

# Creating Value for Organic Growth

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Figure 1. Quantum<sup>®</sup> and 8-Axis

## How Diverse Dimensions Uses the FARO<sup>®</sup> 8-Axis ScanArm to Fulfill Their Customers' Needs

As of the 2010 Census, there were 27.9 million small businesses registered in the United States. That's a lot of competition. To thrive and grow in such a competitive environment, business owners must make wise decisions, commit to high-quality results, and take care of their customers and employees. Those organizations that do are rewarded with organic growth. Those that don't suffer perpetual stagnation.

After a decade as a manufacturing engineer with the Saturn car corporation, Jeff Mass worked for an office furniture manufacturer in West Michigan. And then, like so many other entrepreneurs, Mass decided to strike out on his own, founding *Diverse Dimensions*, a full-service dimensional measurement and reverse engineering lab. Another small business flag planted in the ground.

"2003 is when I formally opened up and put the shingle out for dimensional inspection services," says Jeff Mass, President of Diverse Dimensions. "I started out solo and

anticipated just doing it by myself until retirement, but it organically grew quite quickly. So now there's nine of us."

Mass, with degrees in manufacturing engineering and quality, saw unmet needs for measurement services outside of the company he worked for.

"Originally, it was mainly tooling measurement," explains Mass. "But, I guess my manufacturing engineering background made it pretty easy for me to associate product data with manufacturing process. I could make sense out of the numbers that were showing up on a product as far as the dimensional analysis.

"I didn't want to be a service provider that just handed out reports with numbers on it. I wanted to digest the data a little bit more and find the root cause if dimensional issues were apparent."

Mass also felt that his choice of metrology equipment would be critical to providing the level of service that would give him the best chance at success. He chose FARO based on portability, ease of use, accuracy, and what he considers an unequalled service-support team.

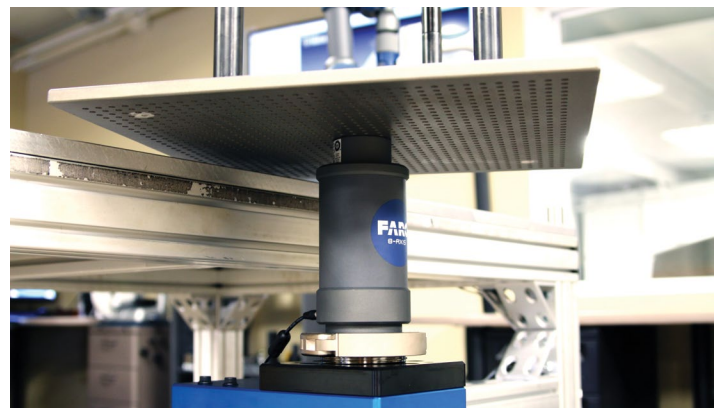


Figure 2. Diverse Dimensions Created their Own Fixturing for 8-Axi

## Portability

The Diverse Dimensions team spends about an equal amount of time servicing customers in the field and in their own facility. Equipment portability is an important consideration.

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“I made the decision when getting into business that I would not go the traditional CMM route,” reveals Mass. “There were a couple of companies here, and in West Michigan, that offer that service and they're pretty good at it, but I didn't see anybody offering portability.”

As Mass saw it, companies offering traditional CMM services, as opposed to laser scanning and portable CMMs, simply couldn't move their equipment to a customer's location.

“We currently have sixteen FARO ScanArms, 6 FAROBlu HD Laser Line Probes (LLPs), a FARO Laser Tracker, two FARO 8-Axis units, and nine technicians that do the measuring,” says Mass. “Some of our customers use tooling that's just too big to ship to us, so we almost always have someone in the field.”



Figure 3. Amos Denbesten, Metrologist at Diverse Dimensions, Scanning with 8-Axis QuantumS ScanArm

### Ease of Use

“The Quantum<sup>S</sup> feels much lighter than [our other scan arms],” says Andrew Haverdink, metrologist at Diverse Dimensions. “It's balanced quite a bit better and has better probing accuracy.”

With excellent ergonomics and dual hot-swappable batteries, the Quantum<sup>S</sup> is the first arm to meet the most rigorous ISO 10360-12 international measurement quality standard. The hard probe and the FAROBlu Laser Line Probe can digitize interchangeably without having to remove either component. Users can digitize simple features with the arm's hard probe and seamlessly scan across diverse surface materials regardless of contrast, reflectivity, or part complexity without any special coatings or target placement.

### 8-Axis

The FARO 8-Axis Quantum FaroArm<sup>®</sup> seamlessly integrates the portable Quantum FaroArm with an eighth-axis,

enabling the part to be rotated in real-time relative to the Arm. The result is no difficulty reaching around the object – a.k.a. scanning yoga or gymnastics—and no need to move the Arm into different locations during the process. This allows users to focus on the actual measurement and not on the measurement processes when reaching at awkward angles—meaning faster scans, less work, and less user fatigue.

