



# Robotic Applications

*Smart Solution for Innovative  
companies*

MI Robotic team



# Main products

- **Automatic Stockers:** storage system within a designated area. It is capable of receiving a reticle as input through appropriate pickup points, storing it inside, recalling it, and delivering it when needed to one of the deposit points.
- **Automatic Transport Systems:** Automated production lot transport systems are designed to connect work areas both within the same building and across different buildings.
- **Automatic Load/Unload Systems for process tools:** Systems capable of receiving, manipulating, and directly loading/unloading production lots into tools. They interact with any external automated transport systems and the internal tracking system within the fab production
- **Mobile Robots:** Autonomous Mobile Robots (AMRs) perceive their environment and adapt to it. AMRs are industrial robots that lift and transport materials within your facility. They move safely around people, equipment, and goods by using Light Detection and Ranging (LiDAR) to detect the surrounding environment and obstacles.

All the systems are capable of handling different types of materials and containers:

- Wafer box: E99; Smif Box; Foup.
- Reticles: Canon; Shipment Box; Smif pods.

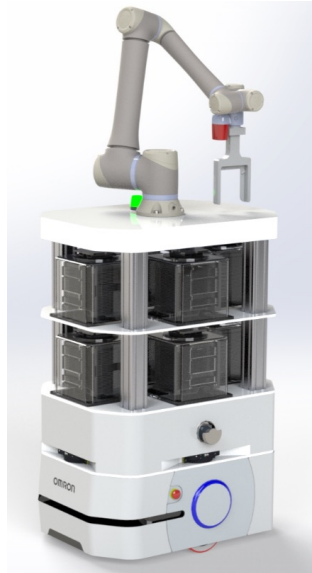


# Mobile Robots

# M.O.M.A. Robots: S.A.R.A. Solutions



**E99 Version**



**SMIF Version**

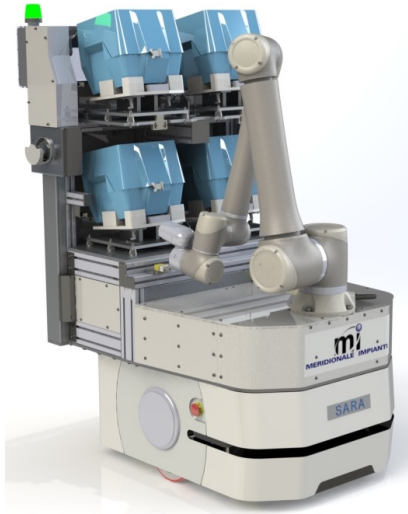


**FOUP Version**



**Carrier Version**

# M.O.M.A. Robots: S.A.R.A. E99 Version



**Front View**



**Rear View**

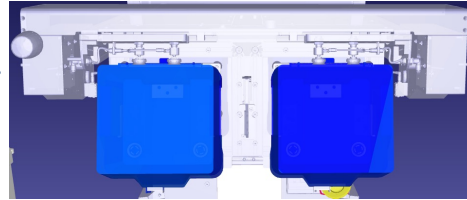
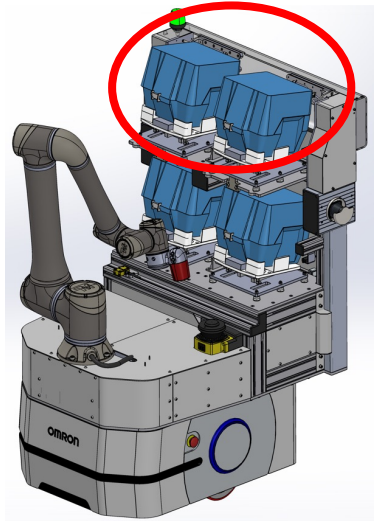
## **Main features:**

Able to contain up to 4 Boxes, is a flexible robot with the following features:

- Can be integrated into the working environment
- Cobot to manage and manipulate the Boxes and carriers inside
- Equipped with sensors and safety systems to avoid collisions with obstacles or people in their path. These systems ensure a safe working environment. Equipped with monitoring and tracking systems PLC Based that allow real-time tracking of loads and collection of data for process optimization
- End Effector able to read carrier barcode

# M.O.M.A. Robots: S.A.R.A. E99 Version

## Integrated Open BOX System

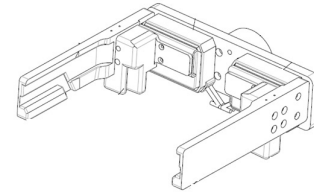


## Central Clip

## Main features:

Able to open the Boxes and manage the carrier inside to Load/Unload process tool directly.

