

U 909 单轴噪声振动分析仪

产品规格书

U 909 Uniaxial Noise and Vibration Analyzer

Product Specification

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产品简介

U 909 单轴噪声振动分析仪



U 909是一款专门为了声学振动测试设计的功能模块。该模块能够实时的将振动信号转换为可监听的音频或振动信号，并实时通过RS232接口输出精确的加速度值、位移值以及分贝值。其核心设计理念是为工业设备状态监测、故障预警及现场监听提供一种直观、高效的解决方案，特别适用于那些需要同时依赖数据量化分析和声学主观判断的复杂应用场景。

功能特点

- 多信号同步输出：实现了振动数据与音频信号的并行实时输出，同时满足定量分析与定性监听的需求
- 工业级通信接口：采用广泛应用的RS-232协议
- 灵活的配置与校准：提供软件配置接口（串口指令），允许用户根据实际使用的传感器特性灵活设置灵敏度、量程范围，增强模块的适用性和便利性

应用场景

- 汽车NVH监测
- 工业自动化旋转机械监测
- 气体泄漏监测
- 轨道噪声监测
- 通用型振动测试

规格参数

整体参数	
通道数量	1路单通道
输入接口	BNC
输出接口	数据输出接口：DB9；音频输出接口：3.5mm
3.5mm接口音频输出模式	左右声道输出
3.5mm接口支持耳机阻抗	16Ω ~ 32Ω标准耳机
3.5mm接口输出增益	0dB、10dB、20dB
支持的加速度计	支持IEPE的压阻式或MEMS加速度传感器
IEPE供电电流	4mA
产品尺寸(mm)	140*96*33
净重量 (kg)	0.35
包装尺寸 (mm)	250*165*65
包装重量 (kg)	0.52
工作温度	-20°C ~ 50°C
工作电压	DC 5V(Type-C)
典型功耗	1W
满载功耗	3W
通讯方式	串口通讯

3.5mm监听通道特性参数

3.5mm监听通道特性参数	
采样率	48kHz
分辨率	24-bit
输入输出增益转换比例	0dB增益：输入信号100mV，输出信号约50mV； 10dB增益：输入信号100mV，输出信号约300mV； 20dB增益：输入信号50mV，输出信号约800mV

3.5mm监听通道音频单点指标

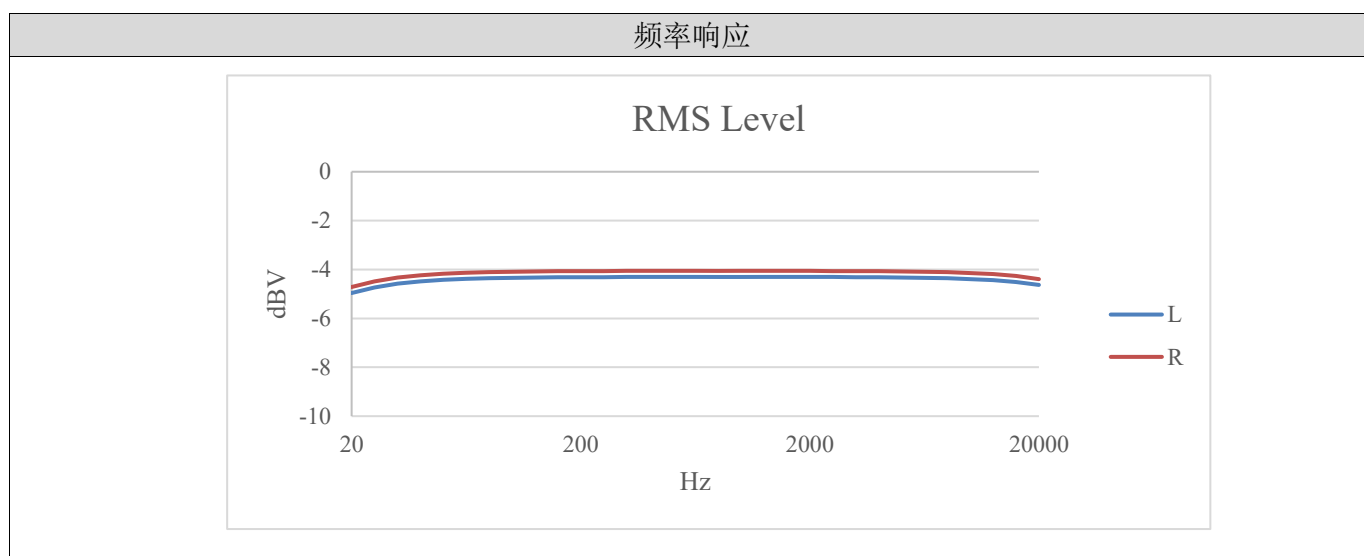
空闲通道噪声(uVrms)	
采样率	fs=48kS/s
典型值	≤ 110
最大值	115
测试条件： [1] 输出源：APx525-AO模块（UNBAL），采集端：APx525-AI模块（UNBAL） [2] U 909增益设置：Gain=0（0dB） [3] 输出源信号输出：0mV 1kHz，采集端滤波设置：无计权，无EQ，10Hz高通滤波器	

