Guide to DSI’s

**Hardwired Amplification**

Digital Signal Conditioners and Accessories

ACQ-7700 Signal Conditioner
Better signals mean better data

The 7700 Platform has a unique sampling mechanism employing a combination of sampling rate and span to provide optimal resolution for many applications:

- Cardiovascular
- Hemodynamic
- Respiratory
- Isolated Organ
- Central Nervous System

DSI's 7700 digital signal conditioners and accessories accelerate your research by delivering better resolution of data using the latest Digital Signal Processors. Our signal conditioners filter the data, eliminating inaccuracies and signal offsets, preventing issues that often arise from analog components.

By using the 7700 Platform with Ponemah Analysis Software you achieve stable, accurate and robust data acquisition and analysis routinely performed in physiology, pharmacology and toxicology laboratories.

DSI 7700 State-of-the-Art Digital Technology offers:

- Easy Graphical User Interface (GUI) setup
- 16 bit resolution
- Less noise, less drift, better stability
- Universal input for multiple physiological signals
- Low cost per channel
- Compact design with flexible application-specific signal conditioner modules available (2, 6, and 13 slot chassis available)
- Synchronization of your hardwired data directly with DSI implanatable telemetry data
- CFR21 Part 11 compliance — all data and changes saved in a configuration file and audit log
- USB interface to workstation

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**Table:**

<table>
<thead>
<tr>
<th>Model</th>
<th>13-7715-59 Universal XE</th>
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</thead>
<tbody>
<tr>
<td>Description</td>
<td>All-purpose or “Universal” input for physiological signals. Handles a wide variety of signals such as biopotential signals, pulmonary pressure and flow signals, cardiovascular signals, temperature signals, isolated tissue and a variety of pressure or tension measurement.</td>
</tr>
<tr>
<td># Channels</td>
<td>4</td>
</tr>
<tr>
<td>Type of Coupling</td>
<td>AC/DC/Gnd</td>
</tr>
<tr>
<td>Maximum Rate</td>
<td>100K Samples/Second per channel</td>
</tr>
<tr>
<td>Excitation Voltage</td>
<td>2.5, 5, 7.5VDC ±1%, and 10VDC ±5% @ 15mA, OFF</td>
</tr>
<tr>
<td>Digitizer</td>
<td>Per Channel</td>
</tr>
<tr>
<td>Options/Accessories</td>
<td>Three lead ECG cable and assorted lead wires: YSI 700 Series temperature probe; isolated/defibrillation protected ECG Probe, General Purpose Probe; BD Medical P23, and disposable pressure transducers; headstage amplifiers and a variety of other transducers, equipment and cabling.</td>
</tr>
</tbody>
</table>

**Signal Characteristics**

| Input Impedance | 10M Ohm |
| Range           | Bipolar: ±25μV to ±5V Full Scale. Unipolar: 0-50μV to 0-5V Full Scale |
| Maximum Input (Max without damage) | ±20VDC or AC Peak |
| Analog Bandwidth | DC-5KHz |

**Input Suppression**

- Zero Suppression: Span ±5V - ±200mV: ±5V
- Span ±200mV – ±0.2mV: ±0.5V
- Less than 0.2mV: ±0.05V

**Programmable Filters**

- Low Pass: Selectable settings of: 10, 30, 100, 300, 1000, 3000, 5000Hz, and OFF
- High Pass: Single-pole Bessel with selectable settings of: DC, 0.05, 0.1, 1.0, 3.0, 30, and 100Hz

**Accuracy Specifications**

- Gain Accuracy, % of FS: <0.5% in mV range
- Offset Accuracy, % of FS: <0.4% in mV range at FS
- Linearity, % of FS
- Noise % of FS: <10μV Typical with 1kHz filter at Max Gain
- Common Mode Voltage: ±5V
- Common Mode Rejection: >60dB
- Crosstalk (60Hz): <80dB

*BNC interfaces are offered for 4 or 32 high level analog signals. For further flexibility, DSI also offers an assortment of Cable Kits.*
Model 13-7715-35 Carrier
Model 13-7715-02 Advanced 32
Model 13-7715-04 Advanced 4
Model 13-7715-70 Digital Communication Module

**Description**
All-purpose or "Universal" input for physiological signals. Handles a wide variety of signals such as biopotential signals, pulmonary pressure and flow signals, blood pressure and flow signals, temperature signals, isolated tissue and a variety of pressure or tension measurement.

**Designed specifically for use with**
the Validyne DP-45 and DP-250 Differential Pressure Transducers for accurate pulmonary pressure, volume and flow measurements.

Up to 32 input channels available with the ability to select uni-polar, bi-polar, single-ended or differential measurements.

* Cable kits offered

Standard laboratory BNC connections easily allow high level signals to be brought into Ponemah for association with other signals.

* Cable kits offered

Provides a communication link with the external BIO12 POD and the Multi-Lead ECG POD. Delivers an ECG sync pulse using standard TTL logic when used with the Multi-Lead ECG POD.

