

# Mensura

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- Mobile mapping case study
- Photo competition results
- KOREC Reports - the SX10



## The SX10 KOREC Reports



**KOREC's** Chris Harris shares his views on the SX10's finer points!

As you may have read in our previous issue of Mensura, the SX10 is a truly revolutionary instrument which will not only change the way we work with its ability to capture whole scenes but also enable surveyors to be many times more efficient on site.

I've been using the SX10 since October and shown it to plenty of people across the UK. Early feedback has been very positive and from that I'd like to explain three key strengths that have really come across from initial use.

...continued overleaf...

## Announcing Trimble Catalyst

**KOREC** brings you cm positioning, everywhere and for everyone

Announcing Trimble Catalyst, a subscription based software GNSS receiver that addresses the key requirements of a broader base of users.

Geospatial professionals are well served with a wide choice of Trimble handhelds offering everything from cm accuracy to a ruggedness that will see them withstand harsh weather conditions and 1.22m drops. These are tools entirely fit for demanding field conditions and are understandably priced accordingly.

But what of the broader base of users out there who wish to use positioning to support their primary tasks, the landscape contractors, builders, drain layers, sports people and architects who just can't justify the upfront costs of a GNSS handheld?

Trimble Catalyst has been developed to bridge the gap between price and performance for these periodic users.

Catalyst is a software-defined GNSS receiver which turns Android mobile handhelds, smartphones and tablets, into high-accuracy GNSS receivers when partnered with a low-cost Catalyst Antenna. Users subscribe to the level of accuracy needed from a range of options costing £35 to £300 per month depending on their requirements, cm, decimetre, sub-metre or metre. To further contain costs, subscription periods start at just one month.



Three easy steps to get started:

1. Download the K-Mobile data capture app
2. Plug the Catalyst DA1 antenna into your Android phone or tablet's USB port
3. Select a subscription based on your accuracy needs - 1metre, sub 1metre, decimetre or precision.

continued overleaf...

**Stop Press:** KOREC launches regional SX10 'lunch and learn' events. Full details coming soon.

# Trimble Catalyst continued

Additionally, **KOREC** is already a part of the Trimble Catalyst Partner Program which will see our K-Mobile data capture software available 'on demand' to Catalyst users at a cost of £50 a month.



See why KOREC Group in the UK is integrating Trimble Catalyst technology with their K-Mobile app.

For further information - please visit our Trimble Catalyst FAQs at [www.korecgroup.com/trimble-catalyst-frequently-asked-questions](http://www.korecgroup.com/trimble-catalyst-frequently-asked-questions) or contact your **KOREC** mapping consultant.

## and for Esri ArcGIS users...

Catalyst is also fully compatible with Esri's Collector App.

Collector for ArcGIS improves the efficiency of your field work force and the accuracy of your GIS. Use your Android device with Trimble Catalyst to collect and update information in the field, whether connected or disconnected. From damage reports and service requests to places of historical interest, create the data that matters most.

Catalyst is also the perfect partner for Trimble's own TerraFlex app for collecting or updating data in the field with simple to create forms.

## ...and something to read

Visit [www.xyht.com/uncategorized/catalyst/](http://www.xyht.com/uncategorized/catalyst/) for a great article on Trimble Catalyst by technology writer, Gavin Schrock. ■ ■ ■

# K-Mobile Update

## 'On demand' K-Mobile for Trimble Catalyst

The launch of Trimble Catalyst (see front page) heralds a new era in software as a service (SaaS) and will bring professional level mapping to hundreds of previously unserved markets. This is why **KOREC** has already integrated K-Mobile with Trimble Catalyst technology.

K-Mobile is easy to use, easy to customise and feature rich - a perfect partner for Trimble Catalyst users. In keeping with the ethos of Catalyst, K-Mobile will also be available 'on-demand' with subscription periods as short as one month.

To find out more, view our video at: <http://catalyst.trimble.com/partnerprogram.htm>

## K-Mobile post-processing service

This new service is available as an optional extra to K-Mobile users and removes all the headaches usually associated with post-processing GNSS data, namely the need for supplementary office software, configuration for firewalls and security and additional support and technical assistance.

