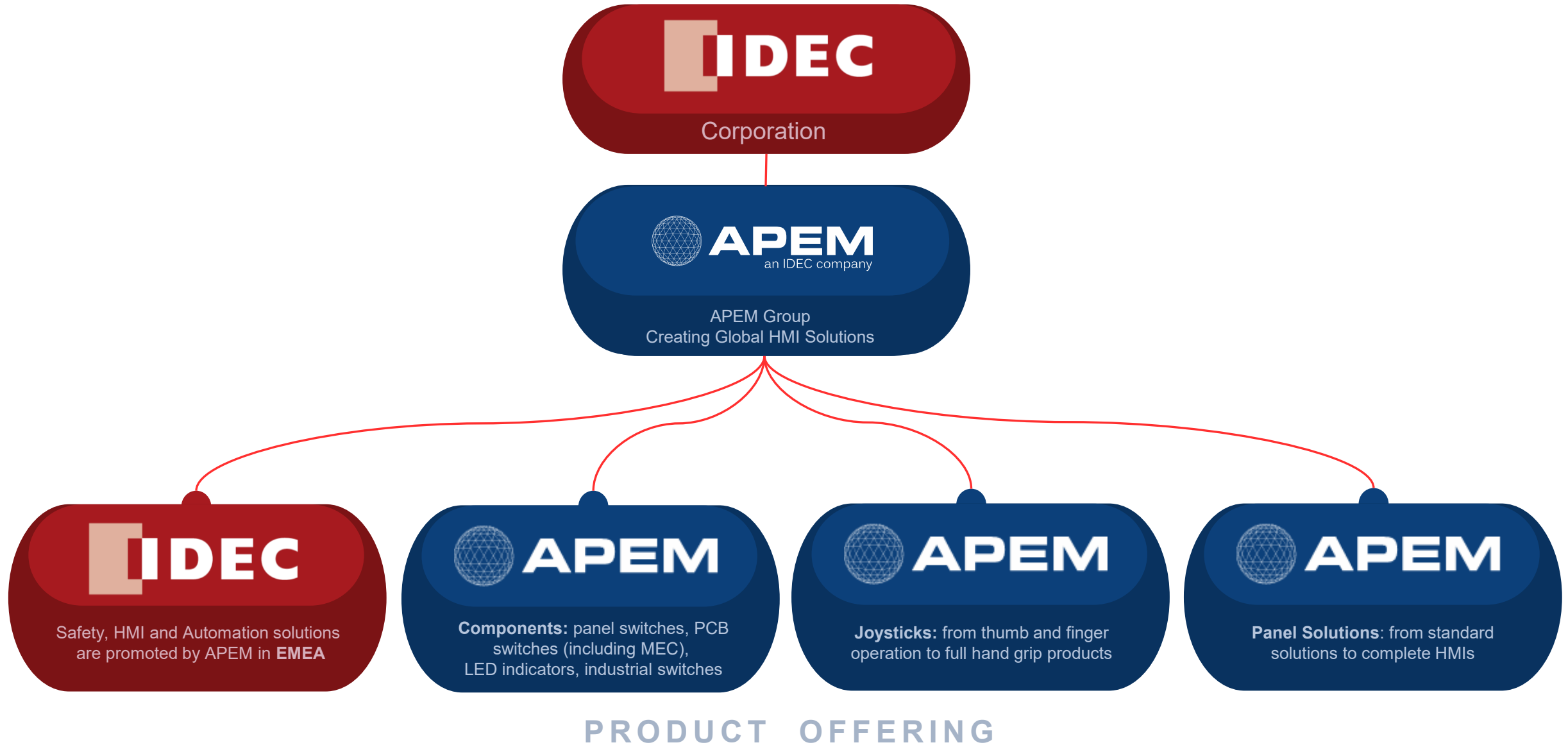


Introducing custom mobile robotics with ez-wheel and ez-way

Sept 2025





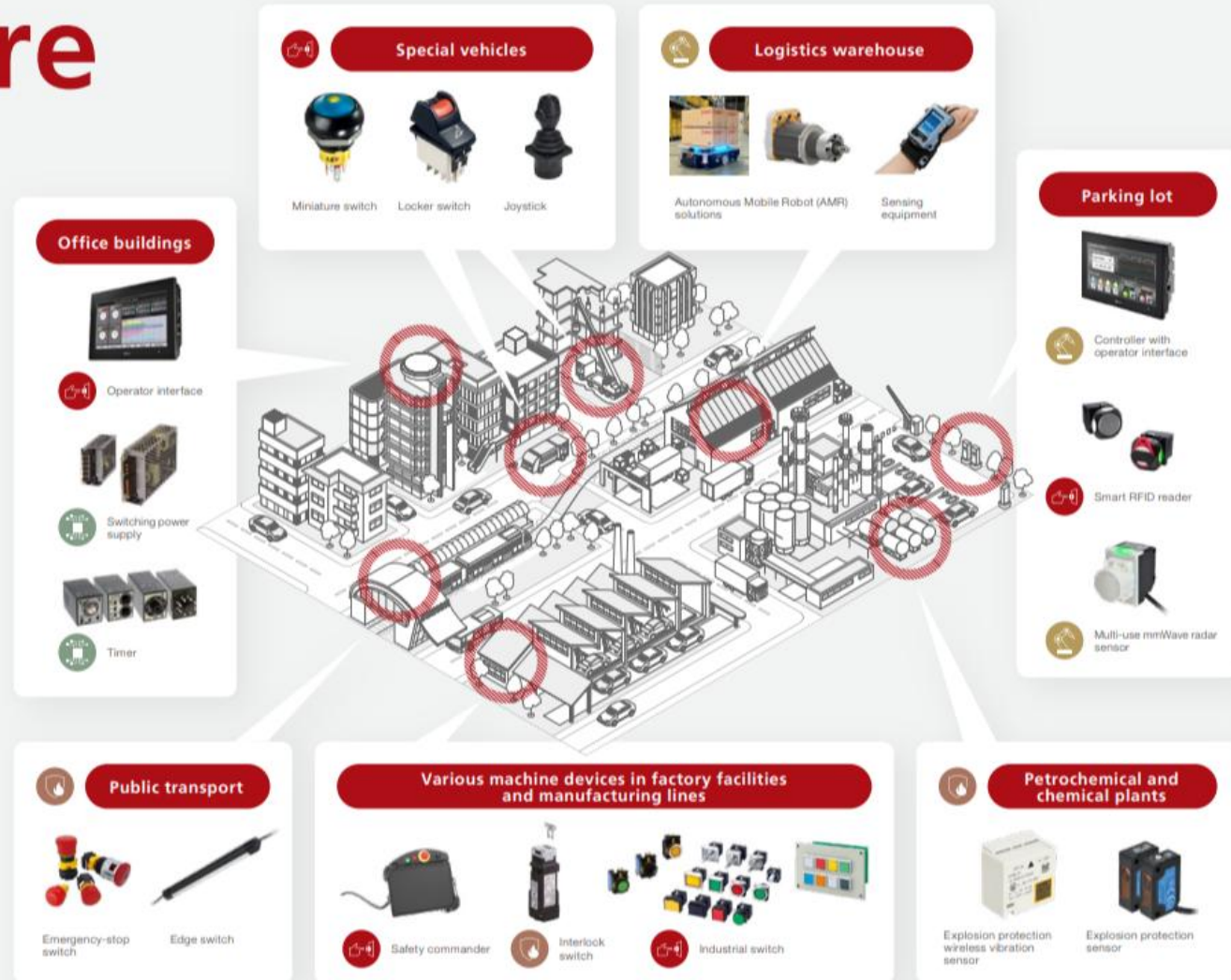
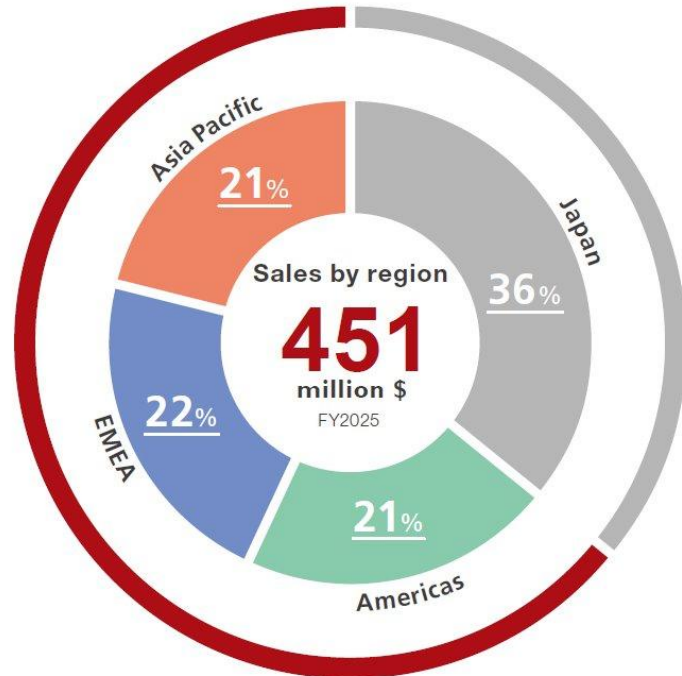
Who We Are

Ratio of overseas sales

64%

Countries and regions of operation

16



Products APEM



APEM has the capability to design and manufacture specific switch panels and joysticks with its expertise in numerous technologies and communication protocols.



IG series – momentary pushbutton with late-stage customization.



Dualmec 6C series is the smallest two-pole SMD tactile switch on the market.



HR series with an infinite scrolling wheel is the new way to integrate encoders in grips and control panels.



Dual Icon Indicator – two distinct visual signals in one single unit.



PK range - compact, modular and CANbus keypads.



