CUSTOMER SUCCESS PROFILE

KINGSTAR

Mecano CNC: How a Software-Based Approach Enables High-Quality CNC Machines at Competitive Prices

BACKGROUND

High-Quality CNC Machines for the Latin American Market

Mecano CNC designs and manufactures CNC machines for cutting, milling, and carving materials including wood, plastics, agglomerates and sheet metals. Founded in 2010 by Jose Moran, the company's mission is to provide first-world technology and quality at local prices throughout Latin America. This strategy has served them well; in less than a decade, Mecano CNC has evolved from an entry-level machine maker to a vendor of world-class high-definition plasma machines.

CHALLENGES

Improve Performance Without Increasing Price

Competition is fierce in Latin America. CNC machine shops are so price-sensitive that they often must forgo performance and quality for lower-cost machines. To combat this challenge, Mecano needed to distinguish their CNC machines by adding quantifiable performance and quality without commensurately increasing price.

As with any business, this was no easy task. What was the secret to Mecano's success? They aggressively embraced industry standards before their competition. This strategy required three key components. Mecano had to select the right fieldbus standard, design the right machine automation architecture, and find the right partners to support their approach.

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STRATEGY

Choose the Right Digital Fieldbus

When selecting a digital fieldbus approach, Mecano understood that a standard is only valuable if the market accepts and adopts it. As more vendors adopt a standard, the competition increases, and the prices decrease. After considerable research, Mecano discovered that EtherCAT clearly stands apart from competing digital fieldbus standards.

EtherCAT met Mecano's needs for a variety of reasons. They found that selecting a new digital fieldbus architecture based on Ethernet Category 5 (aka Cat 5) cabling and a more open, machine controller architecture could dramatically lower their costs and improve their quality. Importantly, proprietary wiring versus Ethernet cabling for machine control can be very expensive. EtherCAT also offers dramatic savings in effort to install, test or fix wiring when comparing a digital fieldbus as the standard versus an analog proprietary brand. Plus, communication to servos with a digital fieldbus is statistically more reliable.

SOLUTION

An All-Software, PC-based Approach

Mecano knew that EtherCAT was a safe bet. However, as the old joke goes: The good news was that so many vendors offered EtherCAT, the bad news was that so many vendors offered EtherCAT. Mecano soon realized that their real challenge was picking a machine automation architecture. They hoped that doing so would narrow the field of potential EtherCAT vendors that could support their CNC machine controller.

Mecano compared a DSP-based proprietary CNC architecture versus an all-software, PC-based CNC-software approach. They quickly found that only an all-software PC-based approach delivered on their long-standing promise of being cost-competitive without sacrificing quality. CNC software on a Windows PC coupled with EtherCAT offered the best flexibility as well as best-in-class quality and performance. Even better, an all-software EtherCAT on a Windows PC can reduce the machine controller cost by more than 56%.

With their approach defined, Mecano now faced the task of choosing the right vendors. First, they identified a set of requirements that would help them achieve best practices and get to market quickly.

- "Plug-and-play" capabilities for minimal configuration. EtherCAT can be complex to configure, so the ideal vendor needed to simplify the configuration process.
- A controller interface that runs on Windows, so it's user-friendly and easier to find developers.
- A real-time operating system (RTOS that's market tested AND capable of running on the same Windows PC or a second PC.
- An RTOS without restrictions on 3rd party applications run on the PC.
- Superior CNC software that is adopted around the world.
- CNC software that is immensely customizable to protect their brand.

While there were plenty of vendors that offered proprietary, hardware-based, EtherCAT-enabled solutions (and sometimes also offered CNC hardware), there were only a handful of all-software CNC packages that ran on a PC-based Windows system.

Mecano chose Mach4 CNC from Newfangled, the KINGSTAR Motion Bundle, and downloaded the KINGSTAR plugin for Mach4. This solution met all their requirements, like outstanding CNC machine automation and ease of use. Further, it offered distinguishing features like a true plug-and-play EtherCAT feature, an architecture that transforms Windows into an RTOS, and the ability to run 3rd party software or controllers on the same PC. This flexibility protects Mecano as demands for Industry 4.0 features arise in the future, such as IoT edge computing.

RESULTS

Higher Quality, Lower Prices, and Delivering on Their Promise

By selecting the KINGSTAR Motion Bundle and MACH4 CNC, Mecano embraced an exceptional Industry 4.0 machine automation architecture that provides a quality and performance/price advantage now and will adapt to increasing demands in the future. The EtherCAT standard has proven to be the right choice for Mecano, lowering the cost of the components and enabling breakthroughs in machine control while delivering operational and support benefits. Founder Jose Moran reports that "Troubleshooting for wiring problems within the machine has become non-existent thanks to EtherCAT." Eliminating problems for customers makes Mecano that much more competitive.

Most importantly, by switching from hardware-based CNC to an all software-based CNC approach, Mecano continues to deliver on its customer promise to offer world-class machine automation at Latin American prices. Finally, Moran feels that his machine controller is now set up for whatever the future might bring too. "Because our controller evolved to a completely open architecture based on machine automation software that executes on an industrial PC, we will always be able to quickly capitalize on any disruptive changes that emerge from the market just like we are for Industry 4.0 right now."