Software | Electronics | Sensors | Fixture | Control technology | Robotics | Image processing

ITgroup

Test system for steering column switches in robot cell

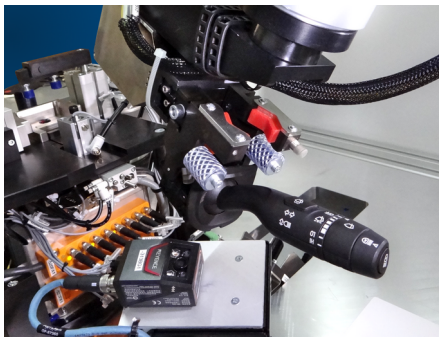
End-of-Line Station for function testing and quality assurance

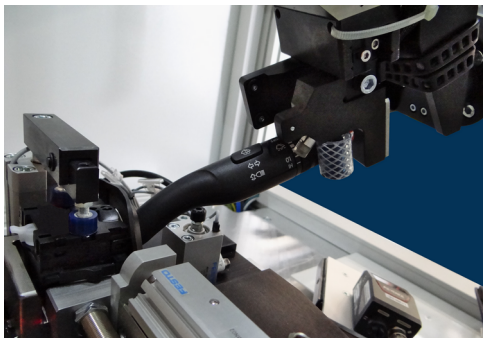
Initial situation

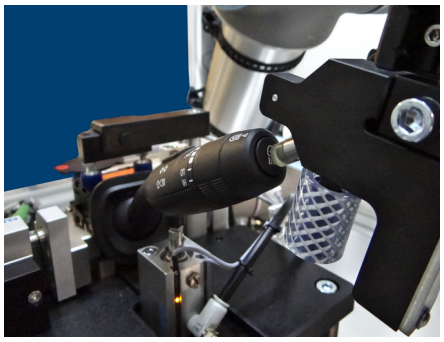
- The customer needs a solution for the demanding testing of its steering column switches, which was previously handled manually
- Independence from operator control on critical quality parameters should be achieved
- Currently not an optimal cycle time

Goal

- Completely automatic function test and quality assurance of the steering column switches by measuring the force/angle as well as capturing and evaluating electrical signals
- Optical inspection of all printed symbols
- Automatic rejection in case of failed exam
- Reduction of cycle time through automation







Solution

In order to offer the customer a completely automatic end-of-line inspection, ITronic has developed a complete system that includes a robot, measuring technology and a special gripper for the necessary inspections, especially for this application. The gripper, in combination with a six-axis robot, is the core of the testing system. After the steering column switch is manually inserted, the system first checks the basic position and the lever positions. Afterwards, all gearshifts, push buttons, turn signals, headlamp flashers, high beams and the indicator reset, including 6D force-displacement measurement and torque measurement, are checked completely automatically. Thereby, the robot acts as a positioner and handles the test item. The customised gripper ensures damage-free handling during the test activities.

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Solution

Additionally, all printed symbols are checked for positional accuracy, completeness, quality and variant by an optical inspection, where the robot aligns the test item exactly for the camera. The inspection of the plug variant is also covered by the comprehensive inspection of the EoL system.

If the test is not passed, the steering column switch is sorted out as "not OK". This ensures that only steering column switches marked as faultless are sent on to the subsequent dispatch.

Quickly replaceable elements, such as a changeable contact, increases the ease of servicing. Exchangeable adaptations with complete test item fixtures allow extremely flexible adaptability to other products. In addition, innovations or model modifications are easily possible by adapting the testing software.

Cooperation

The project was carried out in cooperation with a reputed automotive supplier.