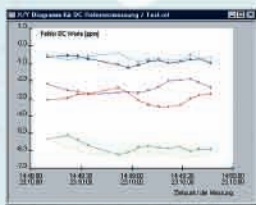


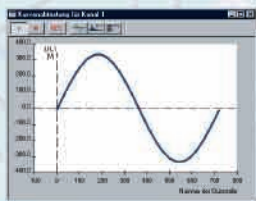
ZERA

RMM 3000

Reference Multimeter



U1	U2	U3	I	S
Min	0.16137	0.1413	0.0000	0.0000
Max	0.16137	0.1413	0.0000	0.0000
Avg	0.16137	0.1413	0.0000	0.0000
RMS	0.16137	0.1413	0.0000	0.0000
PF	0.16137	0.1413	0.0000	0.0000
Hz	0.16137	0.1413	0.0000	0.0000
W	0.16137	0.1413	0.0000	0.0000
VAr	0.16137	0.1413	0.0000	0.0000
VA	0.16137	0.1413	0.0000	0.0000
Power	0.16137	0.1413	0.0000	0.0000
Energy	0.16137	0.1413	0.0000	0.0000



DC	DC	DC	DC	DC		
1	21.909011.08.22	1.00000	2	202.2	2462.0	4261.0
2	21.909011.08.30	1.00000	3	202.2	2462.0	4261.0
3	21.909011.08.40	1.00000	4	202.2	2462.0	4261.0
4	21.909011.08.50	1.00000	5	202.2	2462.0	4261.0
5	21.909011.09.00	1.00000	6	202.2	2462.0	4261.0
6	21.909011.09.10	1.00000	7	202.2	2462.0	4261.0
7	21.909011.09.20	1.00000	8	202.2	2462.0	4261.0
8	21.909011.09.30	1.00000	9	202.2	2462.0	4261.0
9	21.909011.09.40	1.00000	10	202.2	2462.0	4261.0
10	21.909011.09.50	1.00000	11	202.2	2462.0	4261.0
11	21.909011.10.00	1.00000	12	202.2	2462.0	4261.0
12	21.909011.10.10	1.00000	13	202.2	2462.0	4261.0
13	21.909011.10.20	1.00000	14	202.2	2462.0	4261.0
14	21.909011.10.30	1.00000	15	202.2	2462.0	4261.0
15	21.909011.10.40	1.00000	16	202.2	2462.0	4261.0
16	21.909011.10.50	1.00000	17	202.2	2462.0	4261.0
17	21.909011.11.00	1.00000	18	202.2	2462.0	4261.0
18	21.909011.11.10	1.00000	19	202.2	2462.0	4261.0
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20	21.909011.11.30	1.00000	21	202.2	2462.0	4261.0
21	21.909011.11.40	1.00000	22	202.2	2462.0	4261.0
22	21.909011.11.50	1.00000	23	202.2	2462.0	4261.0
23	21.909011.12.00	1.00000	24	202.2	2462.0	4261.0
24	21.909011.12.10	1.00000	25	202.2	2462.0	4261.0
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26	21.909011.12.30	1.00000	27	202.2	2462.0	4261.0
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28	21.909011.12.50	1.00000	29	202.2	2462.0	4261.0
29	21.909011.13.00	1.00000	30	202.2	2462.0	4261.0
30	21.909011.13.10	1.00000	31	202.2	2462.0	4261.0
31	21.909011.13.20	1.00000	32	202.2	2462.0	4261.0
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53	21.909011.17.00	1.00000	54	202.2	2462.0	4261.0
54	21.909011.17.10	1.00000	55	202.2	2462.0	4261.0
55	21.909011.17.20	1.00000	56	202.2	2462.0	4261.0
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57	21.909011.17.40	1.00000	58	202.2	2462.0	4261.0
58	21.909011.17.50	1.00000	59	202.2	2462.0	4261.0
59	21.909011.18.00	1.00000	60	202.2	2462.0	4261.0
60	21.909011.18.10	1.00000	61	202.2	2462.0	4261.0
61	21.909011.18.20	1.00000	62	202.2	2462.0	4261.0
62	21.909011.18.30	1.00000	63	202.2	2462.0	4261.0
63	21.909011.18.40	1.00000	64	202.2	2462.0	4261.0
64	21.909011.18.50	1.00000	65	202.2	2462.0	4261.0
65	21.909011.19.00	1.00000	66	202.2	2462.0	4261.0
66	21.909011.19.10	1.00000	67	202.2	2462.0	4261.0
67	21.909011.19.20	1.00000	68	202.2	2462.0	4261.0
68	21.909011.19.30	1.00000	69	202.2	2462.0	4261.0
69	21.909011.19.40	1.00000	70	202.2	2462.0	4261.0
70	21.909011.19.50	1.00000	71	202.2	2462.0	4261.0
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72	21.909011.20.10	1.00000	73	202.2	2462.0	4261.0
73	21.909011.20.20	1.00000	74	202.2	2462.0	4261.0
74	21.909011.20.30	1.00000	75	202.2	2462.0	4261.0
75	21.909011.20.40	1.00000	76	202.2	2462.0	4261.0
76	21.909011.20.50	1.00000	77	202.2	2462.0	4261.0
77	21.909011.21.00	1.00000	78	202.2	2462.0	4261.0
78	21.909011.21.10	1.00000	79	202.2	2462.0	4261.0
79	21.909011.21.20	1.00000	80	202.2	2462.0	4261.0
80	21.909011.21.30	1.00000	81	202.2	2462.0	4261.0
81	21.909011.21.40	1.00000	82	202.2	2462.0	4261.0
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85	21.909011.22.20	1.00000	86	202.2	2462.0	4261.0
86	21.909011.22.30	1.00000	87	202.2	2462.0	4261.0
87	21.909011.22.40	1.00000	88	202.2	2462.0	4261.0
88	21.909011.22.50	1.00000	89	202.2	2462.0	4261.0
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90	21.909011.23.10	1.00000	91	202.2	2462.0	4261.0
91	21.909011.23.20	1.00000	92	202.2	2462.0	4261.0
92	21.909011.23.30	1.00000	93	202.2	2462.0	4261.0
93	21.909011.23.40	1.00000	94	202.2	2462.0	4261.0
94	21.909011.23.50	1.00000	95	202.2	2462.0	4261.0
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96	21.909011.24.10	1.00000	97	202.2	2462.0	4261.0
97	21.909011.24.20	1.00000	98	202.2	2462.0	4261.0
98	21.909011.24.30	1.00000	99	202.2	2462.0	4261.0
99	21.909011.24.40	1.00000	100	202.2	2462.0	4261.0



