



The Engineering source for electronic test.

USING LABVIEW FOR THE DEVELOPMENT OF A MODULAR AND FLEXIBLE PC-BOARD TEST PLATFORM.

Peter van Oostrom
Business development manager

6TL Engineering.

**STANDARD BUILDING BLOCKS FROM 6TL ENGINEERING,
MASS INTERCONNECT FROM VIRGINIA PANEL CORPORATION AND
ADDITIONAL INSTRUMENTATION AND SOFTWARE FROM NATIONAL INSTRUMENTS.**

THE BEST WAY TO CREATE SOLUTIONS TO SUIT ALL YOUR NEEDS.



Testing is our core competence



The Engineering source for electronic test.

What can you expect.

- **6TL ENGINEERING, WHO ARE WE AND WHAT DO WE DO.**
- **TEST TECHNIQUES, COVERAGE AND OVERLAP OF VARIOUS TECHNOLOGIES**
- **HOW TO DESIGN A COST EFFECTIVE, FLEXIBLE BASE TEST SYSTEM (QUESTIONS)**
- **SETTING THE BOUNDARIES**
- **WHY LABVIEW IS USED AS THE BACKBONE OF OUR DESIGNS**
- **EFFICIENT MODULARITY**
- **PHI6, THE SYSTEM SOFTWARE ENVIRONMENT BASED ON LABVIEW**
- **THE PHI6 CORE, WHY DID WE DEVELOP IT**
- **THE PHI6 OPERATOR INTERFACE USING THE POWER OF LABVIEW & TESTSTAND**
- **EXAMPLE OF HOW WE DEVELOP NEW MODULES USING LABVIEW (NEW MMI)**
- **THE BUSINESS MODEL OF THE 6TL ENGINEERING SUCCESS**



The Engineering source for electronic test.
Techniques coverage & overlap.



The Engineering source for electronic test.

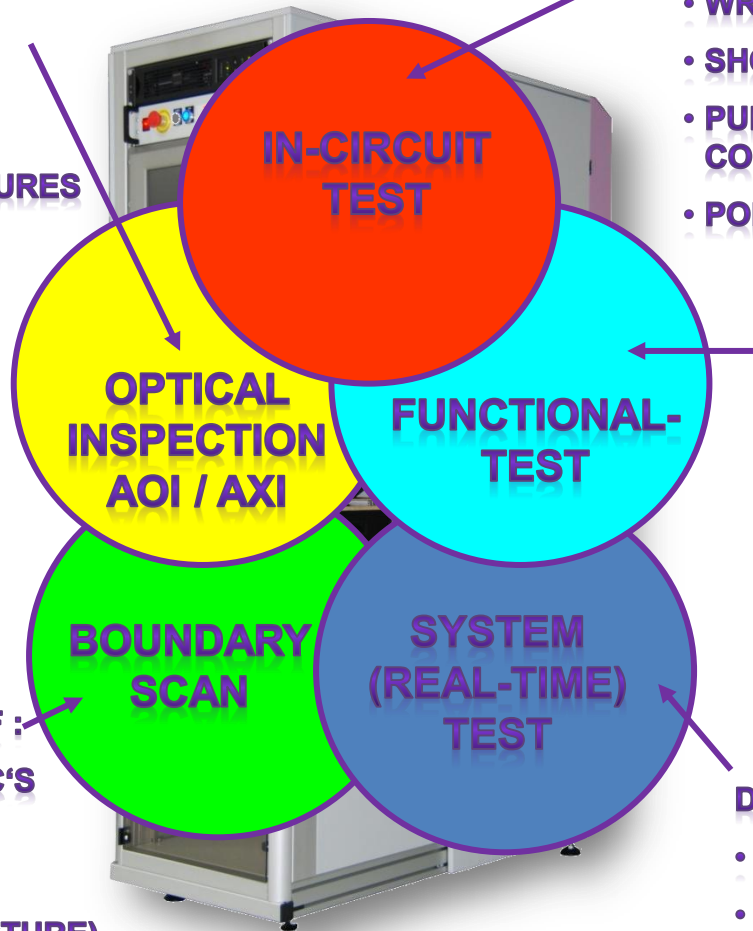
Techniques coverage & overlap.

DETECTING AND LOCALIZING OF :

- INSERTION FAILURES
- SOLDIER FAILURES
- MECHANICAL ATTRIBUTES
- AXI - HIDDEN SOLDER FAILURES

DETECTING AND LOCALIZING OF:

- WRONG OR DEFECT COMP. (STATIC)
- SHORTS, OPENS
- PULL-UP / PULL-DOWNS, SECURITY-COMPONENTS, CIRCUITRY
- POLARITY / ORIENTATION OF COMP.



**OPTICAL
INSPECTION
AOI / AXI**

**FUNCTIONAL-
TEST**

**BOUNDARY
SCAN**

**SYSTEM
(REAL-TIME)
TEST**

DETECTING AND LOCALIZING OF:

- FUNCTIONAL FAILURES
- INTERACTIVE PROBLEMS
- UNDER REAL POWER

DETECTING & LOCALIZING OF :

- OPEN SOLDER JOINTS ON IC'S
- SOLDER FAILURES
- WRONG IC'S
(IF IC'S HAVE THE BS STRUCTURE)

DETECTING AND LOCALIZING OF:

- DYNAMIC FAILURES
- SYSTEM TEST
- REAL-TIME AND ENVIRONMENTAL



The Engineering source for electronic test. Our goals and expectations.

• HOW TO DESIGN A COST EFFECTIVE, FLEXIBLE BASE TEST SYSTEM.

- WITH A MINIMUM / SHORTEST:
 - INVESTMENT
 - ENGINEERING EFFORT
 - DELIVERY TIME, INDEPENDENT OF COMPLEXITY
 - INTEGRATION TIME AND USER TRAINING EFFORT
 - PROGRAM DEVELOPMENT TIME
 - COMMISSIONING / DEBUG TIME
- AND WITH A MAXIMUM OFF :
 - RELIABILITY
 - FLEXIBILITY, ALL TEST TECHNIQUES
 - MODULARITY
 - RE-USABILITY
 - EASE OF USE
 - SERVICE AND SUPPORT



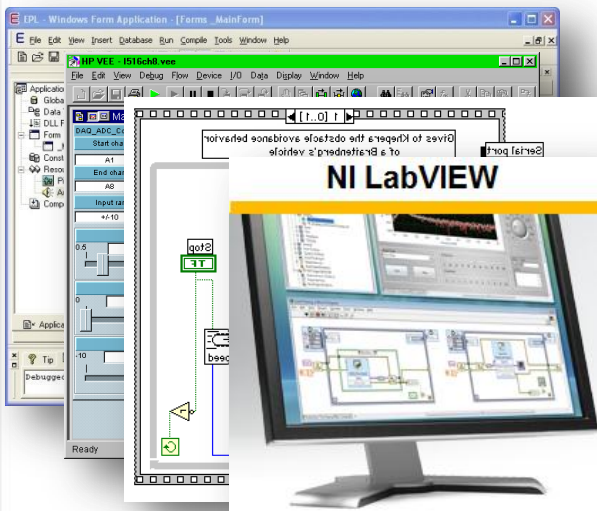


The Engineering source for electronic test. Setting the Boundaries

• IF WE TALK MODULARITY WE DIFFERENTIATE TWO STANDARD AND ONE VARIABLE BUILDING BLOCK,

- 1 – INPUT SIDE – SOFTWARE PLATFORM AND THE SOFTWARE APPLICATION (STANDARD)
- 2 – OUTPUT SIDE – INTERFACE TO THE UNIT UNDER TEST (STANDARD)
- 3 – TESTER ELECTRONICS, INSTRUMENTS AND HOUSING + OPTIONS.

DESIGN PLATFORM AS EFFICIENT AS POSSIBLE
WITH STANDARD BUILDING BLOCKS.



STANDARD INPUT .



STANDARD OUTPUT.



