

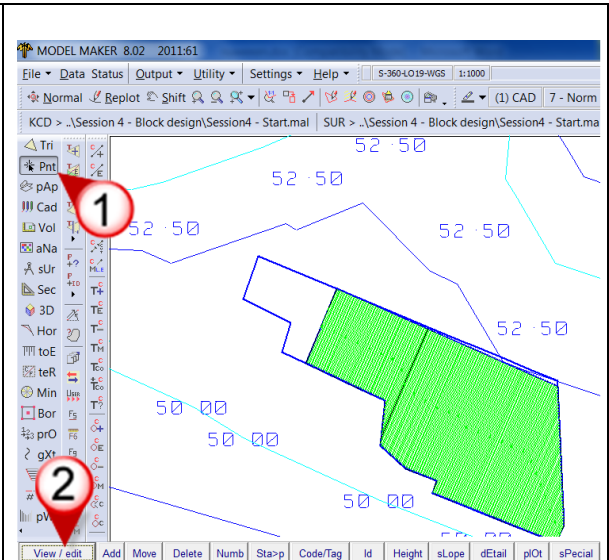
How to shift and rotate old projects to new GPS co-ordinates

With the invention of GPS systems and Google Earth and Model Maker's ability to utilize these technologies it is happening more and more that old irrigation projects which was surveyed on a local co-ordinate system need to be moved to the new GPS co-ordinates.

In this feature I will explain how this can be achieved with Model Maker. This method can also be use full for shifting only survey points and/or CAD. This procedure is not necessarily only applicable to irrigation systems.

Step 1: Choose two points or positions (A and B) on your local survey and make a note of their Y,X and Z values. You can use (1) pNt (2) View/Edit then select the point on screen to view the co-ordinates.

Tip: we use two points so that we can perform a rotation if needed. If your survey is already north rotated, you can work with only one point because a rotation will not be necessary.



Step 2: Use your GPS to measure the same two points in the field and make a note of the YXZ values of the GPS co-ordinates. Calculate the DY,DX and DZ differences for the first point (refer to Table 1). The DY and DX values will be used to apply the shift and the DZ will be used to apply an elevation adjustment.

POINT A				POINT B			
	Y	X	Z		Y	X	Z
Local	125.45	325.25	52.5		325.865	475.634	52.76
GPS	-83538.653	3745984.343	526.25		-83776	3746065	526.51

Y (Local)	Y (GPS)	DY = Y(GPS)-Y(Local)
125.45	-83538.653	-83664.103
X (Local)	X (GPS)	DX = X(GPS)-X(Local)
325.25	3745984.343	3745659.093
Z (Local)	Z (GPS)	DZ = Z(GPS)-Z(Local)
52.5	526.25	473.75

Direction DDD.MMSS	
A-B(GPS)	233.07'00"
A-B(Local)	108.39'28"
Rotation:	124.27'32"

Table 1

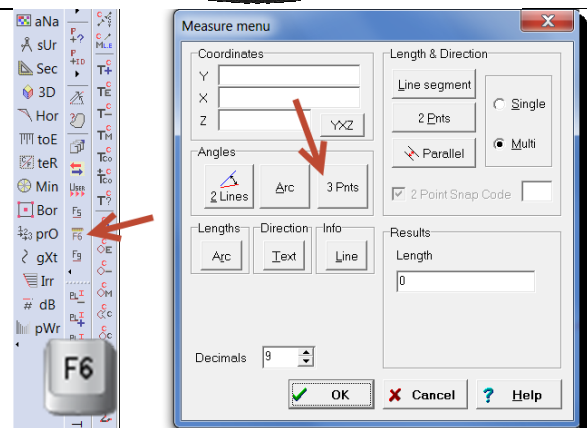
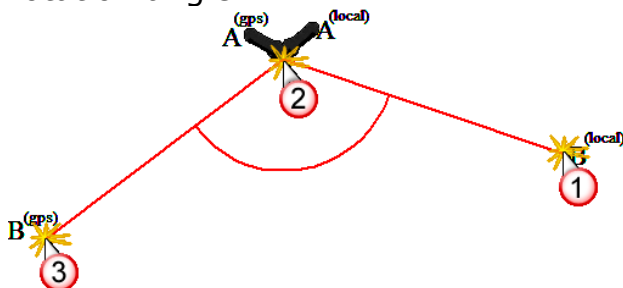
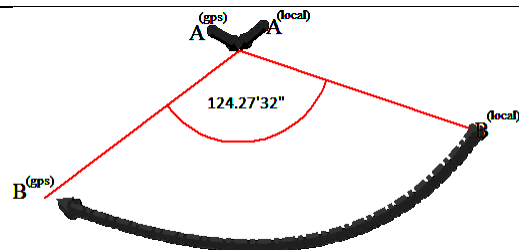
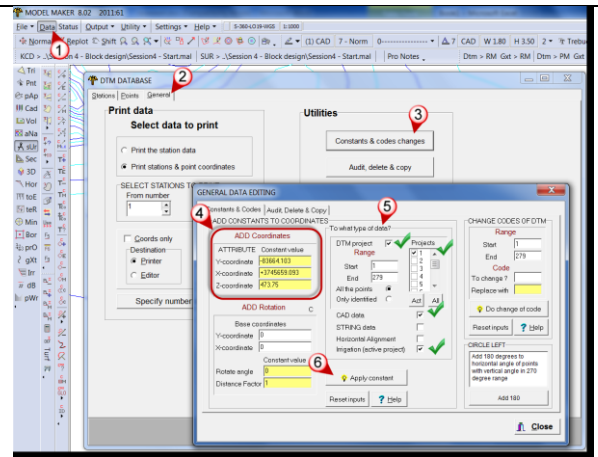
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T INT +27 21 975 7043
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Step 3: Apply the shift on all the **local** survey data in the project using the DY, DX and DZ values as follows: (1) Click on Data (2) General (3) Constants and code changes (4) enter the DY, DX and DZ constants (6) select to what type of data you want to apply the constant (6) Apply the constant.

