

Embracing Digital Engineering

How a major UK surveying company is leading the way by utilising 3D mobile mapping technology



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Midland Survey Ltd describe how mobile mapping technology from GeoSLAM has revolutionised their workflow

Digital technology is changing the way we design, construct, and maintain our infrastructure. New digital technologies such as Building Information Modelling (BIM), wireless sensing, and 3D printing are transforming the way that infrastructure, real estate, and other built assets are designed and constructed. Despite the engineering and construction sector being slower to adopt and adapt to modern technologies than other global industries, the global construction sector is forecast to grow by up to 70% by 2025. To capitalise on this opportunity, leaders in this field will need to reach beyond traditional tools and embrace cutting-edge technology. One such leader is Midland Survey Ltd.

Specialising in measured building surveys, topographical surveys, underground utility mapping and 3D services, this rapidly growing firm is now one of the largest surveying companies in the UK. David Johnson, Director, Midland Survey said, "The built environment is ever more complex and traditional 2D data is not up to the task. As we move towards a more intelligent, more integrated, BIM-focused methodology, 3D data will be the norm. We recognise that to deliver the range of services our clients are asking for, and to stay ahead of our competition, we need to integrate



Capturing a large UK racecourse which has over 250 box rooms using the hand-held ZEB-REVO, project completed in under 3 weeks.

innovative engineering approaches, digital technologies and intelligent data."

Fast and accurate 3D mapping – a game-changer

Using a mixture of traditional survey methods and the latest technology, Midland Survey produce accurate and highly detailed floor plans, sections and elevations of existing structures. Their team of highly experienced surveyors have worked on thousands of building surveys over the last 25 years including country estates, industrial buildings, churches, schools, offices, sports venues, universities, listed buildings and retail centres. Embracing the Digital Engineering trend, Midland Survey bought their first ZEB-REVO in 2016, and were so impressed with the results, they added several more to their arsenal of specialist scanning equipment.

David Johnson said, "We frequently work in hazardous environments such as live construction sites or in buildings being renovated, as well as in complex and difficult to access spaces where there is limited or no GPS coverage such as heritage buildings with thick stone walls. And we often have limited time on site to accurately create a 3D model. Access to user-friendly technology that scans multi-level environments and produces accurate and high-quality 3D survey data is a real game-changer for us."

"We typically use the ZEB-REVO on all building surveys now as the first-choice, and setup evenly-spaced control points to relate back to terrestrial or total station scanners. There's very little deviation in accuracy, around 10mm, and local accuracy is between 5-20mm. And the ZEB-REVO produces a complete



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Scan of historic church in the UK captured using the ZEB-REVO and viewed in CloudCompare.

point cloud with no occlusions, which wouldn't have been feasible with traditional scanning tools. But one of the biggest benefits is undoubtedly the speed. Using the ZEB-REVO we are able to get results up to 3 times faster than using traditional methods.”

One example of this is a scanning project for a large racecourse in the UK. David explained that there were over 250 box rooms, each to be individually scanned. Using static scanners, this would have taken months, but with the portable ZEB-REVO they were able to complete the project in 3 weeks.

Delivering rapid results in half the time

As a growing business, Midland Survey's workload is increasing, including taking on projects that wouldn't have been possible with terrestrial laser scanners. The ZEB-REVO is complementary to their existing scanning hardware, as the combination allows indoor handheld scanning and outdoor surveying to take place simultaneously, saving project time and money.

Another significant benefit of the ZEB-REVO is that it does not require GPS for positioning, allowing users to scan enclosed, complex and difficult to access spaces. One example of this is Oriel College, part of the University of Oxford. Oriel College is nearly 700 years

old, with around 200 rooms across five storeys, including an “island site”, accessible only via foot tunnel. The structure has been added to over the years and no accurate floor plans or elevation drawings existed. As a world-class institute, it is occupied 24/7 and opportunities to accurately scan with minimal disruption are few and far between.

Explaining their approach, David said, “Due to the lack of GPS coverage in the tunnel, the only option was to use the ZEB-REVO. The unusual shape of the building, with its unconventional layout and complex network of rooms, meant it was too difficult and time-consuming to survey with traditional static scanning methods (as this would require multiple individual set-ups and increased post-processing work). We needed a lightweight, mobile tool that works well in enclosed environments. Using the ZEB-REVO around 200 rooms were scanned, amounting to 12,000m². Across 5 days, 12 individual rapid ZEB-REVO scans were completed each taking just 30 minutes. The entire project was completed in around half of the total time that would have been required using static equipment.”



Scan of large pavilion building using handheld ZEB-REVO in just 30 minutes (data viewed in CloudCompare)

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