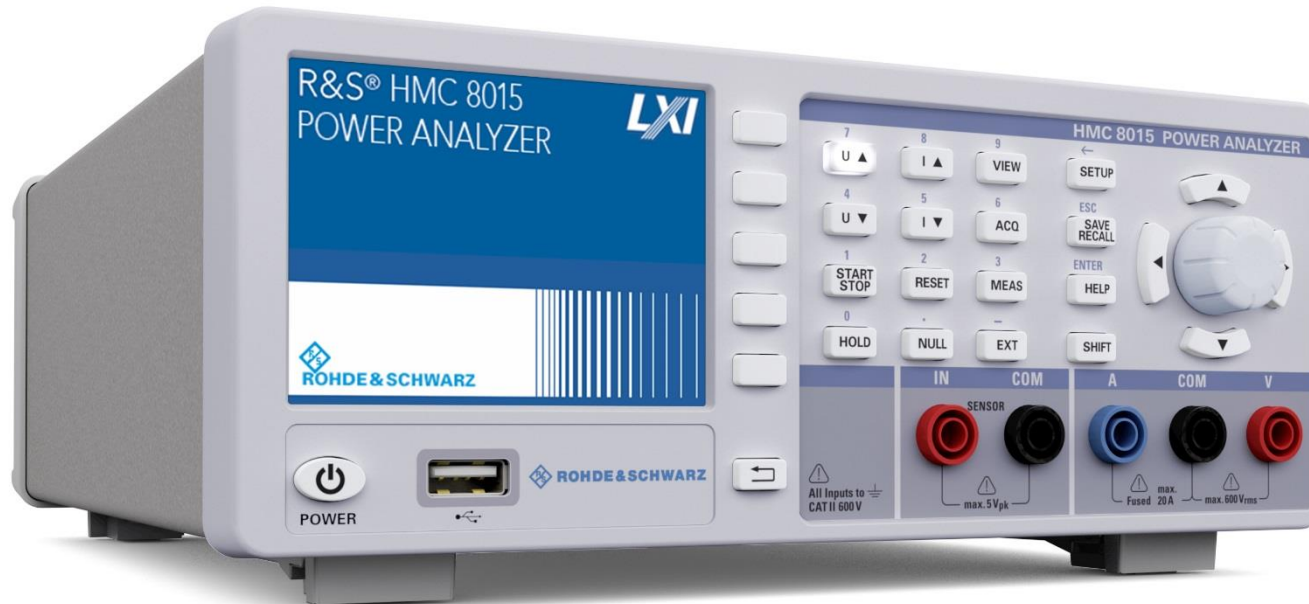


THE NEW HMC8015

Power Analyzer and OneBox Tester



HAMEG®
Instruments

A Rohde & Schwarz Company

Distribuido por: Hameg Instruments, S.L. - Barcelona/Spain

Mail: info@hameg.es Web: www.hameg.es

The HMC Compact Series

HMC8012 DMM



HMC8040 PSU



HMC8015 Power Analyzer

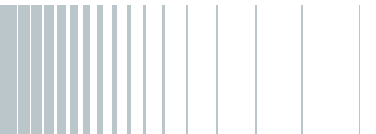


- 5 3/4-digit color TFT display
- 3 measurement parameters at once, e.g. DC + AC + statistics
- Up to 200 measurements per sec
- DC basic accuracy 0.015%
- True RMS measurement

- High energy efficiency
- Low residual ripple
- Overvoltage protection (OVP)
- Overpower protection (OPP)
- FuseLink
- EasyArb function

Customer Benefits

- Multifunctional power analyzer for wired measurements up to 100kHz
- Developed in Germany and manufactured in Europe according to highest quality and production standards
- 6 + 1 analyzer with state of the art functionality and highest in class resolution
- Covering a large application area from electronics design and development to service and production environments
- Compact footprint bench-top combining features of seven different instruments at a best in class performance
- Brilliant QVGA TFT display for excellent readability combined with a freely configurable graphical user interface



