

# Modular Instruments

## PXI/PCI High-Speed Digitizer



| Model Name               | PXI-9820/PCI-9820 | PCI-9812(A)/PCI-9810           | TE-5201     |
|--------------------------|-------------------|--------------------------------|-------------|
| Bus Type                 | PCI               | PXI/PCI                        | PXI         |
| Analog Inputs            | 2-CH              | 4-CH                           | -           |
| Sampling Rates (S/s)     | 65 M              | 20 M                           | -           |
| Input Resolution (bits)  | 14                | 12 (PCI-9812)<br>10 (PCI-9810) | -           |
| Input Ranges             | ±5 V, ±1 V        | ±5 V, ±1 V                     | -           |
| Input Coupling           | DC                | DC                             | -           |
| Input Impedance          | 50 Ω, 1.5 MΩ      | 50 Ω, 1.25 kΩ, 1.5 MΩ          | -           |
| Max. Onboard Memory      | 512 MB (SDRAM)    | -                              | 2 M samples |
| Analog Outputs           | -                 | -                              | 1 CH        |
| Update Rate (S/s)        | -                 | -                              | 100 M       |
| Output Resolution (bits) | -                 | -                              | 14          |
| Output Ranges (V)        | -                 | -                              | ±8 V        |
| Digital Input            | 2-CH (PXI-9820)   | 3-CH                           | -           |
| Analog Trigger           | ●                 | ●                              | ●           |
| Digital Trigger          | ●                 | ●                              | ●           |
| Page Number              | 3-4/3-6           | 3-8                            | 3-28        |

## High-Speed Arbitrary Waveform Generator

## PXI Switch Modules



| Model Name             | PXI-7901                                  | PXI-7921                                  | PXI-7931                                  |
|------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| Description            | General-purpose                           | Two-wire Multiplexer                      | 4-groups 2x4 Two-wire Matrix              |
| No. of Channel         | 16                                        | 24 (two-wire)                             | 32 (two-wire)                             |
| Relay Type             | SPDT (1 Form C)                           | DPDT (2 Form C)                           | DPDT (2 Form C)                           |
| Max. Switching Current | 3 A @ 20 V <sub>DC</sub>                  | 2 A @ 30 V <sub>DC</sub>                  | 2 A @ 30 V <sub>DC</sub>                  |
| Max. Switching Voltage | 220 V <sub>DC</sub> , 250 V <sub>AC</sub> | 220 V <sub>DC</sub> , 125 V <sub>AC</sub> | 220 V <sub>DC</sub> , 125 V <sub>AC</sub> |
| Max. Switching Power   | 50 VA, 60 W                               | 50 VA, 60 W                               | 50 VA, 60 W                               |
| Max. Carrying Current  | 3 A                                       | 2 A                                       | 2 A                                       |
| Failure Rate           | 10 μA @ 10 mV <sub>DC</sub>               | 10 μA @ 10 mV <sub>DC</sub>               | 10 μA @ 10 mV <sub>DC</sub>               |
| Contact Resistance     | 150 mΩ max.                               | 100 mΩ max.                               | 100 mΩ max.                               |
| Scan List              | 1024 steps                                | 1024 steps                                | 1024 steps                                |
| Operation Speed        | 125 operations/s                          | 125 operations/s                          | 200 operations/s                          |
| PXI Trigger Bus        | ●                                         | ●                                         | ●                                         |
| Star Trigger           | ●                                         | ●                                         | ●                                         |
| Page Number            | 3-11                                      | 3-12                                      | 3-13                                      |

## PXI/PCI Digital Multimeter

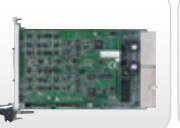
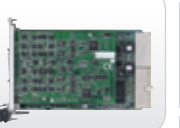


