Discrete I/O – Discrete I/O multichannel programmable modules provide interfacing solutions for almost any embedded or test application. NAI's discrete I/O modules are offered in two versions: Standard Functionality (SF) modules and Enhanced Functionality (EF) modules. All the modules feature unparalleled programming flexibility, a wide range of operating characteristics, and a unique design that eliminates the need for pull-up resistors or mechanical jumpers. The EF Modules add built-in operational functionality to provide Pulse/Frequency Period Measurements of the incoming signal (Input) and/or Pulse/Frequency arbitrary signal generation (Output).

Module	Description
DT1	24 Ch , Discrete I/O (0 to 60 VDC, 500 mA/Ch.)
DT2	16 Discrete/Switch I/O Channels (±80 V, 625 mA/Ch.)
DT3	4 Discrete/Switch I/O Channels (±100 V, 3 A/Ch.)
DT4	Enhanced 24 Discrete I/O Channels (0 to 60 VDC, 500 mA/Ch.)
DT5	Enhanced 16 Discrete/Switch I/O Channels (±80 V, 625 mA/Ch.)

Features

- 24 channels available as inputs or outputs
- Programmable for Input (voltage or contact sensing) or Output (current source, sink or push-pull) per channel/bank
- Programmable debounce circuitry with selectable time delay eliminates false signals resulting from relay contact bounce
- Built-in test runs in background constantly monitoring system health for each channel
- Ability to sense broken input connection and if input is shorted to +V or to ground
- Ability to read I/O voltage and output current for improved diagnostics (indicates if load is connected)

Automatic Background Built-In Test (BIT)/Diagnostic Capability

The Discrete module supports automatic background BIT testing that verifies channel processing. The testing is totally transparent to the user, requires no external programming and has no effect on the operation of the module. This capability is accomplished by an additional test comparator that is incorporated into each module. The test comparator checks each channel and is compared against the operational channel. Depending upon the configuration, the Input data read, or Output logic written of the operational channel and test comparator must agree or a fault is indicated with the results available in the associated status register. The results of the tests are stored in the BIT Dynamic Status and BIT Latched Status registers.

