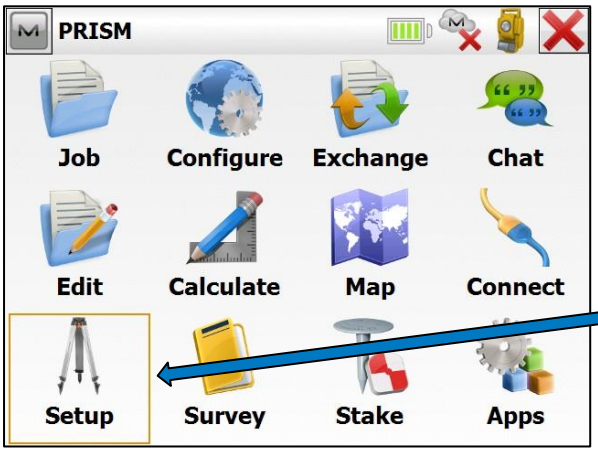
Performing a Resection in MAGNET Field

Resection (also known as 'free station') is the process of calculating instrument coordinates from at least 2 (preferably 3) known coordinated points.

The technique is commonly used when it is not possible to set up the instrument over a survey station of known coordinates.

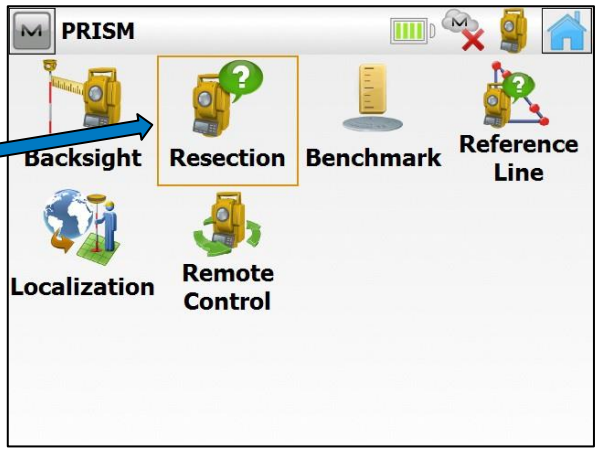


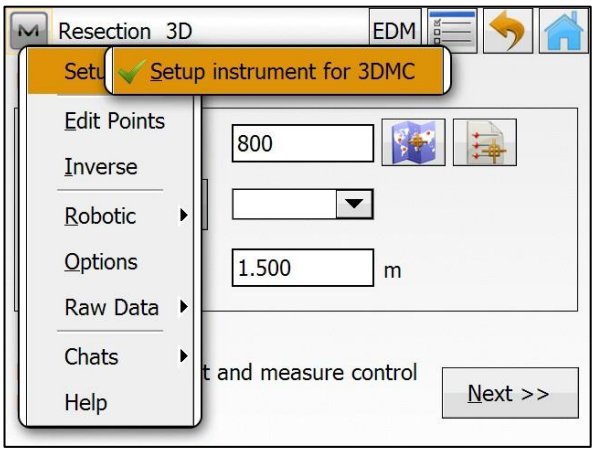
(1)

From the main MAGNET home screen, select the **Setup** menu button.

(2)

From here, select the **Resection** button.





(3)

Press the grey **MAGNET** icon in the top left corner.

Under the **Setup** option ensure **Setup for 3DMC** is **NOT** ticked (this option is only needed when using the instrument for machine control).

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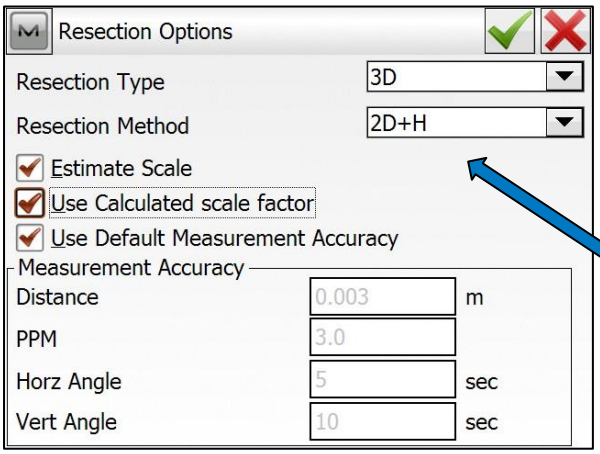


