



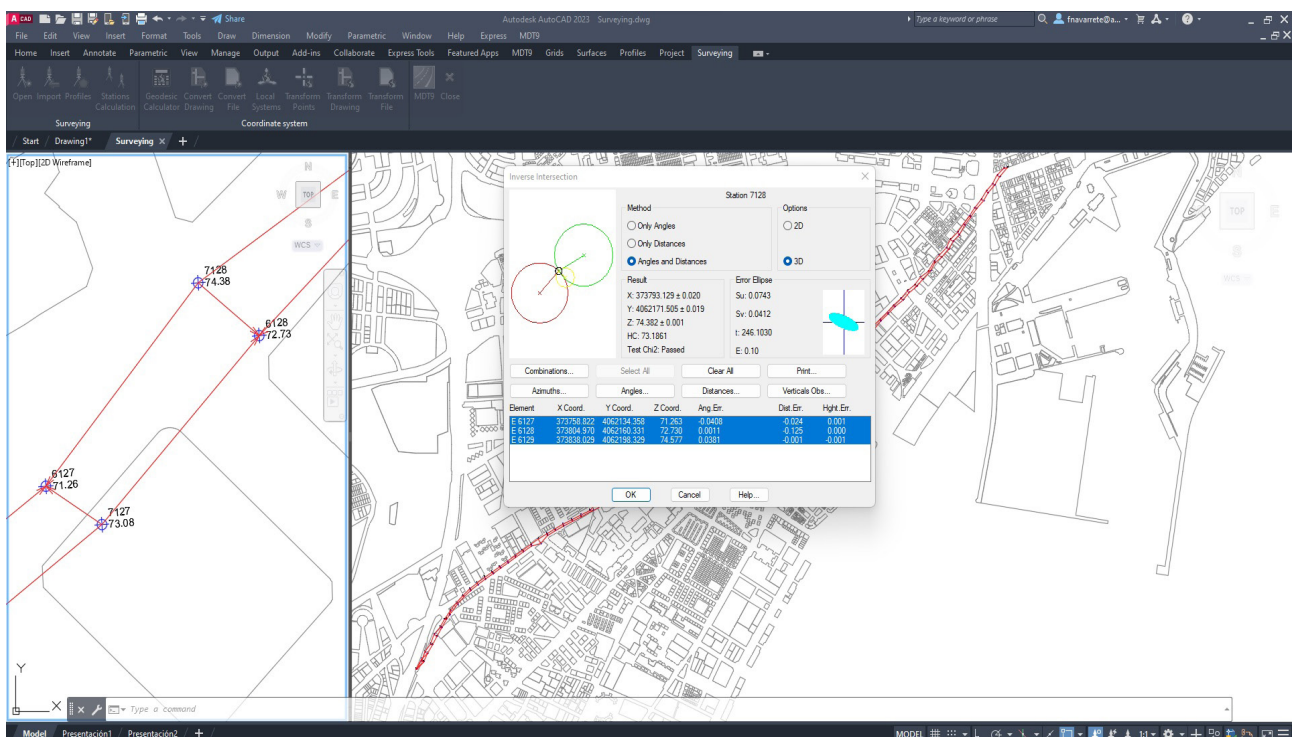
## Topography and Geodesy Module

### Calculation of Total Stations Observations

The surveying module allows the importing of files from total stations and the most usual data collectors on the market and also manual data entry. Based on this information, the program provides all the tools required for the processing, calculation and drawing of stations and topographic points. Stations calculation can be carried out by radiation procedures, inverse bisection, resection, direct intersection and levelling.

The program compensates the mean distances and slopes in the calculation of points and stations. Optionally, corrections may be considered by refraction and sphericity, reduction to ellipsoid and combined scale factor.

