Importance and realisation of electrical test

6tl.es

for PCB (printed Circuit Board) Manufacturing.

Peter van Oostrom.

About us

Sistel Group

DigiProces
ELECTRONICS MANUFACTURING SERVICES

INDIC
EMS ELECTRONICS PVT. LTD.

6TL

SmartLift®

About 6TL

Headquarters

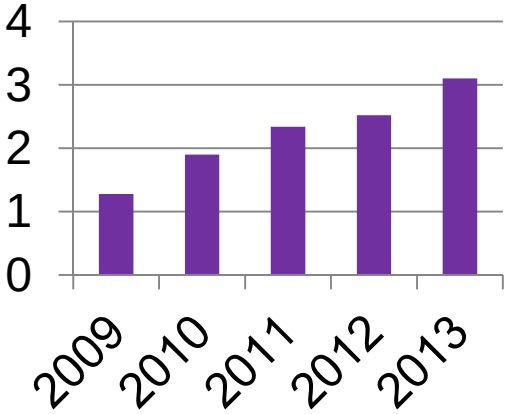
Barcelona, Catalonia (one of the main driving forces of the economy in southern Europe)

Employees

15 highly skilled Soft & Hardware eng.
+ 98 Group resources

NATIONAL INSTRUMENTS Silver Alliance Partner

Billings 6TL



International

Products sold in more than
35 countries worldwide

About us

“ We supply innovative products to test system engineers worldwide, by combining modular technologies with a focus on ease of integration, so they can save resources and time while developing and building their ATE's”.

David Batet

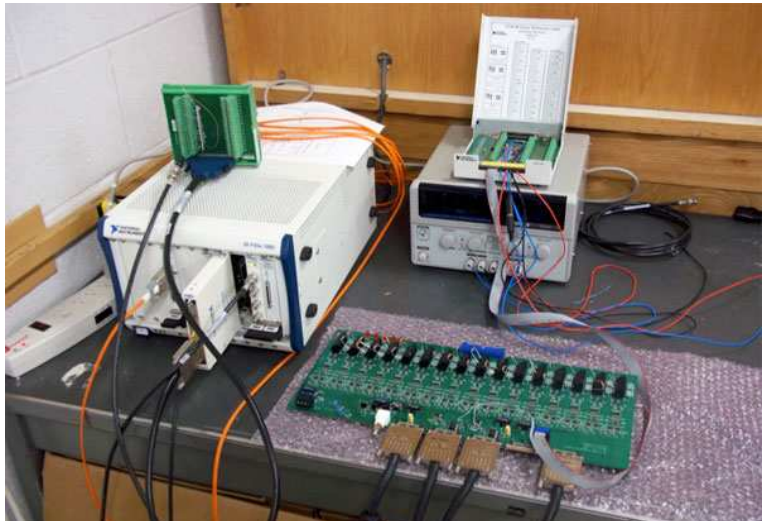
General Manager

About us

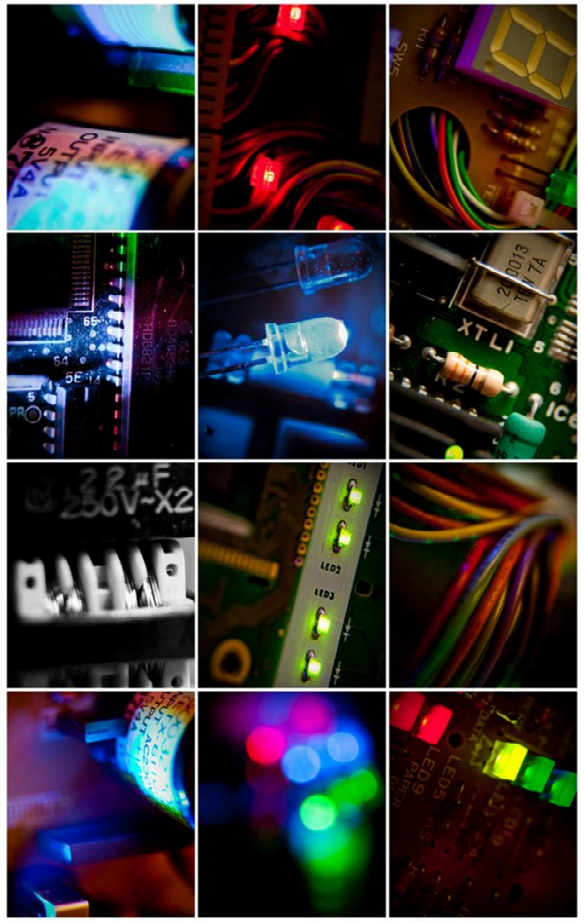
“6TL fills the gap between the test experience in the Lab and the corresponding experience in the Production line”.

Enrique Osorio

R+D Manager SA Sistel



Main question, on the route to zero defects.



Is there a need to test ?

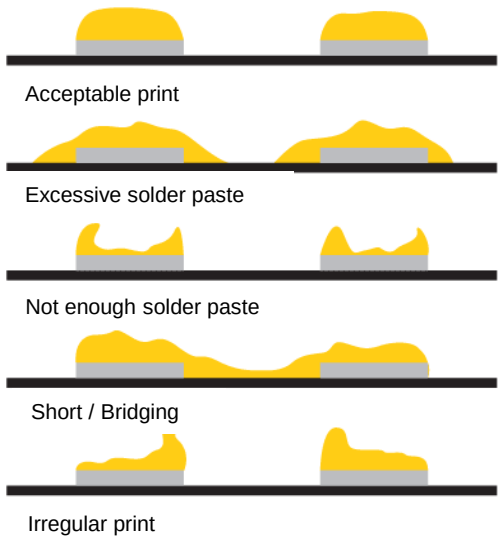
Apply Solderpaste

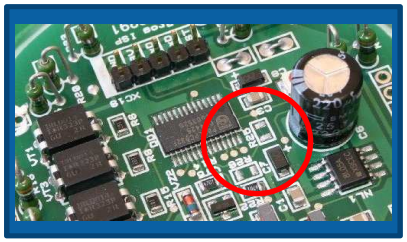
Place your components

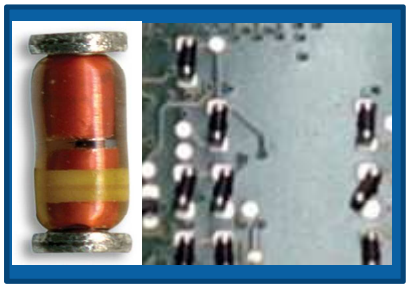
Reflow all components

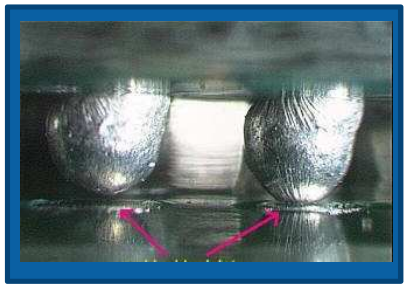
Is there a need to test ?

