6TL Engineering

The Engineering source for electronic test.

Peter van Oostrom

Business development manager

6TL Engineering.

HOW 6TL ENGINEERING IS USING LABVIEW AND TESTSTAND TO CREATE A COST EFFECTIVE, FLEXIBLE, MODULAR, RE-USABLE AND ABOVE ALL, RELIABLE TEST SOLUTION.

Testing is our core competence

National Instruments Silver Alliance Partner

VPC Virginia Panel Corporation

LabVIEW

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What can you expect.

- **6TL Engineering**, Who we are and what we do.
- Do we need Test and Common questions to be asked.
- Test Techniques, coverage and overlap of various technologies.
- Setting the boundaries in the test system design.
- Why 6TL uses a Mass Interconnect & CanBus for our tester concept.
- Efficient modularity the key to our succes.
- **Phi6**, the 6TL system software environment based on labview
- The Phi6 operator interface using the power of labview & teststand
- Example of how the operator interface handles an In-line Test system.
  - A short Video of this process in action.
- What 6TL can offer if there is no need for a large ATE?
- **YAVPack** and **SmartFixture** solution
- Conclusion and questions.

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Barcelona Spain.

6TL Engineering

- **6TL engineering** is a division of the **Sistel Group**, located in Sabadell, Barcelona, Spain.
- **6TL** specialized in developing and building **modules** for functional or combinational test
- **6TL** has global presence, manufacturing & support with just over 100 employees
- **6TL** is an National Instruments Silver Alliance partner.
- **6TL** has over 25 years of experience, providing test solutions for different industries
  - Automotive, Consumer Electronics, Aerospace, military, Telecom, etc.

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ISO 9001 BUREAU VERITAS Certification

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Questions to ask before investing in Test systems.

does my project need any form of testing?

YES !

Do we have the s
or do we need e

Create or find yo
made Soluti

6TL concept will help.

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General goals and expectations.

- How can I keep the cost down, (minimize development and engineering cost!)
- Time to Market - R&D focus, manufacturability, testability, design for test.
- Will my system perform now and in the future?
- Will there be room to Expand my system and can I use all available resources?
- Standard, re-usable, flexible test software architecture with modular building blocks
- Standard expandable and reliable tester interface, (Mass Interconnect)
- Use as many standard Hardware building blocks as possible.
- Test equipment asset management, factory, country, continent, world.
- Prepare wiring diagrams and operator manuals
- Training for operators and Test Engineers
- Cost-effective, long term test instrumentation availability and support.
- Test software and hardware obsolescence.
- Test preparation and testing during design.
- Minimize your vendor list and keep the price under control.
- Order to delivery - Production focus, test speed, handling etc.

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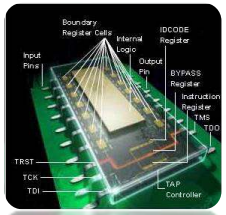
Commonly used and available Test Steps.












PROD.

AOI//MOI /AXI

FPT

ICT

BCT

FCT

SYT

Test-Coverage towards 100%

AOI = Automatic Optical Inspection

FPT = Flying Probe Test

ICT = In-Circuit Test

BST = Boundary Scan Test

MOI = Manual Optical Inspection

AXI = Automatic X-Ray inspection

FCT = Functional Test

SYT = System Test (Environmental)

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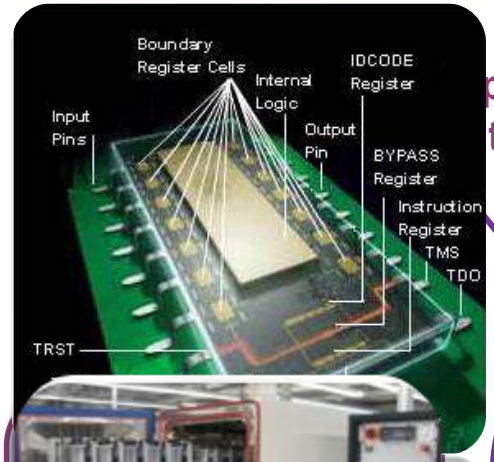
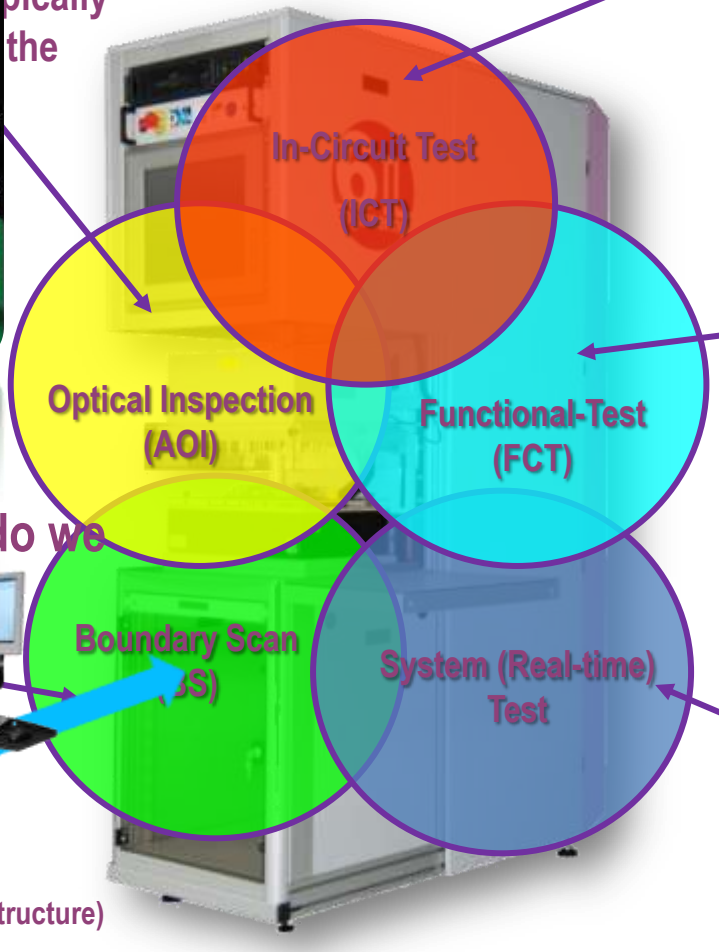
Testing route to follow, coverage & overlap.





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e do we

BS D
Opt

- S
- In
- Failing IC's (if IC's have the BS structure)

ICT Detects and find :

- Wrong or defect Comp. (analog only or analog and digital)
- Shorts, Opens
- Polarity / orientation of Comp.
- most manufacturing failures)

FCT Detects and find :

- Functional failures
- Interactive Problems
- Test is running Under real power and loads simulating real conditions.

