AUTOMATIC TRANSPORT SOLUTIONS

AMR – AGV

Rev11 · 11 · 2023

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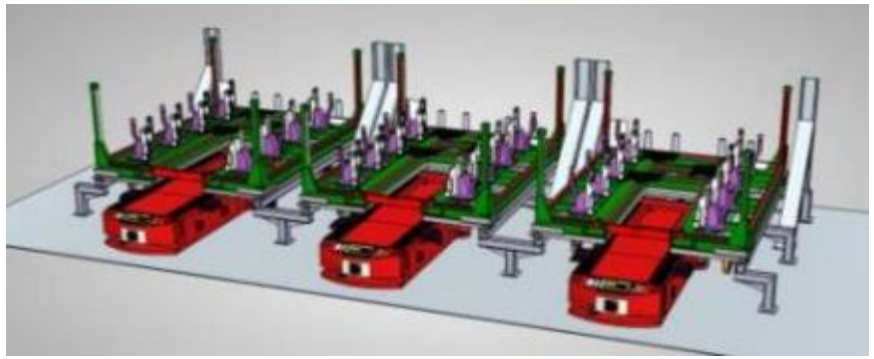
Not only the AGV-AMR



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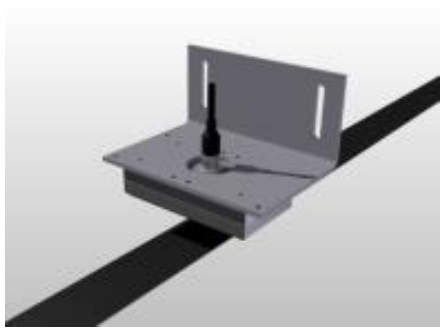
Navigation Technologies

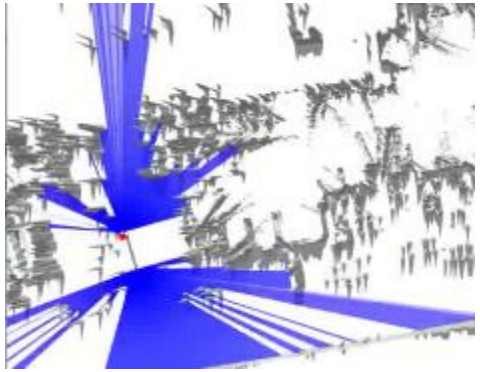
Physical Guidance

- Inductive
- Inductive Hybrid
- Magnetic Tape FREECURVE
- Optic

Virtual Guidance (Free Navigating System)

- Magnets
- Laser, Reflectors
- Contour – Vision – Mapping - SLAM
- GPS
- Vision 3D camera





FUSION NAVIGATION CONCEPT
(combination of 2 or more navigation systems, Example: SLAM + 3d camera)

AGV-AMR Control System Concept

STANDARD COMPONENTS - NO BLACK BOX
SIEMENS, SICK, LEUZE, WENGLOR,…

ALL AGVs ARE EQUIPED WITH SIEMENS SAFEY PLC
Following normative ISO 3691-4
Interface with different Traffic Control Managers available

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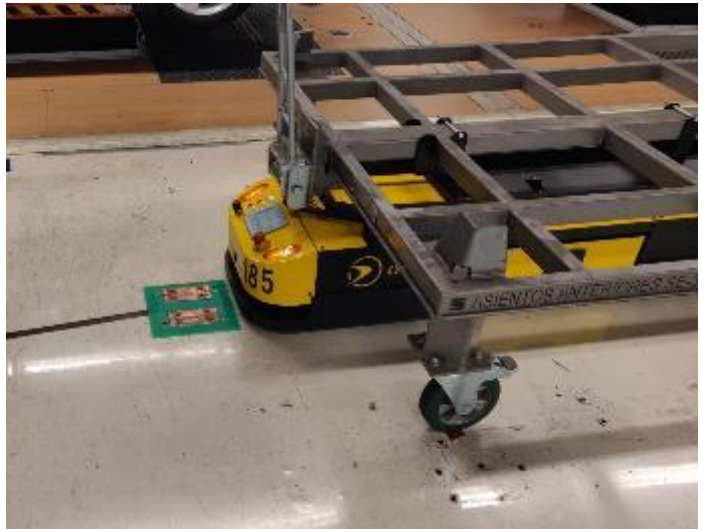
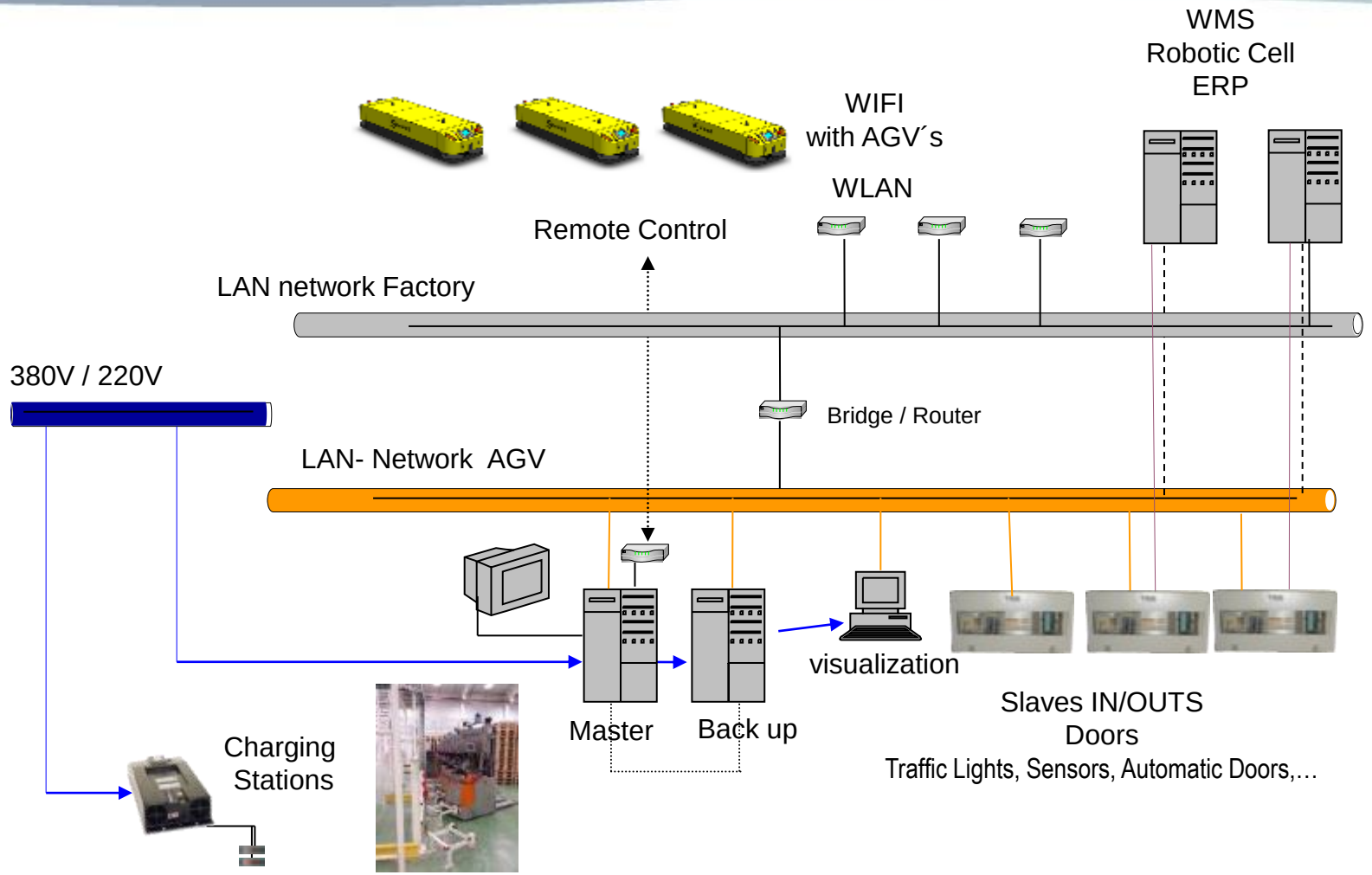
Battery Technologies – Charging systems

- **Batteries**
  - Lead - Acid
  - Gel
  - Lithium

- **Charging Systems**
  - Battery Exchange
  - Automatic with contacts
  - Induction