Apply Solder paste → **Check** → **Place your components** → **Check** → **Reflow all components**



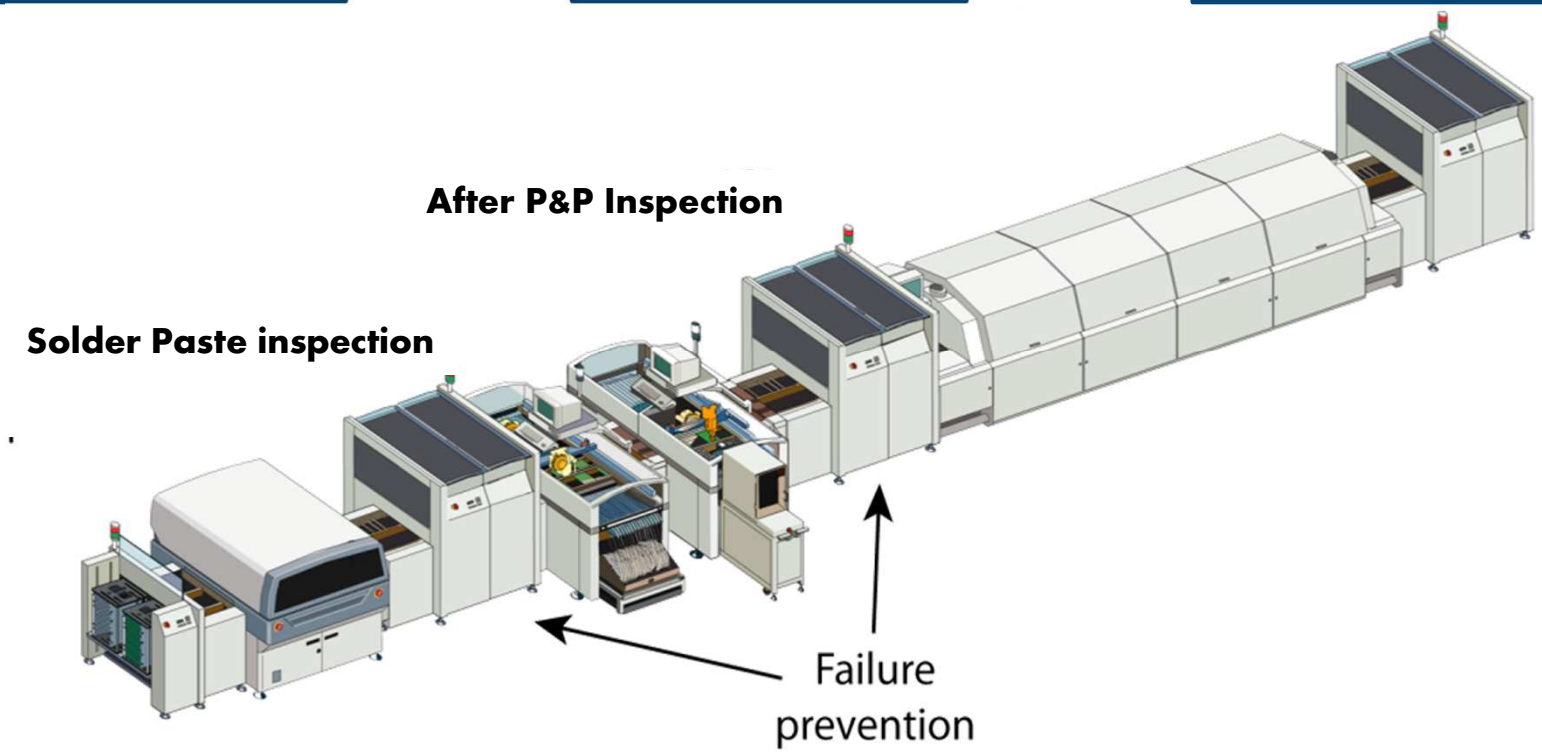






Is there a need to test ?

Apply Solder paste → Check → **Place your components** → Check → **Reflow all components**



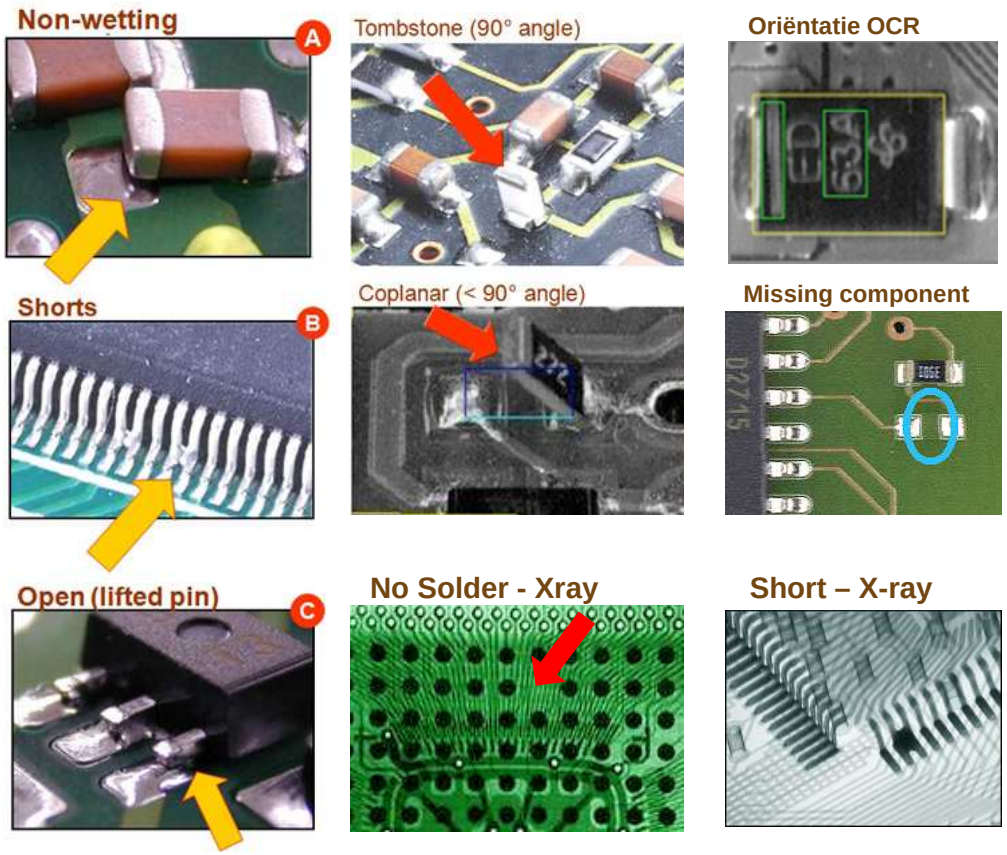
Is there a need to test ?