Customer Benefits

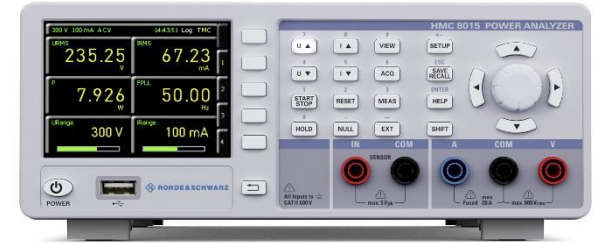
- Lowest basic accuracy in its class → 0.05% of reading
- Automatic AC/DC detection and switching
- Excellent scalability through options and accessories
- Well-balanced sampling rate and bandwidth ratio to never miss any waveform details
- Fanless design for silent operation
- Very fast boot time → less than 8s
- Huge variety of interfaces
- Future-proof investment: long-term support and new functions via firmware upgrades



Applications and Target Customers

The Perfect Choice

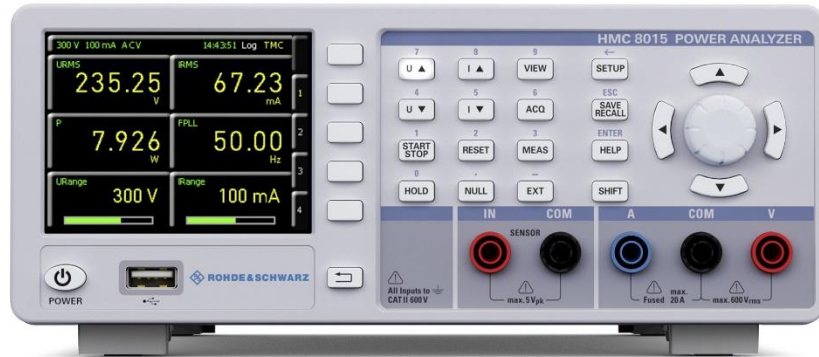
- Consumption analysis of on-grid devices
- Power analysis for embedded systems
- Power electronics R&D
- Quality control in manufacturing
- Standards testing in R&D and production



Target Customers

- Power electronics: engine test stands, switched PSU, power inverter
- Battery and solar industries: charge and discharge cycles
- Embedded and analog hardware design: power consumption of FPGAs, μ Cs, LED panels \rightarrow 5V, mW
- Service and maintenance
- Education customers

HMC8015 At a Glance



HMC8015 Key Facts

Bandwidth	DC to 100 kHz
Sampling Rate	500 kSample/s
Resolution	2x 16-bit simultaneous sampling (voltage and current)
Voltage Input	up to 600V _{rms}
Current Input	up to 20A _{rms}
Basic Accuracy	0.05% of reading
Display	Brilliant color TFT
1+1 Datalogging	CSV to USB stick or remotely via interface
2+1 Oscilloscope	Oscillographic waveform chart (opt.)
3+1 Spectrum Analyzer	Harmonics as bar chart or table view (opt.)
4+1 Energy Meter	Real-time integrator
5+1 Production Tester	Limit testing with PASS-FAIL (opt.)
6+1 Policy Tester	Energy Star, EN50160, EN50564, EN61000-3-2, IEC62301 (opt.)

HMC8015: 1+1 Datalogging

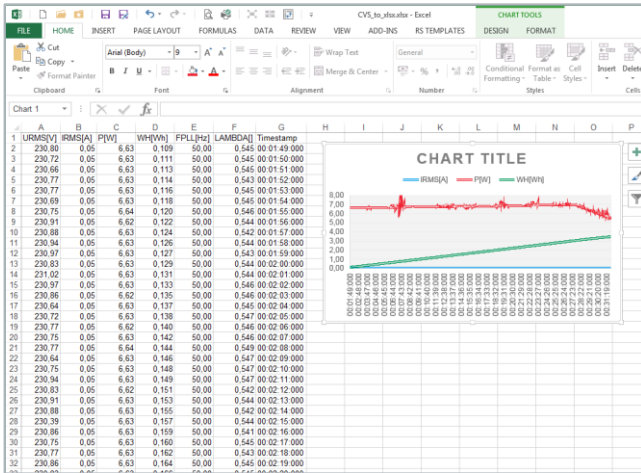


HMC8015 6+1 OneBox Analyzer

1+1 Datalogging

CSV to USB stick or remotely via interface

- Logging of up to 10 measurement parameters
- Recording 10 readings per second
- Absolute time stamps with 100ms resolution
- Directly to USB flash drives (FAT32)
- Logging data saved in CSV format
- Directly utilizable in Excel spreadsheets



