

# ECON

## Conditioning Amplifier

### Technical Specifications

AVANT<sup>®</sup> series



Econ Technologies Co., Ltd.

## Overview

As an important part of the test system, ECON also presents a powerful signal conditioning amplifier, with support for all types of transducers. It integrates filtering, integral and differential analysis functions. You can monitor the setting parameters, running status and some other measured data displayed on the front touch screen. It is quite flexible for different tests with versatile setting parameters. You can connect it to PC easily and set test parameters in your computer via RS232 interface. It also can be combined together for large scale applications. You can connect multiple conditioning amplifiers in series and set up all the conditioning amplifier signal parameters together.

## Features

- Up to 4 signal conditioning circuits
- Digital parameter setting, intuitive and easy to operate
- Input and output channels (via BNC connector) to connect quickly and reliably
- Support Charge, IEPE, and TEDS sensor input type
- Multi-stage low-pass, high-pass filter
- Set parameters through serial control interface (RS-232), single PC can control multiple conditioning amplifiers
- Compact and solid design with built-in battery, can be used for field and laboratory testing



**Conditioning Amplifier**  
**Type: MI-2004**

## Applications

- For IEPE, charge, TEDS accelerometer signal conditioning
- Signal amplification, high and low pass filtering, integral and double integral function
- For high quality field test and measurement verification work
- With the data collection instrument for vibration measurement

## Specifications

### Charge Input

Max. Input Charge:	10 <sup>6</sup> pC
Input protection	3000nC(peak) No damage
Transducer Sensitivity Range:	0.0001pC/Unit to 9999.0pC/Unit (Unit: mS-2,g)
High-pass Filter (-3dB):	0.1Hz, 1Hz, 3Hz and 10Hz
Low-pass Filter (-3dB):	100Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz and 100 kHz
Gain (Output Sensitivity):	10uV/Unit, 31.6uV/Unit,100uV/Unit, 316uV/Unit,1mV/Unit ...3.16V/Unit, 10V/Unit (Unit = pC , -40dB to 80dB, in 10dBsteps, set 1mV/Unit as 0dB)

### Charge Input

Frequency Range:	
Acceleration:	0.1 Hz to 100 kHz
Velocity:	1 Hz to10 kHz
Displacement:	1 Hz to 1 kHz
Output Accuracy:	
Acceleration:	≤±1%(1 Hz to 20 kHz)
Velocity:	≤±2%(3 Hz to10 kHz)
Displacement:	≤±5%(3 Hz to 1 kHz)
Inherent Noise:	≤0.01pC
THD:	referred to input at Max. Gain output ≤ 0.005% (Vin = 1V @ 1kHz, 0dB)

## IEPE or TEDS Input

Maximum input voltage:	$\pm 10V$ (peak)
Input Protection:	$\pm 36V$ (peak) is not damaged
Input impedance:	$\geq 1M\Omega$
IEPE constant current source:	Built-in, +4 mA / +24 V
Transducer Sensitivity Range:	0.0001mV/ Unit to 9999.0mV/Unit (Unit: mS-2, g)
High-pass Filter (-3dB):	0.1Hz, 1Hz, 3Hz and 10Hz
Low-pass Filter (-3dB):	100Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz and 100 kHz
Gain (Output Sensitivity):	100uV/Unit, 316uV/Unit, 1mV/Unit...316mV/Unit, 1V/Unit (Unit: pC, -20dB to 60dB in 10dB steps, set 1mV/Unit as 0dB)
Frequency Range:	
Acceleration:	0.1 Hz to 100 kHz
Velocity:	1 Hz to 10 kHz
Displacement:	1 Hz to 1 kHz
Output Accuracy:	
Acceleration:	$\leq \pm 1\%$ (1 Hz to 20 kHz)
Velocity:	$\leq \pm 2\%$ (3 Hz to 10 kHz)
Displacement:	$\leq \pm 5\%$ (3 Hz to 1 kHz)
Inherent Noise:	$\leq 20\mu V$ referred to input at Max. Gain output
THD:	$\leq 0.005\%$ ( $V_{in} = 1V @ 1kHz, 0dB$ )

