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32-Channel, 16-bit Scanning ADC

A multichannel ADC with optional input filters

V215

Features

- 32-channel capability with differential inputs
- 16-bit resolution
- Programmable gain (1 to 1024) per channel
- Programmable number of active channels
- Self-scan and triggered scan operation
- Dual-ported buffer memory
- Options with 6 Hz low-pass filter
- Options available with temperature reference inputs

Typical Applications

- Powertrain/engine testing
- Temperature measurements
- General-purpose data acquisition

General Description

The V215 is a single width, C-size, register-based, VXIbus module that can digitize as many as 32 analog voltage channels. The resulting digital data can be read over the VXIbus. The module contains a 16-bit analog-to-digital converter capable of resolving one part in 65,536. The number of active (scanned) channels is software programmable. There are two software-selectable scan modes: continuous and single-scan. With continuous mode, VXIbus Read cycles are asynchronous with the conversion process, eliminating any overhead due to testing for "converter busy." If it is desirable to synchronize scanning and reading, single-scan mode can be used. In this mode, an interrupt is generated after the last channel has been converted. In addition, the external trigger input may be used to synchronously trigger a single scan on multiple V215s.

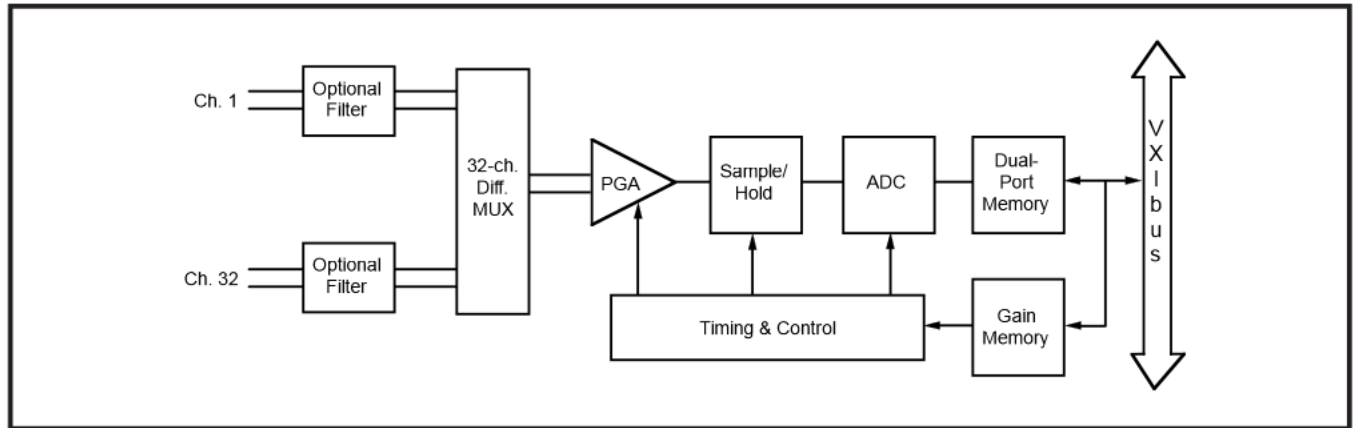
The V215 contains a 4-bit, 32-word memory which can be loaded on a channel-by-channel basis with an appropriate gain factor for each differential input signal. Eleven gain factors, from 1 to 1024, are available. This allows one V215 to measure a wide variety of input signal types (such as thermocouples, high-level inputs, etc.). Once channel scanning is initiated, each channel's input is selected, the pre-loaded gain factor is applied to it, the amplified signal is converted, and the resultant binary information is stored in the on-board memory. Conversions take place at the rate of one every 250 μ s (all 32 channels in 8 ms). The memory is configured in a dual-ported fashion to facilitate the retrieval of data with block transfer operations.

