



SKC

PRODUCT MANUAL



SKC Acoustics Technology Co., Ltd.
www.skcaudio.com

Universal Connection
Efficient Sense



Company Profile

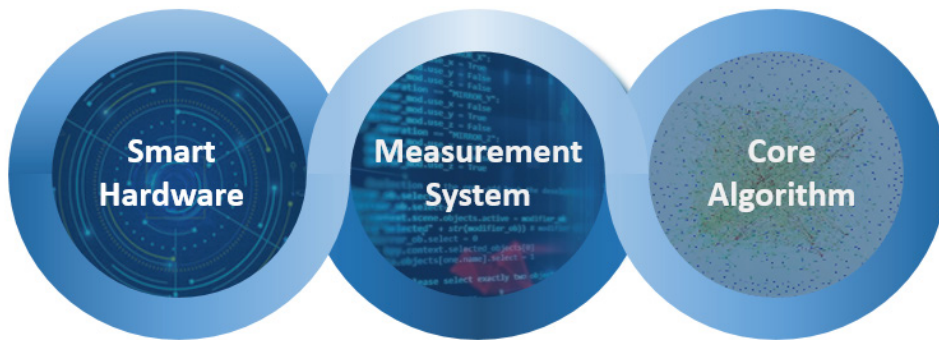
SKC Acoustic Technology Co., Ltd. is a high-tech enterprise dedicated to the independent research and development of digital intelligent sensors and intelligent terminals."Sincere, Knowledgeable, Creative" is SKC's tenet of providing services to customers.

We focus on public safety, smart city, military industry and other fields, involving rail transit, power energy, aerospace, environmental noise, bridge engineering and other industries, integrating software and hardware research and development, production, sales, construction, service in one of the comprehensive overall solution providers, committed to providing users with diversified solutions and one-stop quality services.

Adhering to the concept of customer needs driving products, the company provides customers with professional pre-sales consulting services, develops professional measurement systems for specific environmental requirements according to customer needs, or provides research and development and customized services for special acoustic vibration products.

The R & D team of SKC has profound professional background and experience in acoustic technology, electronic engineering, and software development, and has close cooperative relationship with many professional research institutions and laboratories, so as to provide customers with comprehensive, sincere, intelligent and creative technical services.

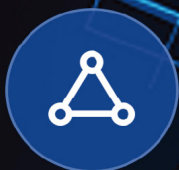
The company has passed ISO9001 quality management system certification.





CONTENT

Transducer.....	1
Microphone.....	2
Microphone Cartridge	3
Preamplifier.....	4
Microphone Set	5
Special Microphone.....	7
TEDS Microphone	7
Intrinsically Safe Microphone	7
Surface Microphone	8
Outdoor Microphone.....	8
USB Microphone.....	9
Phantom Power Microphone	10
Microphone Calibration	11
Acoustic Calibrator	11
Electrostatic Actuator Amplifier.....	11
Power Amplifier	11
Optical Fiber Acoustic Sensor	12
Hydrophone	12
Accelerometer.....	13
Strain Gauge.....	17
Accessory	19
Signal Conditioning.....	22
Signal Conditioner.....	23
Data Acquisition Analyzer.....	24
Strain Conditioner	26
Wireless Data Acquisition Analyzer.....	27
Measurement System	28
Acoustic Material Test System.....	29
Sound and Vibration Test System	30
Wireless Sound and Vibration Test System	31
Sound Power System	32
Sound Intensity System	32
Acoustic Array System	33
Solutions	34
Outdoor Noise Monitoring	35
Boundary Noise Monitoring.....	36
Active Noise Control	37
Structure Condition Monitoring	38
Vibration Attenuation Analysis.....	39



Transducer

02 Microphone

12 Optical Fiber Acoustic Sensor

12 Hydrophone

13 Accelerometer

17 Strain Gauge

19 Accessory

Microphone

Use Scenarios

- Acoustic Testing and Analysis
- Loudspeaker and Audio System Testing
- Environmental Noise Monitoring
- Automotive and Aerospace Testing
- Product Quality Control
- Vibration and Structural Analysis
- Occupational Noise Monitoring
- Calibration and Testing of Audio Equipment
- Speech and Voice Analysis
- Building Acoustics



Selection Guide

STEP1 Determine whether it needs an external polarization microphone or a pre-polarization one

STEP2 Judge whether the application scenario is free field ,pressure field or diffuse field

STEP3 Determine the dynamic range of the acoustic signal to be measured

STEP4 Determines the frequency range of the acoustic signal to be measured

SKC Microphone

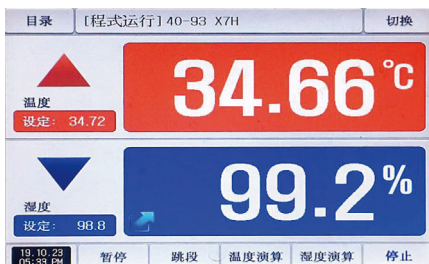
As the foundation of SKC Acoustics ,microphone have been produced and sold for over 14 years. Product performance and production technology level are in the leading position.



Frosting During Low Temperature Aging

Microphone Aging

All microphone series have been subjected to harsh environmental aging, including long term high and low temperature aging test and high humidity aging.

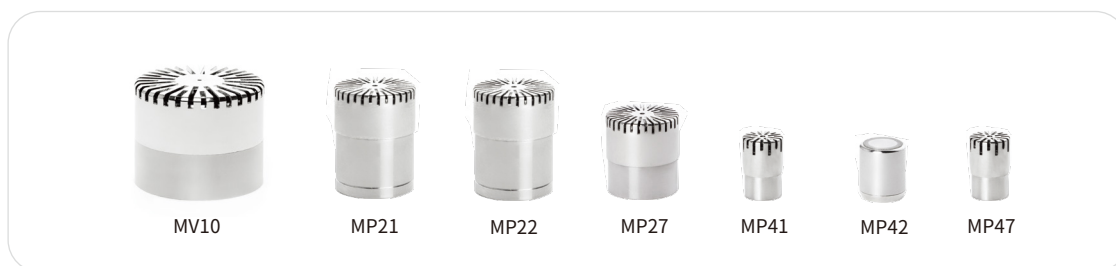


Temperature and Humidity Cycling Aging

Microphone Advantages

Good stability, high sensitivity and wide dynamic range.
Flat frequency response in wide frequency range.
Low distortion, low internal noise.
Various microphone series suitable for different test occasions

Microphone Cartridge



Free Field Microphone (Prepolarized)							
Type	Size	Sensitivity (mV/Pa)	Frequency Range (Hz)	Dynamic Range (dB)	Polarization Voltage (V)	Height (mm)	Design Standard (IEC 61094)
MP20	1/2"	12	6.3~40k	25~155	0	12.3	WS2F
MP21	1/2"	50	6.3~20k	17~146	0	17.6	WS2F
MP22	1/2"	40	10~16k	17~148	0	17.6	WS2F II
MP41	1/4"	4	10~40k	34~164	0	10.5	WS3F
MP41A	1/4"	4	10~70k	34~164	0	10.5	WS3F
MP41B	1/4"	2	10~100k	34~170	0	10.5	WS3F
MP42	7mm	8	20~16k	36~142	0	8	Type II

Free Field Microphone (Externally Polarized)							
Type	Size	Sensitivity (mV/Pa)	Frequency Range (Hz)	Dynamic Range (dB)	Polarization Voltage (V)	Height (mm)	Design Standard (IEC 61094)
MV10	1"	50	3.15~16k	10~147	200	19	WS1F
MV20	1/2"	12	5~40k	20~162	200	12.3	WS2F
MV21	1/2"	40	6.3~20k	16~150	200	17.6	WS2F
MV41	1/4"	4	4~40k	34~164	200	10.5	WS3F
MV41A	1/4"	4	4~70k	34~164	200	10.5	WS3F
MV41B	1/4"	2	4~100k	34~170	200	10.5	WS3F

Pressure Field Microphone (Externally Polarized)							
Type	Size	Sensitivity (mV/Pa)	Frequency Range (Hz)	Dynamic Range (dB)	Polarization Voltage (V)	Height (mm)	Design Standard (IEC 61094)
MV17	1"	50	3.15~8k	11~146	200	19	WS1P
MV27	1/2"	12	5~20k	25~155	200	12.3	WS2P
MV28	1/2"	40	6.3~10k	17~149	200	17.6	WS2P
MV47	1/4"	4	4~20k	35~170	200	10.5	WS3P
MV47A	1/4"	1.6	4~70k	35~172	200	10.5	WS3P

Pressure Field Microphone (Prepolarized)							
Type	Size	Sensitivity (mV/Pa)	Frequency Range (Hz)	Dynamic Range (dB)	Polarization Voltage (V)	Height (mm)	Design Standard (IEC 61094)
MP27	1/2"	12	5~20k	25~155	0	12.3	WS2P
MP28	1/2"	50	6.3~10k	16~146	0	17.6	WS2P
MP47	1/4"	4	10~20k	35~162	0	10.5	WS3P
MP47A	1/4"	3	10~40k	35~170	0	10.5	WS3P
MP47B	1/4"	1.6	10~70k	45~174	0	10.5	WS3P

Preamplifier

Preamplifier connects with the microphone cartridge through IEC 61094 standard thread. It has the performance of low noise and high input impedance. Its flat frequency response ensures high precision acoustic measurement.

For prepolarized microphone cartridges (MPxx series), SKC provides two kinds of preamplifiers, typical IEPE type and DC voltage type. When users don't have IEPE signal conditioner, the DC type can be easily powered by batteries or DC power supply.

For externally polarized microphone cartridges (MVxx series), LEMO traditional powered type NV21 should be used.



