



Industry: Automotive
Automatic automobile ceiling assembly line

Waldkirch/ Ceska Lipa, Tour Stop No 25 2010 - In a car assembly line, a range of different photoelectric proximity sensors, color sensors and cylinder sensors from SICK ensure that all components for a car ceiling assembly are present and used correctly.

Challenge: Flexible production

The Czech company Q-Plus manufactures tools, assembly lines and specialist machines for several different industries. The company has developed an assembly line to construct the vehicle ceiling for an automobile manufacturer's final assembly. Several versions and colors of the ceiling are available, and these are produced "just in sequence" to suit the automobile type. During assembly, it must be ensured that all foam and small parts are installed completely and in the correct colors to match the car ceiling. At the same time, the system must guarantee that the assembly speed matches the four minutes per ceiling necessary for the vehicle production.

In order to guarantee use of harmonized components and minimize consulting and procurement costs, Q-Plus wanted to obtain all the sensor solutions from a single source.

Solution: SICK complete solution for the automatic vehicle ceiling assembly line

The assembly is divided between four fully and partially automatic workstations: from fabric cutting, over insertion of different foam parts to pressing in small parts. Application consultation and sensor technology from SICK provide solutions for these different applications. The presence of manually inserted, foamed ceiling parts in the assembly tool is checked using flat miniature photoelectric proximity sensors (WT2F). These take up very little space in the assembly tool, and reliably detect the presence of the foam part. Color sensors (CS8-4) are used to ensure that all the visible assembled parts of the ceiling are the same color. Minia-



ture photoelectric proximity sensors (WTB4-3) check that the small parts to be installed are complete and that the ceiling is in the correct assembly position. Magnetic cylinder sensors (MZT8) detect the end positions of clamps used for holding the ceiling in the assembly position in all pneumatic cylinders, and monitor the end position of the cylinder when the small parts are pressed in. The hazardous point, based on a cutter used to cut the fabric at the semi-automatic work station, is safeguarded with a safety light curtain (C4000 Eco).

Customer Benefits:

- 100% monitoring of the car ceiling assembly
- Space-saving sensor solutions
- Efficient consulting and implementation of solutions provided by a single source

With the aid of the sensors, the process steps are monitored at all assembly stations, thus ensuring the high level of quality required by the final customer. The flexible, automatic adjustment of the system to the required car ceiling variant is guaranteed. The compact sensor designs make integration easier, even in tight spaces in the assembly equipment. The consulting and support from a single source on sensors and safety enabled the customer to maintain a simple and cost-effective procurement process and to integrate harmonized sensor solutions.