



DOCUMENTATION

Spatial Manager for ZWCAD

The Spatial Manager for ZWCAD documentation brings everything together in one place: a simple introduction to get you started, a practical user guide to help you learn the tools at your own pace, and useful support resources.

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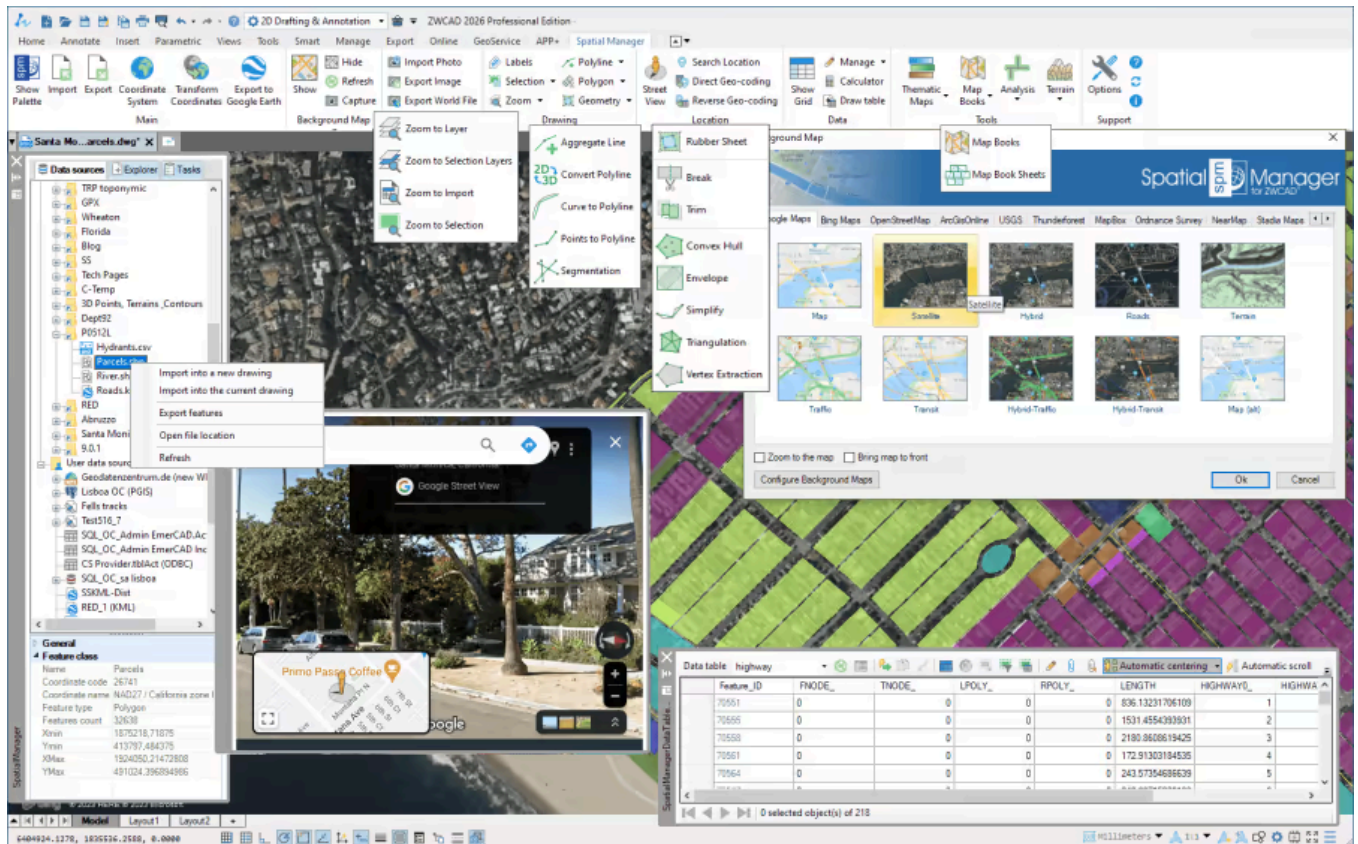
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Introduction

Spatial Manager™ for ZWCAD is a powerful ZWCAD plug-in designed for ZWCAD users who need to import, export, and manage spatial data in a simple, fast, and inexpensive way, which includes many possibilities not seen so far in ZWCAD. It comes in a lightweight application that runs inside ZWCAD and allows the user to import and export geospatial data between ZWCAD drawings and geospatial files, data servers or data stores, manage attached data, display dynamic Background Maps or Street Views, search locations, geo-code postal addresses (direct and reverse), define thematic maps, create terrains or contours, perform GIS analysis operations or selections, etc.



Spatial Manager™ for ZWCAD preview screen

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Compatibility

Compatible ZWCAD applications

The compatible ZWCAD applications for the [latest available version](#) of Spatial Manager™ for ZWCAD at this time are the following:

Applications

- ZWCAD, ZWCAD Architecture and ZWCAD MFG

Versions

- From v.2017 to v.2026 1.2 both included
- Important warning: for ZWCAD 2019 Do not use the version "2018.07.26(35476)"

Editions

- Professional
- Classic and Standard editions are *not compatible*

Languages

The application is available in several languages (read the Note below). The appropriate language is automatically selected based on the installed ZWCAD language (not the Operating System but ZWCAD) and cannot be forced to another one.

- English (it will be selected for English ZWCAD and for any other not available language, see the following list)
- French - Français
- German - Deutsche
- Portuguese - Português
- Spanish - Español

Notes:

- *You can review the compatibility table for ZWCAD versions and Spatial Manager versions on the [versions page](#).*
- *Some functions may not be available in older versions. Please review the instructions and notes in each section because they describe the functional limitations for these versions.*
- *The setup application as well as technical documents (this Wiki, Blog posts, etc.), are only available in English. Marketing documents (Website, etc.) may not be available in all of the above languages.*

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Installation

First of all, [download Spatial Manager™ for ZWCAD](#).

Installation steps

Then you need to install Spatial Manager™ for ZWCAD by executing the setup program. The name of the file to run will be different for each release of the application. It will appear as follows:

SpatialManagerforZWCAD-X.exe, where "X" is the release number of the application.

- **Notes:**
 - *32-bit and 64-bit versions: There are 32-bit and 64-bit versions of Spatial Manager™ for ZWCAD, but you do not need to worry about what platform is selected because the setup program automatically chooses the same version as the ZWCAD installed.*
 - *If the installation process does not produce any errors but later you cannot execute any 'Spatial Manager™ for ZWCAD' commands and/or the application's user interface does not appear in ZWCAD, please run ZWCAD "as administrator" and try again.*
 - *"Quiet" setup: You can install the application in "quiet" mode using the "/quiet" parameter, which will adopt the default values (installation path, etc.) and it will not be necessary to follow the installation process step by step. For example, from the Windows command line you can execute: [Path]/SpatialManagerforZWCAD-X.exe /quiet.*
 - *"[Path]" is any local or networked path where the installation EXE file can be found.*
 - *"X" is the release number of the application.*
 - *Note also that this command can be executed from a batch file (*.bat), which will facilitate the deployment of network or remote installations.*

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How to Start

After the installation, you will see the Spatial Manager™ for ZWCAD icon placed on the Windows Desktop, which will let you return to this documentation page anytime you want to.



Spatial Manager for ZWCAD Icon

When you install Spatial Manager™ for ZWCAD, the setup application also adds the [Interface components](#) to ZWCAD and a [sample data set](#) including some spatial files to your system. Watch this short video and follow the next steps to learn how to start using the application and to check that everything works fine.

VIDEO AVAILABLE

[Watch video on YouTube](#)

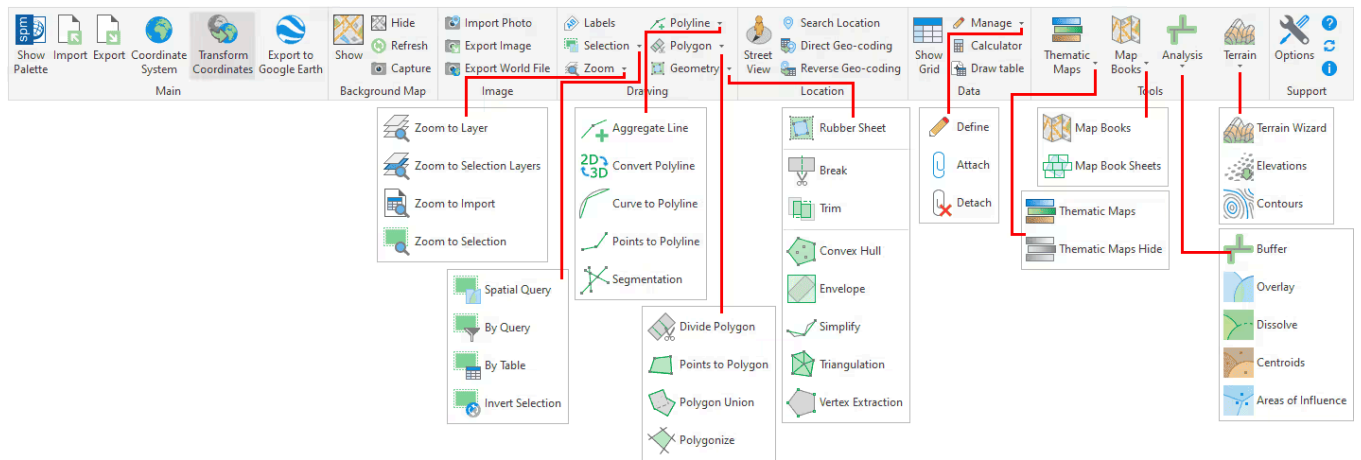
Explore features

Discover the full list of available [Commands](#) . You can execute them directly on the command line or locate them in the [interface](#) .

We invite you to take a look at these pages to learn more about some of the features of Spatial Manager™ for ZWCAD or to test with the included [sample data](#) .

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Commands



Spatial Manager™ for ZWCAD Commands Ribbon

List of ZWCAD commands included in **Spatial Manager™ for ZWCAD**:

Main commands

- **SPM** : *Show Palette*. Opens and/or displays the main application Palette.
- **SPMIMPORT** : *Import*. Directly imports features from geospatial files or tables without using the main application Palette.
 - **-SPMIMPORT [Task name]** : *Import (Command Line)*. Execute Task(s) from the command line, useful in scripts, etc. ("Professional" edition only).
- **SPMEXPORT** : *Export*. Exports ZWCAD entities into geospatial files or tables ("Professional" edition only).
 - **-SPMEXPORT [Parameters]** : *Export (Command Line)*. Exports ZWCAD entities from the command line, useful in scripts, etc. ("Professional" edition only).
- **SPMSETCRS** : *Coordinate system*. Sets the Coordinate Reference System (CRS) for the drawing. Includes options to define user CRSs.
- **SPMTRANSFORMCRS** : *Transform Coordinates*. Creates a new drawing transforming geometrically entities from the current one between two Coordinate Systems ("Professional" edition only).
- **SPMCREATEKML** : *Export to Google Earth*. Exports the current status of the drawing to Google Earth (one click) ("Standard" and "Professional" editions only).
- **SPMCLOSE** : *Close*. Closes all application Palettes (Main, Data Grid, Street View, etc.). In addition, it redefines the location and size defaults for when they are reopened.

Background Maps

Available on editions **Standard** **Professional**

- **SPMBGMAPSHOW** : *Show*. Displays the selected image Map in the drawing. Includes tools to manage the user Background Maps.
- **SPMBGMAPHIDE** : *Hide*. Hides the Background Map if it is displayed.
- **SPMBGMAPREFRESH** : *Refresh*. Regenerates the image of the Background Map, which may be needed under certain graphic situations.
- **SPMBGMAPIMAGE** : *Capture*. Creates a ZWCAD raster image corresponding to the display view of the current Background Map (Snapshot).
- **SPMBGMAPIMAGEPURGE** : *Purge*. Deletes 'orphan' image tiles and performs some other cleaning operations.

Image

Available on edition **Professional**

- **SPMIMPORTPHOTO** : *Import Images*. Import of geo-referenced raster images and photos.
- **SPMEXPORTIMAGE** : *Export Images*. Export of geo-referenced images, geo-reference files and Coordinate System files.
- **SPMWORLDFILE** : *Export Geo-reference Files*. Export of images geo-reference and Coordinate System files (World, PRJ, etc.).

Drawing

- **SPMLABEL** : *Entities Labeling*. Texts based on entities data and properties.
- **Selection**
 - **SPMSPATIALQUERY** : *Spatial Query*. Advanced entities selection based on geometric and data operations between existing entity groups (Intersect, Touches, Within, Contains, Disjoint, Overlaps or Crosses) ("Standard" and "Professional" editions only).
 - **SPMSELECTBYQUERY** : *By Query*. Selects entities by a simple or compound query over their data ("Standard" and "Professional" editions only).
 - **SPMSELECTBYTABLE** : *By Table*. Selects all the entities attached to a specific data table ("Standard" and "Professional" editions only).
 - **SPMSELECTINVERSE** : *Inverse Selection*. Inverts current entities selection.
- **Zoom**
 - **SPMZOOMTOLAYER** : *Zoom to Layer*. Zoom to the entities on the selected layers (by default on the current layer).
 - **SPMZOOMTOSELECTIONLAYER** : *Zoom to Selection Layers*. Zoom to the entities on the layers of selected entities.
 - **SPMZOOMTOIMPORT** : *Zoom to Import*. Zoom to the entities resulting from the last import process.
 - **SPMZOOMTOSELECTION** : *Zoom to Selection*. Zoom to the selected entities.

Geometry Tools

Available on edition **Professional**

- **Polyline**

- **SPMAGGREGREGATELINE** : *Aggregate line*. Connect separate line segments or polylines into continuous polylines, optionally adding segments and grouping by field value.
- **SPMCONVERTPOLYLINE** : *Convert polyline*. Convert polylines between different ZWCAD polyline types.
- **SPMCURVETOPOLYLINE** : *Curve to polyline*. Convert curved entities (arcs, circles, ellipses, splines) into polylines made of straight segments.
- **SPMPOINTSTOPOLYLINE** : *Points to polyline*. Create polylines from point sets, with ordering and grouping options and optional closing.
- **SPMSEGMENTATION** : *Segmentation*. Split polylines or polygons at all intersection points, generating non-overlapping segments.

- **Polygon**

- **SPMDIVIDEPOLYGON** : *Divide polygon*. Subdivide polygons using equal areas, equidistant strips, or custom area/percentage values.
- **SPMPOINTSTOPOLYGON** : *Points to polygon*. Create closed polygon entities from point sets, with ordering and grouping options.
- **SPMPOLYGONUNION** : *Polygon union*. Merge overlapping or adjacent polygons into unified polygons, removing internal boundaries.
- **SPMPOLYGONIZE** : *Polygonize*. Create polygons from closed polylines or from polyline collections that form closed boundaries.

- **Geometry**

- **SPMRUBBERSHEET** : *Rubber Sheet*. Elastically deform geometries by matching source/target control point pairs to align data.
- **SPMBREAK** : *Break*. Split entities at intersections with boundary entities.
- **SPMTRIM** : *Trim*. Remove portions of entities inside or outside boundary polygons, keeping only the desired parts.
- **SPMCONVEXHULL** : *Convex hull*. Create the smallest convex polygon that contains all selected entities.
- **SPMENVELOPE** : *Envelope*. Create minimum bounding rectangles (envelopes) around selected entities.
- **SPMSIMPLIFY** : *Simplify*. Reduce polyline complexity by removing vertices while respecting a tolerance.
- **SPMTRIANGULATION** : *Triangulation*. Create a TIN from the vertices of selected entities or from point entities.
- **SPMVERTEX** : *Vertex extraction*. Extract vertices from polylines or polygons and create point entities at each vertex.

Location

Available on edition **Professional**

- **SPMSTREETVIEW** : *Street View*. Application palette for displaying (and navigating) dynamic Google Street View images on any geo-referenced drawing/map.
- **SPMSEARCHLOCATION** : *Search Location*. Search in the drawing for the location of geographical entities (streets, postal addresses, neighborhoods, etc.) based on the text entered.
- **SPMGEOCODING_DIRECT** : *Geo-coding (Direct)*. Insertion of points in the drawing from postal addresses.
- **SPMGEOCODING_REVERSE** : *Geo-coding (Reverse)*. Obtaining postal addresses from entities in the drawing.

Data Tables

Available on editions **Standard** **Professional**

- **SPMDATATABLEGRID** : *Data grid*. Opens and displays the 'Data Grid' palette ("Professional" edition only).
- **SPMDATATABLEDEFINE** : *Define Table*. Defines, restores, modifies, renames or deletes a data table or its fields.
- **SPMDATATABLEATTACH** : *Attach*. Attaches one or more entities to a data table.
- **SPMDATATABLEDETACH** : *Detach*. Detaches one or more entities from their corresponding attached data table.
- **SPMDATACALCULATOR** : *Fields Calculator*. Calculation of new or existing field values using arithmetic, mathematical, date, etc., expressions including constant values and/or values from other fields ("Professional" edition only).
- **SPMDATATABLEDRAW** : *Draw Table*. Draws the data table for the selected entities ("Professional" edition only).

Thematic Maps

Available on edition **Professional**

- **SPMTHEMATICMAP** : *Define Thematics*. Definition and edition of thematic maps according to data field values.
- **SPMTHEMATICMAPHIDE** : *Hide Thematics*. Hide thematic viewings.

Map Books

Available on edition **Professional**

- **SPMMAPBOOK** : Map books generation.
- **SPMMAPBOOKSHEETS** : Definition of sheets for map books.

GIS Analysis

Available on edition **Professional**

- **SPMBUFFER** : *Buffers*. Buffered polygons around point entities, linear entities or polygon boundaries.
- **SPMoverlay** : *Overlays*. New entities based on geometric and data operations between existing entity groups (Intersect, Union, Erase, Identity, Clip, Paste or Symmetric Difference).
- **SPMDISSOLVE** : *Dissolve*. New polygons based on the grouping of other adjacent polygons with some common data.
- **SPMCENTROID** : *Centroids*. Polygon Centroids creation by adopting the polygons data, or add Centroids data to the polygons that contain them.
- **SPMINFLUENCEAREAS** : *Areas of Influence*. Polygons defined by the set of points closest to each point of a selection of points in the drawing (Voronoi diagrams).

Terrains

Available on edition **Professional**

- **SPMTERRAIN** : *Terrain*. Create Terrains, Contours and elevation 3D Points. Command options:
 - **1**: 3D Points built by accessing Elevation service providers in any selected area.
 - **2**: 2D or 3D Contours from selected 3D Points.
 - **3**: Terrain wizard. Complete 3D Points, Contours and Terrains functionality.

Support

- **SPMOPTIONS** : *Options*. Set of parameters to configure the application (includes also the functionality of SPMUPDATE and SPMABOUT).
- **SPMHELP**: *Help*. Shows the application help.
- **SPMUPDATE**: *Updates*. Checks if there is a new application release to be downloaded from Internet.
- **SPMABOUT**: *Information*. Shows basic information about the application and the installed release.

Note: All the command names are also valid if you replace the prefix *SPM* with *SPATIALMANAGER*. For example, *SPATIALMANAGERCREATEKML* is equivalent to *SPMCREATEKML*, or *SPATIALMANAGER* is equivalent to *SPM*.

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Interface

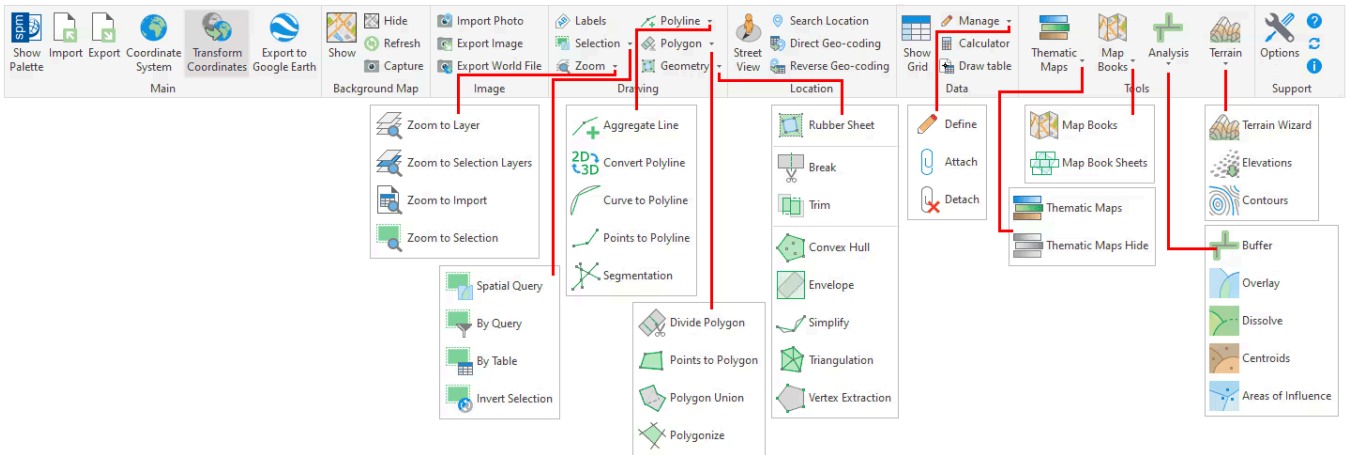
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Ribbon, toolbar and menu

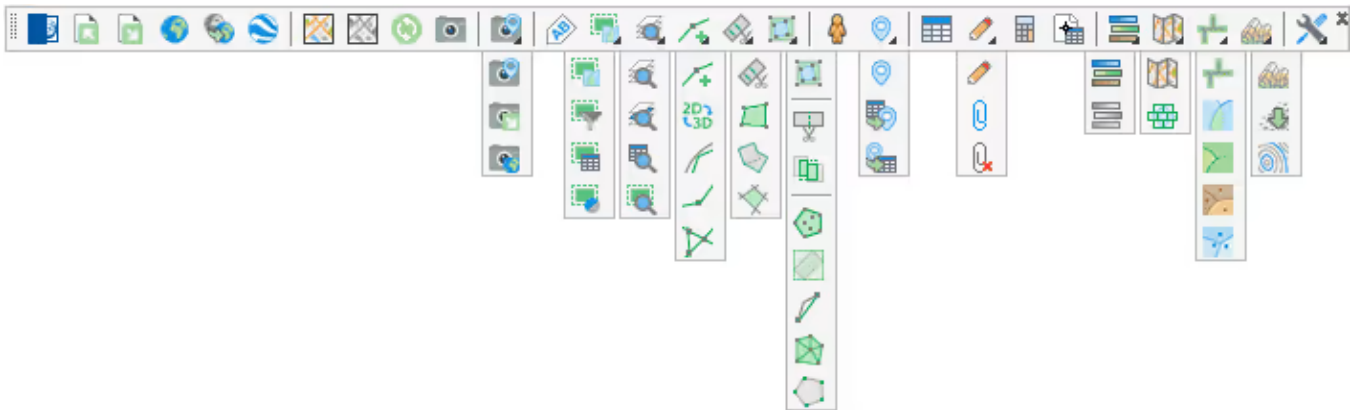
The Spatial Manager™ for ZWCAD Ribbon (if the ribbon is available), toolbar, or drop-down menu allow you to access the [commands](#) of the application.

Spatial Manager™ for ZWCAD ribbon



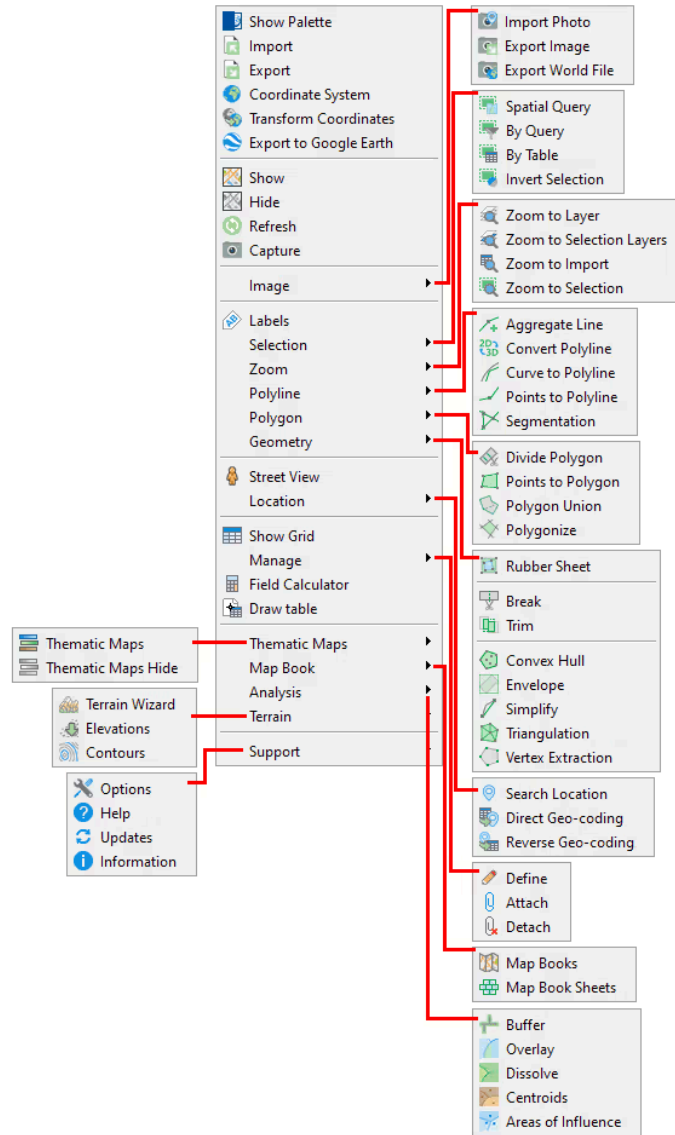
Spatial Manager™ for ZWCAD Ribbon

Spatial Manager™ for ZWCAD toolbar



Spatial Manager™ for ZWCAD Toolbar

Spatial Manager™ for ZWCAD menus



Spatial Manager™ for ZWCAD Menus

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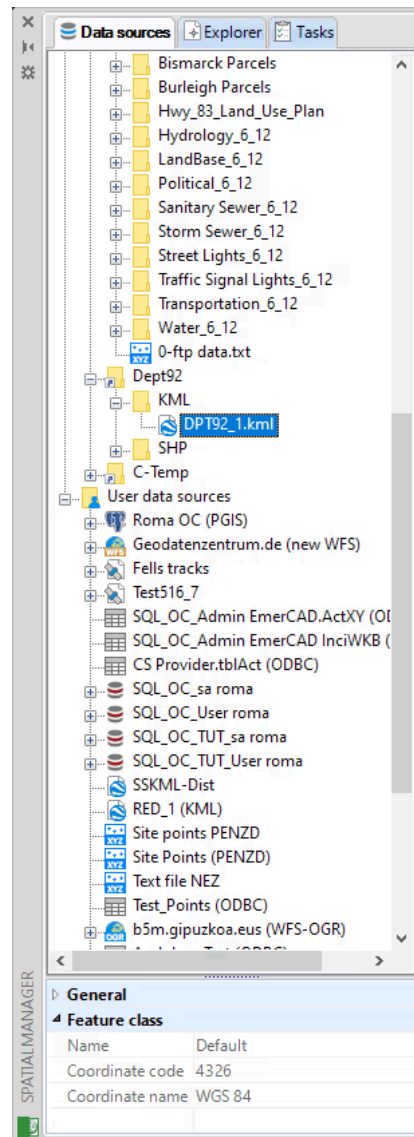
Palette

The 'Spatial Manager' palette includes some of the main commands of Spatial Manager™ for ZWCAD. From here, you will be able to manage your data sources, launch your import processes, define and manage thematic maps, manage the import tasks, and much more. Like any ZWCAD palette, the 'SpatialManager' palette can be arranged, docked, undocked, grouped, self-collapsed, etc., and resized, depending on the preferences and needs of each user or each job, by dragging its title bar, double-clicking on its title bar, etc.

You can open this palette in ZWCAD by executing the command **SPM** (or **SPATIALMANAGER**), and you can close it by executing the command **SPMCLOSE** (or **SPATIALMANAGERCLOSE**).

Application palette

The 'Spatial Manager' palette is split into two areas: the upper area is the "Data sources/Explorer/Tasks" area, and the lower area is the "Properties" area. Inside the palette, you can move the split line up or down to distribute the space for both areas as you need.



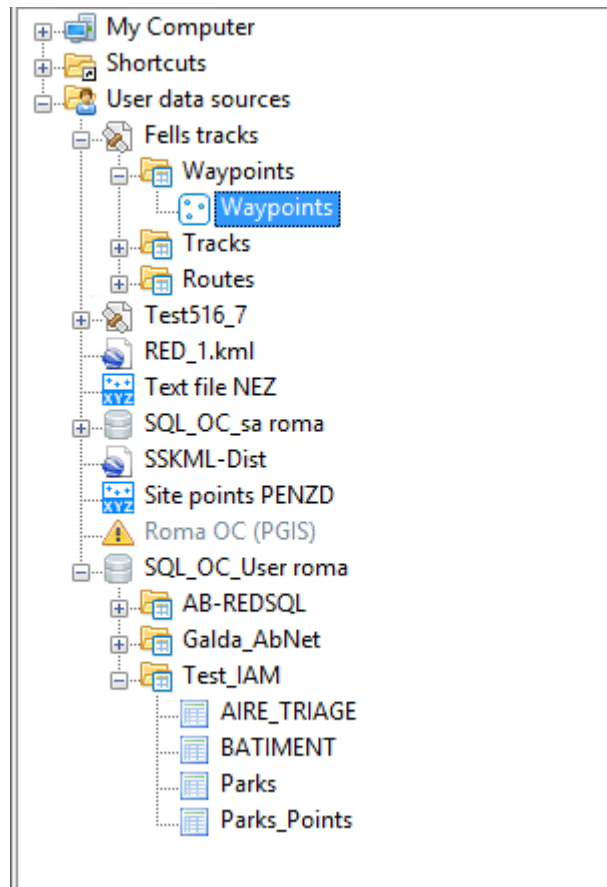
Spatial Manager™ for ZWCAD Application Palette

Notes:

- Selection of entities in ZWCAD may be a bit slower when the 'Spatial Manager' palette is open, depending on the data of the entities.
- *Tasks* and *Thematic Maps* are available in the "Professional" edition only.

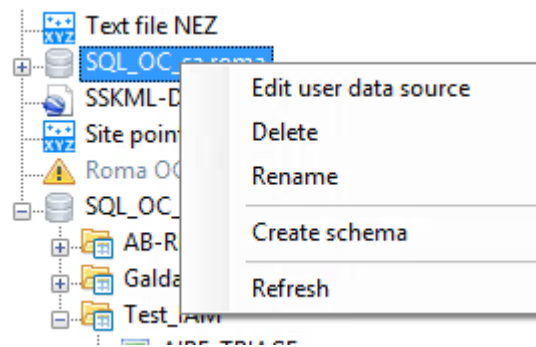
Data sources area

In this area you can launch import processes, create, edit, or sort [Shortcuts](#) and [User Data Sources \(UDSs\)](#) ("Standard" and "Professional" editions only), etc. This area is shared with the "Explorer" and "Tasks" areas, and you can switch between them by clicking on the "Data sources", "Explorer", or "Tasks" tabs.



Data sources Area

Contextual menus (mouse right-click)



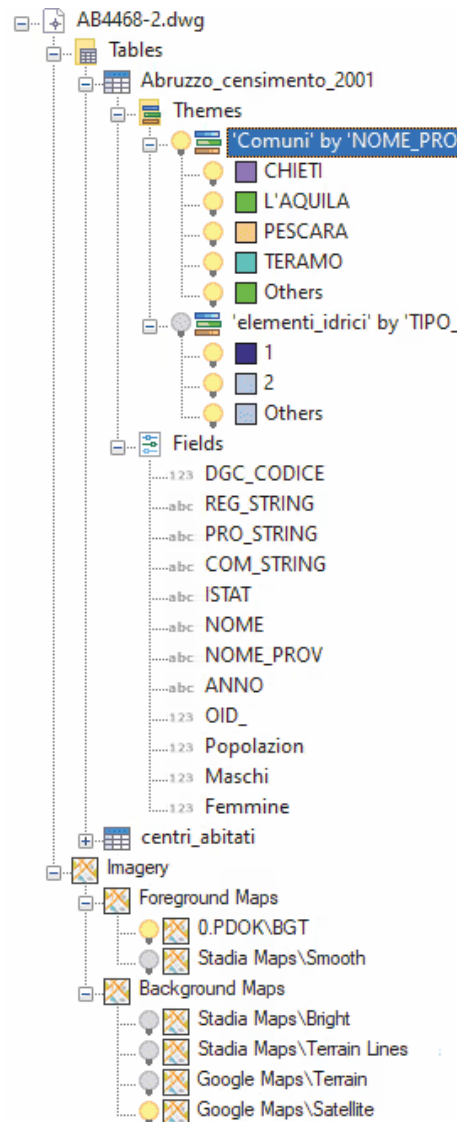
Contextual menus

Content varies depending on the selected item.

Explorer area

The 'Spatial Manager' Explorer shows in tree form specific elements of the application, such as [Data Tables](#) (Tables), Thematic Maps (Themes), or Background/Foreground Maps (Imagery). Here, through the different contextual menus, you will be able to access many of the main application functions, manage thematic maps ("Professional" edition only), data tables ("Standard" and "Professional" editions only), or [Background/Foreground Maps](#) ("Standard" and "Professional" editions only), etc. This area is shared

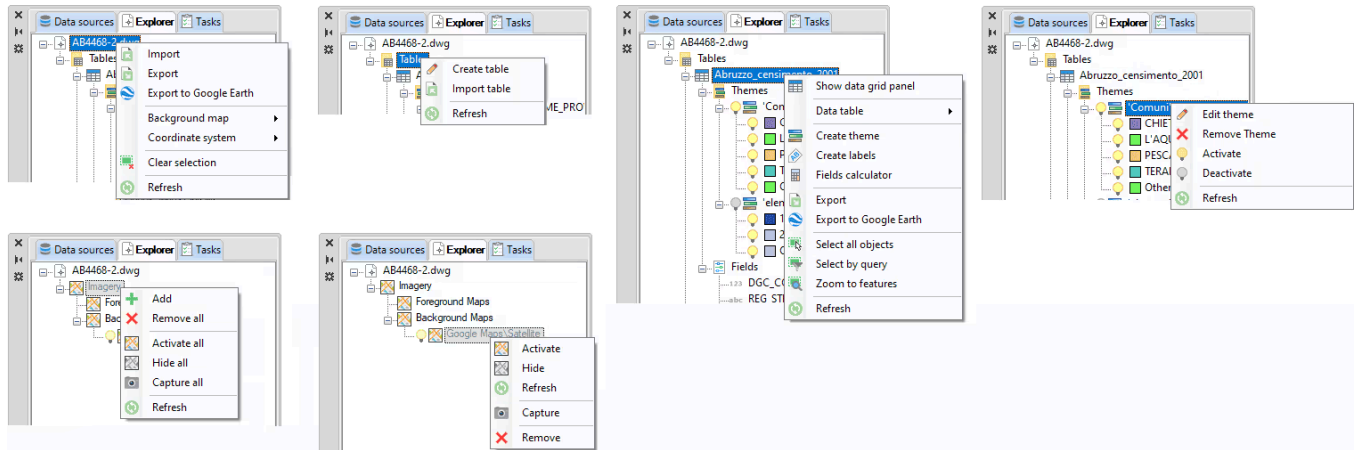
with the “Data sources” and “Tasks” areas, and you can switch between them by clicking on the “Data sources”, “Explorer”, or “Tasks” tabs.



Explorer Area

Contextual menus (mouse right-click)

Content varies depending on the selected item.

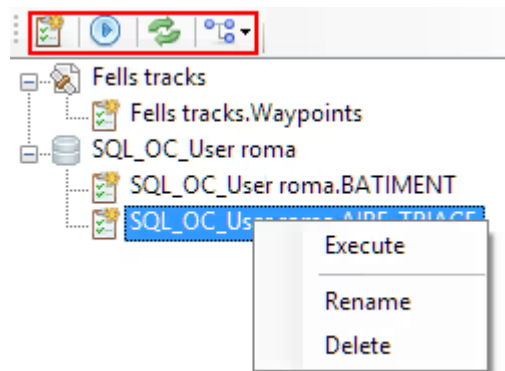


Contextual menus

Tasks area

In this area you can save, manage, and execute **Tasks** (“Professional” edition only), which allow you to replay any import process as many times as desired without needing to enter its parameters again. This area is shared with the “Data sources” and “Tasks” areas, and you can switch between them by clicking on the “Data sources”, “Explorer”, or “Tasks” tabs.

Function buttons and contextual menus (mouse right-click)



Spatial Manager™ for ZWCAD Task manager Area

Properties area

In this area you can see information about any data source, tasks (“Professional” edition only), and when you select any entity in your drawing, you will see special information about this entity. If the entity has some data attached, you can also see and edit the entity Extended Entity Data (EED) here (“Standard” and “Professional” editions only).

General	
Provider	ESRI Shape file
File path	C:\Users\Spatial\Spatial Manag
File size	308.5 KB
Feature class	
Name	Floodzone
Description	Floodzone
SRID code	26741
SRID name	NAD27 / California zone I
Feature type	Polygon
Features count	15
Bounding box Xmin	1868798.52539796
Bounding box Ymin	408156.937806486
Bounding box XMax	1934501.40222228
Bounding box YMax	501453.545029432

Spatial Manager™ for ZWCAD Source data Properties

General	
Layer	96003
Geometry	
Type	Line string
SRID code	0
SRID name	Undefined CRS
Is 3D	False
Is measured	False
Bounding box Xmin	1884598.097
Bounding box Ymin	464982.245
Bounding box XMax	1888047.58
Bounding box YMax	466661.074
Data	
ST_NAME	QUARTZ HILL RD
ST_TYPE	COL
SEG_ID	5644
LENGTH	3975.18
ZIPL	96003
ZIPR	96003
L_F_ADD	200
L_T_ADD	800
R_F_ADD	201
R_T_ADD	799

Spatial Manager™ for ZWCAD Entity Extended Entity Data (EED) and other Properties

In the Properties area:

- By placing the cursor over any data, if CTRL + C (standard combination for "Copy") is pressed, the corresponding data goes to the Windows clipboard and can be exploited within the same application or any other, using "Paste" or by pressing CTRL + V.

- If any data is not fully visible due to the width of the Properties area, a tooltip will display by keeping the cursor over this data.
- When editing any field value in this area, you need to press Enter or move to another field in order to validate the changes.

Note: Because of performance considerations, the number of entities selected for which their data are shown in the application palette is limited by the system variable PROPOBJLIMIT.

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Data grid

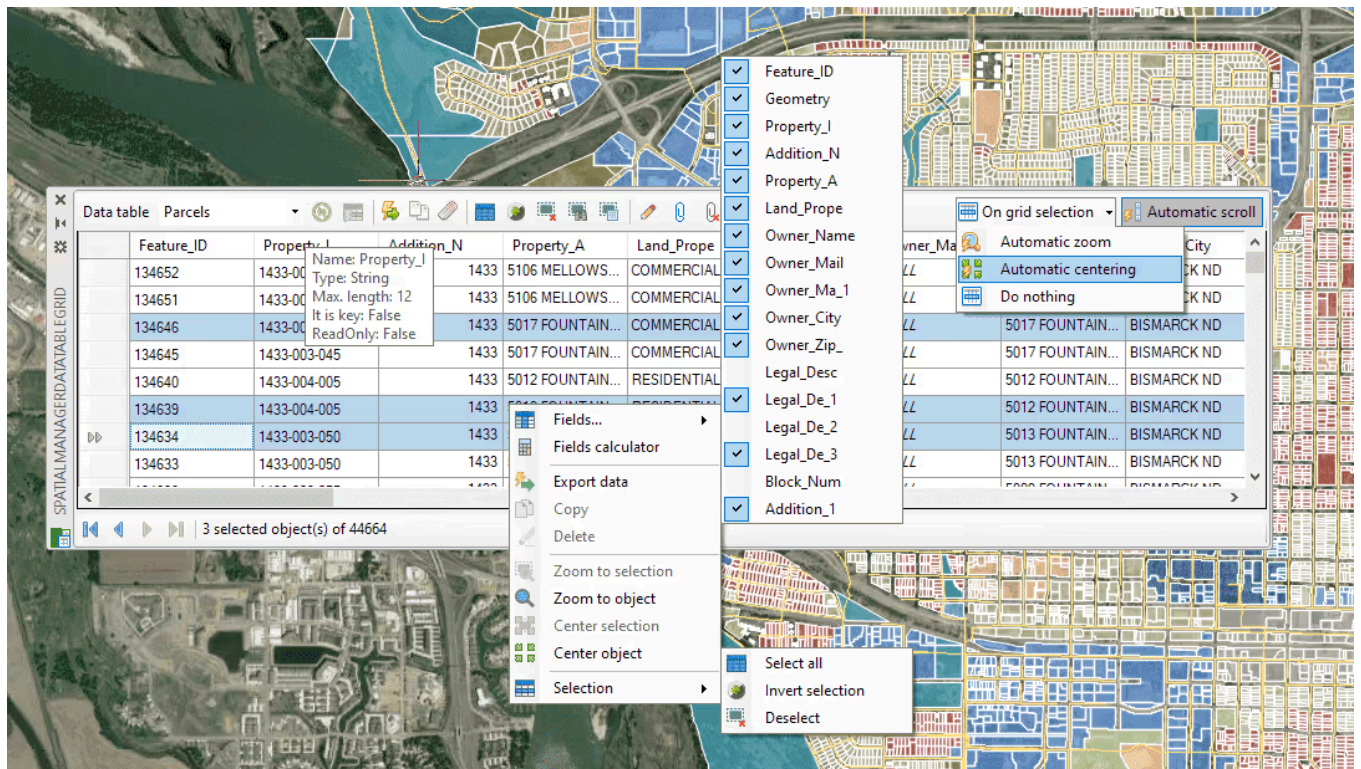
Available on edition

Professional

The Data Grid palette in ZWCAD allows you to view, edit, etc. the objects data for any table in the drawing. You can also select objects from the Data Grid, export the data from the tables and more.

Data Grid palette

The 'Data Grid' palette of Spatial Manager™ for ZWCAD allows you to view, edit, select, export, etc. the entities data in a table form.



'Data Grid' palette

Learn more about the 'Data Grid' and all its features and functions.

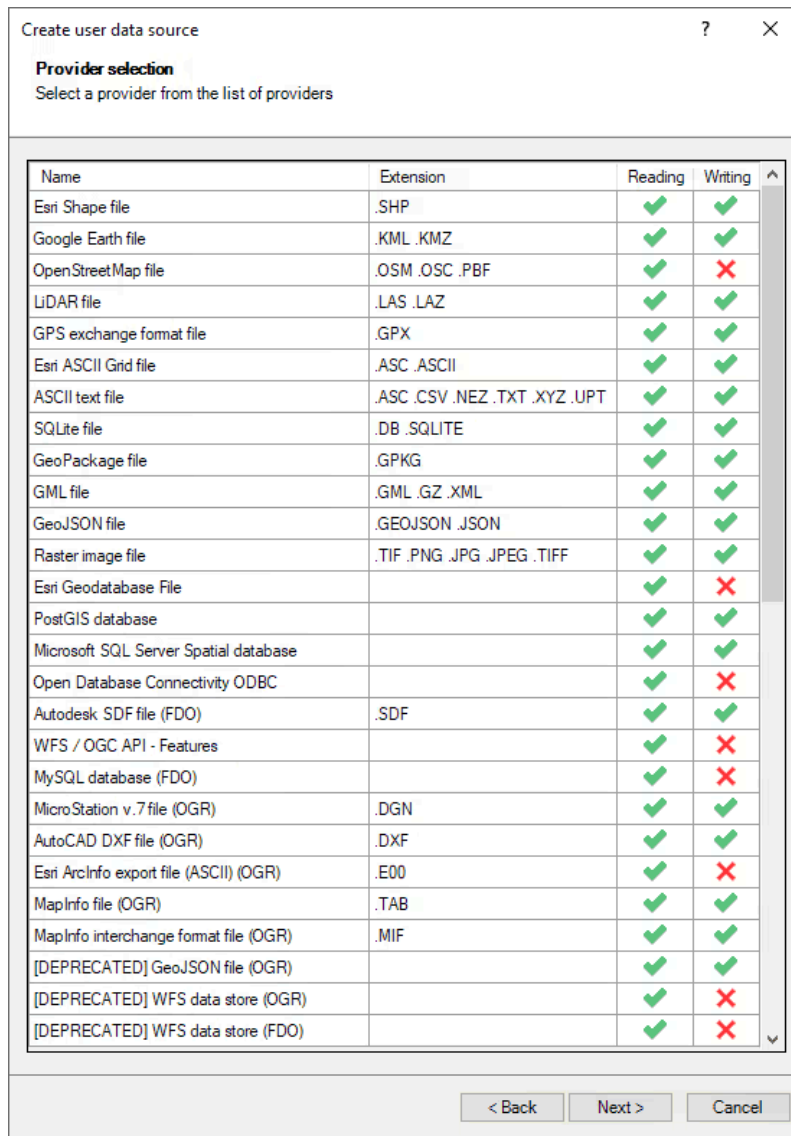
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Wizards

Wizards guide you step-by-step through the main Spatial Manager™ for ZWCAD commands (“Create user data source”, “Import”, “Export”, etc.). You can navigate back and forth through each step to configure all the options and parameters needed to complete a task.

