

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GE PACSYSTEMS RX7I

IC697ALG320J

FOUR-CHANNEL VOLTAGE/CURRENT ANALOG OUTPUT MODULE

Used with the applicable Series 90-70 analog I/O configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: GE official manufacturer documentation

GFK-0388G
August 1997

High Level Analog Output System - Voltage/Current Module

Features

- High Level Analog voltage and current outputs on one module
- Output module has four outputs individually configurable for voltage or current
- Provides unipolar or bipolar Analog voltage outputs up to ± 10 volts full scale
- Provides 0 to 22.5 milliamp current loop signals
- Individual user scaling on each output channel
- Fast update rate
- No jumpers or DIP switches for user to configure
- Calibrated at factory with factory calibration data stored in non-volatile EEPROM memory

Easy configuration using the configuration function of the MS-DOS® or Windows® programming software running on Windows® 95 or Windows NT® over Ethernet TCP/IP or through the SNP port. The Programming Software configuration function is installed on the programming device. The programming device can be an IBM® XT, AT/PS/2® or compatible Personal Computer.

Functions

The high level Analog Output system for the Programmable Logic Controller (PLC) accepts digital data from the CPU or other controllers accessing the PLC backplane. This output data is converted by a Digital to Analog (D/A) converter to analog outputs of up to 10 volts full scale, or 0 to 22.5 milliamp current loop signals.

The basic converter is 16 bits resolution (1 part in 65536) with 14-bit monotonicity. Outputs are isolated from the backplane and are protected against transient and steady-state overvoltage conditions.

Analog outputs use %AQ references in the PLC. A maximum of 8K words of %AQ memory is available in the PLC. Each output channel uses one word (16 bits) of %AQ memory.