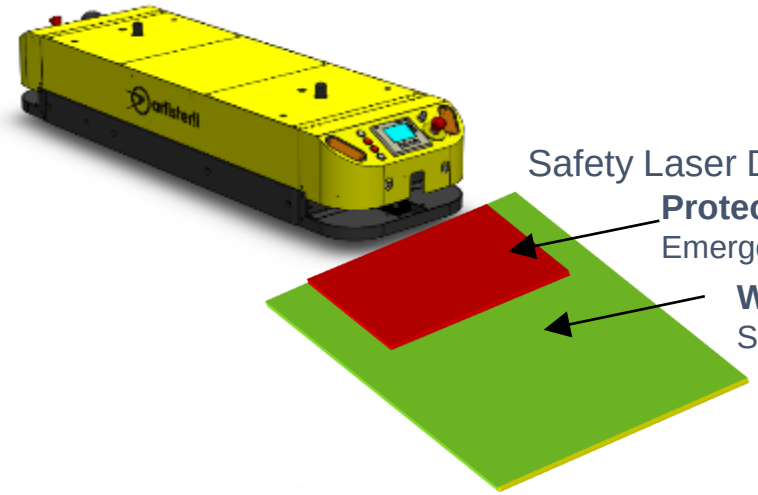
Communication architecture



If WIFI communication is not available is possible in some cases to use RF (Radio Frequency) as alternative

Safety

EN-1525 / ISO 3691-4



Safety Laser Detection:

Protection area
Emergency stop

Warning area
Speed reduction

Safety Laser Scanner

3D Cameras for Object Detection and improve accuracy

IA module for Pallet Hole Detection

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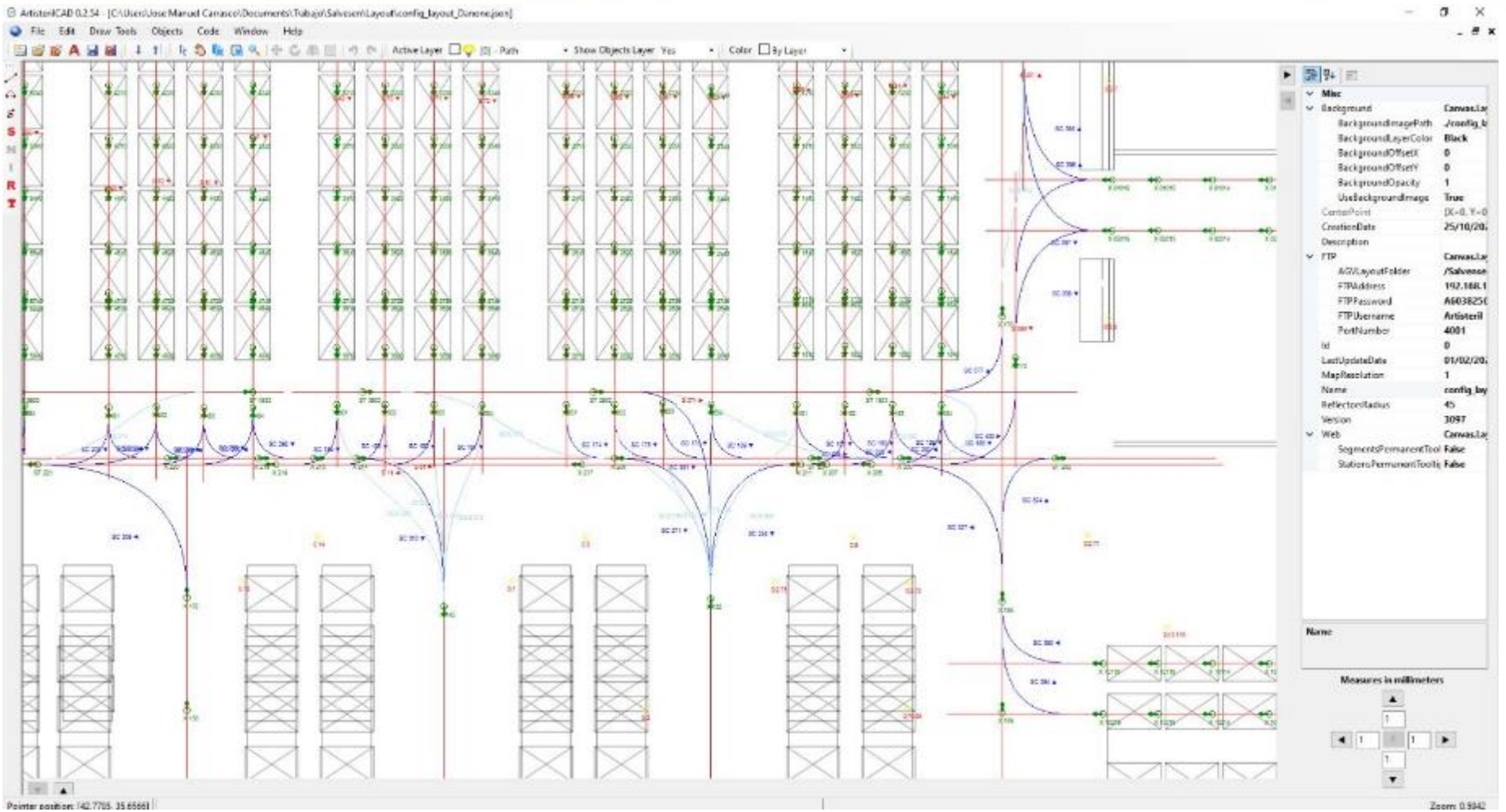
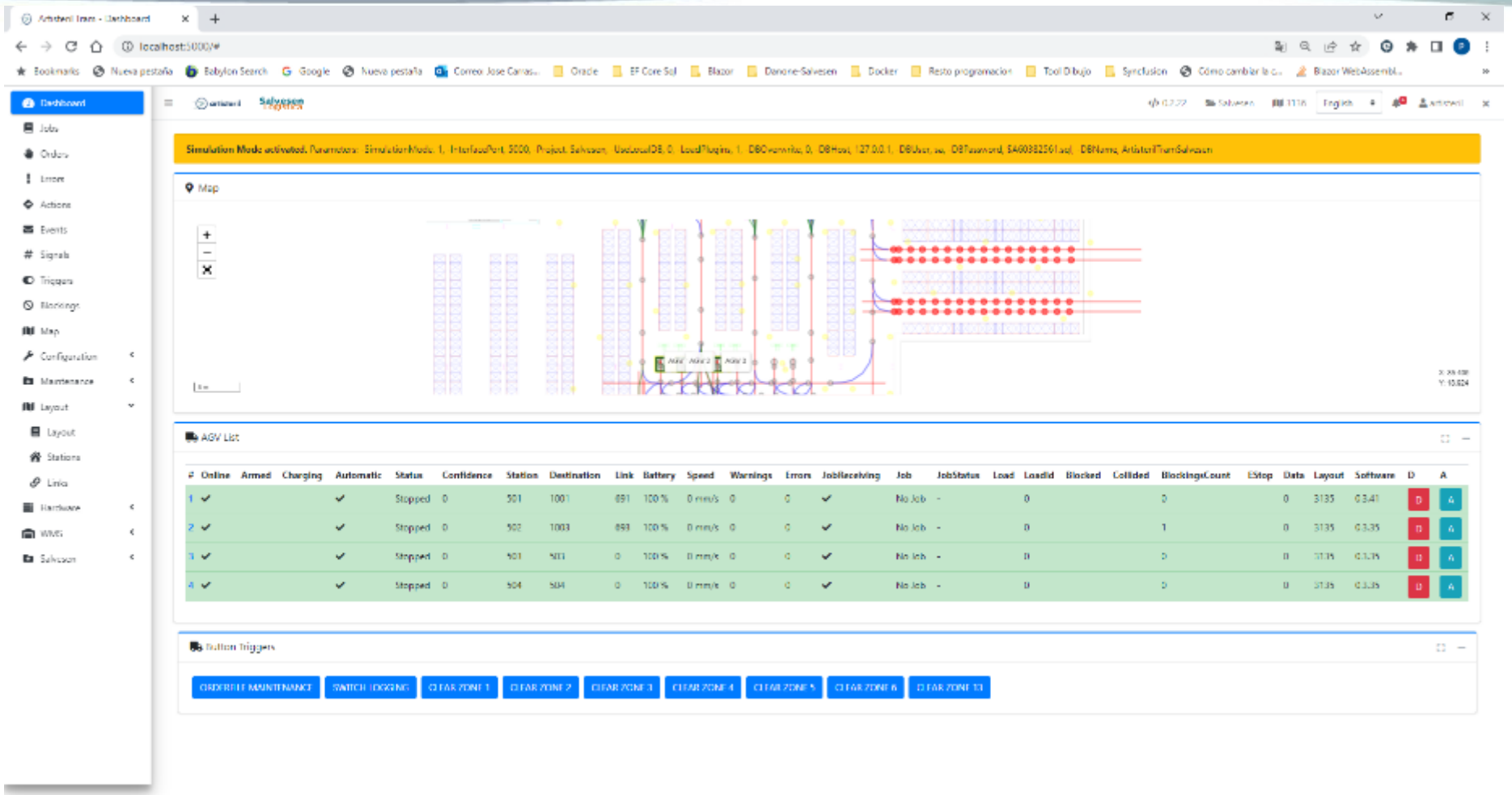
Layout and Circuit Generation



