

# **System Integration - Challenge in mobile robotics**

**Different solution approaches to simplify applicability**

**KEBA Group AG**

**ARTI – Autonomous Robot Technology GmbH**

The logo for KEBA, featuring the letters 'K', 'E', 'B', and 'A' in a bold, sans-serif font. The 'K' and 'E' are green, while 'B' and 'A' are dark blue. A registered trademark symbol (®) is located to the upper right of the 'A'.

**KEBA**<sup>®</sup>

Automation by innovation.

A large, illuminated sign for KEBA, with the letters 'K', 'E', 'B', and 'A' in a bold, sans-serif font. The 'K' and 'E' are green, while 'B' and 'A' are dark blue. The sign is mounted on a metal frame and is illuminated from below.

**KEBA**

The logo for KEBA, featuring the letters 'K', 'E', 'B', and 'A' in a bold, sans-serif font. The 'K' and 'E' are green, while 'B' and 'A' are dark blue. A registered trademark symbol (®) is located to the upper right of the 'A'.

**KEBA**<sup>®</sup>

Automation by innovation.

# KEBA Group AG

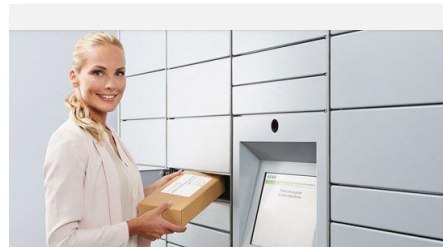
## Industrial Automation

Portfolio Examples



## Handover Automation

Portfolio Examples



## Energy Automation

Portfolio Examples





Industry expert in automation



553.5 million euro turnover

03/2023



Founded in 1968



87 % export



Active worldwide



13.7 % R&D rate



In private ownership



>2000 employees

**KEBA**<sup>®</sup>

Automation by innovation.

# Company

ARTI — Autonomous Robot Technology GmbH

Autonomy for robots

Founded in early 2019 with 6 shareholder

High-Tech Start-Up from Austria

Spin-off of the Graz University of Technology

Employees: 15

Customers across Europe

Research projects to increase the quality of our products and services

Offices in Graz, Styria (Austria)

- Embedded in industrial and high-tech network
- Excellent connections to universities and research institutions
- Excellent transportation links and a central location within Europe

**Science Park**  
The High Tech Incubator  
Graz

- Incubated in 2017



INCEPTION PROGRAM

- Incubated since 2018



**business  
incubation  
centre**

Austria

ARTI is an Alumnus of  
ESA Business Incubation  
Centre Austria 2023

- Incubated in 2021

# System Integration

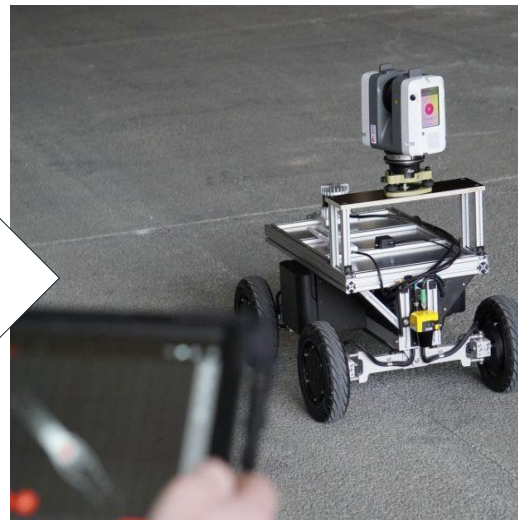
The integration of the solution spans multiple stages.

Each stage varies in required skill levels, integration targets, and the extent of system changes.