Reflow all components

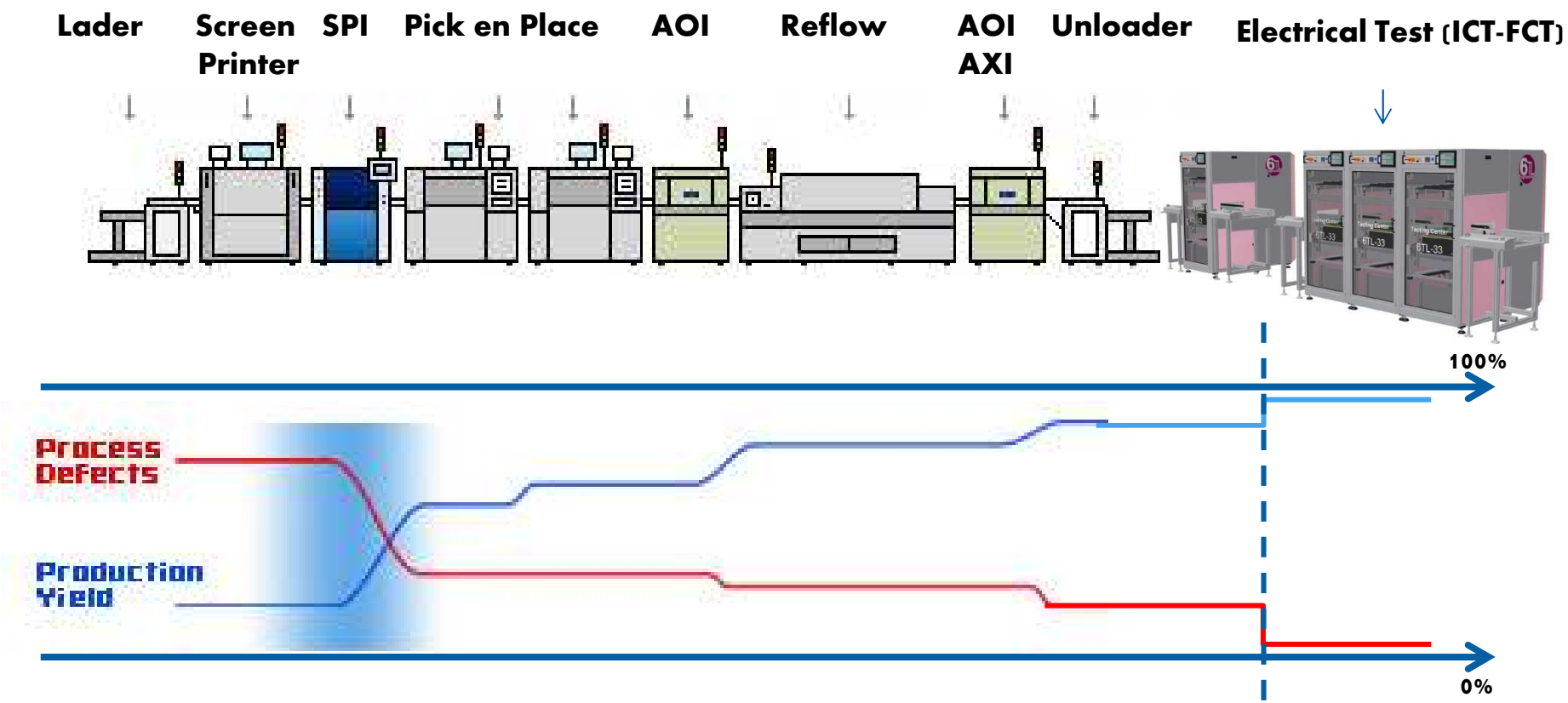
Check

Automatic Optical Inspection

Manual, with Camera's or X-Ray



Is there a need to test? Answer YES!



What possibilities do I have?

Route to zero Defects

Components are reflowed

Check

Electrical test

Environmental Test

Manual or automatic test system

MDA or In-Circuit test

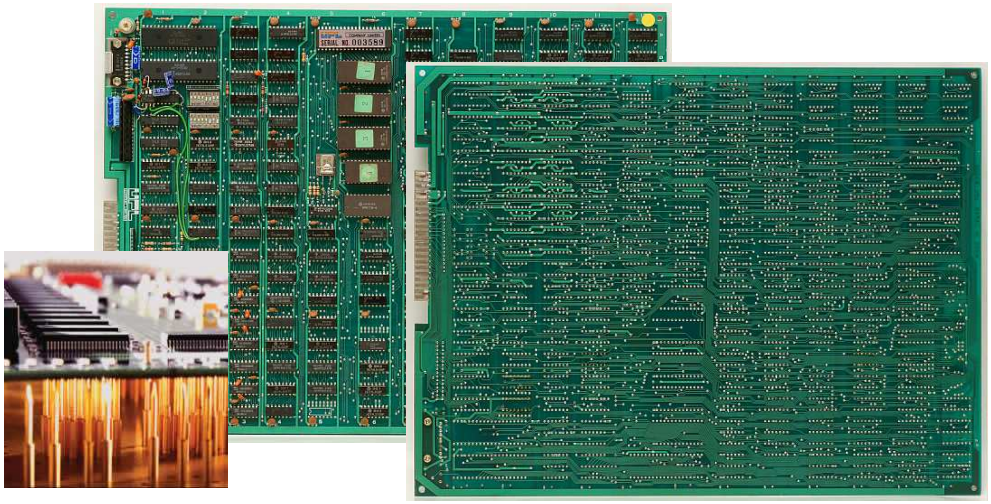
Functional testing

Flying prober or Bed of Nails

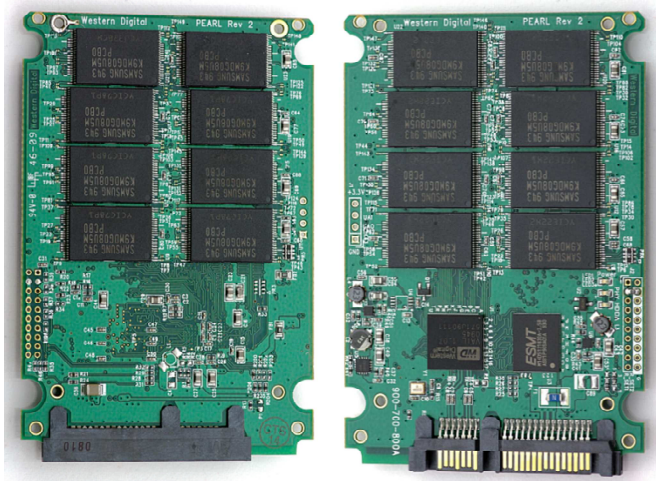
Typical A bed of nails

Importance of Design For Test (DFT)

- Visual inspection
  - Does not provide information about the functionality of the board.
  - Impossible to verify if components work properly together
- ICT test provides the best coverage and failure indication.
  - But only if you have enough test access to the board.



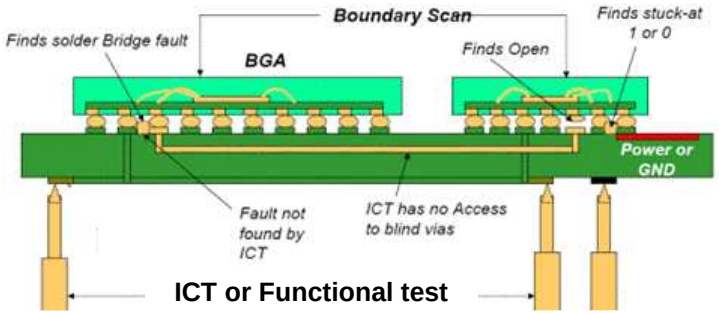
Past

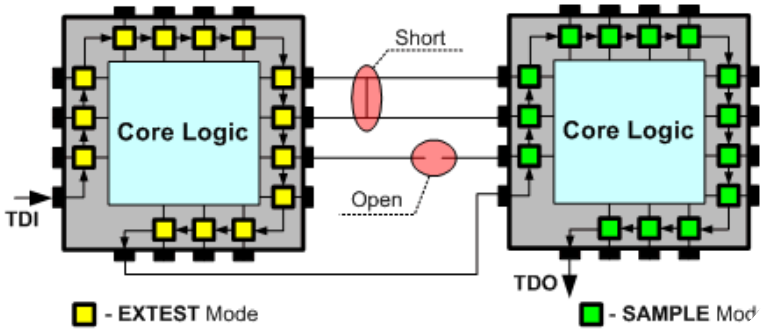


Today's technology

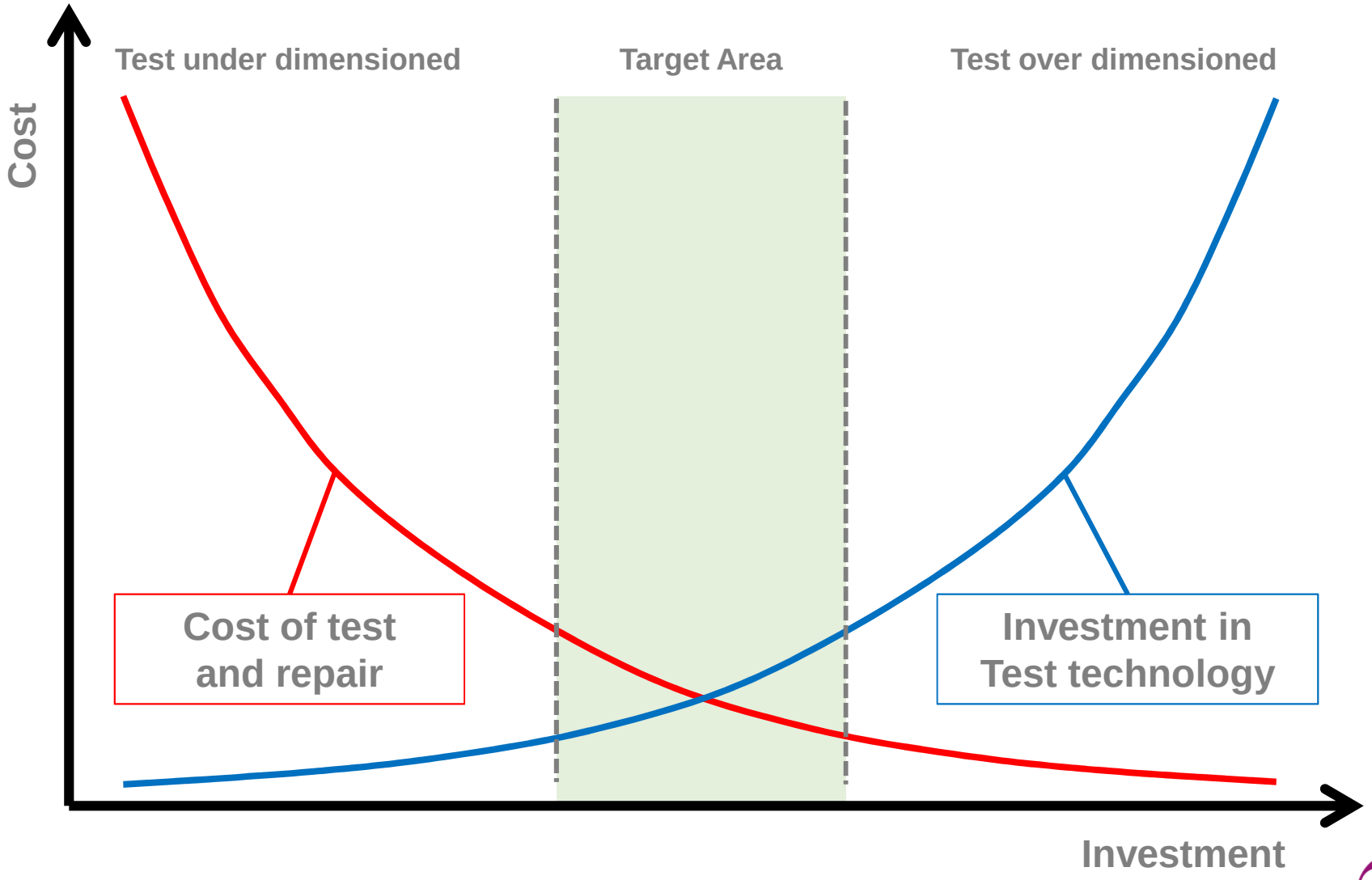
Importance of Design For Test (DFT)