| Model Name                                    | SM2040<br>SMX2040 | SM2042<br>SMX2042 | SM2044<br>SMX2044  | SM2060<br>SMX2060 | SM2064<br>SMX2064  |
|-----------------------------------------------|-------------------|-------------------|--------------------|-------------------|--------------------|
| Max. Digits of Resolution                     | 6.5               | 6.5               | 6.5                | 7.5               | 7.5                |
| Max. Measurement Rates                        | 1000/sec          | 1000/sec          | 1000/sec           | 1400/sec          | 20000/sec          |
| DCV Ranges, >10 GΩ and 10 MΩ Input Resistance | 330 mV to 330 V   | 330 mV to 330 V   | 330 mV to 330 V    | 240 mV to 330 V   | 240 mV to 330 V    |
| ACV Ranges, 1 MΩ Input                        | 330 mV to 250 V   | 330 mV to 250 V   | 330 mV to 250 V    | 240 mV to 330 V   | 240 mV to 330 V    |
| 2-Wire Ohms                                   | 330 Ω to 33 MΩ    | 33 Ω to 330 MΩ    | 33 Ω to 330 MΩ     | 240 Ω to 24 MΩ    | 24 Ω to 240 MΩ     |
| 4-Wire Ohms                                   | 330 Ω to 330 kΩ   | 33 Ω to 330 kΩ    | 33 Ω to 330 kΩ     | 240 Ω to 24 MΩ    | 24 Ω to 24 MΩ      |
| DC Current                                    | 3.3 mA to 2.5 A   | 3.3 mA to 2.5 A   | 3.3 mA to 2.5 A    | 2.4 mA to 2.4 A   | 240 nA to 2.4 A    |
| AC Current                                    | 3.3 mA to 2.5 A   | 3.3 mA to 2.5 A   | 3.3 mA to 2.5 A    | 2.4 mA to 2.4 A   | 2.4 mA to 2.4 A    |
| Capacitance                                   | -                 | 10 nF to 10 mF    | 10 nF to 10 mF     | -                 | 1.2 nF to 12 mF    |
| Inductance                                    | -                 | -                 | 33 μH to 3.3 H     | -                 | 24 μH to 2.4 H     |
| DCV Source                                    | -                 | -                 | +/- 10.0 V         | -                 | +/- 10.0 V         |
| ACV Source (0 to 20 V pk-pk)                  | -                 | -                 | 2 Hz - 75 kHz      | -                 | 1 Hz - 200 kHz     |
| DC Current Source                             | -                 | -                 | 1.25 μA to 12.5 mA | -                 | 1.25 μA to 12.5 mA |
| Diode V/I Characteristics                     | 100 nA - 1 mA     | 100 nA - 10 mA    | 100 nA - 10 mA     | 100 nA - 10 mA    | 100 nA - 10 mA     |
| Thermocouple Temperature (8 types)            | -                 | ●                 | ●                  | -                 | ●                  |
| RTD Temperature (five RTD types)              | -                 | ●                 | ●                  | ●                 | ●                  |
| Pulse Width, Pos./Neg., & Duty Cycle          | -                 | ●                 | ●                  | ●                 | ●                  |
| Totalizer/Event Counter                       | -                 | ●                 | ●                  | -                 | ●                  |
| Variable Threshold Timing Measure             | -                 | ●                 | ●                  | -                 | ●                  |
| Pulse / Pattern Generator                     | -                 | -                 | -                  | -                 | ●                  |
| Six Wire Guard                                | -                 | -                 | -                  | -                 | ●                  |
| Frequency & Period Measurement                | -                 | ●                 | ●                  | ●                 | ●                  |
| External and Threshold Trigger                | ●                 | ●                 | ●                  | ●                 | ●                  |
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Legends: ● Supported — Not available SE: Single-ended DI: Differential

