readings, 3 6/7 digits, backlit
- » power supply 9 V battery, type 6LR61
- » indication of range overflow 'OL' symbol is displayed
- » maximal wire diameter 57 mm
- » maximal busbar dimensions 70 x 18 mm
- » continuity test threshold 30 Ω
- » diode test I = 0.8 mA, U₀ = 3.2 V DC
- » sampling rate nominal: 2.8 Hz
analog bar graph: 28 Hz
- » input impedance approx. 10 MΩ
- » auto-off timeout 30 minutes
- » operating temperature range 0...+50°C
- » storage temperature -20...+60°C
- » storage humidity <80%
- » dimensions 281 x 108 x 53 mm
- » weight with battery 570 g
- » compliance with standards EN 61010-1, EN 61010-2-032
- » quality standard ISO 9001

Clamp meter

SONEL CMP-1006

index: WMXXCMP1006



Resistance measurement

Display range	Resolution	Accuracy
0.0...659.9 Ω	0.1 Ω	±(1.0% m.v. + 4 digits)
0.660...6.599 kΩ	0.001 kΩ	±(1.5% m.v. + 2 digits)
6.60...65.99 kΩ	0.01 kΩ	
66.0...659.9 kΩ	0.1 kΩ	±(2.5% m.v. + 3 digits)
0.660...6.599 MΩ	0.001 MΩ	
6.6...66.0 MΩ	0.1 MΩ	±(3.5% m.v. + 5 digits)

"m.v." = "measured value"

Other technical specifications

- » display segment LCD, readout of 6600 readings, 3 6/7 digits, backlit
- » power supply of the meter 9 V battery, type 6LR61
- » indication of range overflow 'OL' symbol
- » maximal wire diameter 34 mm
- » continuity test threshold 40 Ω; measurement current < 0.5 mA
- » diode test I = 0.3 mA, U₀ < 3 V DC
- » sampling rate 2 Hz
- » input impedance 10 MΩ (V DC and V AC)
- » auto-off timeout 25 min
- » operating temperature +5...+40°C
- » storage temperature -20...+60°C
- » storage humidity <80%
- » dimensions 229 x 80 x 49 mm
- » weight 303 g
- » measuring category CAT III 600 V (CAT IV 300 V)
- » compliance with standards EN 61010-1, EN 61010-2-032
- » quality standard ISO 9001

Standard accessories of the meter:

Set of test leads (CAT IV, S)	WAPRZCMM1
Temperature measurement probe (type K)	WASONTEMK
9 V battery	
Calibration certificate	

Product features

- » 11 measuring functions
- » True RMS AC voltage and current measurement for accurate and reliable readings of non-sinusoidal signals
- » INRUSH function for measuring current drawn by an electrical device when first turned on
- » clamps allow the measurement of conductors up to 34 mm in diameter
- » current measurement up to 1000 A AC/DC
- » temperature measurement in Fahrenheit and Celsius
- » automatic selection of measuring ranges
- » HOLD function, allowing for freezing the result on the display
- » holding of MAX/MIN values
- » relative measurement mode for direct current - DCA ZERO function
- » automatic power down
- » shock resistant rugged case

Direct and alternating (TRUE RMS) current measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
0...659.9 A	0.1 A	±(2.5% m.v. + 5 digits)	±(2.5% m.v. + 8 digits) for f = 45...65 Hz
660...1000 A	1 A	±(2.8% m.v. + 8 digits)	±(2.8% m.v. + 8 digits) for f = 45...65 Hz

Direct and alternating (TRUE RMS) voltage measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
0...6.599 V	0.001 V	±(1.5% m.v. + 3 digits)	±(1.8% m.v. + 5 digits) for f = 45...65 Hz
6.60...65.99 V	0.01 V		
66.0...600.0 V	0.1 V		

Measurement of frequency

Display range	Resolution	Accuracy
30.0...659.9 Hz	0.1 Hz	±(1.2% m.v. + 2 digits)
0.660...6.599 kHz	0.001 kHz	
6.60...15.00 kHz	0.01 kHz	

sensitivity:

30...5 kHz:10 V RMS min.

5 kHz...15 kHz:40 V RMS min. for 20%...80% of duty cycle



Clamp meters

SONEL CMP-401 / CMP-400

index: WMXXCMP401 / WMXXCMP400



Product features

- » 11 measuring functions (CMP-401) and 9 measuring functions (CMP-400)
- » clamps allow the measurement of conductors up to 30 mm in diameter
- » current measurement up to 400 A AC and DC (CMP-401) or up to 400 A AC (CMP-400)
- » temperature measurement in Fahrenheit and Celsius
- » non-contact voltage indication
- » automatic and manual selection of measuring ranges
- » **HOLD function**, allowing for freezing the result on the display
- » relative measurement function
- » automatic power down - **Auto-OFF** function
- » **shock resistant rugged case**

Other technical specifications:

- » display segment LCD, readout of 4000 readings, 3 6/7 digits, backlight
- » power supply of the meter 9 V battery, type 6LR61
- » indication of range overflow 'OL' symbol is displayed
- » maximal wire diameter 30 mm
- » continuity test threshold 50 Ω , measuring current <0.5 mA
- » diode test $I = 0.3 \text{ mA}$, $U_0 = 1.5 \text{ V DC}$
- » sampling rate 2 Hz
- » input impedance 10 M Ω
- » auto-off timeout approx. 30 minutes
- » operating temperature range +5...+40°C
- » storage temperature -20...+60°C
- » storage humidity <80%
- » dimensions 197 x 70 x 40 mm
- » weight 183 g
- » measuring category CAT III 600 V (CAT IV 300 V)
- » compliance with standards EN 61010-1, EN 61010-2-032
- » quality standard ISO 9001