- Visual inspection
  - Does not provide information about the functionality of the board.
  - Impossible to verify if components work properly together
- ICT test provides the best coverage and failure indication.
  - But only if you have enough test access to the board.
  - Test Fixture relatively expensive due to high pin count
  - For SMD technology Boundary Scan can enlarge test coverage





Spend your budget wisely



What we do!

Enable your engineers or customers to build higher quality ATE systems using your preferred “PXI” instrumentation and our *fast*ATE® concept, in record time!

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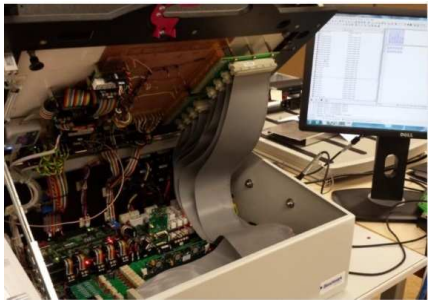
*fast*ATE® Technology

What is ATE?

Manual Test



Testfixture based test

Test rack based test.

In-line

fastATE® Technology

*fast*ATE® technology

What is *fast*ATE® Technology ?

It is a modular concept developed by 6TL to integrate and build Automatic Test Equipment (ATE's) using intelligent modules, which results in a risk free integration with a, significant shorter integration time, up to 70%.*

** Depending of the ratio between 3d party instrumentation and 6TL's YAVModules.*

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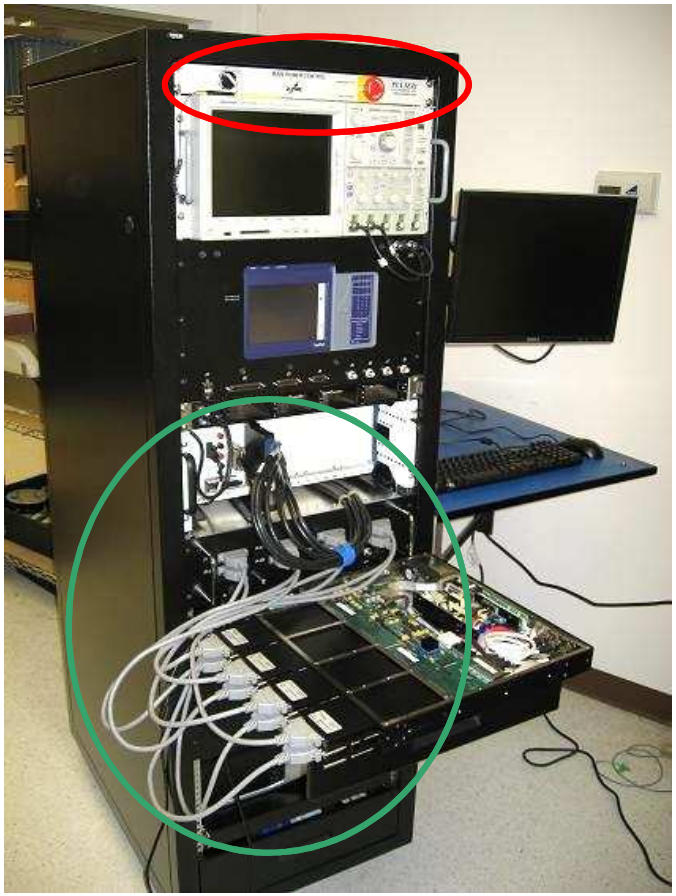
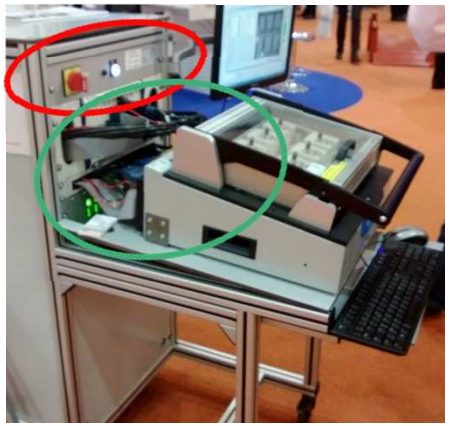
*fast*ATE® technology improves test.

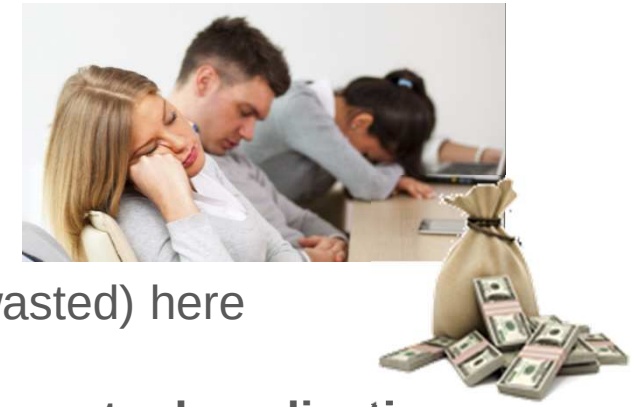
- Sample PCB test stations.
- Housing or rack
- Measurement Electronics
- Safety & Control panel
- Cabling & Interfacing
- Need Engineering





*fast*ATE® reduces engineering.

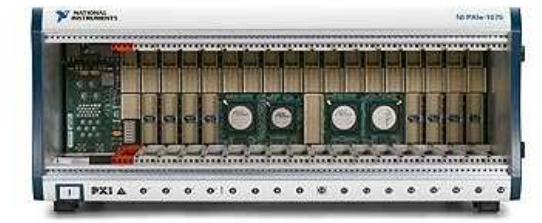
- Engineers spend a lot of time
  - Developing customer wanted features.
  - Defining and/or searching for the right components
  - Ordering and tracking these components
  - Designing system wiring
  - Designing instrumentation to MIC/UUT wiring
  - Implementing safety features
  - Software / driver implementation
  - Debugging,
  - Documentation etc. etc.
- All this involves a lot of meetings



- We believe to much time and money is used (wasted) here
- **As engineers should focus on developing the actual application.**

*fast*ATE® technology is Modularity.