- The End Effector (**Patent**) is able to work with E99 and Carriers:

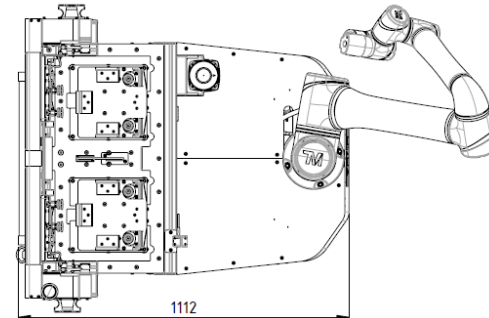
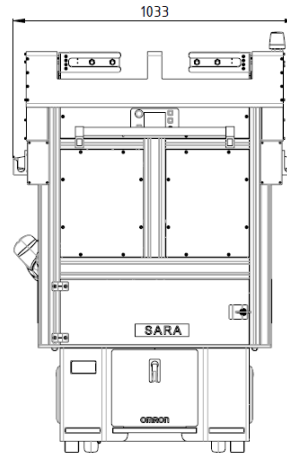
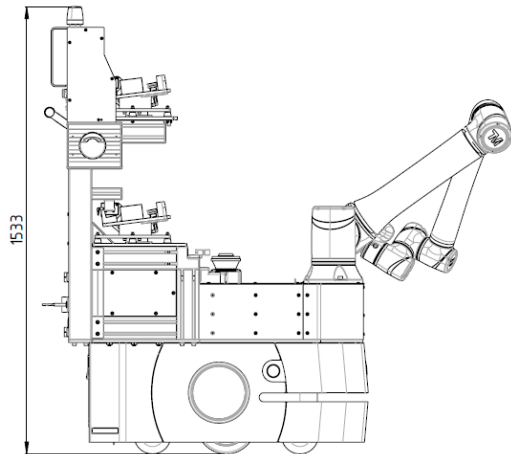


- End Effector able to read carrier barcode:



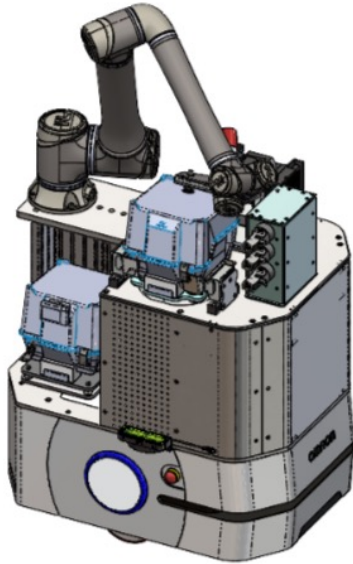
# M.O.M.A. Robots: S.A.R.A. E99 Version

## Dimensions

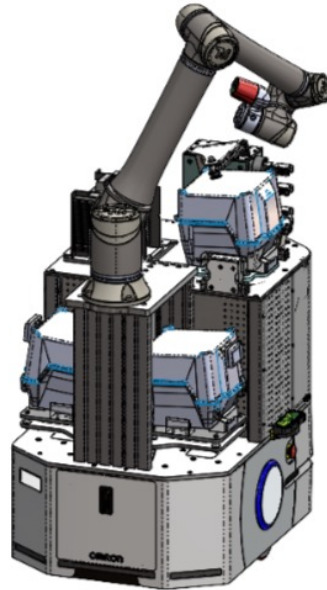


**Weight: 350 kg**

# M.O.M.A. Robots: S.A.R.A. E99 Version



**Front View**



**Rear View**

## **Main features:**

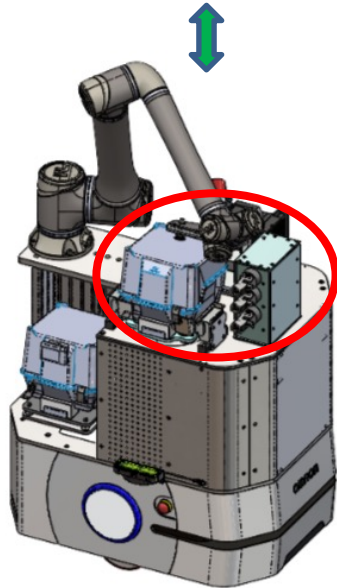
Able to contains up to 3 Boxes + 1 Carrier, is a flexible robot with follow features:

- Can be integrated into the working environment
- Cobot to manage and manipulate the Boxes and carriers inside
- Equipped with sensors and safety systems to avoid collisions with obstacles or people in their path. These systems ensure a safe working environment. Equipped with monitoring and tracking systems PLC Based that allow real-time tracking of loads and collection of data for process optimization
- End Effector able to read carrier barcode



# M.O.M.A. Robots: S.A.R.A. E99 Version

Integrated N°1 Open  
BOX System

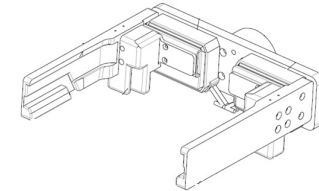


Double Clips

## Main features:

Able to open the Boxes and manage the carrier inside to Load/Unload process tool directly.

- The End Effector (**Patent**) is able to work with E99 and Carriers:

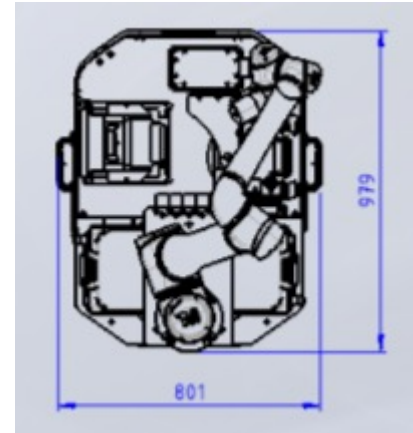
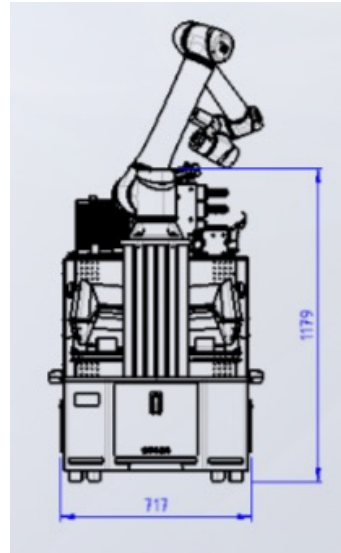
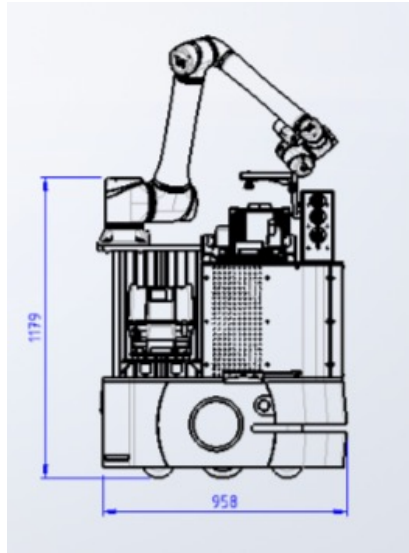


- End Effector able to read carrier barcode:



