SERIES 6800
Portable Data Acquisition Systems

Series 6800 for portable applications is a ready-to-run, high performance measurement system that is DC powered for mobile applications. All connections are front mounted for easy installation in tight places or on the go. 6800 systems come equipped with a conditioner, amplifier, filter and digitizer. Each channel has a front mounted connector specific to a measurement type: RJ-45 for 8-wire bridge transducers or BNC for voltage or ICP/IEPE inputs. Individual channels have a differential +/- 10V input and can digitize and record data to 16-bit resolution with upper and lower programmable alarm capability that is checked each time the output is digitized. Solutions are available for providing digital outputs based on these alarm conditions.

Systems interface to a familiar Windows based Operator Workstation over USB where the included software, PI660, is used for setup, display and acquisition of measurement data. PI660 allows for acquisition and control of one or many 6800 systems and provides real time data display. Data can be displayed and recorded in any number of ways, creating a versatile system that can fit any application and can be easily expanded or customized, should test requirements change.

Multiple systems can be combined for larger and/or distributed installations, made capable with an onboard, distributed sample clock bus. Programming and data transfer are over USB which provides high data transfer rates with low, predictable latency. It interfaces to the USB port provided on most PC computers, including laptops for ultimate portability.

Data Redundancy is optionally available. A 2.5" HD (Model 6095) mounts on the USB controller board in each system and provides a redundant recording point for the DAS. In the unlikely event the Operator's Workstation or DAS Software fails, data will continue to record and can be recovered from the system post test.

The Operator's Workstation (6800-PCCOWU-LT) is the primary control and data recording point for the Series 6800 DAS. The PCCOWU-LT is typically a laptop, connected to the USB port and runs PI660 Data Acquisition Software for system setup, calibration, display, recording, distribution and export.

COMMON FEATURES

- 8 to 32 Channel Configurations
- DC Powered, 13.4" Wide, 4U
- USB Connection to Your Laptop or PC
- IRIG Time A, B or G Recording
- Includes Turnkey Software & Shipping Case
- Optional Redundant Storage
- Multiple Systems Easily Combined

SPECIFICATIONS

PORTABLE CONFIGURATIONS

VOLTAGE / IEPE / STRAIN / BRIDGE / LVDT

6815-X .....16 or 32-Ch 12VDC Portable Voltage/IEPE/Strain/Bridge/LVDT DAS

VOLTAGE / IEPE / ICP BNC

6820-X .....8, 16, 24 or 32-Ch 12VDC Portable Voltage/IEPE/ICP DAS BNC

STRAIN / BRIDGE / LVDT RJ45

6840-X .....8, 16, 24 or 32-Ch 12VDC Portable Strain/Bridge/LVDT DAS RJ45

OPERATOR'S WORKSTATION (6800-PCCOWU-LT)

Operating System ..Windows 7, 64-Bit (other Windows OS configurations available).
Processor .....Intel Core i5 or better. 8GB RAM.
Media.....Dual 160GB SSD or better.
Ethernet .....Gigabit Ethernet.
Display .....15".
Power .....115 or 230 VAC, 47 to 63 Hz..
Temperature .....0°C to +50°C operating.
Size .....Laptop (other configurations available).

ACCESSORIES

6800-PCCOWU-LT ..Operator's Workstation, Laptop.
6095 .....Redundant Hard Drive.

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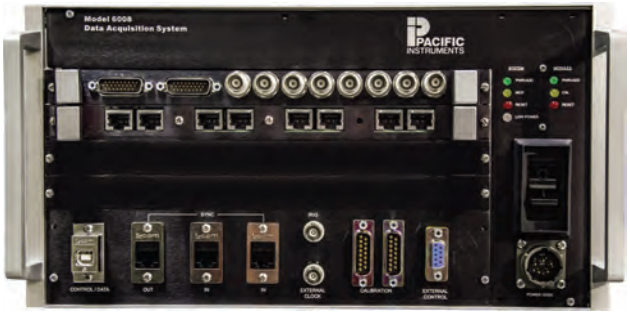
MODEL 6815
Portable Voltage/IEPE/Strain/Bridge/LVDT Data Acquisition System



FEATURES

- 16 or 32 Ch Voltage/ICP/IEPE/Strain/Bridge/LVDT Input
- BNC & RJ45 Input Connectors
- AC/DC Coupling for Voltage/IEPE
- Bridge Completion, Shunt Cal & Balance for Strain/Bridge
- IRIG Time A, B or G
- PI660 Turnkey Software Included
- Shipping Container

SPECIFICATIONS

VOLTAGE/IEPE/ICP

See Model 6820 (Page 2) for Voltage/ICP/IEPE specifications.

