



Fast resonance testing using LabVIEW RealTime

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NATIONAL INSTRUMENTS

LabVIEW

CERTIFIED DEVELOPER

Microsoft
CERTIFIED
Professional



Agenda

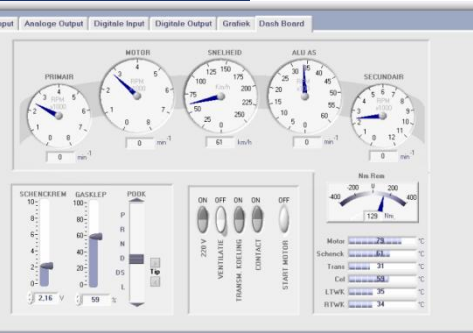
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- **Company Introduction**
- **Challenge**
- **Measurement principle**
- **Measurement solution**
- **Product handling challenges**
- **Robot alignment using Vision**
- **Total machine concept**



Company Introduction



- **System integrator of specialized testing systems**
- **More than 10 years experience, over 40 people**
- **Delivering services and turn-key solutions to a wide variety of industries.**
- **Concurrent Engineering partner joining you in all your project steps**



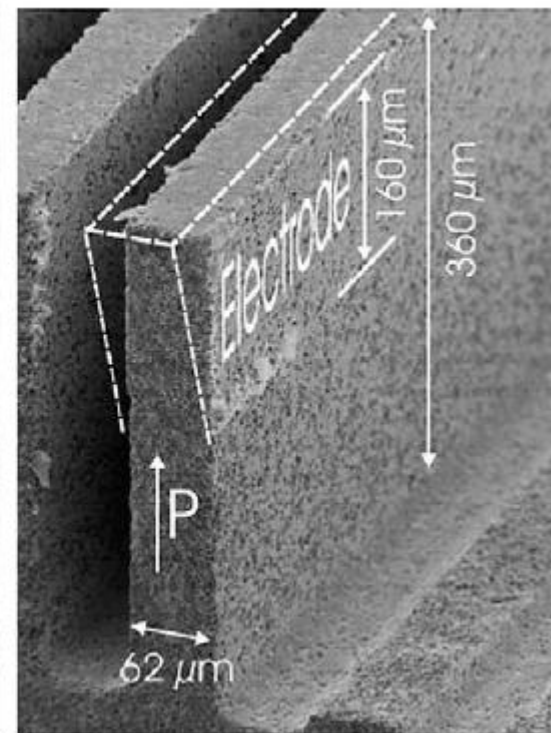
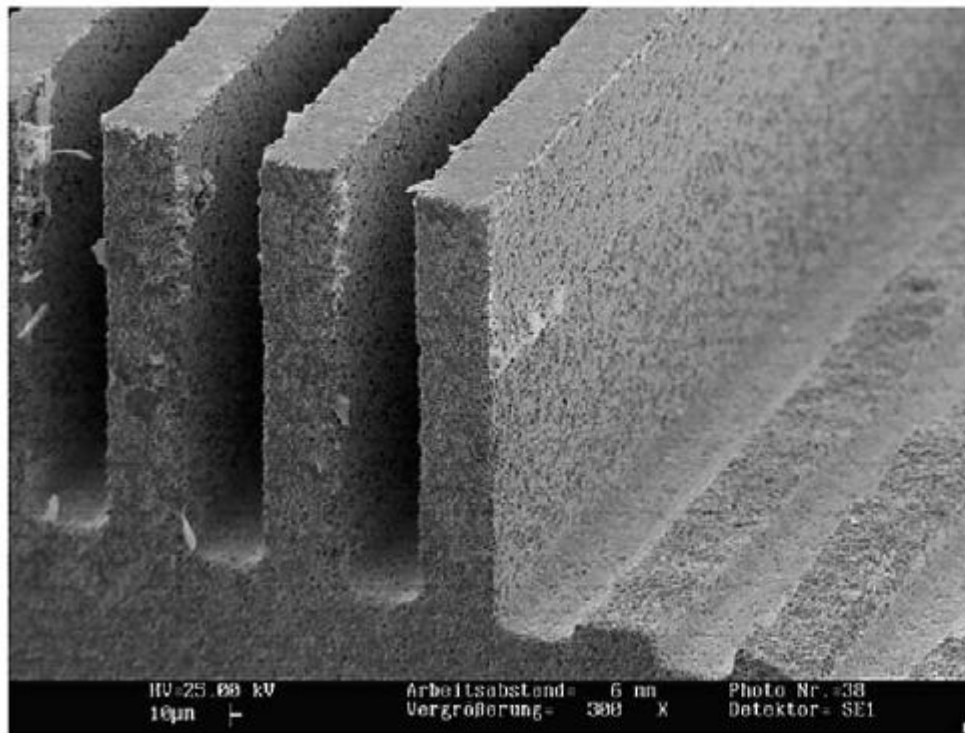
Technical Solutions Towards Quality



Challenge : Printhead parts

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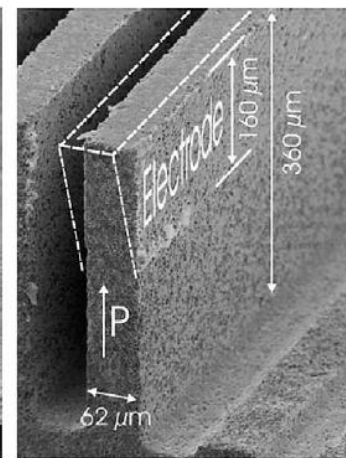
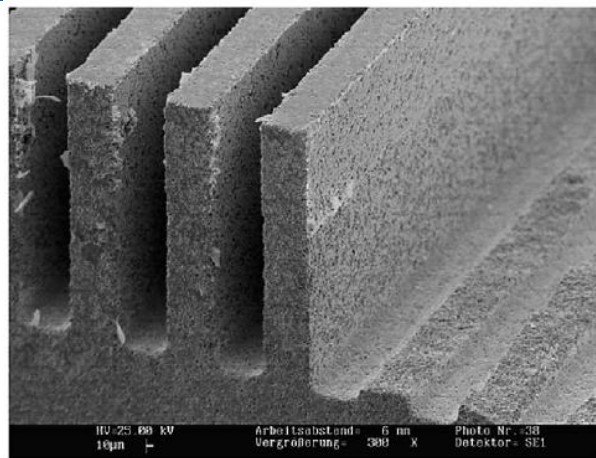
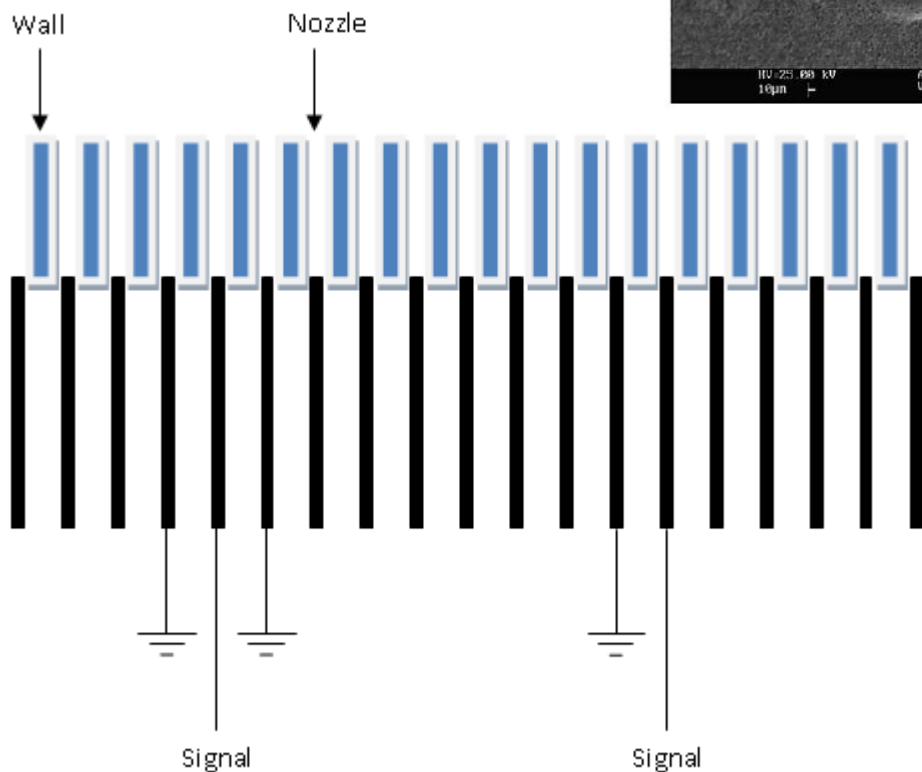




Challenge : Printhead parts

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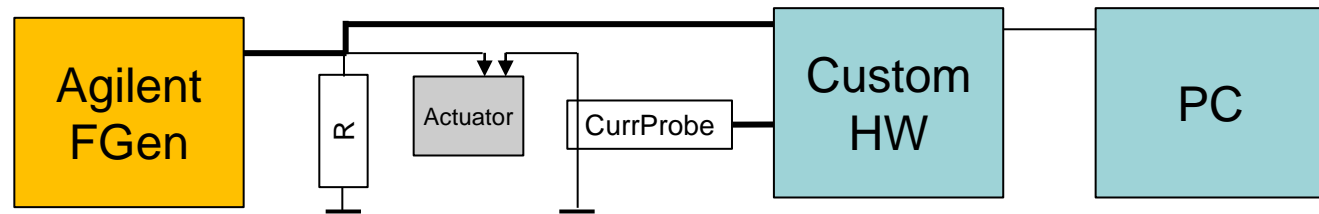


Challenge

- Replace existing hardware
- Increase equipment capacity
- Flexible measurement possibilities
- Mixed product batches
- Unassisted operation for at least 1 shift
- Limit cleanroom floorspace to minimum



Measurement Principle : Existing equipment



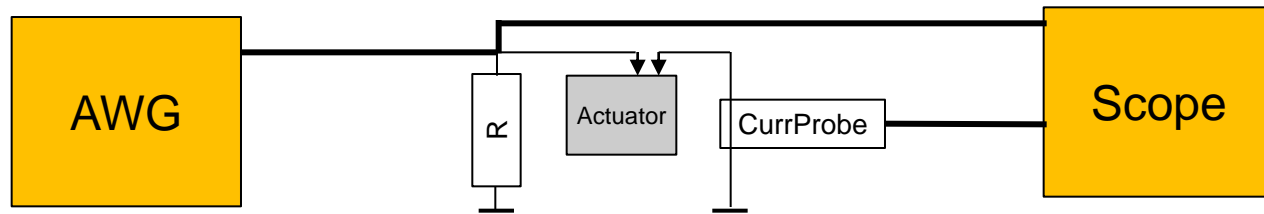
- Agilent Fgen is triggered by Custom HW
- RMS measurement in Hardware
- Results transmitted to PC (Serial)

Disadvantages

- Dedicated hardware per product type
- Type change reconfiguration required
- Single measurement / analysis type



