

I/O Dataspec.

PRODUCT Analog Output

MODEL 620-870 thru 875

DATE January 1, 1973



varian data machines

ANALOG OUTPUT MODULES AND EXPANSION MODULES

INTRODUCTION

The Models 620-870 thru 875 Analog Output Modules (AOM) are options for use with the Varian 620 Series and V73 Computers. The AOMs provide up to two digital-to-analog converters (DAC) with 10-, 12- and 14-bit resolution and control for up to eight digital-to-analog converters. The DAC expansions (DACE) provide an incremental expansion of two digital-to-analog converters to the DACs.

GENERAL DESCRIPTION

The DAC and DACE data transfer operation resulting in a digital-to-analog conversion occurs in two stages: first the individual converter is selected using an Extended External Control (EXC2) instruction; then a data word is sent to the selected buffer register and converted to the equivalent voltage output signal.

Data transfer into the buffer register can be accomplished under program control or under the control of the optional Buffer Interlace Controller (BIC). When operating under program control, data transfers are initiated by the computer and are executed under input/output instruction control. When operating with a BIC, data transfers are initiated externally and are executed without input/output instruction control. The BIC permits automatic, high-speed, block data transfers between the DAC and the computer memory without disturbing the sequence of the main program.

The DACs provide up to two analog outputs and control for up to eight analog outputs. One DAC and three DACEs with two analog outputs each can provide eight outputs per device address and up to eight device addresses are available. A maximum of 64 analog outputs in a single computer system can be configured with eight DACs and twenty-four DACEs.

For configurations involving both analog and digital outputs the Analog Output Expansion Modules can be used as incremental expansions to the Digital Output Module. Likewise, the Digital Output Expansion Modules can be used as incremental expansions to the Analog Output Modules.

PREREQUISITES

For DACs

- 620 System Computer or V73
- 620 Expansion Chassis (requirements determined on individual system basis)
- 620-88 Analog Power Supply (requirements determined on individual system basis)
- 620 Peripheral Backplane Wiring Panel (requirements determined on individual system basis)
- 620-20 Buffer Interlace Controller (BIC) (optional)

For DACEs

- DAC or Digital Output Module.
- 620 Expansion Chassis (requirements determined on individual system basis)
- 620-88 Analog Power Supply (requirements determined on individual system basis)
- 620 Peripheral Backplane Wiring Panel (requirements determined on individual system basis)

