

The integrators source for electronics Test.

Modularity and standardization of Automatic Functional Test equipment. Avoiding unnecessary risks is the key to success.

In today's electronics industry, fast time-to-market (TTM), time-to-profit (TTP) and the economical (cost) issues are the key to customer satisfaction and company competitiveness.

Users of ATE (Automatic Test Equipment) required to validate the electronics produced in electronic production companies, are then confronted with the following question: **How to get the maximum functionality with low cost, long term reliability, flexibility and a minimum of integration and debugging time.**

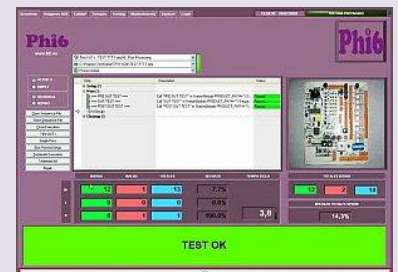
Using the latest control techniques based on field bus and modularity concepts, **6tl engineering** has developed a complete family of components for system integration on automatic test equipment that fulfill the above mentioned market needs, with the following advantages for the test system integrator:

1. Minimum integration time, independent of Test system complexity.
2. 100% scalable, from a small bench top test system, rack based test system to an automatic in-line, single or multi module test system, using the same standard basic components and engineering efforts.
3. Flexibility, covering all your test needs: ICT, functional, Hipot, Boundary Scan, Test-jet, Vision, etc.
4. High Quality interface standardization allows full fixture interchangeability between different systems.
5. Lower costs due to the minimization of engineering redundancy costs.
6. Maximum reliability due to the use of high quality, high accuracy components in all modules.
7. All components can be re-used.
8. Virtual panels (software) of all its components, minimizing developing time and helping the maintenance and debug of the systems.
9. Remote Tele-service (via Internet) with 100% system access: Instruments, hardware and fixture.
10. Intelligent automatic test adapters (Intelligent fixtures).
11. Dedicated self test adapter for easy fast and accurate system validation and test system fault finding.
12. Detailed and complete technical documentation for each module.
13. Technology and standardization as key factors.

Technology and standardization, key points

Mechanical design of all units integrated inside a test system is based on standardized structures EIA 310D IEC 60927 (19" Rack). Therefore the configuration of the test system does not require any additional engineering cost. The time you need to configure a new system is just the time that you spend to plug and fix the additional units you need inside the standardized rack if you decide to do it yourself. Alternatively, **6TL Engineering** also offers a one part number system solution where we deliver a complete assembled tester to your specifications.

Communication between all the units is done via CANbus (PCI/PXI/USB-CAN hardware). Each device integrated in the system is automatically identified and shares the status of its I/O with all the other modules that might be integrated. Virtual panels delivered with each module let you immediately start communicating with each device after switching it on for the first time. These virtual instrument panels are also a very useful tool to debug and maintain test programs or module fault finding and validation. For all modules an NI LabView driver or NI TestStand instruction palette is available, so an easy integration of the modules in the test development software is guaranteed. The only thing you need to concentrate on is the development of the test program itself and its test fixture application. Let **6TL Engineering** take care of the test system.



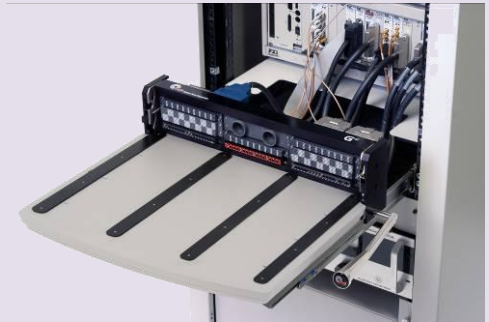
A CANbus controlled module, build inside the test fixture, provides all the important information about the Unit Under Test (UUT) to the system (Information like the test program to be selected for testing the UUT, dimensions for an automatic adjustment of the conveyor needed to test the UUT, etc.). The module also count the number of test cycles and advice for maintenance intervals of the test needles. Included in this module is a compatibility code that enables the "start test" only when the fixture is 100% compatible with the platform.

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Available 6tl modules.

A Virginia Panel Mass Interconnect Interface receiver and NI PXI based racks and instrumentation have been recognized as being preferred solutions by most known functional test manufacturers. Logically, as these devices are the key for standardization on automatic test systems.

The VPC Mass Interconnect Interface offer a very reliable and standard interface, independent from the tester hardware. Within the range of VPC there are standard wiring modules available for most PXI, VXI, SCXI and LXI instruments offering a plug and play wiring solution. Unfortunately these additional wiring solutions add to the cost of the entire test system.