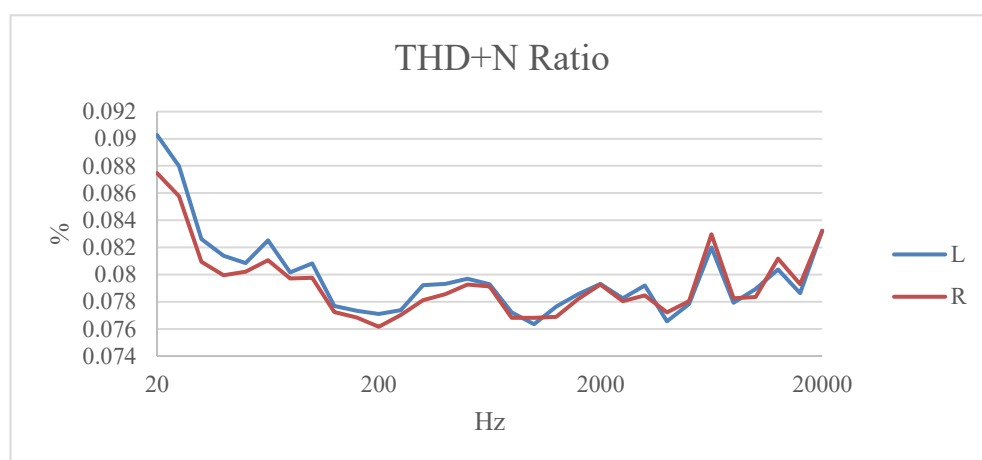
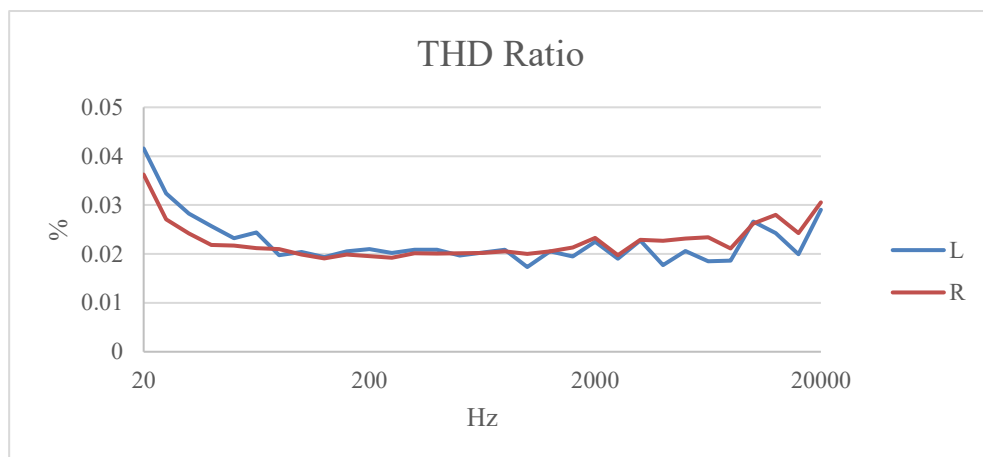
总谐波失真 THD (dB)	
采样率	fs=48kS/s
典型值	≤ -73
最大值	-72
测试条件： [1] 输出源：APx525-AO模块（UNBAL），采集端：APx525-AI模块（UNBAL） [2] U 909增益设置：Gain=2（10dB） [3] 输出源信号输出：200mV 1kHz，采集端滤波设置：无加权，无EQ，10Hz高通滤波器	

