

Technical Note

Date: 06/12/2010

Re: Map updating with SCC, PocketDTM and Atlas Comms Server

This document outlines how SCC, PocketDTM and Atlas Comms Server can be used to streamline and automate the process of map updating, by taking data from corporate GIS, CAD and engineering design systems into the field on a tablet PC, using various surveying and data collection techniques to update this data, and then transferring these updates back to the original systems.

The components of this system are as follows;

- Survey control centre (SCC)

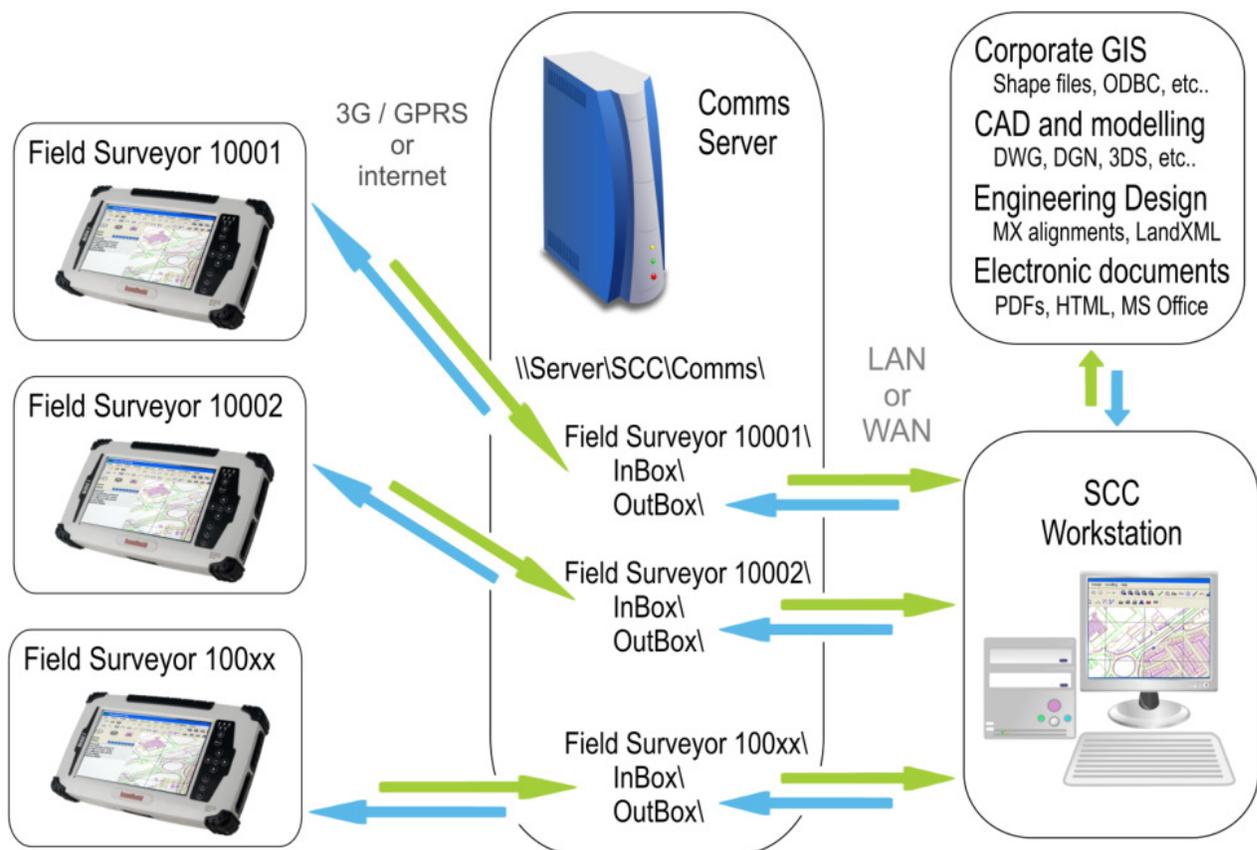
SCC is a geomatics and modelling package that is responsible for importing and exporting data to and from external GIS, CAD and design systems. This can include vector data transferred from CAD in DGN, DWG and DXF format, combined vector and database information from GIS formats such as ESRI shape files (.SHP), and model data from packages such as Bentley MX and Civil 3d in LandXML. Additional customised data exchange interfaces can be added to meet specific requirements, as was the case for the Dubai municipality PSS system.

- Comms server

The Atlas communications server is responsible for transferring data between the office and field, using a variety of media including 3G, GPRS, internet, and direct cable connections. Comms server maintains an incoming and outgoing mail box for each surveyor, both in the office and in the field. It has a scripted interface, and operates in a fully automatic manner, transferring data between the field and office, generating reports of data transfers by user, and notifying users of any communications events as required. While the comms server was written for SCC and PocketDTM, it can be used to transfer data between any field and office systems

- PocketDTM

PocketDTM is a field survey package that runs on a variety of devices. For map updating, field completion, and GIS users, we recommend running PocketDTM on modern light weight tablet devices, such as the Algiz 7, as they offer a large high quality screen necessary for this type of work. PocketDTM can be used for topographic survey including map updates, control survey and adjustment (traverses & networks), GIS data capture, setting out and checking, levelling, and road and rail works. PocketDTM can collect measurements via total stations (manual and robotic), RTK and NRTK GPS, electronic levels, distance meters and cameras. It also allows for a wide range of manual data entry methods, such as tape and offset, distance intersection, and sketching with the pen. When collecting GIS data, any number of fields can assigned to any given GIS layer, along with intelligent defaulting to minimise the amount of time required in the field. GIS data can also include photography from on-board cameras, on screen signature capture, and automatically completed fields such as time & date, position, point number, chainage and offset, etc... It can also include fields with default values populated from the head office database.