HMC8015: 2+1 Oscilloscope



HMC8015 6+1 OneBox Analyzer

2+1 Oscilloscope

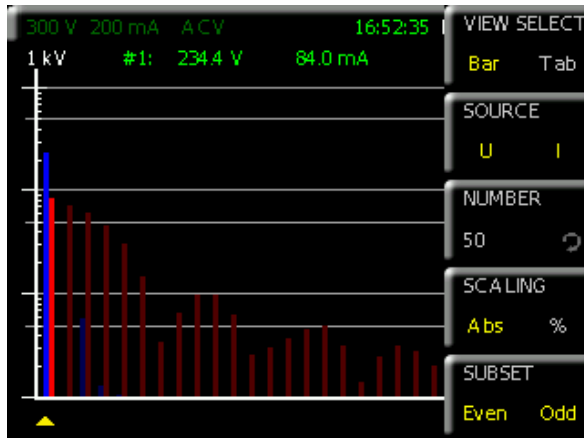
Oscillographic waveform chart

- Waveform auto-scaling
- Automatic hardware-based triggering
- Simultaneous display of voltage, current and power for one period
- Auto-measurement for U_{rms} , I_{rms} , F_{PLL} , P , Φ



Note for full operation
HVC151 option
is required (→ slide 24)

HMC8015: 3+1 Spectrum Analyzer



Note for full operation
HVC151 option
is required (→ slide 24)

HMC8015 6+1 OneBox Analyzer

3+1 Spectrum Analyzer

Harmonics as bar chart or table view

- Harmonics visualized as bar chart or table view
- Calculation covering 50 harmonics
- Scaling with absolute V/A values or as percentage of basic wave
- Logarithmic display to never miss any details
- Export function for easier report generation

HMC8015: 4+1 Energy Meter

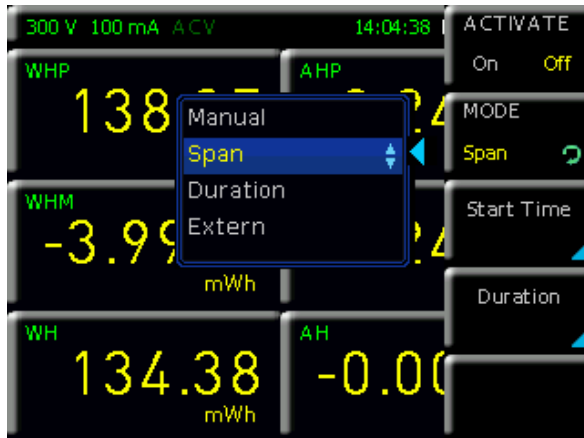


HMC8015 6+1 OneBox Analyzer

4+1 Energy Meter

Real-time integrator

- High precision and gapless acquisition
- Hardware-based, real-time integration
- Distinguishing positive and negative Wh, Ah
- Acquisition modes: manually, time-based, event-based (ext. trigger)
- Logging functionality as standard



Note for full operation
HVC152 option
is required (→ slide 24)

HMC8015: 5+1 Production Tester



HMC8015 6+1 OneBox Analyzer

5+1 Production Tester

Limit testing with PASS-FAIL

Limit testing

- Numerical display with limit bar
- Up to 6 limits freely configurable
- PASS-FAIL for one limit via rear connectors
 - Analog output representing limit bar
 - Digital output showing limit violations

Production environment

- Huge variety of interfaces for remote control
- SCPI command set
- Rackmount kit capability

Note for full operation
HVC152 option
is required (→ slide 24)

R&S[®]HMC8015: 6+1 Policy Tester



Note for full operation
HVC153 option
is required (→ slide 24)

