



E2E Sample Management

2025-09-26

Albane Ferraris | Guillaume Zimmermann
| Fabien Gindrat



Robotics strategists at the core



Speakers



Albane Ferraris

Director, Head Technology Innovation



Fabien Gindrat

Head of Robotic Systems



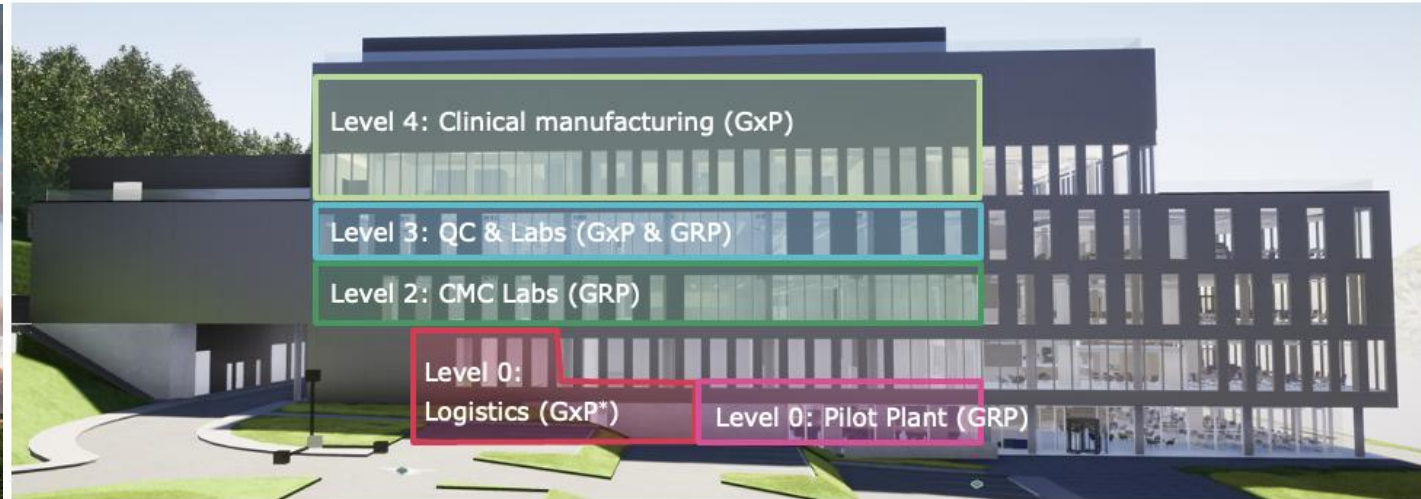
Guillaume Zimmermann

Founder & Managing Director



Merck BDC, Corsier (CH) Biotech Development Center

The Merck Biotech Development Center is a 16'000m² facility, delivered in 2023; it hosts a 300 employees, multidisciplinary team, supported by the most advanced solutions, particularly Robotic Lab Automation.





AGV-1.1 & AGV-1.2

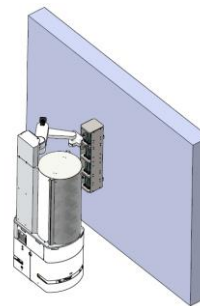
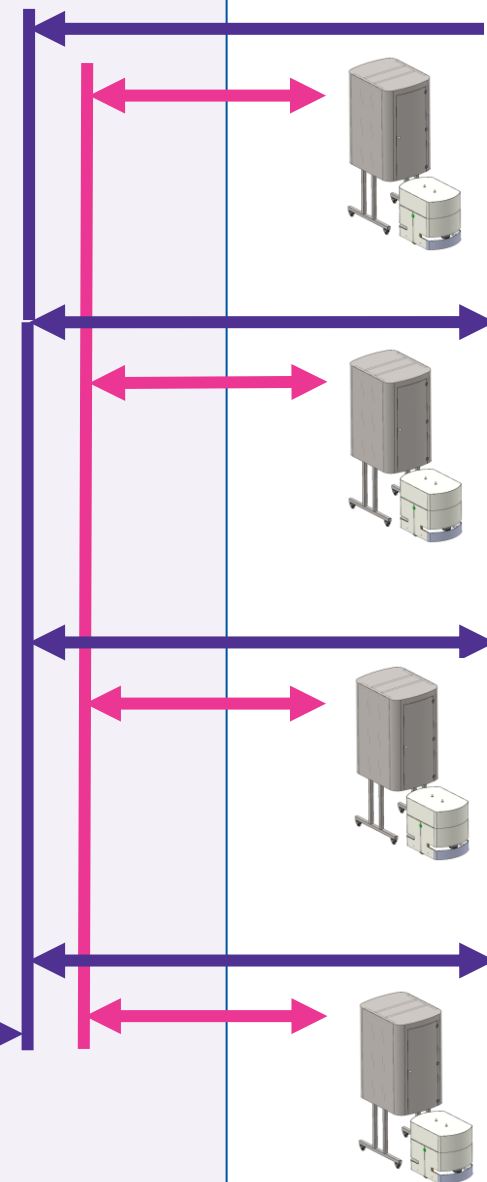


