TRANS PACIFIC TECHNOLOGIES, INC.

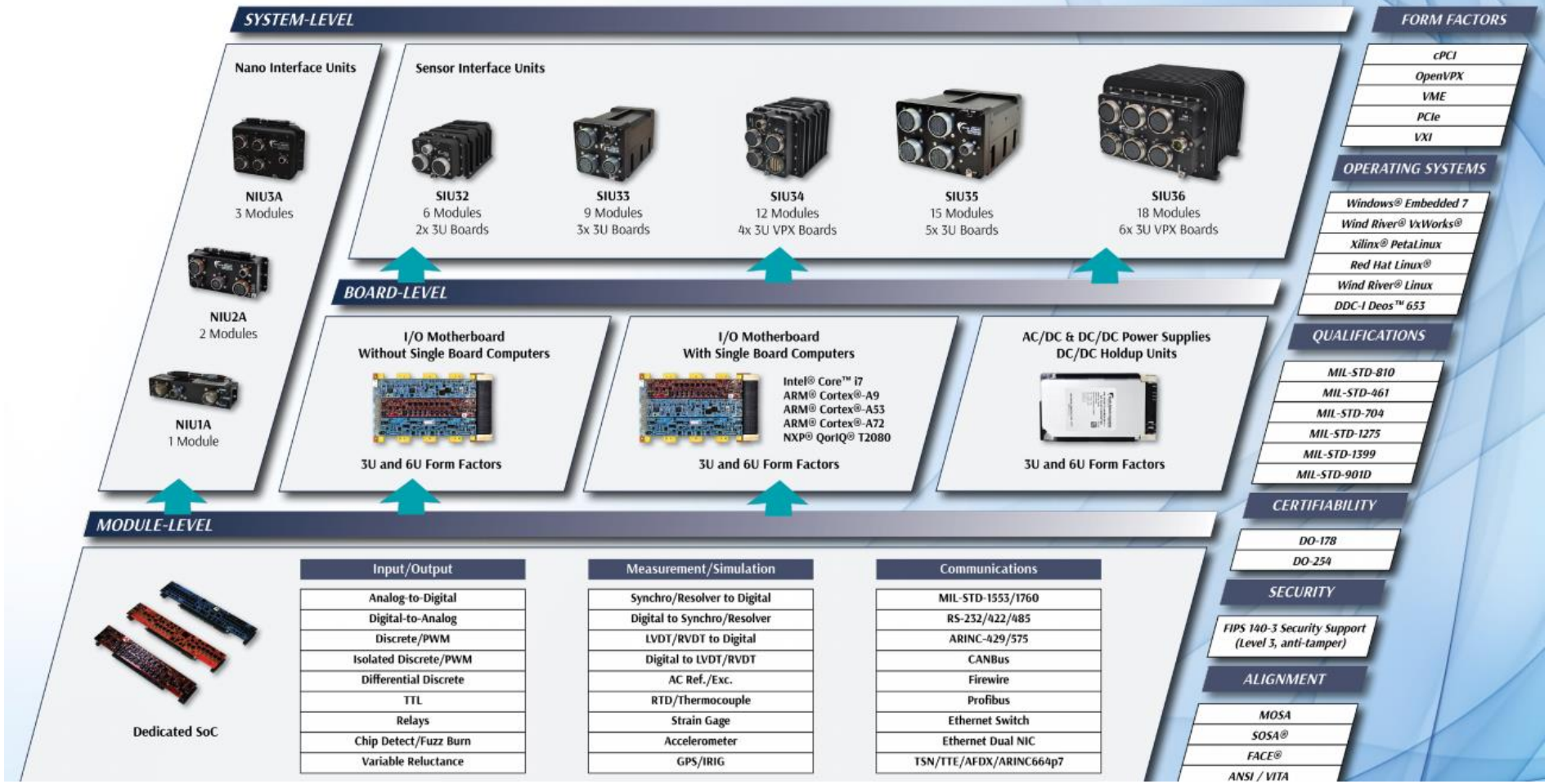
Newsletter 2021年10月号

Reduce Size, Weight and Power for Board and System Level Products

目次

NAI Configurable Open Systems Architecture™ (COSA®) for I/O Boards, SBCs, and Systems

A massively configurable, modular, intelligent approach offering unmatched breadth and scalability. COSA supports a wide range of complex and time-critical requirements in a distributed, intelligent, software-driven architecture that allows you to rethink the way you engineer power-critical and I/O-intensive mission systems.



