
Analog Bus Extension for PXI (ABex) and its Applications in Semiconductor Test and Generic ATE

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Who we are

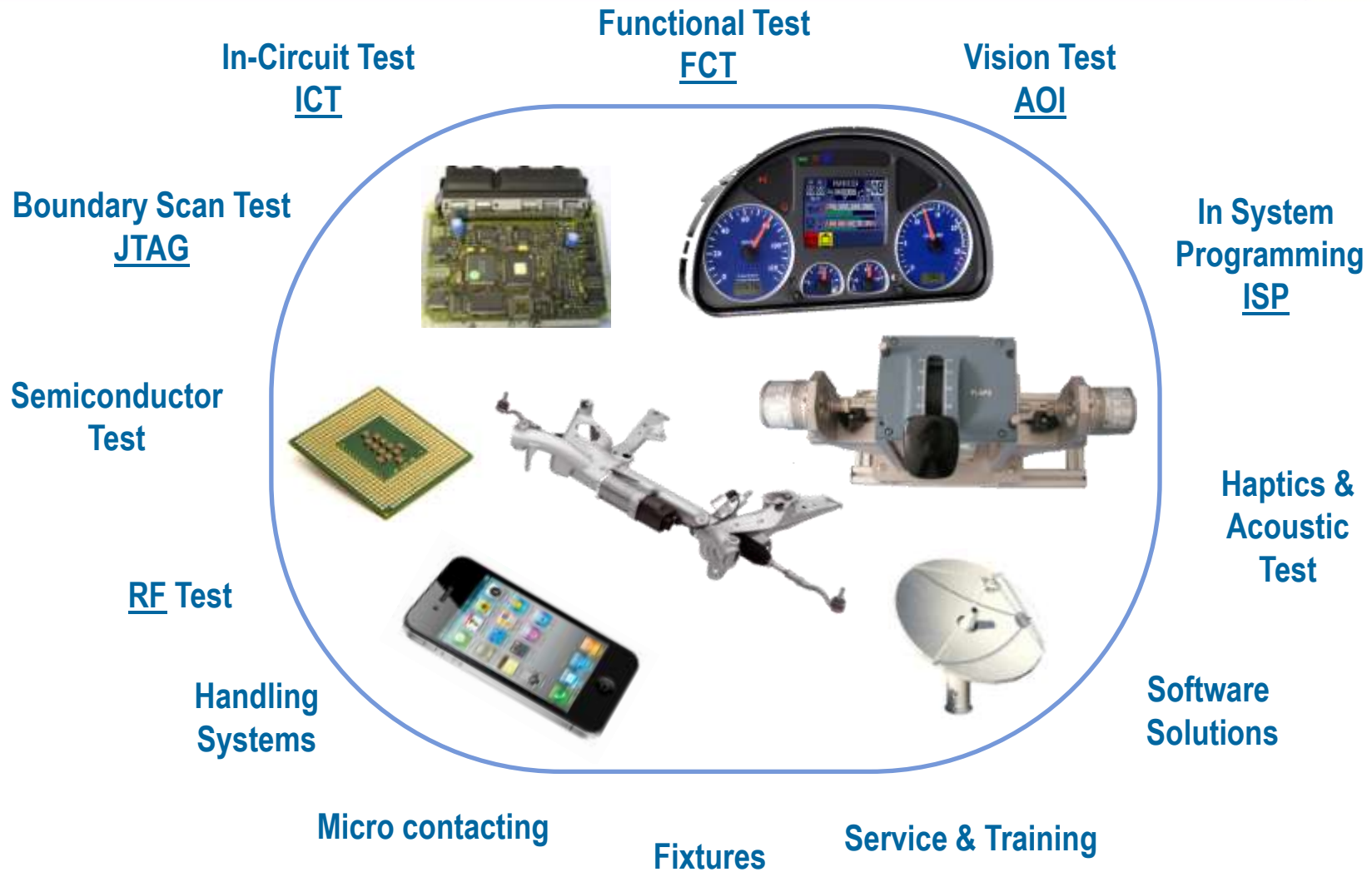
- System Integration Company for Test & Measurement Solutions
- Headquarter in Radolfzell, Germany
- Founded in 1993
- 60 employees
- NI Alliance Partner since 1994
- More than 1000 installed solutions worldwide



Where we are



What we do



Challenges in System Integration

Integration of Non-PXI
ressources ?

Signal
routing?

Connectivity?

Space for
wiring?

Signal
Quality?

DUT interface ?