NP21 (1/2 inch IEPE)



NP22 (1/2 inch IEPE)



NP41 (1/4 inch IEPE)



NV21 (1/2 inch LEMO)



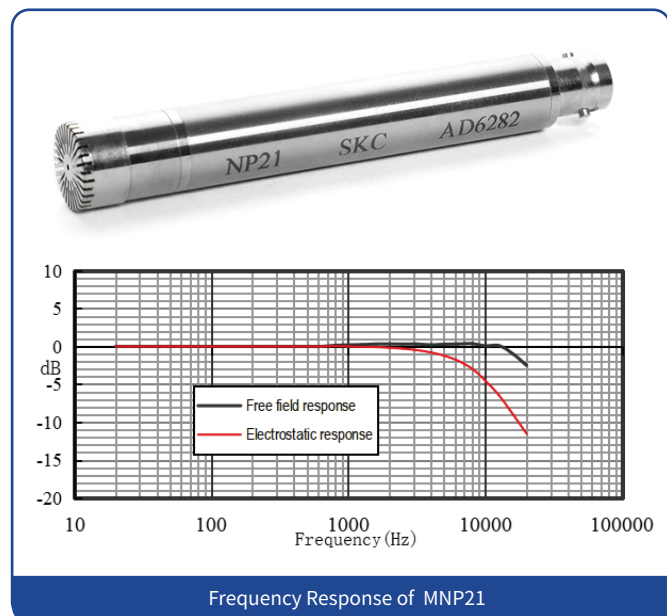
NS20 (1/2 inch DC type)

The Preamplifier of The Microphone					
Type	NP21	NP22	NP41	NV21	NS20
Diameter	1/2 inch	1/2 inch	1/4 inch	1/2 inch	1/2 inch
Frequency Range (Reference: 250Hz,0.5dB)	5Hz~100kHz	5Hz~100kHz	5Hz~100kHz	5Hz~100kHz	10Hz~100kHz
Attenuation(10Hz-100kHz)	<0.5dB	<0.5dB	<0.5dB	<0.5dB	<0.5dB
Input Impedance	>5GΩ	>5GΩ	>1.5GΩ	>5GΩ	>5GΩ
Output Impedance	<110Ω	<110Ω	<110Ω	<110Ω	<110Ω
Electrical Noise	A weighting <2.0μV 20Hz~20kHz <6.0 μV	A weighting <2.0μV 20Hz~20kHz <6.0 μV	A weighting <2.0μV 20Hz~20kHz <6.0 μV	A weighting <2.0μV 20Hz~20kHz <6.0 μV	A weighting <3.0μV 20Hz~20kHz <10.0 μV
Maximum Output Voltage	8.0 Vrms	8.0 Vrms	8.0 Vrms	10.0 Vrms	7.1 Vrms
Power Supply Mode	IEPE(2~20)mA	IEPE(2~20)mA	IEPE(2~20)mA	DC(28~120)V	DC(4~28)V
Operating Temperature	-40°C~+100°C	-40°C~+100°C	-40°C~+100°C	-40°C~+100°C	-40°C~+70°C
Operating Humidity	0~98%RH	0~98%RH	0~98%RH	0~98%RH	0~98%RH
Output Interface	BNC	SMB	SMB	7-pin Lemo	Three Wire Output
Length	84.5mm	35mm	58mm	80mm	15mm
Weight	25.5g	14.5g	6.5g	28g	11g (with 50cm cable)

Microphone Set

MNP21 is a 1/2 inch free field measurement microphone set , which conforms to IEC 61094 WS2F standard. MNP21 has high sensitivity with the frequency range of 6.3Hz-20kHz. It is generally applicable to class 1 sound level meter and other noise measurement devices.

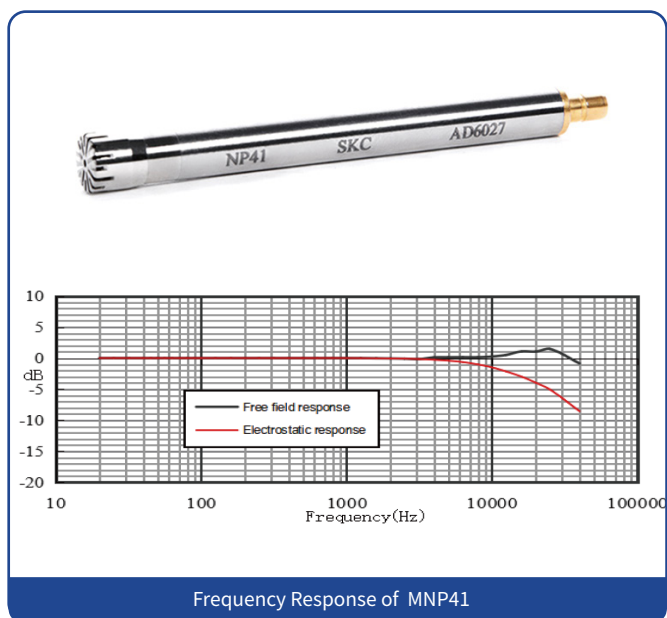
MNP21 consists the microphone cartridge of MP21 and preamplifier NP21.



MNP21	
Type	MNP21
Size(inch)	1/2
Sensitivity(mV/Pa)	50
Frequency Range(Hz)	6.3 ~ 20000
Application	Free Field
Polarization Voltage(V)	0
Dynamic Range (dB)	17 ~ 146
Output Impedance(Ω)	<110
Electrical Noise	A Weighting <2.0 μ V
	20Hz ~ 20kHz <6.0 μ V
Maximum Output Voltage	8.0Vrms
Power Supply Mode	IEPE (2 ~ 20mA)
Operating Temperature	-30°C ~ +70°C
Operating Humidity	0 ~ 98%RH
Output Interface	BNC

MNP41 is a 1/4 inch free field measurement microphone set , which conforms to IEC 61094 WS3F standard. The microphone has undergone rigorous environmental aging test to ensure stability.

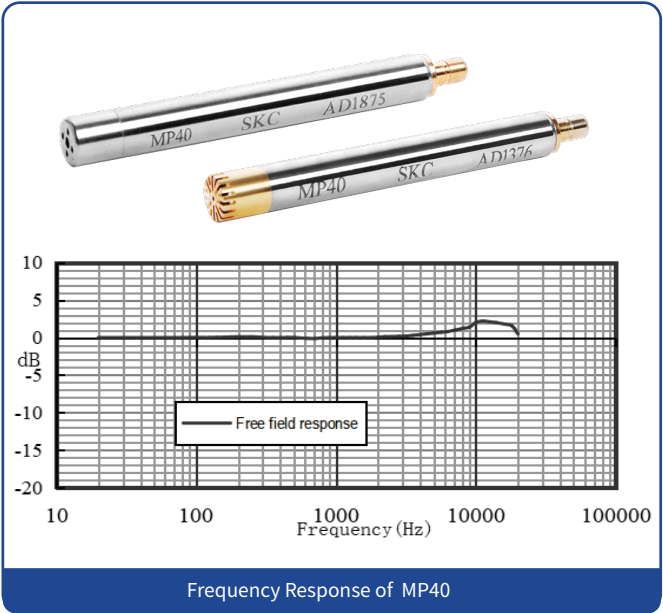
MNP41 consists the microphone cartridge of MP41 and preamplifier NP41. Its frequency range can reach 100kHz when changing to microphone cartridge MP41B.



Microphone MNP41	
Type	MNP41
Size(inch)	1/4
Sensitivity(mV/Pa)	4
Frequency Range(Hz)	10 ~ 40000
Application	Free Field
Polarization Voltage(V)	0
Dynamic Range (dB)	34 ~ 164
Output Impedance(ohm)	<110
Electrical Noise	A Weighting <2.0 μ V
	20Hz ~ 20kHz <6.0 μ V
Maximum Output Voltage	8.0Vrms
Power Supply Mode	IEPE (2 ~ 20mA)
Operating Temperature	-30°C ~ +70°C
Operating Humidity	0 ~ 98%RH
Output Interface	SMB

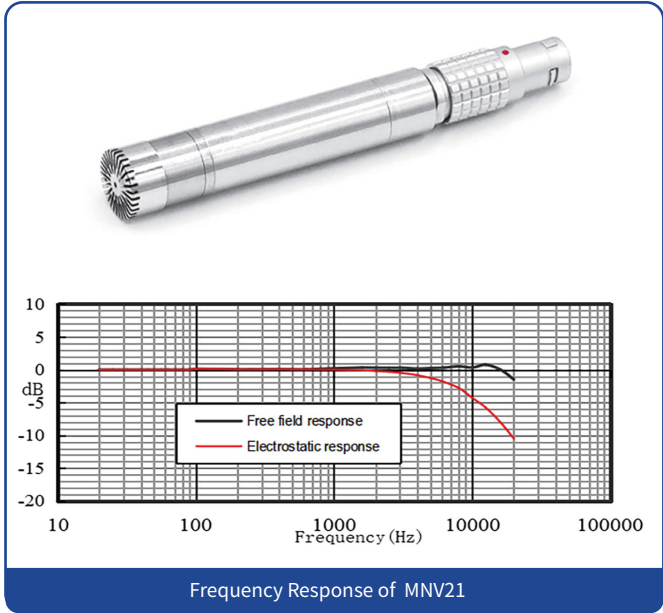
MP40 is a prepolarized free field measurement microphone set which adopts IEPE power supply mode and SMB connector. It is the only product that can not be separated between microphone cartridge and preamplifier. It has the characteristics of high sensitivity, good stability and high reliability.

MP40 can be used for accurate measurement of array microphone, free field or diffusion field, and can also be used to measure the acoustic characteristics of small sound sources.



Microphone Set	
Type	MP40
Size(mm)	7
Sensitivity(mV/Pa)	50
Frequency Range(Hz)	20 ~ 20000
Application	Free Field
Polarization Voltage(V)	0
Dynamic Range (dB)	29 ~ 127
Supply Current(mA)	2 ~ 20(Model 4mA)
Output Interface	SMB

MNV21 measurement microphone is a free field measurement microphone with 200V polarization voltage. It adopts DC power supply mode and 7-pin lemo male connector.



Microphone Set	
Type	MNV21
Size(inch)	1/2
Sensitivity(mV/Pa)	50
Frequency Range(Hz)	6.3 ~ 20000
Application	Free Field
Polarization Voltage(V)	200
Dynamic Range (dB)	16 ~ 150
Output Impedance(Ω)	<110
Electrical Noise	A Weighting <2.0μV
	20Hz ~ 20kHz <6.0μV
Maximum Output Voltage	8.0Vrms
Power Supply Mode	DC(28 ~ 120V)
Operating Temperature	-30°C ~ +70°C
Operating Humidity	0 ~ 98%RH
Output Interface	7-pin Lemo Male

TEDS Microphone

MNP41T measurement microphone includes NP41T preamplifier and MP41 1/4 inch high-quality prepolarized free-field microphone. The preamplifier has a built-in TEDS function, which supports data acquisition equipment to directly read microphone information, including model, serial number, and sensitivity. etc. The shell of the preamplifier is made of stainless steel, which is suitable for the acoustic test requirements of various occasions.



