

# SOLUTIONS FOR AUTOMATION OUT OF THE BOX

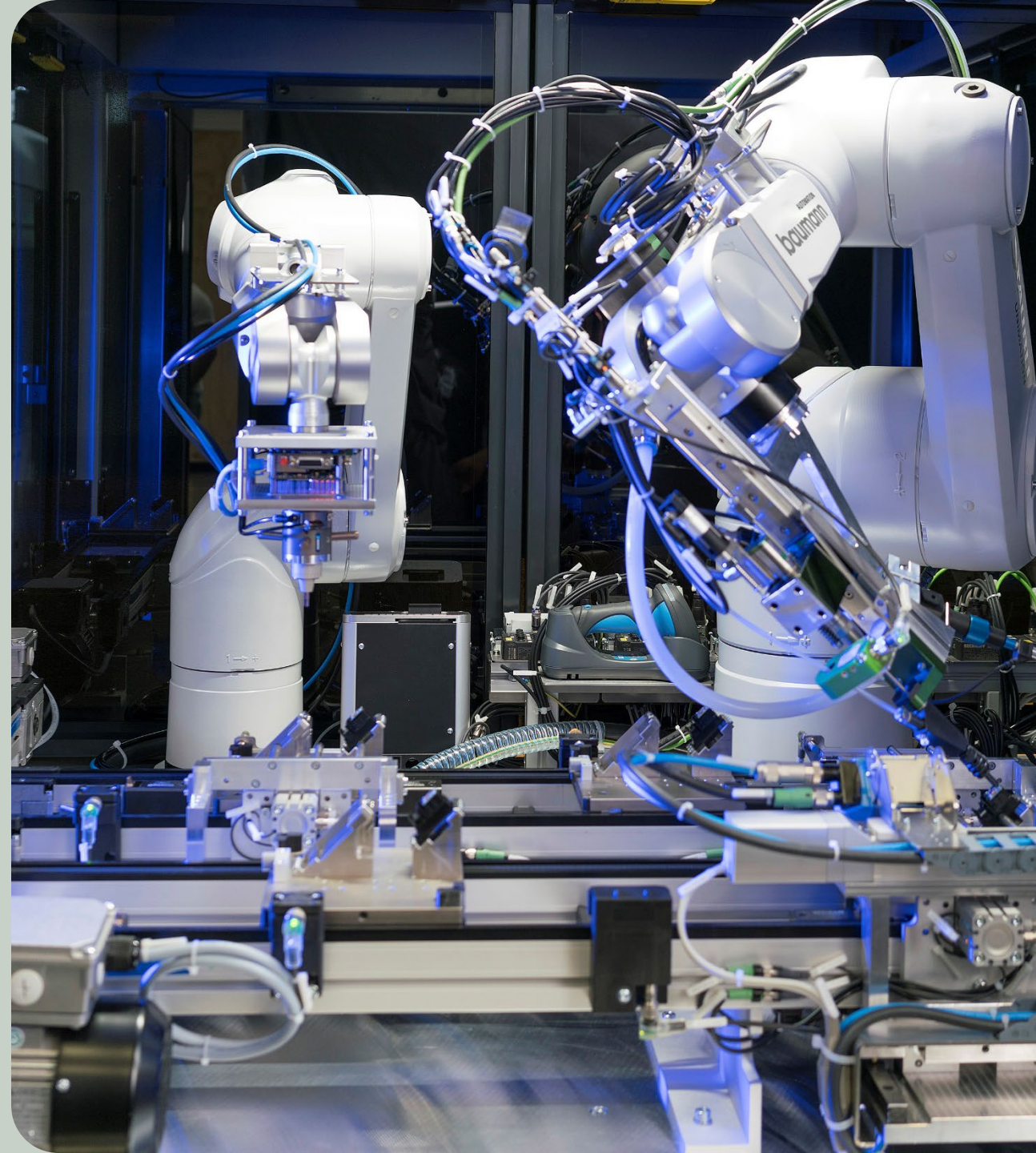
Welding of pacemakers

Stefan Wendl



# CONTENTS

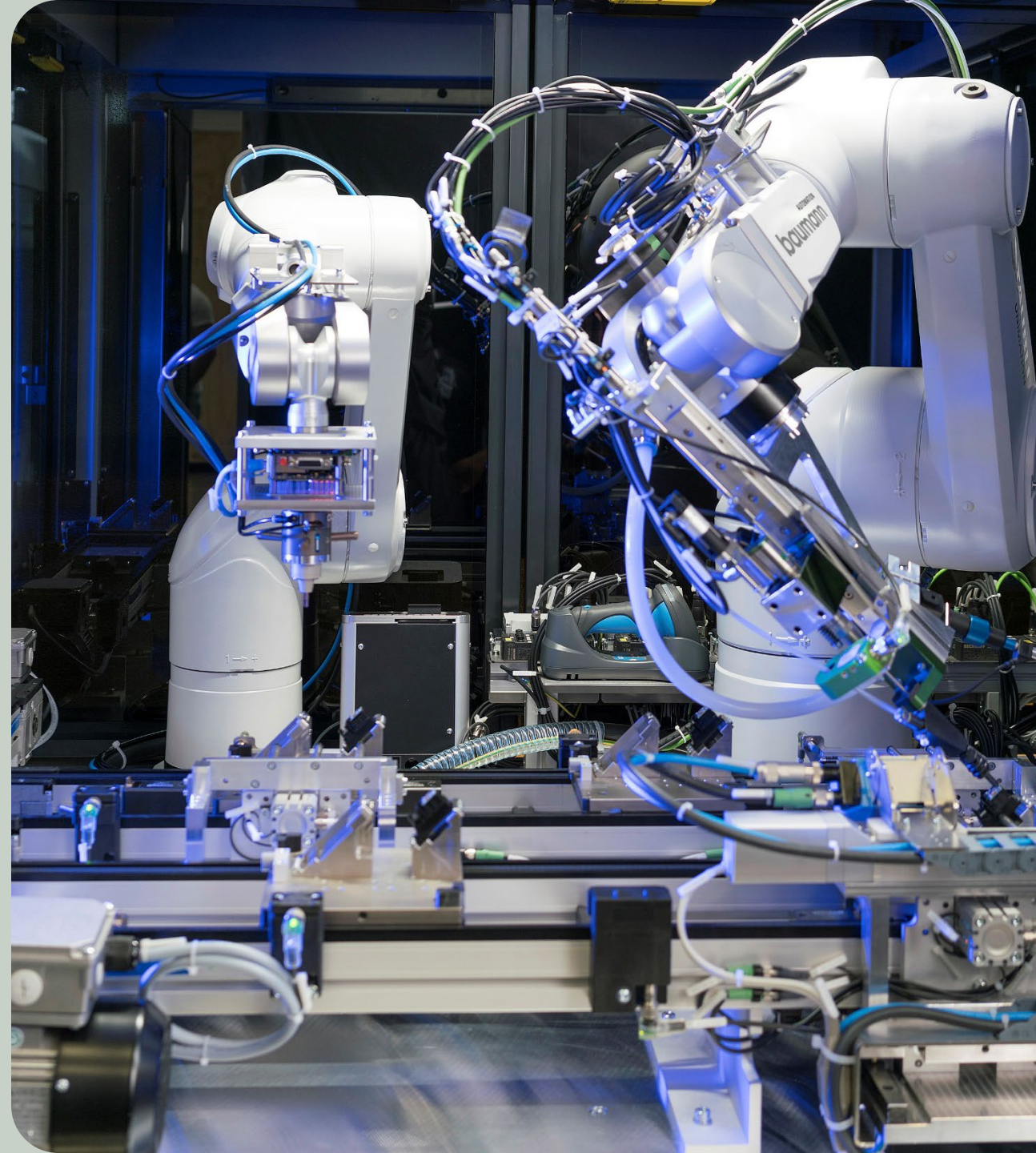
1. Baumann Automation
2. pacemakers - challenges
