HAMEG Instruments
A Rohde & Schwarz Company

Digital Multimeter
HMC8012

HMC8012

USB | USB Stick | TCP/IP | optional IEEE-488 | Lab-VIEW | Software | Printed Manual

HMC8012 - rear view of GPIB-version

HZC95
19" rackmount kit 2RU

HZ15 (included)
Silicon test lead with safety connector and probe

- ☑ 5¾-Digit Display (480,000 Counts)
- ☑ Simultaneous Display of 3 Measurements, e.g. DC + AC + Statistics
- ☑ Up to 200 Measurements per Second
- ☑ DC Basic Accuracy 0,015%
- ☑ 12 Measurements Functions: DCV, DCI, True RMS, ACV and ACI, Frequency, 2- and 4-Wire Resistance, Capacitance, Continuity, Diode Test, Temperature, Power
- ☑ Crisp color TFT display for excellent readability
- ☑ Resolution: 1µV, 100nA, 1mΩ, 1pF, 1Hz, 0,1°C
- ☑ True RMS Measurement AC, AD + DC
- ☑ Mathematic Functions: Limit Testing, Minimum/Maximum, Average, Offset, DC Power, dB, dBm
- ☑ Temperature Measurements with Platinum Sensors (PT100/PT500/PT1000)
- ☑ Data Logging in .CSV-Format to Internal Memory or USB-Stick
- ☑ Interfaces: USB-TMC and Ethernet (LXI in Preparation), optional IEEE-488 (GPIB)
- ☑ SCPI commands widely compatible with Agilent 34410A

Digital Multimeter HMC8012

All data valid at 23°C ±5K after 90 minutes warm-up and with 5¾ digits.

DC Specifications DC Accuracy in ± (% of reading + % of range):

Function	Range[1]	Test Current Voltage drop	Input Impedance	1 Year 23 °C ± 5 K	Temp. Coefficient 0-18 °C, 28-55 °C
DC Voltage	400,000 mV		10 MΩ/>10 GΩ	0,015+0,002	0,0010+0,0005
	4,00000 V		10 MΩ/>10 GΩ	0,015+0,002	0,0008+0,0003
	40,0000 V		10 MΩ	0,020+0,002	0,0010+0,0005
	400,000 V		10 MΩ	0,020+0,002	0,0015+0,0005
	1000,00 V		10 MΩ	0,025+0,002	0,0015+0,0005
Resistance	400,000 Ω	1 mA		0,050+0,005	0,0020+0,0005
(2/4-wire)[2]	4,00000 kΩ	1 mA		0,015+0,002	0,0020+0,0002
	40,0000 kΩ	100 µA		0,015+0,002	0,0020+0,0002
	400,000 kΩ	10 µA		0,030+0,003	0,0020+0,0002
	4,00000 MΩ	1 µA		0,060+0,005	0,0020+0,0002
	40,0000 MΩ	100 nA		0,250+0,003	0,0080+0,0005
	250,000 MΩ	460 nA || 10 MΩ (parallel)		2,000+0,010	0,200+0,0005
DC Current[4]	20,0000 mA	<0,30 V		0,05+0,010	0,008+0,0010
	200,000 mA	<0,27 V		0,05+0,010	0,008+0,0010
	2,00000 A	<0,2 V		0,25+0,070	0,012+0,0015
	10,0000 A[3]	<0,60 V		0,25+0,070	0,010+0,0010
Continuity	4000 Ω	1 mA		0,05+0,010	0,005+0,0005
Diode Test	5 V	1 mA		0,05+0,010	0,005+0,0005

Notes:
1) 240.000 / 480.000 counts exept in 1000 V and 10 A range
2) Specifications are for 4-wire measurement; 2-wire measurement using NULL function.
3) Maximum current load at >5 A is 30 seconds, followed by a pause of >30 seconds
4) At 250 V maximum

AC Specifications AC Accuracy in ± (% of reading + % of range):

Function	Range[1]	Frequency	1 Year 23 °C ± 5 K	Temp. Coefficient 0-18 °C, 28-55 °C
AC Voltage[2]	400,000 mV	10 Hz–20 Hz	3,0+0,05	0,01+0,01
	4,00000 V	20 Hz–45 Hz	1,5+0,05	0,01+0,01
	40,0000 V	45 Hz–20 kHz	0,3+0,05	0,01+0,01
	400,000 V	20 kHz–50 kHz	1,0+0,05	0,02+0,01
	750,00 V[6]	50 kHz–100 kHz	3,0+0,05	0,05+0,01
AC Current[5]	20,0000 mA	20 Hz–40 Hz	1,5+0,05	0,01+0,01
	200,000 mA	40 Hz–1 kHz	0,5+0,05	0,01+0,01
	2,00000 A	1 kHz–5 kHz	1,5+0,05	0,01+0,01
	10,0000 A[4]	5 kHz–10 kHz[3]	2,5+0,05	0,01+0,01

Notes:
1) 240.000 / 480.000 counts exept in 750 V and 10 A range
2) Specifications are for sinusoidal curves. Input impedance is 1 MΩ parallel <100 pF
3) Except 10 A range
4) Maximum current load at >5 A is 30 seconds, followed by a pause of >30 seconds
5) At 250 V maximum
6) For ACV measurements and frequencies above 50 kHz the user is required to choose an appropriate measurement range.