AGV-2.1



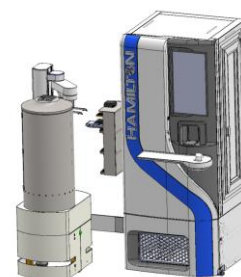
Centralized Sample Storage (-40°)
Samples Long & short-term storage

Elevator



Level 4 - Clinical Manufacturing (CTS)

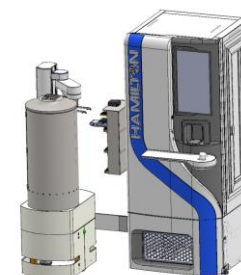
- 4 x Samples generation
- 5 x Goods & Special samples shipment and reception



Level 3 - Analytical Development and QC

- 2 x Samples generation & reception
- 2 x Goods & Special samples shipment and reception

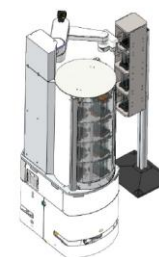
Temp Sample Strage (5°)



Level 2 - Drug Substance and Drug Product Development

- 2 x Samples generation & reception
- 2 x Goods & Special samples shipment and reception

Temp Sample Strage (5°)



Level 0 - Pilot Plant

- 1 x Samples generation
- 1 x Goods & Special samples shipment and reception

Level 0 - Logistic

- 1 x Samples reception for external shipment
- 1 x Goods & Special samples shipment and reception



AGV1 SBS Type 5 to 150 mm high max



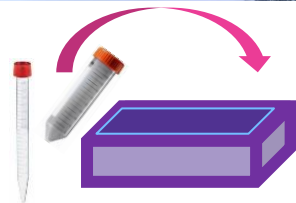
SBS Rack 48 x 2.0 mL



SBS Deepwell plate 2000 µL



SBS Microwell plate



SBS Special box
max 69mm-150mm height

AGV2 Goods & Special samples that don't fit in a SBS box 150mm high max



AGV2 will be able to manage many types of “tools” :

- 1. Cart with shelves like the video
- 2. Custom-designed cart
- 3. Basket “tool”

Centralized Sample Storage (-40°)



Barcode scan and transfer into high-density labware



-40° Shelf-storage - Samples Long & short-term storage

Vials Tracking Across Robotic Systems & Laboratories



Barcode and Data Matrix tracking



Live updates into the digital system

→ real-time sample location & status

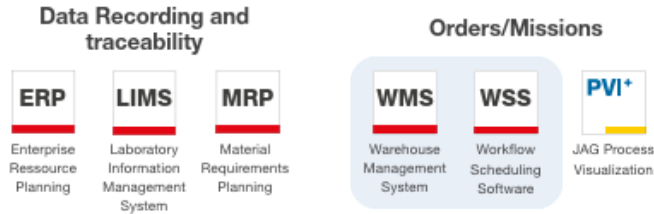


Visual management : Color-coded Caps GMP (Blue) non-GMP (Orange)