3. why robots and why laser welding?
4. project procedure
5. outlook





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# THIS IS OUR PASSION.



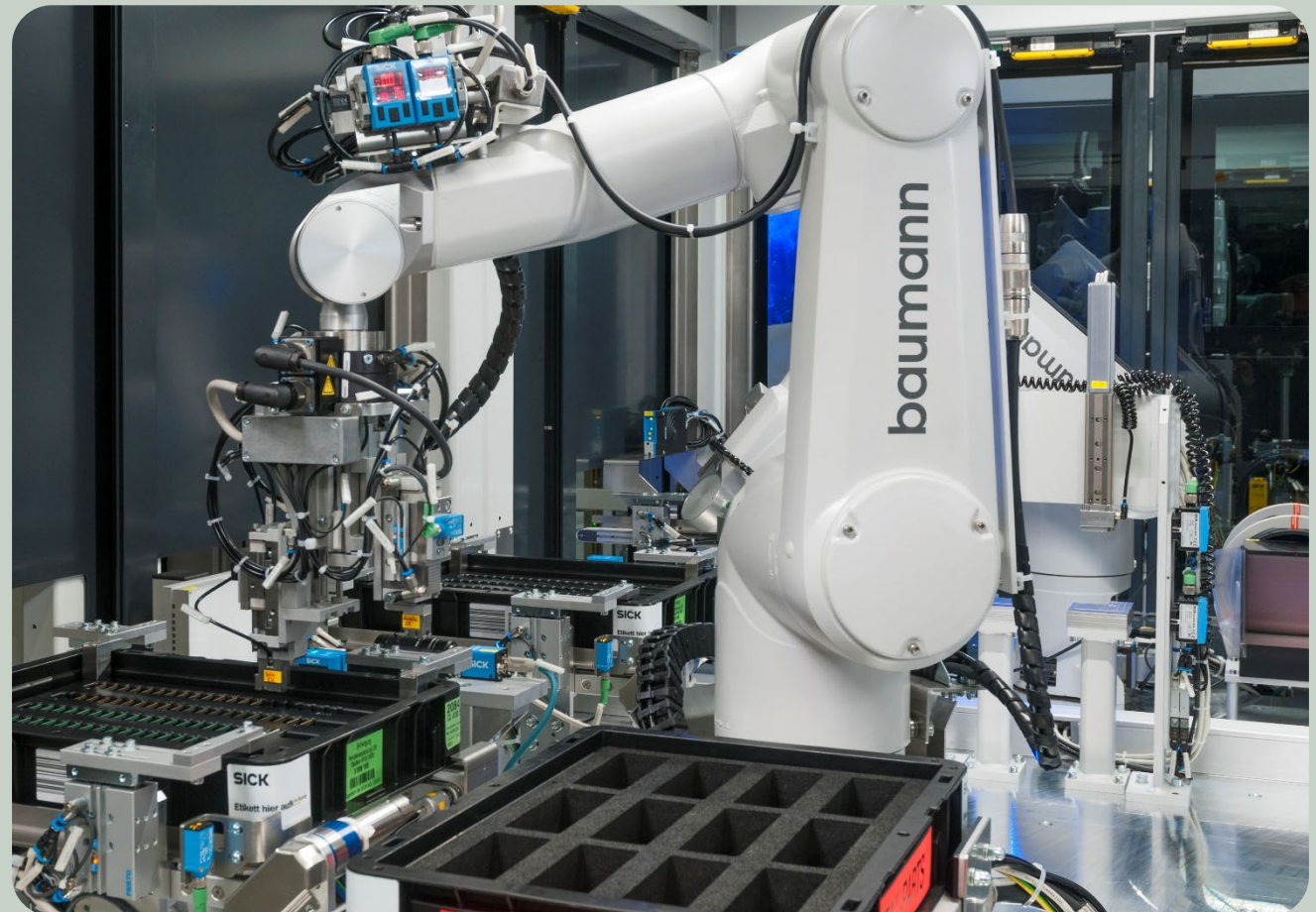
**AUTOMATION** —  
HANDLING. ASSEMBLY. TESTING.