Data Provider in the data source Wizard

Available on editions **Standard** **Professional**



Spatial Manager™ for ZWCAD 'Create user data source' Wizard

Import parameters in the Import Wizard

Import ? X

Import parameters
Set the parameters to import the incoming Features as Objects

Points and Centroids options

Import as points
 Import as Blocks There are no block definitions in drawing Block options...

Lines and Borders options

Import as Polylines Insert Nodes (as Points)

Polygons options

Import as Borders and Centroids Fill areas using Hatches Hatch options...

Label options

Label points using field value HAUTEUR Label options...

General options

Layer/Table name BATIMENT
 Use Field values for Layer CATEGORIE
 Apply random colors to new Layers
 Elevation Thickness
 Import as 2D Objects (Z coordinate will be ignored)
 Import Features data as Objects Extended Entity Data (EED)
 Import only Features in the current view

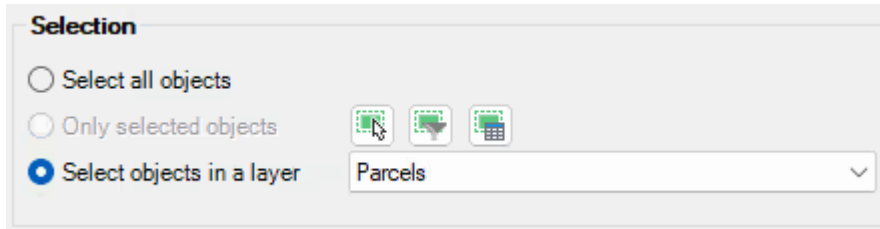
< Back Next > Finish Cancel

Spatial Manager™ for ZWCAD 'Import' Wizard

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Selection control

Some of the tools described allow entity selections before or during their execution. Even some of them allow you to select two groups of entities to operate between them.



Selection control

For all of these commands, the following notes and instructions apply:

- **Select all entities:** All entities in the drawing will be processed.
- **Only selected entities:** Only a selection of entities will be processed. You can select the entities before executing the commands or by using the Selecting buttons in their corresponding windows.
 - Manual selection.
 - Select by Query: Select entities according to the result of a simple or compound data query ([See 'Selecting by Query'](#)).
 - Select by Table: Select entities which have been previously attached to a specific data table ([See 'Selecting by Table'](#)).

Note: As you can select the entities previously to execute the commands, in addition to the use of the above included selection options or in combination with them, you can make use of some other [Advanced selection application tools](#), select entities in the [Data Grid](#), or any other selection method available in ZWCAD (Quick Select, etc.). Also note that, as most of the advanced application or ZWCAD selection commands will let you apply the selection to the current selection, the number of possible combinations to select what you are interested in is almost unlimited.

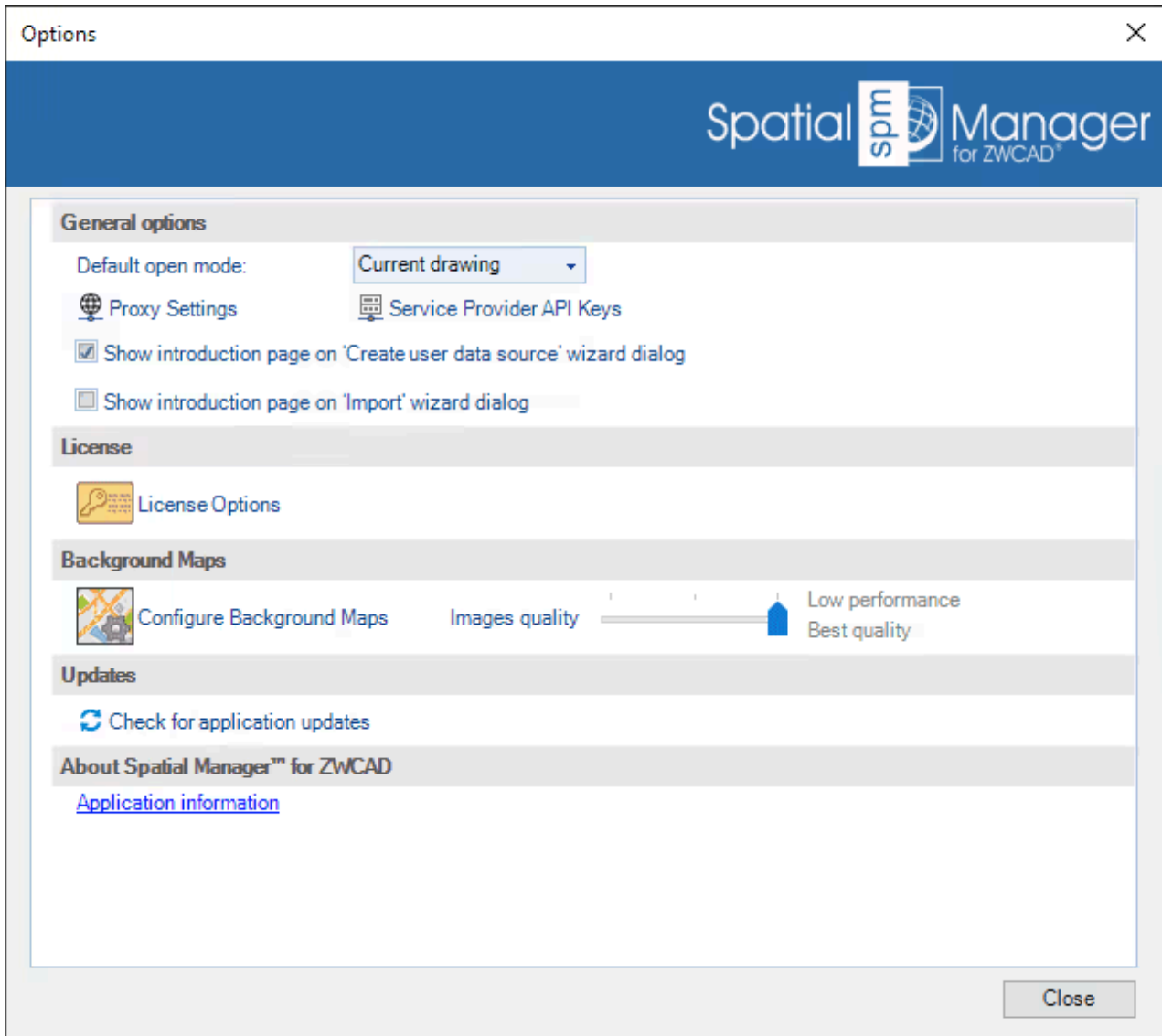
- **Select entities in a layer:** Only the entities included in a ZWCAD layer will be processed. You can select the layer using the drop-down list in this window.

Note: The selection of entities in ZWCAD may be a bit slower when the 'SpatialManager' palette is open, depending on the data of the entities.

DOCUMENTATION

Options

You can change the options and the user preferences of Spatial Manager™ for ZWCAD through the new “Spatial Manager” tab, which you can see when running the “Options” ZWCAD command; you can also run the **SPMOPTIONS** command. This tab includes five paragraphs (“General options”, “License”, “Background Maps”, “Updates”, and “About Spatial Manager™ for ZWCAD”) to access the options or preferences of the application and also setup and information shortcuts.



Spatial Manager™ for ZWCAD Options

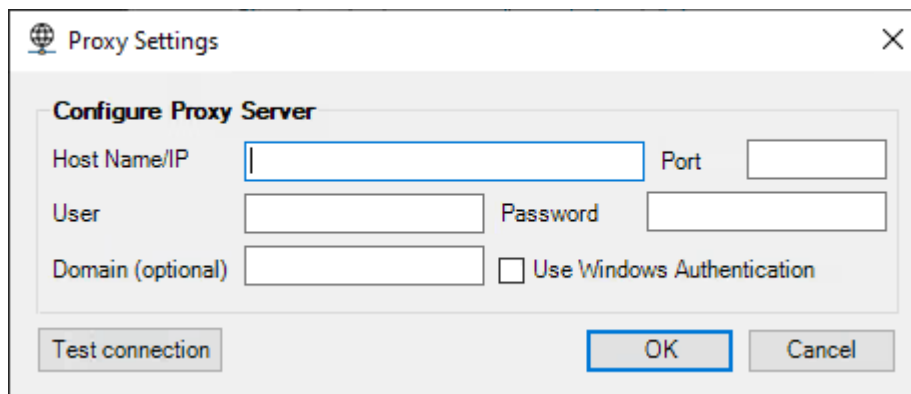
- **General options**

- Default open mode: You can select if an upcoming table from a data source will be imported into the current drawing or into a new drawing when double-clicking on the table in the Spatial Manager palette.
- Proxy Settings: [read below](#) .

- Service Provider API Keys: Some Service Providers (Bing, Google, etc.) may require a user account for some or all of their services [Geocoding](#) , [Background Maps](#) , [Search Locations](#) , etc. Many of the provider accounts are completely free of charge or include a sufficient number of queries for most users at no charge. Anyway, if a certain provider requires an API Key for a certain service, in this options window you can review how to get the API Key, enter it, check its validity, and examine which services of each provider may require an API Key.
 - Show introduction page on 'Create user data source' wizard dialog ("Standard" and "Professional" editions only).
 - Show introduction page on 'Import' wizard dialog.
 - **License:** [see Licenses](#) .
 - **Background Maps:** [see Background Maps](#) .
 - **Updates** (same as the SPMUPDATE command).
 - Check for application updates: Although by default the application will check for updates automatically, you can click here to check for new application updates whenever you want.
 - **About Spatial Manager™ for ZWCAD** (same as the SPMABOUT command).
 - Application information: Display the application "About" window.
-

Proxy Settings

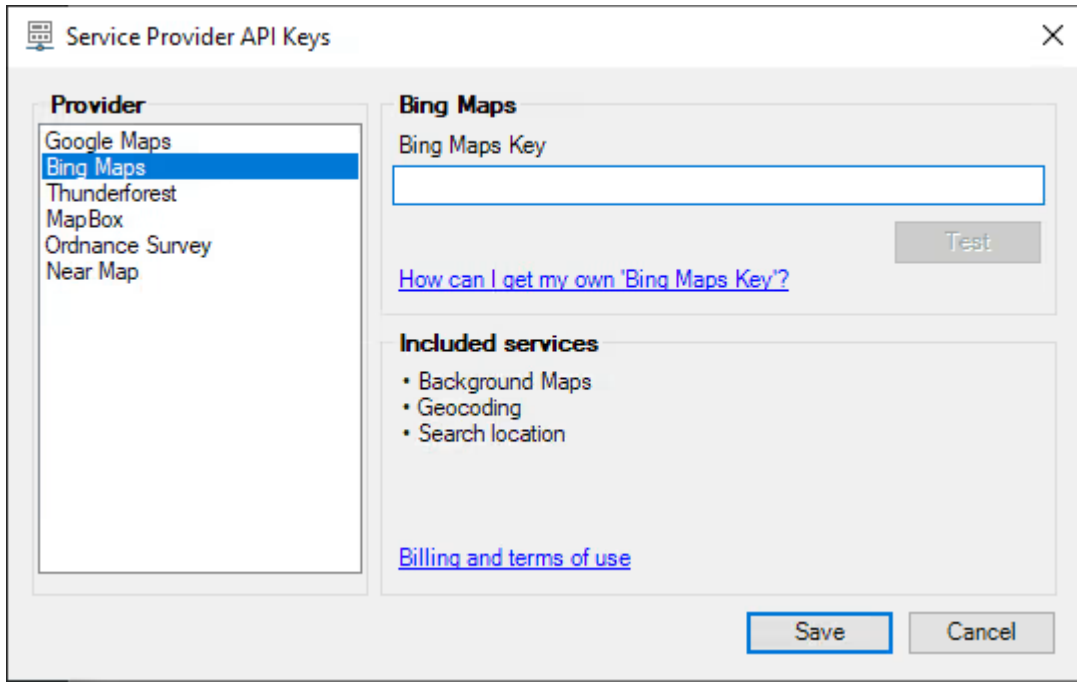
If you are accessing the Internet through a Proxy server, you can configure the Proxy access parameters here. There are several processes in the application in which it is necessary to access the Internet from the application itself (Background Maps, license activation, etc.). If you find problems accessing the Internet in any of these processes, ask your network administrator if it is being accessed through a proxy server and what the connection parameters are.



The image shows a 'Proxy Settings' dialog box with a title bar containing a globe icon, the text 'Proxy Settings', and a close button (X). The main content area is titled 'Configure Proxy Server' and contains the following fields and controls:

- 'Host Name/IP' and 'Port' input fields.
- 'User' and 'Password' input fields.
- 'Domain (optional)' input field and a checkbox labeled 'Use Windows Authentication'.
- At the bottom, there are three buttons: 'Test connection', 'OK', and 'Cancel'.

Proxy Settings window



Service Provider API Keys window

DOCUMENTATION

Configuration

All the settings for Spatial Manager™ for ZWCAD are stored in XML files. This is the list of configuration files.

- **Shortcuts.config**: Shortcuts configuration.
- **Tasks.config**: Saved tasks ("Professional" edition only).
- **UserDataSources.config**: User Data Source (UDS) configuration.
- **UserSettings.config**: Global application settings.
- **BackgroundMaps.config**: User Background Maps configuration ("Standard" and "Professional" editions only).
- **BackgroundMapGroups.config**: Background Maps Groups configuration ("Standard" and "Professional" editions only).

You will find them in the folder "user folder\AppData\Local\Opencartis\Spatial Manager for ZWCAD".

When a file is modified, an automatic backup copy is stored in the "backup" sub-folder. Each backup file name includes the date and time it was created.

To restore a backup file:

1. Close the application.
2. Make a copy of the current configuration file (recommended).
3. Rename the backup file to match the original configuration file name.
4. Copy it to the appropriate folder, replacing the current file.

Note: The backup files are kept for 30 days, with a minimum of 15 backups before deleting any file.

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Sample files

You can find a small set of sample files, which you can use for your own tests, located inside the folder "Common\Samples" (a subfolder of your application main installation folder).

- Click on the "Show Palette" button to open the Spatial Manager palette, which includes the main functions of Spatial Manager™ for ZWCAD.
 - If you cannot or you do not want to access the ribbon, key in **SPM** in the command line to open the palette.
 - Problems with the ZWCAD ribbon? Review the [troubleshooting section](#) .
- Expand the "Sample data" shortcut to access the sample files (grouped by format).
- Right-click over any file to import the spatial information as ZWCAD entities into the current drawing or into a new drawing.
- Use the default parameters in all wizard steps.
- Check the imported ZWCAD entities.
 - Note for the Trial version users: Take a look at the application [Limitations in this Version](#) .
- Import more files into the same drawing or into new drawings while choosing different import options.
- Try to import other kinds of spatial files such as Google Earth KML, GPS/GPX, SQLite, or XYZ point files.
 - Note about Coordinate Reference Systems (CRS): If you want to merge into the same drawing spatial data that has been saved using different CRSs, you need to transform the coordinates of the incoming data so that they are consistent with each other. This can help you learn how coordinate transformation works in the application. In the sample data set, the Shapefiles (SHP) and the SQLite and XYZ files were saved using the CRS "WGS 84 / Pseudo-Mercator" (SRID=3857), and the KML and GPX files were saved using the CRS "WGS 84" (SRID=4326) (mandatory for these formats).

The Sample data folder (and subfolders) is a read-only folder, so select another folder when trying to write data through export processes, etc.

DOCUMENTATION

Main features

General

- Import/export spatial data into/from ZWCAD drawings.
- Publish to Google Earth.
- Search the location of geographic entities.
- Geo-coding postal addresses (Direct and Reverse).
- Dynamic background image maps from Google Maps, Azure Maps, Bing, OpenStreetMap, Mapbox, Ordnance Survey, NearMap, etc.
 - Configurable user maps.
 - XYZ / TMS, WMTS, and WMS compatible.
 - WMS multi-layer maps.
 - Export/Import user background maps.
 - Snapshots (geo-referenced ZWCAD Images) of the current background map.
- Display and navigate palette for Google Street View.
- Thematic maps.
- Spatial Manager Explorer in the main application palette.
- Terrains.
 - From 3D points selected in drawing.
 - From a grid of 3D points built by accessing elevation service providers in any selected area.
 - 2D or 3D contours.
 - Minor and major contours.
 - Contour labels. Optional label masks.
 - Layer separation and different color models.
 - Contours attached to a data table.
 - Generation of three-dimensional terrain models (using 3D meshes or some other CAD/BIM entities).
- Transformation of coordinates when importing, exporting, showing background maps, projecting background map images on terrains, etc.
- Transform the drawing coordinate system.
- Extended Entity Data (EED).
 - Data grid palette, interactive and synchronized.
 - Selecting entities and navigation tools in the grid.
 - Editing data and columns.
 - Column sorting.
 - Sorting data by column.

- Automatic column width adjustment.
- Direct export to CSV, TXT, etc.
- Multi-table grid.
- Viewer palette.
 - Also shows some other data such as the block properties (name and attributes), layer, geometric properties, etc.
- Edit values directly in the palette.
- Hyperlinks.
- Managing data structure.
 - Define, modify, rename, and delete tables and fields.
 - Recover data table structures from the drawing entities.
 - Attaching entities to a table.
 - Detaching entities from their tables.
- Fields data calculator.
- Selecting entities by a simple or compound spatial and/or data query over entities' geometric relations and/or data.
 - Choose or search data from available values in the fields.
- Selecting the entities attached to a table.
- Zoom to the selected entities.
- Process GIS analytical operations.
 - Buffers.
 - Overlays.
 - Dissolve.
 - Create centroids or capture centroid data.
 - Areas of influence (Voronoi diagrams).
- Create texts from entities data. Optional text masks.

Import processes

- Entities imported into a new or open drawing.
- Raster and vector entities.
- Smart batch import.
- Basic target layer or new target layers using a field value.
- Use blocks for points and centroids.
 - Select the name of the block according to the value of a field.
 - Block insertion parameters from field values.
- Polygon fills and transparencies.
 - Fill properties can be taken from field values.

- Polygon centroids.
- Smart labeling of entities while importing. Optional label masks.
- Spatial filter to import only the entities in the current view.
- Elevation and thickness from field values.
- Import data from tables as Extended Entity Data (EED).
- Speed up the processes skipping some wizard steps.
- Use the intuitive palette options or the quick import function.
- Save tasks to replay the import processes as many times as desired.

Export processes

- Entities exported to geospatial files or servers.
- Export directly from any data source to any target.
- Export (publish) the current status and style of the drawing to Google Earth (one click).
 - Raster and vector entities.
- Select the entities to be exported.
- Option to export also the data of the entities and choose it from what table and fields.
- Option to treat the closed polylines as polygons.
- Options to export ZWCAD properties (Handle, Color, Layer, Elevation, etc.) of the entities.
- Options to export the name and the attributes of the block references as well as their rotation and scales.
- Options to export text entities and their basic properties (contents, rotation, and height).
- Options to export hatch entities and their properties (name, angle, scale, etc.).
- Options to export the X/Y/Z coordinates, length, and area of the entities.
- Automatic complex geometric operations.
- Filtering of incompatible entities.
- Option to open the exported file location directly.

Data sources

- Manage your own shortcuts.
- Access to spatial data files (SHP, GPX, KML/KMZ, OSM, PBF, LAS/LAZ, GPKG, CSV, TXT, ASC, XYZ, MIF/MID, TAB, E00, SQLite, SDF, GML, XML, JPF, PNG, TIF, etc.).
- Manage your user data sources.
- Access to spatial database servers (SQL Server, PostGIS, etc.).
 - Views and tables.
- Access to other connections (WFS, ODBC points or WKB – Excel, Access, dBase, etc. –, etc.).
- [See current available Data Providers](#) .

- Notes:
 - GIS analysis functionality is only available in the 'Professional' edition.
 - 'Street View' functionality is only available in the 'Professional' edition.
 - Transforming the coordinate system of the entities in a drawing functionality is only available in the 'Professional' edition.
 - Terrains and related entities functionality is only available in the 'Professional' edition.
 - 'Search Location' functionality is only available in the 'Professional' edition.
 - Geo-coding functionality is only available in the 'Professional' edition.
 - 'Thematic Maps' functionality is only available in the 'Professional' edition.
 - Data management (structures, queries, direct editing, etc.) based on Extended Entity Data (EED) is only available in the 'Standard' and 'Professional' editions.
 - Data grid is only available in the 'Professional' edition, although the overall data management (structures, queries, direct editing, etc.) is also available in the 'Standard' edition.
 - The fields calculator is available in the 'Professional' edition only.
 - 'Background maps' functionality is available in the 'Standard' and 'Professional' editions only.
 - Full export functionality (SPMEXPORT) is only found in the 'Professional' edition, although the functionality to export the current status of the drawing to Google Earth (SPMCREATEKML) is also available in the 'Standard' edition.
 - The tasks technology is available in the 'Professional' edition only.
 - You can optionally prevent the automatic activation of the "Geolocation" tab in the ZWCAD ribbon, because it may interfere with the functionality of the new background maps and other applications or ZWCAD functions (use SPMOPTIONS).

To get a first preview of the application, please watch these videos.:

VIDEO AVAILABLE

[Watch video on YouTube](#)

- [Importing 1 \(SHP, GPX, KML, ...\)](#).
- [Importing 2 \(Shapefile\)](#).
 - **IMPORT video** updated on May 2018.:
 - [Importing Shapefiles \(SHP\)](#).
- [Importing 3 \(CSV\)](#).
- [Importing 4 \(OpenStreetMap\)](#).
- [Exporting](#).
- [Dynamic Background Maps](#).

- *User Background Maps (WMS, ...).*
- *Terrains.*
- *Publishing to Google Earth.*
- *Data Management.*
- *Queries and Selections.*
- *Data sources.*

DOCUMENTATION

Uninstall

Uninstall 'Spatial Manager™ for ZWCAD' in Windows XP

- Close all ZWCAD windows.
- Go to the **Control panel**.
- Click **Add or Remove Programs**.
- Double-click **Spatial Manager™ for ZWCAD**.
- Click **Remove**.
- Click **Uninstall** in the application dialog.

Uninstall 'Spatial Manager™ for ZWCAD' in Windows Vista / Windows 7 / Windows 8 / Windows 10 (first versions)

- Close all ZWCAD windows.
- Go to the **Control panel**.
- Click **Programs and Features**.
- Double-click **Spatial Manager™ for ZWCAD**.
- Click **Uninstall** in the application dialog.

Uninstall 'Spatial Manager™ for ZWCAD' in Windows 10 (latest versions) and Windows 11

- Close all ZWCAD windows.
- Go to the **Settings**.
- Click **Apps**.
- Click **Apps & features**.
- Click **Spatial Manager™ for ZWCAD**.
- Click **Uninstall**.
- Click **Uninstall** in the confirmation dialog.
- Click **Uninstall** in the application dialog.

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Import

Imports spatial data, into new or existing ZWCAD drawings, as ZWCAD objects and Extended Entity Data (EED).

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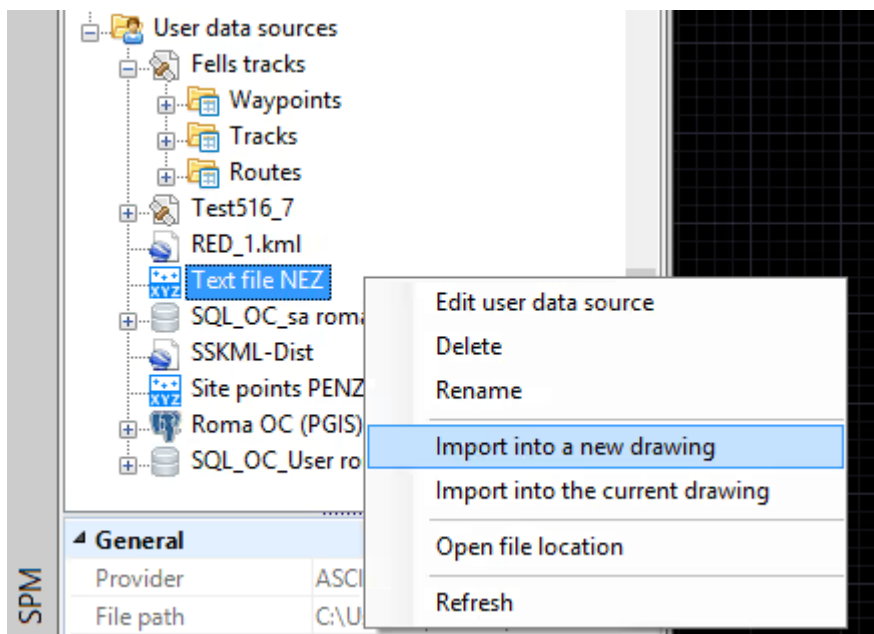
DOCUMENTATION

Import spatial data

Imports spatial data, into new or existing ZWCAD drawings, as ZWCAD objects and Extended Entity Data (EED).

Import spatial Features as ZWCAD Entities

Import spatial features as ZWCAD entities into Spatial Manager™ for ZWCAD by using the contextual menu (mouse right-click) on any table or spatial file in the 'Data sources' area of the 'SpatialManager' palette. This will launch the "Import" wizard of the application. As you will see, you can import the table or the file in the current or a new drawing (see also "How to import directly into the current drawing?" below). In any case, within a work session, the parameters of an import process are kept to be applied by default in the next import.



Import a file or a table into ZWCAD using the contextual menu

While running the "Import" wizard, you can select the import parameters that match your needs.

Import

Import parameters
Set the parameters to import the incoming Features as Objects

Points and Centroids options

Import as points
 Import as Blocks There are no block definitions in drawing Block options...

Lines and Borders options

Import as Polylines Insert Nodes (as Points)

Polygons options

Import as Borders and Centroids Fill areas using Hatches Hatch options...

Label options

Label points using field value HAUTEUR Label options...

General options

Layer/Table name BATIMENT
 Use Field values for Layer CATEGORIE
 Apply random colors to new Layers
 Elevation Thickness
 Import as 2D Objects (Z coordinate will be ignored)
 Import Features data as Objects Extended Entity Data (EED)
 Import only Features in the current view

< Back Next > Finish Cancel

Import Parameters window

- **Points and Centroids options.** Here you can define the options for point-type features and for centroids of polygons (if you choose any option to draw centroids in the polygons options). This area will be disabled if the application “knows” there are no points or centroids to draw.
 - *Import as ZWCAD Points.*
 - *Import as Blocks.* This item will be disabled if there are no Block definitions in the drawing.
 - *Select a Block definition.* You can select:
 - *A Block Name* in the drawing, or
 - *Choose the option “Use Field values for Name...”,* allowing you to select the Block definition to use for the point features or centroids depending on the value of a field in the data table. If this value does not match any name among the Block names in the drawing, the application will use ZWCAD Points to import the corresponding point features or centroids. If you choose this option, the “Block options” window (see next paragraph) will be automatically opened, allowing you to select the field for the Block names.

- **Block options.** Here you can choose the field for the Block names (see the previous paragraph), the correspondence between fields (if any in the data source) and Block attributes (if any in the Block definition), the option to use or not LUPREC for decimal places (*see Notes below*), and the Block insertion parameters such as the rotation and the scales, from values of fields in the data source. This item will be disabled if there are no attributes in the Block definition and there are no numeric fields in the data source.
 - **Notes:**
 - When inserting, the rotation of the Block references will consider the positive angles direction defined according to the value of the system variable ANGDIR.
 - You can choose whether the value of the LUPREC variable (Length precision) is used for the number of decimal places when writing attributes to a numerical field. This option also affects numeric field labels and can also be changed there (*see Label options below*).
- **Lines and Borders options.** Here you can define the options for linear-type features and for borders of polygons (if you choose any option to draw borders in the polygons options). This area will be disabled if the application “knows” there are no lines or borders to draw.
 - *Import as ZWCAD Polylines, Polylines 2D or Polylines 3D.*
 - *Insert Nodes (of Polylines) as ZWCAD Points.*
- **Polygons options.** Here you can define the options for polygonal-type features. This area will be disabled if the application “knows” there are no polygons to draw.
 - *Import Borders, Borders and Centroids, Centroids only, Polygons or Polygons and Centroids.*
 - *Fill areas using Hatches.* This item will be disabled if you have chosen the option to import as “Only Centroids”.
 - **Hatch options.** Here you can define options such as pattern, angle, scale, transparency (if supported) and whether the hatch is associative. Some parameters can be taken from fields in the data source.
- **Label options**
 - *Label entities using field value.* You can select any field to create text entities in ZWCAD in order to label the incoming entities by reading the text strings from this field. Each text entity will go to the same layer as the labeled entity. Polygon labels will be placed at the polygon centroid position and polylines will be labeled using a “smart” scheme.
 - **Label options.** You can define style, height, justification, rotation, rotation units and other parameters. Some can be taken from fields. For linear entities you can set repeated label spacing or choose a single label. You can set whether to use LUPREC for decimal places and whether to insert only the label (no geometry). Mask labels will generate wipeouts.
 - **Notes:**
 - Rotation respects ANGDIR.
 - LUPREC affects numeric labels (*and Block attribute numeric formatting above*).
 - Extended Entity Data (EED) is not attached to labels.
 - Label masks available from ZWCAD 2020 SP2 Special Package (2020.05.15 - 56123).
 - The [SPMLABEL](#) command is also available for labeling existing entities.
- **General options**

- *Layer/Table name.* Defines the target layer name for the imported entities. If left blank, uses the current layer. This is also the name of the data table if importing feature data.
- *Use Field values for Layer.* Defines layers dynamically from a field value.
- *Apply random colors to new Layers.*
- *Use Field values for Entity Elevation and/or Thickness.*
- *Import as 2D Entities (Z coordinate ignored).*
- *Import Features data as Entities Extended Entity Data (EED)* ("Standard" and "Professional" editions only).
 - *Notes:*
 - Fields starting with "http" become active links.
 - Disabled if importing labels only.
- *Import only Features in the current view.*
 - *Notes:*
 - Entire bounding box must be outside the view to be excluded.
 - Disabled when importing into a new drawing.

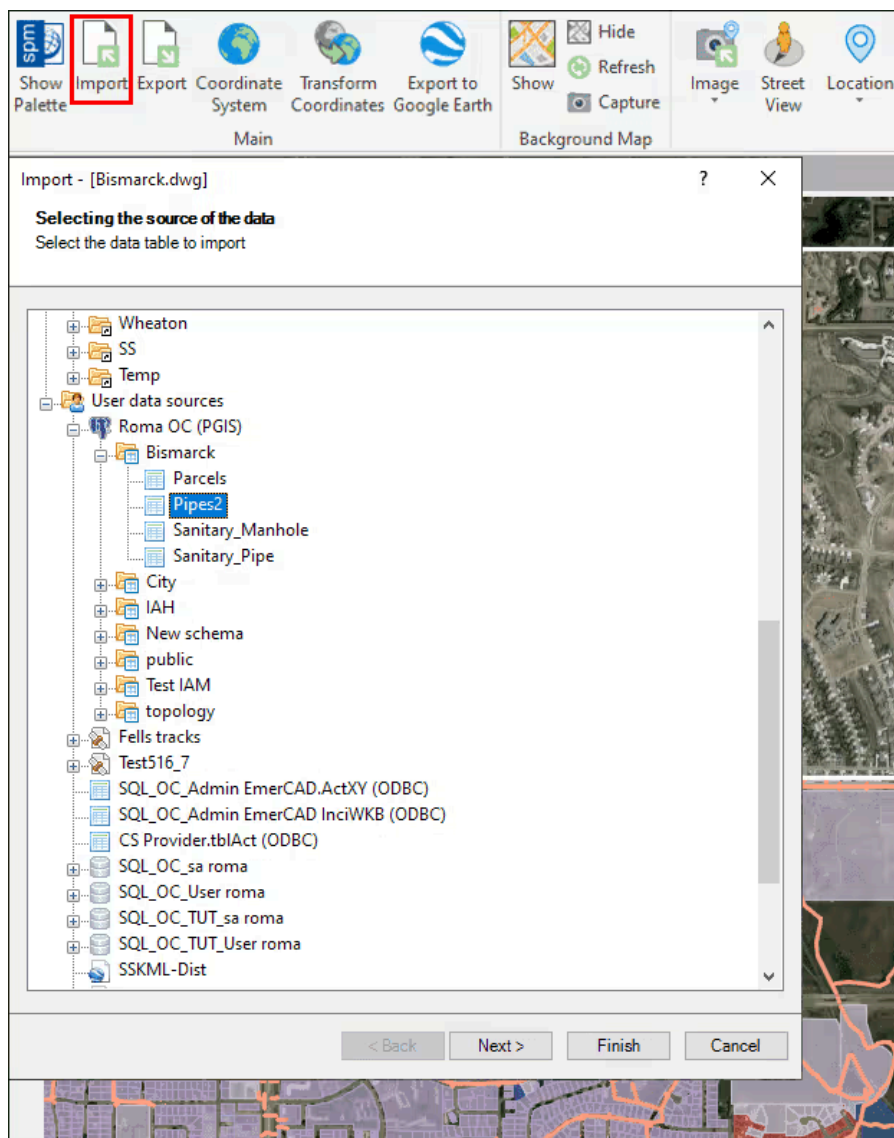
▲ General	
Layer	zoning
▲ Geometry	
Type	Line string
Coordinate System code	2229
Coordinate System name	NAD83 / California zone 5 (ftUS)
It is 3D	False
It is measured	False
Bounding box Xmin	6405692.61589155
Bounding box Ymin	1831168.35285446
Bounding box XMax	6415119.97837377
Bounding box YMax	1841169.35349927
▲ Data	
ZONING	R1
MAJOR_CAT	R
ZONEDESC	Single Family Residential
LABEL	R1
URL	http://santa-monica.org/planning
	<div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <p>URL http://santa-monica.org/planning/planningc omm/zoningordinace.htm</p> </div>

Entity data and 'http' case

Importing raster images or photos: Although the general import functions allow importing raster files in addition to vector files, the `SPMIMPORTPHOTO` command is more straightforward for importing geo-referenced raster images.

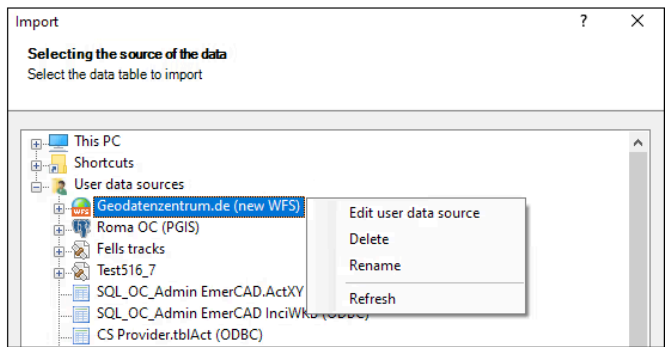
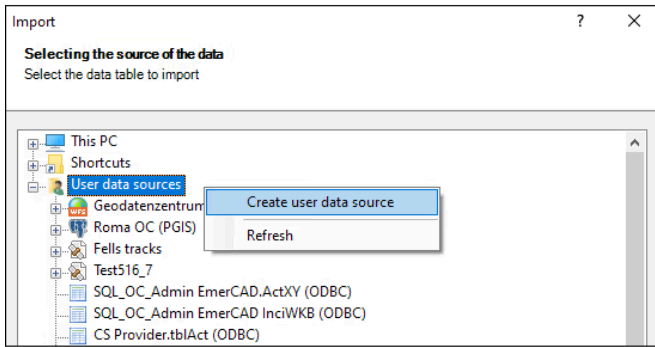
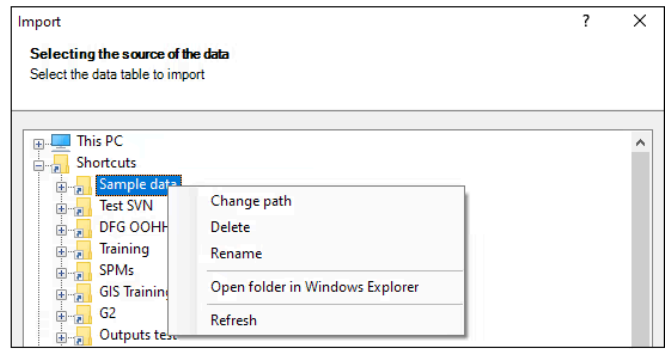
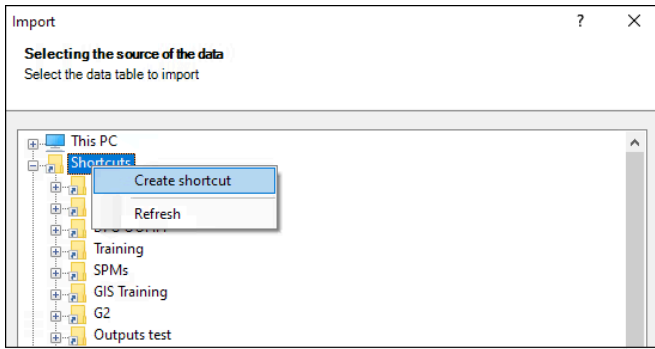
Import directly into the current drawing

The **SPMIMPORT** command of Spatial Manager™ for ZWCAD allows you to import features directly into the current drawing without opening the palette. The displayed window is similar to the palette's Data Sources section, and once the import source is selected, the wizard proceeds with the same steps and parameters described above.



Import directly window

Although the application's main palette is the primary tool to manage resources, shortcuts and UDSs, the context menus in this direct import window also allow executing many of these functions on the fly.



Contextual options in the Import window

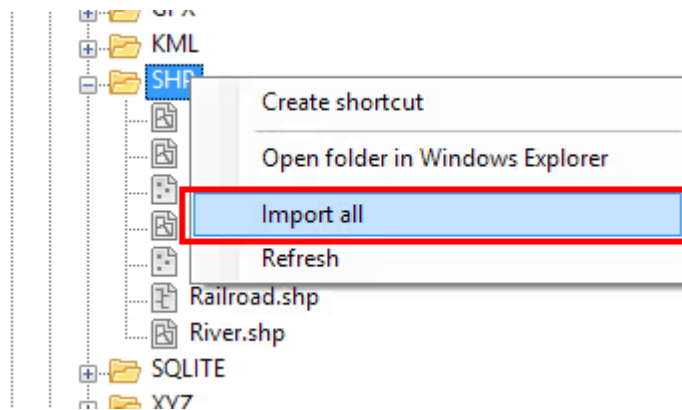
DOCUMENTATION

Batch import

Imports spatial data, into new or existing ZWCAD drawings, as ZWCAD objects and Extended Entity Data (EED).

Import all files from a folder in a single step

Spatial Manager™ for ZWCAD provides this functionality through the contextual menu of the folders in the application palette.

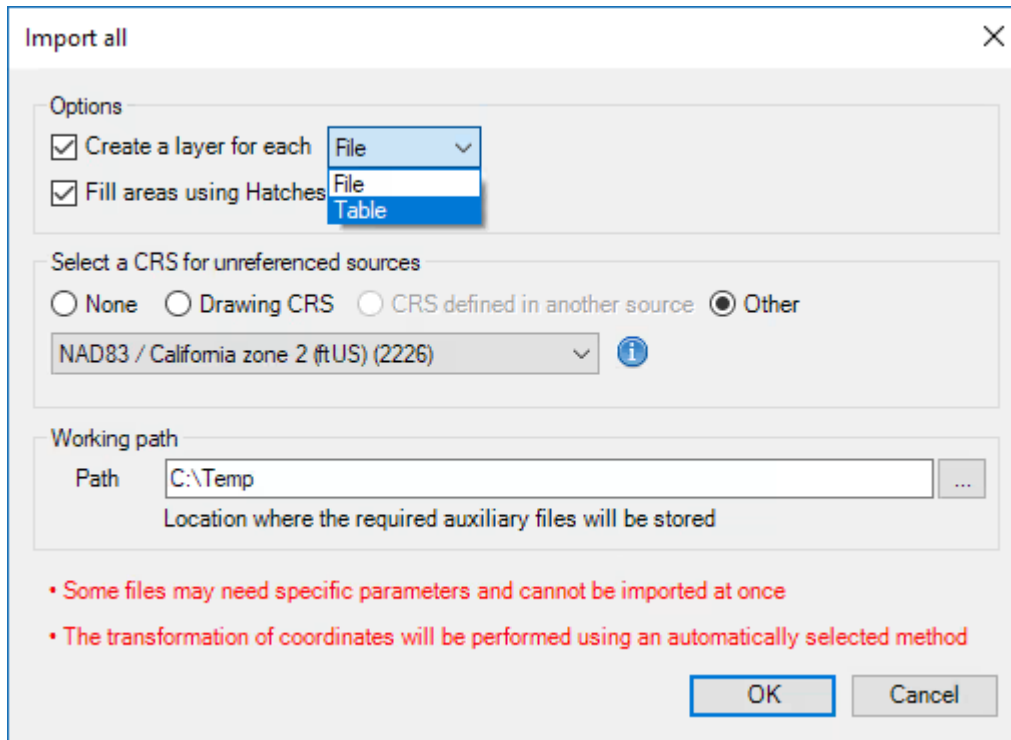


Contextual function to import in one go the content of all the files from a folder

When executing “Import all” you can define some basic parameters:

- Create a layer for each File or Table.
 - You may want to mark this option, for example, when the information contained in each file or table is not homogeneous.
 - You may want to unmark this option, for example, when you are importing the same class of entities split in a grid.
 - When the “Table” option is selected and there are several files to import, the name of the layers will be formed by the file name and the corresponding table name.
- Fill areas using Hatches.
 - This option will be applied to all the polygonal entities imported from any file.
- Select a CRS for unreferenced sources.
 - Since the “Import all” process will transform the coordinates between the sources and the drawing when needed, you can select a CRS for those sources without a defined CRS (if any). You will find the following options:
 - Drawing CRS (if defined).
 - CRS defined in another source that has been included in the current “Import all” process (if any).
 - Other CRS, which can be selected using the same ways as when you run any import process. Please take a look at [this section](#) .

- Working path.
 - Defines a location where the application will save any auxiliary files required throughout the Import-all process.
 - For example, raster image files created when importing images that need to be transformed (coordinate transformation, etc.).
 - If this parameter is left blank, the application will ask you where to save each auxiliary file when necessary.

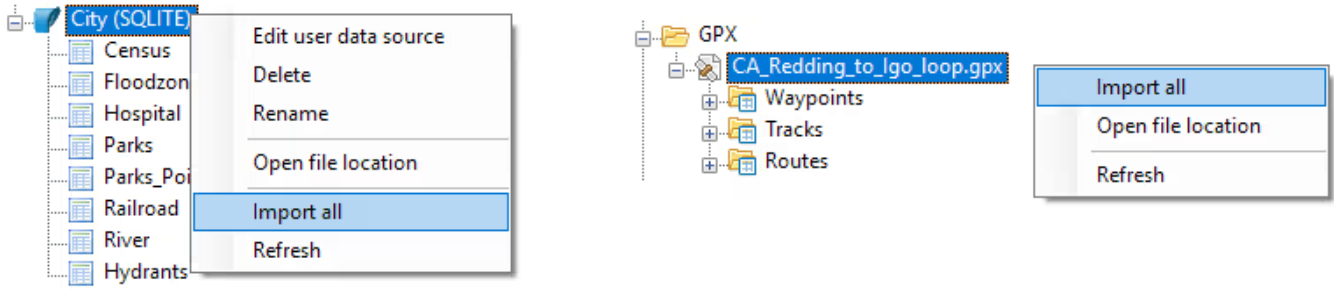


'Import all' basic options window

Note: When using this function, if the drawing is unreferenced, the most suitable CRS will be automatically assigned to the drawing.

Import all schemas in a User Data Source (UDS) or all tables in a schema or file in a single step

Spatial Manager™ for ZWCAD provides a functionality similar to that of the previous section when it comes to batch importing all schemas from a data source or all tables in a schema or file.



'Import all' schemas or tables in a schema

DOCUMENTATION

Coordinate transformations

Imports spatial data, into new or existing ZWCAD drawings, as ZWCAD objects and Extended Entity Data (EED).

