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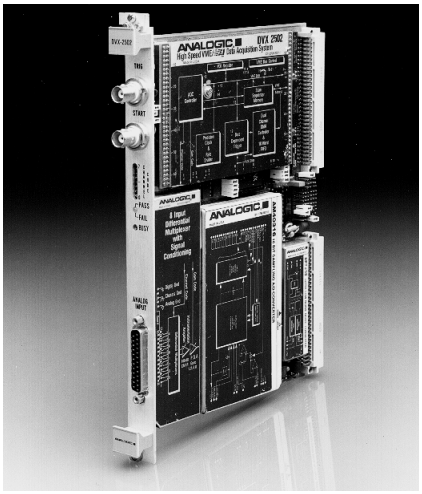
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DVX 25XX Series

Multichannel Data Acquisition/ Digitizer Systems



The DVX 25XX Series of high resolution, multichannel Data Acquisition/ Digitizer Systems combines the superior precision of 14-, or 16-bit measurements with the high throughput of 200 kHz, 400 kHz, and 1 MHz, and the compactness of a dual eurocard (6U) VME format (VXI size B). Fully compatible with the VME specification Rev. C1, and VXI specification Rev. 1.3, the DVX 25XX Series occupies a single slot in a VME chassis and provides unparalleled price/performance ratio when used either alone or in combination with other VXI/VME based boards (multiplexers, digital-to-analog converters) of the Analogic DVX 2xxx family of cards. Reflecting Analogic's experience in precision instrumentation, the DVX 25XX Series has been designed to meet the stringent demands of fast and accurate measurements associated with multichannel data acquisition applications.

Eight shielded, differential inputs are provided with both voltage and current protection. Each unit is directly expandable to 256 channels with the Analogic family of DVX multiplexer boards. The eight input signals are multiplexed via an instrumentation amplifier and a programmable gain amplifier, with four software selectable gains, into an ultrafast, high resolution, sampling analog-to-digital converter. The front-end switching and settling time of the DVX 25XX Series have been optimized to support the high performance of the A/D converter.

The DVX 25XX Series provides a powerful 2-channel on-board DMA controller as a standard feature. The DMA controller executes fast transfers over the VMEbus sending data directly to system memory, significantly enhancing total system performance by dramatically reducing the I/O overhead of the bus. Once initialized by the host computer, the DMA controller operates in transparent mode.

Three flexible trigger sources are available: a user supplied external trigger, an internal trigger, and a data-dependent trigger produced by the occurrence of a prespecified event on a selected channel. Before beginning the data acquisition, trigger information, as well as channel selection inside a scan, and gain setting are downloaded into the timing and control unit resident on the DVX 25XX Series of cards. For ease of integration, fully compatible software drivers are available. No coding is required; all necessary commands are included in the drivers.

FEATURES

- ❑ 14-, 16-Bit Resolution
- ❑ 200, 400 kHz; or 1 MHz Throughput
- ❑ Dual Channel DMA Controller
- ❑ 8 Differential Inputs
- ❑ Expandability up to 256 Channels
- ❑ Voltage & Current Input Protection
- ❑ Excellent CMRR
- ❑ Dynamically Set Gain per Channel on DVX 2502 & 2503
  Every Cycle on DVX 2504
- ❑ Variable Sampling Rate
- ❑ Multiple Sample Clock Sources
- ❑ Precision Internal Clock
- ❑ Versatile Trigger Unit
- ❑ Seven Level Interrupt
- ❑ VXI Support
- ❑ DC to DC Converter, Powered by +5V Only
- ❑ Self-Test Capability
- ❑ Software Drivers Available

APPLICATIONS

- ❑ Real Time Data Acquisition
- ❑ Precision Instrumentation
- ❑ Automatic Test Equipment
- ❑ Monitoring and Control
- ❑ Audio
- ❑ Sonar

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SPECIFICATIONS [1]