PXI



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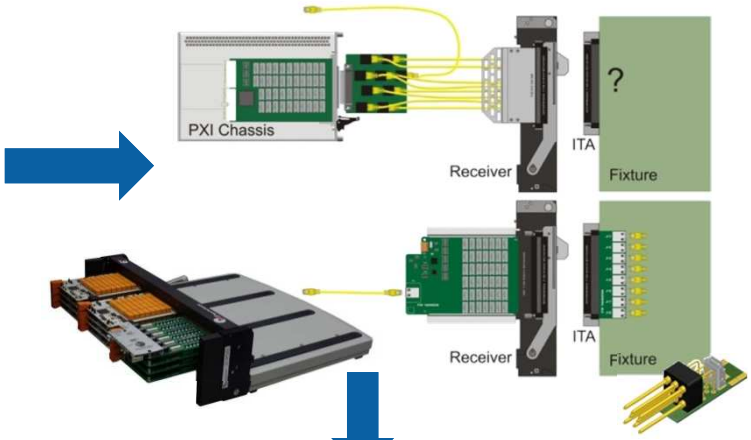

*fast*ATE® technology is Modularity.

PXI + Mass Interconnect. + 6TL = *fast*ATE®

*fast*ATE® technology is Modularity.

NI VirtualBench.

*fast*ATE® 6TL-08 All-On-One.

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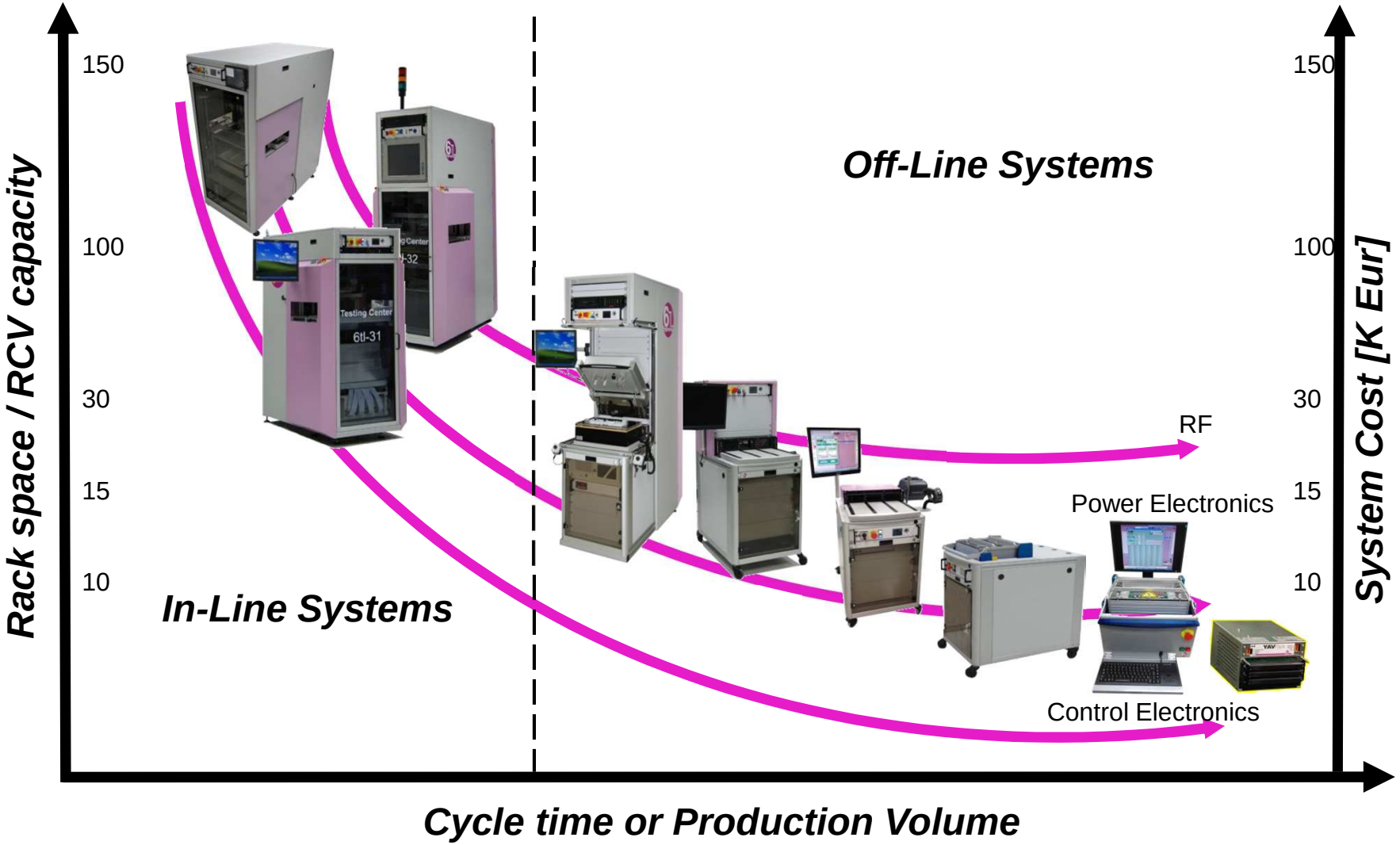
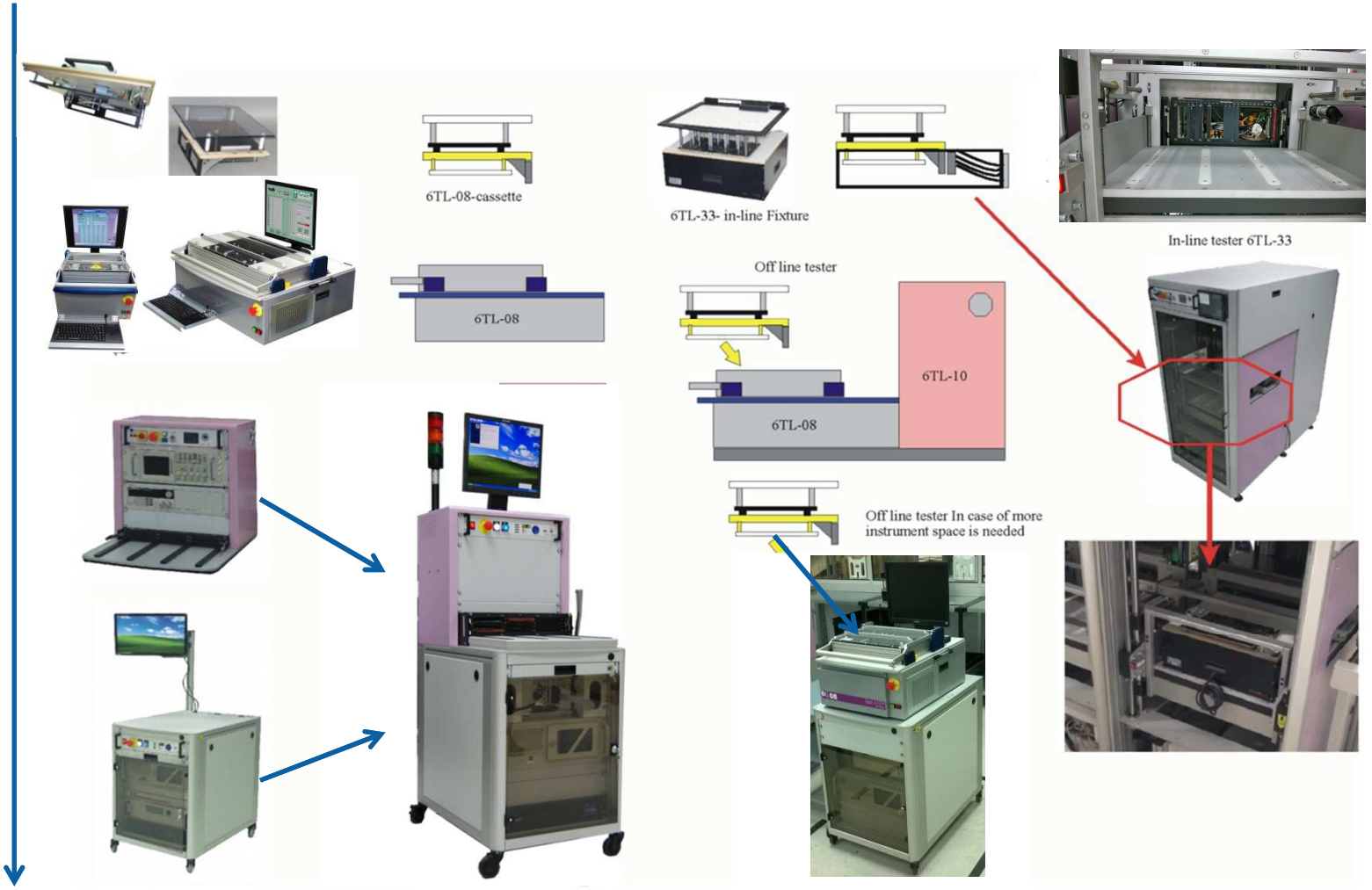
*fast*ATE® technology is scalability.