Roadmap overview



World's first
**self-propelled
wheel**, 2010



Series 300 / 10"

First product, integrated and versatile
Discontinued in 2026



Series 160

Focus on assisted manual handling
Trolleys, medical devices, logistics carts



Series 150

Heavy load wheel drive
Industrial tools

+ performance
++ modularity
+++ **safety**



World's first
**safety wheel
drive**, 2021



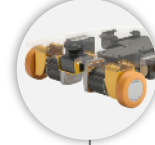
SWD® Core / 125

Gearmotor range with full safety
Robots, pallet shuttles, lifts, conveyors



SWD® 150 / 200

"Safety Wheel Drive"
Mobile robotics, AGVs, AMRs

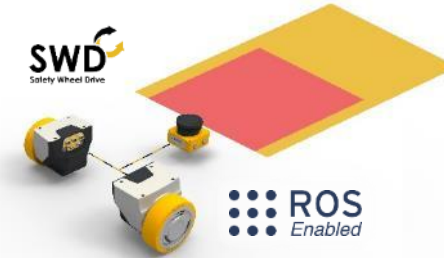


SWD® Starter Kit

Safety + ROS development kit
Mobile robotics

From ez-Wheel® to ez-Way® => creating value by
encapsulating advanced software into
smart embedded systems

+ embedded IT
++ connectivity
+++ **navigation**



Paving the way
to a safety certified
mobile robotics platform
supporting open-source
software, 2025-2030



Navigation & FMS suite

Local operating software for AGVs, AMRs
Fleet management system and APIs



AMR configurator

Mobile robot configuration tool
To address integrators

SWD® Integrated Safety

- 1 CANopen Safety
- 2 Power 24V In/Out
- 3 Safety Inputs
- 4 Ethernet
- 5 USB



Warning zone
→ **SLS mode**
up to SIL2/PLd



Collision risk
→ **SDI mode**
up to SIL2/PLd



Stop required
→ **STO/SBC**
up to SIL3/PLe

World's first
integrated drives
featuring
**Safe Motion &
Safety Encoder**

SWD
Safety Wheel Drive



SWD® - World's first Safety Wheel Drive



World's first wheel drive

- with embedded **Safe Motion**
- with integrated safety encoder
- with chainable safety bus

SIL2 / PLd / Cat.3
SIL3 / PLe / Cat.4

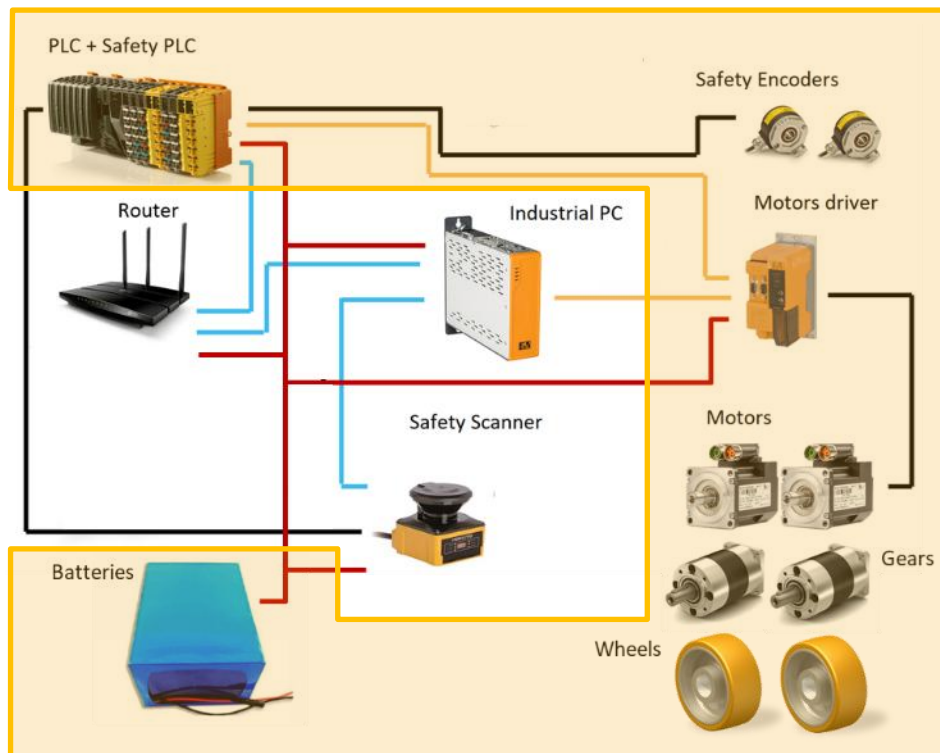
AGV safety compliance

Fulfills most complex 3691-4
safety requirements :

- speeds limits according to safe
detection areas
- machine maximum absolute
speed configuration
- Stop & brake control



