That's automation.

Automated Manufacturing, Assembly and Test Technologies for Actuators and Sensors

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Agenda

1. Brief overview of company XENON

- XENON Facts and Figures
- XENON Business Fields

2. Experience in automation - modular concepts

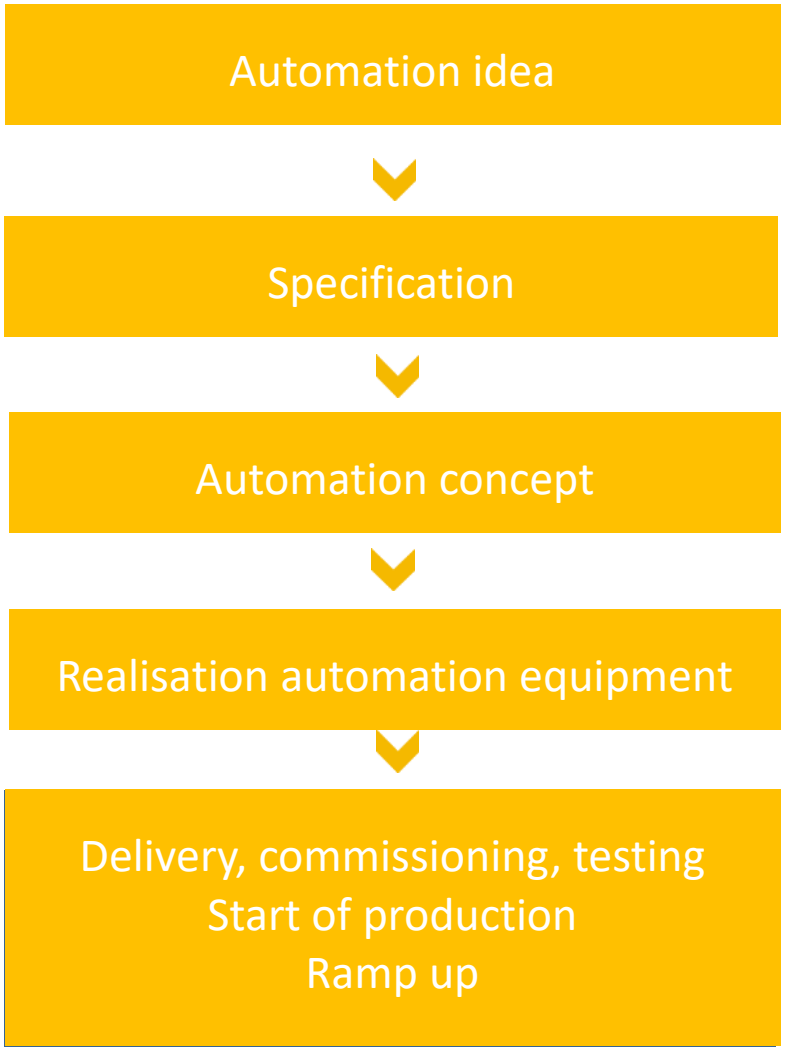
- Lessons learned
- Flexible
- Configurable