Measurement Principle : New Setup



- NI AWG
- NI Scope card
- Analysis completely done in Software

Advantages

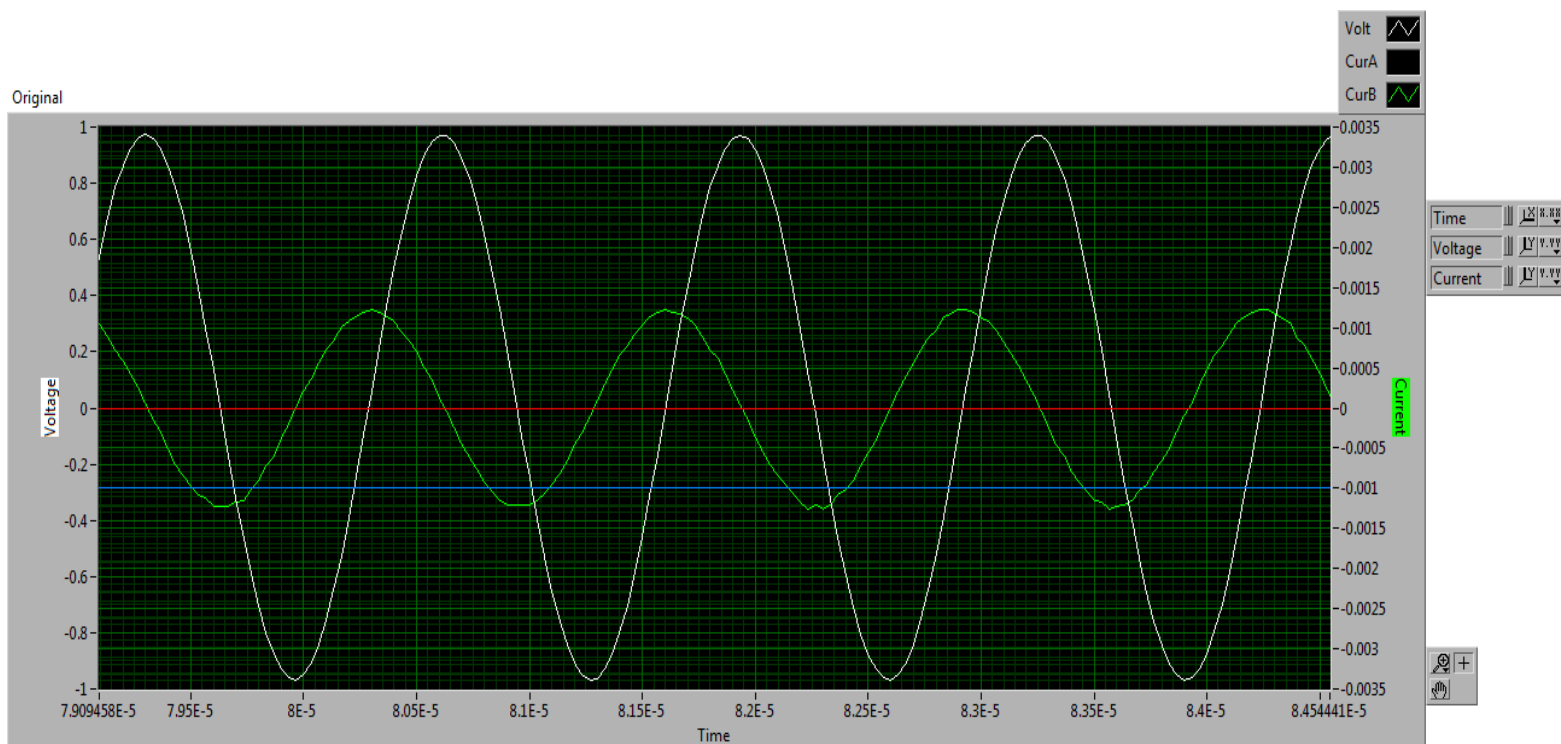
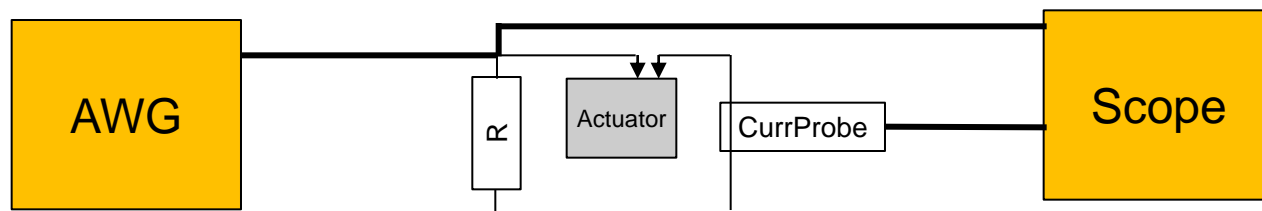
- 'Simple' hardware setup (only Routing signals)
- Software reconfigurable measurement types
→ Configurable per test



Measurement Principle : New Setup

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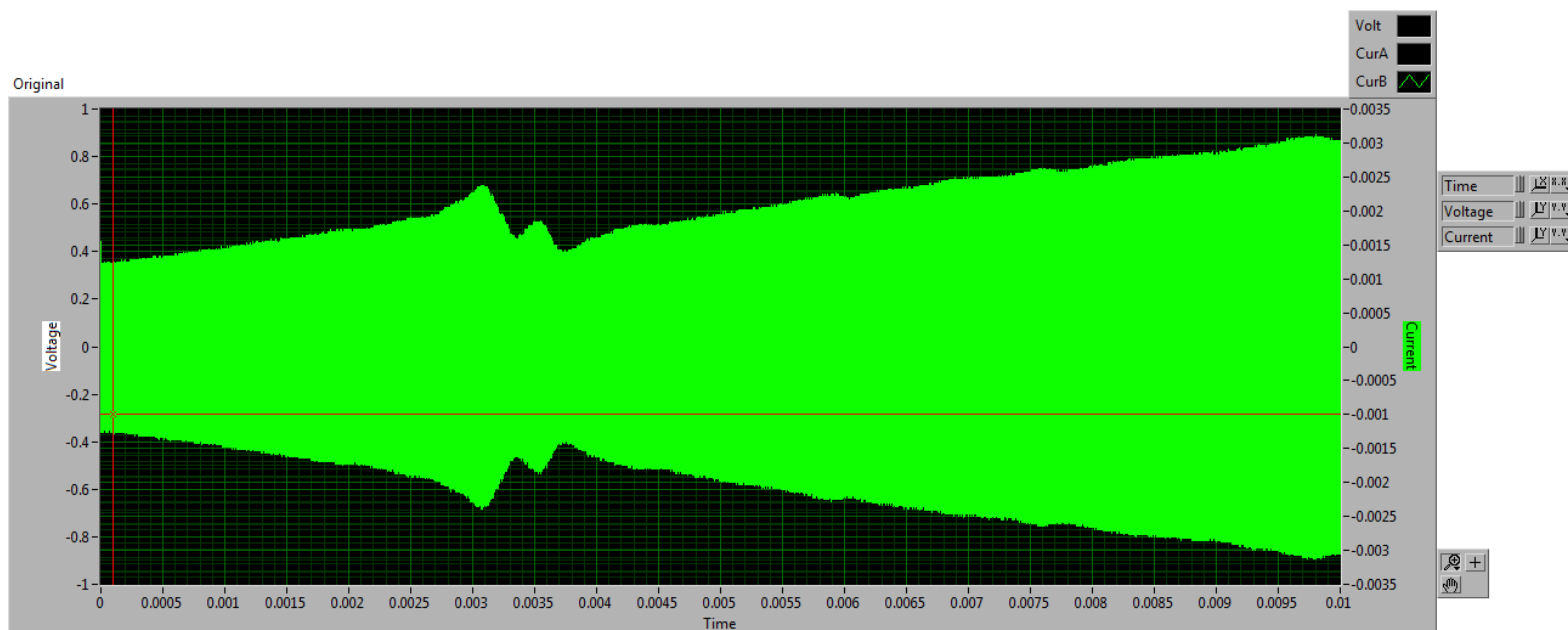




Measurement Principle : Current Response

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700 KHz

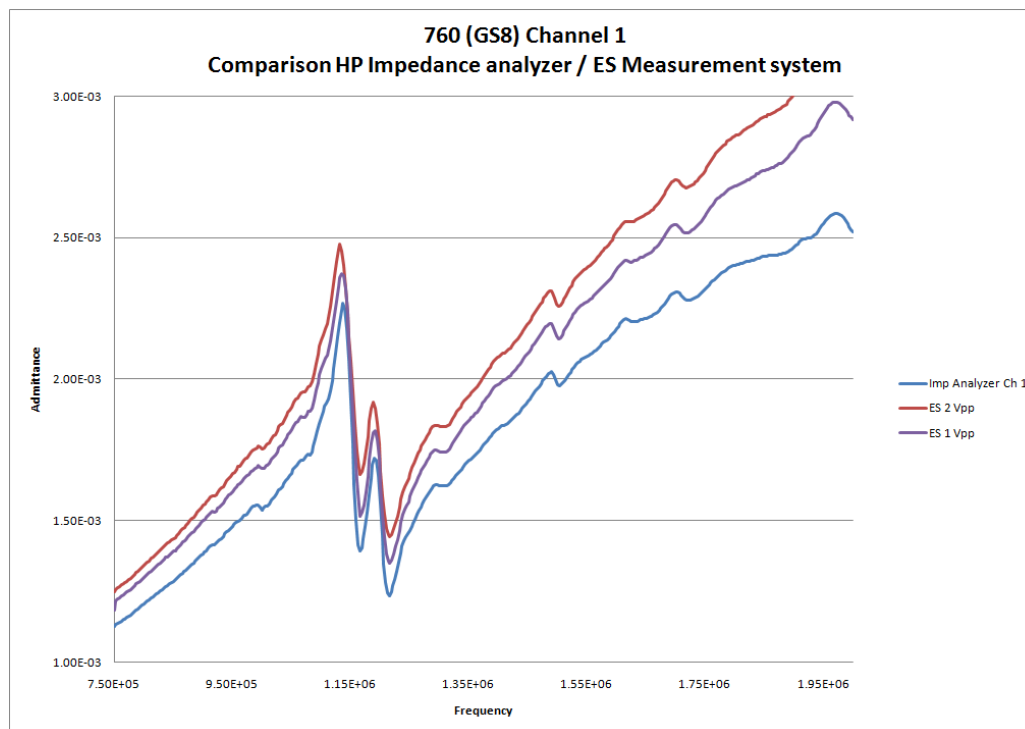
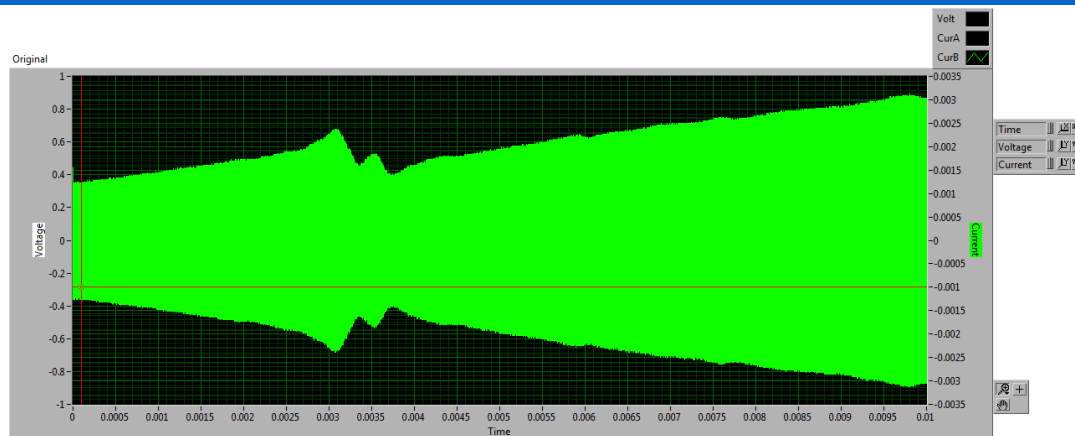
2.2 MHz