- **LABVIEW HAS OFFERED 6TL ENGINEERING ALL THE TOOLS NEEDED TO ACHIEVE OUR GOALS,**
 - **LABVIEW OFFERS US FAST GRAPHICAL PROGRAM GENERATION AND DEVELOPMENT**
 - **FAST PLUG & PLAY HARDWARE INTEGRATION WITH LABVIEW DRIVERS**
 - **POWERFUL PLATFORM TO DEVELOP OUR PHI6 CORE COMMUNICATION MODULE**
 - **DATA DISPLAYING AND A BASE OF OUR PHI6 USER INTERFACE, INCLUDING PARALLEL TESTING.**
 - **LABVIEW PROVIDES AN ENVIRONMENT FOR DEBUG, SETUP, MANAGEMENT , REPORTING**
 - **BASE FOR PHI6 EXPLORER TO MONITOR AND FAULT FIND ALL OUR MODULES.**



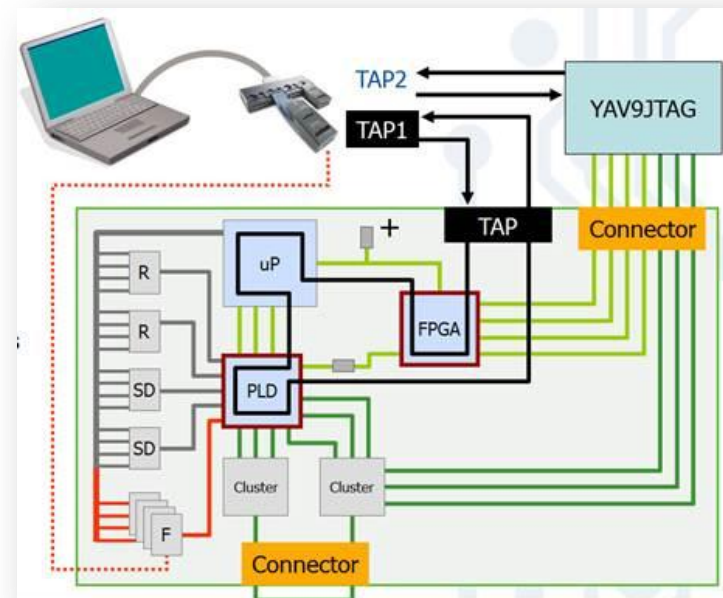
The Engineering source for electronic test. Efficient Modularity.

• TESTER MODULES FOR TASKS THAT OFTEN REQUIRE ADDITIONAL HARDWARE FOR EACH NEW U.U.T.

- 1 – INVESTMENT NEEDS TO BE DONE ONLY ONES
- 2 – ONE COMPACT BOARD SAVES A LOT OF ENGINEERING TIME TO DEFINE NEEDED PARTS.
- 3 – FAST INTEGRATION AND IMMEDIATELY READY FOR USE IN LABVIEW OR TESTSTAND.



TO EXTEND BOUNDARY SCAN COVERAGE PROVIDE ADDITIONAL BOUNDARY SCAN CELLS INSIDE THE TEST SYSTEM.

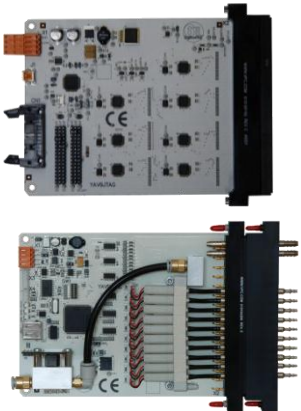




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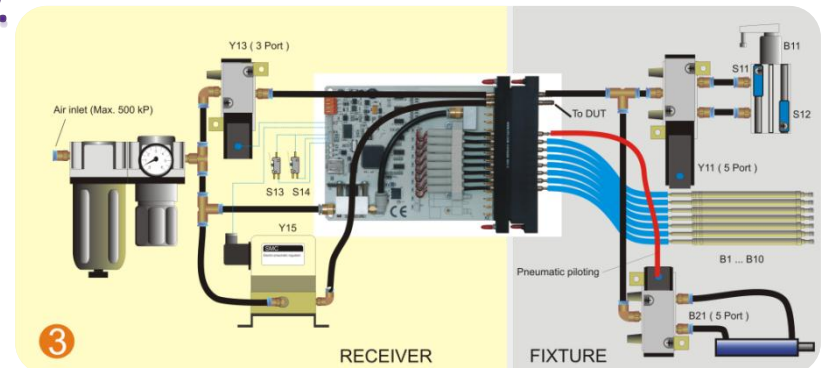
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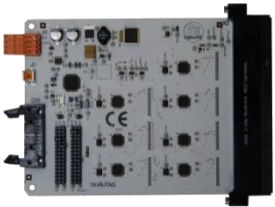
TO DRIVE PNEUMATICS TO AUTOMATE FUNCTIONAL TEST DIRECTLY FROM THE TEST SYSTEM AND FROM LABVIEW.



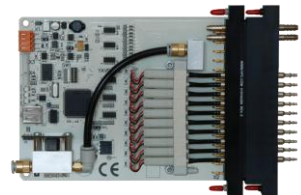


The Engineering source for electronic test. Efficient Modularity.

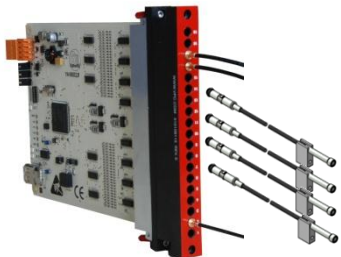
- **TESTER MODULES FOR TASKS THAT OFTEN REQUIRE ADDITIONAL HARDWARE FOR EACH NEW U.U.T.**
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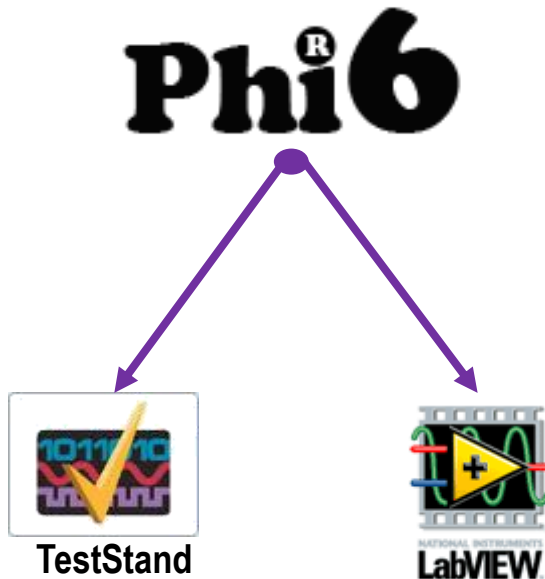
TO CHECK ALWAYS COLOR AND INTENSITY DIRECTLY FROM THE TEST SYSTEM.





The Engineering source for electronic test. LabView, the Backbone of our Concept.

**PHI6 IS THE SOFTWARE ENVIRONMENT, BASED ON STANDARD TOOLS, TO
MANAGE, CONTROL AND PROGRAM THE 6TL MODULES AND SYSTEMS.**