Frequency Counter Specifications Frequency Accuracy in ± (% of reading):

Function	Range[1]	Frequency	1 Year 23 °C ± 5 K	Temp. Coefficient 0-18 °C, 28-55 °C
AC Voltage[2]	all ranges	5 Hz–700 kHz	0,01	0,005
AC Current[2]	20 mA, 200 mA	5 Hz–10 kHz	0,01	0,005
	2 A, 10 A	5 Hz–5 kHz	0,01	0,005

Notes:
1) Display of frequency available as 2nd measurent for main functions ACV and ACI
2) Input sensitivity: >7,5 % of full scale (5 Hz-400 kHz) resp. >20 % (400-700 kHz)

Frequency Counter Resolution

Setting	Measurement time	Display range	Resolution
Slow	1 s	999,999 kHz	1 Hz
Medium	100 ms	999,99 kHz	10 Hz
Fast	10 ms	999,9 kHz	100 Hz

Capacitance Specifications	Capacitance Accuracy in ± (% of reading + % of range):		
Function	**Range**	**1 Year 23 °C ± 5 K**	**Temp. Coefficient 0-18 °C, 28-55 °C**
Capacitance	5,000 nF	2,0+2,5	0,02+0,002
	50,00 nF	1,0+2,0	0,02+0,002
	500,0 nF	1,0+0,5	0,02+0,002
	5,000 µF	1,0+0,5	0,02+0,002
	50,00 µF	1,0+0,5	0,02+0,002
	500,0 µF	2,0+1,0	0,02+0,002

General Information

Power supply:	115 V / 230 V ±10%, adjustable voltage selector on rear panel; Frequency 50Hz / 60Hz
Power consumption:	25 W max., 12 W typ.
Ambient temperature:	0 ...+55 °C (operating); –40 ...+70 °C (storage)
EMC compliance:	DIN EN 61326-1, DIN EN 55011
Safety compliance:	DIN EN 61010-1, CAN/CSA-C22.2 No. 61010-1-12
Measuring Category:	CAT II, 600 V; CAT I, 1000 V_{DC}, 750 $V_{AC\ RMS}$
Dimensions (W x H x D):	222 x 88 x 280 mm
Weight:	approx. 2.7 kg
Warm-up time:	90 minutes

All data valid at 23°C ±5K after 90 minutes warm-up and with 5 ¾ digits

Additional Specifications

DC voltage	
Measuring Method	Sigma Delta analog/digital converter
Input Resistance	>10 GΩ (selectable for ranges 400 mV / 4 V 10 MΩ (on all ranges)
CMRR	120 dB for VCM <500 V, 1 kΩ unbalance in the LO-line and 5 measurements/second
SMRR	>60 dB for 50 or 60 Hz ±0,1% and 5 measurements/second
Input current	60 pA for 25 °C
Overload protection	1000 V for all ranges
AC voltage	
Measuring Method	AC coupled True RMS measurement
Input Resistance	1 MΩ parallel <100 pF (on all ranges)
Crest Factor	Max. 10 (0,5% additional measurement uncertainty)
CMRR	>60 dB 1 kΩ in the LO-line and frequency <60 Hz
Overload protection	750 V_{rms} (for all ranges)
AC current / DC current	
Shunt Resistance	13,75 Ω for 20 mA; 1,25 Ω for 200 mA; 25 mΩ for 2 A, 10 A
Overload protection	Fuse: F10H250V on the front panel
Resistance	
Measuring Method	2-wire and 4-wire
Overload protection	1000 V for all ranges
Continuity	
Measuring Method	1 mA constant current
Threshold value	Adjustable in 1Ω steps
Response Time	200 measurements/second
Overload protection	1000 V
Diode Test	
Measuring Method	1 mA constant current
Threshold value	Adjustable in 10 mV steps
Response time	10 measurements/second
Overload protection	1000 V
Temperature	
Measurement method	Resistance measurement with platinum sensor
Sensor types	PT100, PT500, PT1000
Connection	2-wire, 4-wire
Overload protection	1000 V
Math Functions	
Statistics	Min/Max/Average/Standard deviation
Relative measurement	NULL key, offset via keyboard
Logarithmic functions	dB: Reference level via keyboard or NULL key dBm: Reference impedance 50/75/600Ω or freely selectable
Data logging	
Number of measuring counts	Internal: 50,000; external: defined by USB stick capacity.
Rate Log	Min.: 5 ms typ. (in accordance to measuring function and resolution) Max: 3.600 s
Duration Log	Internal: 250 s...50.000 h; external: defined by USB stick capacity
Data Log	Main, 2nd, Time-Stamp
Interfaces	USB 2.0 (TMC and CDC/VCP), Ethernet 10/100 (LXI in Preparation), IEEE-488/GPIB optional
Programming	SCPI, compatible with Agilent 34401A and 34410A

Reading Rates

Function	Setting	Resolution	Display	Reading Rates (per sec.)
AC Voltage	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	200
DC Voltage	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	200
AC Current	Slow	5 3/4	200,000	5
	Medium	4 3/4	20,000	10
	Fast	4 3/4	20,000	200
DC Current	Slow	5 3/4	200,000	5
	Medium	4 3/4	20,000	10
	Fast	4 3/4	20,000	200
Resistance (2-wire)	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	50
Resistance (4-wire)	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	25
Frequency	Slow	6	999,999	1
	Medium	5	99,999	10
	Fast	4	9,999	100
Diode		4 3/4	40,000	10
Continuity		4 3/4	40,000	200
Temperature		4	999,9	10

Accessories supplied: Line cord, printed operating manual, HZ15 Silicon test lead with safety connector and test probe, 1m (black + red), Software-CD

Recommended accessories:

HZ812	PT100 Temperature probe 2-wire
HZ887	PT100 Temperature probe 4-wire
HZC95	19" rackmount kit 2RU for HMC series

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