

## Analog Output Module, 2 Channel Voltage: IC694ALG390



The **2-Channel Analog Voltage Output** module, IC694ALG390, has two output channels, each capable of converting 13 bits of binary (digital) data to an analog output signal for field devices. The Analog Voltage Output module provides outputs in the range of -10 volts to +10 volts. Both channels are updated on every scan.

The module's outputs can be set up to either *Default to 0 volts* or *Hold-Last-State* if the CPU goes to the Stop mode or Reset. Selection of the output default state is made by a jumper on the module. If the jumper is not installed, the outputs Hold Last State.

This module can be installed in any I/O slot in an RX3i system.

### Isolated +24 VDC Power

If the module is located in an RX3i Universal Backplane, an external source of Isolated +24 VDC is required to provide power for the module. The external source can be connected via the TB1 connector on the left side of the backplane or directly on the module's terminal block.

If this module is located in an Expansion Backplane, its primary power source can be either the Isolated +24 VDC from the backplane power supply or an external Isolated +24 VDC power supply connected to the module's terminal block. If the external source is set between 27.5-30 VDC, it takes over the module's load from the Isolated 24 VDC system supply. Note that an external source should be used if it is desired to maintain hold last state operation during a loss of backplane power.

### LED

The **Module OK** LED is ON when the module's power supply is operating.

**Specifications: ALG390**

<b>Voltage Range</b>	-10 to +10 volts
<b>Calibration</b>	Factory calibrated to 2.5 mV per count
<b>Supply Voltage (nominal)</b>	+24 VDC, from isolated +24 VDC on backplane or user-supplied voltage source, and +5 VDC from backplane
<b>External Supply Voltage Range</b>	18 VDC to 30 VDC
<b>External Supply Voltage Ripple</b>	10%
<b>Update Rate</b>	Approximately 5 milliseconds (both channels) Update rate is application dependent.
<b>Resolution</b>	2.5 mV (1 LSB = 2.5 mV)
<b>Absolute Accuracy *</b>	+/-5 mV at 25°C (77°F)
<b>Offset</b>	1 mV maximum, 0 to 60°C (32° to 140°F)
<b>Output Loading (maximum)</b>	5 mA (2 K ohms minimum resistance)
<b>Output Load Capacitance</b>	2000 pico farads, maximum
<b>Isolation, Field to Backplane (optical) and to frame ground</b>	250 VAC continuous; 1500 VAC for 1 minute
<b>Internal Power Consumption</b>	32 mA from +5 VDC supply 120 mA from +24 VDC supply (isolated backplane or user supply)

Refer to Appendix A for product standards and general specifications.

\* In the presence of severe RF interference (IEC 801-3, 10 V/m), accuracy may be degraded to ±50 mV.

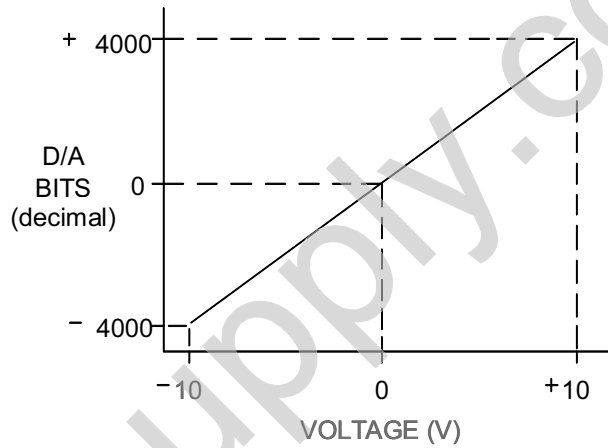
**Data Format: ALG390**

Module data is stored by the PLC CPU in 16-bit 2's complement format:

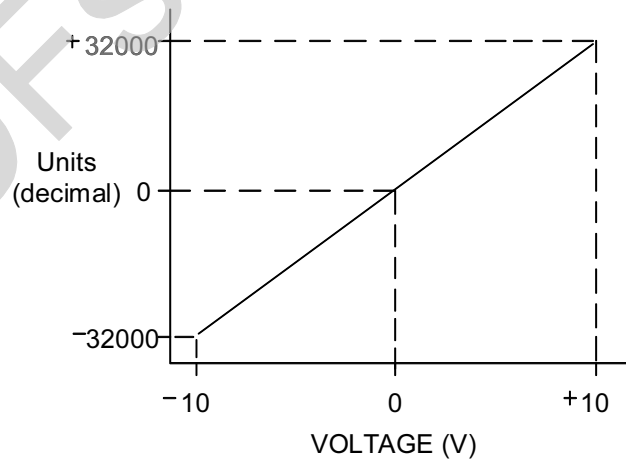
MSB											LSB				
+/-	10	9	8	7	6	5	4	3	2	1	0	X	X	X	X

Resolution of the converted signal is 12 bits binary plus sign, which is effectively 13 bits (1 part in 8192). The module scales the digital data to create an output voltage for the output:

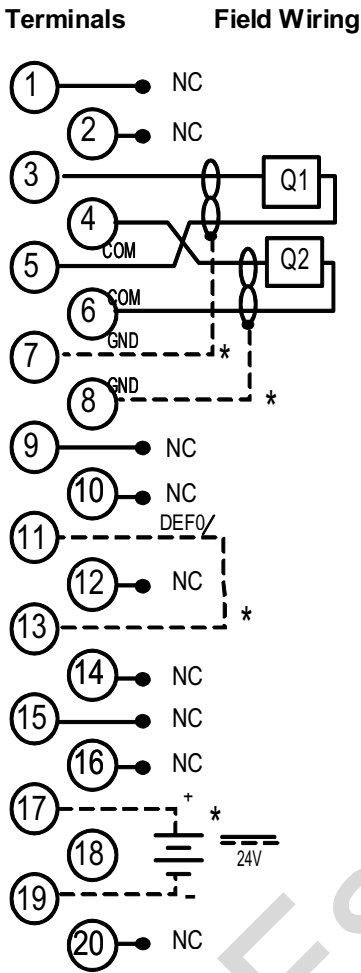
**D/A Bits versus Voltage Outputs**



Scaling of the output is shown below.



**Field Wiring: ALG390**



Terminal	Connection
1	No connection
2	No connection
3	Output 1
4	Output 2
5	Output 1 Common
6	Output 2 Common
7	Shield termination point for output 1
8	Shield termination point for output 2
9	No connection
10	No connection
11 - 13	Output default selection jumper
12	No connection
13	Output default selection jumper
14	No connection
15	No connection
16	No connection
17	External +24 VDC Power Supply +
18	No connection
19	External +24 VDC Power Supply -
20	No connection

\*Optional Connections

To minimize capacitive loading and noise, all field connections should be wired using a good grade of twisted, shielded instrumentation cable. The shields should be connected to GND on the user terminal connector block. The GND connection provides access to the backplane (frame ground) resulting in superior rejection of noise caused by any shield drain currents.

DEF0 is the optional Output Default Jumper. It determines the operation of both outputs when the CPU is in Stop or Reset mode. The jumper should be installed if outputs should default to 0. The jumper should not be installed if outputs should hold their last state (the last valid commanded value received from the CPU).

An optional external +24 VDC supply can be installed as shown.