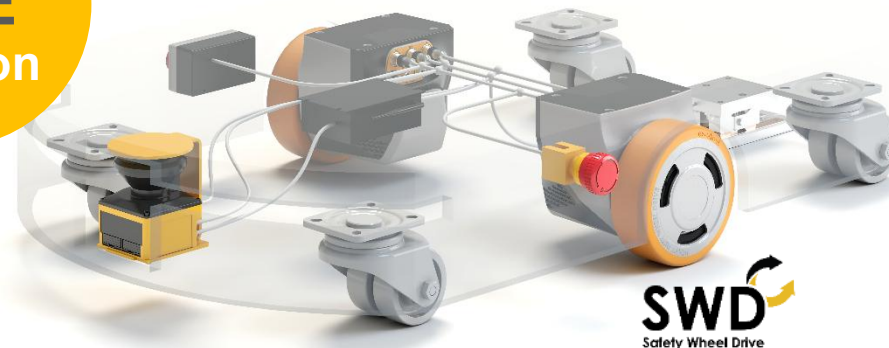
Typical solution for AMR development



SWD 150 wheels integrates and replaces all those devices

All in
ONE
solution

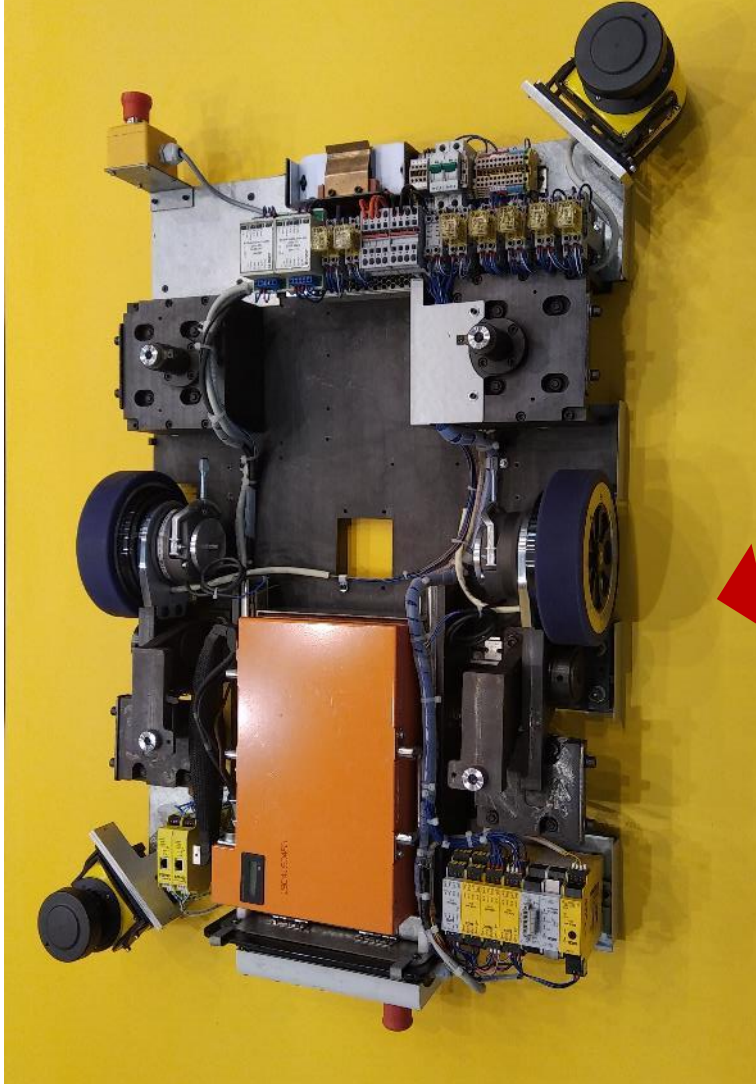
Solution based on SWD



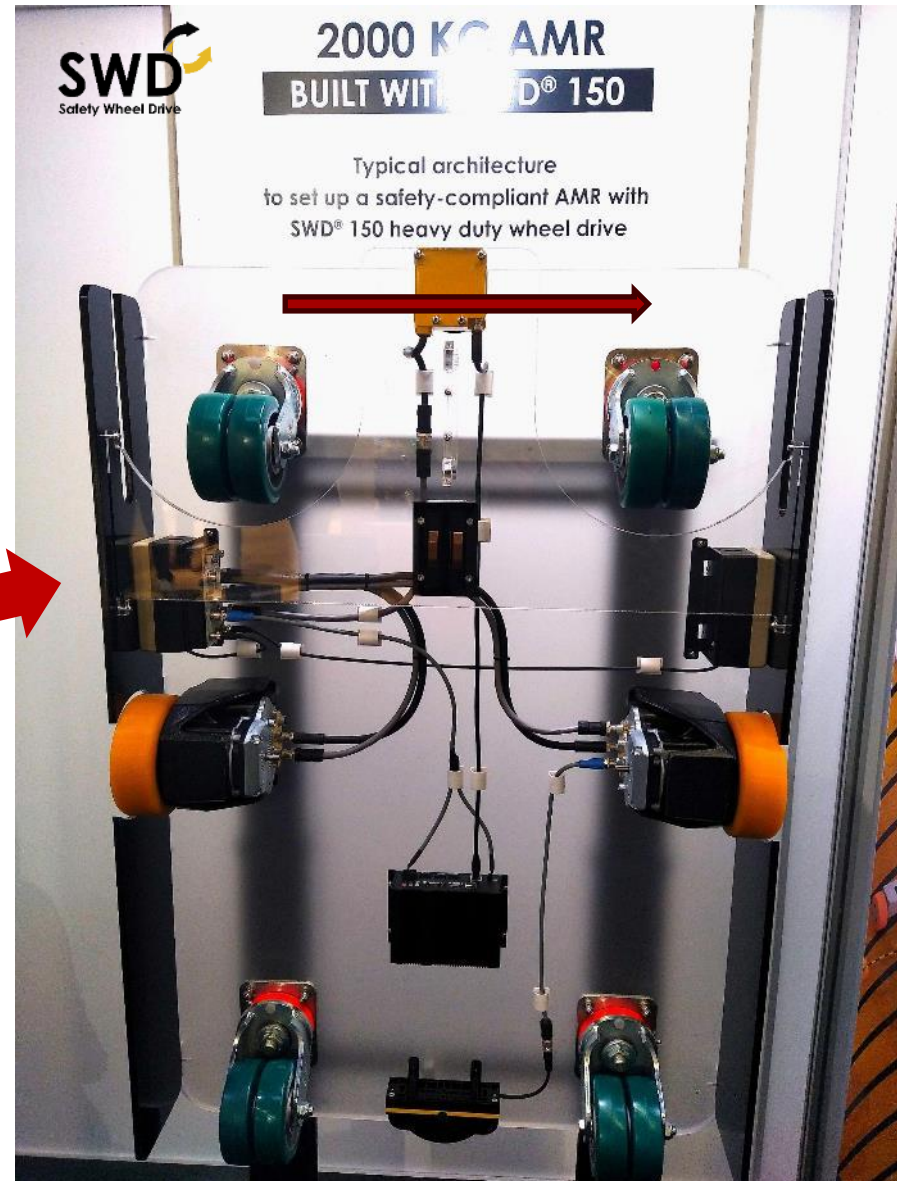
- ❖ **Automation** of large set of equipment
- ❖ **Very simple** integration
- ❖ Full embedded **safety**
- ❖ **Low energy** consumption
- ❖ Hardware **cost down**