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Measurement Principle : Current Response





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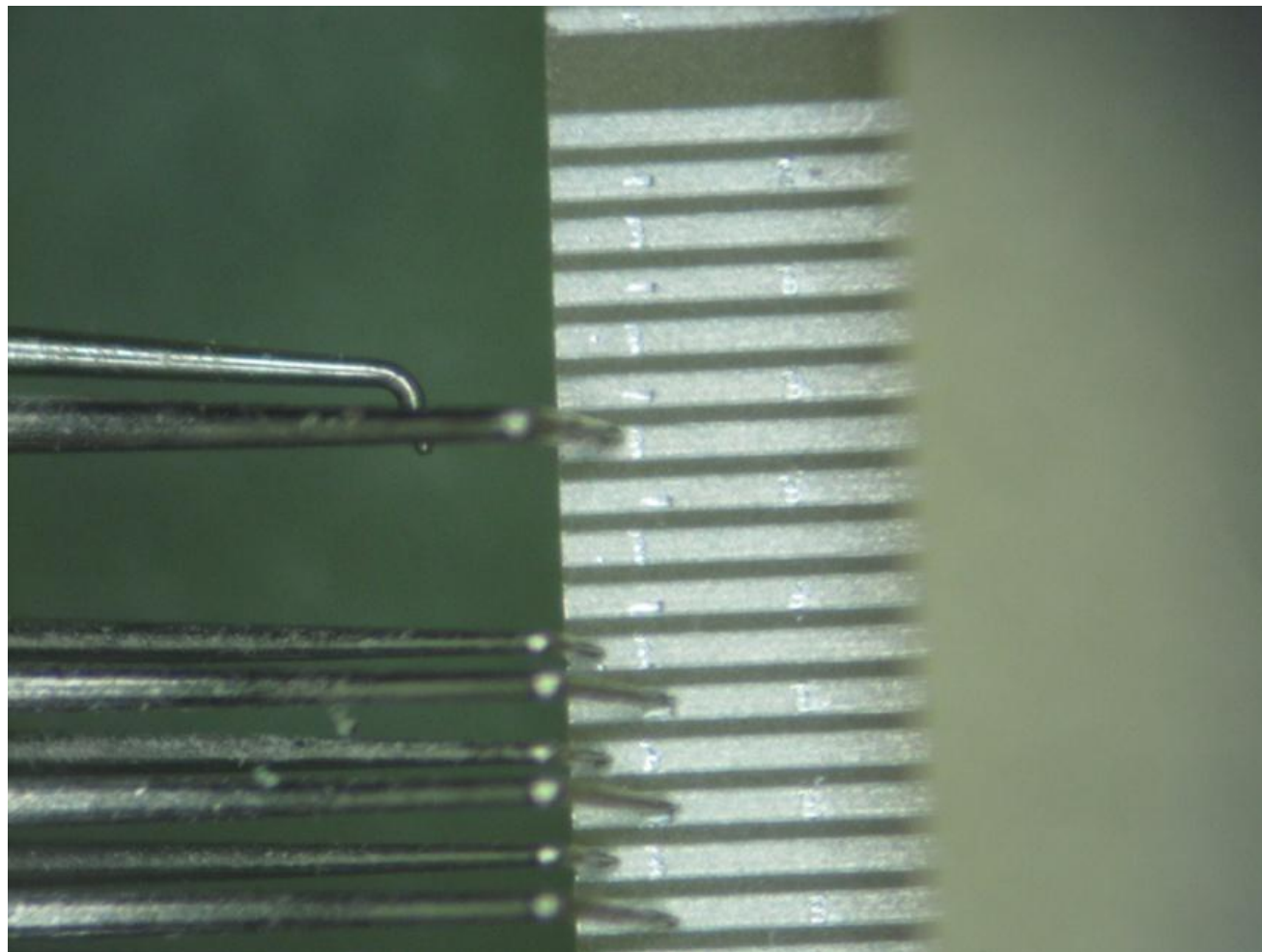
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Measurement Principle : Probing

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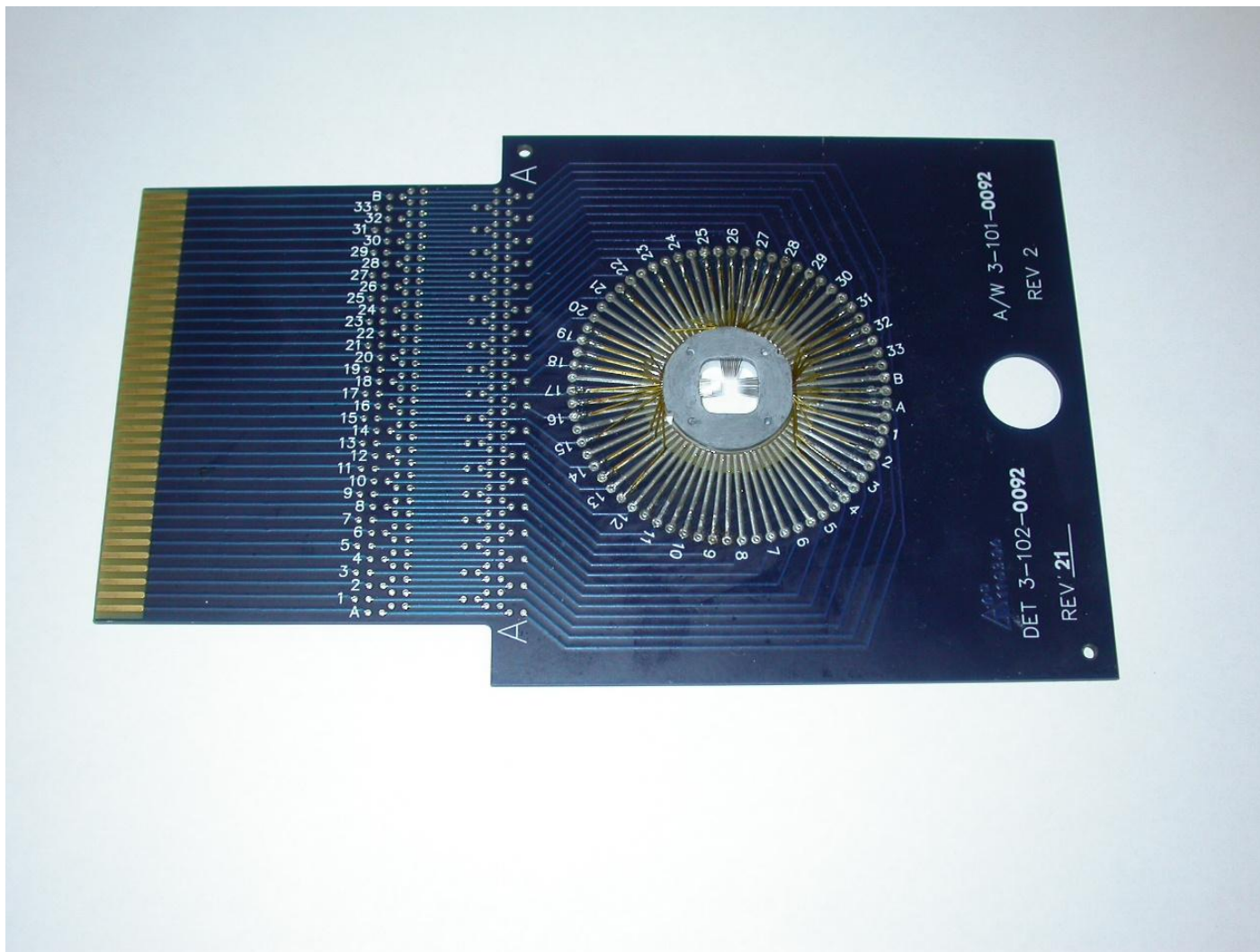




Measurement Principle : Probing

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Measurement principle :Cycle

- 1. Download Test wave form in AWG**
- 2. Arm AWG and Scope card**
- 3. Route the signals to and from the test probes**
- 4. Trigger AWG and Scope card**
- 5. At the end of the measurement switch to next channel and repeat until all channels are scanned**
- 6. Read data from Scope in parallel and analyze data**

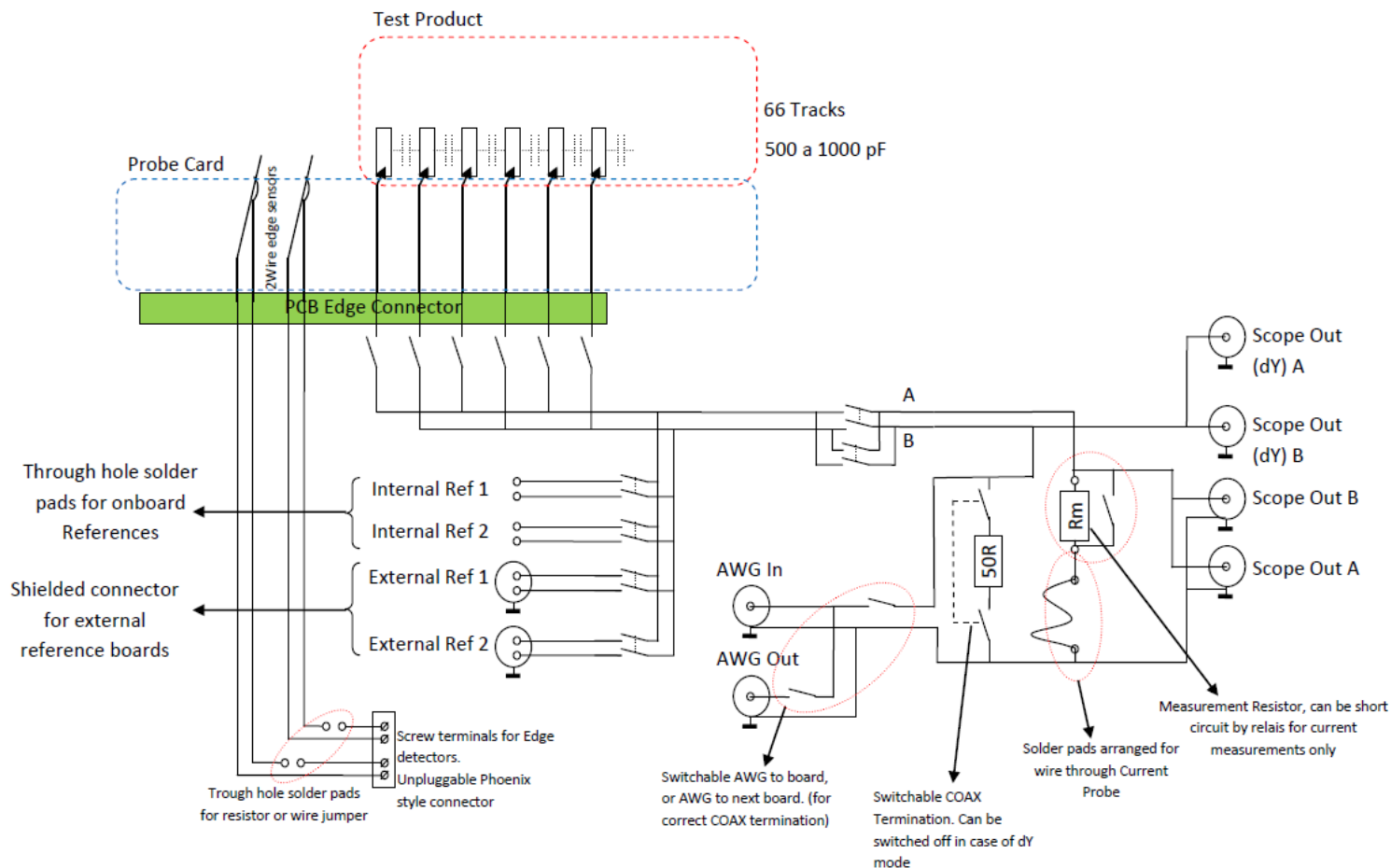


Measurement Principle : Probe card interface

Revision b (2009 – 12 – 11)

