

## Leica Captivate: Measure plane/grid

This guide covers the functions available in the Measure plane/grid application within Leica Captivate.

It covers three aspects of the application:

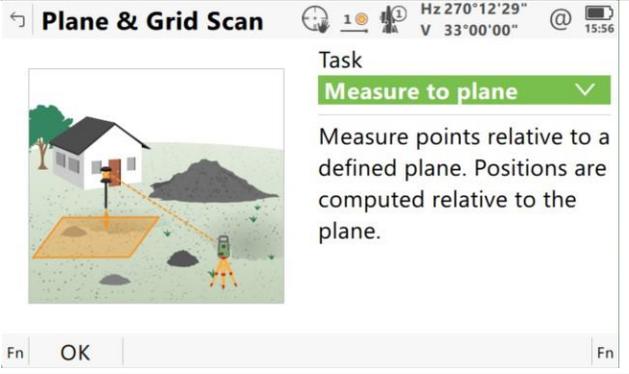
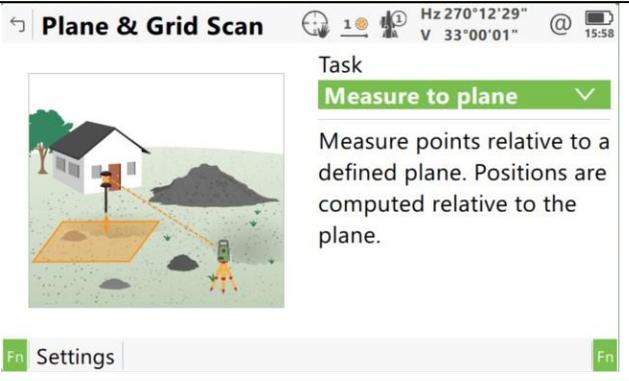
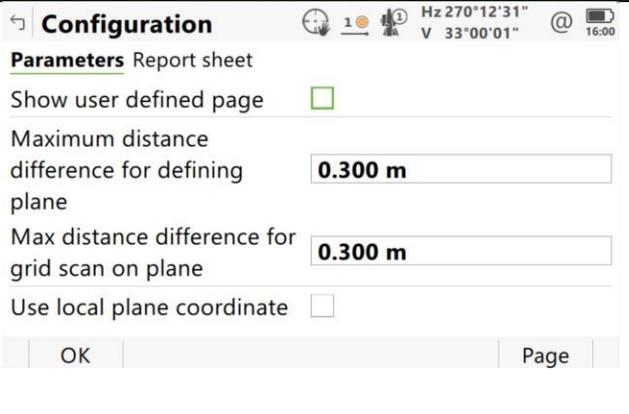
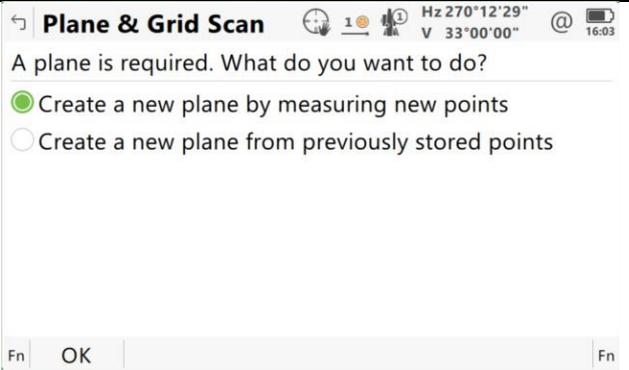
1. **Measure to Reference Plane.** Allows you to define and visualize a position in relation to a predefined plane.
2. **Grid Scan to a plane.** Automatically measure a grid of points on a plane you can define.
3. **Grid Scan to a surface.** Define a measurement area using a polygon or rectangle, then capturing a grid of points.