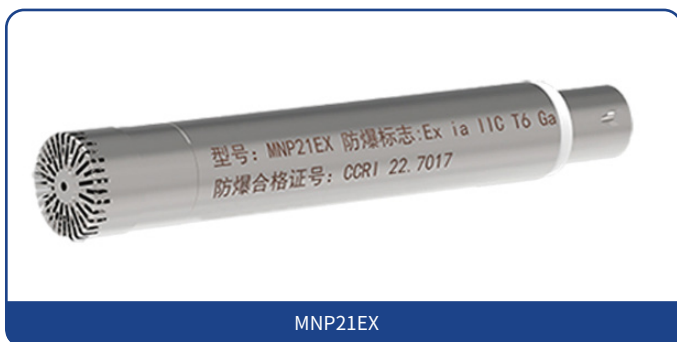
Features

- Suitable for precise acoustic testing.
- Suitable for high-frequency acoustic testing, such as ultrasonic measurement, transient signal testing, etc.
- Suitable for high sound pressure testing.
- Built-in TEDS function, IEEE 1451.4 V1.0
- Compact structure and small size.
- Threaded connectors ensure a secure connection

Intrinsically Safe Microphone

MNP21EX measurement microphone includes NP21EX preamplifier and MP21 1/2 inch high-quality prepolarized free-field microphone.

This microphone is suitable for all other explosive gas environments except coal mine gas environment.



Features

- Explosion-proof type: intrinsically safe
- Explosion-proof mark: Ex ia IIC T6
- Ideal for precision acoustic testing
- Frequency range covers most test needs
- IEC60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

Surface Microphone

SMP47 is a special microphone independently developed by SKC, it can be installed on the object surface with double sided adhesive tape. It has the advantages of light weight, small volume and wide application range. It has great advantages for automotive NVH test and aerospace test.



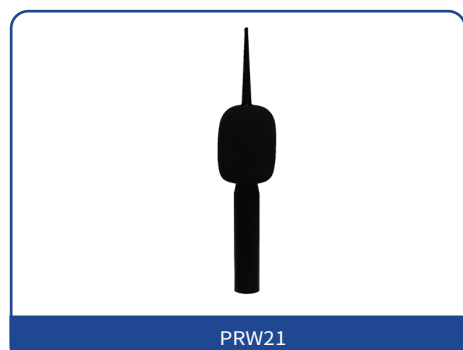
Use Scenarios

- 1.Enclosed space inlay
- 2.Clay model inlay
- 3.Ground array measurement
- 4.General noise measurement

Surface Microphone SMP47	
Frequency Range	10 Hz~20 kHz
Dynamic Range	36dB~160dB
Sensitivity	4mV/Pa, -48dB, Max SPL 160dB
Temperature Range	-10°C~+65°C

Outdoor Microphone

PRW21 is a microphone specifically for outdoor noise measurement. It does not have a built-in calibration device, so it needs to be calibrated periodically with a sound calibrator, and is suitable for short-term outdoor noise measurement. PRW21 meets IP55 protection grade. 60mm diameter windscreen and internal rain cover can fully protect the microphone, making it withstand the test of wind, rain, snow and other bad weather, and prevent dust damage. The single column bird-proof frame can prevent birds from affecting the accuracy of the measurement.



Features

1. IP55 protection level, fully protect against wind, rain, snow and dust.
2. Prevent birds from roosting.
3. The protection kit can be quickly removed to facilitate regular acoustic calibration.
4. IEPE constant current power supply.

USB Microphone



MNU21 integrates the microphone cartridge, microphone preamplifier, 24 bit A/D and USB interface. It transmits the measurement data to PC or mobile terminal through USB connection line, and cooperates with the test software for high-performance noise measurement and recording.



USB Microphone MNU21	
Frequency Range	20Hz~20kHz
Nominal Sensitivity	50mV/Pa
Dynamic Range	26dB~126dB
Sampling Frequency	48kHz
Sampling Bit	24 bit
USB Standard	USB2.0, Backward Compatible With USB1.1 Standard
USB Power Supply	5V
Overall Dimension	Total Length 118.5mm
	Diameter 12.7mm
	The Outer Diameter Of The Protective Cover 13.2mm
Weight	40g

Features

- The PC terminal or mobile terminal supplies power directly without additional power supply.
- Compatible with Windows / Android system, plug and play, without additional driver installation.
- It includes two channels, namely low sensitivity channel and high sensitivity channel. Users can choose the channel by themselves.

Phantom Power Microphone



CR series engineering level measurement and recording microphone adopts phantom power supply through XLR connector. Each type of microphone has different characteristic parameters such as maximum sound pressure level, sensitivity, frequency response and equivalent noise level. With anti-corrosion metal diaphragm, omni-directional and high sensitivity, it is suitable for on-site pickup of concert halls and acoustic instruments, accurate, detailed and natural sound reproduction.



CR Series Microphone

Type	CR11	CR22	CR24	CR30	CR42	CR45
Directivity	Omnidirectional					
Sensitivity	-24dB	-28dB	-36dB	-30dB	-28dB	-52dB
Frequency Range (Hz)	20~20k	20~20k	20~40k	20~20k	20~20k	20~50k
Output Impedance	220Ω					
Microphone Type	Pre Polarization					
Maximum Sound Pressure Level	130dB	140dB	155dB	130dB	130dB	160dB
Equivalent Noise Level	18dBA	18dBA	20dBA	22dBA	28dBA	30dBA
Power Supply Mode	48V Phantom Power Supply					

Acoustic Calibrator

C224 acoustic calibrator is used to calibrate sound pressure of sound level meter and other acoustic measuring instruments.

The product meets the Class I standard of IEC/EN 60942 (2017) Class 1. It has two standard sound pressure levels of 94.0 dB and 114.0 dB. Its working frequency is 1000Hz, and its calibration is independent of the weighting network used by the sound level meter.

C224 sound level calibrator is small in size, light in weight, low in power consumption, stable in performance and easy to use. It is a miniature ideal calibration sound source.



Calibrator C224	
Sound Pressure Level	94dB, 114dB
Accuracy of Sound Pressure Level	94db ± 0.2 db 114dB ± 0.3 dB
Frequency	1000Hz $\pm 1\%$
Harmonic Distortion	$\leq 2\%$
Battery	9V
Temperature Range	0°C \sim +40°C
Relative humidity	$\leq 80\%$ (23°C)
Weight	About 250g

Electrostatic Actuator Amplifier



PAS800 is used to supply 800V DC polarization voltage of electrostatic driver, and amplify the output signal of signal source to meet the requirements of electrostatic driver voltage.

Power Amplifier

PA50 is an amplifier that can produce the maximum power output to drive a load (such as a loudspeaker) under a given distortion rate. It dominates whether the whole system can provide good sound quality output.



Power Amplifier PA50	
Frequency Range	10Hz \sim 45kHz
Signal-to-noise Ratio	90dB
Power	30W / 68W
Impedance Range	4 \sim 8 Ω
Harmonic Distortion	$< 0.008\%$ 1kHz 1W
Input Connector	RCA
Power Voltage	AC 220V 50 \sim 60Hz
Accessary	220V 3C (Power Cable \times 1)
Dimension	155 \times 60 \times 261mm

Optical Fiber Acoustic Sensor



FPC-01 integrates optical and acoustic characteristics and has the following characteristics:

- High sensitivity to acoustic pressure
- Compact structure and light weight
- Immunity to electromagnetic interference and remote sensing capability
- High resolution and fast response
- High temperature resistance and wide dynamic range

Optical Fiber Acoustic Sensor FPC-01	
Sensitivity	200mV/Pa
Frequency Range	3.15Hz~6kHz
Upper Limit Dynamic Range	114dB
Fiber Length	1~200m
Type	Interferometric

Hydrophone

Hydrophone MKY30 is a sensor for underwater acoustic measurement. The internal sensitive components are made of high-performance piezoelectric ceramic materials, and the external components are packaged with polyurethane. The hydrophone probe can be integrated with a preamplifier, which provides high sensitivity, low noise and high hydrostatic resistance.



Hydrophone MKY30	
Operating Bandwidth	10Hz~20kHz
Receiving Sensitivity	-193dB \pm 1.5dB (without amplifier)
Preamplifier	Customizable
Horizontal Directivity	Omnidirectional
Cable Length	15m
Service Depth	>1000m
Operating Temperature Range	-5°C ~ +70°C
Storage Temperature Range	0°C ~ +40°C

Accelerometer

Use Scenarios

- Engineering
- Biology
- Industry
- Building and structural monitoring
- Medical applications
- Navigation
- Transport
- Volcanology



Selection Guide

There are many specifications of accelerometer, and each one has its special application. Therefore, in order to obtain high fidelity test data, users need to choose the most suitable accelerometer according to their own test requirements.

In general, the main factors in the selection of accelerometer included:

- **Type of measurement:** Consider the type of measurement you need to make, such as vibration, motion, shock, or seismic.
- **Type of acceleration:** Determine whether you need to measure static or dynamic acceleration.
- **Device size:** Choose an accelerometer that is appropriately sized for your application, whether it be handheld, medium, or heavy machinery.
- **Environment:** Consider the environment in which the accelerometer will be used, as temperature and gravity can affect some accelerometers.
- **Measurement range and sensitivity:** Select an accelerometer with a measurement range and sensitivity that is appropriate for your needs.

QV Series Accelerometer

The QV series of the accelerometer belong to the IEPE vibration sensor, which is specially developed for NVH test of high-speed railway, automobile, aviation, aerospace, energy and other fields. It is suitable for multi-channel NVH test and whole vehicle modal test. Because of its wide frequency response, large dynamic range, high reliability and easy to use, it can be compatible with the DAQ of major manufacturers in the market.