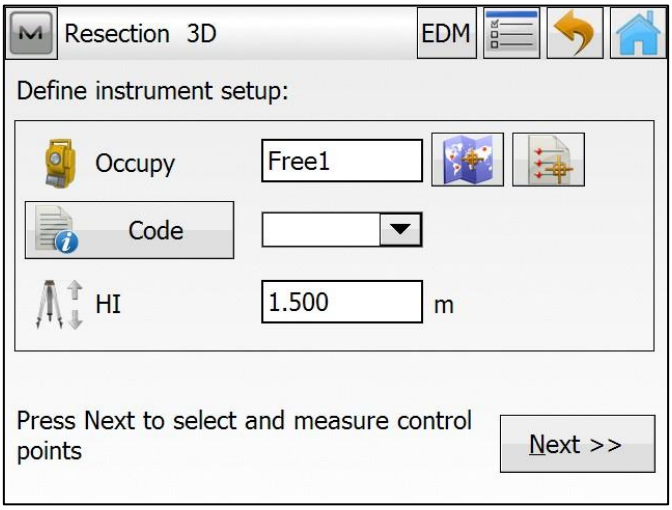
(4)

Prior to undertaking a resection, it is important to check the correct settings have been selected.

Under the same **MAGNET** menu, press the **Options** button. Set the options as illustrated on the screen to the left.

For a **3D** resection ensure **Resection Method** is set to **2D+H**.

CAUTION: *the **'Use Calculated scale factor'** option should only be used at the discretion of the end-user as in certain circumstances this can induce an error into the calculated position of the instrument. If unsure, leave this option Unchecked.*



(5)

Enter an **Occupation Point name** for the STN/Point *to be determined*. In the above case this is **'Free1'**

It is only necessary to insert the **Instrument Height (HI)** if you wish to permanently mark the spot with a peg or nail so that you can return in future. If you do not plan to return, then entering zero is acceptable.

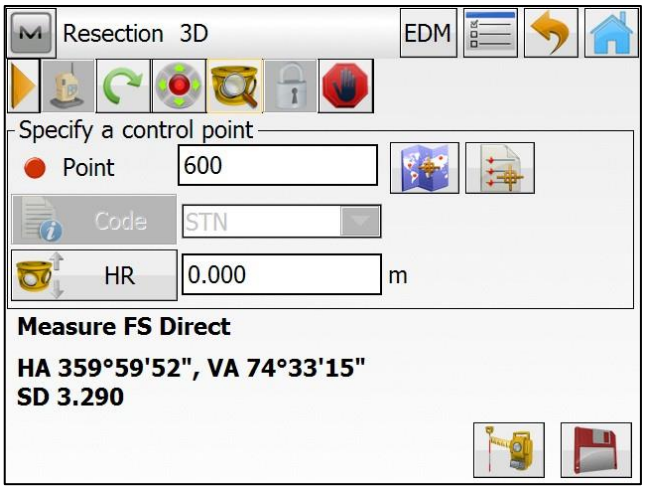
Press **Next**.

(6)

Select previously recorded control points for use in the resection from the **List/Map** menus, or insert the name of your first **known** survey station

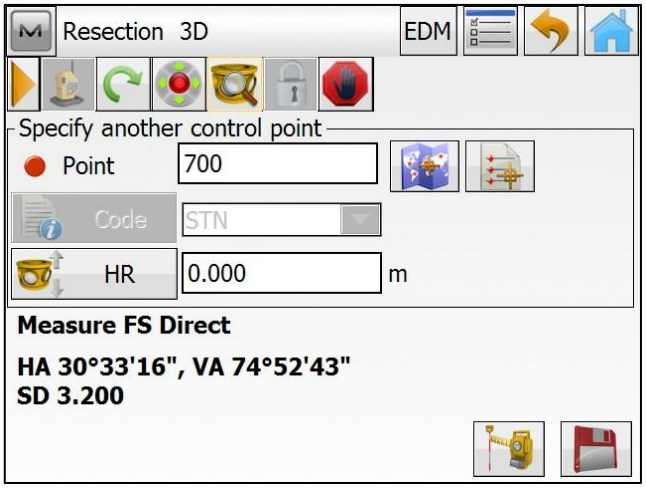
In this case it is point 600.

