

FAROBOT | 2021 WHITEPAPER

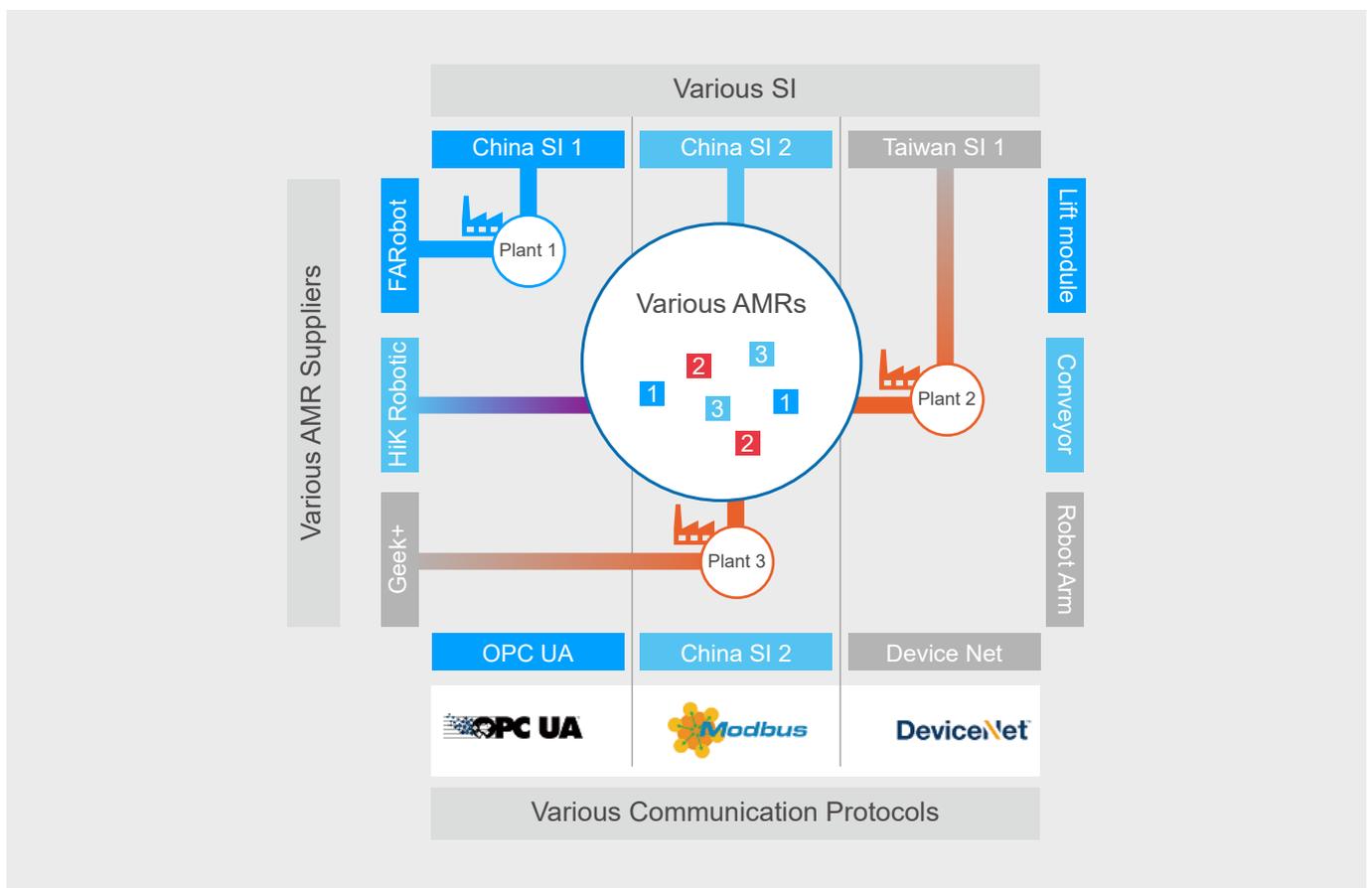
SOLVING AMR HYBRID FLEET CHALLENGES USING SWARM DYNAMIC CONFIGURATIONS



INTRODUCTION

FARobot was founded to change the way we use robots. With our headquarters at the epicentre of advanced automation, we see new field requirements emerging every day, and they all revolve around the same problem:

The growth of the robotic population also increases the variety of robots in the field. Consequently, this has resulted in the decline of usage rates for individual robots. Managing the degradation of overall ROI has made AMR projects even more complex than they already are.



Hybrid AMR Fleet Brings Challenges

This strong demand is driving a market offering expansion with numerous new players. Each player enters the market with one robot variation using its own software, hardware, navigation and safety policy.