ST Detects and find :

- Dynamic failures
- System Test failures
- Real-time and Environmental

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Setting the Boundaries

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TestStand + LabVIEW

MMI module & base Platform

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Mass Interconnect Solution: RECEIVER

Fixturing (RF or baseband)

(PC/Embed.-controller)
NI-PXI Instrumentation
Power Supply's
UPS, etc.

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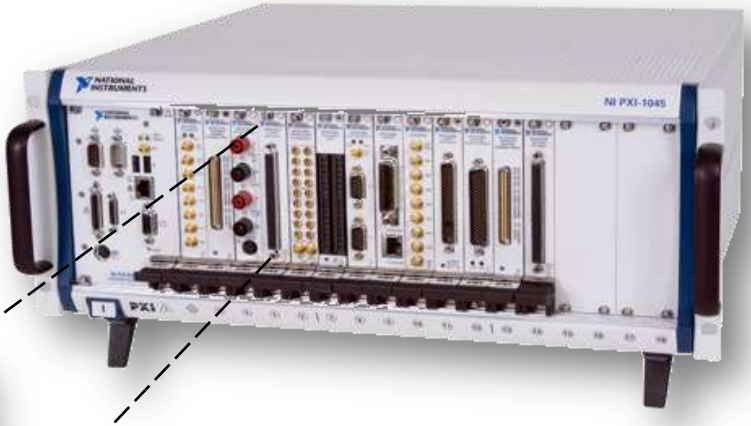
Why Mass Interconnect ?

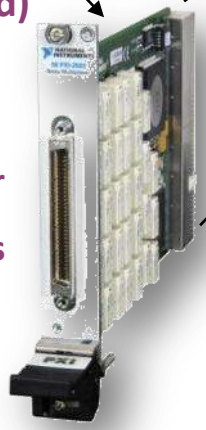
(PXI Test Instrument Card)



(Valuable Test Instrumentation)

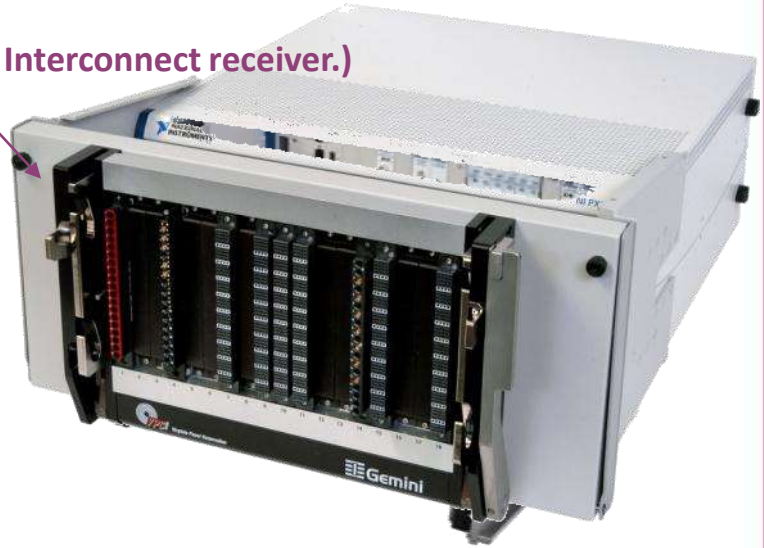
Delicate Commercial Connector

Life cycle: +/-200 cycles



Connector bad, instrument bad, Tester down

(Mass Interconnect receiver.)



One negative side to Mass Interconnect is that Cabling becomes more complex which adds to cost and complexity of the wiring diagrams.

Virginia Panel Corporation

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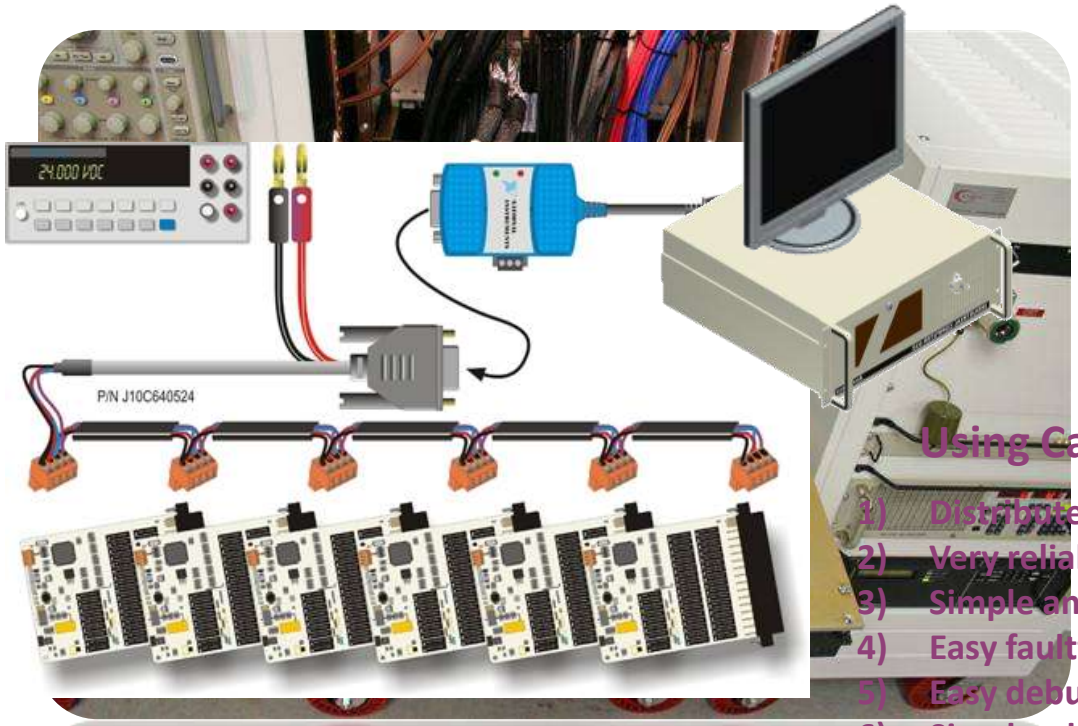
Minimize wiring inside our platforms.

As we wanted to minimize wiring inside our platforms we have included Mass Interconnect onto our instruments and used CanBus as interface between all modules.