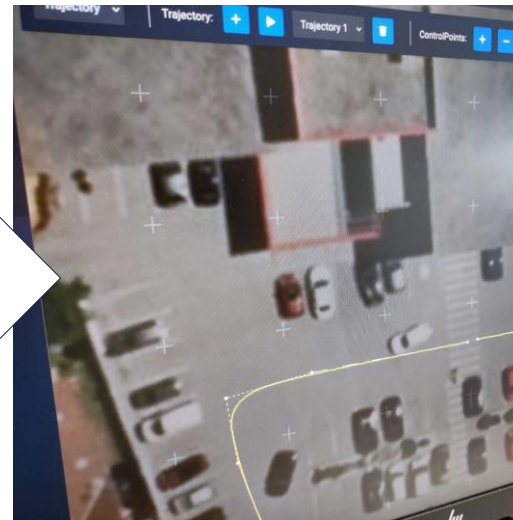
## Development

From Prototype to Product



## Production

Scaling Up Production



## Commissioning

Integration at Site



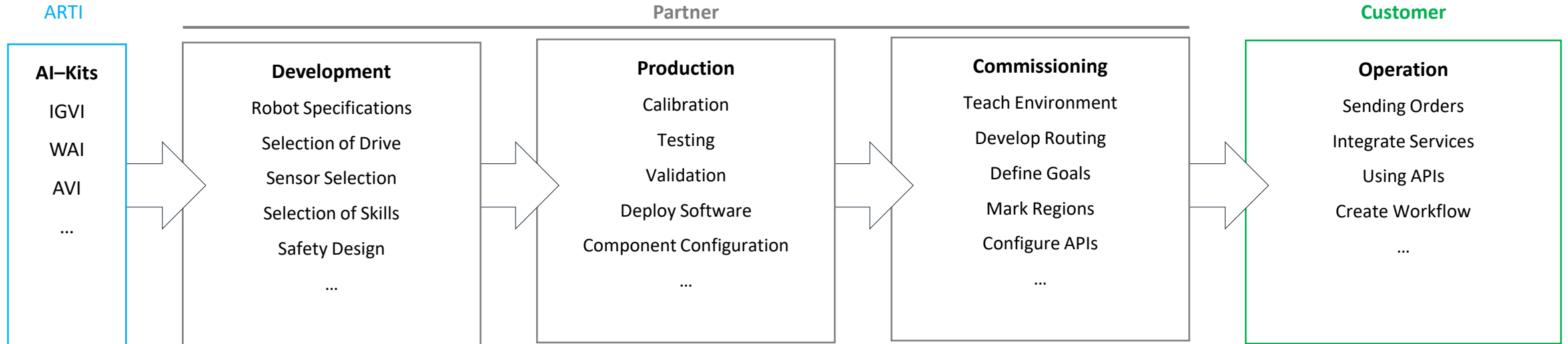
## Operation

Operational Longevity

# Integration Workflow in Detail

Experience seamless integration at every stage, from development to operation.

Our comprehensive workflow ensures your autonomous robots achieve peak performance.



Required Expertise:

Software Expert

Hardware Expert

Service Expert

Application Expert

# Integration Tools

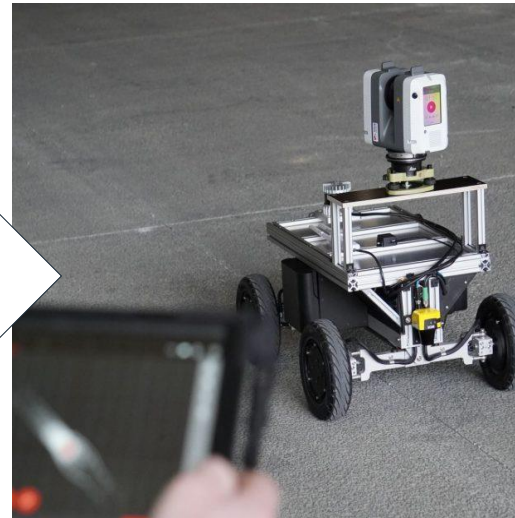
The integration of the solution spans multiple stages.

Each stage varies in required skill levels, integration targets, and the extent of system changes.