Front View



As a follow-on to previous developments, the Reference Multimeter RMM has been introduced as a new member of the ZERA precision measuring equipment.

The Reference Multimeter RMM can be used for current, voltage, phase angle and power measurements. Also energy comparison measurements of electricity meters via scanning head or other substandard meters via pulse input is possible. The RMM can be used for single and polyphase applications. The functionality of RMM is sufficient for metrological institutes, test laboratories of power utilities and electricity meter manufacturers. In combination with the robust transportation case (option) the RMM is also suitable for on site meter tests.

Features

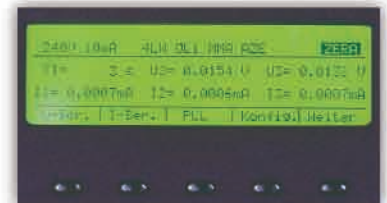
- High accuracy, independent from measurement mode,
- Simple, menu-controlled operation using a front-face LCD display,
- Convenient operation and evaluation, including protocol generation with Windows® based SSM 3000 operator software, RS 232 interface.

RMM reference multimeters can be operated manually using the front LC display and 5 menu-related function keys.

Functions

The following functions can be called up via soft keys:

- Actual values,
- Meter accuracy testing,
- Energy comparison measurement,



Picture: Display with softkeys

User Software

The SSM 3000 control program runs under MS Windows® application (95/98/2000/XP/...). The software is increasing the functionality of RMM by a multiplicity of additional features.

Actual Value Display

The following measurements in an three phase AC system are displayed as mean values:

- Individual voltage and current rms values,
- All phase angles
- Active, reactive and apparent power, with power factors
- Frequency and phase indication
- DC components

Reference Multimeter RMM 3000

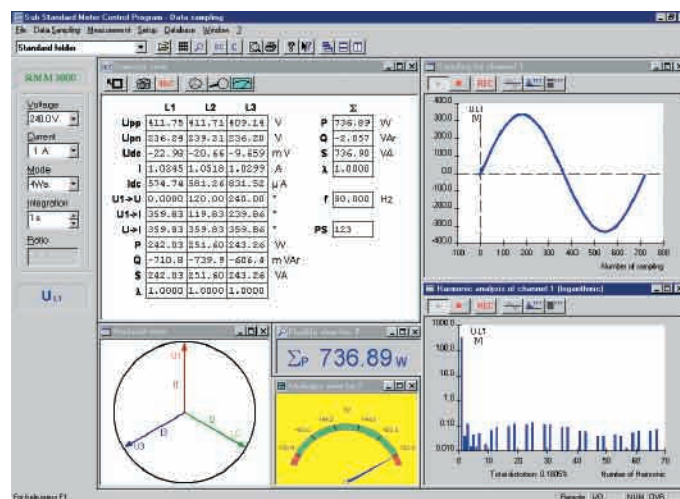


Picture: Rear view RMM 3000

The actual values can be displayed as an overview with all values, as display of individual values, view as a measuring instrument or as graph. In addition, measurements over long periods are possible, to allow their long-term behaviour to be analysed. The SSM 3000 software is used to read out voltage and current waveforms. The values can be displayed graphically, as a logarithmic frequency spectrum giving the relative harmonic content, or as a list of Fourier coefficients.

With Energy comparison measurement, RMM is able to test other substandard meters with a pulse output proportional to the power. Static and mechanical electricity meters can be tested with RMM during the Accuracy Test. A scanning head (option) is required for this test.