Standard accessories of the meters:

Set of test leads (CAT IV, S)	WAPRZCMM1
Temperature measurement probe (type K)	WASONTEMK
9 V battery	
Calibration certificate	

Direct and alternating voltage measurement

Display range	Resolution	Accuracy		Accuracy
		CMP-400 (AC)	CMP-401 (AC)	CMP-400,-401 (DC)
400.0 mV	0.1 mV	$\pm(1.5\% \text{ m.v.} + 30 \text{ digits})$	$\pm(1.5\% \text{ m.v.} + 30 \text{ digits})$	$\pm(0.8\% \text{ m.v.} + 2 \text{ digits})$
4.000 V	0.001 V	$\pm(1.8\% \text{ m.v.} + 8 \text{ digits})$	$\pm(1.5\% \text{ m.v.} + 5 \text{ digits})$	$\pm(1.5\% \text{ m.v.} + 2 \text{ digits})$
40.00 V	0.01 V			
400.0 V	0.1 V			
600.0 V	1 V	$\pm(2.5\% \text{ m.v.} + 8 \text{ digits})$	$\pm(2\% \text{ m.v.} + 5 \text{ digits})$	$\pm(2\% \text{ m.v.} + 2 \text{ digits})$

frequency range: 50 Hz...400 Hz

Alternating current measurement

Display range	Resolution	Accuracy CMP-400	Accuracy CMP-401
4.000 A	0.001 A	$\pm(2.5\% \text{ m.v.} + 12 \text{ digits})$	no range
40.00 A	0.01 A	$\pm(2.5\% \text{ m.v.} + 8 \text{ digits})$	$\pm(2.5\% \text{ m.v.} + 8 \text{ digits})$
400.0 A	0.1 A	$\pm(2.8\% \text{ m.v.} + 8 \text{ digits})$	$\pm(2.8\% \text{ m.v.} + 5 \text{ digits})$

frequency range: 50 Hz...60 Hz

Direct current measurement (only CMP-401)

Display range	Resolution	Accuracy
4.00 A	0.01 A	$\pm(2.5\% \text{ m.v.} + 5 \text{ digits})$
400.0 A	0.1 A	$\pm(2.8\% \text{ m.v.} + 5 \text{ digits})$

Resistance measurement

Display range	Resolution	Accuracy
400.0 Ω	0.1 Ω	$\pm(1\% \text{ m.v.} + 4 \text{ digits})$
4.000 k Ω	0.001 k Ω	$\pm(1.5\% \text{ m.v.} + 2 \text{ digits})$
40.00 k Ω	0.01 k Ω	
400.0 k Ω	0.1 k Ω	$\pm(2.5\% \text{ m.v.} + 3 \text{ digits})$
4.000 M Ω	0.001 M Ω	
40.00 M Ω	0.01 M Ω	$\pm(3.5\% \text{ m.v.} + 5 \text{ digits})$

"m.v." = "measured value"

Leakage current clamp meter

SONEL CMP-200

index: WMXXCMP200

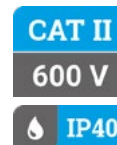


Measurement of alternating current up to 200 A:

- » high resolution (0.1 mA),
- » 3 measuring subranges: 200 mA, 2 A, 200 A.

Additional functions of the meter:

- » segment LCD, readout of 1999 readings, 3 1/2 digits, backlight,
- » maximal wire diameter 30 mm,
- » **HOLD** function, allowing for freezing the measurement result on the display,
- » **MAX** function, freezing of maximum values,
- » automatic power down of instrument when not in use,
- » reinforced, impact resistant enclosure.



Pomiar prądu

Display range	Resolution	Accuracy
199.9 mA	0.1 mA	$\pm(5\% \text{ m.v.} + 8 \text{ digits})$
1.999 A	0.001 A	$\pm(5\% \text{ m.v.} + 10 \text{ digits})$
199.9 A	0.1 A	$\pm(2.5\% \text{ m.v.} + 10 \text{ digits})$



