

Application example:

## dispense and die place automotive sensor assembly

### Customer Requirements

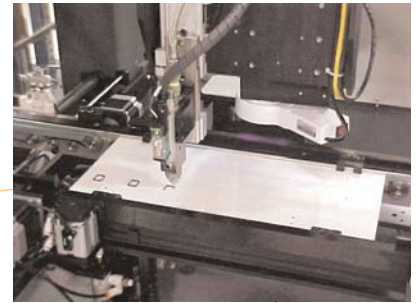
Universal Instruments' challenge was to address multiple tasks in a pressure sensor application, including dispense and glass IC placement. These pressure sensors were constructed within a plastic housing that connected to the engine's electrical and manifold pressure systems. An adhesive gasket, an adhesive for IC attach, and a hermetic seal were the required dispensing operations. An electronic circuit on a ceramic substrate and a 2.2mm x 2.2mm x 1.9mm IC, from a wafer, needed to be placed. All steps in the manufacturing process required full traceability.

### Universal Instruments' Solution

Universal Instruments integrated four Polaris Multi-Process Assembly Cells for the dispense operations and IC placement. In the first Polaris cell, an auger pump dispensed the adhesive gasket inside the plastic sensor housing. The gasket was then inspected for completeness. The second Polaris cell picked and placed the ceramic substrate onto the gasket. After curing, the product was flipped and an auger pump in the third Polaris cell dispensed the adhesive for the IC and the hermetic sealant for the electrical contact cavity. The adhesive was inspected for complete material before the fourth Polaris cell picked and placed the glass IC onto the adhesive using a vacuum spindle. To accommodate the glass IC supplied in wafer format, Universal integrated a direct die wafer feeder.

### Technology Utilized

- Polaris Multi-Process Assembly Cell with Network Kit
- 2.6 m/p Upward Looking Cameras for optical inspection
- Time-Pressure Dispense Valve
- Piston Positive Displacement Valve
- Auger Pumps with Cartridge Feed
- Servo-Theta Pick and Place Tool Module
- Color Inspection System
- Platform Setup Validation to verify the bar code from wafer or tape feeder
- Downward Looking Camera for vision guidance
- Direct Die Wafer Feeder
- Non-Contact Dispense Needle Calibration



*Dispensing adhesive gasket onto generic product*



*Hybrid circuit on gasket and IC on adhesive*



*Direct die wafer feeder*

**www.uic.com**

**email: universal@uic.com**

**AMERICAS**

Tel. 1-800-432-2607 or

Tel. +1-607-779-7522

**ASIA**

Tel. +65-6281-0991

**CHINA**

Tel. +86-755-2686-0160

**EUROPE**

Tel. +36-23-445500

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