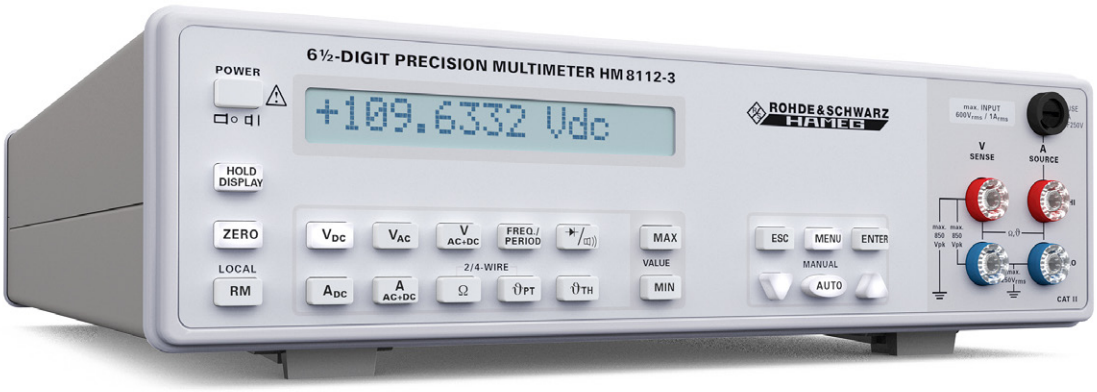
HM8112-3
6½-Digit Multimeter
Technical Data

HAMEG Instruments
A Rohde & Schwarz Company



USB · RS-232 · optional IEEE-488 · Lab-VIEW

Key facts

- 6½-Digit Display (1,200.000 Counts)
- Resolution: 100 nV, 100 pA, 100 uΩ, 0.01 °C/F
- DC Basic Accuracy 0.003%
- 2-wire/4-wire Measurements
- Measurements Intervals adjustable from 0.1…60s
- Up to 100 Measurements per Second transmitted to a PC
- True RMS Measurements, AC and DC+AC
- Mathematic functions: Limit Testing, Minimum/Maximum, Average and Offset
- Temperature Measurements with Platinum (PT100/PT1000) and Ni (K and J types) Sensors
- Internal Data Logger for up to 32,000 Measurement Results
- Offset Correction
- Galvanically isolated USB/RS-232 dual interface, optional IEEE-488 (GPIB)
- [HM8112-3S]: HM8112-3 incl. Scanner Card (8+1 Channels each 2- and 4-wire)

Technical Data

6½-Digit Multimeter
HM8112-3

All data valid at 23 °C after 30 minutes warm-up.

DC specifications

Ranges HM8112-3:	0.1 V; 1 V; 10 V; 100 V; 600 V	
Ranges HM8112-3S:	0.1 V; 1 V; 10 V; 100 V	
Input impedance:		
0.1 V, 1,0 V:	>1 GΩ	
10 V, 100 V, 600 V:	10 MΩ	

Accuracy: Values given are in ±(% of reading (rdg.) + % of full scale (f.s.)):

Range	1 year; %rdg.	23 °C ±2 °C %f.s.	Temp. coefficient 10…21 °C + 25…40 °C
0.1 V	0.005	0.0006	0.0008
1.0 V	0.003	0.0006	0.0008
10.0 V	0.003	0.0006	0.0008
100.0 V	0.003	0.0006	0.0008
600.0 V	0.004	0.0006	0.0008

Integration time:	0.1 s	1…60 s
Display range:	120.000 Digit	1.200.000 Digit
600 V range	60.000 Digit	600.000 Digit
Resolution:	1 µV	100 nV
Zero point: Temperature drift	better than 0.3 µV/°C	
Long-term stability	better than 3 µV for 90 days	

AC specifications

Ranges HM8112-3:	0.1 V; 1 V; 10 V; 100 V; 600 V	
Ranges HM8112-3S:	0.1 V; 1 V; 10 V; 100 V	
Measurement method:	true rms, DC or AC coupled (not in 0.1 V range)	
Input impedance:		
0.1 V and 1 V	1 GΩ II <60 pF	
10…600 V	10 MΩ II <60 pF	
Response time:	1.5 sec to within 0.1 % of reading	

accuracy For sine wave signals >5 % of full scale Values given are in ±(% of reading + % of full scale); 23 °C ±2 °C for 1 year

Range:	20 Hz - 1 kHz	1 - 10 kHz	10 - 50 kHz	50 - 100 kHz	100 - 300 kHz
0.1 V	0.1 + 0.08	5 + 0.5 (5 kHz)			
1,0 V	0.08 + 0.08	0.15 + 0.08	0.3 + 0.1	0.8 + 0.15	7 + 0.15
10.0 V	0.08 + 0.08	0.1 + 0.08	0.3 + 0.1	0.8 + 0.15	4 + 0.15
100.0 V	0.08 + 0.08	0.1 + 0.08	0.3 + 0.1	0.8 + 0.15	
600.0 V	0.08 + 0.08	0.1 + 0.08			

Temperature coefficient 10…21 °C and 25…40 °C; (% rdg. + % f.s.)		
at 20 Hz…10 kHz	0.01 + 0.008	
at 10…100 kHz	0.08 + 0.01	
Crest factor:	7:1 (max. 5x range)	
Integration time:	0.1 s	1…60 s
Display range:	120.000 Digit	1.200.000 Digit
600 V range:	60.000 Digit	600.000 Digit
Resolution:	1 µV	100 nV
Maximum input voltage LOW against chassis/safety earth:		
Ranges:	alle	
all the time:	850 V_{peak} oder 600 V_{DC}	
Maximum input voltage LOW against chassis/safety earth:	250 V_{rms} at max. 60 Hz or 250 V_{DC}	