3. Assembly and Test Technologies

- Sensor Manufacturing
- Actuator Manufacturing

4. Industrie 4.0 projects

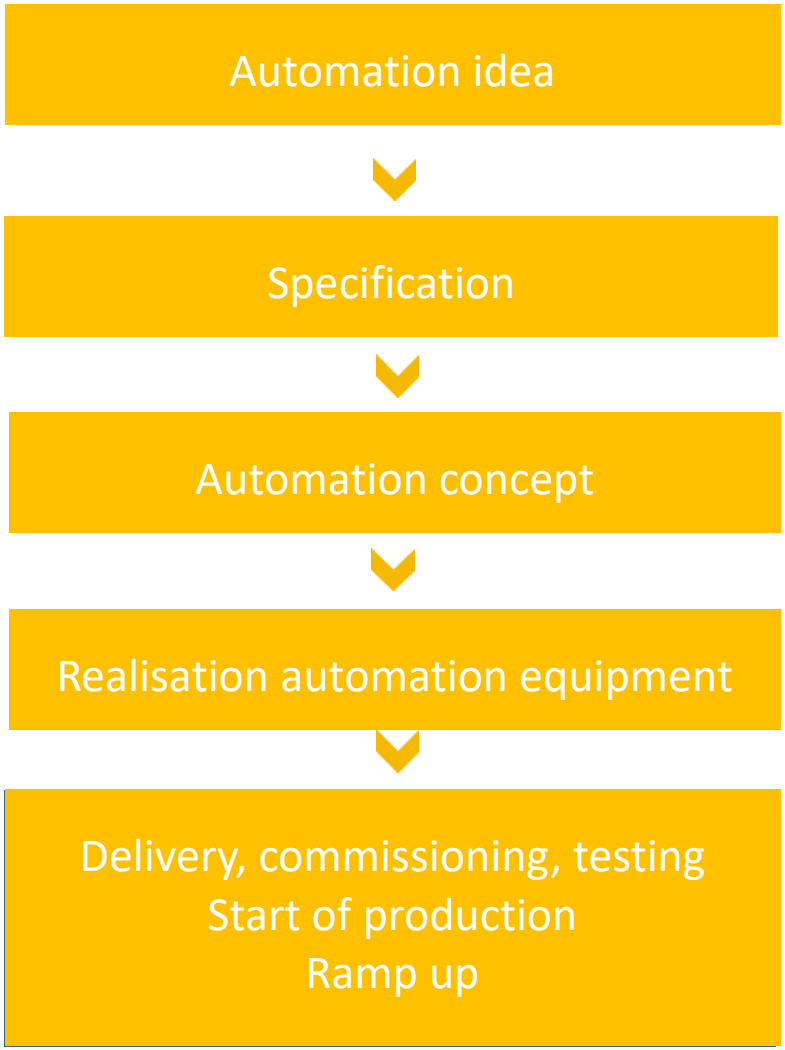
Lessons learned in automation



Fix targets:

- Reduction of costs
- Less manual work
- Better quality, which quality characteristics
- 100 % controlled quality
- Production increase
  - Flexible, scaleable
- Product variants

Lessons learned in automation



- Design of all product variants
- Design freeze (if possible)
- Parameters to be defined:
  - Cycle time, output (how many shifts)
  - Quality characteristics, tolerances
  - Technological process times
  - OEE figures
- Max. dimensions of equipment

Basic module: SPACE 400 – Placement, dispensing, …

SPACE 400 module

Functions

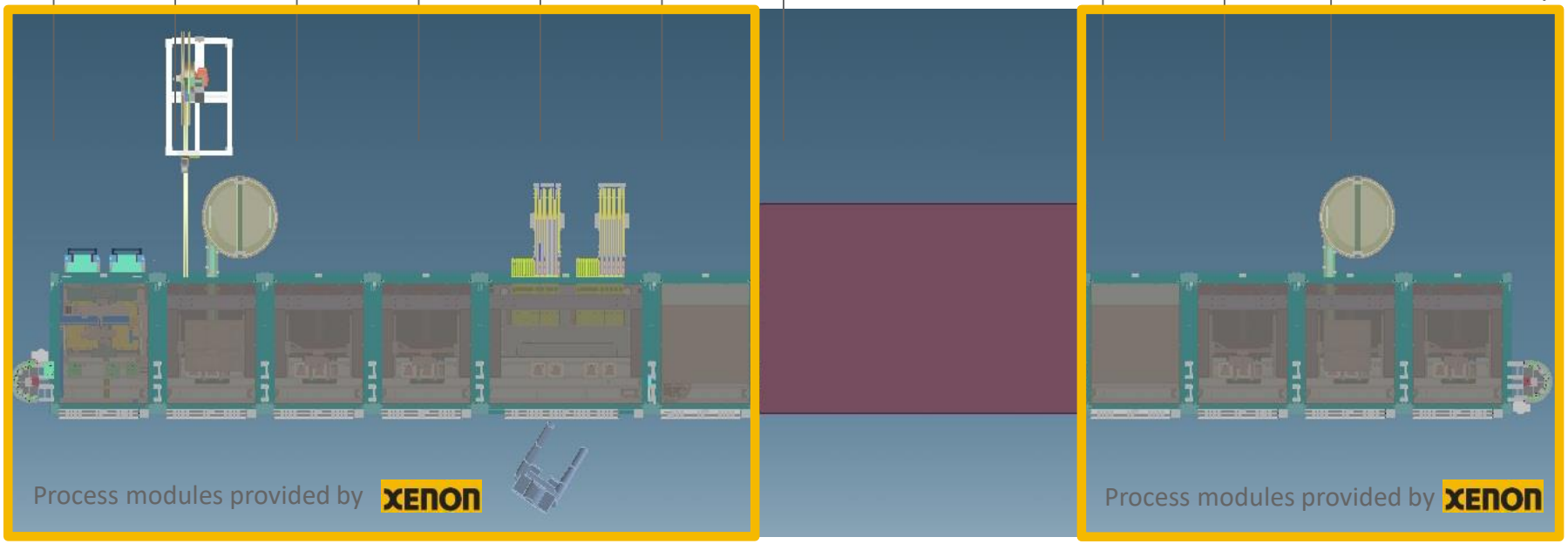
- Flexible configurable in-line-module
- 4-axes-portalsystem (linear direct drives)
- Workpiece manipulator for full-3D-applications
- 3D workpiece referencing
- 2 process axes with standard interface

Integrable processes

- Precision assembly
  e.g. sensor elements, optic elements
- Placement
  e.g. resistors, diodes, LEDs, chips, odd forms
- Micro dispensing
  e.g. solder paste, conductive adhesives, micro encapsulation