# PXI-Based Smart DAQ Solutions

## PXI-2000 Series

|                                                         | Simultaneous Sampling DAQ Cards                                                   |                                                                                   |                                                                                   |                                                                                    | Analog Output Cards                                                                 |                                                                                     |
|---------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                         |  |  |  |  |  |  |
| <b>Model Name</b>                                       | PXI-2010                                                                          | <b>NEW!!</b> PXI-2016                                                             | PXI-2005                                                                          | PXI-2006                                                                           | PXI-2501                                                                            | PXI-2502                                                                            |
| Bus-mastering DMA                                       | Scatter-gather                                                                    | Scatter-gather                                                                    | Scatter-gather                                                                    | Scatter-gather                                                                     | Scatter-gather                                                                      | Scatter-gather                                                                      |
| Auto Calibration                                        | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  | ●                                                                                   | ●                                                                                   |
| <b>Analog Input</b>                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Analog Inputs                                           | 4 DI                                                                              | 4 DI                                                                              | 4 DI                                                                              | 4 DI                                                                               | 8 SE                                                                                | 4 SE                                                                                |
| Max. Sampling Rates (S/s)                               | 2 M                                                                               | 800 k                                                                             | 500 k                                                                             | 250 k                                                                              | 400 k                                                                               | 400 k                                                                               |
| Simultaneous Sampling                                   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  | -                                                                                   | -                                                                                   |
| AD Resolution (bits)                                    | 14                                                                                | 16                                                                                | 16                                                                                | 16                                                                                 | 14                                                                                  | 14                                                                                  |
| FIFO Size (samples)                                     | 8 k                                                                               | 512                                                                               | 512                                                                               | 512                                                                                | 1 k                                                                                 | 1 k                                                                                 |
| Channel-gain Queue                                      | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                  | -                                                                                   | -                                                                                   |
| Bipolar Input Ranges (V)                                | ±10 V, ±5 V,<br>±2.5 V, ±1.25 V                                                   | ±10 V, ±5 V,<br>±2.5 V, ±1.25 V                                                   | ±10 V, ±5 V,<br>±2.5 V, ±1.25 V                                                   | ±10 V, ±5 V,<br>±2.5 V, ±1.25 V                                                    | ±10 V                                                                               | ±10 V                                                                               |
| Unipolar Input Ranges (V)                               | 0-10 V, 0-5 V,<br>0-2.5 V, 0-1.25 V                                               | 0-10 V, 0-5 V,<br>0-2.5 V, 0-1.25 V                                               | 0-10 V, 0-5 V,<br>0-2.5 V, 0-1.25 V                                               | 0-10 V, 0-5 V,<br>0-2.5 V, 0-1.25 V                                                | 0-10 V                                                                              | 0-10 V                                                                              |
| <b>Analog Output</b>                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Voltage Outputs                                         | 2 + AWG <sup>(1)</sup>                                                            | 2 + AWG <sup>(1)</sup>                                                            | 2 + AWG <sup>(1)</sup>                                                            | 2 + AWG <sup>(1)</sup>                                                             | 4 + AWG <sup>(1)</sup>                                                              | 8 + AWG <sup>(1)</sup>                                                              |
| Update Rate (S/s)                                       | 1 M                                                                               | 1 M                                                                               | 1 M                                                                               | 1 M                                                                                | 1 M                                                                                 | 1 M                                                                                 |
| Simultaneous Update                                     | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  | ●                                                                                   | ●                                                                                   |
| DA Resolution (bits)                                    | 12                                                                                | 12                                                                                | 12                                                                                | 12                                                                                 | 12                                                                                  | 12                                                                                  |
| FIFO Size (samples)                                     | 2 k                                                                               | 2 k                                                                               | 2 k                                                                               | 2 k                                                                                | 8 k                                                                                 | 16 k                                                                                |
| Settling Time                                           | 3 μs                                                                              | 3 μs                                                                              | 3 μs                                                                              | 3 μs                                                                               | 3 μs                                                                                | 3 μs                                                                                |
| Analog Output Ranges                                    | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                               | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                               | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                               | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                                | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                                 | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                                 |
| <b>Digital I/O, Timer/Counter, and External Trigger</b> |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Digital I/O                                             | 24-bit 8255 PIO                                                                   | 24-bit 8255 PIO                                                                   | 24-bit 8255 PIO                                                                   | 24-bit 8255 PIO                                                                    | 24-bit 8255 PIO                                                                     | 24-bit 8255 PIO                                                                     |
| Timer/Counter                                           | 16-bit x2                                                                         | 16-bit x2                                                                         | 16-bit x2                                                                         | 16-bit x2                                                                          | 16-bit x2                                                                           | 16-bit x2                                                                           |
| Analog Trigger                                          | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  | ●                                                                                   | ●                                                                                   |
| Digital Trigger                                         | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  | ●                                                                                   | ●                                                                                   |
| Page Number                                             | 3-16                                                                              | 3-16                                                                              | 3-16                                                                              | 3-16                                                                               | 3-22                                                                                | 3-22                                                                                |

