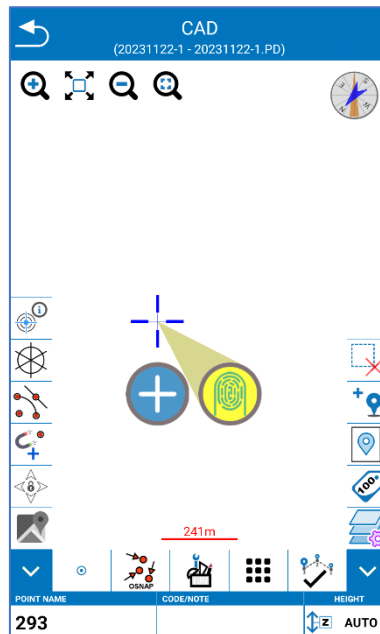


1. CAD

In the CAD environment you can use various SNAPS to draw or edit existing entities. The main CAD function are available: move, rotate, trim, scale, align, mirror and many other features described below.



In the upper right there is the icon of a yellow question mark: hold down this icon to start a contextual help that allows you to remember, always, the meaning of the icons in the CAD area. Read the instructions that appear to use the help guide.

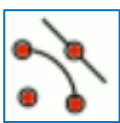
The icons in the vertical bar on the left are described below. They turn yellow when enabled.



If enabled, displays the information for the selected entity.



If enabled, hides the points symbol.



If enabled, turn on all snaps you choose.



If enabled, the cursor is automatically snapped to.

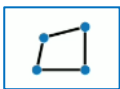


If enabled, snap the pointer to the map.

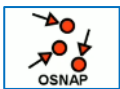


As in the survey area, enable a background map (e.g., Google).

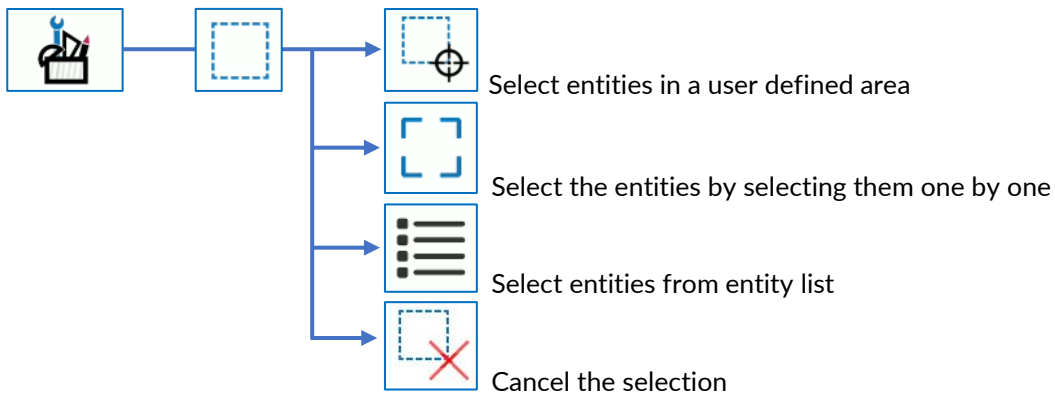
The icons in the horizontal bar are described below.