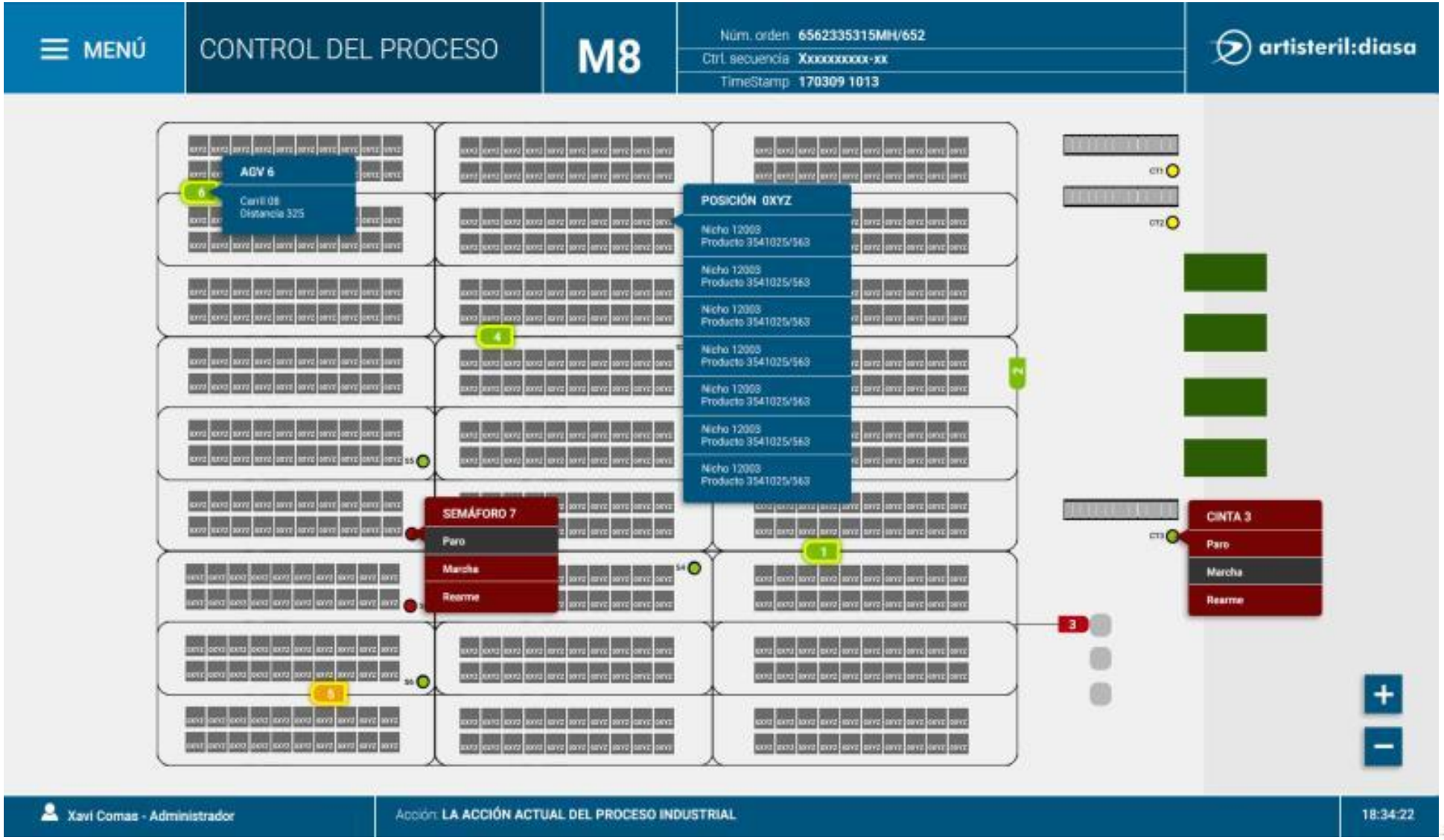
Tool for easy and simple Layout Circuit generation
Costumers and partners could do changes by themselves

Traffic Control Manager

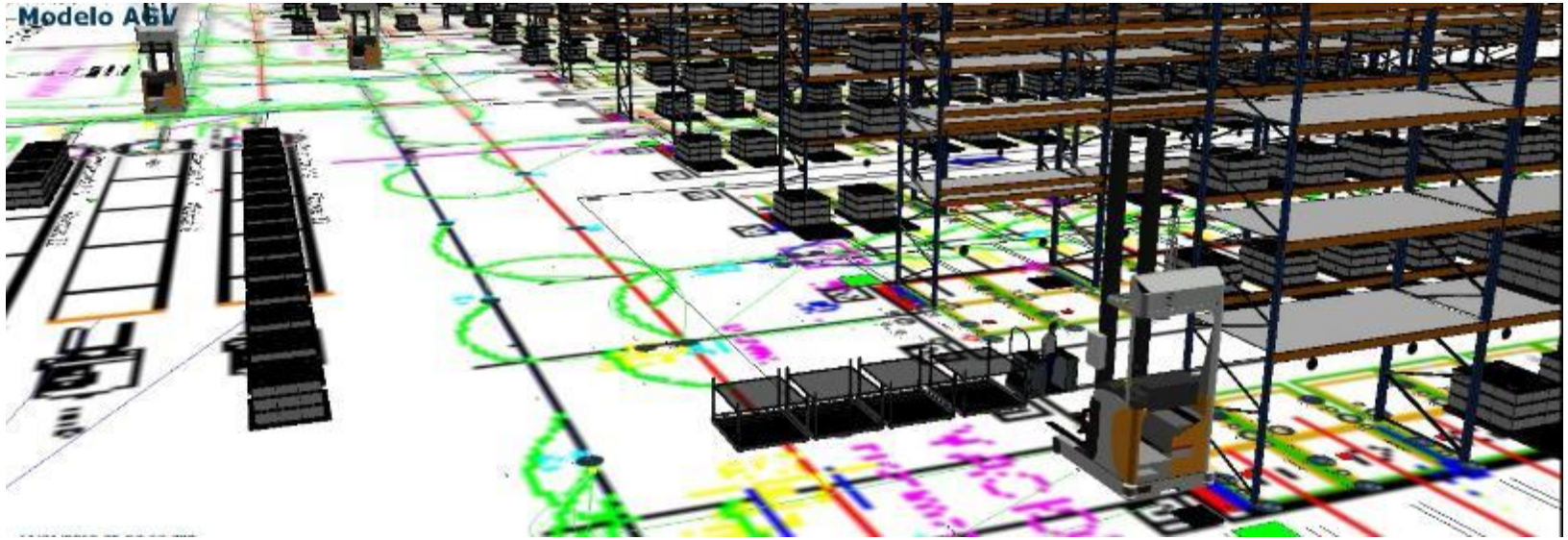


Traffic Control Manager in WEB following VDA5050
SIMULATOR to run the system OFF LINE and test all changes
DO IT FOR YOUR SELF oriented design, costumers and partners could do changes by themselves