For more details on the application please consult the Captivate Technical Reference Manual

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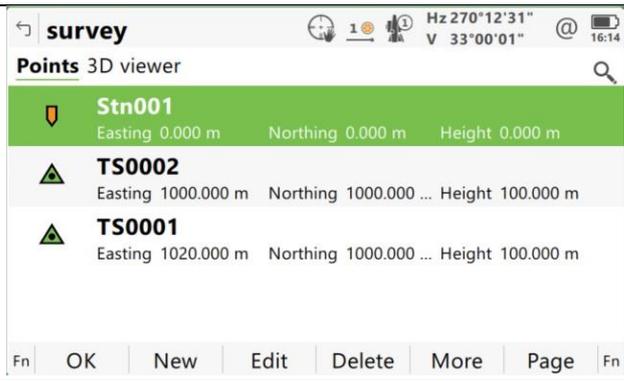
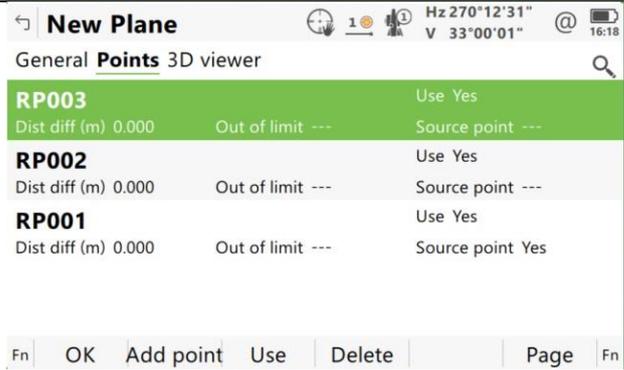
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<p>1</p>	<p><b>Measure to Plane</b></p> <p>Open the <b>Measure plane/grid</b> app then select Measure to plane and <b>F1 OK</b></p>	
<p>1. 1</p>	<p>To edit some of the settings for the program press the <b>Fn</b> key. Then Press <b>F1 Settings</b></p>	
<p>1. 2</p>	<p>This allows the user to add an additional display screen to the application from the survey application.</p> <p>Set a tolerance for how well the points defining the plane fit to it</p> <p>Whether to use a local coordinate grid (tick) or be in the same grid as the</p>	
<p>2</p>	<p>Choose the option that suits. In this case select the option to Create a new plane by from previously measured points. <b>F1 OK</b></p> <p>If you choose to measure new points you will be taken to the measure screen.</p>	

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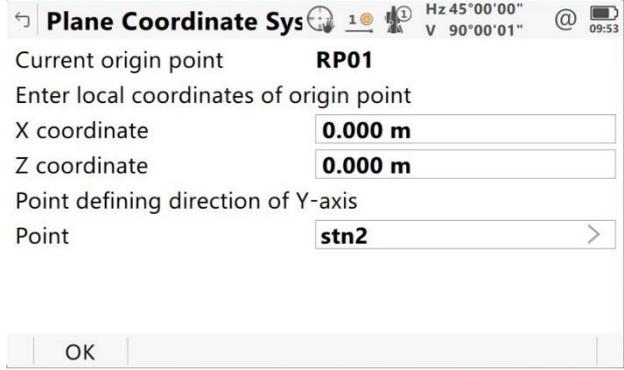
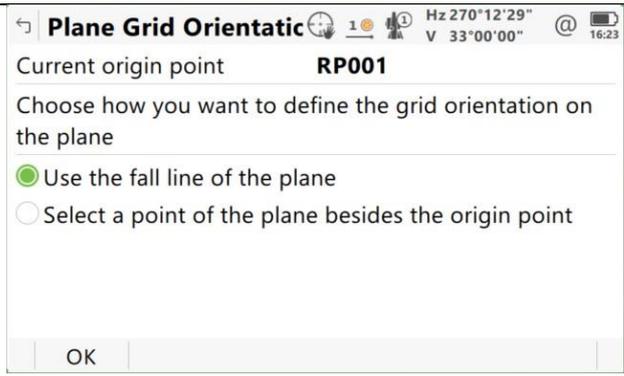
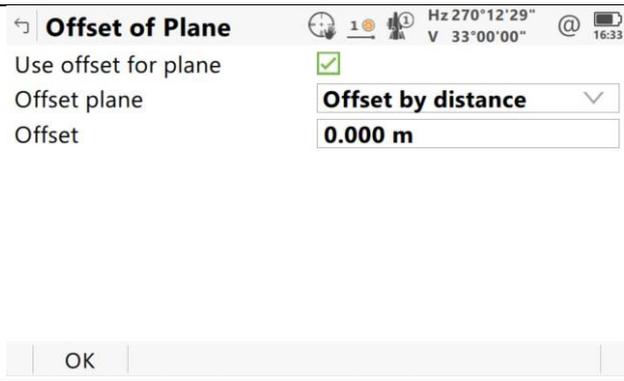
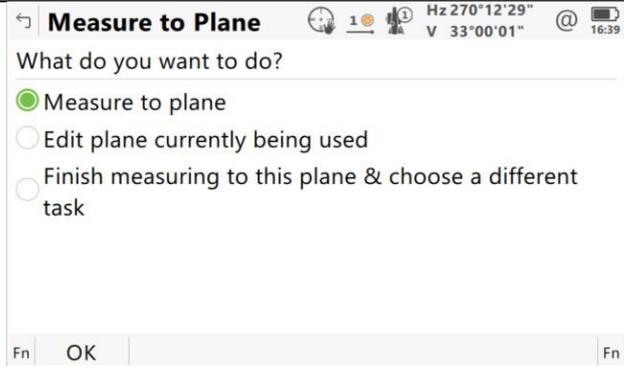
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<p><b>3</b></p>	<p>Give the reference plane a name. <b>F1 OK</b></p>																	
<p><b>4</b></p>	<p>In the point tab select <b>F2 Add Point</b>.</p>																	
<p><b>5</b></p>	<p>Select the point from the list of points available. Click on <b>F1 OK</b> to select the highlighted point. <b>NB:</b> These can be previously measured or keyed into the active working job.</p>																	