Single Axis Type (TNC)



Single Axis Type (top end)



Single Axis Type (side end)



Triaxial Type

Model	Type	Measurement Range	Sensitivity	Resolution	Frequency Range	Resonant Frequency	Electrical Connector	Weight
		g	mV/g	mg	Hz	kHz		g
QV1002	Single Axis	±2	500	0.6	0 ~ 400	15	M5	22
QV1004	Single Axis	±4	1200	0.6	0.1 ~ 1000	12	M8	100
QV1005	Single Axis	±5	1000	0.6	0.2 ~ 15000	25	M5	34
QV1010	Single Axis	±10	500	0.6	0.2 ~ 15000	27	M5	31
QV1010-2	Single Axis	±10	500	0.6	0.2 ~ 8000	27	TNC	75
QV1010-3	Single Axis	±10	500	0.6	0.2 ~ 10000	3	TNC	95
QV1020	Single Axis	±20	250	0.6	0.2 ~ 20000	30	M5	31
QV1025	Single Axis	±25	200	0.6	0.2 ~ 20000	30	M5	18
QV1050	Single Axis	±50	100	0.6	0.2 ~ 20000	35	M5	18
QV1050-2	Single Axis	±50	100	0.6	0.2 ~ 8000	30	TNC	75
QV1050-3	Single Axis	±50	100	0.6	0.2 ~ 8000	30	TNC	31
QV1050-4	Single Axis	±50	100	0.6	0.2 ~ 8000	25	TNC	32
QV1050-5	Single Axis	±50	100	0.6	0.2 ~ 10000	15	TNC	90
QV1080	Single Axis	±80	62.5	0.6	0.2 ~ 10000	13	TNC	90
QV1100	Single Axis	±100	50	0.6	0.2 ~ 20000	35	M5	18
QV1100-2	Single Axis	±100	50	0.6	0.2 ~ 8000	30	TNC	75
QV1100-3	Single Axis	±100	50	0.6	0.2 ~ 10000	30	TNC	31
QV1100-4	Single Axis	±100	50	0.6	0.2 ~ 8000	25	TNC	32
QV1100-5	Single Axis	±100	50	0.6	0.2 ~ 10000	12	TNC	90
QV1125	Single Axis	±125	40	0.6	1 ~ 11000	30	M5	3.4
QV1500	Single Axis	±500	10	0.6	0.2 ~ 15000	30	M5	12
QV11000	Single Axis	±1000	5	0.6	0.2 ~ 15000	30	M5	12
QV3005	Triaxial	±5	1000	0.6	0.2 ~ 5000	10	M5	120
QV3010	Triaxial	±10	500	0.6	0.5 ~ 5000	10	M12	27
QV3020	Triaxial	±20	250	0.6	0.5 ~ 5000	10	M12	27
QV3025	Triaxial	±25	200	0.6	0.5 ~ 5000	10	M12	27
QV3050	Triaxial	±50	100	0.6	0.5 ~ 5000	10	M12	27
QV3100	Triaxial	±100	50	0.6	0.5 ~ 5000	10	M12	27
QV3200	Triaxial	±200	25	0.6	0.5 ~ 5000	10	M12	27
QV3500	Triaxial	±500	10	0.6	0.5 ~ 5000	10	M12	27

HW Series Accelerometer

HW series accelerometers feature low noise density and low power consumption. HW series sensors can perform high-resolution vibration measurement with very low noise. The accelerometer shell is made of hard aluminum alloy, which is lighter than the traditional accelerometer.

Advantages: strong anti electromagnetic interference ability.

This product can be used in aerospace, platform stability system, structural health monitoring, state monitoring, tilt detection, robotics, rail transit and other fields.



Triaxial Accelerometer(HW3010)



Triaxial Accelerometer(HW3010)

HW Series Accelerometer										
Number	1	2	3	4	5	6	7	8	9	10
Type	HW3002	HW3003	HW3004	HW3005	HW3005B	HW3008	HW3010	HW3030	HW3050	HW3200
Measurement Range	±2g	±3g	±4g	±5g	±5g	±8g	±10g	±30g	±50g	±200g
Frequency Range X/Y/Z	DC ~ 1kHz						DC ~ 3kHz		DC ~ 6kHz	
Sensitivity	400mV/g	300mV/g	200mV/g	400mV/g	400mV/g	100mV/g	135mV/g	66.7mV/g	40mV/g	40mV/g
Accuracy	3.5mg	3.5mg	3.5mg	3.5mg	3.5mg	3.5mg	2.5mg	5mg	8.5mg	8.5mg
Lateral Sensitivity	≤ 5%									
Degree of Linearity	≤ 1max%FSO									
Operating Electricity	≤8mA									
Output Impedance	≤100Ω									
Power Supply Mode	Separate Power Supply									
Power Supply	+8V ~ +16 V (DC)									
Temperature Range	-40°C ~ +120°C									
Material	Aluminium Carbide									
Install	M5 Screw Mount/Adhesive									
Weight	19g (Typical)(None Wire)									
Application Scenarios	1.Inertial Measurement Unit (IMU)/ Aviation And Heading Reference System (AHRS) 2.Platform Stabilization System 3.Structure Health Monitoring 4.Seismic Imaging 5.Tilt Testing 6.Robotics 7.Condition Monitoring						1.Condition Monitoring 2.Predictive Maintenance 3.Asset Health 4.Test And Measurement 5.Health And Usage Monitoring System (HUMS)			

LV Series Accelerometer

Features

Titanium alloy material

Built-in more integrated micro-miniature circuit

Small size, light weight, more suitable for small structure measurement

The whole series uses memory alloy fasteners, shear structure, stable and reliable

Top or side connector output



LV1050



LV32500



LV1500

Integrated Acoustic Accelerometer

SKC has launched a new type of sensor. The sensor can meet the requirements of synchronous testing of vibration and noise. At present, the vibration and noise sensors are all tested separately in the market. Many customers have a strong demand for simultaneous acquisition of noise and vibration test points, so we have developed and produced this integrated acoustic accelerometer.

The sensor consists a triaxial accelerometer and a free field microphone. The shell is cut integrally to ensure the stability of each sensor. Accelerometer measurement range is $\pm 50g$, frequency range of the microphone is 20-20kHz. It can meet the requirements of conventional vibration and noise test. The installation of the product is similar to that of the conventional accelerometer, either magnetic base or direct paste can be used.



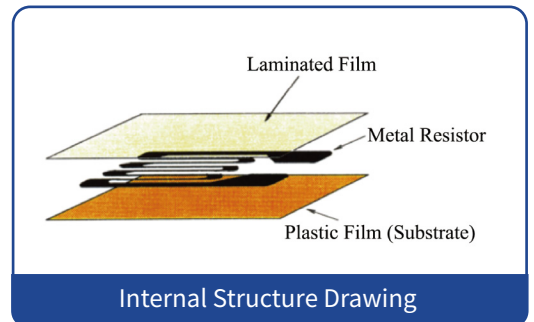
Integrated Acoustic Accelerometer MHW43100

Integrated Acoustic Accelerometer MHW43100	
Measurement Range	100g
The Amplitude-frequency Response X	DC~2kHz
The Amplitude-frequency Response Y	DC~2kHz
The Amplitude-frequency Response Z	DC~2kHz
Sensitivity	20mV/g
Transverse Sensitivity	≤5%
Nonlinearity	≤1%FSO (max)
Accuracy	17mg
Operating Electricity	≤8mA
Output Impedance	≤100Ω
Power Supply Mode	Separate Power Supply
Power Supply	+5V~+13V (DC)
Temperature Range	Vibration: -40°C ~125°C
	Noise: -40°C ~80°C
Material	Aluminium Carbide
Install	M5 Screw Mount/Adhesive
Weight	58g (Typical)(None Wire)

Strain Gauge

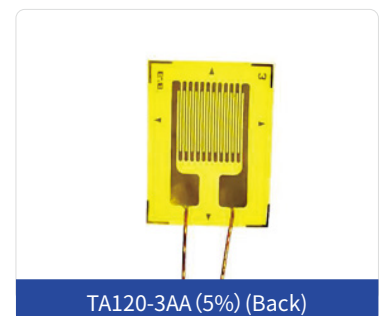
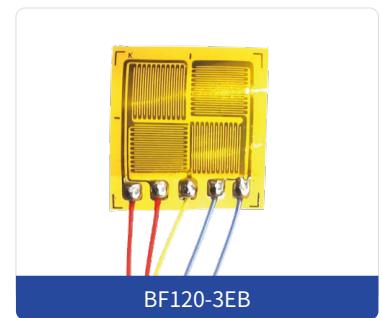
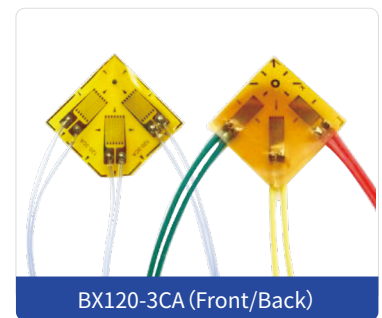
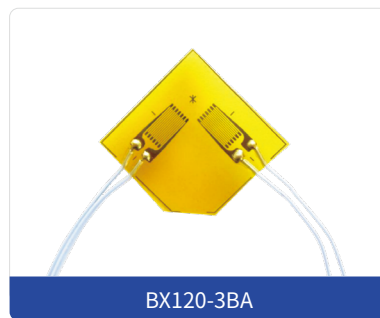
Introduction

There are many kinds of strain gauges. The general strain gauge is in a plastic film called a substrate (15-16 μm) attaching the sensitive grid (3-6 μm) made of thin metal foil. Then, it is covered with a layer of film to form a laminated structure.



Principle Of Strain Gauge

Stick the strain gauge on the measured object and make it expand and contract with the strain of the measured object, so that the metal foil inside will elongate or shorten with the strain. The electrical resistance of many metals changes as they mechanically elongate or shorten. The strain gauge applies this principle to measure the strain by measuring the change of resistance. Generally, the sensing grid of the strain gauge uses copper chromium alloy, and its resistance change rate is constant, which is directly proportional to the strain. Single strain gauge can only measure the strain in a single direction. Multiple strain gauges are used to measure the strain in multiple directions, which can more accurately measure the strain of the measured surface.



