Encore’s Products and Services

Signal Conditioners
Encore Electronics manufactures signal conditioners and amplifiers for signals from strain gages, LVDTs, accelerometers, thermocouples, RTDs, pressure transducers and flow sensors. They are available in various configurations including rack assemblies, DIN-rail mount and computer-controlled amplifiers.

Applications
Encore’s products and services are used in a wide variety of engineering, industrial and technology applications including aircraft engine, automotive and turbine testing, product design, research and development, power generation and aerospace electronics.

Custom Engineering and Services
Encore’s engineering staff and associated test and shop facilities permit a quick response to your individual signal conditioning requirements. Our specialty is designing and building customized units to meet your specific needs.

Encore’s Delivery
In-stock units can ship overnight. Most custom requests, including new designs, are fulfilled and shipped within 4 weeks of receipt.

Rental
Equipment rentals are available on a monthly basis for your short term needs. Purchase options based on length of rental are available.

Additional Services
• Electronic cabling and assembly
• Small scale sheetmetal fabrication
• Painting and screen printing on metal
• Computerized PC board layouts

Quality Control
Encore’s quality control system is in accordance with MIL-I-45208A. We maintain a quality control manual available for review. ISO9001:2000 certification is pending.

Encore Electronics, Inc.
Since 1967, Encore Electronics, based in New York State, has pioneered custom designs and instrumentation that fulfill our customers’ needs worldwide.

Please call us today with your application needs.

866-936-2673
**Vibration Instrumentation**

Encore Electronics offers a wide variety of vibration monitors, conditioners and amplifiers for applications using accelerometers.

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**Model 144**  
**Accelerometer Conditioner**  
Compact and economical package in a two-channel portable carry case.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Three output modes:</strong></td>
<td>±10V at filtered signal frequency; 3½ digit LED voltmeter readout; relay trip protection</td>
</tr>
<tr>
<td><strong>Input signal:</strong></td>
<td>Accelerometer/charge converter; typically 50mV/g</td>
</tr>
<tr>
<td><strong>Excitation:</strong></td>
<td>4mAADC constant current to charge converter; 24VDC compliance</td>
</tr>
<tr>
<td><strong>Gain:</strong></td>
<td>Front panel switch selects pre-filter gains of 0.1, 1, or 10. Overall range 0.1 to 200</td>
</tr>
<tr>
<td><strong>Bandpass filter:</strong></td>
<td>Sharply tuned twin-tee filter at 120Hz (factory adjusted from 40Hz to 5kHz)</td>
</tr>
<tr>
<td><strong>AC output:</strong></td>
<td>Acceleration signal 120Hz filtered (0-7VRMS max)</td>
</tr>
<tr>
<td><strong>DC output:</strong></td>
<td>RMS/DC output (0-7VDC) or 4-20mA</td>
</tr>
<tr>
<td><strong>Display:</strong></td>
<td>3½ digit LED meter indicates RMS/DC output</td>
</tr>
<tr>
<td><strong>Alarm level:</strong></td>
<td>Settable by front panel trimpot from 0.1-7VRMS</td>
</tr>
<tr>
<td><strong>Mechanical:</strong></td>
<td>Available in a two-module carry case</td>
</tr>
</tbody>
</table>

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**Model 149**  
**Dual Channel Charge Amplifier Module**  
Provides a DC (RMS) signal from charge mode accelerometers for acceleration, velocity and displacement in engineering units.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input signal:</strong></td>
<td>Charge output from accelerometer</td>
</tr>
<tr>
<td><strong>Input sensitivity:</strong></td>
<td>1 to 11pC/g or 10 to 110pC/g with 10-turn locking adjustment</td>
</tr>
<tr>
<td><strong>Acceleration gain:</strong></td>
<td>Front panel switch selects 10mV/g or 100mV/g</td>
</tr>
<tr>
<td><strong>Acceleration frequency response:</strong></td>
<td>5Hz to 15kHz (factory adjustable)</td>
</tr>
<tr>
<td><strong>Integration:</strong></td>
<td>Two stages convert acceleration to displacement, unity gain frequency set at 350Hz</td>
</tr>
<tr>
<td><strong>Displacement gain:</strong></td>
<td>Front panel switch selects 10mV/mil or 100mV/mil</td>
</tr>
<tr>
<td><strong>Acceleration output:</strong></td>
<td>±10V max, 10mA peak load</td>
</tr>
<tr>
<td><strong>DC output:</strong></td>
<td>DC voltage equal to RMS value of either acceleration or displacement signal, selected by front panel switch; +7VDC max</td>
</tr>
<tr>
<td><strong>Maximum signal input:</strong></td>
<td>12000pC peak, up to 2kHz</td>
</tr>
<tr>
<td><strong>Calibration:</strong></td>
<td>Onboard sinewave charge source</td>
</tr>
<tr>
<td><strong>Mechanical:</strong></td>
<td>19”W x 5.25”H x 9”D, eight module 16-channel rack adapter or two module four-channel carry case</td>
</tr>
</tbody>
</table>