Comparison of clamp multimeters



CMP-2000
High-end model
for industry area



CMP-1006
Various applications
in industry



CMP-401
For general use

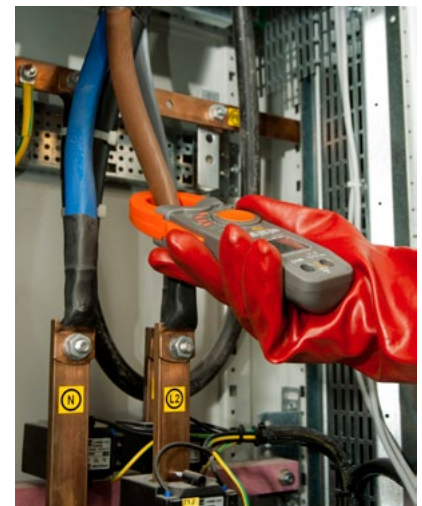


CMP-400
For general use



CMP-200
Leakage current

	CMP-2000	CMP-1006	CMP-401	CMP-400	CMP-200
Measurement functions					
AC/DC voltage	750 V / 1000 V	600.0 V / 600.0 V	600 V / 600 V	600 V / 600 V	- / -
AC/DC current	1500 A / 2000 A	1000 A / 1000 A	400.0 A / 400.0 A	400.0 A / -	200 A / -
Resistance	60.00 MΩ	66.00 MΩ	40.00 MΩ	40.00 MΩ	-
Frequency	1.000 MHz	15.00 kHz	10 kHz	10 kHz	-
Capacitance	6.599 mF	-	100.0 μF	-	-
Temperature	1000°C	760°C	760°C	760°C	-
Non-contact voltage indication	-	-	✓	✓	-
Duty cycle (%)	✓	✓	✓	✓	-
Continuity / diode test	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	-
Inrush current	✓	✓	-	-	-
Basic features					
True RMS measurement	✓	✓	-	-	-
Automatic / manual range selection	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	- / ✓
Maximum diameter of measured conductor	57 mm (conductor) 70 x 18 mm (bus bar)	34 mm	30 mm	30 mm	30 mm
Input impedance	10 MΩ	10 MΩ	10 MΩ	10 MΩ	-
Advanced features					
MAX / MIN / AVG measurement	✓ / ✓ / -	✓ / ✓ / -	- / - / -	- / - / -	✓ / - / -
HOLD	✓	✓	✓	✓	✓
PEAK HOLD	-	-	-	-	-
Relative measurement	✓	✓	✓	✓	-
Other features					
Automatic power down	✓	✓	✓	✓	✓
Battery indicator	✓	✓	✓	✓	✓
Beeper	✓	✓	✓	✓	-
Dimensions	281 x 108 x 53 mm	229 x 80 x 49 mm	197 x 70 x 40 mm	197 x 70 x 40 mm	182 x 61 x 34 mm
Weight	570 g	303 g	183 g	183 g	225 g
Display					
Display	segment LCD readout of 6600 readings 3 6/7 digits, backlit	segment LCD readout of 6600 readings 3 6/7 digits, backlit	segment LCD readout of 4000 readings 3 6/7 digits, backlit	segment LCD readout of 4000 readings 3 6/7 digits, backlit	segment LCD readout of 1999 readings 3 1/2 digits, backlit
Segmented	✓	✓	✓	✓	✓
Screen backlit	✓	✓	✓	✓	✓
Safety and conditions of use					
Measurement category (EN 61010)	CAT IV 600 V CAT III 1000 V	CAT IV 300 V CAT III 600 V	CAT IV 300 V CAT III 600 V	CAT IV 300 V CAT III 600 V	CAT II 600 V
Ingress protection	IP20	IP40	IP40	IP40	IP40
Operating temperature	0...50°C	5...40°C	5...40°C	5...40°C	0...50°C



SONEL CMM-60

index: WMXXCMM60

- CAT III**
- 1000 V**
- CAT IV**
- 600 V**
- IP67**
- BLUETOOTH**
- RECORDER**



Measurements

- » over 14 measuring functions
- » AC & DC voltage
- » AC & DC current
- » resistance
- » capacitance
- » temperature
- » duty cycle & impulse width
- » frequency
- » current loop 4-20 mA%
- » ...and much more

Additional functions

- » the **AC + DC function** allows you to simultaneously display the value of the constant and variable component or the sum of both components during voltage measurement
- » **True RMS for AC voltage and current** for measuring the effective value of distorted waveforms
- » **4~20 mA** function used for, among others, measurement of the analogue control circuits of temperature, pressure, pH or flow sensors
- » fast and easy reading is provided by a **colour display** with a resolution 320 x 240 pixels and a diagonal of 3.5", enabling reading the result under wide angle and in dark locations
- » built-in **low-pass filter**, thanks to which the voltage measurements will be more accurate by eliminating the influence of interference generated by machines and electronic devices
- » displaying **PEAK** values
- » the relative **REL** measurement
- » **real-time clock** that allows adding date and time of measurement to each stored result
- » **built-in memory for 2000 measurements**
- » possibility of quick detection of irregularities due to the registration of measurement results in graphical form of the trend, thanks to the **Trend Capture function** and the built-in recorder with the possibility of recording up to 10,000 samples
- » built-in **Bluetooth module** for sending live measurement results to **Android mobile devices** and - for PCs - **CMM-60 Multimeter Software**
- » registration of maximum and minimum values and calculation of the average of current measurements
- » integrated **HELP** function
- » manual and automatic range selection
- » freezing the measurement result thanks to **HOLD and Auto HOLD function**
- » auto power-off thanks to **Auto-OFF function** after selecting of a specific idle period
- » extremely hermetic (**IP67**) and reinforced, shock-protected housing **covered with elastomer**

Direct and alternating (TRUE RMS) voltage measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
50.000 mV	0.001 mV	±(0.05% m.v. + 20 digits)	f = 50/60 Hz
500.00 mV	0.01 mV		±(0.3% m.v. + 25 digits)
5.0000 V	0.0001 V	±(0.025% m.v. + 5 digits)	f < 1 kHz
50.000 V	0.001 V		±(0.5% m.v. + 25 digits)
500.00 V	0.01 V	±(0.05% m.v. + 5 digits)	f < 5 kHz
1000.0 V	0.1 V		±(3% m.v. + 25 digits)

frequency range 50...10 kHz

Direct and alternating (TRUE RMS) current measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
500.00 µA	0.01 µA	±(0.1% m.v. + 20 digits)	f = 50/60 Hz
5000.0 µA	0.1 µA		±(0.6% m.v. + 25 digits)
50.000 mA	0.001 mA	±(0.15% m.v. + 20 digits)	f < 1 kHz
500.00 mA	0.01 mA		±(1.5% m.v. + 25 digits)
10.000 A	0.001 A	±(0.3% m.v. + 20 digits)	f < 5 kHz
20 A			±(3% m.v. + 25 digits)

maximum 30 seconds with reduced accuracy

SONEL MULTIMETER MOBILE



Sonel Multimeter Mobile application is intended for reading measurement values in live mode, as well as for transferring and storing measurement results in the memory of mobile devices based on the Android system. It can be downloaded from the www.sonel.pl/en website or by scanning the QR code placed above.

