

Generation and Measurement of voltage signals using Power Supply and Digital Multimeter

Step-By-Step Application Guide

Products:

- | R&S® HMC8043
- | R&S® 4040
- | R&S® HMC8012

The purpose of this document is to allow participant to practice and navigate some of the key features of R&S®HMC8043/ R&S®HMP4040 Power Supply and R&S®HMC8012 Digital Multimeter. By completing the exercise, user should learn how to demo some of the key feature of both the equipment and explains some of the concepts and settings. The document is separated into two part, with the first part explaining the main controls of each instrument. The second part of the document contains the lab exercise with the R&S®HMC8043 / R&S®HMP4040 generating a voltage signal and R&S®HMC8012 displaying the generated signal.

History

History		
01.06.2016	Heng Wee Boo	first version

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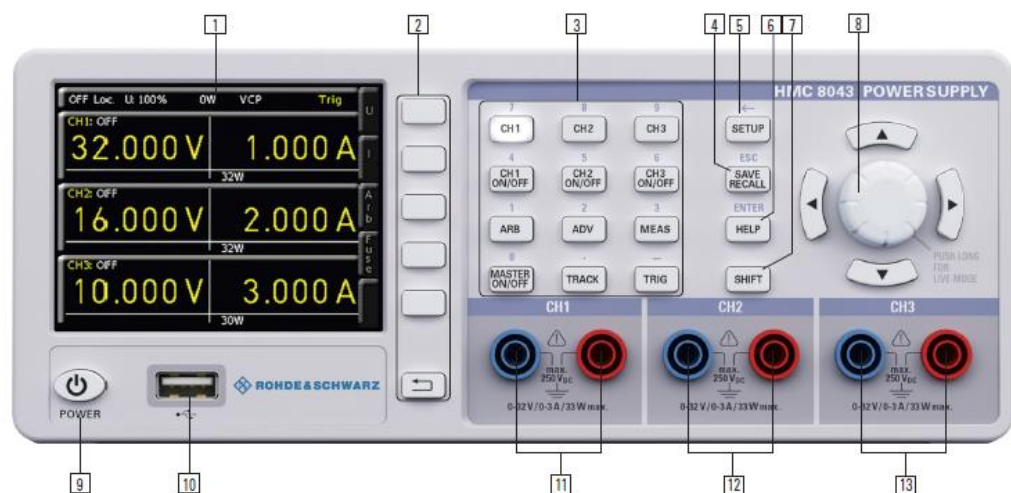
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1 Introduction of Operating Elements

R&S®HMC8043 Power Supply

Front panel of R&S®HMC 8043

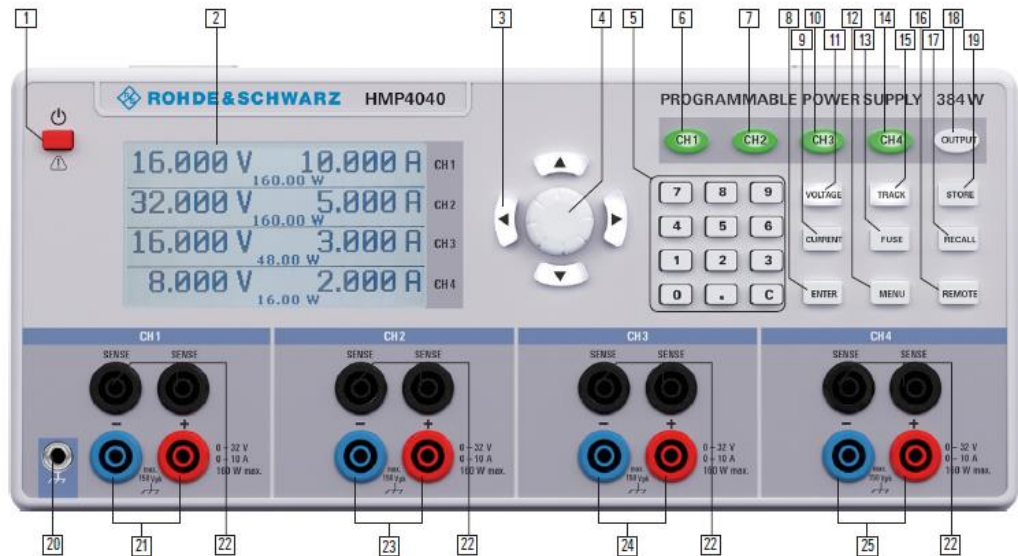
<ol style="list-style-type: none"> 1. Display - Color display (320 x 240 pixel) 2. Interactive soft menu keys 3. Function keys – To be used as numeric keypad in SHIFT function CH1 - Settings for channel 1 CH2 - Settings for channel 2 CH3 - Settings for channel 3 CH1 ON/OFF - Activating / Deactivating channel 1 CH2 ON/OFF - Activating / Deactivating channel 2 CH3 ON/OFF - Activating / Deactivating channel 3 ARB - EasyArb function ADV - Advanced functions (e.g. OVP, OPP, Fuse etc.) MEAS - Logging function / power display MASTER ON/OFF - Selected channels may be switched ON or OFF TRACK - Activating the tracking function TRIG - Manual trigger 	<ol style="list-style-type: none"> 4. SAVE/RECALL – Loading/storing of instrument settings 5. SETUP – Access to basic instrument settings 6. HELP – Integrated help display 7. SHIFT – Shift key to activate the numeric keypad 8. Universal knob with arrow keys – Setting desired values (edit keys) 9. POWER – On/Off for standby mode 10. USB connector – USB connector to save parameters 11. CH1 (4 mm safety sockets) Outputs channel 1; 0 V to 32 V / 3 A (33 W max.) 12. CH2 (4 mm safety sockets) Outputs channel 2; 0 V to 32 V / 3 A (33 W max.) 13. CH3 (4mm safety sockets) Outputs channel 3; 0 V to 32 V / 3 A (33 W max.)
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R&S®HMP4040 Power Supply