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**Model 158**  
**Vibration Amplifier**  
Used to convert acceleration signal inputs to velocity outputs. Typically scaled for 2 inches/second peak velocity when used with a 100mV/g accelerometer.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input:</strong></td>
<td>Accelerometer, 100mV/g sensitivity</td>
</tr>
<tr>
<td><strong>Accel excitation:</strong></td>
<td>4mA ±2% at 24VDC to input connection</td>
</tr>
<tr>
<td><strong>Output:</strong></td>
<td>4-20mA current loop output, into 0-600 ohms load resistance</td>
</tr>
<tr>
<td><strong>Full scale output:</strong></td>
<td>2 inches/second peak velocity results in 20mA output</td>
</tr>
<tr>
<td><strong>Zero signal output:</strong></td>
<td>Zero acceleration results in 4mA output</td>
</tr>
<tr>
<td><strong>Calibration level:</strong></td>
<td>0.14VRMS input (1.4gRMS) at 60.14Hz results in full-scale 20mA output</td>
</tr>
<tr>
<td><strong>Frequency range:</strong></td>
<td>5Hz to 2000Hz filtering, or customer-specified range</td>
</tr>
<tr>
<td><strong>Accel signal output:</strong></td>
<td>Buffered accelerometer signal on separate BNC</td>
</tr>
<tr>
<td><strong>Sensor fault alarm:</strong></td>
<td>Red LED indicating open/shorted accelerometer reduces 4-20mA output below 2mA</td>
</tr>
</tbody>
</table>

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Innovation  
Precision  
Reliability
Vibration Instrumentation

Model 165
General Purpose
Vibration Monitor
Switch-selectable to display acceleration, velocity or displacement.

SPECIFICATIONS
Input: 100mV/g accelerometer with 15 ft. cable (included)
Accel excitation: 4mA ±2% at 24VDC to input connection
Lowpass filter output: Switch-selectable acceleration, velocity or displacement display
Highpass filter: 1.6Hz or customer-specified
Integration: Two stages of integration with unity gain at 40Hz
Connectors: BNC

Model 521/522
Dual Channel Low Cost
AC Vibration Amplifier Module
Plugs into Encore’s 19” eight-slot rack or two-slot carry case.
Eight-slot rack accommodates up to eight modules for 16 channels. Amplifier provides gain, noise filtering and RMS/DC output for any voltage input signal. Front panel gain adjustments provided to match output to desired engineering units. Model 522 adds an integration stage.

SPECIFICATIONS
Transducer excitation: -20VDC at 6mA per channel
Input signal: Voltage 0 to 70VRMS max
Gain: Three calibrated settings of 0.1, 1, and 10, plus 10:1 attenuator
Integrator frequency (522): Unity gain at 307Hz, factory adjustable
Frequency response: 10Hz to 100kHz
Signal output: ±10V max, 10mA peak load

General Purpose Signal Conditioner System (GPSC)
Designed with common edge card wiring to accommodate various modules.
Operates on 115VAC or 12VDC through a modular power supply.
Common cal input on the rear of the chassis provided to calibrate the entire system.
The GPSC rack or two module carry case may be populated using any combination of the following modules:
Model 118 - Potentiometer Conditioner
Model 119 - LVDT/LVRT Conditioner
Model 145 - Dual Channel Charge Amplifier
Model 149 - Dual Channel Charge Amplifier
Model 151 - Digital Voltmeter Module
Model 223 - F/V Converter
Model 521 - Proximitor Conditioner
Model 522 - Vibration Amplifier with Integrator
Model 633 - Strain Gage Amplifier
Model 849 - DC Power Supply Module 10 to 15VDC input (portable applications)
Signal Conditioners

Encore Electronics designs and manufactures instrumentation to work in conjunction with various signals and to meet specific customer needs.

