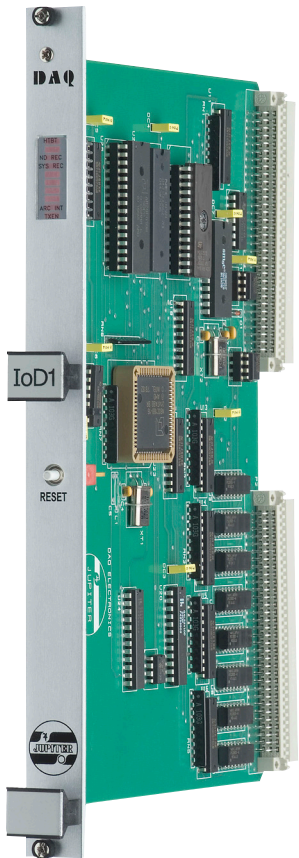# IoD1

Digital Processing Module
STATUS/ALARM MONITORING AND SOE RECORDING

The IoD1 module serves as the digital processing node in the Callisto™ network and is capable of monitoring up to 32 status/alarm input points, individually configurable for 1 millisecond time-tagged sequence of events (SOE) recording without the need for additional hardware or software. To accommodate additional digital inputs, multiple IoD1 nodes may be combined within a Callisto remote. The IoD1 works in conjunction with digital termination cards, which provide physical connections for input wiring along with signal conditioning and protection. Each termination card has the capacity for eight distinct inputs, which can be configured as pulse accumulator points.

Status events are time-tagged and instantaneously transferred to the Callisto host node (IoE1, Polaris, etc.), where a software application enables extensive SOE recording functions. A digital filtering algorithm is utilized to maintain time-tagging accuracy during contact bounce conditions, with the debounce time being user-definable in multiples of 1 millisecond with a 16 millisecond default.

Anti-toggle filtering is activated when a user-definable number of invalid state changes occur, or when a "chattering" point produces an excessive number of valid changes within a user-defined period. In both cases, the IoD1 can be configured to automatically disable the point and report a flag condition to the master station.

Providing seamless digital input processing, the Callisto IoD1 module is a key element in DAQ's SOE recording solution, which replaces traditional, stand-alone SOE recorders with an internal software application.

KEY FEATURES

- Capacity for up to 32 status/alarm inputs with wet and dry contact input configurations

- 1 millisecond time-stamping of all status changes

- Form A and C accumulators, definable on a per point basis

- Keying voltages of 12, 24, 48, and 125VDC

- Integral part of DAQ SOE recorder application

- User-definable debounce on a per point basis

- Anti-toggle filtering

- Multiple change detection

DAQ ELECTRONICS

PROCESSING

Processor
- 12MHz Intel 80C188 Microcontroller
  - 8 bit data bus
  - 20 bit address bus
  - 2 DMA channels
  - Direct addressing to 1MB memory and 64KB I/O

Operating System
- Industry standard Nucleus RTX real-time, multi-tasking system
- Simple integration of user-defined applications and algorithms

Memory
- Intel 80C188
  - 128K x 8 Flash Memory
  - 128K x 8 EPROM
  - 128K x 8 RAM
  - 1K x 1 Serial EEPROM

MEASUREMENTS

Digital Inputs
- Up to 32 inputs via termination cards
- Configurable for any combination of status, Form A, or Form C accumulators
- Status
  - Keying voltages: 12, 24, 48, 125VDC
  - Scan rate: 1 scan/ms
  - Debounce: configurable per point from 2 to 255 ms
- Accumulators
  - Formats: Form A, Form C
  - Pulse frequency: Rates up to 1 change per debounce period
  - Rollover: definable 16 or 32 bit

Configuration
- Via CallistoView™ software package from any Callisto host node

ADDITIONAL SPECIFICATIONS

Local Area Network
- DAQ Voyager protocol operating on Callisto standard ArcNET LAN at speeds up to 2.5 megabits per second

Power
- 290mA @ 5VDC

Isolation
- Opto-isolation: >1.5kV AC, input and input to ground
- Surge withstand: 5kV ANSI/IEEE C37.90.2002 SWC using IoD1, IoDT1
- Electrical interference
  - Insulation/isolation: IEC 255-5
  - High frequency disturbance: IEC 255-22-1
  - Fast transient/burst: IEC 801-4
  - Electrostatic discharge: IEC 801-2

Environmental
- Operating range: -20 to +70°C
- Storage range: -20 to +70°C
- Relative humidity: 5 to 95% non-condensing
- Vibration: 5 to 65Hz

Dimensions
- Standard 4-layer Double EuroCard PCB
- 6 ¼" x 9 ¼" (160mm x 235mm)

DAQ
ELECTRONICS