# Welcome !

# Do's & Don'ts

## In the design & realization of your Automatic Test Equipment.

**Peter van Oostrom.**
**pvanoostrom@6tlengineering.com**

# Decision process and typical arguments.

## Do's & Don'ts

- You need a test system to test your DUT's

- Highest Quality
- Maximum Flexibility
- Highest reliability
- Fastest throughput etc.
- Lowest Price
- Shortest Delivery time




technology

# Decision process and typical arguments.

## Don’ts


- You need a test system to test your DUT’s
- Ask yourself, “What is the best way for us to realize this?“

  AND should reconsider some thoughts like;
- I am an Engineer and I can design and build the tester myself.
- I design my own test board including the switching and I/O
- I create my own test software  it is cheaper, a student / stagier will design it for me
- I build my own interface and save on cost for a Mass Interconnect Interface.
- I let my operators connect to the DUT in production, using our own cables.
- I designed the system and I am always here, I can save on Documentation.

# Do's and Don'ts in building ATE's

- It is all about quality,  We all want the best system for the lowest price.

# What can you expect.

"Optimizing, Design and Build of end of line ATE's".

- Who is 6TL and what do we do
- What is *fast*ATE
- ATE Core configurations;  What more is needed before it's a test system.
- Mass Interconnect the heart of each test system.
- Optimize and minimize internal tester wiring makes sense.
- High speed Data, a challenge for a mass interconnect interface.
- Independent Building blocks enable efficient tester design and build.
- Custom step types provide easy and consistent program development.
- Conclusion and questions.

# Who are we ?

Sistel Group

DigiProces
ELECTRONICS MANUFACTURING SERVICES

INDIC
EMS ELECTRONICS PVT. LTD.

SmartLift®

# About 6TL.

- “6TL is a pioneer in developing and applying innovative and intelligent products to test system engineers worldwide, by combining modular technologies with a focus on ease of integration, so they can **save on engineering resources and time without sacrificing quality** while developing and building their ATE's”.

David Batet
General Manager

fastATE® technology

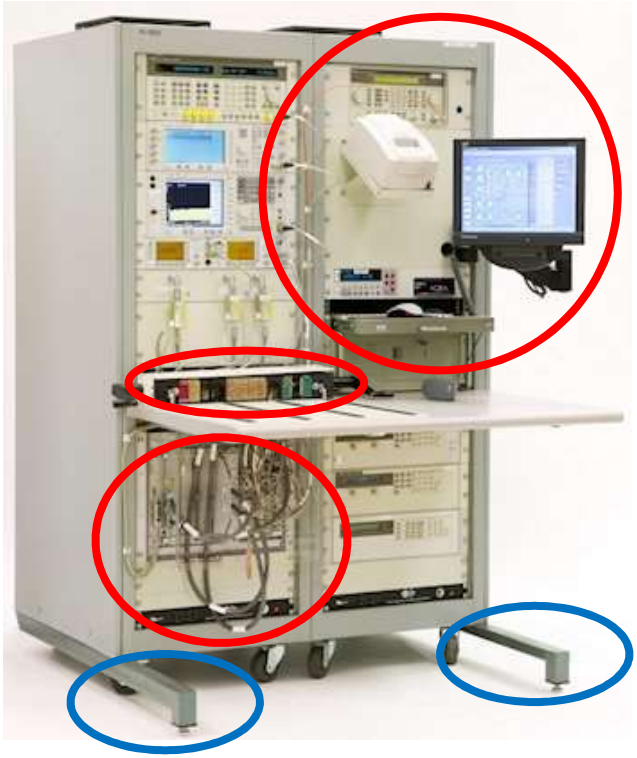
# Do’s and Don’ts in building ATE’s

**ATE Core Configurations.**

“**Building test system is a difficult job** – one that even the best organizations spend many months accomplishing purely because of the number of components, suppliers and interoperability challenges present,” “The new ATE Core Configurations can help users dramatically simplify the purchasing process for a common set of requirements and reduce the time and cost of building a system.

And when you ultimately want a turn-key system, they form a great bridge to the integration expertise of our Alliance Partner Network.”

# Building an ATE is more then just configuring.



**Add tools** like printers and barcode scanners, a Light Tower, communication to the operator, controlled cooling, guard temperature, monitor & keyboard, energy efficiency, include safety and CE Marking, etc.

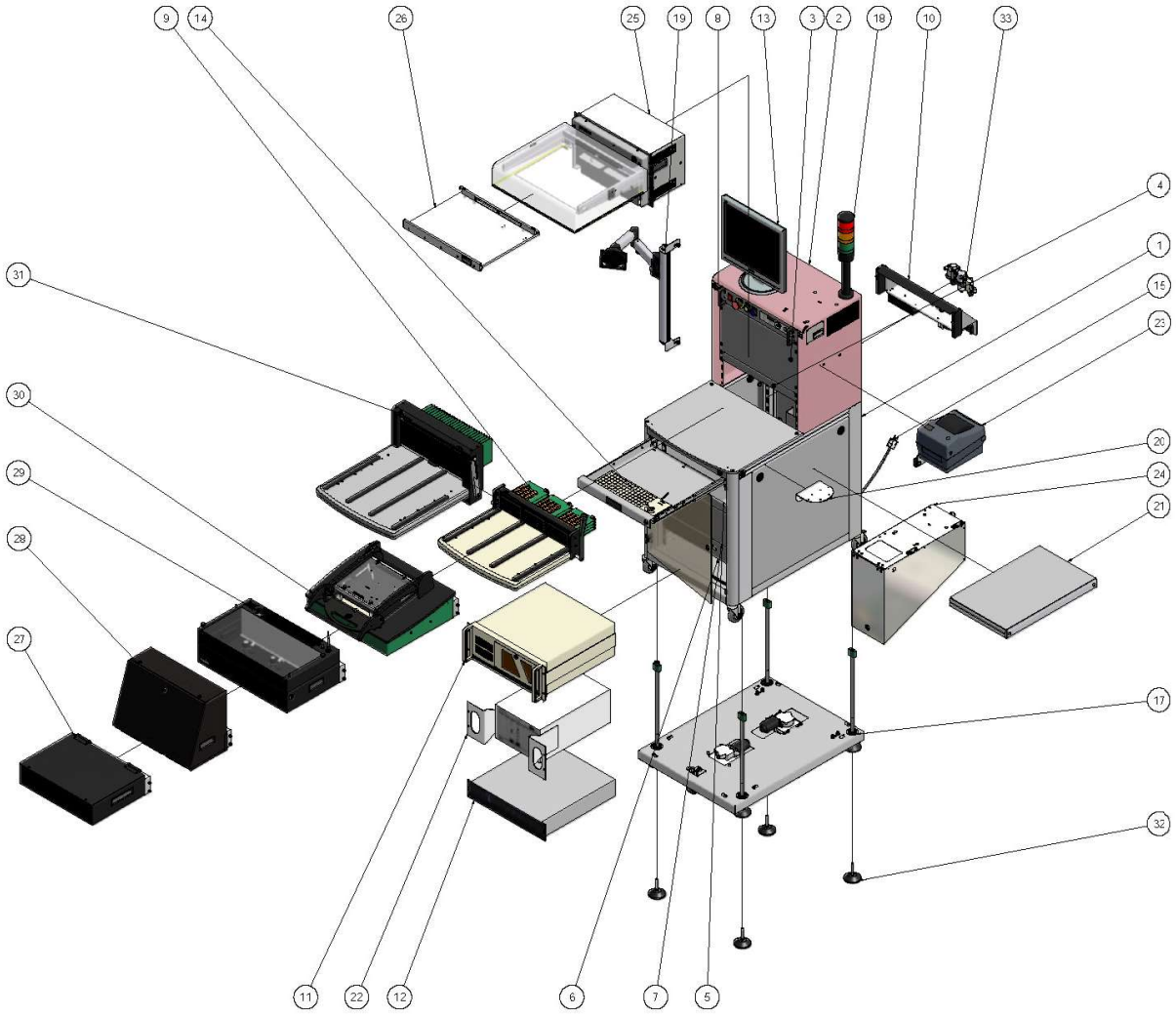
**Mass Interconnect** You introduce a mass interconnect to benefit from its reliability and it provides you with a standard interface. But it adds additional cabling inside the tester.

**Create ITA's**
For each different UUT you need to design a reliable way of connecting them to your Mass Interconnect Interface. And when they are heavy you need to take measures.

**Create Documentation**
To be able to maintain and debug your tester and ITA's you need good documentation.

# Building an ATE is more then just configuring.

- Adding tools can only be done efficiently if your rack is ready for these tools.




# Adding tools in an efficient way.

- Minimize engineering effort, by offering modularity in the choice of your base test platforms.
- Design them to be ready to receive additional options and tools.

6TL-10 6TL-19 6TL-22

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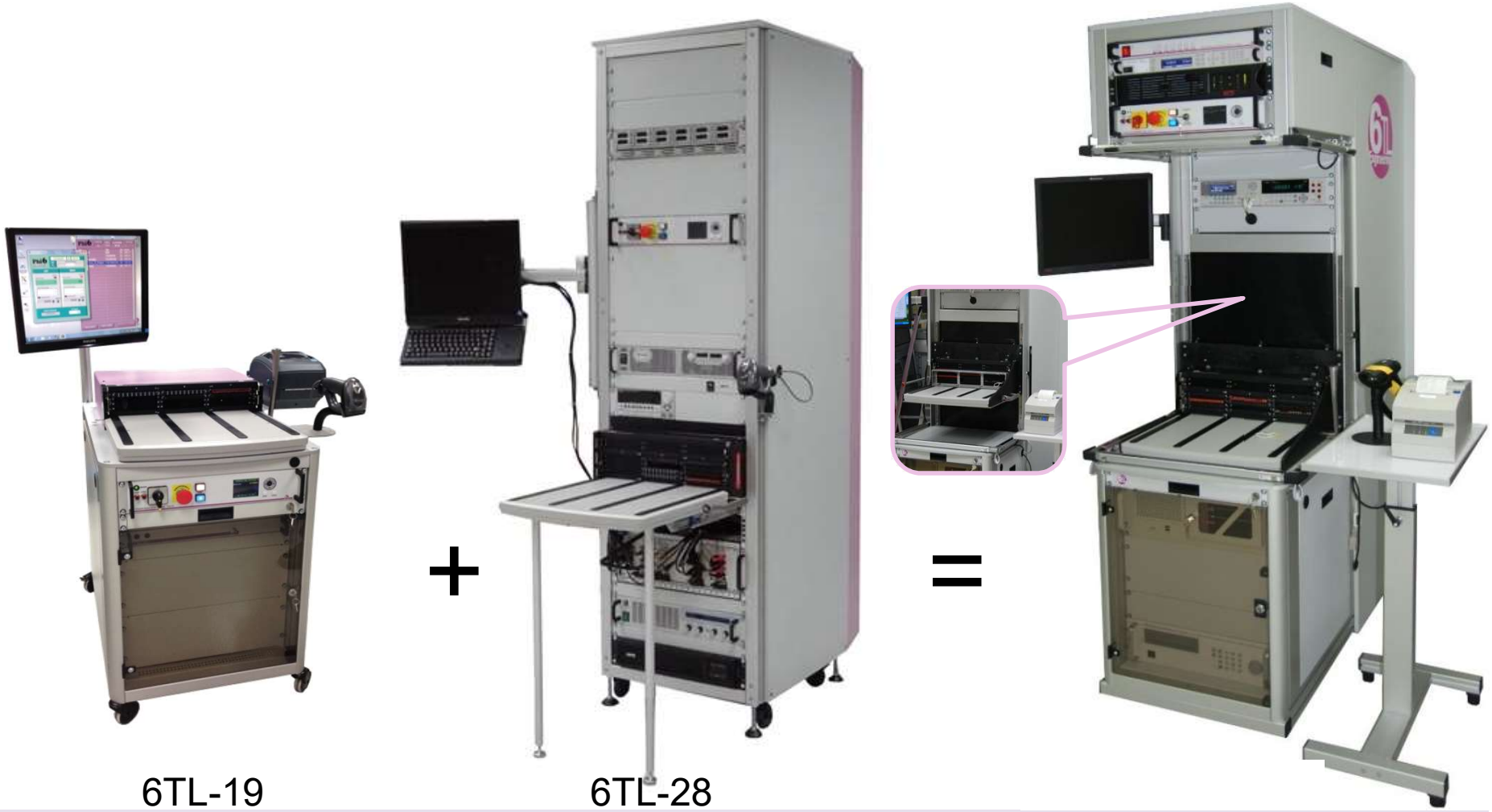