Define a Transformation of coordinates

When you are importing Features as ZWCAD entities using Spatial Manager™ for ZWCAD, you will see that you can choose a Transformation of coordinates from the source Features to the entities in the drawing, in the "Import" wizard. This means that the application will calculate a geometric transformation between the source and the target data, which will depend on the chosen CRS for the source (incoming Features) and for the target (imported ZWCAD entities) data. You can choose the appropriate CRSs by clicking on "CRS catalog..." in the CRS dropdown list for the source or for the target data. In the CRS table you can:

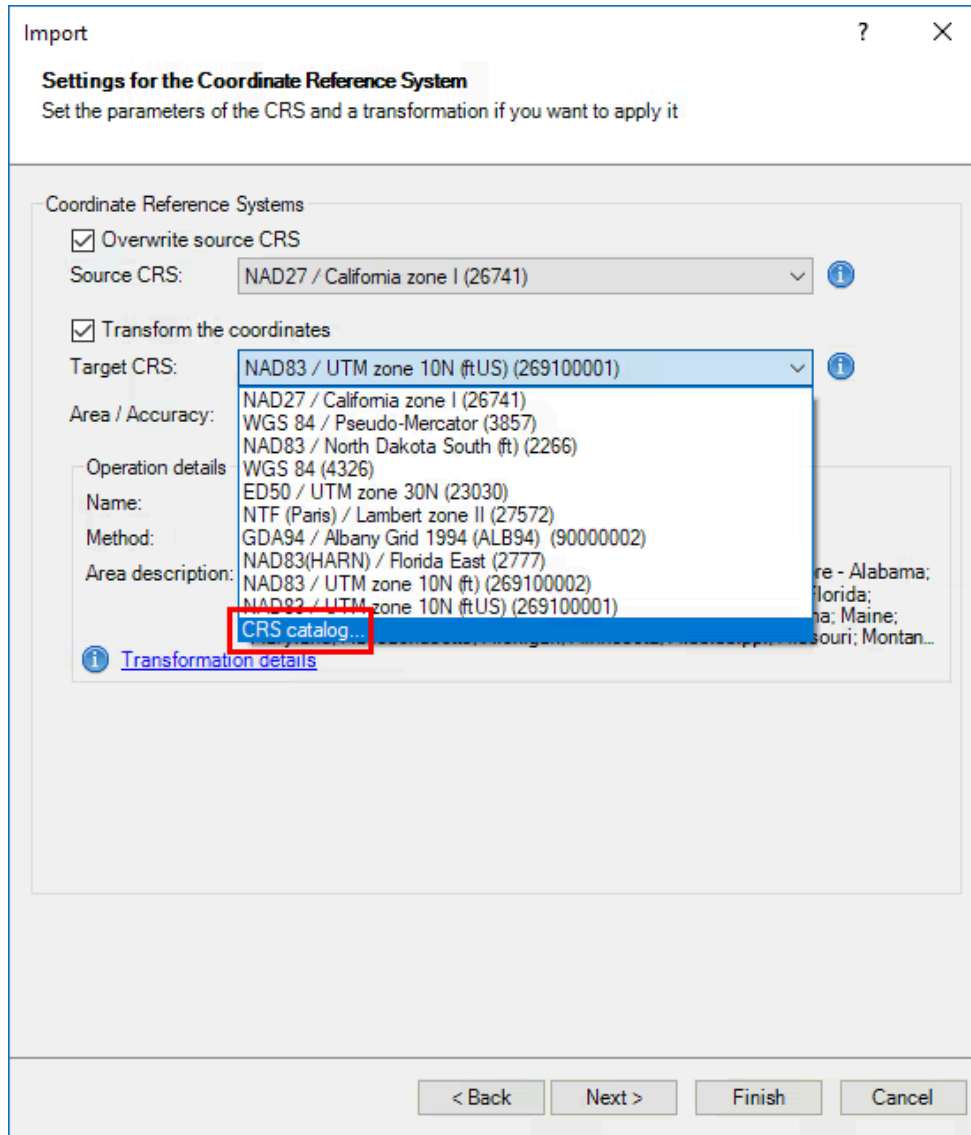
- Filter the CRSs by type (Geocentric, Projected, etc.).
- Choose a CRS by clicking on its row in the table.
- Search CRSs by typing the search criteria in the "Search" box. You can type here as many words as you like separated by blanks. The application will find all the rows including all these words in any column of the table.

After choosing a pair of valid CRSs for a Transformation, you can choose the geographic Area to apply it to (the application will choose by default the most common Area for this Transformation).

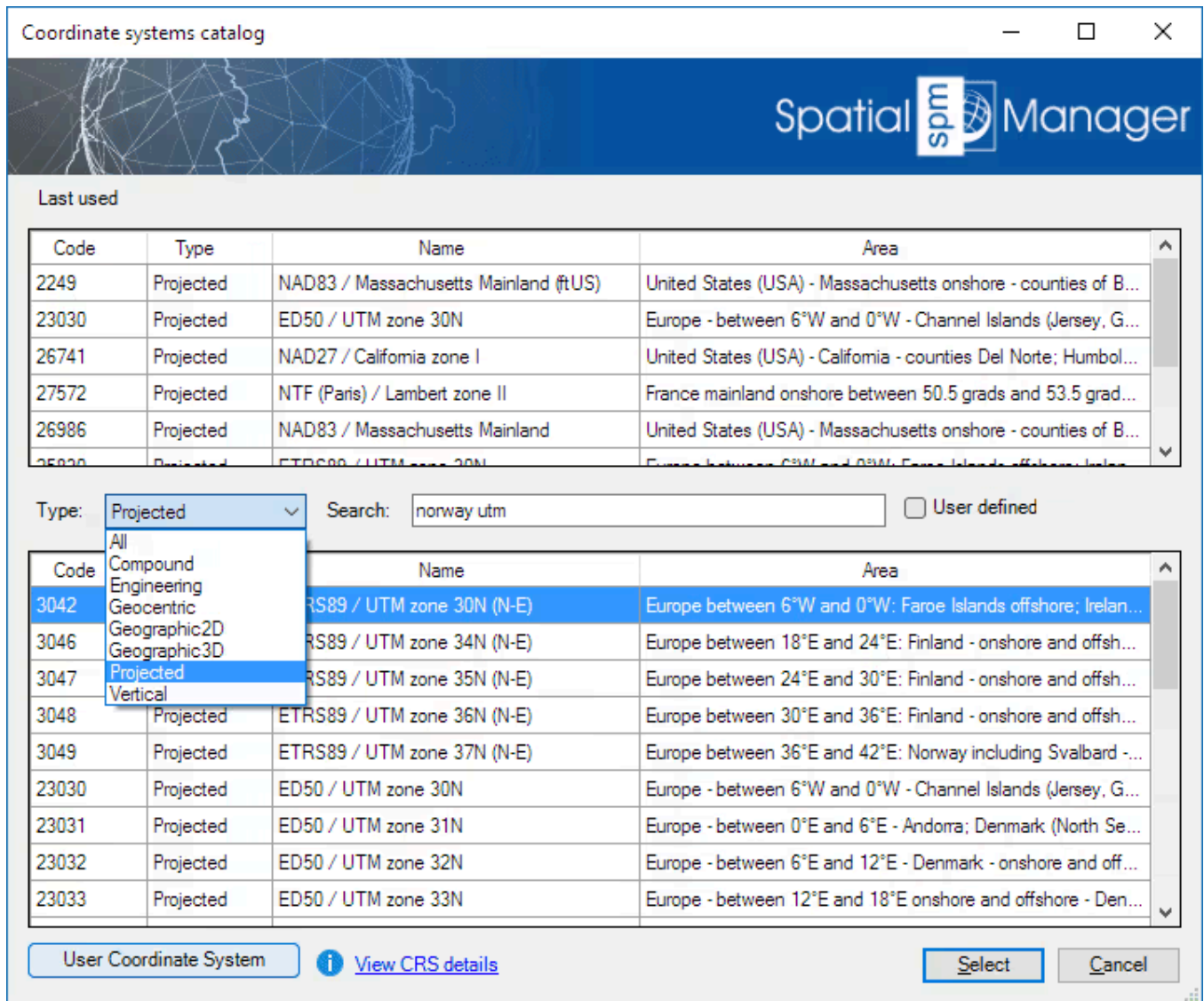
If the application "knows", "guesses" or "can assume" the CRS of the source and/or the target (drawing) data, it will be chosen by default. You will be able to modify this choice except in cases where only one CRS is valid; for example, for a KML or a KMZ file the only valid choice is the CRS "WGS84 (SRID 4326)", because these types of file are always defined using this CRS.

You can assign a CRS to the drawing or modify it using the command **SPMSETCRS**. By executing this command, you will access the CRS Catalog of the application described in the previous lines. In this case the Type "Projected" will be selected by default because it is the most common choice.

- When importing a table defined using a known CRS into a drawing without an assigned CRS, the CRS of the table is automatically assigned to the drawing.
- If you change the target CRS by choosing any CRS other than the drawing CRS, you will get a warning from the application, but you can continue and perform the Transformation of coordinates if you want to.



Access to the CRS Catalog of the application



CRS Catalog of the application

- Notes:
 - To unassign (undefine) the coordinate system of the drawing, choose "Undefined CRS" (EPSG 0).
 - As you will see, the CRS dropdown lists will include more and more CRSs as they have been previously chosen in other Transformation operations, so that you can choose your "last-used" CRSs directly from the dropdown list without having to access the CRS Catalog all the time. In addition, the CRS Catalog window shown when you execute **SPMSETCRS** to assign a CRS to the drawing or modify it also includes a list of the "last-used" CRSs (if any) in the upper zone.
 - If the incoming data is defined using the CRS "WGS84 (SRID 4326)" and the drawing has not assigned any CRS, the transformation to the CRS "WGS 84 / Pseudo-Mercator (SRID 3857)" is selected by default to get a projected map instead of a flat representation of geodesic coordinates.
 - [Coordinate Systems and Transformation details](#)
 - [Coordinate Systems entities available in the current version](#)

DOCUMENTATION

Data

Available on editions

Standard

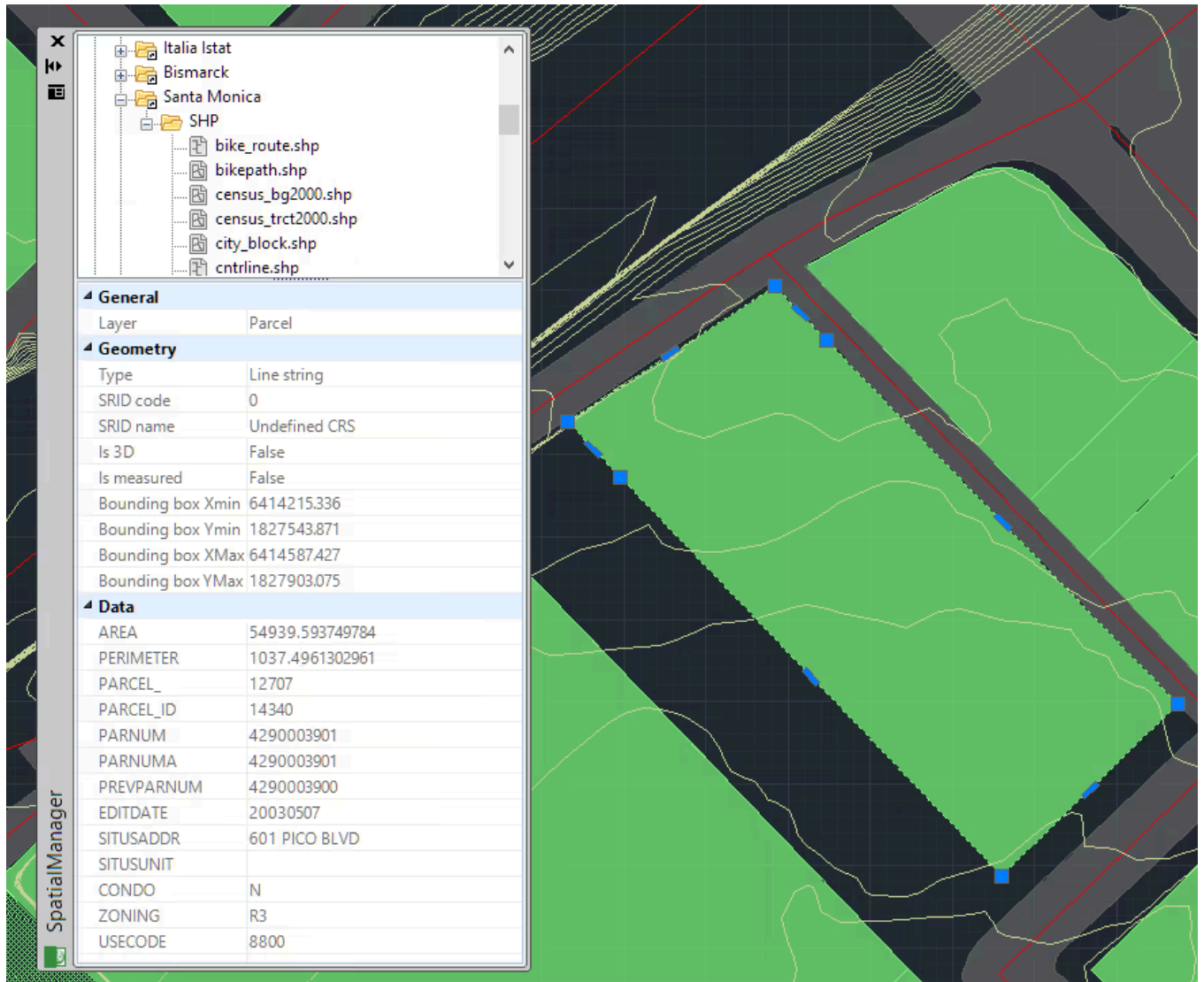
Professional

Manage the alphanumeric data attached to the objects, design and edit the structure which will be used to store the data in ZWCAD.

Review the data of the imported Features

You can see the data of the imported Features in Spatial Manager™ for ZWCAD, because this data is also imported as Extended Entity Data (EED) attached to the resulting entities in the drawing. To see it, select an imported entity in ZWCAD and its data will be shown in the group 'Data' of the 'Properties' area in the 'SpatialManager' palette.

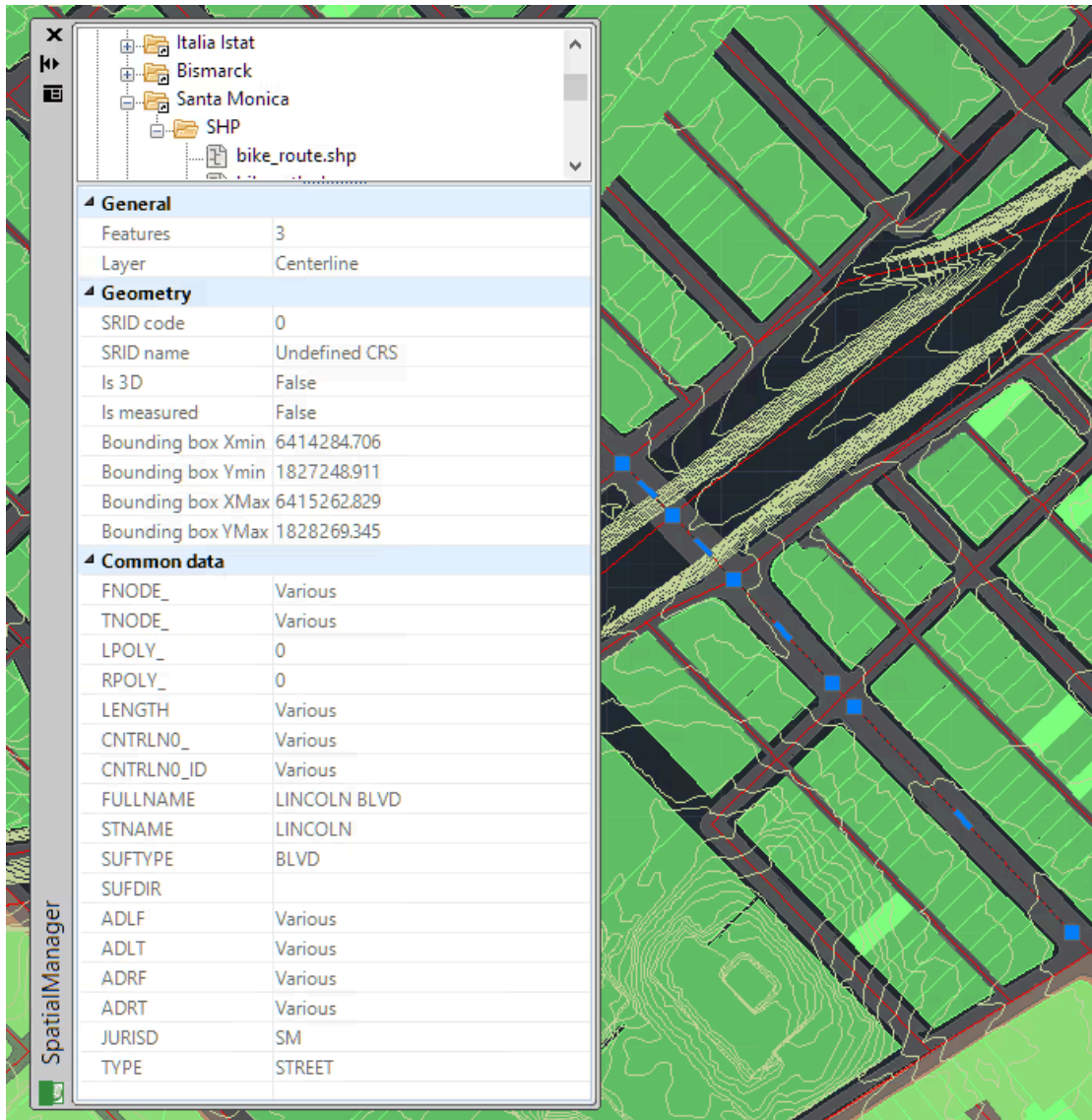
In addition to the Extended Entity Data (EED), you will see some other entity data, such as its Layer or its Bounding box, in other groups, such as "General" or "Geometry".



Entities data in the application palette

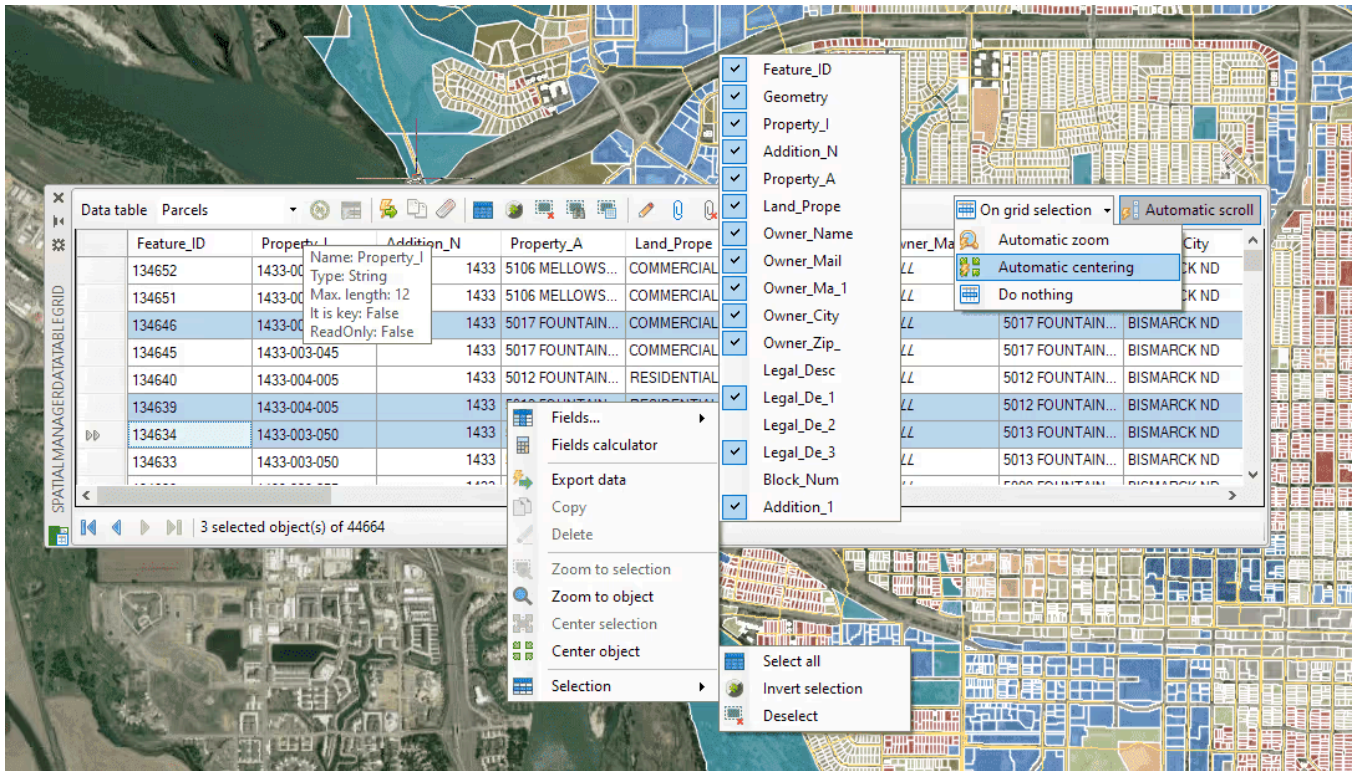
When selecting multiple entities, you will see their common data here. All the data which is not equal for the selection will be shown as "Various".

Note: Because of performance considerations, the number of entities selected for which their data is shown in the application palette is limited by the system variable PROPOBJLIMIT.



'Various' case in the entity data display

Alternatively, you can use the Spatial Manager™ for ZWCAD 'Data Grid' palette ("Professional" edition only) in order to view, edit, select, export, etc. the entities data in a table form.



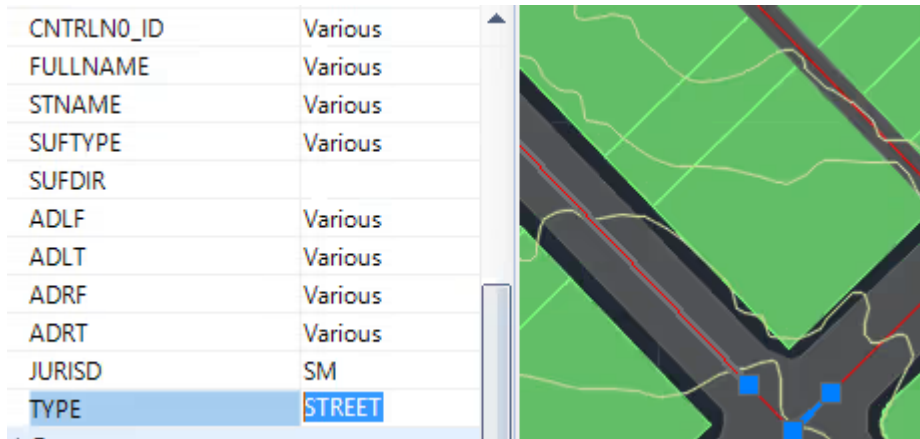
'Data Grid' palette

Learn more about the [Data Grid](#) and all its features and functions.

Modify the field values of the entities data

You can directly edit a field value (Extended Entity Data (EED) direct data edition) for one or more entities in Spatial Manager™ for ZWCAD by selecting the entity(s) in the drawing and typing the new value for this field in the 'Properties' area of the 'SpatialManager' palette. You can also delete the field content to get a null value in this field. To validate any modification, you need to press Enter or click on a different field.

Note: Because of performance considerations, the number of entities selected for which their data is shown in the application palette is limited by the system variable PROPOBJLIMIT.



Direct data edit in the Properties area

As you can read in the previous article, you can use the Spatial Manager™ for ZWCAD 'Data Grid' palette ("Professional" edition only) in order to view, edit, select, export, etc. the entities data in a table form.

Learn more about the [Data Grid](#) and all its features and functions.

Modify the entities data structure

You can add, modify, or delete fields in a table structure as well as create, restore, edit, rename, and delete data tables. Learn more about the [Data Structure Management](#) .

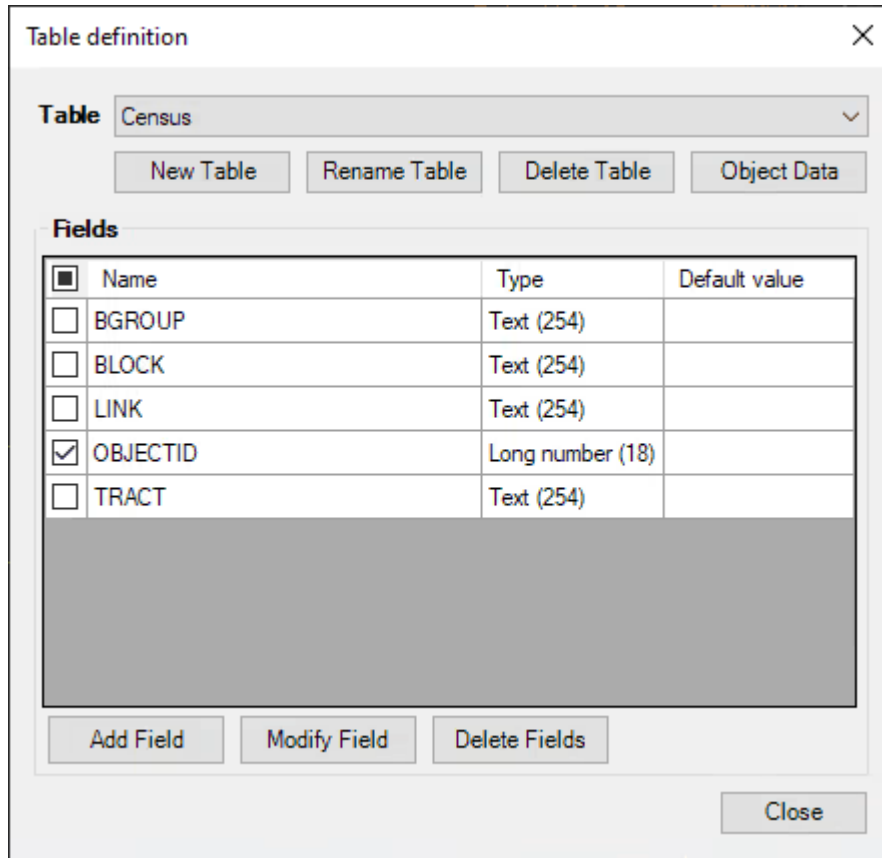


Table definition window

DOCUMENTATION

Tasks

Available on edition

Professional

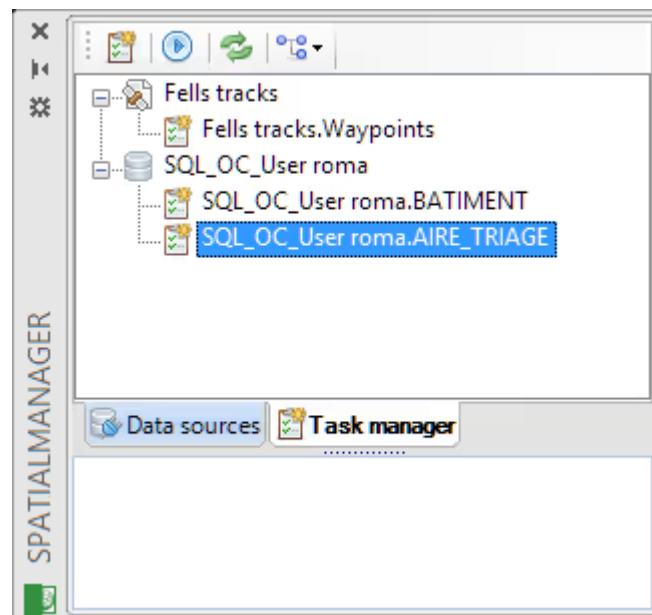
Save Tasks in ZWCAD to replay import processes (including all process parameters) so many times as desired.

What are the Tasks

The Tasks in Spatial Manager™ for ZWCAD are the way you can save any import process and its parameters, allowing you to run, whenever you want, repetitive processes for importing data tables into ZWCAD. You can access Tasks through the **"Task manager"** area in the *SpatialManager* palette.

Importing tables from files, servers or data stores in ZWCAD may be executed regularly, and sometimes these processes require several complex parameters: source definitions, import settings, coordinate transformations, etc.

Spatial Manager™ for ZWCAD introduces the concept of **Task**, which stores all necessary operations and parameters for any spatial-information import process. Once saved, you can run the Task from the Task Manager whenever needed.



'Task manager' area in the application palette

Note: Within a work session, the parameters of any Import process are kept to be applied by default in the next Import.

Create a new Task

You can create new Tasks in Spatial Manager™ for ZWCAD using the **“New task”** button in the Task Manager.

You may also create a Task while defining an import process, since you will run the same wizard. Both methods let you run the import process immediately and/or save it as a Task at the end of the wizard.

As when defining import processes, you must specify:

- Source data table access parameters
- Import process parameters
- Coordinate system transformation parameters (if required)
- Task name
- Optional description

All this information is stored as a new Task until you delete it.

Import ? [X]

Save and/or run the task immediately
Choose whether to run the task immediately and/or save it for later use

Run the task immediately

Save the task

Name:

Description:

< Back Next > Finish Cancel

Create a new Task

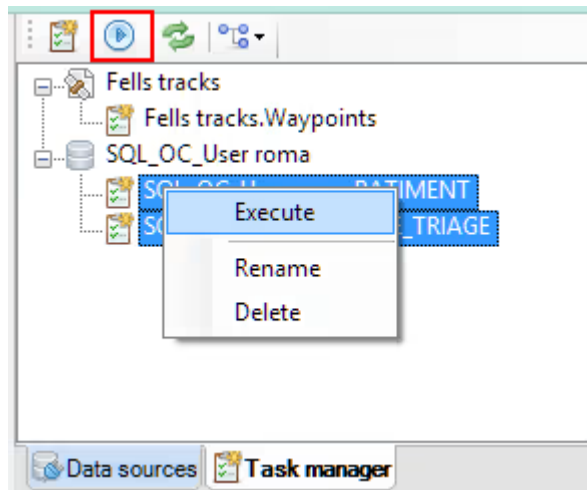
*Note: If you enable “**Import only Features in the current view**”, this condition will also be saved into the Task and may produce unexpected results if the drawing view is different when you later execute the Task.*

Execute one or more Tasks

You can select one or multiple Tasks in the Task Manager using **CTRL** and/or **SHIFT**.

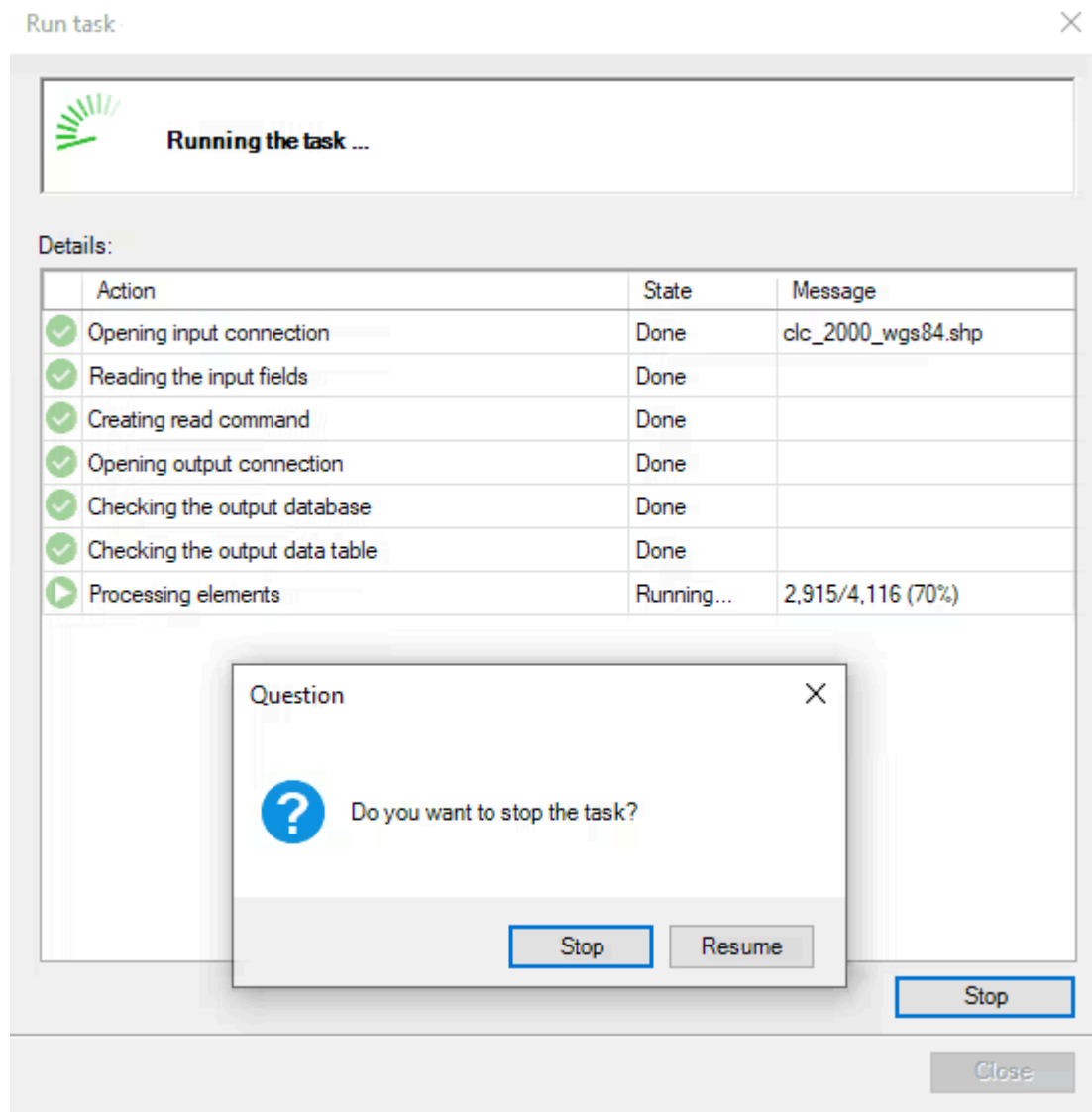
To execute them, right-click any selected Task and choose “**Execute**”, or use the “**Execute**” button.

All selected Tasks will run sequentially, importing their corresponding entities into the current drawing.



Execute one or more Tasks

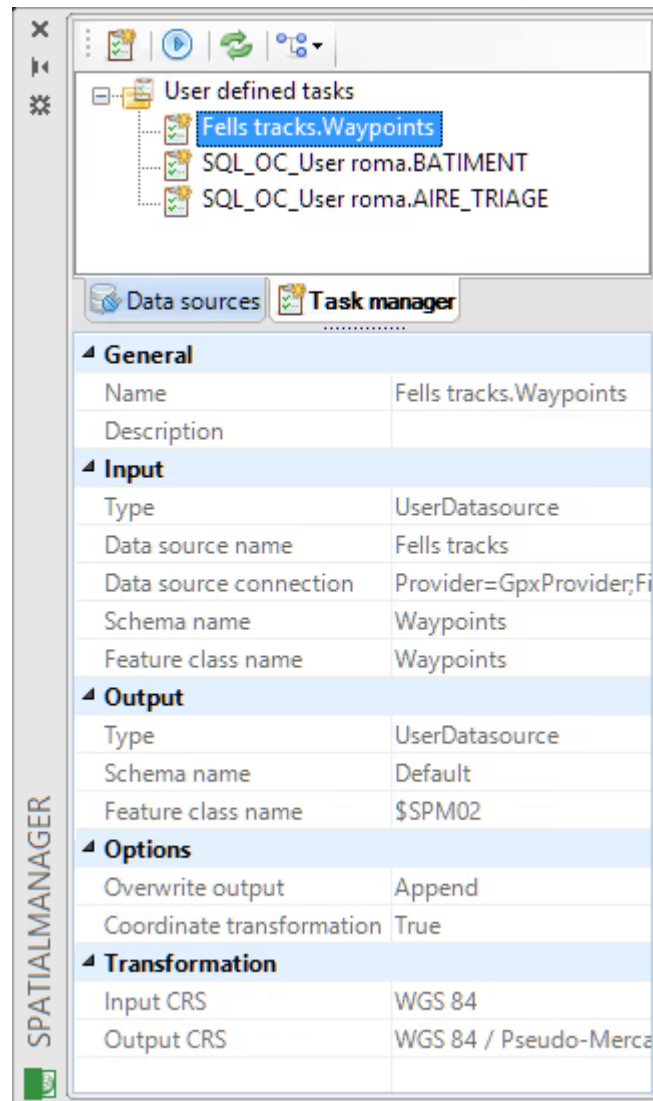
While Tasks are running, you will see a progress window listing all performed actions. You may cancel the process at any time.



Cancel a Task

Review the Properties of a Task

You can review the Properties of a selected Task (only one at a time) in the **“Properties”** area of the Spatial Manager™ for ZWCAD palette.

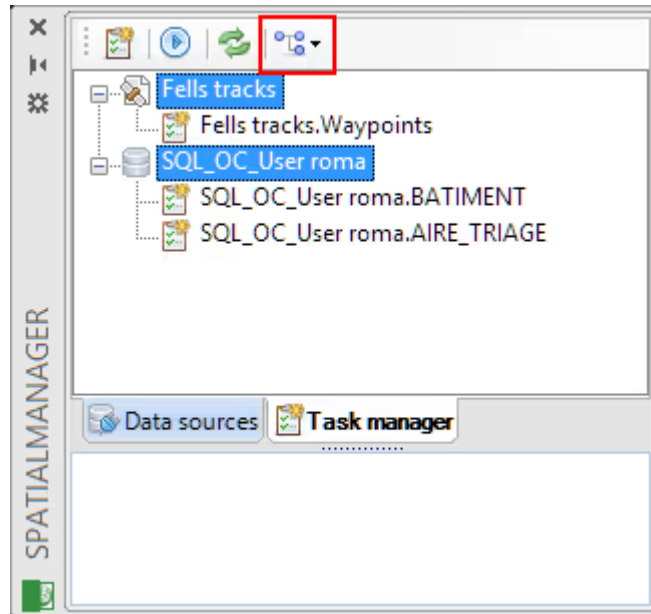


Properties of a Task

Sort the Tasks in the “Task manager”

You cannot manually rearrange Tasks in the list, but Spatial Manager™ for ZWCAD allows you to sort them using the “**Sort**” button:

- **Group by source** – Tasks are grouped by their referenced data source
- **Plain list** – All Tasks displayed together and sorted by creation date

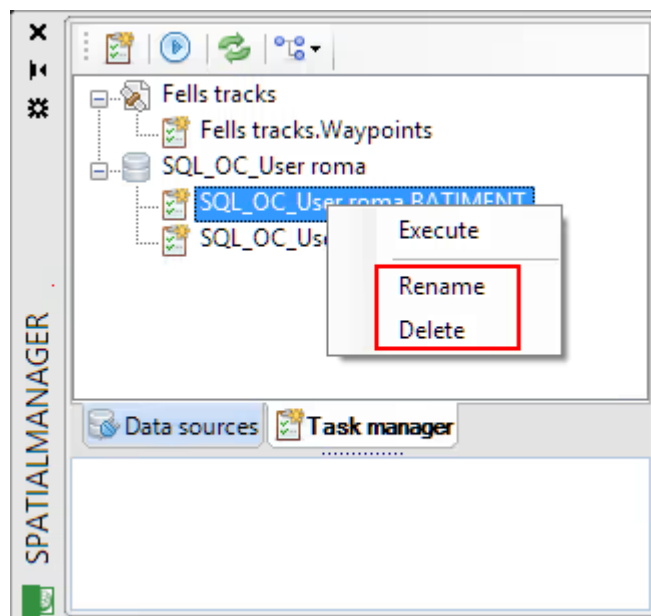


Sort Tasks button

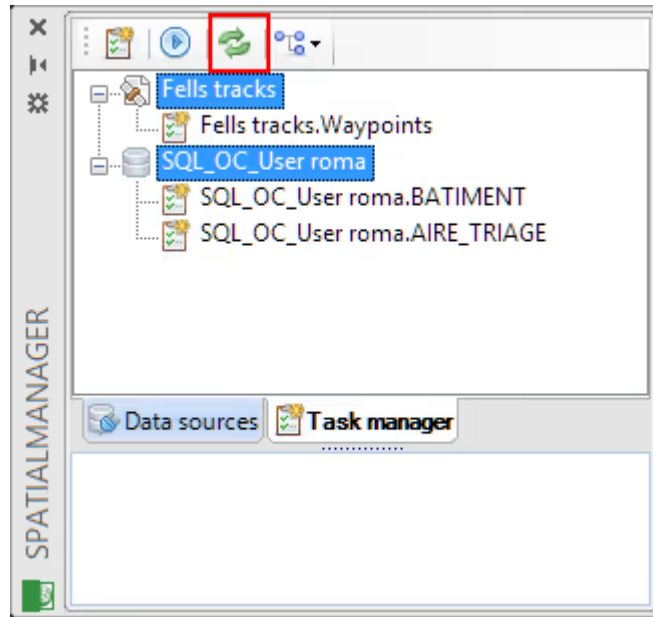
Other functions for the Tasks

You can **Delete** or **Rename** a Task using the right-click menu on a single Task entry.

You can also **Refresh** the Task list using the "Refresh" button, useful when the data sources change during the current work session.



Delete or rename a Task



Button for Refresh the Task list

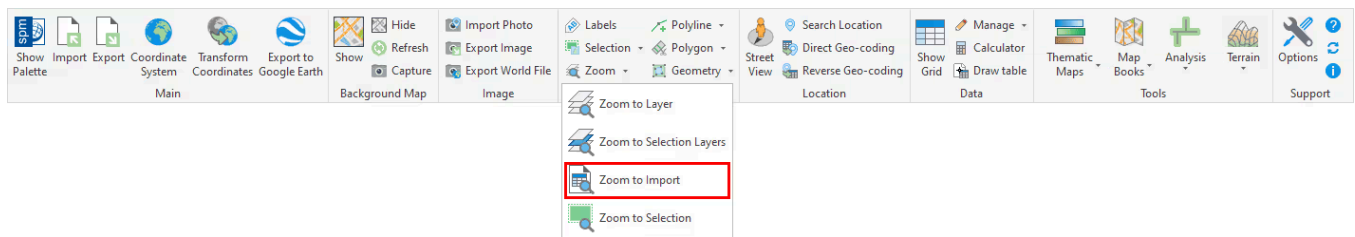
DOCUMENTATION

Advanced

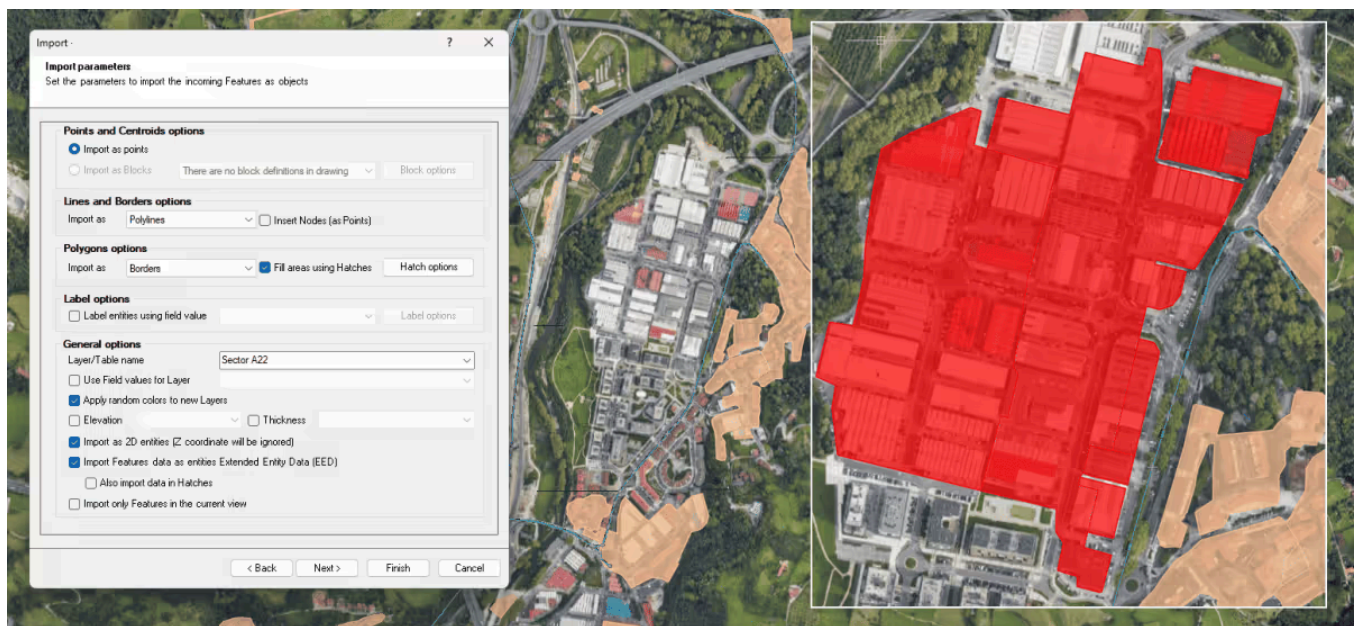
Imports spatial data, into new or existing ZWCAD drawings, as ZWCAD objects and Extended Entity Data (EED).

