SWTEST
PROBE TODAY, FOR TOMORROW

SWTest Conference 2024

turbodynamics
MADE IN GERMANY

Automation of Large and Heavy Probe Card Exchange, Handling and Storage

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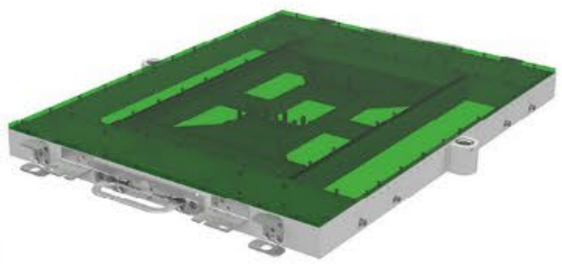
Introduction

New Generation Probe Cards → **Problems, Risks and Costs**

- **Large**
- **Heavy >20kg**
- **Very expensive**



Ergonomic handling limits

High damaging risk

- from test cell to storage
- at maintenance

?

Automation Issue:

- **Test floor environment is requiring**
- **5 axis collaborating robots**
- **Weight handling limit is < 20 kg**
- **Very high initial invest & risk for full automation** at test floor and maintenance

Resolution:

- Manual portal robot
- Precision alignment support for operator
- Weight handling capability > 45 kg
- Step by step automation scalability
  - Semi automation
  - Full automation

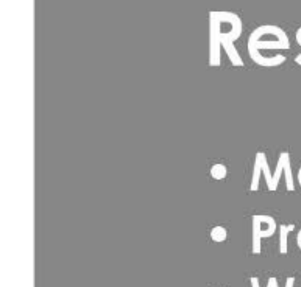
Probe Card Storage | **Semi/Auto Probe Card Transport** | **Probe Card Exchange**

Production Storage

Engineering/ Maintenance Storage

Interface for Box Storage

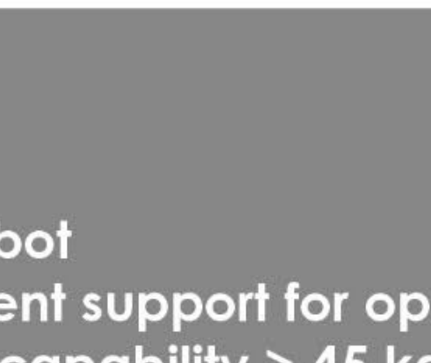
Auto Probe Card Trollex XL



Common Platform Architecture supporting parallel use and scalability

Manual Probe Card Trolley XL

Final Test



Probing

Maintenance

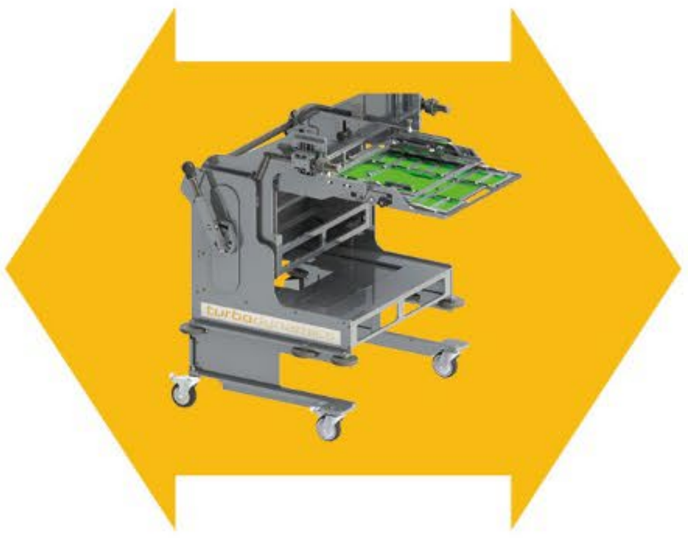
Case Study

3 Years of Production Experience with Semi automated Probe Card Exchange, Handling & Storage

Probe Card Storage

- Automated Probe Card Stocker
- I/O for probe card trolley
- Precision registration with catch bracket technology

Semi/Auto Probe Card Transport



- Manual Probe Card Trolley
- Handling by operator
- Transport by operator or AGV

Probe Card Exchange

- Prober card loading to SACC
- Precision registration with patented catch bracket technology

Learnings:

- **Precision Registration** of Probe Card to SACC most reliable with mechanical support means
- **Trolley needs to provide**
  - **Sufficient compliance** to accommodate floor tolerances
  - **Gripper flip and turn capability** to support removal of probe head cover and orientation change for transport box removal
  - **Easy adaptation to different target heights**
- **Typical maintenance requirement to flip probe card upside down needs support as well** at test floor and maintenance

Conclusion: New Developments of

→ **Catch Bracket Technology** to provide precision registration

→ **2nd Generation Manual Trolley** providing

→ **6 DOF compliance at probe card gripper**

→ **Flip and turn capability**

→ **Drive support for auto height adjustment**

→ **Flip trolley and maintenance tables**

2nd Generation Trolley

- For largest probe cards
- Drive supported auto adjusts
- Probe card flipping & 90° turn