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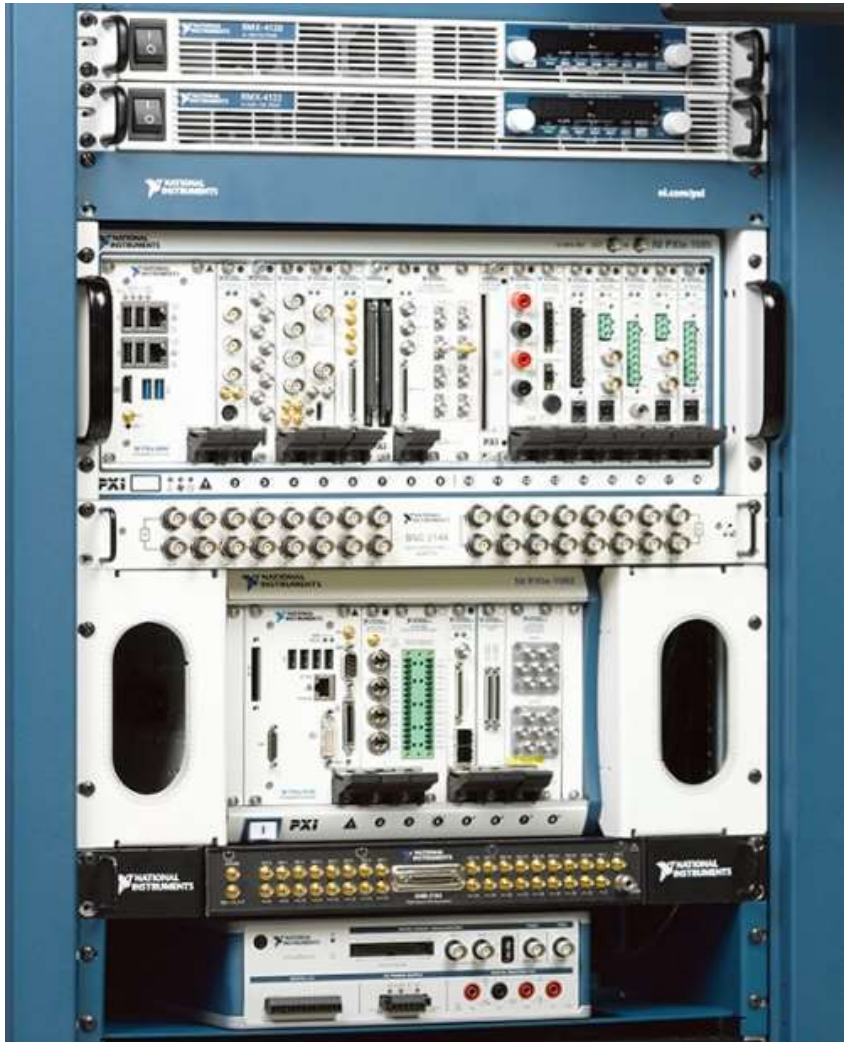
# Building is more then configuring an ATE.



**Another thing is connecting instruments to the UUT (Unit Under Test)**

Can you imagine the wiring of this system?

# Building is more then configuring an ATE.

## CHAOS

## ORDER

**Another thing is connecting instruments to the UUT (Unit Under Test)**

Can you imagine the wiring of this system?


Typically you add a Mass Interconnect and use an ITA (Interchangeable Test Adapter) for each UUT to create order in this chaos.

# What are the benefits of fastATE

- Improve the reliability of the test system using a Mass interconnect.

Pylon Interface

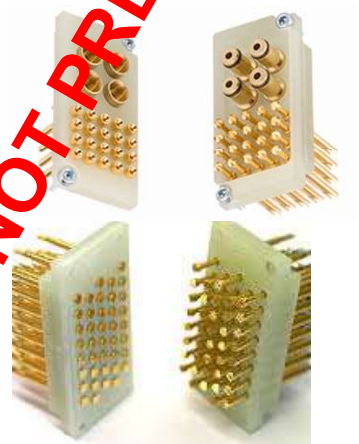

# What are the benefits of fastATE

- Improve the reliability of the test system using a Mass interconnect.

## Pylon Interface

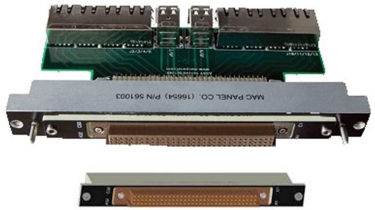
ITA Receiver

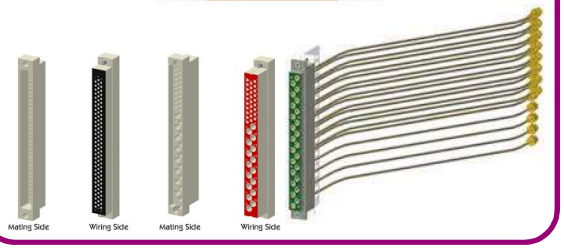
NOT PREFERRED



## MacPanel Interface


ITA Receiver



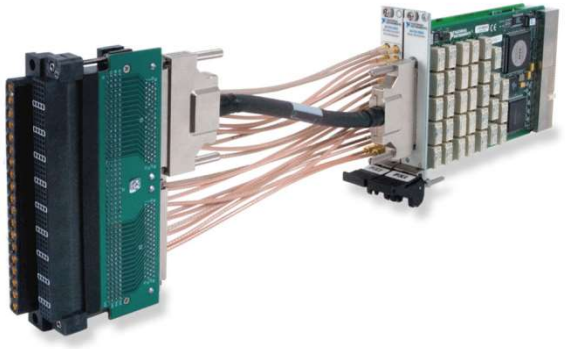


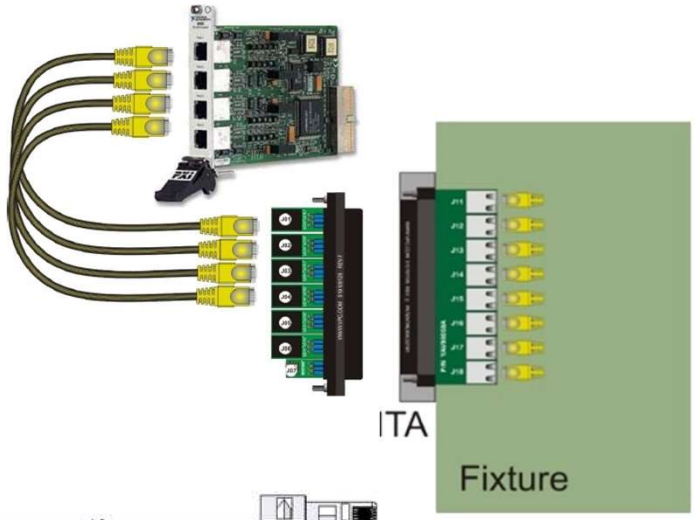
## VPC Interface


ITA Receiver

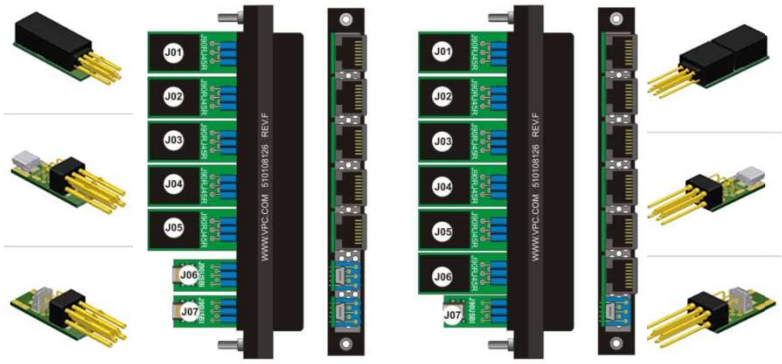
# What are the benefits of fastATE

- Simplify wiring inside your test system.