Using CanBus has many advantages

1) Distributed intelligence (Labview – Teststand).
2) Very reliable and robust interface.
3) Simple and fast wiring of the system.
4) Easy faultfinding.
5) Easy debug & software development.
6) Simpler documentation & diagrams.
7) No Cables between MIC and Instrumentation.
8) Shorter signal paths, minimizing risk for Crosstalk !!
9) Less PXI Rackspace needed.
10) ……

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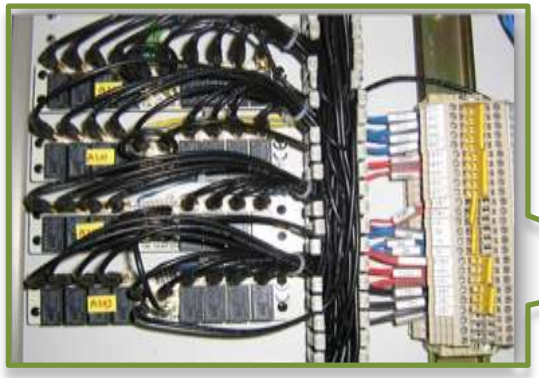
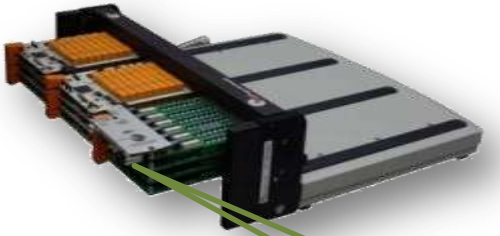
Modularity extended into the Test Fixture.





Control through CanBus
Inside each fixture

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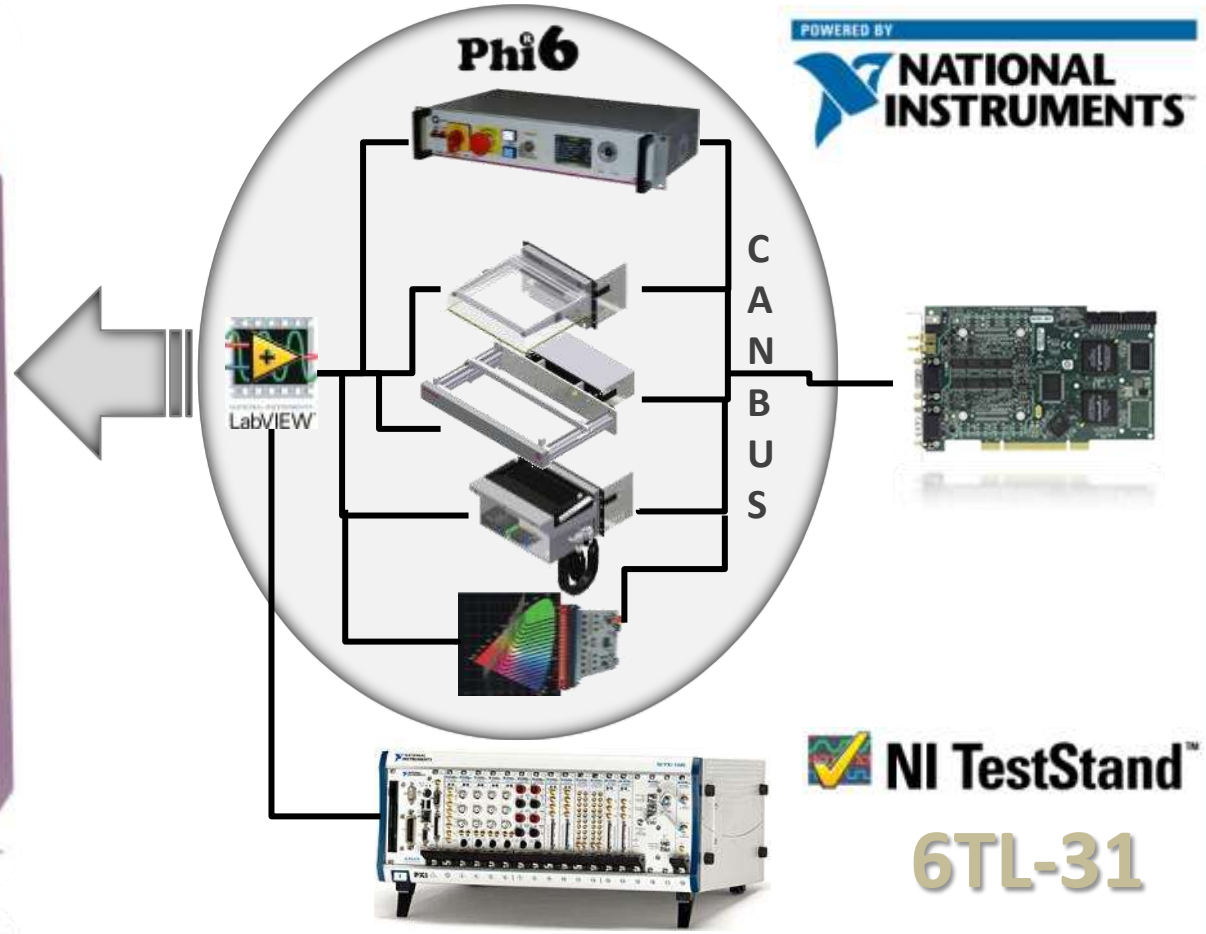
Modularity & Software architecture.

- All our modules communicate through CanBus and Include LabVIEW drivers
- All our modules are independent subsystems



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Modularity.

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Modularity.

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The Engineering source for electronic test.

Modularity.

6TL-32

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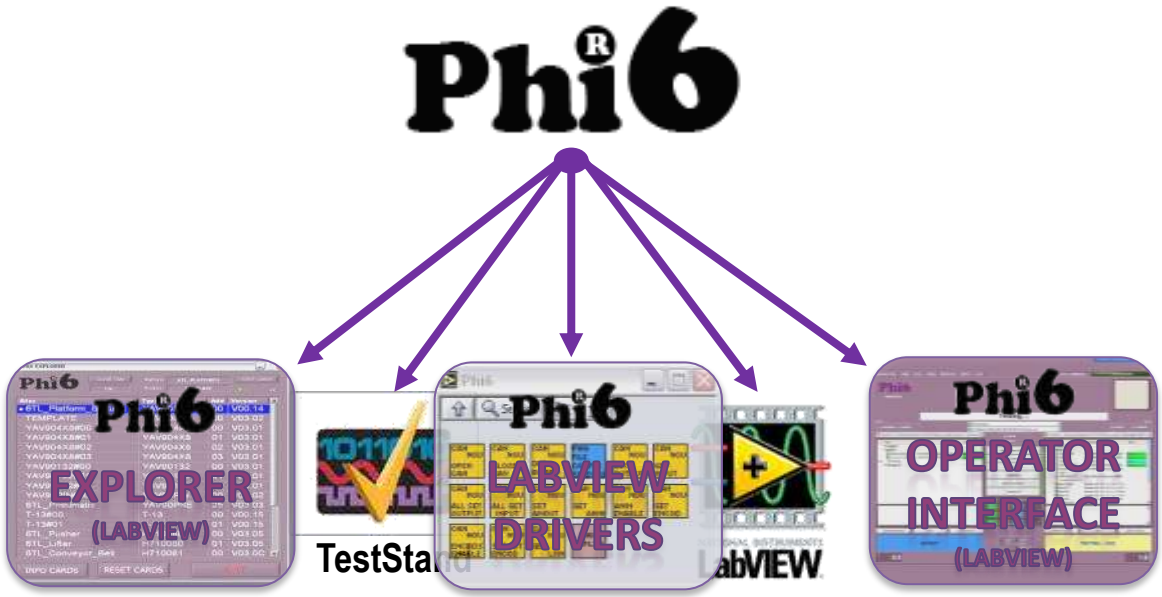
LabView, the Backbone of our Concept.

