Guide to Hardwired Amplification

Digital Signal Conditioners and Accessories

DSI™

An Affiliate of Harvard Bioscience, Inc.

Better signals mean better data

The ACQ-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 ACQ-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.

In combination with Ponemah Analysis Software you achieve stable, accurate and robust data acquisition and analysis routinely performed in physiology, pharmacology and toxicology laboratories.

State-of-the-Art Digital Technology:

- Easy software-based 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 implantable telemetry data
- CFR21 Part 11 compliance —all data and changes saved in a configuration file and audit log
- USB interface to workstation

Model	13-7715-59 Universal XE	Model 13-7715-35 Carrier	13-7715-02 Advanced 32	13-7715-04 Advanced 4
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
# Channels	4	4	32 Single-ended or 16 Differential	4 Single-ended
Type of Coupling	AC/DC/Gnd	AC	DC	DC
Maximum Rate	100K Samples/Second per channel	5K Samples/Second per Channel	1 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		
Digitizer	Per Channel	Per Channel	Multiplexed	Multiplexed
Options/Accessories	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.	Validyne DP45 and DP250 series Differential Pressure Transducers.	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	>10M Ohm	100K 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) Full Scale	±1.25, 2.5, 5, 10, 20V Full Scale 0 -1.25, 2.5, 5, 10, 20V Full Scale	± 1.25, 2.5, 5, 10, 20V Full Scale 0 - 1.25, 2.5, 5, 10, 20V Full Scale
Maximum Input (Max without damage)	±20VDC or AC Peak	30V DC or AC Peak	+ 50V DC or AC Peak	+ 50V DC or AC Peak
Analog Bandwidth	DC-5KHz	DC-100KHz	DC-10KHz	DC-10KHz
Input Suppression				
Zero Suppression	Span ±5V - ±200mV: ±5V Span ±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	10, 30, and 100Hz		
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	<0.5%	<0.7%	<0.7%
Offset Accuracy, % of FS	<±0.4% in mV range at FS		<0.5%	<0.5%
Linearity, % of FS		<0.1%	<0.2%	<0.2%
Noise % of FS	<10µV Typical with 1kHz filter at Max Gain	<0.02%	<0.5%	<0.5%
Common Mode Voltage	±5V		+20V	+20V
Common Mode Rejection	>60dB		>80dB	>80dB
Crosstalk (60Hz)	<80dB	<45dB	<60dB	<60dB

13-7715-70 Digital Communication Module

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.

12 channel biopotential pod

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: 40uV 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.

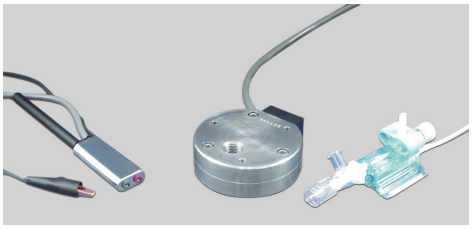
- ECG presentations: Lead I, II, III, aVR, aVL, aVF, 6V-leads
- Selectable high fidelity filtering from 0.05 – 500Hz
- Patient isolation
- Defibrillation protected with baseline reset
- Leads off detection
- TTL output for QRS pulse to trigger external equipment

* BNC Interfaces are offered for 4 or 32 high level analog signals For further flexibility, DSI also offers an assortment of Cable Kits generated from existing laboratory equipment into the data acquisition system to connect most laboratory equipment.

Hardwired Amplification Accessories

Hardwired Sensors

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



ACQ-7700

The ACQ-7700 2-Slot Acquisition Interface is an affordable 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).

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