总谐波失真加噪声 THD+N (dB)	
采样率	fs=48kS/s
典型值	≤ -63
最大值	-62
测试条件： [1] 输出源：APx525-AO模块（UNBAL），采集端：APx525-AI模块（UNBAL） [2] U 909增益设置：Gain=2（10dB） [3] 输出源信号输出：200mV 1kHz，采集端滤波设置：无加权，无EQ，10Hz高通滤波器	

信噪比 SNR (dB)	
采样率	fs=48kS/s
典型值	≥67
最小值	66
测试条件： [1] 输出源：APx525-AO模块（UNBAL），采集端：APx525-AI模块（UNBAL） [2] U 909增益设置：Gain=2（10dB） [3] 输出源信号输出：300mV 1kHz，采集端滤波设置：无加权，无EQ，10Hz高通滤波器	

3.5mm监听通道音频扫频指标





测试条件:

[1] 输出源: APx525-AO模块 (UNBAL), 采集端: APx525-AI模块 (UNBAL)

[2] U 909增益设置: Gain=2 (10dB)

[3] 输出源信号输出: 200mV 20~20kHz, 采集端滤波设置: 无计权, 无EQ, 10Hz高通滤波器

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Product introduction



Uniaxial Noise and Vibration Analyzer

U 909 is a functional module specifically designed for acoustic and vibration testing. This module can convert vibration signals into audible audio or vibration signals in real time, and simultaneously output precise acceleration values, displacement values, and decibel levels through an RS232 interface in real time. Its core design philosophy is to provide an intuitive and efficient solution for industrial equipment condition monitoring, fault early warning, and on-site monitoring, particularly suited for complex application scenarios that require both quantitative data analysis and acoustic subjective judgment.

Features

- Multi-signal synchronous output: Enables real-time parallel output of vibration data and audio signals, meeting the needs of both quantitative analysis and qualitative monitoring
- Industrial-grade communication interface: Utilizes the widely adopted RS-232 protocol
- Flexible configuration and calibration: Provides a software configuration interface (serial port commands), allowing users to adjust sensitivity and measurement range based on actual sensor characteristics, enhancing module adaptability and usability

Applications

- Automotive NVH monitoring
- Industrial automation rotating machinery monitoring
- Gas leak monitoring
- Railway noise monitoring
- General vibration testing

Specifications parameters

Parameters	
Number of channels	Single channel
Input interface	BNC
Output interfaces	Data output interface: DB9; Audio output interface: 3.5mm
3.5mm interface audio output mode	Left and right channel output
3.5mm interface supported headphone impedance	16Ω ~ 32Ω standard headphones
3.5mm interface output gain	0dB、10dB、20dB
Support accelerometers	IEPE-compatible piezoresistive or MEMS acceleration sensors
IEPE supply current	4mA
Product dimensions (mm)	140*96*33
Net weight (kg)	0.35
Packaging dimensions (mm)	250*165*65
Packaging weight (kg)	0.52
Operating temperature	-20°C~50°C
Operating voltage	DC 5V(Type-C)
Typical power consumption	1W
Full-load power consumption	3W
Communication method	Serial communication