Phi6 is the software environment, based on standard NI tools, to manage, control and program the 6TL modules and systems.



- Ease of programming
- Code is re-usable
- Increasing development speed
- Scalable and Modular
- Standard functionality for all Modules and Systems included

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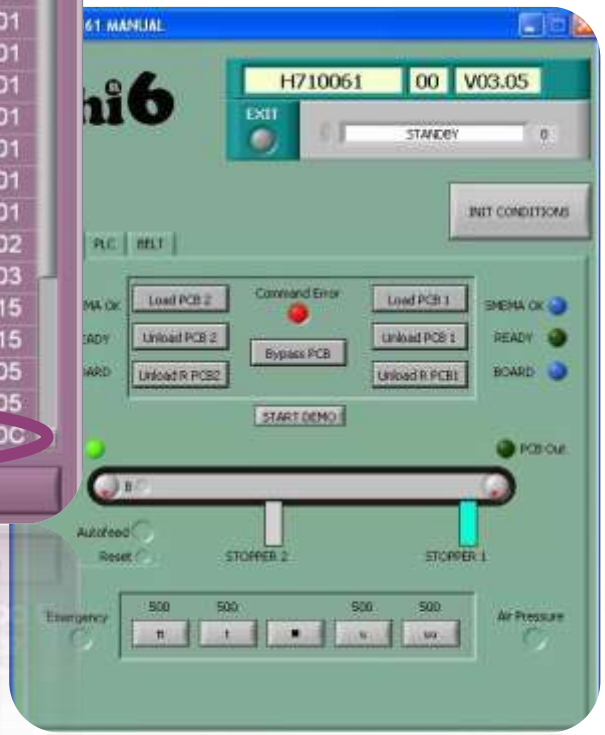
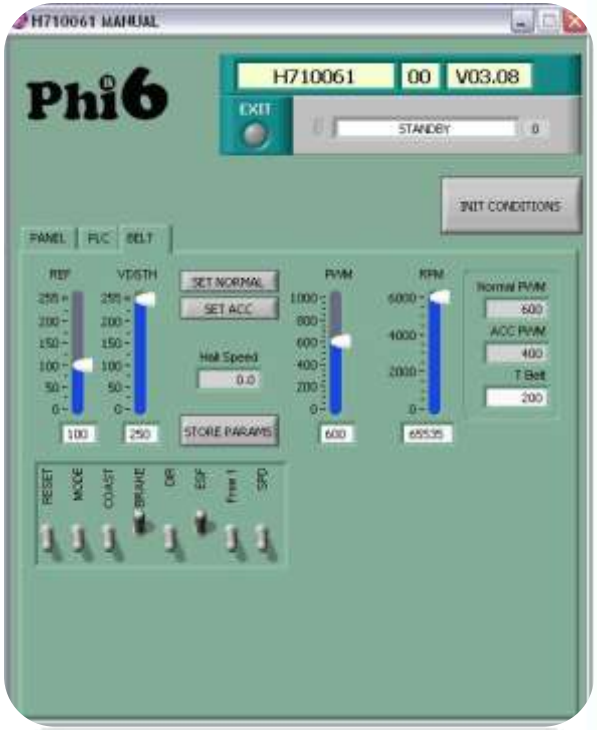
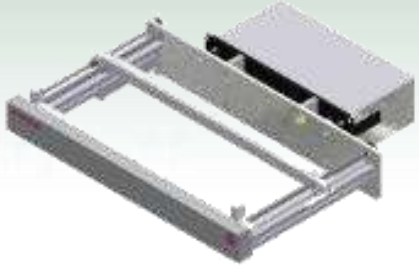
Phi6 Explorer.

Fast Setup & Debug.







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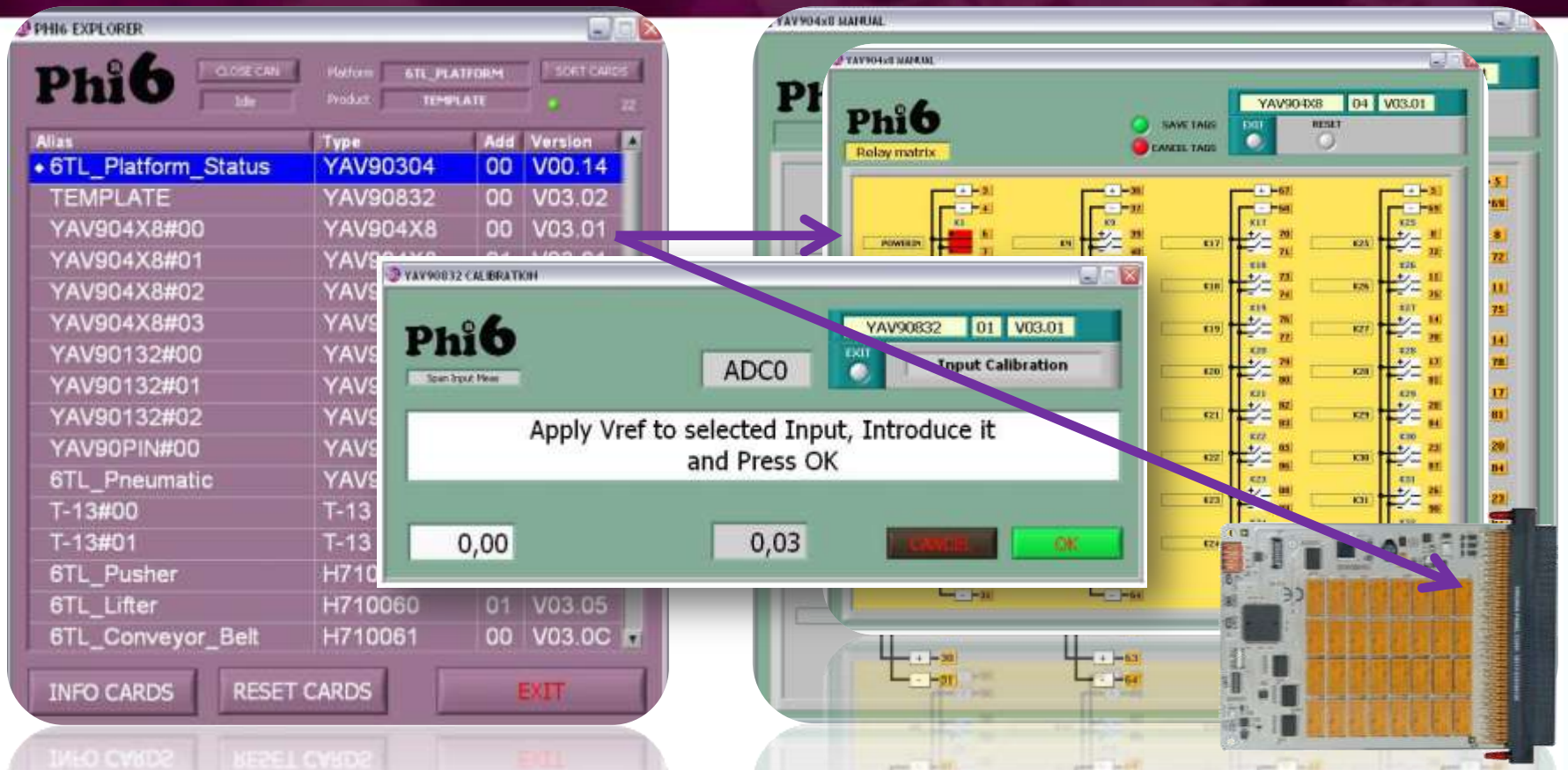
Phi6 Explorer.