Integration Level 3

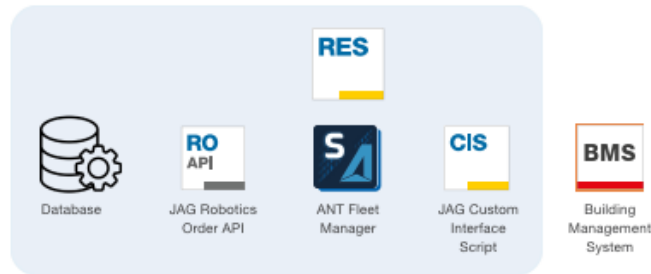
Supervision, Planning & Integration (management)



Integration Level 2

JAG RES - Robotics Execution System

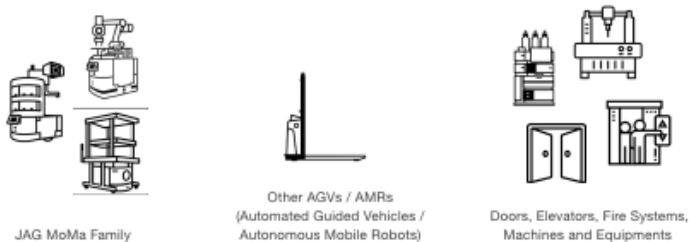
Coordination, Execution & Integration (middleware)



Integration Level 1

Field System

Physical actions (hardware)



Digital Backbone – Three Layers, One Flow

Level 3 : Client Systems (GLIMS, BOLT, MES)

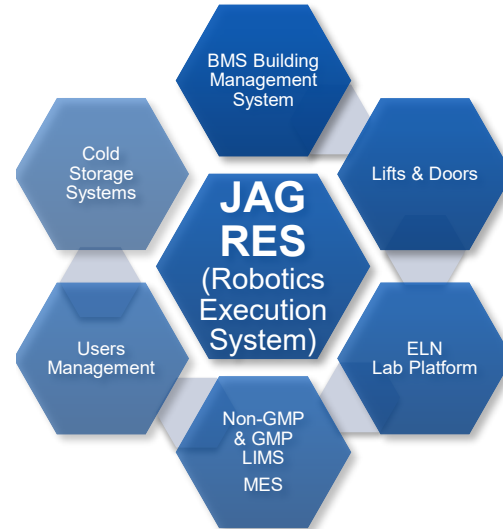
→ Users stay in their daily tools, no extra software, no duplication.

Level 2 : Execution Layer (JAG RES)

→ The Robotic Execution System: one brain to orchestrate all machines.

Level 1 : Fiels System

→ AGV, CSS, Temp Storage handling vials, while the system also controls elevators and doors for seamless transport.



One interface. One command. Full traceability.

Vision

Redefining E2E Sample Management Through Robotic and Digital Integration



Build a fully automated, digitally integrated ecosystem that **transports, stores, tracks, and secures samples across the entire value chain**, delivering end-to-end automation and real-time digitalization of every sample flow.

Strategic Value / Drivers :

- Empowers scientific teams by **removing repetitive tasks and enabling focus on high-value work**.
- Establishes a **scalable model for automated sample and material logistics** that can be replicated across facilities and adapted to evolving needs.
- Bridges physical and digital operations, ensuring **real-time traceability, compliance, and operational continuity with 24/7** operational readiness.

Why It Matters

Cost Effectiveness / ROI

- Optimized workflows and reduced manual handling.
- Verified ROI : **3.5 years**, including error reduction and compliance gains.

Area of Application

- QC, Analytics, R&D Lab, Logistics, and Pilot plant.
- Manufacturing through Material Air lock (MAL)



Flexibility

- **Modular, scalable architecture**; supports new labware, workflows, and digital systems.
- **Supports both GMP and non-GMP** flows, with digital segregation.
- All kind of raw material can also be managed by AGV using trolley

Ease of Integration

- **Users remain in their daily systems** no duplication, no new tools.
- Designed for seamless deployment in existing buildings: No or light building modifications needed

Vote for the Future of Sample Management

End-to-End Sample Management can be a game-changer

- Turns sample handling from a bottleneck into a catalyst for progress.
- Frees scientists to focus on discovery, not logistics.
- Ensures reliability, transparency, and speed day and night.
- Provides not just a solution for today, but a blueprint for the future of scientific operations.



If you believe science deserves reliable, efficient, and future-proof sample management, vote for the project that delivers it every day.

