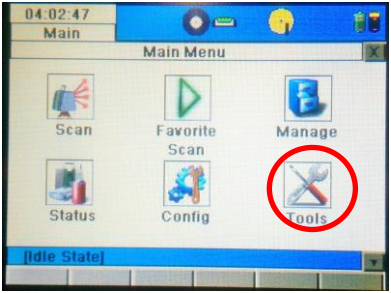
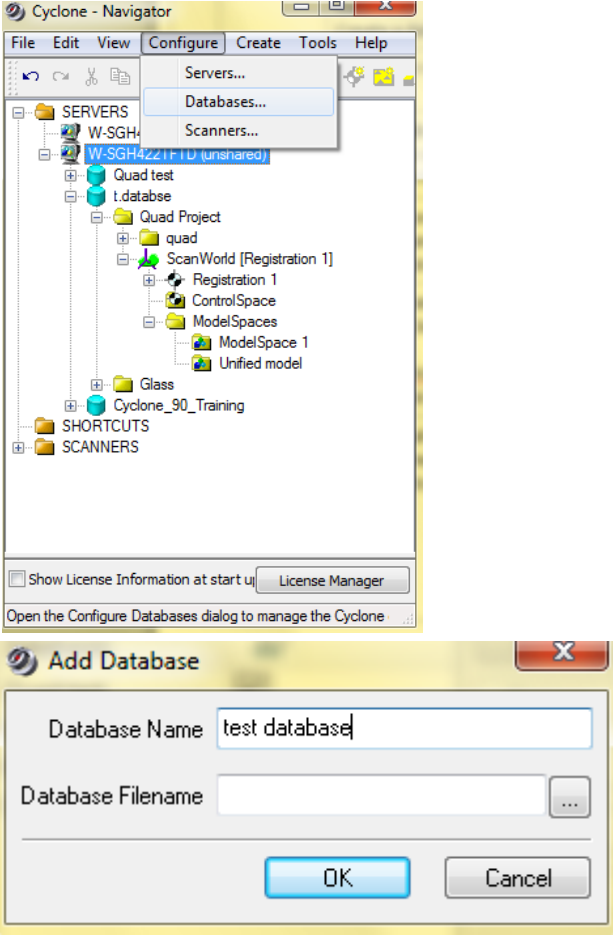
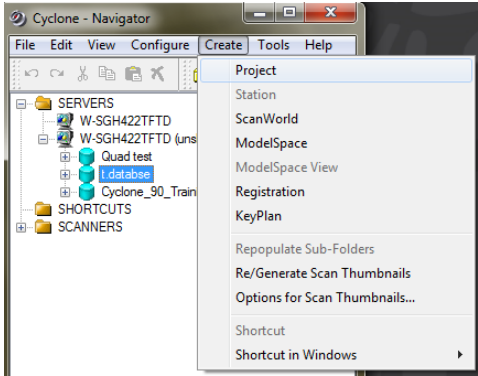
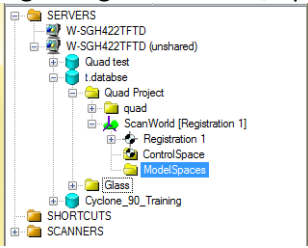