<p><b>6</b></p>	<p>Repeat steps 6 and 7 until the reference plane is defined. <b>N.B.</b> it is possible to change the origin point of the plane by highlighting the intended origin point, pressing the Fn key and selecting <b>Origin</b></p>	 <table border="1" data-bbox="847 1368 1471 1738"> <thead> <tr> <th>Point ID</th> <th>Dist diff (m)</th> <th>Out of limit</th> <th>Source point</th> </tr> </thead> <tbody> <tr> <td><b>RP003</b></td> <td>0.000</td> <td>Out of limit ---</td> <td>Use Yes</td> </tr> <tr> <td><b>RP002</b></td> <td>0.000</td> <td>Out of limit ---</td> <td>Use Yes</td> </tr> <tr> <td><b>RP001</b></td> <td>0.000</td> <td>Out of limit ---</td> <td>Use Yes</td> </tr> </tbody> </table>	Point ID	Dist diff (m)	Out of limit	Source point	<b>RP003</b>	0.000	Out of limit ---	Use Yes	<b>RP002</b>	0.000	Out of limit ---	Use Yes	<b>RP001</b>	0.000	Out of limit ---	Use Yes
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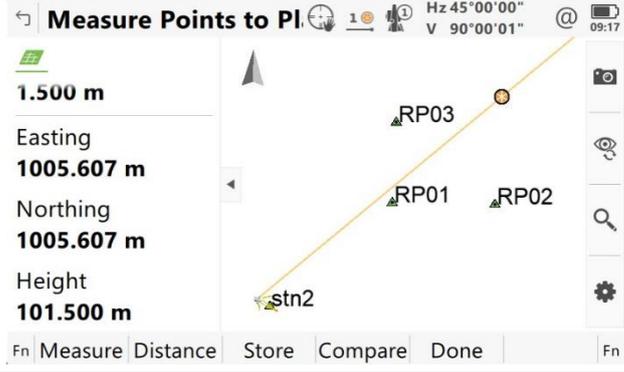
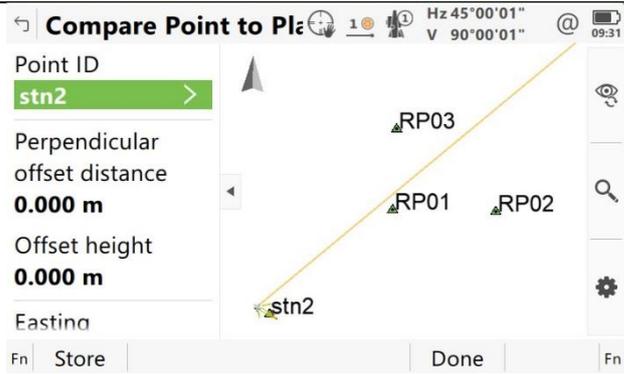
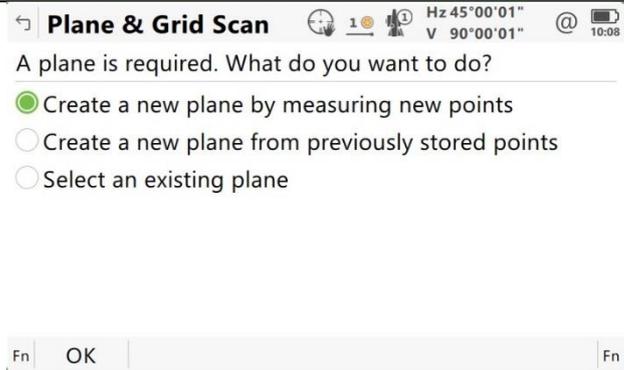
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<p><b>6b</b></p>	<p>If you selected the option to use a local plane coordinate system you will get the option to define that coordinate system here.</p> <p>This will let you define new coordinates for the points within your plane.</p>	 <p><b>Plane Coordinate Sys</b> Hz 45°00'00" V 90°00'01" 09:53</p> <p>Current origin point <b>RP01</b></p> <p>Enter local coordinates of origin point</p> <p>X coordinate <b>0.000 m</b></p> <p>Z coordinate <b>0.000 m</b></p> <p>Point defining direction of Y-axis</p> <p>Point <b>stn2</b></p> <p>OK</p>
<p><b>7</b></p>	<p>The next page lets you define the orientation of the grid. Either by using the fall line of the current origin point or by selecting another point on the plane other than the origin point.</p> <p>The fall line of the plane is the curve following the steepest slope. It is always orthogonal to the contour lines.</p>	 <p><b>Plane Grid Orientatic</b> Hz 270°12'29" V 33°00'00" 16:23</p> <p>Current origin point <b>RP001</b></p> <p>Choose how you want to define the grid orientation on the plane</p> <p><input checked="" type="radio"/> Use the fall line of the plane</p> <p><input type="radio"/> Select a point of the plane besides the origin point</p> <p>OK</p>
