

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

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## Introduction

### New Generation Probe Cards



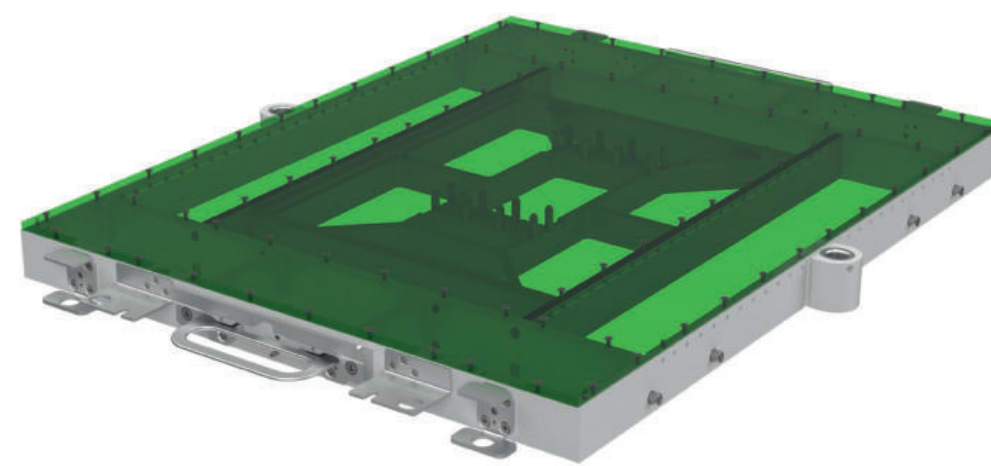
### Problems, Risks and Costs



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

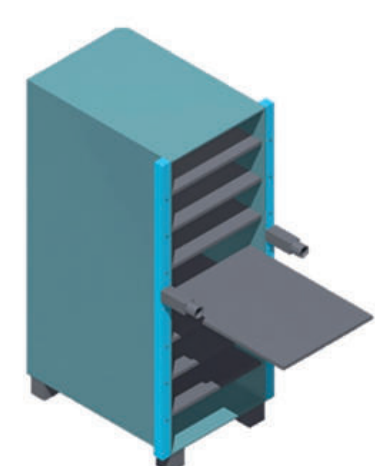
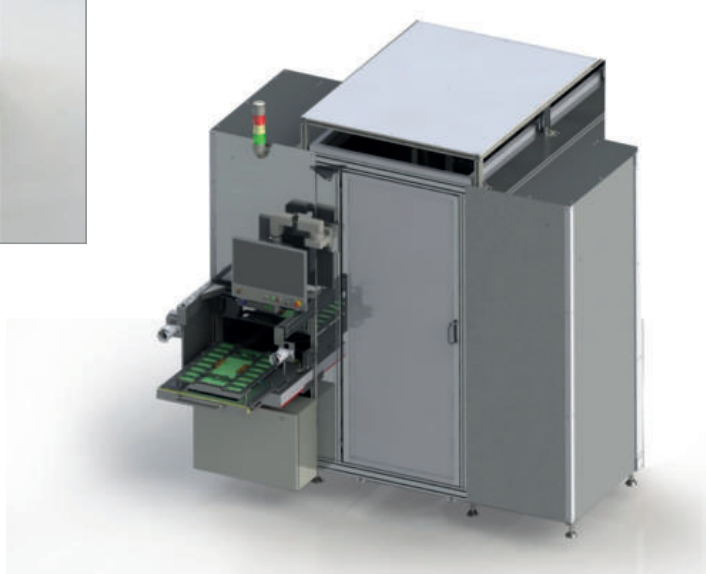
### Semi/Auto Probe Card Transport