HMC8015 6+1 OneBox Analyzer

6+1 Policy Tester

Energy Star, EN50160, EN50564,
EN61000-3-2, IEC62301

- Step-by-step wizard
- Stand-alone capability, no PC required
- Automatic protocol generation (html,txt)

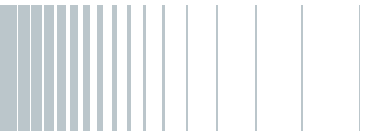


EN50160

EN50564

EN61000-3-2

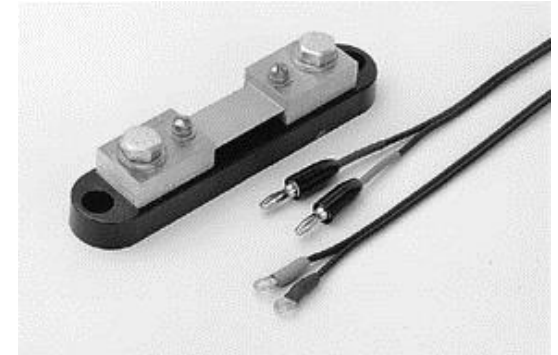
IEC62301



HMC8015: Input Ranges

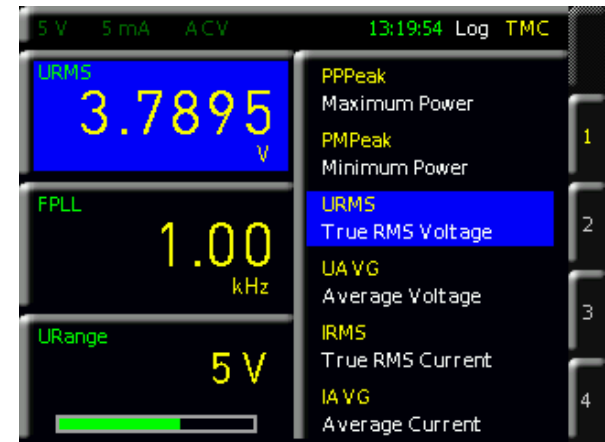
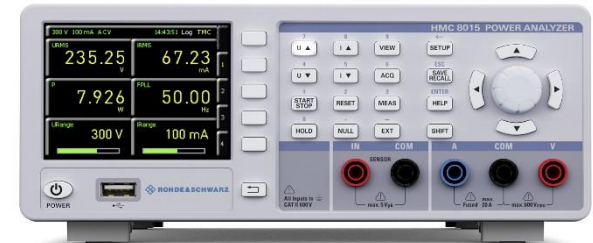
- $600V_{rms}$ and $20A_{rms}$
- Short-term peaks up to 1,800V and 60A
- Two selectable crest factors: CF3, CF6
- Automatic internal current range switching
- 3-times overload capability
- Increase current input range by external shunts or current probes
- Graphical range and limit bars

Power Analyzer R&S®HMC8015			
Range configuration			
	CF3	CF6	Peak
voltage	5V 15V 30V 60V 150V 300V 600V	2.5V 7.5V 15V 30V 75V 150V 300V	±15V ±45V ±90V ±180V ±450V ±900V ±1800V
current (500mΩ)	5 mA 10 mA 20 mA 50 mA 100 mA 200 mA 600V	2.5 mA 5 mA 10 mA 25 mA 50 mA 100 mA 300V	±15 mA ±30 mA ±60 mA ±150 mA ±300 mA ±600 mA ±1800V
current (10mΩ)	0.5 A 1 A 2 A 5 A 10 A 20 A	0.25 A 0.5 A 1 A 2.5 A 5 A 10 A	±1.5 A ±3 A ±6 A ±15 A ±30 A ±60 A



HMC8015: Measurement Parameters

- Simultaneous sampling of voltage and current
 - Real-time integrator
 - 26 different measurement parameters
- **HMC8015 basic unit**
 $P, S, Q, U_{\text{rms}}, U_{\text{avg}}, U_{\text{THD}}, I_{\text{rms}}, I_{\text{avg}}, I_{\text{THD}}, F_U, F_I, F_{\text{PLL}}, \lambda, \Phi, Wh_+, Wh_-, Wh, Ah_+, Ah_-, Ah$
 - **Advanced Analysis (HOC151/HVC151)**
same as basic unit plus $U_{p+}, U_{p-}, I_{p+}, I_{p-}, P_{p+}, P_{p-}$,
waveform, trendchart, inrush, harmonics view