[Additional Information]

Module Benefits

Over 70 Modules Available (6 modules 6U VPX and VME, 3 Modules 3U VPX and cPCI)

Dedicated SoC

Input/Output
Analog-to-Digital
Digital-to-Analog
Discrete/PWM
Isolated Discrete/PWM
Differential Discrete
TTL
Relays
Chip Detect/Fuzz Burn
Variable Reluctance

Measurement/Simulation
Synchro/Resolver to Digital
Digital to Synchro/Resolver
LVDT/RVDT to Digital
Digital to LVDT/RVDT
AC Ref./Exc.
RTD/Thermocouple
Strain Gage
Accelerometer
GPS/IRIG

Communications
MIL-STD-1553/1760
RS-232/422/485
ARINC-429/575
CANBus
Firewire
Profibus
Ethernet Switch
Ethernet Dual NIC
TSN/TTE/AFDX/ARINC664p7

- Background Built-in-Test (BIT) monitors each channel during operation
- Dedicated FPGAs embedded on our smart modules enable you to rapidly create configurable mission systems while reducing or eliminating SBC overhead
- Each channel is programmable to customize for your application
- Each module has an Embedded Soft Panel GUI to provide easy access to program and monitor the data

Function Modules

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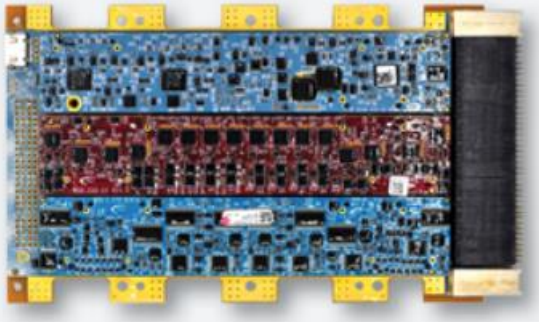
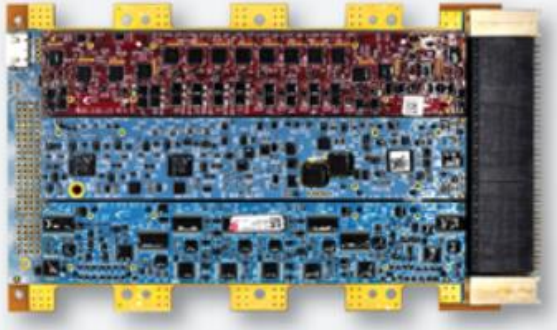
Board Options 6U VPX and VME supports up to 6 Modules

I/O Motherboard
Without Single Board Computers



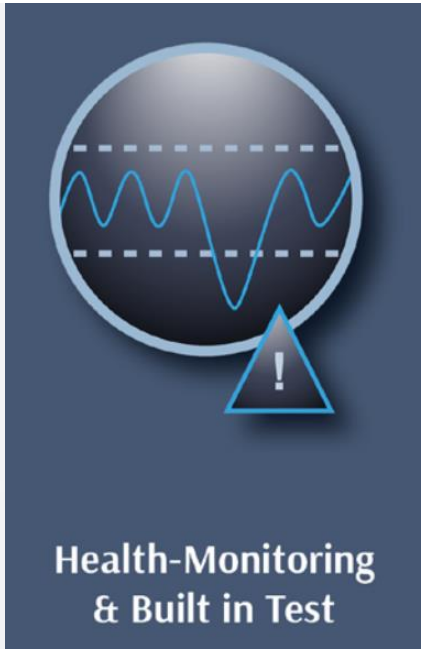
3U and 6U Form Factors

I/O Motherboard
With Single Board Computers



Intel® Core™ i7
ARM® Cortex®-A9
ARM® Cortex®-A53
ARM® Cortex®-A72
NXP® QorIQ® T2080

