

# R&S®UPP系列 音频分析仪

## 多信道且经济高效，适用于 实验室和生产应用

生产用的音频分析仪要满足的重要要求：高速测量、多通道应用并行信号处理、连续工作中的高可靠性。如果除此之外您还需要一台经济实用的仪器，解决方案就是R&S®UPP系列音频分析仪；而且根据型号的不同，可并行处理两个、四个或八个通道。通过级联多台仪器，用户可同时触发多达48个测量通道。



UPP200二通道音频分析仪，含UPP-B2数字音频接口选件

R&S®UPV 系列音频分析仪-罗德与施瓦茨的高端仪器-数年来始终在音频测试与测量应用中占有一席之地。具有峰值造极的测量精度和动态范围，结合独特的测量功能，使得R&S®UPV系列音频分析仪很适用于研发及质量保证任务。

很多音频应用对动态范围和多功能性的要求并不是很高，在生产中往往强调高吞吐量，生产测试组件的成本也是一大考量。测试消费类音频设备时，还必须使用 HDMI®<sup>1</sup>等高端接口测量环绕声系统的多信道设备。R&S®UPP 音频分析仪系列能够派上用场。此类分析仪可以并行处理 2 个、4 个或 8 个信道，因不同型号而异。通过多台仪器级联，用户可以同时触发最多 48 个测量信道，有效缩短测量时间。

R&S®UPP 音频分析仪是专为系统应用而设计的紧凑且经济高效的解决方案。该分析仪外形低，且不带前面板控制元件或集成显示屏。该仪器可通过 LAN、USB 或 IEC/IEEE 接口总线远程控制。结合外部显示器、鼠标及键盘，该仪器成为一个可手动操作的实验室工作台测量仪。该仪器具有集成控制 PC，且所需软件已装，用户可以立即开始测量。

凭借相同的操作原理和远程控制功能，R&S®UPV 和 R&S®UPP 音频分析仪强强结合：能分别为研发和生产应用提供最优解决方案，并且能够在必须更换仪器设置或测量程序的情况下很好地协调。

<sup>1</sup> HDMI® is a registered trademark of HDMI Licensing, LLC.

### 主要特点

- 适合所有接口：模拟、数字和组合
- 最多可对八个通道进行并行测量
- 最高带宽80kHz，采样率200kHz
- 用户可编程滤波器，可用于音频分析仪和信号发生器
- 紧凑型仪器，高度较低，与PC集成



UPP400四通道音频分析仪，含UPP-B2数字音频接口选件



# R&S®UPP系列 音频分析仪

## 主要优点和特征

### 强大和快速

- ▮ 平行测量，吞吐量高
- ▮ 覆盖整个系统的高速测量
- ▮ 非常适合生产线使用
- ▮ 通过级联进行多通道测量

### 所有的测试信号和测量功能集于一体

- ▮ 生成广泛的模拟信号以及配置R&S®UPP-B2/UPP-B4/UPP-B8选件产生数字测试信号
- ▮ 在标配模拟接口和选配 R&S®UPP-B2/UPP-B4 数字接口上，均可实现范围广泛的测量
- ▮ 强大平滑的多通道FFT分析，分辨率低至1 Hz 以下
- ▮ 用户可编程滤波器：几秒钟内即可调整适应单个测量任务
- ▮ 集成控制 PC：只需外接显示器、鼠标、键盘即可手动操作

### 一台仪器集成多种接口

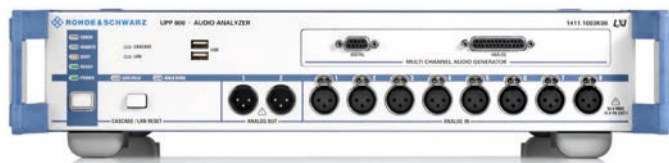
- ▮ 具有模拟输入的双通道、四通道或八通道音频分析仪
- ▮ 模拟发生器输出 (双通道)
- ▮ 用于测量数字音频组件的 AES/EBU 和 S/P DIF 接口 (需配 R&S®UPP-B2 选件)
- ▮ 用于测试音频集成电路的 I<sup>2</sup>S 接口 (需配R&S®UPP-B2 选件)
- ▮ HDMI 设备测试 (R&S®UPP-B4 选件)
- ▮ 发生器以及分析仪的接口可以彼此单独设置，也能够以任何组合形式结合使用