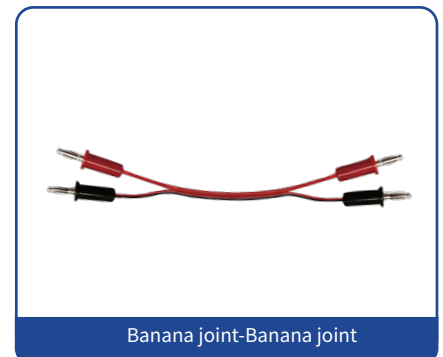
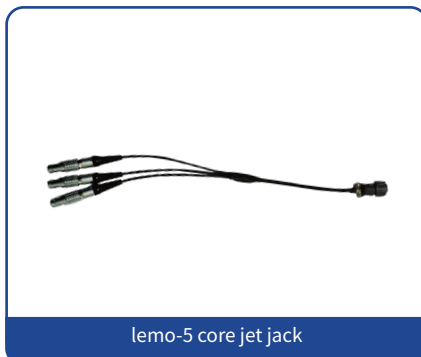
Specifications

Plastic Base Foil Strain Gauge/Flower				
Type	Sensitive Grid Size (mm)	Nominal Resistance (Ω)	Sensitivity Coefficient	Accuracy Grade
Product Form: Single Axis				
BX120-1AA	0.5×0.5	120	2.08±1%	A
BX120-1AA	1×0.5	120	2.08±1%	A
BX120-1AA	1×1	120	2.08±1%	A
BX120-1AA	1×1	120	2.08±1%	A
BX120-2AA	2×1	120	2.08±1%	A
BX120-2AA	2×2	120	2.08±1%	A
BX120-3AA	3×2	120	2.08±1%	A
BX120-5AA	5×2	120	2.08±1%	A
BX120-5AA	5×3	120	2.08±1%	A
BX120-6AA	6×1	120	2.08±1%	A
BX120-10AA	10×2	120	2.08±1%	A
BX120-10AA	10×3	120	2.08±1%	A
BX120-15AA	15×3	120	2.08±1%	A
BX120-20AA	20×3	120	2.08±1%	A
BX120-30AA	30×3	120	2.08±1%	A
BX120-40AA	40×3	120	2.08±1%	A
BX120-60AA	60×3	120	2.08±1%	A
BX120-80AA	80×3	120	2.08±1%	A
BX120-100AA	100×3	120	2.08±1%	A
Product Form: Two Axis 90°				
BX120-3BA	3×2	120	2.08±1%	A
BX120-5BA	5×2	120	2.08±1%	A
BX120-5BA	5×3	120	2.08±1%	A
BX120-6BA	6×2	120	2.08±1%	A
BX120-10BA	10×2	120	2.08±1%	A
Product Form: Two Axis T Model				
BX120-2BB	2×2	120	2.08±1%	A
BX120-4BB	4×4	120	2.08±1%	A
Product Form: Three Axis 120°				
BX120-2CD	2×1	120	2.08±1%	A
BX120-3CD	3×2	120	2.08±1%	A
BX120-5CD	5×2	120	2.08±1%	A
Product Form: Three Axis 45°				
BX120-3CA	3×2	120	2.08±1%	A
BX120-5CA	5×2	120	2.08±1%	A
BX120-10CA	10×3	120	2.08±1%	A
BX120-15CA	15×3	120	2.08±1%	A
BX120-30CA	30×3	120	2.08±1%	A
Product Form: Four Axis				
BF120-3EB	3×3	120	2.08±1%	A
BF350-6EA	6×6	120	2.08±1%	A
Others				
BX350-(15)KA	Φ15mm	350	2.08±1%	A
TA120-3AA(5%)	3×3	120	Measurement Range 5%	A

Accessory

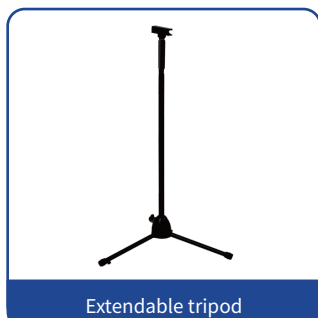
Cable

SKC can provide a variety of cables, the standard length of 2 meters, 5 meters, 10 meters. Length and connector can also be customized according to customer requirements.



Microphone Tripod

SKC can provide various types of microphone tripod, such as conventional microphone tripod, microphone extendable tripod, microphone array tripod and other products.



Extendable tripod



Microphone stand (with clamp)

Nose Cone

Turbulence occurs when the microphone is placed in laminar flow, this phenomenon will lead to unwanted pressure changes on the diaphragm so that the microphone may damage.

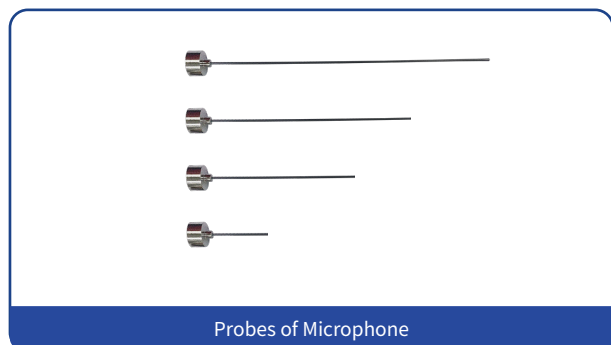
We can avoid the harmful consequence by using the nose cone to face the flow in a single direction. The SKC's nose cone is suitable for the 1/2 and the 1/4 inch microphones.



Nose Cone

Nose Cone		
Model	NC21	NC41
Measure	1/2 "	1/4"
Height	38.8mm	30mm
Inner Diameter	12.20mm	5.96mm
Outside Diameter	13.19mm	7.52mm

Probe Microphone



Probes of Microphone

Probe Microphone Protective Cover	
Frequency Range	10Hz~8kHz
Dynamic Range	40dB~166dB
Temperature Limit	400°C
Sensitivity	3mV/Pa

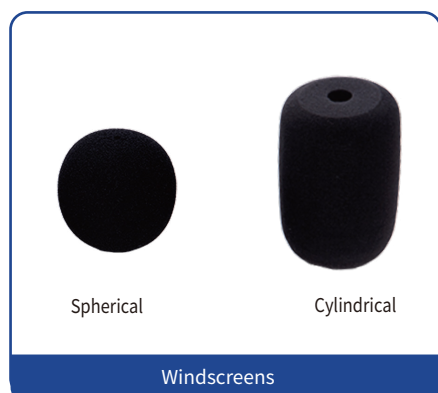
Use scenarios

1. Acoustic impedance measurement
2. Exhaust system measurement
3. Near field measurement
4. High temperature measurement
5. Measurement of pressure distribution in small sealed chamber

Windscreen

When the microphone is placed in laminar flow, if airflow sounds come from different directions, these pressure changes are made as far away from the diaphragm as possible by using a windscreen.

SKC windscreen is suitable for 1/2 and 1/4 inch microphones. After size optimization, its special open-hole foam structure and number of holes per inch (PPI) design are optimized to resist airflow conditions without significantly affecting sound pressure measurements.



Number	Type	Suit	Shape	Outside Diameter	Inner Diameter	Height
1	WS34	1/4 Inch Microphone	Sphericity	50mm	5mm	50mm
2	WS52	1/2 Inch Microphone	Sphericity	80mm	11.5mm	50mm
3	WS62A	1/2 Inch Microphone	Sphericity	80mm	11.5mm	60mm
4	WS62B	1/2 Inch Microphone	Cylinder-shaped	50mm	11.5mm	80mm
5	WS62C	1/2 Inch Microphone	Cylinder-shaped	60mm	11.5mm	100mm
6	WS71	1 Inch Microphone	Cylinder-shaped	60mm	10mm	120mm
7	WS82	1/2 Inch Microphone	Sphericity	60mm	11.5mm	80mm
8	WS84	1/4 Inch Microphone	Sphericity	80mm	5mm	80mm
9	WS92	1/2 Inch Microphone	Sphericity	90mm	11.5mm	90mm

Raincover

SKC raincovers support outdoor testing of 1/2 inch microphones, regardless of rainy weather conditions.



Type	Material	Dimension	Use Scenario
RCa	Copper Nickel Plating	Diameter(15.5mm) Height(9.3mm)	Outdoor Testing(Single Microphone), Outdoor Testing of Acoustic Array
RCs	Copper Nickel Plating +PTFE	Diameter(25mm) Height(24.7mm)	Outdoor Testing(Single Microphone)



Signal Conditioning

- 23 Signal Conditioner
- 24 Data Acquisition Analyzer
- 26 Strain Conditioner
- 27 Wireless Data Acquisition Analyzer

Signal Conditioner

P110

The single conditioner provides input connection of IEPE sensor and voltage output to the DAQ instrument.

It includes constant current source power supply, signal conditioning, amplification.



P110	
Input channel	Single BNC connector
Output channel	Single BNC connector
Gain	x1 , x10 , x100
IEPE current	4mA
Frequency range	5Hz to 175kHz ($\pm 0.5\text{dB}$)
Operating temperature range	-10 to +50 °C
Operating humidity range	0 to 95% RH
Self-noise	< - 100dBV
Operating voltage	24V AC
Size	120×75×37 mm
Weight	120 g

P440

P440 is a 4-channel IEPE signal conditioner which has 4 BNC input connectors and 4 BNC output connectors, and mainly be used for providing the standard 4 mA current for IEPE sensor.

It has many characteristics such as low background noise, phase consistency, good stability and high reliability.



P440	
Input Channel	4 BNC connectors
Output Channel	4 BNC connectors
Gain	x1 , x10 , x100
IEPE Current	4mA
Background Noise	< - 100dBV
Power Supply	Typical 220V AC
Size	250×195×45 mm

Data Acquisition Analyzer

Q421

Q421 is a 4-channel IEPE signal conditioning and data acquisition integrated equipment developed by our company, which provides standard 4 mA current for IEPE microphone.

Q421 has BNC input and output interfaces, it has the characteristics of low self-noise, consistent phase, good stability and high reliability.

The front panel is set with 10 times and 100 times gain to meet the general requirements of the test.



Features

- 4-channel input, applicable to IEPE type measurement microphone or accelerometer
- 2 channel output, which can be directly connected with the power amplifier to drive the loudspeaker
- Analog gain of each channel, x1, x10, x100
- Connect with computer through USB cable
- 220 V AC power supply
- Suitable for laboratory and outdoor measurement

Q421	
Input channel	4-channel BNC connector
Output channel	2-channel BNC connector
Gain	x1 , x10 , x100
IEPE current	4mA
Sampling rate	44.1kHz,48kHz
Dynamic range	112dB, A weighting
Output Mode	USB

Q801U/Q1601U

Q801U and Q1601U are multi-channel IEPE signal conditioners and data analyzers integrated equipment developed by our company, which provide standard 4 mA current for IEPE microphone.

They don't have analog voltage output interfaces, they connect to the computer through USB cable.

The front panel is set with 10 times and 100 times gain to meet the general requirements of the test.



