

Dear Reader,

Audi line of their electric vehicles has been modernized by using SEW MAXOLUTION® system solution during their running production. To know more about how all challenges have been addressed with SEW's latest technology and executed seamlessly, please read the article below.

Brand & Communication Team,
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Drive technology TODAY

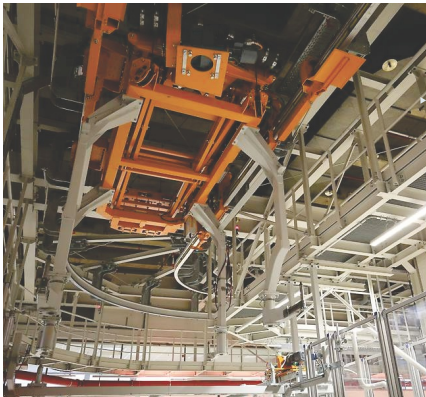
Audi Brussels: Dual-track electrified monorail system

On the new assembly line,
the Audi e-tron handles the curve with ease

Overview

► Quiet, safe, and always at just the right speed: At Audi in Brussels, sophisticated MAXOLUTION® technology permits particularly flexible and ergonomic assembly of the new Audi e-tron electric vehicle fleet.

Smooth, silent motion has taken the place of rigid cycle timing and rattling chain drives. This is made possible by perfect synchronization of all AGV frames and maximum safety.



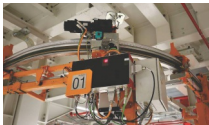
Customer

AUDI BRUSSELS S.A./N.V.

Location: Brussels (Belgium)

Challenge

- Modernization of the assembly lines for a new electric vehicle fleet parallel to running production of the A1
- Transition period of mixed production of both A1 and e-tron vehicles
- Each transport unit is to have its own controller and be networked with the others
- Creation of an ergonomic assembly line with maximum flexibility
- Very high safety standards
- Flexible cycle timing and windows
- No rattling chain drives
- Monitoring of state parameters of each transport unit
- Embedded into the superordinate Siemens plant control system
- Electric vehicle Audi e-tron with completely new technology requires new plant technology
- Electric van weighs 2.9 tons (for comparison: A1 weighs 1.18 tons)
- The production line incorporates tricky curved sections



Dual-track EMS carriage



Mono-track EMS (cockpit system)



Dual-track EMS with Audi A1

Solution

Modernization of the assembly lines during running production using individual MAXOLUTION® system solutions.

- Dual-track electrified monorail system for heavy loads on the assembly line:

- 96 vehicles over a length of 1,100 meters, carrier payload of 3,200 kilograms for each vehicle
- **2 travel drives for each unit:** one heavy-duty electrified monorail system gearmotor for each track, with electronic motors (HK60 DRC2), efficiency class IE4, frequency inverter integrated into the motor
- **Curved track:** the two widely separated travel drives are coupled using a function called "electronic differential"
- **2 lifting drives on each unit:** one R107 DRN132 helical gearmotor for each track, efficiency class IE3
- One MOVIPRO® decentralized drive, positioning and application controller for each EMS vehicle
- Positioning using a DataMatrix barcode system (PXV)
- MOVISAFE® HM31 safety controller for each EMS vehicle
- **Safety functions:** Safe Positioning, Safely Limited Speed (SLS), Safe Direction of Movement (SDI), Safely Limited Position, (SLP), Safe Stop 1 (SSI), Safe Torque Off (STO), Safe Distance Monitoring, switching on/off of the battery charging device, monitoring of the brake test
- All modules and performance features are scalable, quick to start up, and can be combined with the simulation and startup software MOVIVISION®.

- Single-track electrified monorail systems for the Cockpit area of the plant (length 330 meters, 43 carriers)

- Single-track electrified monorail systems for the Doors area of the plant (length 390 meters, 40 carriers)

- Electrified monorails move as necessary at any given moment, always in synchrony with the skillets on the floor and the lifting stations

- **Each transport unit knows its position in the plant at all times** and reports its state parameters continuously to the stationary segment controllers, which exchange data among themselves and pass on the position information to the plant control system

Results

Assembly process in a single, smooth motion:

- During the refitting phase for the e-tron electric vehicle, production of the A1 can continue unimpaired
- Safe and quick startup phase thanks to virtual startup that allowed all interfaces and functions to be tested in advance
- Low noise level due to the absence of rattling chain drives
- Flexible cycle times and windows
- No mechanical spacers between the carriers – minimum permissible distance maintained by safety functions
- Electrified monorail system perfectly synchronized with lifting stations and skillets
- The carriers move autonomously at speeds between one and 70 meters per minute
- In the assembly area, where the plant workers are, the speed is limited to 15 meters per minute
- Curved sections also usable for work stations
- Higher flexibility and better ergonomics in plant workers' tasks
- Refitting completed within just four weeks
- Future-proof production



Lifting drive and rope drum



Travel drive, control technology