STRAIN/BRIDGE/LVDT

See Model 6840 (Page 3) for Strain/Bridge specifications.

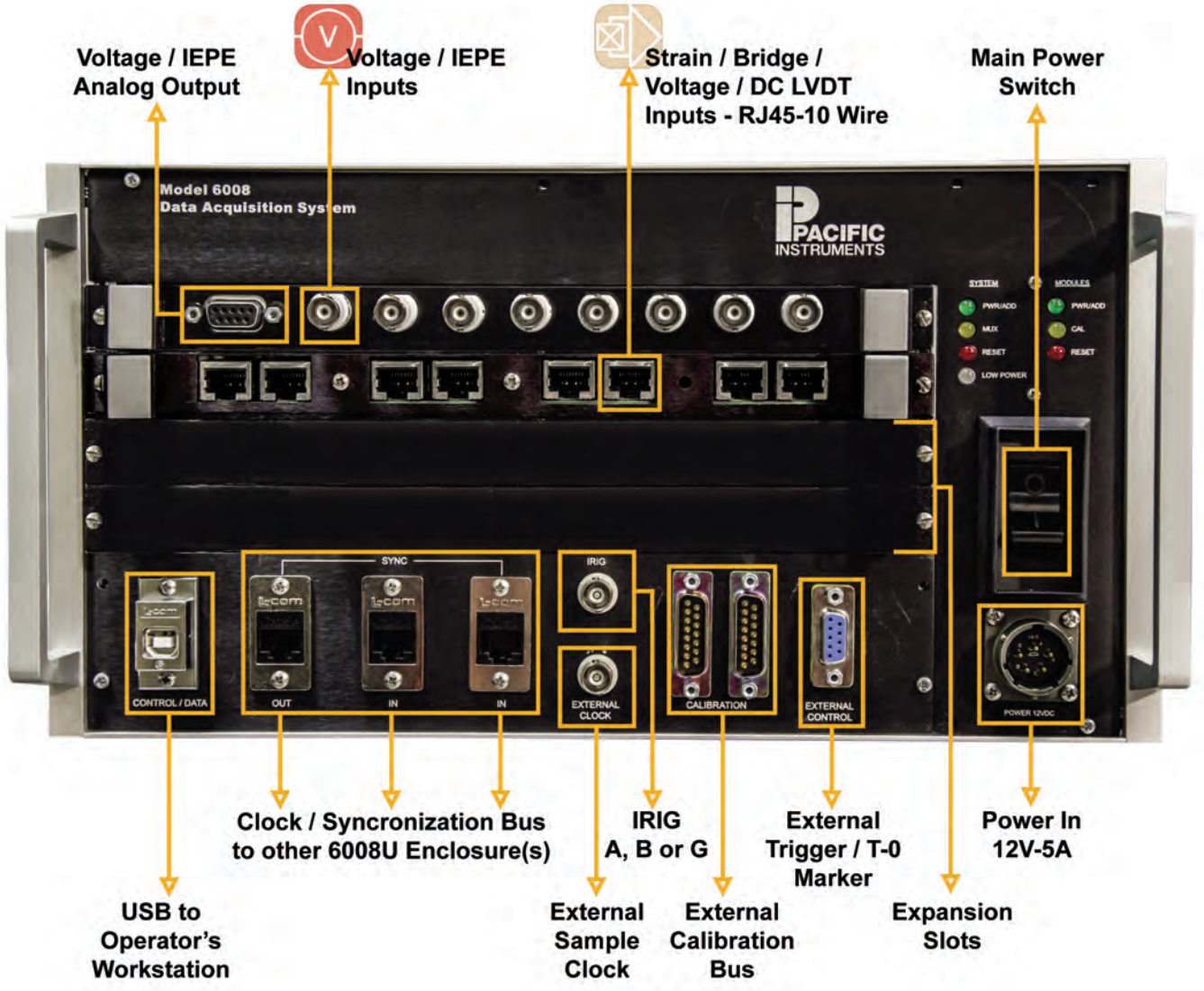
ORDERING INFORMATION

6815-16 .....16-Ch 12VDC Portable DAS
8 Voltage/IEPE w/ BNC and
8 Strain/Bridge/LVDT w/ RJ45