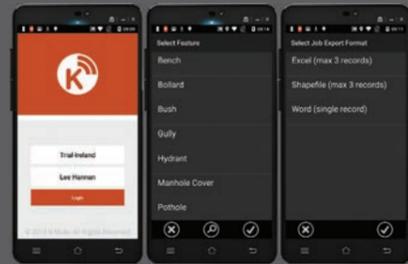
Instead the process can be almost fully automated:-

1. Capture data with a post-processing enabled GNSS receiver
2. Upload data via the cloud to **KOREC**'s fully secure post-processing server
3. Download corrected high-accuracy data within 2-3 hours (depending on availability of RINEX data) . ■ ■ ■

## Download K-Mobile for a hassle free, no commitment trial

A trial Android version of K-Mobile for field data capture can now be downloaded at [www.kmobileinstall.com](http://www.kmobileinstall.com) where you can also find an easy step by step guide on how to use it.

The trial version allows you to familiarise yourself with the K-Mobile interface and comes complete with a sample form that includes all the main functionality including drop down menus, nested lists, photos and much more. The trial version allows you to populate this sample form, hit the sync button and then receive your data back by email in your preferred format, excel spreadsheet, word document or SHAPE file. All hassle free! ■ ■ ■



# SX10 - KOREC Reports continued



▲ Hotel scan at 800m - point spacing 100mm (photo pixel size 14mm)

## Data Quality

By this I mean ALL data - the SX10 is a 1" instrument so you would expect the readings to be very accurate and reliable. The SX10 also has a tiny EDM spot size which guarantees terrific reflectorless measurement.

However, more impressive than any of this is the scanning. You would expect the 'cleanliness' of the scan to be on par with other Trimble scanners (TX6/TX8) as it is specified on the datasheet (1.5mm @ 120m) but I have captured dozens of scans, many hundreds of metres away, and still maintained this level of performance. The quality of the scan data and the ability to scan at ranges even beyond the datasheet's 600m range could be very handy onsite.

This instrument is aimed at the surveyor who wants to go out with one box (and maybe a GPS) to do every type of job going. Well the 1" accuracy matched with super clean scans at extreme ranges means you truly can!

## Imaging

Trimble has promoted VISION for several years and in our opinion, the photograph as well as the scan should be able to be measured from. Thankfully, as the cameras in the SX10

are all calibrated images, every pixel can be measured from. This is very useful for fine detail. For example - at 100m you might be able to scan a point every 12mm (superfine scan setting) but each pixel at that range using the coaxial telescope camera is only 1.8mm - which gives you much better scope for fine detail. I say again - you can take direct measurement from the images in the office, or use a combination of image pixels and the scan data.

Secondly, the SX10 doesn't have an eyepiece, you don't look through it. For this reason, the imaging needs to be excellent, really excellent. The cameras need to do everything a surveyor has been used to doing since the days of the theodolite. Everything from looking through the instrument at something in the distance and zeroing in quickly, to then lifting your head up in between measurements and deciding where to point the instrument next.

The SX10 does both with effortless proficiency - eight levels of zoom up to 84x and three cameras all work in harmony to get the job done. It is less like surveying and more like video gaming! And remember, this can all be done remotely as you no longer look through the instrument.

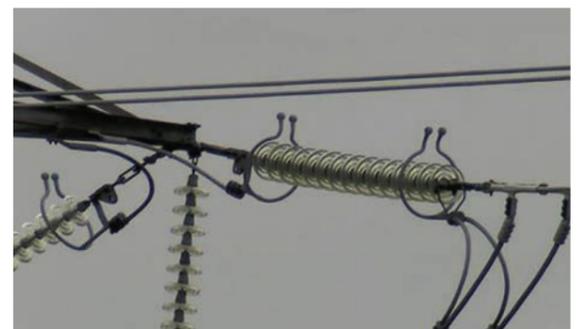
## Topographic Work

Realistically any job can be undertaken with the SX10, it is both a robotic total station and laser scanner. But as many people I've visited have commented, the humble topo is where this instrument shines. A topographic survey (or similar type job) is often considered somewhere in the middle - is it quicker to scan or to use a total station? If I use a scanner I will have to control it first and may still have to detail the odd point but the data will be better. If I just use a total station I will be out on site for longer potentially running around doing a lot of linework and worrying if I've missed something.

In my opinion, if you go out for the first time today with an SX10 you will work much the same doing the topo robotically as you have in the past: traversing, detailing as you go etc.. but you will also do a 360° scan at each setup (as a backup) - why not, it only takes minutes to do this, and you can do it while you're setting up your next tripod. As the weeks and months progress and you become more reliant and trusting of the point cloud that you collect along the way, you will take less and less linework in the field. You will develop the best routine for the type of work you do but get to know which type of points are more efficiently picked up on site and which to extract afterwards.