# M.O.M.A. Robots: S.A.R.A. E99 Version

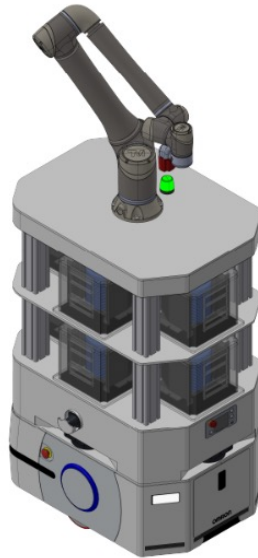
## Dimensions



# M.O.M.A. Robots: S.A.R.A. SMIF Version



**Front View**



**Rear View**

## **Main features:**

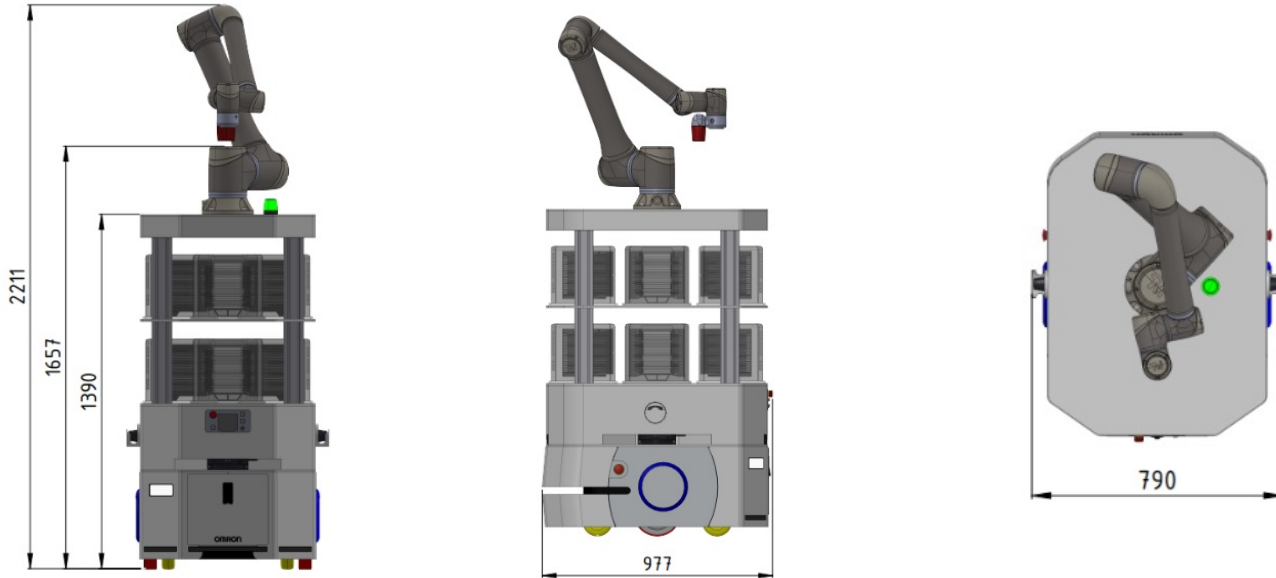
Able to contains up to 8 Boxes, is a flexible robot with follow features:

- Can be integrated into the working environment
- Cobot to manage and manipulate the Boxes
- Equipped with sensors and safety systems to avoid collisions with obstacles or people in their path. These systems ensure a safe working environment. Equipped with monitoring and tracking systems PLC Based that allow real-time tracking of loads and collection of data for process optimization.
- End Effector able to read Box barcode



# M.O.M.A. Robots: S.A.R.A. SMIF Version

## Dimensions



**Weight: 270 kg**

# M.O.M.A. Robots: S.A.R.A. FOUP Version



**Front View**



**Rear View**

## **Main features:**

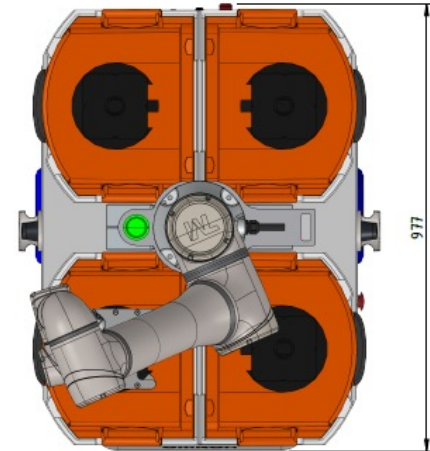
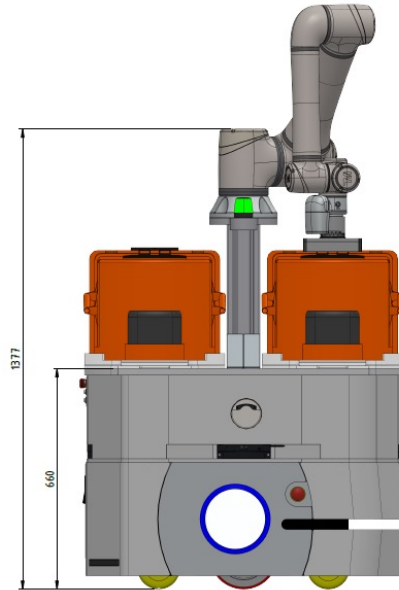
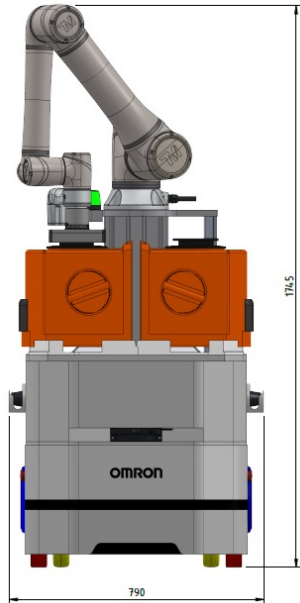
Able to contains up to 4 Foups, is a flexible robot with follow features:

- Can be integrated into the working environment
- Cobot to manage and manipulate the Boxes
- Equipped with sensors and safety systems to avoid collisions with obstacles or people in their path. These systems ensure a safe working environment. Equipped with monitoring and tracking systems PLC Based that allow real-time tracking of loads and collection of data for process optimization.
- End Effector able to read Box barcode



# M.O.M.A. Robots: S.A.R.A. FOUP Version

## Dimensions



**Weight: 310 kg**

# M.O.M.A. Robots: S.A.R.A. Carriers Version

**Able to work with an Automatic Open Box System**



**Open Box System  
(Optional)**



**Front View**

## **Main features:**

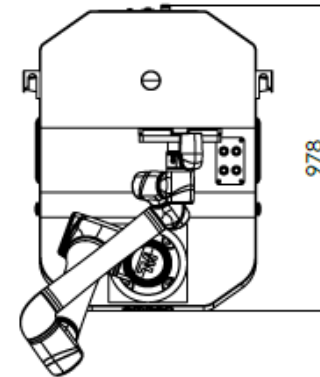
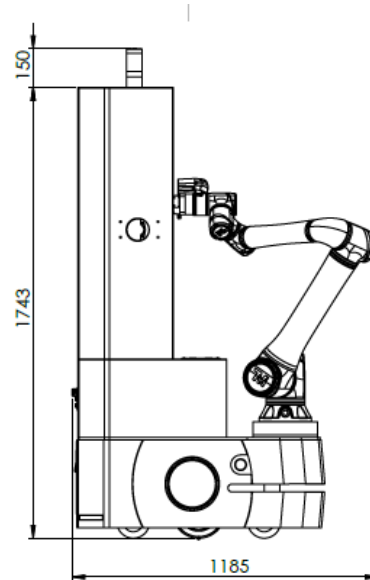
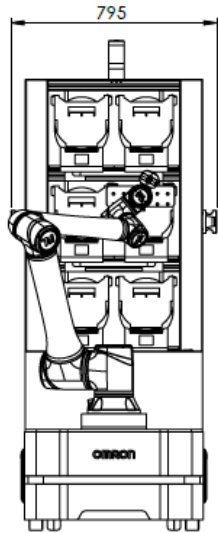
Able to contains up to 6 Carriers, is a flexible robot with follow features:

- Can be integrated into the working environment
- Cobot to manage and manipulate the carriers
- Equipped with sensors and safety systems to avoid collisions with obstacles or people in their path. These systems ensure a safe working environment. Equipped with monitoring and tracking systems PLC Based that allow real-time tracking of loads and collection of data for process optimization
- End Effector able to read Carrier barcode