# THIS IS WHAT SETS US APART.

- comprehensive knowledge of robotics
- broad integration expertise
- extensive testing expertise
- high level of software expertise
- optimised standard modules
- easy-to-use user interface





# THIS IS US.



Headquarters  
in Amberg



Family business  
for 40 years



Over 1.000  
employees worldwide



130 Mio. €  
million total  
output



360-degree  
support



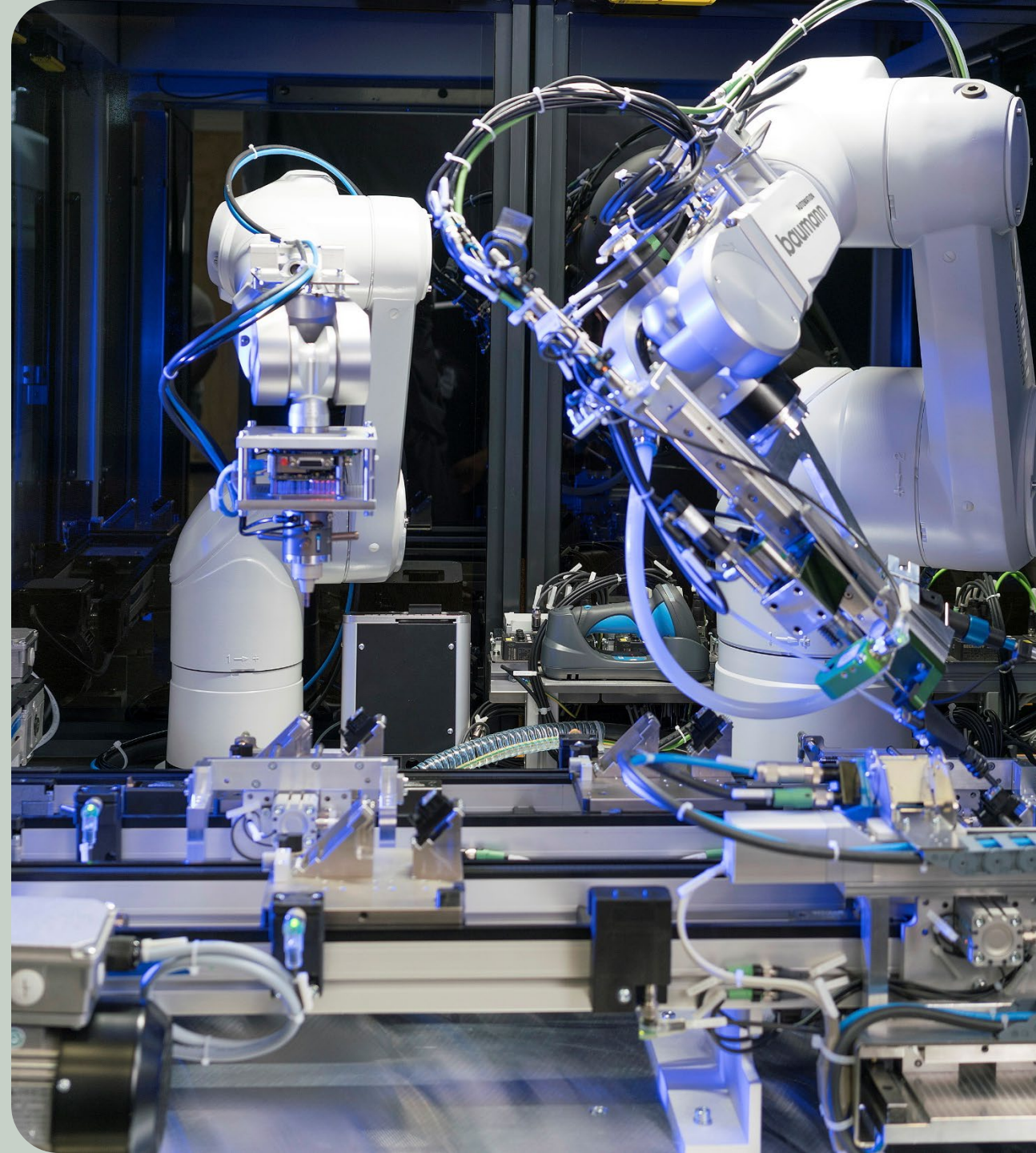
Over 30.000m<sup>2</sup>  
production area