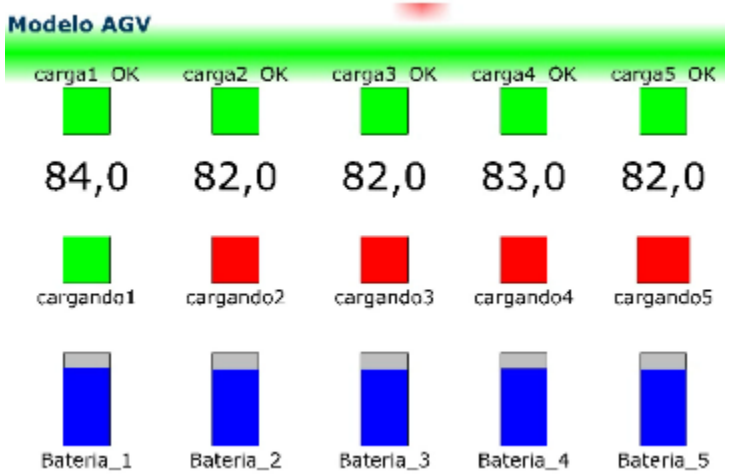
SGA – WMS, Warehouse Management System



Simulation


Modelo AGV

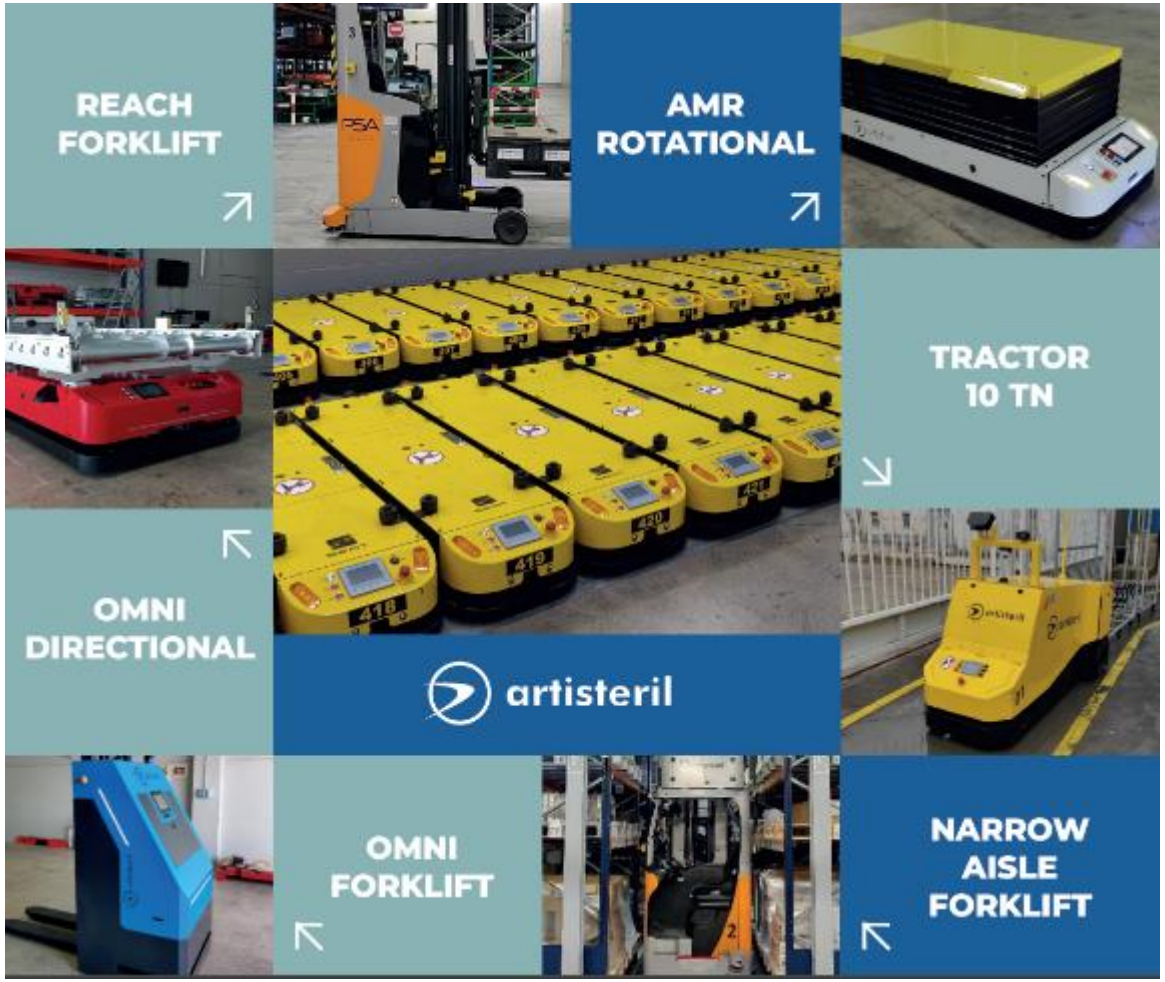
Movimientos por hora
Mov / h
70,0
60,0
50,0
40,0
30,0
20,0
10,0
0,0
Now 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hora


Modelo AGV
carga1 OK
carga2 OK
carga3 OK
carga4 OK
carga5 OK
84,0
82,0
82,0
83,0
82,0
cargando1
cargando2
cargando3
cargando4
cargando5
Bateria_1
Bateria_2
Bateria_3
Bateria_4
Bateria_5

Some References

> 750 AMRs in different applications

CLIENT	NUMBER of AGVs	AGV - AMR TYPE	NAVIGATION
SCANNIA (Sweeden)	12	ARM Omnidirectional	SLAM Mapping
CNH (Italy)	13	ARM Rotational	SLAM Mapping
BENTETLER MOS	1	Apilador EXV	Láser
LABORATORIOS ALTER	5	Bilateral hasta 10 metros + 2 Apiladores	Láser
FERER INTERNACIONAL	3	Bilateral hasta 9 metros	SLAM Mapping
SEAT MARTORELL	25	Tractor 1.500 kg	Magnético
GESTAMP Factory 21	6	Mouse Bidireccional y Omnidireccional	SLAM Mapping
NORTHVOLT (Sweeden)	1	Apilador horquilla telescópica	Láser
MERCADONA - INCARLOPSA	1	Retráctil cámara frigorífica -25	Láser
GESTAMP Vigo	1	Apilador	Láser
DANONE	6	Apilador	Láser
SMP	1	Tractor Indoor / Outdoor 10 Tn	SLAM Mapping
PALMETAL	2	Retráctil para almacén automático	Láser
SEAT MARTORELL	2	Omnidireccional	SLAM Mapping
GESTAMP ABRERA	2	Apilador	Láser
SEAT MARTORELL	6	AMR Apilador Grandes Cargas	SLAM Mapping
SEAT MARTORELL	188	AGV Mouse	SLAM Mapping
BERLIMED	2	AGV Apilador	Láser
VERESCENSE	1	AGV Apilador Contrapesado	Láser
GESTAMP Factory 21	3	AGV FMX, Apilador, Omni	Láser, MAPPING
EXKAL	3	AGV FMX, Apilador, Omni	Láser
FRIGALSA	4	AGV Apilador	Láser
SMP	1	Tracror Outdoor	SLAM Mapping
SEAT ZONA FRANCA	6	Transformación Apilador STILL	Láser
MAHLE	1	AGV Tractor	SLAM Mapping
SEAT TALLER 12	8	AGV Tractor	Magnético
Sinterpack CEMOSA	2	AGV Apilador	Laser
SEAT Montaje	76	AGV Mouse	Mapping
LINDE WIEMANN	9	AGV Mouse	Magnético FREECURVE
SAS AUTOMOTIVE Pamplona	8	AGV Mouse	Magnético + Odometría
AB MAURI Córdoba	1	FMX-14N	Laser
VW Pamplona Taller 2 Montaje	22	AGV Mouse	Magnético + Odometría
SEAT TALLER 2 Barcelona	54	AGV Transporte Contenedores	Magnético + Odometría
MONDELEV Barcelona	1	FMX-14N	Laser
FERRER INTERNACIONAL Barcelona	3	GX-Q	Vision Mapping
VALEO Martos	6	AGV Mouse	Magnético
DENSO Manresa	3	AGV Mouse	Magnético
MERCEDES Vitoria	8	AGV Tractor	Magnético
SAS AUTOMOTIVE Pamplona	8	EXV - MXQ	Laser
PSA Vigo	6	FM-X	Laser
SEAT TALLER 12 Barcelona	32	AGV Tractor	Magnético + Odometría
HOSPITAL CENTRAL DE ASTURIAS Oviedo	12	Tranporte Contenedores	Imanes