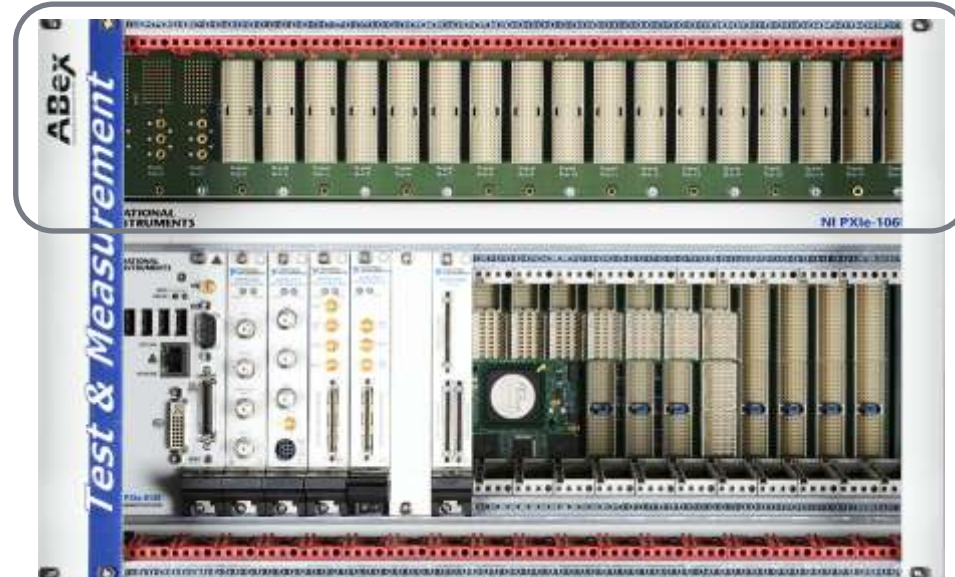


Analog Bus Extension for PXI

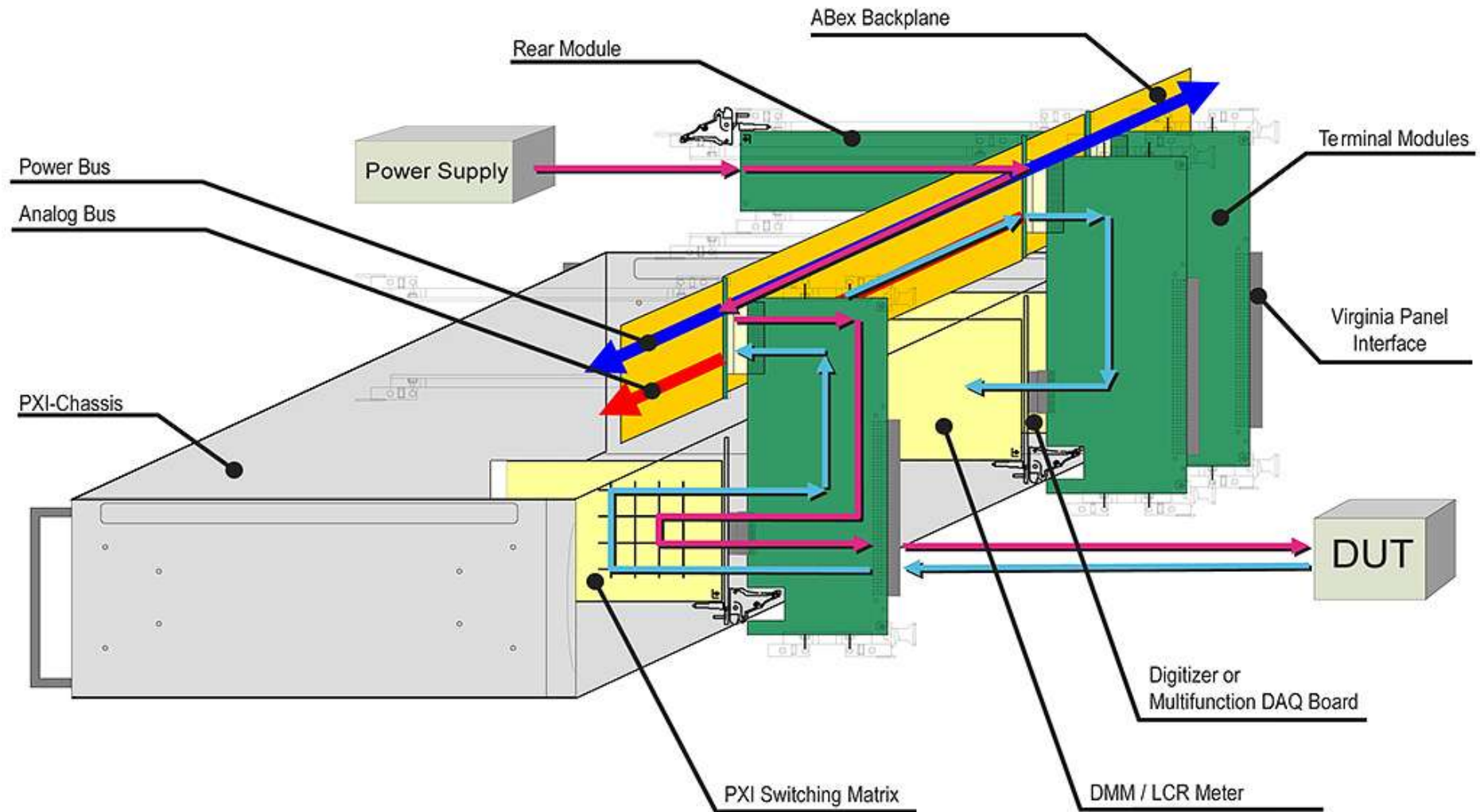
- Open System Extension for PXI
- 100% PXI compliant
- Backplane for cable-less signal connection from the pin to the instruments
- Extends existing PXI chassis
- Terminal modules as front-end to PXI modules
- Rear modules
- DUT interface



- Analog Bus
 - 30 lines
 - 10x3 groups +/-gnd
- Power Bus
 - 40A supply
 - 2 lines parallel up to 5A
 - 12 lines parallel up to 1A
- 20x TTL for I²C, SPI, CAN, ...
- 2x high speed bus

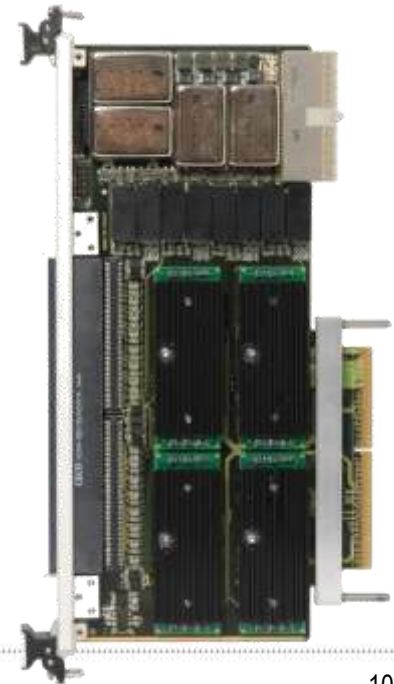
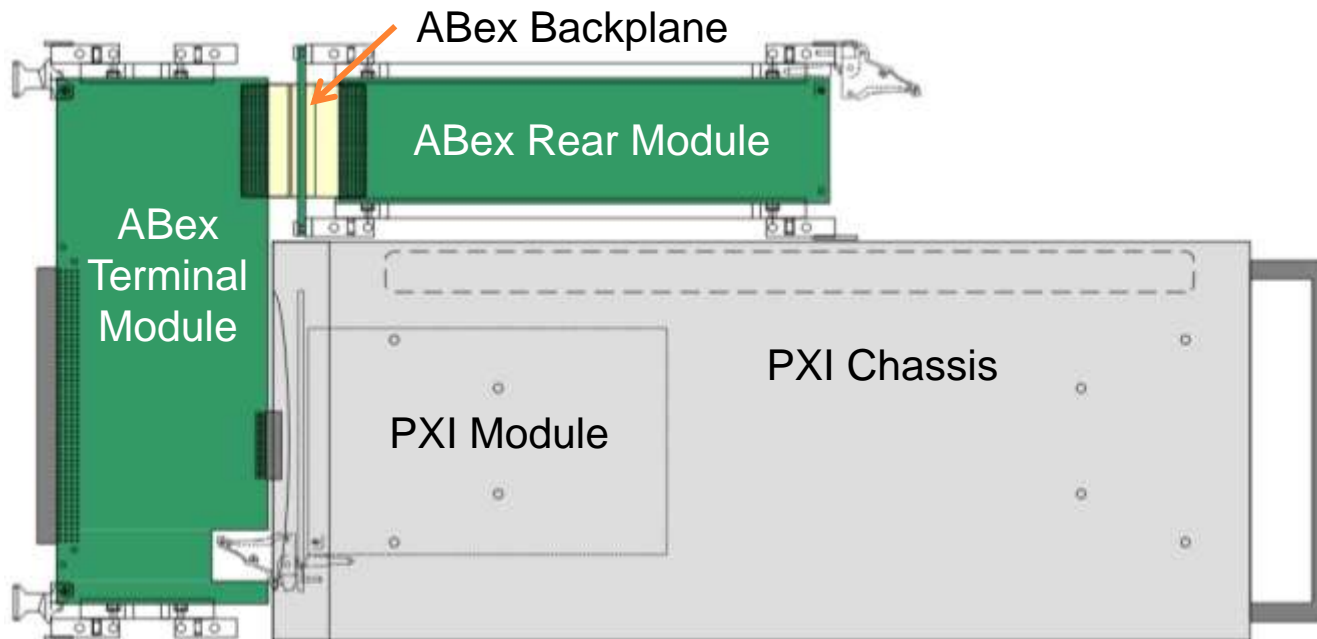