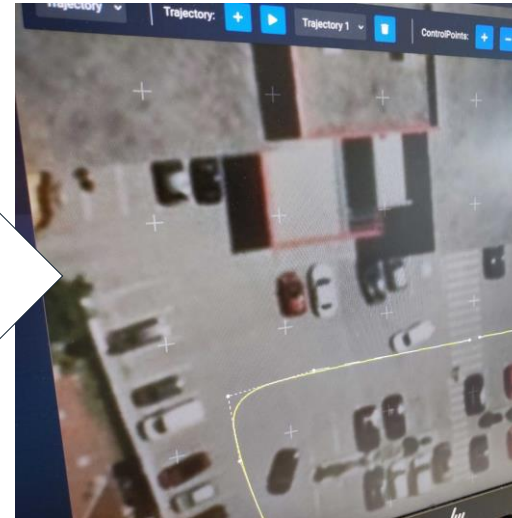
## Development

From Prototype to Product



## Production

Scaling Up Production



## Commissioning

Integration at Site



## Operation

Operational Longevity

# Integration Tools

Our innovative tools and research projects streamline each stage of the integration process, ensuring efficient and effective deployment of autonomous robots.



## Development

From Prototype to Product

### FFG AI-Kits

Modular AI-Software Kits for mobile Robots

Generalizable Foundation



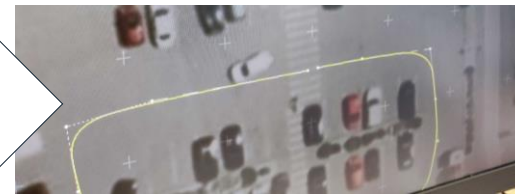
## Production

Scaling Up Production

### FFG READI

Assistance Tool for Integration and Calibration

Wizard  
Automated Calibration



## Commissioning

Integration at Site

### FFG LOKI

Tools to Deploy and Manage Robot Fleets

Data Exchange  
Automated Map Updates



## Operation

Operational Longevity

### FFG PRESENT

Predictive Maintenance

Automated Introspection  
System Inspection

# ARTI Project REDI

Tool: **Robot Efficient Deployment Instrument**  
Making Calibration and Configuration easier.

User-Friendly Setup with Wizard

Simplifies Configuration: Enables customers to handle basic setup and calibration without needing expert assistance.

Automated Calibration

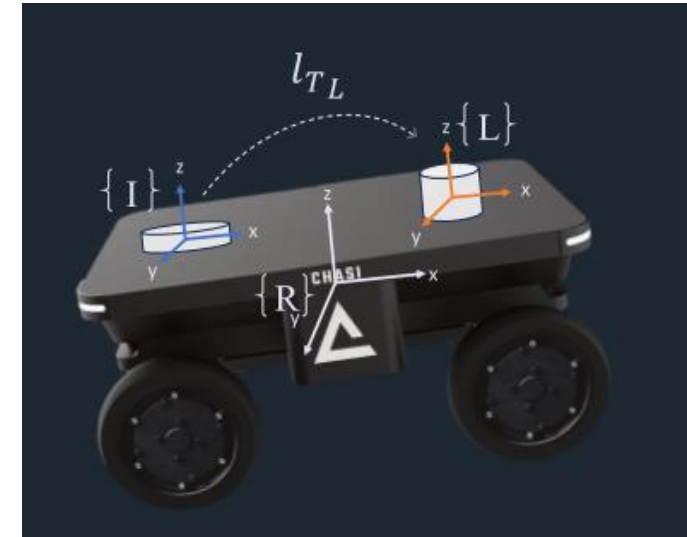
Accelerates Production: Speeds up the deployment process.

Enhances Quality: Reduces human error and increases accuracy.