In conclusion, not since the birth of the total station (merging of angular & distance measurement) have we seen a leap forward like this.

The SX10 truly gives the modern day surveyor the opportunity to capture everything from one instrument and in doing so brings 3D measurement more into the common space than ever before - and you don't even need to register your pointcloud, it's part of your traverse! ■ ■ ■



▲ Original image - SX10 telecamera object at 190m

# GEO Business 2017



## See the SX10 and Trimble Catalyst at this year's GEO Business 2017

**KOREC**'s presence at this year's GEO Business event will be stronger than ever! Not only will we be a part of Trimble's growing stand but we'll also have a separate **KOREC** stand focusing on our K-MATIC software, UAVs and mobile mapping plus an outdoor space, again for mobile mapping. Finally, we're delighted to announce that these groundbreaking technologies will feature in event workshops. We'll be announcing more exciting GEO Business news nearer the event. ■ ■ ■

## Achieving survey accuracy with the MX8

Achieving 10mm accuracy for a 2km road survey with the Trimble MX8 mobile mapping system.



Our thanks go to Andrew Widdison, Projects Manager and John Fisher (FRICS), Director, from Premier Surveys for this informative and candid case study based on their first time use of Trimble's MX8 mobile mapping system through **KOREC's** K-SERVICES for a 2km roads project.

"Throughout 27 years of trading Premier Surveys has always been open to new technologies that take us towards higher levels of automation, increased data integrity and reduced manual work. When we started in 1989 our task was simply the measurement and plotting of roads and buildings. Jobs then were timed in days and weeks; now it's in hours and days. As we have grown, our capabilities have expanded to take in GIS, GIA, GPR, laser scanning & 3D modelling. In recent years, although topographical surveys and measured building surveys continue to make up our core activities, the business focus has shifted towards laser scanning and 3D modelling. By always taking an innovative approach to the application of technology we move a step closer to achieving our goal of a seamless field-to-finish system which telescopes the whole process, from commission to delivery, down to the tight timescales demanded by our clients.

### Balancing commercial necessities with disruption avoidance

During three decades there have been numerous roads schemes surveyed throughout the UK ranging from quiet residential streets to congested and fast-moving carriageways. Our uppermost consideration is achieving a balance between the commercial necessities and the avoidance of disruption to the public and the safety of our staff. We seek to avoid or minimise intrusiveness and exposure to the dangers inherent with all road surveys.



▲ Installing control

While my responsibility is for the management of all our survey projects on this occasion I took a very hands-on approach to see the whole process through and deal with any unforeseen events either on site or in the office. I worked closely with the **KOREC** K-SERVICES team on site who provided valuable advice on target set out to achieve the high quality control necessary for the successful processing of the scan data. Their support was both practical and professional.

This was a small project of just over 2 kilometres of dual carriageway with an overhead section and bridge, for which the client was designing a new relief road link. The key concern for the client was that this was an area already prone to severe congestion at peak times and fast moving traffic at other times. The client was therefore anxious to avoid aggravating the inconvenience to motorists and the high cost that traffic management would entail. He was also working to a strict deadline. From a safety point of view we were concerned that there was no hard shoulder and

very restricted access to the road verge. A novel solution was called for.

### Mobile mapping as an alternative

Owing to its short length this was clearly a survey that we would have normally undertaken using robotic total stations and we would not have expected the use of a mobile mapping system to be economically attractive to the client. However, we were looking for a suitable scheme to trial the mobile mapping technology and this project offered us an ideal opportunity. Our survey teams are accustomed to the attributes and benefits of Trimble systems and equipment; having already invested in their GeoExplorer GIS kit, S6 robotic total station and R6 GPS. Naturally, we were expecting the same from the MX8 system.

Typically, with any unfamiliar technology, we would have preferred to have tested the MX8 system thoroughly before recommending it to the client; however the narrow time constraints made this impractical. Without any previous experience or knowledge of the MX8 system other than demonstrations at exhibitions, there was clearly a calculated risk to be assessed, chiefly regarding accuracy. Satisfied by our pre-survey discussions and the information supplied by **KOREC**, the client judged this to be an acceptable risk. Nevertheless, we resolved to test whether the stated accuracies were achievable under real site conditions by carrying out a standard total station survey that duplicated the MX8 system scan data on the overhead section, which was free of the constraints affecting the dual carriageway.