Set the prism over point 600 and make sure to enter the **Instrument/Prism Height** in the **HR** box.



Sight the target, or if the instrument is in Robotic mode, call up the instrument.

With the pole bubble centred, record the observation by pressing the **Store Point** button.



(7)

Enter the name of the next known **control point**- in this case it is point 700.

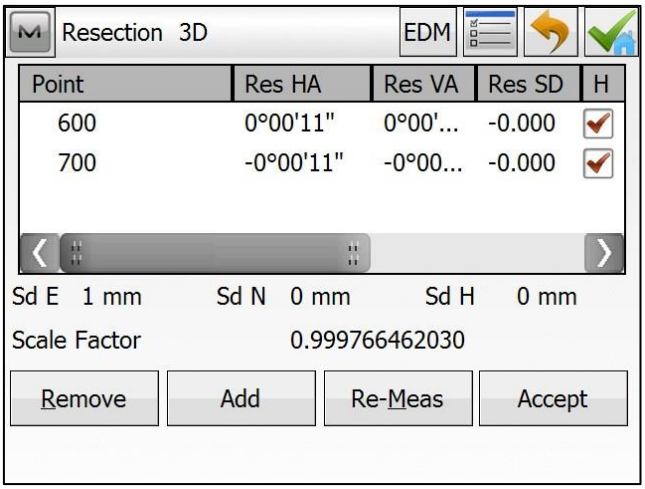
Make sure to enter the height of the prism above the control point in the **HR** box.

Again, store by pressing the **floppy disk** icon.

(8)

The screen will now change to that on the right.

This displays the current **errors** present within the resected calculated coordinates, along with a **Scale Factor**.



(9)

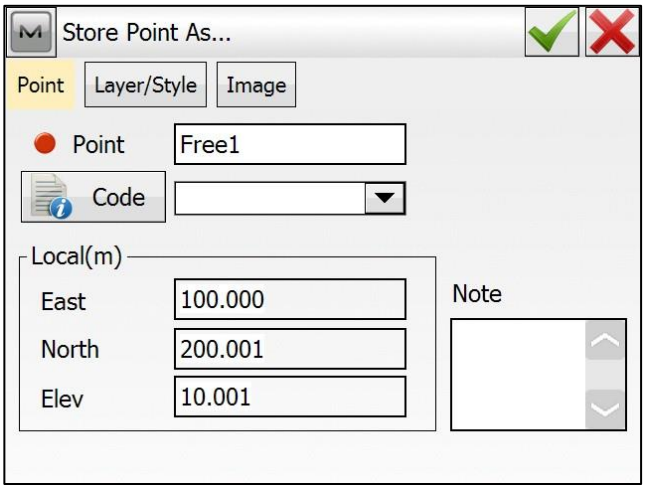
The displayed **Scale Factor** is a measure of the "quality" of the resection- it shows (on average) how the distances measured to the known points have to be scaled to obtain a good "fit". The closer this is to 1.0, the better the resection.

Pressing **Add** allows another control point to be measured. If available, it is recommended to repeat the process for ***at least three*** control points surrounding the newly occupied location for a robust resection.

The **Re-measure** option allows for a repeat measurement and overwrites the selected control point if required.

Remove lets the user delete a measurement if unhappy with the result.

If happy with the results, **Accept** the calculated coordinates.



(10)

After pressing **Accept**, the calculated coordinates can be checked and Codes and Notes added if required.

Press the **Green Tick** to save.

Once you have accepted the coordinates of your new survey station, it is good practice to check the 'quality' of the resection.

An example of this is to enter the **Stake** Points screen (home screen, select Stake then Points) and enter the known station you are nearest (in this example this would be 700). Ensure the prism pole is level and ask the software to '***Stake***' the point.

The screen will change to the **Stake-out** display and will indicate how far the instrument thinks you are away from this point. A good resection should provide results within 10 mm.