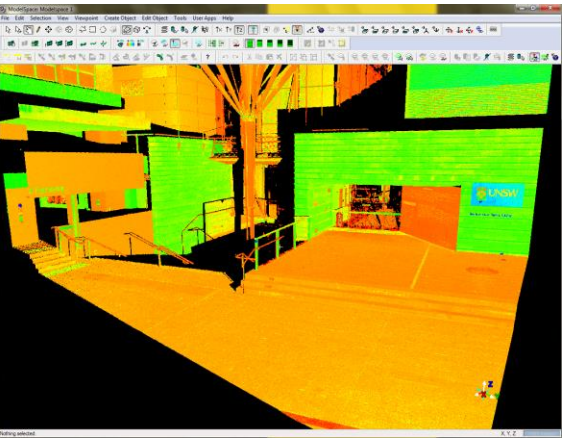
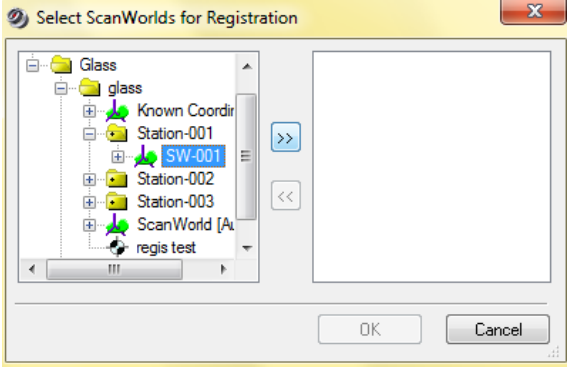
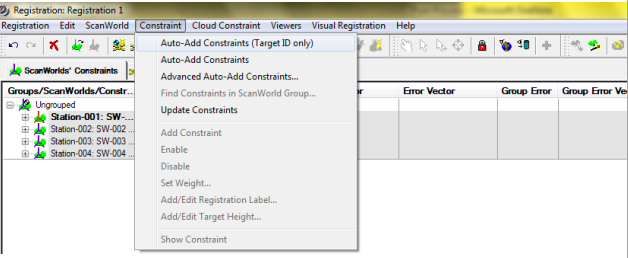
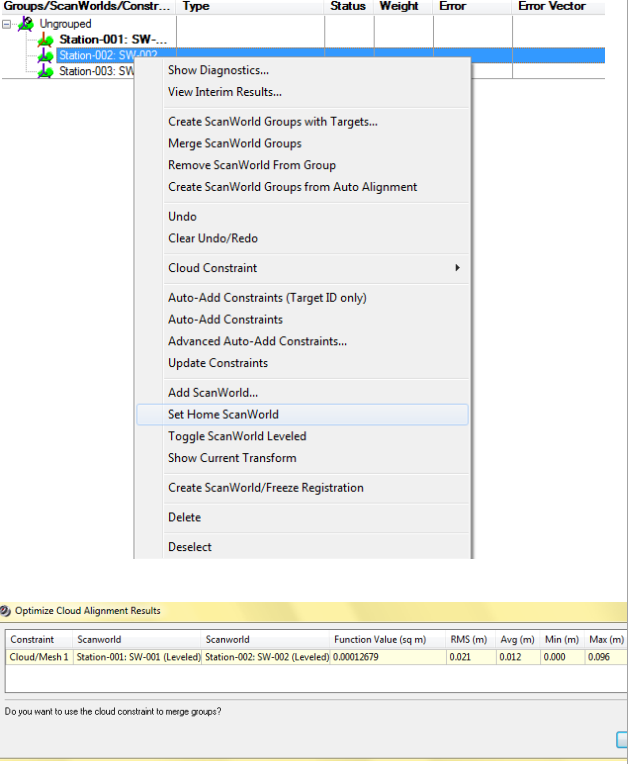


