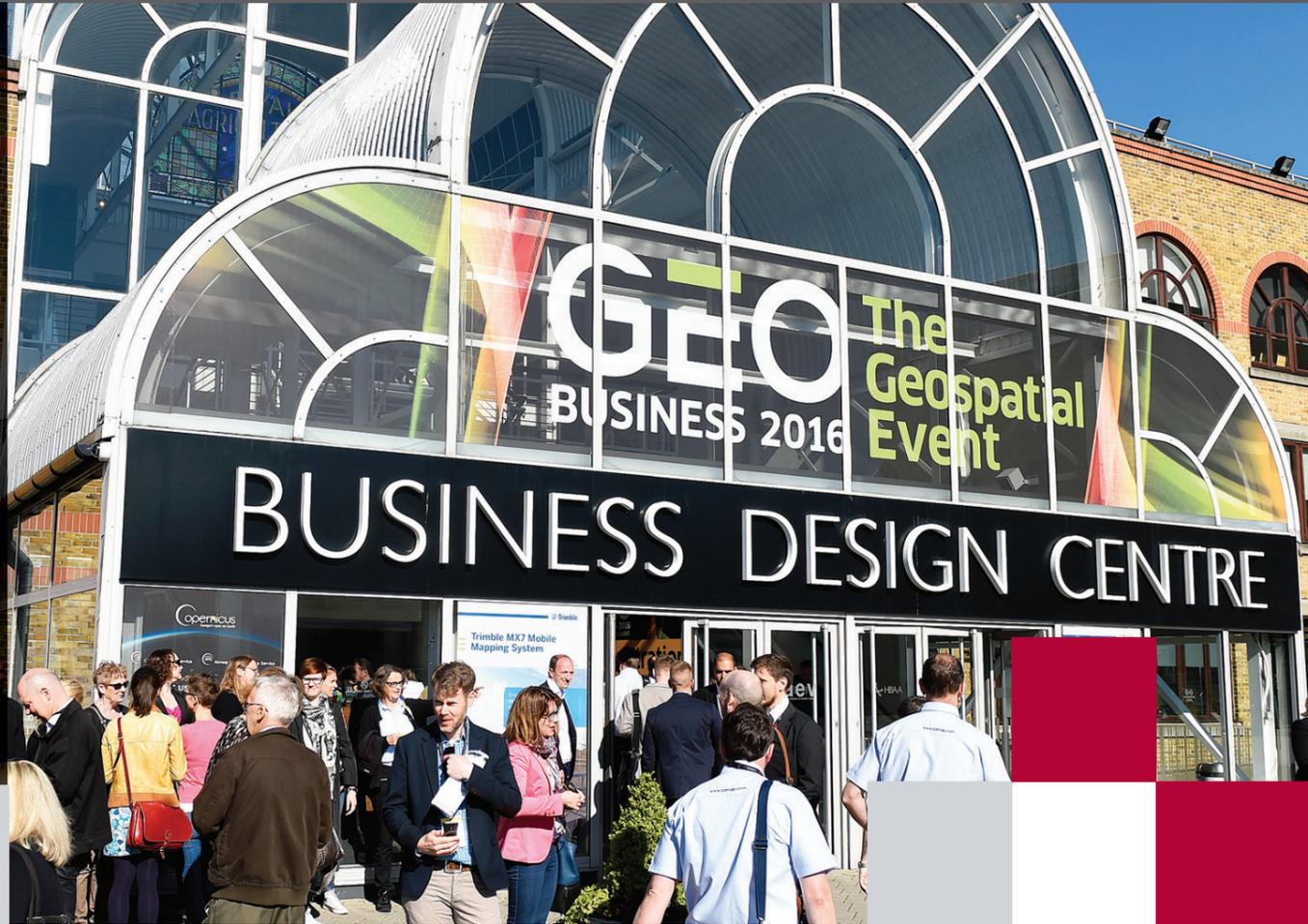


Mensura

- 5 reasons to visit us at GEO Business 2017
- Case study - 3D modelling with rotary drone technology
- VRS Now update
- K-Mobile - latest developments
- The SX10 gathers pace - reports and news



5,4,3,2... Catalyst is coming!



Catalyst is a subscription based software GNSS receiver which turns Android mobile handhelds, smartphones and tablets into high accuracy GNSS receivers when partnered with a low cost Catalyst Antenna that's no bigger than a cup of coffee.