# M.O.M.A. Robots: S.A.R.A. Carrier Version

## Dimensions

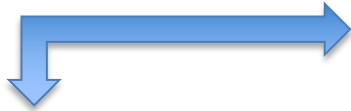


**Weight: 330 kg**

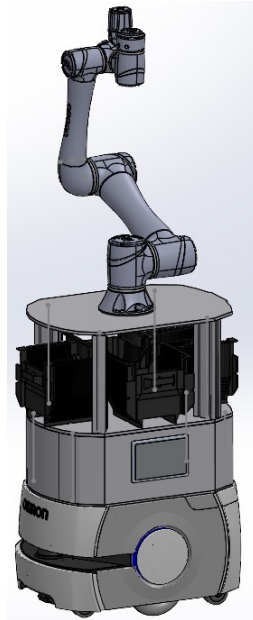


# M.O.M.A. Robots: S.A.R.A. Carriers Version – LD90

**Able to work with an Automatic Open Box System**



**Open Box System (Optional)**



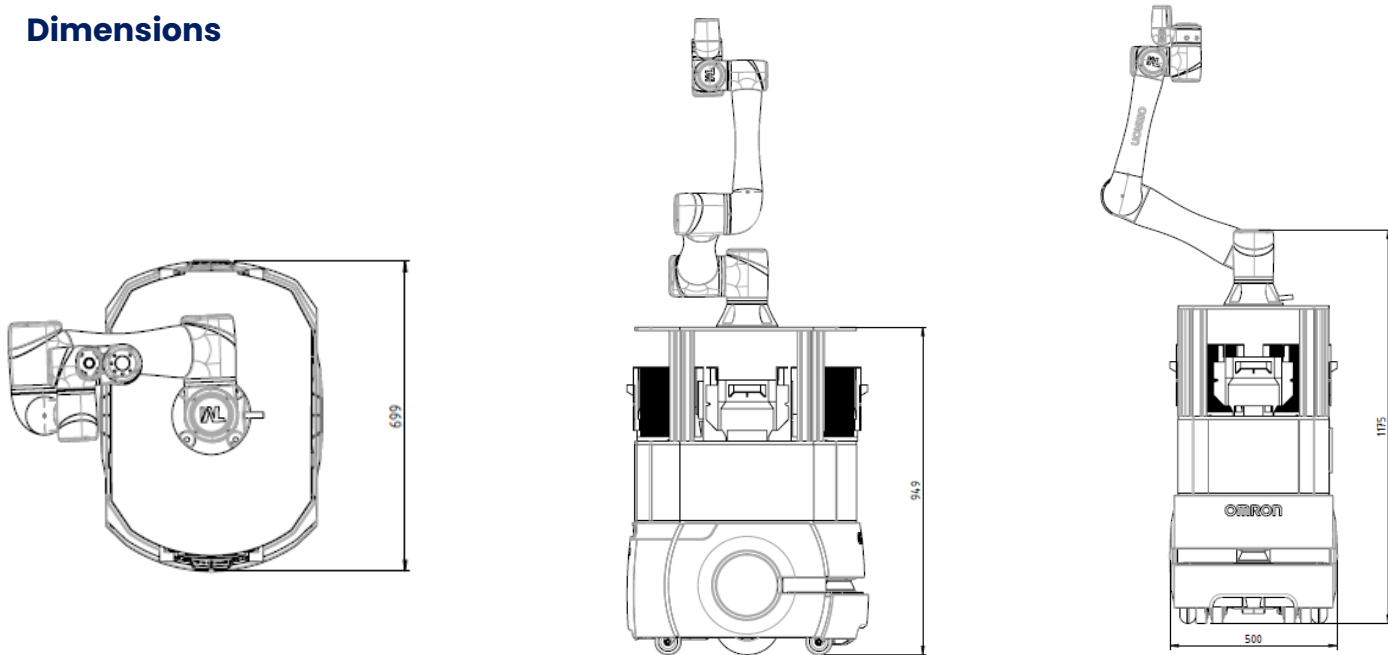
**Front View**

## **Main features:**

- Omron LD 90 mobile robot
- Omron TM5-900 collaborative robot
- built in vision system for tool/Stocker alignment
- Fleet Management
- Supported SEMI:
  - SEMI E84: carrier Handoff
  - SEMI E23: Cassette Transfer Parallel I/O Interface
- Capacity: 4 position
  - 2 for carrier transportation
  - 2 for swap procedure

# M.O.M.A. Robots: S.A.R.A. Carrier Version – LD90

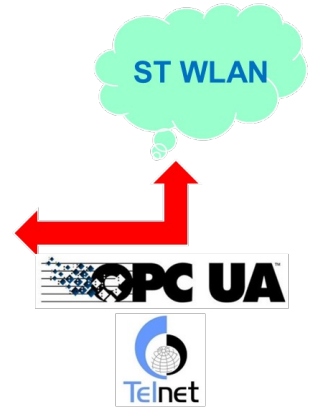
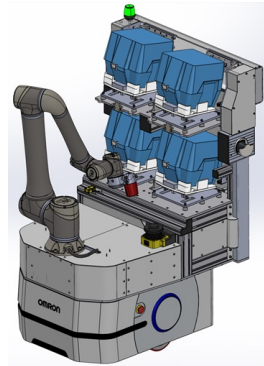
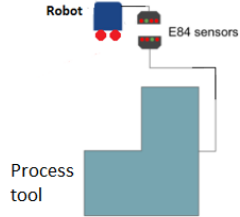
## Dimensions