3U and 6U Form Factors



Health-Monitoring
& Built in Test

- Available in Air-cooled and Conduction-cooled models
- Operating Temperature -40 to +85 Deg C, MIL-STD-810, MIL-STD-461
- Software Support Kits (SSKs) for multiple operating systems are supplied free of charge, with source code and board-specific library I/O APIs, to facilitate system integration. Each I/O function has dedicated processing, unburdening the system SBC from unnecessary data management overhead

VPX SBC's	3U	6U		VPX Multifunction I/O	3U	6U
3U cPCI SBC's	ARM	Intel	PPC	VPX Multifunction I/O	3U	6U

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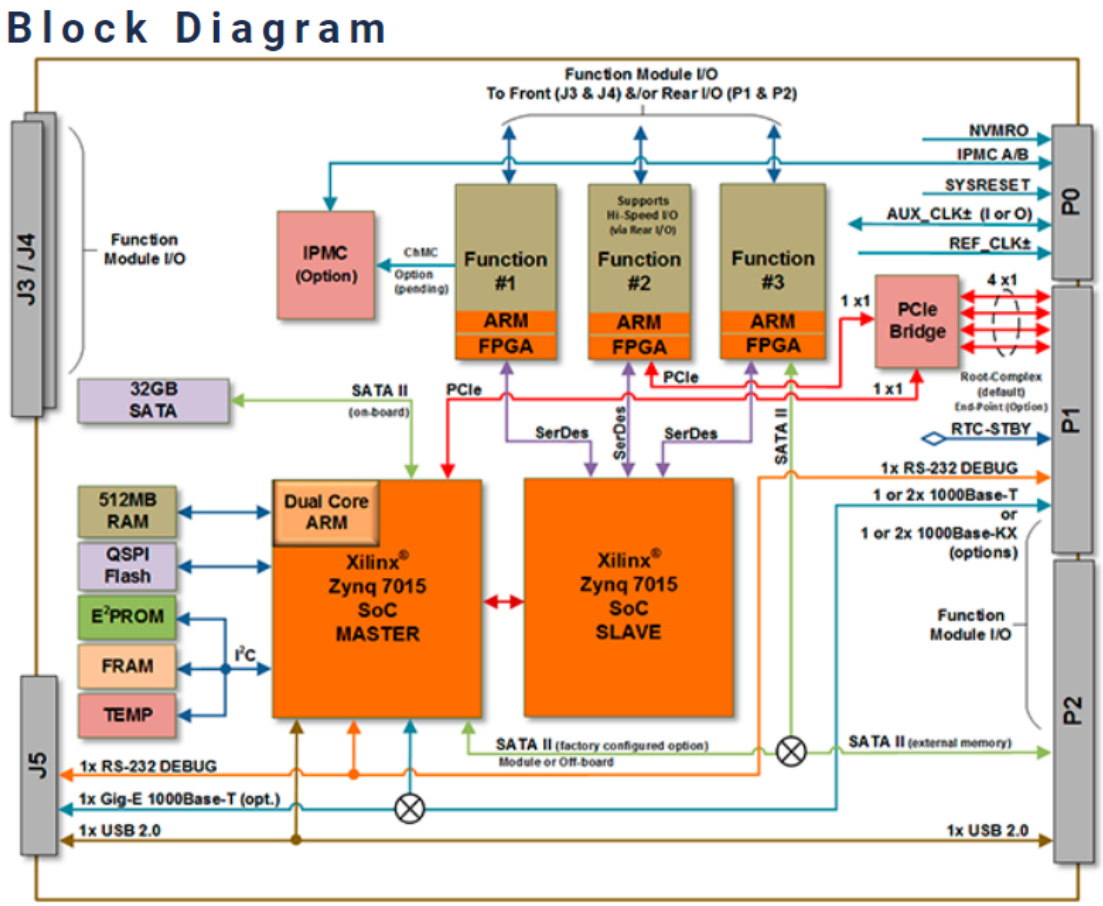
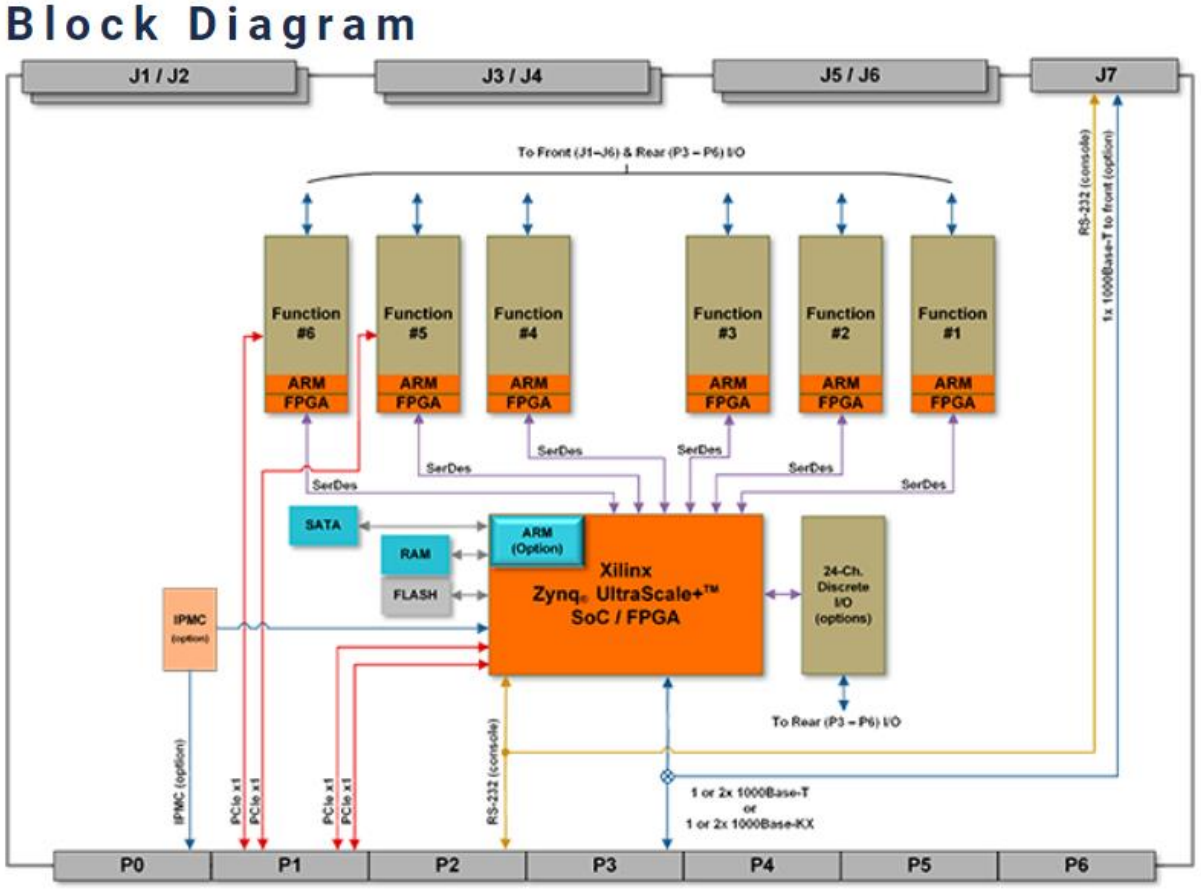
3U and 6U VPX Block Diagrams