Locate on the screen the last imported entities

You can use the Spatial Manager™ for ZWCAD command **SPMZOOMTOIMPORT** that zooms to all entities in the drawing that were included in the last import process.



'SPMZOOMTOIMPORT' command in the Spatial Manager™ for ZWCAD ribbon



Zoom to the imported entities

This function can be used at any time during the current work session, even if other commands are executed, since the visual rectangle surrounding the last imported entities is kept in memory until a new import process is executed.

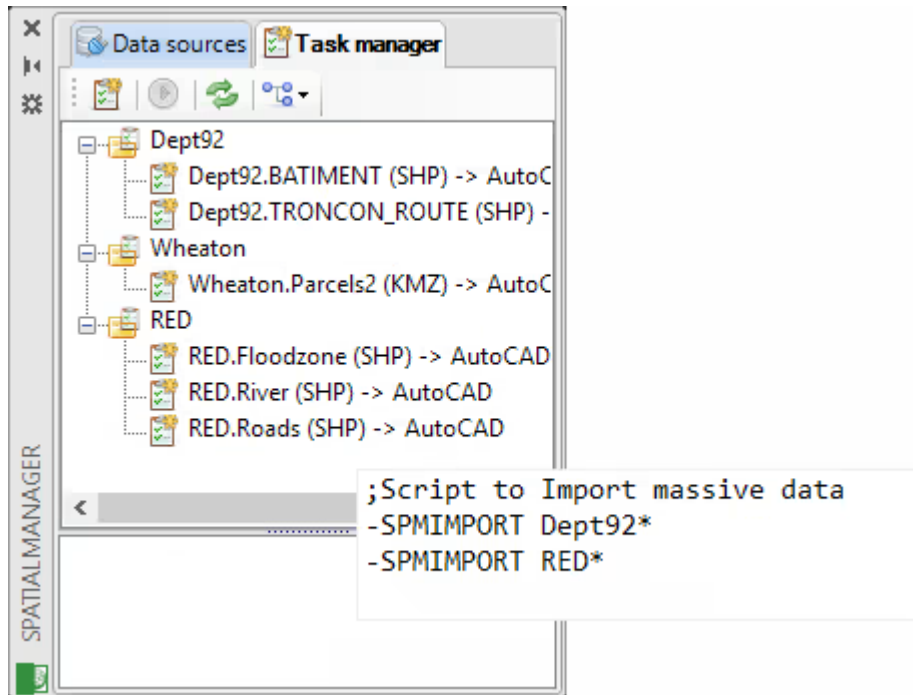
Run Importing processes in the Command Line

Available on edition **Professional**

Spatial Manager™ for ZWCAD includes the command **-SPMIMPORT** that allows you to execute any saved Task in the Command Line.

The command syntax is '*-SPMIMPORT [Task name]*'.

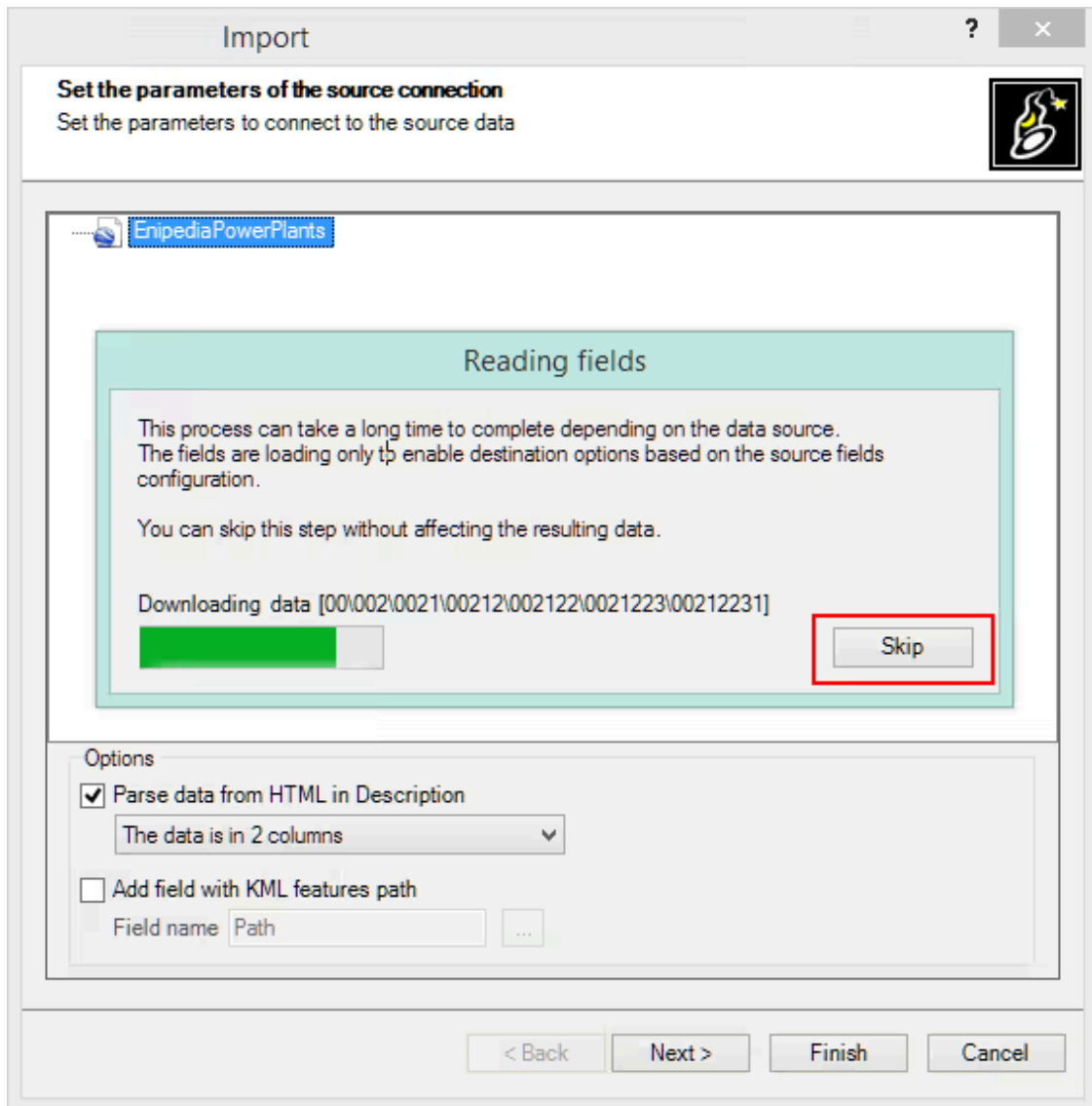
Since the parameter "Task name" supports wildcards, you can process multiple Tasks simultaneously (batch processing) and use it in "ZWCAD Scripts".



Sample script using '-SPMIMPORT'

Speed up the starting Import process

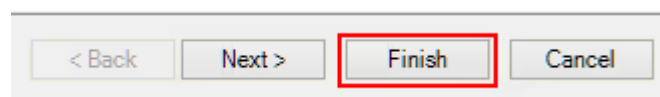
Sometimes, depending on the characteristics of the source, the initial reading of the data Fields may take a long time or even block the importing process. Spatial Manager™ for ZWCAD performs this startup reading to allow you to choose certain options relating to this data on the next wizard window, such as the use of the field values to define the target Layers for the imported entities. However, you have a button available to "Skip" this step, which does not affect the imported entities themselves but only certain options that may not be available in the importing process.



Skip fields window

Speed up the Import wizard steps

To speed up the process when you are importing, all the "Import" wizard windows in Spatial Manager™ for ZWCAD include the "Finish" button. By pressing this button, you will directly run the import process. The wizard will assume the default values in each step to be omitted.



Finish (skip steps) button

DOCUMENTATION

Export

Available on edition**Professional**

Export objects from ZWCAD to spatial files or databases, and saves their Extended Entity Data (EED) as alphanumeric data tables.

Export spatial data	74
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DOCUMENTATION

Export spatial data

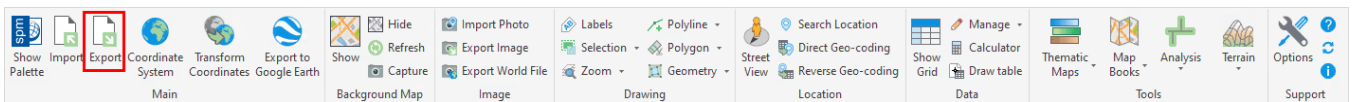
Available on edition

Professional

Export objects from ZWCAD to spatial files or databases, and saves their Extended Entity Data (EED) as alphanumeric data tables.

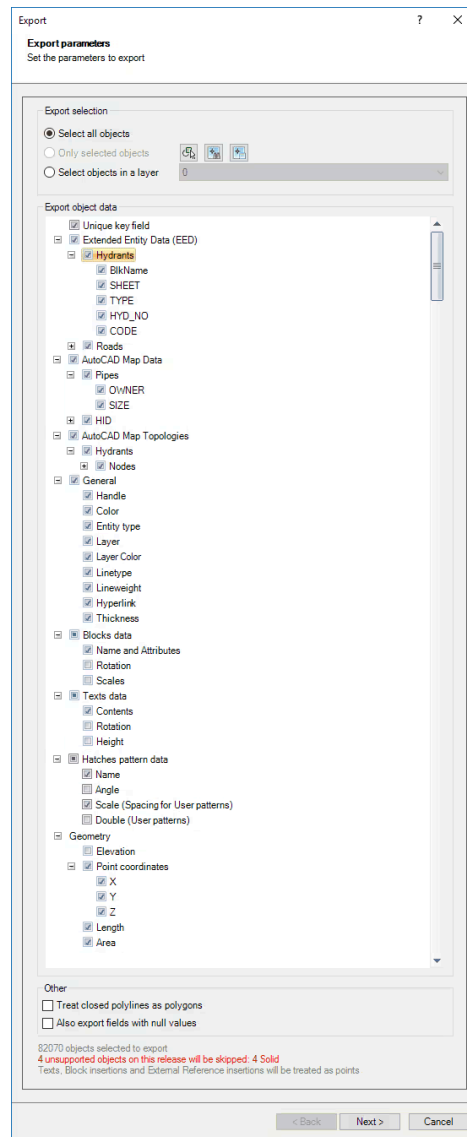
Export ZWCAD entities as spatial features

You can export ZWCAD entities as spatial features into files or databases by executing the **SPMEXPORT** command of Spatial Manager™ for ZWCAD, which you will find in the “Spatial Manager” ZWCAD ribbon. This will launch the “Export” wizard of the application, which shares some of the steps with the Import wizard. The command not only exports the selected entities but saves their Extended Entity Data (EED) as data tables (see below). Upon completion of any export process to a file, you can directly open the file location. When exporting to a KML or KMZ file you can choose to open the file in Google Earth (if installed).



'SPMEXPORT' command in the Spatial Manager™ for ZWCAD ribbon

While running the “Export” wizard, you can select the export parameters that match your needs:



Export Parameters window

- **Export selection** (review [selection control options](#)).
- **Export entity data (options tree).**
 - *Unique key field*: when checked, the data table will include a new Unique Key Field (numerical consecutive) ('AdSPMKey'). This field will be defined as Primary Key if the target data provider uses keys (SQL Server Spatial, PostGIS, SQLite, etc.).
 - *Extended Entity Data (EED)*: the exported data table will include the entities data (Extended Entity Data (EED)). You can choose which tables and/or fields will be exported.
 - *ZWCAD Map Data and ZWCAD Map Topologies*: if there are ZWCAD Map Entity Data or Topologies tables defined in the drawing, the exported data table will include this data. You can choose which Entity Data/Topologies tables and/or fields will be exported.
 - *General*: when checked, the data table will include new fields for the corresponding ZWCAD entity properties.
 - *Handle* ('*dwg_handle*').
 - *Color* ('*Color*').

- *Entity type.*
- *Layer ('Layer').*
- *Layer Color.*
- *Line type ('Linetype').*
- *Line weight ('Lineweight').*
- *Hyperlink ('Hyperlink').*
- *Thickness ('Thickness').*
- *Blocks data:* when checked, the data table will include new fields for the corresponding data of the Block References (if any).
 - *Name and Attributes ('BlkName') ('Attribute Names').*
 - *Rotation ('BlkRotation').*
 - *Scales ('BlkXscale', 'BlkYscale', 'BlkZscale').*
- *Texts data:* when checked, the data table will include new fields for the corresponding data of the Text entities (if any).
 - *Contents ('TxtString').*
 - *Rotation ('TxtRotation').*
 - *Height ('TxtHeight').*
- *Hatches pattern data:* when checked, the data table will include new fields for the corresponding data of the Hatch entities (if any).
 - *Name ('HPatName').*
 - *Angle ('HPatAngle').*
 - *Scale (Spacing for User patterns) ('HPatScale').*
 - *Double (User patterns) ('HPatDouble').*
- *Geometry.*
 - *Elevation:* when checked, the data table will include a new field ('Elevation') whose value will be the elevation of the entities.
 - *Note: Regardless of this option, the application will use the entity elevation as Z-coordinate when exporting any XY-only entity (Circles, Polylines, etc.).*
 - *Point coordinates:* when checked, the data table will include new fields for the corresponding X/Y/Z coordinate values of the point-type entities (if any).
 - *X.*
 - *Y.*
 - *Z.*
 - *Note: If the coordinates are transformed along the exporting process [see this section](#), the transformed values will be exported instead of the original values.*
 - *Length:* when checked, the data table will include a new field ('Length') whose value will be the length of the entities.
 - *Area:* when checked, the data table will include a new field ('Area') whose value will be the area of the entities.

- **Other.**
 - *Treat closed polylines as polygons:* when checked (default value), all closed polylines in the drawing will be exported to the target as polygon features. Most of the time, the closed polylines represent polygonal elements in the target data format and this conversion can be automatic.
 - *Note: Be aware that, in order to avoid forgetting entities, in this case and in any other case where polygonal entities are exported to a polyline-type target, the polygon contours will be exported as polylines.*
 - *Also export fields with null values.*
 - If not checked (default value): when you export to a target table with uniform fields structure (such as Shapefiles SHP), the table will include any field that has a non-null value in at least one entity of the export selection. When you export to a target table with non-uniform fields structure (such as KML), each entity will only include the fields that have a non-null value for the entity itself.
 - If checked: in all cases, each entity and thus the entire table will include all the fields (null or non-null).
- **Entities report:** the application shows here the total number of the entities that will be exported and any warnings prior to the export process, such as the total number of unsupported entities that will not be exported or others.

When will duplicate fields be automatically renamed (by adding a correlative suffix) in the exported tables?

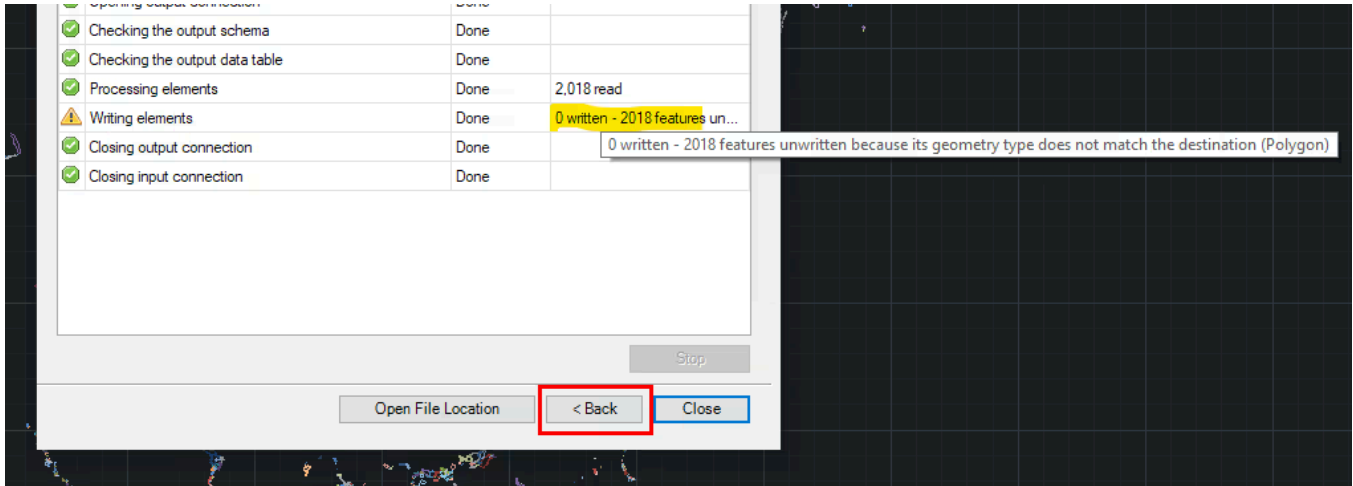
- When there are fields that can be found in different tables having the same name but different type. Those that can be found in different tables but have the same name and the same type are considered a single field.
- When a field (for example, "X") already exists for any entity and the export options force adding a field with the same name (such as the "X" coordinate of the points).

"Back" button: As in the other application wizards, you will find the "Back" button in each step of the wizards in order to modify or add any previously introduced parameter. In the case of the "Export" wizard, this button is present even in the last step of the wizard and is applicable even after the export process is finished. Thus, if you detect that the export has failed or been incomplete due to some erroneous or partial parameter, you can comfortably repeat the process by modifying the wrong parameter(s) without having to modify any other.

- *Tip: This tool can be an interesting time saver when you are exporting several types of entities to some target that only supports one particular type of entity. For example, assume you want to export all the entities in the drawing (linear, polygonal, points) to Shapefiles. You can select to export "All entities," but when you define the type of feature that the Shapefile will contain you can only choose one type, since this is a limitation of Shapefiles. The application will filter the entities that can be exported to the chosen Shapefile type. But once the export is finished, the "Back" button will allow you to choose another type of feature for the target Shapefile without modifying any other settings (entity*

parameters, coordinate transformation, etc.) to quickly export the new type entities to another Shapefile.

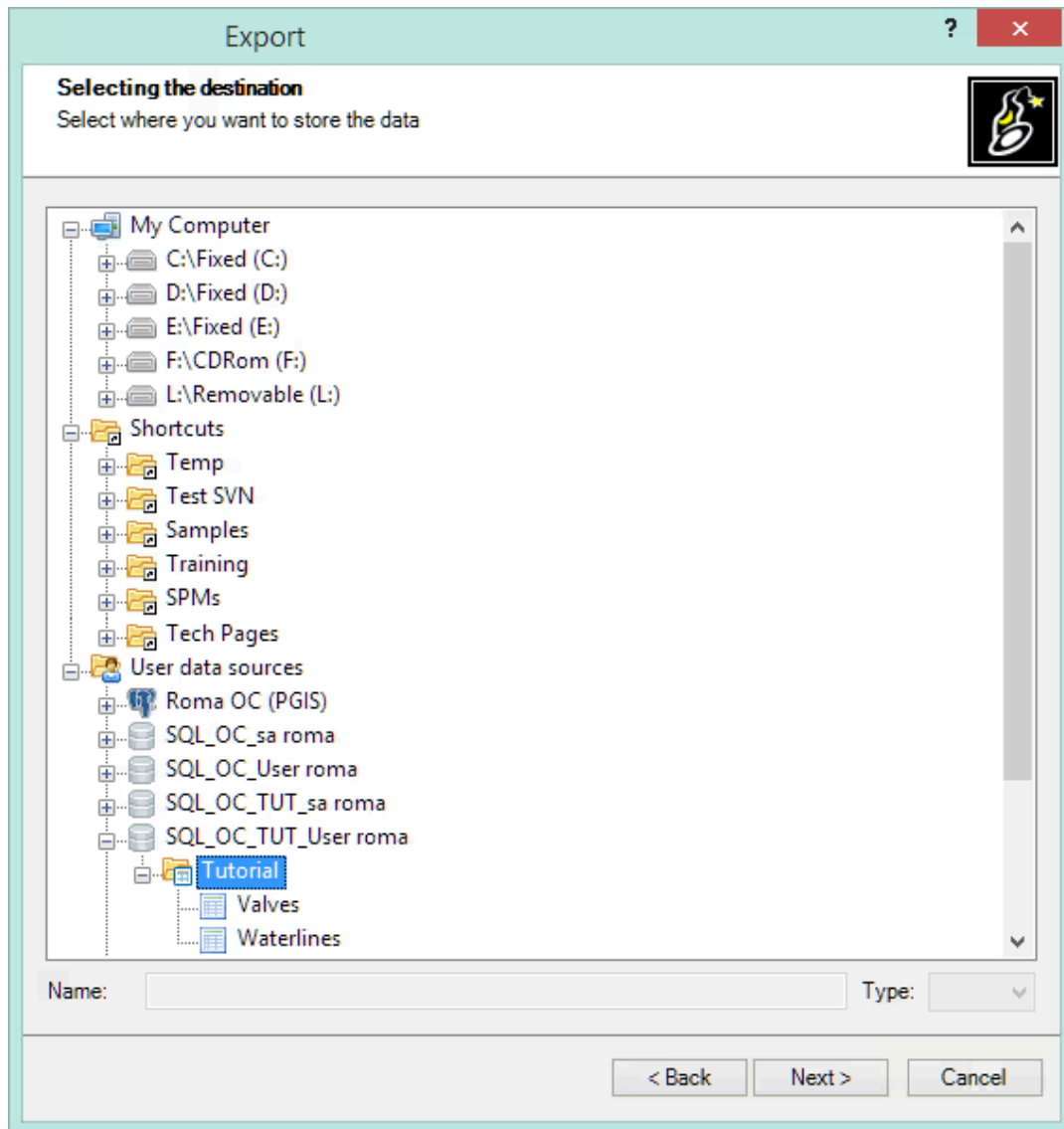
- o Note: The "Automatic" option that can be found when exporting to Shapefiles also simplifies this task because the export process will automatically create a different Shapefile for each entity type (Point, Polyline, etc.).



'Back' button on the last wizard step

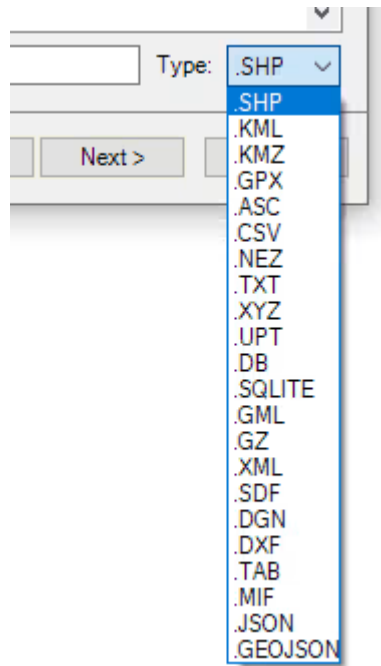
Configure the spatial target when exporting from ZWCAD

When you export using Spatial Manager™ for ZWCAD you must select the exporting destination. If needed, you also must select the data provider and its parameters.



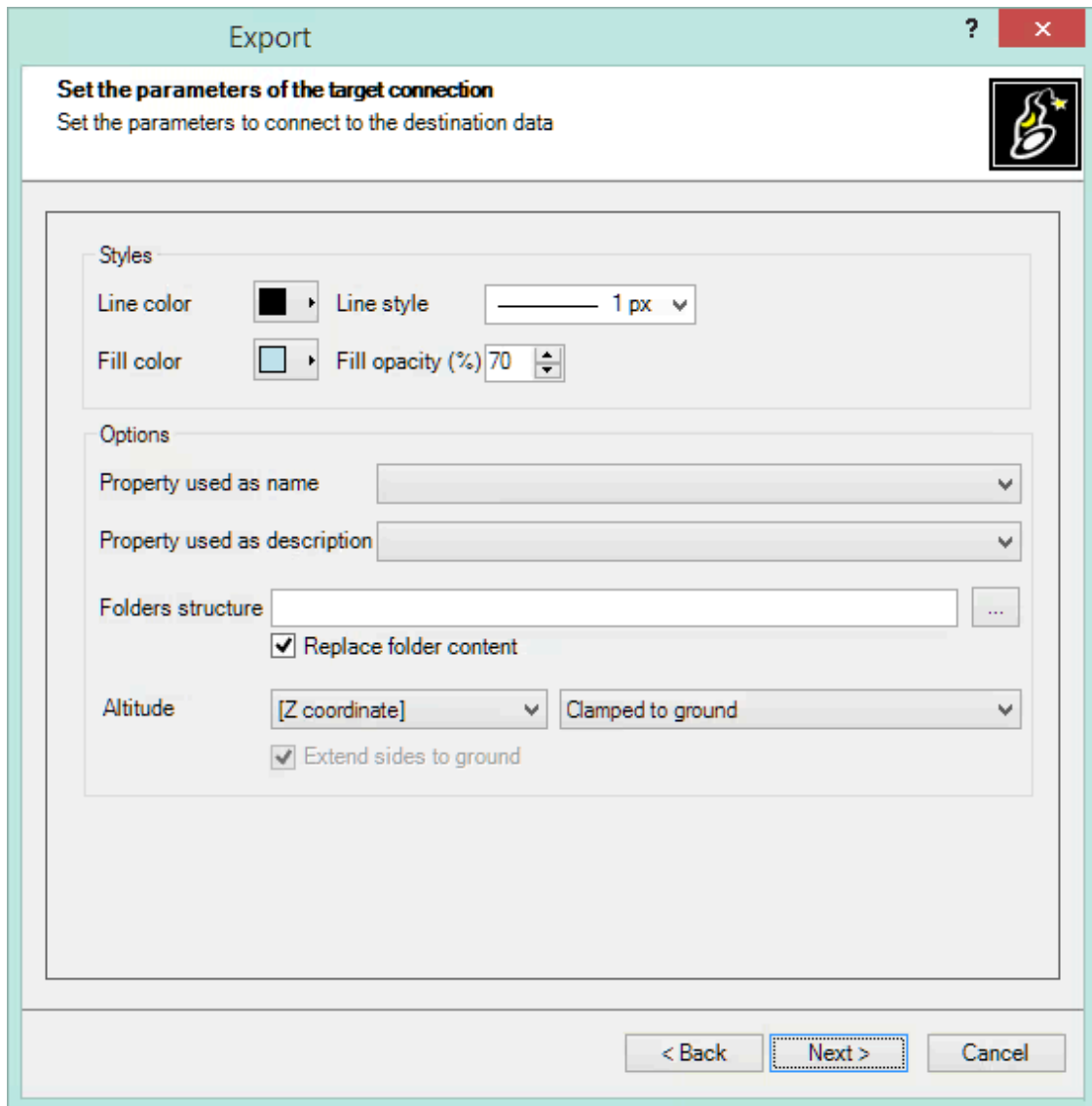
Export destination

First, you select the destination for the exported data: a file or a table inside a file or a database (or inside a schema of a file or a database).



Export target file

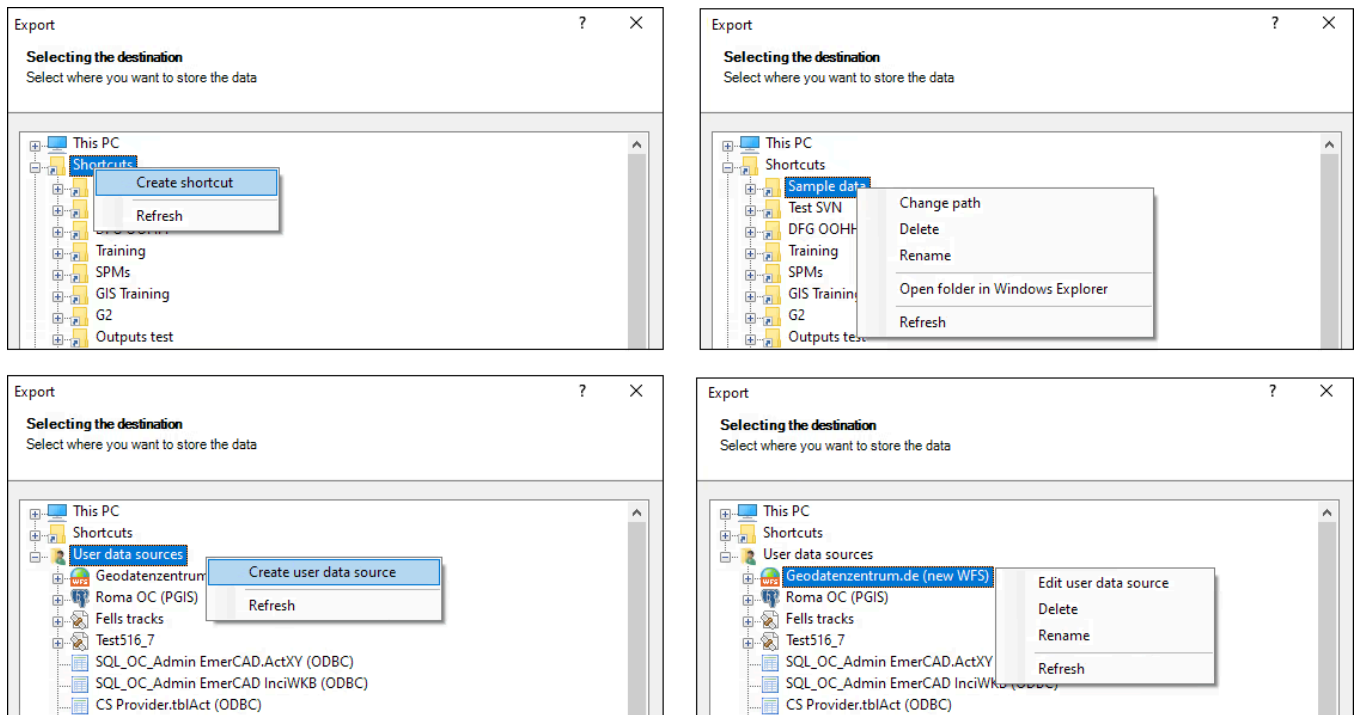
Next, you select a file type (the data provider). This step is not required if you have selected a UDS-based destination which defines its own data provider and provider parameters (such as a SQLite table, PostGIS table, a UDS for a simple file, etc.).



Data provider connection parameters

Then, you configure the export data provider connection parameters, if needed (*Image: sample of the KML/KMZ files data provider*).

*Note: Although the application main palette (see [Data sources](#)) is the primary tool to manage resources and accesses, create/edit [Shortcuts](#) and [User Data Sources \(UDS\)](#), and other related functions, the context menus (right-click) in this *Export* window will also allow you to execute many of these functions “on the fly,” without having to return to the main palette.*



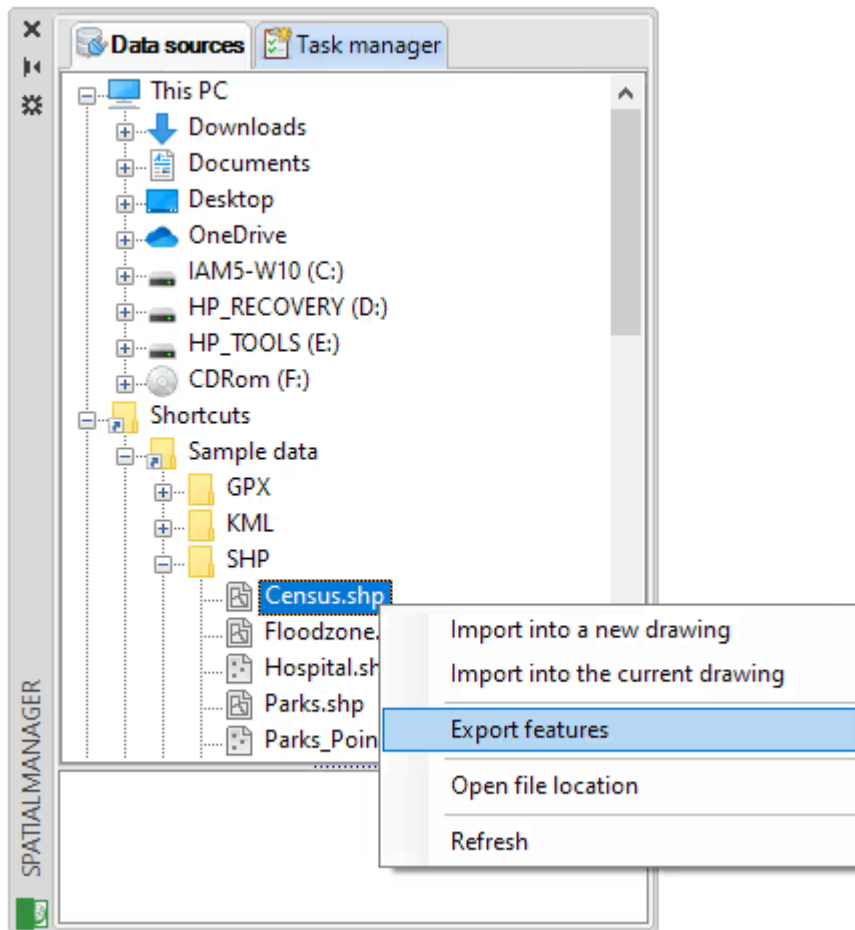
Contextual options in the Export window

Exporting geo-referenced images: Although the general Export functions allow exporting raster files in addition to vector files, the command [SPMEXPORTIMAGE](#) in Spatial Manager™ for ZWCAD is more straightforward for exporting geo-referenced images and, if needed, related geo-referencing additional files (Geo-reference and Coordinate System files).

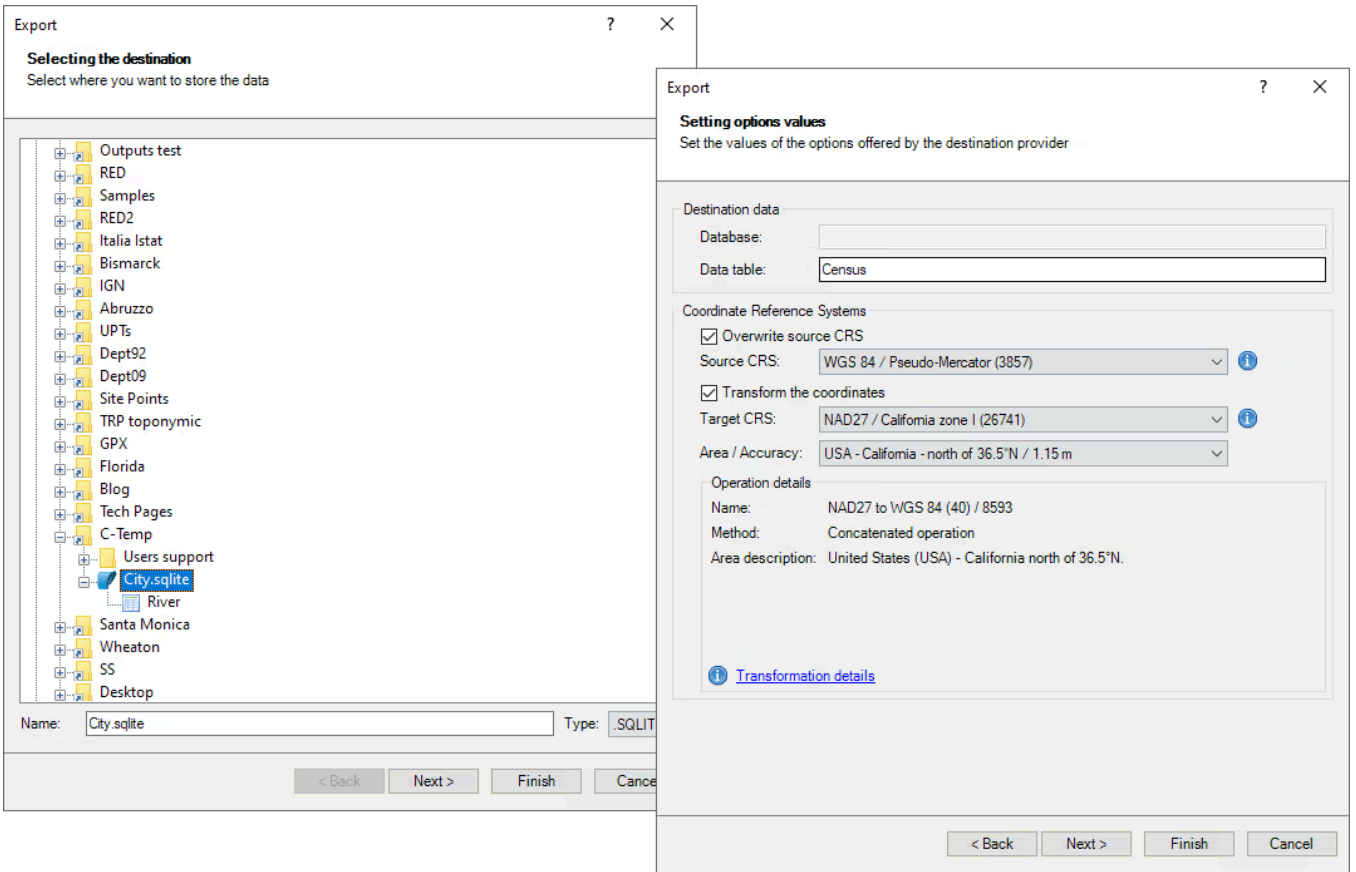
Exporting additional geo-reference files of an image: In addition, although when exporting images it is possible to include additional geo-reference files (World, PRJ, etc.) in the export process, it is also possible to export only these additional files when the image is already stored as a separate file. This operation can be carried out using the command [SPMWORLDFILE](#) of Spatial Manager™ for ZWCAD.

Export directly from a data source to another without importing into ZWCAD

You can directly export or convert from a data source to any supported data target by using the data sources contextual menu (right-click) in the main Spatial Manager™ for ZWCAD palette. This functionality allows you to run export processes without having to previously import the elements from the source data table into an ZWCAD drawing, and you will find similar options (coordinate system transformation, etc.) to those you can find when exporting ZWCAD entities.



Direct Export function



Direct Export parameters and options

DOCUMENTATION

Coordinate transformations

Available on edition

Professional

Export objects from ZWCAD to spatial files or databases, and saves their Extended Entity Data (EED) as alphanumeric data tables.

Define a transformation of coordinates when exporting

When you are exporting ZWCAD entities as spatial features using Spatial Manager™ for ZWCAD, you will see that you can choose a transformation of coordinates from the source to the target in the “Export” wizard. This means that the application will calculate a geometric transformation between the source and the target data, which will depend on the chosen CRS for the source (drawing) and for the target (outgoing features) data. You can choose the appropriate CRSs by clicking on “CRS catalog...” in the CRS dropdown list for the source or for the target data. In the CRS Catalog you can:

- Filter the CRSs by type (Geocentric, Projected, etc.).
- Choose a CRS by clicking on its row in the catalog.
- Search CRSs by typing the search criteria in the “Search” box. You can type as many words as you like here, separated by blanks. The application will find all the rows that include all these words in any column of the catalog.

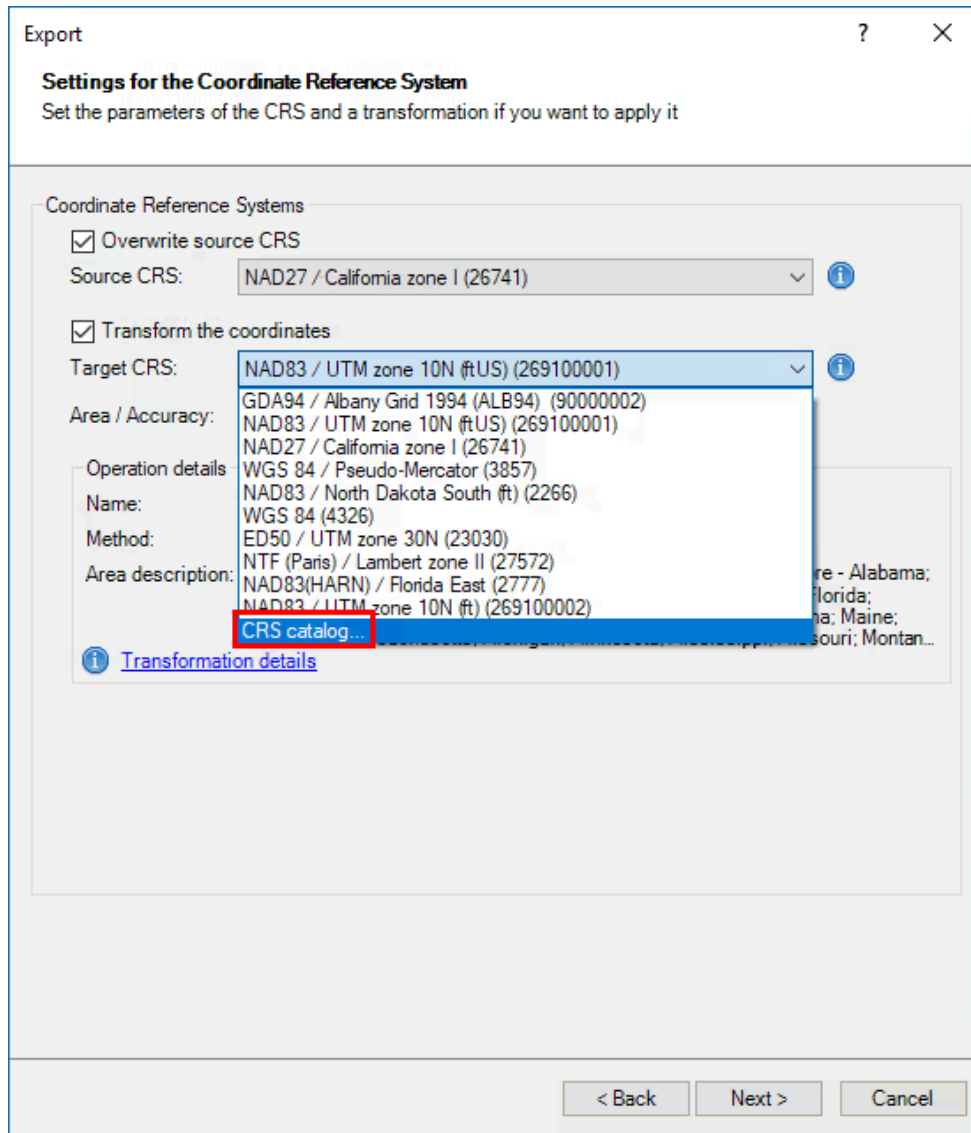
After choosing a pair of valid CRSs for a transformation, you can choose the geographic area to apply it to (the application will choose by default the most common area for this transformation).

If the application “knows,” “guesses” or “can assume” the CRS of the source and/or the target data, they will be chosen by default. You will be able to modify this choice except in cases where only one CRS is valid; for example, for a KML or a KMZ file the only valid choice is the CRS WGS84 (SRID 4326), because these types of file are always defined using this CRS.

You can assign a CRS to the drawing, or modify it, using the command **SPMSETCRS**. By executing this command, you will access the CRS Catalog of the application, described in the previous lines. In this case, the type “Projected” will be selected by default because it is the most common choice.


- When exporting:
 - Those entities without an assigned CRS will adopt the CRS of the drawing in the transformation of coordinates.
 - If all the entities to export have the same assigned CRS and the drawing does not have an assigned CRS, the transformation of coordinates will take the CRS of the entities as the source CRS by default. *Note: To unassign (undefine) the coordinate system of the drawing, choose “Undefined CRS” (EPSG 0).*

- Notes:
 - To unassign (undefine) the coordinate system of the drawing, choose "Undefined CRS" (EPSG 0).
 - As you will see, the CRS dropdown lists will include more and more CRSs as they have been previously chosen in other transformation operations, so that you can choose your "last-used" CRSs directly from the dropdown list without having to access the CRS Catalog all the time. In addition, the CRS Catalog window shown when you execute **SPMSETCRS** to assign a CRS to the drawing, or modify it, also includes a list of the "last-used" CRSs (if any) in the upper zone.
 - [Coordinate Systems and Transformation details](#) .
 - [Coordinate Systems entities available in the current version](#) .