<p><b>8</b></p>	<p>The next option allows you to set an offset to the plane you are working with.</p> <p>Offsets are set on the Z axis of the plane</p>	 <p><b>Offset of Plane</b> Hz 270°12'29" V 33°00'00" 16:33</p> <p>Use offset for plane <input checked="" type="checkbox"/></p> <p>Offset plane <b>Offset by distance</b></p> <p>Offset <b>0.000 m</b></p> <p>OK</p>
<p><b>9</b></p>	<p>The final set of options allow you to move on to measuring relative to the plane, edit the plane or finish the task.</p> <p>Select <b>Measure to the plane</b>.</p>	 <p><b>Measure to Plane</b> Hz 270°12'29" V 33°00'01" 16:39</p> <p>What do you want to do?</p> <p><input checked="" type="radio"/> Measure to plane</p> <p><input type="radio"/> Edit plane currently being used</p> <p><input type="radio"/> Finish measuring to this plane &amp; choose a different task</p> <p>Fn OK Fn</p>

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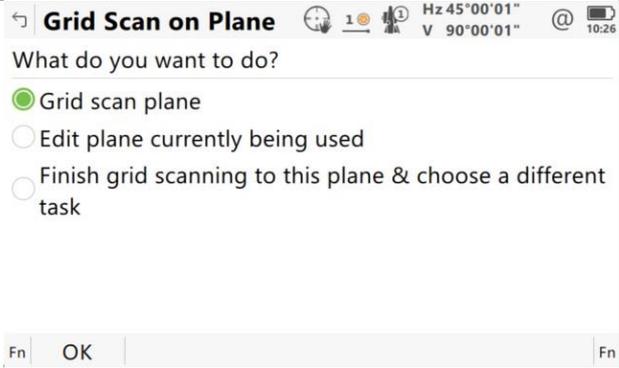
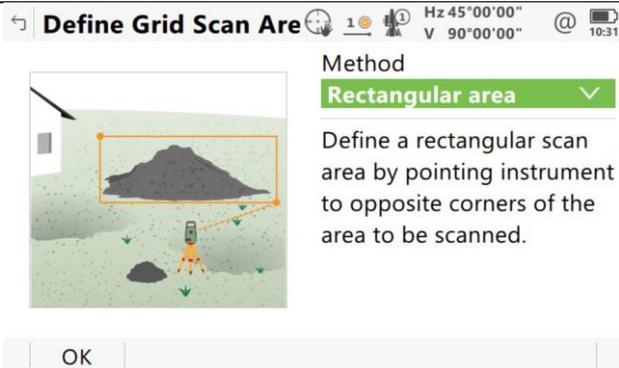
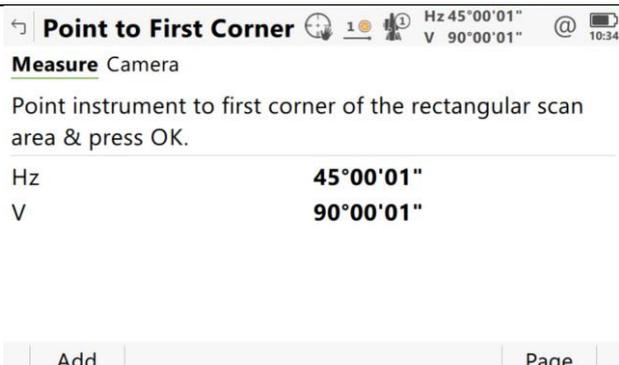
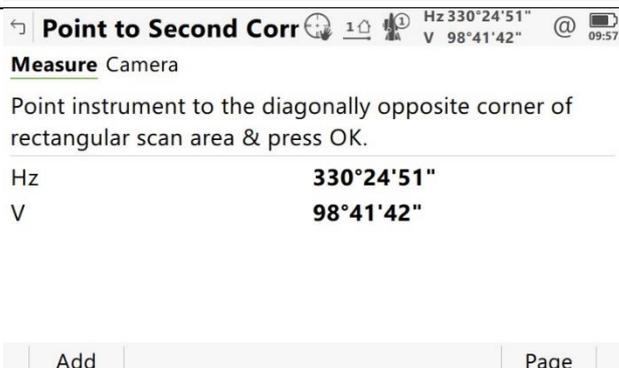
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<p><b>10</b></p>	<p>In the following screen you can start measuring positions relative to the plane you have created. As in the Measure App the <b>Measure</b> button will measure and store the point and <b>Distance</b> will take a reading but not record the result.</p>	
<p><b>11</b></p>	<p><b>Compare</b> (F4) lets you compare previously stored points to the plane you have just created.</p>	
<p><b>12</b></p>	<p><b>Grid Scan on a Plane</b></p> <p>Lets you measure a regular grid of points on an area defined by a plane.</p> <p>Open the <b>Measure plane/grid</b> app and select <b>Grid scan on plane</b>.</p>	
<p><b>13</b></p>	<p>The first task is to define your plane either by measuring new points on the surface or selecting them from points you have already measured.</p>	