It's been designed to address the key requirements of a broader base of users and in particular, those for whom accurate positional data collection is secondary to their line of work.

With the launch of Trimble Catalyst to the UK market just around the corner, things are developing nicely. **KOREC** is a Trimble Catalyst Partner and we're delighted to announce that our K-Mobile data capture software is now fully Catalyst compatible and ready for use, as is Esri's Collector App. ■ ■

GEO Business 2017 5 reasons to visit us!

Keep one step ahead and join more than 3,000 visitors from 50 countries at GEO Business 2017, one of the industry's premier events.

KOREC and Trimble will be hosting complimentary stands at this year's GEO Business event which means you can find all the expertise you need in just one area, from demonstrations on Trimble's ground breaking SX10 Scanning Total Station and revolutionary Catalyst software GNSS to old favourites such as the Trimble R10 GNSS, TX8 3D laser scanner and S-Series total stations.

5 reasons why a visit to the Trimble and KOREC areas (L6 and L1) shouldn't be missed

- See the SX10 in action by booking your own personal demonstration slot on either of the two show days at www.korecgroup.com/geo-business-2017
- Find out about Trimble Catalyst, a software GNSS subscription based service that delivers cm positioning, everywhere and for everyone.
- **KOREC** and Trimble free workshops - including 'The rise of software as a service: Why previously unserved markets can now afford high accuracy data capture' (Tuesday 23rd May, 14.00), 'Software GNSS is here: Learn about Trimble Catalyst and how it can work for you' (Wednesday 24th May, 11.00) and 'Trimble SX10 Scanning Total Station: How to benefit from combined surveying and scanning capabilities' (Tuesday 23rd May, 11.00).
- Talk to **KOREC** and Trimble experts on ground breaking Trimble technology, all under one roof, including TIMMS (Trimble's Indoor Mobile Mapping System), R10 GNSS, S-Series robotic total station technology, TX8 3D laser scanner, mobile mapping services in our outdoor area and of course our bestselling mapping data collection systems including K-Mobile software.
- And don't forget, there'll also be coffee, cake, a popcorn machine, great giveaways and a fabulous competition! ■ ■



Stop Press: J Murphy & Sons Ltd become the first main contractor to invest in Trimble SX10 technology

Trimble VRS Now Update

Three Trimble VRS Now users remind us why 'Reliability' is the most commonly cited benefit of this service



Surveyors and engineers need reliable, quality data and they need to maximise their time on site. Because of this, we know that when **KOREC** customers renew their Trimble VRS Now license with us, they have taken an active decision based purely on the quality of the correction service that they have received.

Often these customers have had experience of services provided elsewhere before subscribing to VRS Now and their repeat subscriptions reinforce what we believe about Trimble VRS Now – it is the most reliable service out there!

The Trimble VRS Now subscription service is ideal for sites where it is not practical to set up a base station. Utilising Trimble operated VRS technology, centimetre level accuracy is available on demand, anywhere within the reference station network. It's highly cost effective and efficient, super convenient, simple to use, and, best all, it's always on so ensures the highest amount of uptime.

For more information on how Trimble VRS Now can provide the ideal solution for your business, contact us on info@korecgroup.com.

Visit www.korecgroup.com/news to read our latest VRS Now case studies

Greenhatch - one year on

Greenhatch adopted Trimble VRS Now in 2015 after struggling with their existing correction service which was continually failing to deliver the quality of data, reliability and peace of mind that they required.

"VRS Now has allowed our survey crews to work freely, safe in the knowledge they are not going to be let down by dropouts when on site. This reliability has negated the need for post processing or return visits to sites, which in turn, has provided a more fluid service to our clients and a more profitable solution."

Greenhatch Group Director, Neil Jefferies

Highways England - three years on

Highways England is the subject of another of our VRS Now 'catch ups'. Following a successful tender at the beginning of the year, **KOREC** will provide Highways England with the real-time RTK correction service that it uses for the police for a second three year period. This resource will be delivered via Trimble VRS Now licenses and will be used by the police primarily for collision scene investigation where the reliability of Trimble VRS Now enables them to quickly and efficiently survey incidents and minimise road closures.