Model 146
Load Cell Conditioner
Strain gage conditioner for load cell applications. 4½ digit LCD display switch-selectable to show excitation or amplifier output.

SPECIFICATIONS
Gain: Switch-selectable from 1 to 1000 in log steps with vernier
Offset: Referred-to-input and referred-to-output offset adjustment pots
Filter: Switch-selectable lowpass filter at 10, 100, 2k or 10kHz, plus bypass
Output: ±10VDC max, up to 10mA load
Excitation: 1.25VDC to 15VDC, front panel adjustable, plus on/off switch
Bridge completion: Internal completion resistors for full, half or quarter bridge configurations
Bridge balance: 10-turn locking trimpot plus coarse/medium/fine range select
Calibration: Switch-selectable precision cal resistors can be placed across one leg of the bridge

Model 147
LVDT Signal Conditioner
4½ digit LCD display switch-selectable to show excitation, calibration voltage, or amplifier output. Available with two- and four-module bench top carrying cases.

SPECIFICATIONS
Gain: Switch-selectable 0.5, 1, 2, or 5 with vernier
Filter: Fixed lowpass filter at 1kHz, four-pole Bessel response
Output: ±10VDC max, up to 10mA load
Excitation: Two sources, +18VDC and +6VDC front panel adjustable
Suppression: 10-turn lockable trimpot adjusts DC offset injection from 0-6VDC
Connectors: Bridge inputs are PT02-style bulkhead connectors; amplifier outputs are BNC

Model 227
Analog Frequency to Voltage Converter
Wideband converter with six frequency ranges from 200Hz to 10kHz and input isolation to 1000V.

SPECIFICATIONS
Input: 0.025V peak to 100V peak
Input isolation: Transformer isolated to 1000VRMS
Common mode rejection: 2.5VRMS
DC to 1kHz will not trigger the unit
Frequency range: Six full scale ranges selected with front panel switch; 200Hz, 500Hz, 1kHz, 2kHz, 5kHz, 10kHz
Analog output: 0-10VDC full scale output with front panel trimpot to adjust span; front panel BNC for voltmeter monitoring
Mechanical: 19”W x 5.25”H x 11”D for a six-module rack assembly, two-channel portable carry case also available

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**Model 422**
Thermocouple Isolation Amplifier

Each module is dual channel with CJC for Type J thermocouples. Type K available upon request.

TC isolated from the output by up to 3500VDC. Millivolt signals can also be isolated and amplified.

**SPECIFICATIONS**

- **Input**: Type J thermocouple connector (type K also available) or millivolt signal
- **Cold junction compensation**: Type J or K
- **Output**: 10mV per °C; 3.1mV at 0°C
- **Voltage input scaling**: Factory set at unity gain; other gains available
- **Gain accuracy**: ±0.5% max
- **Input-output isolation**: ±3500VDC or 2500VRMS
- **Open TC indication**: Front panel LED on open channel
- **Frequency response**: Two-pole low-pass filter with -3dB point at 10kHz
- **Mechanical**: PC boards mounted in ten-channel 19” rack adapter

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**Model 619M**
Instrumentation Amplifier with Filtering

Low cost differential amplifier useful in test environments where high CMRR is desired.

**SPECIFICATIONS**

- **Input signal**: ±10V max on x1.0 range; ±100V max on x0.1 range
- **Input impedance**: 100k ohms minimum each input
- **Operating modes**: DC coupled, AC coupled, zero
- **Gain**: Switch-selectable 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 plus x1.0/x0.1 attenuator
- **Gain vernier**: Continuously adjustable lockable 10-turn dial spans gain steps
- **CMRR**: 75dB, DC to 70Hz
- **Frequency response**: DC to 100kHz unfiltered
- **Filter**: Four-pole lowpass filter, switch-selectable for 300Hz, 1kHz, 20kHz and out
- **Other frequencies available on request**
- **Signal output**: ±10V max, 100mA peak load
- **Output noise**: 10mV RMS RTI max, DC to 20kHz at G=1000
- **Input DC offset suppression**: 0 to ±1.2V in x1.0 range, 0 to ±12V in x0.1 range

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**Model 632**
Strain Gage Amplifier

Auto balance, adjustable bridge excitation, selectable bridge completion with capacity of sixteen channels per 19” rack adapter.