Post-Process (input/ register/ unify/ model space)

Step	Action	Detail	Picture
1	Transfer Data to USB drive and then to computer	<p>To transfer data to USB memory: On Scanner Tools > Transfer > Project</p> <p><i>This above step might already have been done in the field, it can take 30 mins for a few small scans with images.</i></p> <p>Start computer / login. Copy the raw data scans folder from USB into a folder that you can access later. You should see separate directories for images, scans and targets. But you can only view this data in the Cyclone environment.</p> <p>Can take e.g. 8 mins for this step from USB to computer.</p>	
2	Create Database	<p>On computer open Cyclone (<i>takes a moment to open</i>)</p> <p>Open Servers Pick Unshared server</p> <p>On main menu bar, Configure > Database > Add</p> <p>On Add Database window, Name Database</p> <p><i>(Database filename is for importing an existing database at the project level, we don't need it when beginning.)</i></p> <p>OK</p> <p>On Configure Database window, Close</p> <p><i>(Note: make sure file extensions are turned on. Control panel/ Appearance and Personalization/ folder options/ view/ click on Show hidden files, folders and drives and click off Hide extensions for known file types)</i></p> <p>[about 4 mins this step]</p>	

3	Create Project	<p>Click the + on the unshared server Left Click on your new Database Create> Project</p> <p><i>(If Project is greyed out, then the license isn't connected. Click the license manager button in previous step's window – it should say @cvepwlic001)</i></p> <p>[1 min]</p>	
4	Import scan Raw data	<p>If data not already on computer as per step 1 above, plug in USB drive, otherwise...</p> <p>Right Click on Project 1 > Import C5/C10 data to project <i>(navigate to raw data project – the import function will find images, scans and control automatically)</i></p> <p>Select the folder on the computer e.g. D drive or USB, that contains the field data OK In Import C5/C10, tick generate scan thumbnails OK <i>It may take a few minutes to download. (This will import all scans setups from the project)</i></p> <p>[4 mins]</p>	
4A	Optional step to view the point cloud data in Cyclone before Registration	<p>Before Registration. In the Cyclone Navigator window. Select project, station 001 (or similar) Scans, scan001.bin double click. Or you can explore the model space or images. Explore each of the scans.</p> <p>When viewing a scan cloud mouse left button hold button and drag mouse rotates model, right button does pan, and both buttons does zoom.</p> <p>Use circle with cross through it to set centre of rotate / pan / zoom functions.</p> <p>Look at a plan view.</p> <p>Use the (pick) arrow button to get coordinates in the model space or use multi pick (arrow with +, and shift click) to get coordinates and distance between points.</p> <p>Close X any open windows will return to Navigator menu.</p> <p>Zoom in on any target in a scan and see if the fine scan has been done and the centre determined (lines appear through the centre in 3 orthogonal directions)</p> <p>[20 or more minutes depending on your experience with cyclone and how thorough you want to peruse the data.]</p>	<p>E.g. navigator window, open + quad here</p>  

5	Create new Registration	<p>Left Click on project</p> <p>On the main menu bar, Create > Registration</p> <p>Double click on Registration (just created)</p>																	
6	Import all stations	<p>On registration window, ScanWorld > Add Scan world > (<i>Open project to station level</i>)</p> <p>...Select data from all stations... (<i>Ctrl+Click for multiple selects of stations</i>)</p> <p>Press ">>" to select</p> <p>OK</p> <p>OK</p>																	
7a	Target Registration (do only 7a or 7b then go to step 8)	<p>Select ungrouped</p> <p>Highlight all stations (use Ctrl+Click)</p> <p>Open Constraints List tab</p> <p>On main menu bar, Constraint > Auto-Add Constraints (Target ID Only)</p> <p>(Note there are no error vectors yet. First you need to register the targets together. Step 8)</p>																	
7b	Visual Registration	<p>Right click on one station and "Set Home ScanWorld"</p> <p>Highlight 2 Stations (including Home ScanWorld)</p> <p>On main menu bar, Visual Registration > Visual Alignment...</p> <p>Try to align blue floor plan with orange floor plan(Home ScanWorld) (click and drag)</p> <p>Note: Move (Edit > Modes > Move Point Cloud) Rotate (Edit > Modes > Rotate Point Cloud) View (Edit > Modes > View Mode) Seek - during View Mode press "S" and click on any point to centre/focus the screen</p> <p>Switching between Plan View and Section View (View Point > Top View/Elevation View)</p> <p>Try to align blue section plan with orange section plan(Home ScanWorld)</p> <p>Tools > Optimize Constraint</p> <p>On Optimize Cloud Alignment Results window, Yes</p> <p>Close Visual Alignment window</p>	 <table border="1" data-bbox="930 1675 1560 1742"> <thead> <tr> <th>Constraint</th> <th>Scanworld</th> <th>Scanworld</th> <th>Function Value (sq m)</th> <th>RMS (m)</th> <th>Avg (m)</th> <th>Min (m)</th> <th>Max (m)</th> </tr> </thead> <tbody> <tr> <td>Cloud/Mesh 1</td> <td>Station-001: SW-001 (Leveled)</td> <td>Station-002: SW-002 (Leveled)</td> <td>0.00012679</td> <td>0.021</td> <td>0.012</td> <td>0.000</td> <td>0.096</td> </tr> </tbody> </table>	Constraint	Scanworld	Scanworld	Function Value (sq m)	RMS (m)	Avg (m)	Min (m)	Max (m)	Cloud/Mesh 1	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	0.00012679	0.021	0.012	0.000	0.096
Constraint	Scanworld	Scanworld	Function Value (sq m)	RMS (m)	Avg (m)	Min (m)	Max (m)												
Cloud/Mesh 1	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	0.00012679	0.021	0.012	0.000	0.096												
	Repeat step	Not every station has to be paired together, the																	