# Control Architecture

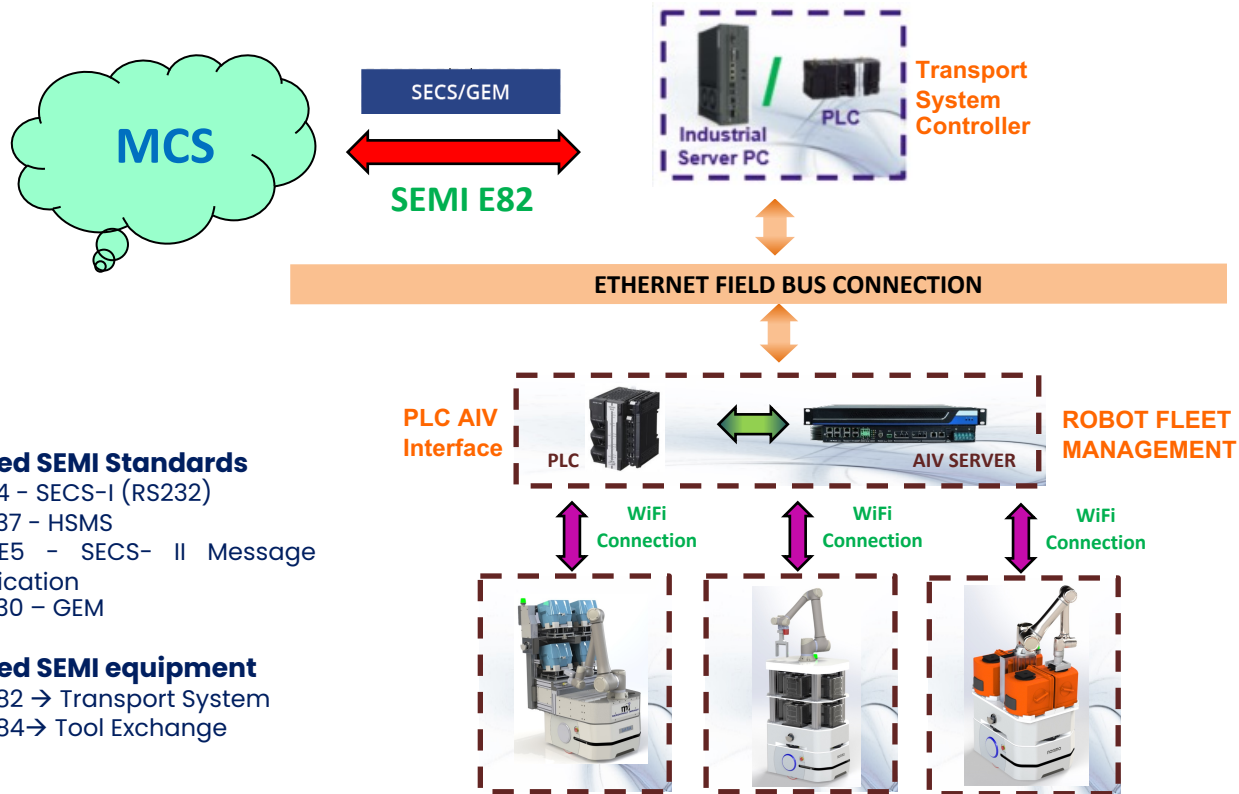
# Stand Alone Control



The main content exchanged between equipment and vehicle is:

- Port/Material Status : available or not to Drop/Pickup a Rack
- Cycle type : Dropoff or Pickup
- Cycle Status : Handoff ongoing or not
- End of : Dropoff or Pickup
- Emergency stop

# General Control Architecture



## Supported SEMI Standards

- SEMI E4 - SECS-I (RS232)
- SEMI E37 - HSMS
- SEMI E5 - SECS- II Message Specification
- SEMI E30 - GEM

## Supported SEMI equipment

- SEMI E82 → Transport System
- SEMI E84 → Tool Exchange



# Thank you

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