- Quickly control all YAV boards. (Debug & Repair)
- Configure YAV channels.
- Change labels (TAGS)
- Calibrate YAVmodules

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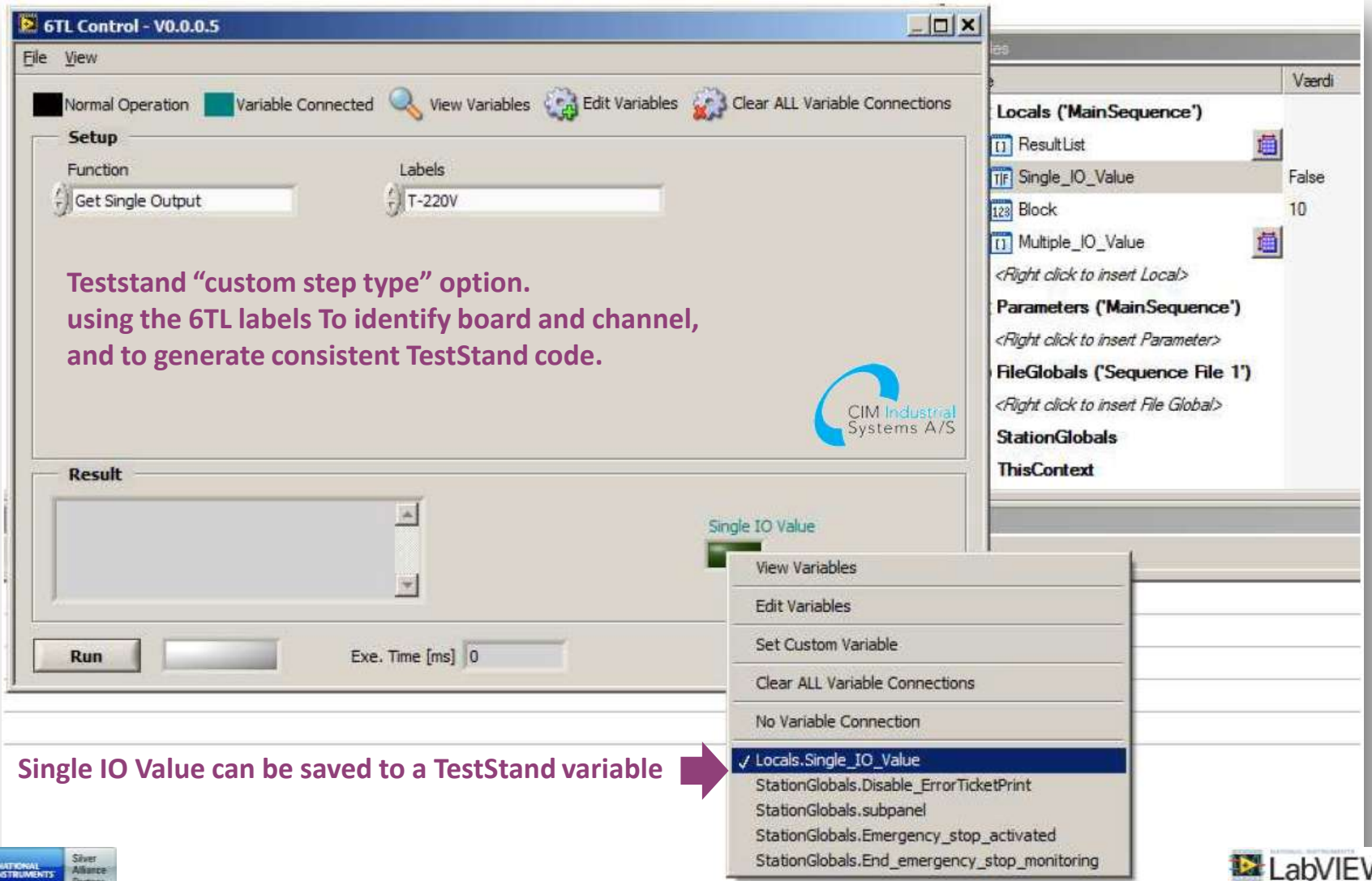
Labels provide easy programming.