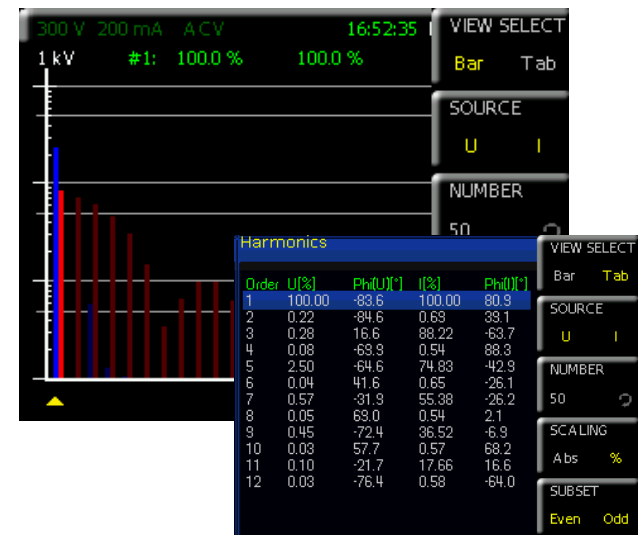
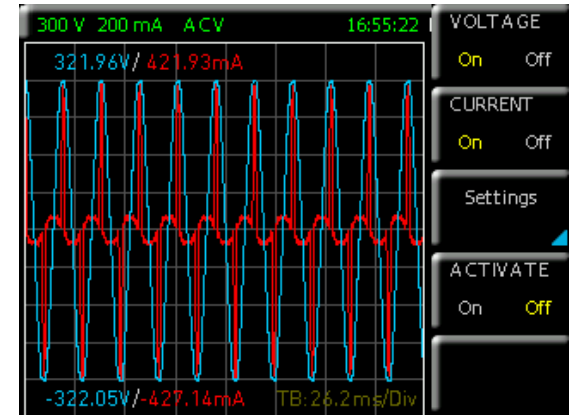


Note for full operation
HVC151 option
is required (→ slide 24)

HMC8015: Measurement Parameters

■ 6 different display and operation modes

- Numeric
- Waveform
- Trendchart
- Inrush
- Harmonics
- Policy Testing



Note for full operation
HVC151, HVC153
options are required (→ slide 24)

HMC8015: Filters

- Advanced signal processing system
- 3 different levels of filtering mechanisms
- Improving the signal's accuracy to a maximum

■ Frequency Filter

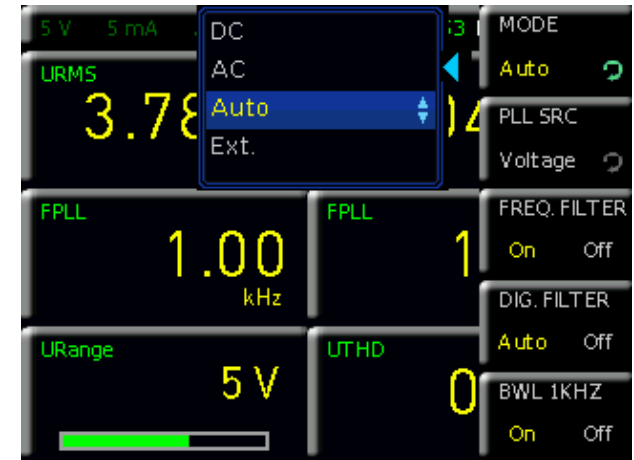
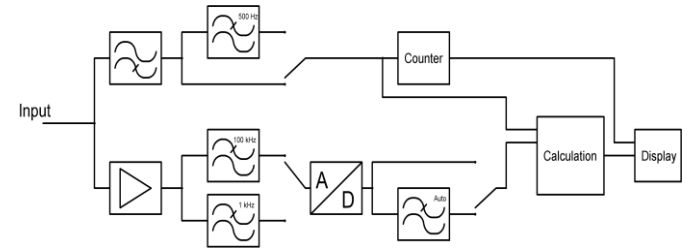
- Reliable detecting of zero crossings for precise determination of the signal's period