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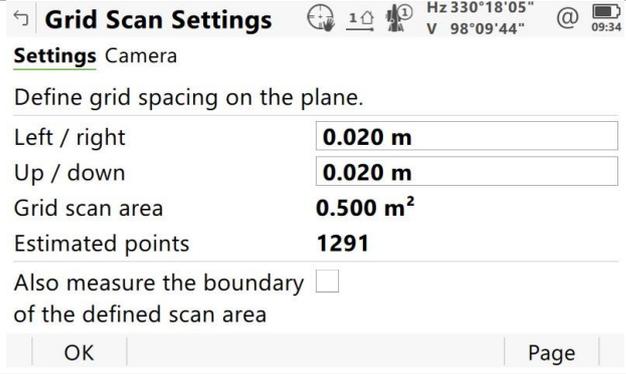
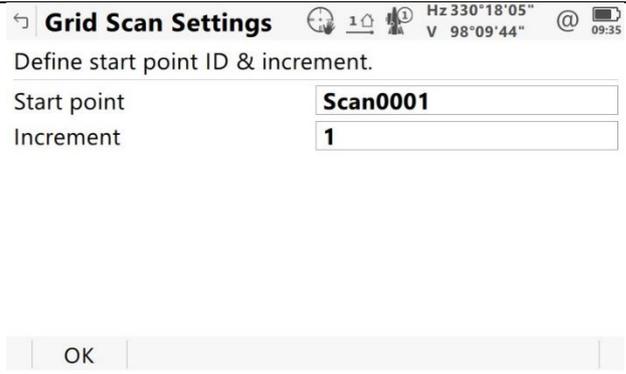
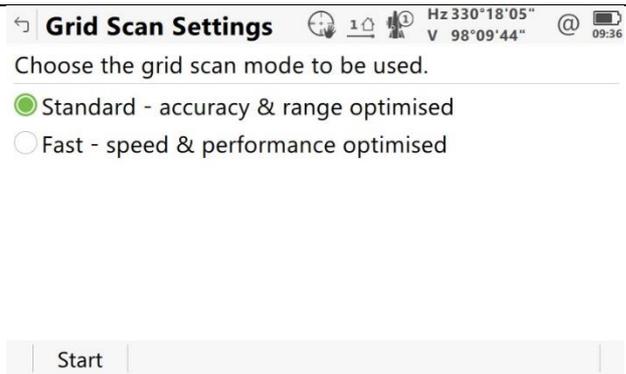
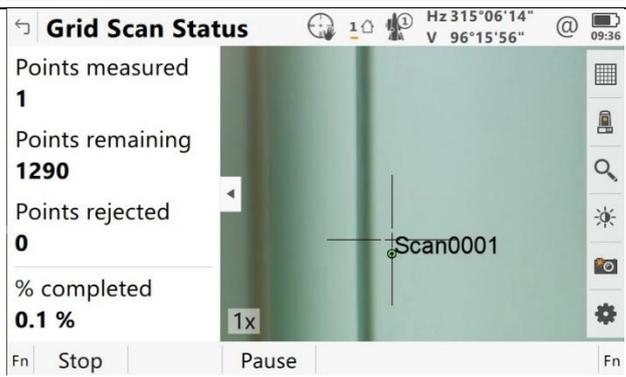
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<p><b>14</b></p>	<p>Once you have established your plane the next option is to either edit the plane you just created or actually start your grid scan.</p>	 <p><b>Grid Scan on Plane</b> Hz 45°00'01" V 90°00'01" 10:26</p> <p>What do you want to do?</p> <ul style="list-style-type: none"> <li><input checked="" type="radio"/> Grid scan plane</li> <li><input type="radio"/> Edit plane currently being used</li> <li><input type="radio"/> Finish grid scanning to this plane &amp; choose a different task</li> </ul> <p>Fn OK Fn</p>
<p><b>15</b></p>	<p>There are two methods to set the area within the grid you want to scan.</p> <p>Rectangular area requires you measure two points to define an area.</p> <p>Polygonal area allows you to define an area using more measured points.</p>	 <p><b>Define Grid Scan Area</b> Hz 45°00'00" V 90°00'00" 10:31</p> <p>Method <b>Rectangular area</b> ▾</p> <p>Define a rectangular scan area by pointing instrument to opposite corners of the area to be scanned.</p> <p>OK</p>
<p><b>16</b></p>	<p>For example, selecting the Rectangular area will get you to the screen opposite. Point the TS to the top right of the area you want to measure then select F1 Add.</p> <p>Your measurement area needs to be within the area of your plane. So it is important to create your plane to be larger than the area you want to measure</p>	 <p><b>Point to First Corner</b> Hz 45°00'01" V 90°00'01" 10:34</p> <p><b>Measure</b> Camera</p> <p>Point instrument to first corner of the rectangular scan area &amp; press OK.</p> <p>Hz <b>45°00'01"</b> V <b>90°00'01"</b></p> <p>Add Page</p>