3.5mm monitoring channel characteristic parameters

3.5mm monitoring channel characteristic parameters	
Sampling rate	48kHz
Resolution	24 - bit
Input/output gain conversion ratios	0dB gain: input signal 100mV, output signal ≈ 50mV; 10dB gain : input signal 100mV, output signal ≈ 300mV; 20dB gain: input signal 50mV, output signal ≈ 800mV

3.5mm monitoring channel audio single-point metrics

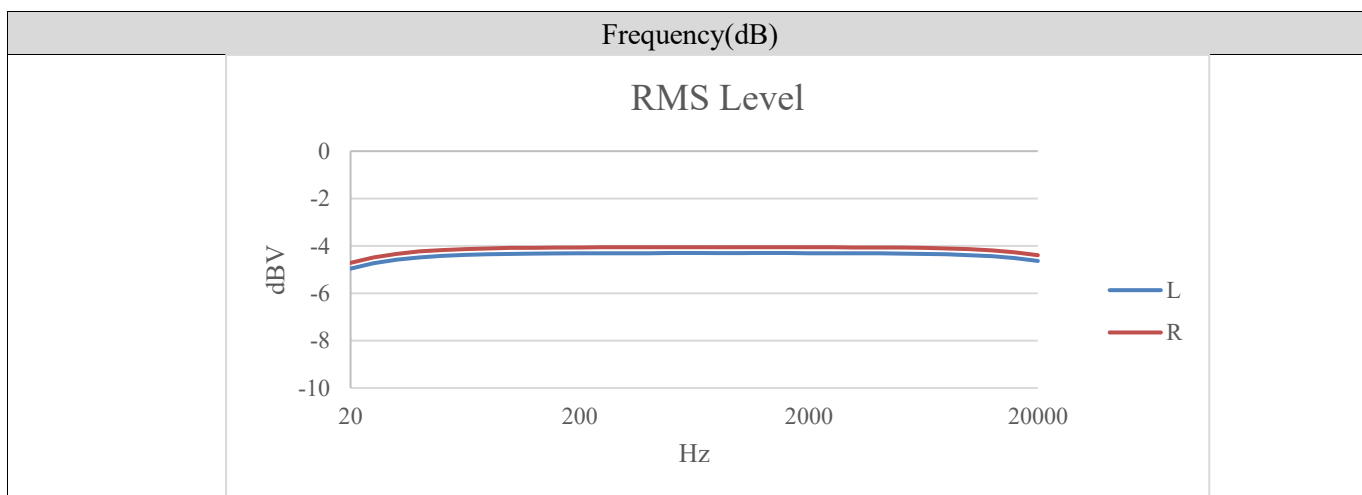
Idle Channel Noise (μ Vrms)	
Sampling rate	fs=48kS/s
Typical value	≤ 110
Maximum value	115
Test conditions: [1] Output source: APx525-AO module (UNBAL), acquisition terminal: APx525-AI module (UNBAL) [2] U 909 gain setting: Gain=0 (0dB) [3] Output source signal: 0 mV, 1 kHz, acquisition terminal filter settings: no weighting, no EQ, 10 Hz high-pass filter	

