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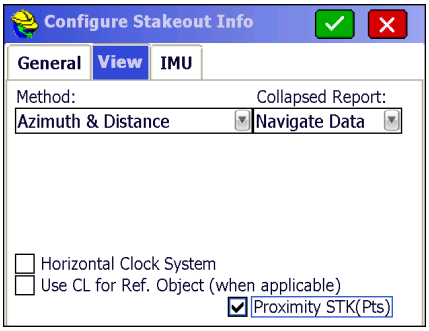
Proximity Stakeout

SurvCE 5.04 and higher brings the full power of data collector and GNSS receiver sensors together in a new ultra-efficient and highly intuitive stakeout method known as Proximity Stakeout. This feature is available on all GNSS receivers and robotic total stations.

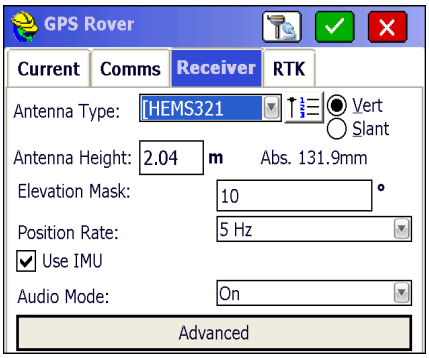
To enable the Proximity Stakeout feature you will need to tap Equip / Configure and then tap the View tab and check the box in the bottom right for "Proximity STK(Pts)". Once enabled, SurvCE will automatically use the new method of staking in all stakeout functions.



***Please Note: *Proximity stakeout is fully compatible with all existing stakeout methods and will not affect guidance directions at the bottom of the screen.*

Sensor Configuration (not required)

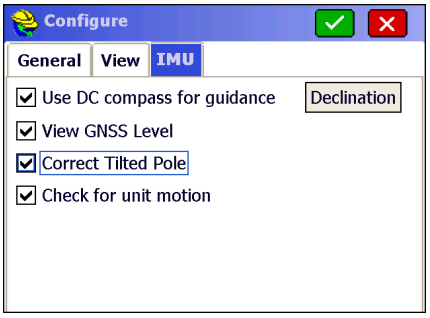
Proximity stakeout does not require tilt or compass sensors in the data collector or GNSS receiver. It is ideal though, to enable all available sensors for your hardware configuration as this will lead to the most powerful use of the new feature.



If your GNSS receiver supports tilt and/or compass, they can be enabled under Equip/GPS Rover. Enable the "Use IMU" option to allow use of the receiver sensors.

****Please Note: You will need to calibrate your receiver sensors before use by following the manufacturer's instructions.*

To choose which IMU features you would like to use in SurvCE, tap the Equip tab then select Configure and tap the IMU tab.



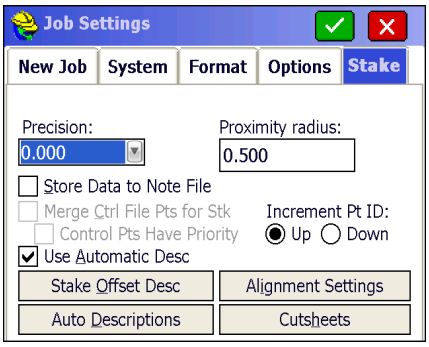
To get the most benefit from the Proximity stakeout routine it is recommended to enable all four options in the IMU tab.

- **Use DC compass for guidance** – this setting improves navigation directions by using the internal compass of data collectors if possible. It may be necessary to calibrate the internal compass of your data collector. The Magnetic Declination button allows you to confirm the calculated magnetic declination for your geographic location. Internal compass is not available on all data collectors. When not supported, SurvCE will use the GPS vector to determine navigational directions.

- **View GNSS Level** – This setting will add an e-level display overlay to the map on active survey screens, giving instant visibility to the level status of the antenna pole. This option is available for receivers with internal tilt sensors. Display of the e-level is a user preference and does not affect application of tolerances or tilt correction.
- **Correct For Tilted Pole** – For receivers with an internal compass, this option allows SurvCE to automatically correct for the tilt in the pole, accurately calculating a position on the ground.
- **Check For Unit Motion** – SurvCE automatically rejects compass readings when magnetic noise or unit motion is detected. Some users prefer to ignore the flag for unit motion as it can be distracting during stakeout. This is a user preference, and applies to limited receivers.

