



GEOMATICS

Capacity Building Initiative UNIVERSITIES AND POLYTECHNICS IN NIGERIA

GeoQinetiq wishes to congratulate the staff and students of the University of Lagos, Ahmadu Bello University, Zaria and University of Nigeria, Nsukka on the arrival of the full range of ultra-modern Geomatics equipment and technologies by Leica Geosystems of Switzerland, and on the imminent commencement of delivery and training by GeoQinetiq to achieve their transformation into world-class Geomatics centres of excellence as envisioned by His Excellency, President Umaru Musa Yar'Adua when he approved the ETF/NBTE intervention in 2008.



LAGOS CORS

Lagos State recently launched the State's first operational Continuously Operating Reference Station designed and installed by GeoQinetiq Limited, which is based on the ultra-modern, 'future-proof' Leica GRX1200GG GNSS reference station receiver, along with Spider GPS network control software, which will integrate a network of base stations deployed at strategic locations across Lagos State, providing very high-accuracy real-time and post processed data for a wide range of surveying and construction applications. This technology will help build a new Lagos infrastructure; help in tackling land management, poor town planning practices and contribute to alleviating road congestion, road safety as well as improving public transport. Such technologies offer dramatic increases in productivity, accuracy and error-proof repeatability. The four Nigerian Geomatics centres of excellence have been equipped and trained to prepare 'GNSS ready' graduates; able to utilise the SR123D RTK receivers for a range of positional solutions in a variety of applications in real-time and post-processed up to centimetre accuracy.

REFINERIES

3D laser scanning technology facilitates the capture of physical objects such as structures, pipe work and mechanical components. Through survey analysis this is converted to a virtual but true to life as-built 3D image. From this model existing component geometries and physical relationships can be extracted within a tolerance of few millimetres. For example, the Federal Government of Nigeria spends hundreds of millions of dollars on Nigeria's refineries and complex engineering projects like Ajaokuta Steel Company. Kaduna Polytechnic and Federal School of Surveying, Oyo today have the technology and ability to perform high resolution 3D scans of entire industrial settings to produce digital & highly detailed 'as-built' documentation and models' to enable the production of TAM (Turn Around Maintenance) designs and enable political leadership to get a hold on the state of key National assets.

GURARA DAM & WATER PROJECT

Leica digital levels were the first in the world to be equipped with digital electronic image processing for the determination of heights and distances. The staff reading and the distance are displayed and recorded digitally; the heights of the staff stations are calculated continuously and so there can be no errors related to reading, recording and calculating. The Nigerian Geomatics Institutes can now offer fast accurate leveling with software for post-processing the recorded data. Producing digital terrain modules in half the time and double the accuracy. Large transfers of water over long distances depends on accurate surveys of the routes, especially on the elevation information to control the levels. Federal Polytechnic, Damaturu is equipped and able to lead and deliver such projects in the future.

UNDERGROUND SURVEYS

The DIGICAT locator unit is designed to help avoid damage to underground services during excavation and is an easy to operate, fully automatic location system. With the DIGISYSTEM the Nigerian Geomatics Institutes can locate, trace and mark all underground services quickly, precisely and reliably. These technologies allow for the scanning and mapping of buried utilities like water pipes, GSM/telephone/power cables, etc. so that such installations are not damaged during road construction or maintenance of close-by facilities.

AERIAL PHOTOGRAMMETRY

Softcopy photogrammetry work, stereo-Compilation, and ultimately, orthophotos can only be as accurate as the source imagery. Working in a digital photogrammetry environment requires that the scanned aerial photographs are not only as accurate as possible but that the appearance of the film is reproduced faithfully and that the raw air photos are scanned quickly so that production can begin rapidly. The Leica DSW700 Digital Scanning Workstation is a photogrammetric scanner, designed for maximum throughput. It is capable of scanning aerial film, cut sheets or roll, black and white, colour or false colour, positive or negative, at a very high speed, producing output that is both geometrically and radiometrically accurate. The DSW700 can also easily change pixel size from one job to the next. Kaduna Polytechnic is now able to produce and update all paper maps to accurate digital images.

SATELLITE (GPS) SURVEYING

The Leica SmartStation comprises a TPS1200 total station with an ATX1230 SmartAntenna. The SmartAntenna is a 12L1 + 12L2 dual frequency GPS RTK receiver that fits on and communicates with the total station. All commands, displays, functions, operations and computations relating to GPS reside in the total station. TPS and GPS are perfectly integrated.

With SmartStation there is no need for the Nigerian Geomatics Institutes of Excellence to search for and set up over control points, to run long traverses, or to reset the position. With SmartStation you simply:

- i. Set up wherever it is convenient.
- ii. Determine the position coordinates in a few seconds to centimetre accuracy with RTK.
- iii. And then survey and stake out with the total station.

QUANTITY SURVEYING

The "DISTO" hand-held laser meter from Leica Geosystems is another simple instrument that uses a visible laser beam and needs no reflector; it is particularly suitable for indoor and outdoor measurements to ascertain spacing's, areas and volumes. No more do you have to fuss with the inaccuracy and unreliability of the tape measure, ruler, or even ultra sonic range finders. Leica DISTO Distance-Meters measurements are so precise and reliable they can measure up to 200 meters with millimeter accuracy.

With one press of the button, the quantity surveyor can calculate the number of blocks, tiles or buckets of paint required and hence, the total cost of building or refurbishing.

LISCAD

LISCAD is a purpose made software for the Engineer and Surveyor. Data from virtually any surveying instrument can be imported and turned into finished plans easily.

All surveying and engineering tasks are covered from computations through adjustments to volume calculation and evaluation of digital terrain models (DTM). All four Geomatic Institutes of Excellence have full LISCAD Professional installed providing the power for the users to deliver field to finish solutions. LISCAD can be used to process data from all manufacturer instruments providing output for most applications and includes Computations, Input/Output, Adjustment and Transformations. Background Images, Modeling, Volumes, Profiles and Design.

LGO provides office software for all your instruments, new and old, providing the Geomatics Institutes of Excellence seamless import and combing of data from all instruments to produce the final results, regardless of manufacturer. Providing a platform for managing and combining data to ensure you get the best results. LGO provides GNSS instrument support, TPS instrument support and Level instrument support.

ERDAS IMAGINE

Imagery is the most valuable source of geospatial data, vital to decision-making processes. Imagery captures actual events at specific times and places, and allows you to track the changes that take place. ERDAS IMAGINE® is the world's foremost remote sensing solution, providing tools to create, manage and analyze imagery to increase the value of your geospatial information. Kaduna Polytechnics can now utilise ERDAS IMAGINE to combine remotes sensing and GIS capabilities, enabling the creation of geospatial data, with the ability to extract information and update their existing GIS data.

CYCLONE

Leica Geosystems HDS Cyclone software modules provide point cloud users with the widest set of work process options for 3D laser scanning projects in engineering, surveying, construction and related applications.

Cyclone lets users take advantage of traverse, back-sight, and resection capabilities of the laser scanner for more cost-effective as-built and topographic surveys and lets users create plant as-built models more efficiently from laser scans.

The inherent completeness of 3D point clouds represents one of their major advantages over other sources of geometric information. Cyclone's unique Object Database Client/Server software architecture provides the highest performance environment for laser scanning projects. Cyclone software makes it easy for users to manage data efficiently in databases. Users can work concurrently on databases, thereby reducing the need to copy and/or transmit large point cloud project files.

Kaduna Polytechnic is able to process, in real time, data from the Leica HDS Scanstation2 on cyclone.