**SPECIFICATIONS**

- **Bridge configuration**: Quarter, half, and full bridges; switch-selectable
- **Bridge completion**: Switch selects either 120 ohm or 350 ohm internal precision completion resistors
- **Bridge excitation**: Front panel adjustable, 0 to 15VDC; front panel on/off switch; BNC provided for volt-meter monitoring
- **Bridge balance**: Auto: Remote control activation of bridge balance on all modules
- **Manual**: Adjustable via front panel trimpot
- **Gain**: Front panel switch-selectable gains of 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000
- **Frequency response**: DC to 100kHz
- **Calibration**: Shunt cal activated by remote command; internal cal resistors provided for 120/350 ohm bridges
- **Signal output**: ±10V max, 100mA peak load
- **Output noise**: 5mV RMS RTI max, DC to 100kHz at G=1000
Model 633
Cost-Effective Strain Gage Amplifier
Provides two channels per module, for up to sixteen channels per 19” rack.

SPECIFICATIONS
Bridge configuration: Quarter, half, and full bridges with internal bridge completion header.
Bridge excitation: Front panel adjustable, 1.25 VDC to 10.0 VDC; monitor jacks provided for voltmeter monitoring. Constant current excitation available.
DC shunt calibration: Front panel switch actuated header-mounted calibration resistor
Gain: Switch-selectable 1, 100, 200, 500, 1000 with adjustable gain vernier
Frequency response: DC to 20kHz, -3dB, G=1 to 500
DC to 15kHz, -3dB, G=1000
Signal output: ±10V max, 10mA peak load
Output noise: 5mV RMS RTI max, DC to 20kHz at G=1000
Available in four- and sixteen-channel configurations

Model 635
Strain Gage Amplifier
Very low output noise, broadband response and auto-bridge balance.
Dual channels allow dynamic and static measurements simultaneously from one bridge.

SPECIFICATIONS
Bridge configuration: Quarter, quarter dynamic, half and full bridges; switch-selectable
Bridge completion: Switch selects either 120 ohm or 350 ohm internal precision completion resistors
Bridge excitation: Front panel adjustable, isolated 1.25VDC to 15.0VDC; front panel on/off switch; monitor jacks provided for voltmeter
Bridge balance: Front panel pushbutton or remote control activation of autobridge balance cycle
LED indicates unbalanced condition
Operating modes: Switch selects AC coupled, DC coupled, zero, DC cal or external cal signal
Gain: Main channel: Front panel 1- 5000; DC channel: Board-mounted jumper selectable gain of 1, 100, 200, 500
Frequency response: DC to 100kHz, with filters at 200, 500, 5k, 16k, 32kHz
DC channel: DC to 10Hz
Calibration: Shunt cal or external cal
Signal outputs: ±10V max, 100mA peak load
Output limit: Front panel LED lights if output signal exceeds 1VRMS
Output noise: 2.5mV RMS RTI max, DC to 32kHz at G=1000
A variety of rack adapters are available depending on the number of channels needed

Model 910
Rack Mounted Carrier Amplifier
Provides 1kV bridge isolation. Used where strain gages are mounted in an electrically noisy environment such as a 60Hz electromagnetic field. Provision is made for synchronization.

SPECIFICATIONS
Bridge configuration: Accommodates a 3-wire strain gage
Bridge completion: Completion resistors can be external or mounted to an internal header
Bridge excitation: 1.4-7VRMS at 10-20kHz with one common source for all modules in rack; frequency and amplitude are front panel adjustable; multiple racks may be synchronized to one master
Bridge balance: Front panel trimpots provide both resistive and capacitive balancing adjustments
Operating modes: Switch selects zero, null, operate or DC cal
Gain: Front panel switch-selectable gains of 100, 200, 500, 1000, 2000 with lockable gain vernier
Isolation: 1kVRMS for externally connected bridge elements and calibration resistor
Frequency response: Four-pole active filter; five position switch selects 30Hz, 100Hz, 300Hz, 1kHz, or 5kHz
Carrier filter: Six-pole active filter; 120dB attenuation at carrier frequency; 105dB attenuation at 2x carrier frequency

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Filters

Encore Electronics offers lowpass, highpass, bandpass, bandstop and anti-aliasing filters. Designs feature switch-selectable cutoffs, switched-capacitor tracking filters and twin-tee notch/bandpass types. Active filters are available in two- to eight-pole designs with rolloffs to 100kHz.