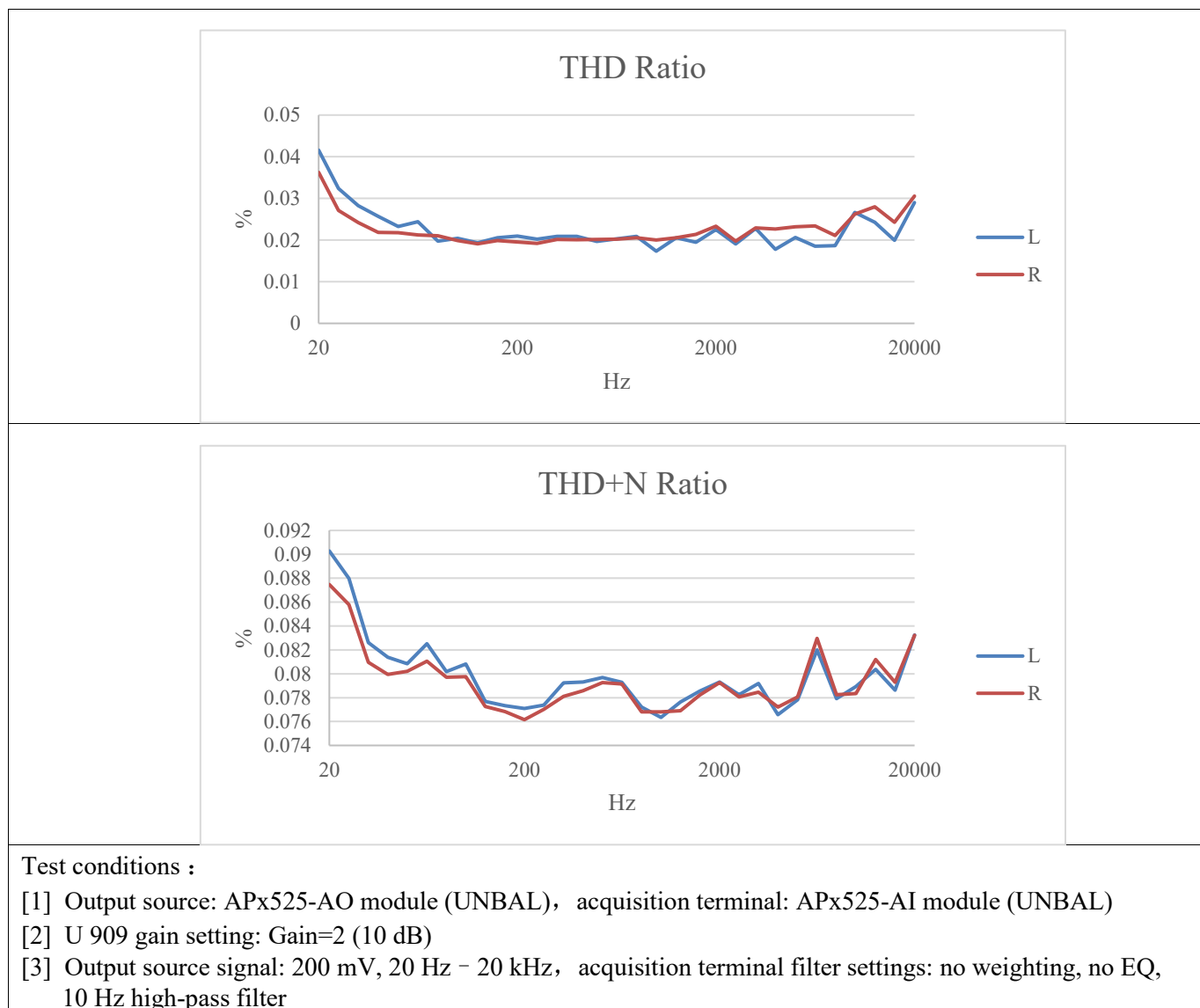
THD (dB)	
Sampling rate	fs=48kS/s
Typical value	≤ -73
Maximum value	-72
Test conditions : [1] Output source: APx525-AO module (UNBAL), acquisition terminal: APx525-AI module (UNBAL) [2] U 909 gain setting: Gain=2 (10 dB) [3] Output source signal: 200 mV, 1 kHz, acquisition terminal filter settings: no weighting, no EQ, 10 Hz high-pass filter	

THD+N (dB)	
Sampling rate	fs=48kS/s
Typical value	≤ -63
Maximum value	-62
Test conditions : [1] Output source : APx525-AO module (UNBAL), acquisition terminal : APx525-AI module (UNBAL) [2] U 909 gain setting : Gain=2 (10dB) [3] Output source signal : 200mV 1kHz, acquisition terminal filter settings : no weighting, no EQ, 10 Hz high-pass filter	