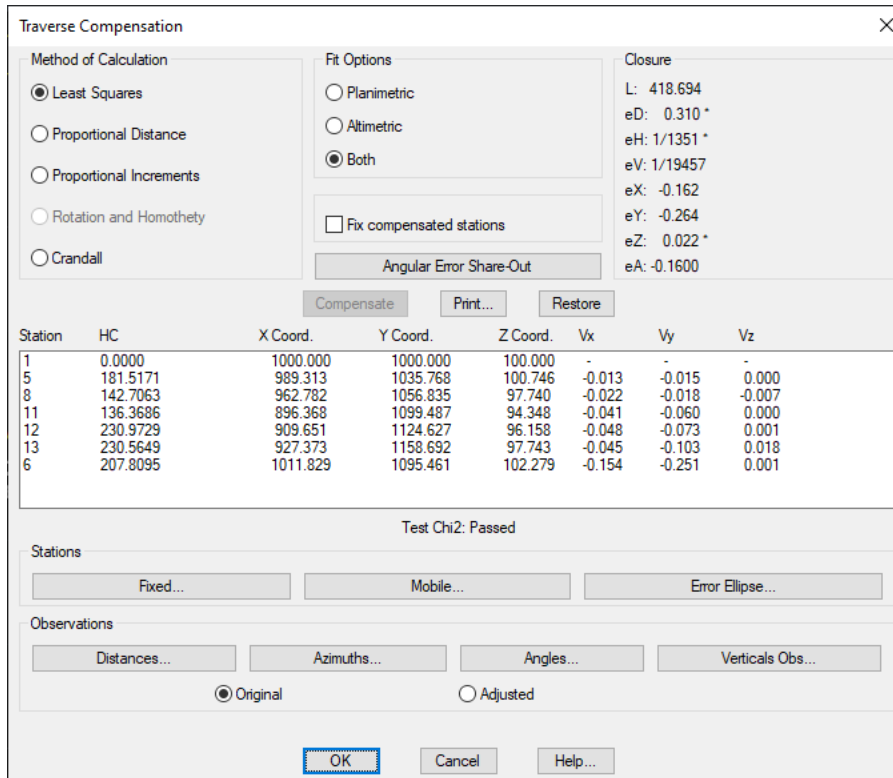
It also includes the automatic correction of disorientations of mutual observations and instrument angular errors in direct-inverse circle observations. Finally, for these calculations to be more precise, a table is included with the precisions and characteristics of the most usual instruments.



## Traverses and Networks

MDT includes the compensation of networks and traverses (closed, open and tied to one or more fixed points) by Least Squares, proportional to the distances, coordinates' increases, Crandall rule or rotation and dilation.

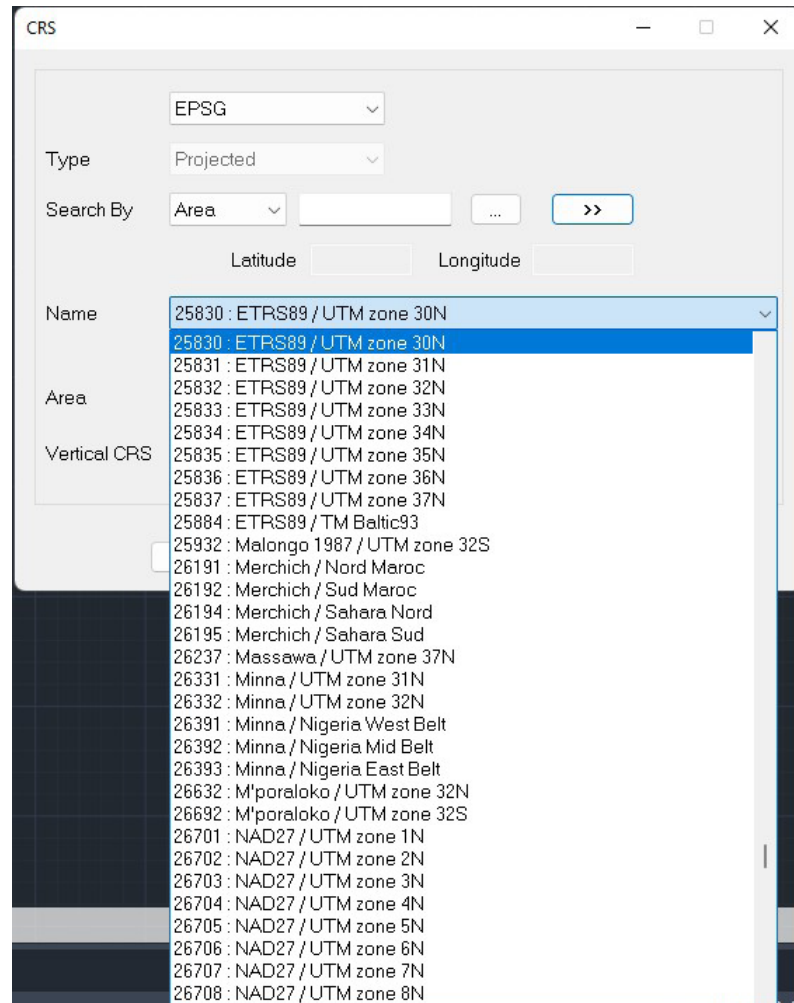
The program allows the configuration of admissible errors and for calculation methods which use Least Squares, the tests can be activated which assess the reliability of the observations and of the adjustment made.