|                                                         | Multi-Function DAQ Cards                                                            |                                                                                     |                                                                                     |                                                                                      |
|---------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                         |  |  |  |  |
| <b>Model Name</b>                                       | PXI-2204                                                                            | PXI-2205                                                                            | PXI-2206                                                                            | PXI-2208                                                                             |
| Bus-mastering DMA                                       | Scatter-gather                                                                      | Scatter-gather                                                                      | Scatter-gather                                                                      | Scatter-gather                                                                       |
| Auto Calibration                                        | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                    |
| <b>Analog Input</b>                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
| Analog Inputs                                           | 64 SE/32 DI                                                                         | 64 SE/32 DI                                                                         | 64 SE/32 DI                                                                         | 96 SE/48 DI                                                                          |
| Max. Sampling Rates (S/s)                               | 3 M                                                                                 | 500 k                                                                               | 250 k                                                                               | 3 M                                                                                  |
| Simultaneous Sampling                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                    |
| AD Resolution (bits)                                    | 12                                                                                  | 16                                                                                  | 16                                                                                  | 12                                                                                   |
| FIFO Size (samples)                                     | 1 k                                                                                 | 1 k                                                                                 | 1 k                                                                                 | 1 k                                                                                  |
| Channel-gain Queue                                      | 512                                                                                 | 512                                                                                 | 512                                                                                 | 1024                                                                                 |
| Bipolar Input Ranges (V)                                | ±10 V, ±5 V, ±2.5 V,<br>±2 V, ±1.25 V, ±1 V,<br>±0.5 V, ±0.25 V,<br>±0.2 V, ±0.05 V | ±10 V, ±5 V,<br>±2.5 V, ±1.25 V                                                     | ±10 V, ±5 V,<br>±2.5 V, ±1.25 V                                                     | ±10 V, ±5 V, ±2.5 V,<br>±2 V, ±1.25 V, ±1 V,<br>±0.5 V, ±0.25 V,<br>±0.2 V, ±0.05 V  |
| Unipolar Input Ranges (V)                               | 0-10 V, 0-5 V, 0-4 V,<br>0-10 V, 0-5 V, 0-4 V,<br>0-0.5 V, 0-0.4 V,<br>0-0.1 V      | 0-10 V, 0-5 V,<br>0-2.5 V, 0-1.25 V                                                 | 0-10 V, 0-5 V,<br>0-2.5 V, 0-1.25 V                                                 | 0-10 V, 0-5 V, 0-4 V,<br>0-2.5 V, 0-2 V, 0-1 V,<br>0-0.5 V, 0-0.4 V,<br>0-0.1 V      |
| <b>Analog Output</b>                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
| Voltage Outputs                                         | 2 + AWG <sup>(1)</sup>                                                              | 2 + AWG <sup>(1)</sup>                                                              | 2 + AWG <sup>(1)</sup>                                                              | -                                                                                    |
| Update Rate (S/s)                                       | 1 M                                                                                 | 1 M                                                                                 | 1 M                                                                                 | -                                                                                    |
| Simultaneous Update                                     | ●                                                                                   | ●                                                                                   | ●                                                                                   | -                                                                                    |
| DA Resolution (bits)                                    | 12                                                                                  | 12                                                                                  | 12                                                                                  | -                                                                                    |
| FIFO Size (samples)                                     | 1 k                                                                                 | 1 k                                                                                 | 1 k                                                                                 | -                                                                                    |
| Settling Time                                           | 3 μs                                                                                | 3 μs                                                                                | 3 μs                                                                                | -                                                                                    |
| Analog Output Ranges                                    | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                                 | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                                 | ±10 V, ±EXTREF,<br>0-10 V, 0-EXTREF                                                 | -                                                                                    |
| <b>Digital I/O, Timer/Counter, and External Trigger</b> |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
| Digital I/O                                             | 24-bit 8255 PIO                                                                     | 24-bit 8255 PIO                                                                     | 24-bit 8255 PIO                                                                     | 24-bit 8255 PIO                                                                      |
| Timer/Counter                                           | 16-bit x2                                                                           | 16-bit x2                                                                           | 16-bit x2                                                                           | -                                                                                    |
| Analog Trigger                                          | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                    |
| Digital Trigger                                         | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                    |
| Page Number                                             | 3-20                                                                                | 3-20                                                                                | 3-20                                                                                | 3-18                                                                                 |

**Legend:**  
● Supported — Not available

**Note:**  
(1) Analog outputs with hardware-based arbitrary waveform generation.

- 1 Software Solutions
- 2 PXI/CompactPCI Platforms
- 3 Modular Instrument
- 4 PXI/CompactPCI Modules
- 5 Bus Interface
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- 7 PCI/PCI Express<sup>®</sup> DAQ Cards
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- 9 PC/104-Plus Modules
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