Front panel of R&S® HMP 4040

<ol style="list-style-type: none"> 1. POWER (key): Power switch to switch the instrument on and off 2. Display (LCD): Parameter display 3. Arrow keys: Setting the parameters 4. Knob: for setting and confirming the nominal values 5. Numeric keypad (keys): Setting the nominal values 6. CH1 (key illuminated): Option key channel 1 7. CH2 (key illuminated): Option key channel 2 8. Enter (key): Key to confirm values via keypad 9. CURRENT (key illuminated): Regulating the current setting 10. CH3 (key illuminated): Option key channel 3 11. VOLTAGE (key illuminated): Regulating the output voltage 12. MENU (key illuminated): Accessing the menu options 13. FUSE (key illuminated): Electronic fuse adjustable for each channel 14. CH4 (key illuminated): Option key channel 4 15. TRACK (key illuminated): Activating the tracking function 	<ol style="list-style-type: none"> 16. REMOTE (key illuminated): Switching between keypad and external control 17. RECALL (key illuminated): Loading stored measuring instrument configurations 18. OUTPUT (key illuminated): Selected channels may be switched on or off 19. STORE (key illuminated): Storing measuring instrument configurations 20. Ground socket (4mm socket): Reference potential connection (connected to protective earth) 21. CH1 (4mm safety sockets): Outputs channel 1; 0...32 V / 10 A 22. SENSE (4mm safety sockets; 2 x per channel): Compensating the line resistances 23. CH2 (4mm safety sockets): Outputs channel 1; 0...32 V / 10 A 24. CH3 (4mm safety sockets): Outputs channel 3; 0...32 V / 10 A 25. CH4 (4mm safety sockets): Outputs channel 4; 0...32 V / 10 A
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R&S®HMC8012

Front panel of R&S® HMC 8012

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Display – Color display (320 x 240 pixel) 2. Interactive soft menu keys – All relevant functions are directly accessible 3. Function keys – To be used as numeric keypad in SHIFT function
 DC V – DC voltage measurement
 DC I – DC current measurement
 AC V – AC voltage measurement
 AC I – AC current measurement
 Ω – Resistance measurement, 2- and 4-wire
 \ast/\ast - diode / transmission measurement
 SENSOR – Temperature measurement
 HOLD – Measurement with hold function
 NULL – Zero point of the measurement section
 CAP – Capacity measurement
 MEAS – Limit measurement / mathematical functions / statistic
 TRIG – Manual trigger | <ol style="list-style-type: none"> 7. SHIFT – Shift key to activate the numeric keypad 8. Universal knob with arrow keys – Setting desired values (edit keys) 9. $V \Omega \ast/\ast$ connector – Input for voltage, frequency, resistance and temperature measurement 10. COM connector – Common measurement input for voltage, resistance, temperature and capacity measurement 11. A connector – Input for current measurement 12. LO/HI connectors – Sensor for resistance and temperature measurement 13. FUSE – Measuring circuit fuse 14. USB connector – USB connector to save parameters 15. POWER – On/Off for standby mode |
|--|---|

4. SAVE/RECALL – Loading/storing of instrument settings
5. SETUP – Access to basic instrument settings
6. HELP – Integrated help display



2 Exercise

Setting up the power supply

Equipment Needed:

- R&S®HMC8012

Instrument Settings:

1. Power on the R&S®HMC8012
2. Setup the power supply with the following voltage and current level:
Channel 1 : 5 V 500mA
Channel 2: 3 V 300mA
Channel: 3 2 V 300mA
3. Switch Channel 1 and Channel 3 output to ON only

Equipment Needed:

- R&S®HMP4040

Instrument Settings:

4. Power on the R&S®HMP4040
5. Setup the power supply with the following voltage and current level:
Channel 1 : 5 V 500mA
Channel 2: 3 V 300mA
Channel 3: 2 V 300mA
Channel 4: 0.5 V 100mA
6. Switch Channel 1 and Channel 3 output to ON only

Measuring the given voltage signal using a R&S®HMC8012 Digital Multimeter

Equipment Needed:

- R&S®HMC8012
- “Banana” plugs cables

Instrument Settings:

1. Measure the voltage output from all channels
2. Verify that only stated “ON” channel has voltage output.

Summary

This short exercise show how two instruments can be used to demo the functionary of both the instruments.

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