

Mitsubishi Electric previews Smart Carriage for linear transfer systems

Visitors to SPS IPC Drives 2016 had the first chance to see a brand new Smart Carriage technology from Mitsubishi Electric and APT Automation. Developed to operate with a dedicated linear transfer system, the Smart Carriage delivers on-board intelligence plus integrated power for on-carriage equipment. It also supports the ability to switch between parallel tracks on production lines allowing multiple operations on different products.

Due for official launch later this year, Mitsubishi Electric sees the Smart Carriage as a key technology to help address industry challenges such as improved productivity, increased overall equipment effectiveness and greater production line flexibility. As manufacturers look to increase their ability to meet customer demands for smaller batch sizes and greater levels of customisation, there has been a growing interest in the new breeds of linear transfer systems. The Smart Carriage offers increased intelligence to users who are looking to upgrade factories to Industry 4.0 benchmark standards.

Uniquely, 240V AC and 24V DC power is available on the carriages, making it possible for users to connect components which will provide additional functions or deliver additional information, such as on-board sensors or grippers. It also means data collected by sensors can be stored on the Smart Carriages. On-board intelligence and data storage means the Smart Carriage can carry around product information from station to station. This enhanced intelligence enables the carriage to identify the product and its destination, allowing production flexibility to be significantly increased. With the ability to switch between



parallel tracks, the Smart Carriage allows individual products to be routed to different stations on parallel production lines. Different processes can be realised in parallel, and then consolidated at a subsequent position on the rails.

These capabilities deliver on one of the key requirements for Industry 4.0 production, where production lines will be able to reconfigure themselves on the fly – based on the requirements of the individual product and the available capacity at different stations.

Further advantages of the linear transfer system include a reduced permissible distance between the carriages on a given track. A minimum distance reduced to less than 1mm means a greater number of carriages can be accommodated on a rail, leading to gains in productivity. A maximum carriage speed of 3m/s and acceleration/deceleration of 3G means the Smart Carriage can offer fast positioning for shorter moves. Collision

avoidance technology prevents collisions even when there are numerous carriages on the rails moving at high speed. Positioning accuracy and repeatability are quoted as $\pm 0.01\text{mm}$.

In addition, because Mitsubishi Electric's automation platform underpins the Smart Carriage, it is easy to integrate into a wider automation system, including simple synchronisation with Mitsubishi Electric's MELFA robot range. Combined with APT Automation's extensive experience in the mechatronics associated with linear transfer systems, the result is a highly efficient and flexible intelligent transfer system that meets all the requirements of an Industry 4.0 production environment.

Malte Stahnke, managing director of APT Automation, remarked: "We have worked closely with Mitsubishi Electric to develop a solution that delivers many benefits in terms of productivity and quality. The integration of an advanced control infrastructure has enabled the advancement of innovative linear transfer systems and their integration with the wider manufacturing environment."

Hartmut Pütz, president of factory automation EMEA at Mitsubishi Electric Europe, commented: "Bringing new technology to the market that offers customers reduced costs in every phase of the automation process is part of Mitsubishi Electric's e-F@ctory concept. The Smart Carriage technology is a great example of that philosophy in practice. We are proud to be creating solutions that enable the automation and digitalisation of key industrial processes."

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Multi-carrier system from Festo and Siemens offers flexibility for Industry 4.0

Festo has announced the Multi-Carrier-System (MCS), its Industry 4.0-ready linear motor track system, jointly developed with Siemens. MCS is an adaptable, modular transport solution for manufacturing and production, combining linear motor



and mechanical guidance technology from Festo with Siemens' extensive controls expertise. It delivers unparalleled levels of flexibility and can be easily incorporated into existing processing and packaging environments.

MCS addresses the acute need for flexibility in modern manufacturing and production environments driven by increasingly complex product diversity, shorter product life cycles and growing levels of mass customisation. Potential applications include cosmetics packaging with its huge number of product variants, food and beverage processing with quick seasonal changes or industrial manufacturing of customised, bespoke products.

Its configurable linear transport rail can be easily integrated into existing intralogistics and standard conveyor systems, with precise synchronisation and seamless infeed and outfeed of transport carriers. Movement of carriers within the system can be rapidly adapted to deal with different formats, sizes and types of

product – down to batch sizes of one, or even to handle seasonal requirements.

Motion profiles can be defined for each carrier, enabling them to move freely and independently of all other carriers – at speed, jerk-free and precisely. They can be started and stopped at any desired position and moved towards each other without risk of collision, as well as grouped together and moved synchronously at fixed distances. Carriers can also effortlessly transfer between linear motor sections and the standard recirculating conveyor system, so users benefit from shorter set-up times and virtually seamless format changes.

Incorporating decentralised sensors and intelligence, MCS also addresses Industry 4.0 requirements and applications. Its flexible design enables adaptable, reconfigurable and economic production, even for small batch sizes, while its OPC-UA interface enables integration into Industry 4.0 environments.

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