Model 711
14-Channel Universal
Highpass/Lowpass Filter

Designed to be used with strain gage, accelerometer or vibration measuring systems.

**SPECIFICATIONS:**
- **Response:** Each channel can be highpass or lowpass depending on the filter module
- **Frequency:** Customer-specified -3dB frequencies from 0.3Hz to 30kHz for each of five positions per module, plus filter bypass
- **Attenuation:** 24dB per octave (four-pole filter)
- **Response:** Butterworth or Bessel
- **Gain:** 0dB ±0.3dB in passband
- **Signal range:** ±10V max
- **Input impedance:** 100k ohms minimum
- **Connections:** Rear panel mounted BNC connectors for input and output signals
- **Construction:** 19” wide rack adapter

Model 721/721M
Switch Selectable
Anti-aliasing Filter

Modular rack-mounted lowpass filter. Two channels per module and up to 16-channels per rack. One of five frequency cutoffs or filter bypass selected with front panel rotary switch for each channel.

**SPECIFICATIONS:**
- **Frequency:** Customer-specified -3dB frequencies from 0.3Hz to 30kHz for each of five positions per module, plus filter bypass
- **Attenuation:** 48dB per octave (eight-pole filter)
- **Response:** Bessel response (linear phase) standard; Butterworth available
- **Gain:** 0dB ±0.3dB in passband
- **Model 721M adds switch-selectable gain of 1, 10 or 100
- **Signal range:** ±10V max
- **Input impedance:** 100k ohms min.
- **Test points:** Front panel tip-jack connections for output signal monitoring
- **Rack:** Modules plug into Model 4015-109 19” rack with integral power supply
- **Connections:** Rear panel mounted BNC connectors for input and output signals

Model FL724
Notch Reject Filter
(DIN-Rail Module)

Can be configured for up to 55dB of signal rejection at 60Hz or 50Hz. Operates in conjunction with the ±15VDC power module (#FL854). Offered in 60Hz or 50/60Hz configurations.

**SPECIFICATIONS:**
- **Input signal:** 0-7VRMS
- **Output signal:** 0-7VRMS, DC to 10kHz, 5mA max into 2k ohm min. load
- **Notch frequency:** 50Hz or 60Hz
- **Attenuation:** Greater than 50dB at the selected frequency
- **Connections:** Six wire-clamp screw terminals
- **Mechanical:** 2.9”H x 0.9”W x 3.1”D DIN-rail mount

Encore Electronics
www.encore-elec.com
Power Supplies

Both linear and switching power supplies are available for instrument and control systems. These units are available in modular (plug-in), rack-mountable and benchtop configurations. Power supply monitoring and electronic test loads are also offered.

Model 821
Multi-Output Linear Power Supply

Rack-mountable supply with four floating and regulated DC output voltages. Mainly used for signal conditioning power requirements. Load monitor meter for all outputs.

SPECIFICATIONS:

**Input:** 115V or 230VAC @ 50/60Hz
**Typical outputs:** Dual ±15VDC @ 2A; 5VDC @ 2A; and 24VDC @ 0.5A
**Regulated outputs:** Four voltages, all floating with respect to power supply common and ground, allowing any jumper-selected combination of polarities
**Regulation:** ±0.1% typical line and load
**Ripple:** Less than 10mV p-p
**Front panel meters:** Three at 0-3ADC from the 15V and 5V output and one at 0-1ADC for the 24V output
**Connections:** Five-way banana jacks with shorting links

Model 842B
Series Regulated Power Supply

Tightly regulated for applications requiring low ripple and noise. Heat sinks on the rear of the supply provide adequate convection cooling for operation without the need for fans.

SPECIFICATIONS:

**Input voltage:** 97 to 132VAC, 47 to 500Hz, 10ARMS at full load
**Output:** 842-22: -22VDC ±0.5V, 0 to 15ADC 842-24: +24VDC ±0.5V, 0 to 15ADC 842-30: +30VDC ±1.0V, 0 to 12ADC
**Regulation:** 0.1% max over line and load variations
**Ripple:** 1mVRMS max
**Output protection:** Overvoltage and current limited
**Front panel:** Analog meters display output voltage and current

Model 850A
Regulated 23VDC Linear Power Supply

Designed for applications requiring low ripple and noise. Can operate in standby mode with backup unit for critical power applications.

