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WHEN ACCURACY MATTERS

ProDAQ Signal Conditioning Carrier & Cards

ProDAQ 5720 Signal Conditioning Carrier
ProDAQ 5820 Series Signal Cond. Cards

OVERVIEW

The ProDAQ 5720 Signal Conditioning Unit provides power and cooling for up to two Signal Conditioning Cards from the ProDAQ 58xx Series. These Signal Conditioning Cards provide conditioning for 8 or 16 channels and can be used directly with Bustec's high-performance ProDAQ ADC function cards such as the ProDAQ 3416 16-ch. Sigma-Delta ADC Function Card or the ProDAQ 3424 8-ch. Sigma-Delta ADC Function Card.

To connect the function cards to the signal conditioning cards SCSI-style cables from the ProDAQ 8010-Bx Series are used. They provide shielded twisted pair connections for signals and control.

Features & Benefits

- **19" x 1U** unit for up to two signal conditioning cards
- **Self-Contained Standard Power Supply** for all Signal Conditioning Card Types
- **Easy Interfacing** to ProDAQ Function Cards
- Voltage Reference **Monitoring**

PRODAQ 5821 16-CH. RTD SIGNAL COND. CARD

The ProDAQ 5821 series of Signal Conditioning Cards is designed to interface with a variety of sensors, principally RTDs, Thermistors, Cryogenic Diodes and Voltage type sensors. Each version of the 5821 provides the capability of precise 4-wire measurement. In order to achieve this, a precise 500µA constant current source is provided per channel. The current source can be disabled on a per channel basis and is monitored to ensure that current is flowing. The value of the output current is stored on-board after calibration. In order to achieve the highest accuracy the output current may be automatically calibrated 'on-the-fly' using the ProDAQ 3416 24-bit Sigma-Delta ADC card and an on-board precision resistor.

The 5821-AA low cost version interfaces directly with the ProDAQ 3416. Typical accuracy achieved for a 4-wire PT-100 is 0.05°C and 0.003% for a 5kΩ thermistor.

The 5821-BA has per channel on-board gain and voltage calibration in order to achieve the highest accuracy possible. Typical accuracy for the 5821-BA for a PT-100 is 0.05°C and 0.002% for a 5kΩ thermistor. The 5821-BA also provides compensation for 3-wire sensors. With compensation employed the error on a 3-wire PT-100 can be reduced from several degrees to typically 0.1°C. The 5821-BA also provides support for 2-wire sensors so that the user need not make connections at the front panel of the SCU. This feature saves time when switching between different sensor types. The 5821-BA also includes broken wire detection as well as current monitoring.

The 5821-BB is similar to the 5821-BA but includes a second current source of 10µA, designed for use with cryogenic diodes. The 10µA current source is adjusted during calibration so that its typical absolute accuracy is 0.01%. The current source may also be used to make precision high resistance measurements, up to 1MΩ. Measurement accuracy at 1MΩ is typically 0.015%.

Features & Benefits

- Interfacing to **RTDs, Thermistors and Cryogenic Diodes**
- Accuracy up to **0.003 °C**
- **Automatic** 2-, 3- and 4-wire Connection
- **3-wire Compensation Accuracy 0.01 °C**
- **Broken-Wire Detection**
- **Current Monitoring**

For more information, visit **www.bustec.com**.

Learn more about the **ProDAQ 5720** on our website by scanning the code below.

PRODAQ 5822 16-CH. THERMOCOUPLE SIGNAL COND. CARD

The ProDAQ 5822 series of Signal Conditioning Cards is designed to interface with various thermocouple types, principally the popular types J, E, N, K, T, R, S and B. There are two versions of the 5822: the 5822-AA is a low cost version that uses the 3416-XX to directly amplify the thermocouple signals while the 5822-BA has an on-board dedicated per channel thermocouple amplifier for improved accuracy. Typical accuracy for the 5822-BA is 0.3°C at 0°C for types J, E, N, K and T.

The Cold Junction Compensation scheme varies with the version. To allow all 16 channels to be used the 5822-BA uses calibrated hardware compensation to correct for the temperature of the cold junction. The 5822-AA uses a multiplexing scheme so that the user can occasionally determine the temperature of the cold junction. It is also possible in both board versions to digitally read the cold junction temperature, if so desired.

Each version of the 5822 has Open Thermocouple Detection (OTD). The 5822-BA has continuous OTD so that no user intervention is required. An LED indicates that OTD has occurred and the software shows an alarm. The 5822-AA has switched OTD which allows the user to check for OTD before or after a test has run. The LED will only indicate OTD detection when this check is made.

Both versions of the 5822 include EMI filtering and Overvoltage Protection as standard.

Features & Benefits

- Interfacing to all **popular Thermocouple Types**
- Accuracy up to **0.3 °C**
- **Hardware** Cold Junction Compensation
- **Low-pass Filter** per Channel
- **Open Thermocouple Detection**

PRODAQ 5824 8-CH. BREAK-OUT CARD

The ProDAQ 5824 Signal Conditioning Cards are designed to facilitate the interface of the ProDAQ 3424-XX to a number of sensor types. It does this by providing 8 BNC connectors on the input and a 3424 pin-compatible 50-pin SCSI on the rear of the card.

