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Decentralized drive technology by AMKmotion moves car bodies and saves space:

**A range of different types on a single line**

**The three-axis positioning system by LEANTECHNIK enables flexible assembly of different vehicle variants on a single production line. In combination with the smart drive solution by AMKmotion, the module works highly efficiently and saves space.**

The variety of models and variants of vehicles continues to increase, and experts say that the trend towards electromobility will accelerate this development even further. The production of different models confronts the automotive industry with considerable challenges: it has to meet customer demand for more individualization while at the same time ensuring economic production.

One car manufacturer wanted to make its production line more flexible and contacted LEANTECHNIK AG in search of a solution. For more than 30 years, the company based in Oberhausen has been developing rack-and-pinion hoist gears for automation systems. The medium-sized company solves positioning tasks in various industries. In addition to automotive and mechanical engineering, its components are also used in the process industry and in packaging technology, for example.

**Flexible positioning – from small to large**

The task was demanding: the customer required a system that was able to pick up different body variants and lift them out of the conveyor system. The manufacturer had previously produced each vehicle model on its own line, which incurred high costs. So the desired positioning solution was to enable the production of a variety of body types on a single production line – from small cars with combustion engines through to electrically powered saloons.

The three-axis positioning system (DAP) by LEANTECHNIK meets the customer’s specifications. Throughout the entire operation, four to six of the DAPs each lift, guide and position a car body. The bodies can be of any shape or size. The first generation of the DAP was used successfully in the automotive industry for many years. Since the drive used a standard servo motor, however, each production line had a large switch cabinet for control technology and converters – and this took up space.

The car manufacturer relies on well-established partners – including AMKmotion. The drive technology specialist has been manufacturing servo motors and inverters, control technology and automation solutions since 1963, with the automotive industry being among its customers. The company previously supplied components for the car manufacturer’s swivel units. So the car manufacturer suggested that AMKmotion should get in touch with LEANTECHNIK.

**Decentralized drive technology reduces space requirements**

Even after initial talks, LEANTECHNIK designer Mario Dobnik and his colleagues realized they had found the ideal partner in AMKmotion. “The decentralized servo drives are very well suited to our DAP because their distinctive design makes them extremely compact,” says Dobnik. In the iDT5 synchronous servo motor with integrated inverter by AMKmotion, the drive and inverter form a mechatronic functional unit because the servo controller is located directly on the motor. This reduces the space required for switch cabinets and cabling by up to 70 per cent.

The LEANTECHNIK team replaced the DAP’s previous standard servo motor with the decentralized synchronous servo motor featuring integrated inverter iDT5 by AMKmotion, which is manufactured in three sizes with a maximum torque ranging between 5.8 and 9.5 Newton metres. The iDT5 is equipped with an absolute encoder and a holding brake and drives the lifgo rack-and-pinion gear units by LEANTECHNIK via a torsionally stiff coupling. An iDT5 servo motor and a lifgo gearbox are mounted on each of the DAP’s three axes.

“It’s a customized solution, but we only use three article numbers: two variants of the decentralized power supply with integrated motion controller iSA and the synchronous servo motor with integrated inverter iDT5. This simplifies service for the end customer – especially since the user is already familiar with precisely these components from their swivel drives,” explains Jürgen Schnitzler, Global Key Account Manager at AMKmotion. The same AMKmotion models are installed in the swivel units – the only difference being the software of the decentralized power supply with integrated motion controller, because of the different task involved.

Each production module consists of six pick-up points and therefore six decentralized power supplies with integrated motion controller. Three synchronous servo motors each allow movement around a total of 18 axes. “15 to 20 of these modules can be connected in series on a production line,” says Schnitzler. “That’s a lot of axes,” he adds with a smile.

In order to protect the electronics from magnetic fields generated during welding, the iDT5 synchronous servo motor is fitted with an additional EMC protection panel consisting of a perforated plate that is capable of dissipating the electromagnetic fields.

**Automatic adaptation to body type**

At the top end of the Z axis of each DAP there is a clamping unit. This picks up the body and conveys the information to the station. The X and Y axes adapt to the required variant and the Z axis of four to six DAPs lifts the body into the machining position.

