



# Small Scale Autoinjector Assembly



RAYA 2025 Finalist Event

# Speakers



**Dr Sebastian  
Trennheuser**  
Vice President Operations



**Fabian Stutz**  
CEO | **Pharma  
botix**

# About Pharmabotix



- Swiss-based automation & robotics specialist for pharmaceutical and biotech industries.
- From Consulting & Engineering – to Turnkey solutions and special projects (Annex1)
- Focus on flexibility, GMP compliance, and digital integration
- Innovative, modular machine concepts enabling fast changeovers and future-ready automation.



# About PSM



- Family owned German end-to-end **CDMO** (1.5 hrs west of Frankfurt Airport)
- Approved according to new EU GMP Annex 1
- Fill and finish services for clinical trials and commercial batches
- RTU syringes, vials and cartridges for batches up to 600 L (20 L for orphan drugs)
- Focus on biological products, biosimilars, mAbs, mRNA,...and also small molecules

# About PSM

## End-to-End from clinical phases through commercialization of products



# About the project

- Clinical phase project
- Requirements of filling 1500 cartridges including pen assembly (end-to-end)
- Required processes:
  - Compounding
  - Filling of pre-crimped cartridge (A in B)
  - Vacuum Stoppering (A in B)
  - Manual VI (D)
  - (Automated) Gerresheimer pen assembly (D)



# Drivers for the Automation of this Process



- Follow strategy of automating key processes
- Manual non-critical handling steps for cost efficiency reasons
- High force and accurate press fit requires a mechanical support anyhow
- «It's fun to explore new technological solutions»

# Requirements

- Small Scale Autoinjector Assembly for Clinical Studies
- Infeed / Outfeed Ports for front and rear assembly
- Infeed station für cartridges
- Servo press for the process-reliable pressing together of assemblies
- Evaluation of servo press data, including force sensor
- 3 pcs / minute
- Autoinjector Gerresheimer Gx Inbeneo