Station	HC	X Coord.	Y Coord.	Z Coord.	Vx	Vy	Vz
1	0.0000	1000.000	1000.000	100.000	-	-	-
5	181.5171	989.313	1035.768	100.746	-0.013	-0.015	0.000
8	142.7063	962.782	1056.835	97.740	-0.022	-0.018	-0.007
11	136.3686	896.368	1099.487	94.348	-0.041	-0.060	0.000
12	230.9729	909.651	1124.627	96.158	-0.048	-0.073	0.001
13	230.5649	927.373	1158.692	97.743	-0.045	-0.103	0.018
6	207.8095	1011.829	1095.461	102.279	-0.154	-0.251	0.001

## Geodesy

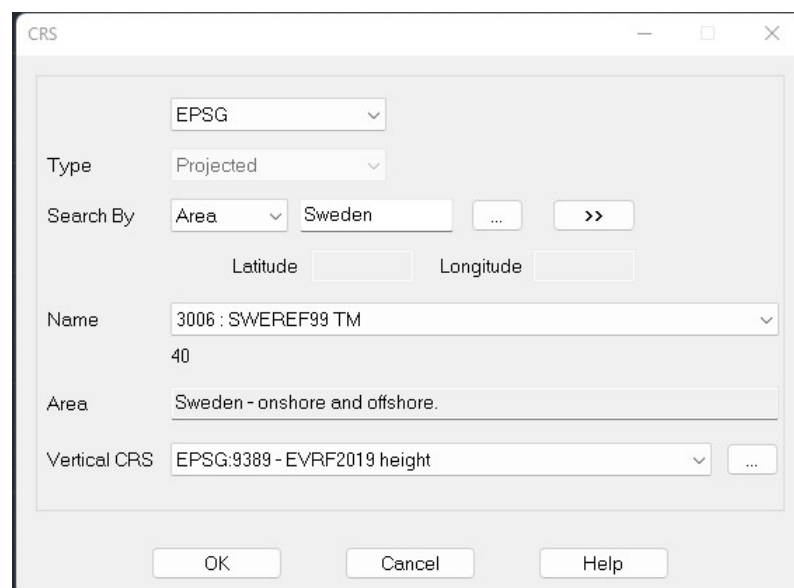
MDT 9's coordinate system transformation engine uses the powerful PROJ library, which transforms geospatial coordinates from one CRS to another. In practice, this allows the use of more than 8,000 reference systems used throughout the planet, including the most recent ones.



These can be projected, geographic 2D, geographic 3D and geocentric. In addition to the EPSG, other authorities such as ESRI and France's IGN have been included. The installation also contains multiple grids and geoids from different countries.

Also, if there are multiple conversion alternatives, the most accurate option is automatically chosen, without the need to manually select the transformation.

The selection of the origin or destination CRS can be made by name, region, code or latitude and longitude.

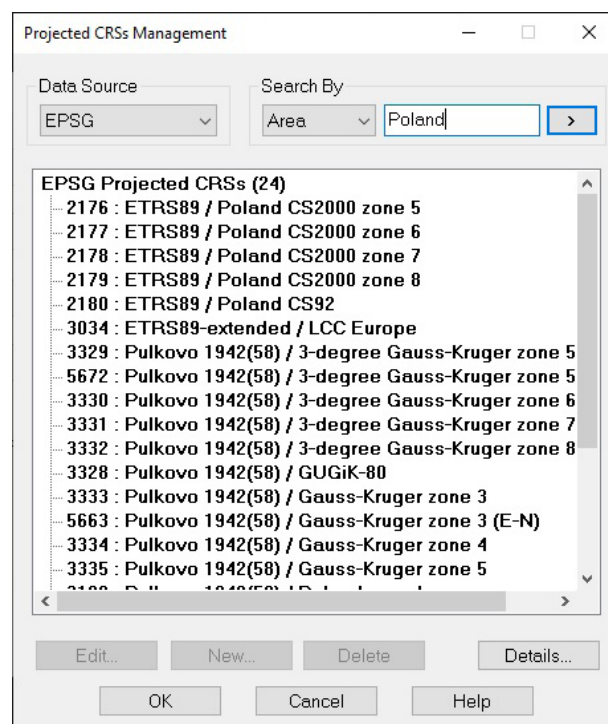
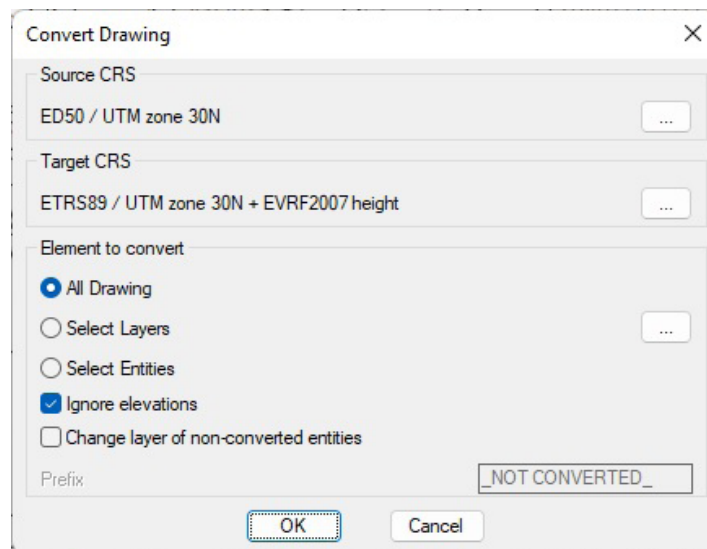