Throughout the test area the comparison between both sets of data was +/- 5mm. We believe this correlation was aided by the installation of three-times the recommended density of control.

Seventeen high precision survey marker boards were installed throughout the survey area and controlled using robotic total stations prior to scanning. Weather conditions

on the day were not ideal. The MX8 system is mounted on the roof of a vehicle which travels at a moderate speed during data capture. Two passes were scanned on each carriageway. The work was disrupted by intermittent rain showers but, in spite of this, completed within four hours. In perfect weather conditions times would have been reduced to one hour.

Using our control co-ordinates, **KOREC** post-processed and registered their scan data files within a couple of days and supplied us with a composite Pointcloud in .LAS format. This was loaded directly into AutoCAD via Recap enabling us to complete the normal plotting of the carriageways. This took 2.5 days longer than standard topographical survey plotting but this would diminish as our team became more familiar with plotting from this type of 3D data. There were certain areas where road gullies and other small objects were difficult to identify from the Pointcloud, this necessitated minor field verification.

"...shorter timescales mean reduced project risk and greater utility of our valuable resources."

**Andrew Widdison**



▲ A total station was used to confirm accuracies

### MX8 brings greater control

The MX8 system enabled us to complete the survey within a very narrow time-frame without the need for traffic management. Even on a project as small as this, the small increase in office time was more than adequately offset by the +80% reduction in site time. Scaled up to a major road survey the cost benefits would become even more attractive. Based on our own estimates, 10 to 15 kilometres of road could be controlled and scanned per day in ideal conditions. This would produce huge cost savings far outweighing any increase in office processing and plotting time. The investment we made trialling the MX8 system under "live" conditions proved itself fully justified by the delivery of a survey that met the client's requirement and at the same time significantly advanced our knowledge and understanding of a new technology.

The principal advantages of the MX8 mobile mapping system are to an extent self-evident; however, the key advantage for me as a project manager is the greater control it affords me to manage my survey teams – shorter timescales means reduced project risk and greater utility of our valuable resources." ■ ■



# KOREC News

## KOREC Photo competition

### Our winners for the 2016 competition are...

Congratulations to all the runners up and the overall winner of the 2016 **KOREC** photography competition. They took home fabulous Amazon and **KOREC** voucher prizes. The level and quality of entrants was overwhelming and Landform Surveys' shot of their Trimble UX5 over a Cumbrian quarry was a worthy winner!

### ...and launching an even better competition for 2017

We're shaking things up for our 2017 competition to include anything from site photos to office shots to datasets – as long as they feature **KOREC** supplied instruments or software. Each month we'll be sending a goody bag to the best entrant and of course there'll be the usual great prizes at the end of 2017. Email entries to [marketing@korecgroup.com](mailto:marketing@korecgroup.com) or post them on **KOREC**'s Facebook page where you'll also find the rules and conditions. ■ ■ ■



▲ Overall winner, Landform Surveys - Trimble UX5



▲ Category winners: Murphy Surveys - Trimble S5 and R8, Severn Partnership - Trimble S6 and Christian Geomatics - Trimble TX8

## And just to finish...

Whilst the Trimble SX10 and Catalyst have been stealing the headlines recently, we felt it only right to give a shout out to two of **KOREC**'s most popular products!

### Trimble R10 GNSS

It's been around for a while now but the R10 has received more testimonials than any other **KOREC** product. Many thanks to Roy Smith, Survey Manager at J Murphy & Sons Ltd for reminding us just how reliable the R10 is.

"On a recent contract for a gas distribution supplier, Murphy Group was undertaking a laser scan survey near the village of Elveden in Suffolk, where they were scanning overland valve systems for a redesign. The scans were successfully completed as was an internal traverse in the conventional way. However, the Leica GNSS we had on site just couldn't connect to Smartnet so although the scan data was in a local grid, it was useless to our client without the attendant OS coordinates. We tried for over an hour to resurvey the traverse but with no luck. However, we'd recently purchased an R10 and I knew, pound for a penny, that it would connect to the Trimble VRS network without a problem. Our surveyor Arthur Mazzezy went out first thing the next morning and sure enough, the R10 connected instantly, he was back in the office by 10.30 and the completed survey was successfully delivered to the client. The R10 is second to none when it comes to reliability and it saved us from having to do a very long traverse to get out of the Smartnet dead-spot."

