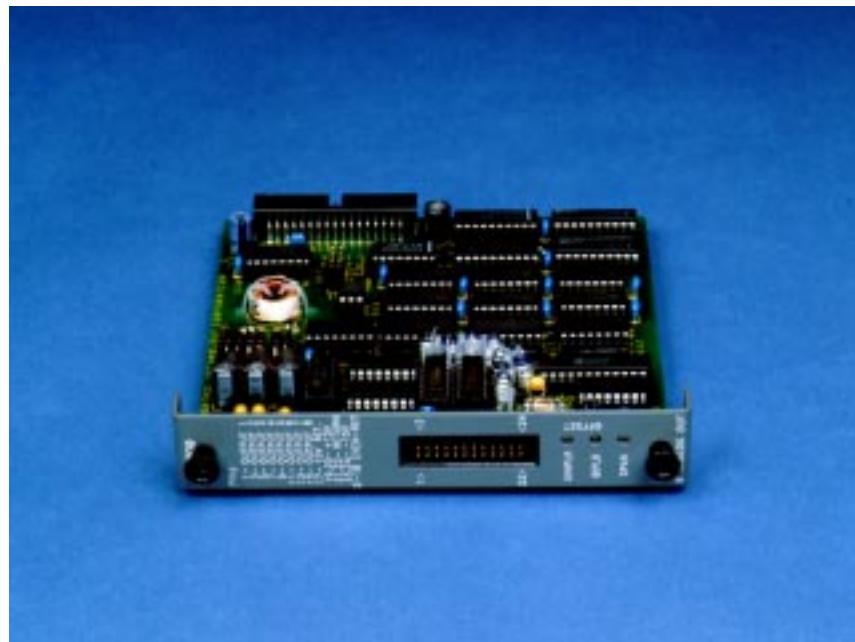


## **Model 2209 8-Channel Analog Output Module**

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**High-Resolution (12 bit) Unipolar or Bipolar Outputs**



The model 2209 Analog Output Module provides eight outputs which may collectively be configured for one of three operating ranges: +10 V (unipolar),  $\pm 10$  V or  $\pm 5$  V. These outputs offer 12-bit resolution (1 part in 4096), making the module suitable for such demanding applications as process control, motor speed control, interfacing to external systems, etc.

### **Fast Response Times**

The unique architecture of the model 2209 provides extremely fast response to programmed changes in analog output values. This capability allows its use in critical process control applications where response time is a primary criterion. Mass flow controllers, electromechanical servos and precise fluid dispensing are but a few of the applications where the fast response time of this module provides benefits.

### **External Interfacing Flexibility**

In addition to the configurable voltage ranges, which allow the module's resolution to be more fully utilized, the model 2209 has several additional features which assist in interfacing to external circuitry. First, the module's internal  $\pm 15$  volt power supply is available at the output connector. In applications requiring external interface circuitry, this supply may often be used as a power source, eliminating the need for an external power supply (note, however, that the current limitations must be observed).

In addition, a +10.0 volt reference is provided at the output connector for external use.

### **Optoisolated for Increased Noise Immunity**

As with other Control Tech. analog modules, the model 2209 outputs are optoisolated from the controller's logic circuitry. Although this entails extensive additional circuitry, the result is a module which allows high-performance analog interfacing while maintaining a high degree of controller noise immunity.



The model 2209 Analog Output Module may be used in any Control Tech. controller with a type 2200 bus.

On-board jumpers are provided for configuring the span (10V or 20V) and mode (unipolar or bipolar) of the module. Factory preset adjustments are provided for unipolar and bipolar offset, and for span adjustment.

#### For More Information

Further detailed connection and application information may be found in Control Tech. publication IG2209; this is the Installation Guide for the model 2209.

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

Absolute Maximum Ratings	Min	Max	
Output Load Resistance	2.0		kΩ
Power Supply Capacity ( $\pm 15$ VDC) - Note 1		60	mA
Reference Output Capacity (+10.000 VDC)		100	μA
Ambient Temperature	0	50	°C
Specifications	Min	Typ	Max
Analog Output Voltage Ranges			
Unipolar, 10 V span	0.000		+10.000 VDC
Bipolar, 10 V span	-5.000		+5.000 V.D.C.
Bipolar, 20 V span	-10.000		+10.000 VDC
Output Resolution			
10 V span setting		2.44	mV
20 V span setting		4.88	mV
Output Accuracy			
10 V span setting		±2.44	±4.88 mV
20 V span setting		±4.88	±9.77 mV
Power Supply Output			
Negative Supply Voltage	-15.75		-14.25 VDC
Positive Supply Voltage	+14.25		+15.75 VDC
Reference Output Voltage	9.900		10.100 VDC

#### Performance Specifications

Settling Time (full scale change, +10V to -10V)	2.8		mS
Settling Time (1 volt change, 0 to +1 V)	2.2		mS

#### Power Requirements (from controller)

Logic Supply (5 V)	170	225	mA
Auxiliary Supply (24 V)	107	175	mA

#### Notes:

1. The external capacity of the on-board  $\pm 15$  volt supply must be reduced by the amount drawn from the analog outputs.
2. Specifications shown above are at 25° C., unless otherwise noted.

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