Standard accessories of the meter:

Test leads set for CMM (CAT IV, M)	WAPRZCMM2
Temperature probe (type K, metal)	WASONTEMK2
Type K temperature probe adapter	WAADATEMK
Battery charger for CMM-60	WAZASZ21
Charging adapter for CMM-60	WAADALAD1
CMM-RR radio receiver for CMM-60	WAADACMRRR
Li-Poly battery 7.4 V, 2.4 Ah for CMM-60	WAAKU25
2x socket protective plug	
Sonel CMM-60 Multimeter Software	
Calibration certificate	

Resistance measurement

Display range	Resolution	Accuracy
50.000 Ω	0.001 Ω	±(0.5% m.v. + 20 digits)
500.00 Ω	0.01 kΩ	
5.0000 kΩ	0.0001 kΩ	±(0.05% m.v. + 10 digits)
50.000 kΩ	0.001 kΩ	
500.00 kΩ	0.01 kΩ	±(0.1% m.v. + 10 digits)
5.0000 MΩ	0.0001 MΩ	
50.000 MΩ	0.001 MΩ	±(2% m.v. + 20 digits)

Capacitance measurement

Display range	Resolution	Accuracy
5.000 nF	0.001 nF	±(2% m.v. + 40 digits)
50.00 nF	0.01 nF	
500.0 nF	0.1 nF	
5.000 µF	0.001 µF	±(5% m.v. + 40 digits)
50.00 µF	0.01 µF	
500.0 µF	0.1 µF	
10.00 mF	0.01 mF	

Electronic frequency measurement

Display range	Resolution	Accuracy
50.000 Hz	0.001 Hz	±(0.01% m.v. + 10 digits)
500.00 Hz	0.01 Hz	
5.0000 kHz	0.0001 kHz	
50.000 kHz	0.001 kHz	
500.00 kHz	0.01 kHz	
5.0000 MHz	0.0001 MHz	
10.000 MHz	0.001 MHz	

Other technical specifications

- » display 3.5" colour TFT LCD 320 x 240 pixels
- » power supply Li-Pol 7.2 V rechargeable battery
- » indication of range overflow "OL" symbol
- » crest factor ≤3 for full 500 V range
decreasing linearly to ≤1.5 at 1000 V
- » continuity test I < 0.35 mA, sound signal for R < 25 Ω
- » diode test I = 0.9 mA, U₀ = 3.2 V DC
- » sampling rate 20 Hz
- » input impedance >10 MΩ (V DC), >9 MΩ (V AC)
- » auto-off timeout 15 min
- » fuses mA, µA range: 0.8 A/1000 V fast-acting ceramic
A range: 10 A/1000 V fast-acting ceramic
- » operating temperature range +5...+40°C
- » storage temperature -20...+60°C
- » dimensions 220 x 97 x 58 mm
- » weight 342 g
- » measurement category CAT III 1000 V (CAT IV 600 V)
- » compliance with standards EN 61010-1, EN 61010-2-032

Industrial multimeter

SONEL CMM-40

index: WMXXCMM40

- CAT III**
- 1000 V**
- CAT IV**
- 600 V**
- IP67**



Measurements

- » 12 measuring functions
- » AC & DC voltage
- » AC & DC current
- » resistance
- » capacitance
- » temperature
- » duty cycle
- » frequency
- » current loop 4-20 mA%
- » diode test and continuity

Additional functions

- » the **AC + DC function** allows you to simultaneously display the value of the constant and variable component or the sum of both components during voltage measurement
- » **True RMS for AC voltage and current** allows to measure the effective value of distorted waveforms
- » the **4~20 mA function** used for, among others, measurement of the control circuits of temperature, pressure, pH or flow sensors
- » displaying **PEAK** values
- » the **relative REL measurement function**
- » dual display to show several results at the same time
- » built-in memory for 2000 measurements
- » registration of maximum and minimum values
- » **automatic and manual range selection**
- » HOLD function
- » auto power-off thanks to **Auto-OFF function** after selecting of a specific idle period
- » extremely hermetic (**IP67**) and reinforced, shock-protected housing **covered with elastomer**

Direct and alternating (TRUE RMS) voltage measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
400.00 mV	0.01 mV	±(0.06% m.v. + 4 digits)	±(1% m.v. + 40 digits)
4.0000 V	0.0001 V		
40.000 V	0.001 V		
400.00 V	0.01 V	±(1% m.v. + 30 digits)	
1000.0 V	0.1 V		

frequency range 50...1000Hz.

Direct and alternating (TRUE RMS) current measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)	
400.00 µA	0.01 µA	±(1.0% m.v. + 3 digits)	±(1.5% m.v. + 30 digits)	
4000.0 µA	0.1 µA			
40.000 mA	0.001 mA			
400.00 mA	0.01 mA			
10.000 A	0.001 A			
20 A		maximum 30 seconds with reduced accuracy.		