Manual and automatic operating modes are provided for both tests.

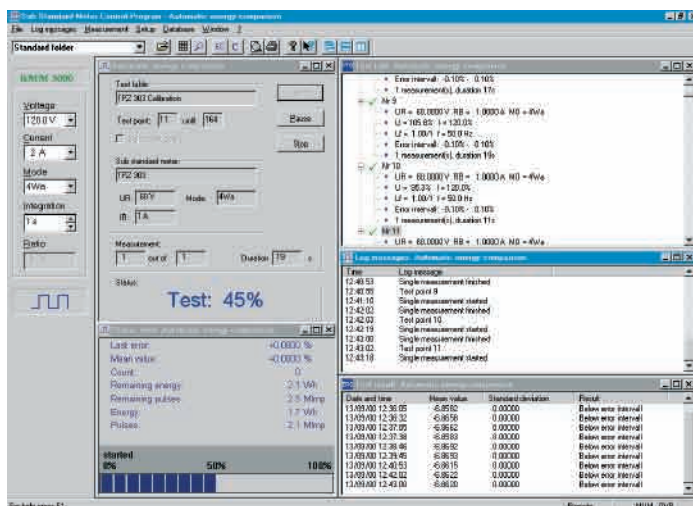


Rear View

Curve Sampling

Energy Comparison Measurement

Accuracy Test



All test data relevant to the test (parameters and control codes for the item under test, switch-on sequence, tolerance ranges...) are stored in databases and can therefore be reused.

The test results from databases can be statistically analyzed with the SSM 3000 software protocol function, printed out in the different display forms, and exported into MS Excel files.



Reference Multimeter RMM 3000



Unless otherwise indicated, all measurement errors are related to sine-wave test parameters in the nominal frequency range and appropriate range selection.

Technical Data

Referenz Multimeter	RMM 3000	
Power supply	230V +10% -15%, 47... 63 Hz	
Power consumption	< 80 VA	
Test voltage	30 V ... 500 V	
Voltage ranges	60-120-240-480 V	
Test current	1 mA ... 160 A	
Current ranges	5-10-20-50-100-200-500 mA 1-2-5-10-20-50-100-200 A	
Fundamental frequency	15 ... 70 Hz	
Bandwidth	DC ... 3500 Hz	
Measuring mode	4 wire Active 4 wire Reactive true 4 wire Reactive geometric 4 wire Reactive cross 4 wire Reactive Q60 4 wire Reactive Q60 cross 4 wire Apparent 4 wire Apparent geometric 3 wire Active 3 wire Reactive true 3 wire Reactive geometric 3 wire Reactive cross connected A 3 wire Reactive cross connected B 3 wire Reactive Q60 3 wire Reactive Q60 cross 3 wire Apparent 3 wire Apparent geometric	
Voltage measurement error <small>(referred to the range limit)</small>	< 100×10^{-6}	
Voltage measurement drift	< 30×10^{-6} / year	
Current measurement error <small>(referred to the range limit)</small>	< 100×10^{-6} (50 mA ... 160 A) < 300×10^{-6} (1 mA ... 50 mA)	
Current measurement drift	< 70×10^{-6} / year (1 mA ... 16 A) < 200×10^{-6} / year (16 A ... 160 A)	
Power/energy measurement error in the ranges 30 ... 500 V <small>(related to apparent power irrespective of measurement Type)</small>	< 200×10^{-6} (50 mA ... 160 A) < 400×10^{-6} (1 mA ... 50 mA)	
Power/energy measurement error independent of the type of measurement, in the ranges 30 ... 500 V and 100 mA ... 16 A at PF=0.5i, 0.8c and 1 <small>(referred to the value read off with optimum range selection)</small>	< 200×10^{-6}	
Power/energy measurement drift	< 100×10^{-6} / year (50 mA ... 16 A) < 200×10^{-6} / year (16 A ... 160 A)	
Angle measurement error	< 0,01°	
Temperature range	15°... 40° C	
Temperature drift	U < $2,5 \times 10^{-6}$ / K I < $5,0 \times 10^{-6}$ / K P < $7,5 \times 10^{-6}$ / K	
Inputs / outputs	3 x current (fused 1 mA ... 16 A) 3 x current (10 A ... 160 A) 3 x voltage 2 x pulsed output 1 x pulsed input 1 x Scanning head input for meter testing 1 x RS232 interface 1 x bit-bus interface 1 x ZERA fibre optics interface	
Dimensions	132 x 483 x 460 mm (19"-rack-mounted model) 152 x 465 x 460 mm (Desktop model)	
Weight	13 Kg	

Other Products:

Stationary Test Systems
for Electricity Meters

Portable
Meter Test Equipment

Stationary and Portable
Power Sources

Insulation Testers

Test Systems for
Instrument Transformers

Test Systems for
Circuit Breakers and
Switch Gears

Voltage Stabilizers

Test Equipment for
Ripple-Control Receiver

Primary Injection Test Sets

Secondary Injection Test Sets

Stationary and Portable
Test Systems for Calibration
of Measuring Transducers

Modernisation of
Meter Test Systems

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