# I/O Products

## IC697VAL306

GFK-2111
814-000443-000
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## 16-Channel D/A Current or Voltage Output Board

### Features

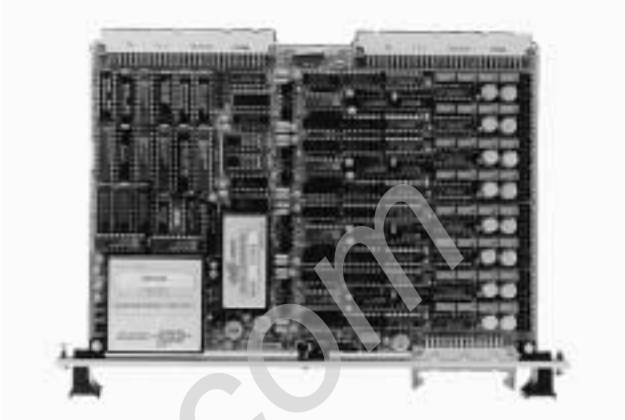
- Sixteen analog output channels
- Jumper-selectable voltage and current, voltage only or current loop outputs
- Current transmitter ranges (0 to 20mA, 4 to 20mA, and 5 to 25mA)
- Output voltage ranges (0 to +5V, 0 to +10V, ±2.5V, ±5V, ±10V)
- 12-bit resolution
- Front panel outputs (P3)
- On-board DC-to-DC
- Complies with VMEbus specification
  - ANSI/IEEE STD 1014-1987
  - IEC 821 and 297

## Applications

- Industrial process control
- Current source reference for data acquisition
- Programmable current source for test equipment
- Automated manufacturing
- GE Fanuc Series 90™-70 PLC

## Introduction

The Analog Output Board provides 16 high-quality analog output channels. These channels are jumper-selectable for voltage outputs, current loop outputs, or a combination of voltage and current loop outputs. Each output range is also jumper-selectable. A block diagram of the board is shown in Figure 1.



### Functional Characteristics

(Typical at +25°C and rated power supplies unless otherwise stated.)

**Compliance:** This product complies with VMEbus specification ANSI/IEEE STD 1014-1987 IEC 821 and 297, with the following mnemonics: A16: D16, D08 (EO): 29, 2D

**Board Address:** The physical address for the board may be selected by on-board jumpers. VMEbus address lines A06 through A15 are decoded for board selection.

**VMEbus Access:** Address modifier bits are jumper-selected and decoded to support nonprivileged short I/O or supervisory short I/O. The board is factory configured for supervisory short I/O.

**Output Data Transfer:** Data for each analog output channel is written directly into an on-board RAM location dedicated to a specific channel. The data is then periodically retrieved from the RAM, and converted to an analog voltage which is then transferred to one of 16 sample-and-hold output buffers.

**Memory Test:** This product is designed with dual-port on-board memory that may be tested by executing a memory diagnostic test for operational verification.

**SysFail:** Application of the SysFail signal via the VMEbus initializes the board into a state with all voltage outputs disconnected from the output connector (P3). Current outputs are set to the lowest value of the output range selected. For example, if 4 to 20mA is the output

range selected, then power up or system reset will set the current output to 4mA.

**Front Panel Fail LED:** If an error condition occurs during diagnostics, a software-controlled LED may be illuminated to visually indicate a failure. The LED is illuminated by system reset at power up and is extinguished upon successful diagnostic execution.

## Voltage Analog Outputs

**Number of Output Channels**: 16 output channels, one Sample-and-Hold buffer per channel

**Full-Scale Analog Output (Jumper-Selectable):**

| | | | |
|---|---|---|---|
| Unipolar: | 0 to +10V | Bipolar: | ±2.5V |
| | 0 to + 5V | | ±5.0V |
| | | | ±10.0V |

**Analog Output Code:** The 12-bit Digital-to-Analog Converter (DAC) accepts digital codes in straight binary and offset binary.

**Output Load Current:** 5mA, maximum at full accuracy

**Resolution:** 12 bits

**Output Impedance:** 0.33Ω

**Total Error:** ±0.05% of full-scale range

**Maximum Settling Time to 1 LSB**: 1.7ms

**Refresh Update Rate:** 588Hz (default); 1,600Hz (FAST REFRESH). The FAST REFRESH rate provides a filtered output for complex functions; whereas, the 588Hz rate provides settling to 0.01% for stepped outputs at each update. The 1,600Hz rate provides settling to 0.2dB (2%). Both rates provide settling to 0.01% in 1.7ms.