ANALOG INPUTS	DXV 2502	DVX 2503	DVX 2504
Number of Channels	8 differential, expandable to 256	8 differential, expandable to 256	8 differential, expandable to 256
Input Ranges			
Gain 1	±5V, ±10V, 0 to +10V	±5V, ±10V, 0 to +10V	±10V
Gain 2	±2.5V, ±5V, 0 to +5V	±2.5V, ±5V, 0 to +5V	±5V
Gain 4	±1.25V, ±2.5V, 0 to +2.5V	±1.25V, ±2.5V, 0 to +2.5V	±2.5V
Gain 8	±0.625V, ±1.25V, 0 to +1.25V	±0.625V, ±1.25V, 0 to +1.25V	±1.25V
Input Bias Current	5 nA Max.	5 nA Max.	5 nA Max.
Input Resistance	100 MΩ Typ.	100 MΩ Typ.	100 MΩ Typ.
Input Capacitance	70 pF Max.	70 pF Max.	70 pF Max.
Common Mode Voltage	±10V Max.	±10V Max.	±10V Max.
Input Overvoltage Protection	±25V Max.	±25V Max.	±25V Max.
Input Current Protection	50 mA Max.	50 mA Max.	25 mA Max.
CLOCK/TRIGGER INPUTS			
Logic Levels, LSTTL/CMOS Compatible			
Logic "0"	0.8V Max.	0.8V Max.	0.8V Max.
Logic "1"	2.0V Min.	2.0V Min.	2.0V Min.
Termination	50Ω	50Ω	50Ω
AMPLIFIER CHARACTERISTICS			
Gain	1, 2, 4, 8 (±0.02% Max.)	1, 2, 4, 8 (±0.02% Max.)	1, 2, 4, 8 (±0.02% Max.)
Offset Voltage	±10 mV Max.	±10 mV Max.	±55 mV Max
Slew Rate	12 V/µs Min.	80 V/µs Min.	18 V/µs Min.
CMRR	100 dB @ 60 Hz Typ.	100 dB @ 60 Hz Typ.	86 dB @ 60 Hz Min.
Full Power Bandwidth	200 kHz	400 kHz	0.6 MHz
Settling Time (10V Step, Gain = 1)	1.5 µs Typ. to ±0.001%	1.5 µs Typ. to ±0.001%	0.9 µs Typ. to ±0.008%
DYNAMIC CHARACTERISTICS			
Maximum Sampling Rate	204.8 kHz	409.6 kHz	1.024 MHz
Noise (Referred to input and measured over 700 kHz equivalent noise bandwidth)	(0.5 LSB + 30 µV) rms	(0.5 LSB + 50 µV) rms	800 µV RMS Max. (@ Unity Gain)
Differential Crosstalk	–96 dB (@ 1 kHz) Typ.	–90 dB (@ 1 kHz) Typ.	–83 dB (@ 20 kHz) Max.
S/H Aperture Delay	25 ns Typ.	25 ns Typ.	20 ns Typ.
S/H Aperture Jitter	±400 ps RMS Max.	±100 ps RMS Max.	±100 ps RMS Max.
S/H Feedthrough	–90 dB (@ 1 kHz) Typ.	–90 dB (@ 1 kHz) Typ.	–75 dB (@ 20 kHz) Typ.
Peak Distortion [2,4]	–96 dB Typ. (@ 10 kHz)	–91 dB Typ. (@ 10 kHz)	–82 dB Typ. (@ 50 kHz)
Total Harmonic Distortion [3,4]	–91 dB Typ. (@ 10 kHz)	–90 dB Typ. (@ 10 kHz)	–80 dB Typ. (@ 50 kHz)
TRANSFER CHARACTERISTICS			
Resolution	16 Bits	16 Bits	14 Bits
Quantization Error	±0.5 LSB Max.	±0.5 LSB Max.	±0.5 LSB Max.
Integral Non-Linearity	±0.003% FSR Max.	±0.003% FSR Max.	±0.006% FSR Max.
No Missing Codes	Guaranteed from 0°C to +50°C	Guaranteed from 0°C to +50°C	Guaranteed from 0°C to +50°C
Monotonicity	Guaranteed	Guaranteed	Guaranteed