6815-32 .....32-Ch 12VDC Portable DAS
16 Voltage/IEPE w/ BNC and
16 Strain/Bridge/LVDT w/ RJ45

6800-PCCOWU-LT....Operator's Workstation, Laptop

SERIES 6800 PORTABLE CONNECTOR DIAGRAM



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MODEL 6820
Portable Voltage/IEPE/ICP Data Acquisition System

FEATURES

- **8, 16, 24 or 32 Channels IEPE/Voltage Input**
- **200kS/s 16-Bit Digitizer Per Channel**
- **BNC Input Connectors**
- **AC/DC Coupling**
- **IRIG Time A, B or G**
- **PI660 Turnkey Software Included**
- **Shipping Container**

SPECIFICATIONS

INPUT

Configuration .....Differential, 2-wire with shield.
Input Type .....Programmable AC or DC input. Input attenuator and current input are available.
Range.....±2 mV to ± 10 Volts
Impedance (AC) ....100k Ohms, shunted by 1,000 pF.
Impedance (DC) ....50 Megohms, shunted by 500 pF.
Protection .....±50 Volts differential and common mode.

EXCITATION / TRANSDUCER POWER

Current .....2 to 20 mA. 6 mA is supplied unless otherwise specified.
Compliance.....24 Volts minimum.
Verification .....Short and open detection.
Voltage .....±12 or ±15 Volts jumper selectable per channel, ±24 also available.

AMPLIFIER

Gain .....Programmable 1 to 5000, in 1, 2, 3, 5 steps, with ±0.05% accuracy
Gain Stability .....±0.01%, ±0.005%/°C.
Linearity .....±0.01% for Gains < 1,000, ±0.02% for gains > 1,000.
Common Mode .....60 dB plus gain in dB to 110 dB, DC to 60 Hz
CM Voltage .....±10 Volts.
Zero .....Automatic to ±1 mV.
Zero Stability X1 ....±1 mV, ±0.2 mV/°C.
Zero Stability X1000..±5 mV, ±1 mV/°C.
Noise X1 .....0.2 mV RMS for 20 kHz bandwidth.
Noise X1000 .....2.8 mV RMS for 20 kHz bandwidth.
Bandwidth .....DC to 100kHz for Gains 1 to 1,000 and 50kHz for Gains > 1,000 (-3dB). 1Hz to 100kHz (-3dB) in AC coupled mode.
Slew Rate.....3.2 V/µS .
Analog Output.....±10 Volts full scale, 20 mA. Programmable for wideband or filtered response.

FILTER

Type . . . . . .4 frequency 4-pole Bessel.
Frequency . . . . . .10Hz , 1kHz, 10kHz, 20kHz
Noise . . . . . .1 mV peak, RTO.
Other . . . . . .Other filter characteristics and cut offs available.

DIGITIZER

Sample.....±50 nS channel-to-channel time correlation.
Resolution .....16 bits, two's complement output per channel.
Rate.....Programmable up to 200 kS/s digitizer per channel.
Linearity .....±1½ LSB (±0.004%)
Continuity.....Monotonic to 15 bits.
Alarms.....Two alarms each with upper and lower limits that are programmable from negative to positive full scale. Limits checked on each ADC sample.

CALIBRATION

Voltage Subst .....Alternate input for external calibration source. Programmable 1, 0.1 and 0.01, attenuation with ±0.02% accuracy. Attenuator output may be connected to output bus for accuracy check.
Zero .....Amplifier input disconnected and shorted for zero calibration.

OPERATION

Protocol .....Control and data interface is USB 2.0.
Software .....Window's driver (XP and 7, Both 32 and 64-bit). Fully compatible with all implementations of PI660 operating software.
Control Inputs.....TTL inputs for Start, Stop and Trigger assert flags in the header of output data that initiate software control operations.
Alarms .....Warning and alarm buses may be independent or shared between enclosures and may initiate an output from a digital I/O type module.

DATA FORMAT

Data Word .....16/24/32-bits, 2's complement binary.
Scan Table .....Maximum format length is 65,536 samples.
Sample Rates .....Multiple sample rates consisting of the highest sample rate divided by binary numbers. Highest sample rate is programmable with 1µS resolution.

