



## Elevate and Accelerate

### Improve Time to Market with 3D Scanning and Inspection Technology

The digitization of the entire manufacturing process enables the production of commercial-grade plastic, metal and liquid silicone rubber parts in a timeframe of just a single day.

Proto Labs is the world's fastest manufacturer of custom prototypes and on-demand production parts. The company offers services in 3D printing, CNC machining and injection moulding. Its client base encompasses an array of industries including aerospace, automotive, electronics, medical, robotics and alternative energies. Central to Proto Labs manufacturing excellence is the constant strive to reduce customers' time to market. In order to achieve this, it has digitized the entire manufacturing process, from automated quoting through to the proprietary processes on the manufacturing floor. This enables the company to produce commercial-grade plastic, metal and liquid silicone rubber parts in a remarkable timeframe, notably as fast as a single day.

#### Fast speed metrology for complex parts

Metrology and quality inspection form an integral part of Proto Labs' manufacturing process and are cited as an important requirement by its customers. As a manufacturer

parts, the company handles a broad spectrum of unique parts ranging from simple geometries through to those that are highly complex. It is therefore crucial that their metrology solution is capable of accurately scanning all of these geometries, and equally, in as fast a time as possible. They were also faced with the challenge of finding an efficient way of digitizing inspection reports, in a bid to maintain the digital thread and in response to customer demands. Traditional ways of measurement, such as CMMs (coordinate measuring machines) often require lengthy set up times and manual touching. For this type of application, such systems are simply not fast enough and do not align with the rest of their manufacturing process, which focuses on automation and speed.

#### One-Button Automated 3D Scanning and Inspection System

In a bid to overcome the limitations of traditional measurement solutions, the company adopted the CyberGage360 systems in their



With just one button, the CyberGage360 conducts a highly precise 360-degree 3D scan of complex parts, accurate to 7µm.

olis, USA. The ultra-fast metrology-grade, automated 3D scanning and inspection system offered the 'one-stop' solution they were looking for. With just one button, it carries out a highly-precise 360-degree 3D scan of complex parts and a full 3D inspection report can be generated in less than three minutes.

The solution greatly facilitates quality as-



CyberOptics' automated 3D scanning and inspection system, the CyberGage360, on site at Proto Labs manufacturing facility in Minneapolis, USA.

tor of in-process and incoming/ outgoing parts on the manufacturing floor or in the metrology lab. After a part is rapidly manufactured, it gets immediately transported to the Proto Labs metrology lab and placed inside the CyberGage360. With little training, anyone can check parts for any deviation from CAD or check critical features. The machine's speed and efficiency has allowed for it to fit seamlessly into the existing digital and time-critical processes, causing no disruption to the production floor.

The CyberGage360 is powered by CyberOptics' breakthrough 3D Multi-Reflection Suppression (MRS) sensing technology that enables metrology-grade accuracy by inhibiting measurement distortions. This unique sensor architecture simultaneously captures and transmits multiple image data in parallel while proprietary fusing al-

gorithms merge the data together. The result is a highly precise 3D scan and inspection report with accuracy to 7µm, 0.007mm + L/10,000mm, in less than three minutes.

As a result, Proto Labs' customers can now obtain digital inspection reports in the same, or almost the same, lead-time as they were getting their parts - something which is unprecedented in the industry. Customer satisfaction is increased not only because their product to market time is further accelerated, but also because the cost of quality is reduced.

#### Commitment to Digital Manufacturing

Another important component of the prototype and production part manufacturer's ethos is its commitment to digital manufacturing. The industry is experiencing a shift towards the utilization of Product Manufacturing Information (PMI) that can be inputted directly into Solidworks CAD models. The CyberGage360 facilitates this by enabling their customers to put all the PMI directly on to their CAD model, in keeping with the existing digital processes, and which completely eliminates the need for a drawing. The information can then be processed automatically, which translates to quickly, and reports and qualitative information are generated, subject to the customer needs.

Dylan Lundberg, Senior Manufacturing Engineer of Protoworks (Proto Labs' R&D lab) explains, "from our front-end services to our proprietary processes on the manufacturing floor, you will find three consistent objectives: it's fast, it's easy, and it maintains the digital thread. The CyberGage360 comfortably satisfies all three of

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we were looking for to be at the focal point of our lab and future metrology offerings."

#### Unrivaled Solution to Streamline Path to Market for Customers

The key tenet of Proto Labs quality policy is its commitment to delivering quality parts faster than any other manufacturer, and meeting or exceeding customers' expectations. With the CyberGage360 it can now provide inspection reports faster than any other system in the world, this leads to an unrivaled combination for customers as they can deliver both services with unprecedented speed.

"It was a natural extension of our technology-enabled manufacturing approach as we aim to provide product developers and engineers with a total solution to streamline path to market," explains Vicki Holt, Proto Labs President and CEO. "The CyberGage360 has proven that it more than meets what we need as far as proving tolerances and proving dimensions for our customers."

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