*fast*ATE® technology is scalability.



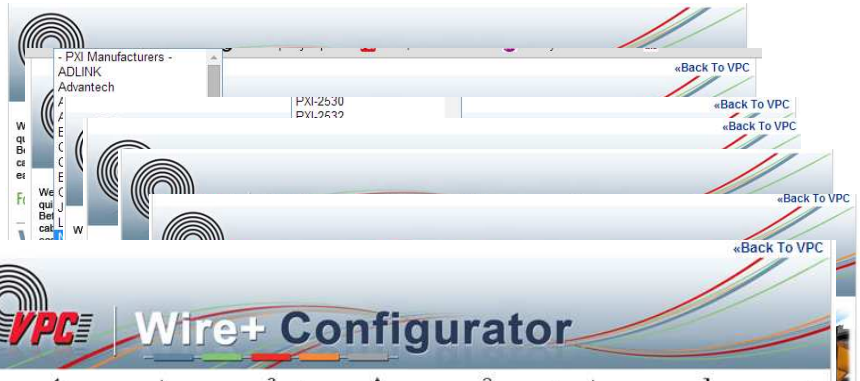
Debug small production Medium complexity to Mass Production

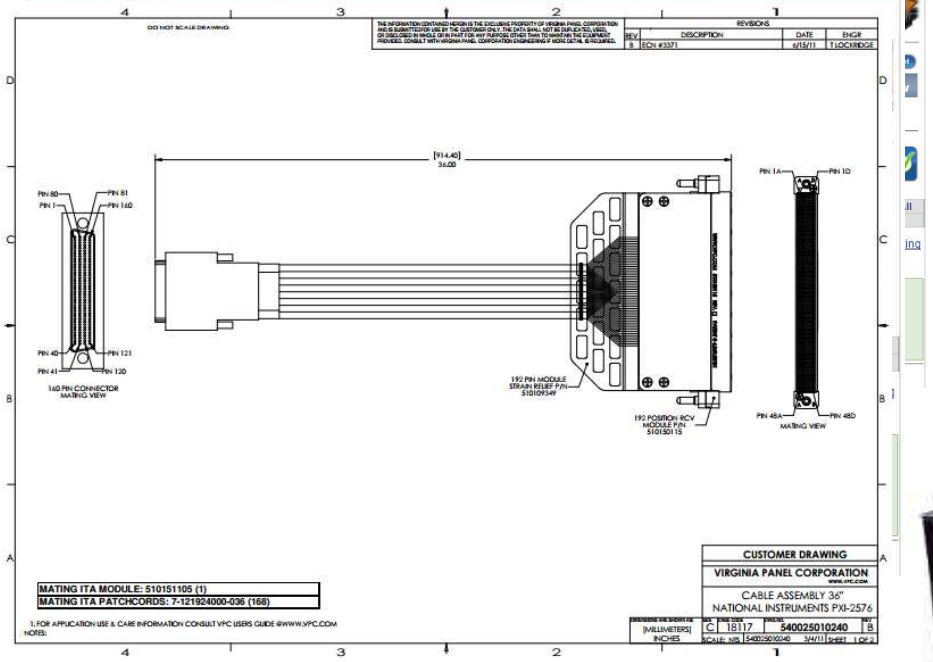
*fast*ATE® is Reliability (using Mass Interconnect.)

- **Mass Interconnect (MIC) is a must for a reliable test system.**
  - **Fast and easy changeover** of products
    - No need for individual connections all is engaged and disengaged in one action.
  - All instrumentation and switching I/O's are engaged using a common **precision engagement system**.
  - MIC provides a **standard interconnect platform** and protects the valuable instrumentation.
  - MIC and all its contacts are rated for minimum off **20000 cycles**
    - Commercial connectors are rated at max 100-500 cycles.
  - MIC is **flexible** and allows for **modularity** and **expansion**.
  - Solutions available for;
    - Power up to 150 Amp
    - Frequency up to 40GHz
    - Fiber optics
    - Pneumatics
    - Signal
    - High speed data

Up to 70% of the measurement errors can be interface related, especially over time

*fast*ATE® is Reliability (using VPC Virginia Panel Corporation)





PATCHCORD designer

Wire+ Configurator

InterConnect Designer

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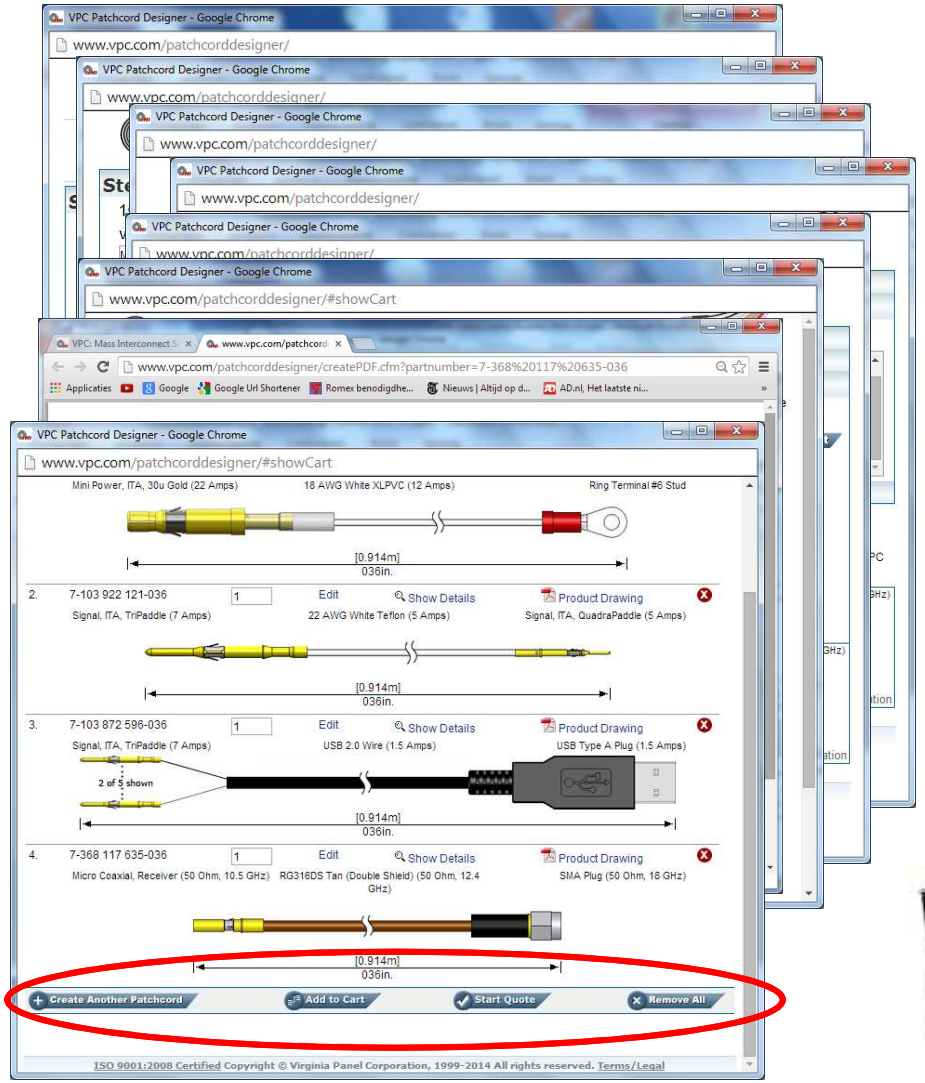
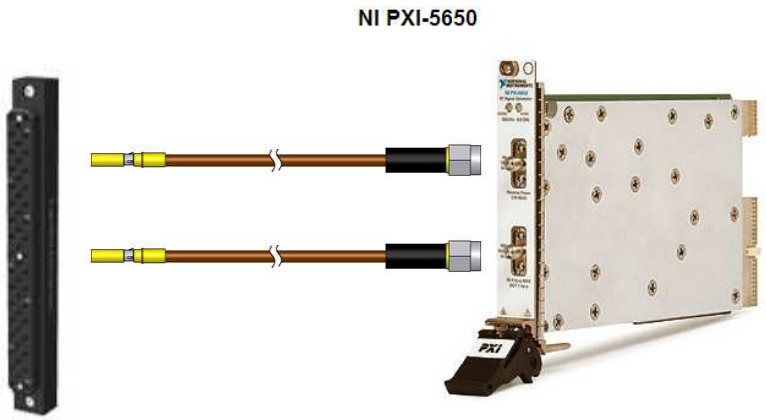
*fast*ATE® is Reliability (using VPC Virginia Panel Corporation)