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# PACEMAKERS - CHALLENGES

## Requirements:

- helium tight welding
- super clean (medical – inside body)
- reliable process
- documented process according to medical standards
- contour flexible

## Technical Cleanliness:

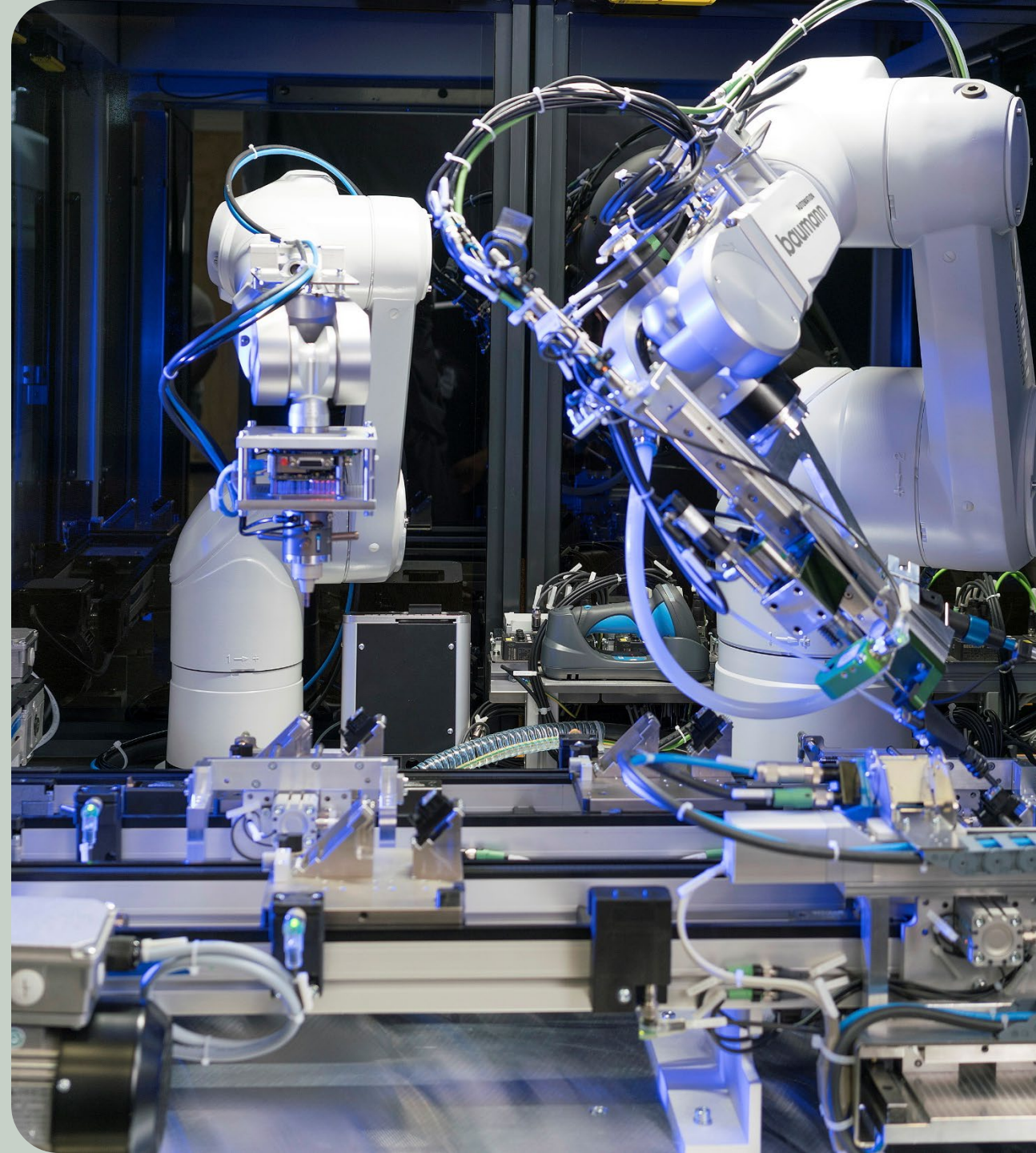
- laminar flow, HEPA filters
- design to cleanliness
- fully automatic process (avoiding human influence)