"I have used VRS in conjunction with Trimble hardware at the scenes of thousands of collisions. VRS is the first tool out of the box at every collision scene because it is fast and reliable. Setup time is measured in seconds. VRS allows me to survey the crucial evidence most efficiently and to allow already congested roads to be reopened as soon as possible."

Collision Investigator, SE England

Skanska - seven years on

Skanska is one of our longest term users of a VRS Now site license. It was back in 2010 that we announced the Skanska Balfour Beatty JV adoption of Trimble VRS Now for the 100km+ M25 road widening scheme. Fast forward to 2017 and to a new road project, this time a Skanska/Costain/Balfour Beatty/Carillion JV delivering the £1.5bn A14 Cambridge to Huntingdon improvement scheme. The VRS Now license has been ported over to the new site for use with the A14 integrated delivery team's 20+ Trimble GNSS receivers.

"We have always used Trimble VRS due to the continuous connection time and stability in the service. The option to port over an ongoing "site wide license" ensures that a project that is coming to an end and a project that is starting, gets the best value without interruption in the license provision."

Mark Lawton, Chief Engineering Surveyor, Skanska

K-Mobile Update

Our K-Mobile development team never stands still! Here's a round-up of the latest useful features they've been building into our best-selling data capture software.

K-Mobile – latest developments

- **Remote Wiping** – it's your worst scenario, a lost handheld with all your client's confidential data on it. Not any more – a new K-mobile security feature now allows you to remotely send a command to your device and delete data.
- **Rapid Tracking** – Your Android device with K-Mobile on-board now has a new option for rapid tracking – every 6 seconds! Useful applications include real-time tracking of field workers for progress and safety or for traffic management to identify bottlenecks.
- **Automatic conversion and publishing of background maps** – let this feature do the work for you. It simply sits on your desktop and monitors for new SHAPE files and background maps. As they download from K-Mobile in the field, they are converted and published automatically so that all your stakeholders have access to the very latest information.

New Release: K-Gully

Contractors are now equipped to provide their clients with a high-quality record of the on-site work completed with K-Gully, a hosted gully cleaning management system.

Designed with contractors in mind, K-Gully is a full end to end gully cleansing, recording and reporting system addressing the key needs of contractors and their clients on a daily basis as well as their future requirements for cost-effective gully cleansing programmes.

Contractors are now equipped to provide their clients with a high-quality record of the on-site work completed that provides 100% proof that work was carried out at a specific time and location. This is because K-Gully utilises the K-Mobile data collection app that allows field engineers to record the date, time and location of each gully being cleaned as well as additional information such as silt levels, condition etc. For additional backup, photographic evidence can be tagged to each individual gully. K-Mobile can work in 'inspection mode' for existing gully checks or in 'capture mode' when no existing gully information is known.

Fully customisable and easy to use by non-technical users, K-Mobile runs on a range of Android and Windows hardware offering positional accuracy options down to 2cms.

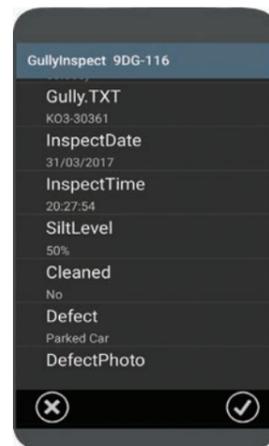
Back in the office, the K-Gully portal allows office staff to assign new jobs, monitor existing projects in near real-time and produce high quality, informative reports at the touch of a button. Interactive maps allow data to be easily visualised and interrogated.

The K-Gully system is especially useful when loaded with multiple years of inspection data enabling intelligent scheduling to increase the cost efficiency of any cleansing programme.

K-Gully joins our other industry specific modules K-Environment, K-Asset, K-Utilities and K-Forest.



▲ K-Gully portal (left and right)



▲ K-Mobile data collection app



▲ Can you spot the R10 in this winning shot from Grasstec?



▲ Lunch & Learn SX10 sessions above and below



KOREC News Events

KOREC Lunch & Learn – a big thank you

Our nationwide Lunch & Learn sessions are now over. We'd like to thank everyone who turned out to see the SX10 at our 13 locations across the UK and Ireland and made the days both successful and enjoyable. The positive feedback was much appreciated.