System Design

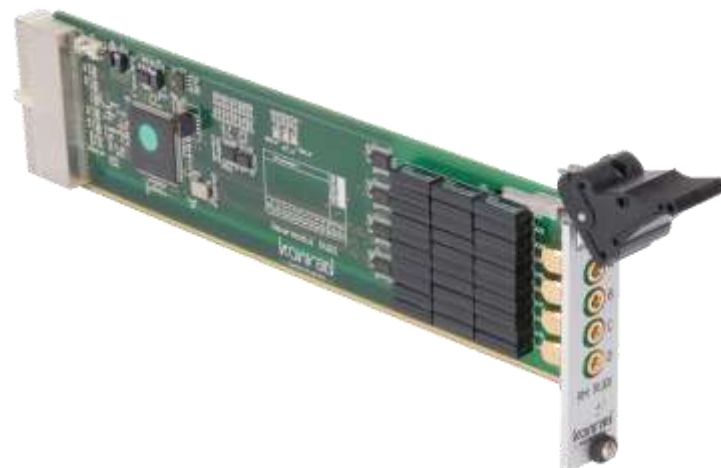


Terminal Modules

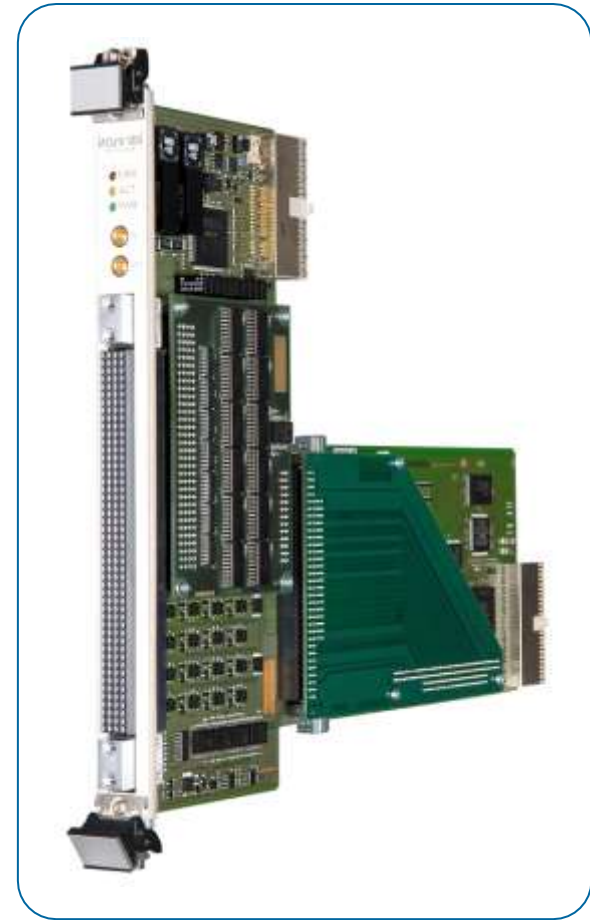
- Link to backplane
- Functional extensions
- Signal conditioning
- Connection to DUT interface
- Many popular NI Instruments supported
- Others can be integrated



- Each backplane slot allows rear connections
- Integration of Non-PXI-Resources
- Load Box, Power Supplies, etc.
- Monitoring/System Debugging
- Space for additional circuits