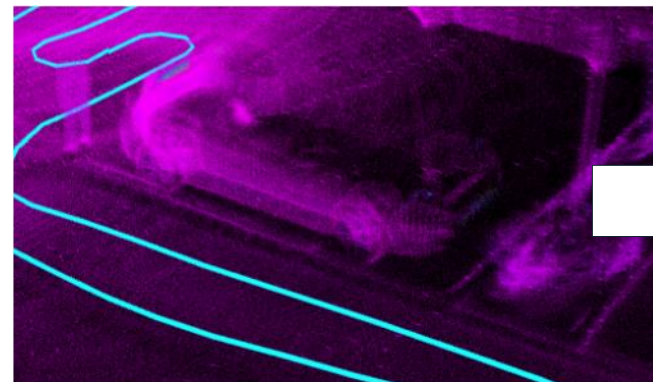
Streamlined Workflow: Provides an easy-to-follow workflow for efficient operation.



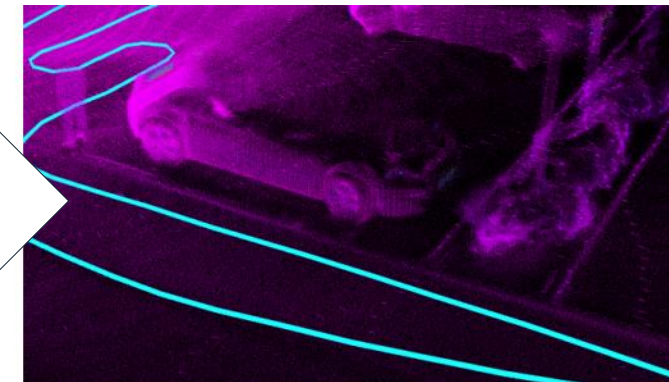
AGV Model



Configuration Diagram



Manual Calibration



Automated Calibration

# ARTI Project LOKI

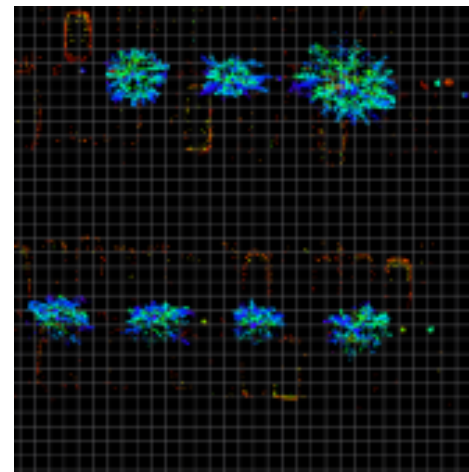
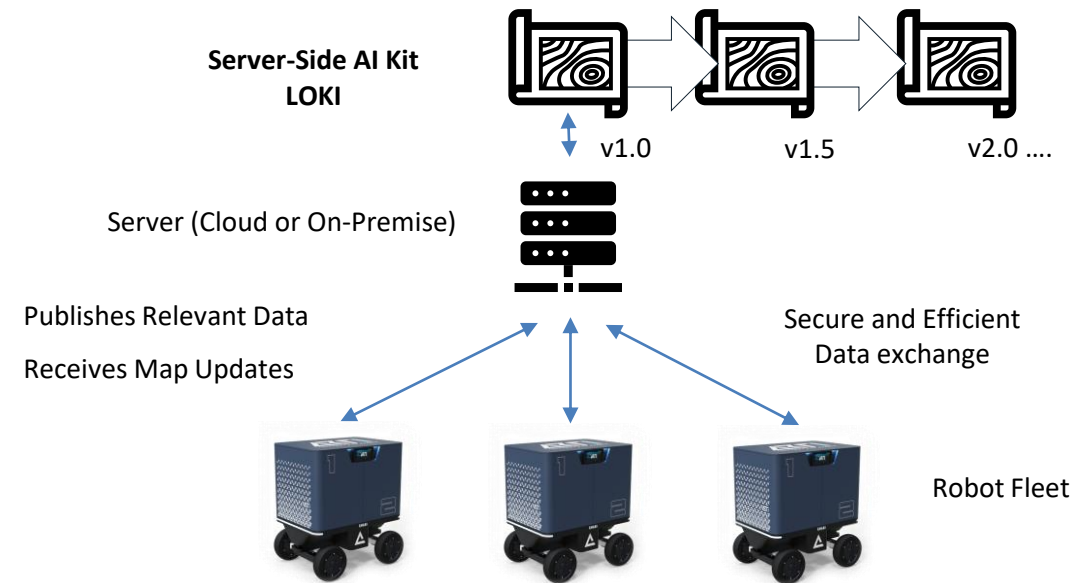
## Server-side AI Kit to Distribute Map Updates Making Deployment and Map Roll-out Easier