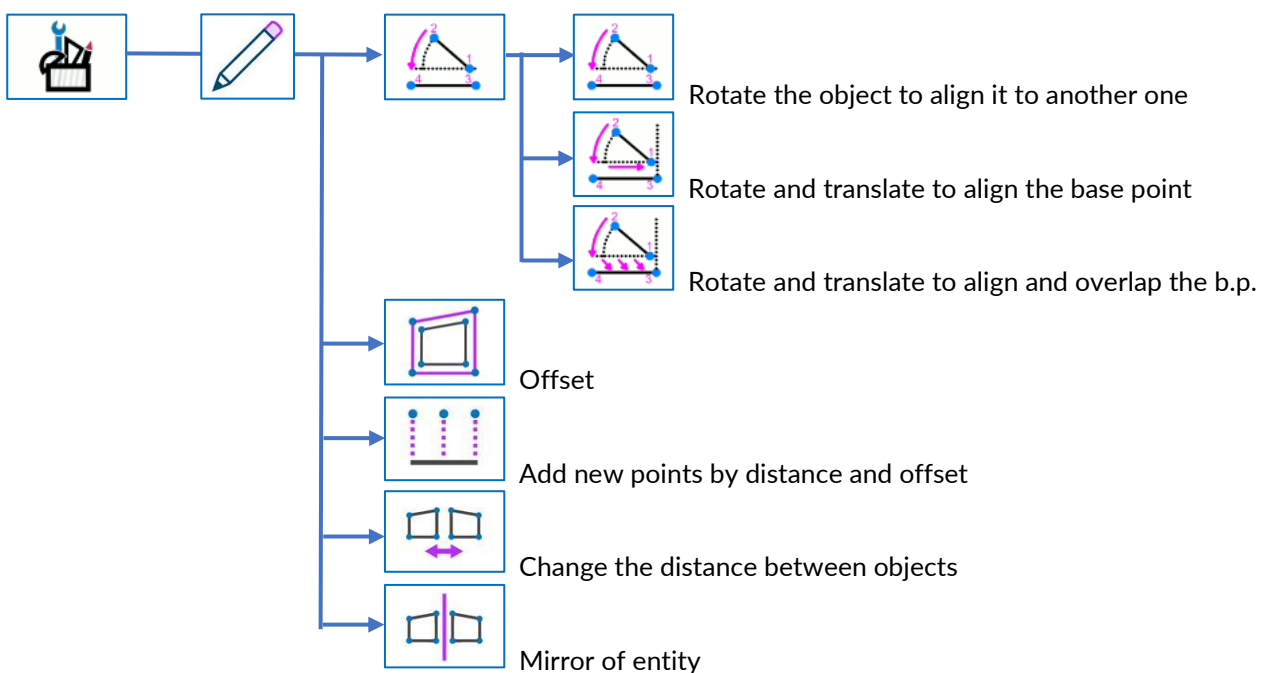
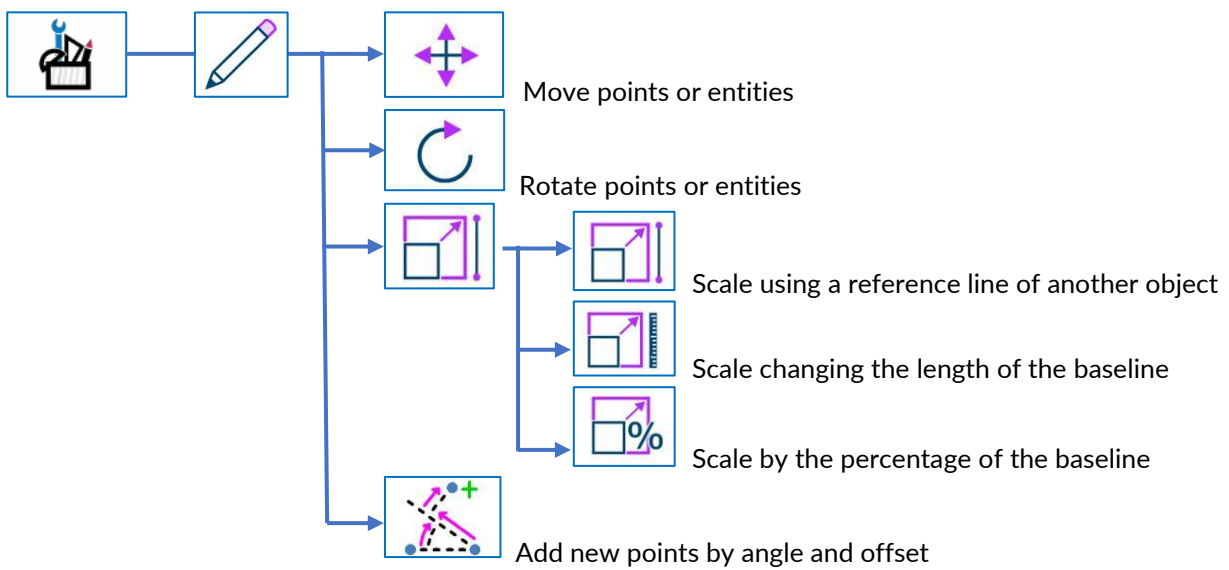
Choose the entity you want to draw