PATCHCORD designer

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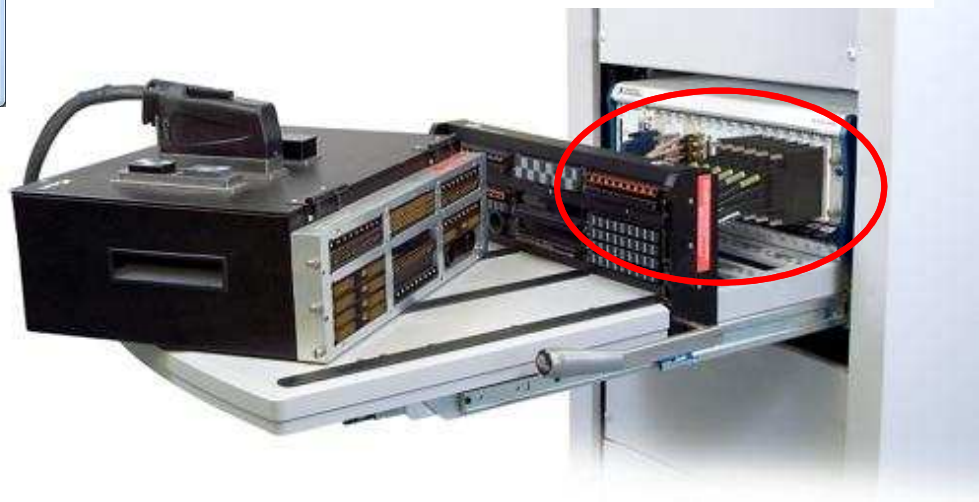

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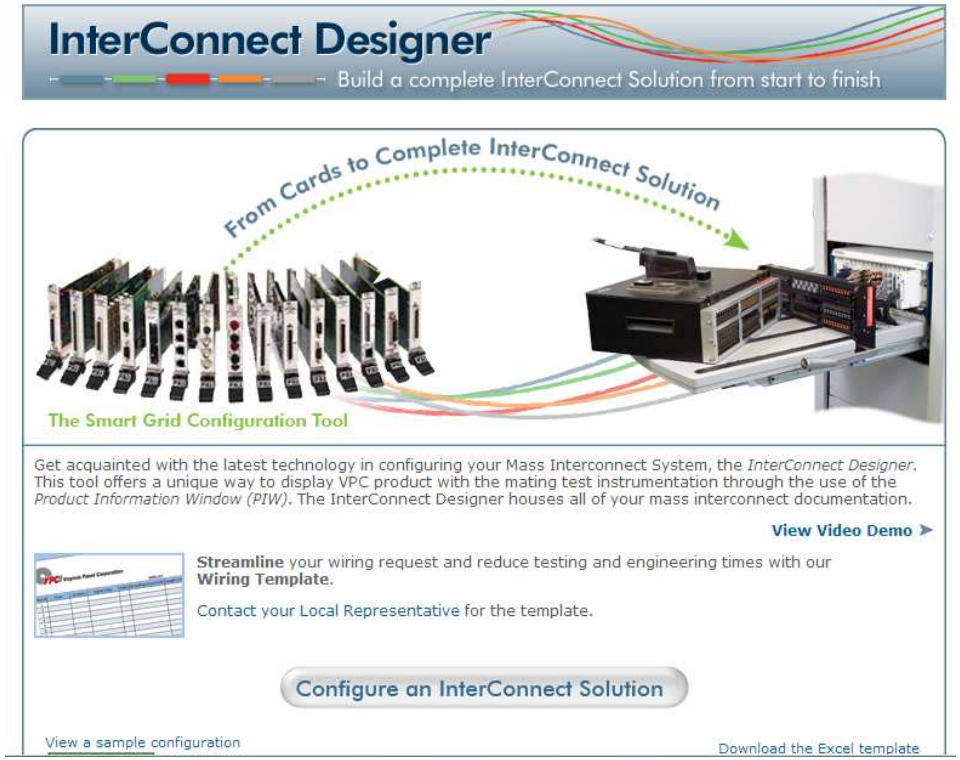
*fast*ATE® is Reliability (using VPC Virginia Panel Corporation)



PATCHCORD designer

Wire+ Configurator

InterConnect Designer

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*fast*ATE® is efficiency & minimized wiring

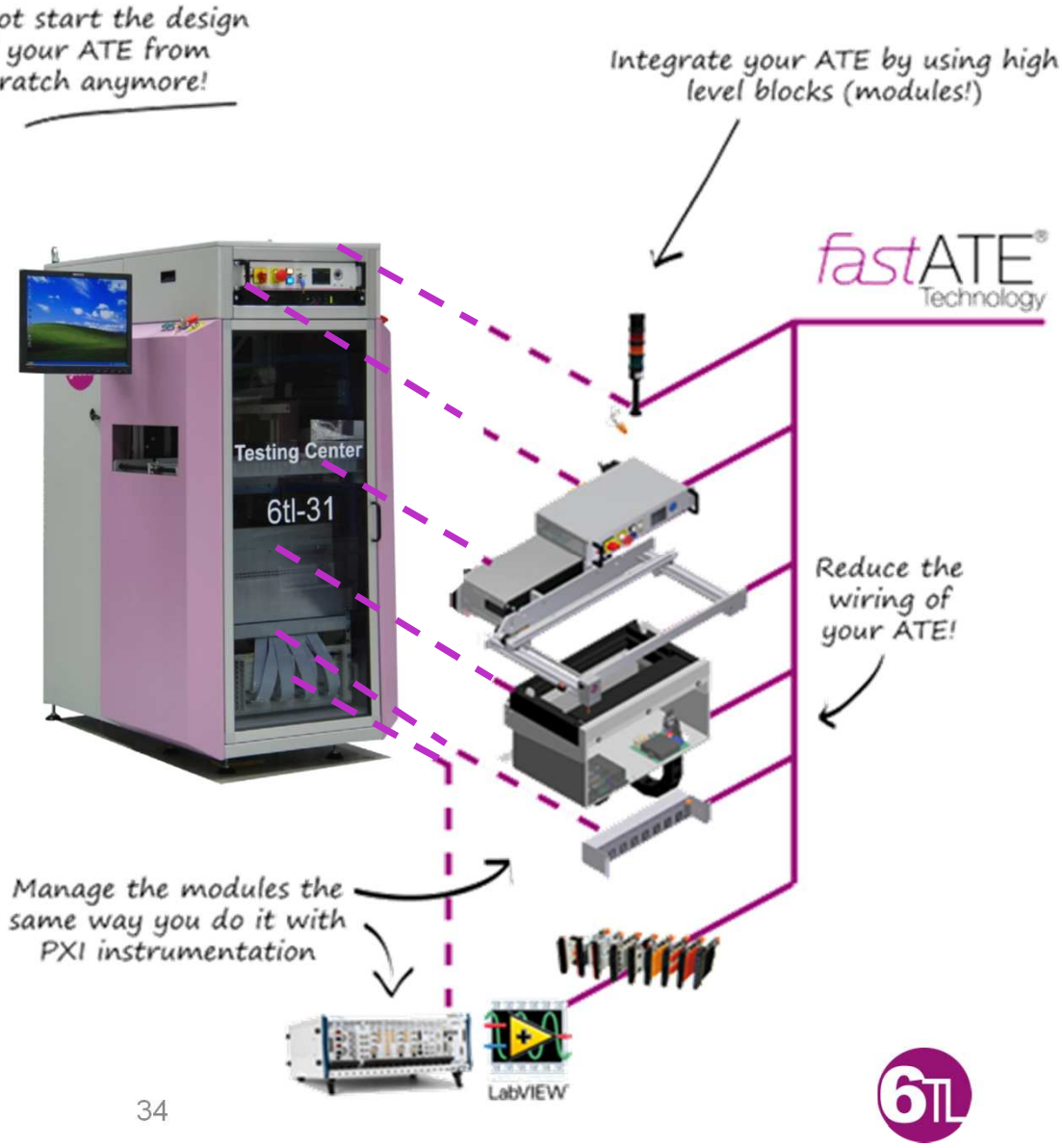
*fast*ATE® Solving time consuming engineering tasks.