Single IO Value can be saved to a TestStand variable

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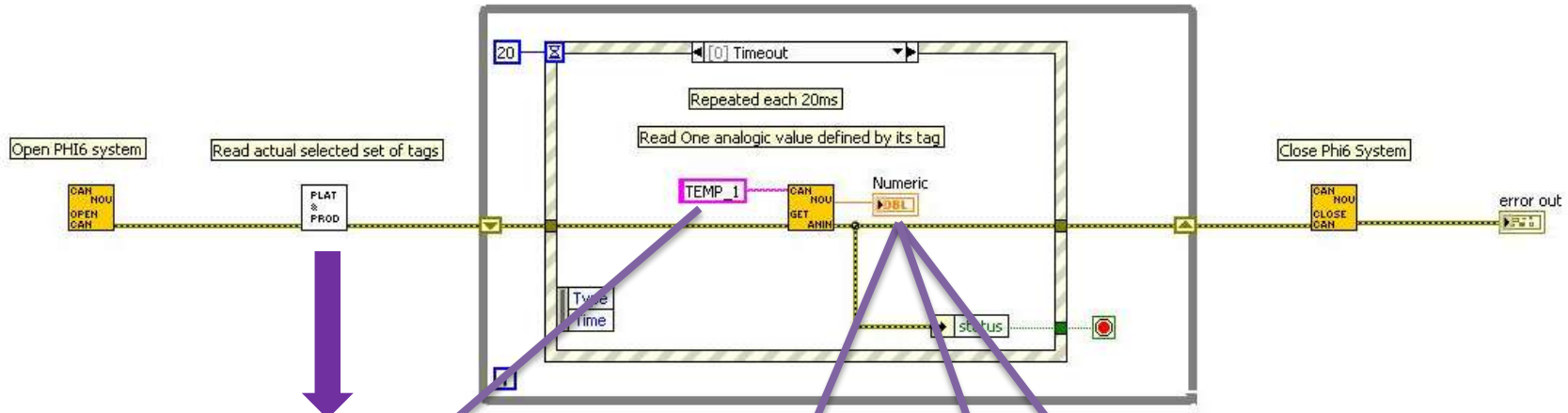
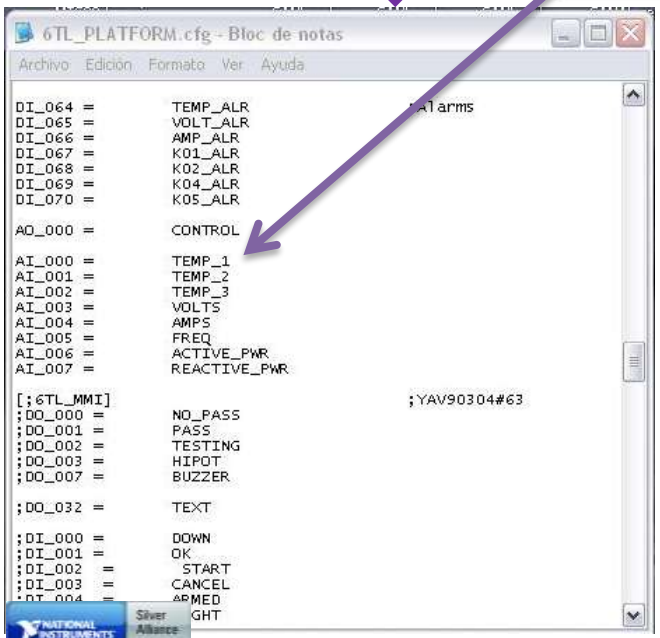
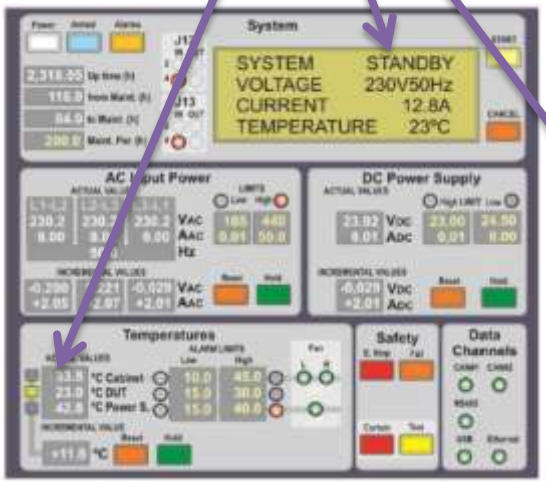
Labels and a MMI Sample Measurement.







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Phi6 Operator Interface.

Clear overview of the test sequence in one schreen.

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Phi6 Operator Interface.

Operation and management of 6TL platforms

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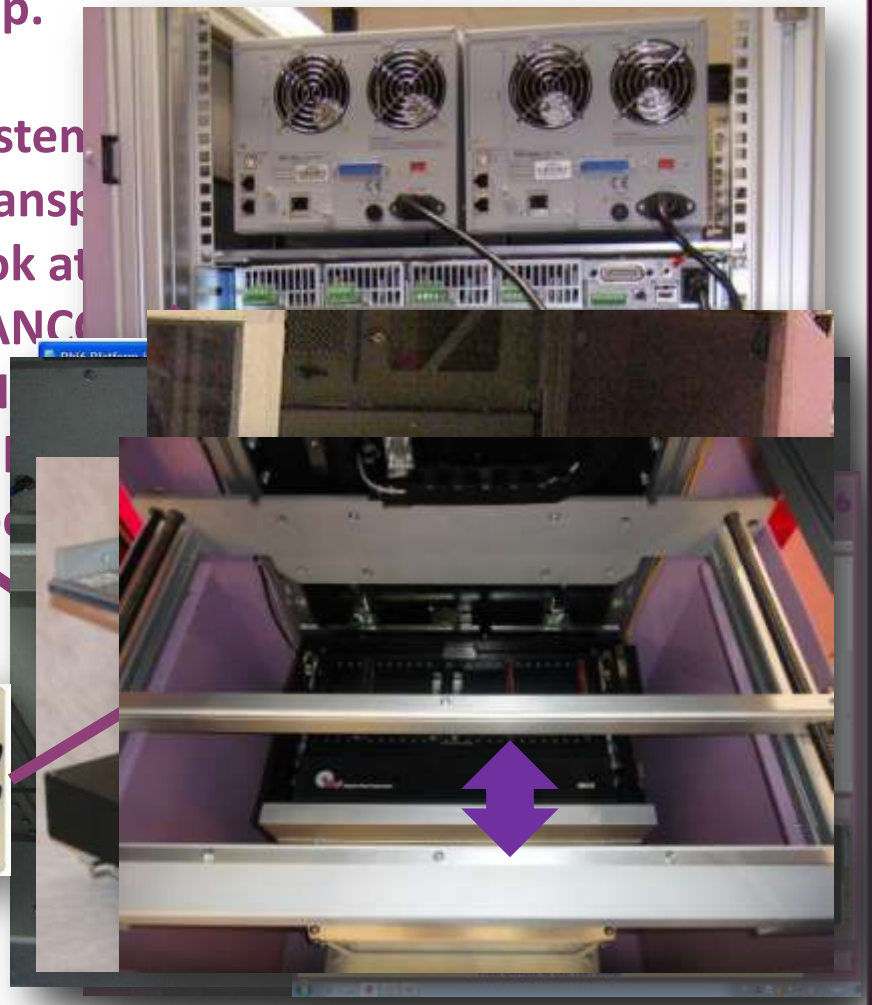
Phi6 Operator Interface, what does it do.

- Switch on the System with the main switch on the MMI
- PDU takes care of a controlled start-up.
- Arm the Machine.
- Load the INI files to determine the systen
- Initialization routine, lifter, pusher, transp
- Check the presence of a Fixture to look at
- Read the information from the YAVCANC
- Load the UUT specific (productname.I
- Load picture of the board + company
- System waits for the start button to b



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Video how this works in real live.

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Modularity is the ideal solution.

Perfect solution for all your universal test challenges.

BUT what if you do not need such a big machine?