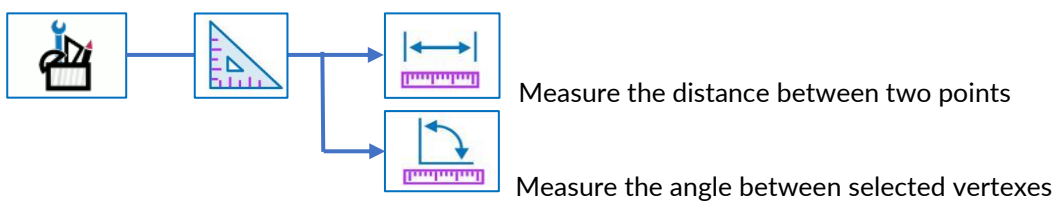
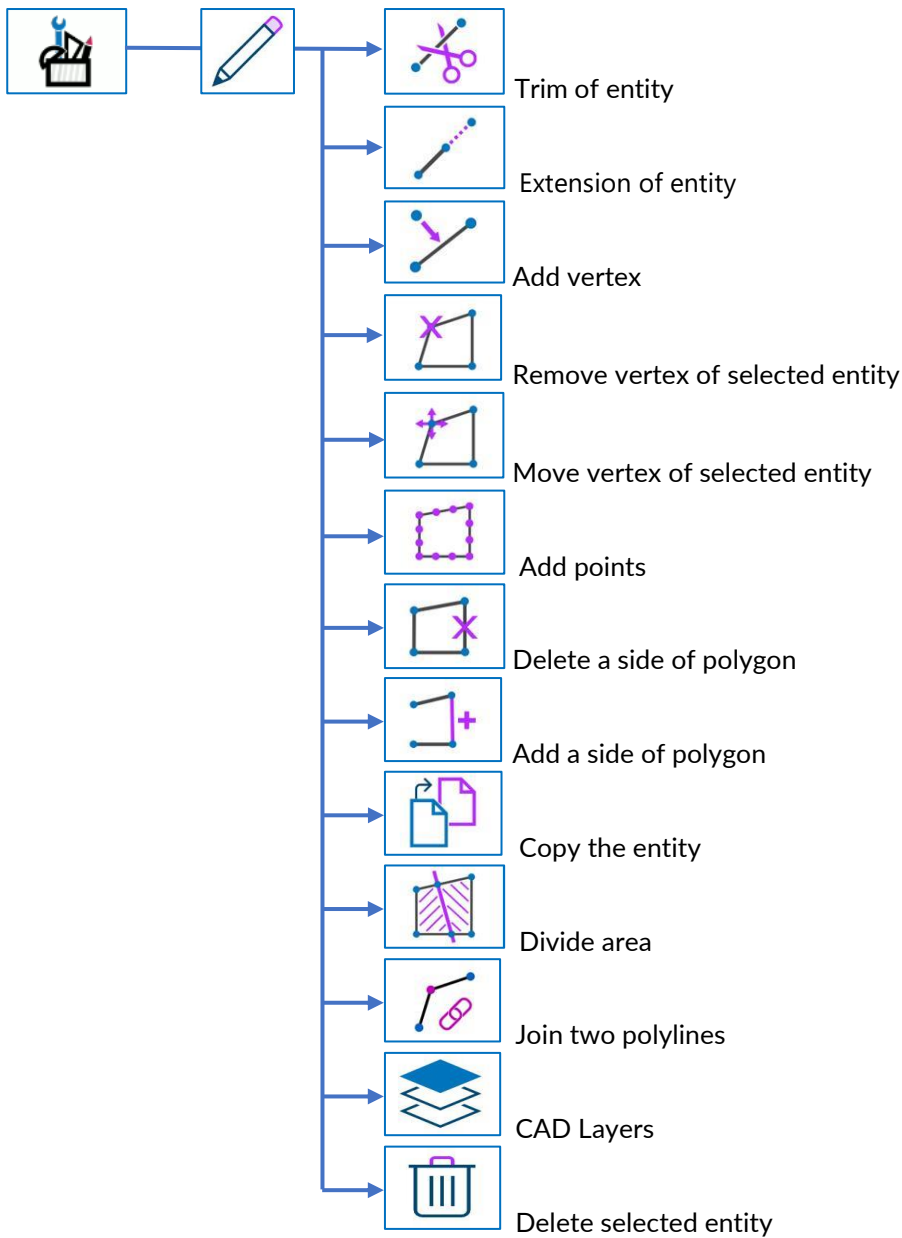


Choose which SNAPS to activate.