Signal Noise Ratio (dB)	
Sampling rate	fs=48kS/s
Typical value	≥ 67
Minimum value	66
Test conditions : [1] Output source : APx525-AO module (UNBAL), acquisition terminal : APx525-AI module (UNBAL) [2] U 909 gain setting : Gain=2 (10dB) [3] Output source signal : 300mV 1kHz, acquisition terminal filter settings : no weighting , no EQ, 10 Hz high-pass filter	

3.5mm monitor channel frequency response specifications





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美格信U909指令集

MegaSig U909 CMD

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串口通讯参数

Baud Rate: 115200
 Data Bits: 8
 Parity: None
 Stop Bits: 1.0
 Flow Control: None
 Termination Char: \n

串口指令

名称	发送	反馈	备注
校准机子与传感器整体灵敏度	>Adjustment	Calibration@@ok CalibrationFinished@@97.54mV/g or CalibrationFinished@@54.32 mV/Pa	接入传感器后使用标准源校准
输入配置传感器灵敏度	>Sensitivity_set=98.04	SensitivitySet@@ok SensitivitySetFinished@@98.04 mV/g or SensitivitySetFinished@@98.04mV/Pa	注意格式 XXX.XX
开始数据传输	>Start	Start@@ok Data@@RMS: 0.099932 m/s2, VP: 0.141543 m/s2, VAL: 84.32f dB or Data@@RMS: 0.099932 V, VP: 0.141543V, SPL: 73.45dB	根据 time 设置间隔返回数据
停止数据传输	>Stop	Stop@@ok	
设置测量时间长短	>Time=1	Sampling@@ok	可输入 0~9 秒间隔
设置波特率	>BAUD_RATE_SET=1	BaudSet@@ok	可调 9600, 115200, 460800, 921600 波特率
设置监听音量大小	>Gain=1	Gain@@ok	可调 0~9 增益
获取状态	>Status_Get	StatusGet@@Baud(1) Sample(1) Sensitivity(54.32) Gain(2) Mode(SPL)	上位机用
连接确认	>Is_Connect	Connect@@ok	上位机用
设置为 SPL 模式	>Change_Mode_SPL	SPLMode@@ok	
设置为 VAL 模式	>Change_Mode_VAL	ValMode@@ok	

Serial Communication Parameters

Baud Rate: 115200
 Data Bits: 8
 Parity: None
 Stop Bits: 1.0
 Flow Control: None
 Termination Char: \n

Serial Port Commands

Name	Send	Feedback	Note
Calibration of device and overall sensitivity of sensors	>Adjustment	Calibration@@ok CalibrationFinished@@97.54mV/g or CalibrationFinished@@54.32 mV/Pa	Calibrate with a standard source after connecting the sensor
Input configuration for sensor sensitivity	>Sensitivity_set=98.04	SensitivitySet@@ok SensitivitySetFinished@@98.04 mV/g or SensitivitySetFinished@@98.04mV/Pa	Note the format: XXX.XX
Start data transmission	>Start	Start@@ok Data@@RMS: 0.099932 m/s ² , VP: 0.141543 m/s ² , VAL: 84.32f dB or Data@@RMS: 0.099932 V, VP: 0.141543V, SPL: 73.45dB	Return data at intervals set according to time
Stop data transmission	>Stop	Stop@@ok	
Set measurement duration	>Time=1	Sampling@@ok	Interval input range: 0 to 9 seconds
Set baud rate	>BAUD_RATE_SET=1	BaudSet@@ok	Adjustable baud rates: 9600, 115200, 460800, 921600
Set listening volume level	>Gain=1	Gain@@ok	Adjustable gain range:0~9
Get status	>Status_Get	StatusGet@@Baud(1) Sample(1) Sensitivity(54.32) Gain(2) Mode(SPL)	For computer
Connection confirmation	>Is_Connect	Connect@@ok	For computer
Set to SPL mode	>Change_Mode SPL	SPLMode@@ok	
Set to VAL mode	>Change_Mode VAL	ValMode@@ok	