### 整体操作方便

- ▮ 先进、直观的用户界面，易学，使操作更快捷
- ▮ 所有测试结果一览无余
- ▮ 有效的在线帮助功能



UPP800 八通道音频分析仪，含UPP-B4数字音频接口选件



UPP800 八通道音频分析仪，含UPP-B8八通道发生器选件

## 级联多个R&S®UPP800音频分析仪



如果需要并行测量的通道超过八个，可以级联多个R&S®UPP音频分析仪。主设备为R&S®UPP800音频分析仪，它控制着其他音频分析仪，这样整个级联就可当作一台测试仪器使用

# 支持未来应用的选项

- R&S®UPP-B2选项提供符合AES/EBU、S/P DIF、I<sup>2</sup>S接口的数字音频接口
- R&S®UPP-K21 数字音频协议
- R&S®UPP-B4 HDMI 和数字音频接口
- R&S®UPP-K41 Dolby® 杜比解码
- R&S®UPP-K45 扩展音视频测量
- R&S®UPP-K601 1/n 倍频程分析
- R&S®UPP-K800 级联软件，用于将多个 R&S®UPP800 音频分析仪组合起来，支持八个以上通道进行并行测量
- XLR/BNC 适配器套件
- 针对模拟和数字接口的连接电缆
- R&S®UPZ 音频切换器：用于切换输入和输出通道

R&S®UP-Z2 AES/EBU cable.



R&S®UP-Z1MF XLR/BNC adapter set.



## R&S®UPP-B2 option providing digital audio interfaces in line with AES/EBU and S/PDIF as well as I<sup>2</sup>S interfaces

This option provides the digital audio interfaces (balanced, unbalanced and optical) for measurements on digital audio devices as well as I<sup>2</sup>S interfaces for measurements on integrated circuits. The interfaces are available for the generator and analyzer; sampling rates up to 200 kHz can be processed. The option and its software expansion (R&S®UPP-K21 digital audio protocol) is described in greater detail on pages 10 and 11.

## R&S®UPP-B4 HDMI and digital audio interfaces

This option includes generator and analyzer functions for measuring HDMI devices. Video test patterns can be generated directly in the R&S®UPP. In addition, the option features digital audio interfaces in consumer format (S/PDIF) and operates up to eight channels in I<sup>2</sup>S format. The option is described in detail on pages 12 and 13.

## R&S®UPP-K41 (Dolby® datastream decoding) and R&S®UPP-K45 (expanded audio/video measurements)

These options complement the measurement of HDMI devices (R&S®UPP-B4 option). For details, see page 14.

## R&S®UPP-B8 eight-channel generator

This option generates up to eight test signals that can consist of multiple signal components and differ from channel to channel. Analog and digital generator signals (S/P DIF format) are available at two D-Sub female connectors. Optional cables (see next page) can be used as XLR/BNC adapters.

This option can also be used to generate background noise in line with ETSI ES 202 396-1 for mobile phone measurements.

## R&S®UPP-K601 1/n octave analysis

The third-octave and 1/n octave analyses are important measurements in the field of acoustics. The levels are determined simultaneously in up to 32 third-octave bands and 128 single-tone bands.

R&S®UP-Z3 I²S cable.



R&S®UP-Z4 I²S cable.



R&S®UP-Z8A and R&S®UP-Z8D cable.



The R&S®UPZ audio switcher can be controlled from the R&S®UPP.



## R&S®UPP-K800 cascading software

The R&S®UPP-K800 control software turns an R&S®UPP800 audio analyzer into a cascade master. Up to five additional R&S®UPP can be combined with this instrument as slaves for parallel measurement of up to 48 channels. The application is described on page 5.

## XLR/BNC adapter sets

The XLR/BNC adapter sets make the use of unbalanced cables easier.

The R&S®UP-Z1MF set contains two XLR male to BNC and two XLR female to BNC adapters; in the R&S®UP-Z1M adapter set, there are four XLR male to BNC adapters.

## Connecting cables

The balanced ports for the digital audio interfaces of the R&S®UPP-B2 option as well as the ports for the I²S interfaces and the R&S®UPP-B8 option are designed as D-Sub male connectors. The following cables make connection to the DUTs easier:

- The R&S®UP-Z2 AES/EBU cable feeds generator and analyzer signals from a 9-pin D-Sub port to an XLR male and an XLR female connector, respectively
- The R&S®UP-Z3 I²S cable for R&S®UPP-B2 feeds the RX Data, RX BitClk, RX FSync, TX Data, TX BitClk, TX FSync and TX MasterClk lines from the 25-pin D-Sub port to one BNC male connector each
- The R&S®UP-Z4 eight-channel I²S cable complements the R&S®UPP-B4 option: Like the R&S®UP-Z3 cable, the R&S®UP-Z4 feeds all signal lines from the 26-pin D-Sub HD port to 13 BNC male connectors
- The following two accessories are available for the R&S®UPP-B8 option:
  - The R&S®UP-Z8A cable feeds the eight analog signal lines from the 25-pin D-Sub port to eight XLR male connectors
  - The eight digital signals are transmitted to four two-channel S/P DIF cables. The R&S®UP-Z8D cable feeds these lines from the 9-pin D-Sub port to BNC male connectors