<p><b>17</b></p>	<p>Once you have added the top right point, you can measure in the bottom left corner of your rectangle.</p> <p>Add this to define your area</p>	 <p><b>Point to Second Corner</b> Hz 330°24'51" V 98°41'42" 09:57</p> <p><b>Measure</b> Camera</p> <p>Point instrument to the diagonally opposite corner of rectangular scan area &amp; press OK.</p> <p>Hz <b>330°24'51"</b> V <b>98°41'42"</b></p> <p>Add Page</p>

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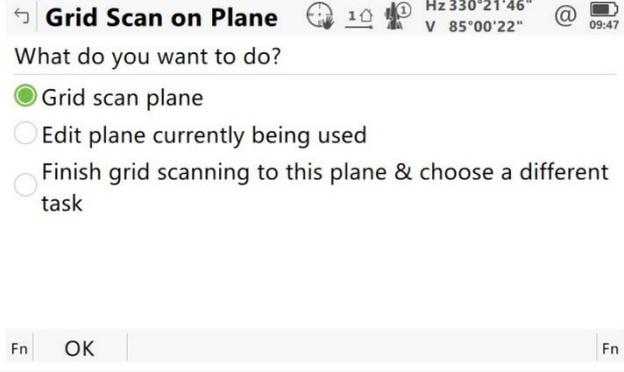
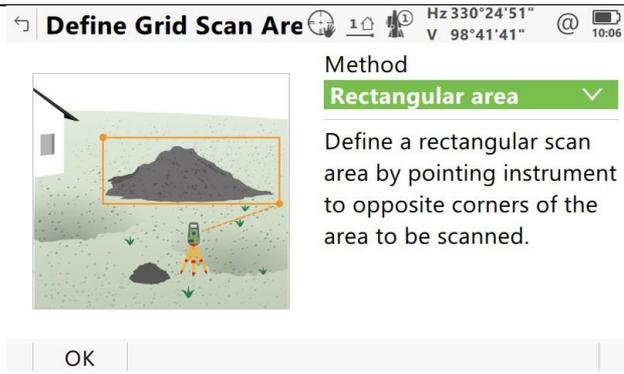
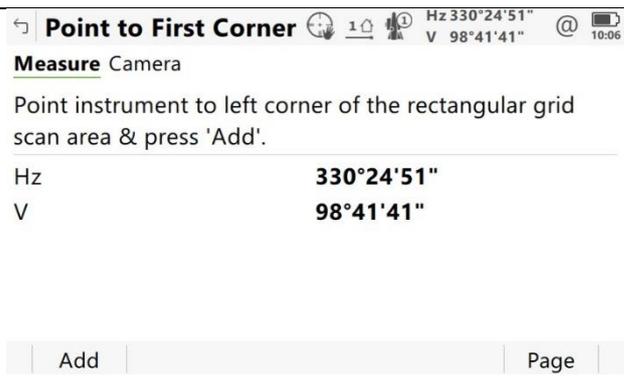
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<p><b>18</b></p>	<p>Once you define the area of the grid to survey you then need to define the spacing of the measurements within that area.</p>	 <p><b>Grid Scan Settings</b> Camera          Define grid spacing on the plane.          Left / right <b>0.020 m</b>          Up / down <b>0.020 m</b>          Grid scan area <b>0.500 m<sup>2</sup></b>          Estimated points <b>1291</b>          Also measure the boundary of the defined scan area <input type="checkbox"/>          OK Page</p>
<p><b>19</b></p>	<p>You can then define the point ID for the scan points as well as the increment in number.</p>	 <p><b>Grid Scan Settings</b>          Define start point ID &amp; increment.          Start point <b>Scan0001</b>          Increment <b>1</b>          OK</p>
<p><b>20</b></p>	<p>Then you can set the grid scan mode.           Standard – will use a single measurement and is optimised for accuracy           Fast – Will use a continuous measurement mode and is optimised for speed.</p>	 <p><b>Grid Scan Settings</b>          Choose the grid scan mode to be used.  <input checked="" type="radio"/> Standard - accuracy &amp; range optimised  <input type="radio"/> Fast - speed &amp; performance optimised          Start</p>
<p><b>21</b></p>	<p>The TS will then begin measuring the points within the grid.</p>	 <p><b>Grid Scan Status</b>          Points measured <b>1</b>          Points remaining <b>1290</b>          Points rejected <b>0</b>          % completed <b>0.1 %</b>          Stop Pause</p>