Out and about

Over the coming months you can catch up with **KOREC** at the following events:

Railtex – NEC, Birmingham, 9-11th May on stand G40

GEO Business – 23-24th May, Business Design Centre, London, on stands L1 and L6

CABLEx – 7th June, Chester Racecourse, Chester, on stand D01 (K-Mobile and Trimble Catalyst)

PLANTWORX – 6-8th June, Bruntingthorpe Proving Ground, Leicestershire, supporting senseFly on stand F14

RailLive – 22-23rd June, Long Marston Airfield, Warwickshire, on stand C2

Photo competition

Don't forget to keep your photos coming to the **KOREC** photo competition. Prizes are now awarded monthly as well as at the end of the year. We'd love to see your images which can include anything from site photos, to office shots, to datasets – as long as they feature **KOREC** supplied instruments or software.

Email your entries to marketing@korecgroup.com

3D modelling with rotary drone technology



Quantum Survey Management explain how they've been using senseFly's albris to add value to their business by generating high accuracy 3D aerial imagery for integration with laser scan data.

The demand for more sophisticated deliverables, often in the form of 3D models, is on the increase and whilst many survey practices have successfully met this need with the adoption of 3D laser scanning, businesses can further differentiate themselves by 'adding value' to their offering through data integration.

However, whilst laser scanning is a useful methodology for capturing data from the ground, it is less relevant for jobs such as roof top inspections (which would require users to work at height and/or hire in mobile access platforms) above bridges (restricted field of view) and for inspection work (lack of detail in inaccessible areas).

The challenge therefore is for surveyors to deliver a comparable level of accuracy in these less accessible areas without compromising either their efficiency or their capacity to provide clients with value for money. One solution is to integrate 3D laser scans with aerial imagery collected by a rotary, rather than a fixed wing, drone.

Rotary drones are extremely effective at capturing high-resolution mm per pixel aerial imagery (as opposed to a fixed wing's cm per pixel) and are also highly manoeuvrable thanks to the combined thrust of the rotors and are therefore especially suitable for small area mapping and inspection projects as opposed to the agricultural, environmental and mining type larger scale projects more suitable for fixed wing drones.

The trend for rotary drones in the UK is showing a slow but steady increase, something reinforced by recent **KOREC** sales of senseFly's albris, an intelligent mapping and inspection drone, for use in applications such as building inspections and condition surveys. One of these customers is Quantum Survey Management (QSM), a multidisciplinary building consultancy offering a range of building surveying, project management, design and aerial surveying services nationwide.

A large proportion of QSM's work is within the insurance sector dealing with major loss claims such as fire, flood, storm and explosion, many of which entail surveys of complex and dangerous buildings. Under the guidance of founder and technical operations director John Cusack, the company's drone capability has recently been expanded to include a **KOREC** supplied senseFly albris. The purpose of this acquisition was threefold - to provide both a safe and efficient way to carry out building inspections for diagnostic purposes, to carry out rapid capture of data on complex or dangerous sites and to reduce survey times to hours and days as opposed to days and weeks. Captured data would then be used for measurement, analysis and 3D modelling through packages such as Revit, Trimble SketchUp and user friendly web browser applications.

After extensive research, John Cusack selected the albris primarily for its ability to switch between capturing video,

still and thermal imagery during the same flight, all without the need to land to change cameras. Additionally, the advanced situational awareness of the albris, delivered through proximity sensors, allows for it to be operated close to structures and surfaces in order to achieve sub-millimetre image resolutions without the movement issues sometimes caused by zooming from afar. The sensor head of the senseFly albris also particularly lends itself to inspection work because it allows the camera to be rotated through 180 degrees - not only can surveyors fly over and look down on areas of interest such as a roof, but also fly under structures such as bridges and look up. These features are especially relevant for QSM's insurance work with dangerous buildings.

Roof survey integrating albris UAV data with scan data

QSM was recently approached by a client tasked by a third party to produce a 3D laser scan, internal and external, of a factory in the north of England. On completion, this laser scan would be used to provide 3D drawings for redevelopment work. However, with no safe access to the top of the building, the client contacted QSM to undertake a drone survey of the roof with a view to using the captured aerial imagery to produce a .LAS point cloud to 10mm GSD (ground sampling distance) tied to their existing survey grid. The two data sets would then be combined into an overall 3D point cloud model.