Access to the CRS Catalog of the application

Coordinate systems catalog



Last used

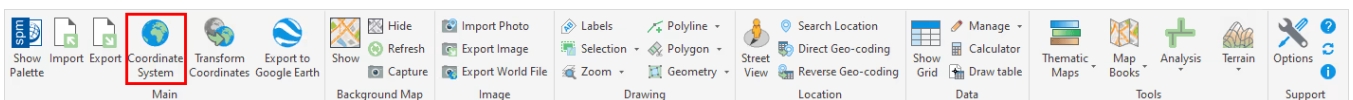
Code	Type	Name	Area
2249	Projected	NAD83 / Massachusetts Mainland (ftUS)	United States (USA) - Massachusetts onshore - counties of B...
23030	Projected	ED50 / UTM zone 30N	Europe - between 6°W and 0°W - Channel Islands (Jersey, G...
26741	Projected	NAD27 / California zone 1	United States (USA) - California - counties Del Norte; Humbol...
27572	Projected	NTF (Paris) / Lambert zone II	France mainland onshore between 50.5 grads and 53.5 grad...
26986	Projected	NAD83 / Massachusetts Mainland	United States (USA) - Massachusetts onshore - counties of B...

Type: **Projected** Search: User defined

Code	Type	Name	Area
3042	Projected	ETRS89 / UTM zone 30N (N-E)	Europe between 6°W and 0°W: Faroe Islands offshore; Irelan...
3046	Projected	ETRS89 / UTM zone 34N (N-E)	Europe between 18°E and 24°E: Finland - onshore and offsh...
3047	Projected	ETRS89 / UTM zone 35N (N-E)	Europe between 24°E and 30°E: Finland - onshore and offsh...
3048	Projected	ETRS89 / UTM zone 36N (N-E)	Europe between 30°E and 36°E: Finland - onshore and offsh...
3049	Projected	ETRS89 / UTM zone 37N (N-E)	Europe between 36°E and 42°E: Norway including Svalbard -...
23030	Projected	ED50 / UTM zone 30N	Europe - between 6°W and 0°W - Channel Islands (Jersey, G...
23031	Projected	ED50 / UTM zone 31N	Europe - between 0°E and 6°E - Andorra; Denmark (North Se...
23032	Projected	ED50 / UTM zone 32N	Europe - between 6°E and 12°E - Denmark - onshore and off...
23033	Projected	ED50 / UTM zone 33N	Europe - between 12°E and 18°E onshore and offshore - Den...

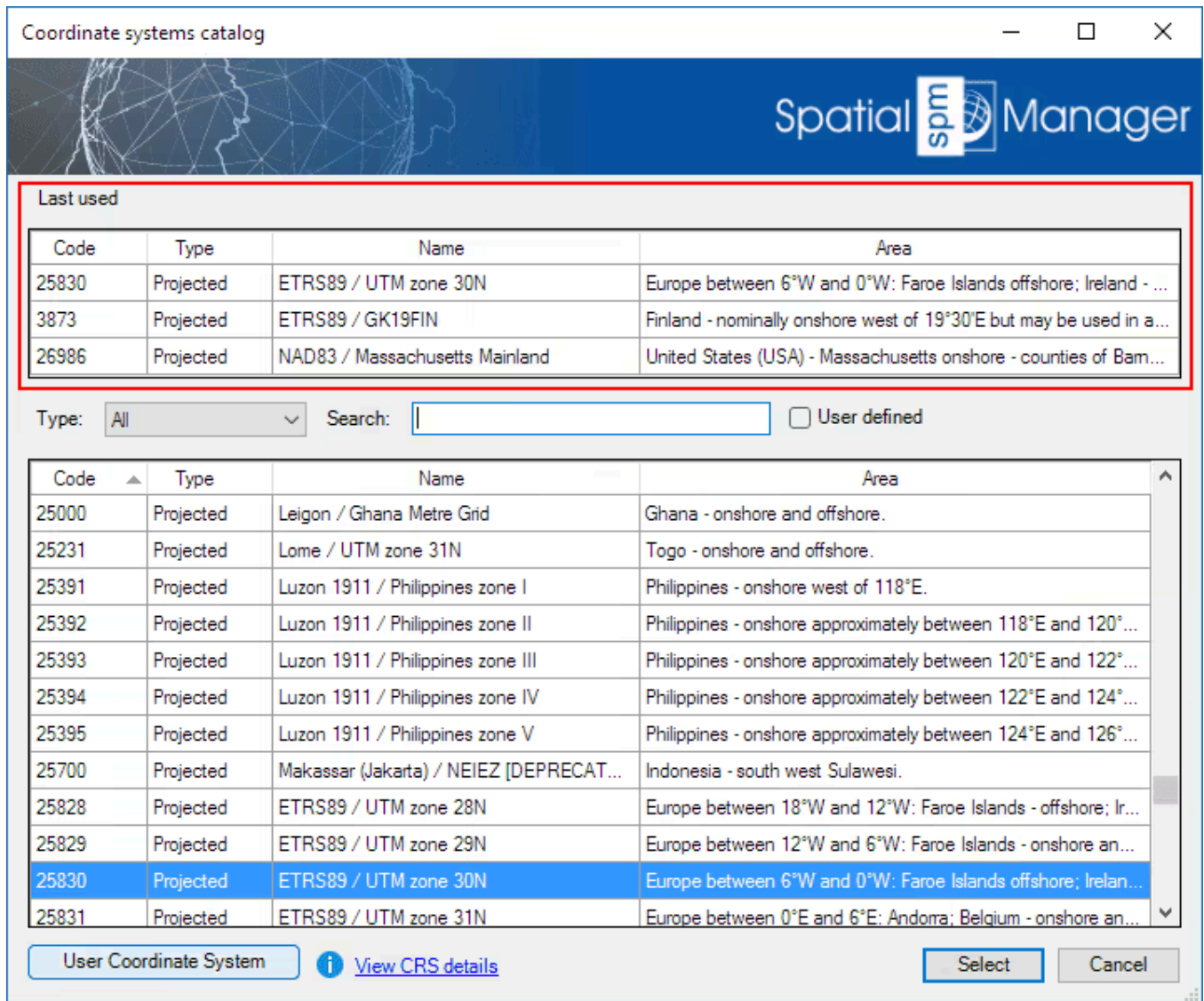
User Coordinate System [View CRS details](#) **Select** **Cancel**

CRS Catalog of the application



The image shows the Spatial Manager ribbon with various tool groups. The 'Coordinate System' button is highlighted with a red box. Other tool groups include Show, Background Map, Image, Drawing, Location, Data, Tools, and Support.

'SPMSETCRS' command in the Spatial Manager™ for ZWCAD ribbon



Last used CRSs in the Catalog window

- *Notes about transformation Grid files:*
 - *Some coordinate transformations (NTv2, etc.) require one or more Grid files in order to be processed. Some of the most commonly used Grid files worldwide are included in the application, but you will see that some others instruct you on where to download Grid file(s) not included with the application (usually a download URL).*
 - *On the other hand, even if the required Grid file(s) already exist (included as standard in the application, or previously downloaded by the user), the application allows the user to choose alternative Grid file(s) so that more accurate or updated Grid transformations can be used when more appropriate files are available. This custom choice for a Grid file is kept by default for a work session but will not be memorized when exiting and re-entering the application.*

Coordinate Reference Systems

Source CRS: DHDN / 3-degree Gauss-Kruger zone 4 (E-N) (5678) ⓘ

Target CRS: ETRS89 / UTM zone 32N (25832) ⓘ

Area / Accuracy: Germany - onshore / 0.9 m

Operation details

Name: DHDN to ETRS89 (8) / 15948

Method: NTv2 (BETA2007.gsb)
[Select custom grid file](#)

Area description: Germany - onshore - states of Baden-Wurtemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein, Thuringen.

ⓘ [Transformation details](#)

Selecting alternative Grid files

User coordinate systems: You can create new user coordinate systems based on any existing one, [review the custom section of coordinate management for more details.](#)

DOCUMENTATION

Export data

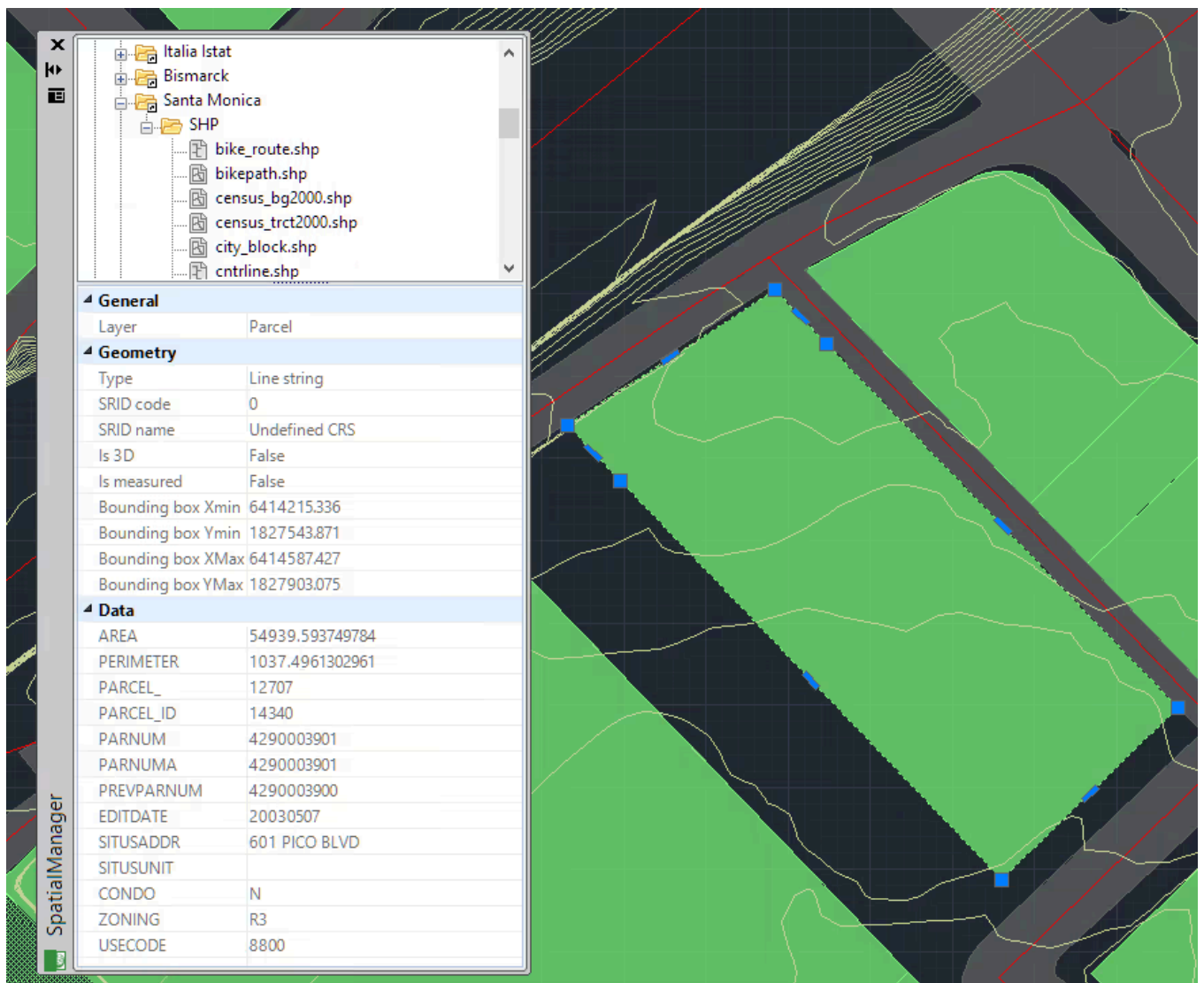
Available on edition

Professional

Export objects from ZWCAD to spatial files or databases, and saves their Extended Entity Data (EED) as alphanumeric data tables.

Export Extended Entity Data (EED)

If the selected entities to be exported have attached data (XDATA / EEDs), this entity data will also be exported as data tables linked to the outgoing features, if the target supports these data tables. The Extended Entity Data (EED) can be attached when the entities are imported, by hand using the [Data Structure Management](#) tools, or can be there by a combination of both cases. As you can see at the beginning of this chapter, you can choose which tables and/or fields will be exported.



XDATA / EEDs to be exported

DOCUMENTATION

Publish to Google Earth

Available on editions

Standard

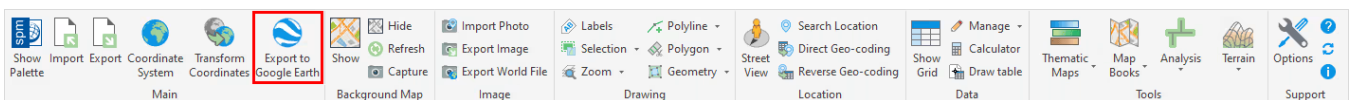
Professional

Export all or part of the objects in the visible Layers from ZWCAD and their data to a KML or KMZ file.

Export the current drawing status (Publish) to Google Earth

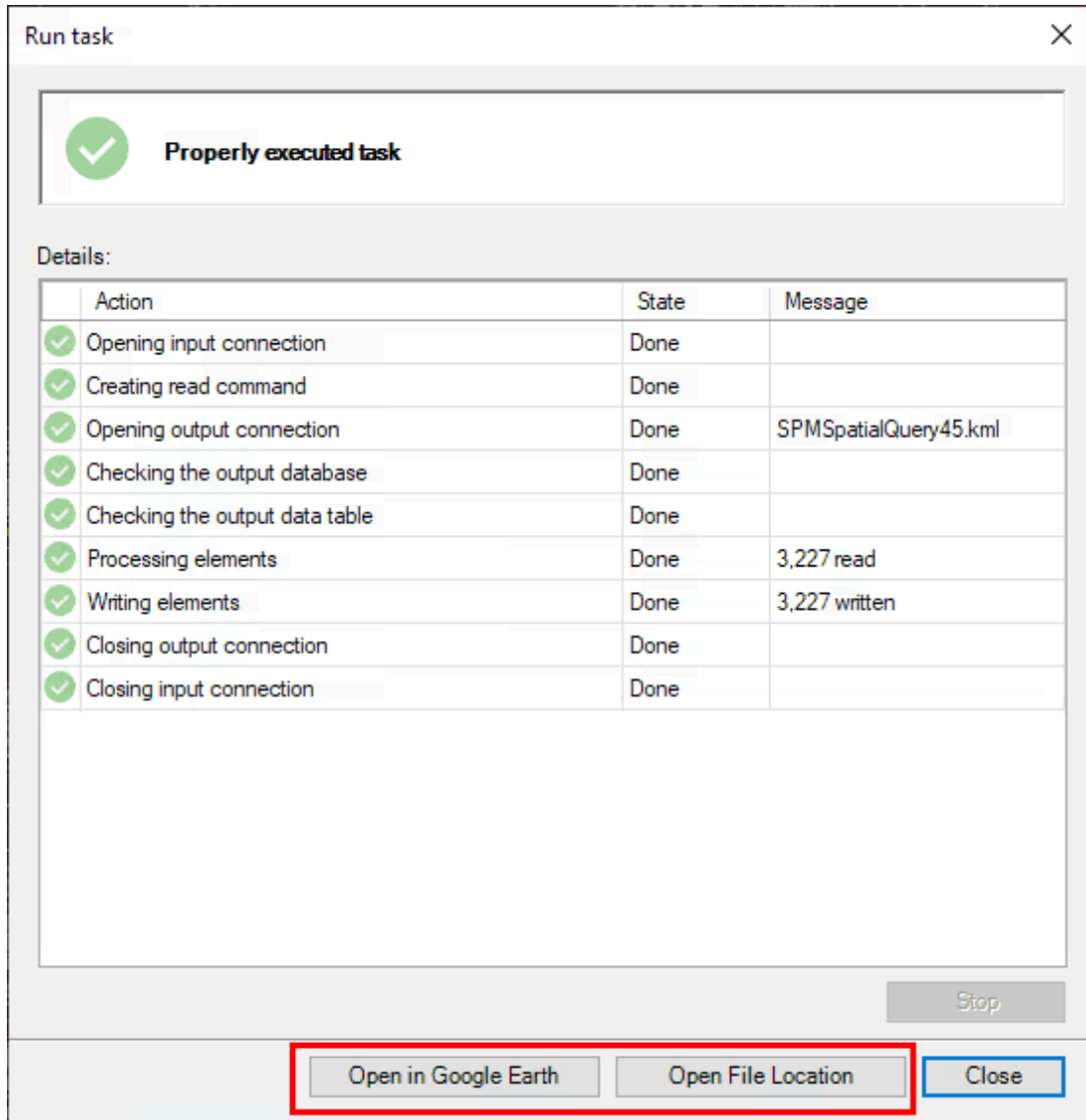
Regardless of the advanced export capabilities of Spatial Manager™ for ZWCAD which can be found in the “Professional” edition, the “Standard” and “Professional” editions of the application include a specific command (SPMCREATEKML) designed to export all or part of the entities in the drawing and their data to a KML or KMZ file (Google Earth) through a one-click operation. This exportation process considers the current layers organization and the properties of the layers and entities.

- The elements in the KML/KMZ file will assume the colors, line weights, etc. of the entities in the drawing. A subdivision based on the type(s) of the entities in the layers will also be created for each layer, allowing you a high level of visibility control in Google Earth.
- The values for the NAME and DESCRIPTION of the elements in the KML/KMZ file will be automatically taken from the data fields “Name” and “Description” if those exist.
- The Text entities will display their content as a label in Google Earth (automatic field “TxtString”).

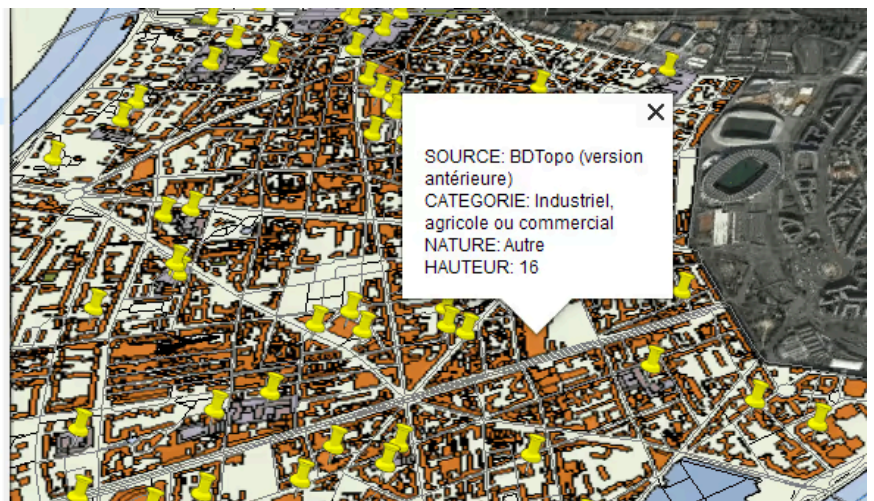
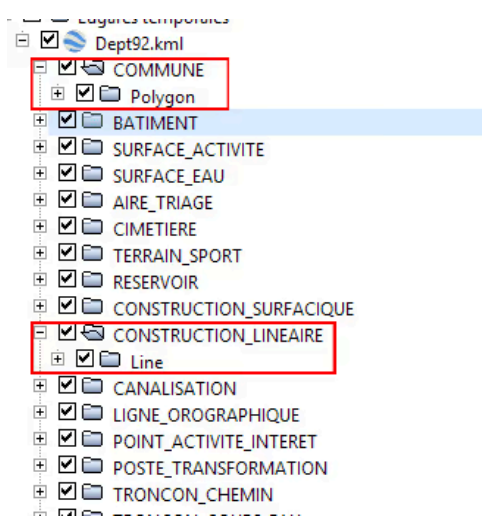


Export to Google Earth (KML/KMZ) command

The exported (KML/KMZ) file can now be opened in Google Earth. As an extra, if Google Earth is installed on the computer where the export process was performed, you can even open it using a button in the export report window. Nevertheless, upon completion of the export process you can open the file location directly.



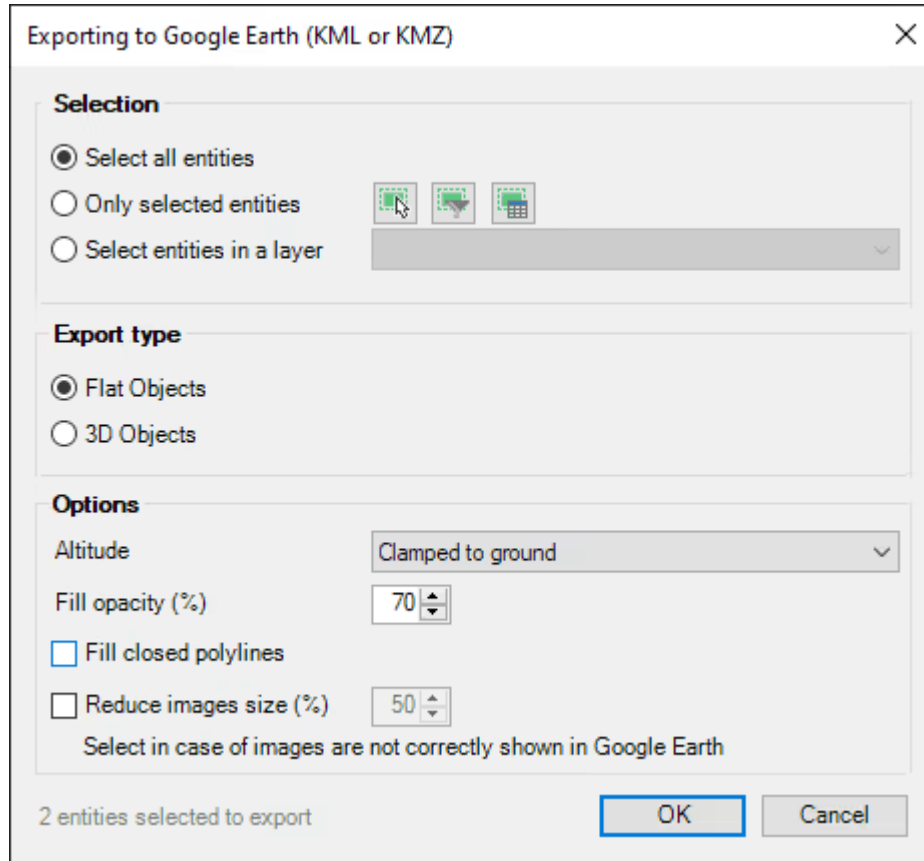
Open file in Google Earth (if installed) or open file location



The file in Google Earth

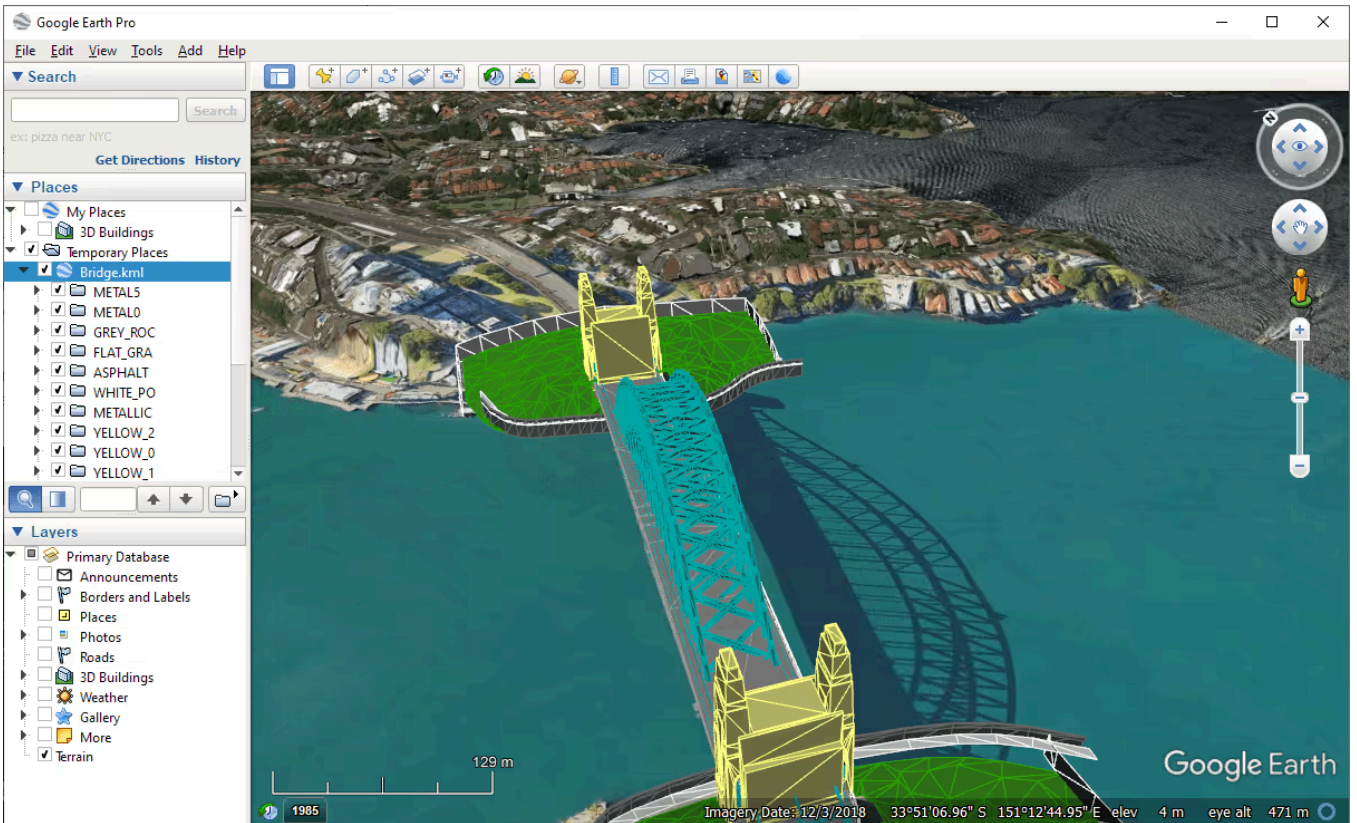
You can export all the entities in a drawing, a selection of entities (Manual, [by Query](#) , or [by Table](#)), or all the entities in a layer.

- *Notes:*
 - *When choosing the option to export all entities in the drawing, those entities that are in locked, off or frozen layers will not be included. If the entities are selected by any means before exporting and the option to export the selected entities is chosen, they will be exported even if they are in locked, off or frozen layers.*



Publish to Google Earth (KML/KMZ) parameters window

You can choose whether, for entities with elevation or 3D values in their geometry, they are considered 2D (Flat, only their XY coordinates are taken) or 3D. In case Z-values are taken into account in the export, you can decide how the vertical relation of the entities with respect to the terrain (Altitude) is taken into consideration.



3D Entities to Google Earth (KML/KMZ)

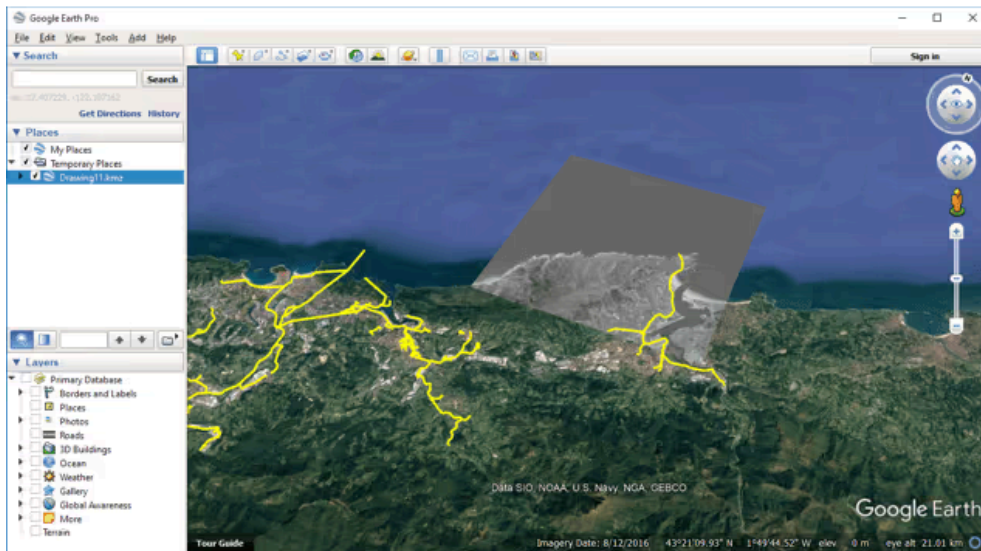
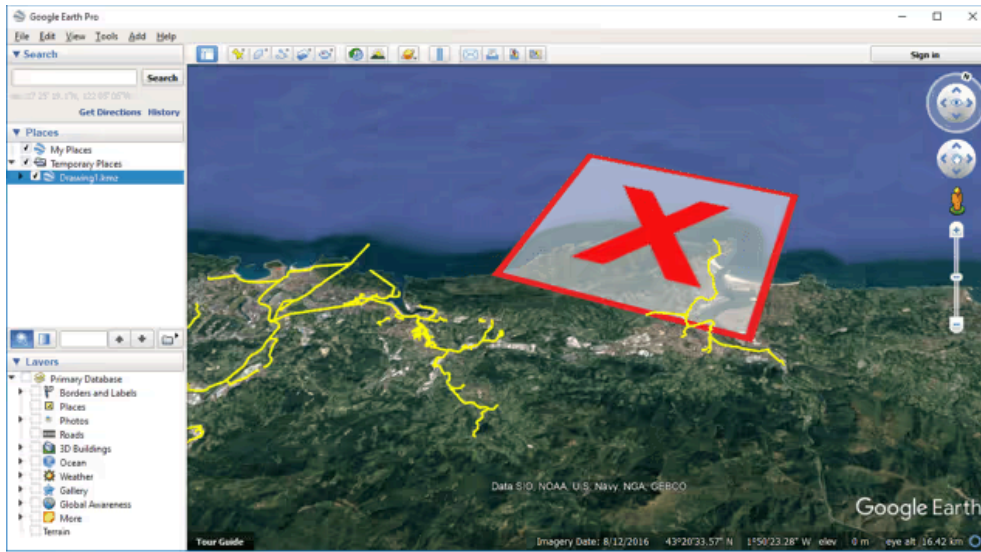
You can also specify a fill transparency for entities that can be opaque (Hatches, Faces, Polyfaces, etc.).

As an additional parameter, you can select the option to fill the closed polylines as if they were polygons. Note that if you check this option, and a polyline is already filled in the drawing (using a Hatch, for example), you will get two polygon elements for this polyline in the exported KML/KMZ file.



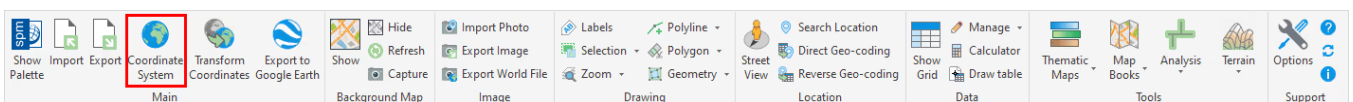
Filling closed polylines in Google Earth

In addition, if the set of entities to be published includes any ZWCAD raster images, you can reduce their size by a percentage while processing. This can help you solve some of the problems in Google Earth concerning large images, which cause them to be missed or cropped.



Reducing the size of images when publishing

The application needs to know the coordinate system (CRS) of the drawing for exporting, as in most cases this will be necessary to perform an automatic coordinate transformation to the CRS used in Google Earth. You will see a warning window if the process cannot be carried out and you may need to assign a CRS to the drawing.



'SPMSETCRS' command in the Spatial Manager™ for ZWCAD ribbon

You can read about CRSs, the [CRS Catalog](#) , and the [Transformation of coordinates](#) .

DOCUMENTATION

Advanced

Available on edition

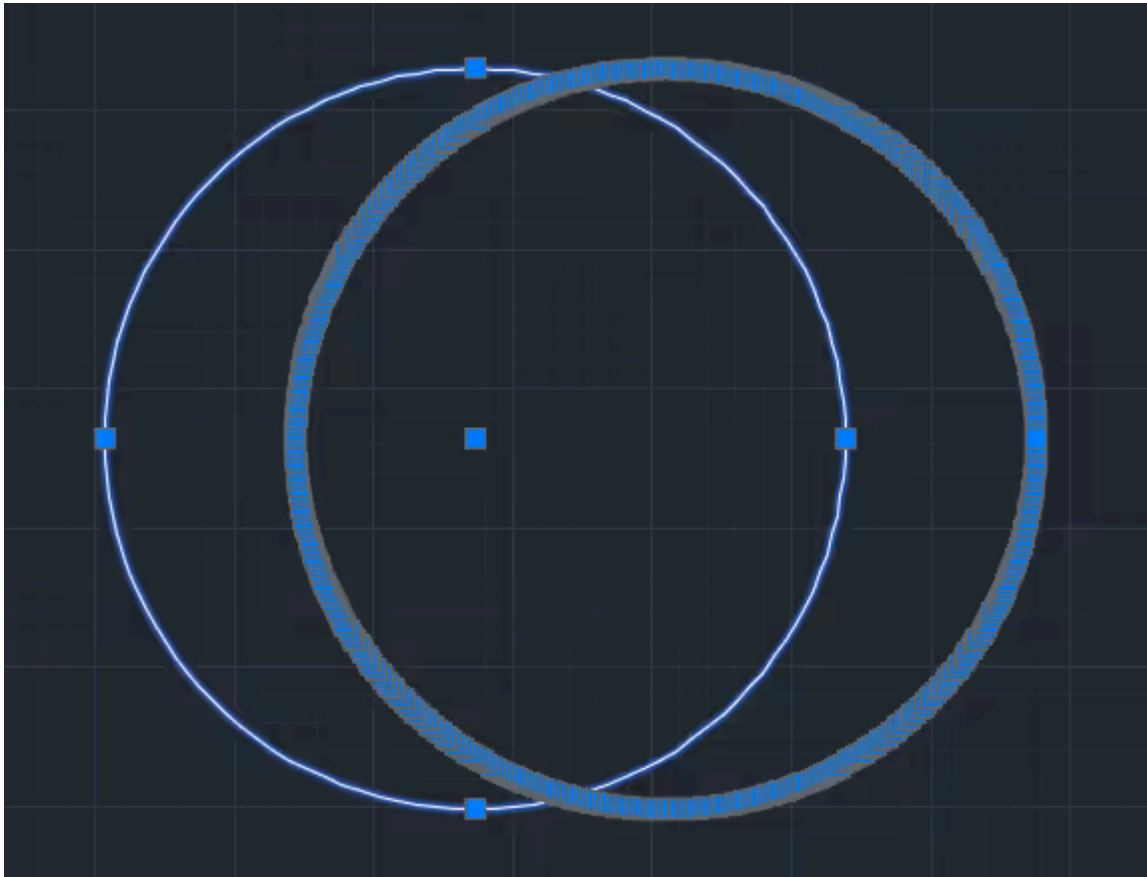
Professional

Export objects from ZWCAD to spatial files or databases, and saves their Extended Entity Data (EED) as alphanumeric data tables.

Limitation or modification in the original entities when exporting

There are some limitations and there may also be automatic changes in the entities when they are exported using Spatial Manager™ for ZWCAD.

- Limitations:
 - Filtering of incompatible entities: There are a few entity types not supported by the export processes (such as Texts, MTexts or complex 3D entities), which are automatically filtered. The filter result is displayed before exporting on the "Entities report" of the first exporting wizard window.
- Modifications:
 - Some entities, such as Blocks or External References, are exported as Point Features (Insertion Points). In the case of the Blocks or XRef, you must explode them before exporting if you want to export their internal entities. The "Entities report" in the first exporting wizard window also warns the user about the number of Blocks and XRef Insertions if any have been selected to export.
 - Automatic complex geometric operations: The application will review and edit the selected entities in order to export geometries accommodated in the target format.



Circle segmentation

Sample: segmentation of an ZWCAD Circle when exported to a polygons Shapefile (SHP).

Run exporting processes in the Command Line

Spatial Manager™ for ZWCAD includes the command `-SPMEXPORT` that allows you to execute parameters-driven export processes in the Command Line.

- Command parameters:
 - **Source** (Mandatory):
 - **All** – All entities in the drawing.
 - **Layer** – Entities in a Layer (Layer name).
 - **Selection** – Selected entities.
 - **Table** – Entities attached to a specific data table (Table name).
 - **Destination** (Mandatory):
 - **User datasource** – UDS name, Schema, Feature class.
 - **File name** – Full filename, including the file extension in order to select the data provider that must be used (Sample: C:\Temp\ExportLayer1.shp).
 - **Geometry type** (Optional. If not specified, all possible geometries will be exported — same as "All"):

- **All.**
- **Point.**
- **Line.**
- **Polygon.**
- **Run** (Mandatory). To execute the command.
- This command allows you to automate the export processes by using it in "ZWCAD Scripts," Lisp routines, etc. Some samples of the use of this command and its parameters in Lisp:
 - `(command "-SPMEXPORT" "_S" "_A" "_D" "_F" "D:\\SpmExport\\Test.shp" "_R") .`
 - `(command "-SPMEXPORT" "_S" "_L" "Layer005" "_D" "_F" "D:\\ExportTarget\\005.shp" "_R") .`
 - `(command "-SPMEXPORT" "_S" "_L" "Layer005" "_D" "_U" "SERVER112\\SQLSERVER2019 (SQL)" "EXPORT_TEST" "005_TABLE" "_R") .`
 - `(setq LayerToExport (getvar "clayer")) (setq Path (strcat "D:\\ExportTarget\\" LayerToExport ".shp")) (command "-SPMEXPORT" "_S" "_L" LayerToExport "_D" "_F" Path "_G" "_L" "_R") .`

DOCUMENTATION

Background Maps

Available on editions

Standard

Professional

Choose in ZWCAD from among a lot of dynamic Backgrounds Maps from providers such as Google Maps, OpenStreetMap, Bing, MapBox, Ordnance Survey, etc. or configure your own maps.

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DOCUMENTATION

Show/Hide

Available on editions

Standard

Professional

Choose in ZWCAD from among a lot of dynamic Backgrounds Maps from providers such as Google Maps, OpenStreetMap, Bing, MapBox, Ordnance Survey, etc. or configure your own maps.

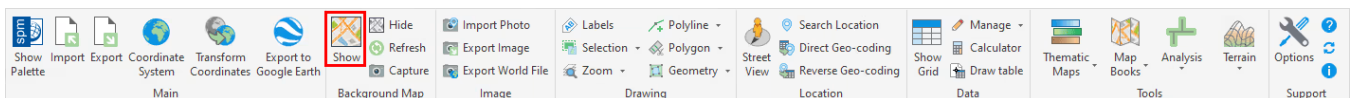
Display a 'Background Map' in the drawing

You can select an image map model to show as 'Background Map' in the drawing by executing the 'SPMBGMAPSHOW' command of Spatial Manager™ for ZWCAD, which you will find in the "Spatial Manager" ZWCAD ribbon. This will open the "Background Map" window, allowing you to select a model from the Maps list. You can find the list arranged using different Groups (Tabs) for the different preset Providers (OpenStreetMap, Mapbox, etc.) and the User groups (see how to [Configure User 'Background Maps'](#)). The image of the dynamic 'Background Map' is automatically adapted to the current drawing view, and it will be automatically fitted when the drawing view changes (zoom, pan, etc.). Compatibility note: The 'Background Maps' are shown properly in the PLAN view of the WCS in the Model space, but the results in other views as well as in the Layouts are unpredictable.

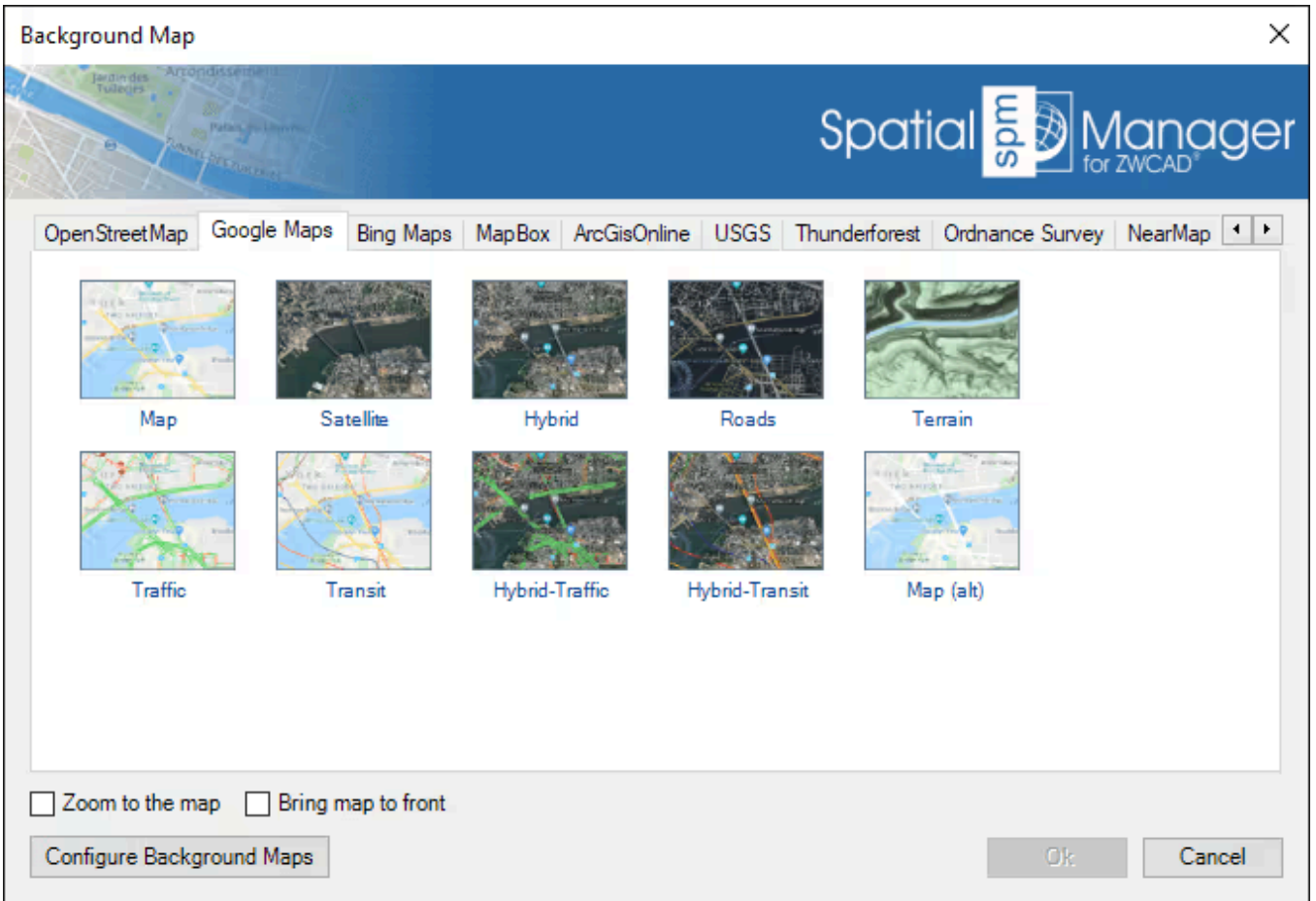
Notes:

- If you want the Map images to be displayed while running ZOOM or PAN (commands or mouse wheel), please set the value of the RTDISPLAY system variable to zero.
- Due to the particular behavior when zooming in or out by using the mouse wheel in ZWCAD, if you cannot enlarge or reduce the view scale from a certain zoom level (you will see a warning like this in the status line: "Can't be further zoomed in/out"), please execute "REGEN" and you will be able to continue zooming in or out on the Map.