**Real-Time Data Collection:** Server collects and optimizes maps in real-time during operation.

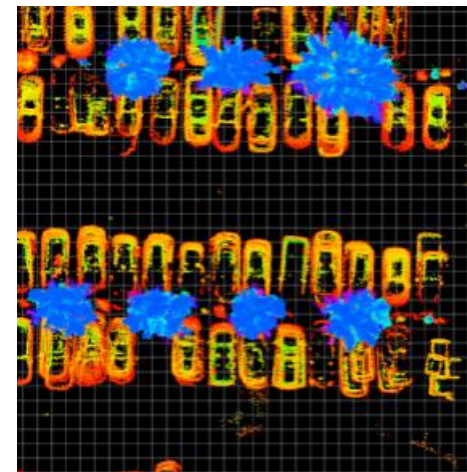
**Adaptability:** Incorporates both short-term and long-term changes in the environment.

**Performance Tracking:** Monitors performance across various spaces, times, and machines.

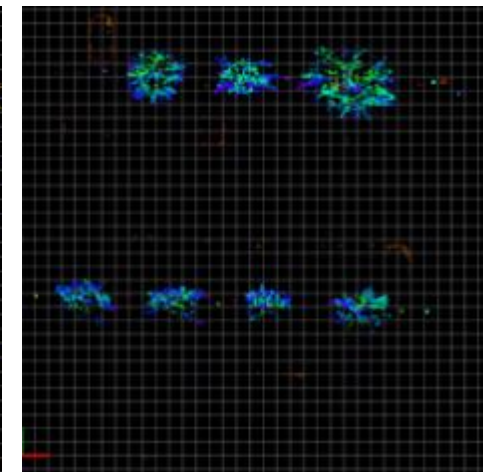
**Future Enhancements:** Plans to use Deep Neural Networks (DNN) to distinguish between static and dynamic elements.



