

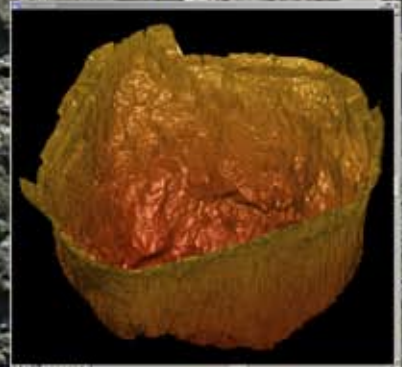
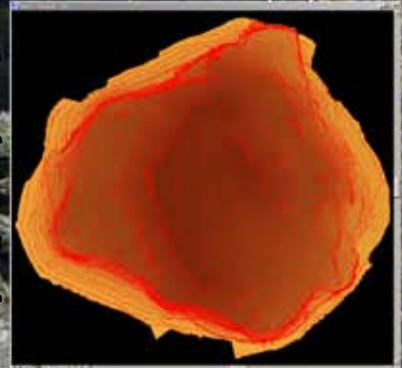
# Are uSMART?

...then rely on technology  
and mapping solutions from  
SmartTech

## Digital Photogrammetry at its Best

Open Cast Mine

Mapped with  
Close range (Terrestrial)  
Photogrammetry  
using an  
inexpensive  
digital camera.



- Map 3D Models in *any* coordinate system on your PC.
- Impress with Orthophotos.  
Create true rectified images that are as accurate as a map & can be used to take measurements.
- Automatic DEM creation.  
Create a grid of points using automatic correlation at an average of 1000 points per second.
- uSMART is a modular system.  
The software can be personalised according to each user's needs.
- We are committed to service excellence.
- Customisation & user requests are top priority.
- Ongoing development ensures an up-to-date & progressive package.
- Delivering to an international client base.

- Mass Data Module.

Allowing extremely fast creation, manipulation & display of billions of elements (points, lines, topology, etc.).



34 Firgrove Way, Constantia Hills  
Cape Town 7806, South Africa

## uSMART - Mapping the World

[www.smarttech.co.za](http://www.smarttech.co.za)

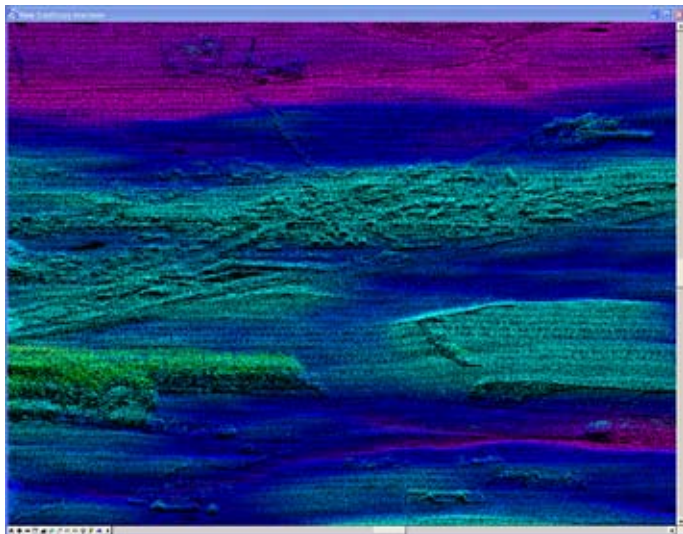
Tel: +27 (0) 21 713 0126  
Fax: +27 (0) 21 713 0127  
Email: [charleen@smarttech.co.za](mailto:charleen@smarttech.co.za)