SPECIFICATIONS:

**Input voltage:** 115VAC ±10%, 50/60Hz
**Output voltage:** 23VDC adjustable from 21 to 25VDC
**Load:** 0 to 12ADC, limited to 18ADC
**Regulation:** ±10mV, line and load
**Ripple:** <2mVp-p
**Output protection:** Overvoltage and current limited
**Load sharing:** Two units in parallel operation allows the highest voltage output to assume the load
Power Supplies

Model 851A
Regulated 125VDC Linear Power Supply

Designed for applications requiring low ripple and noise. Can operate in standby mode with a backup unit for critical power applications.

SPECIFICATIONS:

- **Input voltage:** 115VAC ±10%, 50/60Hz
- **Output voltage:** 125VDC adjustable from 122V to 128V
- **Load:** 0 to 3ADC, limited to 4.5ADC
- **Regulation:** ±50mV, line and load
- **Ripple:** <10mVp-p
- **Output protection:** Overvoltage and current limited
- **Load sharing:** Two units in parallel operation allows the highest voltage output to assume the load

Model 853
Instrumentation Power Supply

Can operate in standby mode with a backup unit for critical power applications. LEDs monitor output voltage.

SPECIFICATIONS:

- **Input voltage:** 115VAC ±10%, 50/60Hz
- **Output voltage:** Adjustable range
  - Output 1: +5VDC, ±0.5V @ 1A
  - Output 2: +15VDC, ±1V @ 1A
  - Output 3: -15VDC, ±1V @ 1A
  - Output 4: +26VDC, ±1V @ 3A
  - Output 5: -24VDC, ±1V @ 0.2A
- **Regulation:** 0.15% line and load
- **Ripple:** <3mVp-p
- **Output protection:** Overvoltage and current limited
- **Load sharing:** Two units in parallel operation allows the highest voltage output to assume the load
DIN-Rail (Flexi-line) Instrumentation

Encore offers a line of compact, economical instrumentation packaged in plastic DIN-rail mounted enclosures. Available models include a frequency to voltage converter, strain gage amplifier, notch filter, accelerometer conditioner, line driver, power supply and others.

Models Available

**FL157 Magnetic Pick Up Line Driver**
- **Input:** Magnetic speed pickup, ±100mV to ±60V
- **Output:** 0-5V pulses ±0.25V at the input frequency
- Frequency range: 20Hz to 200kHz

**FL161 4-20mA Accelerometer Conditioner**
- **Input:** Accelerometer, 100mV/g (not supplied)
- **Accel excitation:** 4mA, ±2% at 24VDC to input connection
- **Output:** Internal jumper selects voltage or 4-20mA current output

**FL228 Frequency to Voltage Converter**
- **Input signal:** 0.5V peak to 20V peak, DC coupled
- **Frequency range:** Single range, factory settable; standard is 10kHz full scale
- **Analog output:** Up to 10VDC fullscale output

**FL230 Voltage to Frequency Converter**
- **Input:** 0-10V; 4-20mA; -0.6 to 3.4V (depending on version selected)
- **Output:** 0-5V pulses (frequency proportional to input signal); 0-15V or open collector output available
- **Frequency range:** Customer-specified

**FL424 Dual Channel Thermocouple Amplifier**
- **Input:** Type K thermocouple
- **Output:** 3mVDC per °F; 0 to 4.76VDC for -50°F to 1500°F

**FL639 Strain Gage Amplifier**
- **Bridge configuration:** Quarter, half and full bridges
- **Bridge excitation:** Front panel adjustable, 4 to 10VDC or constant current of 10 to 20mADC
- **Gain range:** 2-2000

**FL644 High Voltage Isolation Module**
- **Input:** 0 to 1000VRMS (ver. 001), 0 to 10VRMS (ver. 002)
- **Input isolation:** ±1000VDC
- **Gain:** 0.01 to 1000 (depending on version)
- **Frequency response:** DC to 15kHz, ±5%

**FL645 RTD Conditioner**
- **Input:** 100 to 300 ohm RTD
- **Input isolation:** ±1000VDC
- **Output:** 100 to 300 ohm RTD

