CASE STUDY

Drug Delivery Device - Dispense and Cure Application

Automation NTH

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Introduction

Automated Glue Dispense and Cure System Enhances Wearable Medical Device Assembly Production with 15s Cycle Time and Vision-Guided Precision.

A leading medical device manufacturer partnered with Automation NTH to optimize the adhesive application process for a wearable medical device. The manufacturer needed a scalable and precise method to dispense, cure, and inspect glue at three critical locations, addressing rising demand and quality expectations.

Overview

Automation NTH delivered a fully automated, vision-guided system that improved throughput, reduced manual variability, and ensured consistent adhesive placement. Leveraging closed-loop dispensing, real-time vision inspection, and a compact, modular platform, the system enhanced manufacturing precision and throughput while reducing operator workload.

CHALLENGES

Manual Process Limitations

Legacy glue dispensing methods were prone to misalignment and inconsistency, especially at complex critical-to-quality adhesive locations. This led to elevated risk of dispensing occlusions, rework, and compliance concerns

High Performance Expectations

The customer required a 15-second part-to-part cycle time supported by a single operator, all within a cleanroom-compatible, space-constrained environment.

Vision-Guided Accuracy

To meet stringent quality control standards, the system needed to integrate high-resolution vision systems for both robotic offset correction and CTQ (Critical to Quality) inspection.

Process Control Demands

Precise adhesive application required dispense tip calibration, weigh scale verification, and UV cure monitoring, delivered through closed-loop feedback mechanisms.

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SOLUTIONS

Automation NTH implemented a robust automation cell built on its FLEXBASE platform. Key system features include:

Vision Guided Robotics

- Coordinated SCARA and 6-axis robots perform precise adhesive application using closed-loop dispense control.
- Pick offset and critical inspection operations are managed by over multiple vision systems for real-time accuracy.

Advanced Dispense and Control

- Flow rates are monitored and adjusted using weigh scales to ensure consistent volume delivery.
- Auto-calibrating dispense tips with fiber optic sensing maintain reliability across shifts.

UV Cure and Validation

- On-machine UV radiometers verify proper curing in-line, reducing reliance on manual checks and improving process reliability.

Operator-Friendly Interface

- A modern Ignition HMI provides local and remote access, diagnostics, and OEE dashboards.
- Onboard webcams offer real-time visibility and support remote monitoring.

Compact & Scalable Design

- A dial indexer with flip mechanisms allows dual-side access.
- Manual load/unload is supported by conveyor buffering, maintaining flow while reducing system size.

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RESULTS

Performance & Throughput

- Achieves a 15-second cycle time, meeting throughput targets with a single-operator model exceeding OEE targets.

Quality and Compliance

- Vision-guided dispensing and in-line UV verification reduce scrap and ensure consistent adhesive application.
- Closed-loop feedback enhances reliability and reduces part failures.

Labor and Workflow Efficiencies

- Automation reduces manual variability and lowers labor needs to fewer than one operator per system.
- Enhanced visibility through Ignition HMI and SCADA infrastructure improves process support and validation.

System Flexibility

- Modular architecture allows for future expansion and adaptation to new part variants.
- FLEXBASE platform provides a cleanroom-compatible and compact footprint to meet constrained production environment.

CONCLUSION

The automated glue dispense and cure system enables the customer to meet rising production demands with greater speed, accuracy, and confidence. By replacing a manual, variable process with a fully automated solution, they significantly improve product quality, reduce the risk of rework, increase throughput, and minimize operator involvement. The system's seamless integration with existing workflows and SCADA infrastructure also strengthens process validation and real-time monitoring. This solution positions the customer to scale production efficiently while maintaining the high standards expected in medical device manufacturing, supporting both current needs and future growth.

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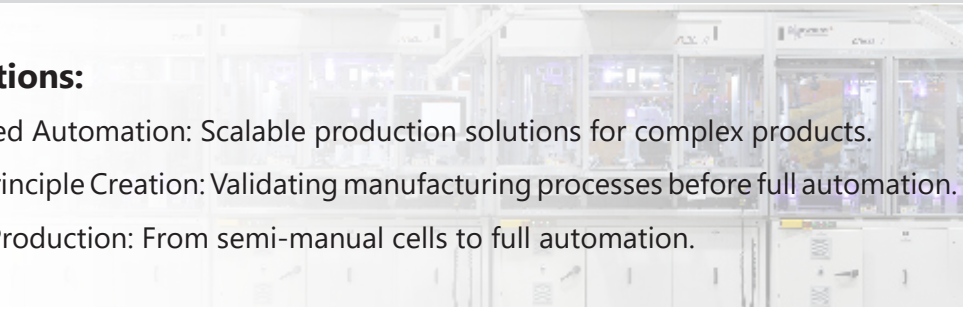
About NTH

Founded in 1999, Automation NTH is a trusted partner in automation for manufacturers, with our headquarters located just outside of Nashville, TN and additional offices in San Diego, CA. Our expertise transforms your manufacturing operations from manual processes to semi-automated and fully automated production. Whether scaling up from individual work cells or introducing fully integrated production lines, we deliver solutions that drive cost savings, enhance efficiency, and minimize risks. With a strong focus on robotics and controls, we ensure timely delivery of projects with strict adherence to budget.

Key markets we serve include:

- Medical Diagnostics
- Drug Delivery Systems
- Wearable Devices
- Therapeutic Devices
- Vascular Technologies

Our innovative approaches improve production capacity, product quality, and enable operator autonomy.



Our Solutions:

- Customized Automation: Scalable production solutions for complex products.
- Proof of Principle Creation: Validating manufacturing processes before full automation.
- Scalable Production: From semi-manual cells to full automation.

Services We Provide:

- Custom Automation
- Automation Consulting
- Equipment Optimation

Engineering Your Edge, Together!

Contact Us today at sales@automationnth.com

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