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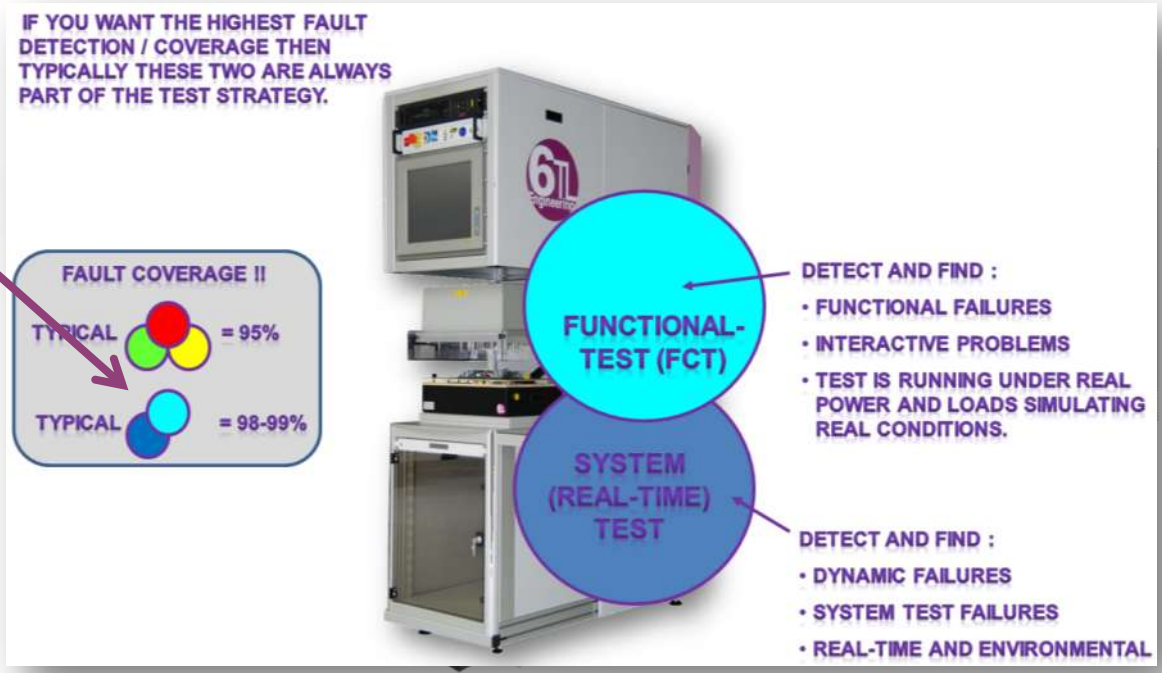
How to keep testing affordable?

- If Universal test solutions are needed 6TL will offer their true modular tester concept.
- We can conclude that with FCT we can get a fault coverage of 98% or more.



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How to keep testing affordable?

- What if you want to start testing during development?
- Or If the cost of test development & engineering are to high for the available budget?
- Or if you do not have the Engineers in house able to develop a suitable test solution and software?
- Or only need to do a verification test.

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How to keep testing affordable?

- Then often you develop something yourself.

- These solutions are not based on any standard!
- Depending on the skills of each individual engineer.
- Very often documentation is poor.
- Therefore difficult to maintain and reliability problems will occur in the future.

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How to keep testing affordable?

- 6TL solution: YavPack Bundels
- Standard Product
- Fixture friendly design
- Easy to program using MS-Excel or LabView
- Easy to create a SmartFixture®.
- And above all affordable.

YAVPacks

SmartFixture®

LabVIEW

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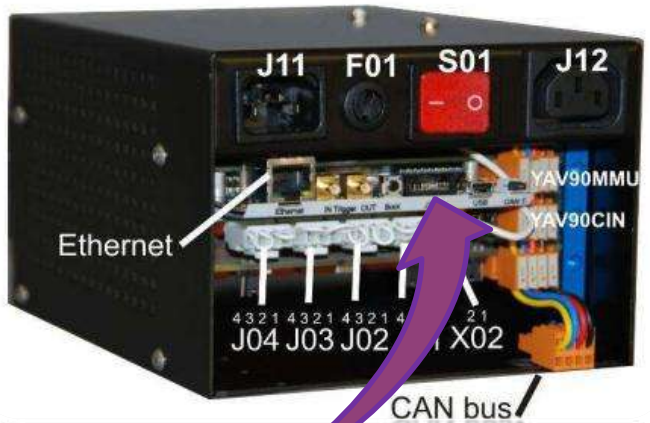
Our Solution !

YAVPacks



Heart of each YAVPACK is a Powerful YAV90MMU
(Measurement & switching Unit)

SmartFixture®

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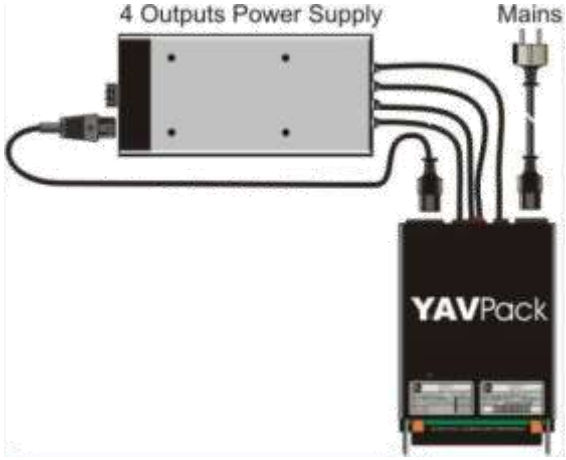
How to keep testing affordable?

- **A second YAVBoard (YAV90CIN) is present in each YAVPack for switching up to 12 power supplies and/or Loads to the DUT.**
- **The current can be directly monitored on each channel.**
- **In combination with the CanBus controlled Man Machine Interface (MMI) we can control the YAVPack.**



(YAV90CIN)

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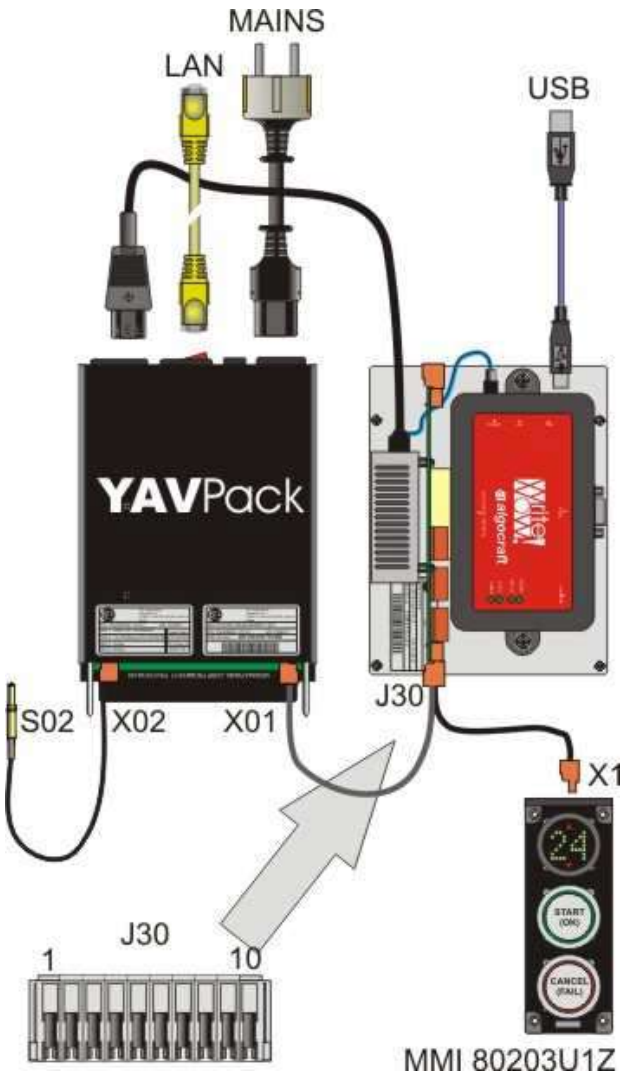
Sample application memory Programming.