## R&S®UPZ audio switcher for switching input and output channels

The R&S®UPZ audio switcher can be used for cabling and switching DUTs/channels. It can be connected to the R&S®UPP audio analyzer via USB and is controlled directly from the analyzer's panel. The audio switcher makes it possible, for example, to apply test signals to a large number of DUTs in parallel.

Further information is provided in the R&S®UPZ audio switcher product brochure, PD 0758.1170.12.

# 主要规格

模拟音频分析仪		
输入		XLR female, balanced (unbalanced measurements possible with XLR/BNC adapter), AC/DC coupling selectable
频率范围	bandwidth 22 kHz/40 kHz/80 kHz	DC/20 Hz to 21.76 kHz/40 kHz/80 kHz
电压范围	RMS, sine	1 $\mu$ V to 50 V
输入阻抗	each pin to ground	100 k $\Omega$ $\pm$ 1%    220 pF
	between pins 2 and 3	200 k $\Omega$ $\pm$ 1%/600 $\Omega$ $\pm$ 1% selectable <sup>1)</sup>
串扰衰减	< 20 kHz	> 100 dB
测量功能		RMS wideband, RMS selective, peak, S/N, DC, FFT, THD, THD+N, SINAD, Mod Dist, DFD, polarity, waveform, frequency, phase, group delay
模拟信号发生器		
输出		XLR male, balanced/unbalanced selectable, short-circuit-proof
源阻抗		25 $\Omega$ /600 $\Omega$ selectable
电压范围	balanced, RMS, sine, open circuit	0.2 mV to 14 V
	unbalanced, RMS, sine, open circuit	0.1 mV to 7 V
频率范围		0.1 Hz to 80 kHz
输出信号		sine, stereo sine, multisine, sine burst, Mod Dist, DFD, noise, arbitrary waveform, polarity, DC, play WAV files
数字音频分析仪/信号发生器 (需配R&S®UPP-B2选件) 数字		
音频接口		
连接器	balanced	9-pin D-Sub male, transformer coupling, 110 $\Omega$
	unbalanced	BNC, grounded, 75 $\Omega$
	optical	TOSLINK
通道		1, 2 or both
音频位数		8 to 24
时钟率		30 kHz to 200 kHz
格式		professional format (AES3 ) and consumer format (IEC 60958)
输出信号/测量功能		same as analog device
	需配R&S®UPP-K21选件	digital audio protocol
I <sup>2</sup> S接口		
连接器		25-pin D-Sub male
通道		1, 2 or both
字长		16 bit/24 bit/32 bit per channel
音频位数		8 to 32
时钟率		6.75 kHz to 200 kHz
输出信号/测量功能		与模拟设备相同
HDMI和数字音频接口(需配R&S®UPP-B4选件)		
数字音频接口		
连接器		BNC 和TOSLINK
通道, 音频位数, 时钟率, 格式		与R&S®UPP-B2相同
输出信号/测量功能		与模拟设备相同, 加数字音频协议