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Phi[®]6



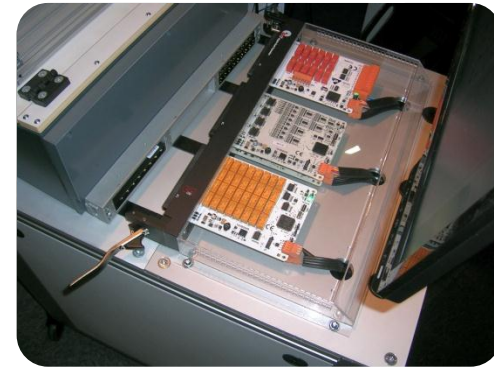
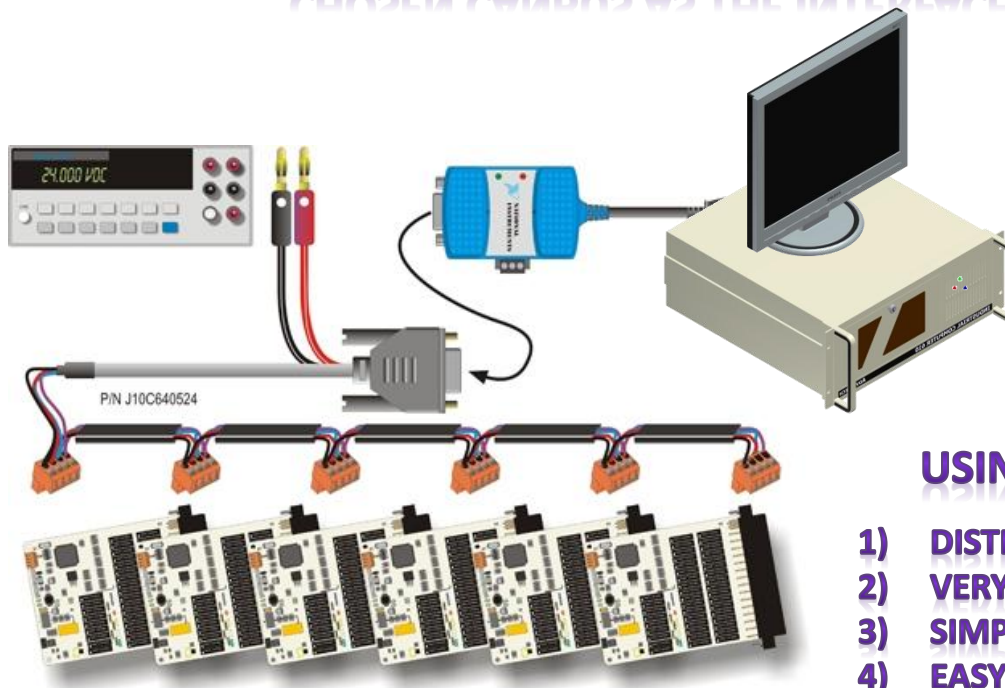
- EASE OF PROGRAMMING
- CODE IS RE-USABLE
- INCREASING DEVELOPMENT SPEED
- SCALABLE AND MODULAR
- STANDARD A LOT OF FUNCTIONALITY



The Engineering source for electronic test.

Minimize wiring inside our platforms.

AS WE LIKE TO MINIMIZE WIRING INSIDE OUR PLATFORMS WE HAVE CHOSEN CANBUS AS THE INTERFACE BETWEEN ALL MODULES.



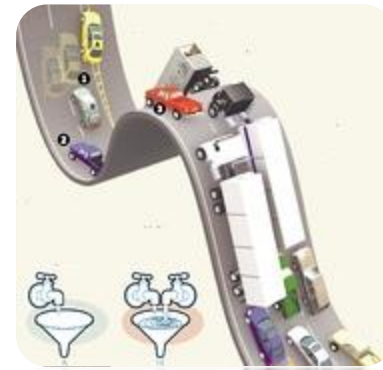
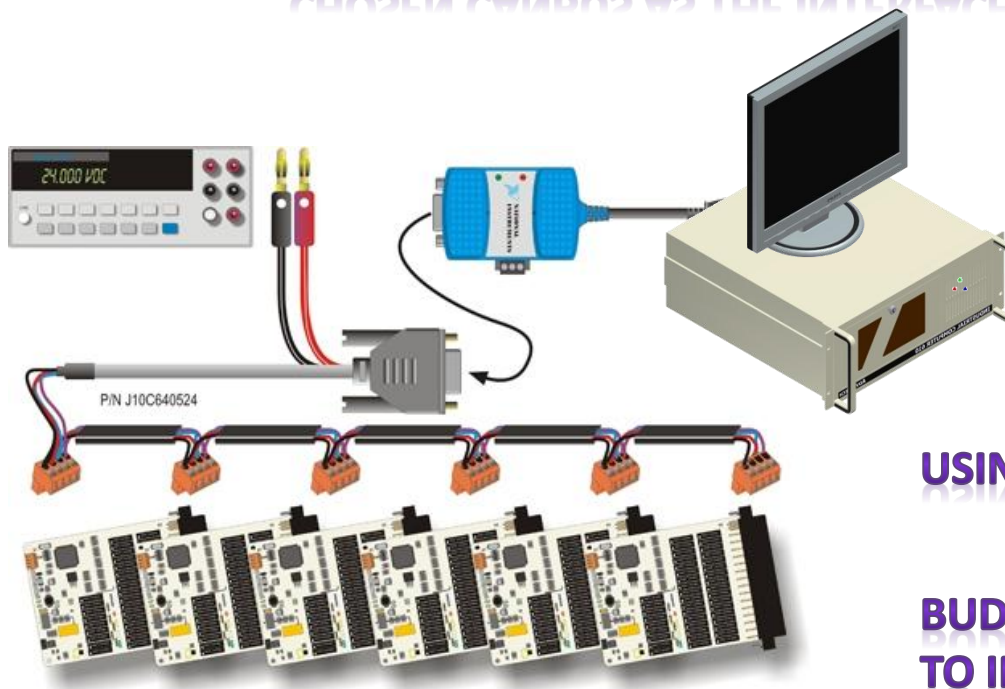
USING CANBUS HAS MANY ADVANTAGES

- 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.
- 9) LESS PXI RACKSPACE NEEDED.
- 10)



The Engineering source for electronic test. Minimize wiring inside our platforms.

AS WE LIKE TO MINIMIZE WIRING INSIDE OUR PLATFORMS WE HAVE CHOSEN CANBUS AS THE INTERFACE BETWEEN ALL MODULES.



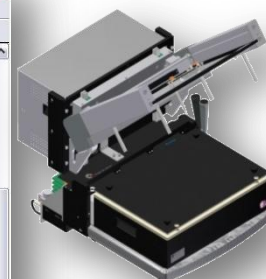
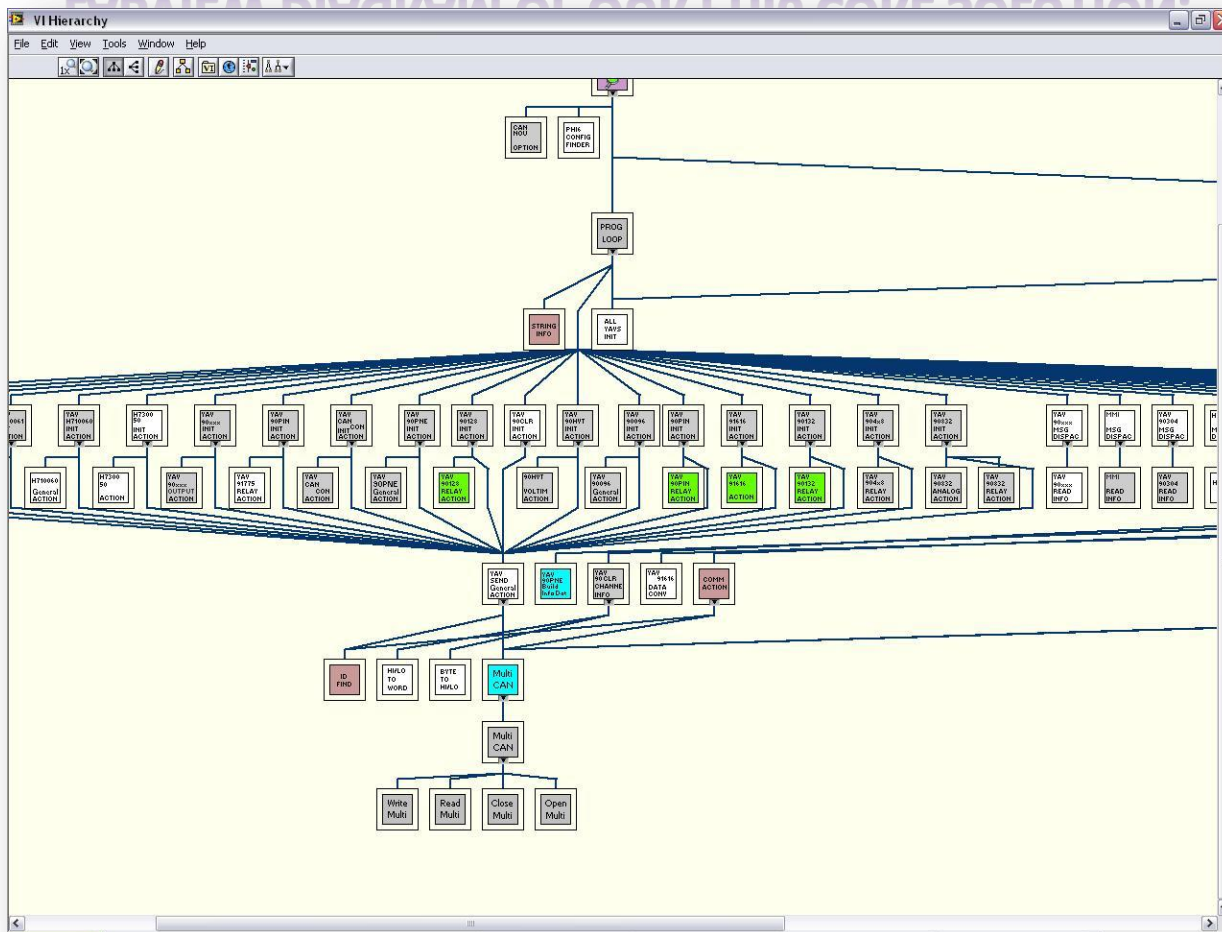
USING CANBUS HAS MANY ADVANTAGES

BUT !! USING CANBUS MIGHT ALSO LEAD TO INEFFICIENT COMMUNICATION BETWEEN HOST AND INSTRUMENTATION AND LEAD TO A DATA TRAFFIC JAM.