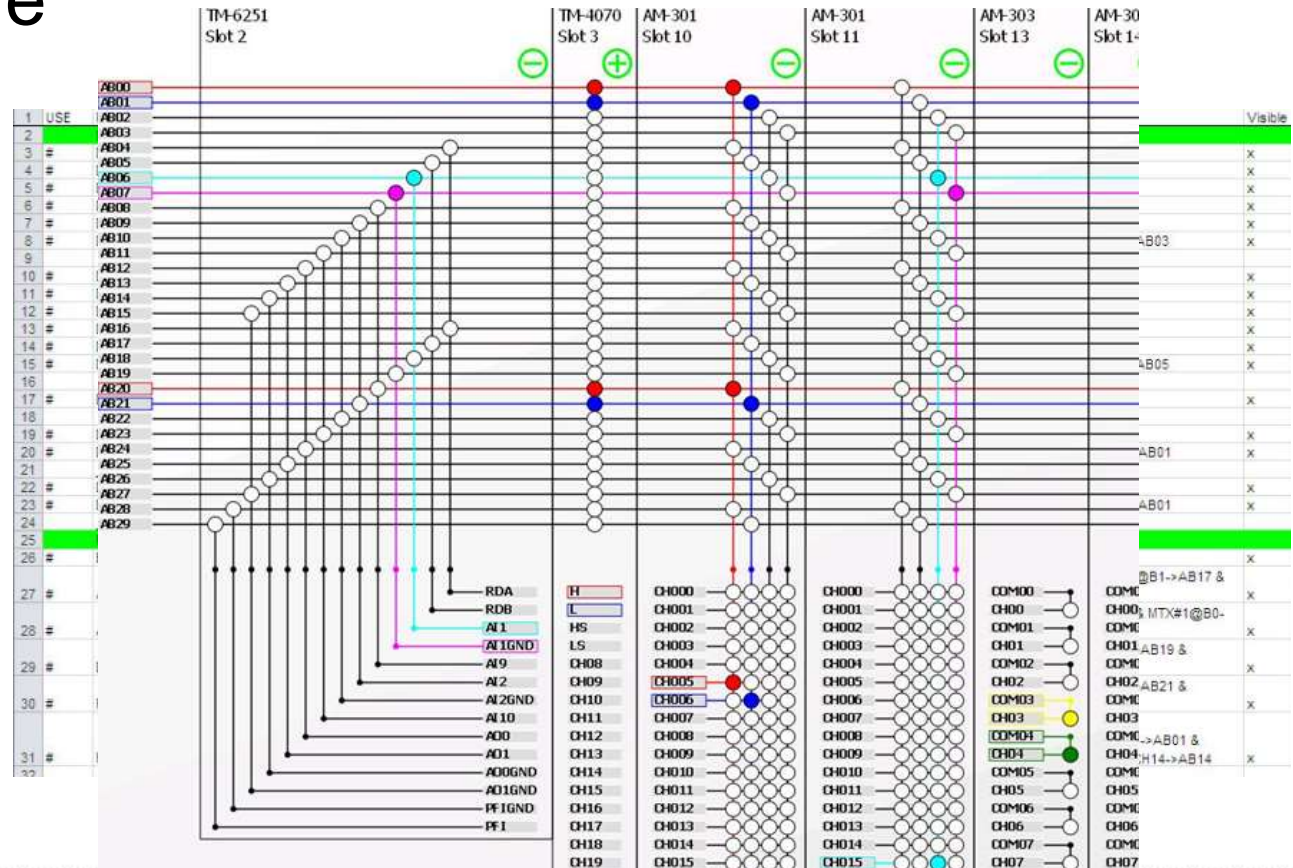


- ABex control
 - Route Switching
- Signal monitoring:
 - Utility Power
 - Fan Fail
 - Voltage Monitor
- Auxilliary I/Os:
 - Opto Isolated Digital I/O
 - Analog I/O
 - I2C
 - SPI