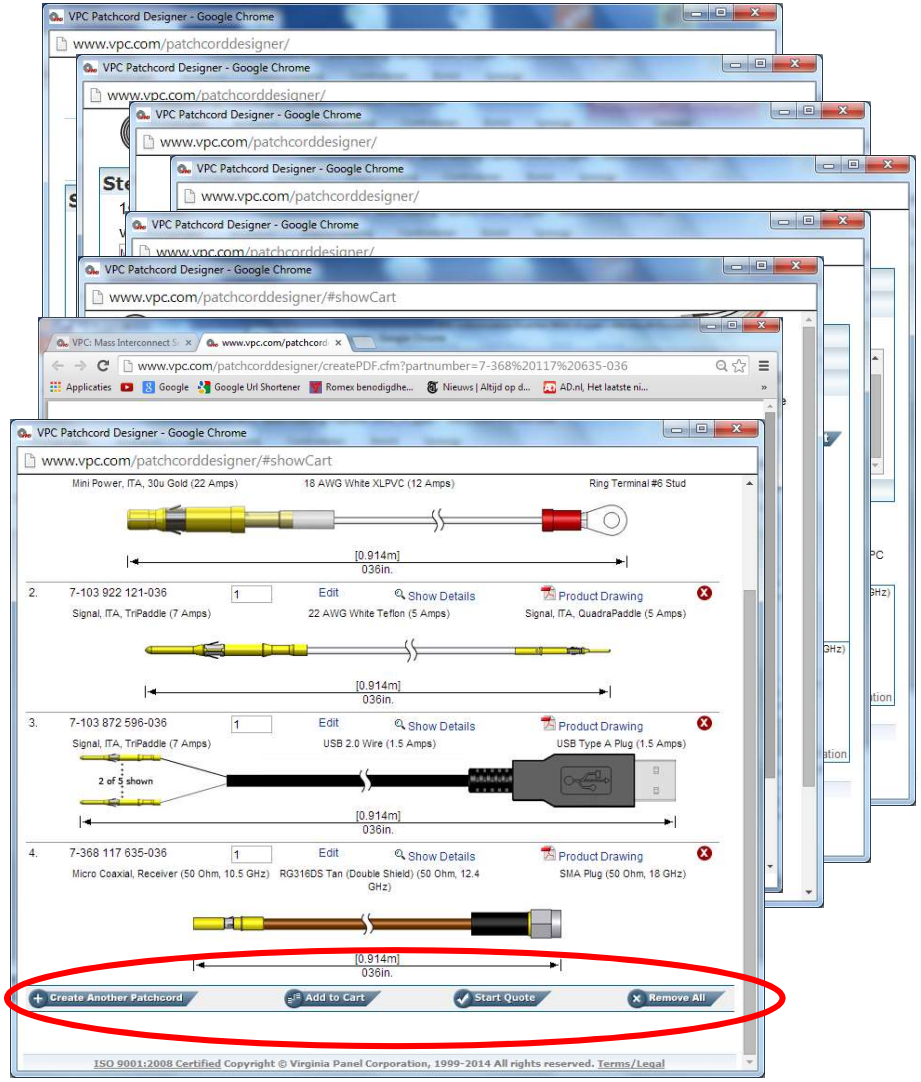


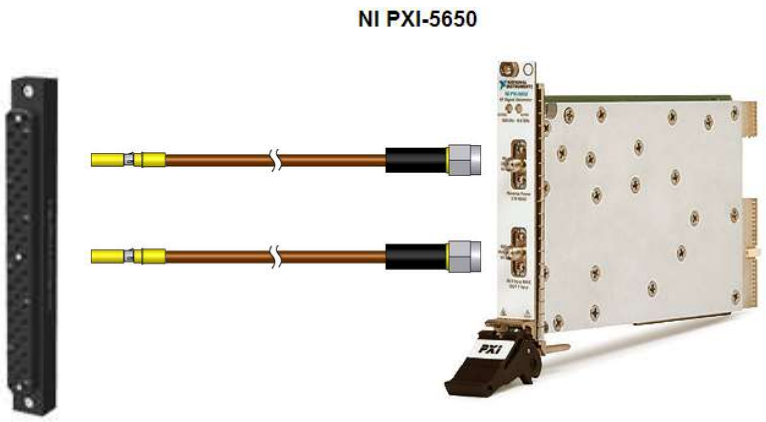







# Powerfull wiring tools from Virginia Panel Corporation



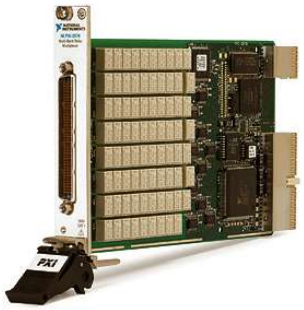



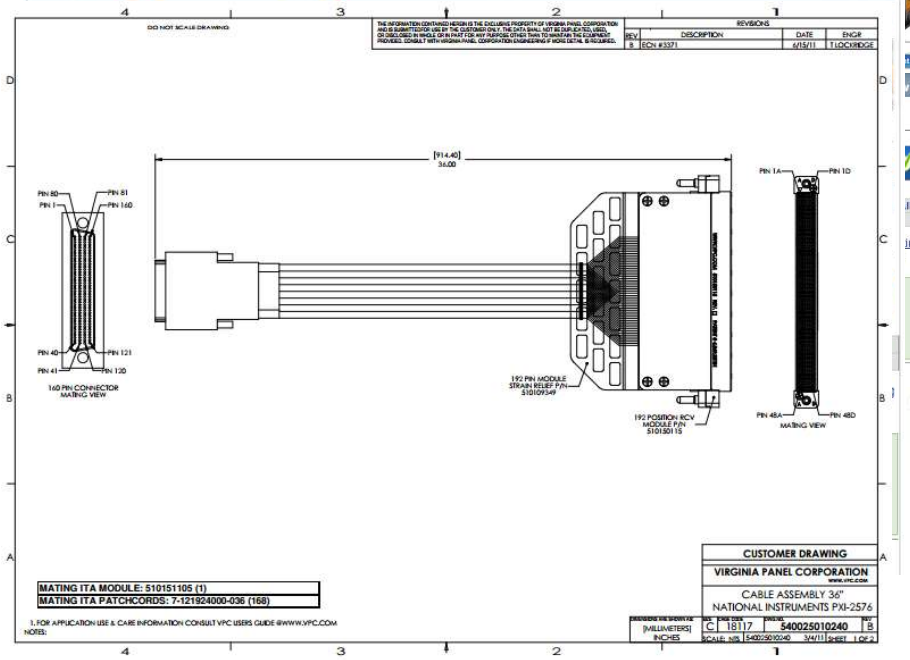



fastATE technology

# Powerfull wiring tools from Virginia Panel Corporation


PXI-2576



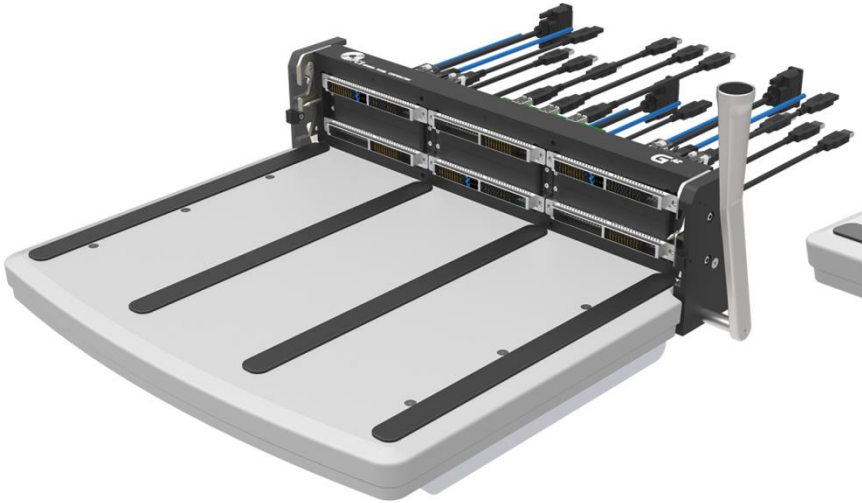


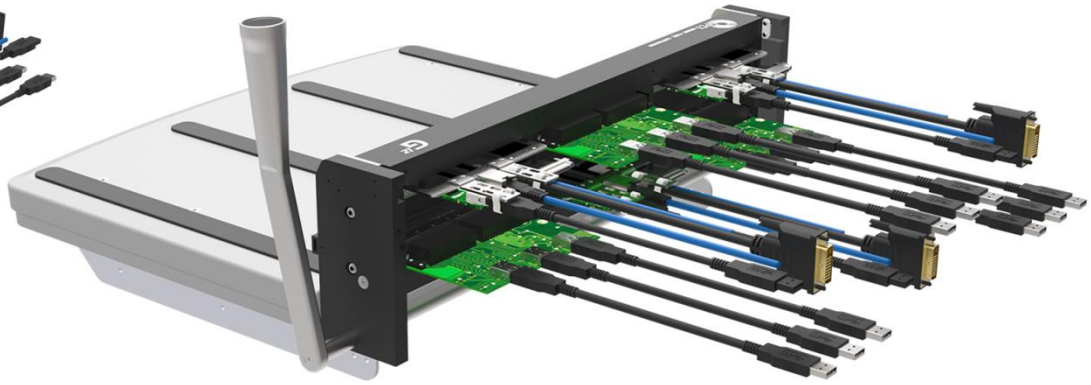



fastATE technology

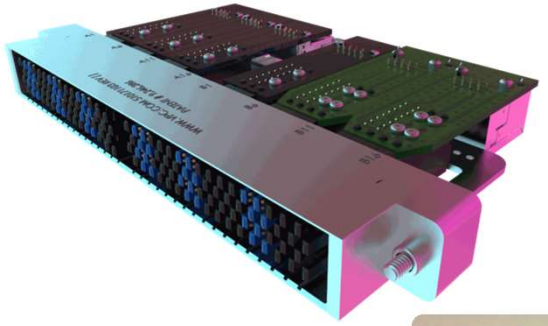
# High Speed Data through a Mass interconnect.

- High speed wiring up to 12Gbs is realized using VTAC from VPC.



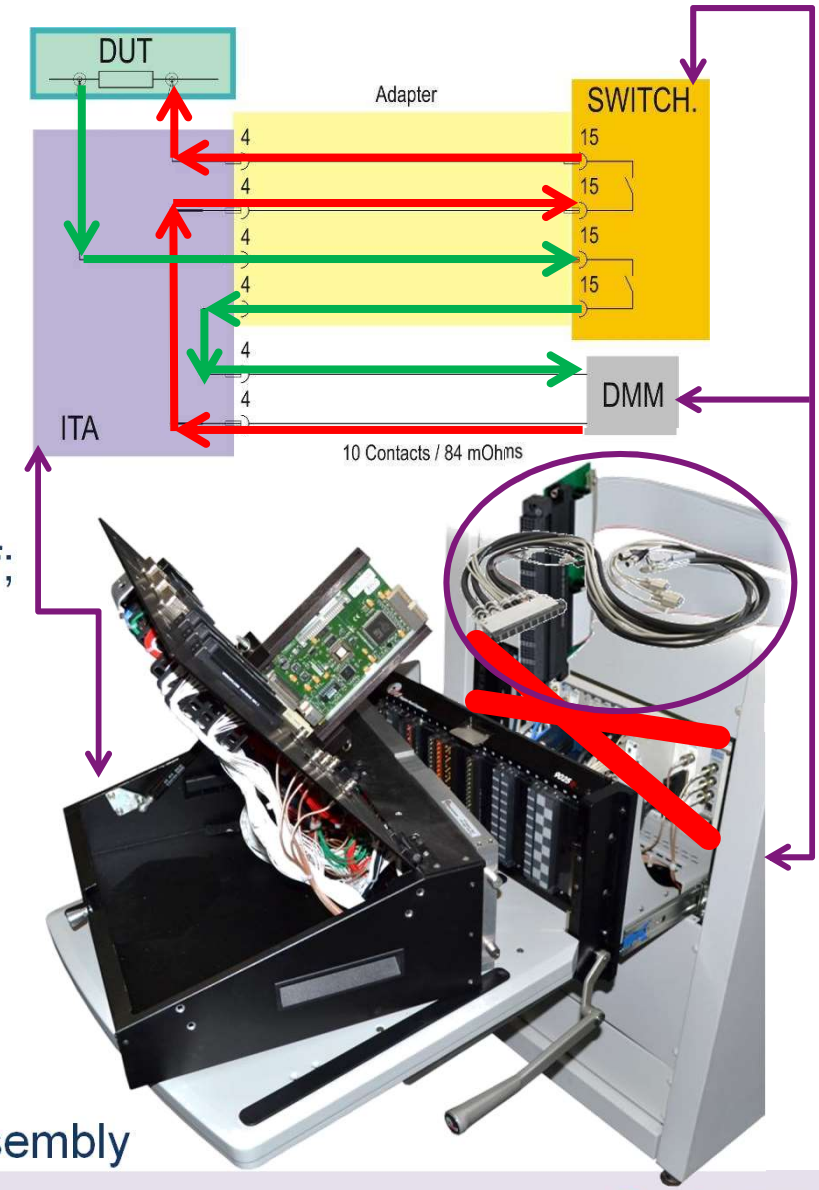


- USB3, DVI, HDMI, Display port, Gigabit LAN, LVDS, etc.