The new entrants are also adding new functionality to their robots by developing top modules that can handle 80% to 90% of factory and warehouse use cases. These new module designs enable each AMR to cover significantly more tasks in the warehouse, thereby increasing their efficiency.

Unfortunately, adoption has been slow, and most of today's AMRs are set for very specific tasks and routes and spend most of their time idle.

Although this approach makes sense in the short-term, there are three downsides:

- AMR usage rate is less than 70%. The more specialized, the less its used.
- Robots are considered mobile depreciating assets and not as labor resources.
- Robots barely act as a horizontal elevator and loses value.

This means that the real value of mobile robots, which is their flexibility to move through space, is never delivered.

Nowadays AMRs paired with their top modules can handle

80 to 90%
of factory use cases.



Hybrid AMR Fleet Brings Challenges

If robots were considered a real source of labor, they would operate as below:

Over the same day, the robots would serve different tasks while complying with cadence peaks and avoiding idle time.

In short, the overall usage rate would be much higher and end-users would view the return on investment as entire site productivity rather than on individual tasks.

In other words:



The different type of robots should be able to repurpose themselves



The correct number of robots should be sent to the right place at the right time



The entire robot fleet should have a clear common goal



The robots should be very aware of each other's action and availability

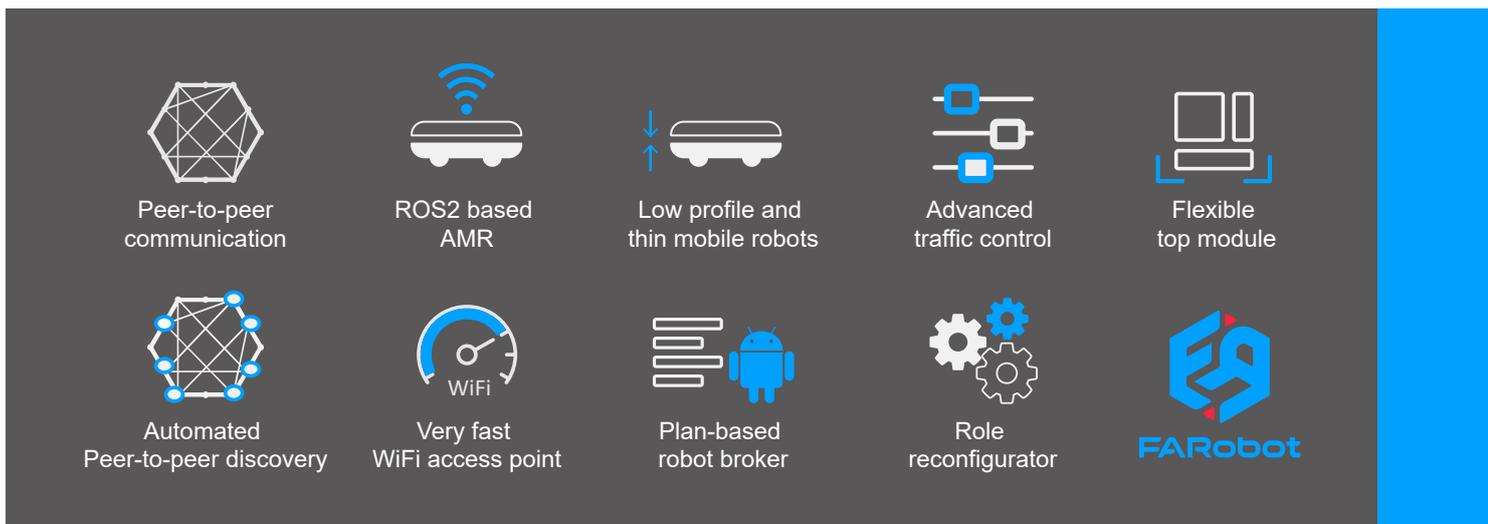
Solution for Universal Control and Dynamic Configuration of Hybrid Fleet

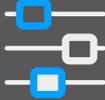
Some would argue that robot brand agnostic software will solve this issue, but will it really?

Robot agnostic control is only a small part of the solution. Being able to control different brands is something FARobot already does and offers.

Universal robot control does not solve the robotic resource management problem. Robotic resource management calls for new technology, new implementations and operational models.

At FARobot, we take this very seriously and will be launching the world's first cross-brand swarm robotic planner. To serve our customers this revolutionary solution, we rely on strong technologies.



 Peer-to-peer communication	 ROS2 based AMR	 Low profile and thin mobile robots	 Advanced traffic control	 Flexible top module
 Automated Peer-to-peer discovery	 Very fast WiFi access point	 Plan-based robot broker	 Role reconfigurator	 FARobot

Combining these technologies in a restrictive, industrial environment is our expertise at FARobot. The output is a swarm-like behavior where any robot can participate in the plan. For our customers, this approach delivers value with lower CAPEX, higher user rate and improved productivity.