Q801U



Q1601U

Q801U	
Input channel	8-channel BNC connector
Gain	x1 , x10 , x100
IEPE current	4mA
Sampling rate	Up to 200 kHz, adjustable within the range
Dynamic range	112dB, A weighting
Output Mode	USB

Q401/Q801/Q1601

These multi-channel data analyzers comply with IEPE constant current source, voltage and other supply mode.

They use TCP/IP protocol and standard RJ45 connector to work with the computer, do not need a special driver.

The Q401 is characterized by high sampling rate, high measurement accuracy, small size and portability, 24 bit $\Delta\Sigma$ data acquisition chip, 4-channel synchronization.



Q401



Q801



Q1601

Use Scenarios

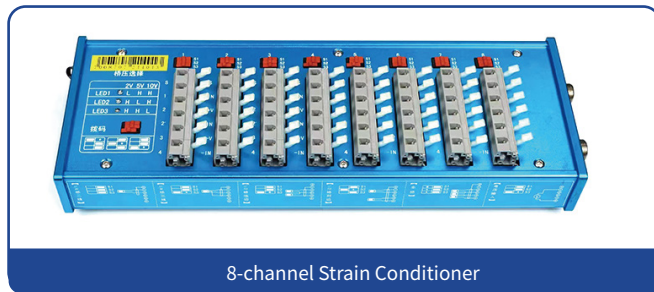
1. vibration
2. noise
3. modal Analysis
4. strain
5. pressure
6. test requirements for voltage, etc

Q401	
Input channel	4-channel BNC connector
Input mode	Voltage or IEPE
Dynamic range	110dB
Gain	x1 , x10 , x100
Sampling rate	64kHz/channel
Input range	± 10 V
Operating voltage	12 V DC
Input noise	<0.03 mVrms @ ± 10 V
Weight	1.5 Kg

Strain Conditioner

SKC's strain conditioner adopts military grade electronic parts, becoming the latest generation of high stability and high performance strain conditioner in China, which is widely used in the field of stress and strain test.

4-channel and 8-channel strain regulators, strain input and voltage output are used to expand the function of the acquisition instrument to collect the signals of strain, stress and strain sensors.



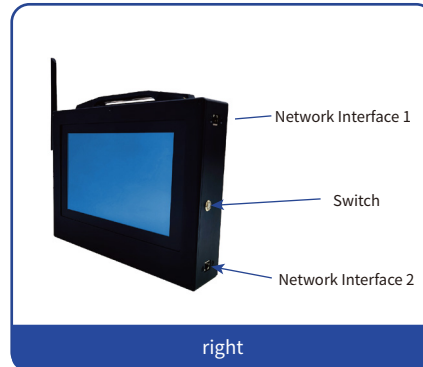
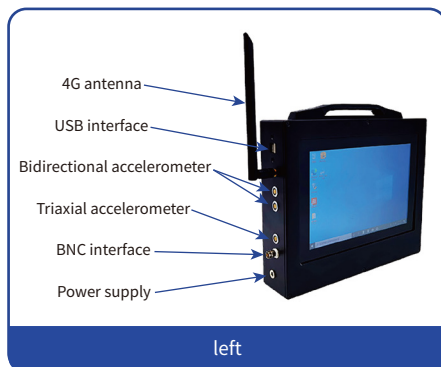
Strain Conditioner	
Number of Channels	4, 8
Bridge Type	1/4 Bridge, 1/2 Bridge, full Bridge
Applicable Resistance	100Ω-1kΩ (Only 120Ω When 1/4 Bridge Road)
Bridge Voltage	2V, 5V
Frequency Response	DC-10kHz (-3±1dB,12dB/oct)
Calibration Value	0.1mV/με (K=2; Bridge Pressure=2V)
Gain and Error	100V/V ± 0.5%
Maximum Output Current	40mA
Balance Mode	Automatic Pre Balance

Features

- The bridge box and amplifier are integrated together;
- The whole conditioner is small and light, and each channel wiring only takes 1-2 seconds;
- The switch is set with bridge connection mode to avoid short wiring on site;
- Voltage output and convenient interface with subsequent instruments;
- Built in battery, outdoor without power can work for more than 8 hours;
- A variety of bridge pressure options to meet the test requirements of different types of strain gauges or bridge sensors.

Wireless Data Acquisition Analyzer

Portable acquisition analyzer is an integrated wireless multi-channel acquisition instrument, which can mainly realize data acquisition, data analysis and other functions. The previous test using computer and analyzer, user can complete the integrated test using this equipment.



Features

- With wireless transmission function
- Users can customize software, interfaces, and functions.
- Supporting IEPE microphones and accelerometers
- Battery configuration, easy to operate and carry.

Calculated data can be uploaded to the IOT monitoring platform through wireless transmission.

Beijing SKC Acoustics Technology Co., Ltd.

Industrial IoT Monitoring Platform

- Environmental Smart Monitoring
- Gas Safety Monitoring
- Bridge Health Monitoring
- Manhole Cover Intelligent Monitoring



Measurement System

29 Acoustic Material Test System

30 Sound and Vibration Test System

31 Wireless Sound and Vibration System

32 Sound Power System

32 Sound Intensity System

33 Acoustic Array System

TEST SYSTEM

Acoustic Material Test System

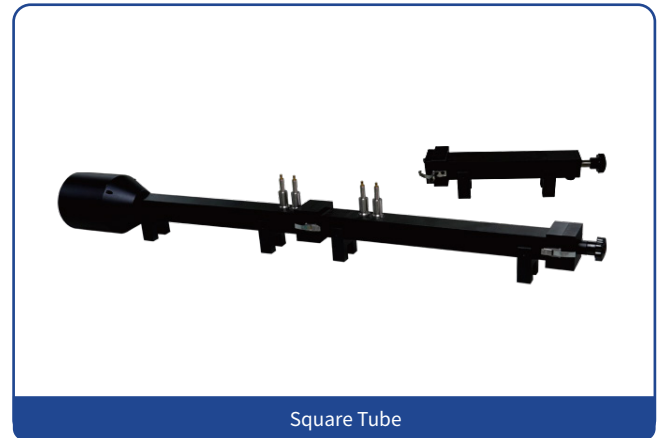
Z series impedance tubes are used to measure the sound absorption coefficient and transmission loss of acoustic materials under the condition of vertical incidence. This system complies with the standard ISO10534-2:1998.

The whole system is composed of impedance tube, high-precision phase matching microphone, data acquisition analyzer and SoundExpress software .

Compared with the standing wave tube, the standing wave ratio method has the characteristics of short test time, continuous spectrum and good repeatability. In particular, the efficiency of the comparative experiment can be greatly improved in material research.

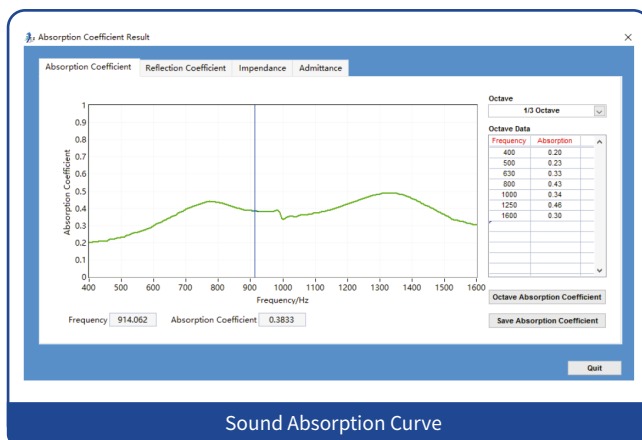


Round Tube

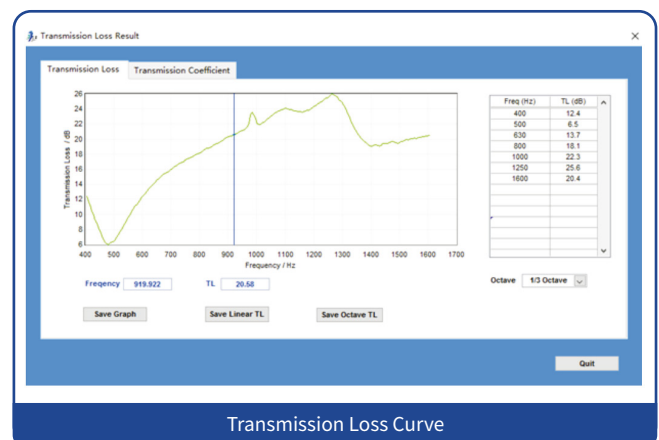


Square Tube

Name	Model	Pipe Diameter	Measuring Range	Microphone Number
Low Frequency Sound Absorption Tube	ZL100	100mm	50Hz~1600Hz	2
Low Frequency Sound Insulation Tube		100mm	50Hz~1600Hz	4
High Frequency Sound Absorption Tube	ZH30	30mm	800Hz~6300Hz	2
High Frequency Sound Insulation Tube		30mm	800Hz~6300Hz	4



Sound Absorption Curve



Transmission Loss Curve

Sound and Vibration Test System

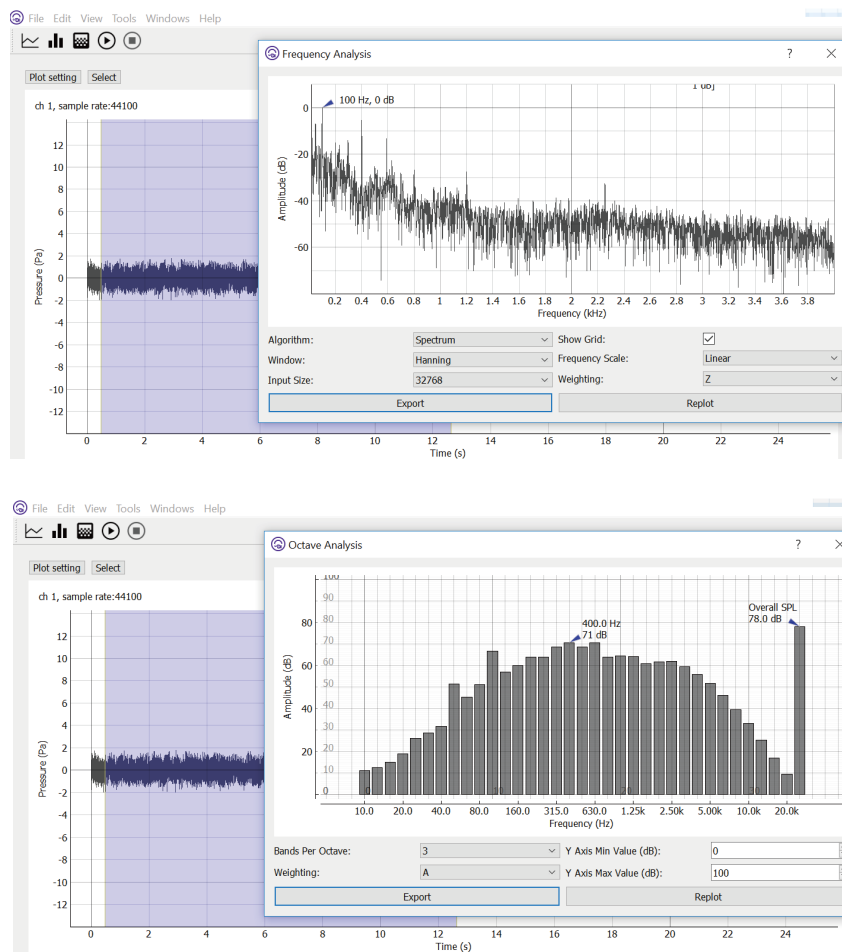
User can perform multi-channel simultaneous test with sensors, data analyser and SKC SVExpress software.