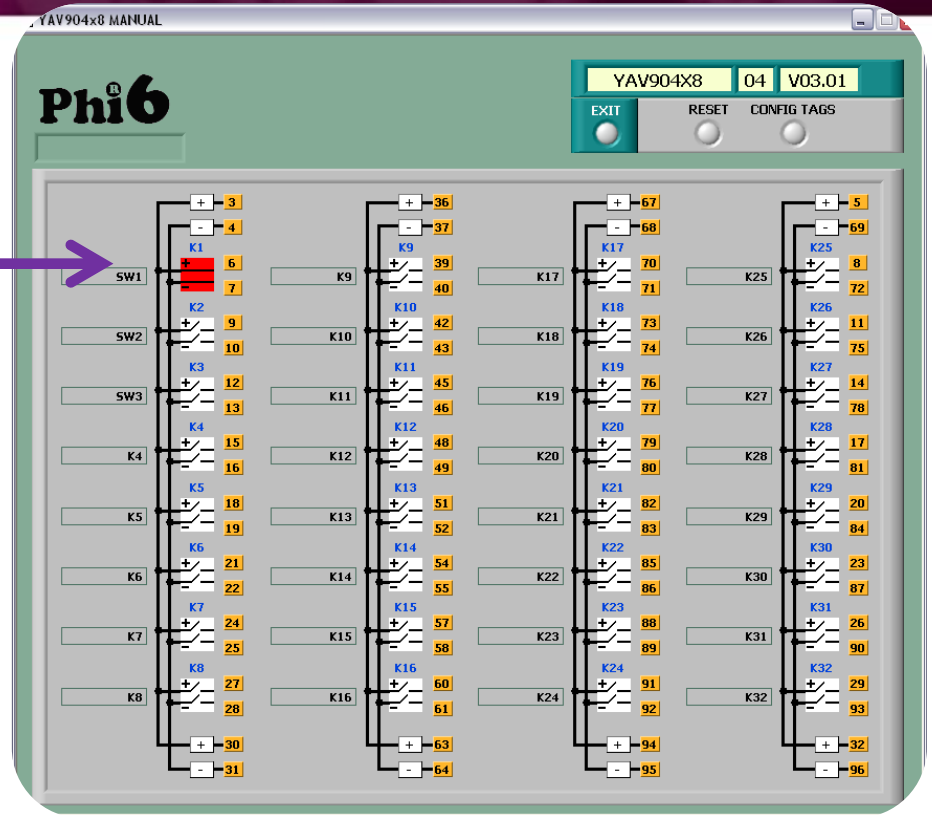
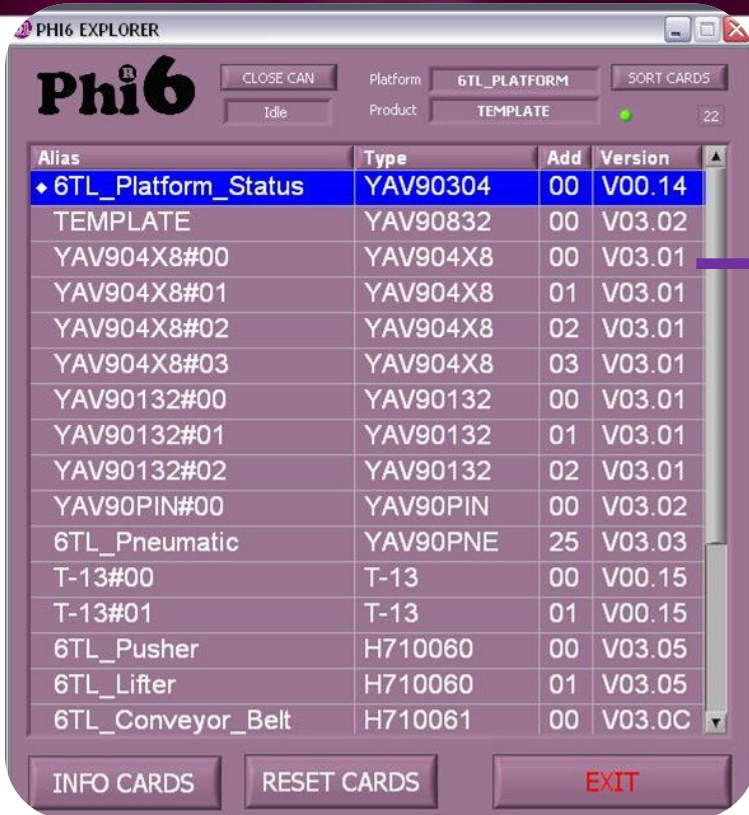
LABVIEW DIAGRAM OF OUR PHI6 CORE SOLUTION.





The Engineering source for electronic test.

Phi6 Explorer.

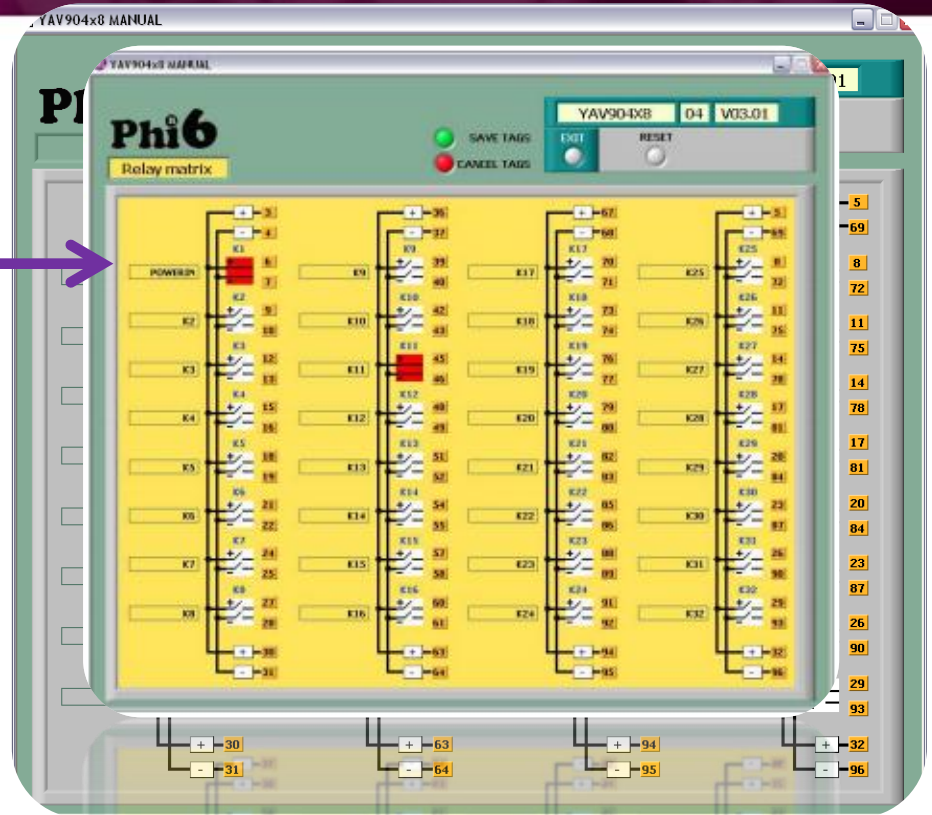
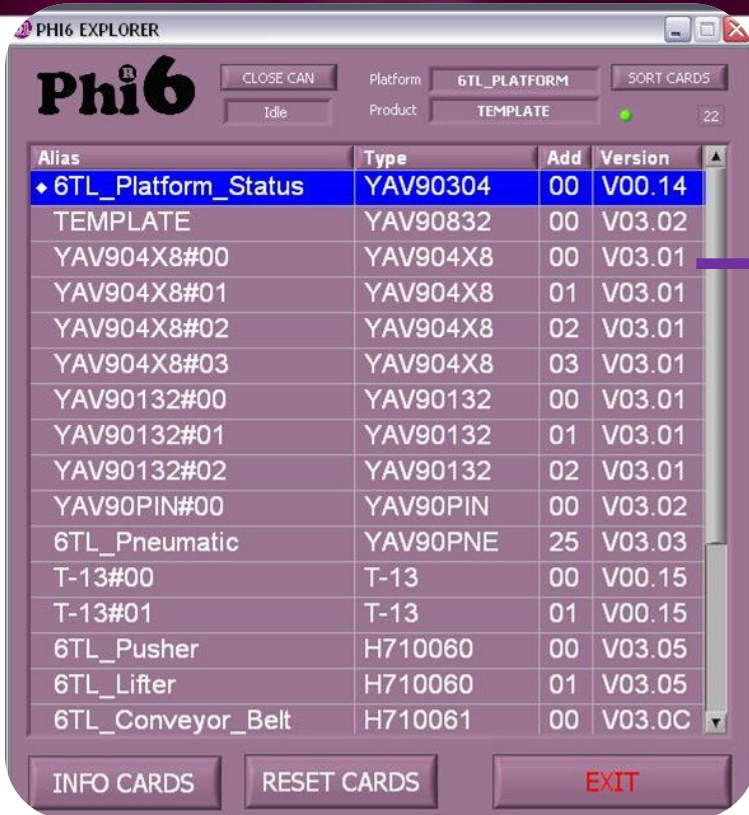