# What are the benefits of fastATE

- Minimize wiring inside your test system.
- Total Signal length: **460 cm**
- Minimizing cable length minimizes the risk off;
  - Variation in signal length
    - Adding resistance
    - Adding capacitance
    - More contact area's (Connectors)
    - Adding noise, cross-talk
    - Adding cost
    - Adding complexity to schematics
      - Fault finding more complex
      - Debugging more complex
      - Risk for human error during assembly



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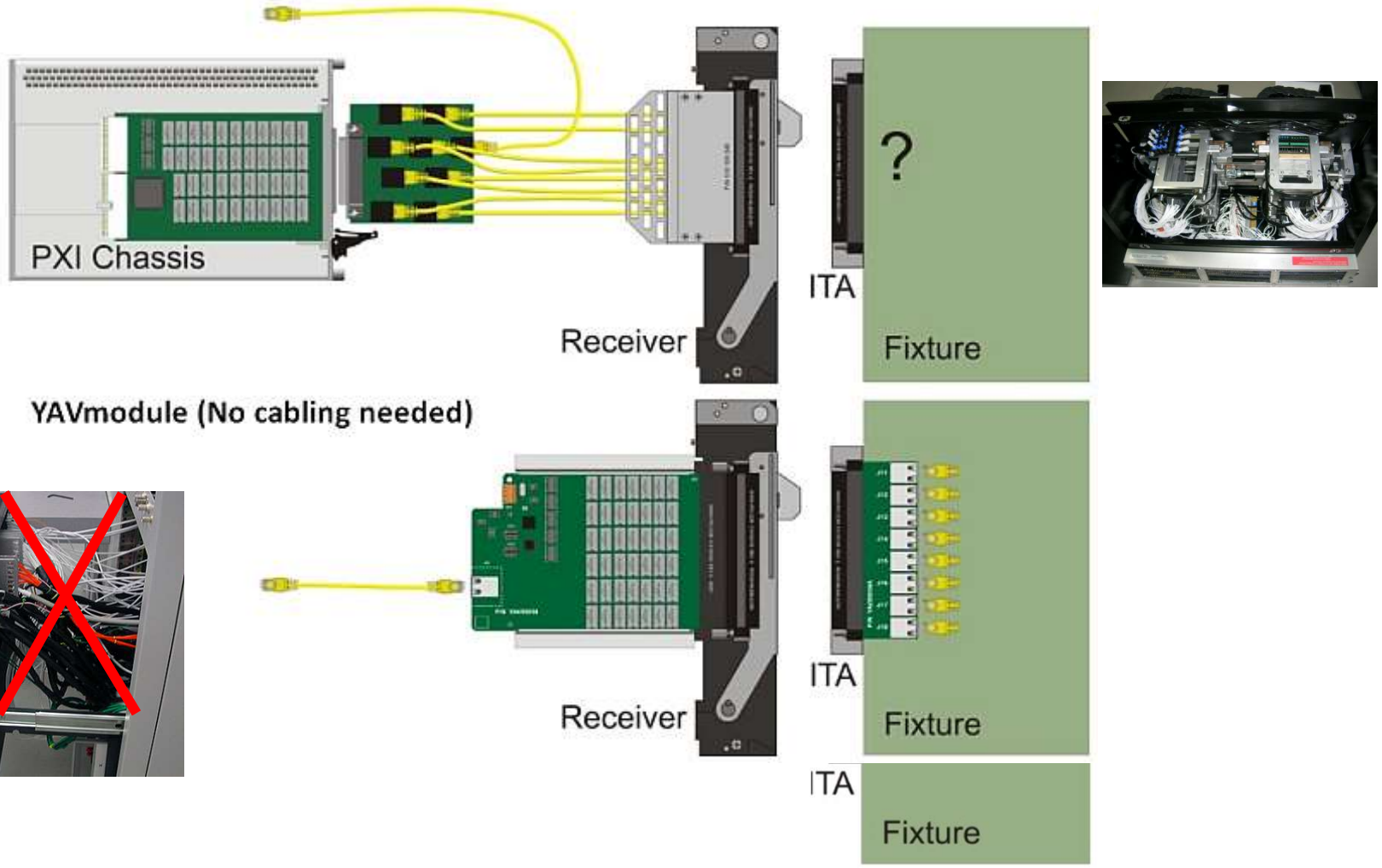
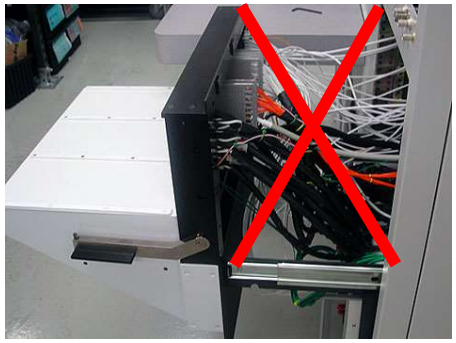
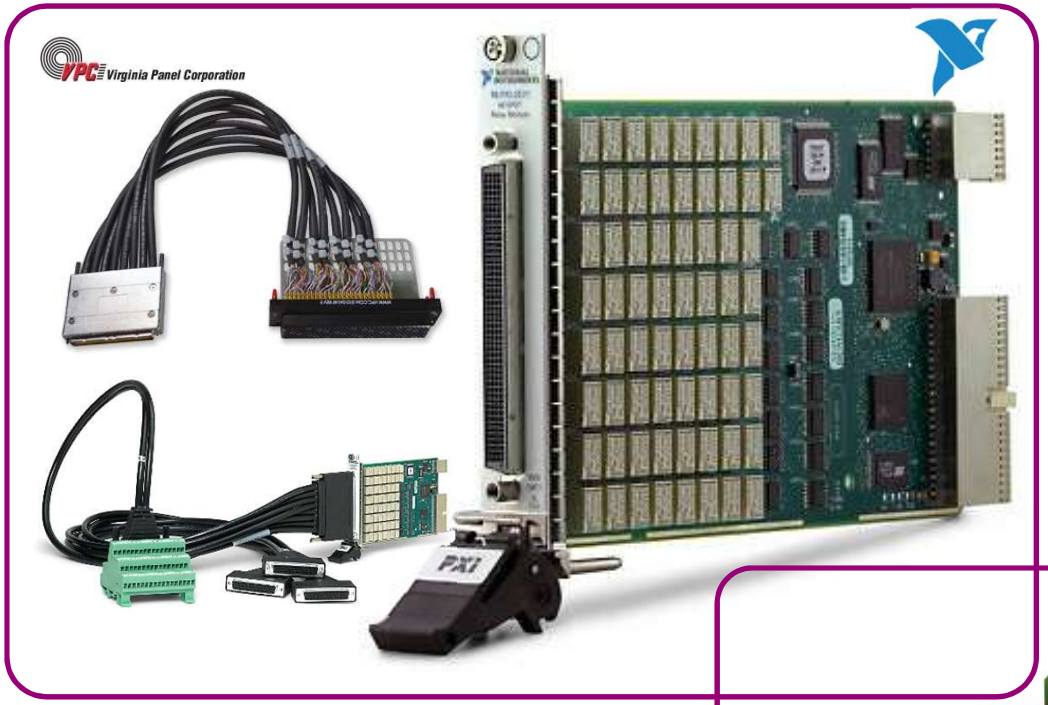




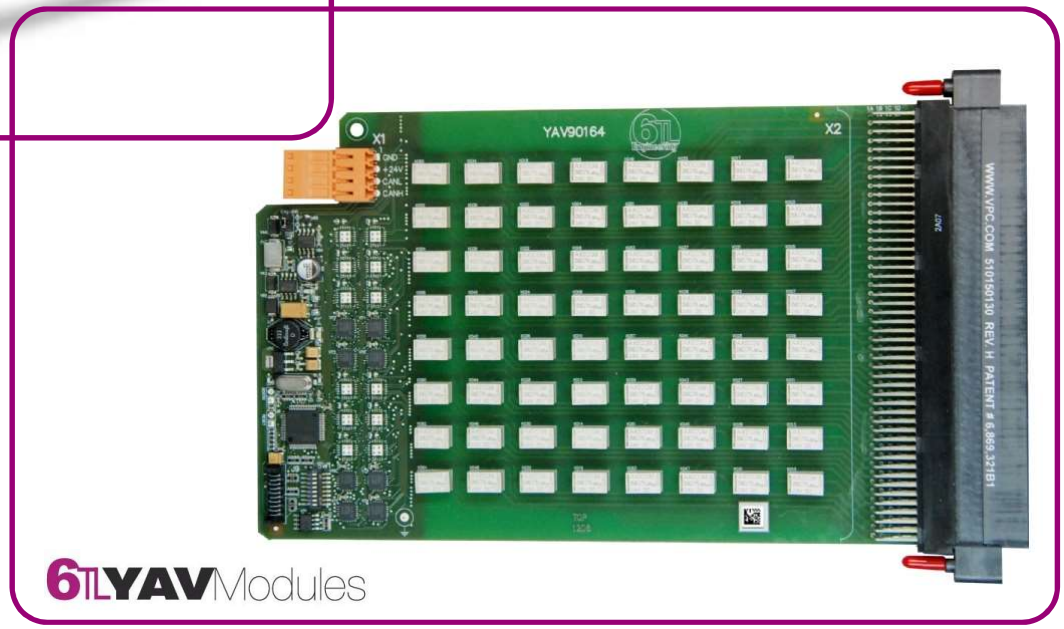



# fastATE - Less cabling, Price benefit

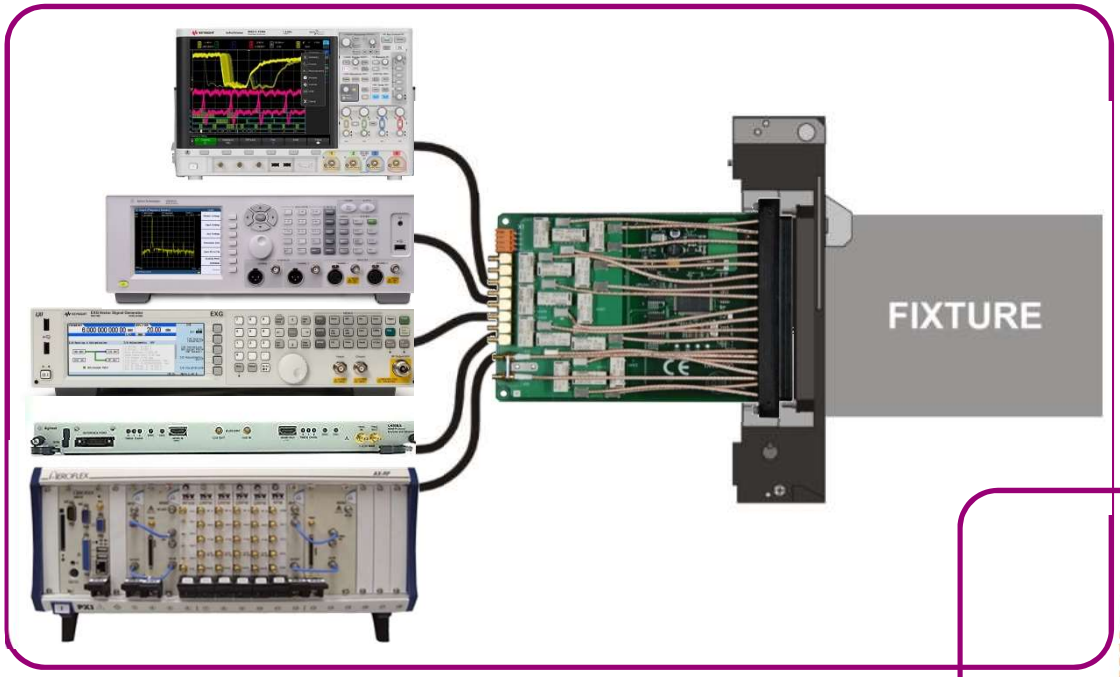
**NI PXI-2571 €1.770,- + €1.888,- = €3.658,-**
66 Channel G-P Relay Switch, 1A