### Probe Card Exchange

#### Production Storage



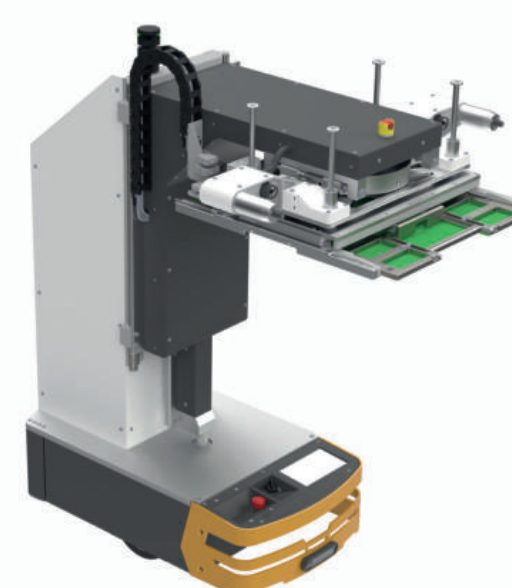
#### Engineering/ Maintenance Storage



Interface for Box Storage



#### Auto Probe Card Trollex XL

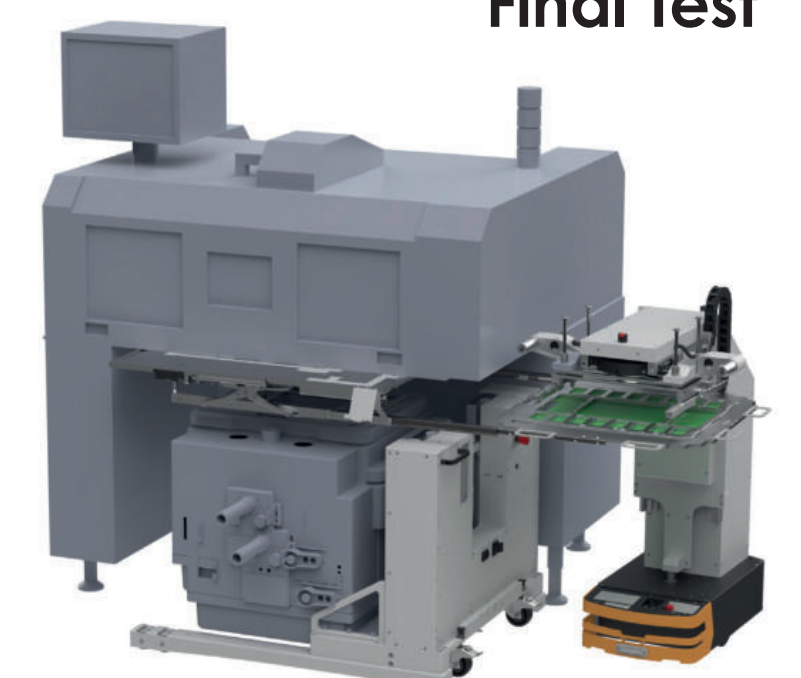


Common Platform Architecture supporting parallel use and scalability