Option: ISP (Memory programming)

- The YavPack can be combined with an ISP device (In-System Programming).
- The YAVPack will manage the I/O, controlling the programmer.
- Compatible with most common communication interfaces

ISP Pin assignement

J30 Pin	Signal	SPI	JTAG	I2C
1	SxL01	SCK	TCK	SCL
2	SxL02	SCLK	TDI	
3	SxL03	MISO	TDO	SDA
4	SxL04	MOSI	TMS	
5	SxL05	/SS		
6	SxL06		TRST	
7	SxL07	CBS		
8	SxPPS			VCC
9	SxRLY			
10	SxGND			GND

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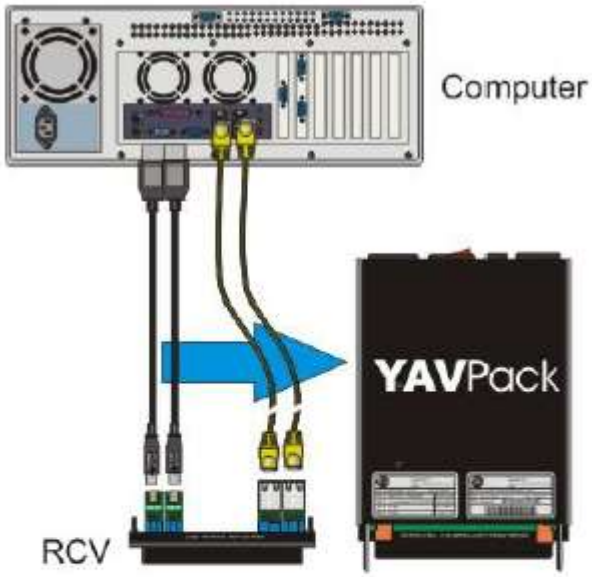
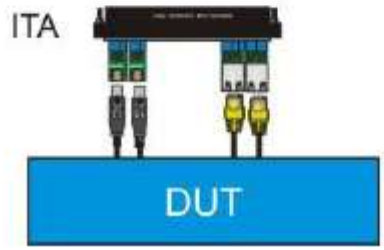
With Labview all is possible.





VPC Virginia Panel Corporation

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How to keep testing affordable?

Calibration kit available.

SmartFixture®

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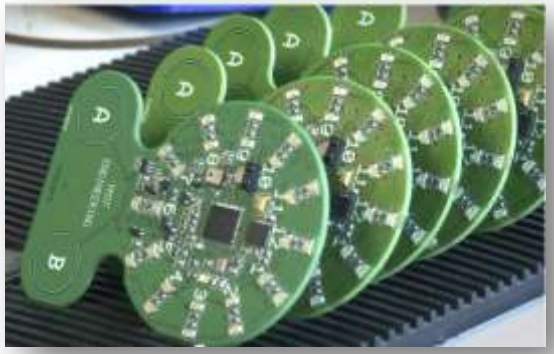
Example.

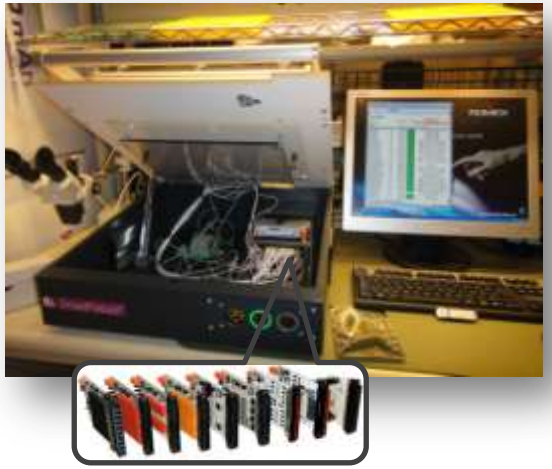
Sample PCB 2000 pieces.

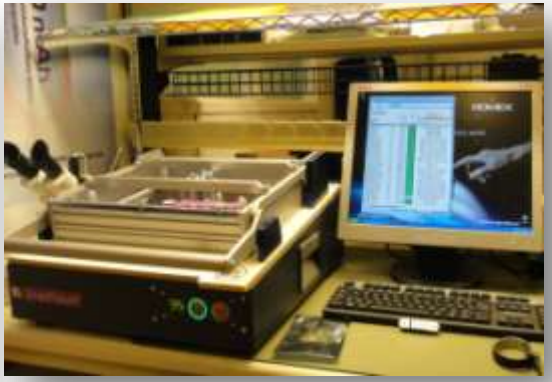


NOT wanted solution.

Wanted modular solution.

The selected solution for low to medium quantities and verification test is the SmartFixture.





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SmartFixture®

LabVIEW

Recap & Conclusion.

Conclusion:

- **Designed for TEST Only** each module is designed for only one purpose, to be a part of an ATE system.
- **Efficient wiring** all modules are connected through CanBus.
- **Flexibility** All modules are independent subsystems easy to add/remove whenever needed.
- **Reliable tester interface** due to full integration of a Mass Interconnect Interface as part of our concept.
- **Short Signal path** CanBus RF or I/O modules inside testfixture, YAV-Modules directly mounted in Mass Interconnect Interface reducing risk for “CROSSTALK” substantially.
- **Fast Build-up of an ATE**. Recurrent tasks in one Module, BS, LED test, MMI, Pneumatic, Flipper, etc.
- Your **Engineering can focus** on tasks that add value to the final ATE system.
- **Short delivery** due to our modularity we can deliver in 3-4 weeks a complete “Base Test Platform”.
- **Small to large solutions** for any test project from development, laboratory and small, medium to large production needs.

The Engineering source for electronic test.

Modularity.

6TL Engineering

Thank you, Any Questions?

Testing is our core competence

Silver Alliance Partner

LabVIEW

Virginia Panel Corporation