Standard accessories of the meter:

Test leads set for CMM (CAT IV, M)	WAPRZCMM2
Temperature measurement probe (type K)	WASONTEMK
Type K temperature probe adapter	WAADATEMK
2x socket protective plug	
Carrying case	
9 V battery	
Calibration certificate	

Resistance measurement

Display range	Resolution	Accuracy
400.00 Ω	0.01 Ω	±(0.3% m.v. + 9 digits)
4.0000 kΩ	0.0001 kΩ	
40.000 kΩ	0.001 kΩ	±(0.3% m.v. + 4 digits)
400.00 kΩ	0.01 kΩ	
4.0000 MΩ	0.0001 MΩ	±(2.0% m.v. + 10 digits)
40.000 MΩ	0.001 MΩ	

Capacitance measurement

Display range	Resolution	Accuracy
40.000 nF	0.001 nF	±(3.5% m.v. + 40 digits)
400.00 nF	0.01 nF	
4.0000 µF	0.0001 µF	±(3.5% m.v. + 10 digits)
40.000 µF	0.001 µF	
400.00 µF	0.01 µF	±(5.0% m.v. + 10 digits)
4000.0 µF	0.1 µF	
40.000 mF	0.001 mF	

Electronic frequency measurement

Display range	Resolution	Accuracy
40.000 Hz	0.001 Hz	±(0.1% m.v. + 1 digit)
400.00 Hz	0.01 Hz	
4.0000 kHz	0.0001 kHz	
40.000 kHz	0.001 kHz	
400.00 kHz	0.01 kHz	
4.0000 MHz	0.0001 MHz	
40.000 MHz	0.001 MHz	
100.00 MHz	0.01 MHz	unspecified value

Other technical specifications:

- » display segment LCD, readout of 40,000 readings, 4 4/5 digits, backlight
- » power supply of the meter 9 V battery, type 6LR61
- » indication of range overflow "OL" symbol
- » crest factor ≤ 3 for full 500 V range
..... decreasing linearly to ≤ 1.5 at 1000 V
- » continuity test threshold 35 Ω, measuring current <0.35 mA
- » diode test I=0.9 mA, U_b=2.8 V DC
- » sampling rate 2 Hz
- » input impedance >10 MΩ (V DC), >9 MΩ (V AC)
- » auto-off timeout 15 min
- » fuses mA, µA range: 0.5 A / 1000 V fast-acting ceramic
..... A range: 10 A / 1000 V fast-acting ceramic
- » operating temperature range 0...+40°C
- » storage temperature -20...+60°C
- » dimensions 187 x 81 x 55 mm
- » weight 342 g
- » measurement category CAT III 1000 V (CAT IV 600 V)
- » type of insulation double, as per EN 61010-1, EN 61010-2-032



SONEL CMM-30

index: WMXXCMM30



- CAT III**
- 1000 V**
- CAT IV**
- 600 V**
- IP67**
- BLUETOOTH**
- AUTO BACKLIGHT**
- BUILT IN FLASHLIGHT**

Measurements

- » 11 measuring functions
- » AC & DC voltage
- » AC & DC current
- » resistance
- » capacitance
- » duty cycle
- » frequency
- » diode and continuity test
- » Low Z

Additional functions

- » the **AC + DC function** allows you to simultaneously display the value of the constant and variable component or the sum of both components during voltage measurement
- » **True RMS** for AC voltage and current allows to measure the effective value of distorted waveforms
- » function **MAX MIN** for displaying extreme values
- » function **AVG** for displaying average value
- » the relative **REL** measurement
- » automatic and manual range selection
- » **HOLD** function
- » built-in **Bluetooth module** for sending data to mobile devices with Android system
- » **automatic backlight** of the display, buttons and rotary switch
- » built-in **flashlight** for illuminating dark measurement places
- » **Auto-OFF** function
- » hermetic (**IP67**) and reinforced housing resistant to shocks, covered with elastomer

Direct and alternating (TRUE RMS) voltage measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
600.0 mV	0.1 mV	±(0.5% m.v. + 8 digits)	-
6.000 V	0.001 V	±(0.8% m.v. + 5 digits)	±(1.0% m.v. + 5 digits)
60.00 V	0.01 V		
600.0 V	0.1 V		
1000 V	1 V	±(1.0% m.v. + 3 digits)	±(1.2% m.v. + 5 digits)

- » input impedance: 10 MΩ
- » frequency range: 45...1000 Hz

Direct and alternating (TRUE RMS) current measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
600.0 μA	0.1 μA	±(1.0% m.v. + 3 digits)	±(1.0% m.v. + 3 digits)
6000 μA	1 μA		
60.00 mA	0.01 mA		
600.0 mA	0.1 mA		
10.00 A	0.01 A	±(1.5% m.v. + 3 digits)	±(2.0% m.v. + 8 digits)

SONEL MULTIMETER MOBILE



Sonei Multimeter Mobile application is intended for reading measurement values in live mode, as well as for transferring and storing measurement results in the memory of mobile devices based on the Android system. It can be downloaded from the www.sonei.pl/en website or by scanning the QR code placed above.

Standard accessories of the meter:

Test leads set for CMM (CAT IV, M)	WAPRCMM2
Type K temperature probe adapter	WAADATEMK
Temperature probe (type K)	WASONTEMK
4x AAA 1.5 V battery	
Calibration certificate	

Resistance measurement

Display range	Resolution	Accuracy
600.0 Ω	0.1 Ω	±(1.5% m.v. + 5 digits)
6.000 kΩ	0.001 kΩ	
60.00 kΩ	0.01 kΩ	
600.0 kΩ	0.1 kΩ	
6.000 MΩ	0.001 MΩ	
60.00 MΩ	0.01 MΩ	

Capacitance measurement

Display range	Resolution	Accuracy
60.00 nF	0.01 nF	±(5.0% m.v. + 35 digits)
600.0 nF	0.1 nF	
6.000 μF	0.001 μF	±(3.0% m.v. + 5 digits)
60.00 μF	0.01 μF	
600.0 μF	0.1 μF	
6000 μF	1 μF	±(5.0% m.v. + 5 digits)

Frequency measurement

Display range	Resolution	Accuracy
9.999 Hz	0.001 Hz	±(1.0% m.v. + 5 digits)
99.99 Hz	0.01 Hz	
999.9 Hz	0.1 Hz	
9.999 kHz	0.001 kHz	

