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V213 32/64-channel, 16-bit, Scanning ADC



FEATURES

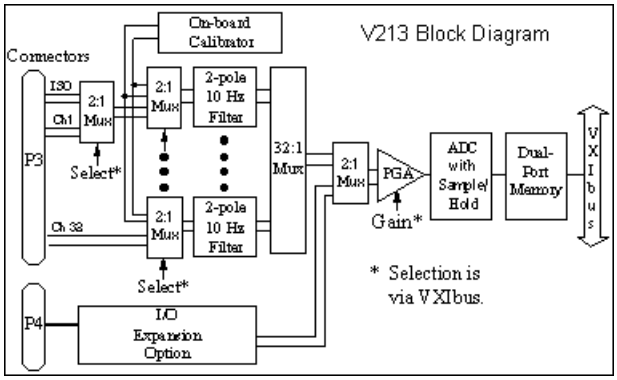
- Up to 64 channel capability
- Up to 50 kHz aggregate sampling rate
- I/O expansion cards for analog input, analog output, or digital I/O
- Programmable gain per channel
- Optional 10 Hz to 1 kHz lowpass filters
- Dual-ported buffer memory
- Programmable limit checking and triggering
- Precision, on-board reference for end-to-end calibration
- On-board self-test and calibration
- Differential inputs

GENERAL DESCRIPTION

The V213 is a single-width, C-size, register-based, VXIbus module that can digitize as many as 64 analog voltage channels. The resulting digital data is stored in a block of memory that can be read over the VXIbus. The 16-bit ADC scans each channel at a scan rate chosen by the user. The number of channels and the scan rate are software selectable. Scans may be triggered from either an internal clock, one of the eight backplane TTL trigger lines, an external SMB connector on the front panel, or as a single-scan. The internal scan rate is divided into one part in 65,536 providing scan rates of 50 kHz through 0.76 Hz. If single-scan operation is chosen, an interrupt may be generated at the end of the scan.

The V213 has programmable gain which can be set on a channel-by-channel basis. Gains of 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, and 2000 are available. On-board calibration is available on each channel for end-to-end calibration.

A block of dual-ported memory is used to receive data from the ADC. The memory is broken up into two blocks: "ping" and "pong". The ADC fills one memory block while VXIbus has access to the other. Using a ping/pong scheme provides random access to each channel's data.



The V213-AAA1 options provide a fixed, 2-pole, passive, 10 Hz filter at the input of every channel. Other filter options are available in a 1, 2, 5 progression from 10 Hz to 1 kHz. Under software control, channels 1 and/or 33 may be configured as an isothermal reference channel for use with the KineticSystems Model V792 Isothermal Termination Panel.

The base option of the V213 provides 32 channels of analog input. Optional I/O expansion cards are also available to provide an additional 32 channels of analog input. Other I/O expansion cards are available including analog output, and digital I/O.

The V213 supports both static and dynamic configuration. It may be accessed using A32/A16, D32/D16 data transfers.

Specifications

Item	Specification
Number of channels Gain ranges	32, expandable to 64 with I/O expansion cards 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, and 2000
Common Mode Input Range Differential Input Range Input protection Input impedance	±10.24 V ±10.24 V ±35 V continuous 100 Mohm
Resolution	16-bit, monotonic over operating range
Scan Rate Internal frequency choices External sources	0.76 Hz to 50 kHz (65,536 steps) Front-panel SMB, TTL to 20 kHz

Duty cycle	50%
Backplane source	1 of 8 TTL trigger lines on VXIbus P2 connector
Transfer Characteristics	
Integral non-linearity	0.003% FSR
Differential non-linearity	0.001% FSR
Initial accuracy, RTI	After automatic calibration:
Gain = 1	±(1 mV + 0.02% of reading)
Gain = 10	±(100 µV + 0.02% of reading)
Gain = 100	±(10 µV + 0.02% of reading)
Gain = 2000	±(5 µV + 0.04% of reading)
Offset stability, RTI	4 µV/ºC @ gain >= 1000
Gain stability	20 ppm/ºC
Bandwidth	1 kHz, V213-GAA1 option
Common mode rejection	-100 dB min at gain >= 100
Noise, RTI	5 µV at gain >= 1000
Channel-to-channel crosstalk	-90 dB
I/O Connector Type	
Analog/Digital I/O	Two 68P High Density
Trigger/Scan Clock Inputs	Two SMB
Calibration Voltage Input	2-contact LEMO
Power Requirements (quiescent)	
+ 5 V	TBD
+24 V	TBD
-24 V	TBD
+12 V	TBD
-12 V	TBD

ORDERING INFORMATION

Model V213-xAA1 — 32/64-channel, 16-bit Scanning ADC

x: Filter Type
- A = 2-pole RC Filter, 10 Hz*
- B = 2-pole RC Filter, 20 Hz
- C = 2-pole RC Filter, 50 Hz
- D = 2-pole RC Filter, 100 Hz
- E = 2-pole RC Filter, 200 Hz
- F = 2-pole RC Filter, 500 Hz
- G = 2-pole RC Filter, 1 kHz*

Factory Integrated Upgrades

(V213 can only accommodate 1 upgrade per card)

Model V213-A100 — Additional 32 channels, 10 Hz filter*
Model V213-A101 — Additional 32 channels, 20 Hz filter
Model V213-A102 — Additional 32 channels, 50 Hz filter
Model V213-A103 — Additional 32 channels, 100 Hz filter
Model V213-A104 — Additional 32 channels, 200 Hz filter
Model V213-A105 — Additional 32 channels, 500 Hz filter
Model V213-A106 — Additional 32 channels, 1 kHz filter*
Model V213-A160 — 32-channel DAC output
Model V213-A180 — 16-channel DAC, 32-channel TTL Digital I/O
Model V213-A200 — 64-channel TTL Digital I/O

Field Upgrades

(V213 can only accommodate 1 upgrade per card)

Model V213-F100 — Additional 32 channels, 10 Hz filter*
Model V213-F101 — Additional 32 channels, 20 Hz filter

Model V213-F102 — Additional 32 channels, 50 Hz filter
Model V213-F103 — Additional 32 channels, 100 Hz filter
Model V213-F104 — Additional 32 channels, 200 Hz filter
Model V213-F105 — Additional 32 channels, 500 Hz filter
Model V213-F106 — Additional 32 channels, 1 kHz filter*
Model V213-F160 — 32-channel DAC output
Model V213-F180 — 16-channel DAC, 32-channel TTL Digital I/O
Model V213-F200 — 64-channel TTL Digital I/O

* The 10 Hz filter option is recommended for most low frequency applications (thermocouples, etc.). The 1 kHz option is recommended for most transient applications (dynamic strain, etc.).

ACCESSORIES

Model 5868-Bxyz — Cable: 68S High Density to Unterminated
Model 5868-Dxyz — Cable: 68S High Density to 68P High Density
Model 5868-Exyz — Cable: 68S High Density to 68S high Density
Model 5857-Cxyz — Cable: 2-contact LEMO to Unterminated
Model 5857-Dxyz — Cable: 2-contact LEMO to 2-contact LEMO
Model 5857-Gxyz — Cable: 2-contact LEMO to BNC; shielded
Model T910-Axyz — Cable: SMB to SMB; shielded
Model T910-Bxyz — Cable: SMB to BNC; shielded
Model T910-Cxyz — Cable: SMB to Unterminated
Model V750-ZC11 — Isothermal Termination Assembly for V213
Model V765-ZA11 — Rack-mount Termination Panel
Model V792-ZA11 — Rack-mount Isothermal Termination Panel

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