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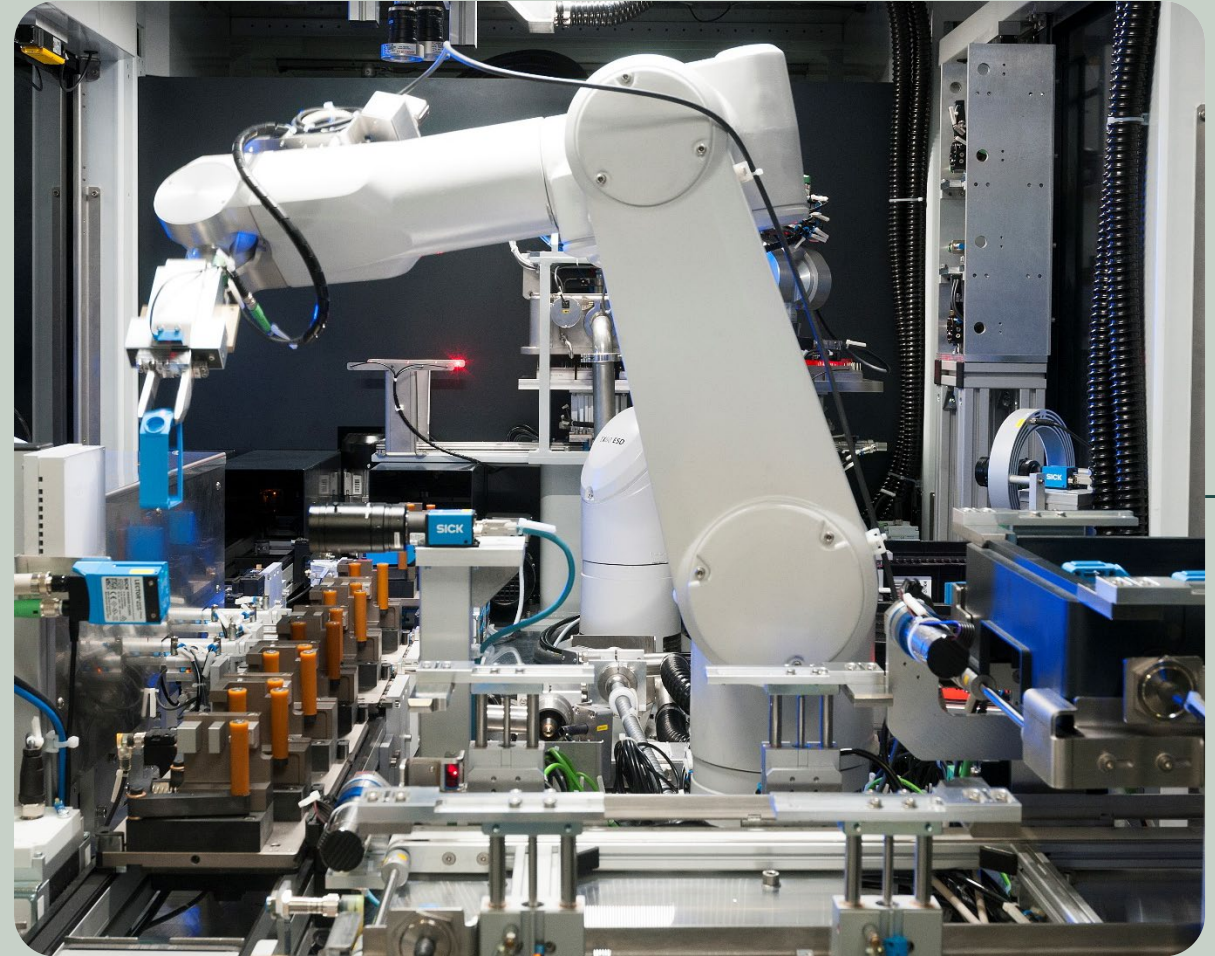
# WHY ROBOTS? – WHY WELDING

## Why robots?

- very flexible
- standardised equipment
- high technical availability
- clean, precise, fast

## Why welding?

- reliable process  $\Rightarrow$  high strength
- not space consuming
- no additional material





# PACEMAKERS - EXPERIENCE

## Scalable machine systems on ro|box standard platform

- standalone machines with magazine feeding system
- interface for AGV loader upgrade
- interface for upgrade to full automated production line
- CAD/CAM interface for prototype and new product testing

## Automated processes

- loading and unloading of work piece carrier
- cleaning and surface treatment for titanium housings
- welding process for anchors, interior fixation, titanium housings
- gas-filling and closing of titanium housings
- leakage testing of pacemakers
- laser etching of pacemakers