■ BWL (1kHz)

- Classical low-pass filter to generate a clean and RF-adjusted signal

■ Digital Filter

- Automatic adaptive filter averaging several periods to increase accuracy



HMC8015: Connectivity

- HCZ815 mains adapter
 - EU, GB, USA
 - 250V_{AC}, 10A max.
 - CAT-II
- Analog and digital I/Os + SENSOR input for external sensors, triggering and monitoring
- Remote control interfaces:
USB (VCP,TMC), Ethernet (LXI + Webserver),
IEEE-488 (GPIB, HMC8015-G)
- Driver packages:
LabVIEW, LabWindows/CVI, VXI, IVI.NET

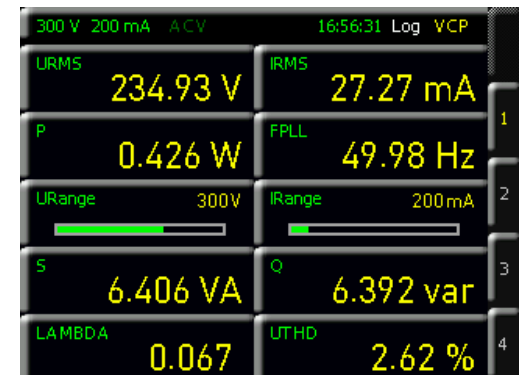
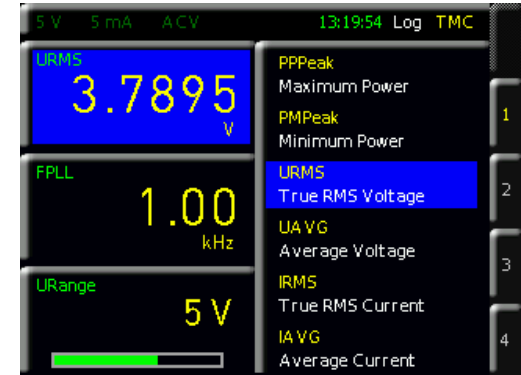
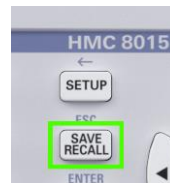


Note

for full operation
HVC152 option
is required (→ slide 24)

HMC8015: Display

- Freely configurable graphical user interface
- Numerical and chart display modes
- Easy to operate, easy to configure measurements
- Flat menu design for fast navigation
- 10 display updates per second
- Easy screenshot export → push&hold