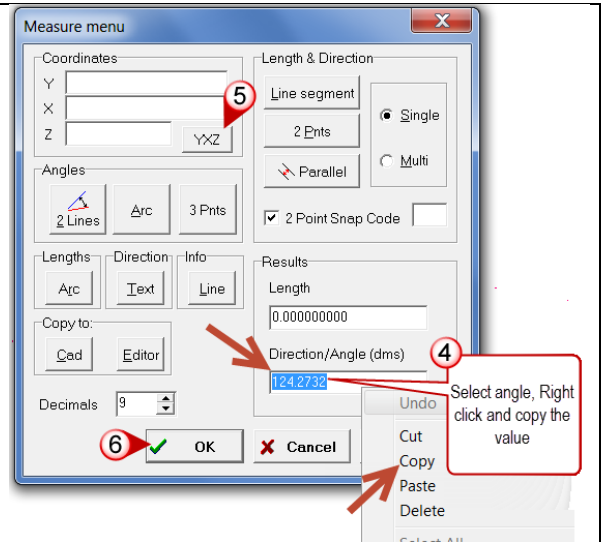
Tip: Now you will notice A(gps) and A(Local) will have the same YX co-ordinates, if this is not the case, you might have applied the constants incorrectly. You may have added instead of subtracting values or vice versa.

Info: If your survey is also rotated incorrectly, you can at this point calculate a rotation angle between the 3 points B(local) to A(gps/local) to B(gps) as follows:

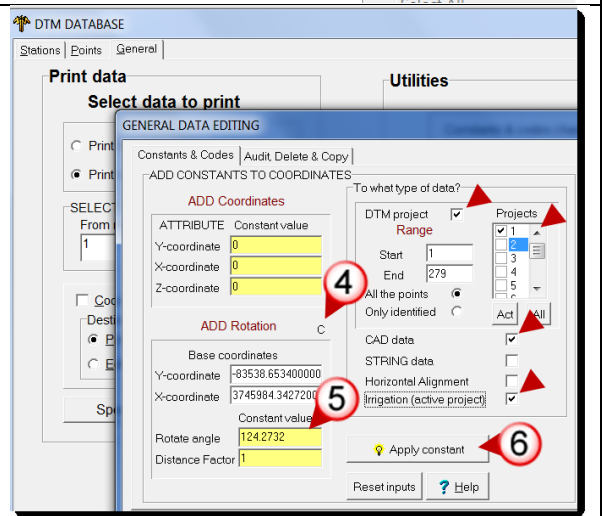
Step 4: To determine the rotation angle in Model Maker, use the F6 key on your keyboard. Select the 3 point method then click on the three points that define the rotation angle.



The Measure menu will be displayed again. (4) select the angle value, right click, and press the copy button. (the value will go to your clipboard ready for later use). Then click the (5) YXZ button and select the common point (point A(gps)=A(local)) on screen, then click (6) OK. The co-ordinates will be used in the next step.



Step 5: To apply the rotation repeat the first part of step 3; (1) Click on Data (2) General (3) Constants and code changes, (4) click on the "C" button (5) right click and paste the rotation angle (6) check that all the relevant data options are selected and apply the constant.



That is it for this feature. In some cases (although preferred and more correct) it might be impractical to go back and do a GPS survey of the two points, so in the next article, I will explain how you can use Google Earth to perform the re-positioning of an existing project.

If you don't have access to an accurate GPS system, please give me a call, I may be able to help.