Duty cycle measurement

Display range	Resolution	Accuracy
20.0...80.0%	0.1%	±(1.2% m.v. + 2 digits)

Other technical specifications:

- » display segment LCD, readout of 6000, 4 digits, backlit
- » power supply 4 x AAA 1.5 V battery or 4x AAA NiMH 1.2 V rechargeable battery
- » indication of range overflow „OL” symbol
- » continuity test threshold 30 Ω, measuring current <0.35 mA
- » diode test I=1 mA, U₀<3 V DC
- » sampling rate 3 Hz
- » input impedance 10 MΩ (V AC/DC)
- » auto-off timeout 15 minutes
- » fuses mA, μA range: 0.8 A / 1000 V fast-acting
A range: 10 A / 1000 V fast-acting
- » operating temperature range 0...+40°C at humidity <75%
- » storage temperature -20...+60°C at humidity <80%
- » dimensions 170 x 75 x 48 mm
- » weight 418 g
- » measurement category CAT III 1000 V (CAT IV 600 V)
- » compliance with standards EN 61010-1
EN 61010-2-031, EN 61010-2-033
EN 61326-1, EN 61326-2-2

SONEL CMM-11

index: WMXXCMM11



- CAT III**
- 600 V**
- IP65**
- BUILT-IN FLASHLIGHT
- BLUETOOTH

Measurements

- » 10 measuring functions
- » AC & DC voltage
- » AC & DC current
- » resistance
- » capacitance
- » duty cycle
- » frequency
- » diode and continuity test

Additional functions

- » True RMS for AC voltage and current allows to measure the effective value of distorted waveforms
- » function MAX MIN for displaying extreme values
- » automatic and manual range selection
- » HOLD function
- » built-in Bluetooth module for sending data to mobile devices with Android system
- » built-in flashlight for illuminating dark measurement places
- » Auto-OFF function
- » hermetic (IP65) and reinforced housing resistant to shocks, covered with elastomer

Direct and alternating (TRUE RMS) voltage measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
400.0 mV	0.1 mV	±(1.0% m.v. + 8 digits)	-
4.000 V	0.001 V	±(1.0% m.v. + 3 digits)	±(1.0% m.v. + 5 digits)
40.00 V	0.01 V		
400.0 V	0.1 V		
600 V	1 V	±(1.2% m.v. + 3 digits)	±(1.2% m.v. + 5 digits)

- » input impedance: 10 MΩ
- » frequency range: 50...60 Hz

Direct and alternating (TRUE RMS) current measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
400.0 μA	0.1 μA	±(1.0% m.v. + 3 digits)	±(2.0% m.v. + 5 digits)
4000 μA	1 μA	±(1.5% m.v. + 3 digits)	±(2.5% m.v. + 5 digits)
40.00 mA	0.01 mA		
400.0 mA	0.1 mA		
10.00 A	0.01 A	±(2.5% m.v. + 5 digits)	±(3.0% m.v. + 7 digits)

SONEL MULTIMETER MOBILE



Sonel Multimeter Mobile application is intended for reading measurement values in live mode, as well as for transferring and storing measurement results in the memory of mobile devices based on the Android system. It can be downloaded from the www.sonel.pl/en website or by scanning the QR code placed above.

Standard accessories of the meter:

Set of test leads for CMM meter (CAT IV, S)	WAPRZCMM1
2x AAA 1.5 V battery	
Calibration certificate	

Resistance measurement

Display range	Resolution	Accuracy
400.0 Ω	0.1 Ω	±(1.0% m.v. + 4 digits)
4.000 kΩ	0.001 kΩ	
40.00 kΩ	0.01 kΩ	
400.0 kΩ	0.1 kΩ	±(1.5% m.v. + 5 digits)
4.000 MΩ	0.001 MΩ	
40.00 MΩ	0.01 MΩ	

Capacitance measurement

Display range	Resolution	Accuracy
40.00 nF	0.01 nF	±(5.0% m.v. + 35 digits)
400.0 nF	0.1 nF	
4.000 μF	0.001 μF	±(3.0% m.v. + 5 digits)
40.00 μF	0.01 μF	
400.0 μF	0.1 μF	±(4.0% m.v. + 5 digits)
4000 μF	1 μF	

Electronic frequency measurement

Display range	Resolution	Accuracy
9.999 Hz	0.001 Hz	±(1.0% m.v. + 5 digits)
99.99 Hz	0.01 Hz	
999.9 Hz	0.1 Hz	
9.999 kHz	0.001 kHz	
99.99 kHz	0.01 kHz	

Duty cycle measurement

Display range	Resolution	Accuracy
0.1...99.9%	0.1%	±(1.2% m.v. + 2 digits)

Other technical specifications:

- » display segment LCD, readout of 9999 readings, 4 digits, backlight
- » power supply 2 x AAA 1.5 V battery or 2 x AAA NiMH 1.2 V rechargeable battery
- » indication of range overflow "OL" symbol
- » continuity test threshold 50 Ω, measuring current <0.5 mA
- » diode test I=0.3 mA, U₀<3.3 V DC
- » sampling rate 2 Hz
- » input impedance 10 MΩ (V AC/DC)
- » auto-off timeout 15 minutes
- » fuses mA, μA range: 0.5 A/600 V fast-acting A range: 10 A/600 V fast-acting
- » operating temperature range +5...+40°C at humidity <80%
- » storage temperature -20...+60°C at humidity <80%
- » dimensions 121 x 67 x 45 mm
- » weight 204 g
- » measurement category CAT III 600 V
- » compliance with standards EN 61010-1 EN 61010-2-031, EN 61010-2-033 EN 61326-1, EN 61326-2-2