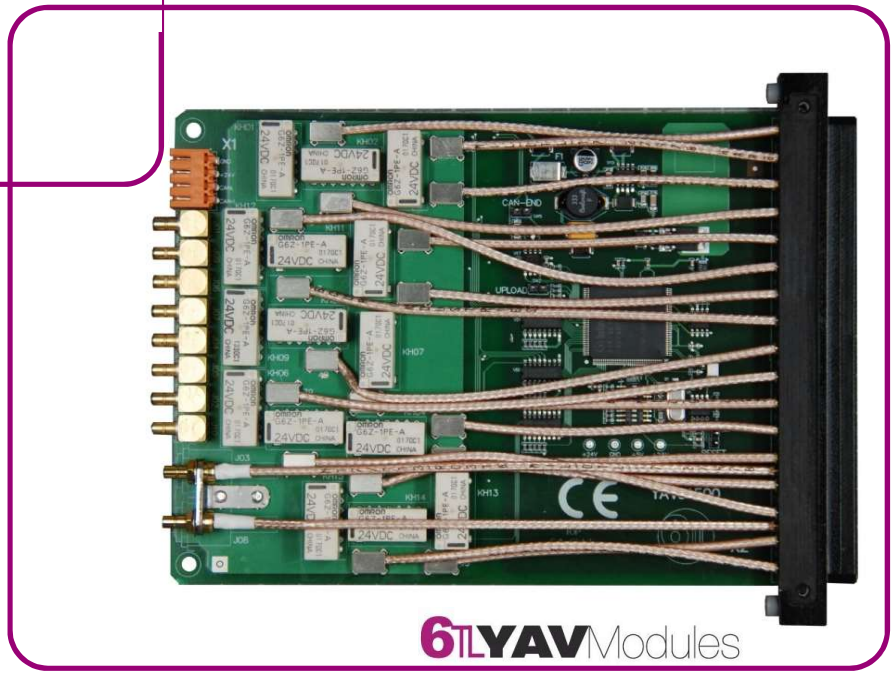



**YAV90164 € 1.642,--**
64 Channel 2A SPDT relays



# fastATE - Efficient wiring flow.



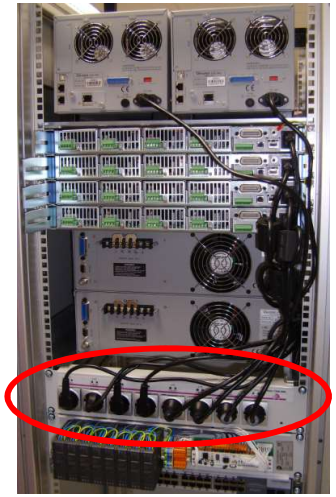
# fastATE - Before and after.

BEFORE

AFTER

# What are the benefits of fastATE

- Put recurring engineering in one efficient building block or module.



6TL YAV Modules

# What are the benefits of fastATE

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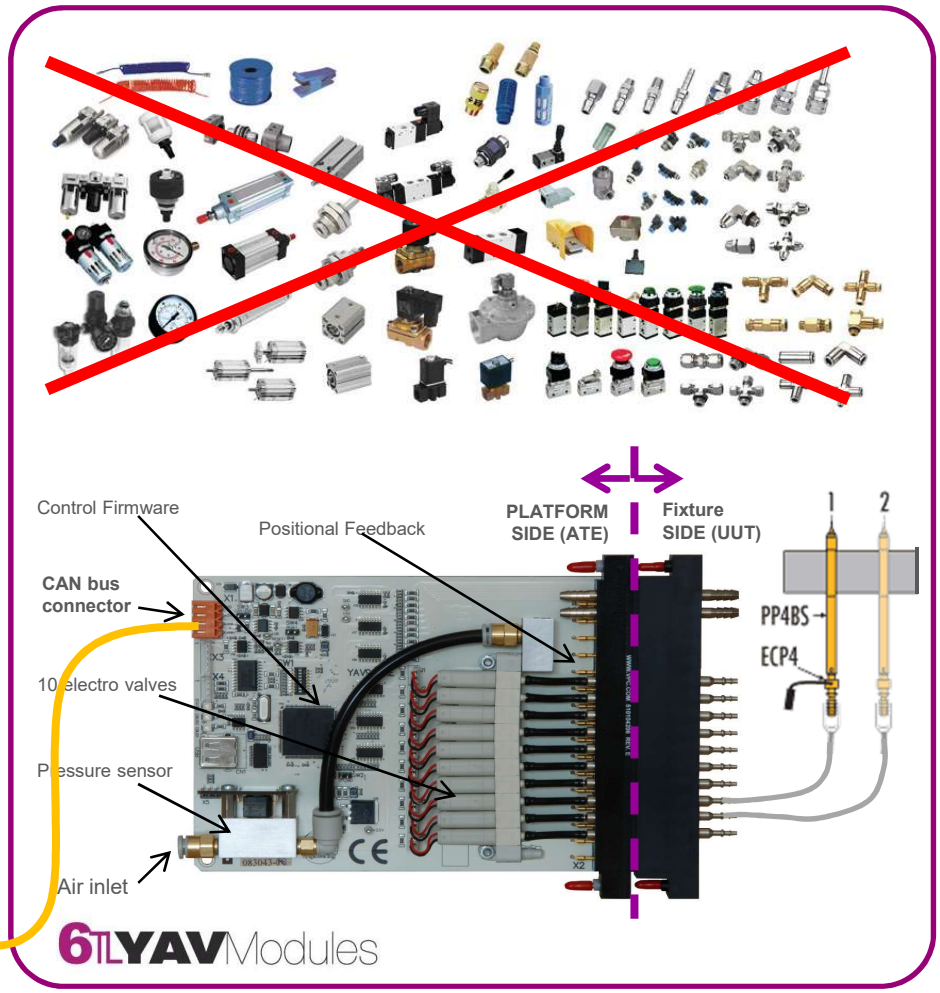
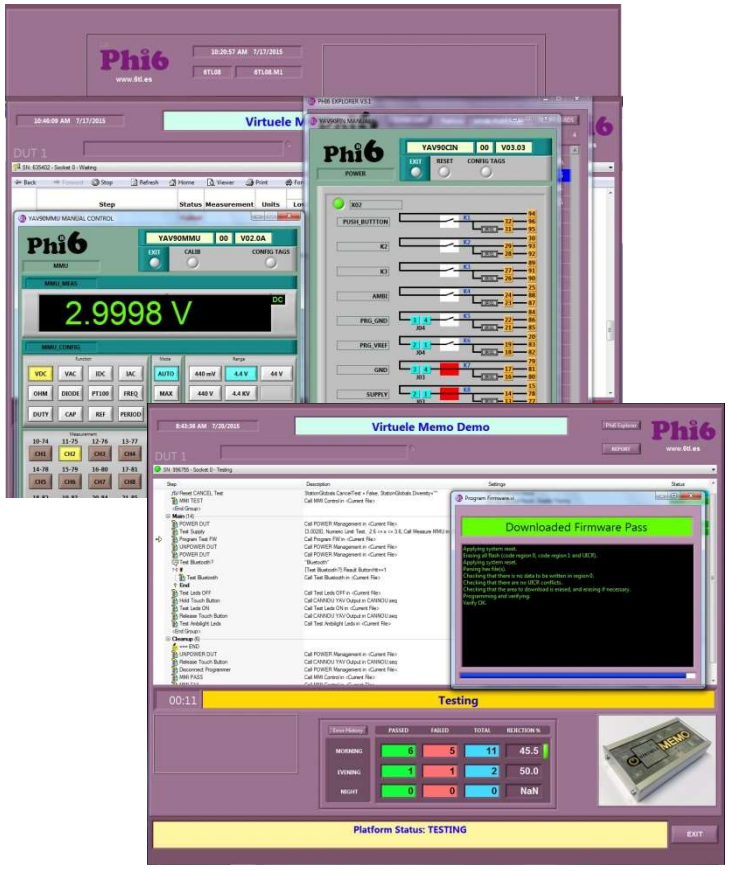
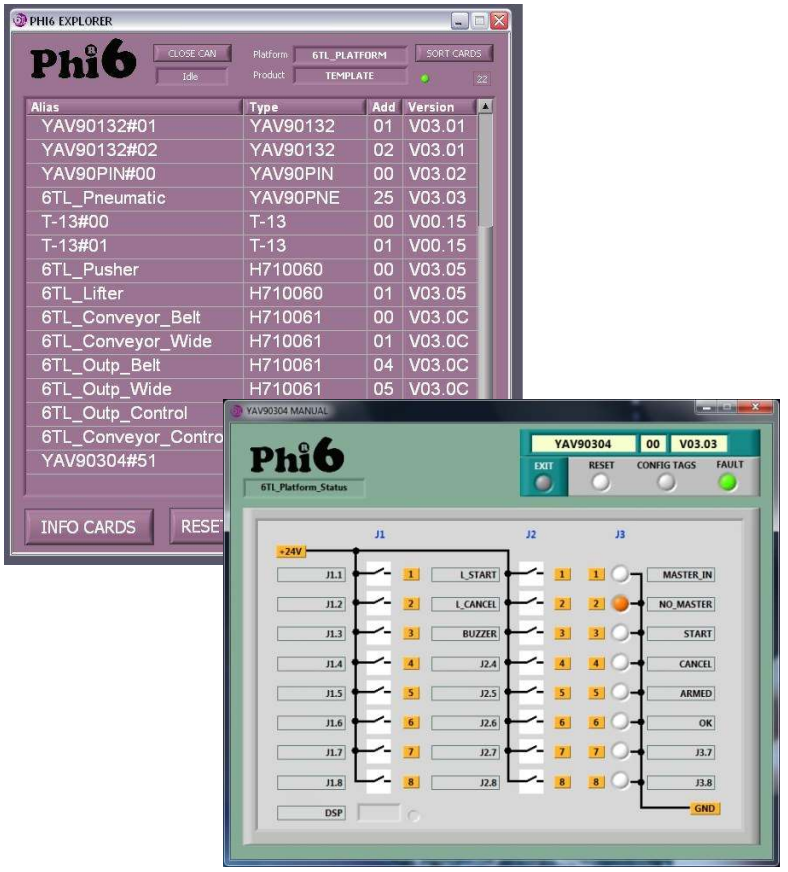