All features available on the 3424-XX are made available on the 5824-XX with no loss of signal quality.

Features & Benefits

- Easy connectivity with standard **BNC connectors**
- IEPE Current **Monitoring**

PRODAQ 5825 16-CH. BREAK-OUT CARD WITH ICP/TEDS

The ProDAQ 5825 Signal Conditioning Cards are designed to facilitate the interface of the ProDAQ 3416-XX to a number of sensor types. It does this by providing 16 BNC connectors on the input and a 3416 pin-compatible 50-pin SCSI on the rear of the card.

All features available on the 3416-XX are made available on the 5825-XX with no loss of signal quality. Several versions of the card are available to suit different customer requirements. The 5825-AA is a simple breakout unit designed for lower cost solutions. The 5825-AB has an input attenuator, increasing the input range of the 3416-XX to signals with an amplitude of up to ±60V peak. The 5825-BA extends the functionality of 3416-XX by including ICP, TEDS, AC/DC coupling and Voltage Reference distribution. The Voltage Reference distribution network allows an external voltage source to be applied in order to calibrate the entire signal path without the need to disconnect sensors. This external voltage source may originate from the 3202-AA or be supplied by the customer and connected to the rear of the 5825-BA. Front panel LEDs indicate ICP status and can be also used for channel identification purposes during system setup and maintenance.

Features & Benefits

- Easy connectivity with standard **BNC connectors**
- IEPE Sensor **Excitation**
- **TEDS Interface**
- **AC/DC** Coupling
- Optional **Attenuator** for up to ±60 V Signals
- Optional Shunt for **Current Measurement**
- IEPE Current **Monitoring**

SPECIFICATIONS
PRODAQ 5720 SIGNAL CONDITIONING CARRIER

GENERAL	
Number of slots	2
ELECTRICAL	
Input	85 – 264 Volts AC, 47 – 63 Hz
Power Consumption	70 W max.
MISCELLANEOUS	
Dimensions	428mm x 43.5mm x 305mm (width x height x depth, without mounting brackets and connectors)
Weight	approx. 1.5 kg
Temperature	0 °C to +50 °C (operational) -40 °C to +70 °C (storage only)
Humidity	10% - 90% (non-condensing)

Ordering Information

- **5720-AA** Signal Conditioning Carrier for up to two sig. cond. Cards

Related Products

- **3180-AA** Ultra-performace Motherboard
- **6100-xx** LXI Function Card Carrier
- **3416-xx** 16-Ch. Sigma-Delta ADC Function Card
- **3424-xx** 8-Ch. Sigma- Delta ADC Function Card
- **8010** series signal cables

SPECIFICATIONS
PRODAQ 5821 RTD SIGNAL CONDITIONING CARD

GENERAL	
Number of channels	16
ADC Function Card	ProDAQ 3416-XX
SIGNAL CONDITIONING	
Type of Sensors	RTD, Thermistors, Cryogenic Diodes, Voltage
Sensor Configurations	2, 3 & 4-wire (5821-BX) 4-wire (5821-AA)
Output Current	500 µA (5821-AA, 5821-BX) 10 µA (5821-BB only)
Current Accuracy	500µA ±0.01% typical, ±0.02% max. 10µA ±0.01% typical, ±0.03% max.
Compliance Voltage	10V
Measurement Accuracy	
4w 500µA, PT-100, 0°C	±0.05°C typical, ±0.15°C max. (All Versions)
4w 500µA, PT-1000, 0°C	±0.003°C typical, ±0.01°C max. (5821-BX)
3w 500µA, PT-1000, 0°C	±0.01°C typical, ±0.05°C max. (5821-BX)
4w 500µA, 5k Resistor	±0.002% typical, ±0.01% max. (5821-BX)
4w 10µA, 250kΩ Resistor	±0.01% typical, ±0.04% max. (5821-BB)
Current Monitoring	Yes
Broken Wire Detection	Yes (5821-BX only)
Voltage Reference Monitoring	Yes (5821-BX only)
MISCELLANEOUS	
Mating Connector	Weidmueller BL 3.50/04/180F SN BK BX (Order Number 1615800000)
Dimensions	300mm x 205mm
Weight	200g
Temperature	0 °C to +50 °C (operational) -40 °C to +70 °C (storage only)

Ordering Information

- **5821-AA** 16-Ch. RTD Signal Conditioning Card
- **5821-BA** 16-Ch RTD Signal Cond. Card with automatic 3-wire compensation
- **5821-BB** 16-Ch RTD Signal Cond. Card with automatic 3-wire comp., 2-wire mode, and Cryogenic Diode mode

SPECIFICATIONS (CONT'D)
PRODAQ 5821 RTD SIGNAL CONDITIONING CARD

MISCELLANEOUS	
Humidity	10% - 90% (non-condensing)
Warm-up Time	> 30 min.
Power Dissipation	TBD