Furthermore, this module includes options for converting projected coordinates' files into generic format X, Y, Z and geographic coordinates into KML formats from Google Earth, GPS exchange Format (GPX) and TcpGPS among others.

Finally, another command allows the projection of drawings opened in CAD, applying the transformations to the complete drawing, a list of layers or a selection of objects and being able to decide whether the elevations will be included in the calculations.

The selected transformation applies to all drawing entities (vertices of lines, arcs and polylines, text insertion points and blocks etc.).

It is also endowed with specific options for transforming a flat and projected coordinates' drawing and vice versa.



## Local Coordinate Systems

This module also has options for local coordinate systems application and management with the following methods being available:

- 2D: XY Translations, Helmert 4 parameters, Similar and Projective.
- 3D: XY Translations and Helmert 7 parameters.
- 2D+1D: Helmert 4 parameters + Z Displacement and Helmert 4 parameters + Z Displacement and Slopes at XY.

To create a local coordinate system there are various possibilities: enter the value of the transformation parameters directly (rotations, translations etc.), establish the pairs of source and target points involved or by importing a predefined file. The program generates a detailed report in which the parameters calculated, various statistics and the coordinates of the checkpoints involved are provided.

Once the local system has been created, recording can be carried out to subsequently carry out transformations of drawings and files of coordinates and it may also be used in the TcpGPS application for mobile devices.

Control Po...	Used	Control	X Source	Y Source	Z Source	X Target	Y Target	Z Target	X Residual	Y Residual	Z Residual
1	Yes	3D	1094.883	820.085	109.821	10037.810	5262.090	772.040	0.048	0.025	-0.001
2	Yes	3D	503.891	1598.698	117.685	10956.680	5128.170	783.000	0.008	-0.056	0.011
3	Yes	3D	2349.343	207.658	151.387	8780.080	4840.290	782.620	-0.014	-0.054	0.009
4	Yes	3D	1395.320	1348.853	215.261	10185.800	4700.210	851.320	-0.042	0.085	-0.019

MSE 3D	MSE H	MSE V	Max X Residual	Max Y Residual	Max Z Residual
0.068	0.067	0.012	0.048 Control Point 1	0.085 Control Point 4	0.019 Control Point 4

Parameters		
TX	10233.826 ± 0.067	RY (°)
TY	6549.968 ± 0.068	RZ (°)
TZ	720.879 ± 0.229	Scale
RX (°)	2°17'2.74309" ± 0°0'30.33323"	

## Requirements <sup>(1)</sup>

CAD	AutoCAD® versions 2007 to 2025 and compatible versions BricsCAD® BIM/Pro/Ultimate versions 16 to 24 GstarCAD® Professional versions 2021 to 2024 ZWCAD® Professional versions 2012+ to 2025
Operating System	Windows 8 / 10 / 11 in x64 architecture <sup>(2)</sup>
Peripherals	Mouse or pointing device
Graphic Card	CD-ROM Reader 1280x720 pixels, compatible with OpenGL 3.3 or better Nvidia or ATI chipset recommended
Drive	10 Gb free space
Memory	Minimum 4 Gb

*(1) Consult the website for further details*

*(2) Operation via a remote desktop and similar services are not guaranteed, nor on virtualization platforms. Write to [soporte@aplitop.com](mailto:soporte@aplitop.com) to ask about these special cases.*

*AutoCAD® is a registered trademark of Autodesk, Inc.*

*BricsCAD® is a registered trademark of Bricsys NV.*

*GStarCAD® is a registered trademark of Gstarsoft Co., Ltd.*

*ZWCAD® is a registered trademark of ZWSOFT CO., Ltd.*

### **APLITOP S.L.**

Sumatra,9 – Urb. El Atabal

E-29190 Málaga (España)

Tlf: +34 95 2439771

e-mail: [info@aplitop.com](mailto:info@aplitop.com)

Web: [www.aplitop.com](http://www.aplitop.com)

# aplitop