All versions of the V215 are precalibrated for ± 10 V inputs. The V215-VC11 and -VD11 options include a single-pole low-pass filter at the input of each channel. These filters provide a -3 dB cutoff frequency of 6 Hz. To facilitate the use of this module in temperature monitoring systems, the V215-VB11 and -VD11 options are available. On these options, both channels 1 and 17 are configured to power and receive an isothermal reference signal from a KineticSystems Model V792-ZA11 32-channel Isothermal Panel. For monitoring 4-20 mA current loop signals, it is common practice to mount a precision 250 Ω resistor external to the module (i.e., at a terminal strip). This allows the input to the V215 to be disconnected without disrupting the current loop. The loop must not exceed the maximum common-mode voltage rating of the V215. The KineticSystems Model 1854 Termination Panel may be used for this purpose.

All input signals are brought to the module through a pair of 36-pin AMP rectangular connectors mounted on the front panel. These connectors mate directly with the KineticSystems Model 5944-Z1A mating connectors and with the 5855-Series of cable assemblies. The external trigger is brought in through a single-pin LEMO connector. An LED flashes whenever the module is addressed, and an ACTIVE light indicates when the module is powered and scanning is activated. An interrupt LED is illuminated whenever an interrupt is pending.

The V215 supports both static and dynamic configuration. Access to the converted data is through memory locations indicated by the Offset Register within the VXIbus Configuration Register set, using A24/A16, D16 data transfers.





Item	Specifications
Inputs Number of input channels Input signal range Input protection Common-mode input voltage Common-mode rejection Input impedance Drift G = 1 to 16 G = 32 to 256 G = 512 G = 1024	32 differential inputs ± 10 V dc, maximum ± 35 V, continuous; ± 300 V for 100 μ s ± 10.5 V dc, maximum -110 dB at dc to 1 Hz; -6 dB/octave rolloff to -70 dB at 1 kHz 22 M Ω $\pm 0.0013\%$ FSR/ $^{\circ}$ C, maximum $\pm 0.0018\%$ FSR/ $^{\circ}$ C, maximum $\pm 0.0030\%$ FSR/ $^{\circ}$ C, maximum $\pm 0.0057\%$ FSR/ $^{\circ}$ C, maximum
Filtering (-VC11, -VD11 Options) Input filter -3dB cutoff frequency (f_c)	single-pole, low-pass RC type 6 Hz
A/D Converter Resolution Linearity error Differential linearity error Drift Quantization error Conversion time	16 bits (one part in 65,536) $\pm 0.003\%$ of Full Scale Range $\pm 0.003\%$ of Full Scale Range $\pm 0.0018\%$ FSR/ $^{\circ}$ C, maximum $\pm 1/2$ LSB, typical 250 μ s
On-board memory	32 16-bit words
Input connector type	36P AMP Rectangular
Power requirements +5 V +24 V -24 V	2.7A, typical 80 mA, typical 79 mA, typical
Environmental and Mechanical Temperature range Operational Storage Relative humidity Cooling requirements Dimensions Front panel potential	0 $^{\circ}$ C to +50 $^{\circ}$ C -25 $^{\circ}$ C to +75 $^{\circ}$ C 0 to 85%, non-condensing to +40 $^{\circ}$ C 10 CFM 340 mm x 233.35 mm x 30.48 mm (C-size VXIbus) Chassis ground

Ordering Information

Model V215-VA11 32-channel, 16-bit A/D Converter; without filters or compensation reference

Model V215-VB11 32-channel, 16-bit A/D Converter; without filters, with compensation reference

Model V215-VC11 32-channel, 16-bit A/D Converter; with filters, without compensation reference

Model V215-VD11 32-channel, 16-bit A/D Converter; with filters and compensation reference

Related Products

Model 5855-Axyz Cable—36P AMP Rectangular to Unterminated

Model 5855-Bxyz Cable—36P AMP Rectangular to 50S Amphenol Ribbon

Model 5855-Cxyz Cable—36P AMP Rectangular to 36P AMP Rectangular

Model 5857-Axyz Cable—1-contact LEMO to Unterminated

Model 5857-Bxyz Cable—1-contact LEMO to 1-contact LEMO

Model 5857-Hxyz Cable—1-contact LEMO to BNC shielded

Model 5910-Z1A Connector—1-contact LEMO

Model 5944-Z1A Connector—36P AMP Rectangular

Model V765-ZA11 Rack-mount Termination Panel

Model V792-ZA11 Rack-mount Isothermal Panel



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