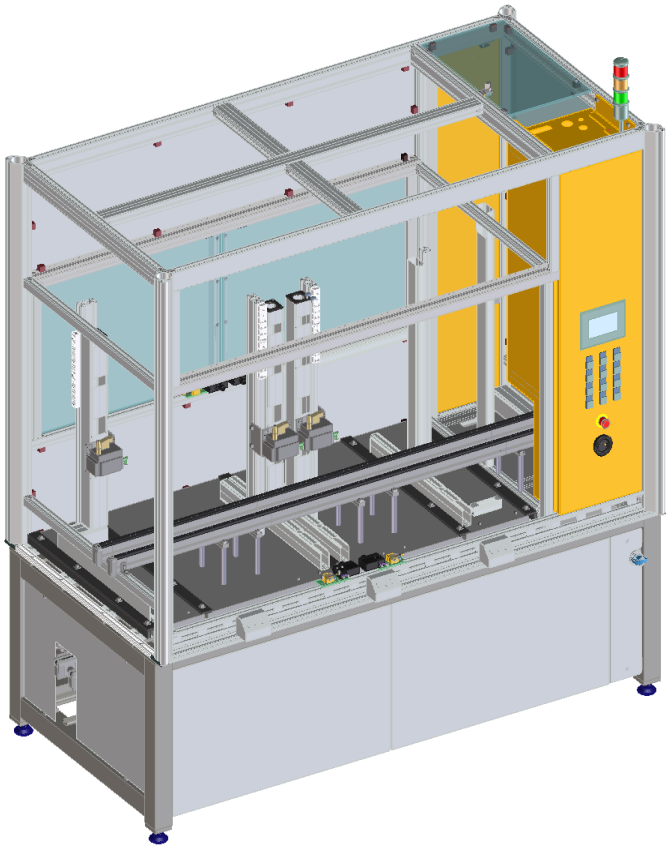
Exemplary modular scalable assembly line

- Loading / Unloading, e.g. Trays
- Special purpose assembly
- Dispensing / Inspection
- Flip Chip placement
- Placement / Inspection
- Solder logistics
- In-line solder furnace (batch-process)
- Solder logistics
- Bonding
- Final Inspection, Final assembly