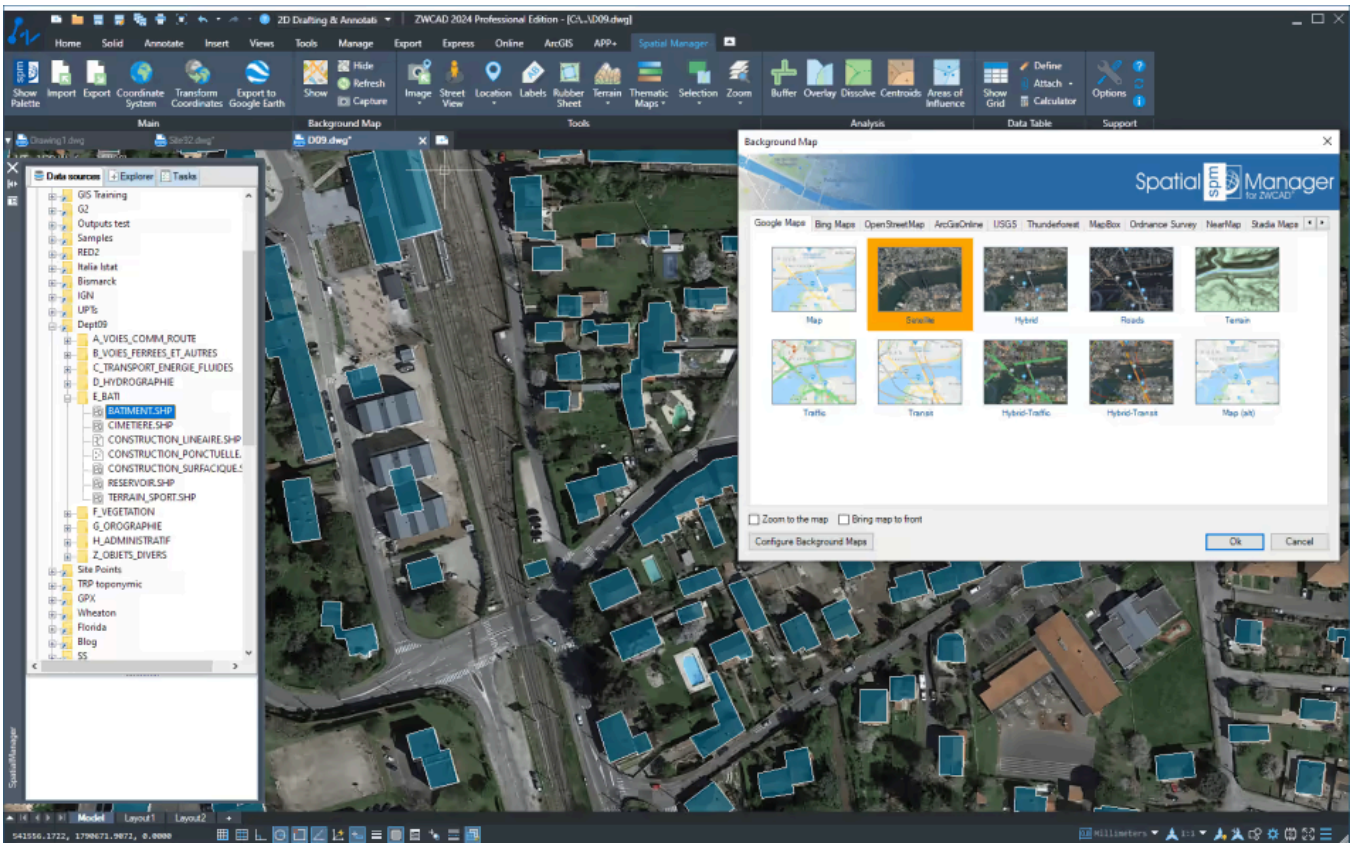
To change the image model map for the 'Background Map', you can execute again the **SPMBGMAPSHOW** command. The "Background Map" window will display emphasized the current image map model, which you can keep by clicking the "OK" button. Click another model if you want to change to this model.



'SPMBGMAPSHOW' command in the Spatial Manager™ for ZWCAD ribbon



'Background Map' list window



'Background Map' applied in a sample drawing

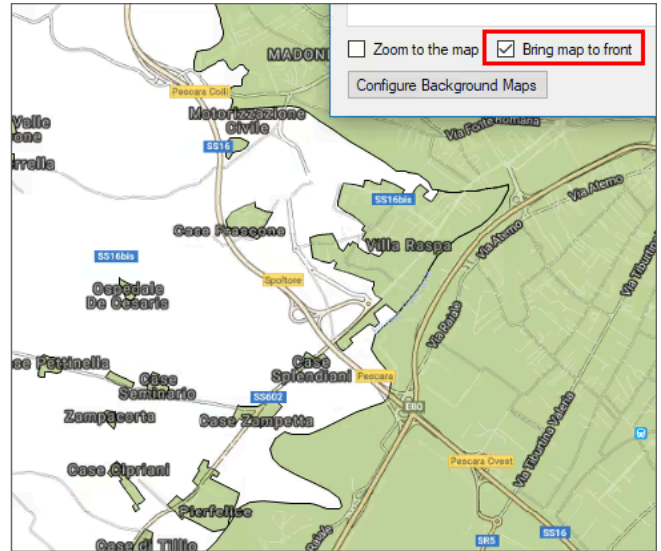
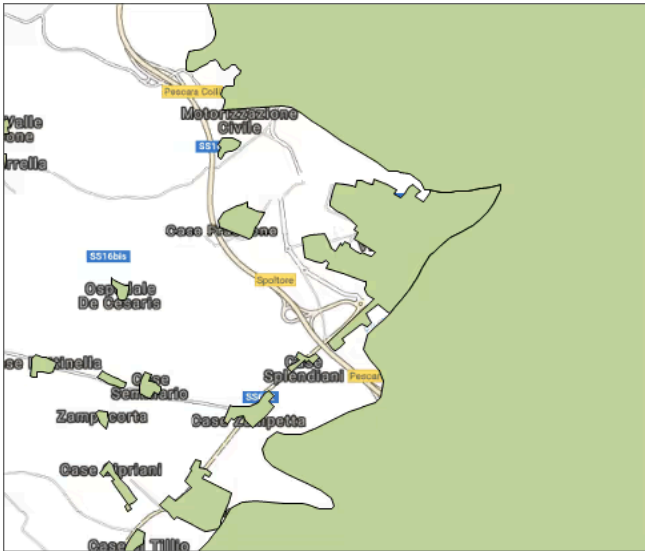
Drawing view behavior when selecting a 'Background Map' and the "Zoom to the map" option:

- There are no entities in the drawing.
 - If the current view does not intersect the 'Background Map' extent or "Zoom to the map" has been selected, then the view fits to the 'Background Map' extent.
 - Otherwise the view does not change. For example, when you select a different 'Background Map' from the current one, since it is not usually interesting to lose the current view in the drawing.
- There are entities in the drawing.
 - "Zoom to the map" selected.
 - If the drawing extent intersects the 'Background Map' extent, then the view fits to the drawing extent (the same effect as ZWCAD "Zoom Extents").
 - Otherwise the view fits to the 'Background Map' extent.
 - "Zoom to the map" not selected.
 - The view does not change. If the current view does not intersect the 'Background Map' extent, a warning alerts you that the selected 'Background Map' is located outside the current view and that you will not see it in the view.
- In any other case not covered above.
 - The view does not change.

Notes:

- *The 'Background Map' extent is the bounding box defined in the corresponding Map Server and sometimes may be greater than the 'Background Map' geographic extent.*
- *If the drawing is not empty when 'SPMBGMAPSHOW' is executed, it is necessary that the drawing has been assigned a Coordinate Reference System (CRS). Learn [how to georeference a drawing](#) .*
- *If the drawing is empty and has no coordinate system assigned to it, when **SPMBGMAPSHOW** is executed Spatial Manager™ for ZWCAD will assign the Background Map CRS to the drawing.*
- *The 'Background Maps' are only available when using **projected** Coordinate Reference Systems.*
- *If the drawing has any assigned CRS and the current view is outside the CRS valid area, when selecting a 'Background Map' a warning alerts you about this and that you will not see the 'Background Map' in the view.*

"Bring map to front" option: When checked, the map will be overlapped to all the entities in the drawing (Foreground Map).



Map in the background vs. foreground

Notes:

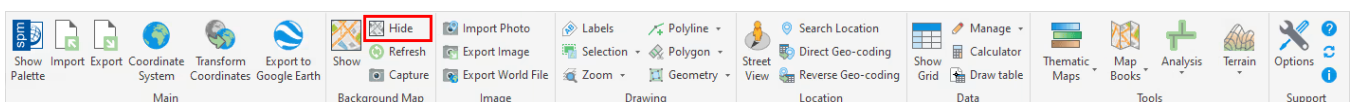
- Bringing the 'Background Map' to front makes sense, and it is a very practical option, when it has any transparent area (learn more about [Transparent 'Background Maps' support](#)).
- If you add entities to the drawing after bringing the 'Background Map' to front (Foreground Map), those will overlap the 'Foreground Map'. If you want to put the 'Background Map' back in the foreground, simply select it again and keep checked the option "Bring map to front", or regen the 'Background Map' (**SPMBGMAPPREFRESH**).

Warning: Bringing the 'Background Map' to front can cause the entities in the drawing to be hidden (except in transparent areas of the 'Background Map', if any).

Hide the 'Background Map' in the drawing

You can hide the 'Background Map' that is shown in the drawing by executing the **SPMBGMAPHIDE** command of Spatial Manager™ for ZWCAD, which you will find in the "Spatial Manager" ribbon, toolbar, or drop-down menu.

If you want to display a 'Background Map', you need to execute the **SPMBGMAPSHOW** command again.



'SPMBGMAPHIDE' command in the Spatial Manager™ for ZWCAD ribbon

DOCUMENTATION

Refresh

Available on editions

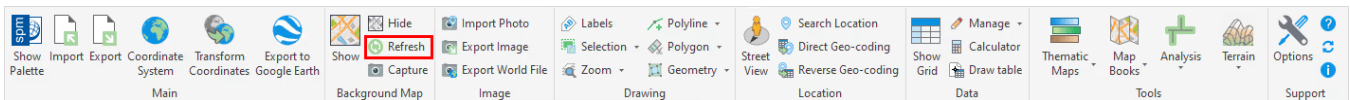
Standard

Professional

Choose in ZWCAD from among a lot of dynamic Backgrounds Maps from providers such as Google Maps, OpenStreetMap, Bing, MapBox, Ordnance Survey, etc. or configure your own maps.

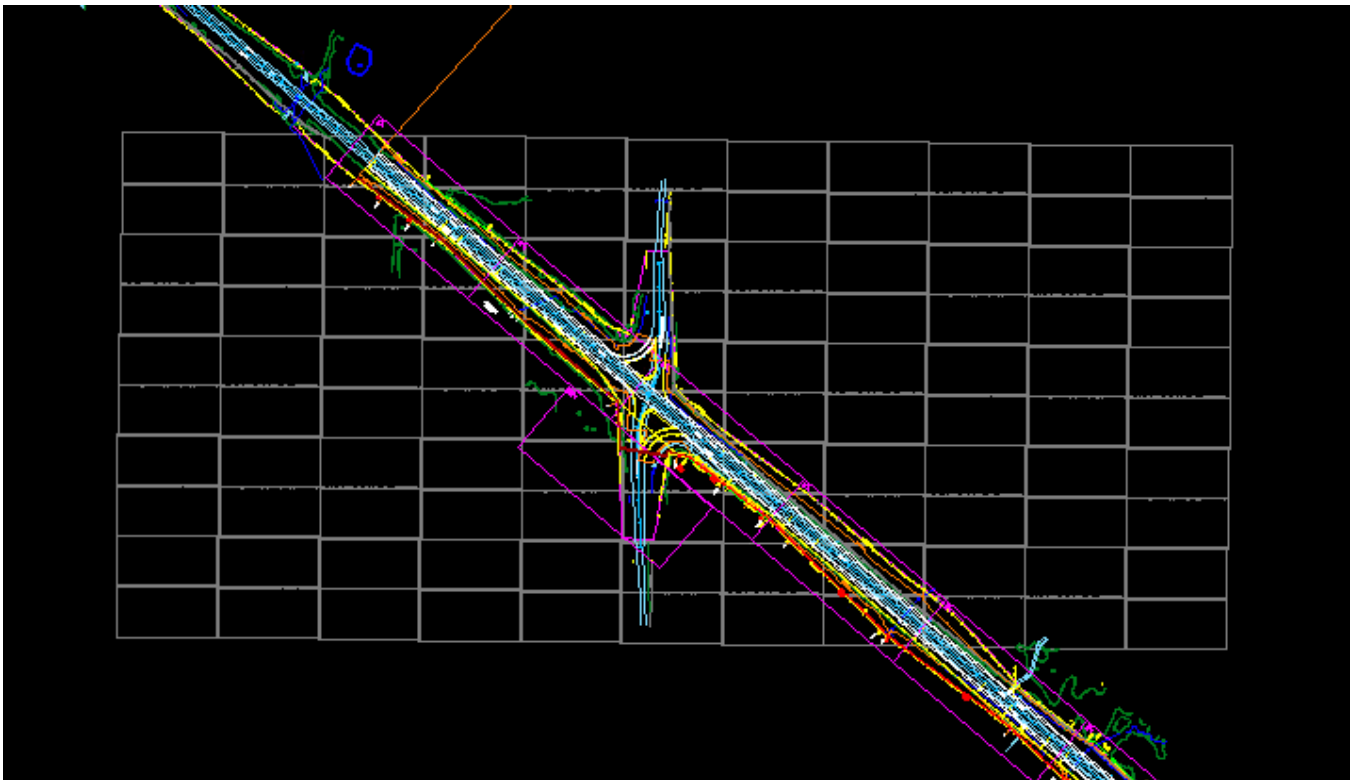
“Repair” or “clean” the image of the ‘Background Map’

There may be situations where the image of the ‘Background Map’ in the drawing shows up as broken or incomplete, etc. Most of these issues can be solved through a regeneration (‘REGEN’) of the drawing. However, some problems may appear which require you to “refresh” the image using the **SPMBGMAPREFRESH** command of Spatial Manager™ for ZWCAD.



'SPMBGMAPREFRESH' command in the Spatial Manager™ for ZWCAD ribbon

In certain cases, the image tiles of the ‘Background Map’ become ‘orphans’. The map is not shown, the frames of the tiles are displayed, but these tiles cannot be deleted using ZWCAD commands. Spatial Manager™ for ZWCAD includes the command **SPMBGMAPIMAGEPURGE** that will delete them.



'Background Map' orphan image tiles

In addition, this command will purge any non-referenced Raster Image in the drawing created using 'SPMBGIMAGE' (Snapshots; see below) and that have been deleted later by the user.

Note that when running this command the 'Background Map' will be hidden (if shown) and the complete cleaning process may be time consuming depending on the number of entities in the drawing.

DOCUMENTATION

Snapshots

Available on editions

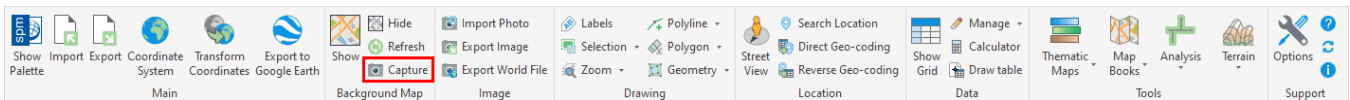
Standard

Professional

Capture static background map images and insert them into the drawing as raster images (PNG, JPG, TIF) or OLE objects. Snapshots can be georeferenced using a World File, and you can select the image detail level. Ideal for presentations, printing, or external GIS use..

Get static “Snapshots” of the ‘Background Maps’

Spatial Manager™ for ZWCAD includes the command **SPMBGMAPIMAGE** that allows you to create (capture) a snapshot corresponding to the current view or a custom area of the shown ‘Background Map’.



'SPMBGMAPIMAGE' command in the Spatial Manager™ for ZWCAD ribbon

As you will see, you can choose between four levels of map image detail and select if you want an externally referenced ZWCAD Raster Image (you can select the path and name of the file to be saved, or accept the proposed default path and name) or an embedded OLE Image. In addition, in the first case you can select the image format and if you want to attach a [World File](#) in order to geo-reference the saved image.

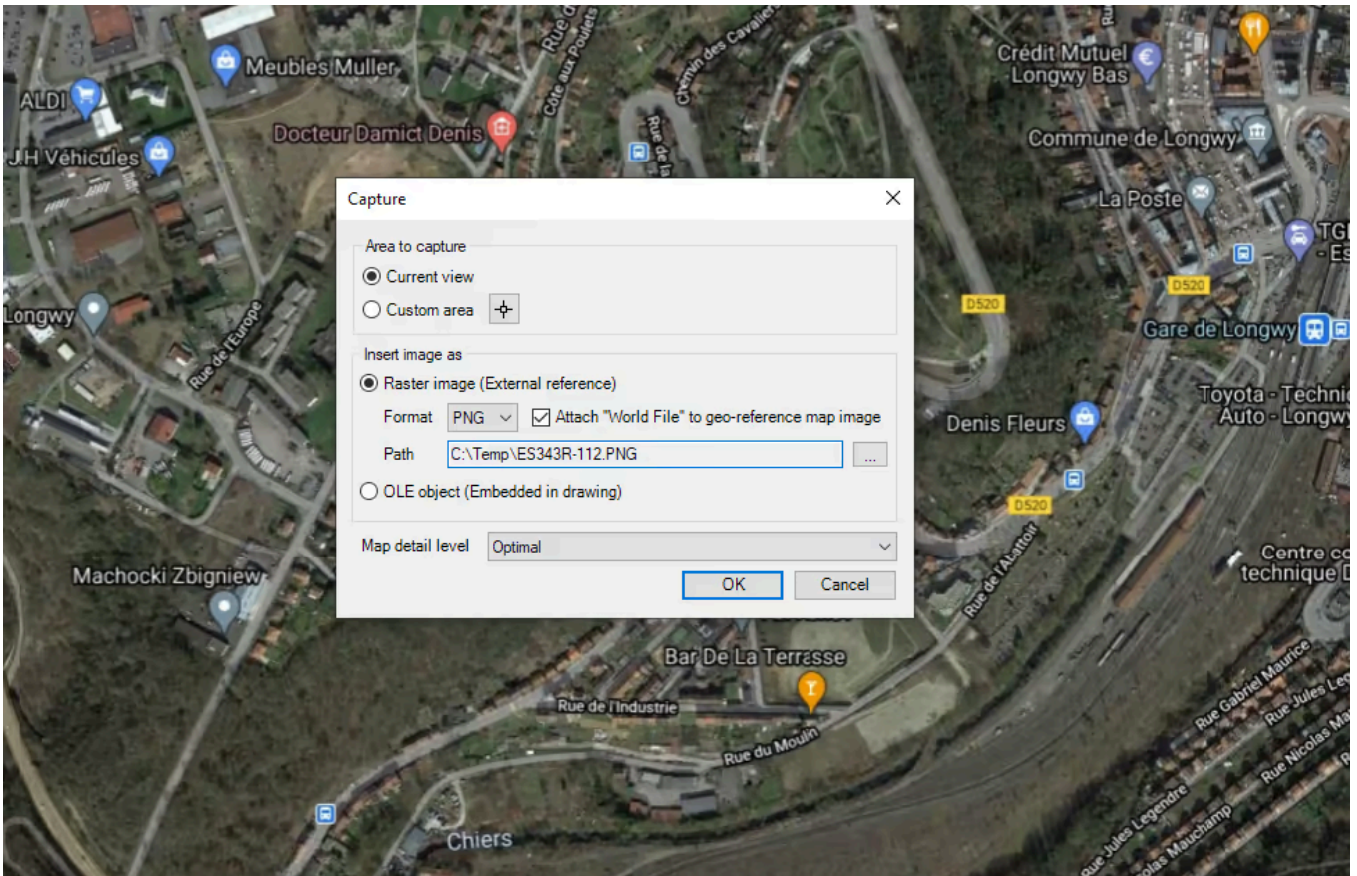


Image Capture options window

Note: In versions previous to 'ZWCAD 2021 SP1' the map image detail "Very fine" is not allowed when capturing as an OLE image.

This command allows you many advanced graphic options when using 'Background Maps', as well as solving some printing issues, which are discussed in the next paragraph.



Combining Raster Images or Images with 'Background Maps'

DOCUMENTATION

Multiple maps

Available on editions

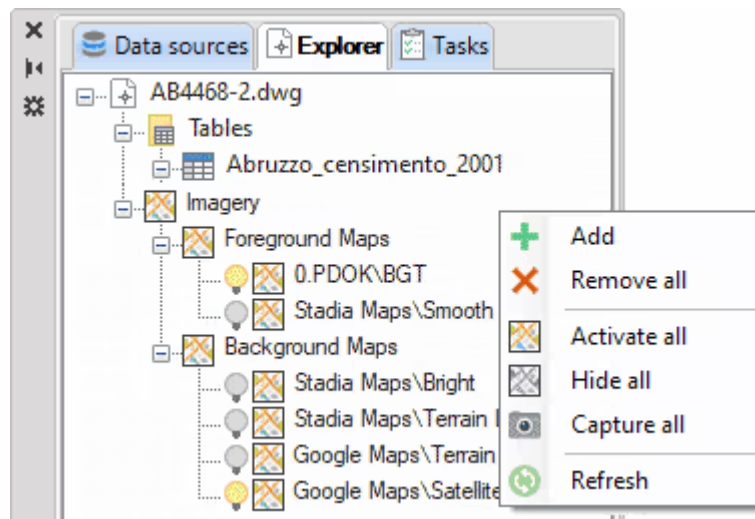
Standard

Professional

Display and manage multiple background maps across views and viewports.

Use and management of several Maps (Background and/or Foreground) in the drawing

You can have several Background and/or Foreground Maps in your drawing and set at any time their status (shown or hidden) and their display order through the "Imagery" branch in the "Explorer" tab of the main application palette (SPM command). This not only allows you to enable or disable the display of any of the Maps shown in the drawing, but also to simultaneously display several Maps and decide their display order, which makes more sense when some of the Map(s) has (have) transparent areas (learn more about [Transparent 'Background Maps' support](#)).



Maps Imagery management (Explorer Area)

Every time you [show a Map](#) , it will be added to the Map tree (in the Background or Foreground branch, as appropriate) and will be activated by default. You can also show a Map from the context menu of the "Imagery" branch. You can show or hide Maps through the "light bulb" icon, sort their relative display positions by dragging the Maps in the branch, and you also have other options in the context menus, such as "Remove All" Maps, "Activate (Show) or Hide All" Maps, [Capture \(snapshot of static image\) All](#) Maps, or "Refresh" the display of the drawing and the currently shown Maps.

DOCUMENTATION

Print

Available on editions

Standard

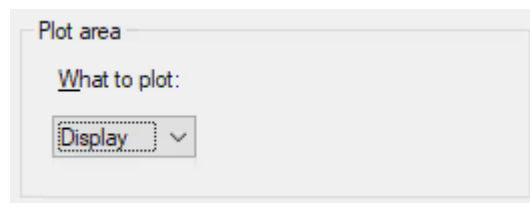
Professional

Include and publish background maps in printed drawings.

Special consideration when Printing or Plotting 'Background Maps'

When printing or plotting from ZWCAD you have to be aware that the only way to be sure about the appropriate printed results is by running the process from the Model Space and selecting "Display" as the "Plot area" (see the first image below). In other cases, the results may not be correct and it would be necessary to apply the following workaround.

To print or plot any other area of the Model Space, or do it from the Paper Space, or Publishing, etc., the use of the Raster Images captured as indicated in the previous article may be the best solution. In the case of Paper Space Viewports, note that these Raster Images are ZWCAD entities, which will allow you to "play" with different possibilities depending on the Layer where they are included and how this Layer is configured in the different Viewports (see the second image below).



Selecting ZWCAD Plot area



Different 'Background Maps' views (Snapshots) in different Viewports

Background Maps Synchronization in Layout Viewports

Background Maps are **automatically synchronized with layout viewports** based on their individual scales. This powerful feature ensures that:

- Each viewport in a layout displays the Background Map at the appropriate detail level for its scale.
- Maps automatically adjust when you change viewport scales.
- Different viewports can show the same area at different detail levels simultaneously.
- The map content and tile resolution are optimized for each viewport's scale.

DOCUMENTATION

Custom maps

Available on editions

Standard

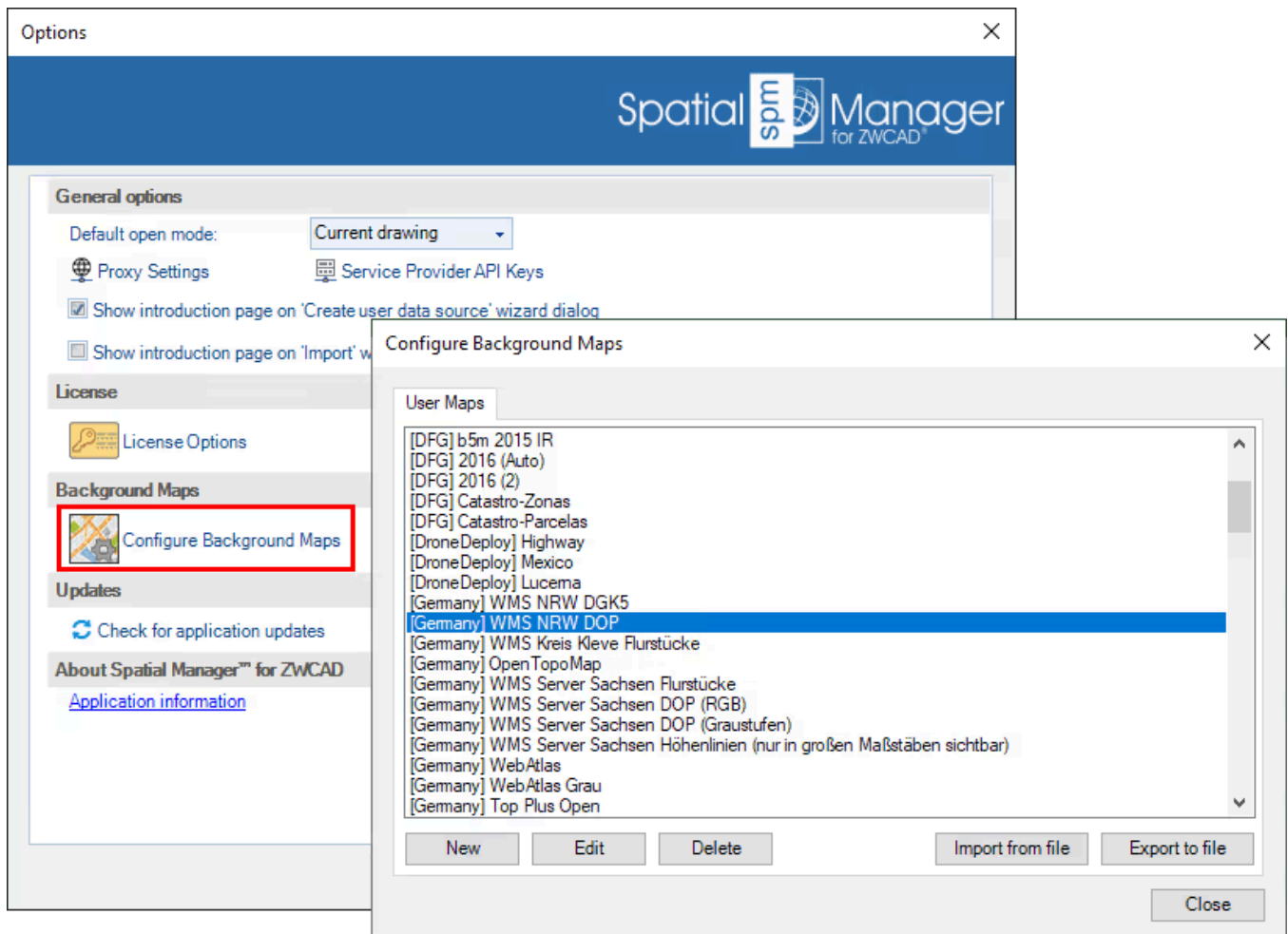
Professional

Connect to your preferred local map provider and work with the most common geospatial data sources, including WMS/OGC API Maps, WMTS/OGC API Tiles, XYZ/TMS services, and Cloud Optimized GeoTIFFs (COG).

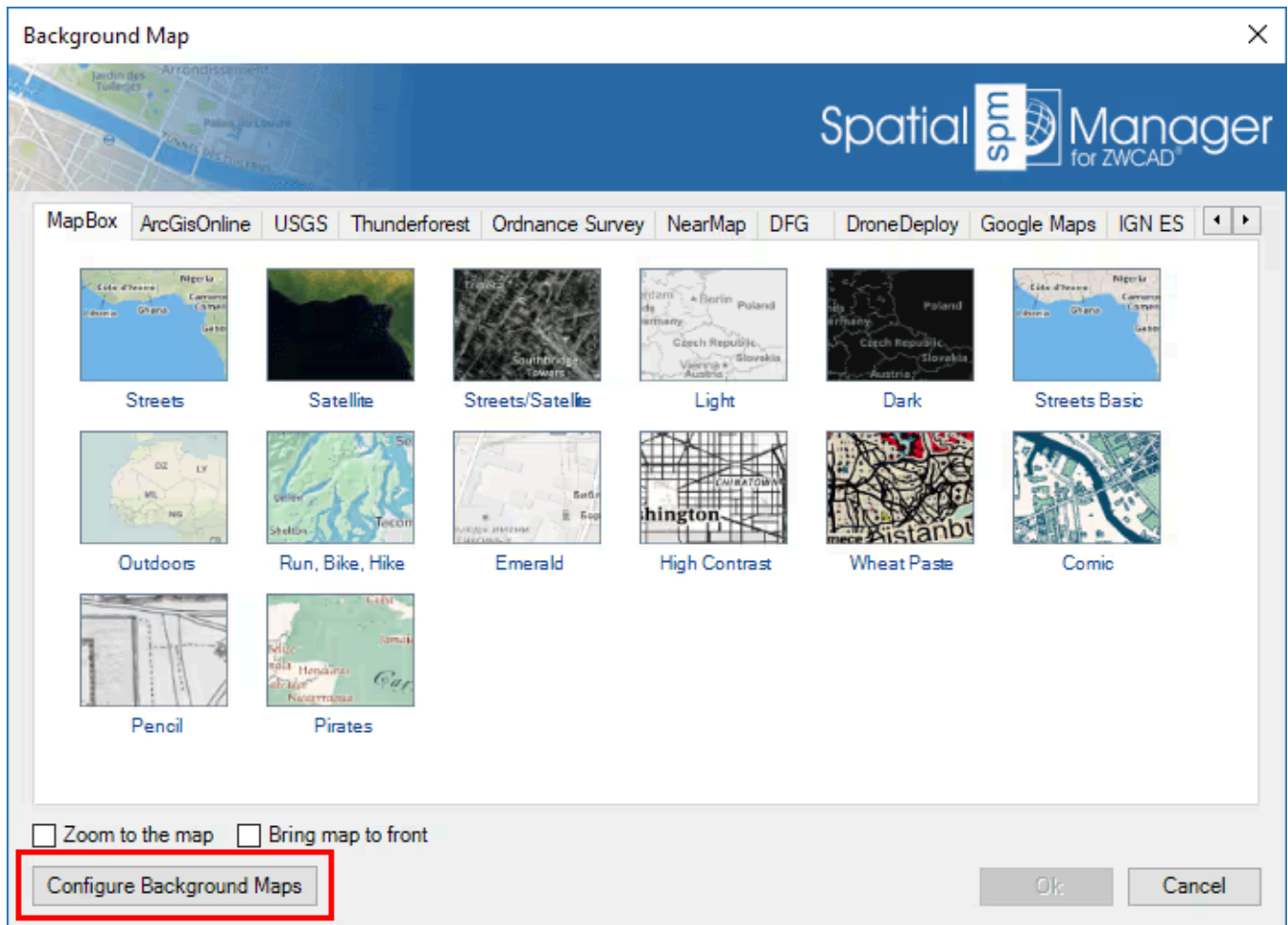
Configure custom Web Map Services as 'Background Maps'

Spatial Manager™ for ZWCAD includes the option to define "User Background Maps" in order to enable access to more Mapping Services ([XYZ / TMS](#), [WMTS/OGC API Tiles](#), [WMS/OGC API Maps](#)).

Enter the parameters needed to define a new "User Background Map" through the option "Configure Background Maps" in the application Options (**SPMOPTIONS**), or through the "Configure Background Maps" button in the 'Background Maps' selection window (**SPMSPMBGMAPSHOW**). As you will see, you can also Edit or Delete any existing "User Background Map" through the same option.



'Configure Background Maps' in the application Options



'Configure Background Maps' button in the 'Background Maps' selection window

Through the "Configure Background Maps" window you can also Export/Import "User Background Maps" to/from a 'Background Map Definition' file (*.bmd). This kind of file includes the definition of one or more 'Background Maps' as well as the Group(s) where they are or will be placed. You can export as many Maps as you want to a single file and, if you are importing already existing Maps, you can choose to either ignore the import of these Maps or rename them using automatic consecutive numbering.

Note: This functionality allows you to share Background Maps between computers or users and helps organize user Background Map definitions. In addition, you will be able to import Maps from services such as [DroneDeploy](#) and others.

XYZ / TMS Type Maps (OSGeo Standard / 256x256 tiles)

- The Name of the Map.
 - Each Map will have its own unique Identifier, so you can apply the same Name to different Maps in different Groups.
- The Group (Tab) where you want to place the Map. If it is a new Group, it will be automatically created. You can drop down the list of Groups to place the Map into an existing Group.
- The Type of the Map (XYZ / TMS in this case).

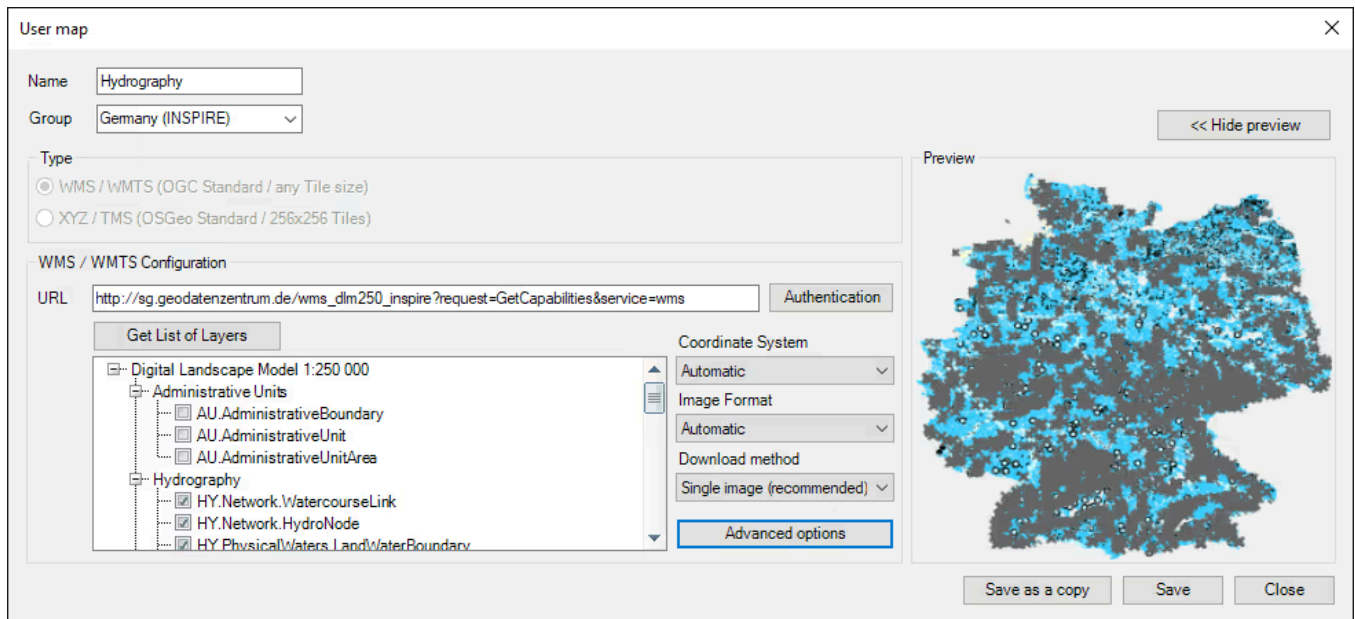
- The URL to access a specific valid Map in a valid Map Server. The URL must include the dynamic parameters specified in the application window.
 - Authentication: To enter the login data to access the service, if needed (Available security protocols SSL3, TLS, TLS1.2).
 - Advanced options:
 - Coordinate System (CRS). Be careful when changing this setting because most XYZ/TMS servers use the default value "WGS84 Pseudo-Mercator (EPSG 3857)", so change it only if you are sure another CRS is required.
 - Tiles origin (Top-left or Bottom-left).
 - *Note: You can also define XYZ/TMS User Background Maps on a local path.*

Configuring 'XYZ / TMS User Background Maps

WMS/OGC API Maps or WMTS/OGC API Tiles Type Maps (OGC Standard / any tile size)

- The Name of the Map.
 - The application will propose a name for the Map based on the selected Layer(s) in the server (see below), but you can modify it if you want to.
 - Each Map will have its own unique Identifier, so you can apply the same Name to different Maps in different Groups.
- The Group (Tab) where you want to place the Map. If it is a new Group, it will be automatically created. You can drop down the list of Groups to place the Map into an existing Group.
- The Type of the Map (WMS/WMTS in this case).
- The URL to access a valid Map Server.

- Authentication: To enter the login data to access the service, if needed (Available security protocols SSL3, TLS, TLS1.2).
- The Layer(s) that you want to include in the 'Background Map'. Click the "Get List of Layers" button and select the Layer(s) from the tree showing the complete Layers structure available in the Map Server.
 - The Coordinate System (CRS) for the selected Layer(s). Choose an available CRS or "Automatic" from the "Coordinate System" dropdown.
 - The default "Automatic" option automatically configures the Map CRS, trying to find the best choice by following this process:
 - The same CRS as the current drawing CRS.
 - If not available, then "WGS 84 / Pseudo-Mercator (SRID 3857)".
 - If that is not available either, then the first CRS available in the server list.
 - *Note: This setting is dynamic because the application reloads the map whenever there are changes to the drawing CRS.*
 - The Image Format for the selected Layer(s). Choose an available Format from the "Image Format" dropdown.
 - The default "Automatic" option automatically sets the most suitable image format by following this process:
 - PNG.
 - If PNG is not available, then any PNG variant (PNG8, etc.).
 - If not, then JPG.
 - If JPG is not available, then the first format available in the server list.
 - The Download method from the server: "Single image (recommended)" or "Image tiles grid" (WMS only).
 - Advanced options:
 - WMS/WMTS options:
 - Ignore axis orientation (needed for some map servers).
 - Invert axis orientation (same as previous).
 - The Map Background Color (solid or transparent) (only for WMS servers that support it).
 - Transparent maps: See the next section.



Configuring 'WMTS or WMS User Background Maps'

Notes about the WMS/WMTS 'Background Maps' performance:

- Whenever possible, select the Coordinate System (CRS) assigned to the drawing in the 'Background Map' configuration.
 - No CRS Transformation implies avoiding the deformation of the Map images while maintaining their original visual quality.
 - In most cases, the default "Automatic" option (see above) is the best one.
- When configuring the "Download method" for a WMS 'Background Map', choose the default option "Single image (recommended)" whenever possible.
 - The image quality is optimum.
 - This choice ensures that texts or other elements are not shown repeated multiple times when they appear in more than one image tile.
 - The alternative "Image tiles grid" should be used only when the "Single image" option becomes too slow.
- Select any compressed image format (PNG, JPG, etc.) if available.
 - The images will be smaller, resulting in shorter download times.
 - In most cases, the default "Automatic" option (see above) is the best one.
- See also [How can I improve the performance of the 'Background Maps' in ZWCAD?](#) .

When configuring a User Map, clicking the "Show Preview" button will display an image of the Map extension to help verify if all settings are correct. The "Preview" image will automatically update when you modify any configuration parameter.

Click the "Save" button to save the Map and exit, or click "Save as a copy" to save the Map and stay on this window. This option allows you to quickly create various Maps using similar configurations without

reopening the dialog repeatedly. For example, in the case of WMS/WMTS Maps, it is very useful for easily creating different Maps that include different Layer(s) of the same source.

DOCUMENTATION

Transparent maps

Available on editions

Standard

Professional

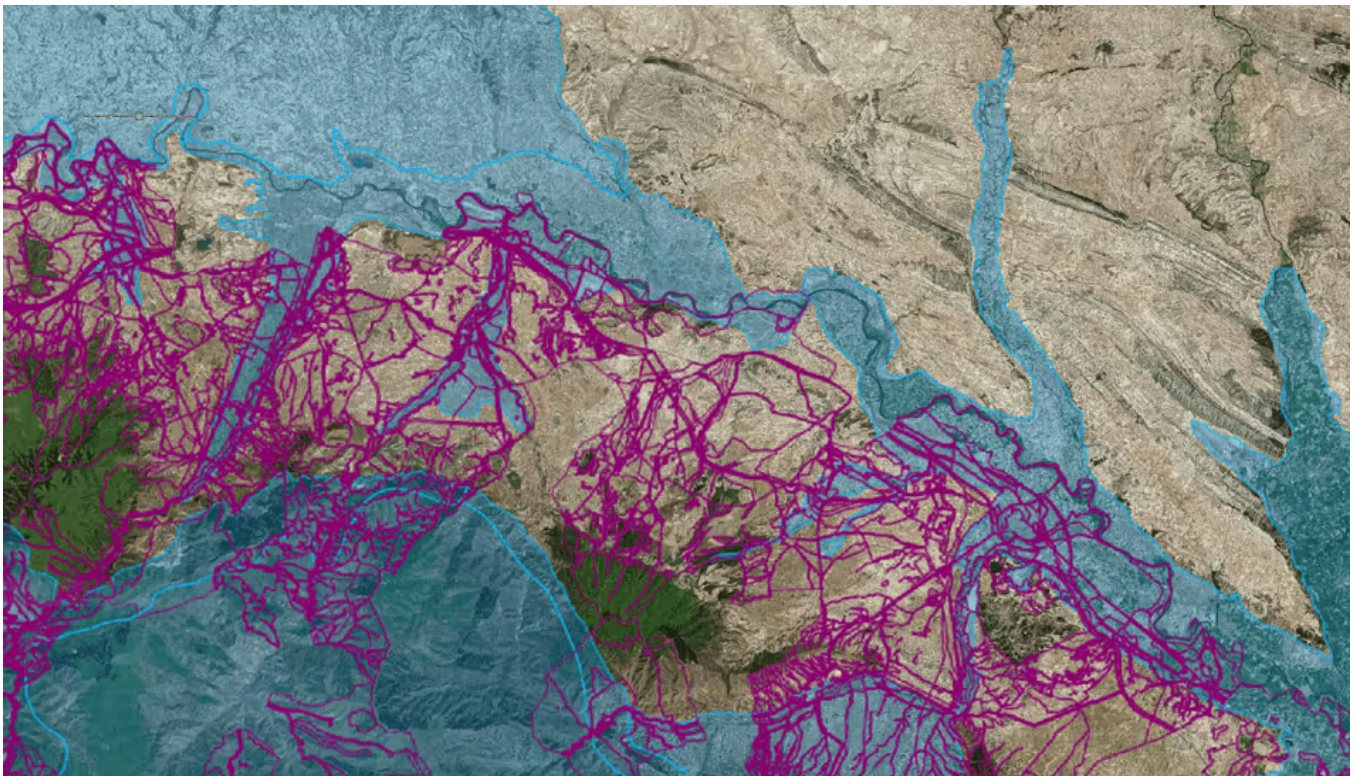
Transparent maps allow you to blend multiple map layers to create visually enhanced and richer backgrounds. By supporting transparency in Background Maps, Spatial Manager™ for ZWCAD enables combination of different map styles.

“Background Maps” and Transparent maps

Spatial Manager™ for ZWCAD supports *Background Maps* that include transparency information. Using transparent maps allows you to get visually richer maps by combining different map models in your drawings.

You can further improve this feature if you use it in conjunction with the **Snapshots** feature (see the next section).

If you select any transparent *Background Map* to show it, and the option **Bring map to front** (*Foreground Map*) is checked when selecting the *Background Map*, you will see the opaque areas of the *Foreground Map* over the entities in your drawing (see the option **Bring map to front** in [display a 'Background Map' in the drawing](#)).



Combining Transparent 'Background Maps'

Note: Transforming coordinates of the resulting images of a map (if needed) is a little slower when a transparent 'Background Map' is shown in the drawing.

