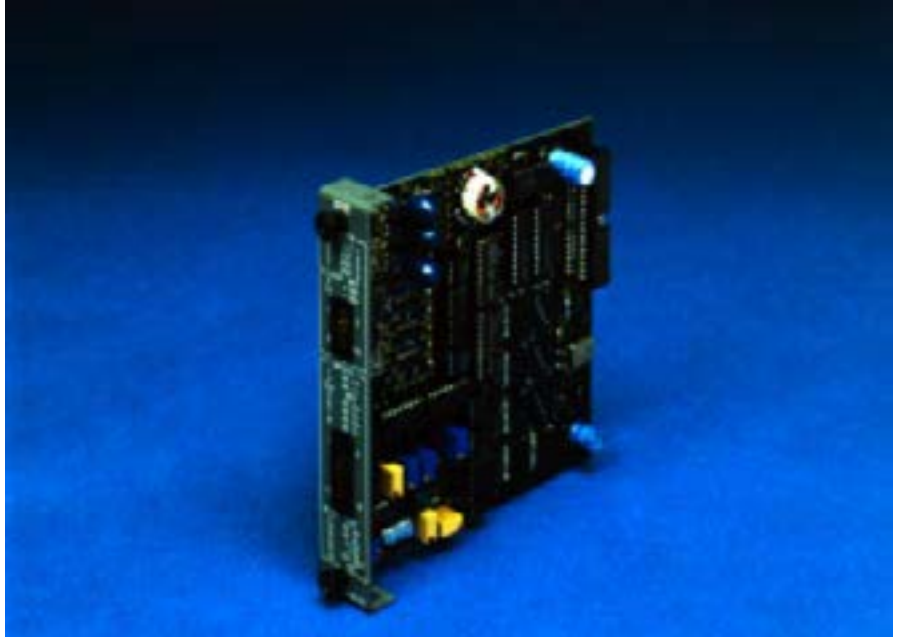


Model 2213 Analog Input/Output Module

High Resolution Differential Inputs, Bipolar Outputs



With 4 high-resolution inputs and 4 analog outputs in a single module, the model 2213 represents an exceptional value for applications requiring analog data acquisition and control. The highly-configurable inputs can accept a variety of signal levels while maintaining their full 14-bit resolution, making this module appropriate for applications ranging from weighing systems to pressure and temperature monitoring. At the same time, the four bipolar (± 10 Volt) analog outputs may be used for generating analog command signals with a resolution of 11 bits, providing all the resources necessary for closed-loop analog control.

Configurable Inputs

The differential inputs of the model 2213 may be independently selected, under program control, to one of 4 different ranges. In the unipolar mode, these ranges are +10 Volts, +1 Volt, +100 millivolt and +20 millivolt full scale, while in bipolar mode, the ranges are ± 5 Volts, ± 500 millivolt, ± 50 millivolt and ± 10 millivolt. These ranges may be selected dynamically, allowing you to expand your resolution of measurement whenever your signal drops into a lower range.

An on-board precision reference supply (+10.000 V) allows self-contained interface to a variety of transducers, including many commonly available load cells and pressure sensors. By using this reference and the 20 millivolt input range, a direct interface may be made between the strain gauge output of a load cell and the differential inputs of the model 2213.

Designed for Accuracy in Industrial Applications

Two resolution ranges are selectable, under program control, for each input channel of the model 2213. For fast, 5 millisecond conversions where extreme accuracy is not the major criterion, 11-bit resolution may be selected. For higher resolution requirements, the 14-bit range results in a resolution of 610 microVolts across a range of 0-to-10 Volts, and proportionately smaller resolutions in lower ranges.

To achieve accuracy in practical applications at these resolutions, an advanced Voltage-to-Frequency conversion technique is used to integrate the input voltage over a precise 16.67 millisecond period. This results in an effective nulling of 60 Hz "noise", so prevalent as a source of inaccuracy and "jitter" in typical analog circuits.

Additionally, full electrical isolation is maintained between the analog I/O of the model 2213 and the other circuitry within the controller, resulting in a reduced chance of ground currents and loops, and their respective errors.



The model 2213 Analog I/O Module may be used in any Control Tech. controller with a type 2200 bus. The module's inputs may be configured for either unipolar or bipolar operation via on-board jumpers; other range parameters are selectable via programmed instructions.

For More Information

Further detailed connection and application information may be found in Control Tech. publication IG2213; this is the Installation Guide for the model 2213.

Selection and applications assistance may be obtained from our staff of Systems Specialists — call the number below for further information.

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Absolute Maximum Ratings

	Min	Max	
Analog Input Voltage (with respect to Analog Common)		±15.00	VDC
Analog Output Load Resistance	2.0		kΩ
Reference (+10.000 V.) Output Current		25.0	mA
Auxiliary (±15 V.) Power Supply Output Current		±30.0	mA
Ambient Temperature	0	50	°C

Specifications – Inputs

	Min	Typ	Max	
Differential Input Ranges – Unipolar				
Range 0	0		+10.000	VDC
Range 1	0		+1.000	VDC
Range 2	0		+0.100	VDC
Range 3	0		+0.020	VDC
Differential Input Ranges – Bipolar				
Range 0	-5.000		+5.000	VDC
Range 1	-0.500		+0.500	VDC
Range 2	-0.050		+0.050	VDC
Range 3	-0.010		+0.010	VDC
Common Mode Voltage Range	-10.0		+10.0	VDC
Input Resistance		10,000		Megohms
14-bit Mode –				
Resolution		.0061		% FS
Accuracy – 25° C.		±.0061	±.012	% FS
Nominal Conversion Time*		19		ms
11-bit Mode –				
Resolution		.0488		% FS
Accuracy – 25° C.		±.0488	±.0977	% FS
Nominal Conversion Time*		15		ms

Specifications – Outputs

Voltage Range	-10.000		+10.000	VDC
Resolution		9.766		mV
Accuracy		±19.5	±30.0	mV
Settling Time: +10.000 to -10.000 V.		100		ms
Settling Time: 0 to +1.000 V.		45		ms

Specifications – Power Supplies & Reference

Power Supply Output Voltages				
Positive Supply	+14.25	+15.00	+15.75	VDC
Negative Supply	-14.25	-15.00	-15.75	VDC
Reference Output Voltage	+9.995	+10.000	+10.005	VDC

Power Requirements (from controller)

Logic Supply (5 V.)	170.0	210.0		mA
Auxiliary Supply (24 V.)		95.0	145.0	mA

Specifications shown above are at 25° C., unless otherwise noted.

*Conversion times based on 2600XM Controller.