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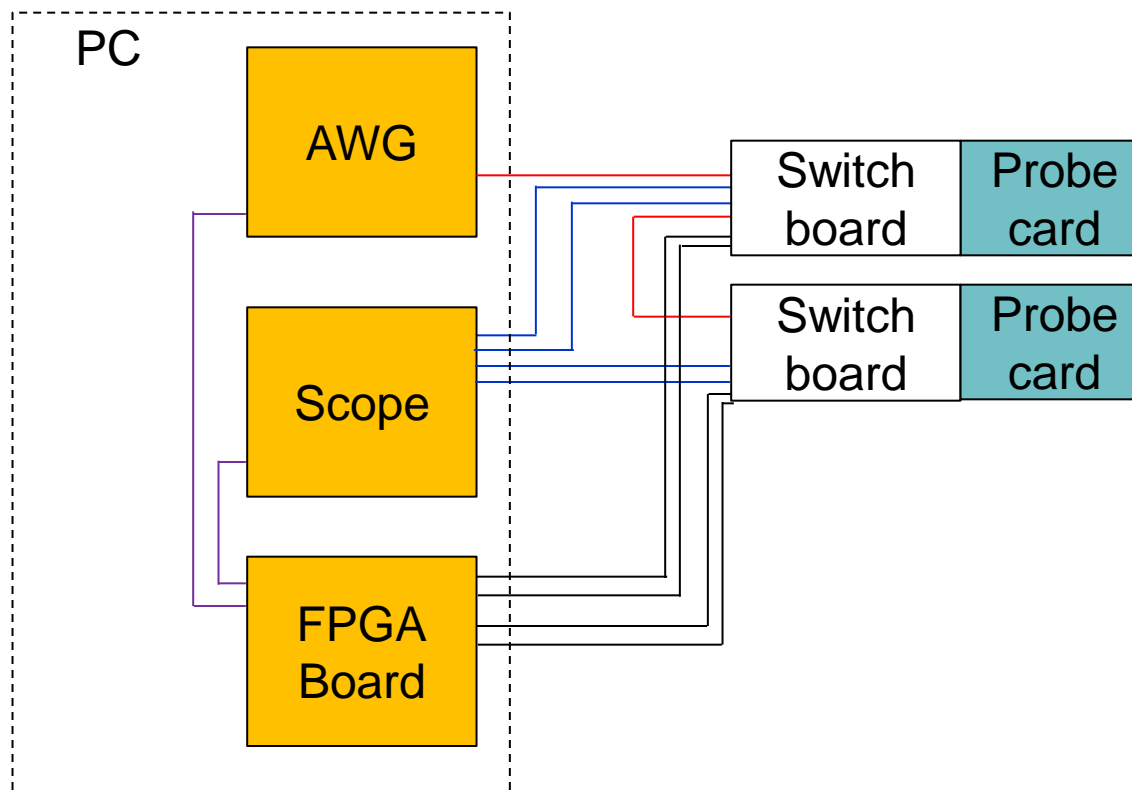




Measurement Principle : Full Setup

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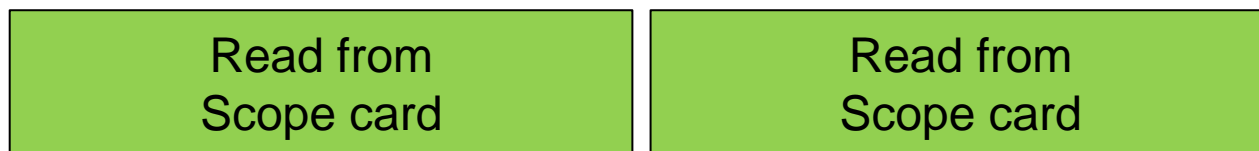




Measurement Principle : Data flow between ch.

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Measurement principle :Cycle

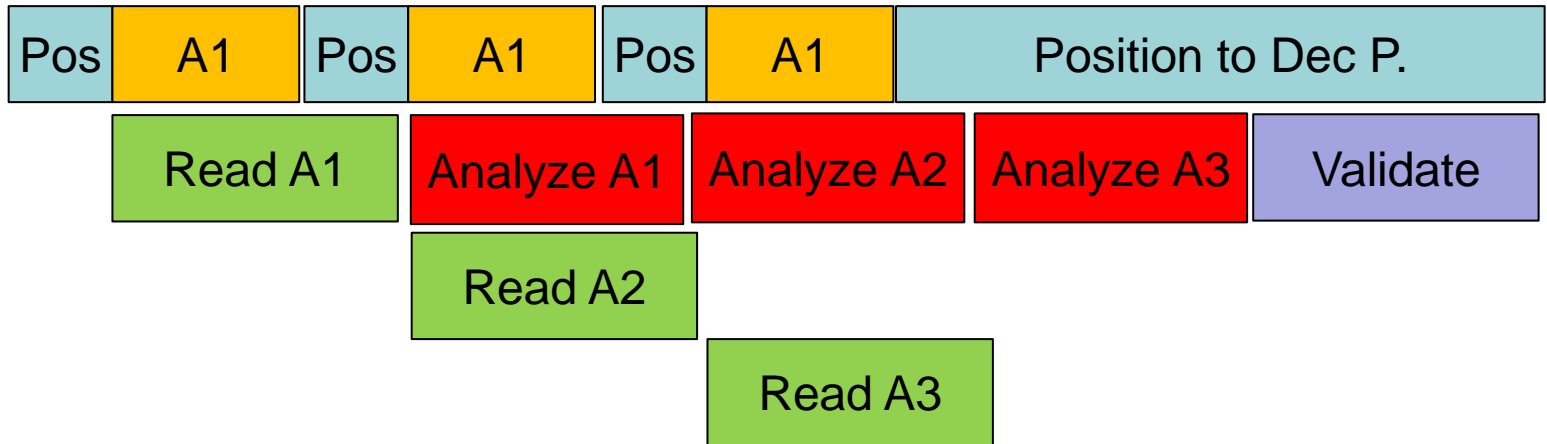
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- 6. Read data from Scope in parallel and analyze data**



Measurement Principle : Between actuators

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Product handling challenges

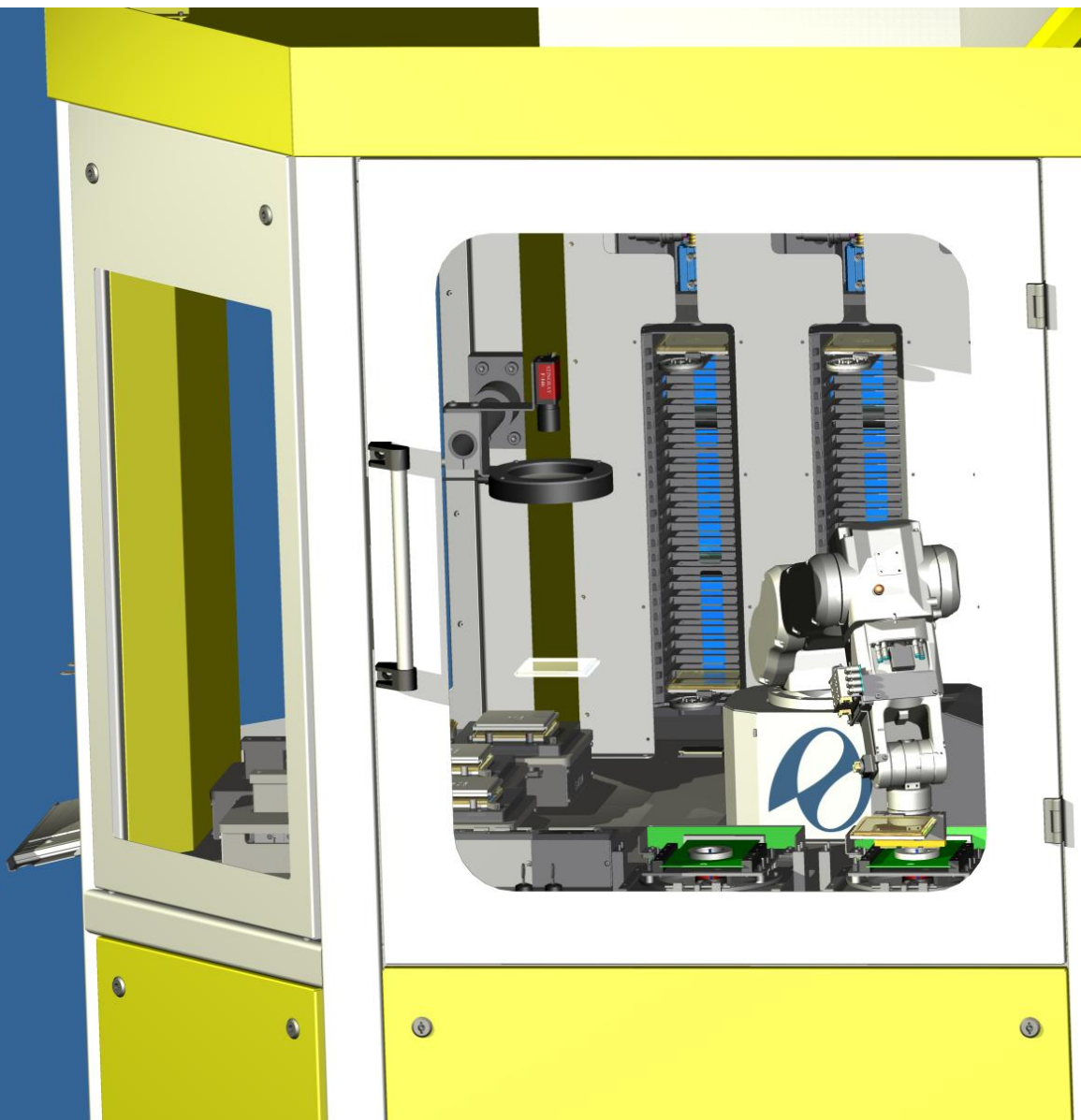
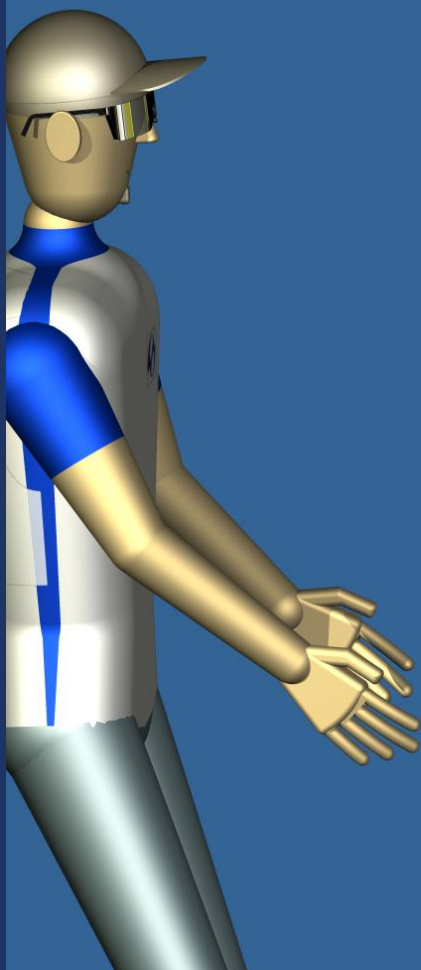
- **'Batch loading' of products for at least 1 shift**
- **Tray handling**
- **Actuator handling**
- **Actuator Alignment for probing**
- **Probing accuracy (+- 20 um)**