SONEL CMM-10

index: WMXXCMM10



CAT II
600 V

IP40

Measurements

- » 11 measuring functions
- » AC & DC voltage
- » AC & DC current
- » resistance
- » capacitance
- » temperature
- » duty cycle
- » frequency
- » diode and continuity test

Additional functions

- » automatic and manual range selection
- » freezing the measurement result thanks to **HOLD** function
- » **REL** function enabling performance of relative measurement
- » **Auto-OFF** function
- » resistant to impacts strengthened housing, covered with elastomer

Direct and alternating voltage measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
400.0 mV	0.1 mV	±(0.5% m.v. + 2 digits)	±(1.5% m.v. + 70 digits)
4.000 V	0.001 V	±(1.2% m.v. + 3 digits)	±(1.2% m.v. + 3 digits)
40.00 V	0.01 V		
400.0 V	0.1 V	±(1.5% m.v. + 3 digits)	±(1.5% m.v. + 3 digits)
600 V	1 V		±(2.0% m.v. + 4 digits)

- » input impedance: 7.8 MΩ
- » frequency range: 50...400 Hz

Direct and alternating current measurement

Display range	Resolution	Accuracy (DC)	Accuracy (AC)
400.0 μA	0.1 μA	±(1.0% m.v. + 3 digits)	±(1.5% m.v. + 30 digits)
4000 μA	1 μA	±(1.5% m.v. + 3 digits)	±(1.8% m.v. + 5 digits)
40.00 mA	0.01 mA		
400.0 mA	0.1 mA	±(1.5% m.v. + 2 digits)	±(3.0% m.v. + 7 digits)
4.000 A	0.001 A		
10.00 A	0.01 A		

Standard accessories of the meter:

Test lead with probe for CMM/CMP (set)	WAPRZCMP1
Temperature measurement probe (type K)	WASONTEMK
Type K temperature probe adapter	WAADATEMK
9 V battery	

Resistance measurement

Display range	Resolution	Accuracy
400.0 Ω	0.1 Ω	±(1.2% m.v. + 4 digits)
4.000 kΩ	0.001 kΩ	±(1.0% m.v. + 2 digits)
40.00 kΩ	0.01 kΩ	
400.0 kΩ	0.1 kΩ	±(1.2% m.v. + 2 digits)
4.000 MΩ	0.001 MΩ	
40.00 MΩ	0.01 MΩ	±(2.0% m.v. + 3 digits)

Capacitance measurement

Display range	Resolution	Accuracy
40.00 nF	0.01 nF	±(5.0% m.v. + 7 digits)
400.0 nF	0.1 nF	±(3.0% m.v. + 5 digits)
4.000 μF	0.001 μF	
40.00 μF	0.01 μF	±(5.0% m.v. + 5 digits)
100.0 μF	0.1 μF	

Electronic frequency measurement

Display range	Resolution	Accuracy
5.000 Hz	0.001 Hz	±(1.5% m.v. + 5 digits)
50.00 Hz	0.01 Hz	
500.0 Hz	0.1 Hz	±(1.2% m.v. + 3 digits)
5.000 kHz	0.001 kHz	
50.00 kHz	0.01 kHz	
500.0 kHz	0.1 kHz	
5.000 MHz	0.001 MHz	±(1.5% m.v. + 4 digits)
10.00 MHz	0.01 MHz	

sensitivity: minimum effective voltage value 8 V.

Duty cycle measurement

Display range	Resolution	Accuracy
0.1...99.9%	0.1%	±(1.2% m.v. + 2 digits)

Other technical specifications:

- » display segment LCD, readout of 5000 readings, 3 5/6 digits, backlight
- » power supply of the meter 9 V battery, type 6LR61
- » indication of range overflow "OL" symbol
- » continuity test threshold 50 Ω, measuring current <0.3 mA
- » diode test I=0.3 mA, U₀=1.5 V DC
- » sampling rate 2 Hz
- » input impedance 7.8 MΩ (V AC/DC)
- » auto-off timeout 30 minutes
- » fuses mA, μA range: 0.5 A/1000 V fast-acting
..... range: 10 A/1000 V fast-acting
- » operating temperature 0...+50°C at humidity <70%
- » storage temperature -20...+60°C at humidity <80%
- » dimensions 138 x 68 x 37 mm
- » weight 210 g
- » measurement category CAT II 600 V
- » compliance with standards EN 61010-1, EN 61010-2-032