SWD® - Simpler Integration & Lower Cost

Competition :



VS.



SWD® - EW2A range



EW2A-000xxxx
Safety Gear motor



EW2A-125xxxx
Safety wheel drive



EW2A-150xxxx
Safety wheel drive



Nominal performance	185 W (S1)	200 W (S1)	185 W (S1)
Speed	0 – 130 RPM	0 to 11 km/h	0 to 3,7 km/h
Max. vertical load	-	Up to 250 kg	Up to 700 kg
Wheel diameter	-	125 mm	150 mm
Type of tyre	-	PU 80 sh. A – Flat profile	PU 92 sh. A – Flat profile
Pushing effort	37 Nm	20 daN / 500 kg moved	60 daN / 1.5T moved
Option(s)	Parking Brake /B		Parking Brake /B Internal battery (100 Wh)

Note: Values for standard gear ratios. See online datasheets for variants

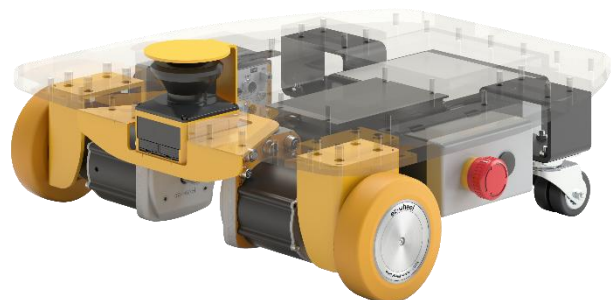
SWD[®] Starter Kit - Safety ready, ROS dev platform



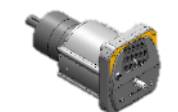
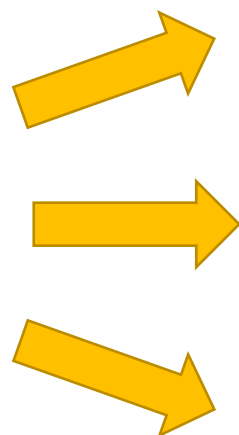
Development platform to experiment SWD[®] products

All developments done on the Starter Kit can be transferred seamlessly to any product of the SWD[®] range