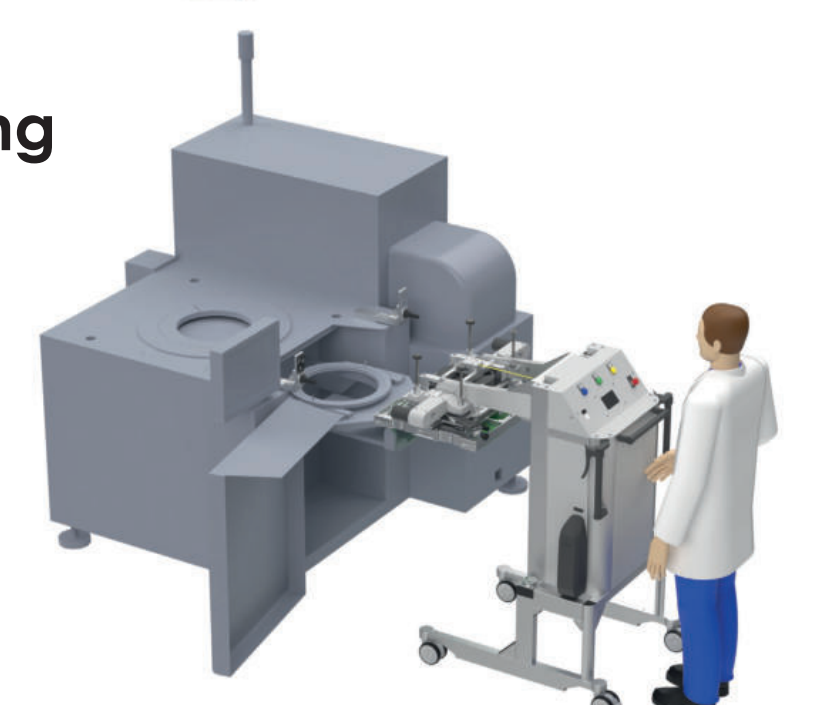
#### Manual Probe Card Trolley XL



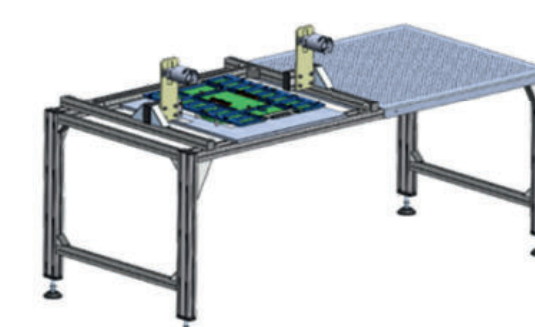
#### Final Test



#### Probing



#### Maintenance



# Case Study

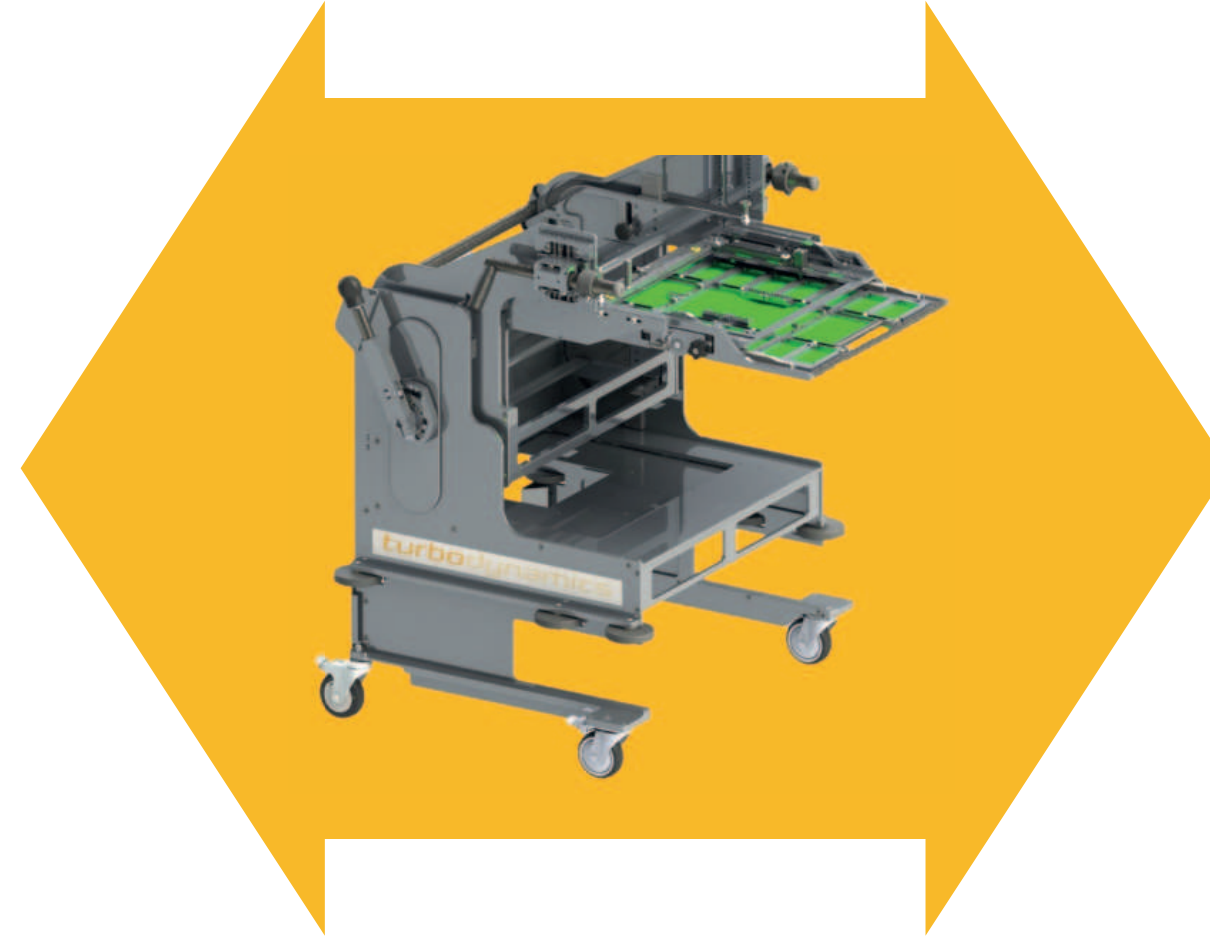
## 3 Years of Production Experience with Semi automated Probe Card Exchange, Handling & Storage