SPECIFICATIONS
PRODAQ 5822 THERMOCOUPLE SIGNAL CONDITIONING CARD

GENERAL		
Number of channels	16	
ADC Function Card	ProDAQ 3416	
PARAMETER	**CONDITIONS**	
Type of Sensor	Thermocouples, types J, E, N, K, T, R, S and B	
Amplifier Gain	100	
Temperature Accuracy After Calibration, 5822-BA	0.25°C at 0°C 0.6°C at 500°C 1.1°C at 500°C	Types J, E, N, K, T Types R, S Type B
Temperature Accuracy After Calibration, 5822-AA	1°C	Types J, E, N, K, T
Temperature Resolution	0.01°C 0.05°C	Type K Type B
Cold Junction Compensation Accuracy	0.1°C (5822-BA), 0.2°C (5822-BA) 0.5°C (5822-AA)	Types J, E, N, K, T Types R, S, B
Open Thermocouple Detection	Yes. 5822-BA Permanently On. 5822-AA Switched.	
Filter	4-Pole 5Hz and Filter Bypass	
Voltage Input Range	±100mV	
Input Bias Current	0.4nA typical	
Voltage Accuracy	0.01% FS	
Input Protection	±25V	
CM Range	±10V	
CMRR (dB) at DC	> 100dB	
EMI Filter	Yes	

Ordering Information

- **5822-AA** 16-Ch. Low cost TC Signal Conditioning Card, multiplexed CJC, switched OTD
- **5822-BA** 16-Ch. TC Signal Conditioning Card with Gain, CJC hardware compensation, permanent OTD and indication

SPECIFICATIONS (CONT'D)
PRODAQ 5822 THERMOCOUPLE SIGNAL CONDITIONING CARD

SIGNAL CONDITIONING	
Output Signal Type	Differential (Improves noise immunity)
Output Signal impedance	100Ω
Output Capacitive Load capability	< 10nF
MISCELLANEOUS	
Mating Connector	Cu-Cu Mini TC Plug
Output Connector	50-pin SCSI
Dimensions	300mm x 205mm
Weight	TBC
Temperature	0 °C to +50 °C (operational) -40 °C to +70 °C (storage only)
Humidity	20% - 80% (non-condensing)
Warm-Up Time	> 30 minutes
Power Dissipation	TBC

SPECIFICATIONS
PRODAQ 5824 BREAKOUT CARD

GENERAL	
Number of channels	8
ADC Function Card	ProDAQ 3424
SIGNAL CONDITIONING	
ICP	4.7mA ±20% nominal. Higher Current available upon request
ICP Indication	LED on Front Panel
TEDS	Class 1 support, reader on 3424 function card
Isolation	No
EMI Filter	Yes
MISCELLANEOUS	
Mating Connector	50Ω BNC
Output Connector	50-pin SCSI
Dimensions	300mm x 205mm
Weight	TBC
Temperature	0 °C to +50 °C (operational) -40 °C to +70 °C (storage only)
Humidity	10% - 90% (non-condensing)
Warm-Up Time	> 30 minutes
Power Dissipation	TBC

Ordering Information

- **5824-BA** 8-Ch. Breakout Card with ICP, TEDS, AC/DC Coupling and Voltage Reference Dist.

About VXI and LXI

- **The VXIbus** (VME EXtensions for Instrumentation) provides a time-tested bus you can trust to support your automated test and measurement needs. Established in 1987, it is a well conceived, established and proven platform for data acquisition and test, based on the industry standard VMEbus. For more details visit **www.vxibus.org**.

- **LXI** (LAN EXtensions for Instrumentation) combines the advantage of Ethernet with the simplicity of GPIB. LXI combines features of GPIB instruments with modular instrumentation by providing high performance test and measurement solutions based on a LAN interface. By utilizing the IEEE1588 Standard for A Precision Clock Synchronization Protocol, LXI Instruments allow you to build scaleable distributed and fully synchronized networked measurement and control systems. For more details visit **www.lxistandard.org**.

SPECIFICATIONS
PRODAQ 5825 BREAKOUT CARD

GENERAL	
Number of channels	16
ADC Function Card	ProDAQ 3416
SIGNAL CONDITIONING	
Input range	±10V (5825-AA, 5825-BA) ±60V (5825-AB)
Common Mode Voltage	60V max. (AC Coupling Mode, 5825-BA only)
ICP	4.7mA ±20% nominal. Higher Current available upon request
ICP Indication	LED on Front Panel
TEDS	Class 1 support, reader on 3416 function card
Isolation	No
EMI Filter	Yes
MISCELLANEOUS	
Mating Connector	50Ω BNC
Output Connector	50-pin SCSI
Dimensions	300mm x 205mm
Weight	TBC
Temperature	0 °C to +50 °C (operational) -40 °C to +70 °C (storage only)
Humidity	10% - 90% (non-condensing)
Warm-Up Time	> 30 minutes
Power Dissipation	8W max.

Ordering Information

- **5825-AA** 16-ch breakout card
- **5825-AB** 16-ch . Breakout Card with Attenuator 6:1
- **5825-BA** 16-ch . Breakout Card with ICP, TEDS, AC/DC Coupling and Voltage Reference Dist.

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