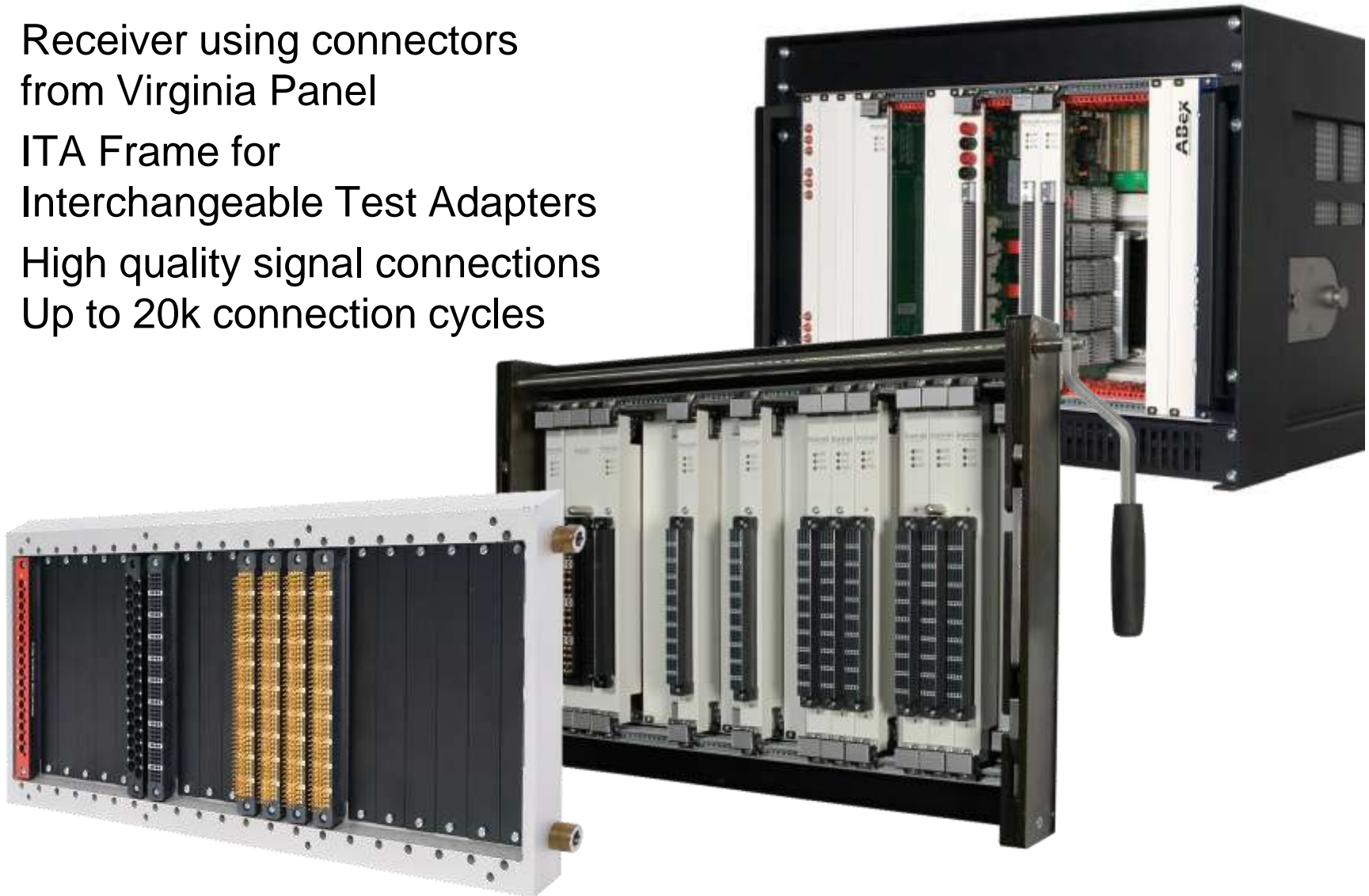


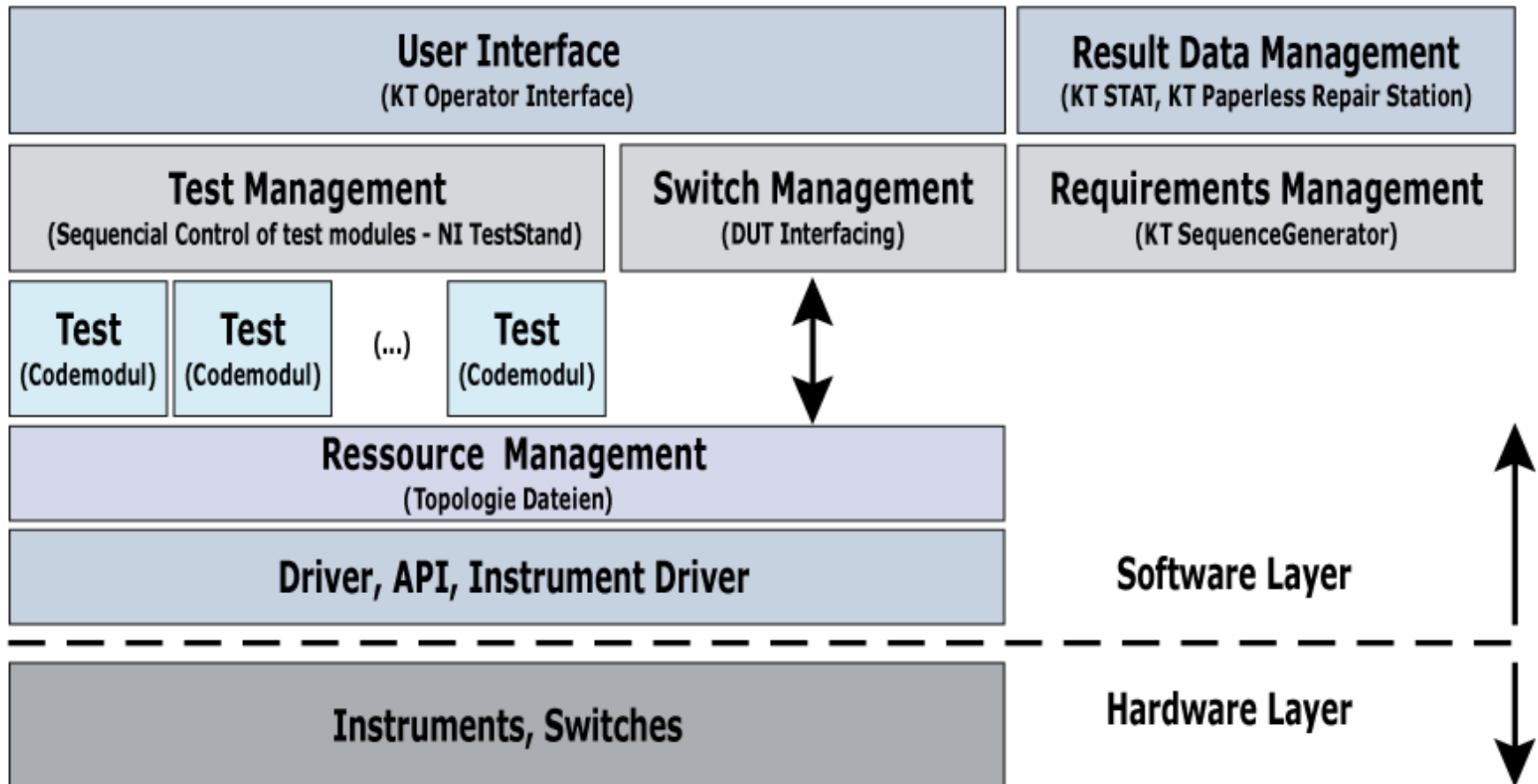
ABex Configuration

- User friendly Route definition via Routing Lists
- Via interactive Connection Scheme
- Reconfigurable



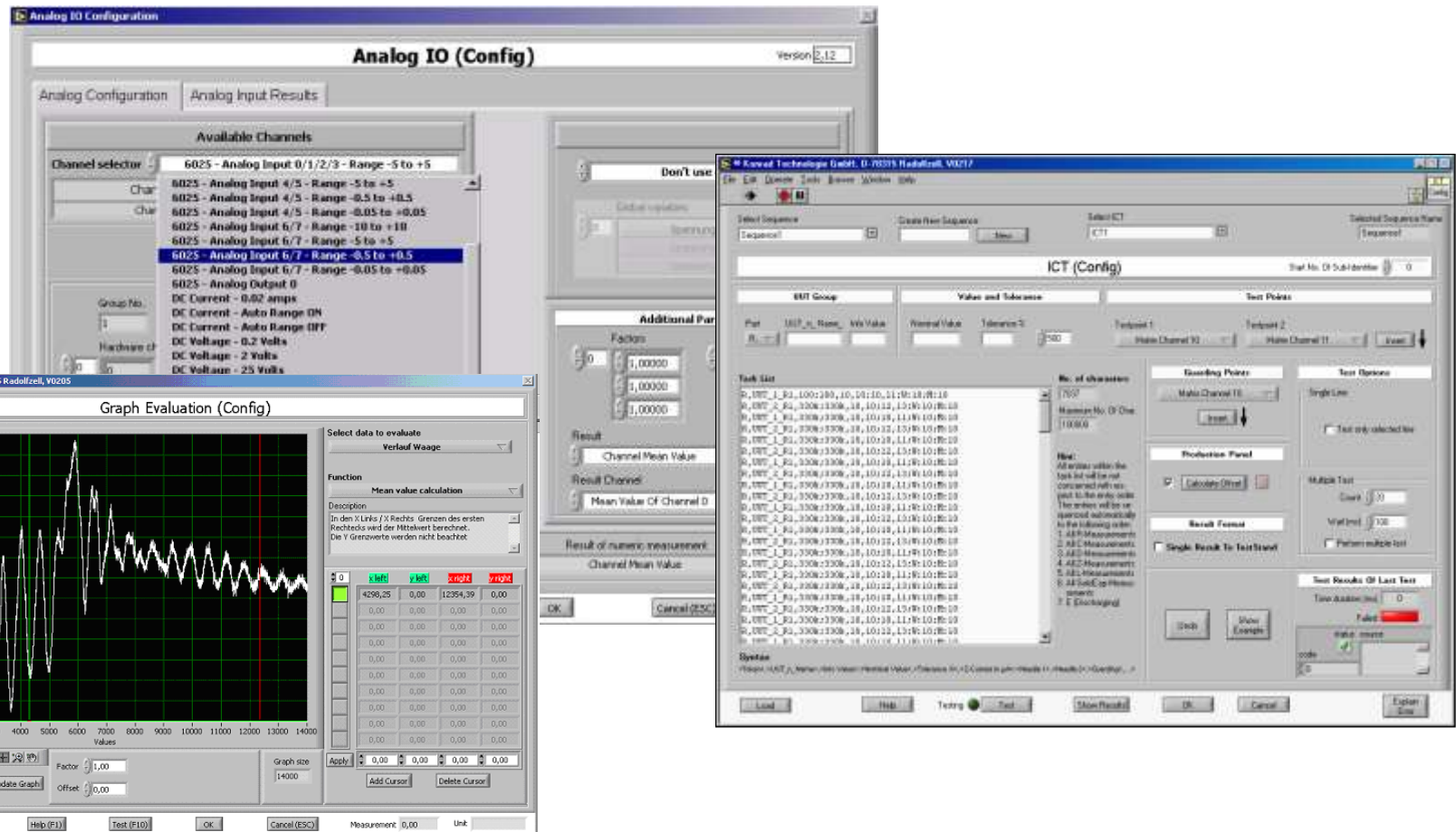
- Receiver using connectors from Virginia Panel
- ITA Frame for Interchangeable Test Adapters
- High quality signal connections Up to 20k connection cycles