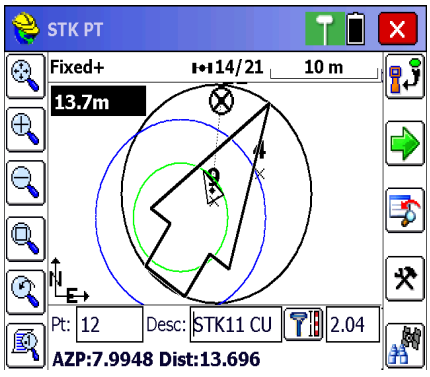
Using Proximity Stakeout

Proximity stakeout divides the task of staking out into two stages: the first stage is when the field crew is a long distance from the point and needs to navigate as quickly and directly as possible to the general vicinity of the point. The second stage is used when they are very close to the point. In this stage, the field crew has stopped walking and needs final left/right and in/out directions to precisely locate the point.



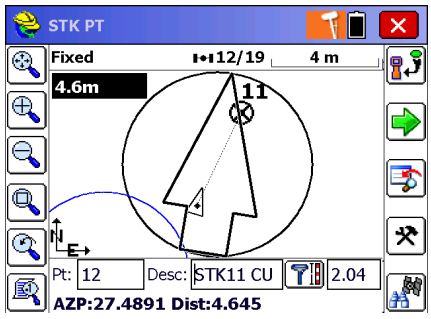
The point of transition between these two modes can be configured under File / Job Settings in the Stake tab. For most users, about 0.5 meters (~1.50 feet) is an ideal radius.

The first stage (navigation mode) of proximity stakeout is shown in the image to the right. In this example, the field crew is in Survey / Stake Points, and is trying to locate the point they have selected.



The black box in the upper left hand corner shows the current distance to the stakeout point (13.7m). The large arrow uses the internal compass to point directly toward the stakeout point at all times. The user must simply walk in the direction of that arrow to reach his point. The small triangle shows the current direction of motion. When the triangle aligns with the large arrow, the user is moving directly toward the stakeout point.

In the image to the right, the field crew is walking quickly toward the point. The orange sensor status icon in the top bar accurately indicates that motion is detected in the compass of the receiver, and the e-level also shows that the pole is very tilted.



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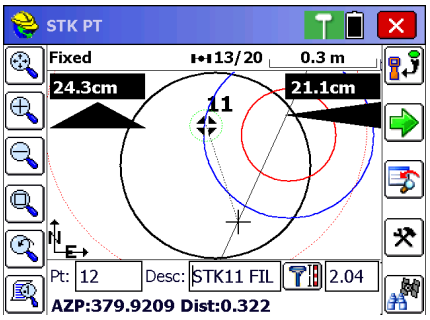
When the field crew gets within the Proximity stakeout radius and slows down, SurvCE shifts into the 2nd stage of the stakeout (proximity mode). At this point, the user needs clear and precise directions to the point.

In the 2nd stage of stakeout, the large arrow disappears and small black triangles are displayed in the upper corners of the map. The triangles indicate that is necessary to move the pole 24.3cm forward and 21.1cm to the left to reach the point.



Note that the sensor icon in the top bar is now green, though the e-level is showing out of level.

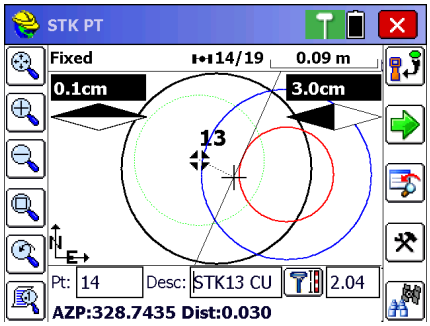
This means that the software is now calculating the position on the ground using the known tilt of the receiver. This is really efficient for stakeout because it is no longer necessary to fully level the pole to get accurate directions to the point. The directions are always relative to the tip of the pole on the ground, regardless of where it is tilted. This allows SurvCE to offer more accurate directions with less effort from the field crew when sensors are available.

When the user reaches the stakeout tolerance on the point, the arrows change into a diamond shape to indicate that the user is now accurately positioned.

In the image to the right, the appearance of two triangles on the left (the diamond) indicates that the point is 1cm forward, but within stakeout tolerance.

The diamond on the right indicates that the point is 3cm to the left, but within stakeout tolerance.

In the case of using a very accurate and stable instrument like a high-precision robotic Total station, the diamonds would turn totally black when the point is located to within 1mm.



In this last image the e-level is off center, which indicates that the pole is tilted, but the green icon at the top lets the user know that the incline will be accounted for in the software.

The field crew can either store the point immediately, or manually level the pole before storing, if they would like although it is not necessary for receivers with tilt correction support.

For more information on the sensor icon in the top bar, and to fully understand use of IMU receiver sensors in SurvCE, please refer to Carlson Knowledge Base article # 1053:
http://www.carlsonsw.com/support/knowledge-base/?action=display_topic&topic_id=1053