# LASER WELDING ROBOT CELL

## Customised machine:

- unique machine adapted to customer and application needs

## Consisting of:

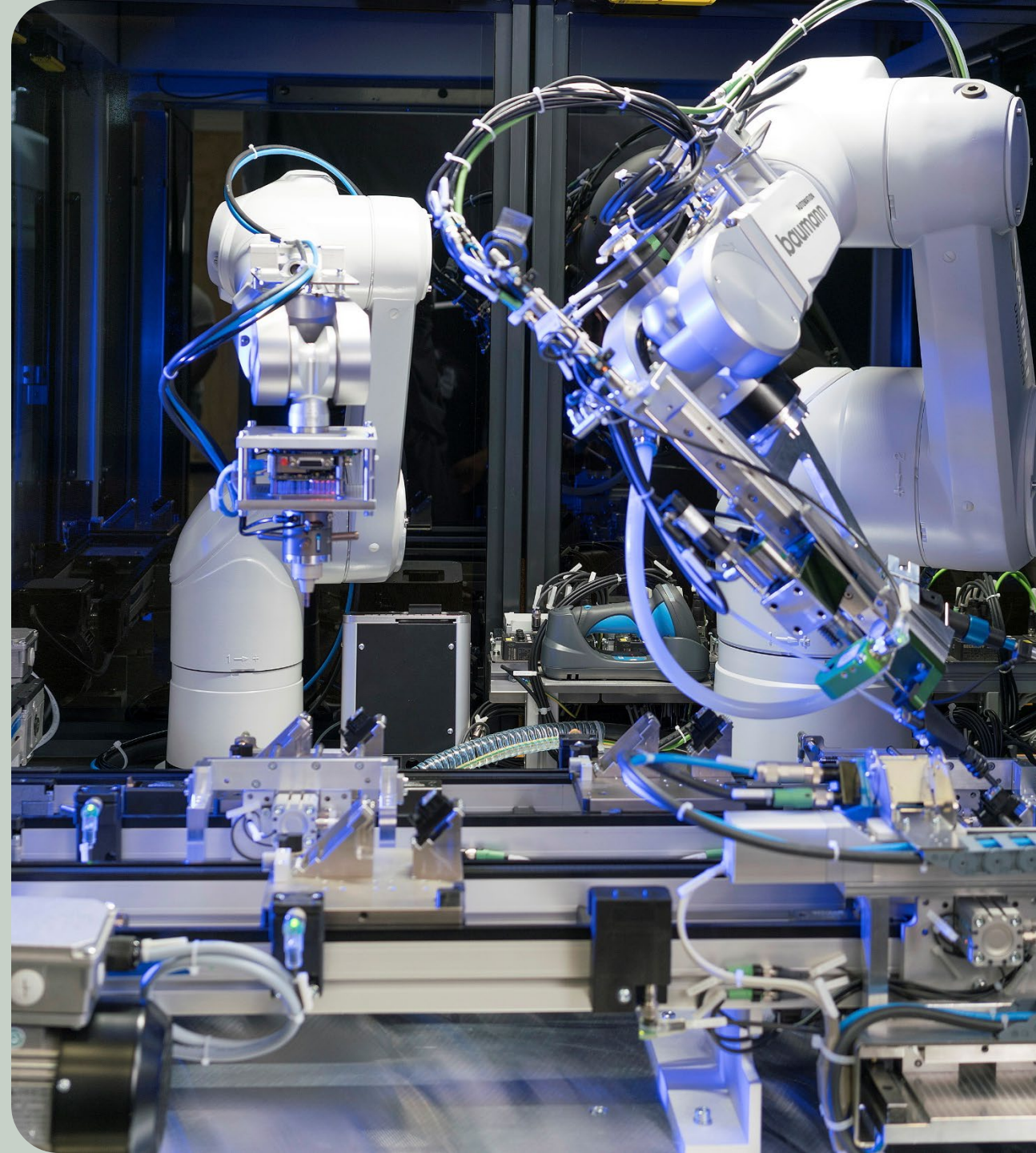
- robot for handling
- laser for welding (source and application)
- down holders (specific to application)
- conveying equipment including gates
- optical inspection systems (guidance and quality)





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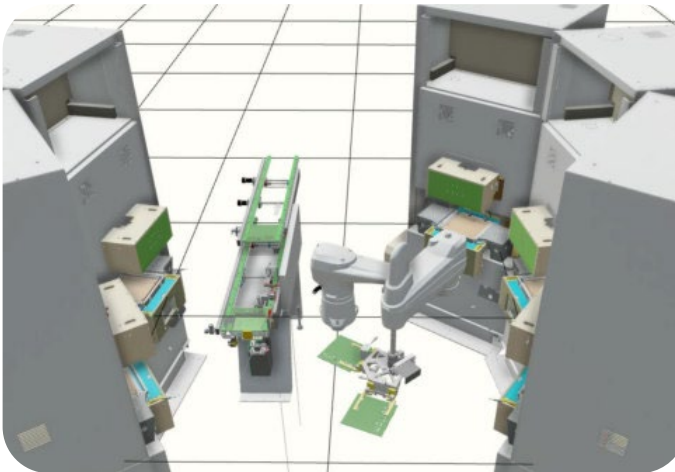