**FL646 Thermocouple Conditioner**
- **Input:** Thermocouple or other millivolt signal up to ±40mVDC
- **Gain:** 250, ±1%
- **Output:** 0 to ±10VDC at 5mA max

**FL651 Differential Instrumentation Amplifier**
- **Input:** 0 to ±500V peak
- **Output:** ±10V, 5mA max
- **Gain:** 0.01 to 1000
- **Frequency range:** DC to 100kHz (customer-specified)

**FL724 Notch Filter**
- **Input signal:** 0-7VRMS
- **Output signal:** 0-7VRMS, DC to 10kHz, 5mA max into 2k ohm min. load
- **Notch frequency:** 50Hz or 60Hz

**FL854 AC/DC Power Supply (Regulated)**
- **Input:** 115VAC, ±10%, 50/60Hz
- **Outputs:** Regulated ±15VDC, ±1%; unregulated ±22VDC nominal ±1%

**FL857 AC/DC Power Supply (Unregulated)**
- **Input:** 230VAC (-001 version is 115VAC) ±10%; 50/60Hz
- **Output:** Unregulated +22VDC
NEW PRODUCTS
Computer-Controlled Systems

Encore Electronics manufactures computer-controlled amplifiers and signal conditioning instrumentation which can be controlled via your web browser through an ethernet connection.

Internal battery backup to maintain settings. Interactive software control over all features through a web browser. Custom software for specific applications available.

Model 662
Computer-Controlled Strain Gage Amplifier System

Analog output to ±10V levels. Low noise levels, automatic offset adjustment and bridge balance. Programmable voltage excitation from 1 - 15VDC, remote sensing.

SPECIFICATIONS:
- **Gain**: Eight fixed gains- 1, 3.01, 10, 30.1, 100, 301, 1000, 3010
- **Gain accuracy**: ±0.5%
- **Filter**: Eight-pole Bessel lowpass at 1, 10, 100Hz
- **Noise**: Less than 0.3mV RMS RTI, G=1000, 100Hz filter, zero mode
- **Bridge connection**: Eight-wire: ±P and ±S with remote sensing (±Ps and ±Ss)
- **Excitation range**: 1-15VDC, ±50mV accuracy, 4mV resolution
- **Bridge balance**: Automatic on request with status report message
- **Balance resolution**: Coarse and fine ranges, 12-bit (4096 step) per range
- **Bridge modes**: Quarter, half, full bridge with internal completion resistors
- **Completion resistors**: Selectable 350 ohm or 1000 ohm precision resistors
- **Shunt cal**: 50k or 500k precision resistor

Model 656
Computer-Controlled Strain Gage Amplifier System (Full-Featured)

Amplifier characteristics similar to Encore’s Model 635. No knobs, indicators or connectors on the rack front panel. In addition to all the features of Model 662, the 656 has continuously-variable gain from 1 to 3000, isolated excitation supply per channel, excitation monitor function, AC coupled amplifier mode, 1/4 dynamic and EMF (no completion) bridge modes. External calibration signal can replace bridge input.

SPECIFICATIONS:
- **Output range**: ±10V (7VRMS) max
- **Gain**: 0.1 - 3000 (continuously variable), 0.1% resolution, 1% accurate
- **Offset**: Autozero cycle at each gain and filter change, ±100mV RTO range
- **CMRR**: 120dB DC-70Hz
- **Bandwidth**: DC-100kHz, filter bypassed, 1VRMS
- **Filtering**: Eight-pole lowpass, 10, 100, 1k, 10kHz, -3dB highpass
- **Noise**: 2.0mV RMS RTI, DC to 10kHz at G=1000
- **AC/DC coupling**: 4.8Hz, -3dB highpass
- **Bridge excitation**: 1-15VDC in 4mV steps plus off; remote sense
- **Excitation monitor**: Amplifier output can be replaced by 1/2 excitation voltage
- **Autobalance**: Dual 12-bit DAC, coarse and fine resolution
- **Shunt calibration**: One of four internal RCAL values to +P or –P
- **Voltage calibration**: External cal signal substitution for input signal
- **Bridge configuration**: Quarter, half and full bridges, quarter dynamic, EMF
- **Bridge completion**: 120 and 350 ohm or any two customer-specified values
- **Mechanical**: 8.75”H x 19”W x 16”D 16-channel rack; 7”H x 10”W x 16”D six-channel carry case