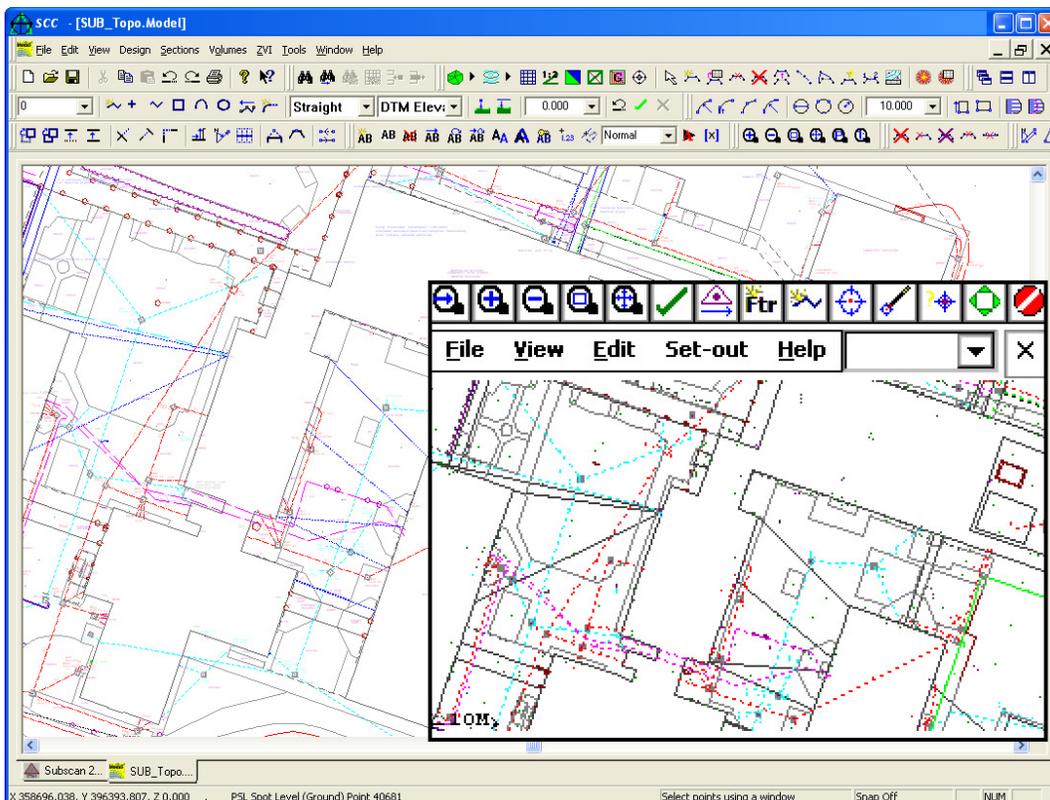


SCC, PocketDTM and communications system diagram

The typical process for a map updating task is as follows;

- Import vector mapping and GIS schema information into SCC. This can include background mapping from CAD packages such as Microstation and/or GIS packages such as ArcInfo. It can also include design alignment information and 3d surfaces from other design and modelling packages such as Bentley MX.
- Allocate work to a specific surveyor or crew. SCC provides the user with a list of active field surveyors, along with the number of their outstanding jobs. The manager selects which surveyor to allocate a job to, and can include notes where specific instructions are required and red-line the background map. This job will automatically be sent to the surveyor by the comms server.
- Collect additional survey data, check data, and / or GIS records. The surveyor with PocketDTM will receive the data from head office, typically comprising of background mapping, stations, points to be set-out or checked, notes, database, and/or design information. The surveyor will then use the surveying tools within PocketDTM to carry out the map updates required, and send the completed job back to head office. The background mapping and GPS can also be used as an aid to navigating to the precise area of the job.
- Export back to CAD and corporate GIS system. SCC will provide a list of completed jobs to the manager, as they arrive from the comms server. These are then checked and exported back to the corporate GIS and / or CAD, design and reporting packages in use.

Background map shown in SCC and PocketDTM (inset)



The sample script, as linked below, illustrates how the comms server transfers data between the office and specific field units. Each tablet PC is running a communications client, that is assigned a remote ID, used to identify mail boxes on the server and tablet. Whenever a session is established, named files are transferred between remote and local mail boxes, based on the remote ID, and the details of the session are logged for the manager. This script file can be easily modified to suit changing communications requirements, without necessitating any software changes. Data is automatically compressed and encrypted for the transfer, and the entire communications session is subject to a two phase commit, such that partial or failed sessions are automatically deleted.

Sample comms server script

<http://www.atlas-files.com/scc-users/sample%20comms%20script.pdf>



For further related information see

SCC brochure

<http://www.atlas-files.com/scc-users/scc-brochure-r9.pdf>

PocketDTM brochure

<http://www.atlas-files.com/scc-users/PocketDTM-2009-lores.pdf>

Tutorial on using SCC and PocketDTM to survey ESRI shape files

<http://www.atlas-files.com/scc-users/SCC%20shapefile%20interface.pdf>

Tutorial on using SCC and PocketDTM for utility surveying with background maps

<http://www.atlas-files.com/scc-users/PDTM%20utility%20surveys.pdf>

Tutorial on using SCC, PocketDTM & Comms Server for Dubai Municipality ADC

<http://www.atlas-files.com/scc-users/ADC-generic%20test.pdf>