Total machine concept

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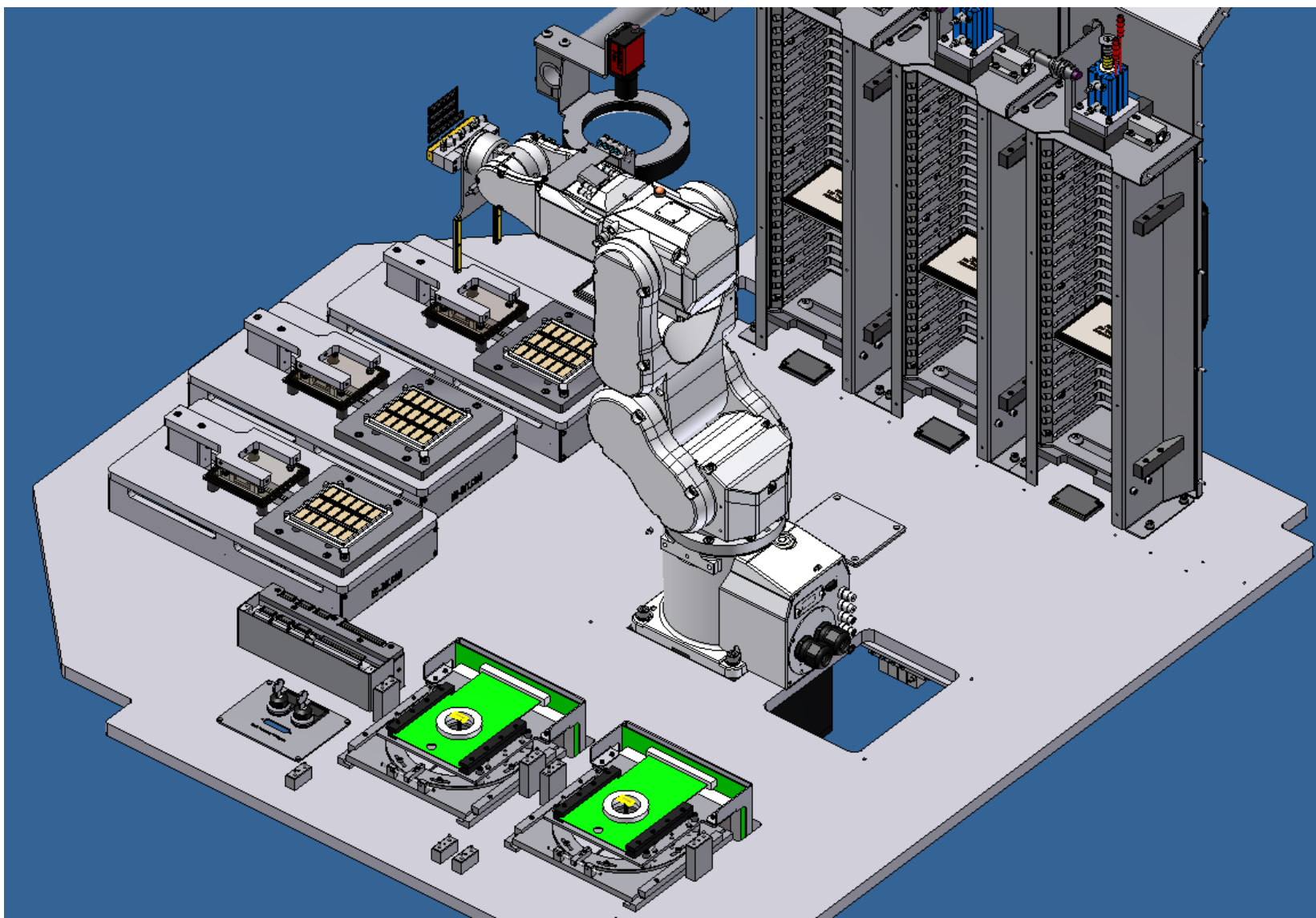




Product handling : Machine overview

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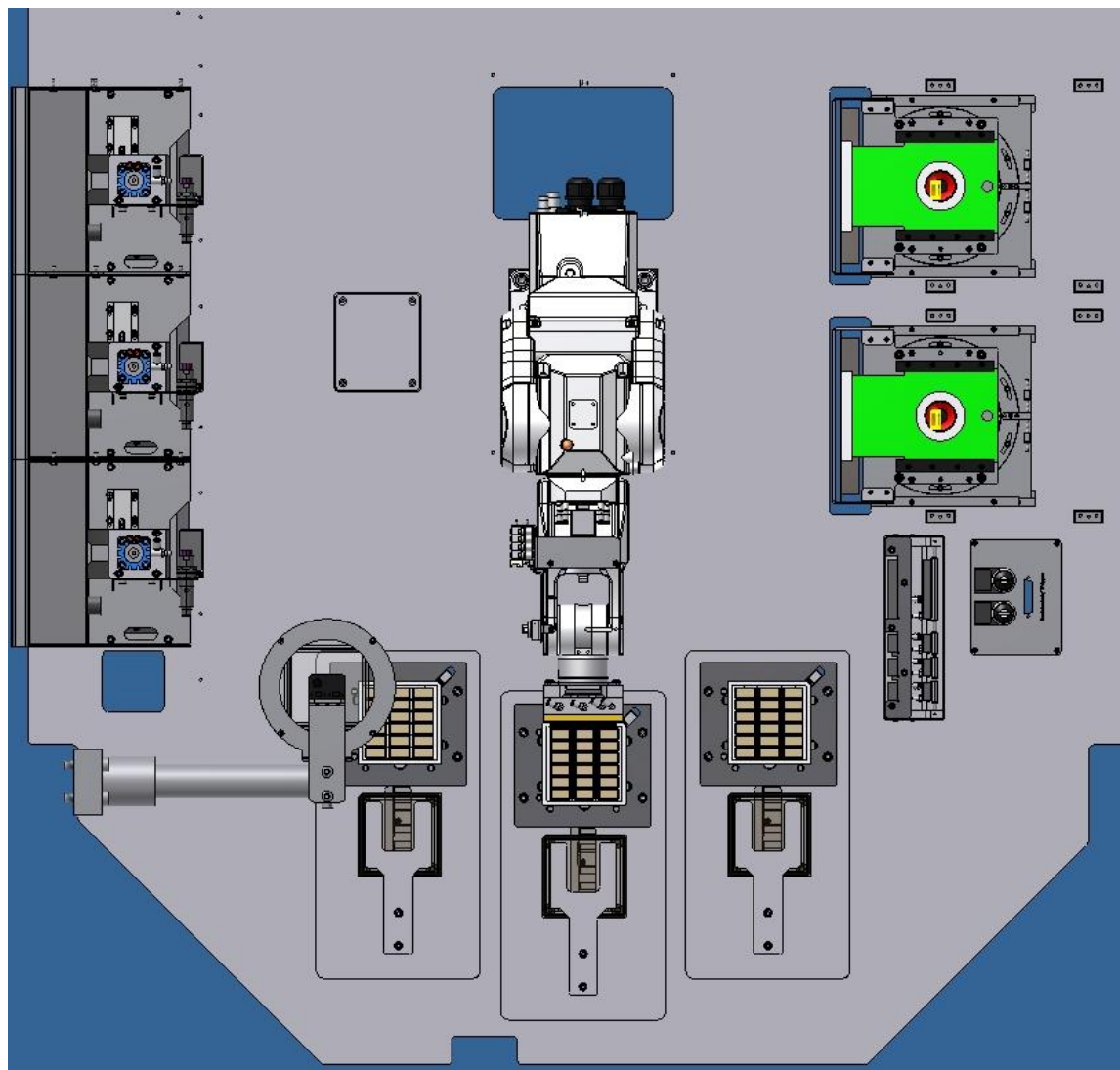




Product handling : Machine overview

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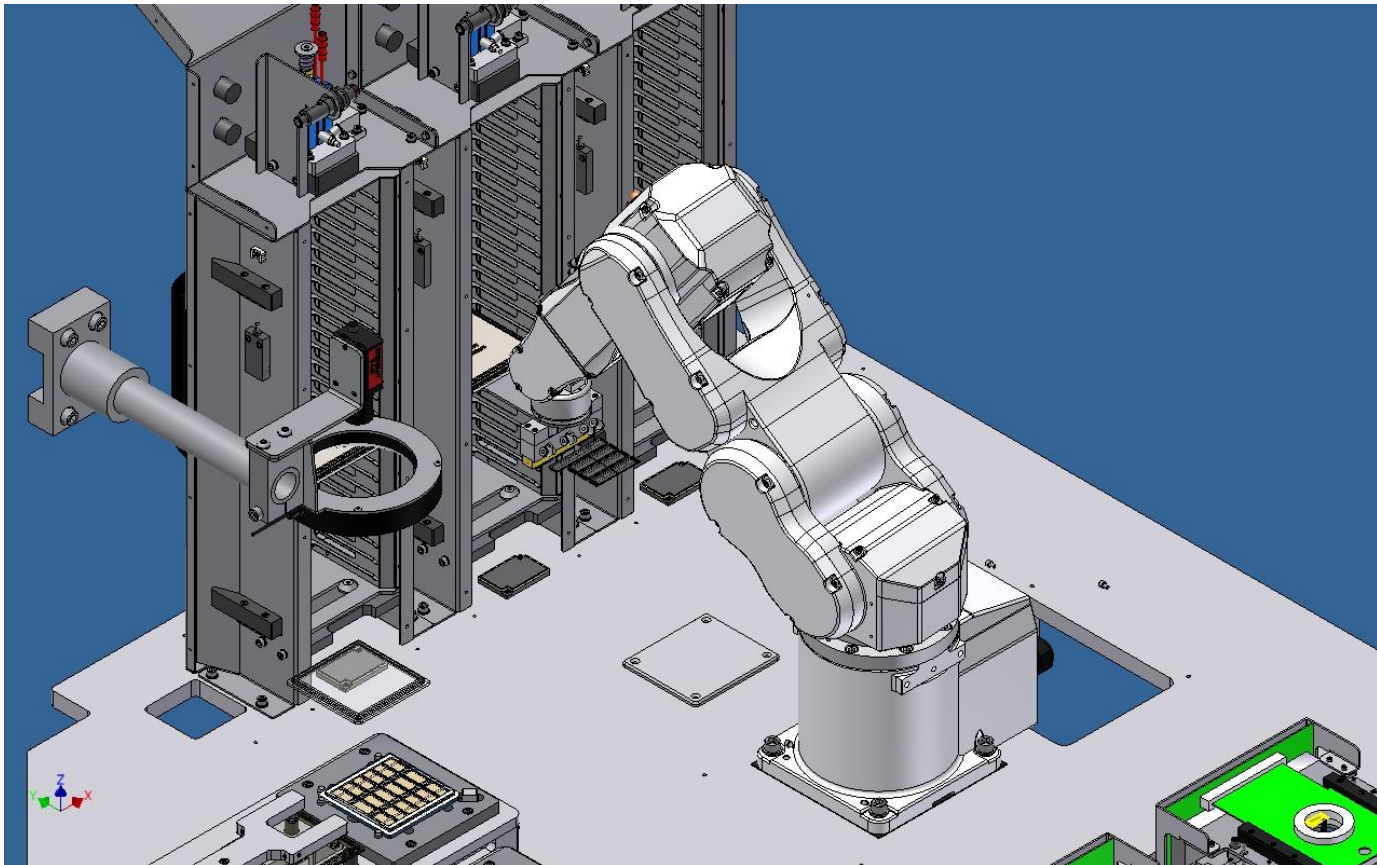
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Product handling : Batch loading