- No operator is the same:
  - Each operator might need a different working height.
  - Less health issues
  - Results in higher productivity
  - Solution lies in modularity.

*fast*ATE® technology in use.

How?

1) Choose a Base platform (In-, Off-Line, Table top)
2) Add 6TL Modules to customize the selected Base Test Platform.
3) Add the needed (PXI) instrumentation.
4) Define MIC Interface and cabling solutions.
5) Control the whole test system with LabVIEW over CanBus.



*fast*ATE® is Modularity.

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fastATE® Technology

So *fast*ATE® Improves Tester development, Why?

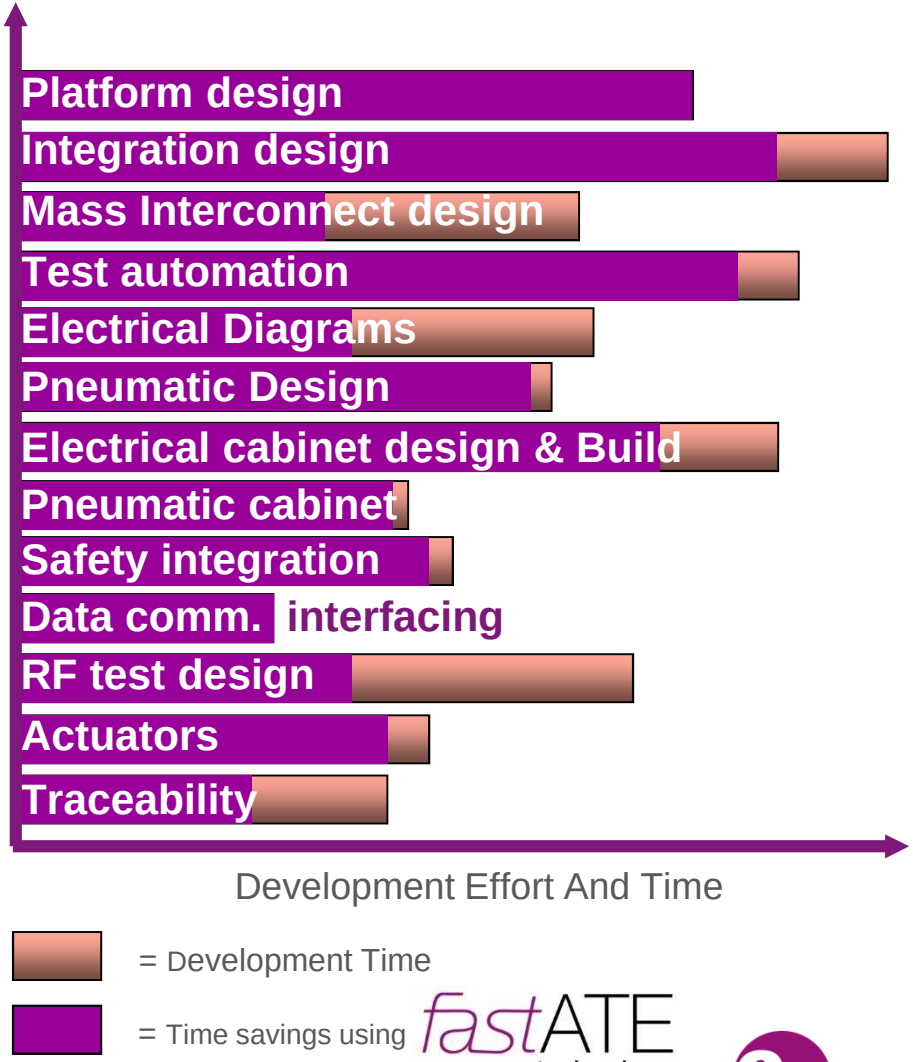
- *fast*ATE turns recurring ATE issues into **intelligent modular solutions**
- *fast*ATE always includes a **Mass Interconnect Interface** (MIC)
- *fast*ATE **minimizes internal wiring** between Instrument to MIC & system.
- *fast*ATE provides a **base test platform** range from table top to full in-line
- *fast*ATE provides **maximum flexibility** in the design of a test platform
- *fast*ATE is 100% complementary to PXI Technology
- *fast*ATE modules are all **independent subsystems** (Building Blocks)
- *fast*ATE modules include their own documentation
- *fast*ATE modules include own support and calibration software
- *fast*ATE modules include DLL's, LabView, TestStand, Can drivers.
- *fast*ATE brings recourses from the fixture back into the test system
- *fast*ATE is building a test system like working with;
- *fast*ATE provides up to 70% time savings in the design and build of a test solution.

*fast*ATE® what are your benefits ?

- Thanks to our modules, Engineering is reduced to a bare minimum, so that the test engineer can reduce time on each and every step he needs to cover to complete his turn-key test solution.

- We provide LabVIEW and TestStand drivers, Direct Can or DLL's drivers to control, set-up and maintain the entire tester architecture.

Build or buy?



*fast*ATE® & PXI

Good Marriage

Summary

KEEP
YOUR INTEGRATION
SIMPLE.
USE 6TL

With fastATE® Technology the user will:

- **Minimize:**
  - Investment
  - Engineering effort
  - Risk
  - Delivery time
  - Integration time
  - User training effort
  - Documentation preparation
  - Program development time
  - Debug time
- **Maximize:**
  - Standardization
  - Reliability
  - Flexibility
  - Modularity
  - Re-Usability
  - Ease of use
  - Service & Support
  - Maintainability
  - **End-user satisfaction**

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fastATE® Technology

*fast*ATE® About 6TL

- 6TL, headquartered in Barcelona, Spain, with test systems installed in more than 30 countries, has over 30 years of experience and equal expertise delivering solutions for the electronics test market.

- 6TL has redefined the way ATE integrators build their Test systems. Using commercial off-the-shelf (COTS) hardware and software blocks so integrators or End-Users can shorten project delivery and build cost-effective, reliable solutions.

- **To learn more about 6TL, visit our Alliance Partner Profile Page.**
- Contact us at info@6tlengineering.com www.6TLEngineering.com

About the presenter…

Peter van Oostrom, Business Development Mgr. for 6TL.

- Electronics Engineer with 30 years experience in T&M
  - Work experience with 6TL 5 Years
  - Work Experience with VPC 2 Years
  - Work experience in PCB Assembly and Test (ICT – FCT – Fixturing) 30 years.

- Contact email pvanoostrom@6tlengineering.com

*fast*ATE® More information.

For your attention. Any QUESTIONS?

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*fast*ATE® Technology