The portability is ensured to the SWD[®] wheels with or w/o integrated batteries



SWD[®] Starter Kit
Versatile and open
development platform



SWD[®] Core



SWD[®] 125

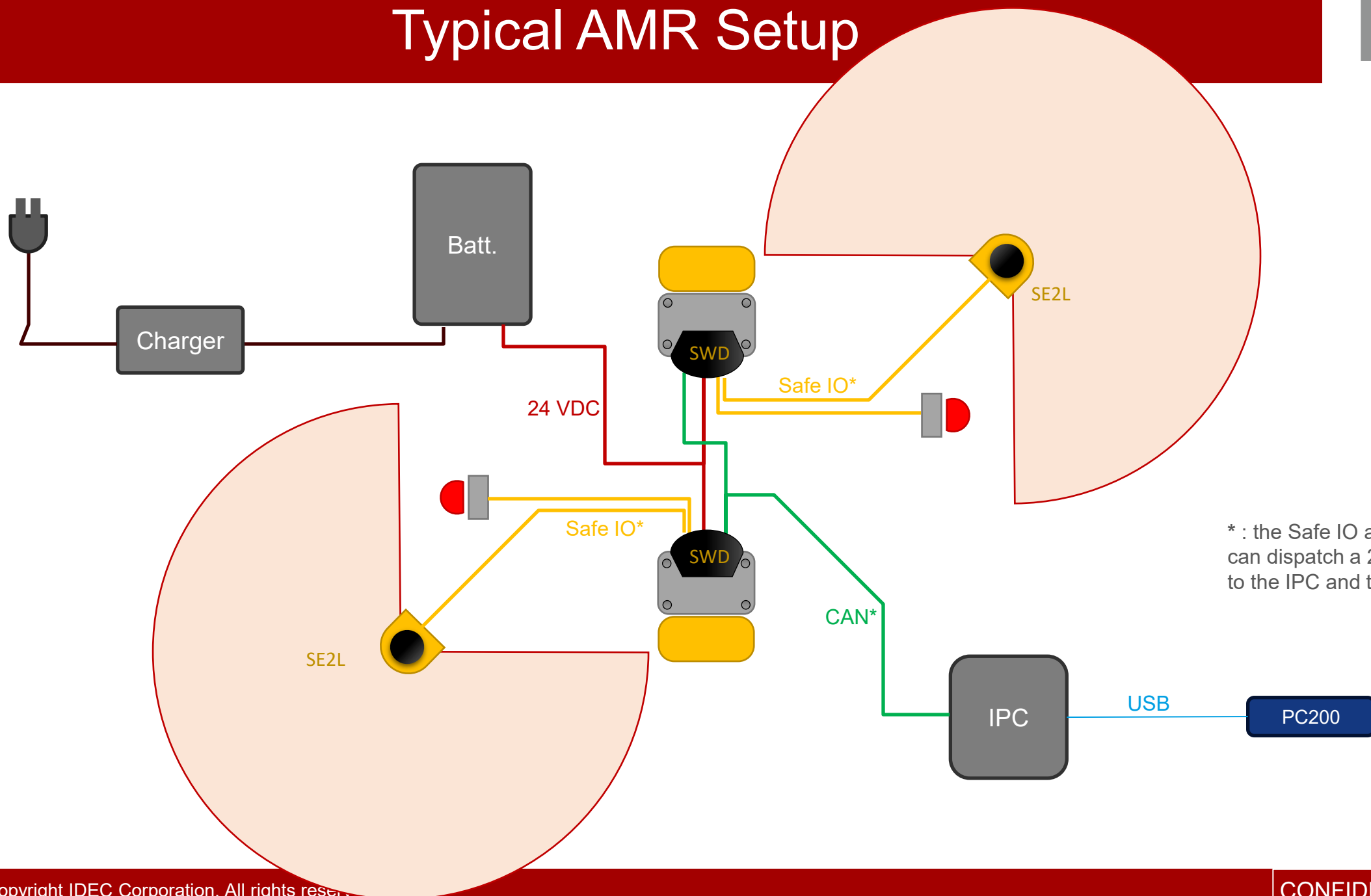


SWD[®] 150
With or without
internal batteries



	✓			✓ ROS drivers
	✓	✓ medium		✓ ROS drivers
	✓	✓ heavy	✓ option	✓ ROS drivers

Typical AMR Setup



- ROS driver
 - Available for ROS and ROS2

- swd_diff_drive_controller node
 - /cmd_vel : Target linear and angular velocities
 - /set_speed : Target speeds in rad/s for left and right wheels.
 - /odom : Odometry message based on wheels encoders

- https://github.com/ezWheelSAS/swd_ros2_controllers

ez-Way® - Software suite for Robots control



3rd party fleet management (server)

- Available from multiple players
- Compliant with VDA 5050
- Suitable for heterogeneous fleets of AGVs