# uSMART - A Complete System

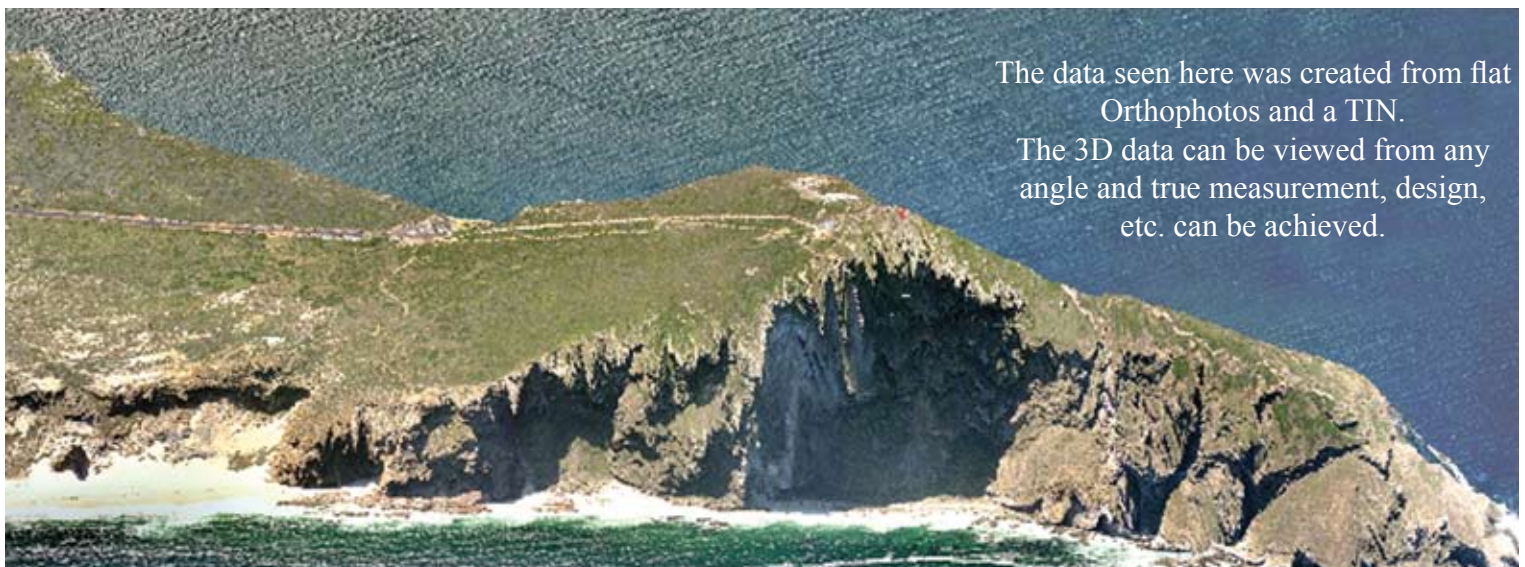
## Create and Incorporate Mass Data

- No need to break up large jobs!
- Import billions of points from lidar, create the TIN and make thousands of Orthophotos without any user intervention.
- Correlate all the models, map all the break lines, create the TIN and make Orthophotos.



- Easy Project setup - wizards, etc.
- Open system (import/export Inner, Exterior, Image coordinates, etc. from/to various other systems).
- Automatic Inner and Relative correlation.
- Navigator for working with three strips simultaneously e.g. for Aerial Triangulation observations.
- Built in Aerial Triangulation (Bundle Block Adjustment) calculations.
- Support for numerous input devices and various stereo viewing techniques.
- Fast mapping e.g. dynamic correlation, grid driver, extensive tool box of mapping functions, etc.
- Grid correlation i.e. automatic DEM creation with no user intervention. Correlation percentages can be shown thematically for blunder detection.
- Powerful Triangulated Irregular Network (TIN) routines for thematics, automatic contour creation, sections, etc.
- Smooth and visually appealing contours.
- Interfaces directly with the uSMART MDM for truly unlimited data sizes. Lidar data, for example, (regardless of size) can very easily be incorporated into the project i.e. viewed in stereo, enhanced with aerial data, etc.
- Very powerful and easy to use True Orthophoto creation with perfectly balanced and feathered images.
- Powerful routines for image manipulation e.g. overview creation, format conversion, resampling, etc.
- The points above are just a few examples of a truly user friendly system where raw field data is used to create final Map/GIS data in a single, complete package.

## Create full colour 3D data from your orthophotos



The data seen here was created from flat Orthophotos and a TIN. The 3D data can be viewed from any angle and true measurement, design, etc. can be achieved.

# Mapping Made Easy



## Seamless Mapping

In the uSMART Softcopy system users are able to create truly seamless maps. Features can be mapped in their entirety i.e. across multiple “Models” (stereo image pairs). Models change automatically while the user is mapping across the project i.e. the user needn’t change the models manually (if set to do so). Whilst moving from one stereo pair to the next, the software will change images virtually instantaneously and the user simply continues mapping the feature. Thus it is far more efficient to create “clean” data.

## Effortless Error Correction

At absolutely any stage in the project corrections can be made. As the changes are executed all relevant data is immediately recomputed e.g. new control point residuals are instantaneously displayed on changing camera or lens information (or any other aspect of the project). If mapping has already commenced, the mapped elements can be transformed to their correct positions at the touch of a button. Each vertex (node) is recomputed with the corrections applied. This means that features are replaced in their correct positions as if the user had originally mapped the feature correctly e.g. a road edge is not simply transformed to a new position but each vertex of the line-string/curve making up that road edge is recomputed according to the Model used (regardless of how many Models it passed over). Data spanning multiple files can be automatically corrected in a single step.

## Devices

uSMART supports most input (control) devices e.g. hand wheels, foot disks and switches, joysticks and various 3D mouse(s). We will also interface to any “open” device which a client may be accustomed to.



## Clean Data

- Data is *created* clean i.e. requiring very little (if any) editing.
- Seamless mapping (as described in this brochure).
- Continuous contours (regardless of labels, length, etc.).
- Capture data directly into GIS (if required).
- Unbroken Linear Features e.g. water courses, fences, etc.
- Easy “Resume” functionality (automatically resumes from the previously placed feature to create a single continuous feature).
- Snap and Insert vertices when joining to an existing Linear Feature.
- Choose components of a coordinate to use when snapping e.g. X and Y from existing feature but Z from stereo.
- Duplicate feature usage e.g. bottom of embankment and water course.
- Numerous cleaning tools to fix data imported from other sources.



# Balancing and Feathering

uSMART generates very high quality and accurate “True Orthophotos” which can subsequently be used for display, printing and precise measurements. The routine is truly user friendly. Once features have been mapped and TINs created (in itself highly automated in uSMART), it takes little more effort than specifying the output file name(s) to create True Orthophotos.

Balancing and Feathering (mosaic creation) can be done as a single step during Orthophoto creation or afterwards. Results are truly outstanding as can be seen in the examples below where the “After” images have similar tonal values and no seam lines i.e. there are no visible joins. Images can then be clipped to any conceivable size and shape in a batch process e.g. according to a user specified sheet layout, etc.

**Before**

**After**