- Automated complex production line for high quantities

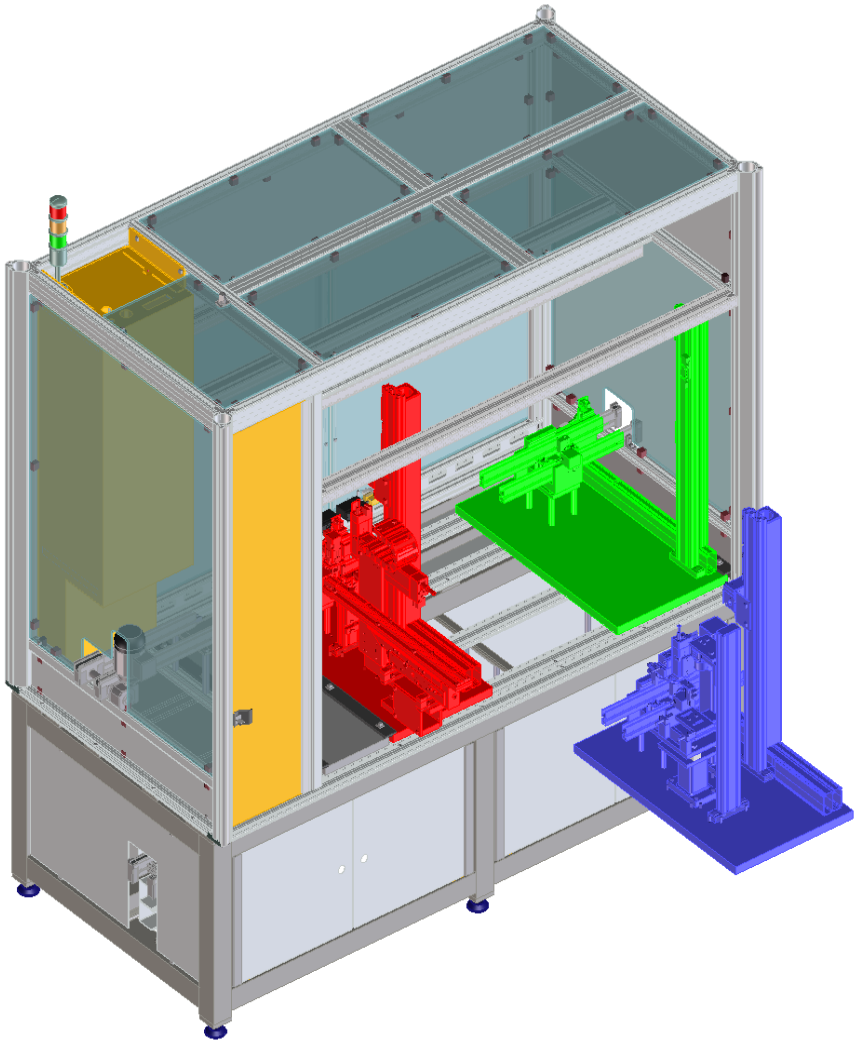
Process modular cell - overview



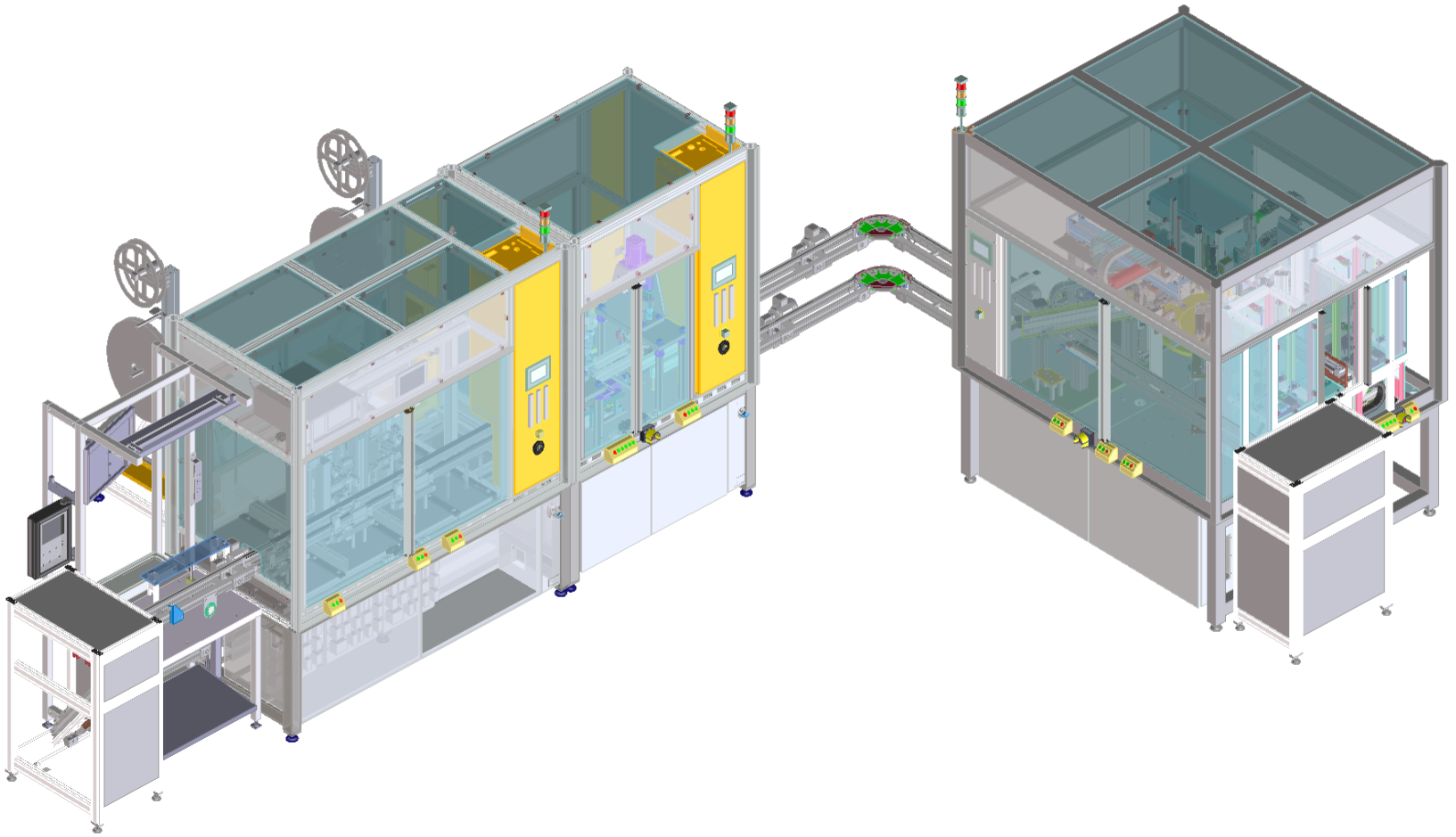
Process modular assembly cell

- Adaptable by exchangeable process stations
- Cost-effective by lean changing interfaces and minimisation of redundancy
- Material transport by webbing transfer wpc sizes 80x80, 120x120, 160x160
- Several cells are combinable to an assembly line also with special cells for special processes
- Exchange of a process within a workday