SVExpress software supports data analysing through both USB or TCP Ethernet connections, so that all our analyzers can be used.

User can set different input signal channel such as sound or vibration in the software according to test needs.



Hardware



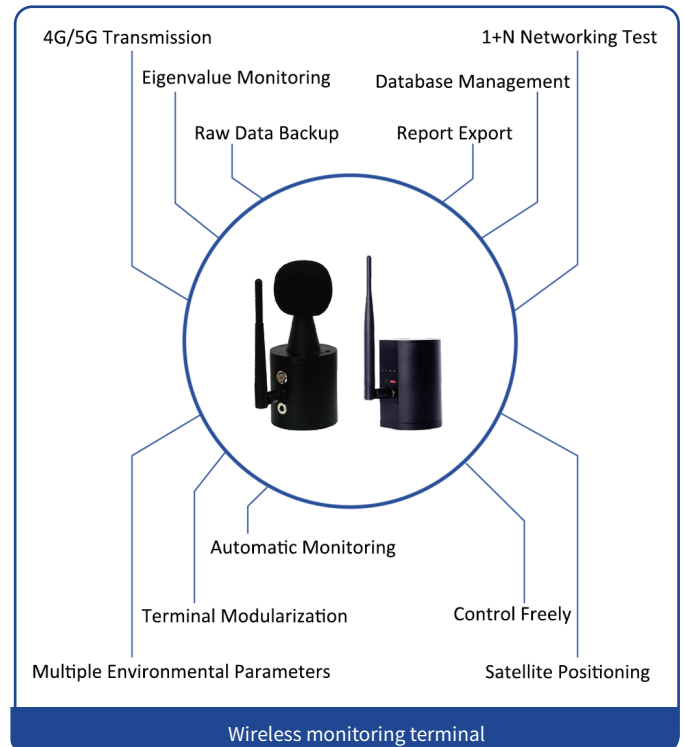
Software Interface

Wireless Sound and Vibration Test System

The system consists of the wireless monitoring terminal (noise or vibration), the local control terminal, the remote database storage and the display terminal.

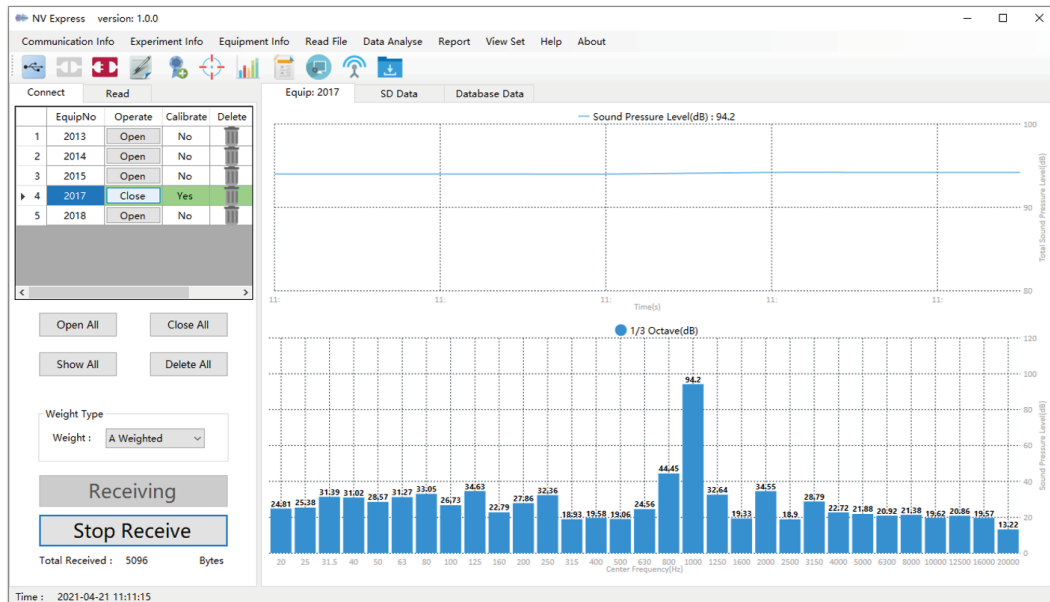
The monitoring terminal includes microphone (or accelerometer), signal acquisition module, signal processing module, device internal storage module, power supply module, transmission module (4G /Lora /Bluetooth/other ways).

User can transfer different data, for example raw data or calculated result through different transmission module.



NVExpress Software

The NVExpress software communicates with multiple monitoring terminals through the Lora protocol to synchronously collect test results.



Software Interface

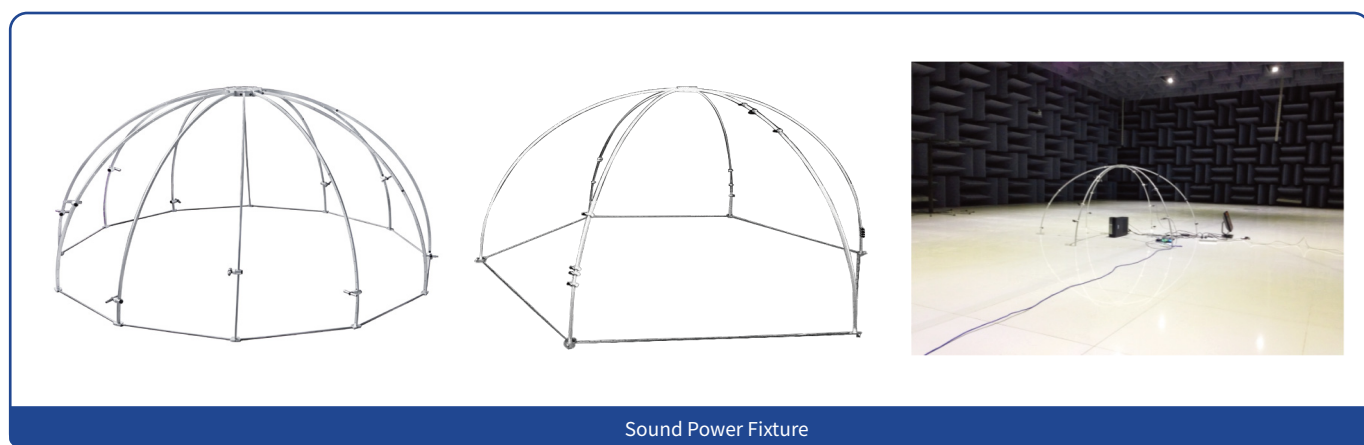
Sound Power System

The sound power fixture PZ1010/SP1020 is developed and produced according to the requirements for microphone test points in ISO3745 and ISO7779 standards.

Half or quarter inch microphones can be easily fixed to the fixture, and the structure can slide the microphone at will to meet the different needs of 10 or 20 points test.

The fixture adopts high-strength aluminum alloy cutting as a whole, the top pressing ring is fixed, and the bottom supporting rod is connected, which ensures the hemispherical stability of the fixture in the process of use.

According to the actual situation, the sound power test has certain requirements for the size of the test envelope. Our company can produce different diameter fixtures of 1 meter, 1.5 meters, 2 meters according to customer requirements.

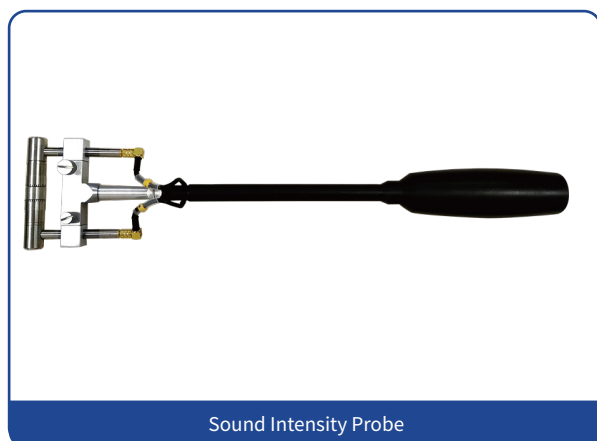


Sound Power Fixture

Sound Intensity System

SQ21 sound intensity test system can provide the amplitude and direction information of sound energy in the sound field. It is widely used in the fields of sound power measurement, sound absorption, sound transmission, noise source identification, sound source location and so on.

SQ21 is a face-to-face sound intensity probe, including three fixed spacers from 8mm to 50mm for microphone isolation. This design allows the user to change the microphone spacing without removing the probe.