3U VPX Arm Processor

6U VPX Multifunction I/O

High Functional Density

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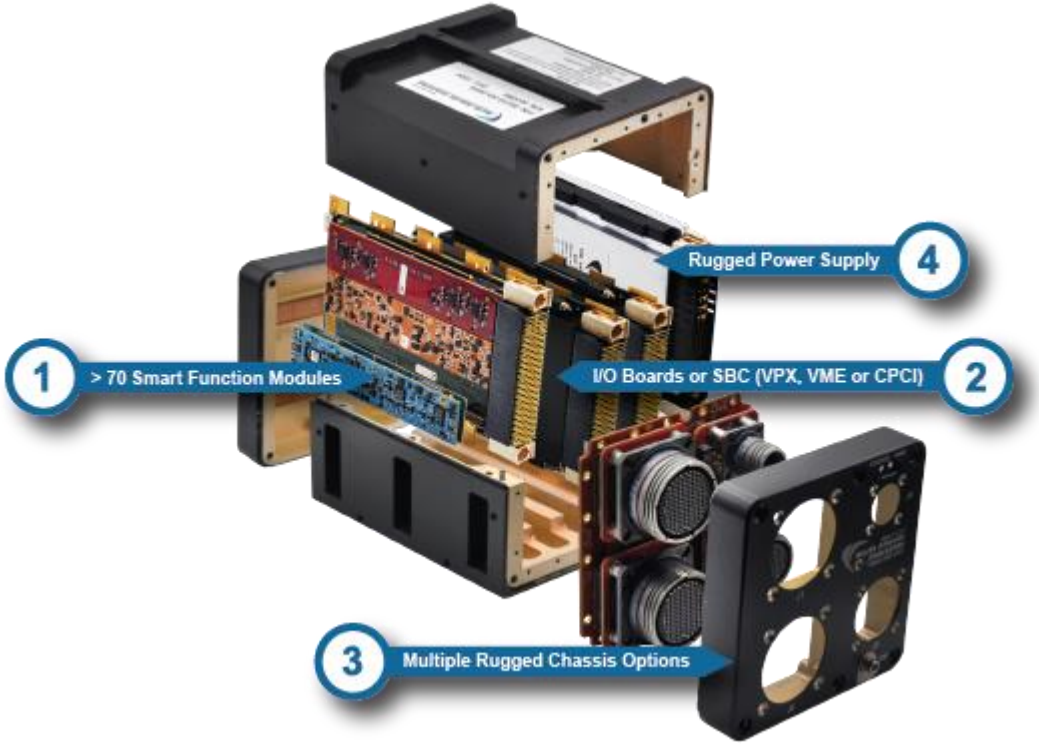
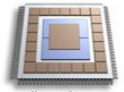
Systems – Complete Solution



- Ultra high-density
- More channels
- Less SWaP, little/no NRE



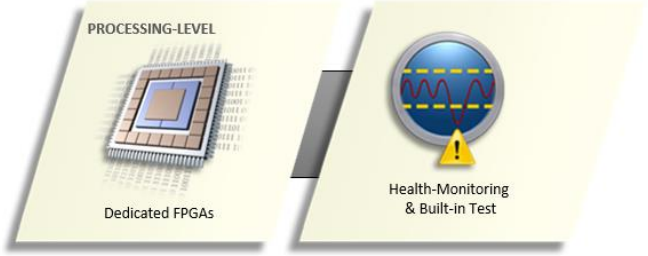
- Dedicated processing & signal analysis
- More programmability
- Eliminates SBC I/O processing overhead

Design-in new CAPABILITY: continuous system self-testing

Integrated Health & Usage Monitoring System

- Sensor/Load reporting information
- (open, short, increased current, Loss of Signal etc.)

Continuous BIT – executes on each individual module



Configurations Available:

- Data Acquisition (DAQ) systems
- Fire Control & Targeting (FCT) systems
- Integrated Vehicle Health Monitoring (IVHM) systems
- Remote Data Concentrators (RDC)
- Vehicle Management Systems (VMS)

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I/O Module Features

A/D

- The input range is field programmable for each channel.
- Each channel includes an anti-aliasing filter and a low-pass filter with a programmable breakpoint.
- All channels have continuous background Built-In-Test (BIT).
- The module(s) also include extended A/D FIFO buffering capabilities for greater storage/management of the incoming samples for post processing applications

D/A

- High-quality D/A conversion, 16-Bit/channel
- Continuous background BIT
- External trigger/synchronization
- Automatic shutdown protection with the results displayed in a status word
- Extended D/A FIFO buffering capabilities

Discrete I/O

- 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)

Differential Transceiver

- 16 channels available as inputs or outputs
- Programmable Pulse Width Modulation (PWM) output mode
- Pattern Generator output mode
- Programmable for fast or slow slew rates
- 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

Communication Module Features

MIL-STD-1553

- Independent (dual-redundant) MIL-STD-1553 interface channels: Bus Controller (BC), Remote Terminal
- (RT), and Bus Monitor (BM) or RT/BM combined mode operation
- 16K words on-board memory/channel
- IP-core register-compatible with DDC™ family of devices
- Message scheduling capability
- Asynchronous message capability
- Message FIFO capability

1394 (Firewire)

- 2-Channel, Tri-port per channel
- Open host controller/link-layer controller with a 3-port 1394b PHY per Channel
- IEEE 1394b / AS5643 Hardware Compatible

TTE (AFDX)