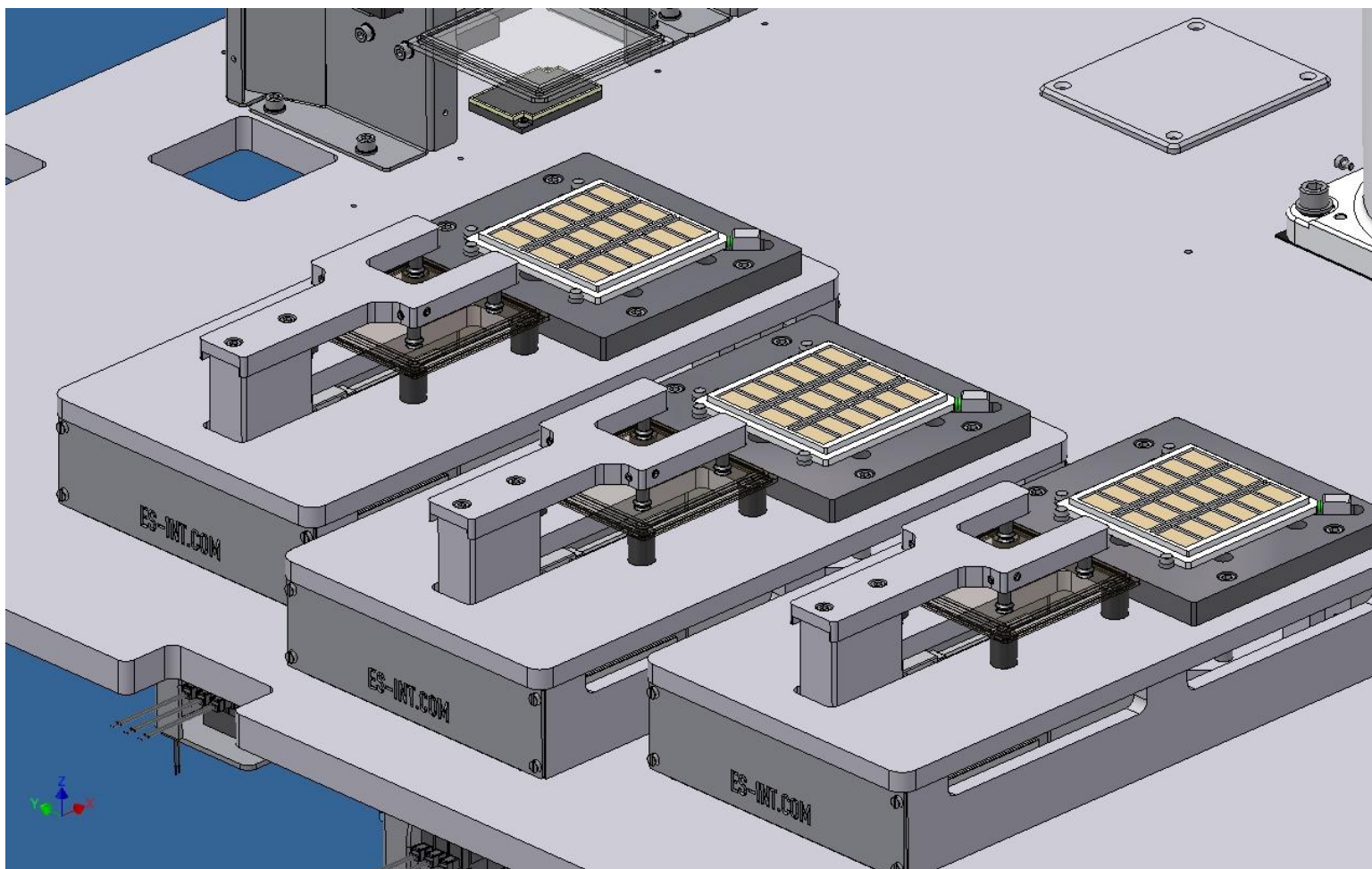
- 3 Carriers which contain several trays
- Actuators in Trays with covers for dust reduction





Product handling : Tray handling

○ 3 Traystations for cover removal

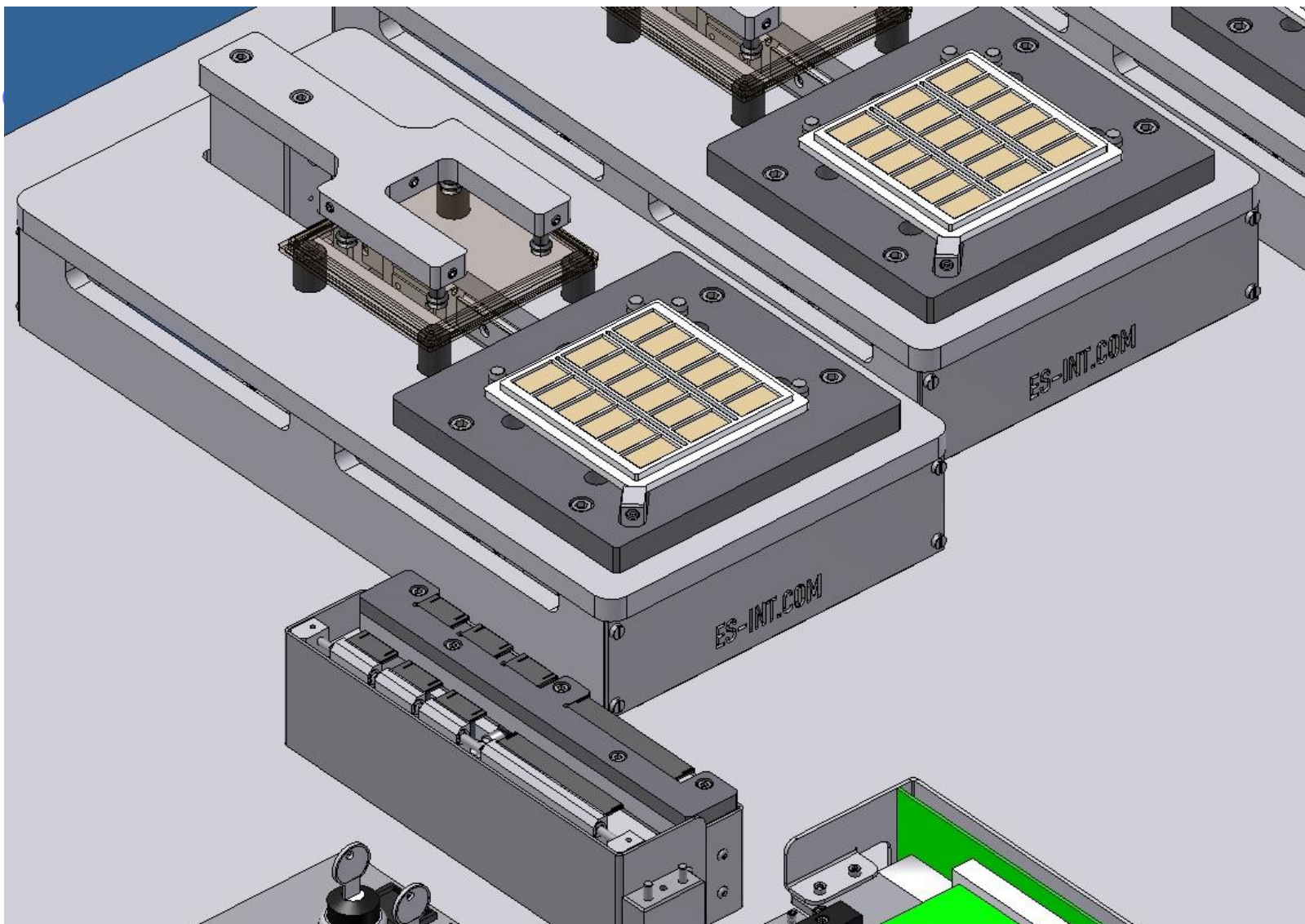




Product handling : Actuator alignment (rough)

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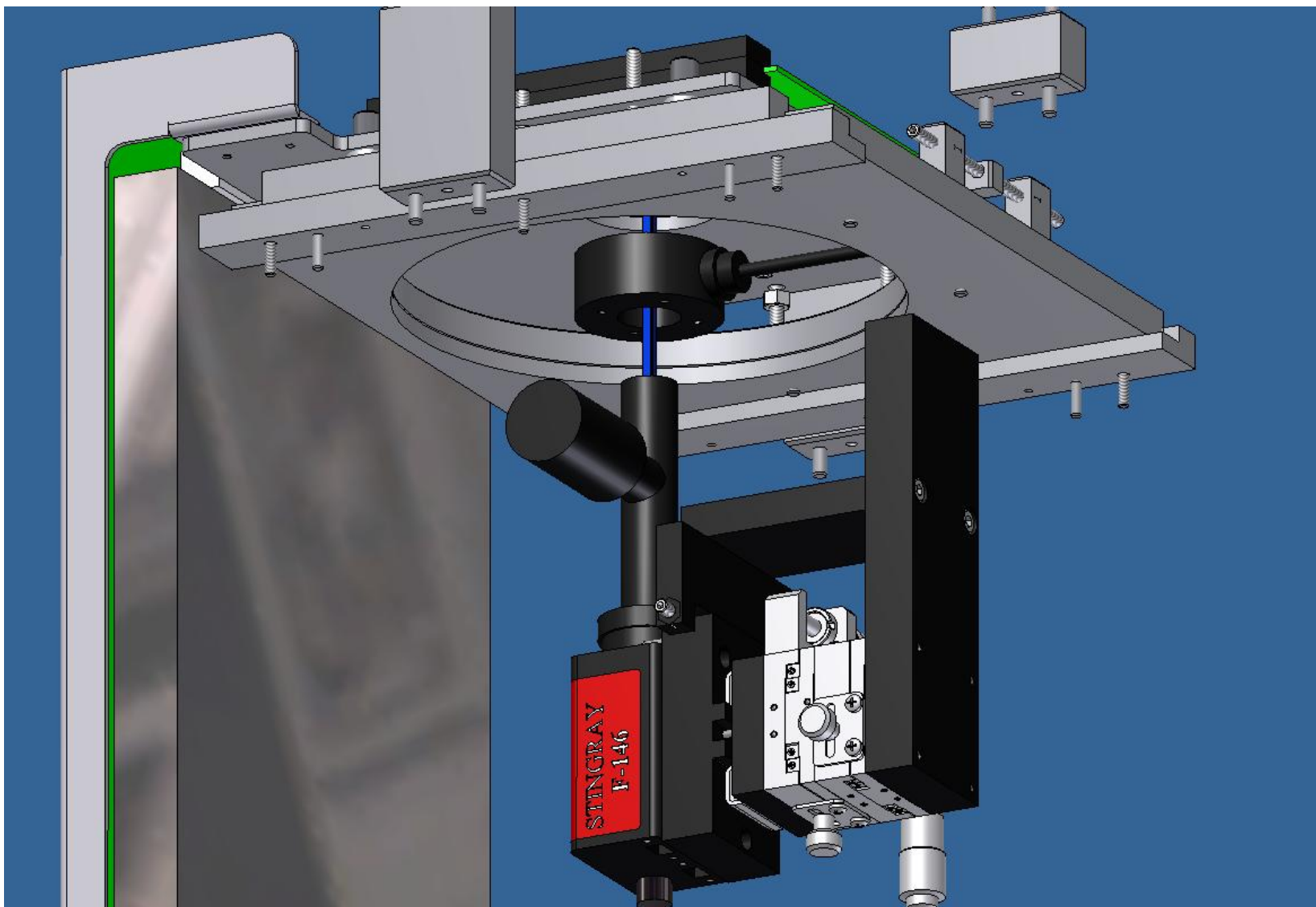