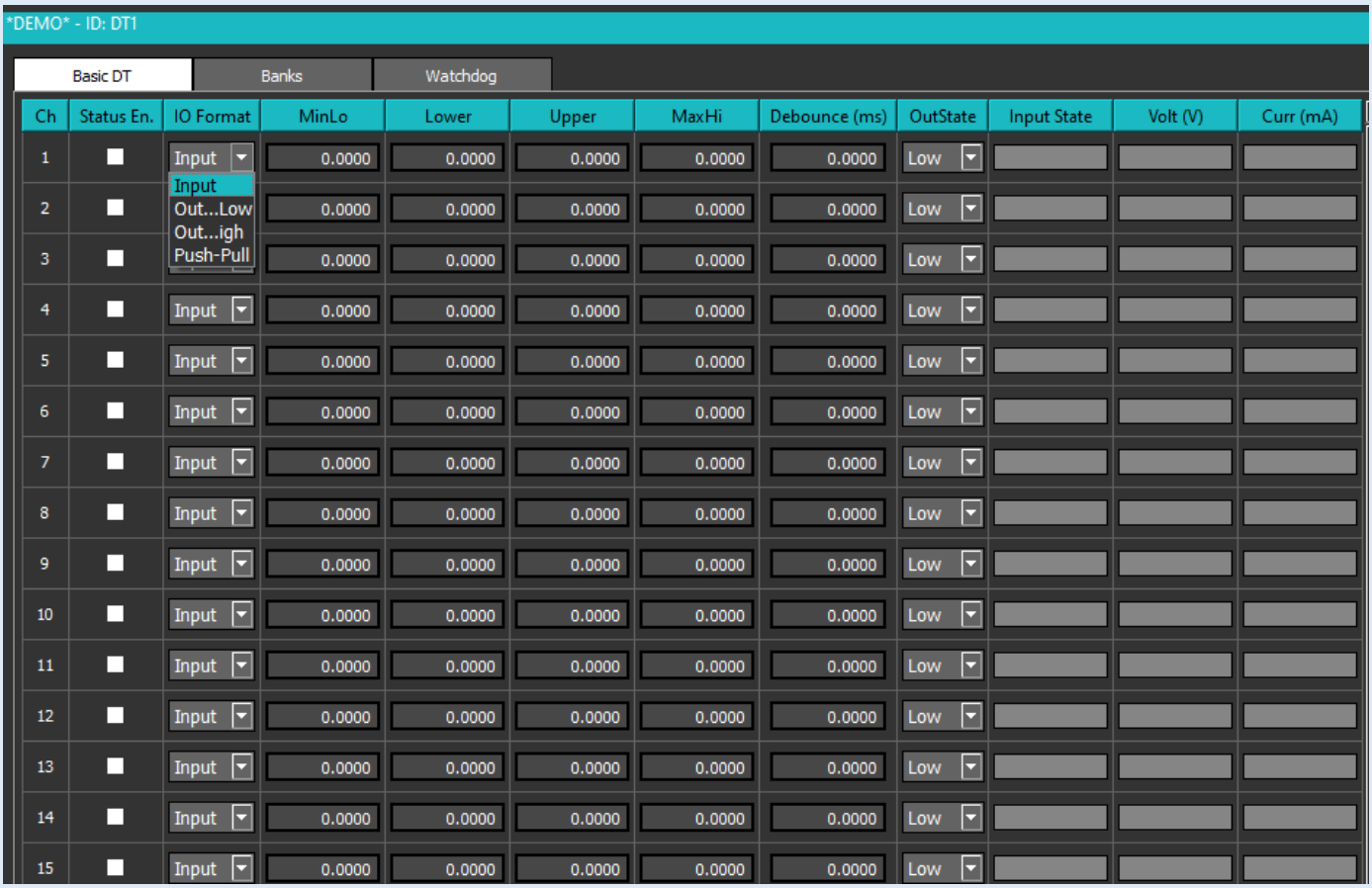
The technique used by the continuous background BIT (CBIT) test consists of an "add-2, subtract-1" counting scheme. The BIT counter is incremented by 2 when a BIT-fault is detected and decremented by 1 when there is no BIT fault detected and the BIT counter is greater than 0. When the BIT counter exceeds the (programmed) Background BIT Threshold value, the specific channel's fault bit in the BIT status register will be set. Note, the interval at which BIT is performed is dependent and differs between module types. Rather than specifying the BIT Threshold as a "count", the BIT Threshold is specified as a time in milliseconds. The module will convert the time specified to the BIT Threshold "count" based on the BIT interval for that module. The "add-2, subtract-1" counting scheme effectively filters momentary or intermittent anomalies by allowing them to "come and go" before a BIT fault status or indication is flagged (e.g. BIT faults would register when sustained; i.e. at a ten second interval, not a 10-millisecond interval). This prevents spurious faults from registering valid such as those caused by EMI and/or dirty power causing false BIT faults. Putting more "weight" on errors ("add-2") and less "weight" on subsequent passing results (subtract-1) will result in a BIT failure indication even if a channel "oscillates" between a pass and fail state.

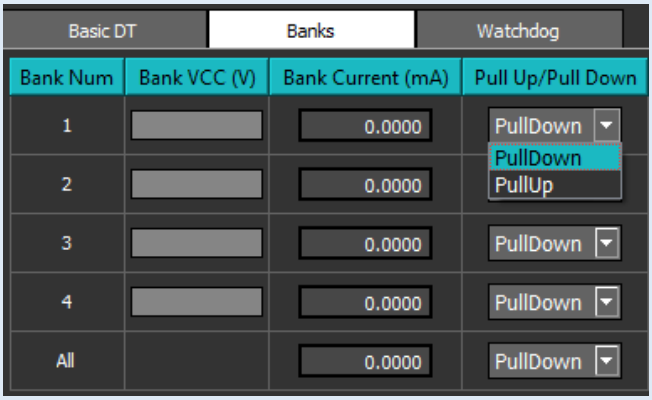
In addition to BIT, the Discrete module tests for overcurrent conditions and provides Above Max High Threshold, Below Min Low Threshold, and Mid-Range statuses for threshold signal transitioning.