Cloud & Messaging

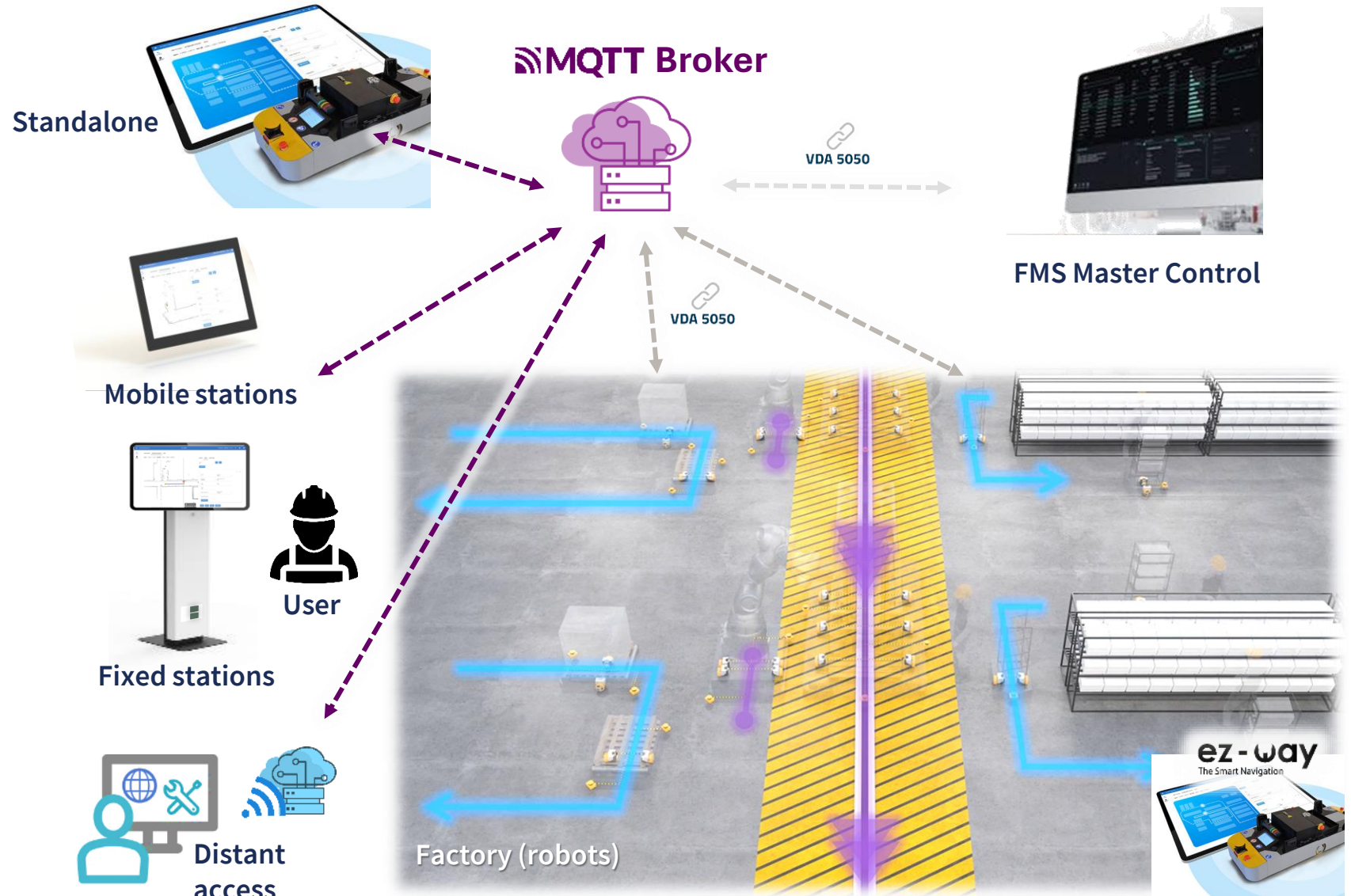
- **MQTT** messaging based on VDA 5050 standard
- Global access & multi-users management
- Full Cloud & SaaS offers available

ez-Way navigation & control (robots)

- Hardware management (control & monitoring)
- Localization & sensors management
- Navigation (guided, path following)

Maintenance (Local / Distant)

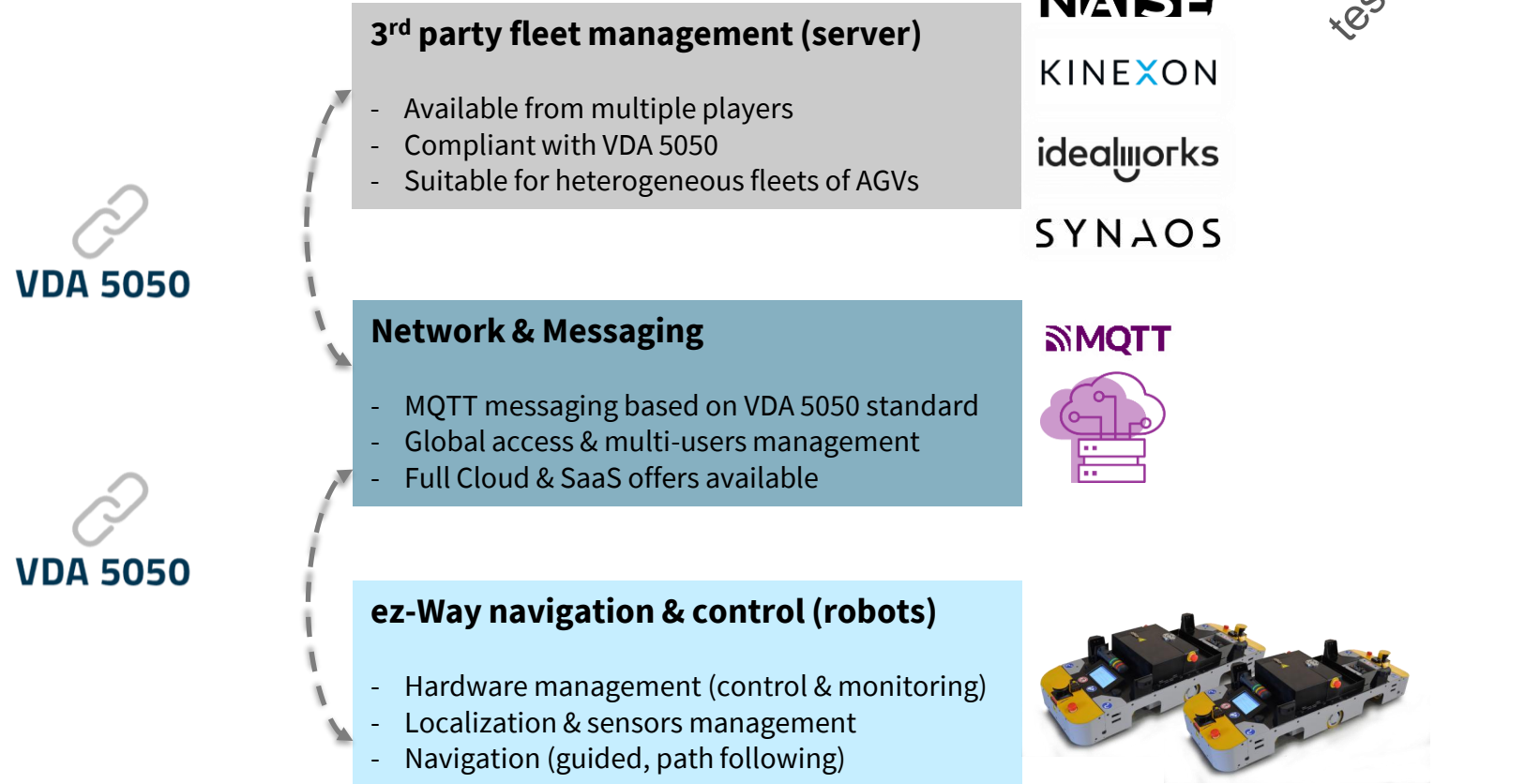
- Distant access for diagnostics and support
- Software updates
- Diagnostic page accessible



