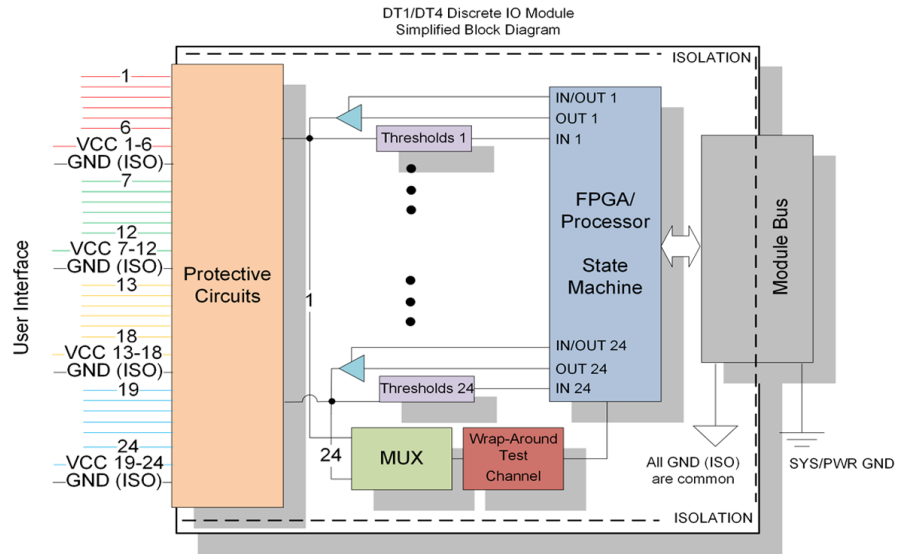
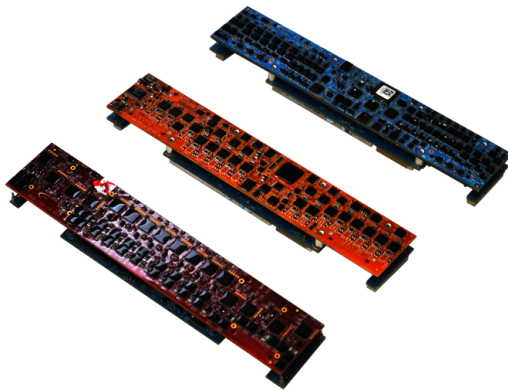




# DT4 I/O Modules Discrete IO - Multichannel, Programmable Function Modules

## Enhanced 24 Discrete I/O Channels (0 to 60 VDC, 500 mA/Ch.)

The DT4 module (the enhanced version) features 24 programmable channels for either input (voltage or contact sensing with programmable, on-module pull-up/pull down current sources), or output (current source, sink, or push-pull) up to 500 mA per channel from an applied, external 3 – 60 VCC source. These modules can sense broken input connections and whether an input is shorted to +VCC or to ground. Additional features of the DT4 (Enhanced Version) are listed below.



### Features

- 24 channels available as inputs or outputs
- Ability to handle high inrush current loads (for example, two #327 incandescent lamps in parallel)
- Built-In-Test runs in background constantly monitoring system health for each channel
- Programmable for Input (voltage or contact sensing) or Output (current source, sink or push-pull) per channel/bank
- Supports 'dual turn-on' (series channel output) applications (for example, dual series 'key' missile launch control)
- Ability to sense broken input connection and if input is shorted to +V or to ground
- Ability to current share\*, by connecting multiple outputs in parallel, to sink/source up to 2 A per bank
- Programmable debounce circuitry with selectable time delay eliminates false signals resulting from relay contact bounce
- Ability to read I/O voltage and output current for improved diagnostics (indicates if load is connected)
- Enhanced DT4 Functionality Features:
  - Additional Enhanced Input Mode Operation: Pulse Measurements, Transition Timestamps, Transition Counters, Period Measurement and Frequency Measurement
  - Additional Enhanced Output Mode Operation: PWM Output and Pattern Generator Output

\* - see *Features* section in manual for details.