### Probe Card Storage



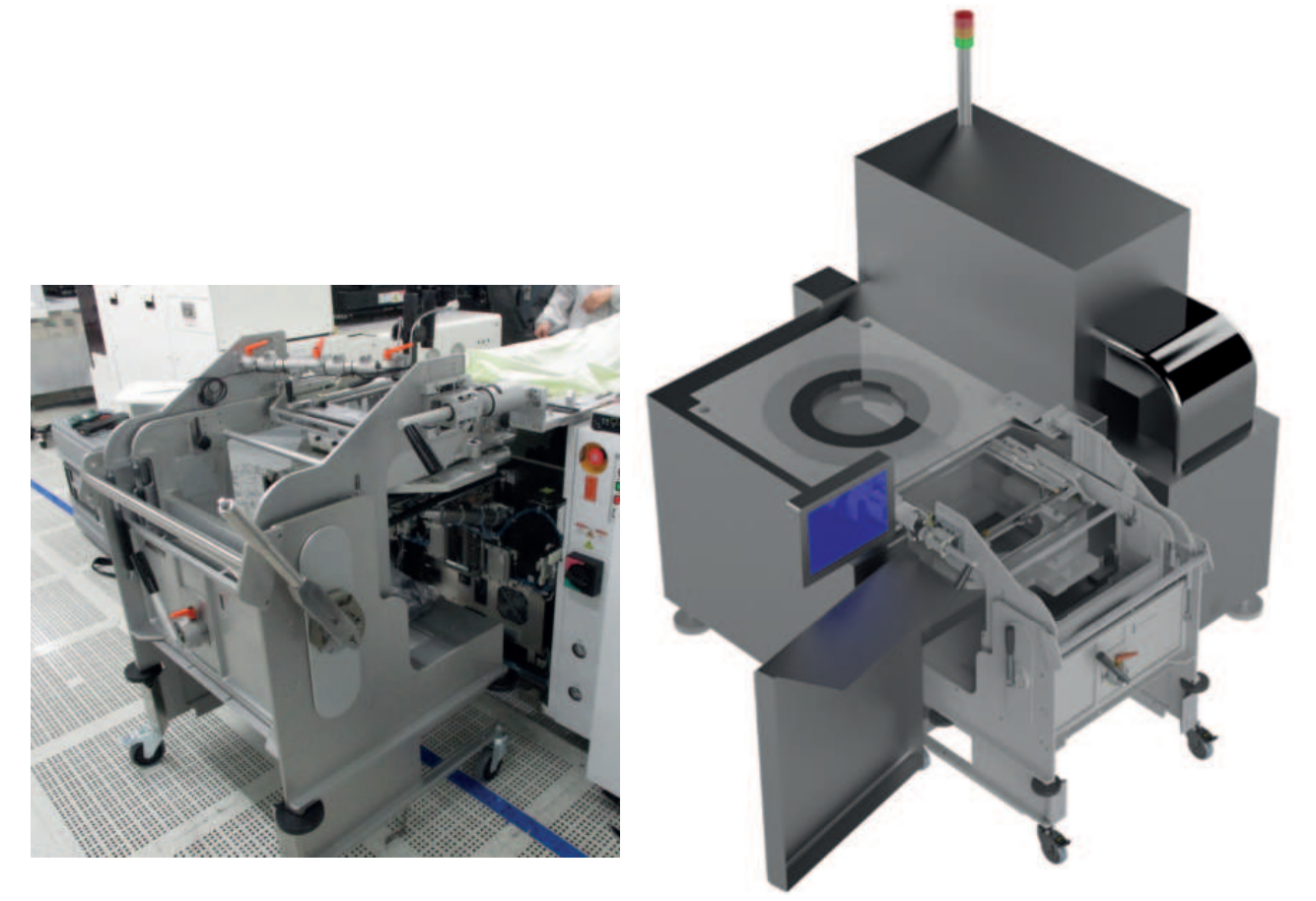
- Automated Probe Card Stocker
- I/O for probe card trolley
- Precision registration with catch bracket technology