Exchange of a process station



Adaptable assembly– expansion stage 3



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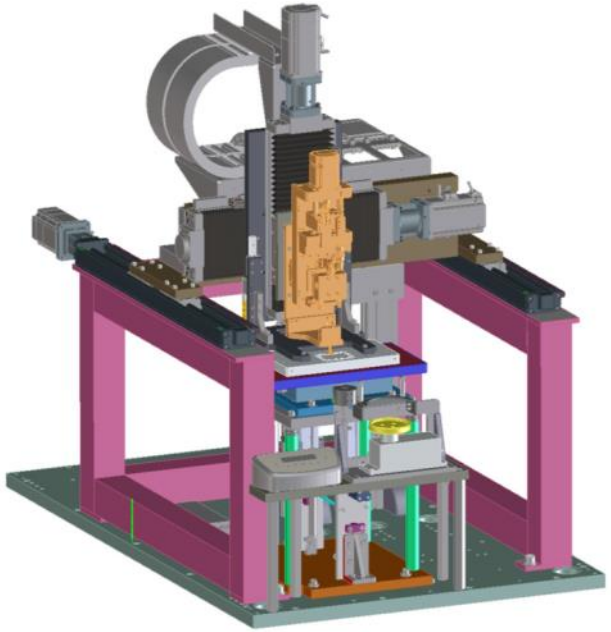
Sample Parts I mechatronic systems

Actuators and sensors

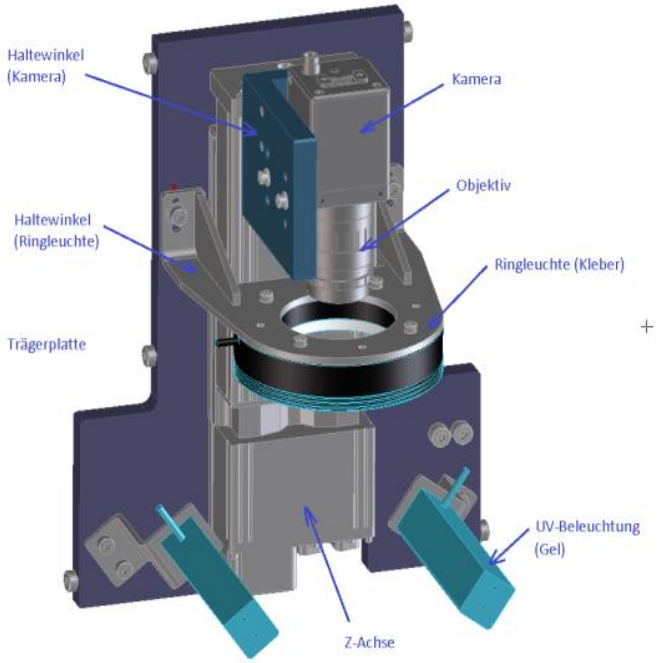
XENON‘s Know-How

Reference technology – vacuum dispensing



Dispense module

- Lifting of workpiece carrier with sealing
- Vacuum chamber
- Guidance of precision needle
- Moveable sealing (X, Y)

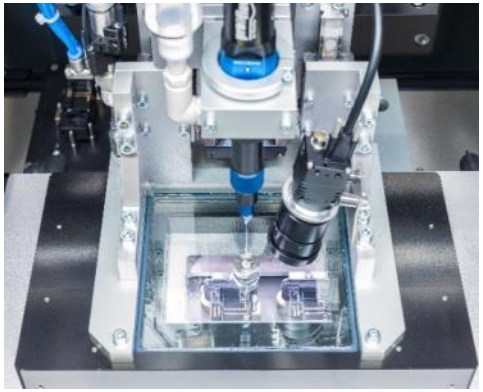


Camera System

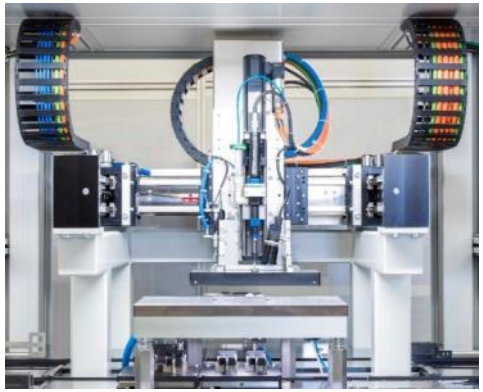
- Digitalkamera 1624x1236 pixel
- Field of view 65x50 mm
- Pixel resolultion 0.04 mm
- Height adjustment ring light
- Angle adjustment uv-light
- Gripping unit

Precision dispensing system with vacuum option

- Precise dispensing process without air bubble inclusions
- Considerable reduction of process time by patented vacuum chamber
- 3-dimensional dispensing possible



Vacuum dispensing



Dosing system

Reference technology – actuator assembly

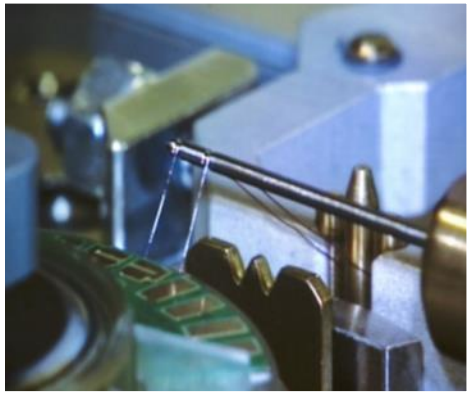
Know-How

- Handling, assembling and testing of electronic devices
- ESD design of machines
- Clean room requirement