Comparison of multimeters



CMM-60
High-end industrial meter



CMM-40
Industrial area meter



CMM-30
Meter for industry

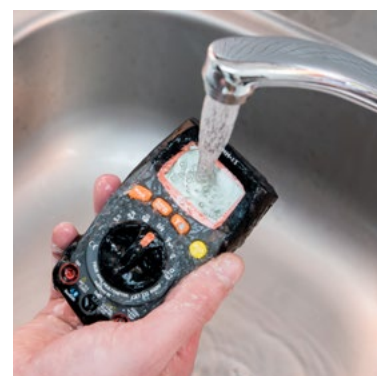


CMM-11
Compact meter for general purpose



CMM-10
Pocket meter for basic measurements

Measurement functions					
AC/DC voltage	1000.0 V	1000.0 V	1000.0 V	600 V	600 V
AC/DC current	10.000 A	10.000 A	10.00 A	10.00 A	10.00 A
Resistance	50.000 MΩ	40.000 MΩ	60.00 MΩ	40.00 MΩ	40.00 MΩ
Frequency	10.000 MHz	100.00 MHz	10 kHz	100.0 kHz	10.00 MHz
Capacitance	10.00 mF	40.000 mF	6000 μF	4000 μF	100.0 μF
Temperature	1000.0°C	1200.0°C	760°C	-	760°C
dB	✓	-	-	-	-
Duty cycle (%)/ impulse width (ms)	✓/✓	✓/-	✓/-	✓/-	✓/-
Continuity / diode test	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
4-20 mA% current loop measurement	✓	✓	-	-	-
Low-pass filter	✓	-	-	-	-
Basic features					
Display	50.000	40.000	6.000	4.000	4.000
True RMS measurement	✓	✓	✓	✓	-
automatic / manual range selection	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
Advanced features					
MAX / MIN / AVG measurement	✓/✓/✓	✓/✓/-	✓/✓/✓	✓/✓/-	-/-/-
HOLD	✓	✓	✓	✓	✓
PEAK HOLD	✓	✓	✓	-	-
Crest factor	✓	-	-	-	-
AC + DC	✓	✓	✓	-	-
Relative measurement	✓	✓	✓	-	✓
Recorder	✓	✓	-	-	-
Trend capture function	✓	-	-	-	-
Memory	✓	✓	in mobile application	in mobile application	-
Bluetooth	✓	-	✓	✓	-
Sonel Multimeter Mobile	✓	-	✓	✓	-
Other features					
Clock	✓	-	-	-	-
Easy access to fuses A / mA	-/✓	-/-	✓/✓	✓/✓	✓/✓
Automatic shutdown	✓	✓	✓	✓	✓
Battery indicator	✓	✓	✓	✓	✓
Built-in flashlight	-	-	✓	✓	-
Beeper	✓	✓	✓	✓	✓
Display					
TFT color	✓	-	-	-	-
Segmented	-	✓	✓	✓	✓
Backlit	✓	✓	✓/ auto	✓	✓
Safety and conditions of use					
Measurement category (EN 61010)	CAT IV 600 V CAT III 1000 V	CAT IV 600 V CAT III 1000 V	CAT IV 600 V CAT III 1000 V	CAT III 600 V	CAT II 600 V
Ingress protection	IP67	IP67	IP67	IP65	IP40
Operating temperature	5...40°C	0...40°C	0...40°C	5...40°C	0...50°C



SONEL MULTIMETER MOBILE



Sonel Multimeter Mobile application is intended for reading measurement values in live mode, as well as for transferring and storing measurement results in the memory of mobile devices based on the Android system. Currently the application supports **CMM-60**, **CMM-30** and **CMM-11** multimeters. It can be downloaded from the www.sonel.pl/en website or by scanning the QR code placed above.



The application enables:

- » reading the multimeter's measurement results in live mode, thanks to Bluetooth wireless data transfer,
- » saving results as a project and complete it with notes and photos from measurement places,
- » reading saved results in two forms: list with date and hour of the measurement, as well as in form of a chart for easier analysis of changes and distortions.

Additional application features i.a.:

- » setting sampling rate and duration of the measurement,
- » setting upper and lower limit with acoustic signal in case of exceeding the set limits,
- » controlling measurement subfunctions, i.e. MAX/MIN, REL or RANGE,
- » fast access to the instrument's website,
- » sending data via e-mail,
- » possibility of saving data to .csv file.

CMP / CMM

Set of standard and optional accessories

1, 2, 4 - number of basic accessories
 * - optional accessories

Photo	Name	Index	CMM-60	CMM-40	CMM-30	CMM-11	CMM-10	CMP-2000	CMP-1006	CMP-401/400	CMP-200
	AC-16 line splitter	WAADAAC16							*	*	*
	M3 carrying case	WAFUTM3						*			
	M5 carrying case	WAFUTM5	*						*		
	M10 carrying case	WAFUTM10	*								
	S1 carrying case	WAFUTS1			*	*	*			*	*
	Test lead with probe for CMM/CMP (set)	WAPRZCMP1	*	*	*	*	1	1	1	1	
	Test leads set for CMM (CAT IV, S)	WAPRZCMM1	*	*	*	1	*	*	*	*	
	Test leads set for CMM (CAT IV, M)	WAPRZCMM2	1	1	1	*	*	*	*	*	
	Crocodile clip mini, 1 kV 10 A (set)	WAKROKPL10MNI	*	*	*	*	*	*	*	*	
	Type K temperature probe adapter	WAADATEMK	1	1	1		1		1	1	
	Temperature probe (type K)	WASONTEMK	*	1	1		1	1	1	1	
	Temperature probe (type K, metal)	WASONTEMK2	1	*	*		*	*	*	*	
	Temperature probe (type K, bayonet)	WASONTEMP	*	*	*		*	*	*	*	
	M1 hanging hook straps	WAPOZUCH1	*								
	Battery charger for CMM-60	WAZASZ21	1								
	Charging adapter for CMM-60	WAADALAD1	1								
	CMM-RR radio receiver for CMM-60	WAADACMMRR	1								
	Li-Pol battery 7.4 V, 2.4 Ah for CMM-60	WAAKU25	1								



Line splitter

SONEL AC-16

index: WAADAAC16

- » ratio x1, x10
- » maximum voltage: 230 V AC
- » maximum current: 16 A

THE ADAPTER CAN BE APPLIED WITH ANY TYPE OF CLAMP METER.



Non-contact AC voltage detector

SONEL VT-2

index: WMXXVT2

CAT III
1000 V

- » signaling: light and sound
- » voltage range: 90~1000 V AC (50/60 Hz)
- » measurement category: III 1000 V
- » power supply: 2x 1.5 V (LR03) batteries