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	DXV 2502	DVX 2503	DVX 2504
STABILITY (0°C TO +50°C)			
Required Warm-up Time (for ultimate specifications)	15 minutes	15 minutes	15 minutes
Offset Tempco	50 µV/°C Max.	50 µV/°C Max.	200 µV/°C Max.
Gain Tempco	20 ppm FSR/°C Max.	20 ppm FSR/°C Max.	20 ppm FSR/°C Max.
Differential Non-Linearity Tempco	±1 ppm FSR/°C Max.	±1 ppm FSR/°C Max.	±2 ppm/°C Max.
Precision Clock	±10 ppm, 0-50°C	±10 ppm, 0-50°C	±10 ppm, 0-50°C
Recommended Recalibration	6 months	6 months	6 months
TRIGGER (START/STOP) MODES			
Internal	Software write to register. Automatically synchronized with on-board precision clock.	Software write to register Automatically synchronized with on-board precision clock.	Software write to register. Automatically synchronized with on-board precision clock.
External (TTL Active Low)	Via front panel BNC	Via front panel BNC	Via front panel BNC
Data Dependent	Generated at the occurrence of a predefined value, at a monitored channel	Generated at the occurrence of a predefined value, at a monitored channel	Generated at the occurrence of a predefined value, at a monitored channel
SAMPLE CLOCK	**DVX 2502**	**DVX 2503**	**DVX 2504**
	Internal via programmable divider and 3.6864 MHz ±0.001% Clock. Produces 3.6k samples/sec to 204.8k samples/sec in 1006 steps.	Internal via programmable divider and 3.6864 MHz ±0.001% Clock. Produces 3.6k samples/sec to 409.6k samples/sec in 1015 steps.	Internal via programmable divider and 3.072 MHz ±0.001% Clock. Produces 3.0k samples/sec to 1024k samples/sec in 1021 steps.
	External, 2.5 MHz to 4.0 MHz, TTL, 50% duty cycle clock via front panel BNC connector & Internal, programmable 10-bit divider. Min. sample rate = 2.5 MHz ∏ 1023 = 2.4k samples/sec.	External, 2.5 MHz to 4.0 MHz, TTL, 50% duty cycle clock via front panel BNC connector & Internal, programmable 10-bit divider. Min. sample rate = 2.5 MHz ∏ 1023 = 2.4k samples/sec.	External, 2.5 MHz to 4.0 MHz, TTL, 50% duty cycle clock via front panel BNC connector & Internal, programmable 10-bit divider. Min. sample rate = 2.5 MHz ∏ 1023 = 2.4k samples/sec.
	External, 0 to 204.8 kHz sample clock via front panel BNC connector or P2 TTLTRG line per VXI spec. Clock signal is TTL active low, edge triggered with low period = 150-200 ns.	External, 0 to 409.6 kHz sample clock via front panel BNC connector or P2 TTLTRG line per VXI spec Clock signal is TTL active low, edge triggered with low period = 150-200 ns.	External, 0 to 1024 kHz sample clock via front panel BNC connector or P2 TTLTRG line per VXI spec Clock signal is TTL active low, edge triggered with low period = 150-200 ns.
	Master/slave(s) for sychronizing multiple modules via P2 TTLTRG line per VXI spec.	Master/slave(s) for sychronizing multiple modules via P2 TTLTRG line per VXI spec.	Master/slave(s) for sychronizing multiple modules via P2 TTLTRG line per VXI spec.
DATA TRANSFER			
Output Coding	Binary, Offset Binary, Two's Complement	Binary, Offset Binary, Two's Complement	Binary, Offset Binary, Two's Complement
Via VMEbus	16-bit word transfer via on-card DMA using a 1k word FIFO buffer	16-bit word transfer via on-card DMA using a 1k word FIFO buffer	16-bit word transfer via on-card DMA using a 1k word FIFO buffer
Interrupts	FIFO status or DMA buffer filled	FIFO status or DMA buffer filled	FIFO status or DMA buffer filled
Via VXI Local Bus	2 successive bytes transfer to adjacent slot	2 successive bytes transfer to adjacent slot	2 successive bytes transfer to adjacent slot
VXI/VME COMPLIANCE			
VXI	Register Based, Local Bus User	Register Based, Local Bus User	Register Based, Local Bus User
VME	A24/16, D16, I1, Slave A24, D16 Master (DMA)	A24/16, D16, I1, Slave A24, D16 Master (DMA)	A24/16, D16, I7, Slave A24, D16, RWD, Master (DMA)

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	DXV 2502	DVX 2503	DVX 2504
SCAN SEQUENCE CONTROLLER			
Number of Steps	1024	1024	1024
Gain Change Capability	Every scan list entry. Rated performance maintained.	Every scan list entry. Rated performance maintained.	Once per Scan Sequence Cycle. All entries within a scan list must be at same gain
Maxi. No. of Multiplexed Channels	256	256	256
FRONT PANEL INDICATORS			
Pass/Fail LED	Green/Red	Green/Red	Green/Red
Busy LED	Red	Red	Red
Channel Selection	Green	Green	Green
POWER REQUIRED			
+5V Supply	+4.75V Min., +5.25V Max.	+4.75V Min., +5.25V Max.	+4.75V Min., +5.25V Max.
Power Consumption	20W Max.	20W Max.	22W Max.
ENVIRONMENTAL AND MECHANICAL			
Temperature Range Rated Performance	0°C to +50°C	0°C to +50°C	0°C to +50°C
Storage	–25°C to +75°C	–25°C to +75°C	–25°C to +75°C
Relative Humidity	0 to 85% non-condensing up to +40°C	0 to 85% non-condensing up to +40°C	0 to 85% non-condensing up to +40°C
Recommended Forced Air Cooling	10 cubic feet per minute	10 cubic feet per minute	10 cubic feet per minute
Dimensions	6U (B VXI)	6U (B VXI)	6U (B VXI)
Front Panel Potential	Chassis Ground	Chassis Ground	Chassis Ground
Weight	1.75 Lb/.79 Kg	1.75 Lb/.79 Kg	1.75 Lb/.79 Kg

NOTES:
1. Unless otherwise noted all specifications apply at +25°C.
2. Peak Distortion represents the ratio between the highest spurious frequency component below the Nyquist rate and the signal.
3. Total Harmonic Distortion represents the ratio between the rms sum of all harmonics up to the 20th harmonic and the RMS value of the signal.
4. ±10V input signal.
5. Single gain setting per scan.

Specifications subject to change without notice.

Ordering Guide

DVX 2502
16-Bit, 200 kHz DAS/Digitizer
DVX 2502 – B05 – Bipolar, ±5V
DVX 2502 – B10 – Bipolar, ±10V
DVX 2502 – U10 – Unipolar, 0 to ±10V

DVX 2503
16-Bit, 400 kHz DAS/Digitizer
DVX 2503 – B05 – Bipolar, ±5V
DVX 2503 – B10 – Bipolar, ±10V
DVX 2503 – U10 – Unipolar, 0 to ±10V

DVX 2504-B10
14-Bit, 1 MHz DAS/Digitizer

82-5041
DVX 2502 Manual

82-5059
DVX 2503 Manual

82-5085
DVX 2504 Manual

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