- TTEthernet's 3 modes of operation: SAE AS6802 (TTE), ARINC 664 Part 7 (AFDX®), IEEE 802.3
- Supports 10/100/1000Base-T Mbps Ethernet

ARINC429

- Receive/Transmit mode programmable per channel
- 100 kHz or 12.5 kHz operation per channel
- Transmit: 255 message FIFO or scheduled transmits per channel
- Receive: 255 message FIFO or mailbox buffering per channel
- Receive time stamping
- Continuous BIT
- Loop-back test
- Tri-state outputs
- High and Low speed Slew Rate outputs

CANBus

- Eight independent galvanically-isolated, channels
- ANSI-C fully Compliant Network, Transport and DataLink layers
- Addressing can be set to be Self-configurable, Non-Configurable or Command-Configurable
- Transport and DataLink layers IAW SAE section J1939/21
- Network layer IAW SAE section J1939/81 for self-configurable or non-configurable device
- Adjustable baud rate with speeds up to 1 Mbit/sec supported

Simulation and Measurement Module Features

Synchro/Resolver Measurement

- 24-bit Accuracy 1 Arc Min. Supports Two-Speed Resolvers
- Synchro and Resolver inputs 2 – 90 V Rms, 47 Hz – 20 KHz
- Programmable Bandwidth 2 – 1280 Hz, Signal Thresholds
- Measures – Reference and Signal (Voltage and Frequency) and Velocity
- Background Continuous BIT test. The module incorporates major diagnostics that ensure that the user is alerted to channel malfunction.

Synchro/Resolver Simulation

- 16-bit Resolution Accuracy 1 Arc Min. Supports 2-speed simulation
- Synchro and Resolver outputs 2 – 90 V Rms, 47 Hz – 20 KHz
- 1 channel 3 VA, 2 channels 2.2 VA, 3 channels .5 VA
- Short Circuit Protection
- The background Built-In-Test runs in the background where each channel is checked to a test accuracy of 0.2% FS. The testing is totally transparent to the user, requires no external programming, and has no effect on the operation of the module or card.

LVDT/RVDT Measurement

- 24-bit supports Accuracy +/- 0.025% Full Scale
- Supports 2,3 and 4 wire LVDT/RVDT's
- Inputs 2 – 90 V Rms, 47 Hz – 20 KHz
- Programmable Bandwidth 2 – 1280 Hz per channel
- Measures – Reference and Signal (Voltage and Frequency)
- Background Continuous BIT test. The module incorporates major diagnostics that ensure that the user is alerted to channel malfunction

LVDT/RVDT Simulation

- 16-bit Resolution Accuracy +/-0 .1 % Full Scale
- Synchro and Resolver outputs 2 – 90 V Rms, 47 Hz – 20 KHz
- 1 channel 3 VA, 2 channels 2.2 VA, 3 channels .5 VA
- Short Circuit Protection
- The background Built-In-Test runs in the background where each channel is checked to a test accuracy of 0.2° . The testing is totally transparent to the user, requires no external programming, and has no effect on the operation of the module or card.

Additional Modules include Thermocouple, RTD, Strain Gauge and Variable Reluctance