ez-Way® – Controllable from 3rd party FMS



Through ez-Way's “**VDA 5050 interface**”, mobile robots can be controlled by any 3rd party Fleet Management System.

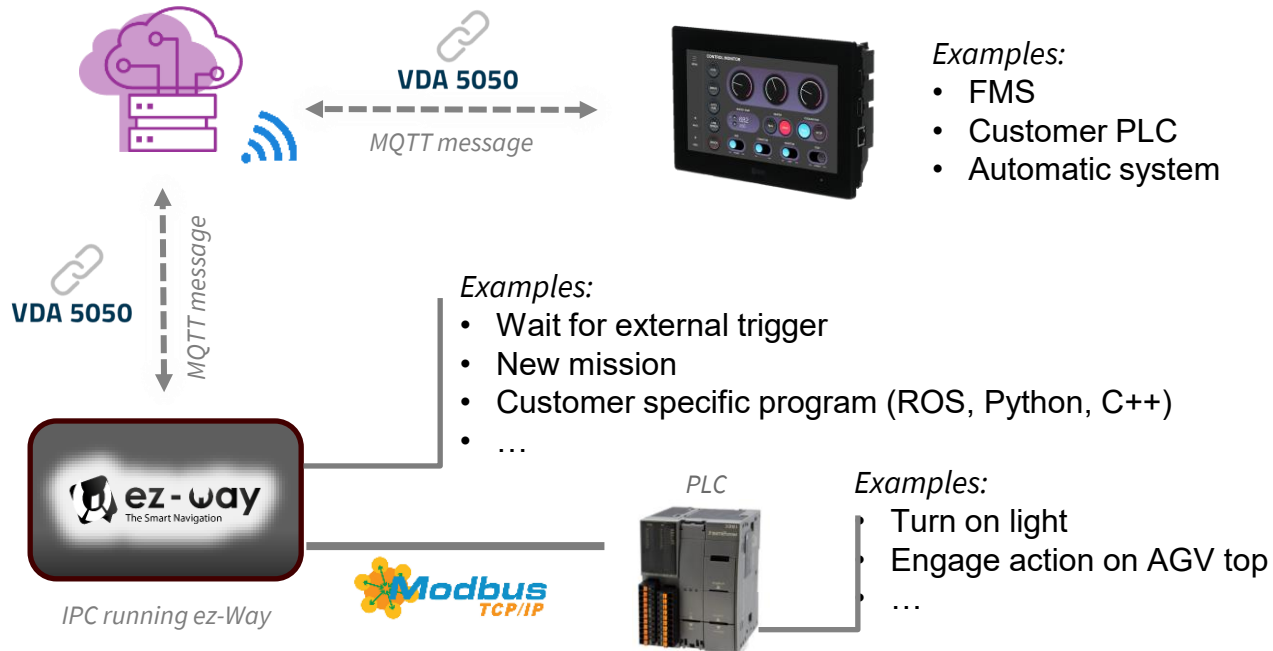


NB: FMS suppliers names are given as examples; compatibility is not tested.

In ez-Way Control Page “**Custom Actions**” can be triggered on a “node” during the mission, to execute customer specific tasks.

- Executed by the embedded IPC running ez-Way
- Executed by a 3rd party PLC, through a Modbus TCP bridge

MQTT Broker



Custom Action

- Affect a specific mission
- Engage an actuator (conveyor, lift, pin...)
- Execute an action on a 3rd party PLC
- Wait for a specific traffic rule



- 

-

- ez-way**
The Smart Navigation
- 
- A small, white, rectangular robot with a black top and yellow accents, featuring a small screen and various sensors.



-  Node as per VDA 5050
- Edge as per VDA 5050 (physical line)
- Edge as per VDA 5050 (virtual line)

Thank you for listening!