**Output Short Circuit Protection:** Indefinite short to common; momentary short to ±25V

**Monotonicity:** Monotonic over the full temperature range

**Reset:** All outputs are disconnected from the output connector at power up or reset.

## Current Analog Outputs

**Number of Output Channels:** 16 output channels

**Output Ranges (Jumper-Selectable):** 4 to 20mA, 0 to 20mA, 5 to 2mA (4 to 12mA, 0 to 10mA and 5 to 15mA also available)

**Nonlinearity:** 0.01% of span

**Initial Offset Error:** 7µA

**Offset Versus Temperature:** 0.0005% of span/°C

**Initial Span Error:** 0.05% of span

**Span Error Versus Temperature:** 0.0025% of span/°C

**Maximum Settling Time to 1 LSB:** 1.7ms

**Load Resistance:** 600Ω maximum at 20mA, 480Ω maximum at 25mA

**Reset:** Current outputs are set to the lowest value of the output range selected

## Physical/Environmental

**Temperature:**
Operating: 0 to 55°C (Standard VME slot)
0 to 65°C (1.6-in slot)
Storage: -40 to +85°C

**Humidity:** 5 to 95% relative, noncondensing

**Altitude:** Operation to 10,000ft

**Cooling:** Forced air convection (Standard VME slot) Convection (1.6-in. slot)

**Dimensions:** Double height Eurocard (6U) 160 x 233.35mm

**Output Connector:** P3 (32-pin DIN) front panel connector

**Power Requirements:** 2.5A (typical) at +5VDC, 4.0A (maximum)

## Agency Approvals: UL1604 with C-UL

Certification by Underwriters Laboratory for use in Class 1, Div. 2, Groups A, B, C, D Hazardous Locations. Board complies with applicable CSA Standards as evaluated by UL. The C-UL mark is accepted throughout Canada.

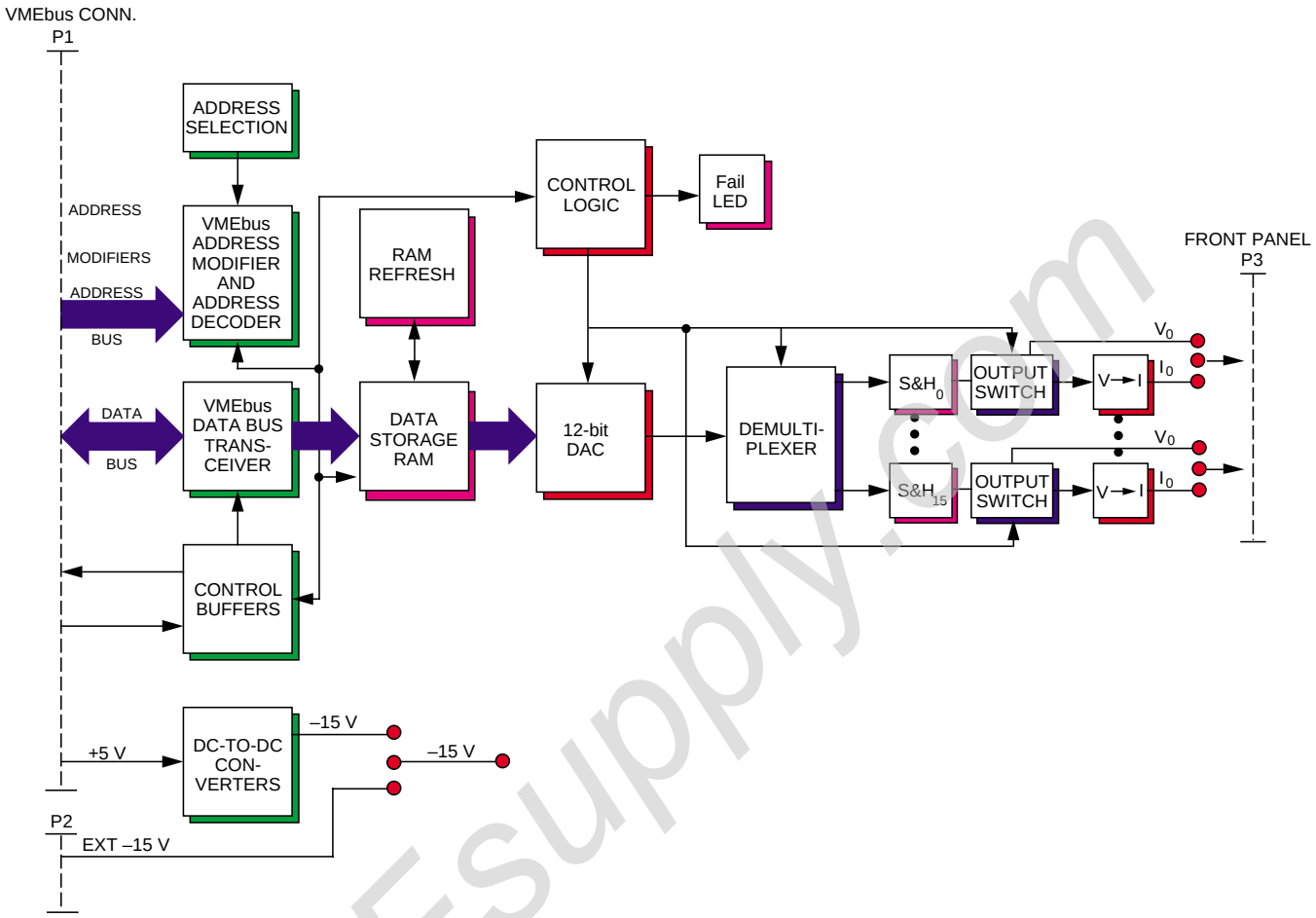



**Figure 1. Functional Block Diagram**