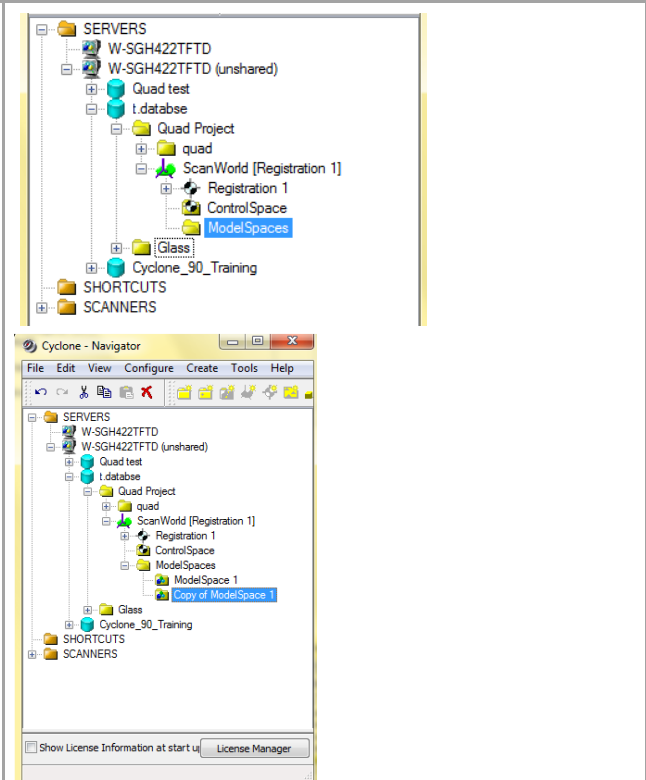
7b to pair all stations together chain from one station to another station is enough. The software will use existing link to chain all of the stations together.

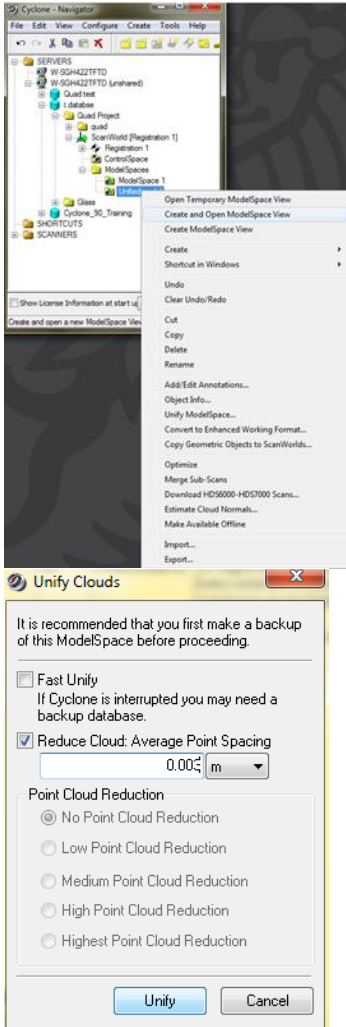
8 Register On Registration window, Registration> Register

9 Check the error Every constraint will now appear Sort by *Error*. (simply click error label) Check the *Errors* in the *Constraint List* tab. Make an assessment as to the quality of the registration. (more than 6mm Error is considered large). For large errors, constraints can be disabled by right clicking/ "Disable" ("Status" will change to "Off") Note all *Errors* are now n/a. You now need to re-Register (repeat step 9) and note that the disabled point status is off. It does not contribute to the registration.