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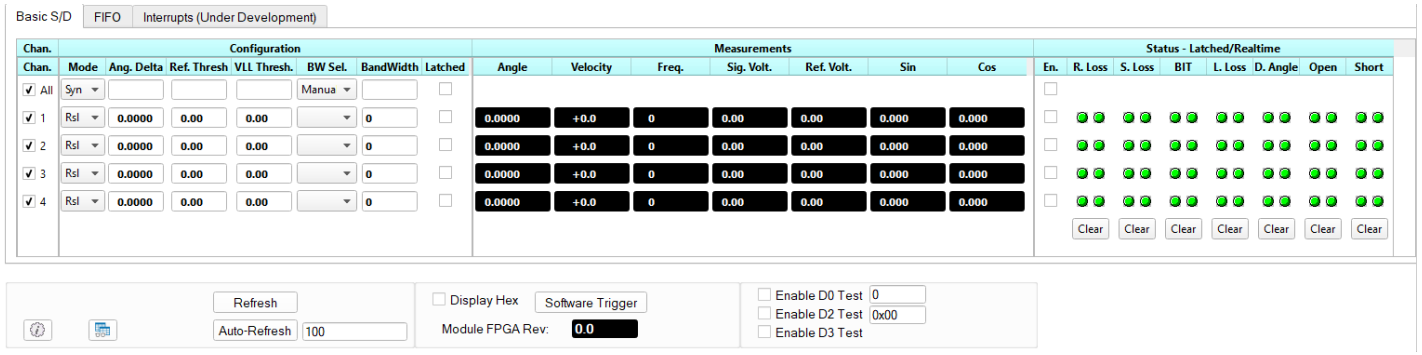
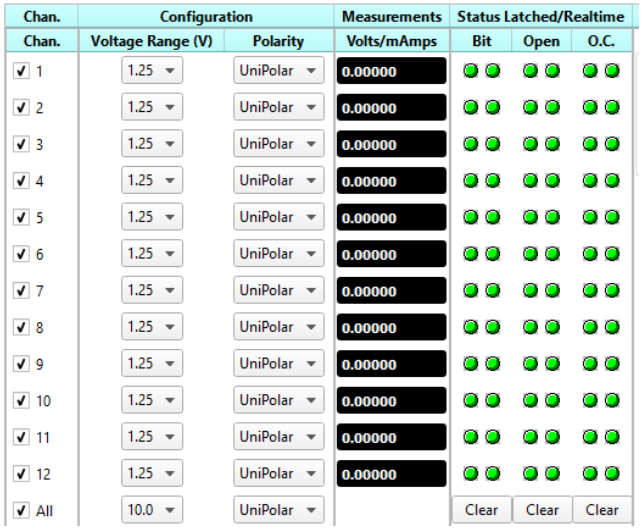
Embedded Soft Panel for Each Module

- Operating Systems Supported – Linux and Windows
- Easy to use GUI, No programming required