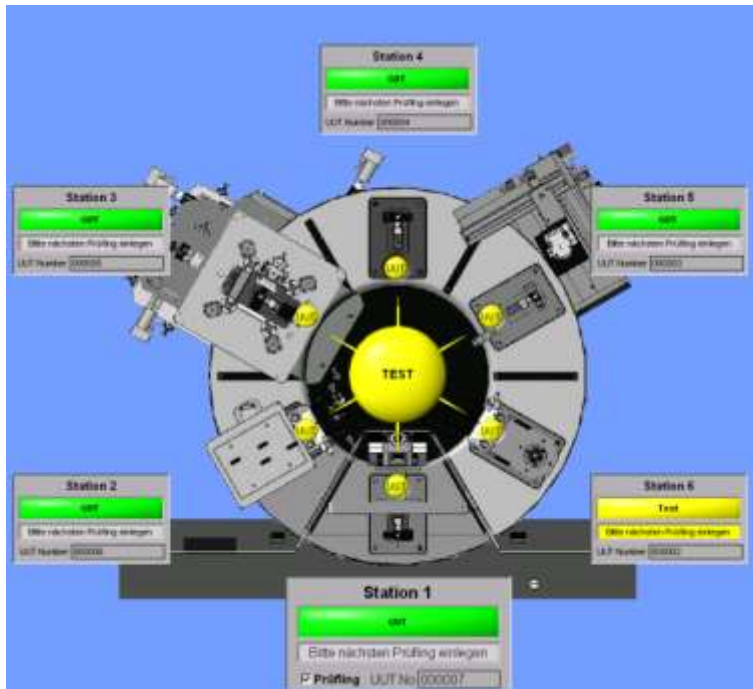
TestStep Libraries

- LabVIEW based modules to be used in TestStand



Operator Interface

- Multiple Login level
- Multiple test stations
- Free Panels
- Debugging





Application Use Cases

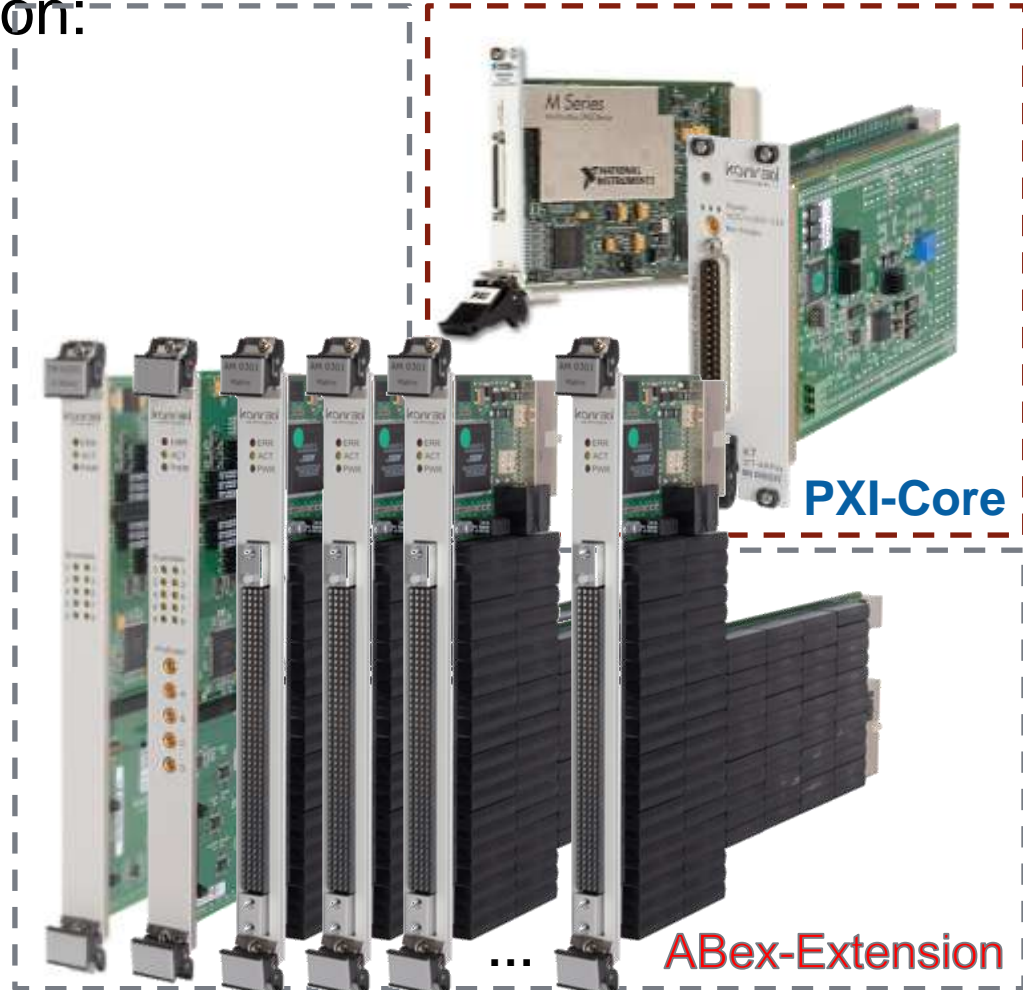
- Standard Tester Konrad-Leon:

- Typical Configuration

- PXI- Chassis
(8, 14, 18 Slots)
- NI-6251 DAQ
- KT-ICT Guarding Amplifier

- Switching

- 172 Test points
- 344 Test points
- 516 Test points
- ...
- 2236 Test Points per
18 Slot Chassis



Application Example – Automotive

- In-Line Production Test
- Panel of multiple PCB
- Multiple cells mounted together
- Dedicated test stations for
 - In-Circuit Test
 - In-System Programming
 - Optical Inspection (AOI)
 - Functional Test
 - Button Test (via pneumatic cylinder)
 - Labeling
 - Traceability system



Application Example – Medical

- Universal Tester for medical electronics
- Siemens Computer Tomography
- Combined test system
 - ICT
 - Functional test
 - RF Test
 - Boundary Scan Test
 - In-System Programming
 - Basic Fixture
 - 52 Inlays incl. STA
 - Variant Handling



Application Example – Defense

- Euro Grid tactical mission computer for Eurocopter Tiger and NH-90 helicopters
- Standard cabinet
- Standard PXI Chassis
- AC Source / DC Sources
- DMM
- Dig I/O, serial IO
- MIL-1553
- Video Master for STANAG-3350 A/B
- Break Out Panel
- Functional Test Signal Generation & Analysis



Application Example – Electronics

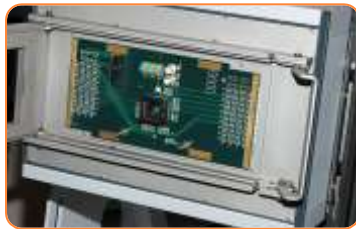
- In-Line Test of PCBs for level measurement & pressure transmitters
- Test of panels with 4 PCBs, combined ICT/FCT
- Good part marking
- Pass/Fail sorting
- Full automated board handling
- PXI/ABex System
 - Cable-less integration of PXI based tester in test handler



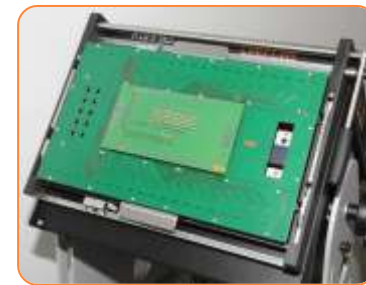
Application Example – Semiconductor Test

- Zero Footprint Test System for Design and Characterization
- Open PXI/ABex-based Architecture with > 1200 Instruments
- Scales from 20 to more than 600 pins
- FPGA based instruments – Tester per Pin Architecture
- Single to multi site parallel test
- Handler and prober test interfaces available
- Load Boards:

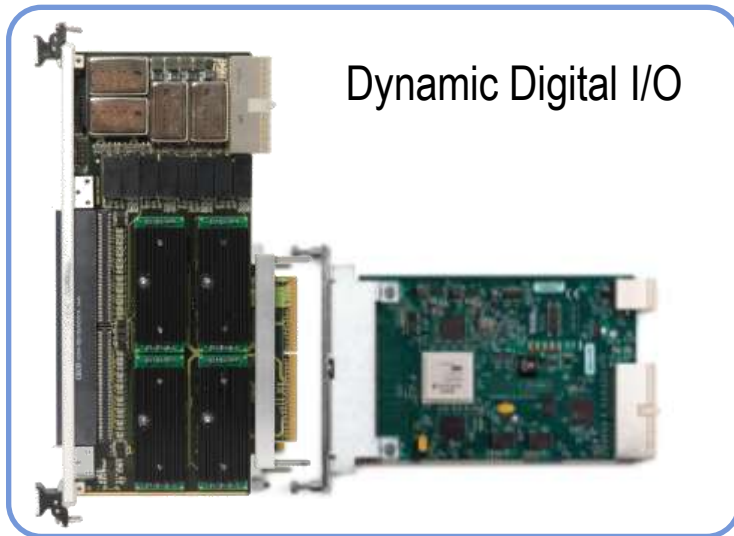
Reuse of existing test interface boards from LTX-Credence, Teradyne, Verigy-Advantest, etc.



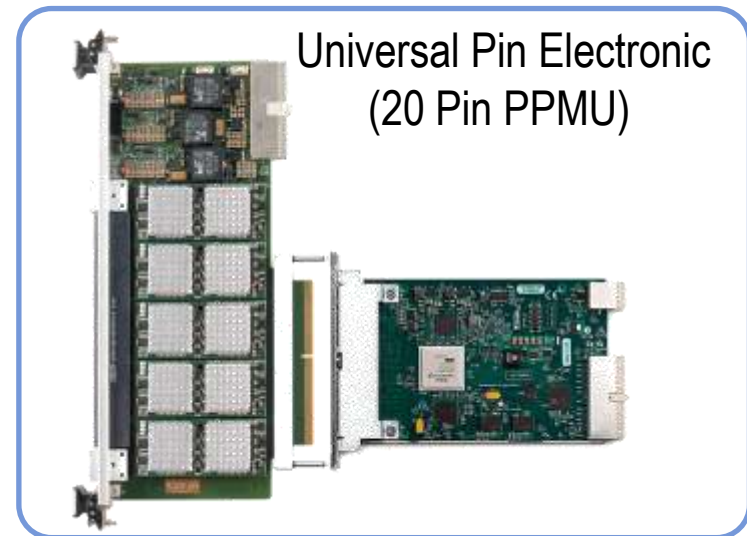
FINN specific load board with pogo pins



- FPGA Technology
- National Instruments FlexRIO Base Modules
- Custom front end on ABex Terminal Module