QUICKLY CONTROL ALL YAV BOARDS. (DEBUG & REPAIR)
CONFIGURE YAV CHANNELS.



The Engineering source for electronic test.

Phi6 Explorer.



QUICKLY CONTROL ALL YAV BOARDS. (DEBUG & REPAIR)
CONFIGURE YAV CHANNELS.
CHANGE TAGS



The Engineering source for electronic test.

Phi6 Explorer.

The screenshot displays the Phi6 Explorer software interface. On the left, a table lists various YAV boards and their configurations. A purple arrow points from the 'YAV904X8#01' entry in the table to a 'YAV904X8 MANUAL' window in the background. In the foreground, a 'YAV90832 CALIBRATION' dialog box is open, showing the 'ADC0' tab and 'Input Calibration' section. The dialog prompts the user to 'Apply Vref to selected Input, Introduce it and Press OK' and displays two input fields with values '0,00' and '0,03'. The background window shows a 'Relay matrix' diagram with various input and output pins.

Alias	Type	Add	Version
6TL_Platform_Status	YAV90304	00	V00.14
TEMPLATE	YAV90832	00	V03.02
YAV904X8#00	YAV904X8	00	V03.01
YAV904X8#01	YAV904X8	00	V03.01
YAV904X8#02	YAV904X8	00	V03.01
YAV904X8#03	YAV904X8	00	V03.01
YAV90132#00	YAV90132	00	V03.01
YAV90132#01	YAV90132	00	V03.01
YAV90132#02	YAV90132	00	V03.01
YAV90PIN#00	YAV90PIN	00	V03.01
6TL_Pneumatic	YAV90PIN	00	V03.01
T-13#00	T-13	00	V03.01
T-13#01	T-13	00	V03.01
6TL_Pusher	H710060	01	V03.05
6TL_Lifter	H710060	01	V03.05
6TL_Conveyor_Belt	H710061	00	V03.0C

- QUICKLY CONTROL ALL YAV BOARDS. (DEBUG & REPAIR)
- CONFIGURE YAV CHANNELS.
- CHANGE TAGS
- CALIBRATE YAV BOARDS



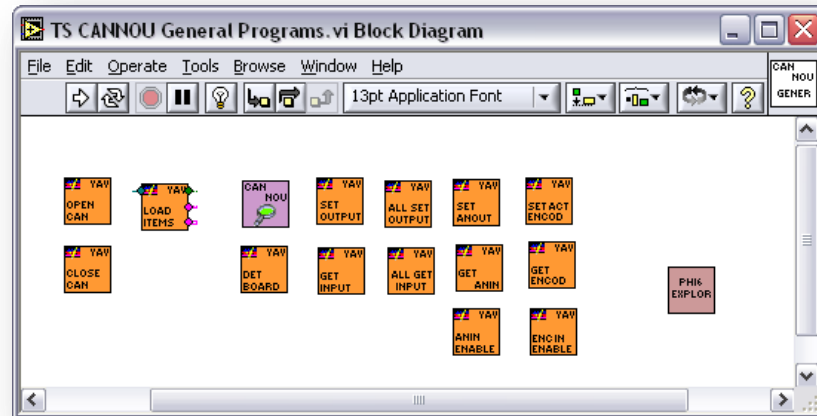
The Engineering source for electronic test. Labview & Teststand Drivers.

LABVIEW PALETTE WITH ALL FUNCTIONS NECESSARY TO INTERFACE WITH A YAV BOARD. FUNCTIONS INCLUDE:

- OPEN AND CLOSE CAN BACKBONE NETWORK.
- READ INPUTS, SET OUTPUTS.
- READ ANALOG INPUTS, SET ANALOG OUTPUTS.
- YAV SPECIFIC I/O: AUDIO & VIDEO SWITCHING, RGB (YAV90CLR), ENCODERS, ETC.

FUNCTIONS READY TO INTERACT WITH TESTSTAND:

- READ AND WRITE TO TESTSTAND PARAMETERS AND VARIABLES.
- CREATE TEXT FOR TESTSTAND REPORT.





The Engineering source for electronic test. Phi6 Operator Interface.

OPERATION AND MANAGEMENT OF 6TL PLATFORMS

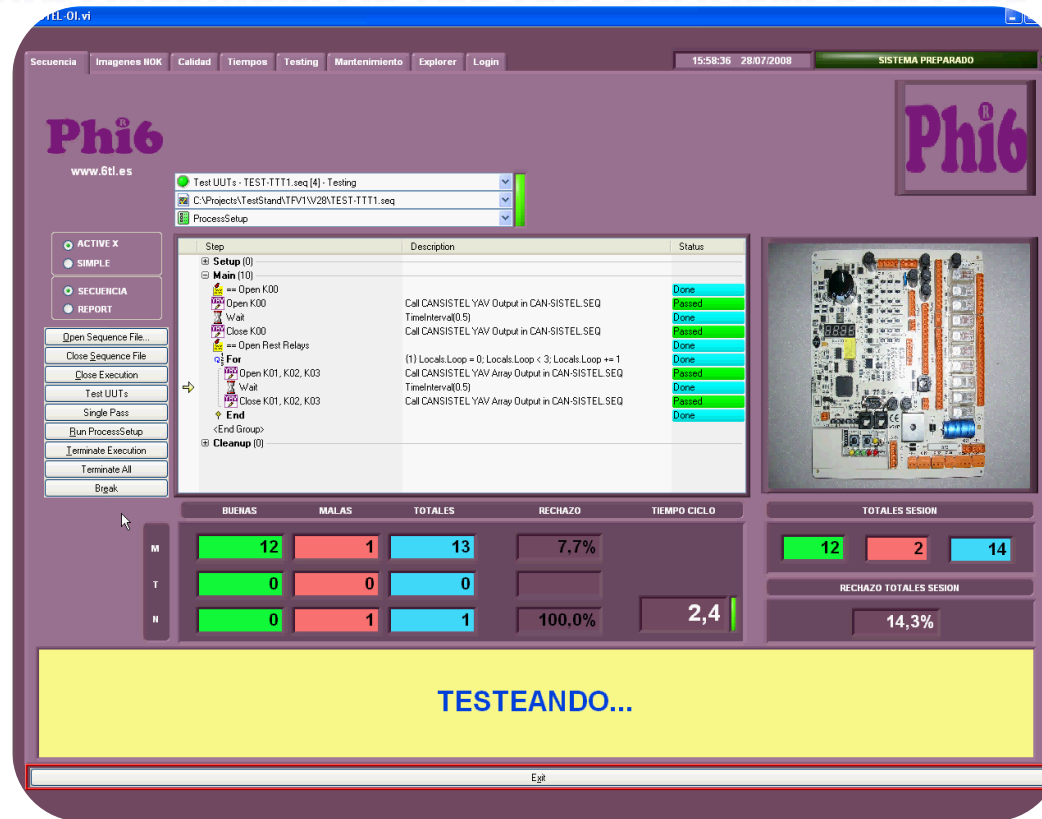


Testing is our core competence



The Engineering source for electronic test. Phi6 Operator Interface.