Reference technology – actuator assembly

Assembling and Testing of Electroacoustic Transducer

Separation of Magnet System



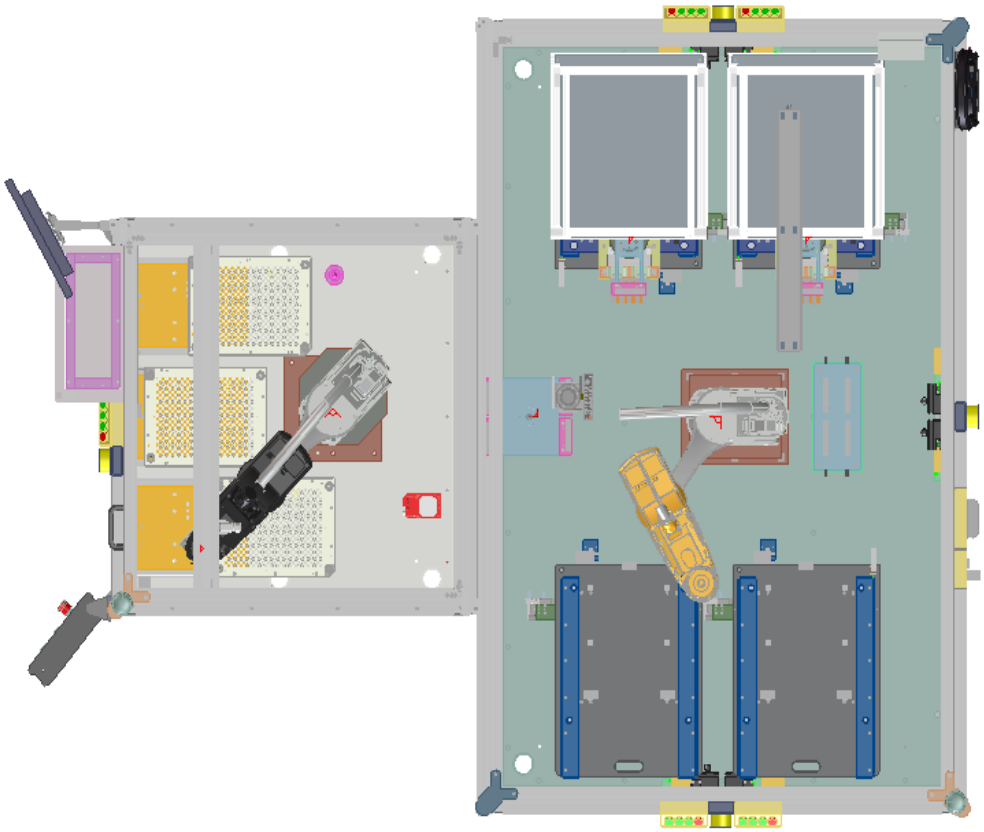
Laying of Wire

Adherence of Membrane

- Special bonding processes
- Inline acoustic end testing

Inspection Lines

Modular design for inspection lines



Extendable module

- Central component handling for flexible process of single inspection tasks
- Extendable for high service-friendly configuration