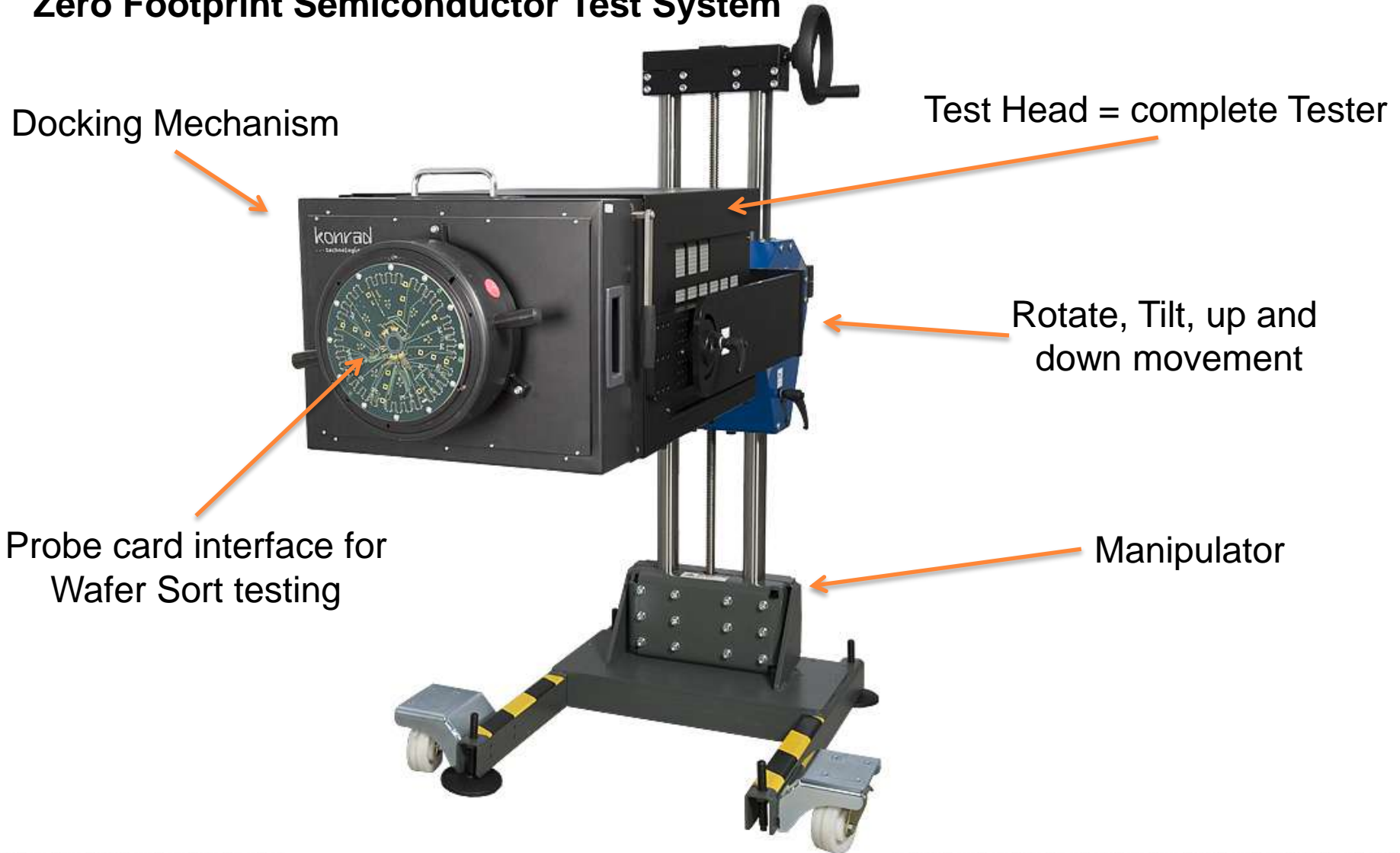
- 64 In, 64 Out, isolated, 1 MHz
- Programmable levels for low and high
- 0...28V, 10mA



- Pattern up to 50 MHz
- -4V .. +13V
- Active and passive load
- DPS

7500 Series *FINN* Test Systems

Zero Footprint Semiconductor Test System



Summary: Advantages ABex

- Less cables – less problems!
- Very good signal integrity
- Standardized test systems
- Short lead times in system design
- Widely useable in many application areas
- Open platform extension to standard PXI

- Open platform for PXI extensions
- Partner network
- ABex development kit for members
- Development exchange
- www.abexstandard.org

The screenshot displays the website for Abexstandard.org, which promotes the ABex Analog Bus Extension for PXI. The header includes the site name and the ABex logo, with the tagline 'Analog Bus Extension for PXI'. A navigation bar lists 'Overview', 'Benefits', 'Applications', 'Products', 'Members', and 'Contact'. The main content area features a large image of a PXI chassis with an ABex module installed. Text to the right of the image states: 'Analog Bus Extension for PXI', 'Additional Analog Bus', 'Additional Power Bus', 'Extends the Capabilities of PXI', and 'Simplifies Signal Routing and Connectivity'. Below this, a section titled 'Terminal Modules' shows a row of various modules. A paragraph explains that the connectivity between instruments and the ABex backplane is achieved using terminal modules, which carry relays for programmatic switching of signals to the buses. It notes that many terminal modules have dedicated space for additional electronic circuitry, such as for signal conditioning. A list of supported instruments is provided, including NI PXI-807x Digital Multimeter, NI PXI-51xx Scopes, NI PXI-60xx DAD boards, Konrad ICT analyzer, NI PXI Switching matrices, NI PXI Relay boards, Konrad K5-7411 UHF subcarrier, Konrad K5-4712 UHF-NF instrument, NI FlexRIO boards, and NI R series FPGA boards. A small image shows a terminal module and a circuit board. A link to the product section is provided at the bottom. On the right side of the page, there are links for 'Home', 'Terminal Modules', 'Relay Modules', 'Software', and 'Members'. Logos for 'NOFFZ Computer Technology', 'konrad ... technologies ...', and 'IMMS' are also visible.

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