DOCUMENTATION

Terms of use

Available on editions

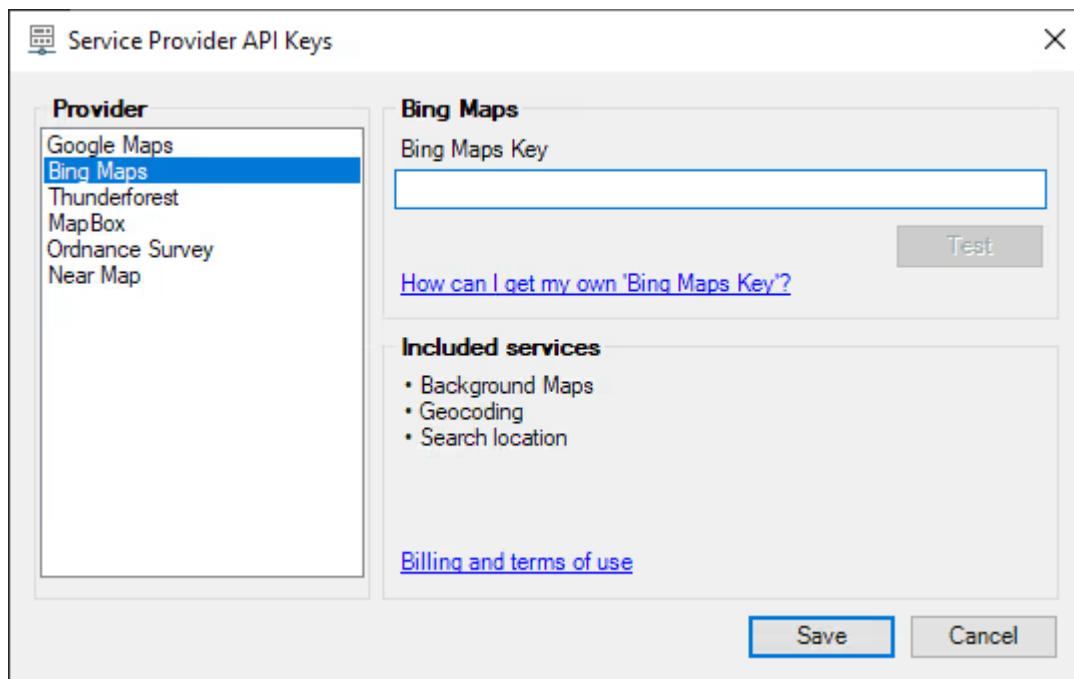
Standard

Professional

Some Background Map providers require specific usage terms or API keys. Spatial Manager™ for ZWCAD lets you configure these credentials easily, enabling access to restricted maps.

Special condition to use the 'Background Maps'

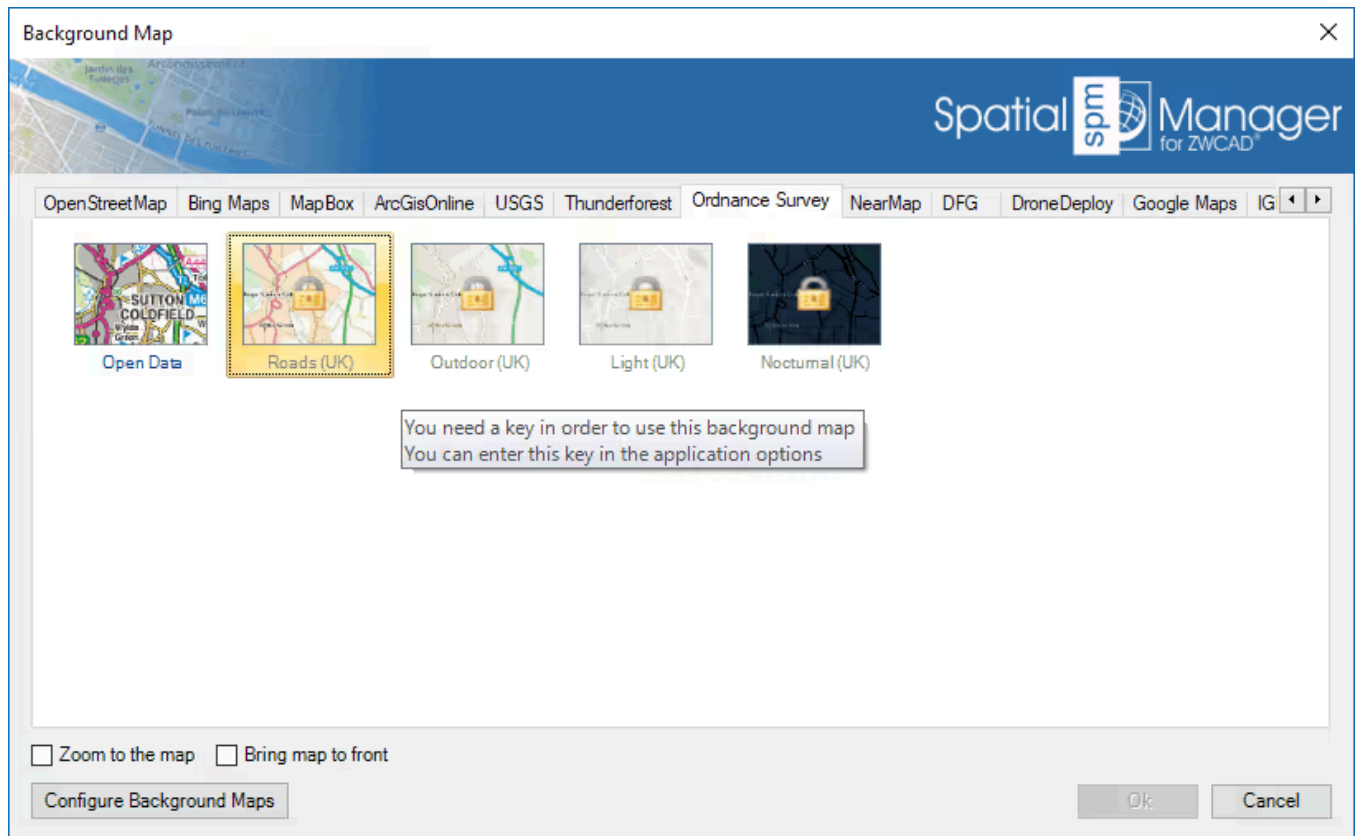
Certain image maps providers included in Spatial Manager™ for ZWCAD may require special terms of use for the users of their maps. You can configure any special setting needed to load the maps of such providers through the [Service Provider API Keys](#) in the application Options ('SPMOPTIONS'). You can also configure and save these settings the first time you try to use ('SPMBGMAPSHOW') a 'Background Map' that needs a special configuration.



Service Provider API Keys window

You can change these settings as often as desired. You can even insert blank values to reset the values of these settings.

Sometimes, the image maps provider lets you access some free maps, but you need to get a key or code to use the others. In this case, you will see "blocked" the maps which need you to modify the configuration according to the instructions above.



'Background Maps' blocked

Important note: Please, read also the specific license conditions in the paragraph relating to the 'Background Maps' of the application [End User License Agreement \(EULA\)](#).

DOCUMENTATION

Advanced

Available on editions

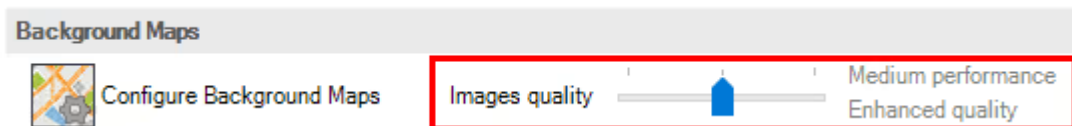
Standard

Professional

Choose in ZWCAD from among a lot of dynamic Backgrounds Maps from providers such as Google Maps, OpenStreetMap, Bing, MapBox, Ordnance Survey, etc. or configure your own maps.

Enhance the quality of the 'Background Maps'

In Spatial Manager™ for ZWCAD you can increase or reduce the map images quality (at the cost of losing or gaining performance) through the "Images quality" option that you will find in the "Background Maps" section of the application Options (**SPMOPTIONS**).



'Images quality' option

Notes:

- *The quality improvement will be more appreciable depending on your graphic system, the zoom level, and the selected 'Background Map'.*
- *In addition, as discussed above, the quality improvements may be more necessary if the CRS of the map must be transformed, as the resulting map images will be obtained by deforming rectangular frames.*
- *If available, the ZWCAD command 'IMAGEQUALITY' (Draft/High) can also affect the 'Background Maps' quality.*
- *Please read also the next article.*



'Images quality' sample results

DOCUMENTATION

Street View

Available on edition

Professional

Google Street View dynamic image browser on any geo-referenced drawing or map in ZWCAD.

DOCUMENTATION

Data Management

Available on editions

Standard

Professional

Manage the alphanumeric data attached to the objects, design and edit the structure which will be used to store the data in ZWCAD.

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DOCUMENTATION

Data table

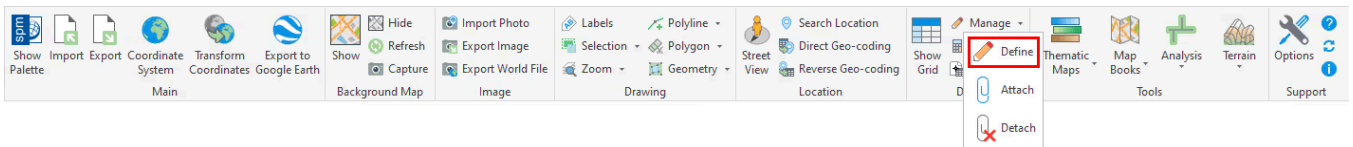
Available on editions



Data tables provide the structure for associating information with drawing objects. They can be attached automatically during import or manually created by adding fields of various data types..

Define data tables in a drawing

The command **SPMDATATABLEDEFINE** of Spatial Manager™ for ZWCAD lets you create new data tables in a drawing as well as modify them. Also, use this command if you need to rename and delete data tables, or import Entity Data tables from ZWCAD Map drawings. You will find this command in the “Spatial Manager” ribbon, toolbar, or drop-down menu.



'SPMDATATABLEDEFINE' command in the Spatial Manager™ for ZWCAD ribbon

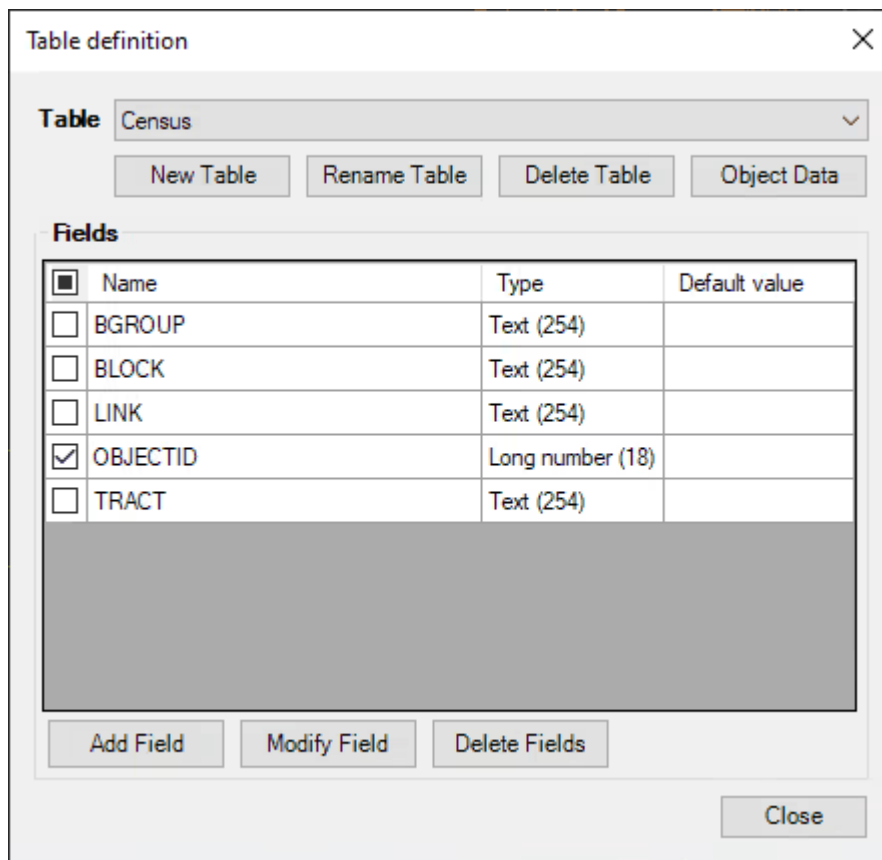


Table definition window

Click on the “New Table” button to create a new (empty) data table. Select a data table in the drop-down list to rename it (“Rename Table” button), delete it (“Delete Table” button), or modify it:

- Add Field. To add a new field in the selected data table.
 - Name. The field name, unique in the selected data table.
 - Type. You can select the field type in the drop-down list: Text, Integer, Date, etc. The field type cannot be changed if you want to modify the field later.
 - Length. For Text-type fields, you can set the maximum field length. The maximum field length cannot be changed if you want to modify the field later.
 - Default value. The default value for this field when the corresponding data table is attached to one or more entities.
- Modify Field. To edit the selected field of the selected data table (see “Add Field” above).
- Delete Fields. To delete the selected fields of the selected data table.

Note: In brackets, the length of the field (and the number of decimal places, when applicable).

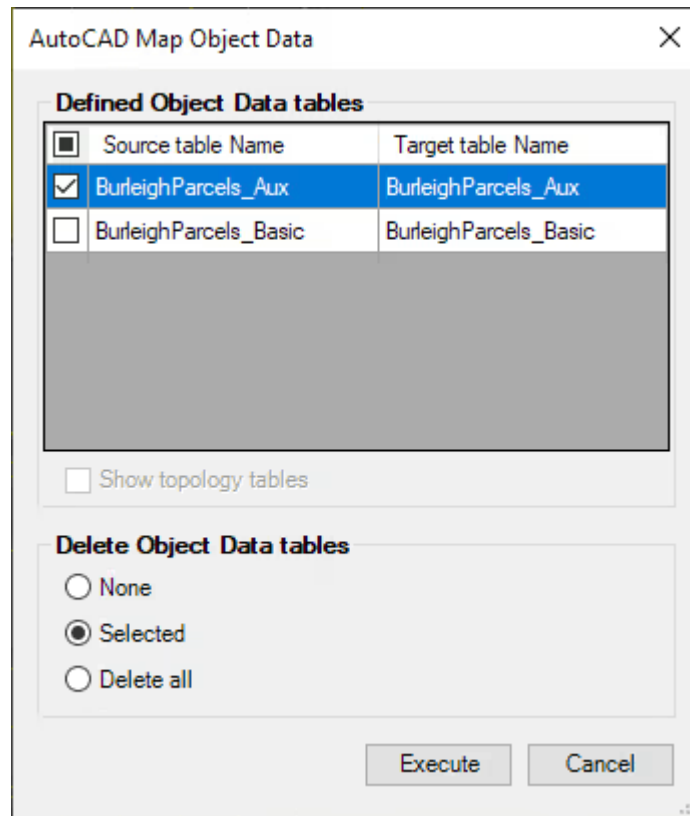
Add / Modify field window

The following is the behavior of the application when you modify a data table that is already attached to one or more entities in the drawing:

- Adding a field: the new field is added to all the attached entities. If a “Default value” has been defined for the field, this will be the value assigned to the field for these entities.
- Modifying a field: only the name of the field (if modified) will be changed for all the attached entities.
- Deleting a field: the field will be erased for all the attached entities.

As you can see in the tables selection dropdown, there is a “scan new tables...” option to retrieve data table structures from the drawing entities. This is useful when copying/cutting and pasting entities from one drawing to another, when saving drawings using WBLOCK, when inserting a drawing into another, etc.

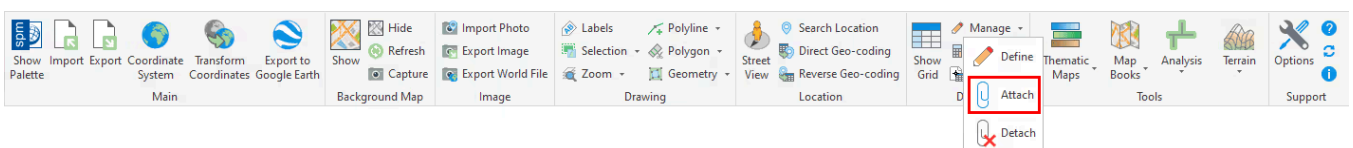
If your drawing includes AutoCAD Map Entity Data tables, you can convert them to ‘Spatial Manager’ data tables by clicking on the “Entity Data” button. Optionally, you can also delete the existing Entity Data tables (all or converted) from the drawing. Since you can attach several tables to any entity (see below), if there are entities linked to several ZWCAD Map Entity Data tables, the required tables and attachments will be generated for each entity.



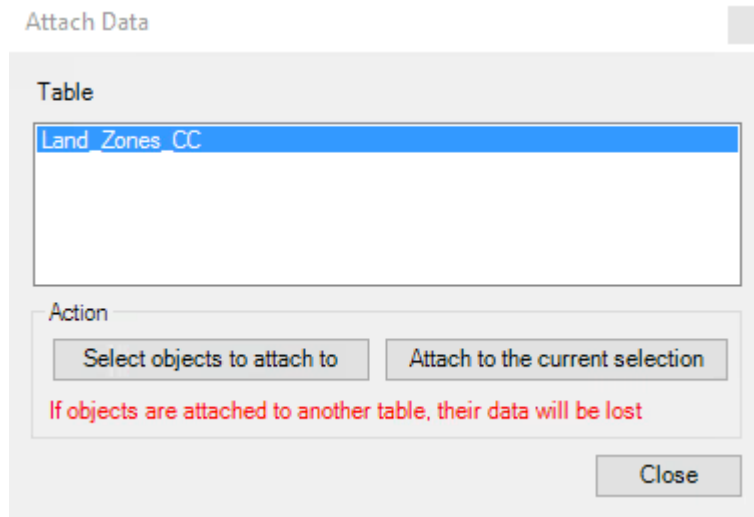
Convert AutoCAD Map Entity Data tables

Attach a data table to one or more entities

When you want to attach an existing data table to one or more entities in the drawing, you can execute the command **SPMDATATABLEATTACH** of Spatial Manager™ for ZWCAD. You will find this command in the “Spatial Manager” ZWCAD ribbon.



'SPMDATATABLEATTACH' command in the Spatial Manager™ for ZWCAD ribbon

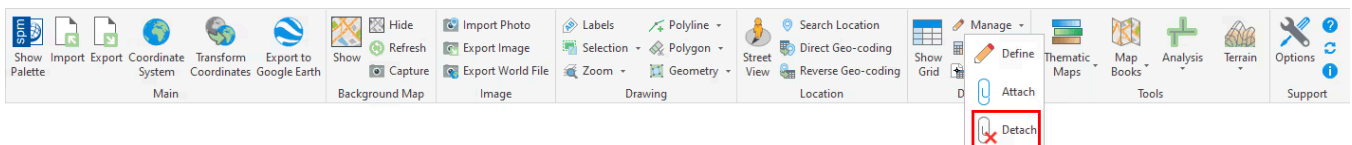


Attach a data table to entities window

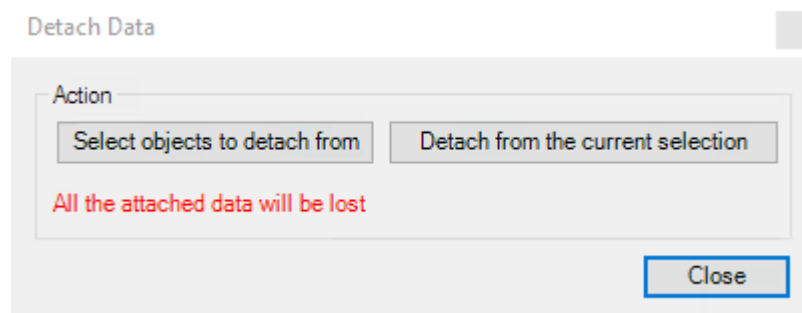
First, choose a data table in the list of defined data tables in the command window. Then, the attach operation can be applied to the selected entities (if any) or to a new entities selection. Note that it is possible to attach several tables to any entity, which allows you to have data organized according to different topics attached to the same entity. For example, you can attach to entities representing parcels a table containing the parcels data and another one containing the parcel owners data.

Detach the data from the entities

Detach any data from one or more entities by executing the command **SPMDATATABLEDETACH** of Spatial Manager™ for ZWCAD. You will find this command in the “Spatial Manager” ZWCAD ribbon.



'SPMDATATABLEDETACH' command in the Spatial Manager™ for ZWCAD ribbon



Detach the data window

The detach operation can be applied to the selected entities (if any) or to a new entities selection.

WARNING: All the current data attached to the entities (if any) WILL BE LOST.

DOCUMENTATION

Data edit

Available on editions

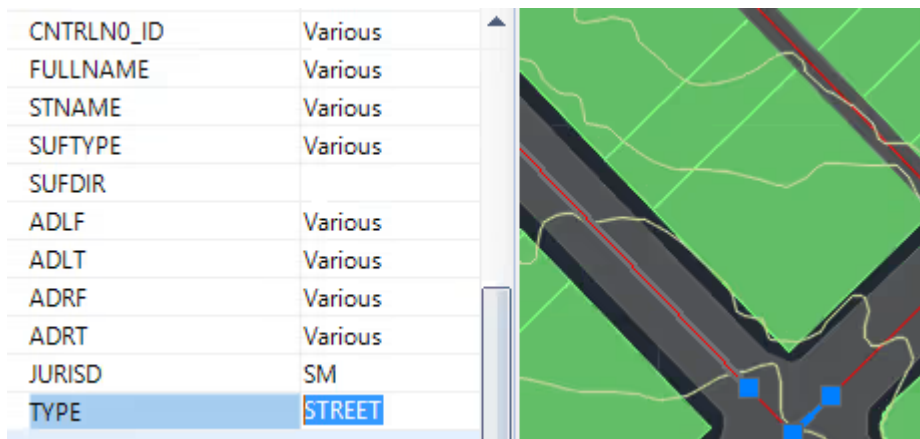
Standard

Professional

Create, edit or delete Fields in any existing table. You can assign a default value to any Field and select the type of data for the Field (Text, Integer, Date, etc.). As happens with the tables, if any alteration occurs in the Fields of a table, the application will automatically update all the attached objects..

Modify the entities data

You can directly edit a data field value (XDATA / EED direct data edition) for one or more entities in Spatial Manager™ for ZWCAD by selecting the entity(s) in the drawing and typing the new value for this field in the 'Properties' area of the 'SpatialManager' palette. You can also delete the field content to get a null value in this field. To validate any modification, you need to press Enter or click on a different field.



Direct data edit in the Properties area

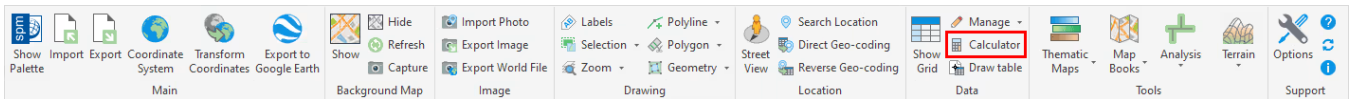
Notes:

- The fields whose value starts with "http" are automatically converted into active links.
- Because of performance considerations, the number of entities selected for which their data are shown in the application palette is limited by the system variable PROPOBJLIMIT.

Calculate field values based on values of other fields and/or constants

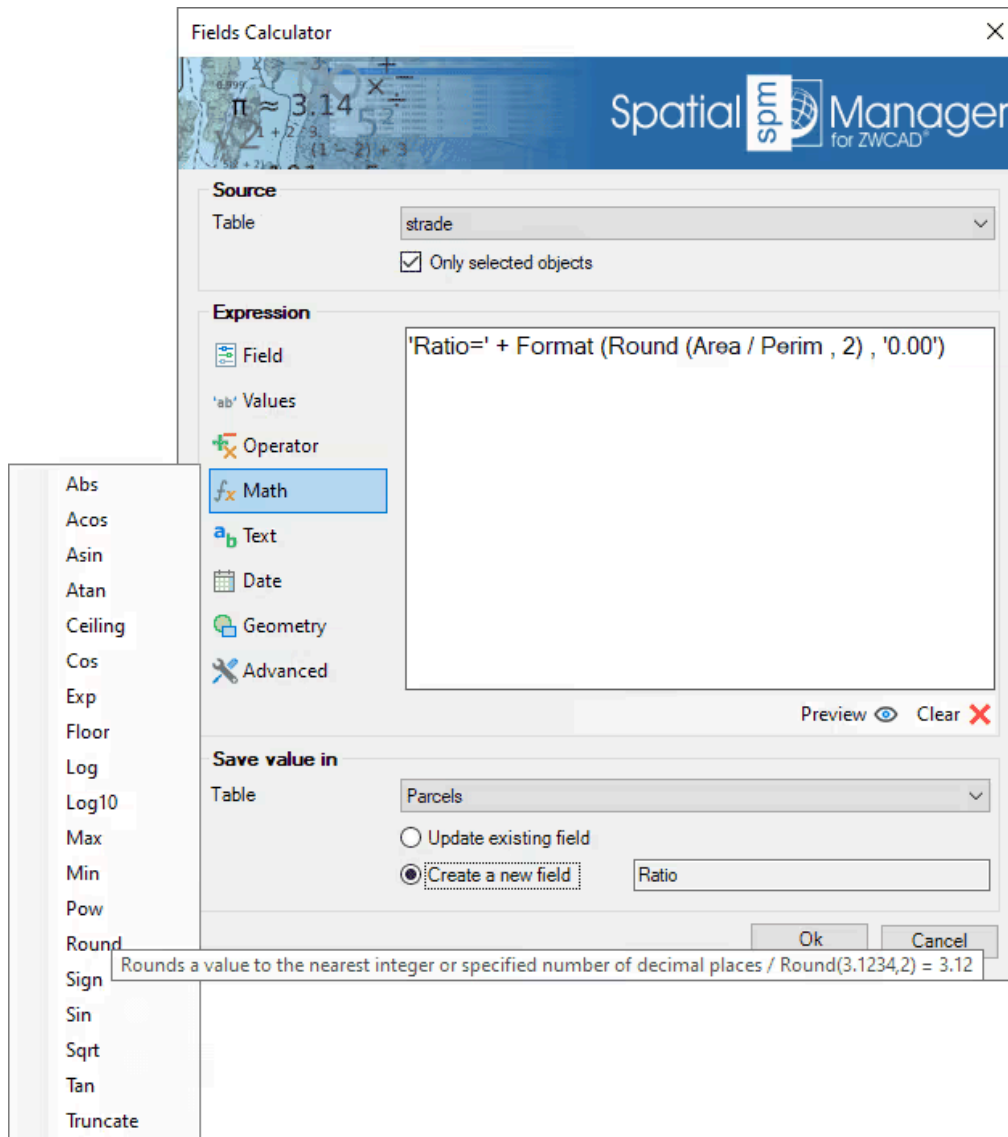
Available on edition Professional

The command **SPMDATACALCULATOR** of Spatial Manager™ for ZWCAD (Fields Calculator) allows you to calculate simple or complex expressions using operators and functions that can be applied to field values in a table and/or to constant values.



'SPMDDATACALCULATOR' command in the Spatial Manager™ for ZWCAD ribbon

- **Source:** Select the source table in order to apply calculations on field values from this table. You can apply the calculation result only to the selected entities and not to the whole table.
- **Expression:** In the writing panel of the Fields Calculator window you can create the expression that will be applied as a calculation to a field of the same source table or another table (see below). For example, in the expression that you can see in the image below, a text value will be calculated resulting from concatenating the fixed text "Ratio=" with another text that is the result of converting into text the rounding with two decimal places of the division between the values of the fields 'Area' and 'Perim'.
 - You can use the "Clear" button to leave the current expression blank, and the "Preview" button to preview the calculation results in tabular format.
 - You can type the operators and functions and the source table fields or constant values to which they apply, and also select them through the sections to the left of the writing panel:
 - **Field:** To select any field name defined in the source table.
 - **Values:** To select any value from a selected field in the source table (you will see the full list of values for the selected field), or some "special" fixed values, such as "NULL".
 - **Operator:** Arithmetic, logical, comparator or conditional operators. Many of them can be applied to numeric values but also to text, dates, etc. For example, the "+" operator will return the sum of two numeric values, but it will also return the concatenation of two texts.
 - **Math:** Mathematical functions such as logarithmic or trigonometric expressions, rounding, square roots, etc.
 - **Text:** Text functions, such as full or partial text replacement, converting numerical values to text, splitting texts, etc.
 - **Date:** Date functions such as hourly, daily or monthly calculations, etc.
 - **Geometry:** Functions applicable to entity geometries, such as area calculations, elevations, etc. They will be applied to entities attached to the source table.
 - **Advanced:** Set of advanced functions not included in the previous sections, such as creating lists, returning values from one list based on the values of another list, etc.
- **Save value in:** You can set the field where the above expression will be applied. This field can be an existing or a new field in the source table or in any other defined table.



Fields Calculator window

- **Notes:**
 - When you pass over the operators or functions on the left side, you can see a small help text for each of them as well as an example of use.
 - Complex calculations are composed within parentheses and are processed from the inner parentheses to the outer parentheses. For example, in the expression that you can see in the above image, first the division between the values of the fields 'Area' and 'Perim' is calculated (/), then the rounding of the previous result to 2 decimal places is calculated (ROUND), and finally this result is converted into a text with the format type "0.00" (FORMAT), so that it can be concatenated to the fixed text "Ratio=".
 - Fixed text values or parameters, such as the text "Ratio=" or the "0.00" parameter of the FORMAT function in the above image, must be enclosed in single quotation marks.
 - When you run the Fields Calculator function, the expression writing panel will display the last expression you entered during the current work session, if you had already used the function, so that

you can correct any previous expression or base a new expression on the whole or part of the last expression used.

- *You can get more help and information about the main available operators and functions through the following links:*
 - *[Functions](#)*
 - *[Extensions](#)*

DOCUMENTATION

Data grid

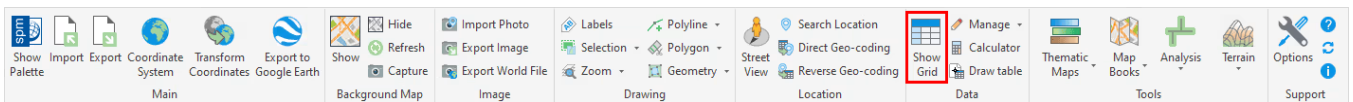
Available on edition

Professional

The Data Grid palette in ZWCAD allows you to view, edit, etc. the objects data for any table in the drawing. You can also select objects from the Data Grid, export the data from the tables and more.

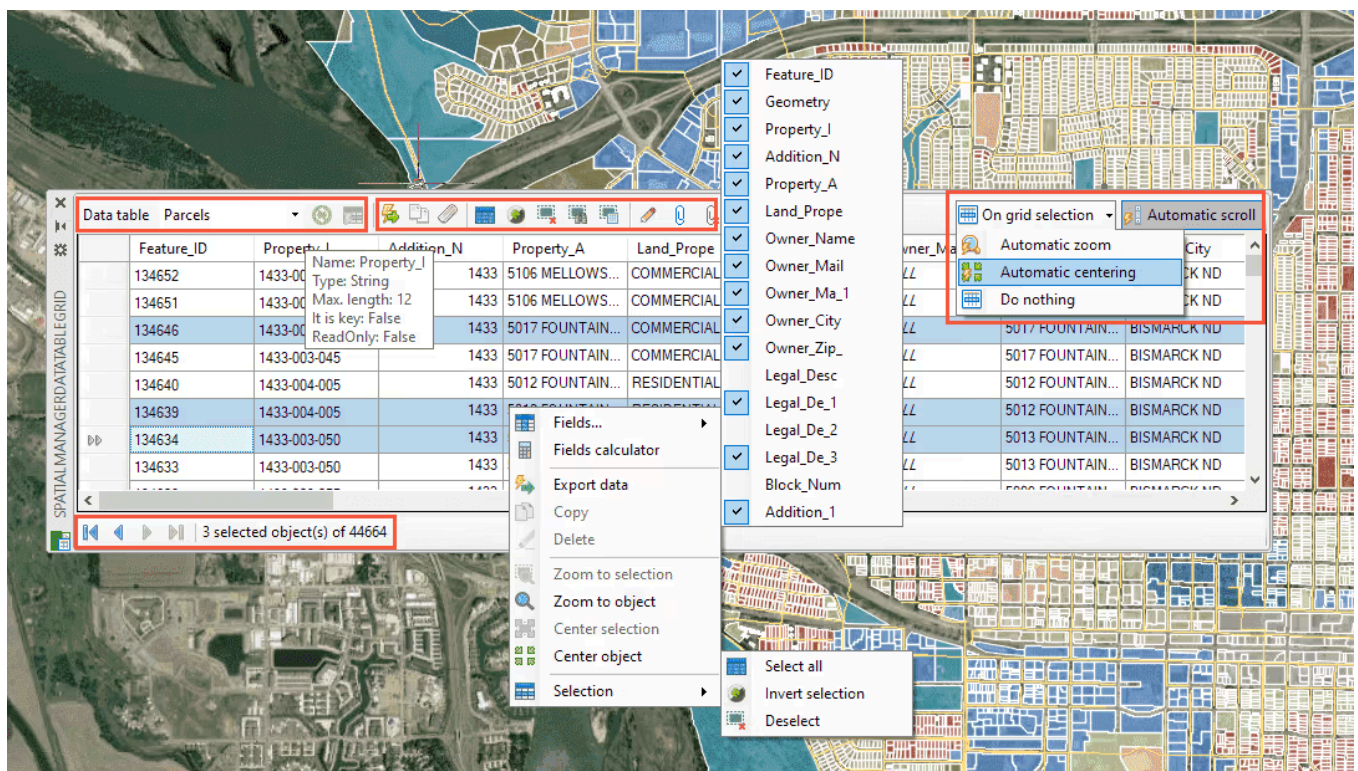
View and edit the entities data in a table form

The command **SPMDATATABLEGRID** of Spatial Manager™ for ZWCAD opens the 'Data Grid' palette where you can view, edit, etc. the entities data in any table in the drawing. You can also select entities from the 'Data Grid', export the data from the tables, and more.



'SPMDATATABLEGRID' command in the Spatial Manager™ for ZWCAD ribbon

Like any ZWCAD palette, the 'Data Grid' palette can be arranged, docked, undocked, grouped, self-collapsed, etc., and resized depending on the preferences and needs of each user or each job, by dragging its title bar, double-clicking on its title bar, etc.

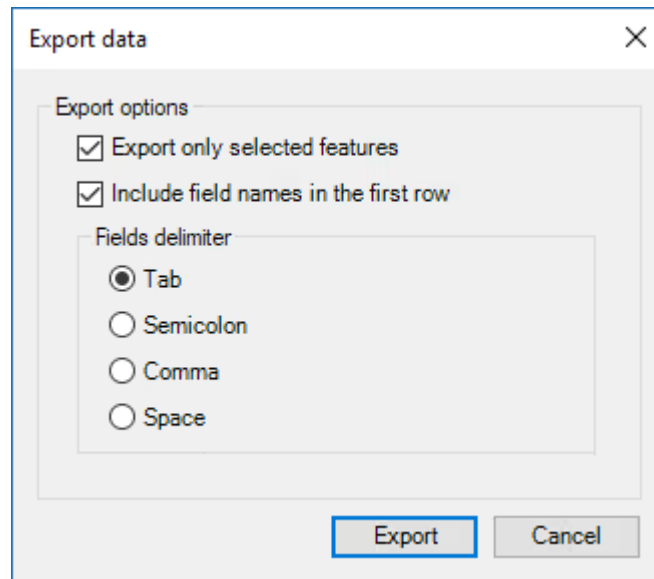


'Data Grid' palette

- To choose the drawing data table that you want to show in the 'Data Grid', you can use the drop-down list of available tables that can be found in the palette upper left area.
 - You can select which table fields you want to display in the 'Data Grid' by right-clicking on any grid area.
 - You can move the field separation lines in the table header to change the width of the corresponding column.
 - A double click on this vertical line (always in the table header) will automatically adjust the corresponding column width to the dimension of the longest value in that field.
 - If the value of a field in a given row cannot be seen completely due to the width of the column, placing the cursor over the corresponding cell will display a tooltip showing the full value in that cell. The same applies to the names of the fields in the table header.
 - To sort the values of a column alphabetically, click on the column name in the table header. A second click will invert the sorting.
 - To move and sort the fields (columns) in the table, you can drag the field name itself in the table header to the left or right.
 - If you hover the cursor in the table header over the name of a field, a tooltip with information about the properties of that field (Name, Type, Length, etc.) will be displayed (except when the incomplete name of a field is displayed as a tooltip — see above).
- The 'Data Grid' is automatically synchronized with the current drawing.
 - You can select entities in the drawing to highlight the corresponding attached rows in the 'Data Grid'.
 - If the "Automatic scroll" option (palette upper right area) is activated, the rows will be automatically scrolled to show the selected entities.
 - You can also select rows in the 'Data Grid' to select the corresponding attached entities in the drawing. You can use the CTRL and SHIFT keys (alone or in combination) when you want to select multiple rows.
 - If the "Automatic zoom" option (palette upper right area) is activated, the drawing view will be adjusted to the selected entities' extent.
 - Use "Zoom to selection" (right-click menu) at any time if you want to do the same thing by hand, or "Zoom to entity" if you only want to zoom to the entity under the cursor in the grid when right-clicking.
 - If the "Automatic centering" option (palette upper right area) is activated, the drawing view will be centered on the selected entities without modifying the zoom level.
 - Use "Center selection" (right-click menu) at any time if you want to do the same thing by hand, or "Center entity" if you only want to center the entity under the cursor in the grid when right-clicking.
 - As long as you are focused on the grid rows, you can use the keyboard (Up, Down, CTRL+Up, etc.) to navigate through the rows, and the SPACE key to select rows (you will see a small "tick" checked on the row header when you select it).
 - Use the selection functions (buttons set on top of the palette / right-click menu) if you want to Select All entities attached to the current table, invert the selected entities (see note below), or

deselect all selected entities.

- Use "Delete" (buttons set on top of the palette / right-click menu) to delete selected entities and their data from the drawing (see note below).
- You can find information about the number of selected entities and the total number of entities, as well as navigation buttons between the rows selected in the table, in the palette lower left area.
- Under some circumstances, synchronization may be lost. To resynchronize drawing and 'Data Grid', use the "Refresh" button next to the tables dropdown (upper left area of the palette).
 - For application performance reasons, sometimes a warning will be displayed to indicate that you need to manually refresh the 'Data Grid'. For example, this may happen when a very large number of entities are deleted in the drawing.
 - Also for performance reasons, the selection of entities may need to use the "Activate table of selected entities" button, located to the right of the previous one, in order to update the table shown in the data grid.
 - If this button is enabled, the table shown in the grid is not attached to any of the selected entities. Pressing it will display the table attached to the selected entity, or to one of the selected entities if there is more than one.
 - When the button is disabled, the table shown in the grid is the table attached to one of the selected entities, or none of the selected entities are attached to any table.
- To edit the value in a cell, simply double-click on the cell. You can also click or press ENTER on the "active" cell to edit its value. To finish the edition, press the ENTER key or the TAB key (edit next field in the same row), or select any other cell or row in the table. To cancel editing, press the ESC key.
 - Pressing CTRL+ENTER will allow you to assign the current value in a cell to all cells in the same column for all selected rows.
 - Pressing SHIFT+ENTER will allow you to assign the current value in a cell to all cells in the same column for all rows.
- You can export to an ASCII file the data in the whole table or in the selected rows only by running "Export" (buttons set on top of the palette / right-click menu).
 - As you will see, you can include the field names in the export process and choose the field delimiter and the extension of the exported file.



'Export data' options

- Alternatively, you can copy the table information to the Windows clipboard by using "Copy" (buttons set on top of the palette / right-click menu) or by pressing CTRL+C.
 - The selected rows and headers (field names) will be copied in a tab-separated format, suitable for pasting into a spreadsheet, ASCII editor, etc.
 - As an exception, if a field is being edited (see above), only the value of this field will be copied to the clipboard.
- From the buttons set on top of the palette, you can also directly access the tables main management and data-related selection commands.
 - Select by query [SPMSELECTBYQUERY](#) .
 - Select by table [SPMSELECTBYTABLE](#) .
 - Define table [SPMDATATABLEDEFINE](#) .
 - Attach [SPMDATATABLEATTACH](#) .
 - Detach [SPMDATATABLEDETACH](#) .
 - Fields Calculator (also in the right-click menu) [SPMDATACALCULATOR](#) .
- Notes:
 - *When you use grid functions that affect selected entities (Invert, Delete, etc.), the selection refers only to those entities linked to the current table. For example, when deleting, the entities selected in the current table will be deleted but not other entities selected in the drawing (if any), which will be deselected before the deletion operation.*
 - *The "Feature_ID" column in the tables is a sequential numeric value that is generated in the data tables when elements are inserted. These values cannot be edited.*
 - *If a table to which entities in the drawing are attached does not appear in the table drop-down list, try to "Restore tables", as these entities may be in the drawing after copying-pasting between drawings, inserting one drawing into another, etc.*

- *If closed, the application will automatically open the 'Data Grid' palette the first time you import any data source that includes a data table (EED/XDATA).*

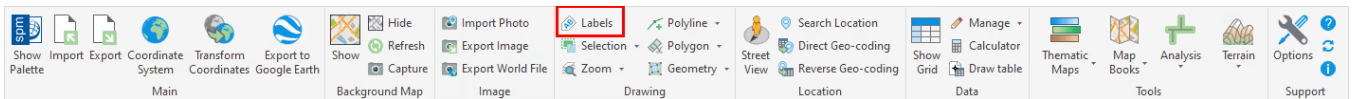
DOCUMENTATION

Label

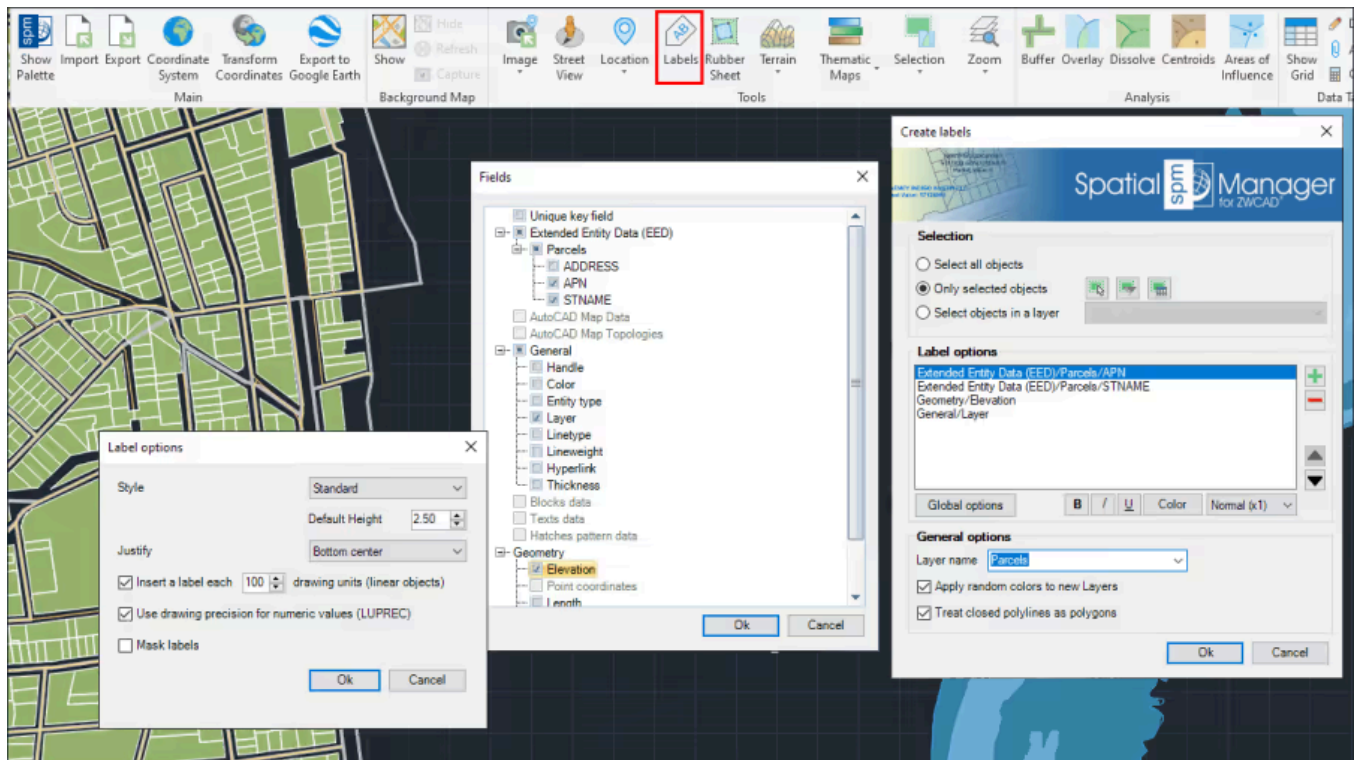
Label data values from tables attached to the objects as Texts in ZWCAD.