DATA INTERFACE

Output Rate .....Processor dependent, typically over 5 million 16-bit samples/second.
Latency.....Processor and scan table dependent, typically less than 5 milliseconds..
Clock Stability.....100 ppm over temperature range.

CONNECTIONS

Calibration/Control ..15-Pin Type D mounted on front panel. Mating connector supplied.
Synchronization.....Sampling clock synchronization for multiple rack systems. RJ45 connector on front.
USB .....Two-meter cable supplied.

MECHANICAL

Power Input .....10 to 20 VDC. AC Adapter Included.
Temperature .....0°C to +50°C operating.
Humidity .....95% without condensation.
Size .....13.4 inches wide, 7 inches high, 16.7 inches deep exclusive of handles.
Weight .....Approximately 20 pounds with all channel modules.

ORDERING INFORMATION

6820-8 ..... 8-Ch 12VDC Portable Voltage/IEPE/ICP DAS BNC
6820-16 .....16-Ch 12VDC Portable Voltage/IEPE/ICP DAS BNC
6820-24 .....24-Ch 12VDC Portable Voltage/IEPE/ICP DAS BNC
6820-32 .....32-Ch 12VDC Portable Voltage/IEPE/ICP DAS BNC
6800-PCCOWU-LT....Operator's Workstation, Laptop

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PACIFIC INSTRUMENTS
A VPG Brand

MODEL 6840
Portable Strain/Bridge/LVDT Data Acquisition System

FEATURES

- **8, 16, 24 or 32 Channels Strain/Bridge Input**
- **10kS/s 16-Bit Digitizer**
- **Bridge Completion, Remote Sense, Shunt Cal Lowpass Filters**
- **RJ45 Input Connectors**
- **IRIG Time A, B or G Recording**
- **PI660 Turnkey Software Included**
- **Shipping Container**

SPECIFICATIONS

INPUT

Configuration .....8 channels, 2 to 8 wire with guard shield. Bridge configuration is programmable for ¼, ½ and full bridge. 350 Ohm completion resistor standard, alternate value may be specified.

Balance.....Automatic by program control. Balance accuracy ±0.05% of range, ±1 mV RTO. Stability ±0.02% for 8 hours, ±0.005%/°C. Range provided is 3.5 mV/V for 350 Ohm bridge.

Impedance .....50 Megohms shunted by 500 pF.

Protection.....±50 Volts differential, ±50 Volts common mode.

EXCITATION / TRANSDUCER POWER

Voltage .....Programmable per channel from 0-12 Volts in 1 Volt ±0.1% steps, or adjustable with 3.3 mV resolution.

Current.....50 mA limited to 70 mA.

Regulation .....±0.01% for ±10% line and no-load to full-load using remote sensing.

Stability.....±0.01%, ±0.005%/°C.

Noise .....200 µV peak to peak.

Monitor .....Calibration mode measures excitation voltage with ±0.2% accuracy.

Transducer Power ..±12 or ±15 Volts (24 V optional) jumper selectable per channel. Transducer power available on separate pins from voltage excitation. Current is 50 mA per channel, limited to 200 mA maximum per card.

AMPLIFIER

Gain.....Programmable from 1 to 5,000 in 1, 2, 3, 5 steps with ±0.05% accuracy

Gain Stability.....±0.01%, ±0.004%/°C.

Linearity .....±0.01% for gains <1,000, ±0.02% for gains 1,000 and higher.

Common Mode .....80 dB plus gain in dB up to 110 dB, DC to 60Hz for ±10 Volts.

Zero .....Automatic to ±1 µV RTI, ±0.5 mV RTO.

Zero Stability.....±5 µV RTI, ±1 mV RTO, ±1 µV/°C RTI, ±0.2 mV/°C RTO. Short term: ±2 µV RTI, ±0.4 mV RTO for 8 hours.

Source Current .....±10 nA, ±1 nA/°C

Noise (10 Hz) .....0.1 uV rms RTI, 0.5 mV rms RTO.

Noise (1 kHz).....1.0 uV rms RTI, 0.5 mV rms RTO.

Bandwidth.....5 kHz for gains < 1,000 and 1 kHz for gains 1,000 and higher.

Slew Rate.....3.2 V/uS.

Recovery.....120 µS to ±0.1% for 10X overload to ±10 V.

FILTER

Type .....4-frequency 4-pole Butterworth with wideband.

Frequency.....4 Hz, 10 Hz, 100 Hz and 1 kHz.