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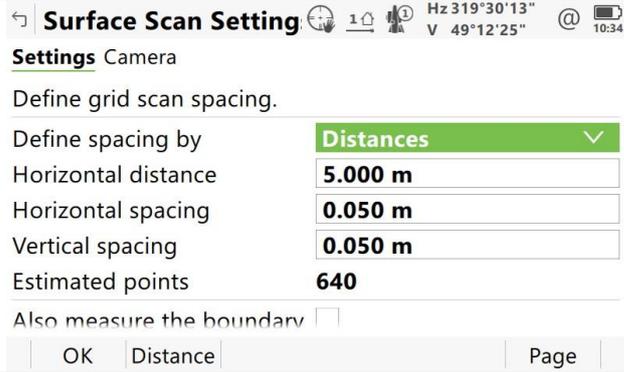
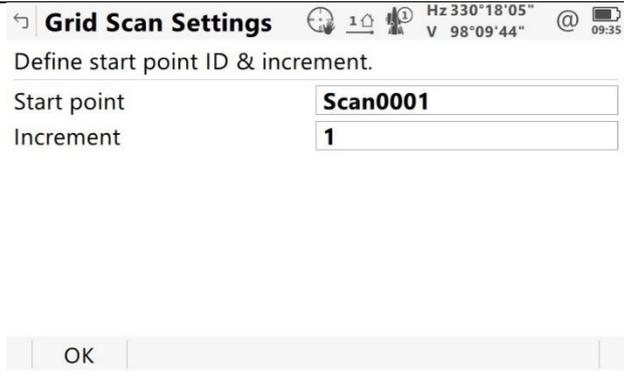
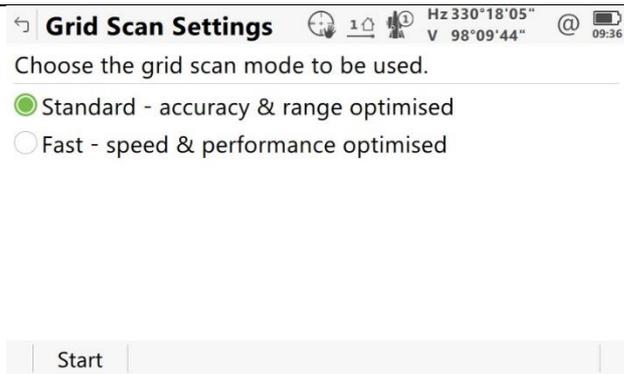
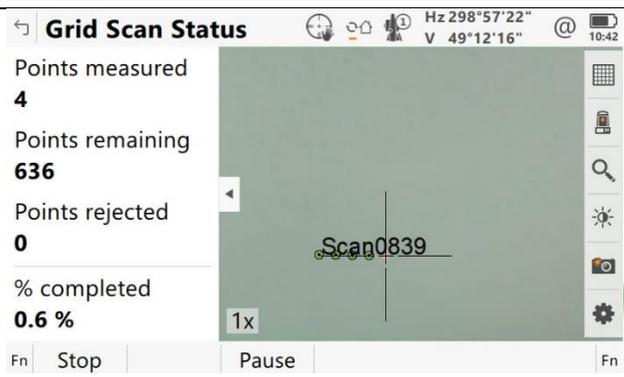
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<p><b>22</b></p>	<p>Once completed the app will ask you if you want to measure another grid on the plane, edit the plane you are using or move onto a different task.</p>	 <p><b>Grid Scan on Plane</b> Hz 330°21'46" V 85°00'22" 09:47</p> <p>What do you want to do?</p> <ul style="list-style-type: none"> <li><input checked="" type="radio"/> Grid scan plane</li> <li><input type="radio"/> Edit plane currently being used</li> <li><input type="radio"/> Finish grid scanning to this plane &amp; choose a different task</li> </ul> <p>Fn OK Fn</p>
<p><b>23</b></p>	<p><b>Grid Scan to Surface</b></p> <p>Similar to grid scan on a plane, grid scan to a surface lets you automatically measure a grid of points but this time without setting a reference plane first</p>	 <p><b>Plane &amp; Grid Scan</b> Hz 330°24'51" V 98°41'41" 10:05</p> <p>Task</p> <p><b>Grid scan on surface</b> ▾</p> <p>Grid scan a regular grid of points on any surface within a defined area.</p> <p>Fn OK Fn</p>
<p><b>24</b></p>	<p>Select how to define your scan area. You can use a rectangle or define a polygonal area using more measurements.</p>	 <p><b>Define Grid Scan Area</b> Hz 330°24'51" V 98°41'41" 10:06</p> <p>Method</p> <p><b>Rectangular area</b> ▾</p> <p>Define a rectangular scan area by pointing instrument to opposite corners of the area to be scanned.</p> <p>OK</p>
<p><b>25</b></p>	<p>You cannot define your surface with pre-measured points so you'll need to measure them live.</p> <p>Either measure the two points of your rectangle as before or measure your points around your polygon and select Next when you're done.</p>	 <p><b>Point to First Corner</b> Hz 330°24'51" V 98°41'41" 10:06</p> <p><b>Measure</b> Camera</p> <p>Point instrument to left corner of the rectangular grid scan area &amp; press 'Add'.</p> <p>Hz <b>330°24'51"</b></p> <p>V <b>98°41'41"</b></p> <p>Add Page</p>