CLEAR OVERVIEW OF THE TEST SEQUENCE IN ONE SCREEN.





The Engineering source for electronic test.

Phi6 Operator Interface.

DIFFERENT LOGIN LEVELS PROVIDE INFORMATION FOR DIFFERENT DEPARTMENTS, PRODUCTION, QUALITY, MAINTENANCE, ENGINEERING ETC.

Sequence Paralel Quality Times Testing Maintenance Explorer Login

SISTEMA PREPARADO

Phi6
www.6tl.es

ACTIVE X
SIMPLE
SECUENCIA
REPORT

Open Sequence File...
Close Sequence File
Close Execution
Test UUTs
Single Pass
Run Process Setup
Terminate Execution
Terminate All
Break

Test UUTs: TEST-6TL22.seq [2] - Serial Number: 062259_08102009 - Testing
C:\Projects\TestStand\6TL22V20\TEST-6TL22.seq
Process Setup

Step Description Status

Disconnect J2.42 to DMM+	Call CANNOUN YAW Output in CANNOUN.seq	Passed
Connect J2.41 to DMM+	Call CANNOUN YAW Output in CANNOUN.seq	Passed
Set Locals: TEST_ID	Locals: TEST_ID = "T01072"	Done
ExtractTestInformationFromTestID (T01072)	Action: ExtractTestInformationFromTestID.vi	Done
Wait 300ms	TimeInterval(0.3)	Done
Read voltage (by DMM)	(-0.0004981), Numeric Limit Test, Locals.minValue <= x <= Loc...	Passed
Disconnect J2.41 to DMM+	Call CANNOUN YAW Output in CANNOUN.seq	Passed
Connect J2.40 to DMM+	Call CANNOUN YAW Output in CANNOUN.seq	Passed
Set Locals: TEST_ID	Locals: TEST_ID = "T01043"	Done
ExtractTestInformationFromTestID (T01043)	Action: ExtractTestInformationFromTestID.vi	Done
Wait 300ms	TimeInterval(0.3)	Done
Read voltage (by DMM)	(3.1909346),	Passed
Disconnect J2.40 to DMM+	Call CANNOUN	Passed
END - Pattern 2 Signal test	Locals: TEST	Done
Set Locals: TEST_ID	Action: ExtractTestInformationFromTestID.vi	Done
ExtractTestInformationFromTestID (T01003)	Action: ExtractTestInformationFromTestID.vi	Done
Check that D159 is on	"Check D159"	Done

Check D159

Check that D159 is ON

Yes, it is ON No, it is OFF

	BUENAS	MALAS	TOTALES	RECHAZO	TIEMPO CICLO
M	0	0	0		
T	0	3	3	100,0%	
N	0	1	1	100,0%	101,9

TOTALES SESION

0	4	4
---	---	---

RECHAZO TOTALES SESION

100,0%

TESTEANDO...

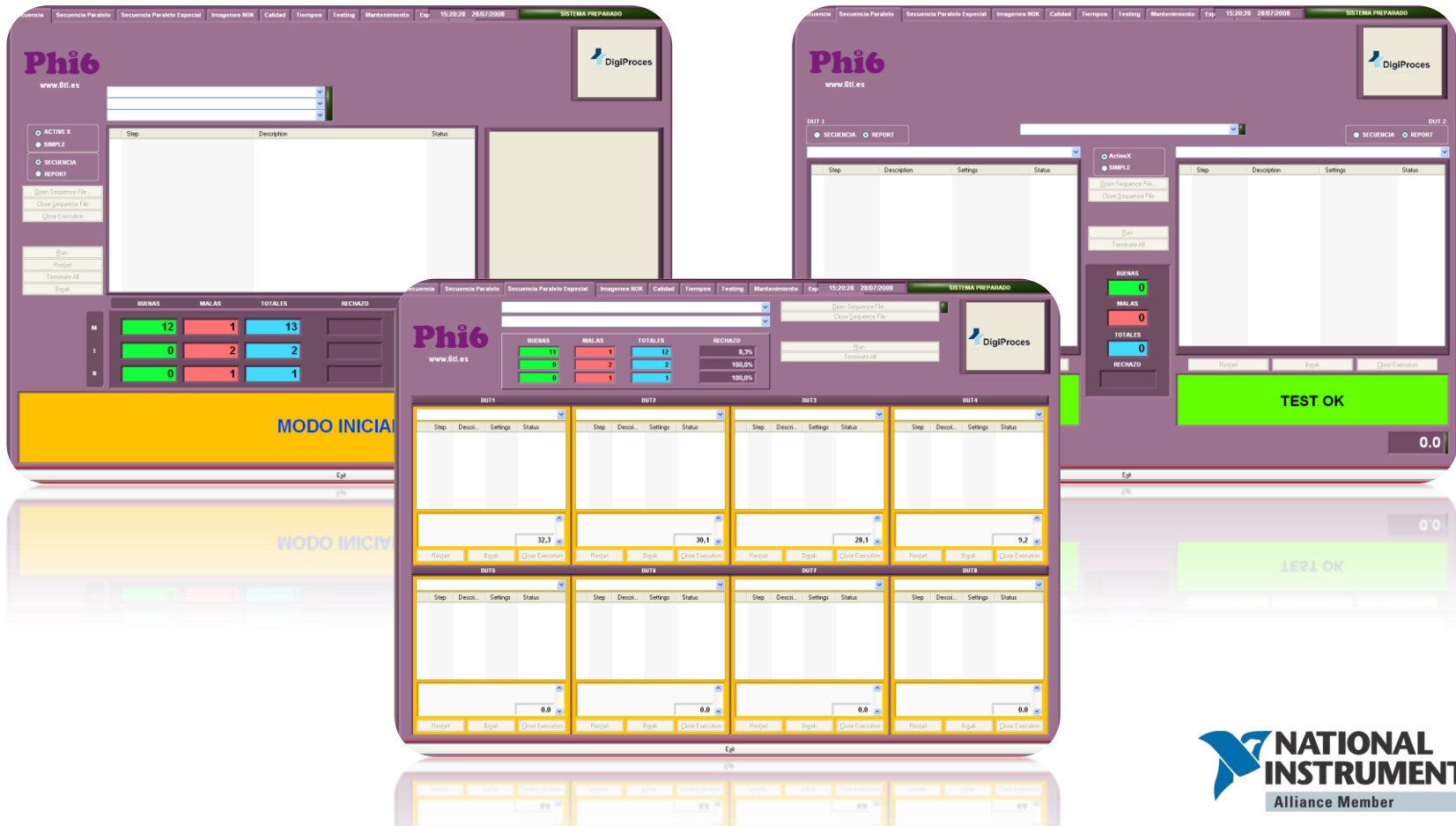
EXIT



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Phi6 Operator Interface.