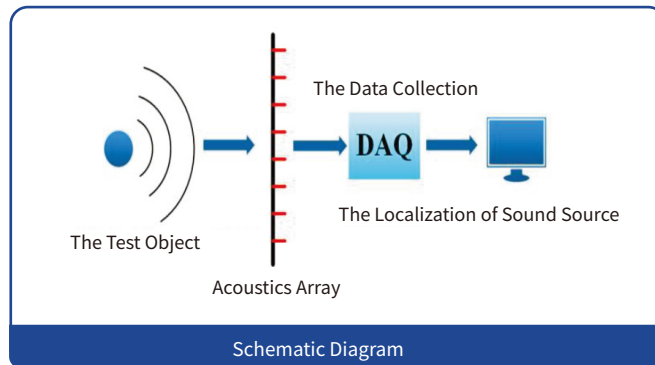


Sound Intensity Probe

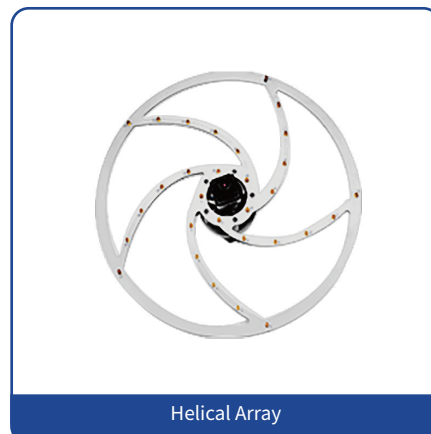
Sound Intensity Probe	
Type	SQ21
Frequency Range	8mm Spacing: 250 Hz~5000 Hz 12mm Spacing: 160 Hz~5000 Hz 50mm Spacing: 63 Hz~1250 Hz
Microphone Model	1/2", Type I Free Field
Preamplifier	Short Front for Sound Intensity
Microphone Sensitivity	50mV/Pa
Output Interface	7 Core Lemo
Microphone Input Interface	Five-meter Lemo to Two BNC Interfaces Are Standard.
Standard Compliance	IEC 1043 CLASS II

Acoustic Array System

Acoustic array system is widely used for the noise source location in many fields, such as aviation, automobile, machine tool and industry. Through the microphone array technology, the position and intensity information of the sound source at different frequencies can be accurately located. Also, the noise source can be understood, which is helpful to the corresponding noise reduction design.



SKC can design linear array, circular array, spherical array, multi-arm spiral array and other arrays according to the application requirements.





Solutions

35 Outdoor Noise Monitoring

36 Boundary Noise Monitoring

37 Active Noise Control

38 Structure Condition Monitoring

39 Vibration Attenuation Analysis

Outdoor Noise Monitoring System

The SQ-N-4 outdoor noise monitoring system can quickly deploy test points, and the number of terminals can be flexibly adjusted according to requirements, the weather monitoring module can be added according to the test requirements.

The original data will be automatically saved to the built-in SD card of the terminal to realize the safe backup of the original data.

In addition, the calculation results can be transmitted to the cloud platform through the wireless network, and the 2,000 pieces of historical data recently uploaded by the device can be queried through the cloud platform. The operation is simple and convenient, and the data is clear at a glance.



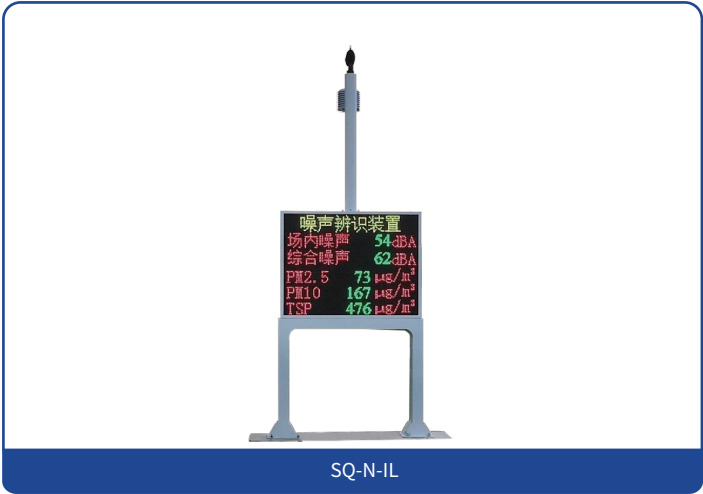
SQ-N-4

SQ-N-4	
Microphone	1/2 Inch Class 1 Condenser Free Field Microphone Dynamic Range: 17~136dB Frequency Range: 10Hz~20kHz
Typical Sensitivity	50mV/Pa
Sampling Rate	44.1kHz
Sampling Accuracy	24bits
Background Noise	27dB
Power Supply Mode	External Adapter Power Supply
Local Storage	Raw data is automatically subcontracted and saved Built-in 16GB SD Card for up to 30 Hours of Continuous Storage (Expandable Memory Card Capacity, Maximum Capacity 1TB, Can Store About 80 Days of Data)
Data Format (SD Card Data)	File Creation Time (Year Month Day Hour Minute Second) Raw Data (32-bit Hexadecimal Raw Data)
Data Structure Format (Wireless Data Transmission)	json String Containing The Following Fields: 1/3 Octave Result Sound Pressure Level Result Geographic Location Data

Boundary Noise Monitoring

The SQ-N-IL site boundary noise monitoring system has 3 microphones, it can perform real-time identification, monitoring and early warning of various noise data in selected areas, clarify the responsibility for pollution control in construction areas and non-construction areas, and help customers effectively monitor and control noise pollution.

The system is highly compatible and can be used with other environmental measurement kits and field displays.



SQ-N-IL	
Noise Type	Emission Noise, Combined Noise
Noise Measurement Accuracy	Class 2
Noise Dynamic Range	35 ~ 120dB
Noise Identification Frequency	160 ~ 5000Hz
Noise Display Delay Status	1s
Data Storage	Cloud Platform Automatic Storage, Easy Query
Data Alarm	Automatically Record Data and Alarm



Test Site

Active Noise Control

SKC can provide a complete active noise cancelling solution, which can be used in automobile, aircraft, high-speed railway, duct noise control etc.

ANC For High-speed Railway

The active noise control technology can reduce the noise in the environment of the high-speed railway carriage, and can enhance the comfort of the environment.



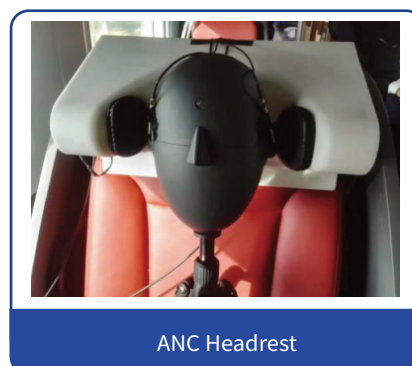
ANC in High-speed Railway Area

ANC Headrest

In addition to ANC solutions for large areas, SKC can also develop ANC headrests for local small areas of the head.



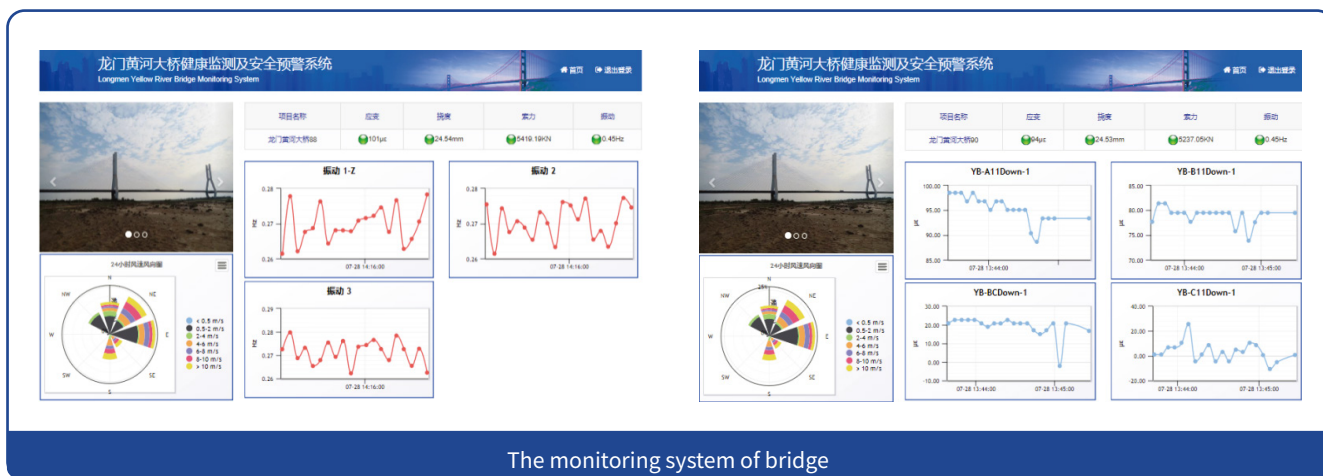
ANC Headrest



ANC Headrest

Structure Monitoring System

The structure monitoring system can monitor the strain, vibration, deflection, force and other data through various of sensors installed on the structure, such as bridge, and can login the platform at any time to view the real-time and historical data.



Vibration Attenuation Analysis

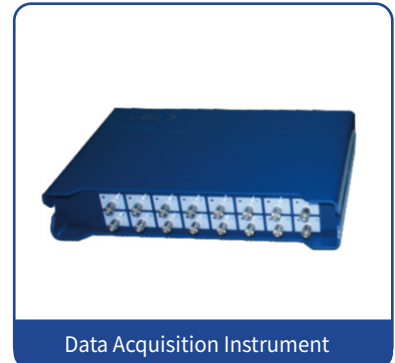
The vibration attenuation test system is designed and developed according to EN15461:2008 + A1:2010 “railway facilities, noise emission, dynamic function characteristics of track components used for noise measurement when train passes by”, it mainly consists data accelerometer, data acquisition analyzer, force hammer and software.



Force Hammer



Accelerometer



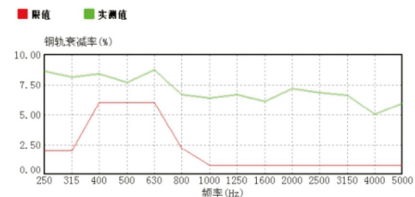
Data Acquisition Instrument

Measurement process

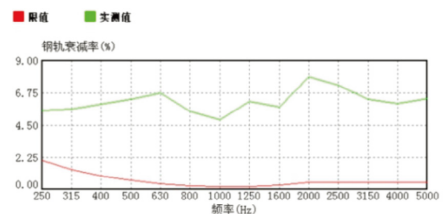
The accelerometer is fixed on the top and side of the rail to test the transverse and longitudinal attenuation rate of the rail respectively; a force hammer with sufficient rigidity is used to apply force pulses to the rail from the vertical and horizontal directions to ensure that the excitation force and response value are at an appropriate frequency meet the requirements within the scope. Acceleration measurements at different distances from the point where the excitation force is applied are obtained respectively. The final attenuation rate is calculated as a function of the frequency response of the longitudinal and transverse point measurements.



Test Field Diagram



Vertical Data



Horizontal Data

SKC

Product Manual

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