Noise .....0.5 mV rms, RTO.

Other .....Other filter characteristics and cut offs available.

DIGITIZER

Sample.....Simultaneous, within ±50 nS channel-to-channel. Droop is less than ±0.005%.

Resolution .....16 bits, two's complement.

Sample Rate.....Up to 10 kS/s per channel.

Linearity .....3 LSB (0.01%).

Continuity .....Monotonic to 15 bits.

CALIBRATION

Shunt .....Two step Bipolar shunt, 0.5024 mV/V and 0.245 mV/V for 350 Ohm bridge, ±0.1%. For a 120 Ohm bridge, steps are 0.17235 mV/V and 0.08402 mV/V, ±0.1%.

Voltage Subst. .....Alternate input for external calibration source. Programmable attenuator with steps of 1, 0.1 and 0.01, ±0.01% accuracy. Output of the attenuator is provided for verification.

Zero .....Amplifier input disconnected and shorted.

OPERATION

Protocol .....Control and data interface is USB 2.0.

Software .....Window's driver (XP and 7, Both 32 and 64-bit). Fully compatible with all implementations of PI660 operating software.

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Weight .....Approximately 20 pounds with all channel modules.

ORDERING INFORMATION

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PORTABLE, PROFESSIONAL TEST MANAGEMENT

PI660 is a turnkey application that runs on Microsoft Windows Operating Systems through Windows 10 64-Bit. Unlike general purpose programming languages, PI660 is turnkey and offers logical access to the various steps of programming, freeing operators and engineers to focus on what matters most: testing results, not writing software. PI660 is divided into various modes of operation. These modes include User Accounts, System Setup, Test Definition, Display Definition, Calibrations, Acquisition, Export & Playback.

Pre-test operations include: system setup, test definition, calibration and configuring the real time data displays. Test configurations (channel name, gain, excitation, filter, sample rate, EU conversion, etc.) can be made either on line or off line and copied to the system over the network. The Test Operator then simply downloads the configuration to the hardware. Following system setup, the Operator performs any necessary calibrations including: engineering unit cal, zero, bridge balance, tare, etc. Calibration results are saved with the test configuration and are part of the recorded files for post-test data traceability. Based on individual needs or those of data analysists, the Operator can configure the real time data displays at this point as well.

Real-time features include: display, acquisition & data distribution to display clients. Large format and multi display workstations are no problem for PI660. The display engine supports multiple configurations, each saved with the test file, and can include any number or combination of display types, including: Oscilloscope, Spectrum (FFT), Waterfall, Bar graph, Strip chart, Background plot, Digital I/O, X-Y Chart, Dynamometer, Picture, Quick Plot, Surface, Text, Tabular and Video. During acquisition, the test operator can toggle to alternate display pages or even add and remove channels (during recording) to and from the displays to visualize results in real time. PI660 can broadcast data to Display Clients allowing other users to look at their own set of data without impacting data connection on the Server.

Post-test functions include: Quick plotting, data replay and export. Following a test or series of tests, channels can be plotted in PI660 Viewer for a "quick look" at the data. Operators can zoom in to a particular part of interest and even export that specific time slice. An entire data file can also be played back in PI660, on the same or different data displays, while speeding up or slowing down playback to look at every data point in detail. The Operator can export individual channels or batch export all channels from all recorded data to many 3rd party formats for post-test analysis. PI660 Export supports formats including ASCII, Winplot, Dynaworks and many more.

FEATURES

- **Test Definition-** Setup channel type, gain, filter, sample rate, EU conversion, etc. on one or many channels at a time. Save configuration files for archive or as a base for new tests.
- **Calibration-** Calibrate one or many channels at the same time. Calibration types include: Gain, Shunt, Balance, Tare, Engineering Unit, etc. Calibrations are performed interactively or automatically.
- **Real-Time Display-** Text and graphical data are displayed on the Operator's Workstation and networked Display Clients including; Scope, FFT, Waterfall, Video, Strip Chart and more.
- **Acquisition-** Record full rate or decimated data while displaying data. Synchronize high and low speed channels in the same data file. Recording can be started manually, triggered and/or event based.
- **Post Process-** Easily plot channels for "quick look" at any recorded channel. Replay already recorded data (high or low speed) with existing or new data displays. Export data to popular 3rd party formats; MATLAB, ASCII, Dplot, WinPlot, Dynaworks, etc.

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