# DIGITAL TWIN AT BAUMANN

Digital Twin  
[Virtual Machine Model]



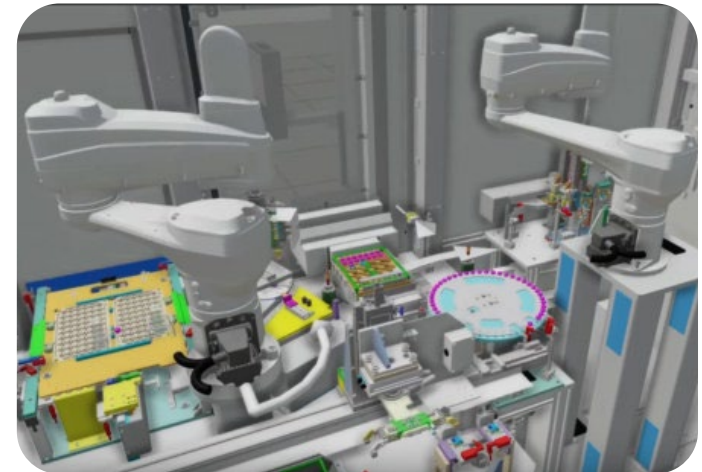
Robot Simulation



Material Flow Simulation



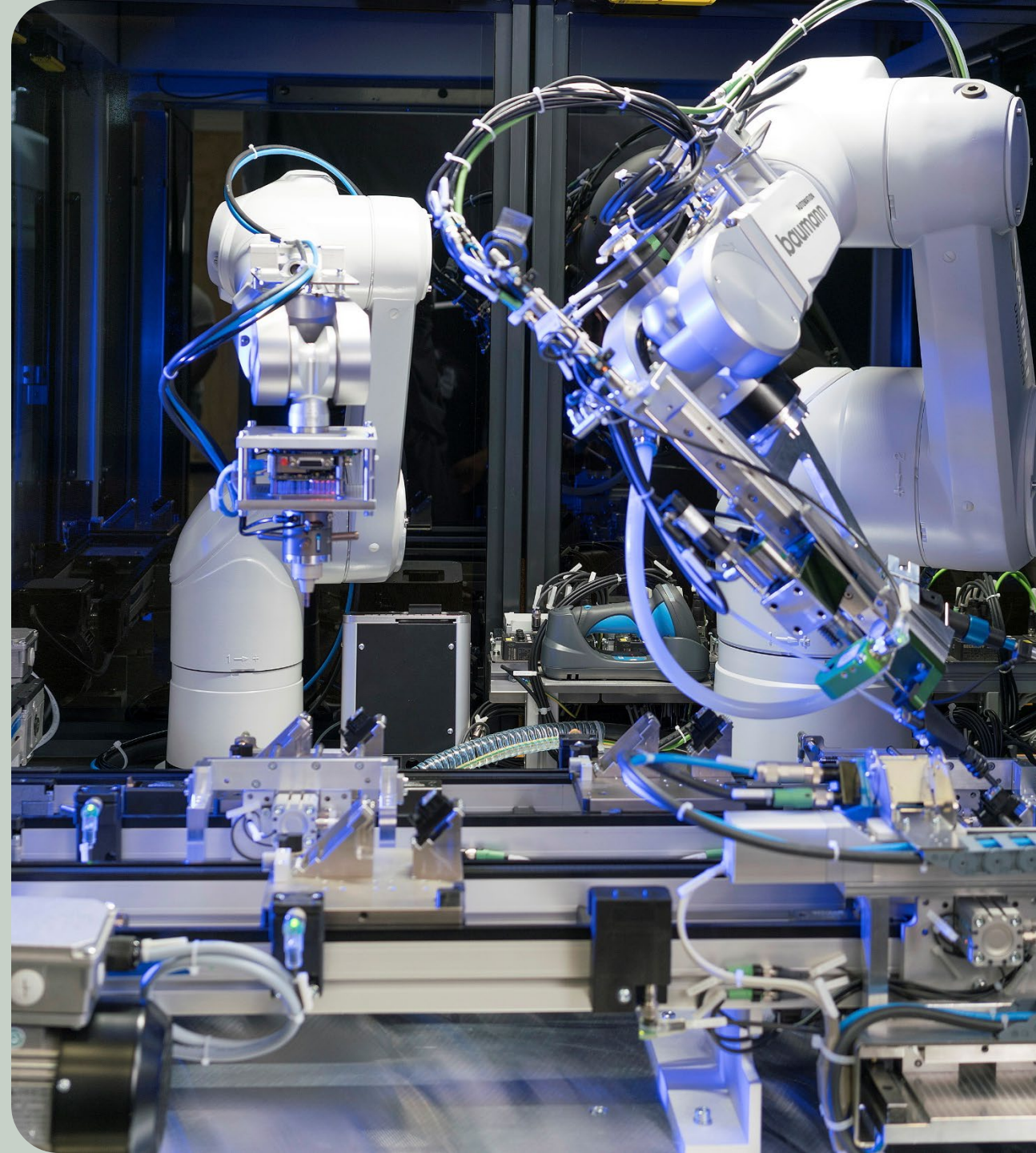
Virtual Installation





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# GLUCOSE METER AND OTHERS

## (Semi-) automated assembly and inspection line

- automated processes with ro|box standard platform
- automated loading and unloading of parts
- linked operator working station for manual processes

