Door Trim Assembly with AS-Interface, PROFIBUS and MOBY

Peugeot, Sochaux

*In the project Sochaux 2000, Peugeot is modernizing its assembly lines at the Sochaux plant. This includes the automation of the door trim assembly and the implementation of the AS-interface – a premiere at the PSA Peugeot Citroen.*

To ensure even painting of all car body panels, the car bodies are painted with the doors in place. Arriving at the new factory building MV2 (Montage Voiture), the painted, complete car bodies of the Peugeot series 406, 605 and the future Z8 are routed onto two identical assembly lines.

To be able to trim the inside of the doors in the next production steps, a worker unhinges the left-side doors and mounts them to the carrier of a circular swing tray conveyor. Further down the line, a second worker performs the same tasks for the right-side doors. The door-less car body continues to move down the assembly line, while the right and left doors in the swing tray conveyors are transported to another building for trimming.

‘After the trim has been attached, the doors are reinstalled at the respective car body. The empty swing tray conveyors return to the starting point and begin a new cycle. 920 swing tray conveyors circulate around each assembly line. For a synchronized transport of the doors and car bodies, the swing tray conveyors take along mobile data storage units (MDS) of the identification system MOBY E as electronic goods issue slips, enabling their identification.

Modernization of the Assembly Plant

“The modernization of the first line for the door trim assembly was tackled in August 1998,” explains the managing automation technician, Claude Iltis. The production equipment of the plant, in which the vehicles were assembled up to now, no longer was up-to-date.
Starting May 1999, all corresponding production processes will be moved to the factory building MV2. As a result, the production flow could be greatly reduced. Two doors are brought on their respective swing tray conveyor through a tunnel to the factory building EX09, trimmed there and conveyed to the workstation for reinstallation onto the car body. Along the entire transport route, stopping points (six position sensors, solenoid valve actuators, pushbuttons and indicator lights) ensure the safety in the danger zones at the conveyor transfer points and at the vertical orientation of the parts.

**AS-Interface in Use for the first Time**

"The conveyor system is controlled in its entirety by Siemens automation components. The project execution was entrusted to the Société d’Électricité Industrielle de l’Est of Kingersheim, which also decided to employ the AS-interface. Three PLCs of the type SIMATIC S7-300 control the six conveyors. PROFIBUS DP is used for the communication between the S7-300 PLCs and the communication with the S7-400 PLCs, which manage the production flow and also monitor the production facilities. The exchange of information is particularly extensive at the workstation for applying the window seals: here, the compact distributed I/O stations SIMATIC ET 200B are employed. Lastly, PROFIBUS DP/AS-interface links provide for the transition to the digital I/Os at the AS-interface. Claude Iltis on this: "The AS-interface is optimally suited for controlling suspended conveying machinery and also represents the most cost-effective solution for integrating smaller functions, when large distances need to be covered."

**Clearly arranged and quickly expandable**

The conveyor system includes a total of 115 AS-interface modules with four inputs and outputs each. "Compared to a conventional point-to-point connection, the AS-interface system offers cost savings of roughly 25 percent. The clarity of the control cabinets is impressive!" Among other things, this can be attributed to the control elements of the sensors (proximity switches) and actuators (solenoid valves, pushbuttons, indicator lights) that can be mounted decentralized, in close proximity to the machines and the AS-interface’s IP 67 degree of protection. Furthermore, configuration changes can be made with little effort: for example, an additional control unit “Production STOP” and/or “Warning of the Production Personnel” can very quickly be set up if required. By means of the AS-interface, the automation structure was considerably improved. “At the beginning, we were anticipating one control cabinet per power unit,” remembers Claude Iltis. “With the AS-interface, however, we were able to group the automation functions of the conveyors.” Where originally three control cabinets were planned, only one is required today! "M12 connectors enable the general use of pre-wired sensors for the integration into the AS-interface," emphasizes Claude Iltis. "With it, wiring errors during the commissioning are practically eliminated. Last but not least, the time required for the wiring is reduced as well."

**With the AS-Interface in the Future**

In the foreseeable future, this assembly line for doors is to be followed by a second. Thanks to the good experiences gained, the implementation of the new project should take even less time. During the creation of the standard schemes for the equipment and the programs (FB, EC), attention was paid to make the used AS-interface transferable to other plants. As a result, the application of the AS-interface is now also planned for the car body conveyor at the Sochaux plant as well as for the door trim assembly lines at the Rennes plant.

http://www.siemens.com/simatic-sensors/rf