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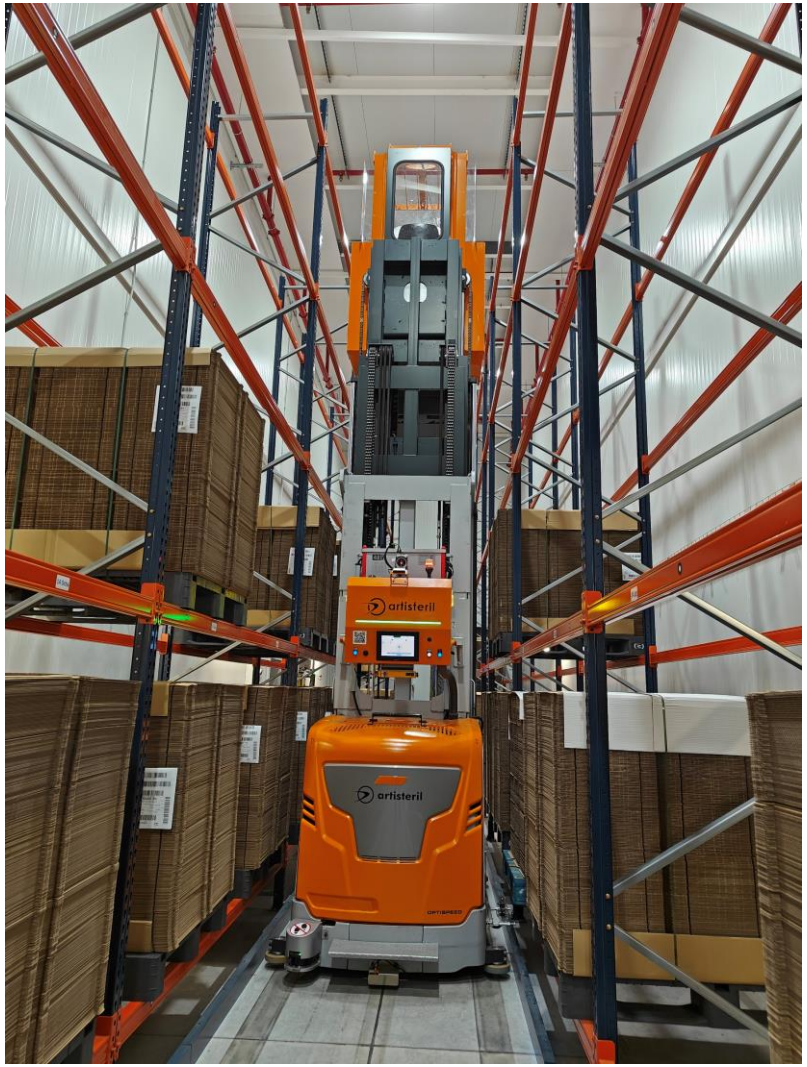
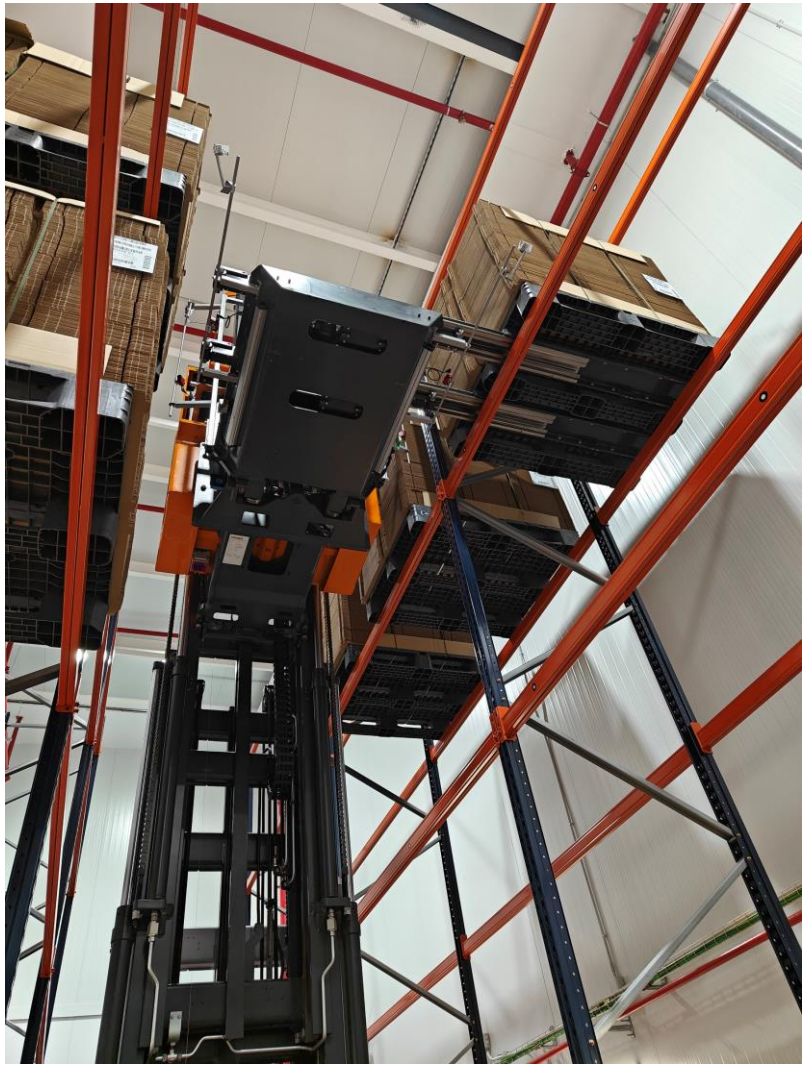
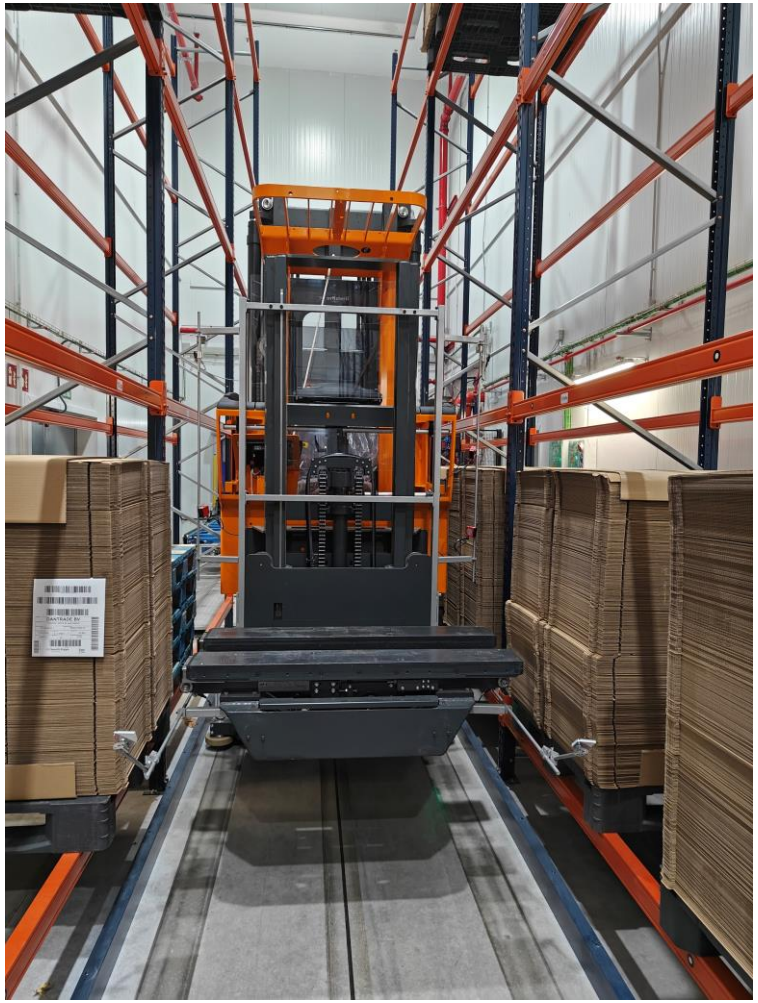
Bilateral Project in DANONE