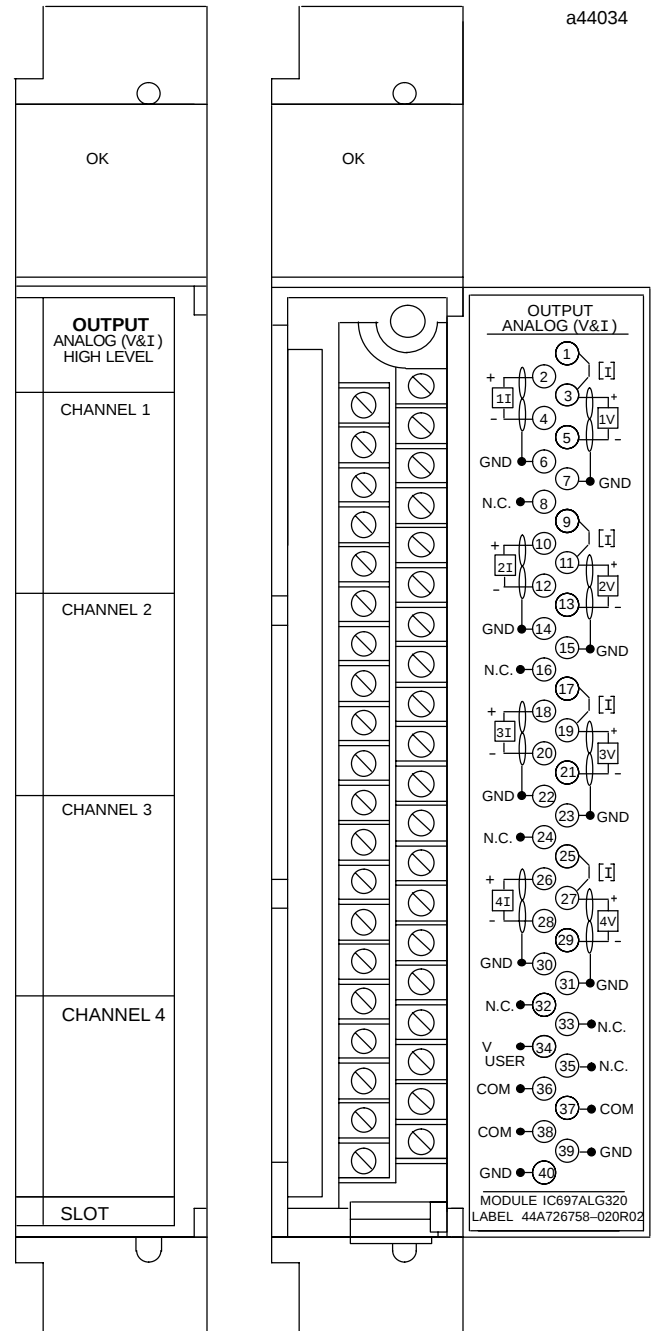


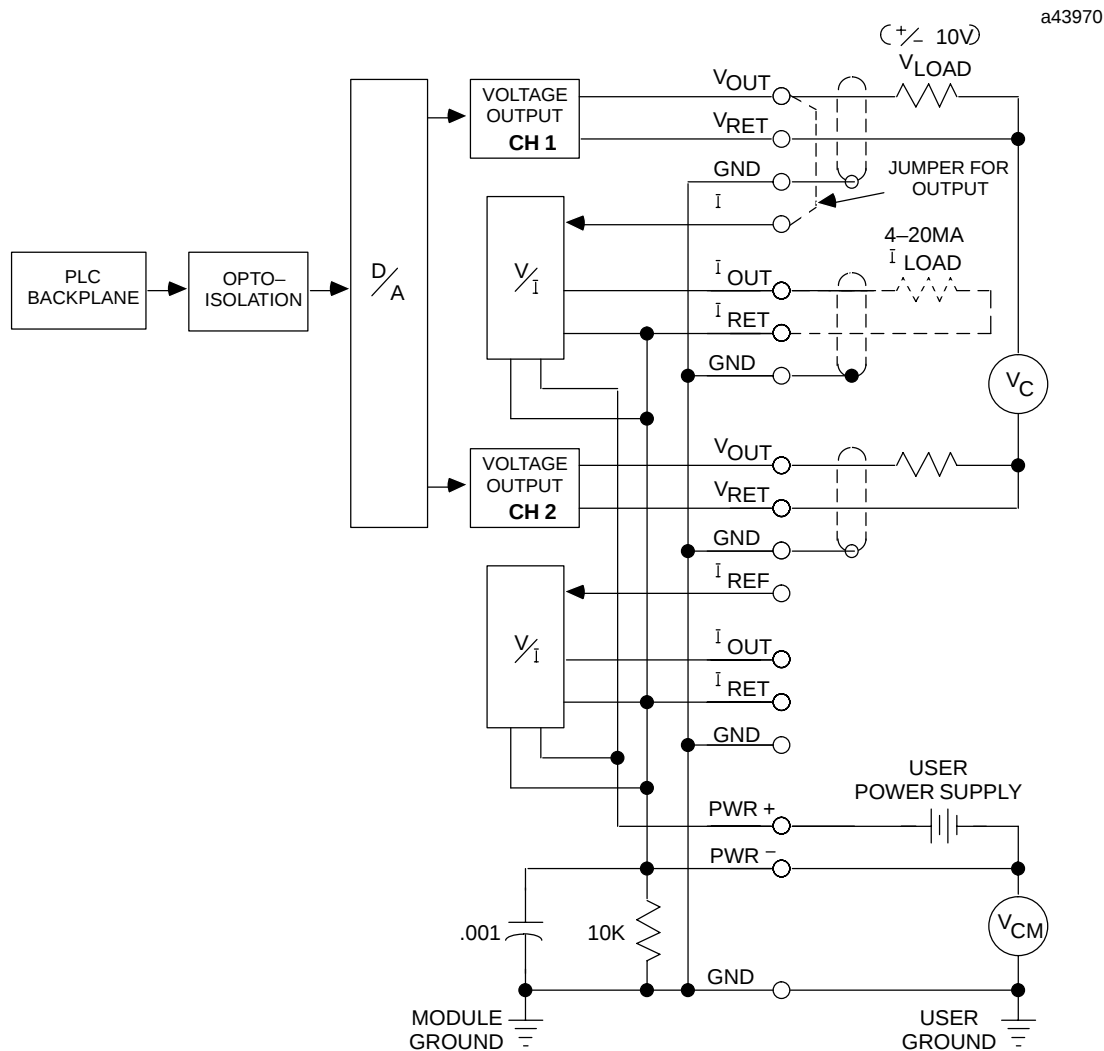
Figure 1. High Level Analog Output Module

® IBM and PS/2 are registered trademarks of International Business Machines Corporation.