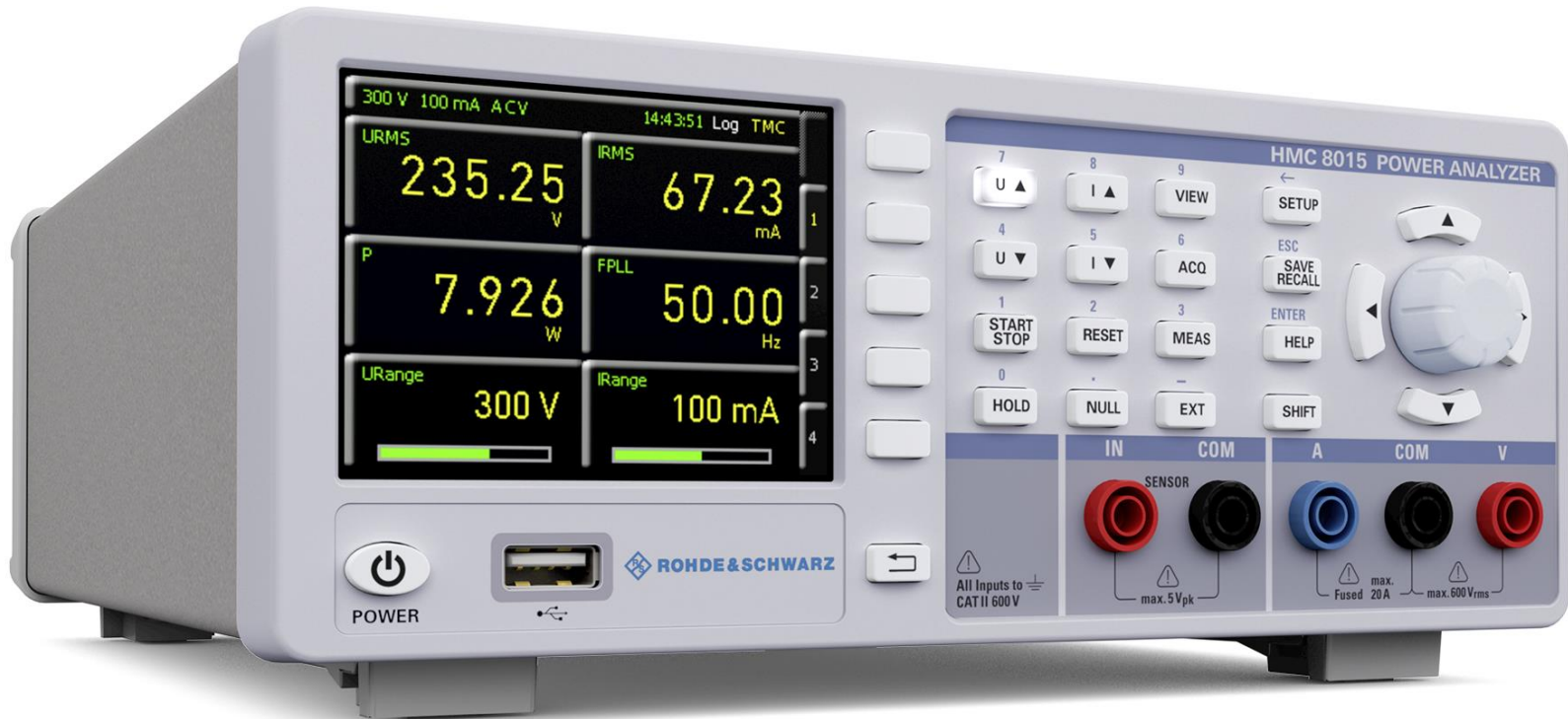
HMC8015: Options Overview

Function	Description	Basic Unit R&S®HMC8015	Advanced Analysis (HOC151 / HVC151)	Advanced I/O (HOC152 / HVC152)	OneBox Tester (HOC153 / HVC153)
P	Active power	X			
S	Apparent power	X			
Q	Reactive power	X			
Λ	Power factor	X			
Φ	Phase difference	X			
F _U	Voltage frequency	X			
F _I	Current frequency	X			
F _{PLI}	Acquisition frequency	X			
U _{RMS}	True RMS voltage	X			
U _{AVG}	Average voltage	X			
I _{RMS}	True RMS current	X			
I _{AVG}	Average current	X			
THD	Total harmonic distortion	X			
Integrator	Wh+, Wh-, Wh, Ah+, Ah-, Ah	X			
Logging	Logging (CSV) on USB stick	X			
USB, Ethernet (GPIB optional)	Remote interfaces	X			
U _{PA}	Peak positive voltage		X		
U _P	Peak negative voltage		X		
I _{PA}	Peak positive current		X		
I _P	Peak negative current		X		
P _{PA}	Peak positive power		X		
P _P	Peak negative power		X		
Harmonics mode	Harmonics bar chart		X		
Waveform / Trendchart mode	Oscillographic waveform display		X		
Inrush mode	Single shot for fast switching-on operations		X		
Sensor Input	Input for current probes or external shunts			X	
Limit / PASS-FAIL	Limit bar display and pulse via D _{out}			X	
D _{OUT}	Digital output connector (BNC)			X	
D _{IN}	Digital input connector (BNC)			X	
A _{OUT}	Analog output connector (BNC)			X	
A _{IN}	Analog input connector (BNC)			X	
Policy testing	Wizard for policy testing with report generation				X