# What are the benefits of fastATE

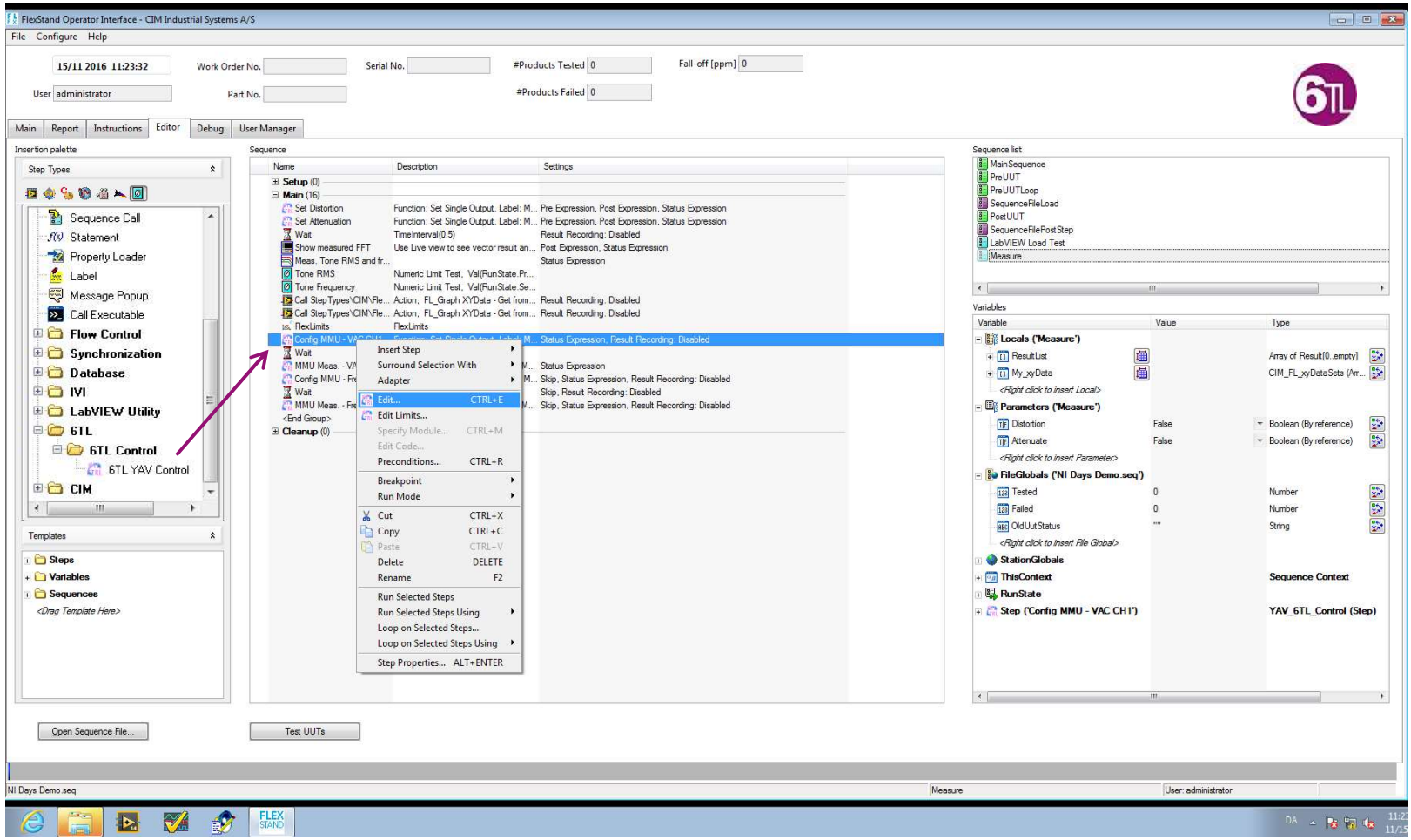
- Tools to make programming test sequences easier and more structured.
  - Phi6 Explorer & OI, Flexstand, Custom step type tool.



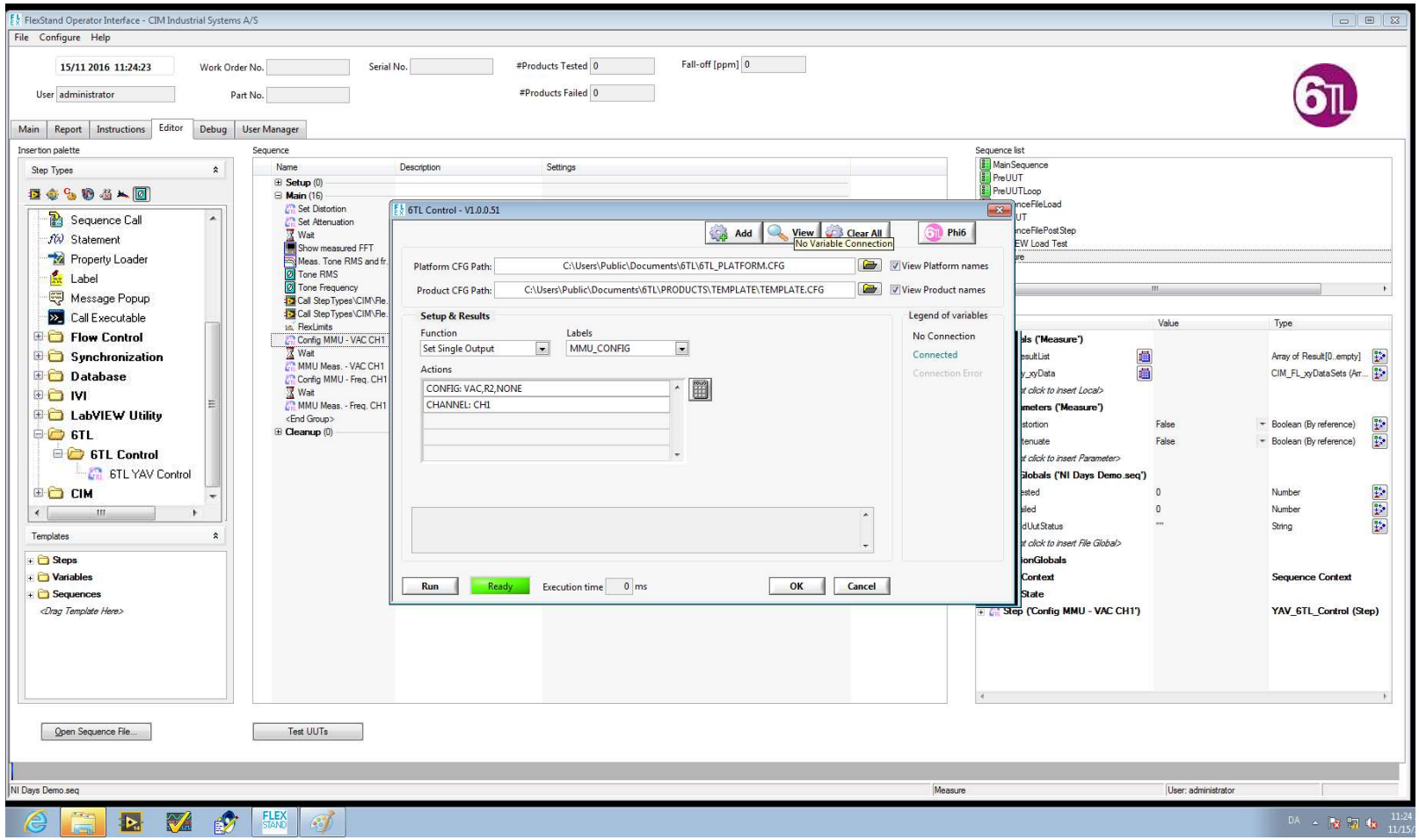
# What are the benefits of fastATE

- Using Teststand or Flexstand in combination with our Custom step type tools.



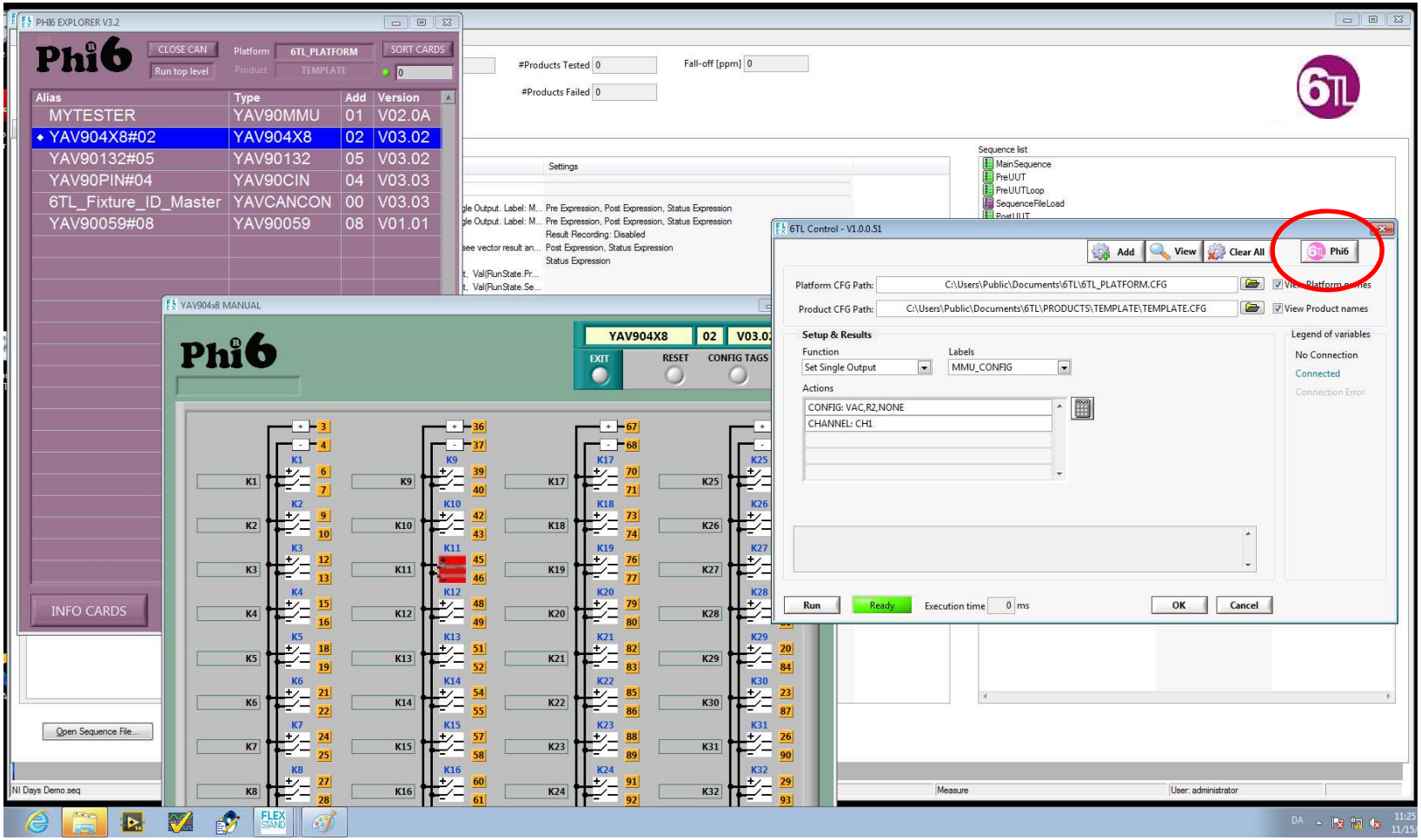
# What are the benefits of fastATE

- Ease & standardize generation of test sequences using our Custom step type tool.