▲ Safe take-off from a restricted area

Mission Planning

Mission planning for the project was undertaken pre site with senseFly's eMotion software which offers live streaming video feedback, full control of what imagery the albris captures, access to sensor and flight data and full flight planning functionality. This included a target GSD of 8mm comprising a high level flight at 50m, a low level flight at 30m and a POI (point of interest) flight to capture building elevations to enable cross checking with existing scan data.

Once on site, a network of seven ground control points was established and these control points tied into their existing survey network. The mission was flown autonomously throughout, producing a total of 300 pictures.

Overcoming typical site challenges

The site and conditions presented a number of challenges:

Proximity of neighbouring properties - regulations dictate a minimum of 50m separation distance from neighbouring properties and in this incidence, the site was bordered by residential properties. The main 38MP camera of the albris enabled QSM to fly high enough at the boundaries of the site to maintain separation and yet still capture the level of detail required.

"We required the ability to capture high-res imagery, thermal imagery and video - the albris delivers."

John Cusack, QSM

Windy weather - the original mission planning had anticipated 3 flights, however rotary drones are more susceptible to wind resistance than fixed wing drones and on the day of the flight, the breeze was stronger than forecast. Therefore battery endurance (up to 22 minutes) was slightly reduced and a fourth flight required. However, this presented few problems in the field because the battery was easily swapped and the eMotion flight planning software allowed for the mission to be resumed post battery change.

Restricted take off area - the site was a busy working factory and the intended take-off area had become a construction site for a car park extension and therefore a revised take-off location was required. Thanks to the small take-off and landing area of the albris, all that was required was for a small area in a delivery yard to be cordoned off and through careful management of on-site staff, the mission was completed safely.



▲ senseFly's albris

Processing and deliverables

Processing was undertaken using Pix4Dmapper Pro following initial data management within eMotion flight planning and control software. QSM's client provided the 3D GCP (ground control point) data post visit and this allowed the model to be calibrated to their local survey grid referenced to OSBG36.

The primary deliverable was a .LAS point cloud file which was then integrated into their existing laser scan data of the elevations and internal areas to produce a full 3D cloud of the site. The final output to the end client was a full set of 3D drawings of the site.

Whilst the point cloud data was the primary output required, QSM's ability to produce a high resolution orthomosaic of the site from the original dataset was an added bonus.

John Cusack reports that the job was delivered on time and to the specification required and that he was able to do this without the need to hire in expensive mobile access platforms which would have compromised the running of the site. He concludes, "**KOREC** has been most helpful with both our acquisition of the technology, ongoing training and support and with regular visits to our offices to review progress and ensure we have all the assistance we require. We have several larger scale projects in the pipeline that will provide further validation of the albris as a tool for the rapid and safe capture of building and infrastructure data." ■ ■

The Trimble SX10 gathers pace!

It's going to be one of the star attractions at this year's GEO Business show and it's already a 2017 bestseller for **KOREC**. There's no doubt that the arrival of Trimble's SX10 Scanning Total Station has provided plenty of food for thought and positive feedback from customers and **KOREC** consultants alike! In our last issue of Mensura, **KOREC**'s Chris Harris highlighted three areas where it really shines, data quality, imaging and topographic work. What better way to verify Chris's findings than to send out a second **KOREC** consultant, Matt Wild, to carry out long range scans of some of London's most famous landmarks, Big Ben, Westminster Bridge, the London Eye and the Houses of Parliament. We weren't disappointed! The full dataset can be viewed on our **KOREC** Group YouTube channel.

KOREC Reports: Scanning London's landmarks

On arriving at the site at 4.00pm, two scan stations were established, one on the right of Big Ben, the other on the south side of the river and four scans were undertaken in fine scanning mode. No registration was required – the SX10 was controlled in the field through standard traversing practices. Once downloaded, the fully registered point cloud was ready to work on.

- All scans completed in under 1 hour on site
- Entire job was just 150 Mb in size thanks to using the SX10's polygon function to select only the areas required for scanning
- Cleanliness of the data was even better than the Trimble TX8 3D laser scanner, even over 300m+ ranges!