HMC8015 - Views



HMC8015 - Views



HMC8015 - Views



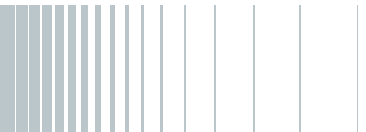
Supporting Material

- Product brochure with datasheet

www.hameg.es or email@hameg.es

- HMC8015 images

www.hameg.es or email@hameg.es



Ordering Information

■ **HMC8015** basic unit

order number: **3593.8646.02 - HMC8015**



■ **HMC8015-G** basic unit with GPIB

order number: **3593.8875.02 - HMC8015-G**

■ **Advanced Analysis** option

license key: HOC151

order number: **3622.0789.02 - HOC151**

voucher: HVC151

order number: **3622.0795.02 - HVC151**

■ **Advanced I/O** option

license key: HOC152

order number: **3622.3542.02 - HOC152**

voucher: HVC152

order number: **3622.3788.02 - HVC152**



■ **OneBox Tester** option

license key: HOC153

order number: **3622.3559.02 - HOC153**

voucher: HVC153

order number: **3622.3794.02 - HVC153**

Recommended Accessories

- **HZC815-EU** mains adapter
order number: **3593.8852.02 - HZC815-EU**
- **HZC815-GB** mains adapter
order number: **3622.2246.02 - HZC815-GB**
- **HZC815-USA** mains adapter
order number: **3622.2252.02 - HZC815-USA**

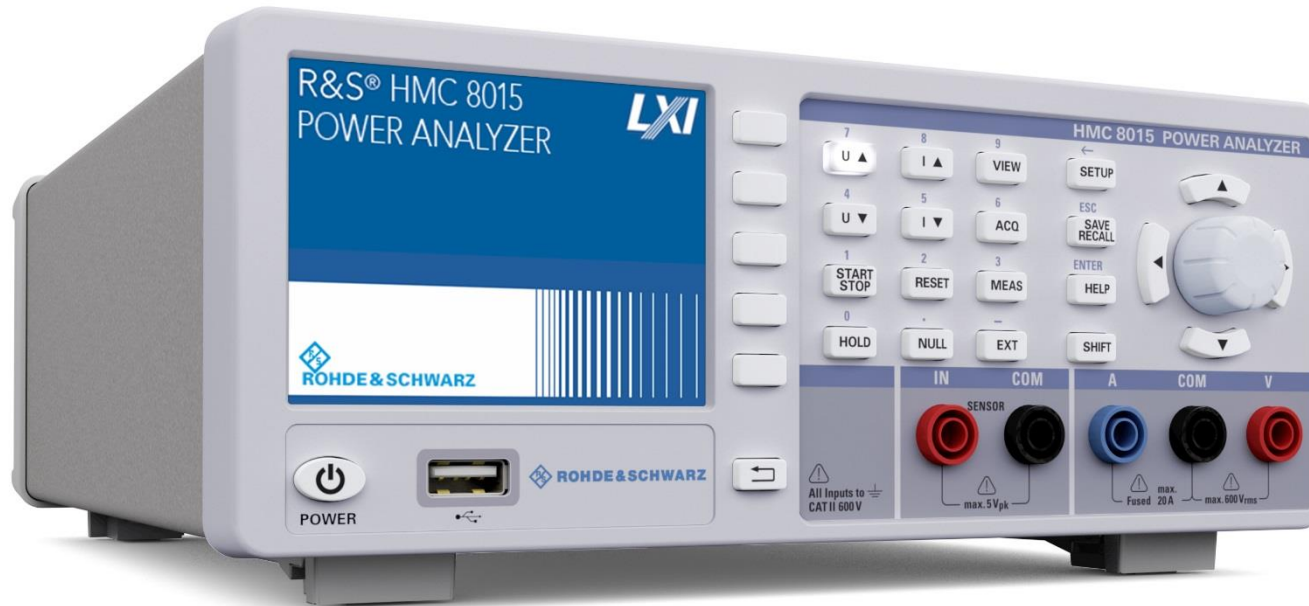


- **HZC50** AC/DC current probe (30A)
order number: **3622.4690.02 - HZC50**
- **HZC51** AC/DC current probe (1kA)
order number: **3622.4684.02 - HZC51**



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