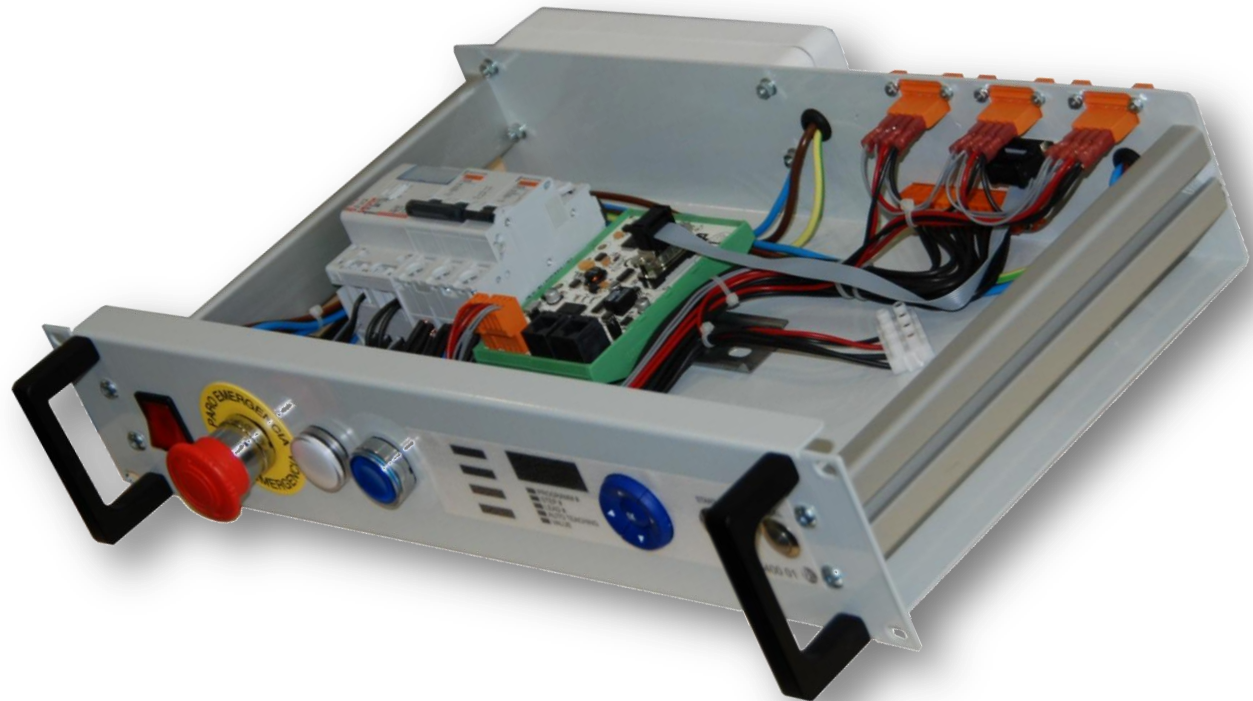
**LABVIEW PERMITS THE PARALLEL PROCESS OF MULTIPLE BOARDS
PHI-6 IS READY FOR PARRALLEL TESTING, IN SINGLE, DUAL OR MULTIPLE MODE.**



Testing is our core competence

The Engineering source for electronic test. **NEW MMI using Labview.**

- **MAN MACHINE INTERFACE MMI**
- **BASE FUNCTIONALITY IS ALWAYS NEEDED IN ALL TEST PLATFORMS**
- **ADDITIONAL FUNCTIONALITY ALWAYS WANTED IN TEST PLATFORMS BUT NEVER APPRECIATED DUE TO ENGINEERING COST**



The Engineering source for electronic test.

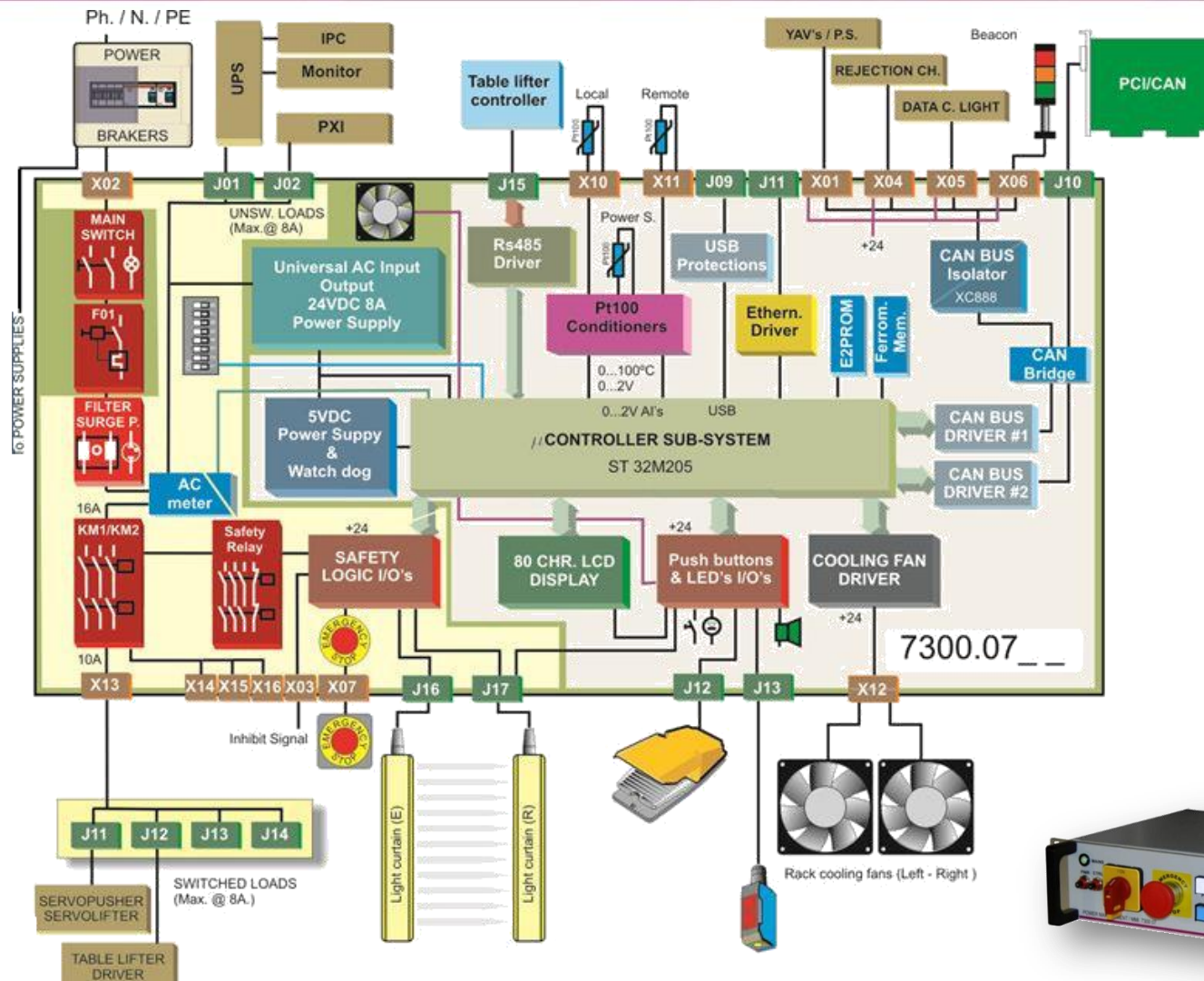
NEW MMI using Labview.

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- **LABVIEW ENABLES US TO CREATE THESE EXTRA'S AS STANDARD.**



The Engineering source for electronic test.

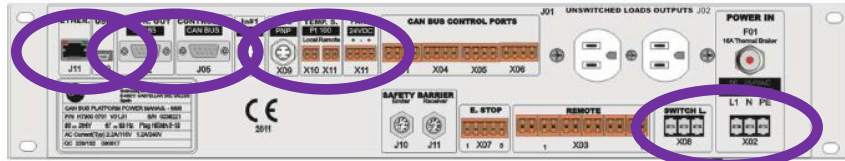
NEW MMI Block diagram.