“Certain jobs are extremely repetitive. It can be tiring,” says Haverdink. “Your arm and back start hurting from scanning all day. With the 8-Axis we're not running around the table all day. Measurement is faster and easier.”

*“Sometimes you get so used to using it you don't realize how cool the 8-Axis is, you know? But I got so used to scanning on it that when they took the initial demo model back, I was like, ‘scanning is hard now!’ ”*

**Andrew Haverdink**

Haverdink and Amos Denbesten, metrologists at Diverse Dimensions, put the 8-Axis unit to the test on a highly repetitive short-run job.

“A perfect example of a repetitive job was some smaller sheet metal parts that were brought in just last week,” says Denbesten. “Andrew and I both set up an 8-Axis and we scanned. We each had an 8-Axis going and scanned 25 parts each. We used a magnet mount right on top of the 8-Axis, spun it around a few different angles and got the entire part scanned. And these were high-quality scans as well.”

“The fixturing is much simpler with the 8-Axis, explains Haverdink. “You don't have to position it to hit every side from the table where the part is. You can fixture it more simply, and then just rotate the 8-Axis to have access to the rest of the part. We've saved a lot of time just on setup.”

*“Initially, I looked at the 8-Axis and thought, ‘Oh that won't be very useful.’ Then I used it and I was all, ‘Oh man, this is so sweet!’ ”*

**Amos Denbesten**

### Accuracy

Diverse Dimensions Techs have found that, if used properly, the 8-Axis system can improve accuracy.

“Shorter ScanArms are inherently more accurate,” explains Denbesten. “Instead of using a longer arm and reaching over a part to scan another spot, with the 8-Axis, sometimes we can use a shorter arm and rotate the part. We don't have to articulate the arm quite as much, and the less you

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articulate, the better the accuracy. More movement means you're more prone to getting a scan misalignment especially in a fine detail part. With the 8-Axis we've noticed fewer misalignments. I think it's a combination of less time, ease of use, and accuracy. Those things combined make the 8-Axis a super valuable tool."

### After-Sales-Support

The initial cost of equipment is only part of the investment. Mass finds that the quality of after-sales service is invaluable to his organization.

"Our employee manual states that if you mess up our relationship with FARO, it's immediate termination," says Mass. "I'd take a bullet for the guys that sell and service our FARO equipment. I still remember the day our account manager dropped off my FARO arm. He had steak dinner at our house. My two daughters knew I was getting into business and they were four and six years old, had no idea what that even meant. But they remember having steak with our account manager as he delivered that FaroArm. It was that big of a deal for me."

### Positioning for Growth

Mass also finds that FARO products help to position his company as experts in the field.

"We do like to be known as having the most cutting-edge product that FARO and Polyworks® deliver," admits Mass. "We want to be known for that. So, when customers show up at our facility with parts, or we show up at their campus for a measurement session, we are convinced that we can handle any dimensional issue in front of us."

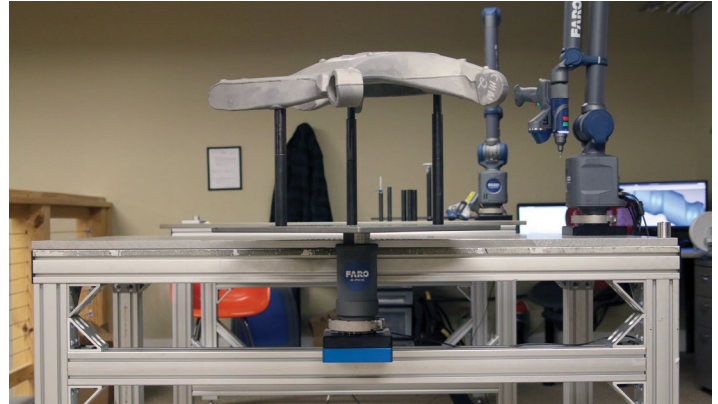


Figure 4. Scanning Lab at Diverse Dimensions

## Four Good Reasons Why Diverse Dimensions Chose 8-Axis Quantum

- 1** Outstanding ergonomics allow for easiest possible workflows, minimal movement of the Arm, and less user effort. Ability to focus on the measurement, not the measurement process.
- 2** Up to 40% reduction in the time it takes to measure parts and assemblies.
- 3** Ability to scan larger parts and assemblies: Larger working volume and use of smaller arm.
- 4** High accuracy: Same accuracy as 7-Axis scanning because Arm movement is minimized. Accuracy is further improved by the ability to scan large parts with a shorter-length Arm.

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