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<p><b>26</b></p>	<p>Then it's time to define the spacing of your measurements. As there is no plane to work from this is slightly more tricky.</p> <p>You can either set the angular spacing between measurements or set the maximum horizontal range of your measurements then the distance spacing.</p> <p>Once you're done select OK</p>	 <p><b>Surface Scan Setting</b> Hz 319°30'13" V 49°12'25" 10:34</p> <p><b>Settings</b> Camera</p> <p>Define grid scan spacing.</p> <p>Define spacing by <b>Distances</b> ▾</p> <p>Horizontal distance <b>5.000 m</b></p> <p>Horizontal spacing <b>0.050 m</b></p> <p>Vertical spacing <b>0.050 m</b></p> <p>Estimated points <b>640</b></p> <p>Also measure the boundary <input type="checkbox"/></p> <p>OK Distance Page</p>
<p><b>27</b></p>	<p>Define your point ID and increment.</p> <p>Select OK</p>	 <p><b>Grid Scan Settings</b> Hz 330°18'05" V 98°09'44" 09:35</p> <p>Define start point ID &amp; increment.</p> <p>Start point <b>Scan0001</b></p> <p>Increment <b>1</b></p> <p>OK</p>
<p><b>28</b></p>	<p>Followed by your scan mode.</p> <p>Select Start</p>	 <p><b>Grid Scan Settings</b> Hz 330°18'05" V 98°09'44" 09:36</p> <p>Choose the grid scan mode to be used.</p> <p><input checked="" type="radio"/> Standard - accuracy &amp; range optimised</p> <p><input type="radio"/> Fast - speed &amp; performance optimised</p> <p>Start</p>
<p><b>29</b></p>	<p>And your scan will begin.</p>	 <p><b>Grid Scan Status</b> Hz 298°57'22" V 49°12'16" 10:42</p> <p>Points measured <b>4</b></p> <p>Points remaining <b>636</b></p> <p>Points rejected <b>0</b></p> <p>% completed <b>0.6 %</b></p> <p>Scan0839</p> <p>1x</p> <p>Fn Stop Pause Fn</p>

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