# Equipment overview

Yaskawa 6-Axis Robot with Servo Gripper

Servo-Press with integrated force sensor

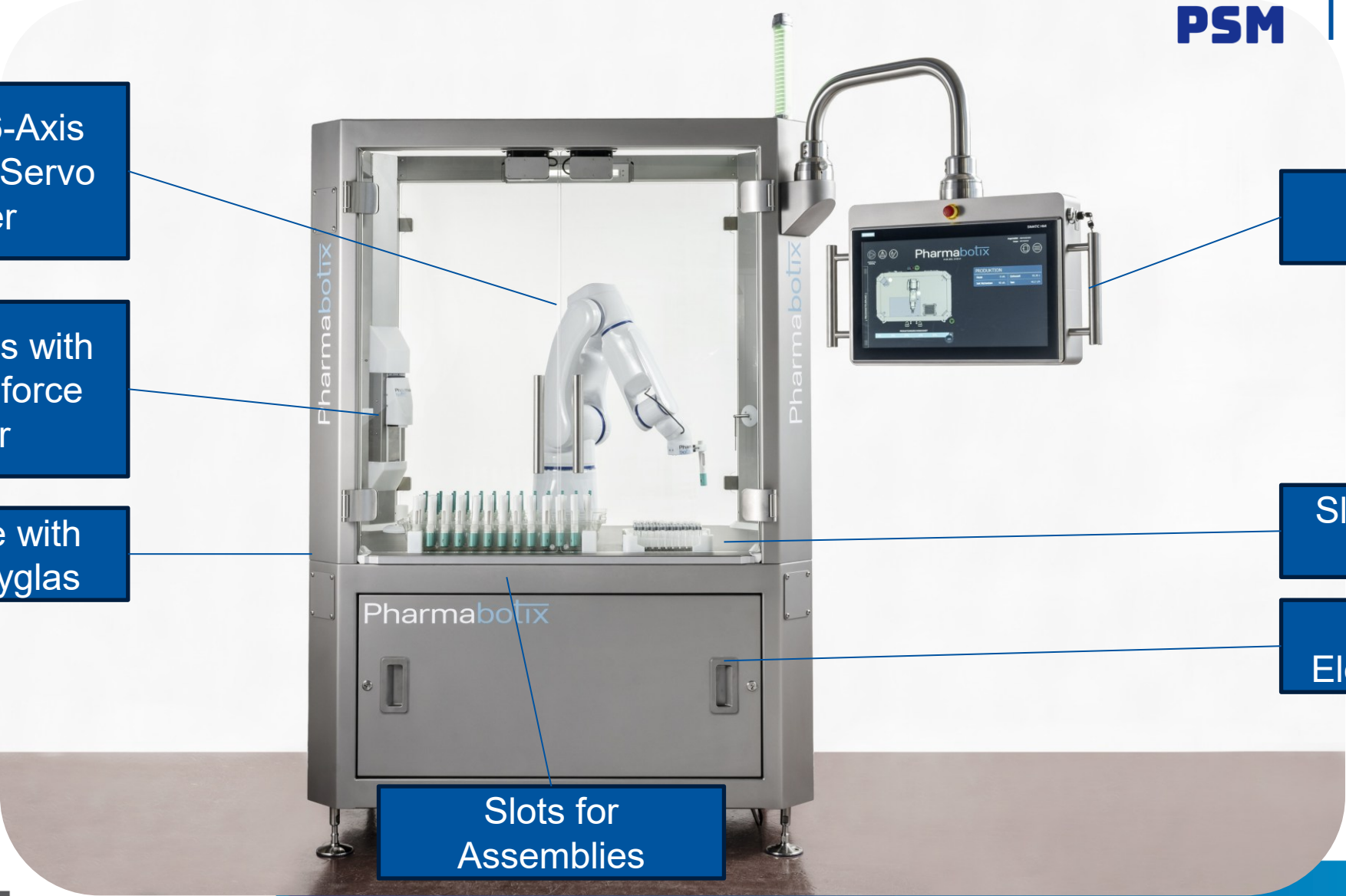
Baseframe with lam. Safetyglas

HMI

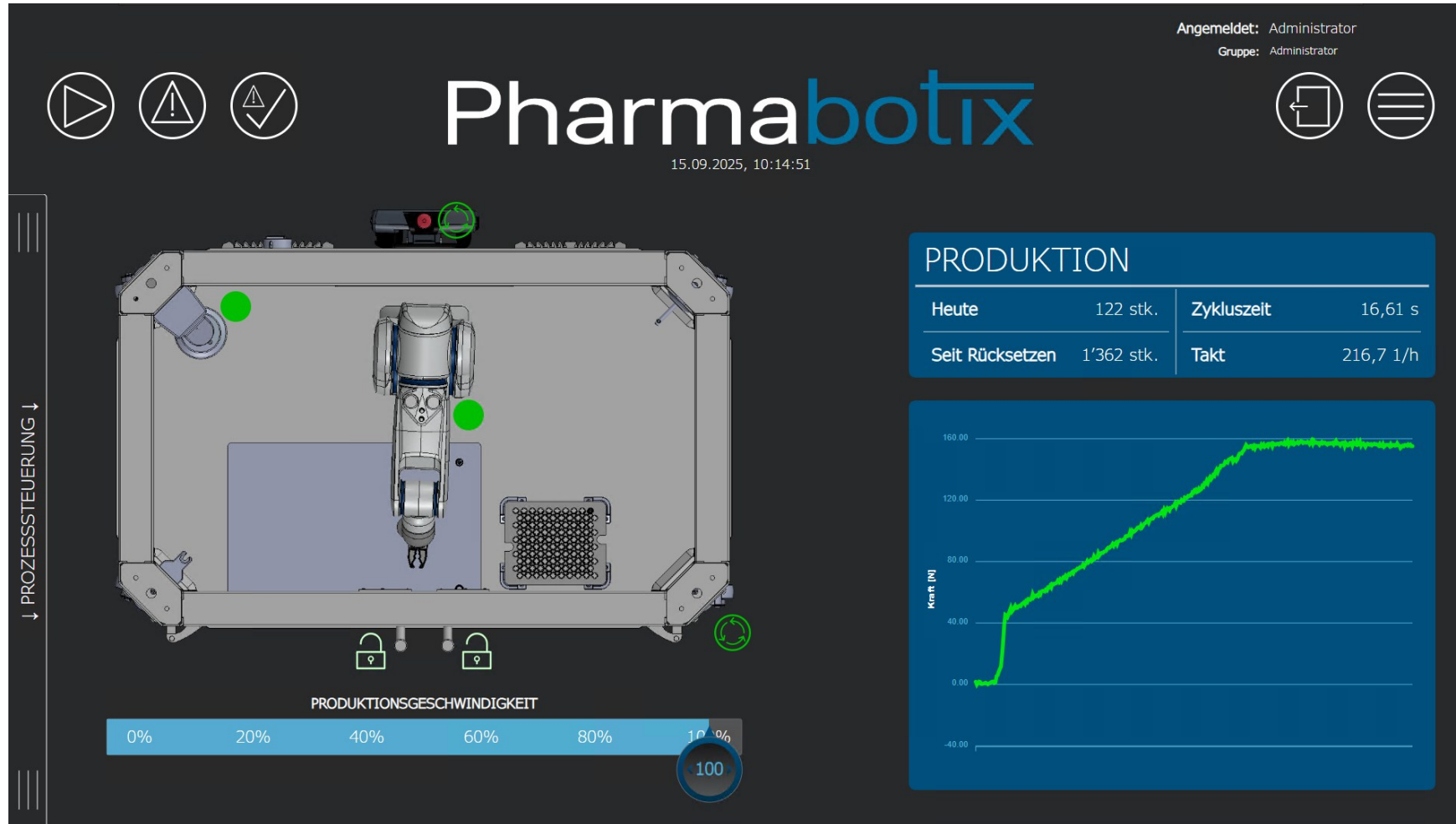
Slot for Nest with Cartridges

Integrated Electrical Cabinet

Slots for Assemblies