® MS-DOS, Windows, Windows 95, and Windows NT are registered trademarks of Microsoft Corporation.

High Level Analog Output System - Voltage/Current Module

A block diagram of the IC697ALG320 High Level Analog Output module and an example of user field wiring connections to the module are shown below.



Connections for both voltage and current loads are shown in the above illustration. Note the following regarding the illustration:

- Connections for both voltage and current loads are shown in the above illustration. Note the following regarding the illustration:
1. Each output may be configured for either voltage **or** current - not both.
 2. If used as a current output you must jumper V_{OUT} to I_{REF}
 3. Power for the voltage output is derived from the PLC backplane. Power for the 4 to 20 mA current output must be supplied by the user. A single connection (PS_{POS} and PS_{NEG}) serves all four channels.

High Level Analog Output System - Voltage/Current Module

GFK-0388G
August 1997

Channel-to-Channel Compliance

While it is expected that output loads will be floating or tied to the same potential (normally ground), the module is designed to allow up to 0.5 VDC compliance voltage (labeled V_C in the previous illustration) difference between outputs and still operate within specifications. This prevents ground loop currents or errors from occurring due to small differences in ground potential at different locations. Note that in addition to this offset, outputs will operate properly in the presence of a large amount of high frequency noise (refer to specifications).

As shown in the previous illustration, the output circuitry is isolated from the PLC backplane. This allows the module to operate within specifications with a common mode voltage of up to $\varnothing$ 60V from ground (shown as V_{CM} in the illustration). It must be observed, however that the entire output section of the module (all four channels) operates at a **singleoffset** voltage from ground potential. Common mode voltage **between** outputs must be within the specifications stated in the previous paragraph.

User Power for Current Loops

This module will accommodate a wide range of load impedance; up to 800 ohms. The range of allowable power supply voltage for a given load impedance is shown in Figure 3. For example, a 24V $\varnothing$ 20% supply (19.2 to 28.8 volts) will provide sufficient power with loads from 200 to 550 ohms.

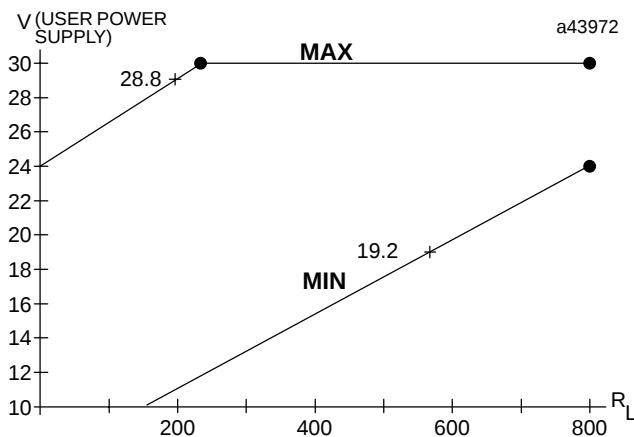


Figure 3. User Power vs. Load Impedance

User Wiring Connections

Figure 4 shows the wiring assignments for the screw terminals on the terminal board on the Analog Output module. In addition to the information in this data sheet, circuit wiring diagrams are printed on the inside surface of the label inserted in the module's hinged door.