## (Semi-) Automated processes

- assembly of housing, LCD display, scroll keys, foils
- ultrasonic welding
- laser etching
- AOI (visual inspection)
- cleaning
- packaging

## Test processes

- depaneling of PCB/DCB
- ICT test of panel or PCB
- flash / function test of PCB
- final electrical test of finished goods





# INSULIN PEN AND OTHERS

## Standard machine systems

- prototype cells
- standalone process cells
- full automated assembly lines

## Automated processes

- assembly of insulin pens
- labelling of insulin pens and ampoules
- AOI (visual inspection)
- palletizing of products
- standard handling and assembly tasks
- laser etching
- cleaning
- packaging





>7.300  
Projekts in  
22 countries

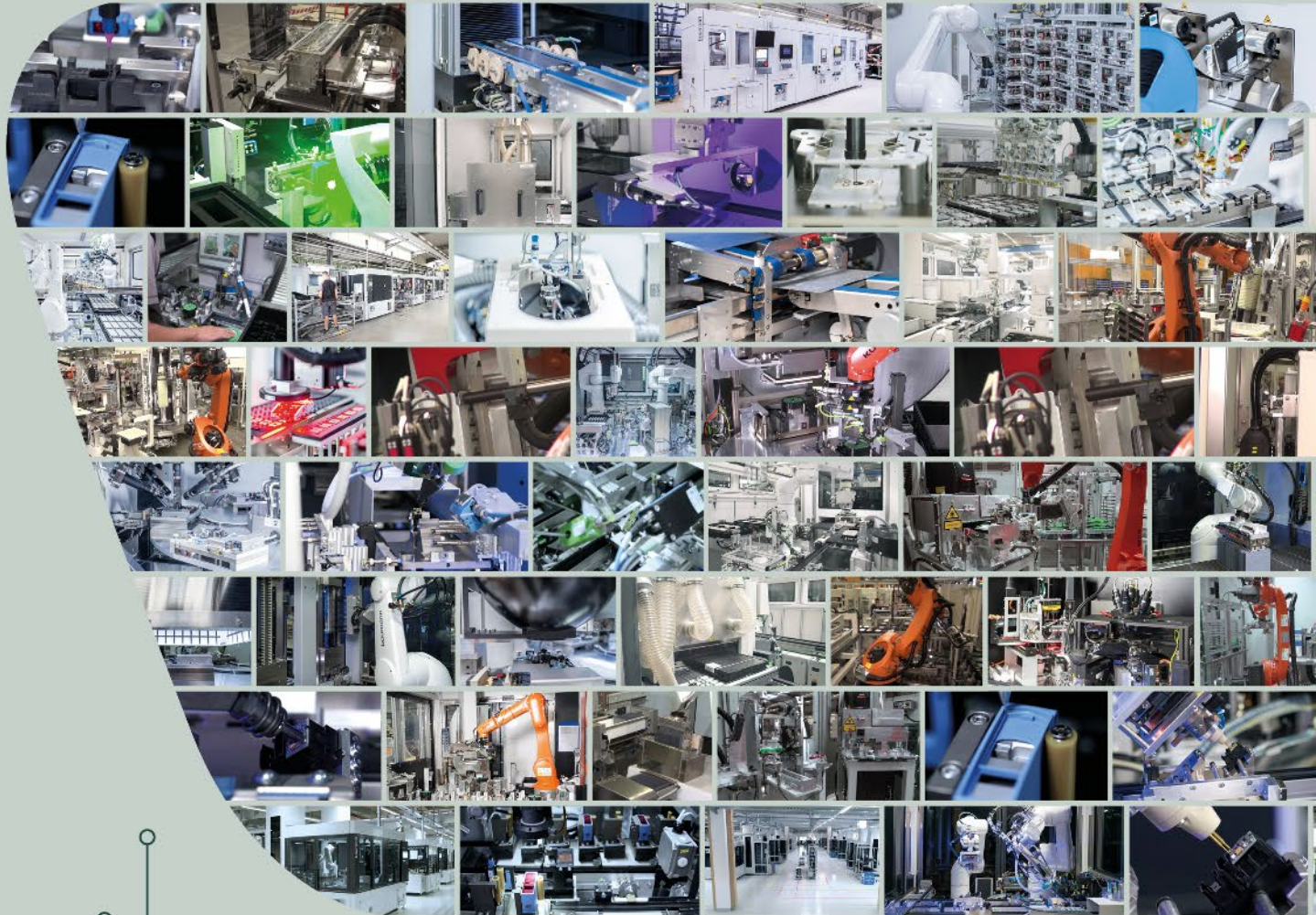
# LET'S TALK ABOUT YOURS.

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