Regarding the following functions, please read and follow the indications that appear in Cube-a while you are using the function, to select the right reference points or lines.







View additional CAD tools



End drawing



Set point elevation

The icons in the vertical bar on the right are described below.



Clear selection



If enabled, as you draw an entity, the vertices become points in the library.



Opens point library










Click to make visible or not the point labels. Hold down to access to the








Click to access to the layers

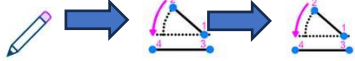
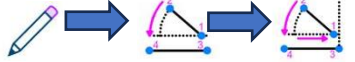
2. Appendix A – CAD Tools

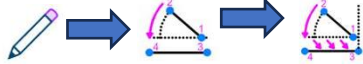

Function	Icons	Operating sequence
Multi selection from area		<p>Move the cursor over a vertex of the Entity bounding box and press [v].</p> <p>"Move the cursor to the opposite vertex of the Entity bounding box and press [v].</p> <p>If the second Vertex is to the right of the first Vertex (blue box), the Entities included entirely in the selection pane will be selected.</p> <p>If the second Vertex is to the left of the first Vertex (green box), the Entities included even partially in the selection pane will be selected."</p> <p>Then the MultiSelEach command (soon below) is automatically activated to allow you to add or remove individual Entities from the current selection.</p> <p>To end the selection command, move the cursor to an empty area and press [v].</p>
Multi selection from entities selection		<p>Move the cursor over each Entity to select and press [+] to add it or [-] to remove it.</p> <p>To end the selection command, move the cursor to an empty area and press [v].</p>
Multi selection from list		<p>The list of Entities in the current Project is displayed.</p> <p>Indicate the Entity to select and press the OK button</p>
Cancel selection		<p>Selecting this command will remove each selection.</p>
Move points		<p>Move the cursor to each Point you want to move and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the first reference point and press [v] or [+].</p>




		<p>Move the cursor to the second reference point and press [v] or [+].</p> <p>In the following dialog, confirm/change the Offset of Moving Points and press [v] to accept or [x] to cancel the command.</p> <p>Finally you can see the Moved Points. Press [v] to end the command.</p>
<p>Move entities</p>		<p>Move the cursor over each Entity you want to rotate and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the first reference point and press [v] or [+].</p> <p>Move the cursor to the second reference point and press [v] or [+].</p> <p>In the following dialog, confirm/change the dot displacement offset and press [v] to accept or [x] to cancel the command.</p> <p>Finally you can see the Moved Points. Press [v] to end the command.</p>
<p>Points rotate</p>		<p>Move the cursor to each Point you want to move and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the center point of rotation (corner vertex) and press [v] or [+].</p> <p>Move the cursor to another point on the initial witness line for rotation (first side of the corner) and press [v] or [+].</p> <p>Move the cursor to another point on the final witness line for rotation (second side of the corner) and press [v] or [+].</p> <p>In the following dialog, confirm/change the angle of rotation of the Points and press [v] to accept or [x] to cancel the command.</p> <p>Finally you can see the Moved Points. Press [v] to end the command.</p>




<p>Entities rotate</p>		<p>Move the cursor over each Entity you want to move and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the center point of rotation (corner vertex) and press [v] or [+].</p> <p>Move the cursor to another point on the initial witness line for rotation (first side of the corner) and press [v] or [+].</p> <p>Move the cursor to another point on the final witness line for rotation (second side of the corner) and press [v] or [+].</p> <p>In the following dialog, confirm/change the angle of rotation of the Entities and press [v] to accept or [x] to cancel the command.</p> <p>Finally you can see the Moved Entities. Press [v] to end the command.</p>
<p>Entities cut</p>		<p>Move the cursor and indicate a first point of the cutting line and press [v] or [+].</p> <p>Move the cursor and point to a second point in the cutting line and press [v] or [+].</p> <p>Move the cursor over each Entity to be dissected and press [+] (to renew it press [-]).</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Finally, you can see the result of the operation and the number of New Entities created. Press [v] to end the command.</p>
<p>Scale entities using a reference line of another object</p>		<p>Move the cursor over each Entity you want to scale and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to finish the selection.</p> <p>Move the cursor to one of the Vertices of the Entities to be scaled to select a reference segment and press [v].</p>