Product handling : Actuator alignment (fine)

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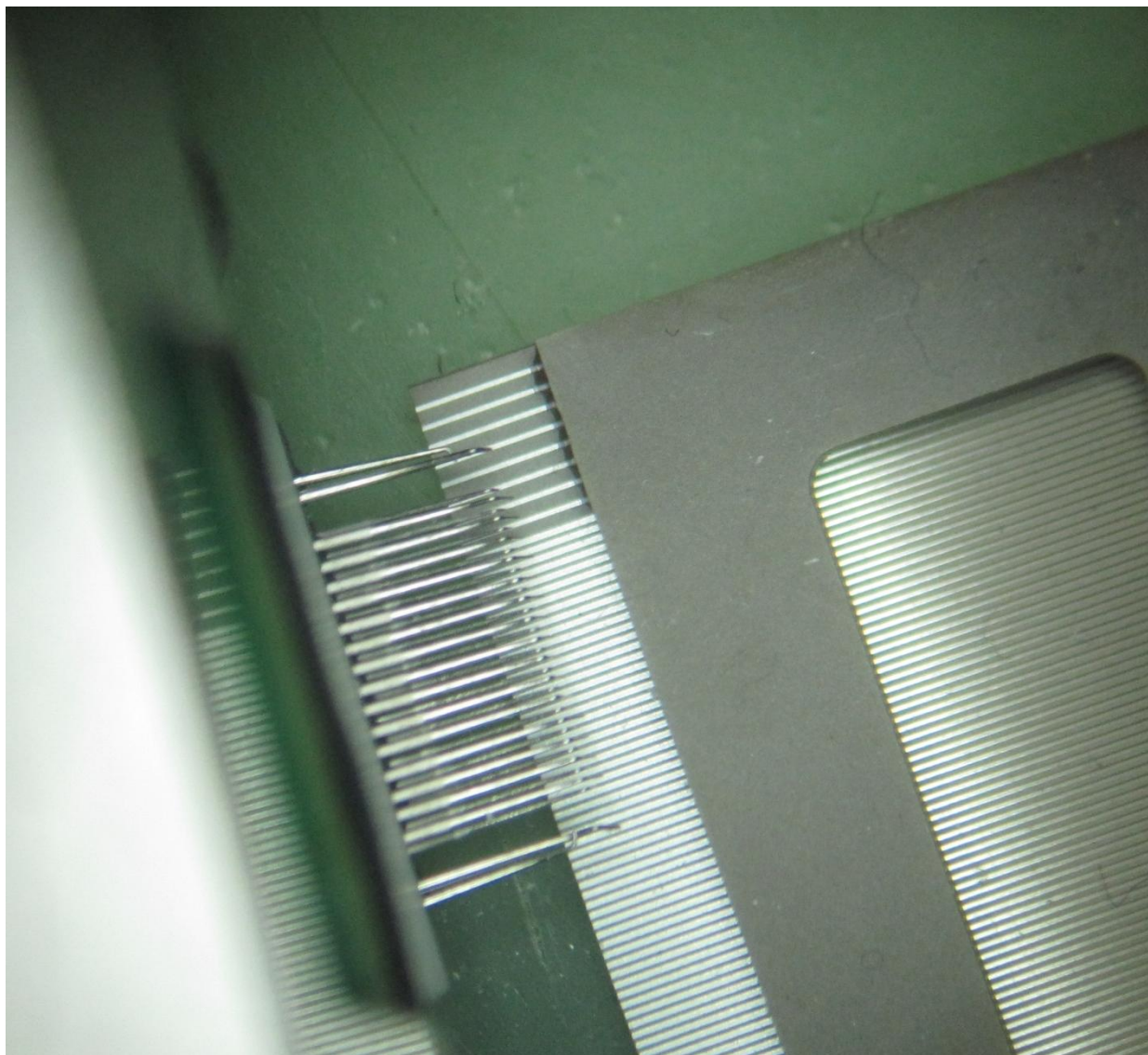




Vision alignment

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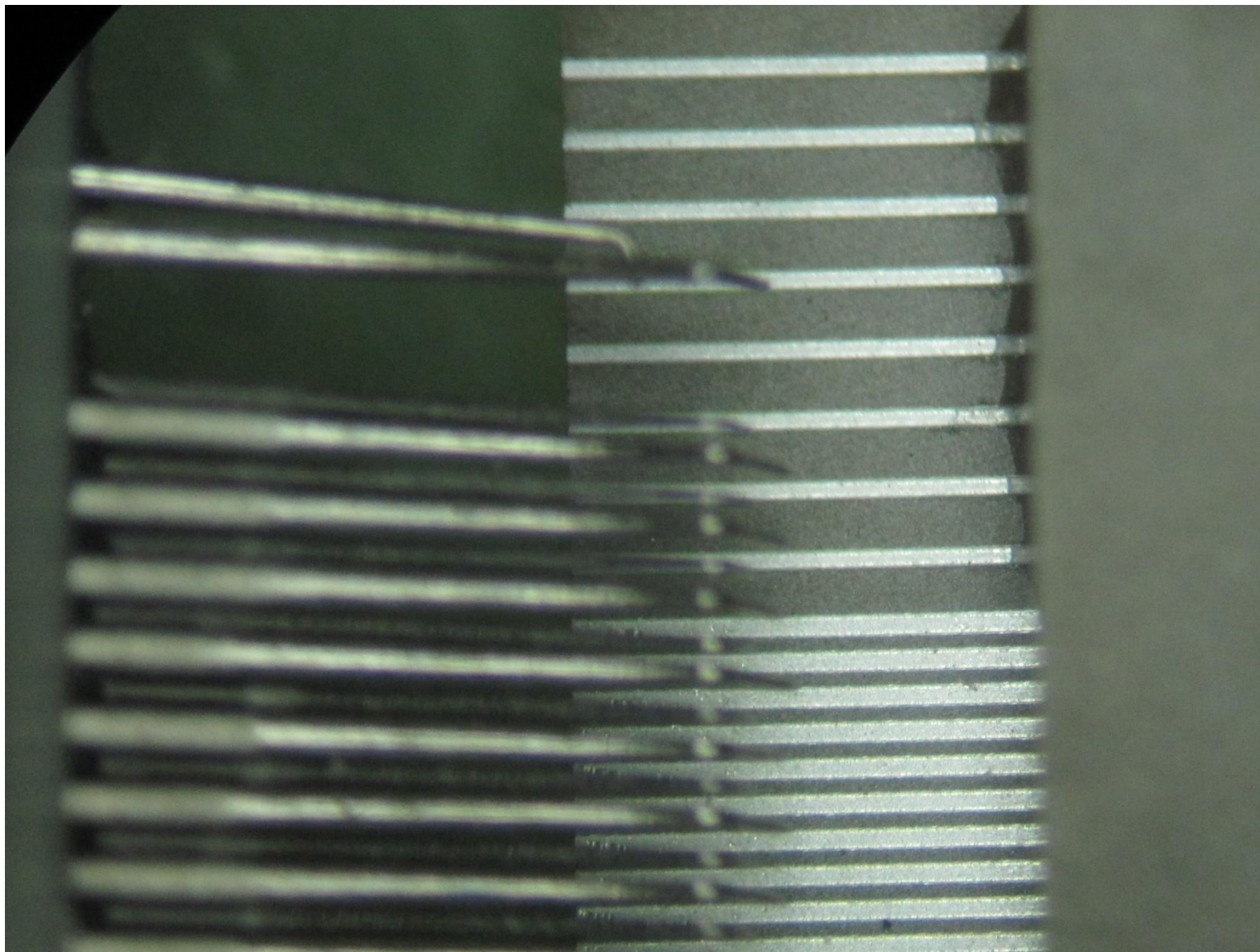