### 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**

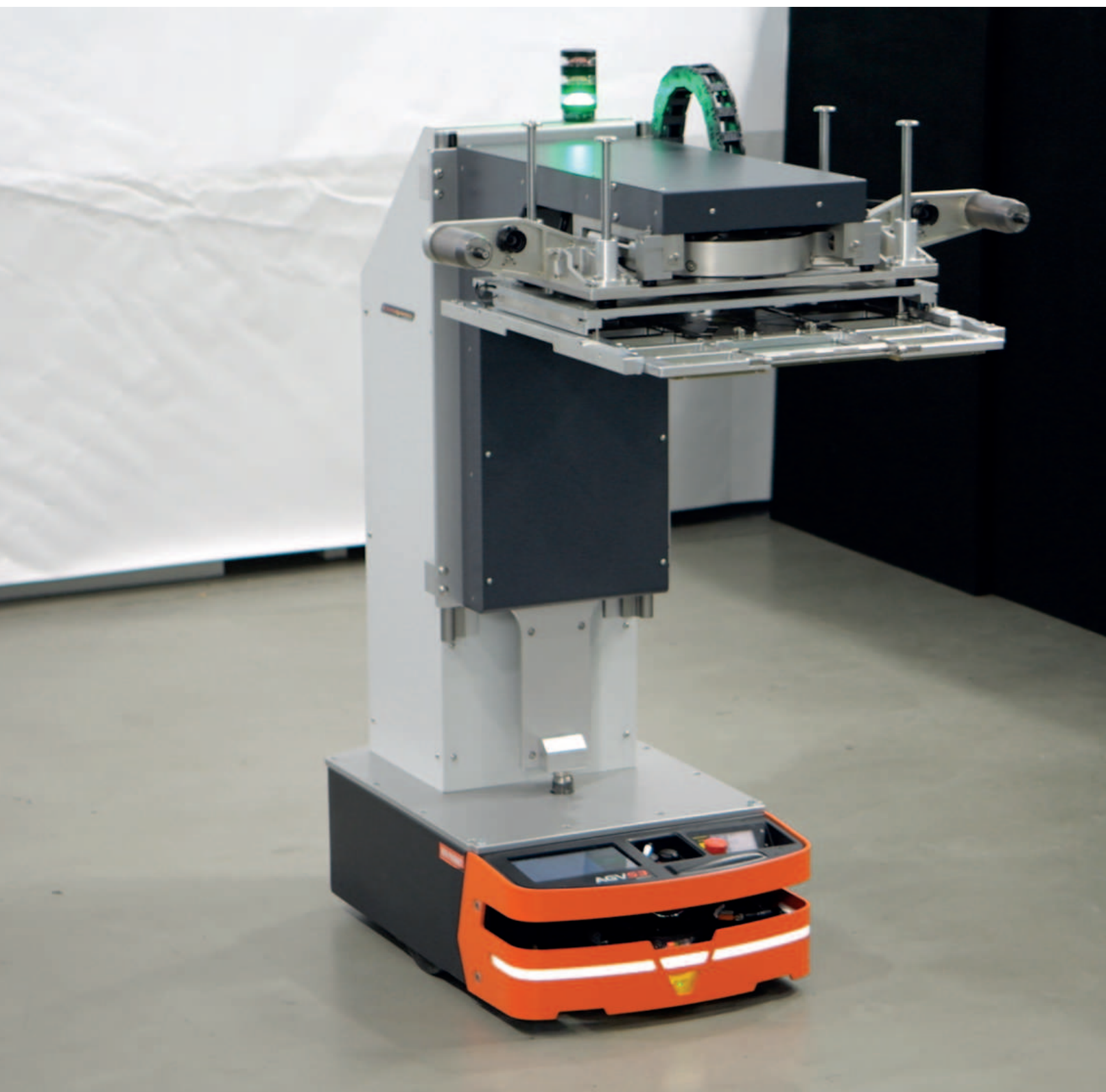


### Flip Trolley

- 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



## Contact Information

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