### Trimble TBC

The latest release of Trimble Business Center survey software features over 50 updates making it one of the most comprehensive packages out there. It's fair to say that Trimble nurtures TBC and invests a lot of time and energy in keeping it relevant and productive for the UK market – something reflected in our ever growing number of TBC users.

Here are three of the highest rated **KOREC** features:

- You can input data from multiple platforms, GNSS, laser scanners, UAVs, total stations and of course scanning total stations in the form of the Trimble SX10! It can also handle data from 3rd party sensors which means anyone can use it.
- New point-cloud tools to manage 3D point cloud data – TBC is the only survey software on the market to apply a traverse adjustment to cloud data.
- Accommodates all your needs – from data to deliverables - eliminating the need for additional software packages. Deliverables include spreadsheets, QA reports, drafting and designs, measurements, adjustments, fixed/custom exports, printed plans and a **KOREC** favourite, 3D PDFs (above right). View a 3D PDF at [www.korecgroup.com/tbc-deliverables-include-3d-pdf/](http://www.korecgroup.com/tbc-deliverables-include-3d-pdf/)

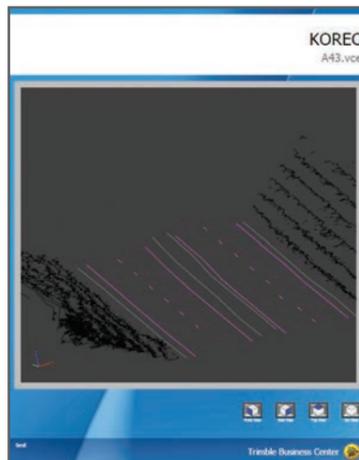
Why do TBC users love it? Our thanks to Jarrod Black and James Nicolau of PLS respectively for these quotes.

"Having complete survey solutions in a single software package has increased our productivity and lowered project costs."

"The implementation of third party support is key to ensuring project integrity throughout its duration." ■ ■ ■



▲ Trimble's R10, proven reliability



▲ Deliverables include a 3D PDF

## Technical news

### RealWorks Release with new features

Visit the RealWorks website to access new features which include Autodesk RCP Export and a Trimble RealWorks Viewer updated to use Trimble Scan Explorer when TZF files are included in the project.

When exporting Ortho images from Realworks, select the image and use the main Export command, choose DXF, this will then automatically position and scale your image correctly, cutting down on another step.

### OSGM15 and OSTN15 updated transformations

Back in August last year, we made you aware that the Ordnance Survey switched to OSTN15 and OSGM15 models as the official transformation of GNSS observed survey data to National Grid. At the same time, some revisions were made to the ETRS89 base coordinates in the OS Net GNSS receiver network.

As a result, the Trimble VRS Now service was updated and the data made available on new VRS Now Mountpoints with the suffix 15\_

Data from the new Mountpoints need to be used with the correct OSTN15 and OSGM15 shift grid and Geoid model files which were also issued at that time.

ALERT: Trimble agreed to continue to make available the old OSTN02 references Mountpoints for a limited period. However these Mountpoints will be turned off at the end of February 2017.

What you need to do : Instructions on how to configure Trimble Access, Survey Controller and Trimble Business Center for OSTN15 are available on the **KOREC** web site.

A note for GeoSite Users and OSTN15: GeoSite doesn't support OSTN15 directly. It is therefore strongly advised to import any GNSS survey data into GeoSite from a CSV coordinate file instead of from the job file on the controller. CSV files can be exported from Trimble Access or Survey Controller and then copied to the computer running GeoSite by USB stick or cable.

### Training

Our 2017 scheduled training dates can now be viewed in the support and training section of our website.

This issue's highlighted course is our Introduction to Topographic Surveying (3 days). It includes how to:

- Follow general survey best practice
- Perform standard stationing operations: resection, known point, measure rounds
- Utilise field coding in the process of conducting a topographic land survey
- Process survey data to create drafted survey drawing
- Export survey data to CAD files

It's an intensive introduction for new or untrained staff members, such as survey assistants and all surveyors or engineers with existing experience who wish to familiarise themselves with the operation of a Trimble robotic total station running Trimble Access.



- Huntingdon 9-11th May and 11th-13th July
- Liverpool 13-15th June and 8-10th August

## 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**

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