XENON Special Know-How- interconnection and contacting technologies








quality control

AOI

measurement systems

dispensing

cleaning

curing

heating

handling placement

(laser) welding

(laser) soldering

bonding

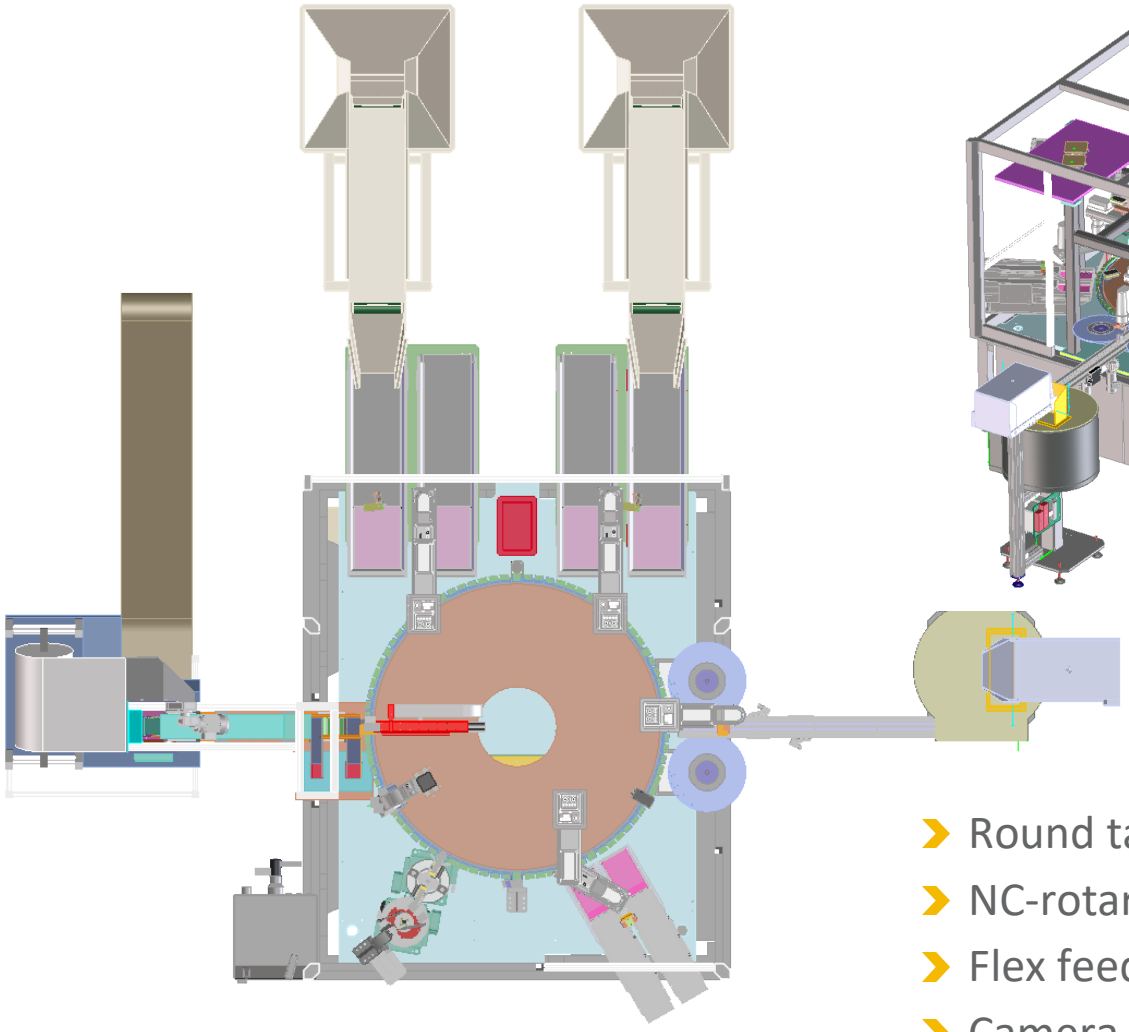
cutting

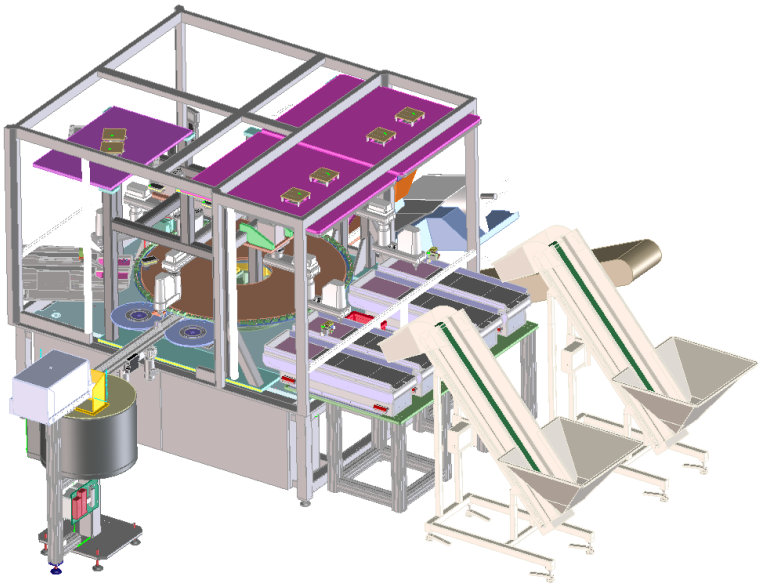
tape & reel

tube/tray

packaging

Flexible assembly – variant diversity of products





- Round table assembly
- NC-rotary indexing table
- Flex feeder for bulk part feeding
- Camera controlled robot assembly