Initial Map – 1 Robot



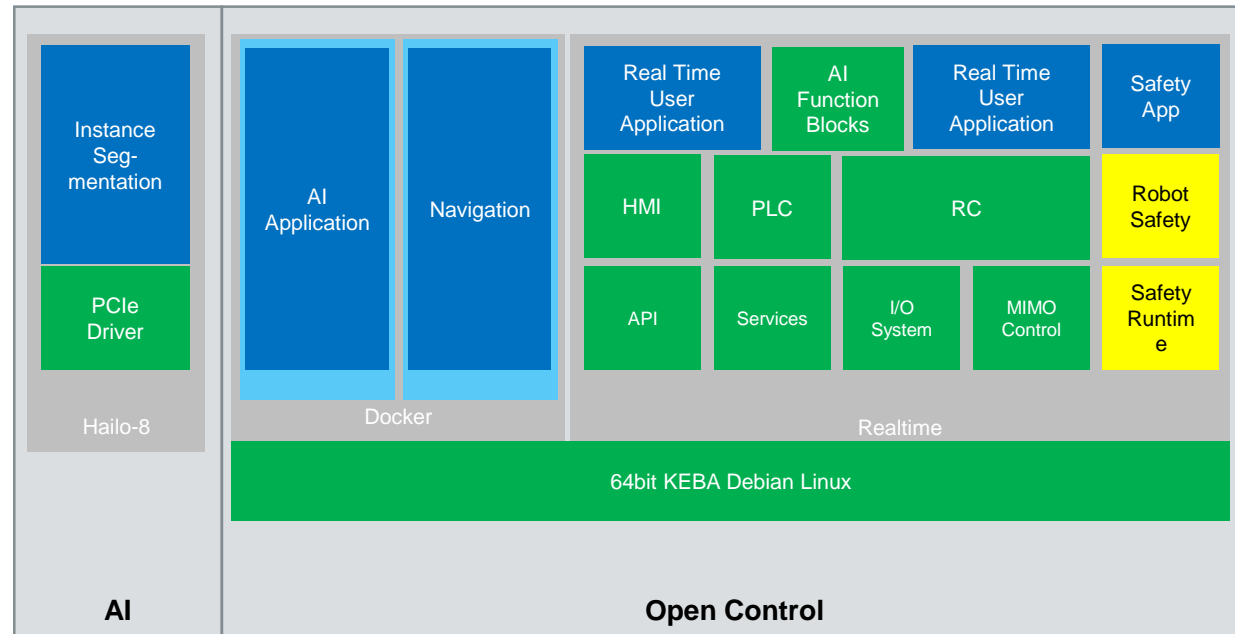
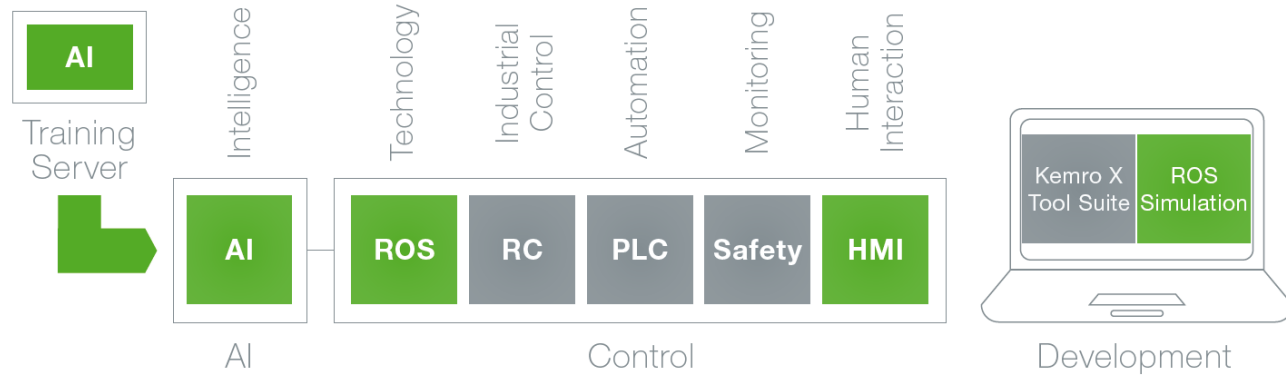
Collected Map – 10 Weeks