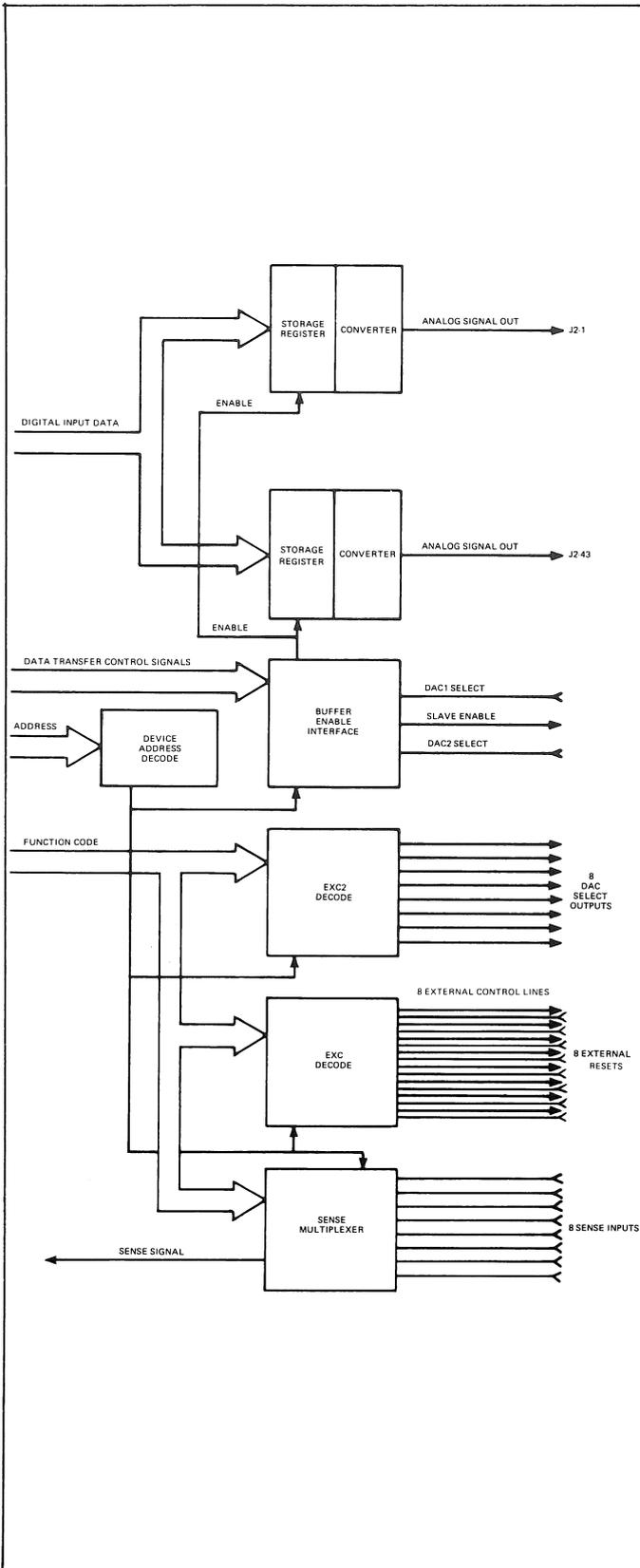
SOFTWARE

A comprehensive software package comprising a Test Program and I/O Driver Program is provided. The Test Program provides an effective tool in determining the operational status of the DAC and DACE. The I/O Driver Program provides convenient access to the DACs and DACEs without detailed knowledge of the hardware. The program can be used by itself or embedded in an operating system. The I/O Driver Program contains two routines: Programmed Data Transfers and Direct Memory Access Data Transfers. These routines permit the user to specify the following parameters:

- The digital-to-analog converter to be used
- The total amount of data to be transferred to the selected digital-to-analog converter
- The array of data to be transferred to the selected digital-to-analog converter.

SPECIFICATIONS

Input Coding	Two's complement
Accuracy (25°C)	±0.003% of 20V full scale (14-bit option) ±0.012% of 20V full scale (12-bit option) ±0.05% of 20V full scale (10-bit option)
Temperature Coefficient	±1 LSB/°C (0°C to 50°C)
Warm Up Time	Essentially zero
Slew Rate	4 volts/microsecond
Settling Time	20 microseconds to stated accuracy
Adjustments	Full scale and zero (10-bit option) Full scale, zero, and MSB (12-bit option) Full scale, zero and 3 MSB (14-bit option)
Output Voltage Range	±10 volts full scale
Output Current Range	10 mA
Switching Transient	200 mV peak, maximum duration less than 5 microseconds
Capacitive Load	2000 pF at specified settling time
Short Circuit Protection	DAC outputs may be shorted to ground indefinitely without damage
Output Noise	Less than ±1/2 LSB peak maximum due to activity on Computer E-Bus or other DAC's
Digital Control Outputs	Number: Eight Type: Open Collector Transistor. TI SN75451P Dual Peripheral Driver sinks current when true. Each output will sink 300 mA and standoff +30 volts. Outputs are controlled by flip-flops which are set by computer instruc- tions and reset externally.
Digital Sense Inputs	Number: Eight Type: TTL logic levels. Ground true, open circuit inputs are held to +5 volt supply through 5.6K ohm resistors.
Power	
(Dual 14-Bit Option)	+15 Vdc ±0.1%, 90 mA -15 Vdc ±3%, 90 mA +5 Vdc ±1%, 850 mA
Temperature Range	Specification: 0°C to 50°C Operating: -10°C to 70°C Storage: -55°C to 85°C
Physical Characteristics	Dimensions: One printed circuit board 7-3/4 x 12 x 1/2 inches Connectors: One 122-terminal card edge connector. Two 44-terminal card edge connectors.



varian data machines

russell house / molesey road / walton-on-thames / surrey / england / (093 22) 28971