The spacing between the pick-up points of the DAP – which vary depending on body type – and the stroke of the axes is controlled by the decentralized power supply with integrated motion controller iSA by AMKmotion: it can lift up to six Z axes simultaneously in master-slave operation. Since all decentralized iDT5 synchronous servo motors are also connected to each other by means of the daisy-chain method, the amount of cabling required is significantly reduced compared to conventional drives.

EtherCAT and PROFINET are used for communication. Designed to comply with IP65, the iSA is ideal for modular machine construction. It performs three functions: controlling the movement, supplying the motor with power and serving as a gateway to the line level.

**Fast, compact, flexible and efficient**

86 DAPs are installed in the car manufacturer’s production line, which is used to produce electric vehicles as well as vehicles with combustion engines. The company benefits in many ways from using the three-axis positioning system with decentralized drive technology by AMKmotion: it has short cycle times, saves time-consuming manual adjustment of the conveyor technology and reduces space requirements to a minimum. Another key aspect is the great flexibility and the high level of efficiency this enables: these advantages make the DAP with smart drives by AMKmotion attractive for other industries as well.

*6.983 Zeichen inkl. Leerzeichen*

***Meta-Title:*** *Decentralized drive technology by AMKmotion moves car bodies and saves space*

***Meta-Description:*** *The three-axis positioning system is equipped with decentralized synchronous servo motors with integrated inverter by AMKmotion. This reduces space requirements to a minimum.*

***Challenge:*** *Limited space on the production line.*

***Solution:*** *Decentralized drives, enabling automation without switch cabinets*

***Keywords:*** *AMKmotion; LEANTECHNIK; car body construction; automotive industry; automation; drive technology; decentralized; synchronous servo motor with integrated inverter; iDT5; decentralized power supply with integrated motion controller; iSA;*

***Social media (for AMK channels):*** *The three-axis positioning system by LEANTECHNIK enables flexible assembly of different vehicle variants on a single production line. In combination with the smart drive solution by AMKmotion, the system works highly efficiently and saves space.*

***Social media (for editorial staff):*** *The three-axis positioning system by LEANTECHNIK enables flexible assembly of different vehicle variants on a single production line. In combination with the smart drive solution by AMKmotion, the system works highly efficiently and saves space.*

**Captions:**



**Image 1:** The LEANTECHNIK team replaced the DAP’s previous standard servo motor with the decentralized synchronous servo motor featuring integrated inverter iDT5 by AMKmotion, which is manufactured in three sizes with a maximum torque ranging between 5.8 and 9.5 Newton metres.

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**Image 2:** The spacing between the pick-up points of the DAP – which vary depending on body type – and the stroke of the axes is controlled by the decentralized power supply with integrated motion controller iSA: in the application it regulates 18 servo axes and can lift up to six Z-axes simultaneously in master-slave operation.

Ein Bild, das Maschine, Im Haus, Bautechnik, Workshop enthält.

Automatisch generierte Beschreibung

**Image 3:** The three-axis positioning system (DAP) by LEANTECHNIK meets the customer’s specifications. The decentralized drive solution by AMKmotion reduces space requirements to a minimum.

Ein Bild, das Gebäude, Maschine, Bautechnik, Industrie enthält.

Automatisch generierte Beschreibung

**Image 4:** 86 DAPs are installed in the car manufacturer’s production line, which is used to produce electric vehicles as well as vehicles with combustion engines.

**Image credits:**

**Image 1 + 2:** AMKmotion GmbH + Co. KG

**Image 3 + 4:** LEANTECHNIK AG

**About AMKmotion**

AMKmotion specialises in the development and manufacture of electric drive systems and sees itself as a long-term partner in the field of industrial mechanical engineering and plant engineering. The company’s aim is to help its customers achieve technological leadership by integrating individual and sustainable solutions.

The basis for this is AMKmotion’s hands-on mentality, combined with expertise acquired in more than 60 years of company history. We attach particular importance to personal advice and trusting cooperation with customers.

The company was founded in 1963 as AMK Arnold Müller GmbH & Co. KG. It has belonged to the Arburg family since 2021 and has operated under the name AMKmotion GmbH + Co KG since then. The portfolio includes electric drive technology, control technology and industrial automation technology. AMKmotion has a total workforce of 500 people. In addition to its headquarters in Kirchheim unter Teck, AMKmotion has production sites in Weida (Thuringia) and in Gabrovo, Bulgaria, as well as twelve branch offices around the world.

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