**Specifications**

Input Range	0 to 60 VDC. Programmable for either voltage or switch closure sensing.
Overvoltage Surge Protection	80 VDC max. (< 50 ms); 100 VDC max. (< 1 μs)
Voltage/Content Sensing	Software selectable per bank. When the input channel is utilized for direct voltage sense, Vcc is not required. When input is used to detect switch closures, Vcc is required to provide a current source (pull-up). Vcc per channel bank must be between 5 VDC min. and 60 VDC max. A module has 4 Vcc banks, each with 6 channels for a total of 24 channels/module.
Input Pulse Detection	A pulse of > 20 μs minimum width will be sensed and reported by the appropriate High-Low or Low-High transition status/interrupt.
Input Impedance	1 MΩ (with or without power applied to module)
Switching Threshold	Four levels (Upper, Lower, Max High, Max Low ) are programmable from 0 to 60 VDC with 10-bit resolution.
Voltage Measurement	User can read input voltage of each channel. From: LSB=100 mV; Accuracy: ±3 LSB's (300 mV) over temp. To: 1% FSR.
HIGH/LOW Differential (Hysteresis)	300 mV min. recommended. Programmable by using Upper & Lower thresholds.
Debounce	Programmable per channel from 0x00000000 (deactivated) to 0xFFFFFFFF (2 <sup>32</sup> * 10μs) (LSB= 10 μs; 32-bit resolution).
Update Rate	Each channel is updated every 10 μs.
Additional Enhanced Input Mode Operation	Pulse Measurements, Transition Timestamps, Transition Counters, Period Measurement and Frequency Measurement.
Output Formats	Low-Side (I sink), High-Side (I source) or Push-Pull (I source-sink); programmable per channel.
Output Voltage Range	0 to 60 VDC. (Output voltage is defined by the user provided Vcc applied to channel bank) Low-side drive does not require Vcc. High-side and push-pull drive requires Vcc.
Overvoltage Surge Protection	80 VDC max. (< 50 ms); 100 VDC max. (< 1 μs)
Output Current	0.5 A maximum (28 V Vcc typical) per channel. 2 A total per Vcc bank (total Module capacity 8 A). Measurement accuracy: ±10% ± 25 mA.
Output Impedance	< 1 Ω (0.5 Ω typical)
Current Share Applications	0.5 A maximum (28 V Vcc typical) per channel. 2 A total per Vcc bank (total Module capacity 8 A). Each channel can be programmed to generate frequency, pulse or arbitrary pulse width with 10 microsecond minimum resolution. Short circuit protected.
Overcurrent Protection	Low current (average): > 625 mA average over 3 ms. High current (pulse): > 6 amps for less than or equal to 30 μs.
Additional Enhanced Output Mode Operation	PWM Output and Pattern Generator Output.
Power	600 mA @ 5 V (typical, non-inclusive of any external VCC related current).
Weight	1.5 oz. (42 g)

**Architected for Versatility**

NAI's Configurable Open Systems Architecture™ (COSA®) offers a choice of over 100 smart I/O, communications, or Ethernet switch functions, providing the highest packaging density and greatest flexibility of ruggedized embedded product solutions in the industry. Preexisting, fully-tested functions can be combined in an unlimited number of ways quickly and easily.

**One-Source Efficiencies**

Eliminate man-months of integration with a configured, field-proven system from NAI. Specification to deployment is a seamless experience as all design, state-of-the-art manufacturing, assembly and test are performed - by one trusted source. All facilities are located within the U.S. and optimized for high-mix/low volume production runs and extended lifecycle support.

**Product Lifecycle Management**

From design to production and beyond, NAI's product lifecycle management strategy ensures the long-term availability of COTS products through configuration management, technology refresh and obsolescence component purchase and storage.

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