Current specifications

Ranges:	100 µA; 1 mA; 10 mA; 100 mA; 1 A	
Integration time:	0.1 s	1…60 s
Display ranges:	120.000 Digit	1.200.000 Digit
1 A range	60.000 Digit	600.000 Digit
Resolution:	1 nA	100 pA

Accuracy: (1 year; 23 ±2 °C)	DC 0.02 + 0.002	45 Hz…1 kHz 0.1 + 0.08	1…5 kHz 0.2+0.08
Temperature coefficient/°C: (%rdg. + %f.s.)	10…21 °C 0.002 + 0.001	25…40 °C 0.01 + 0.01	
Voltage:	<600 mV…1,5 V		
Response time:	1.5 s to within 0.1 % of reading		
Crest factor:	7:1 (max. 5 x range)		
Input protection:	Fuse, FF 1 A 250 V		

Resistance

Ranges:	100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ	
Integration time:	0.1 s	1…60 s
Display ranges:	120.000 Digit	1.200.000 Digit
Resolution:	1 µΩ	100 µΩ

Accuracy, Values given are in ±(% of reading + % of full scale):

Range	1 year; %rdg.	23 °C ±2 °C %f.s.	Temp. Coefficient/°C 10…21 °C	25…40 °C
100 Ω	0.005	0.0015	0.0008	0.0008
1 kΩ	0.005	0.001	0.0008	0.0008
10 kΩ	0.005	0.001	0.0008	0.0008
100 kΩ	0.005	0.001	0.0008	0.0008
1 MΩ	0.05	0.002	0.002	0.002
10 MΩ	0.5	0.02	0.01	0.01

Measurement current:	Range	Current
	100 Ω, 1 kΩ	1 mA
	10 kΩ	100 µA
	100 kΩ	10 µA
	1 MΩ	1 µA
	10 MΩ	100 nA
Max. measurement voltage:	approx. 3 V	
Overload protection:	250 Vp	

Temperature measurement

PT100/PT1000 (EN60751):	2- und 4-wire measurement
Range	-200…+800 °C
Resolution	0.01 °C; measurement current 1 mA
Accuracy	±(0.05 °C + sensor tolerance + 0.08 K)
Temperature coefficient 10…21 °C and 25…40 °C	<0.0018 °C/°C
NiCr-Ni (K-type):	
Range	-270…+1.372 °C
Resolution	0.1 °C
Accuracy	±(0.7 % rdg. + 0.3 K)
NiCr-Ni (J-type):	
Range	-210…+1.200 °C
Resolution	0.1 °C
Accuracy	±(0.7 % rdg. + 0.3 K)

Frequenzmessung und Periodendauer

Range:	1 Hz…100 kHz
Resolution:	0.00001…1 Hz
Accuracy:	0.05 % (rdg.)
Measurement time:	1…2 s

Interface

Interface:	Dual-Interface USB/RS-232 (HO820), IEEE-488 (GPIB) (optional)
Functions:	Control/Data fetch
Inputs:	Function, range, integration time, start command
Outputs:	Measurement results, function, range, integration time (10 ms…60 s)

Miscellaneous

Time to change range or function:	approx. 125 ms with DC voltage, DC current, resistance approx. 1 s with AC voltage, AC current
Memory:	30.000 readings/128 kB

Safety class:	Safety class I (EN 61010-1)
Power supply:	105…254 V~; 50…60 Hz, CAT II
Power consumption:	approx. 8 W
Operating temperature:	+5…+40 °C
Storage temperature:	-20…+70 °C
Rel. humidity:	5…80 % (non condensing)
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	ca. 3 kg

Technical Data Scanner Card HO112	
Channels:	8 (4-wire)
Switching:	bistable, floating relais
Thermal voltage:	typ. 500 nV, max. 1µV*)
Max. voltage between 2 contacts:	125 Vpk
Max. measuring voltage:	125 Vpk - also V/Ω-input -
Volt-Hertz-Product:	≤ 1 x 106 V · Hz
Max. switching current:	1 Aeff
Max.contact resistance:	approx. 1 Ω (each wire)
Life time:	2 x 108 switches (0.1 A; 10 VDC)
Insulating resistance:	3 GΩ **)
Capacity:	>100 pF, between contacts
Switching delay:	20 ms
Measurement delay:	between 50 ms and 300 ms

*) max. 1 µV after a warm-up of 1.5 h
**) at rel. humidity <60 %

Accessories supplied:
Line cord, Operating manual, PVC test lead (HZ15), Interface cable (HZ14), CD

Recommended accessories:
HO112 Scanner Card (Installation only ex factory) as HM8112-3S
HO880 Interface IEEE-488 (GPIB), galvanically isolated
HZ10S 5 x silicone test lead (measurement connection in black)
HZ10R 5 x silicone test lead (measurement connection in red)
HZ10B 5 x silicone test lead (measurement connection in blue)
HZ13 Interface cable (USB) 1.8 m
HZ33 Test cable 50 Ω, BNC/BNC, 0.5 m
HZ34 Test cable 50 Ω, BNC/BNC, 1.0 m
HZ42 19" Rackmount kit 2RU
HZ72 GPIB-Cable 2 m
HZ887 Temperature probe