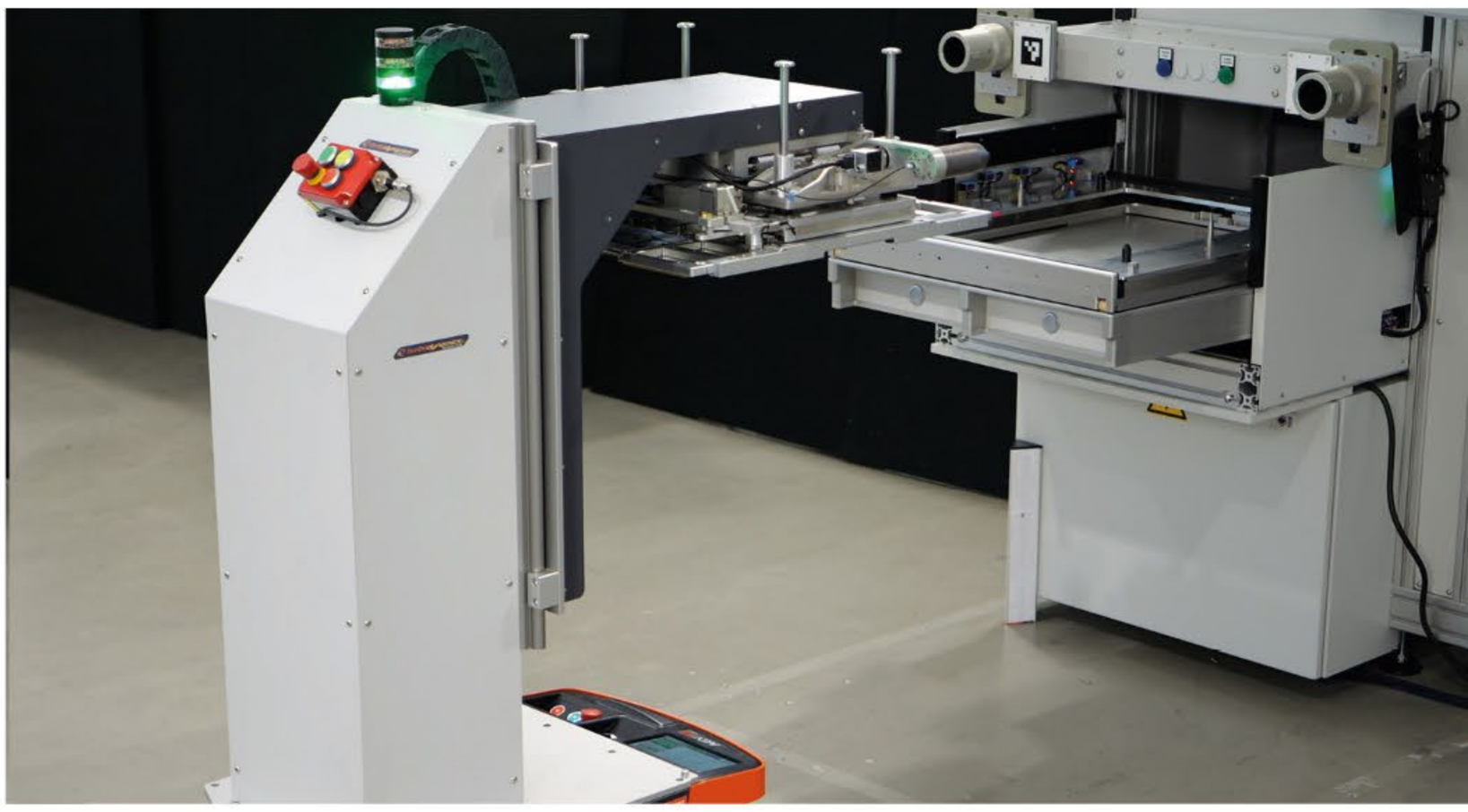
Maintenance Tables

- For unboxing or maintenance
- With **catch bracket technology**

Flip Trolley

- Flipping probe card upside down
- With **catch bracket technology**

Future Outlook



Auto Probe Card Trolley:

- **Autonomously driven AGV robot**
- **Collaborating** with human operator
- **Usable in parallel** to
  - Manual trolley
  - Other AGV brands
- **Precision Registration** with Catch Bracket Techn.
- **Reliable** manual trolley gripper technology
- **Incorporating learnings** from 3 years production

Benefits:

➔ **Step-by-step scalable Automation Solution**
- → Start with manual/semi automation setup
- → Extension and scale up on demand

➔ **Lights out Factory supported** for
- → Probing
- → Final Test

➔ **Complete Eco-System** from
- → Production to
- → Maintenance

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