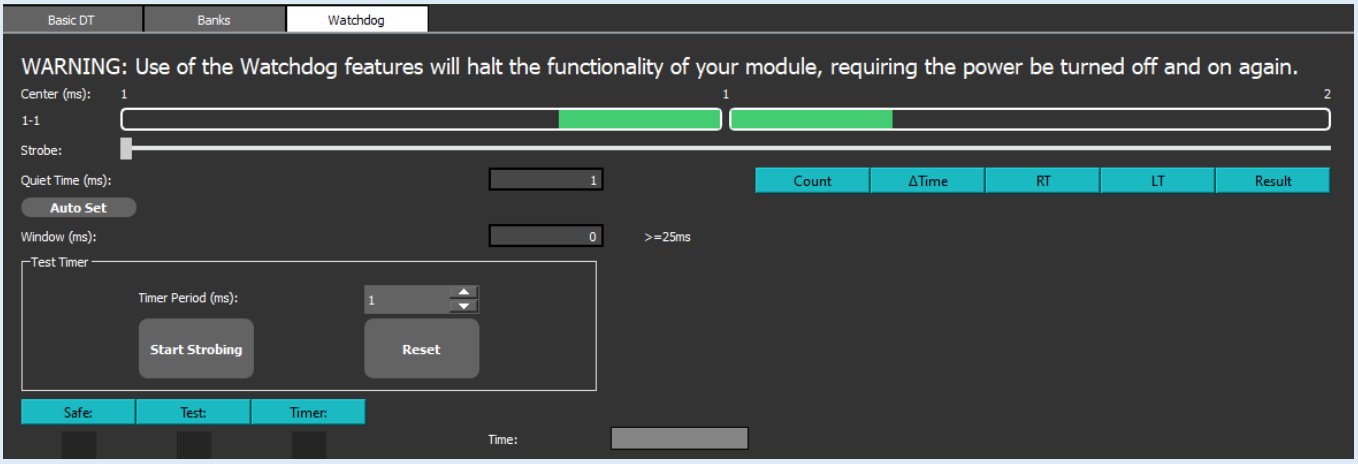
New Embedded Soft Panel

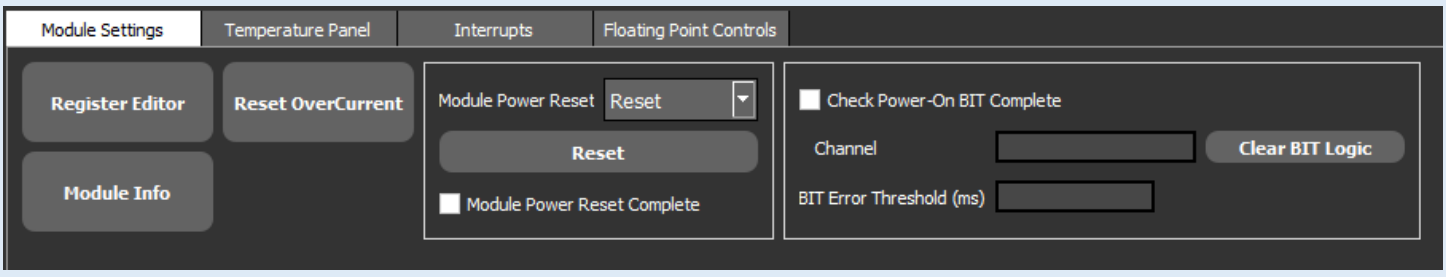
North Atlantic Industries offers the newest cross platform (Windows and Linux) GUI for our Gen 5 products that allows a user to quickly interact with our broad range of modular, I/O cards and rugged embedded computing products. Embedded Soft Panel 2 (ESP 2) is coherent and easy to use with a clean, fleshed out UI with features such as drag and drop dock able windows, a dark and light theme, and multi-language support. Multiple ways to open a board are offered, including saving board opening settings for future use. Interacting with and collecting information on hardware is simple to do with the register editor for reading and writing specific addresses, and the API logger which logs all API library calls including their return status and parameters. ESP 2 has many new features and provides an organized and effortless interface for NAI's next generation products. Available for CentOS 7.4 and 8.2 and Windows 10 x64

Discrete I/O Example - Module DT1 Demo Mode Screen Shots









For more information contact ティー・ピー・ティー株式会社 (TPT K.K.)
www.tptech.co.jp
Telephone:81-3-5832-7350
TPT KK: Contact
Rev. A