(Mass Interconnect modules and contact pins are available for signals in the range of 5, 7, 10 and 50Amp, Coax from 2 to 40 GHz, Twinax, Triax, Fiber Optic, Pneumatic and Vacuum.)

Therefore **6tl engineering** complements the Virginia Panel G12 or G12x test fixture receiver with a range of basic instruments and switching modules that have the VPC Mass Interconnect Module already integrated in their design. So no additional wiring is needed when integrating. Both are integrated in 6TL's (TTT-1 sub-system), Offering Basic Digital and Analog I/O, switching, PSU and load control and most common measuring tasks but also incorporate automatic fixture recognition pneumatic switching, audio/video and HF switching and LED Detection systems. Thanks to this technique we can achieve five additional high value features:



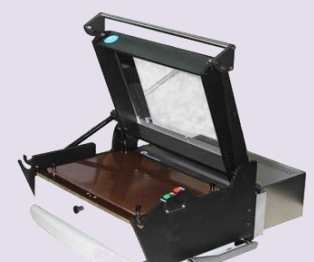
1. Reduced signal loss since no cabling between Instruments and Interface is needed anymore.
2. Compatibility assurance between platforms with the same structure.
3. Modularity and scalability. "Plug & Play" upgradable now and in the future.
4. Cost saving due to easy integration and limited wiring and less PXI or other resources needed.
5. Flexibility with enough room for extension in the VPC G2 or G12x Mass Interconnect system.

Connections to/from the instruments have been standardized as well, with free module positions for the most common functions. Standard patch cords and wiring solutions are available for fast in-fixture wiring.

The TTT-1 sub-system accepts mechanical stand-alone test fixtures, low-cost fixtures in combination with the integrated mechanical linear pusher system or with the automatic external servo pusher module. With the last two pusher options, the fixture cost is drastically reduced, as the investment on a pressure system is done only once, being paid off rapidly with lower cost fixtures.



Conveyors are another example of modularity. Integrated with all the necessary PCB position sensors, motors to adjust the width and transport the boards, and also the SMEMA compatibility to synchronize with the previous and following machine or conveyor. Never before it has been so easy, to upgrade from a manual table top system, into a larger rack system or even a fully automatic single- or multi-station in-line Test system.

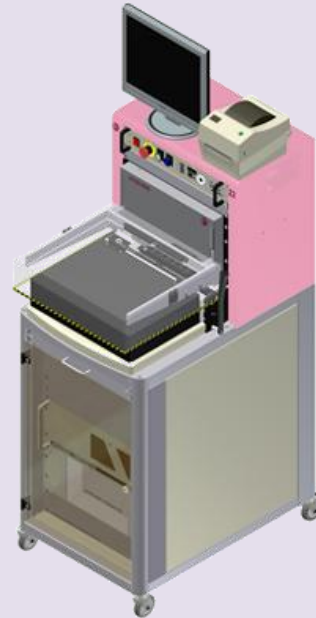


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The Pictures below are showing how, with only few standardized modules, most complex test systems can be designed and assembled, stand alone or in-line.



Modularity. 6tl modules fixed into a 19" rack to integrate into a standard testing platform



6tl-22 testing platform, integrated, following the modularity and standardization concepts

Conclusion;

Modular units manufactured by **6tl engineering**, using **Virginia Panel Mass Interconnect systems**, **6TL basic functional YAV instrumentation**, additional PXI or other instrumentation and NI LabView and/or NI TestStand software platforms are the basic answer to actual test market demands. They offer us versatility, lower cost, functionality, reliability, security and faster integration time without a costly engineering effort. With this, the integrator can fulfill its "Core Business": Delivering the solution that fulfils customer's demands on price and delivery, with enough flexibility for expansion and integration of new technologies today and in the future.

The use of "Off the shelf", standard devices and components avoid economical and technical uncertainties, which is very common in new designs.

Additional advantages:

- Easy Maintenance due to the modular concept and available dedicated self test adapters.
- Spare parts and complete technical documentation available for each module.
- Due to the careful choice of Instrument suppliers, worldwide support guaranteed.
- Fast response to quotes and to execute and deliver projects
- Risk reduction due to the possibility to reuse all modules in other configurations.
- Your technicians are concentrated on the test results instead of spending time on designing tester hardware en creating one-time solutions.
- More internal engineering capacity with lower cost: Higher profit.
- Plug and Play.
- One standard platform ordered with one single part number saving all the time that you normally invest in asking for and comparing quotations, ordering from xxx different suppliers, waiting for parts, creating your documents building your test system, wiring it, debugging it and get it CE approved.

Get your next system from the integrators source for electronics test, 6TL engineering.