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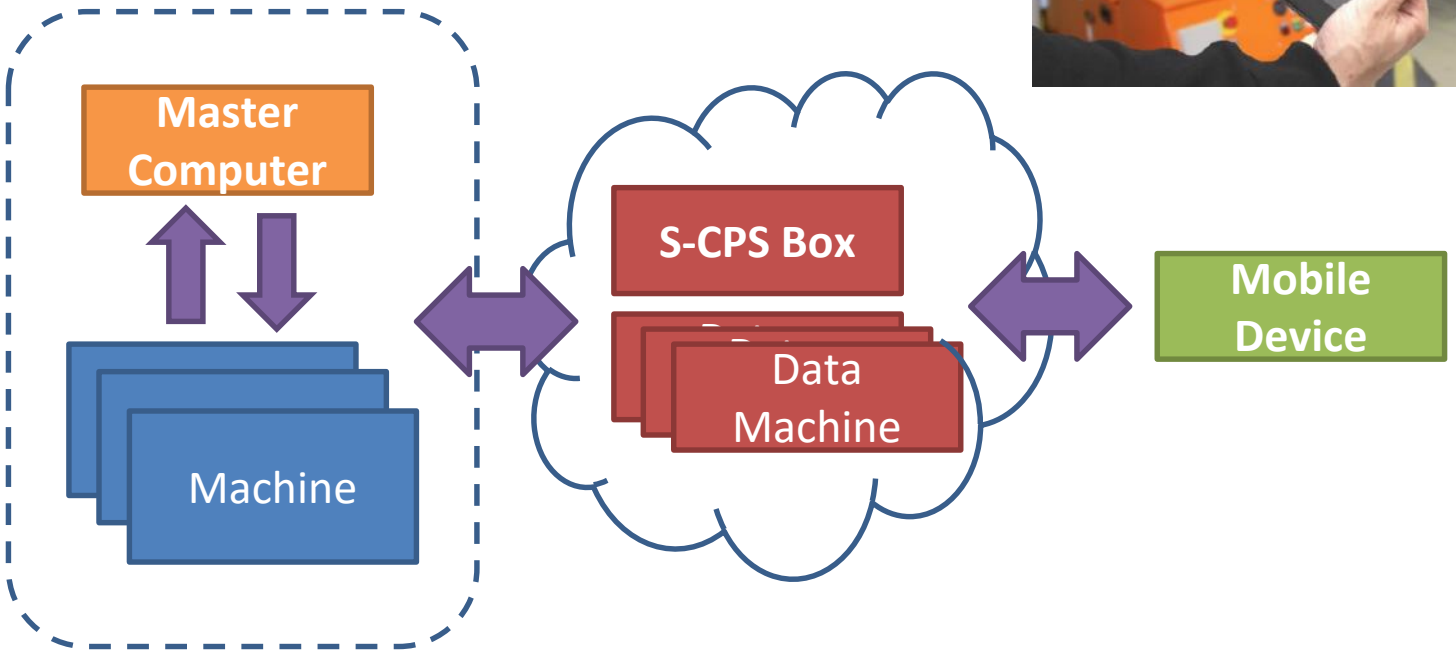
Industry 4.0 projects

1. Resource Cockpit for Cyber Physical Systems “S-CPS”



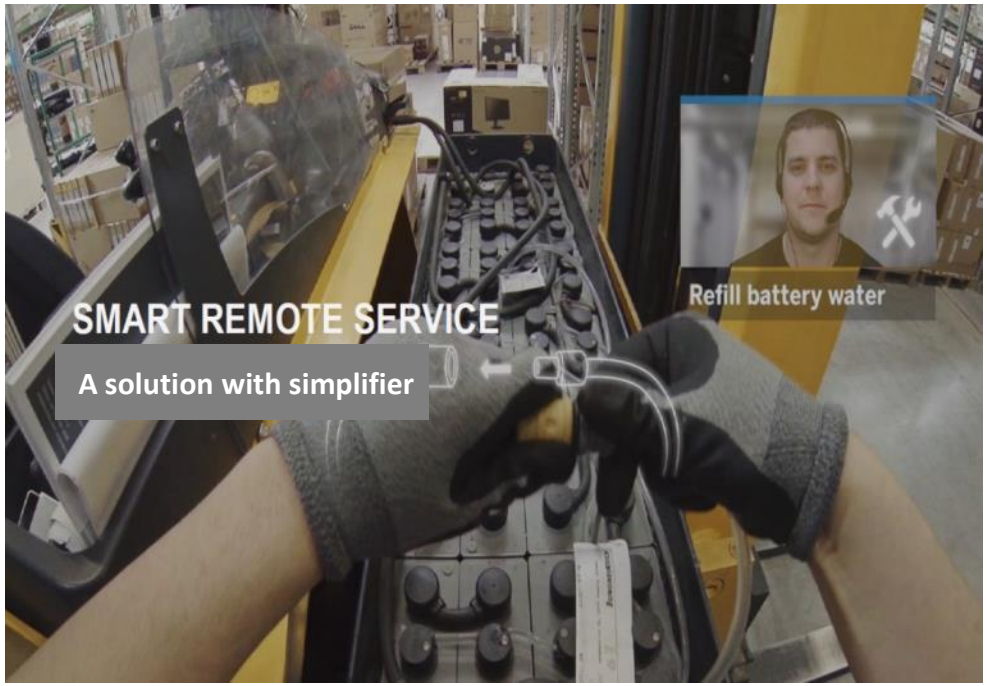
Industry 4.0 projects

2. Process digitalisation with Augmented Reality “ARinFLEX”

Using smart devices – tablets, smartphones, data glasses - for remote services

Remote maintenance of the future means faster diagnosis of failures and more effective assistance at the maintenance of machines and systems.

- Less downtime and shorter repair time
- Trouble-free and transparent communication
- Automated and complete documentation of service and support tickets



Automation Network Dresden

AIS AUTOMATION
SOFTWARE SYSTEMS

HAP
PRECISION HAPPENS.

Factory
Automation
Solutions
ORTNER

SYSTEMA
Manufacturing Excellence through Software Solutions

XENON

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