Optimized Map

# AUTONOMOUS ROBOT

## AI Control Innovation



# PROJECT AMR

AI -NAV

AI -Motion

Control AGV

Control Robotik

Drives - Sensors



## KEBA AMR -TECHNOLOGY

We deliver a unique combination in **one** control system

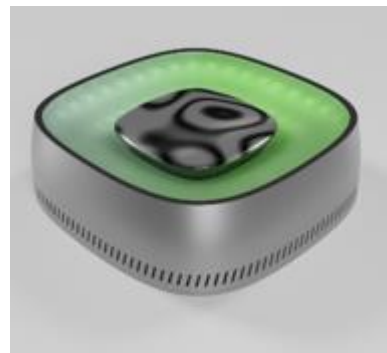
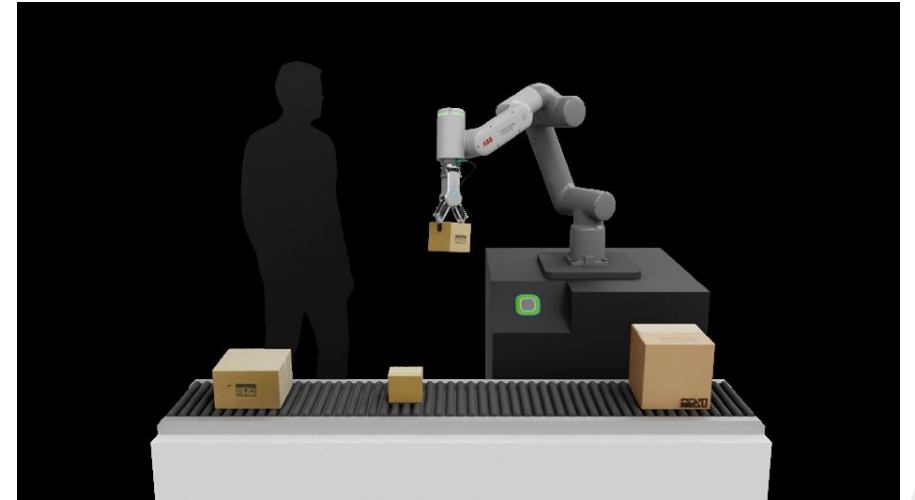
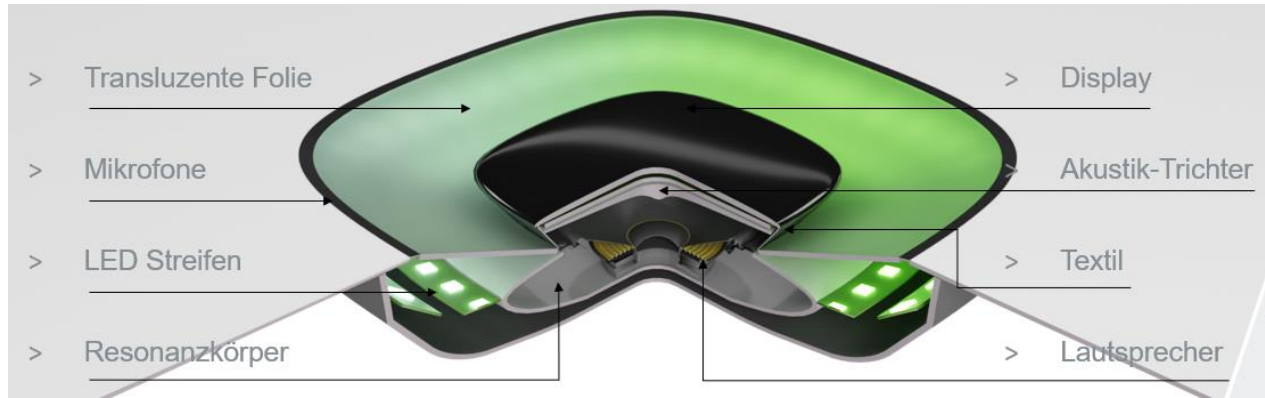
**Industry - Robotics** Precise, fast arm movement

**Industry - AI** autonomous navigation and robot movement

**Industry - HMI** Easy operation and programming

The core problem of all AGV producers is the complex Robotics usable to combine.

Therefore, this basic technology and combination of interesting for all our existing customers and appeals to other new customers.