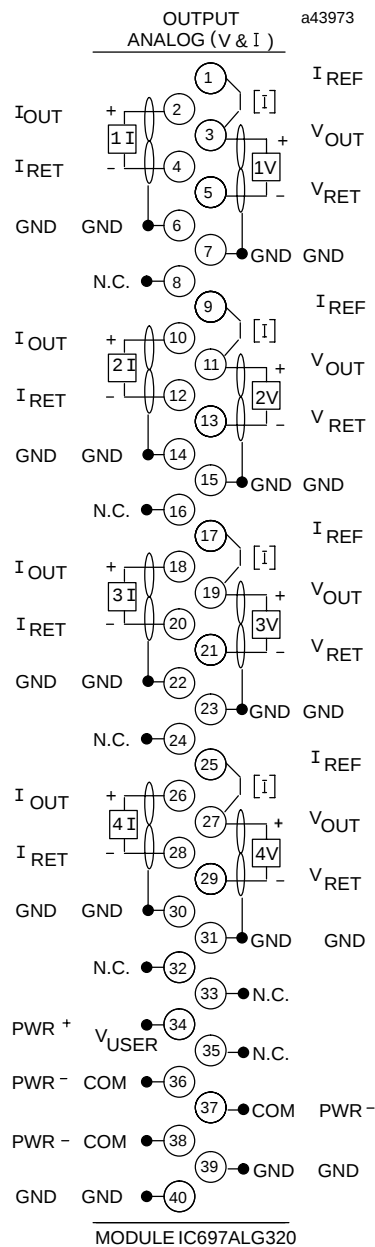


Figure 4. Field Wiring Connections to Module's I/O Terminal Board

GFK-0388G
August 1997

High Level Analog Output System - Voltage/Current Module

Connections to User Devices

Connections to the Analog Output module from user devices are made to screw terminals on a removable 40-terminal connector block mounted on the front of the module. All field connections to the outputs should be wired to the I/O terminal board using a good grade of twisted, shielded instrumentation cable. Separate connections are provided on the terminal board for both current outputs and voltage outputs for each channel. Actual terminals used are determined by the configuration that has been selected for each individual channel.

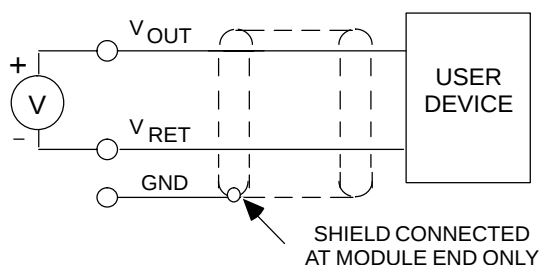
Ground connections for each channel, labeled GND, on the terminal board are provided for connecting

shields. This ground connection is made directly to the rack, resulting in superior rejection of noise caused by any shield drain currents. Actual selection of ground location may be influenced by system power and ground considerations. However, best operation will be obtained when system ground is physically close to the rack containing the analog circuits. Normally, the shield is grounded at only one end (see Figure 5).

For additional system grounding information refer to the discussion on system grounding in chapter 3 of the Programmable Controller Installation Manual.

The module provides electrical isolation of externally generated noise between the output field wiring and the backplane through use of optical isolation.

VOLTAGE:



CURRENT:

a43974

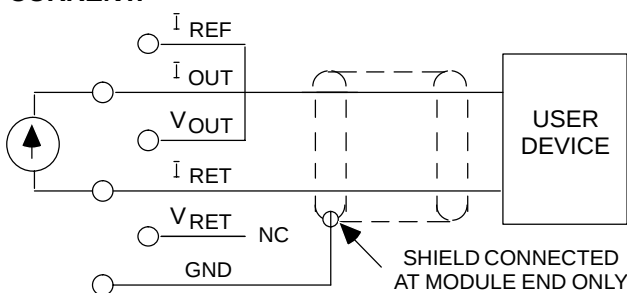


Figure 5. Cable Connections to Field Devices

High Level Analog Output System - Voltage/Current Module

GFK-0388G
August 1997

Recommended Field Wiring Procedures

The following procedures are recommended when connecting field wiring to the detachable terminal

board on the Analog Output module. Module features referenced in the following procedures which are common to all IC697 I/O modules are illustrated in the following figure.

