



Scanning the Horizon of Possibilities

Parker brings portability and reduced time to market to three-dimensional scanning application.

In the world of three-dimensional scanning, reliability and portability are critical. To be effective, 3D scanning equipment must be extremely portable, addressing a wide range of project sizes often times in varying locations. This flexibility is one characteristic that has made Capture 3D, Inc., a success. By capitalizing on new ETHERNET Powerlink-enabled products from Parker Hannifin, Capture 3D (capture3d.com) has been able to successfully bring to market a new generation of reliable, portable and easy-to-use machines capable of scanning anything from a turbine blade to an engine block.

The new generation begins with Capture 3D's MC-XL and MC-SO scanners, which the company builds at their newly expanded Novi, Michigan, facility. Engineered for the aerospace and automotive industries, the larger MC-XL is capable of handling parts up to 300 lbs, while the smaller MC-SO is capable of handling parts weighing 30 lbs. or less -- ideal for smaller parts such as cell phones and compressor blades.



Ethernet Powerlink's ability to precisely deliver motion commands enables this 3D scanner to gather data on an impeller.

The automated systems each use six axes and two cameras to precisely acquire an object's data -- everything from measurements to physical characteristics -- and digitize it. The process requires positioning control of the six motion axes to a repeatable process, allowing automated inspection to keep up with production processes. The scanners are flexible optical measuring instruments that use the principles of triangulation. Projected fringe patterns are observed with the two cameras and three-dimensional coordinates for each camera pixel are calculated with a high degree of precision. A polygon mesh of the object's surface is then generated and compared to a CAD model to generate an inspection report. A customer may ultimately use this descriptive data of the object for pass/fail inspection of a first article, for further analysis of a rapid prototype or for reverse engineering a mold to duplicate a hand fashioned or one-of-a-kind part.

Both the MC-XL and the MC-SO get their powerful and precise multi-axis motion capability from Parker's ACR9040 ETHERNET Powerlink (EPL) controllers and Aries EPL servo drives. The EPL-enabled products add real-time, deterministic motion control over standard Ethernet hardware, enhancing machine performance, reliability and configuration possibilities. The Ethernet cabling simplifies installation, increases reliability, reduces

set-up time and minimizes the required panel footprint. Because EPL systems require less space than traditional analog controls, the MC-XL and MC-SO are able to go where other scanning machines cannot.

“Since our design goal was to provide a system that was rugged enough for the factory floor and quiet enough for an office, we anticipate our clients will use them in both environments and move them back and forth as required,” explains Rick White, Capture 3D’s director of business development. “Portability became important, which meant saving space wherever possible.” White says that after removing a few components, their two machines can be rolled through standard 36-inch door frames. “Portability became easier to achieve with Parker’s Ethernet Powerlink products. We were able to save space in the panel box over previous designs that did not use the EPL technology.”

Because both the MC-XL and MC-SO systems are complete Parker system solutions -- using Parker EPL controllers, EPL drives, motors, actuators and rotary tables -- Capture 3D did not have to worry about product compatibility issues. The balance of Parker system components also passed the rugged factory floor requirement, as well as the audibly quiet benefits of the servo motor technology.

Another critical success factor for machine introductions is reducing the time to market. By using Parker’s EPL system with its streamlined Ethernet cable management, Capture 3D was able to reduce both machine design and build time. “Moving in this direction at the beginning of the product’s life cycle gives us confidence that our current design will be state of the art for years to come,” White says.

White is quick to point out that another reason Capture 3D chose to use Parker Hannifin products is because he and his team have the required confidence in Parker’s reliability. “The measurement systems we provide to the marketplace are high quality, very reliable and not inexpensive, so our customers expect the very best performance and we must continue to live up to those expectations,” he says. “We are a small company, but we pride ourselves on providing superior customer support.” Capture 3D has always delivered very reliable measurement systems to their customers, keeping support costs low and manageable for both the customer and themselves.

An additional aspect of Capture 3D’s decision to use the EPL system was Parker’s level of support and involvement in the project. “When we first started working with Parker, we were relatively new to developing motion control systems,” White says. “We had much more experience with integrating robots into automated measurement environments. The Parker team took the time to help us work with their technical local distributors in the short term with a long-term strategy to become self-sufficient and work directly with the factory. This was an important aspect to keep the cost of our motion control systems affordable for our customers.”

Finally, White is pleased with how well Parker’s ACR controller has integrated with Capture 3D’s own application software. “This has proven to be very advantageous for us,” he says. “With the flexibility to use internal programs and be controlled remotely, we are able to provide an automated measurement system to our clients that is very easy to use. They are able to begin developing automated processes within an hour with no prior knowledge of motion control systems.”

In meeting the challenge to build a machine that could automate the measurement process for small- to mid-size parts, Parker was able to provide a complete system solution, supplying everything from the mechanics to the electronics. For Capture 3D, working with one supplier and relying on Parker’s engineering expertise and flexible, plug-and-play components has meant a decrease in their time to market -- and an increase in their satisfied customers.