Dialog

Emotion AI

Funktion

AI-Control

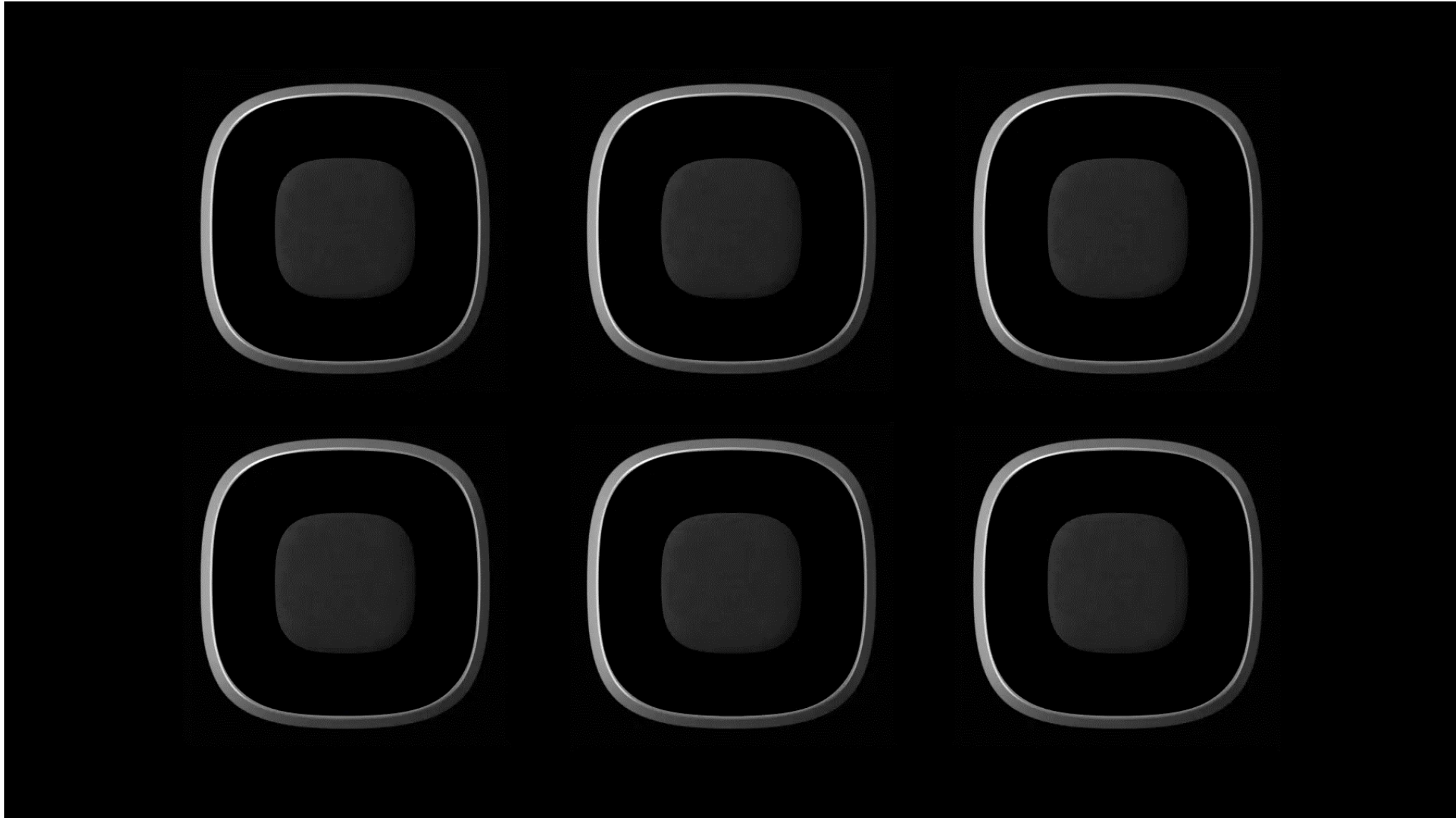


# AI UX - ASSISTENT

HELLO I  
AM KIKI!



# ANIMATION



# KIKI : AI ASSISTANT

KEBA



KI

# Conclusion and Outlook

System integration in the broadest sense in mobile autonomous robotics is essential and remains challenging.  
The complexity can be simplified through research, development and cooperation.

A simple conversation can answer a lot of questions.  
So don't hesitate to get in touch!

ARTI – Autonomous Robot Technology GmbH  
Webpage: [arti-robots.com](http://arti-robots.com)  
Youtube: [youtube.arti-robots.com](https://youtube.arti-robots.com)  
Email: [office@arti-robots.com](mailto:office@arti-robots.com)  
Bundesstraße 83, 8077 Gössendorf, Austria  
Phone: +43 664 5831500

Contact

KEBA Group AG  
Webpage: [keba.com](http://keba.com)  
Email: [keba@keba.com](mailto:keba@keba.com)  
Reindlstraße 51, 4040 Linz  
Phone: +43 732 7090-0