		<p>Move the cursor to a second Vertex of the Entities to be scaled to finish selecting the reference segment and press [v].</p> <p>Move the cursor to a segment vertex that represents the new length of the reference segment above and press [v].</p> <p>Move the cursor to the second vertex of the segment that represents the new length of the reference segment previously indicated and press [v].</p> <p>Finally you can see the result of the Scala operation. Press [v] to end the command.</p>
<p>Scale entities changing the length of the baseline</p>		<p>Move the cursor over each Entity you want to scale and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to one of the Vertices of the Entities to be scaled to select a reference segment and press [v].</p> <p>Move the cursor to a second Vertex of the Entities to be scaled to finish selecting the reference segment and press [v].</p> <p>In the following dialog, enter the new distance to be taken by the previously selected segment and press OK.</p> <p>Finally you can see the result of the Scala operation. Press [v] to end the command.</p>
<p>Scale entities by the percentage of the baseline</p>		<p>Move the cursor over each Entity you want to scale and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the Point that will be the Reference Base Point to scale the selected Entities and press [v].</p> <p>In the following dialog, enter the new scale for the selected Entities and press OK.</p>




		<p>Finally you can see the result of the Scala operation. Press [v] to end the command.</p>
<p>Align entities</p>		<p>Move the cursor over each Entity you want to align and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the Point that will be the Reference Base Point for the rotation of the selected Entities and press [v].</p> <p>Move the cursor to a second Point to indicate the segment to be made parallel to the witness line that will be selected later and press [v].</p> <p>Move the cursor to a first point on the witness line to which to align the selected Entities and press [v].</p> <p>Move the cursor to a second point on the witness line to which to align the selected Entities and press [v].</p> <p>Infine è possibile vedere il risultato dell'operazione di Allineamento. Premere [v] per terminare il comando.</p>
<p>Align entities and base point</p>		<p>Move the cursor over each Entity you want to align and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the Point that will be the Reference Base Point for the rotation of the selected Entities and press [v].</p> <p>Move the cursor to a second Point to indicate the segment to be made parallel to the witness line that will be selected later and press [v].</p> <p>Move the cursor to a first point on the witness line to which to align the selected Entities and press [v].</p>

		<p>Move the cursor to a second point on the witness line to which to align the selected Entities and press [v].</p> <p>Finally, you can see the result of the Alignment operation. Press [v] to end the command.</p>
Align and overlap entities		<p>Move the cursor over each Entity you want to align and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the Point that will be the Reference Base Point for the rotation of the selected Entities and press [v].</p> <p>Move the cursor to a second Point to indicate the segment to be made parallel to the witness line that will be selected later and press [v].</p> <p>Move the cursor to a first point on the witness line to which to align the selected Entities and press [v].</p> <p>Move the cursor to a second point on the witness line to which to align the selected Entities and press [v].</p> <p>Finally, you can see the result of the Alignment operation. Press [v] to end the command.</p>
Entity offset		<p>Move the cursor over the Reference Entity from which to create the Offsets and press [v].</p> <p>Move the cursor to the side where you want to create the new Offset Entities and to the distance that will indicate the step between the new Entities and press [v].</p> <p>In the following dialog, confirm/modify respectively the distance between the new Entities, the Δ dimension and the number of new Entities to be created and press [v].</p> <p>Finally, you can see the result of the Offset operation. Press [v] to end the command.</p>