# Robot Integration and HMI



Angemeldet: Administrator  
Gruppe: Administrator

## Pharmabotix

15.09.2025, 10:14:51

↓ PROZESSSTEUERUNG ↓

PRODUKTIONSGESCHWINDIGKEIT

0% 20% 40% 60% 80% 100%

100

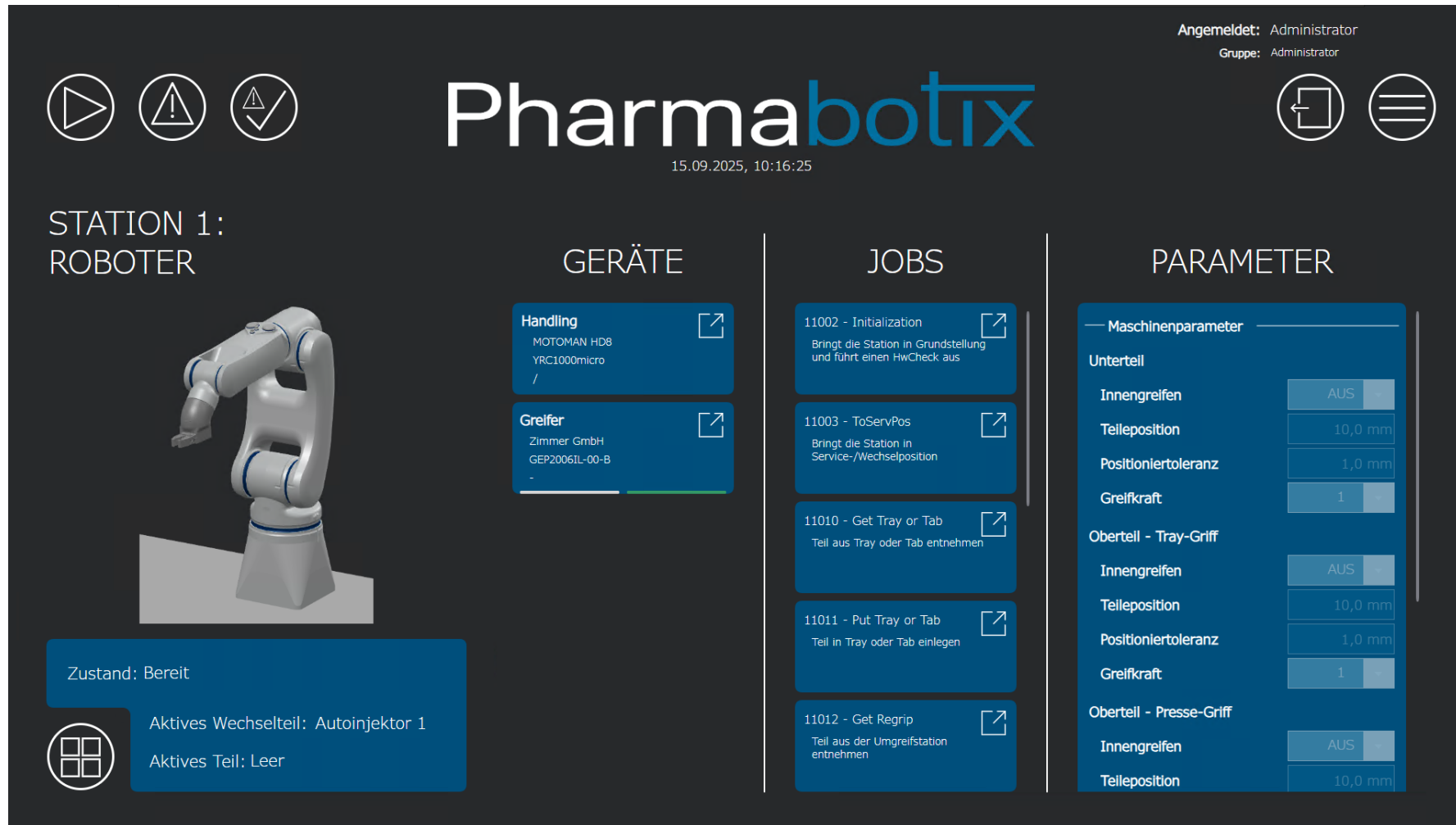
### PRODUKTION

Heute	122 stk.	Zykluszeit	16,61 s
Seit Rücksetzen	1'362 stk.	Takt	216,7 1/h

Kraft [N]

