

3D LASER MAPPING

Woven Into Fabric of Society

3D Laser Mapping, a company specialised in laser-mapping systems, operates from headquarters near Nottingham in the United Kingdom. In addition to airborne Lidar, 3D Laser Mapping has pioneered terrestrial Lidar applications including rapid, vehicle-based 3D mapping, and the company is a global supplier of a range of laser-scanning systems.

3D Laser Mapping was the brainchild of current managing director Dr Graham Hunter, who set up the business from his garage in 1999. A qualified mining engineer, Hunter identified a big potential for laser-scanning technology after working in the mining and civil engineering sectors. Although laser-scanning technology was highly exciting, the practical use of scanners was very limited due to the absence of effective data processing and industry applications. 3D Laser Mapping was formed to take advantage of the new hardware developments by developing complete systems that could address specific industry requirements. This involved a highly flexible approach, typically involving customisation and new development. In the eight years since its formation, the company has grown 30% year on year, growth underpinned by a close working relationship with key equipment manufacturers and software suppliers who offer first access to technology advances and allowed the company to pioneer systems for new markets.

New Applications

The most notable examples of innovations are SiteMonitor and StreetMapper. Here laser-scanning technology has been successfully applied beyond the traditional surveying sector to new industries, respectively boosting mining operations and revolutionising motorway surveying. A strong R&D capability has led to a broad customer-base that includes Anglo American, BAE Systems, National Grid and the Metropolitan Police. One important aspect of our developments is the rapid processing of the vast amounts of data generated from scanning. This is opening up opportunities for new applications such as homeland security and incident analysis, where traditional methods of data collection are regarded as both too slow and inaccurate.

Close to Customers

3D Laser Mapping's mission is simply to make technology useful by working very closely with its customers to address real business issues. Although a major supplier of laser-scanning equipment, the company's real strength lies in its providing complete solutions backed by a high level of support to ensure successful implementation. Customers can also be assisted in their data processing with 3D-modelling and visualisation services. We have a close working relationship with Austrian scanner manufacturer Riegl and the Premier Riegl distributor for the UK, Ireland and sub-Saharan Africa; Riegl-related business accounts for over half of the company's current turnover. Other key areas of business include the vehicle-based laser-scanning system StreetMapper, the result of a venture with German IGI mbH. In the GIS market, meanwhile, we are working with Bentley and we are also one of the largest distributors of Finland's Terrasolid Lidar processing software and a supplier of 3D-modelling software, PolyWorks from Canadian firm InnovMetric.

International Scope

Over half of our business is overseas, and this is continually growing. The twelve-strong technical team based in the UK supports international operatives with established distributors in the USA, Africa, Asia and Australia, including Reutech Radar Systems in South Africa and Elcome in India. Partners are currently being sought in South America, a key market for our mining systems. Currently many of our innovations are unique but address highly specialist requirements, and these often occur in remote parts of the world. Key customers such as Anglo American in the mining sector provide an important route to this global market, with distributors providing essential local support.

CAD and GIS

Laser-scanning equipment is now well developed; scanners are operating reliably even in the harshest environments, such as mines, and are producing highly accurate results for applications such as architectural surveying. The processing of data remains the key challenge, so that systems can generate genuinely useful information. Effective data extraction, interpretation and presentation of data, including integration with software such as CAD and GIS, should be the focus now. These advances in software will open up opportunities for laser scanning and extend applications into a wide diversity of markets. A good example of this is SiteMonitor; a system designed to provide accurate and repeatable measurements of surfaces and slopes in hazardous or inaccessible environments. The application was first developed for monitoring slope stability on old coal-mine waste tips in South Wales, UK. Now the system is being adopted more widely in the mining industry. SiteMonitor records movements in the slope surface as small as 10mm, with a distance range of up to 1,000m. Providing detailed records of mining activity and improved safety monitoring, the system records and analyses up to 8,000 measurements per second to create a detailed, accurate and continuous record of the slope profile. 3D Laser Mapping's developments have been driven by specific customer requirements: for example, those of Anglo American, which has installed the system at platinum and iron-ore mines in South Africa. In addition to site safety and extraction monitoring, SiteMonitor can deliver real commercial benefits by optimising mining operations, allowing greater extraction volumes through steeper slope profiles, only possible with continuous monitoring.

Off-road

Another example of the interesting application of laser-scanning technology is StreetMapper. Using lasers to 3D-map at millimetre accuracy and speeds of up to 70km an hour, this vehicle-based system is used to create a highly detailed 3D model incorporating every

detail along a street corridor, including overhead features. Applications include safety inspections, landscape mapping, street-asset recording, bridge height surveys and road-width mapping for entire routes. The latest StreetMapper system can now be fitted to a standard four-wheel-drive vehicle, allowing off-road surveying. With easy-fit rack mounting and a roof rack suitable for any four-by-four, 3D Laser Mapping is able to ship the system to any location, allowing StreetMapper technology to be used worldwide for the first time. This added portability of laser-scanning hardware opens up other interesting areas of application, and we have developed a mobile system to capture highly accurate 3D measurements of overhead telecom networks. The vehicle-mounted WireFinder system accurately measures the position of assets such as poles and wires. The company has also developed a totally portable system for mapping overhead features on foot. With adverse weather and overgrown vegetation increasingly causing damage to overhead cables, the system is carried as a backpack to instantly map the position of cables and the proximity of nearby vegetation.

Tip of the Iceberg

We see huge untapped potential for laser scanning. Manufacturers such as Riegl are producing ever more sophisticated and portable devices. As illustrated with SiteMonitor, the challenge now is in the application of the technology in the real world, not just in the lab and not just in traditional markets. The information provided by laser-scanning systems provides an important new perspective on our view of the world. Information systems can now be boosted with 3D data for an accurate real-world view of the environment. Flood protection is already benefiting from airborne surveying, but soon we will see benefits to many aspects of our day-to-day life. From protecting power cables and improving worker safety to managing coastal erosion or improving public security, the applications are endless. Today we are seeing the tip of the iceberg, but within a decade data collected by laser scanning will be woven into the very fabric of society.

<https://www.gim-international.com/content/article/woven-into-fabric-of-society>