Constraint ID	ScanWorld	ScanWorld	Type	Status	Weight	Error	Error Vector
1	Station-002 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.000 m	(0.000, 0.000, 0.000) m
4	Station-002 S...	Station-003 S...	Coincident: Vertex - Vertex	On	1.0000	0.001 m	(0.000, 0.000, 0.000) m
3	Station-001 S...	Station-003 S...	Coincident: Vertex - Vertex	On	1.0000	0.001 m	(0.000, 0.001, 0.000) m
1	Station-002 S...	Station-003 S...	Coincident: Vertex - Vertex	On	1.0000	0.001 m	(0.000, 0.000, 0.001) m
1	Station-003 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.001 m	(0.000, 0.000, -0.001) m
4	Station-002 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.002 m	(0.002, 0.001, 0.000) m
4	Station-003 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.002 m	(0.002, 0.001, 0.000) m
5	Station-001 S...	Station-002 S...	Coincident: Vertex - Vertex	On	1.0000	0.002 m	(0.000, -0.001, 0.002) m
5	Station-002 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.003 m	(0.002, -0.001, 0.000) m
3	Station-001 S...	Station-002 S...	Coincident: Vertex - Vertex	On	1.0000	0.003 m	(0.003, 0.000, 0.000) m
3	Station-002 S...	Station-003 S...	Coincident: Vertex - Vertex	On	1.0000	0.003 m	(-0.003, 0.001, 0.000) m
5	Station-001 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.003 m	(0.002, 0.000, 0.002) m
1	Station-001 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.003 m	(0.001, -0.002, 0.003) m
1	Station-001 S...	Station-002 S...	Coincident: Vertex - Vertex	On	1.0000	0.004 m	(0.001, -0.002, 0.003) m
3	Station-001 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.004 m	(-0.004, 0.001, 0.000) m
1	Station-001 S...	Station-003 S...	Coincident: Vertex - Vertex	On	1.0000	0.004 m	(0.002, -0.001, 0.004) m
3	Station-003 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.004 m	(-0.004, 0.000, 0.001) m
4	Station-001 S...	Station-004 S...	Coincident: Vertex - Vertex	On	1.0000	0.005 m	(-0.001, 0.002, -0.004) m
4	Station-001 S...	Station-003 S...	Coincident: Vertex - Vertex	On	1.0000	0.005 m	(-0.002, 0.001, 0.004) m
4	Station-001 S...	Station-002 S...	Coincident: Vertex - Vertex	On	1.0000	0.005 m	(-0.002, 0.001, -0.005) m
3	Station-002 S...	Station-004 S...	Coincident: Vertex - Vertex	Off	1.0000	0.007 m	(-0.007, 0.001, 0.000) m

10 Freeze registration Visually check data When you are satisfied with the quality of your registration errors you can “freeze” this. On Registration window, Registration > Create ScanWorld/Freeze Registration (This locks in your registration for this modelspace and can't be changed) Registration/ Create and Open model space Visually inspect data ** Tanapon – Add how to navigate instructions here Maybe a link to a video or refer to complete training manual with C10 Quickstart ~pp 42 Edit preferences/ point cloud/ check Load: Max points 70(million)/ Display: Max points 25(million) (This sets up the density of point cloud data) OK Check data overall Tools/scanner/Scanworld Explorer Click Apply Scanworld Colour to Scans and colourise adjacent scans. (The different colours relate to the different scan setups) Close



11	Unify data	<p><i>We want to create a combined scanworld of all scans. This is called a Unified model. But we do not want to lose our original data. So we make a duplicate copy.</i></p> <p>In the Cyclone Navigator</p> <p>Right Click on "ModelSpace 1" > Copy Save in ModelSpaces folder Rename it "Unified model"</p> <p><i>Now...</i></p> <p>Right Click on "Copy of ModelSpace 1" > Rename name it "Unified model"</p> <p><i>We want to parse excess points in the unified model space...</i></p> <p>Right Click on "Unified model" > Unify ModelSpace...</p> <p><i>On Unify Cloud window,</i> Check on "Reduce Cloud: Average Point Spacing" Change it to about 0.003 m Unify</p> <p><i>This takes a few minutes.</i></p> <p>You can click on Tools/Scanner/ Scanworld Explorer and click on/off scans to prove it is unified (ie all scans the same colour)</p>	
12	Open Model Space	<p>Right Click on Unified model > Create and Open ModelSpace View</p>	
13	Create Truview	<p><i>You now have a model space that you can view because you have Cyclone installed on your machine. But imagine that you were asked to perform a scan for a client who does not have Cyclone software. Please see the instructions on how to produce a Truview product that clients can view easily for free on their own machine.</i></p>	