



CASE STUDY

Medical Technology Firm Intricon Partners with Summit to Build Automated System to Manufacture Insert Molded Sensor Needles—Production Output Increased 120%

SITUATION

A labor-intensive process was using four workers to manually place insulin sensor needles into an injection molding press. IntriCon needed a more efficient, less expensive process.

Situation

A traditional labor-intensive process using two workers to manually place insulin sensor needles into an insert molding, plastic injection press. Intricon needed a more efficient, less

Intricon—an innovative micromedical technology firm—needed a sophisticated automation system to support the manufacturing of insert molded needles, which would be used in a closed-loop insulin pump, designed and built by a global medical device company. Type 1 diabetes patients use one of the needles every three days to insert a sensor beneath their skin. The sensor constantly measures the level of glucose in the patient's interstitial fluid.

Prior to contacting Summit Engineered Automation, Intricon was traditionally inserting needles manually into the injection mold tooling. It took workers-two per machine-to place needles into the tooling. Each worker would place four needles at two different stations on the indexing table.

IntriCon Corporation

1260 Red Fox Rd
Arden Hills, MN
55112

About IntriCon

As a joint development manufacturer in micromedical technology, Intricon works with their customers every step of the way during medical device development from the earliest idea stages to ongoing production, sharing goals and risks in order to advance program performance and deliver results. They create a partnership with a singular focus – to help customers get to market on time and on budget. Intricon is uniquely positioned to help their customers advance clinical outcomes by looking ahead with proactive support and resources. IntriCon has facilities in the United States, Asia and Europe.

Solution

An automated line built around a B&R Industrial Automation SuperTrak® transport system with several Epson Robots with Millibar EOAT.

Intricon turned to us to help them design and engineer a complete automated system using a series of robots and a SuperTrak transport system, which in the end by reducing cycle time and increasing cavitation could result in an approximate 120% improvement over the company's traditional manual process. By implementing the automated system each molding cycle could potentially achieve up to a 20% cycle reduction due to automated loading verses the traditional manually loading.

The existing manual process is produced using an eight-cavity tool. Summit's automation line allowed that to be doubled to a 16-cavity tool while maintaining the reduced cycle. Our engineers determined that the production rate, based upon the design of the automation could achieve an output of approximately 44 needles per minute. The machine was also designed to run with very little worker intervention.

Automating the production of insert molded needles posed significant challenges because the part is very small, required specific orientation and there was little room for error. For example, we used two vision-guided robots to pick needles with Millibar vacuum EOAT from two custom backlit trays.

The trays of needles are picked from a magazine by two EPSON SCARA robots. The trays are then presented to two additional EPSON SCARA robots that are vision guided to pick and place the needles into a 180-degree rotate station. The needles are then flipped eight at a time onto an awaiting carriage on the SuperTrak transport system. Needles are moved 16 at a time down the line by B&R's SuperTrak.

Our engineers also added an Allen-Bradley servo flip station with a Bosch Rexroth PSK-60 actuator, which was used to invert the needles eight at a time during the production process. To ensure needles were positioned correctly—not upside down—during production, the precision SCARAs minimized mistakes and manufacturing inconsistencies.

Results

IntriCon's new automated system increased production output by 120%, while eliminating additional labor requirements.

Compared to Intricon's former method of manually producing its insert molded sensor needles, the company's new integrated automation line increased production output by 120% allowing Intricon to meet the needs of their customer. At the same time, staffing requirements for the new system were reduced by omitting the need to manually load the needles.

Partial List of Equipment Used

- B&R Industrial Automation SuperTrak® transport system
- Epson G6 robot, 650mm reach, 330mm quill length (2)
- Millibar EOAT with vacuum grippers
- Allen-Bradley – Studio 5000 GuardLogix® safety editor
- Allen-Bradley – CompactLogix GuardLogix Safety PLC
- Allen-Bradley operator interface—PanelView Plus 10" touch-screen panel
- Keyence vision systems

© 2020 Summit Engineered Automation