Vision alignment

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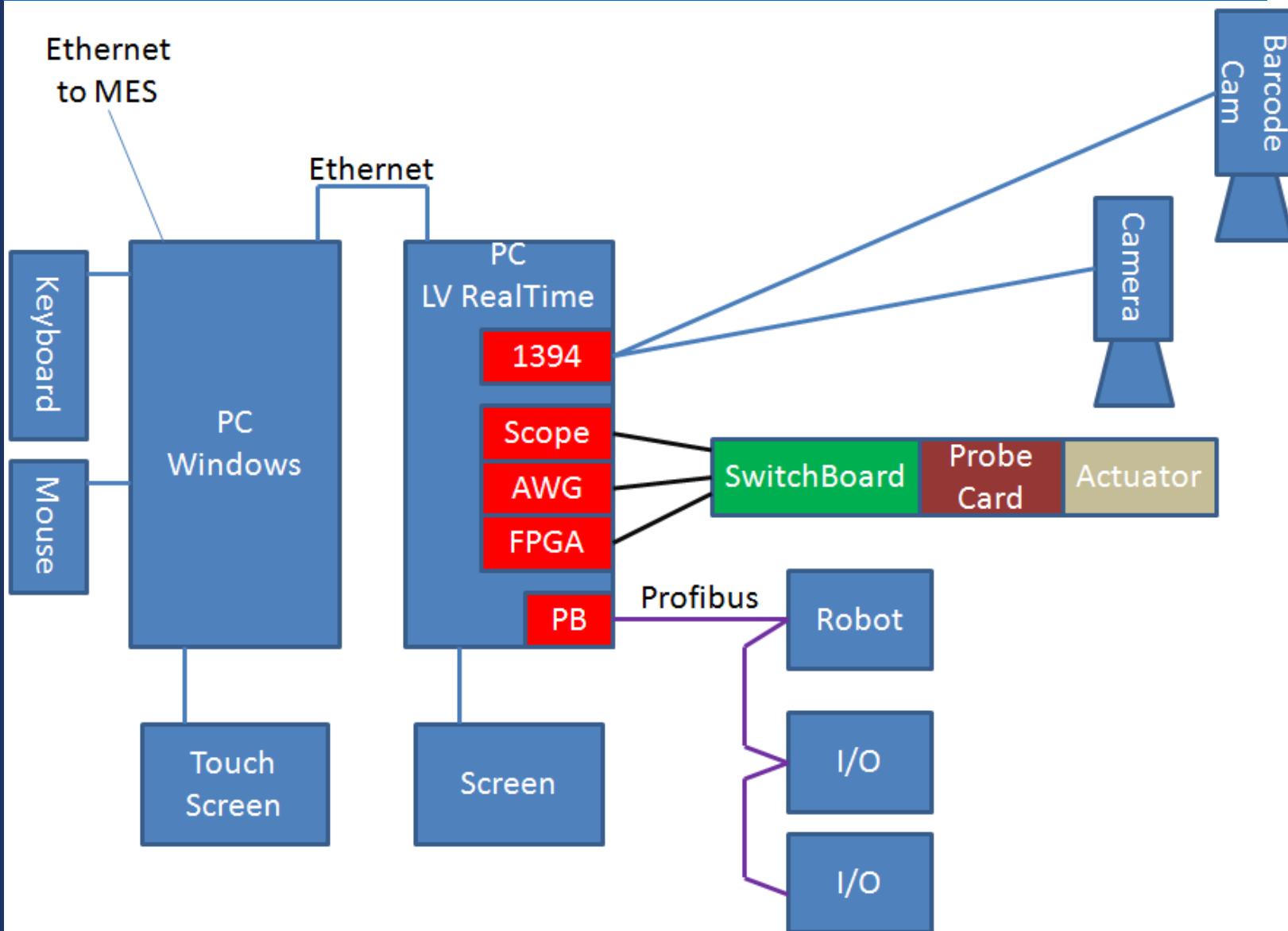
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Total machine concept

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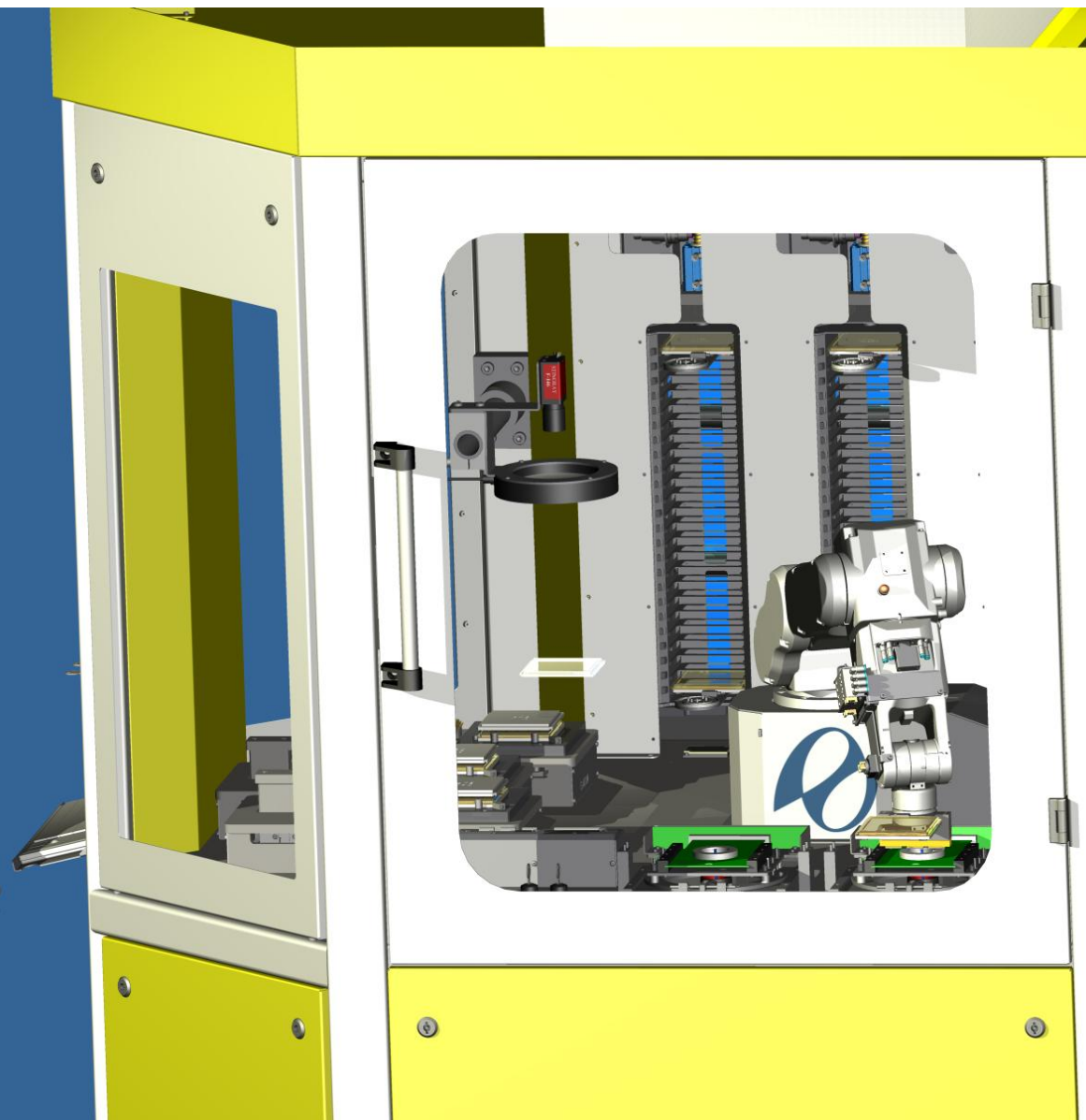
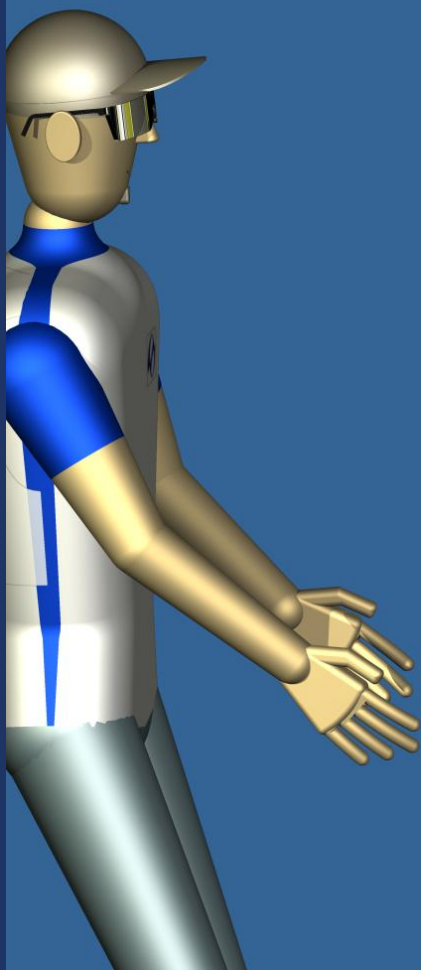




Total machine concept

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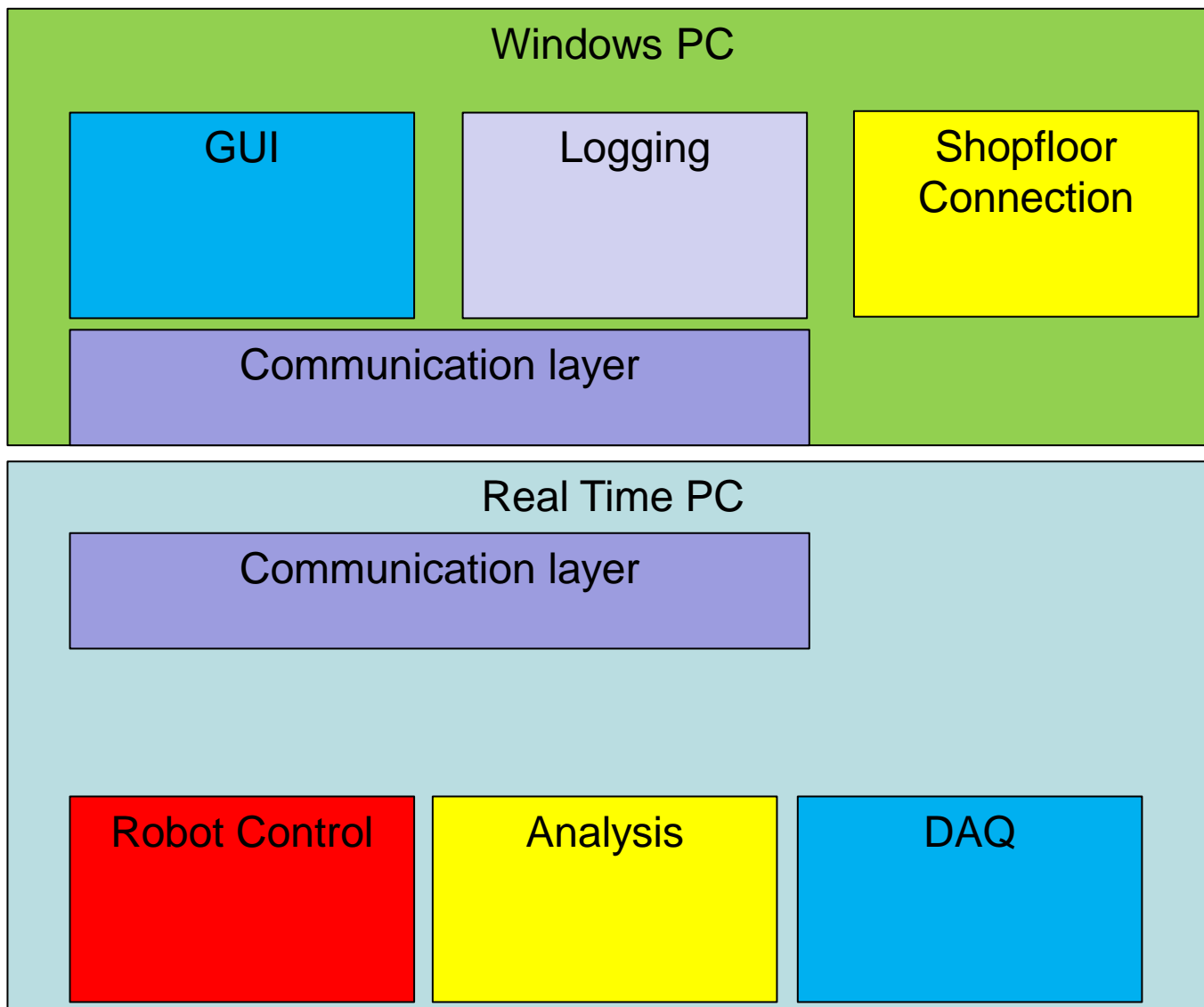




Software architecture

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Conclusions

- **NI Modular instruments highly flexible solution**
- **LabVIEW real time guarantees cycle times**
(And keeps ITnS of your machine control PC's)
- **Six axis robot flexibility reduces floor space**



Questions

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Questions ?



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Technical Solutions towards Quality