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Some References

Omnidirectional COMPACT, elevation 1.000 kg

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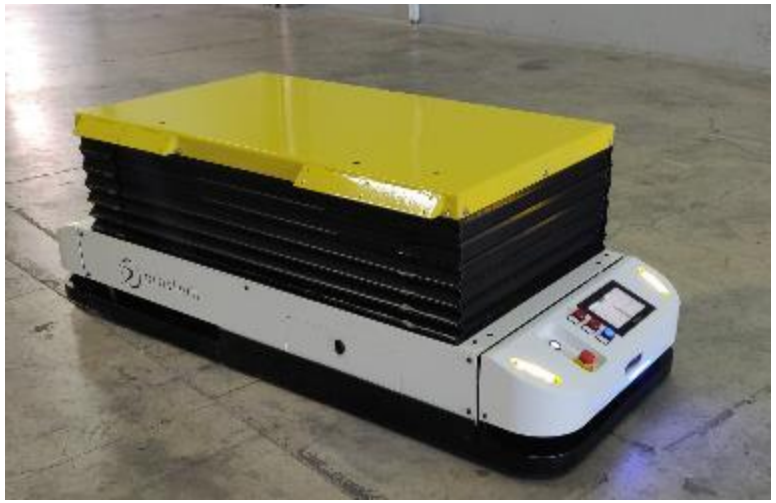
Some References

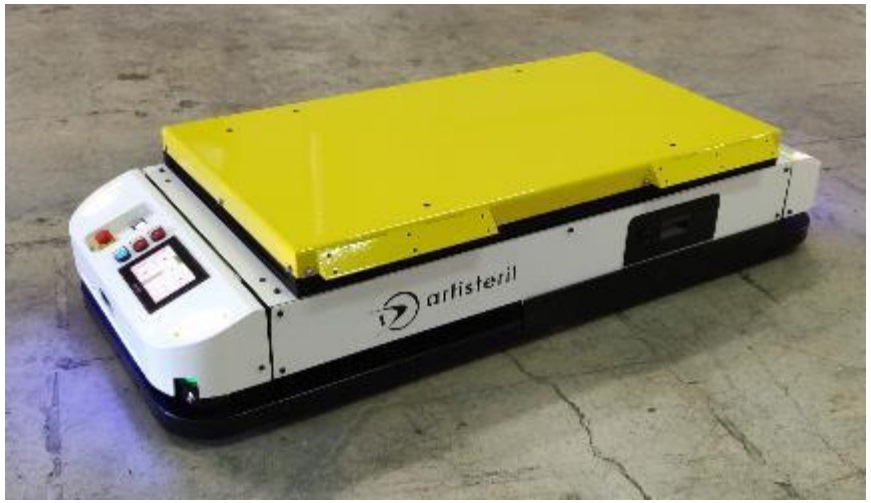
Omnidirectional Stacker – ART-PM120-OM

3D Camera for LOAD DETECTION

Some References

ROTATIONAL





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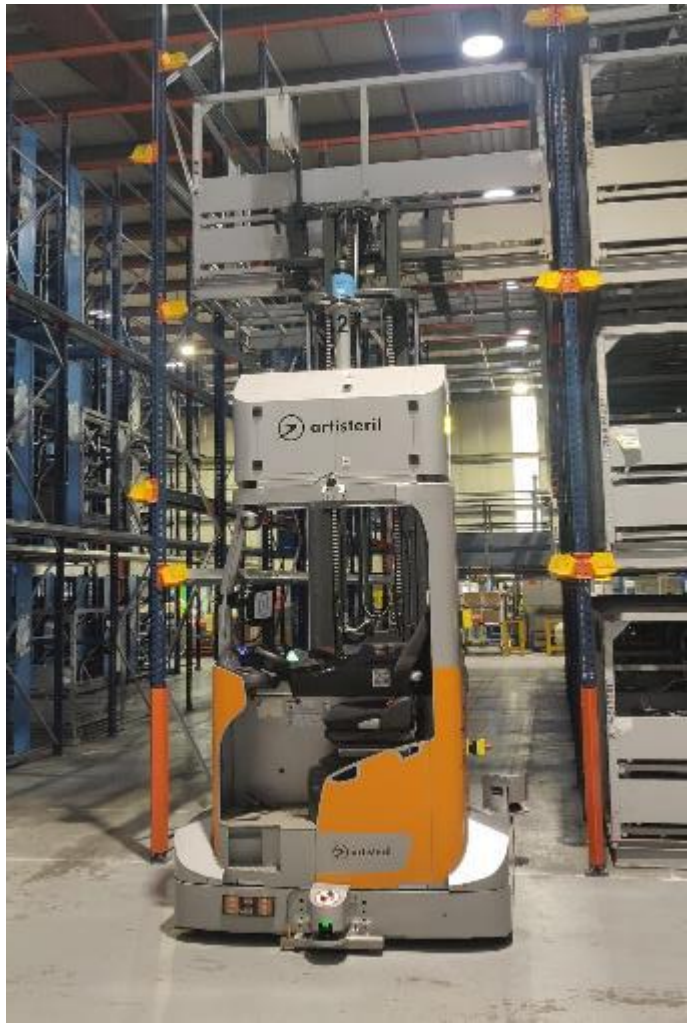
Reach Forklift with DRIVE-IN SHELF, up to 8 meters



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SEAT- 76 + 188 AMR Mouse Mapping Bidirectional

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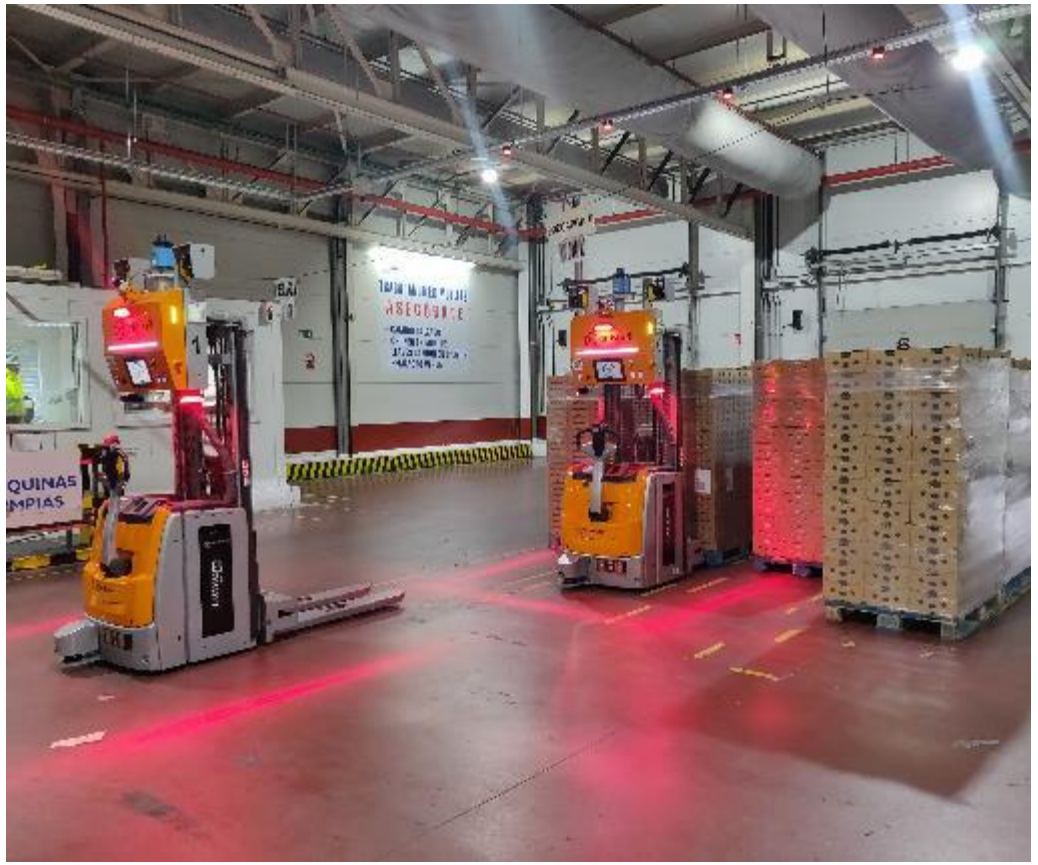