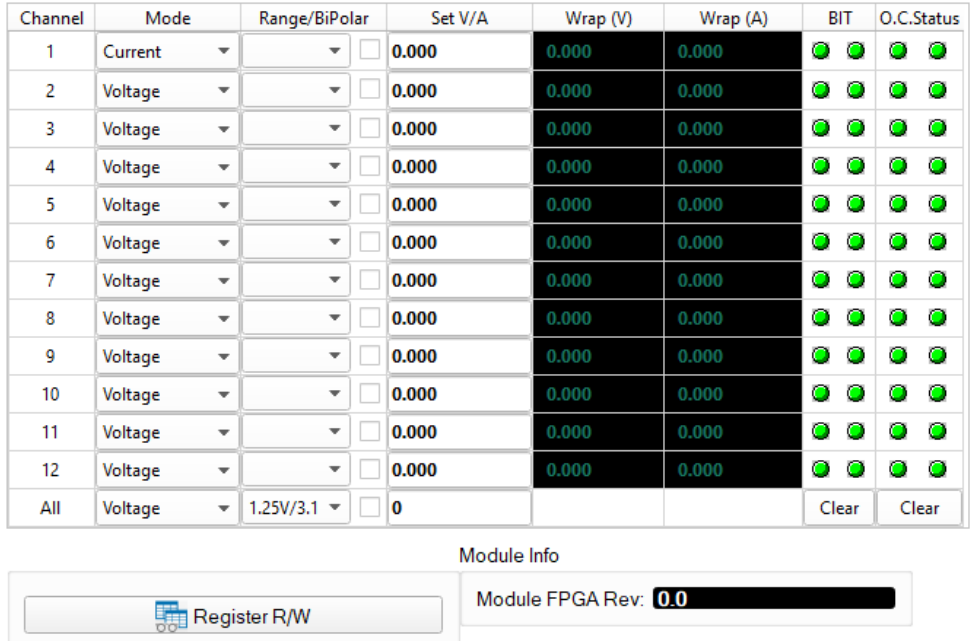
Synchro Measurement



D/A



A/D



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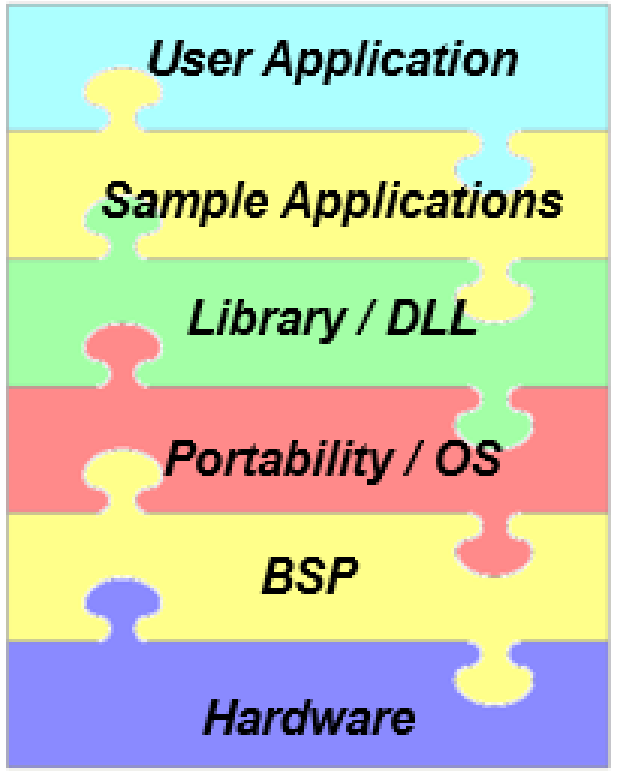
Software Support Kit for Each Module

- Operating Systems Supported:
  - Windows, VxWorks and Linux
- Software Support Kit contains:
  - Help documentation
  - Driver
  - Dynamic link library- DLL
  - VB or C#, Menu (.txt)
  - LabVIEW example
  - C++ example(s)
  - Portability files for other BSP Packages
- All developed software is **FREE**



Airborne Design–Wins

VME
PWM motor control and Power Supply

VPX
Discrete I/O, A/D, D/A, Strain Gauge, Thermocouple, RTD, Variable Reluctance, LVDT, 1553, 429 and RS-422

Small Form Factor System
Over 100 I/O channels

Multiple NIU1A's
Serial, CANBus, 1553, A/D, RTD and Discrete I/O

cPCI
D/A, Synchro and LVDT Measurement and 1553

System
Serial Communications, Discrete I/O, RTD and Power Supplies

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Shipboard/Submarine Design-Wins

VME - 12,000 Sensors
A/D, D/A, Serial, ProfiBus, Discrete I/O, RTD, and 4-20 mA

System
A/D, D/A, RTD channels; Discrete I/O, Serial, CANBus and ProfiBus

System
Serial and 1553

System
A/D, D/A, Discrete I/O, RS-232 and Power Supplies

VME
Discrete I/O, A/D, D/A

TBD

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Ground Based and Ground Support Design-Wins

System
Discrete I/O Synchro Measurement and Simulation

Commercial Aircraft
Power Monitor

Landing Gear and Fuel System Testing
A/D. D/A, Discrete I/O and LVDT Simulation

Flight Control Surface Testing
LVDT/RVDT Simulation and Measurement

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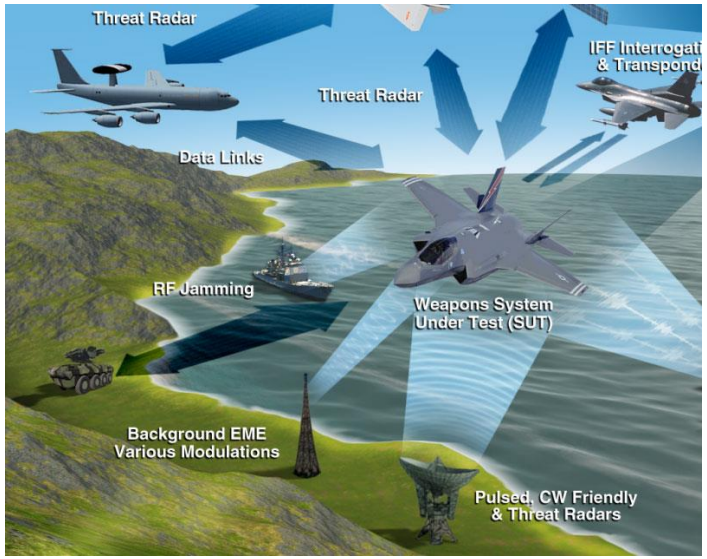

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