Scan 1, Big Ben:

Points scanned	1,582,921
Total scan time	6 minutes 6 seconds
Point spacing	0.031m @ 122.144m
Scan Density	Fine



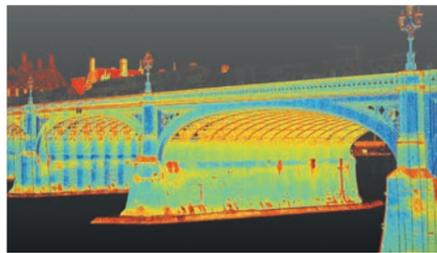
Scan 2, London Eye:

Points scanned	1,118,677
Total scan time	10 minutes 7 seconds
Point spacing	0.080m @ 318.362m
Scan Density	Fine



Scan 4, Westminster Bridge:

Points scanned	1,635,354
Total scan time	8 minutes 17 seconds
Point spacing	0.024m @ 96.722m
Scan Density	Fine



Scan 3, Houses of Parliament:

Points scanned	1,380,145
Total scan time	9 minutes 49 seconds
Point spacing	0.064m @ 255.382m
Scan Density	Fine



First Trimble SX10 hits the south!

Over the coming months we'll be catching up with our new SX10 users to find out exactly how they are using the SX10 for a range of applications. Meanwhile we'd like to congratulate the latest **KOREC** customer to receive the SX10, London based South East Site Engineers Ltd (SESE). SESE is the first company in the South of England to take delivery of a **KOREC** supplied Trimble SX10 Scanning Total Station:-

Specialising in BIM Level 2 standard measured surveys and setting out services in and around London and the South East, SESE is a family run business that prides itself on delivering a 'professional, prompt and precise' service; an ethos which makes it a perfect fit for SX10 technology.

SESE Contracts Manager Dayo Ashaye said, "The Trimble SX10 will fit in with a very specific strategy at SESE, namely to halve the measured survey scanning time we spend on site and to cut processing time back in the office. We are a busy company and the scanning speed of the SX10, combined with its robotic total station capabilities, will enable us to be more productive in the field, deliver jobs within tight time constraints and pass on cost savings to our clients. The SX10 is a fast and impressive instrument and our surveyors have been quick to adapt to its workflows, directing surveys through a tablet running Trimble Access software rather than through an eyepiece. In terms of performance, the SX10 is out there on its own." ■ ■ ■



▲ Joshua Ndimbo (left) and Dayo Ashaye (right) of SESE Ltd try out their new Trimble SX10

Contact us:

For further information on any of the products or services mentioned in Mensura, please contact your nearest **KOREC** Sales Consultant or visit our website

T: **0345 603 1214**

IRE: **01 456 4702**

E: **info@korecgroup.com**

www.korecgroup.com

Technical news

Trimble Power Hour

Trimble's 'Power Hour' webinar series is a fantastic resource that has covered around 40 topics in the last couple of years. View the archive at <http://bit.ly/2pkhZo>

Trimble Access 2017.00

Key features include:

Improved Trimble SX10 scanning total station support:

- Improved performance for measurements has reduced the time taken for a standard measurement by approximately 1 second.
- The Survey report has been enhanced to include panorama and scan information collected with an SX10.

Mobile data service providers in Germany: T-Mobile support

The list of service providers has been updated to include the new APN for M2M Portal 2 SIM cards.

This plan is named "M2M-2". Older Portal 1 M2M SIM cards use the APN in the plan named "M2M-1".

New release: TBC 3.82

Including new Cutting Plane workflows enabling users to draft and export in custom-defined views and more efficiently create façade, retaining wall or surface related CAD and drafting deliverables.

New release: RealWorks 10.3

For one of the nicest new features, press Shift and N to create a temporary zoom around the cursor position – it's great for checking the cloud or fit of the data to the cloud in tricky to see locations.

We also rate the new 'Point Visibility: See Inside' feature. This mode hides the points acquired from behind. This is useful when looking at indoor scans from an outside viewpoint: the first wall will be hidden to let you view the inside. This mode requires points to have normal information.

And finally, the 'Point Visibility: Outline' feature. This mode hides all the points on surfaces facing the current view. This is particularly useful for indoor environments. This mode requires points to have normal information.

Top Tip

Toggle maps: In Trimble Business Center 3.80, we have a new way to display a background map on your survey data.

Read the full tip at <http://bit.ly/2phEIFU>

KOREC Training

Our new website has a dedicated training area – please visit www.korecgroup.com/training for a full timetable of our training courses.



Hire the SX10!

The SX10, is endlessly versatile and already enhancing productivity for lots of businesses. Even better news is that it's now on our hire fleet! Call **0345 603 1214** for further information.