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Counter Balance Pallet Mover

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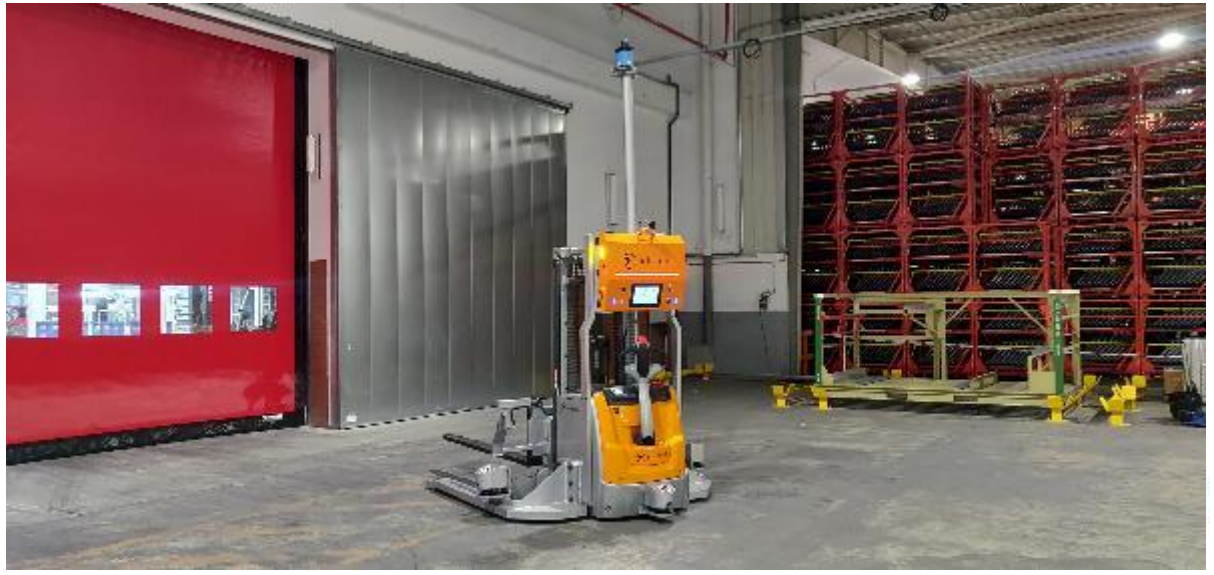
Some References