<b>I²S接口</b>		
连接器		26-pin D-Sub HD female
通道数		1 to 8
Word length, audio bits, clock rate		same as R&S®UPP-B2
Output signals/measurement functions		same as analog device, plus 8-channel generator signals
<b>HDMI接口</b>		
Connectors		HDMI type A
Channels		1 to 8
Word length		16 bit/20 bit/24 bit per channel
Number of audio bits		16 to 24
Clock rate		32 kHz to 192 kHz, ± 4%
Output signals		same as analog device plus 8-channel generator signals, playback of Dolby®-coded data streams
Measurement functions		same as analog device
	with R&S®UPP-K41 option	Dolby® datastream decoding
	with R&S®UPP-K45 option	measurement of BERT, lip sync (time offset between video and audio signal), Hsync frequency, Vsync frequency, pixel clock
<b>8通道发生器 (需配R&amp;S®UPP-B8选项)</b>		
模拟输出		25-pin D-Sub female
电压范围	unbalanced, RMS, sinewave, open circuit	0.1 mV to 7 V
频率范围		0.1 Hz to 80 kHz
数字输出		9-pin D-Sub female
数据格式		consumer format in line with IEC 60958
时钟率		30 kHz to 200 kHz
<b>FFT分析</b>		
频率范围	digital	DC to 50% of sampling rate
	analog, bandwidth 22 kHz/40 kHz/80 kHz	DC to 22.5 kHz/43.5 kHz/87 kHz
FFT长度		512, 1k, 2k, 4k, 8k, 16k, 32k, 64k, 128k, 256k points
窗口函数		rectangle, Hann, Blackman-Harris, Rife-Vincent 1 to 3, Hamming, flat-top
<b>滤波</b>		
加权滤波器	A weighting, C weighting, CCIR 1k weighted, CCIR 2k weighted, CCIR unweighted, CCITT, C message, DC noise highpass, deemphasis J.17, 50/15, 50, 75, preemphasis 50/15, 50, 75, IEC tuner, jitter weighted, rumble weighted, rumble unweighted,	
高通和低通滤波器		highpass 22 Hz, 400 Hz, lowpass 22 kHz, 30 kHz, 80 kHz, AES 17
用户定义滤波器	design parameters	8th order elliptical type C (for highpass and lowpass filters also 4th order selectable), stop-band attenuation selectable up to approx. 120 dB
	filter types	highpass, lowpass, bandpass, bandstop, notch, third octave and octave
	file-defined filters	any 8th order filter cascaded from 4 biquads, defined in the z plane by poles/zeros or coefficients
<b>通用指标</b>		
供电电源	AC电源范围	110 V ~ 240 V ± 10%
	AC频率范围 power	50 Hz ~ 60 Hz
	功耗	80VA
尺寸	W × H × D	465 mm × 96 mm × 460 mm
重量	含选件	6.7 kg

# 订货信息

产品描述	型号	订货号
<b>主机单元</b>		
二通道音频分析仪	R&S®UPP200	1411.1003.02
四通道音频分析仪	R&S®UPP400	1411.1003.04
八通道音频分析仪	R&S®UPP800	1411.1003.08
<b>主机标配附件</b>		
电源线		
快速操作指南		
CD盘, 内含操作手册和维护手册		
<b>硬件选件</b>		
数字音频 I/O接口	R&S®UPP-B2	1411.2300.02
HDMI和数字音频接口	R&S®UPP-B4	1411.2500.02
八通道模拟/数字信号发生器	R&S®UPP-B8	1411.2700.02
<b>软件选件</b>		
用于R&S®UPP-B2的数字音频协议	R&S®UPP-K21	1411.0807.02
用于R&S®UPP-B4的Dolby数据流解码	R&S®UPP-K41	1411.0813.02
用于R&S®UPP-B4的增强音频/视频测量	R&S®UPP-K45	1411.0859.02
1/n倍频程分析	R&S®UPP-K601	1411.0765.02
用于R&S®UPP800的级联功能软件	R&S®UPP-K800	1411.0759.02
重叠FFT分析	R&S®UPP-K602	1411.2180.02
<b>系统组件</b>		
XLR/BNC适配器套件, 公头	R&S®UP-Z1M	1411.3358.02
XLR/BNC适配器套件, 公头/母头	R&S®UP-Z1MF	1411.3306.02
用于R&S®UPP-B2的AES/EBU排线	R&S®UP-Z2	1411.3406.02
用于R&S®UPP-B2/UPV-B41的I²S排线	R&S®UP-Z3	1411.3458.02
8通道I²S排线, 用于R&S®UPP-B4	R&S®UP-Z4	1411.3258.02
8通道模拟排线, 用于R&S®UPP-B8	R&S®UP-Z8A	1411.3206.02
8通道数字排线, 用于R&S®UPP-B8	R&S®UP-Z8D	1411.3158.02
19"机架	R&S®ZZA-211	1096.3260.00
音频切换器 (输入)	R&S®UPZ	1120.8004.12
音频切换器 (输出)	R&S®UPZ	1120.8004.13



北京海洋兴业科技股份有限公司 (证券代码: 839145)

北京市西三旗东黄平路19号龙旗广场4号楼 (E座) 906室

电话: 010-62176775 62178811 62176785

企业QQ: 800057747 维修QQ: 508005118

企业官网: [www.hyxyyq.com](http://www.hyxyyq.com)

邮编: 100096

传真: 010-62176619

邮箱: [market@oitek.com.cn](mailto:market@oitek.com.cn)

购线网: [www.gooxian.com](http://www.gooxian.com)



扫描二维码关注我们

查找微信公众号: 海洋仪器