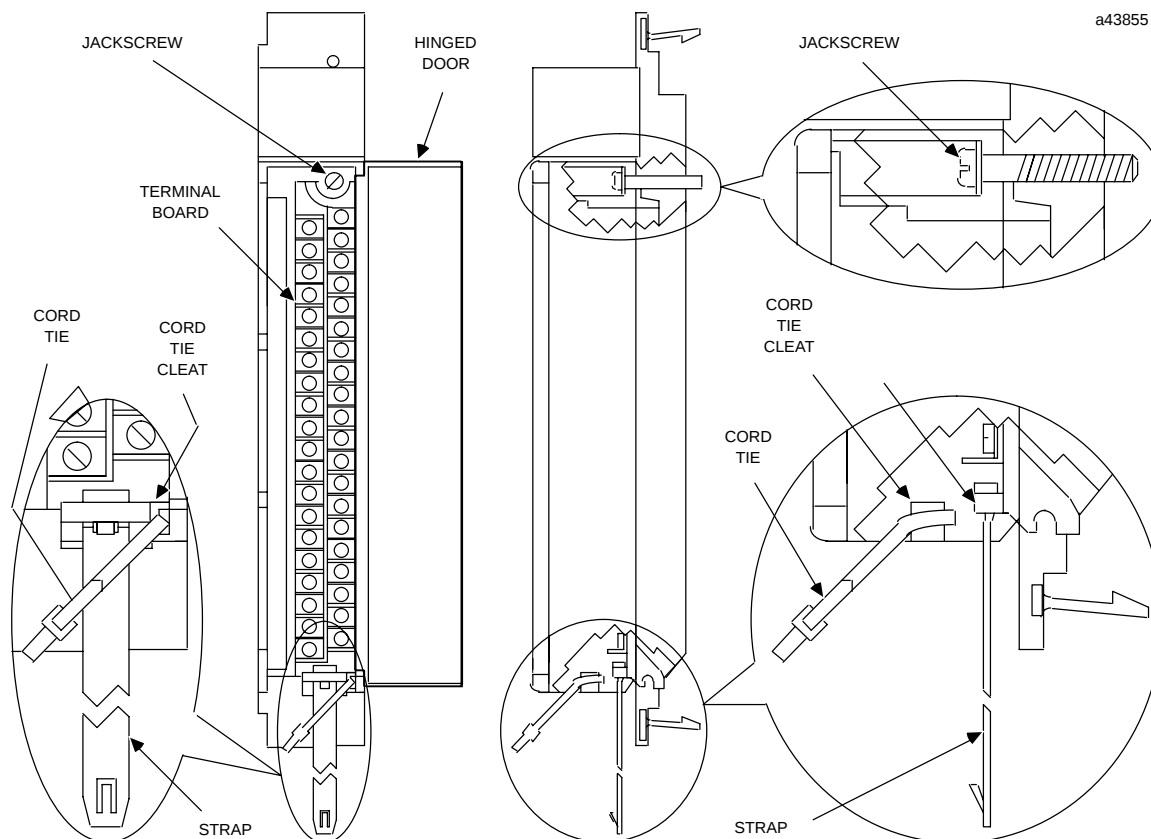


Figure 6. I/O Module Common Features

1. Turn off power before removing or installing terminal boards. Open the hinged door on the module to access a jackscrew which holds the terminal board securely in place. The Detachable field wiring terminal board can now be removed from the module by turning the jackscrew counter-clockwise until it is fully disengaged.
2. To remove the terminal board, grasp the top of the terminal board and swing it outward.
3. The terminal board is designed to accept wire sizes from AWG #22 (0.36 mm²) through AWG #14 (2.10 mm²). It is important that when using AWG #14 (2.10 mm²) wire for wiring all points, that a maximum insulation diameter of .135 inch (3.43 mm) not be exceeded. To ensure proper connection, two wires may be terminated on any one terminal only if both wires are the same size.
4. The terminal board is designed to accept a maximum of (40) AWG #14 (2.10 mm²) wires. If AWG #14 (2.10 mm²) wires are to be used, then wire markers should be placed at least 8 inches (203 mm) from termination end to provide sufficient space for the hinged door to close.

Caution

Do not use the hinged door to remove the terminal board. The hinged door could be damaged if this is done.