Pallet Mover for BIG loads

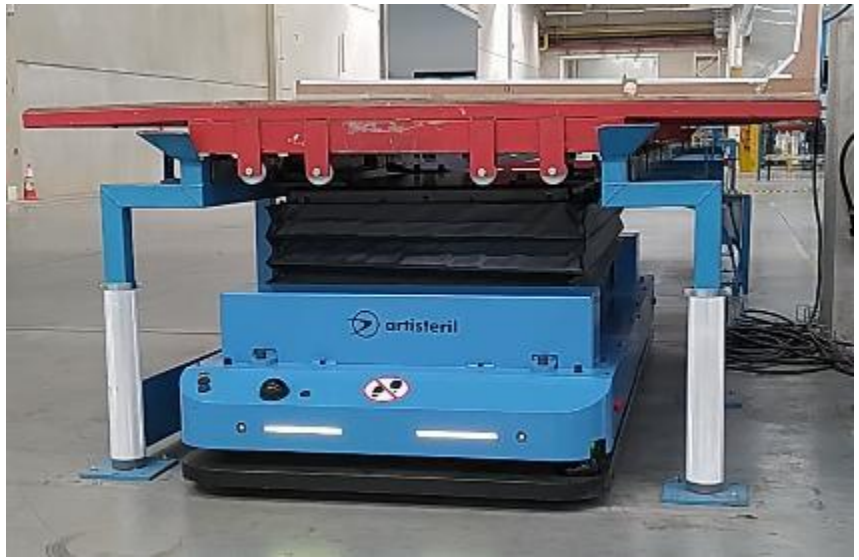


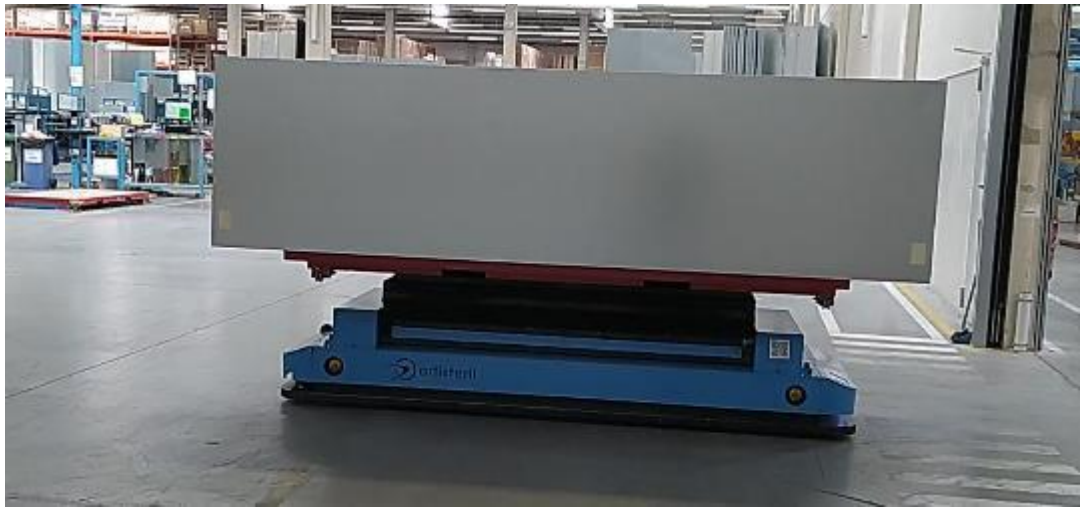
Some References

AMR omnidirectional with PIN

Some References

AMR omnidirectional with Elevation





Some References

AMR omnidirectional with Roller Conveyor

Some References

Outdoor / Indoor 10Tn Tugger
Double Navigation MAPPING + Magnetic

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Some References

Proyecto SEAT-AUDI A1 – 64 AGVs

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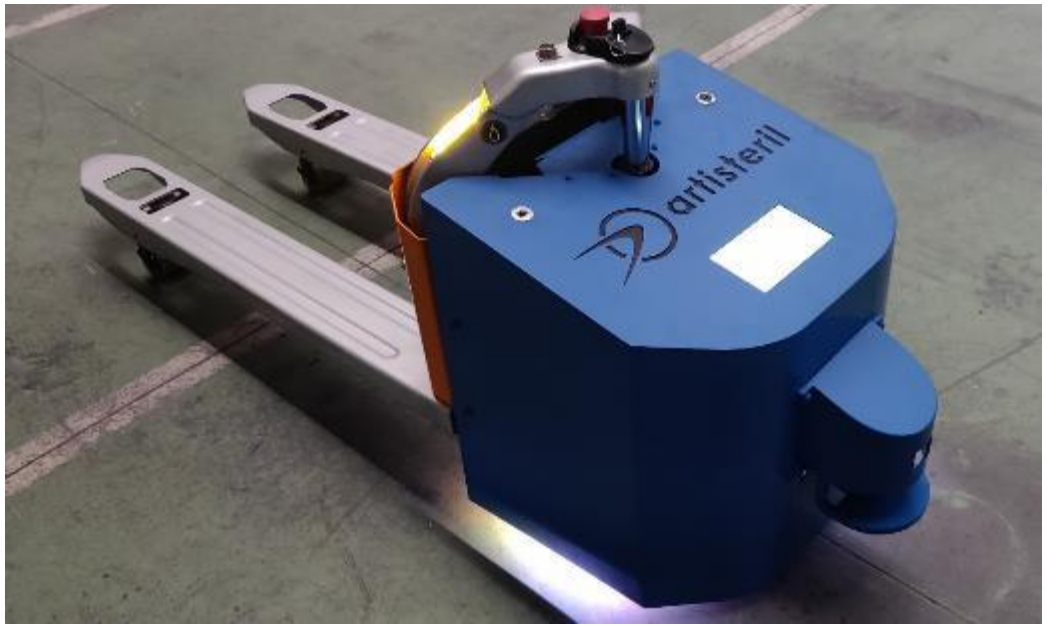
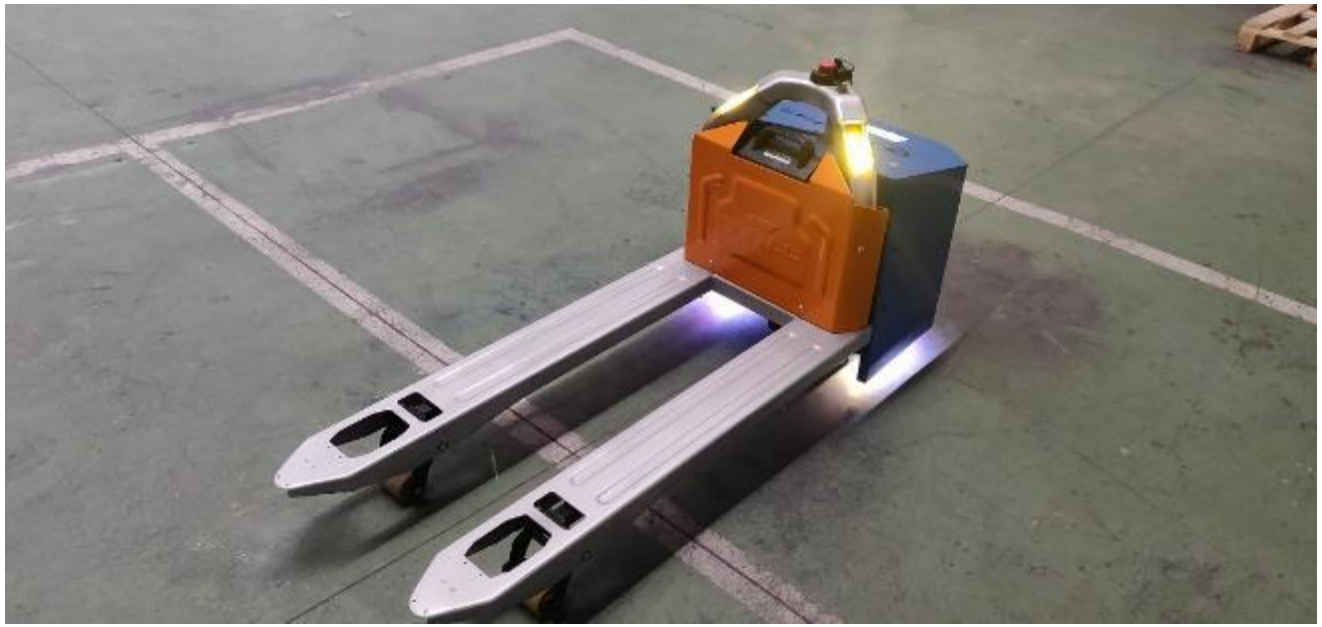
Pallet Mover Floor Level





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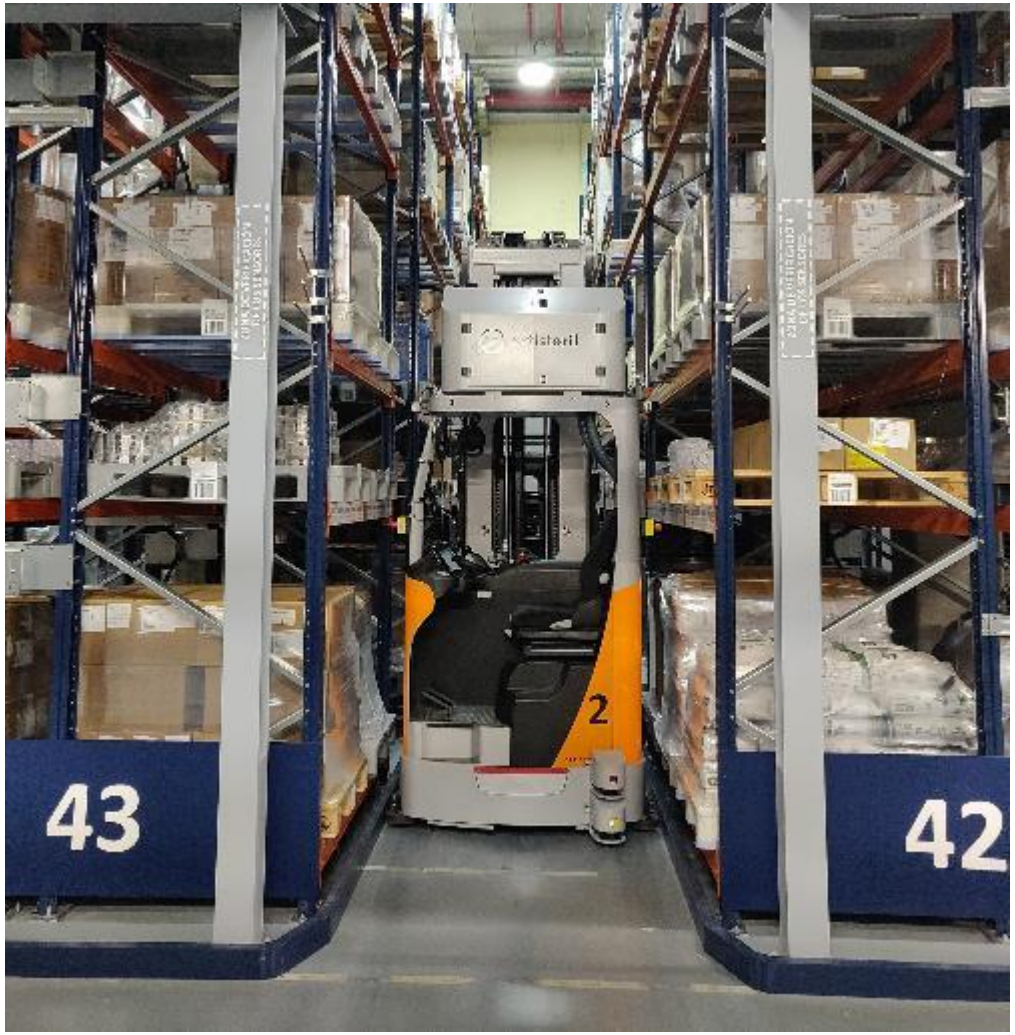
Bilateral for narrow aisles



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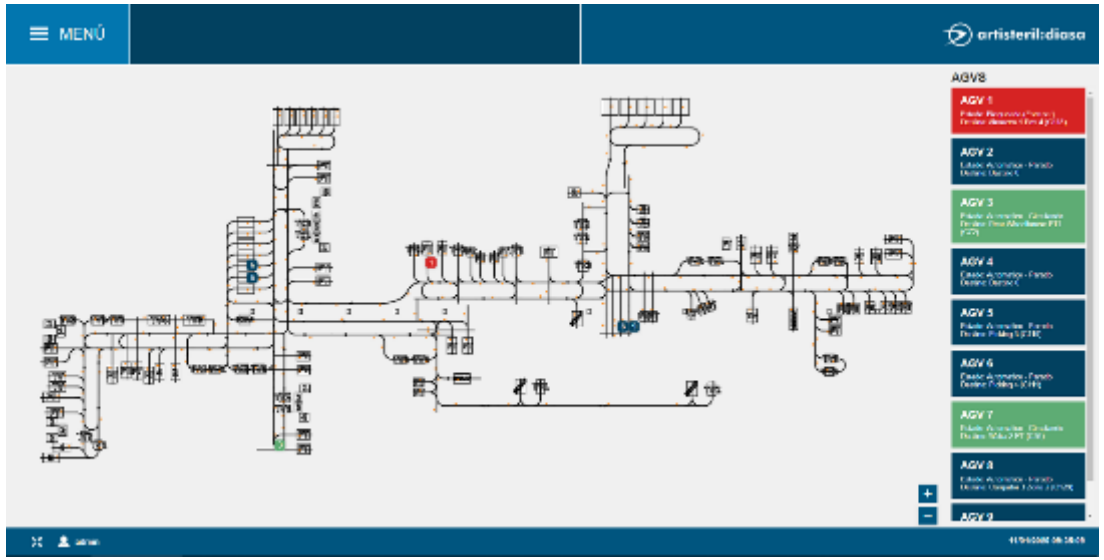

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AMR Stacker for containers

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