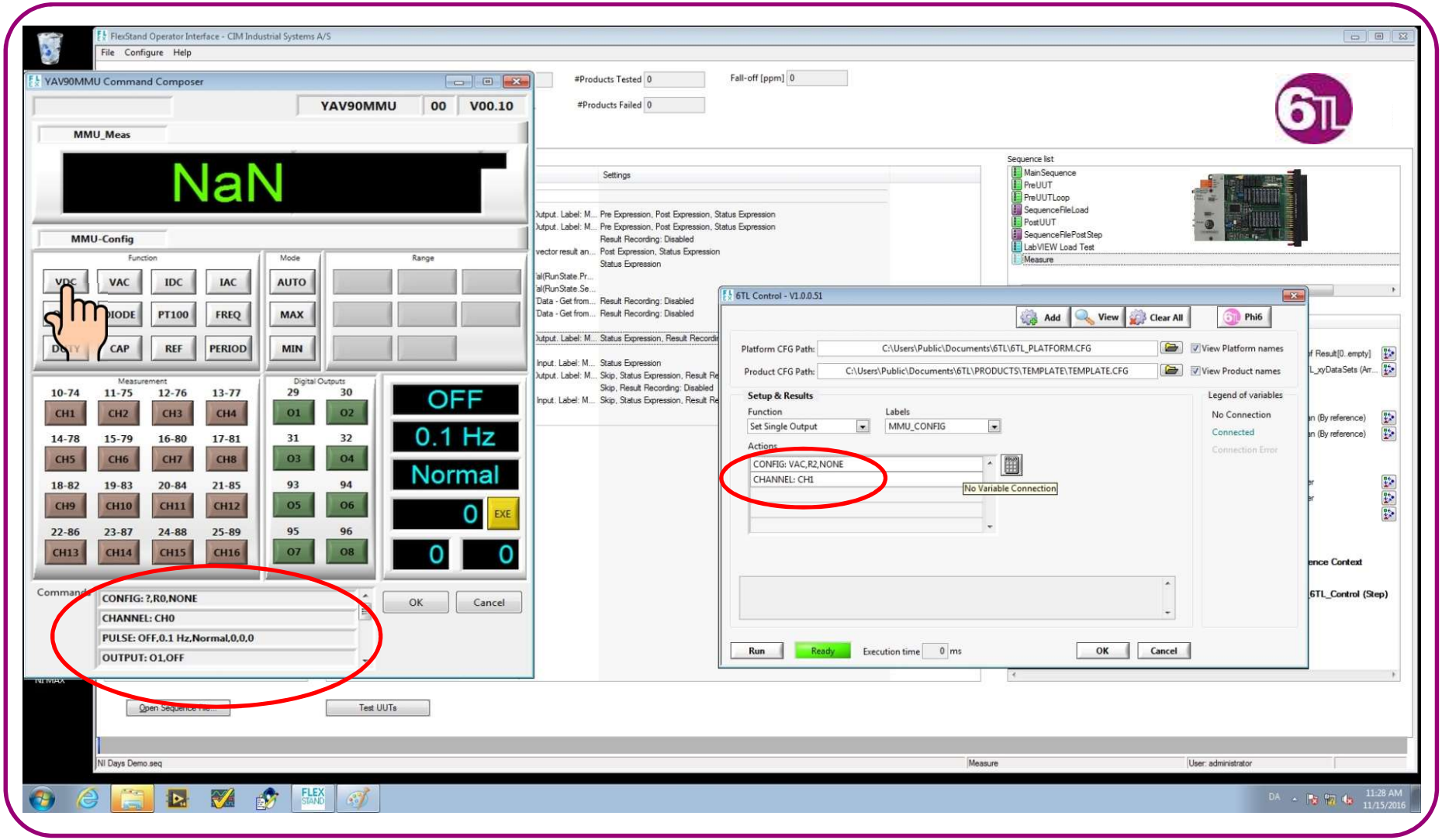
# What are the benefits of fastATE

- Check the result in Phi6 Explorer directly from the Custom step type tool.



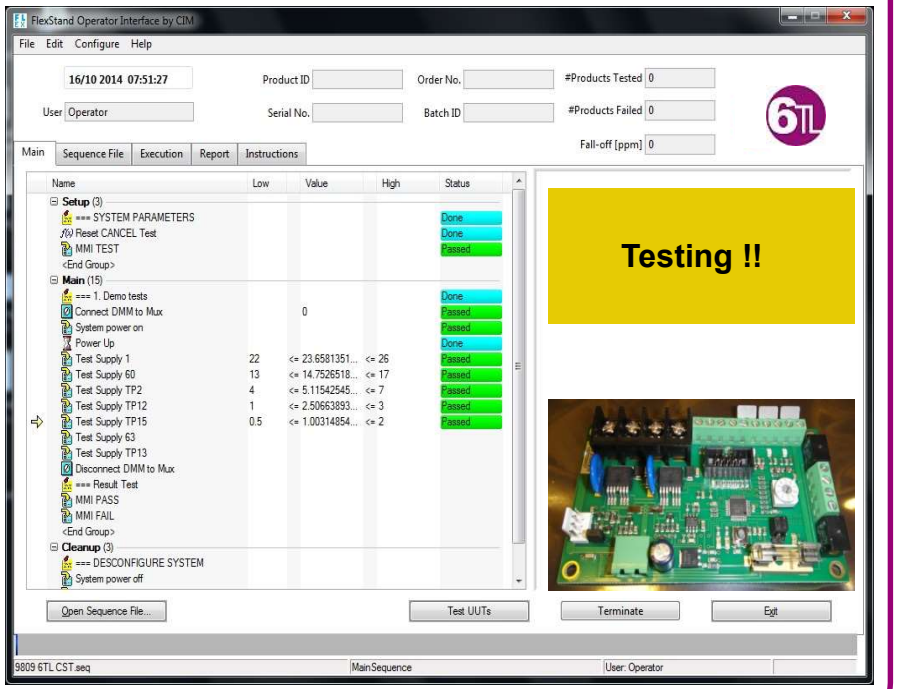
# What are the benefits of fastATE

- Program the custom step type test step instruction using Phi6 explorer.



# What are the benefits of fastATE

- 6TL test solutions enable more efficient  programming with Custom step type tools.
- Start testing with Phi6 OI (Operator Interface), Flexstand OI or your own OI.

# What are the benefits of fastATE

- fastATE is ready for FCT, FCT & Bscan, ICT, ICT & BScan and any type of combinational testing, in- and off-line, manual and automatic.

6TL-10 6TL-19 6TL-22 6TL-24

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6TL-28

6TL-29


6TL-31

6TL-33

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6TL-33

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6TL-33

6TL-34

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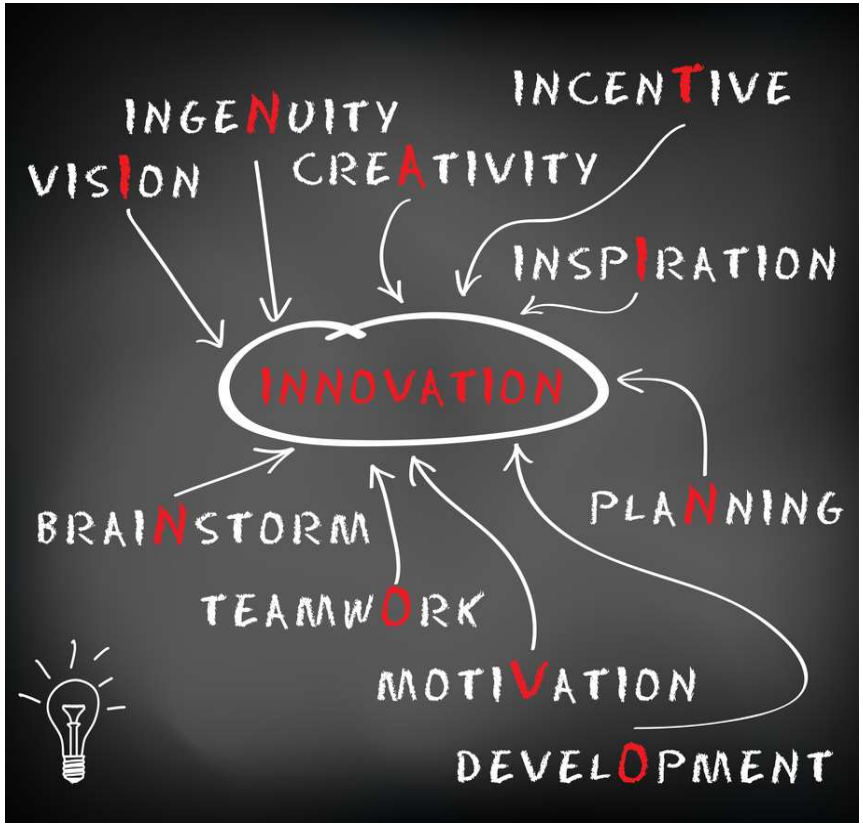
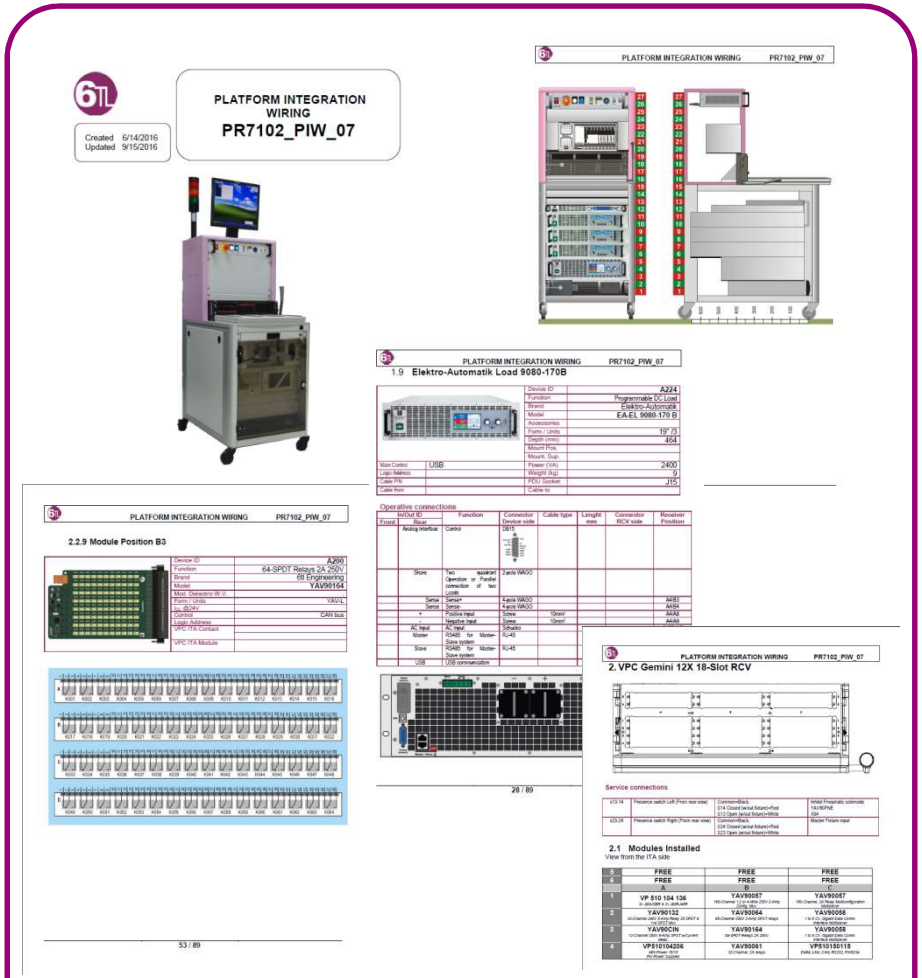
6TL-35



