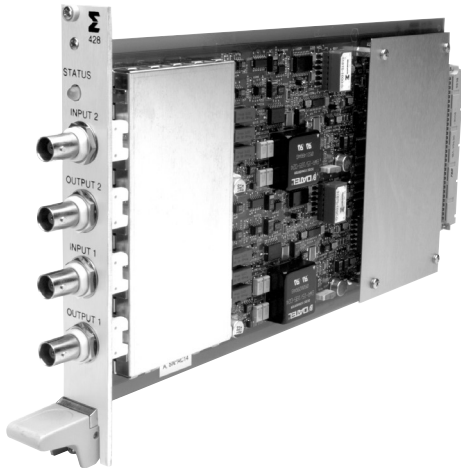


# Dual channel PE/Isotron<sup>®</sup> rack mounted signal conditioner

## Model 428



### Key features

- User selectable front-end
- Gain auto-ranging
- Gain 0 to 10 000
- Selectable butterworth 4-pole low-pass filter
- PE sensor detection
- 0.5 Hz to 120 KHz bandwidth (-3 dB Corners)
- AC or RMS DC output selected by internal switch

Endevco model 428 piezoelectric/Isotron signal conditioner is a high-performance, two-channel, rack-mounted card with an isolated single-ended front-end. This amplifier is designed for use with PiezoElectric (PE) accelerometers, Isotron accelerometers and remote charge converters (RCC). Each channel provides one AC output proportional to the AC voltage or charge input.

The AC output can be amplified with a programmable gain of 0 to 10,000 or can be automatically scaled using the auto-range feature. The selectable low pass 4-pole, Butterworth filter plug-in module is available in 1, 2, 4, 6 and 8 steps from 10 Hz to 60 KHz or custom. (The default filter corner is 10 KHz; See Endevco model 31875-XXXX.)

The model 428 dual-channel card is designed to be used with the Endevco rack model 4990A, 19" rack. The model 4990A rack is remotely controlled via ethernet or RS-232 interface and holds from one to 16 cards of the 400 series amplifiers in any combination.

The model 4990A rack provides the communication link (ethernet or RS-232) from a PC to the model 4xx cards. The system controlling program is a Windows<sup>®</sup> based application software providing an extremely user-friendly communication interface. The 4XX series amplifier card family includes: model 433 - a three-channel, non-isolated, DC bridge amplifier card; and model 482 eight-channel smart Isotron amplifier card.

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### Specifications

#### ELECTRICAL CHARACTERISTICS

SENSOR INPUT	PE High Impedance, single-ended with one side connected to signal ground
MAXIMUM CHARGE INPUT	< 110 000 pC, 0 ≤ gain < 1 < 11 000 pC, 1 ≤ gain < 10 000
SOURCE RESISTANCE	> 10 Meg Ohms
SOURCE CAPACITANCE	< 30 000 pF
ISOTRON	PE with internal electronics, single-ended with one side connected to ground, supplying constant current in a two-wire system. Constant current excitation may be disabled through the front panel allowing a voltage input.
CONSTANT EXCITATION CURRENT	Off, 4 mA, 10 mA; Computer selected.
ACCURACY	± 10 %
COMPLIANCE VOLTAGE	≥ 22 VDC
MAXIMUM INPUT VOLTAGE	< 22 V (AC + DC Components)
INPUT IMPEDANCE	100 Meg Ohms/33000 pF

#### OUTPUTS

TYPE	Single-ended with one side connected to ground. Signal proportional to input.
MINIMUM LINEAR OUTPUT	10 Vpk
MINIMUM CURRENT OUTPUT	10 mA (10V into a 1 KOhm load)
DC OFFSET	15 mV maximum for gain ≤ 1000 25 mV for gain > 1000 PE input 50 mV for gain > 1000 with IEPE input
PROTECTION	Short circuit protected

#### TRANSFER CHARACTERISTICS

GAIN	Programmable 0 to 10 000
RANGE/RESOLUTION	0.25 100 ≤ gain < 1000
ACCURACY AT 1 KHZ, FILTERS DISABLED	± 0.5%, 0.1 ≤ Gain < 10 000, ± 0.05% / gain, gain < 0.1
LINEARITY	± 0.1% full scale, best fit straight line at 1 KHz
BROADBAND MAGNITUDE FREQUENCY RESPONSE	- 5%, < 0.97 Hz to 40 KHz for gain > 1 -3dB, < 0.37 Hz to > 120 KHz for gain > 1

#### LOW PASS FILTER CHARACTERISTICS

Filter can be enabled or disabled. Corner frequency may be changed by replacing the internal header module (See data sheet 31875-XXXX for available filter corner frequencies.) The corner frequency will be displayed in software.

FILTER TYPE	4- Pole Butterworth
CORNER FREQUENCY (-3dB)	10 KHz ± 12% (Standard Default)
MAGNITUDE % ERROR AT CORNER FREQUENCY	± 22% Maximum
ROLL-OFF	-24 dB per octave
MAGNITUDE FREQUENCY RESPONSE	See Data Sheet 31875
PHASE FREQUENCY RESPONSE	See Data Sheet 31875
RESIDUAL NOISE	Noise specification valid for the following conditions: 1. Internal standard 10 KHz , 4-pole low pass filter enabled.
PIEZOELECTRIC	0.01 pCrms plus 0.001 pC per 1000 pF of source capacitance referred to input (RTI) plus 0.5 mVrms referred to output (RTO).
ISOTRON	10 microV rms referred to input (RTI), plus 500 microV rms referred to output (RTO). Input shunted with 249 Ohms (4 mA excitation) or 100 Ohms load (10mA excitation).
CROSSTALK BETWEEN CHANNELS	> 80 dB RTI minimum. Crosstalk specification valid for the following conditions: 1. Inject signal into one channel, gain set to 1. 2. Other channels set as follows: Input shunted with 1000 Ohms. Gain set to 10 000.

#### POWER REQUIREMENTS

VOLTAGE	± 15 VDC and + 24 VDC (Provided by Rack Model 4990)
POWER DISSIPATION	10 Watts typical
ISOLATION	
INPUT TO OUTPUT SIGNAL GROUNDS	Isolated.
CHANNEL TO CHANNEL OUTPUT SIGNAL GROUNDS	No isolation between channels.
OUTPUT SIGNAL GROUND TO CASE GROUND	No isolation.
INPUT SIGNAL GROUND TO CASE GROUND	Isolated.

#### PHYSICAL CHARACTERISTICS

SIZE	Fits into the Model 4990 Rack.
WEIGHT	16 oz (454 g)
CONNECTIONS	
Sensor Input (1 & 2)	BNC
AC Output (1 & 2)	BNC
TEMPERATURE	
Operating	32 to 122° F (0 to 50° C)
Storage	-40 to 185° F (-40 to 85° C)
HUMIDITY	0 % to 90 % non-condensing

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## Model 428

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**INCLUDED ACCESSORIES**

IM428  
31875-1000-0      10 KHZ LOWPASS FILTER MODULE  
EJ21                      BNC TO 10-32 ADAPTER

**OPTIONS**

31875-XXXX-Y      ADDITIONAL FILTER CORNER MODULES, SEE DATA SHEET

**Notes**

1. Maintain high levels of precision and accuracy using Endeveco's factory calibration services. Call Endeveco's inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

**Contact****ENDEVCO**

[www.endevco.com](http://www.endevco.com)

Tel: +1 (866) ENDEVCO

[+1 (866) 363-3826]