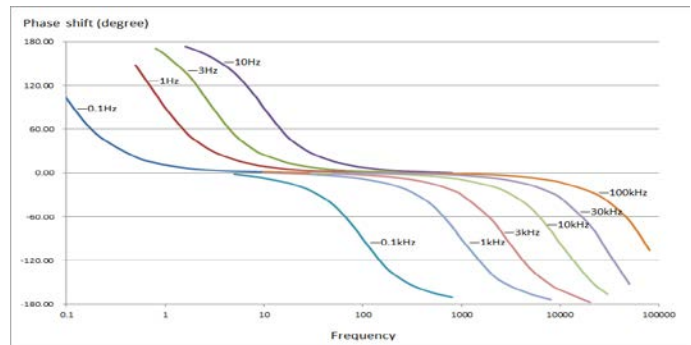
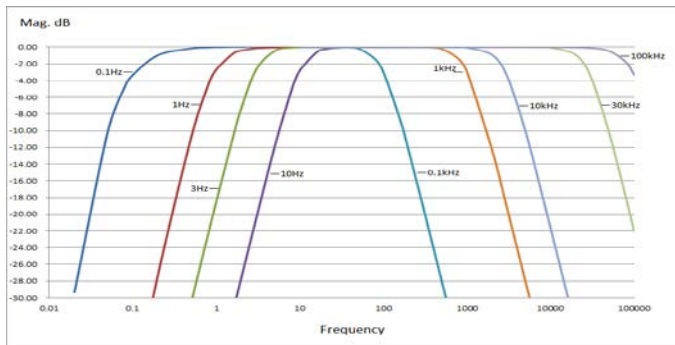
## PC software

Conditioning amplifier and the computer interface, multi-conditioning amplifier serial interfaces: RS-232 Plug and Play	
Baud Rate:	19200
Parity	None
Data bits:	8
Stop bits:	1

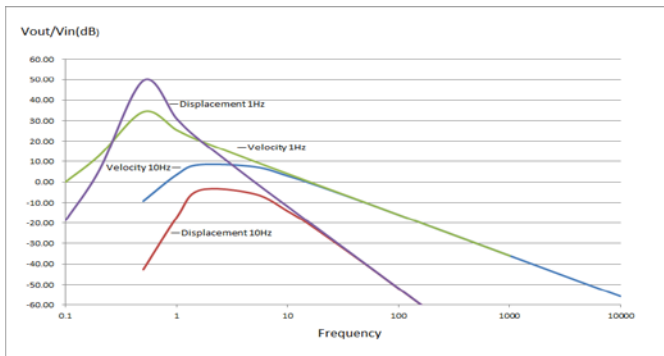
## I/O Specifications

Input-Output Channels:	1 to 4
Input Interface:	BNC Q9
Output Interface:	BNC Q9
Maximum output voltage:	$\pm 10V$ (peak)
Output Channel Impedance:	$1\Omega$
Power supply:	DC 12-28V
Display:	128 x 64 dot matrix LCD screen
Appearance:	110 x 180 x 310mm (H x W x D)
Weight:	4.45kG (4 channels, including lithium batteries, without power adapter)

Filter Attenuation Capability Curve



One Integral & Quadratic Integral Curve



## Hardware

Item	Part No.	Description
1	MI-2004-1	1-Channel High Precision Conditioning Amplifier
2	MI-2004-2	2-Channel High Precision Conditioning Amplifier
3	MI-2004-4	4-Channel High Precision Conditioning Amplifier
4	MI-20EX01	Rechargeable Lithium Battery
5	ACC-7000	Accessories

## Application Software

Item	Part No.	Description
1	2100	PC End User Control

## About Us

ECON is a leading designer and manufacturer of instruments and equipment for test and measurement, headquartered in Hangzhou, China

With more than 10 years experiences, ECON is also a comprehensive solution supplier for Vibration Test, Vibration and Noise Measurement and Analysis, Structural Model Test, Transducer Calibration, and Environmental Reliability Test.

- Leading role in design and manufacturing of instrument and equipment for test and measurement in China
- A global sales and marketing network.
- Over 2,000 instruments installed worldwide: China-Mainland, Taiwan, Europe, USA, Russia, Mid-east, India, Korea, and Japan.....
- Customers among Aerospace, Aviation, Automotive, Electronics, IT & Computers, Packaging, transportation, Institutes and Universities.....
- 70 employees, with an experienced and innovative R&D Team.
- A subsidiary company specialized in environmental test service

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