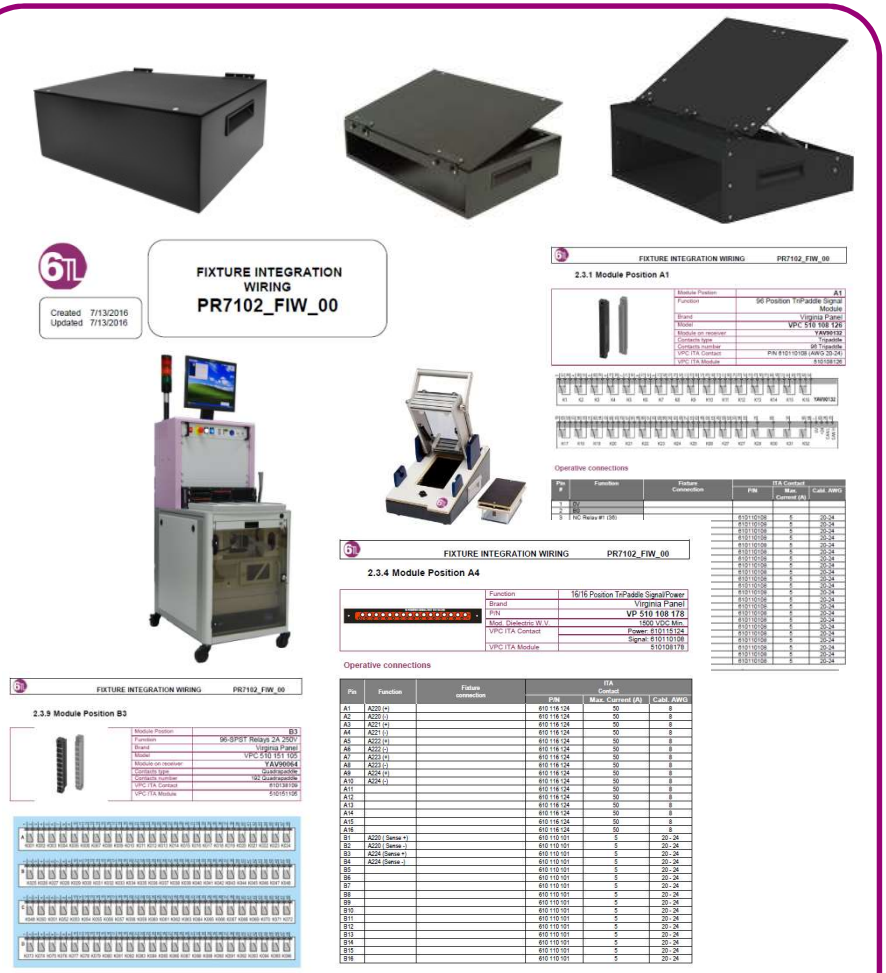

6TL-??

# What are the benefits of fastATE

- Receive your turn-key test solution including all documentation (PIW & FIW).




- PIW (Platform Integration & Wiring).




- FIW (Fixture Integration & Wiring).

# What are the benefits of fastATE

- Building, Base, Turn-Key or multiple systems, 6TL has the solution.

## Our capabilities – Your advantage:

- **Understanding customer needs**: Detailed requirement gathering
- **Information transparency**: Precise and updated documentation,
- **System traceability: D**etailed Bill of Materials (BOM)
- **Repeatability**: Optimization of wiring & cable fixtures
- **Ability to ramp up**: In-house production flexibility
- **Timely sourcing**: Easy procurement through trusted partners
- **Skilled Labor**: Cost effective resources
- **Quality**: Inherent in our core values Agile purchasing department
- **Extended reach**: Global delivery system
- **Continuous support**: Established warranty system and worldwide support to serve your needs

# Conclusion.

## Most important Do's

- Minimize engineering, use it wisely and focus on engineering key competences
- Pick the right partners and products
- Build-in reliability and flexibility
- Use the same strategy on software
- Minimize internal wiring, optimize system build.
- Prepare for Documentation and CE.
- Standardization (design only ones)
  - Include future needs & expectations
- Use REAL specifications for TEST, don't Under- or Over-specify your instruments and use the "best in their field" suppliers.
- Use a Mass Interconnect interface.
  - Provides reliability and Flexibility
- Use well established software tools and build-in standardization and modularity.
- Disadvantage of Mass Interconnect
  - Use modules dedicated to test
- Thanks to standardization no issue
  - Each building block is CE and has its own documentation.

# Conclusion.

## Most important Don'ts

- I am an Engineer and can design and build the tester myself.
- I do not need partners as I can do all myself, I am the designer of the DUT.
- Mass Interconnect is expensive
- I use my own software is much cheaper a student or stagier will design it for me
- I let my operators connect to the DUT in production, using our own cables.
- I designed the system and I am always here, I do not need Documentation.
- Your engineers should not re-invent the wheel or become your buyer.
- Use partners that add to your own key competences, together you are stronger
- Saving money on the interface will fire back on you in the long run.
- Use software that is designed for test and If you need support use the correct tools that add to your own expertise.
- Cables are a cost and a reliability and stability risk and add to the complexity.
- But what if you have multiple testers in multiple locations, you become ill or worse.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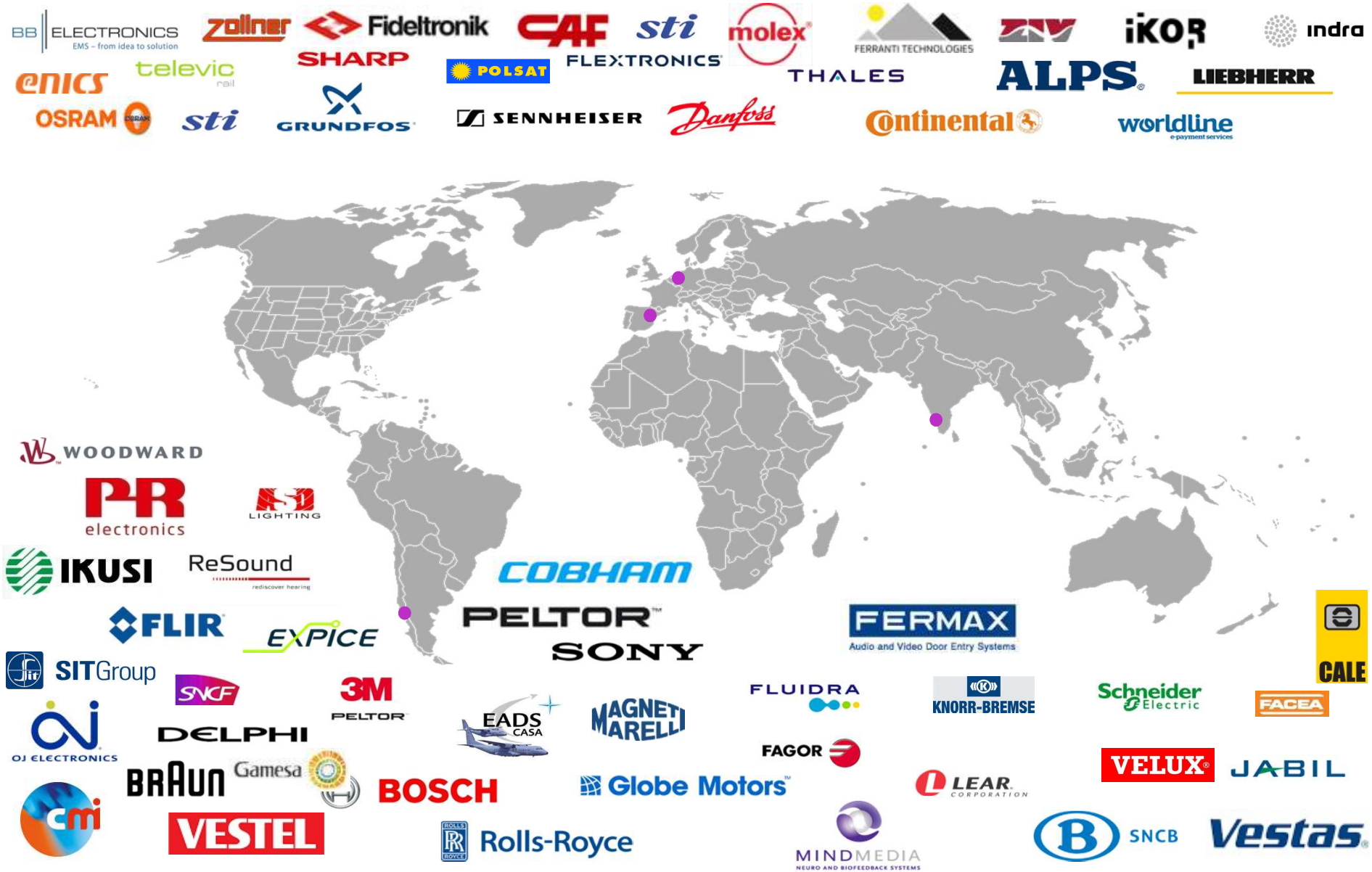

# Thanks you for your attention, Any Questions?


**Represented in your country by:**

CIM.AS



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