160.00  
120.00  
80.00  
40.00  
0.00  
-40.00

# Robot Integration and HMI



The screenshot shows the Pharmabotix HMI interface. At the top right, it displays the user 'Administrator' and the group 'Administrator'. The main title 'Pharmabotix' is centered, with the date and time '15.09.2025, 10:16:25' below it. The interface is divided into three main sections: 'STATION 1: ROBOTER' on the left, 'GERÄTE' (Devices) in the middle, and 'JOBS' and 'PARAMETER' on the right. The 'STATION 1: ROBOTER' section features a 3D model of a white robotic arm and a status box showing 'Zustand: Bereit', 'Aktives Wechselteil: Autoinjektor 1', and 'Aktives Teil: Leer'. The 'GERÄTE' section lists 'Handling' (MOTOMAN HD8 YRC1000micro) and 'Greifer' (Zimmer GmbH GEP2006IL-00-B). The 'JOBS' section lists five tasks: 11002 - Initialization, 11003 - ToServPos, 11010 - Get Tray or Tab, 11011 - Put Tray or Tab, and 11012 - Get Regrip. The 'PARAMETER' section shows machine parameters for 'Unterteil' and 'Oberteil - Tray-Griff', including 'Innengreifen', 'Telleposition', 'Positioniertoleranz', and 'Greifkraft'.

Angemeldet: Administrator  
Gruppe: Administrator

## Pharmabotix

15.09.2025, 10:16:25

### STATION 1: ROBOTER

Zustand: Bereit

Aktives Wechselteil: Autoinjektor 1  
Aktives Teil: Leer

### GERÄTE

- Handling  
MOTOMAN HD8  
YRC1000micro
- Greifer  
Zimmer GmbH  
GEP2006IL-00-B

### JOBS

- 11002 - Initialization  
Bringt die Station in Grundstellung und führt einen HwCheck aus
- 11003 - ToServPos  
Bringt die Station in Service-/Wechselposition
- 11010 - Get Tray or Tab  
Teil aus Tray oder Tab entnehmen
- 11011 - Put Tray or Tab  
Teil in Tray oder Tab einlegen
- 11012 - Get Regrip  
Teil aus der Umgreifstation entnehmen

### PARAMETER

#### Maschinenparameter

Parameter	Wert
<b>Unterteil</b>	
Innengreifen	AUS
Telleposition	10,0 mm
Positioniertoleranz	1,0 mm
Greifkraft	1
<b>Oberteil - Tray-Griff</b>	
Innengreifen	AUS
Telleposition	10,0 mm
Positioniertoleranz	1,0 mm
Greifkraft	1
<b>Oberteil - Presse-Griff</b>	
Innengreifen	AUS
Telleposition	10,0 mm

# Design & Cleanability



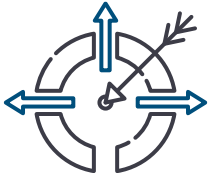
# Robot & Gripper



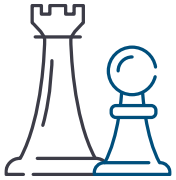
Pharma  
botix



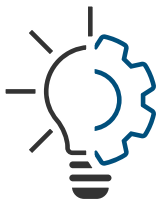
# Summary



- Attractiveness:**
- Adapted to customer process, compact and easy to use
  - Reliable and stable production speed

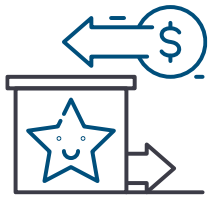


- Flexibility**
- Suitable for different types of Gx Inbeneo Injectors
  - Very short setup times - ideal for small batches



- Easy operation**
- Graphical User interface insures smooth operation
  - Recipe / product-based, calculated positions  
teaching unnecessary

# Summary



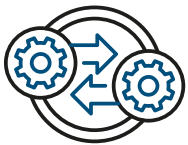
## ROI

- <3Y by enhancing production efficiency and multiplying the overall output compared to the existing solution



## Plug and play

- all shipped on one Baseframe – becoming operation after 2 days



## Integration

- Anyone can buy it, apply without customization

# Your vote for the audience award

# 3



- **Precision & Quality**  
6-axis Yaskawa robot with servo-press ensures validated force control, full traceability, and GMP compliance.
- **Flexibility for Clinical & Small Batches**  
Rapid adaptation to different autoinjector formats via recipe-driven HMI
- **Efficiency & Risk Reduction**  
Automates all critical steps (3 pcs/min), minimizes human error
- **Plug & Play Integration**  
Fully qualified system, immediate deployment in GMP environments, no hardware customization needed.
- **Sustainability & Future-Readiness**  
100% electric drives, low energy consumption





# Small Scale Autoinjector Assembly