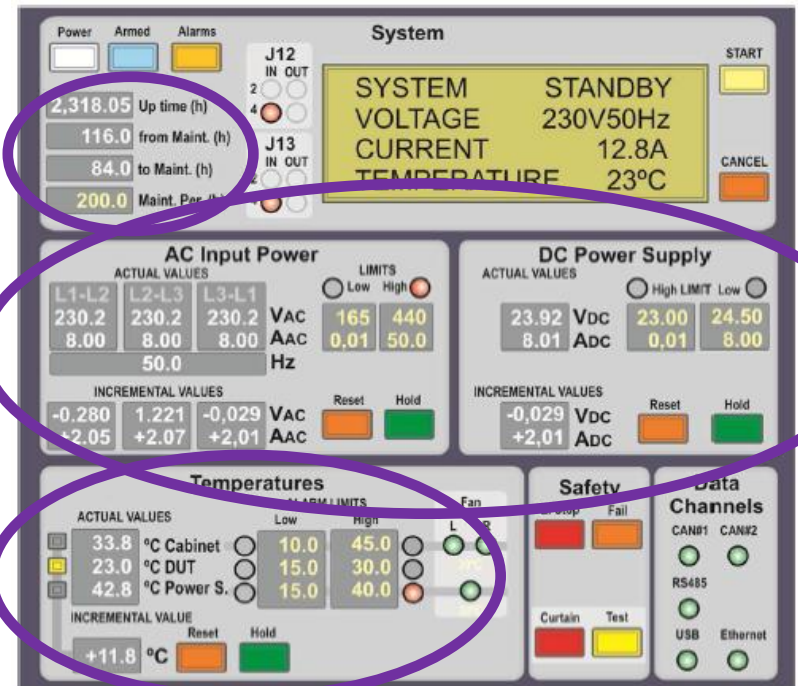
The Engineering source for electronic test.

Innovative modularity



MAN MACHINE INTERFACE (MMI)

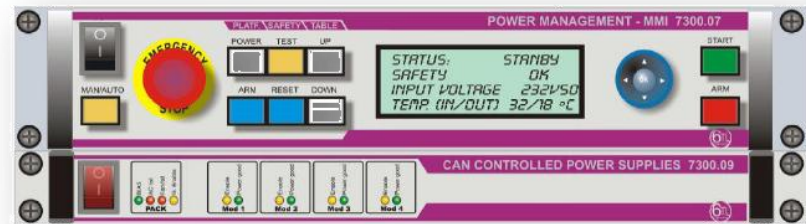
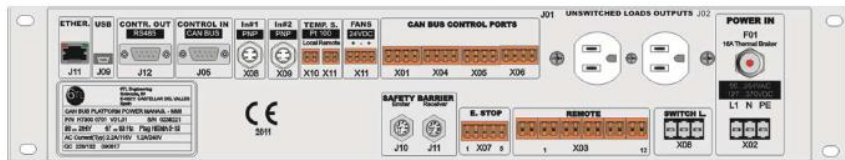
- Safety circuitry for system controlling the emergency stop(s), light curtains, Power etc.
- On/Off, Start/Stop, Pass/Fail, monitoring info.
- System height adjustment control
- System Temp measurements and fan control
- 24V system supply and switched mains
- Light Beacon control and signal buzzer
- CanBus Isolator
- External USB or Ethernet control for CanBus
- System usage & maintenance info storage
- Ext. & internal system temperature monitoring
- Power consumption and condition monitoring





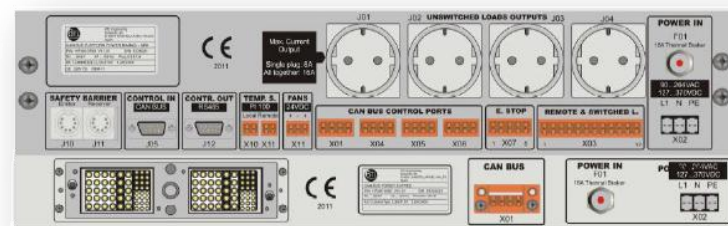
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Innovative modularity



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VPC ICON RCVR & MODULES

Testing is our core competence



The Engineering source for electronic test. Business model for 6TL.

THE 6TL ENGINEERING 8 STEPS, THAT LEAD TO YOUR SOLUTION.

1. SELECT THE RIGHT TEST PLATFORM THAT MATCHES YOUR NEEDS.
2. SELECT AS MANY STANDARD BUILDING BLOCKS AS POSSIBLE.
3. ADD SPECIFIC THIRD PARTY INSTRUMENTATION.
 - UPDATE THE SYSTEM DOCUMENTATION AND WIRING.
4. CONFIGURE THE MASS INTERCONNECT INTERFACE.
5. DEVELOP YOUR TEST FIXTURE WITH A LOCAL PARTNER.
 - OR IN-HOUSE WITH YOUR OWN ENGINEERING DEPARTMENT.
6. DEVELOP YOUR TEST PROGRAM WITH A LOCAL PARTNER.
 - OR IN-HOUSE WITH YOUR OWN ENGINEERING DEPARTMENT.
7. UPDATE YOUR SYSTEM DOCUMENTATION.
8. INITIATE A TRAINING PROGRAM FOR YOUR ENGINEERS





The Engineering source for electronic test. Testing is what we do best.



6TL Engineering

the integrators source
for electronics test

- > Choose the test platform
- > Choose 6tl modules
- > Choose COTS instruments

and Integrate the test system

AVOID UNNECESSARY RISKS
CONCENTRATE IN YOUR CORE BUSINESS

6TL Engineering

the integrators source
for electronics test

*"through our solutions,
integrators can afford supplying
Electronic Test Systems to their
customers, in a faster
and more cost effective
manner."*





The Engineering source for electronic test.
True Modularity in Test is what we do best.

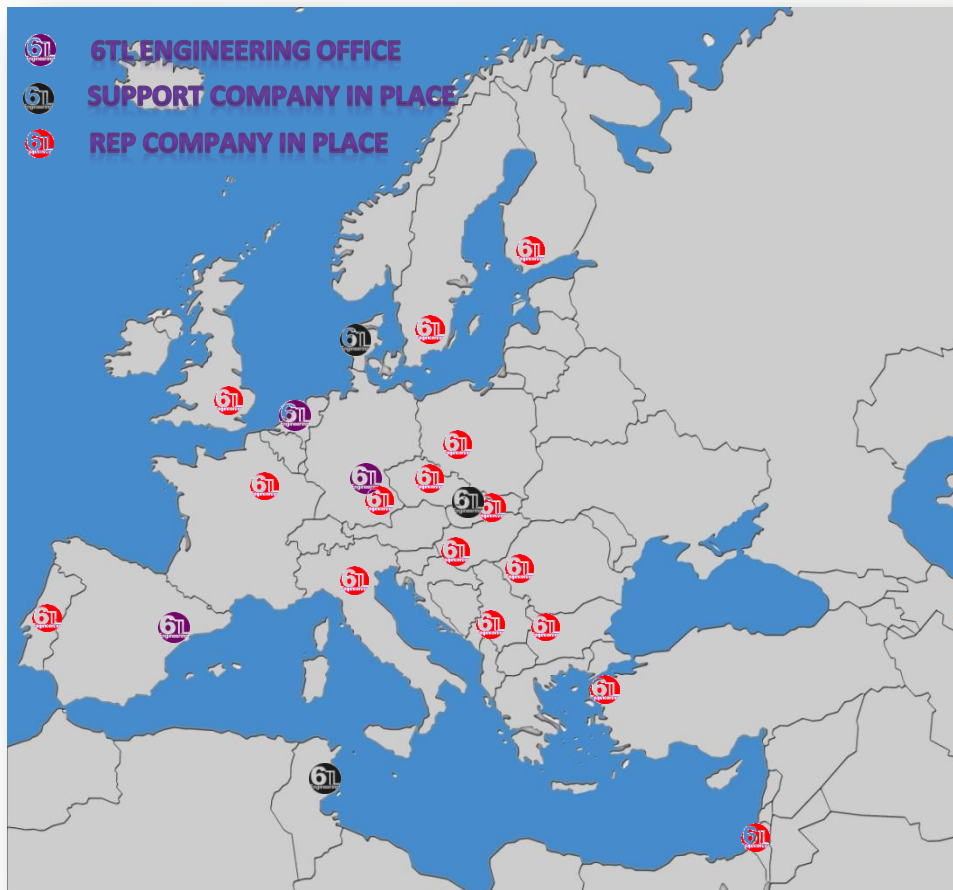


THANK YOU FOR YOUR ATTENTION,
ANY QUESTIONS ?

Testing is our core competence



The Engineering source for electronic test.
Success of our efforts in the Market.



FLEXTRONICS



THALES



Testing is our core competence

SALES AND SUPPORT LOCATIONS IN EUROPE.



The Engineering source for electronic test.
Contact details.

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Website: www.6TL.es

Testing is our core competence

ISO 9001

BUREAU VERITAS
Certification

