Automation case study

Surface Grinding Machine using IPC based motion controller

Grinding efficiency revolutionized by Inovance's automation expertise

Customer profile

A prominent Indian industrial automation company with over a decade of experience excels in delivering comprehensive automation solutions.
Their unwavering commitment lies in providing the perfect blend of products, services, and support at competitive prices for a diverse clientele in the automation sector, including those involved in SPM applications. They distinguish themselves by prioritising solution-oriented offerings, backed by a team of highly skilled engineers and a vast knowledge base encompassing various applications.

The challenge

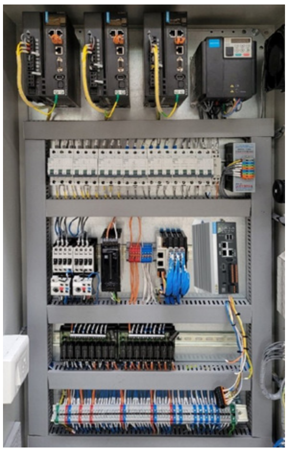
Modern surface grinding machines leverage PLCs and G-code functionality to achieve superior precision and automation. However, these advancements come with inherent challenges:

- Synchronized motion across axes: Grinding machines necessitate precise and coordinated movement across the X, Y, and Z axes during interpolation. This demands real-time feedback mechanisms to rectify errors and backlash consistently.

- Aligning scan time with cycle process: Matching the motion scan time with the grinding cycle is paramount for achieving accuracy on par with CNC controllers.

- G-code accuracy: Precise interpretation and execution of G-code instructions by the PLC are fundamental for machining precision. Programming or interpretation errors can lead to part rejection or even machine damage.

- Collision detection: Implementing effective collision detection algorithms to prevent tool or machine crashes is crucial for ensuring safe operation. However, designing such systems that identify potential collisions without hindering the machining process presents a significant hurdle.



The solution

To overcome these obstacles, customer partnered with Inovance, a global leader in industrial automation. Through collaborative efforts, a comprehensive solution package was implemented, featuring:

- AC703 - IPC Motion Controller
- SV660N Servo Drives
- MS1H3 Servo Motors
- MD310 AC Drive
- IT7100E HMI

In applications, the web-visualization functionality of IPC serves as the user interface, offering a user-friendly platform for machine operation, monitoring and programming. Operators can visualize the grinding process, diagnose potential issues, and make real-time adjustments, ensuring optimal performance and efficiency. The AC drive precisely regulates the grinding spindle motor, delivering outstanding speed control and maintaining consistent torque throughout the grinding process. This results in high-quality surface finish.

The benefits

Inovance's solution delivered a significant performance boost to the customer's grinding operations, resulting in increased machine speed, improved efficiency, and minimized errors. Grinding jobs saw a notable reduction in defects and tool damage, leading to smoother overall operation. The customer expressed high satisfaction with the exceptional performance and accuracy achieved through Inovance's integrated product and **IPC based motion controller**.

Key benefits

- High accuracy and repeatability
- STO SIL 3 functional safety
- Exceptional reliability
- Simplified commissioning and maintenance

The conclusion

Customer's collaboration with Inovance exemplifies a successful partnership that effectively addressed the challenges in their surface grinding operations.
The implemented solution yielded significant improvements in speed, quality, efficiency, accuracy, safety, and overall ease of use. This case study reinforces the importance of leveraging cutting-edge automation solutions to achieve superior performance in industrial applications.