### Channels
- **4**
  - 32 Single-ended or 16 Differential
- **4 Single-ended**

### Type of Coupling
- **AC**
- **DC**
- **Gnd**

### Maximum Rate
- **5K Samples/Second per Channel**
- **250K Samples / Second Aggregate**
- **250K Samples / Second per Channel**

### Excitation Voltage
- **2.5, 5, 7.5VDC ±1%, and 10VDC ±5% @ 15mA, OFF**
- Synchronized to Excitation Voltage
- **5VRMS @ 5KHz** for use specifically with Validyne Transducer

### Digitizer Per Channel
- **Per Channel Multiplexed**

### Input terminal box with BNCs for connection to most laboratory equipment.

### BNC cable kits for connection to most laboratory equipment.

### Signal Characteristics
- **Input Impedance**
  - >10M Ohm
  - 100K Ohm
- **Range**
  - Bipolar: ±25μV to ±5V Full Scale
  - Unipolar: 0-50μV to 0-5V Full Scale
  - Continuously Variable ±500μV to ±300mV (0.2mV V to 120mV/V)
  - ±1.25, 2.5, 5, 10, 20V Full Scale
- **Maximum Input**
  - ±20VDC or AC Peak
  - 30V DC or AC Peak + 50V DC or AC Peak
  - ±50V DC or AC Peak
- **Analog Bandwidth**
  - DC-5KHz
- **Input Suppression**
  - Zero Suppression Span
  - ±5V - ±200mV: ±5V
  - ±200mV - ±0.2mV: ±0.5V
  - Less than 0.2mV: ±0.05V
  - Continuously variable ±250mV

### Programmable Filters
- **Low Pass**
  - Selectable settings of: 10, 30, 100, 300, 1000, 3000, 5000Hz, and OFF
- **High Pass**
  - Single-pole Bessel with selectable settings of: DC, 0.05, 0.1, 1.0, 3.0, 30, and 100Hz

### Accuracy Specifications
- **Gain Accuracy**
  - <±0.5% in mV range
- **Offset Accuracy**
  - <±0.4% in mV range at FS
- **Linearity**
  - <0.1%<0.2%<0.2%
- **Noise**
  - <10μV Typical with 1kHz filter at Max Gain
  - <0.02%<0.5%<0.5%
- **Common Mode Voltage**
  - ±5V
- **Common Mode Rejection**
  - >60dB
- **Crosstalk (60Hz)**
  - <80dB

### 13-7770-BIO12 12 Channel Isolated Biopotential Pod
- Satisfy a wide variety of biopotential applications including Langendorff preparations, isolated heart preparations and open-chested models where electrograms or other biopotentials are monitored.
  - 12 differential pairs
  - Input Range: 40μV to 40mV Full Scale
  - Input Impedance: >10M Ohm
  - Low Pass filter settings: 100, 300, 1,000Hz
  - High Pass filter fixed at: 0.05Hz

### 13-7770-ECG12 Multi-Lead ECG Pod
- Accurately conditions up to twelve simultaneous surface ECG leads using a standard industry 10-lead cable with various attachments.
  - ECG presentations: Lead I, II, III, aVR, aVL, aVF, 6V-leads
  - Selectable high fidelity filtering from 0.05 – 500Hz
  - Patient isolation
  - Defibrillation protected with baseline reset
  - Leads off detection
  - TTL output for QRS pulse to trigger external equipment

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* BNC Interfaces are offered for 4 or 32 high level analog signals generated from existing laboratory equipment into the data acquisition system.

* For further flexibility, DSI also offers an assortment of Cable Kits to connect most laboratory equipment.

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generated from existing laboratory equipment to connect most laboratory equipment.
The ACQ-7700 2-Slot Acquisition Interface is a low cost solution designed specifically to interface to the Ponemah Physiology Platform. The modular design allows the user to easily expand the number of available acquisition channels to a maximum of 64, through the installation of 7700 series signal conditioner modules.

The smaller, portable, and rugged chassis is perfect for laboratories that conduct acute studies using a few test subjects at a time. When combined with the Multi-Lead ECG POD, a 10-lead patient ECG cable, and the Digital Communication Module (DCOM), researchers have a portable ECG System capable of conditioning up to 12 simultaneous surface ECG leads (Lead I, II, III, aVR, aVL, aVF, and 6 V leads).

Sensors available for blood pressure, differential pressure, force, biopotential, and temperature measurements.

To learn more about DSI’s hardware amplification digital signal conditioners and accessories please contact our North American, European or Asia Pacific sales representatives.

<table>
<thead>
<tr>
<th>Headquarters and North American Sales:</th>
<th>European Sales:</th>
<th>Asia Pacific Sales:</th>
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<tbody>
<tr>
<td>1-800-262-9687 (U.S.)</td>
<td>Tel: 31-13-5479356</td>
<td>Tel: 86-21-50793177</td>
</tr>
<tr>
<td>1-651-481-7400 (International)</td>
<td><a href="mailto:europe-sales@datasci.com">europe-sales@datasci.com</a></td>
<td><a href="mailto:DSI-shanghai-Office@datasci.com">DSI-shanghai-Office@datasci.com</a></td>
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<td><a href="mailto:sales@datasci.com">sales@datasci.com</a></td>
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datasci.com