<p>New points along a parallel line, from offset and step</p>		<p>Move the cursor to indicate the first point on the witness line and press [v] or [+].</p> <p>Move the cursor to indicate the second point on the witness line and press [v] or [+].</p> <p>Move the cursor to indicate the location of the first point in the series to be created and press [v] or [+].</p> <p>In the following dialog, confirm/modify the Square and Distance values of the first point to be created and press [v].</p> <p>Move the cursor to indicate direction and pitch of the new Points to be created and press [v].</p> <p>In the following dialog, confirm/edit Step, Δ Quota and Number of new Points to create and press [v].</p> <p>Finally, you can see the result of the Point Offset operation along a parallel. Press [v] to end the command.</p>
<p>New points from angle and offset</p>		<p>Move the cursor to indicate the first point on the witness line and press [v] or [+].</p> <p>Move the cursor to indicate the second point on the witness line and press [v] or [+].</p> <p>In the following dialog, enter Angle, Distance, Square, and Δ Dimension of the new Point and press [v].</p> <p>Finally you can see the result of the Operation of Offset Point from Angle-Distance-Square. Press [v] to end the command.</p>
<p>Entity spacing</p>		<p>Move the cursor over each Entity you want to Translate and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the first reference point to calculate the new distance and press [v] or [+].</p> <p>Move the cursor to the second reference point to calculate the new distance and press [v] or [+].</p>

		<p>In the following dialog, confirm/modify the new distance between the 2 points to translate the selected Entities along the indicated direction and press [v].</p> <p>Finally you can see the result of the Translation operation. Press [v] to end the command.</p>
<p>Entities mirror</p>		<p>Move the cursor over each Entity from Mirror and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the first Reference Point of the mirror line and press [v] or [+].</p> <p>Move the cursor to the second Reference Point of the mirror line and press [v] or [+].</p> <p>Finally you can see the result of the Mirror operation. Press [v] to end the command.</p>
<p>Extend entities</p>		<p>Move the cursor over the Line that identifies the extension limit of the ends of the selected Entities and press [v].</p> <p>Move the cursor over each Entity whose ends you want to extend and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to finish selecting Entities and execute the command.</p> <p>Finally you can see the result of the Extension operation. Press [v] to end the command.</p>
<p>Insert vertex</p>		<p>Move the cursor to the side of the Polyline where you want to add the new Vertex and press [v].</p> <p>Move the cursor to the point where you want to insert the new Vertex and press [v] or [+].</p> <p>In the following dialog, confirm/change the coordinates of the new Vertex and press [v].</p> <p>Finally, you can see the result of the Vertex Insertion operation. Press [v] to end the command.</p>

Delete vertex		<p>Move the cursor to the Vertex of the Polyline to be deleted and press [-].</p> <p>Finally you can see the result of the Summit Erase operation. Press [v] to end the command.</p>
Move vertex		<p>Move the cursor to the Vertex of the Polyline you want to move and press [v].</p> <p>Move the cursor to the new position where you want to move the Vertex and press [v] or [+].</p> <p>In the following dialog, confirm/change the new summit coordinates and press [v].</p> <p>Finally, you can see the result of the Vertex Shift operation. Press [v] to end the command.</p>
Copy entities		<p>Move the cursor over each Entity you want to copy and press [+] to select it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>Move the cursor to the first reference point and press [v] or [+].</p> <p>Move the cursor to the second reference point and press [v] or [+].</p> <p>In the following dialog, confirm/modify the placement offset of the newly copied Entities and press [v] to accept or [x] to cancel the command.</p> <p>Finally you can see the copied Entities. Press [v] to end the command.</p>
Move entities on a different layer		<p>Move the cursor over each Entity you want to Move and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>In the following dialog, indicate the new Layer where to move the selected Entities and press [OK].</p> <p>Finally you can see the Moved Entities. Press [v] to end the command.</p>

Delete entities		<p>Move the cursor over each Entity you want to Erase and press [+] to select it. Press [-] to deselect it.</p> <p>Move the cursor to an empty area and press [v] to end the selection.</p> <p>The following dialog prompts you to confirm the deletion operation of the selected Entities by pressing [v] to confirm or [x] to cancel.</p> <p>Finally you can see the result. Press [v] to end the command.</p>
Measure distance		<p>Move the cursor to indicate the first point of the segment to be measured and press [v] or [+].</p> <p>Move the cursor to indicate the second point of the segment to be measured and press [v] or [+].</p> <p>Finally you can see on the status bar the size of the Segment. Press [v] to end the command.</p>
Measure angle		<p>Move the cursor to indicate the vertex of the Angle to be measured and press [v] or [+].</p> <p>Move the cursor to indicate a point on the first side of the Angle to be measured and press [v] or [+].</p> <p>Move the cursor to indicate a point on the second side of the Angle to be measured and press [v] or [+].</p> <p>Finally you can see on the status bar the size of the Angle. Press [v] to end the command.</p>