Label the entities data in the drawing

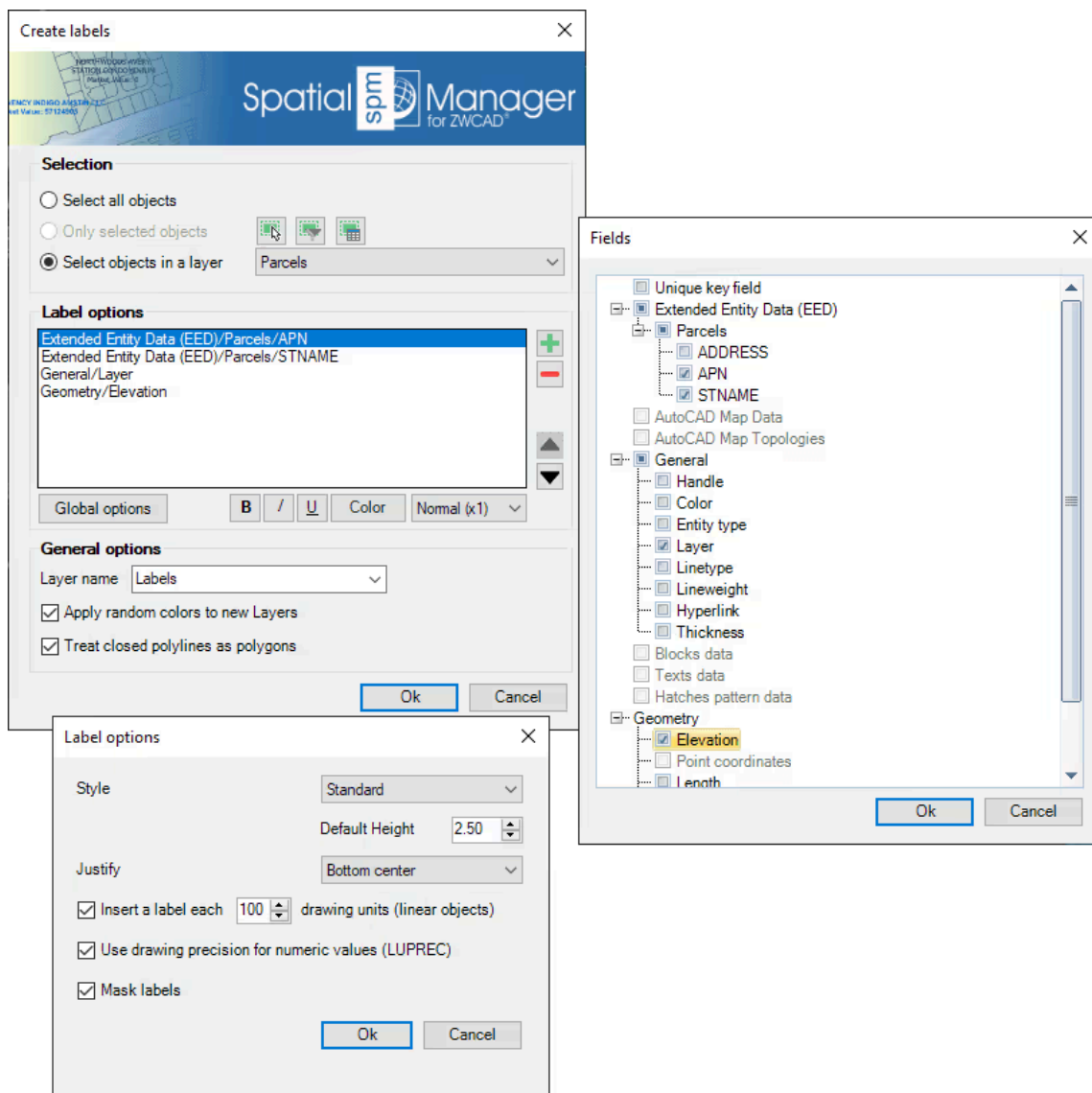
Although some application commands allow automatic labeling of entity data as part of the process (e.g. when [Importing entities](#)), the 'SPMLABEL' command labels data values from tables attached to the entities as texts.



'SPMLABEL' command in the Spatial Manager™ for ZWCAD ribbon



Labeling entities data in the drawing



Label parameters window

• Parameters and options

- *Selection* (review [selection control options](#)).
- *Table and Field*: Lets you select the data to label.
 - *Warning*: Please note that if none of the entities selected for labeling are attached to the chosen Table/Field, no label will be created and the application will display a warning.
- *Layer name*: This setting defines the target layer name for the labels. You can select an existing layer in the drawing or you can write the name to create a new layer.
- *Apply random colors to new layers*.
- *Treat closed polylines as polygons*: When checked (default value), all closed polylines in the drawing will be labeled as polygons (label in the centroid). If not, these polylines will be labeled as linear entities.
 - *Label options*. You can define the style, height, justification, rotation, and rotation units of the label text entities here. Some of these parameters can be taken from fields in the data tables. For linear entities, you can also specify the separation in drawing units between labels to be

repeated along the entity, or if you want a single label for each entity. As added parameters, you can set the option to use or not LUPREC for decimal places "(see Notes below)" and "Mask labels", which will generate masks (Wipeout entities, grouped with the labels), and they will "trim" the entities located behind the labels in order to improve their reading.

■ *Notes:*

- *When labeling, the rotation of the texts will consider the positive angles direction defined according to the value of the System Variable ANGDIR (please, take a look at ANGDIR and UNITS in the ZWCAD Help).*
- *You can choose that the value of the LUPREC variable (length precision) be used or not for the number of decimal places when labeling entities using a numerical field (please, take a look at LUPREC and UNITS in the ZWCAD Help).*
- *Label masks are available for ZWCAD 2020 SP2 Special Package (2020.05.15 - 56123) and upper versions.*

DOCUMENTATION

Selection

Available on editions

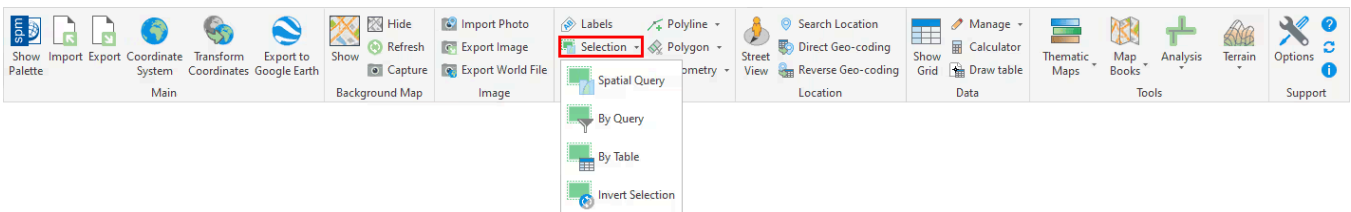
Standard

Professional

Manage the alphanumeric data attached to the objects, design and edit the structure which will be used to store the data in ZWCAD.

Select by data values or geometric relationship

'Spatial Manager™ for ZWCAD' includes several commands for advanced selection tasks.

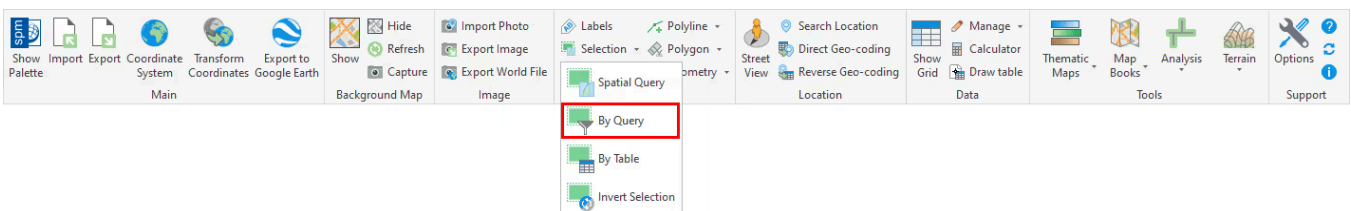


Advanced selection commands in the Spatial Manager™ for ZWCAD ribbon

- [SPMSPATIALQUERY](#) allows you to select entities in the drawing according to the result of advanced simple or compound spatial queries.
- [SPMSELECTBYQUERY](#) allows you to select entities in the drawing according to the result of a simple or compound data query.
- [SPMSELECTBYTABLE](#) allows you to select all the entities that have been previously attached to a specific data table.
- [SPMSELECTINVERSE](#) allows you to invert the selection of entities in the drawing.
- [SPMZOOMTOSELECTION](#) zooms to the current selection extent so you can locate all the selected entities in an optimal size view, and [SPMZOOMTOSELECTIONLAYER](#) zooms to all the entities included in the layers corresponding to the selected entities.

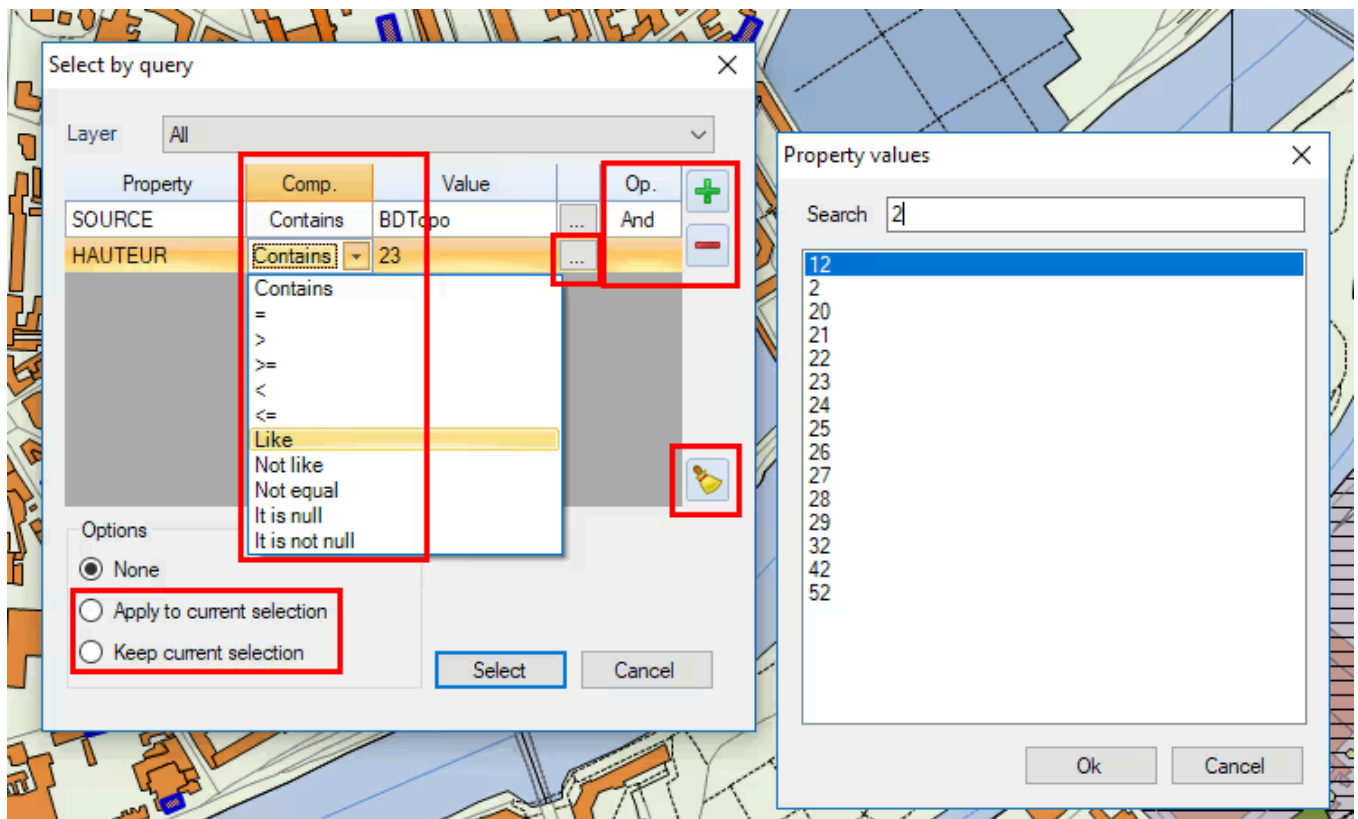
Select entities based on data values

The command **SPMSELECTBYQUERY** in Spatial Manager™ for ZWCAD allows you to select entities in the drawing according to the result of simple or compound data queries.



'SPMSELECTBYQUERY' command in the Spatial Manager™ for ZWCAD ribbon

- The query can be applied to one data table or to all the data tables defined in the drawing.
- Click on the "+" button to add at least one condition and thus create a data query (a condition that stands for "Property & Comparator & Value").
- When you are defining a compound query, you can add as many conditions as you want to the conditions list. Click on the "+" button each time you need to add a condition.
 - You can select the logical operators "And" or "Or" when adding new conditions. "And" will be the default operator.
- In addition, if there is any entity selected when you run the command, you can:
 - Apply the query to the current selection and not to the entire drawing, or,
 - Keep the current selection so the new "query selection" will be added to the current selection.



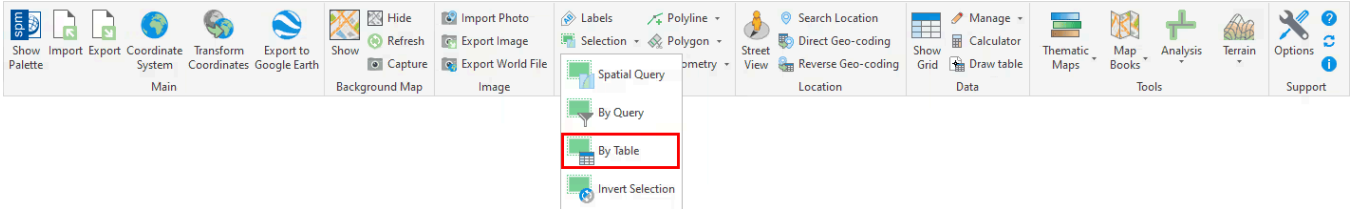
Define selection queries window

- *Notes:*
 - You can choose and search (...) among the available values for a field.
 - The command keeps the list of query conditions used the last time it was executed.
 - If there are no results during a query, the command window is shown again and keeps the list of query conditions.
 - You can use the "-" button every time you need to remove a condition from the conditions list in the query, or you can use the Clean button (the "broom") to remove all query conditions from the list.

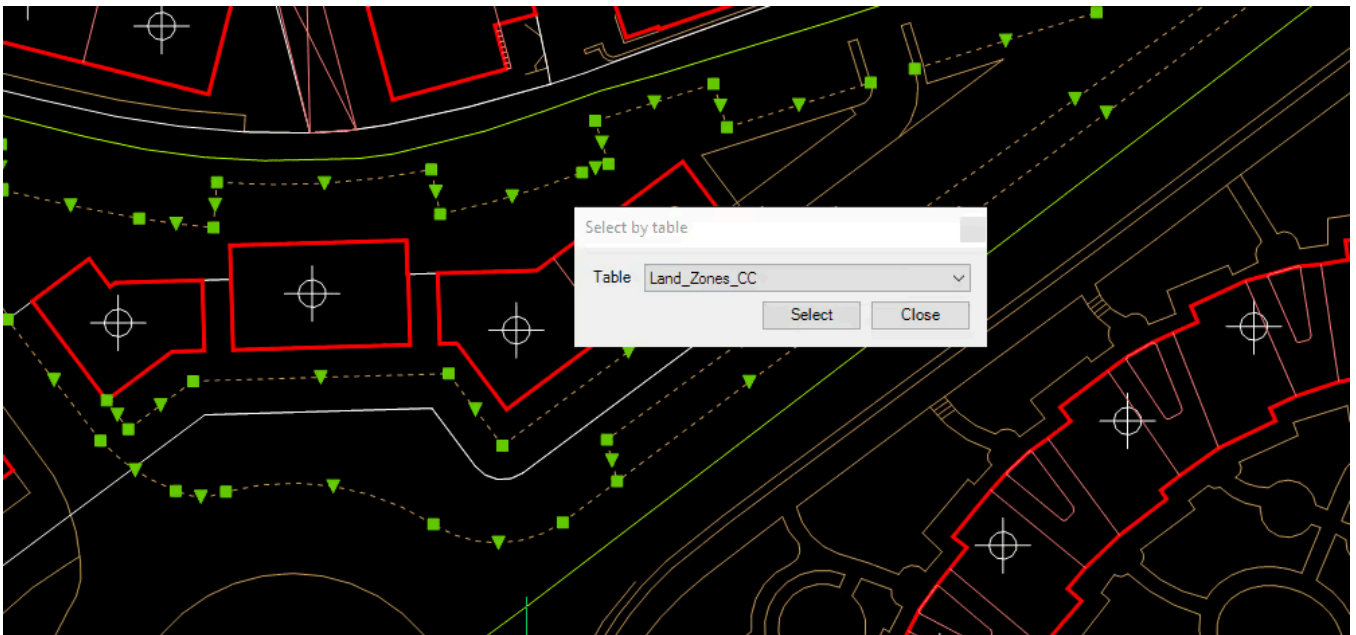
You can use the command **SPMZOOMTOSELECTION** (see below) to quickly zoom to the selection extent.

Select the entities attached to a data table

You can select all the entities that have been previously attached to a specific data table. To do that, execute the command **SPMSELECTBYTABLE** of Spatial Manager™ for ZWCAD. You will find this command in the “Spatial Manager” ZWCAD ribbon.



'SPMSELECTBYTABLE' command in the Spatial Manager™ for ZWCAD ribbon



Select entities by table window

To choose the one you want, click on the data tables drop-down list.

*Note: You can use the command **SPMZOOMTOSELECTION** (see below) to quickly zoom to the selection extent.*

DOCUMENTATION

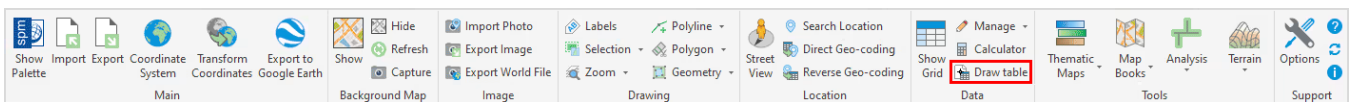
Draw data table

Available on edition

Professional

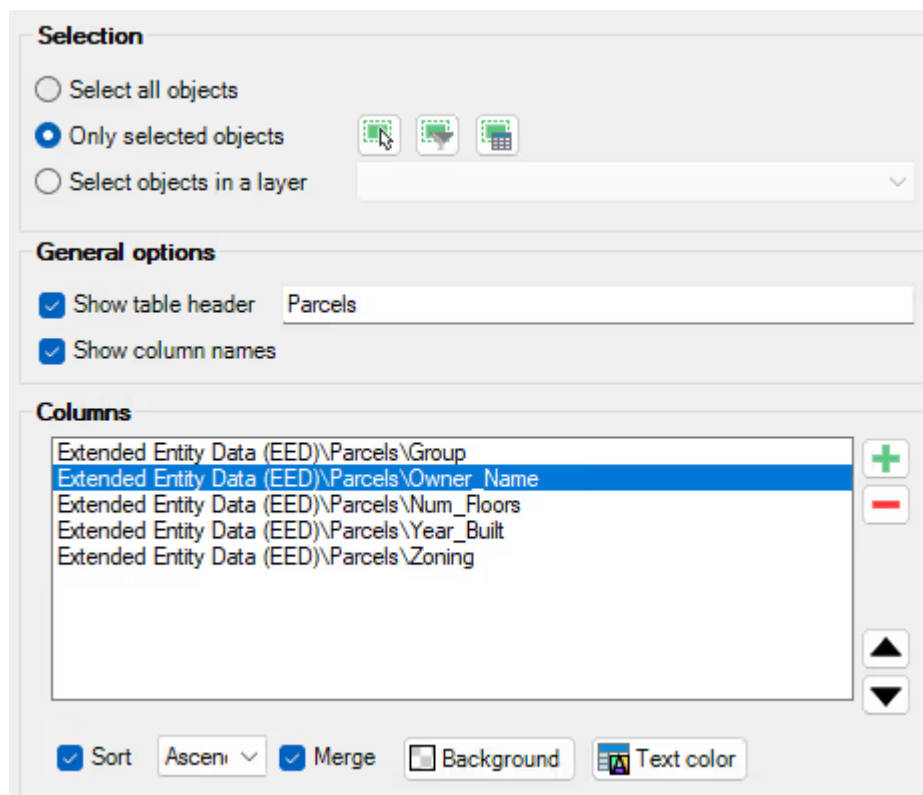
Creates a table object in the ZWCAD drawing from a data table associated with the objects. The fields to be included as table columns can be selected, allowing flexible configuration of the output. The table may also be formatted by applying row colors according to the layers or entities of the corresponding objects..

Use this command to create tables in the drawing from the data tables. The **SPMDATATABLEDRAW** command is available from the ribbon on the Data group:



SPMDATATABLEDRAW command on ribbon

Draw table options



SPMDATATABLEDRAW command options

- **Selection** (review [selection control options](#)).
- **General options:**

- *Show table header*: Includes a row with table name.
- *Show column names*: Shows the field names as column headers.
- **Columns**: This setting defines the target layer name for the labels. You can select an existing layer in the drawing or you can write the name to create a new layer.
 - Add or remove fields with + and - buttons, and sort them up and down (columns will move left to right). Also columns from entities properties can be added, like layer or type, and geometric properties like area, length or elevation.
 - For each field you can set:
 - *Sort*: the rows will be sorted ascending or descending by the field values.
 - *Merge*: if contiguous rows have the same value for this field, the cells will be merged.
 - *Background*: transparent, by layer, by entities color or use a custom value.
 - *Text color*: default text color, by layer, by entities color or use a custom value.

STNAME	RSUBD	CITYST	RBLOCK
WHITE FOX	06	BISM ARCK ND	4
WHITE FOX	06	BISM ARCK ND	4
WHITE FOX	06	BISM ARCK ND	4
WHITE FOX	06	BISM ARCK ND	4
TRAPPERS	06	BISM ARCK ND	4
TRAPPERS	06	BISM ARCK ND	4
TRAPPERS	06	BISM ARCK ND	4
TRAPPERS	06	BISM ARCK ND	4
SUNNY	37	BISM ARCK ND	1
SUNNY	37	BISM ARCK ND	1
SAPPHIRE	25	BISM ARCK ND	3

Sample of inserted table

Draw table from data grid

- Open data grid running `SPMDATATABLEGRID` command.
- Sort and/or select entities, they will be used to create the table. If any is selected, the full table will be inserted.
- Click on the draw table icon on the grid header.
- By default the visible fields are selected, you can remove the unwanted fields.
- Change additional options like grouping and colors.

Data table Parcels

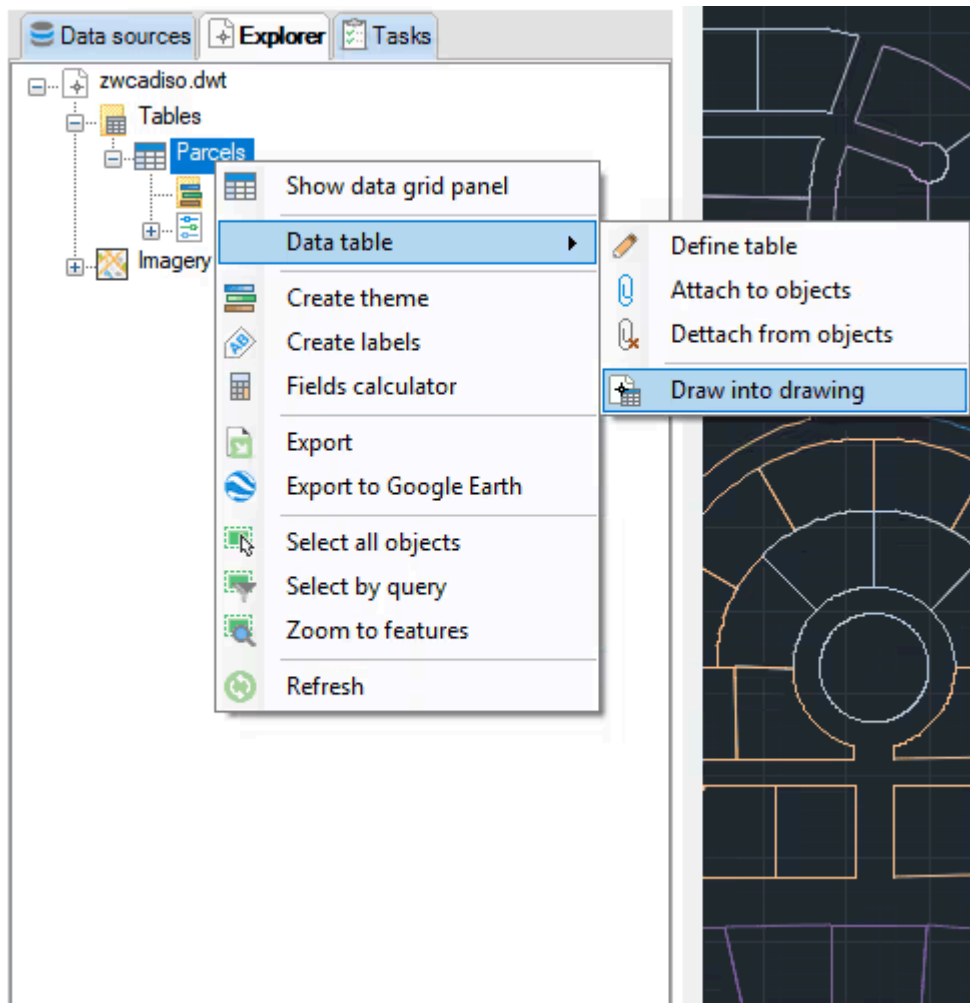
Group	Property_A	Land_Prope	Year Built	Main Floor	Zoning	Num_Floors
807	732 E CALGARY...	RESIDENTIAL		1344	RESIDENTIAL DUPLEX	0
807	703 E CALGARY...	RESIDENTIAL	2003	1452	RESIDENTIAL DUPLEX	0
807	733 E CALGARY...	RESIDENTIAL	1999	1215	RESIDENTIAL DUPLEX	0
804	3560 VIEWPOIN...	COMMERCIAL	0	0	RES MUTI FAMILY 15 UNITS	0
804	3516 VIEWPOIN...	RESIDENTIAL	2001	1340	RES MUTI FAMILY 15 UNITS	0
804	3502 STONERID...	RESIDENTIAL	2000	1410	RES MUTI FAMILY 15 UNITS	0
804	3518 VIEWPOIN...	RESIDENTIAL	2001	1430	RES MUTI FAMILY 15 UNITS	0
804	3504 STONERID...	RESIDENTIAL	2000	1410	RES MUTI FAMILY 15 UNITS	0
804	3524 VIEWPOIN	RESIDENTIAL	2003	1620	RES MUTI FAMILY 15 UNITS	0

3 selected object(s) of 22350

SPMDATATABLEDRAW available from the data grid

Draw table from main palette

This tool is also available from the [Explorer](#) in the main palette. When it is executed from the main palette, the full data table will be inserted.



Draw data table from context menu on main palette

Review this video to see the full process:

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

LISP Programming

Available on edition

Professional

Integrate with your own LISP functions using the API (Application Programming Interface) creating custom data-related operations.

Data management

- **Get the names of the fields of a table:** `(spm_fdtablename "TableName")`.
 - `TableName` : Name of an existing table.
 - *Sample:* `(spm_fdtablename "Census")`.
- **Get the names of the table(s) linked to the selected entities:** `(spm_fdgettables)`.
- **Attach a data table to the selected entities:** `(spm_fdattachtable "TableName")`.
 - `TableName` : Name of an existing table.
 - *Sample:* `(spm_fdattachtable "Census")`.
- **Set the value of a data field for the selected entities:** `(spm_fdsetfieldvalue "TableName" "FieldName" "Value")`.
 - `TableName` : Name of an existing table.
 - `FieldName` : Name of an existing field in the above table.
 - `Value` : Value for the above field.
 - *Sample:* `(spm_fdsetfieldvalue "Census" "TRACK" "99")`.
- **Get the value of a data field for the selected entity:** `(spm_fdgetfieldvalue "TableName" "FieldName")`.
 - `TableName` : Name of an existing table.
 - `FieldName` : Name of an existing field in the above table.
 - *Sample:* `(spm_fdgetfieldvalue "Census" "TRACK")`.

DOCUMENTATION

Coordinate Management

Calculate coordinate transformations of the objects in the import and export processes in ZWCAD.

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DOCUMENTATION

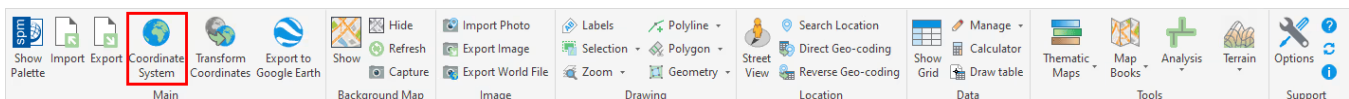
Reference drawing

This section explains how to reference a drawing and assign its location by setting a Coordinate Reference System (CRS). A valid CRS is required for Spatial Manager functions, and it can be assigned, modified, or undefined using the **SPMSETCRS** command.

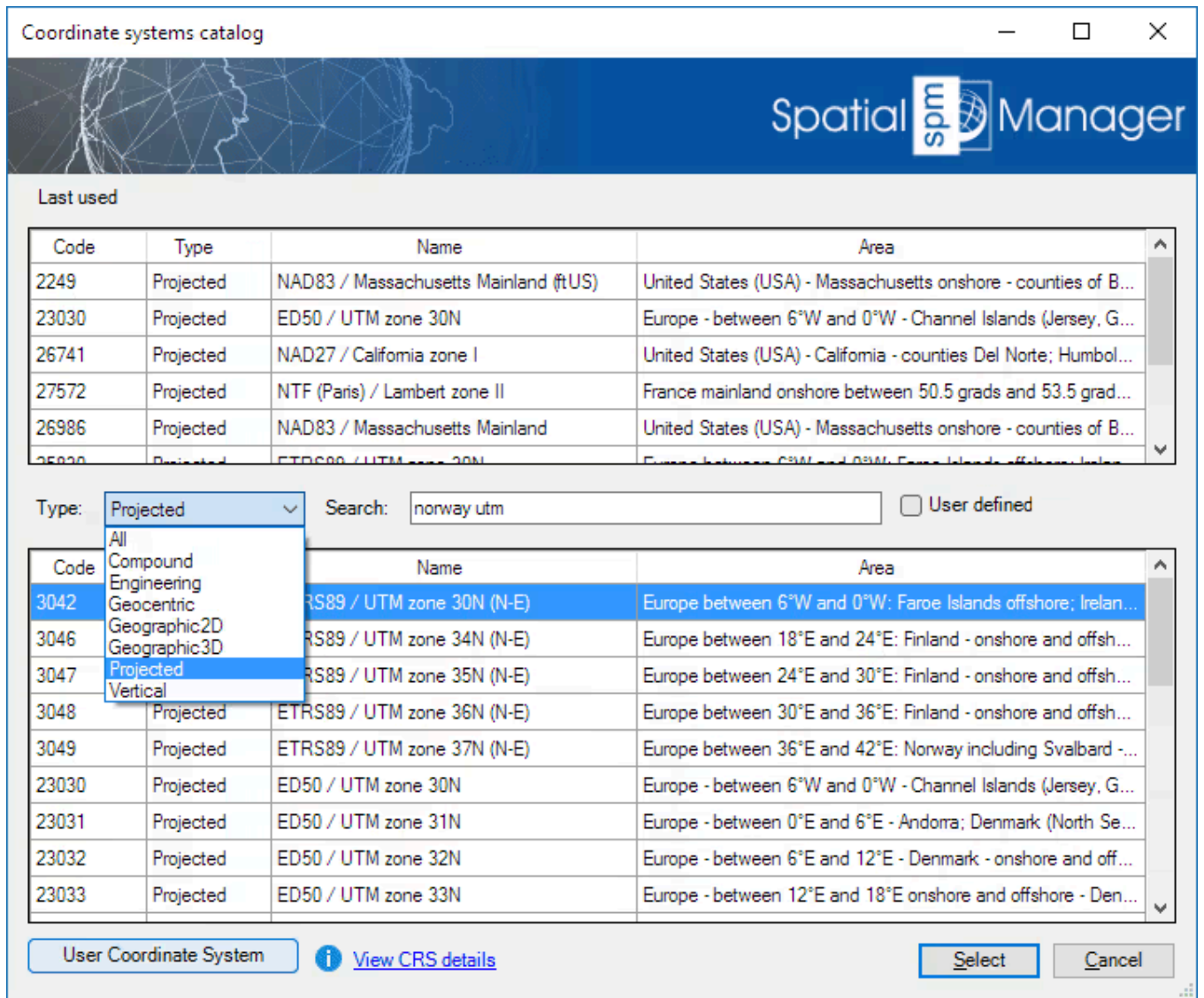
Reference the drawing and set location

If the drawing is not empty when some commands are executed, it is necessary that the drawing has been assigned a Coordinate Reference System (CRS), which is required for several functions in Spatial Manager to work correctly. If this is not the case, you can assign a CRS to the drawing (and modify it) using the command **SPMSETCRS** of Spatial Manager™ for ZWCAD. By executing this command, you will access the CRS catalog of the application where you can:

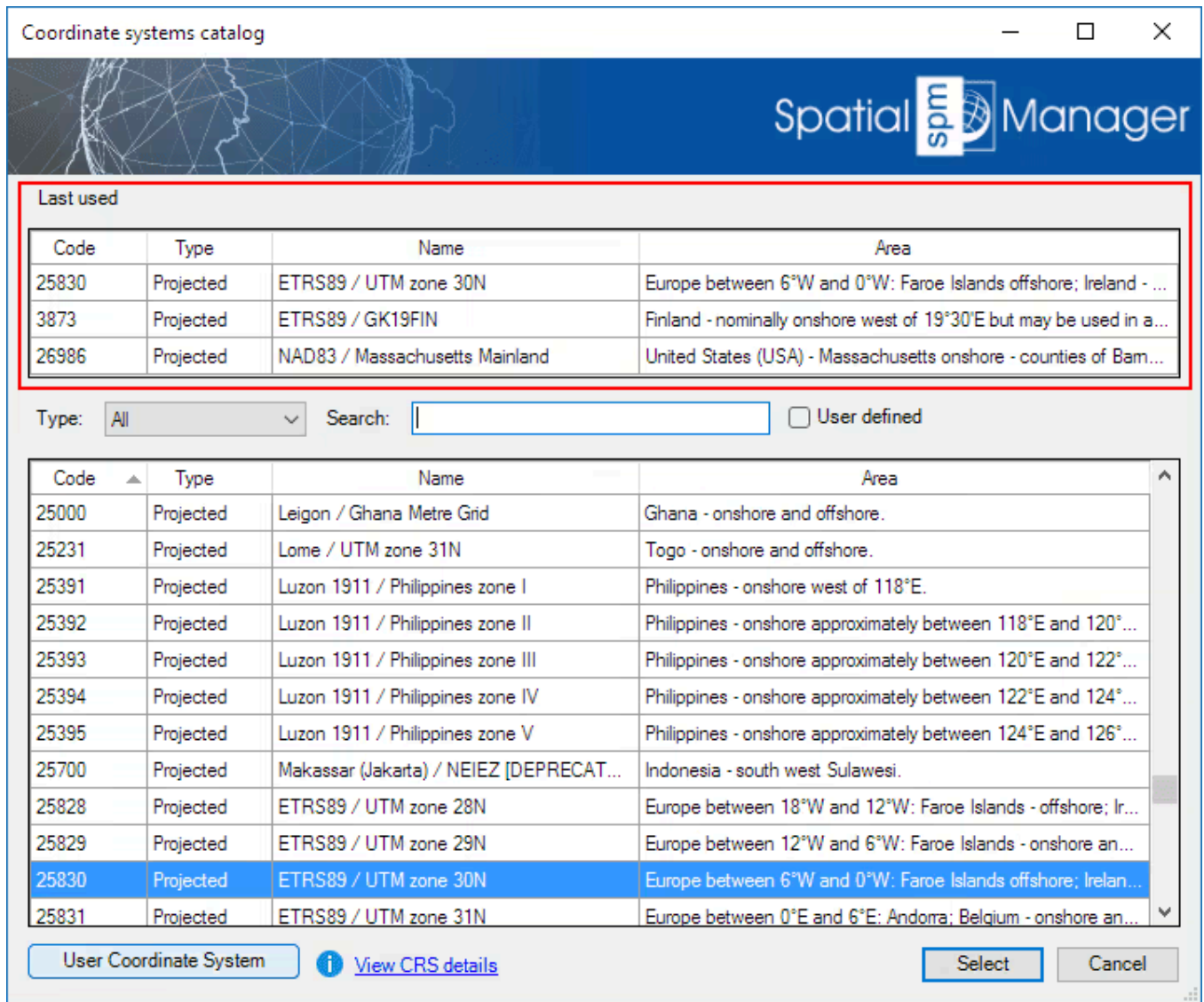
- Filter the CRSs by type (Geocentric, Projected, etc.). The type "Projected" will be selected by default because it is the most common choice.
- Choose a CRS by clicking on its row in the table.
- Search CRSs by typing the search criteria in the "Search" box. You can type here as many words as you like separated by blanks. The application will find all the rows including all these words in any column of the table.
- Unassign (undefine) the Coordinate System of the drawing by choosing "Undefined CRS" (EPSG 0).
- *Notes:*
 - [Coordinate Systems and Transformation details](#) .
 - [Coordinate Systems entities available in the current version](#) .



'SPMSETCRS' command in the Spatial Manager™ for ZWCAD ribbon



CRS catalog of the application



Last used CRSs in the Catalog window'

Note: Read more about *Coordinate Systems*, *Coordinate Systems Transformation* and how to define and select *User Coordinate Systems* in the *Import* or *Export* articles.

DOCUMENTATION

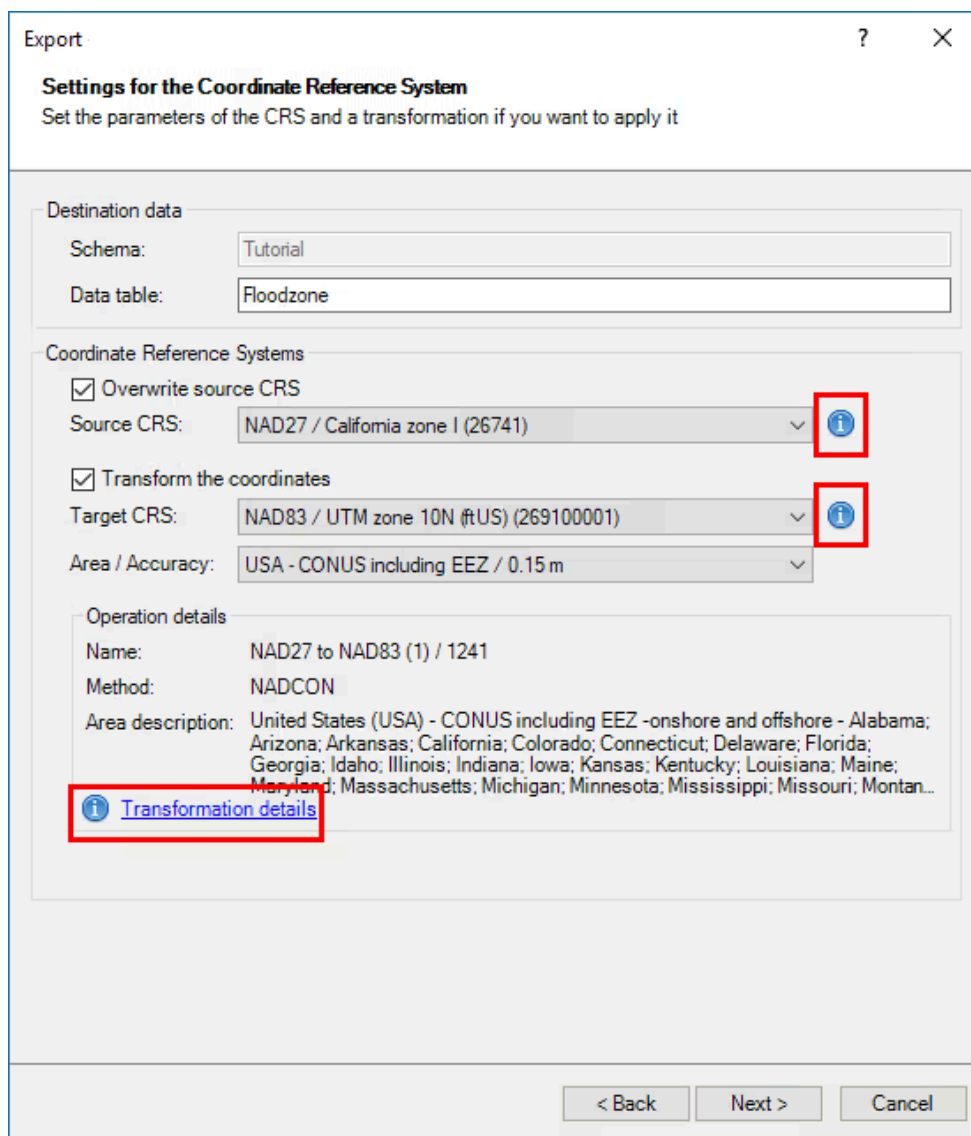
Details

Unified CRS catalog for assigning and transforming coordinates.

Coordinate Systems and Transformation details

As you will see in several 'Spatial Manager™ for ZWCAD' windows, there are some links or buttons to access detailed information about a selected Coordinate System or Transformation process.

Sample links and buttons to access detailed information (Export Wizard)



Sample links and buttons to access detailed information

Extended CRS information

- Datum.

- Prime Meridian.
- Ellipsoid.
- Type.
- Scope.
- Projections and parameters.
- Etc.

Coordinate Reference System
✕

Name and Code	NAD27 / California zone I	26741	Type	Projected
Area	USA - California - SPCS - 1. United States (USA) - California - counties Del Norte; Humboldt; Lassen; Modoc; Plumas; Shasta; Siskiyou; Tehama; Trinity.		Coordinate System	Cartesian 2D CS. Axes: easting, northing (X,Y). Orientat
Datum	North American Datum 1927	6267	Scope	Large and medium scale topographic mapping and engineering survey.
Datum origin	Fundamental point: Meade's Ranch. Latitude: 39°13'26.686"N, longitude: 98°32'30.506"W (of Greenwich).		Remarks	
Prime Meridian	Greenwich	8901	Inf. Source	
Ellipsoid	Clarke 1866	7008	Data Source	OGP
Semi-major axis	6378206.4 Metre	Inv flattening	294.97869	Revision Date
				02/06/1995

Projection and parameters

Base CRS	NAD27	Geographic2D	4267	
Conversion/Projection	California CS27 zone I		10401	
Coordinate Operation Method	LCC_2SP		9802	

Transformation parameter	Value	Unit	Sign Rev
Latitude of false origin	39.2	SexagesimalDms	False
Longitude of false origin	-122	SexagesimalDms	False
Latitude of 1st standard parallel	41.4	SexagesimalDms	False
Latitude of 2nd standard parallel	40	SexagesimalDms	False
Easting at false origin	2000000	USsurveyFoot	False
Northing at false origin	0	USsurveyFoot	False

< Previous Next > Close

CRS detail window

Extended Transformation information:

- Accuracy.
- Method.
- Scope.
- Parameters.
- Etc.

Transformation Detail ✕

Name and Code	NAD27 to NAD83 (1)	1241	Scope	Accuracy at 67% confidence level is 0.15m onshore, 5m nearshore and undetermined farther offshore.
Source CRS	NAD27	4267		
Target CRS	NAD83	4269	Remarks	Uses NADCON method which expects longitudes positive west; EPSG GeogCRS NAD27 (code 4267) and NAD83 (code 4269) have longitudes
Area	USA - CONUS including EEZ. United States (USA) - CONUS including EEZ -onshore and offshore - Alabama; Arizona; Arkansas; California; Colorado; Connecticut; Delaware; Florida; Georgia; Idaho;		Inf. Source	US Coast & Geodetic Survey www.ngs.noaa.gov
Accuracy (m)	0.15000000		Data Source	OGP
Method	NADCON		Revision Date	27/04/2004

Parameters

Transformation parameter	Value	Unit	Sign Rev
Latitude difference file	conus.las		
Longitude difference file	conus.los		

Close

Transformation detail window

DOCUMENTATION

Transform drawing

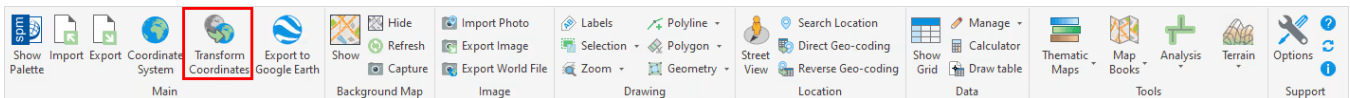
Available on edition

Professional

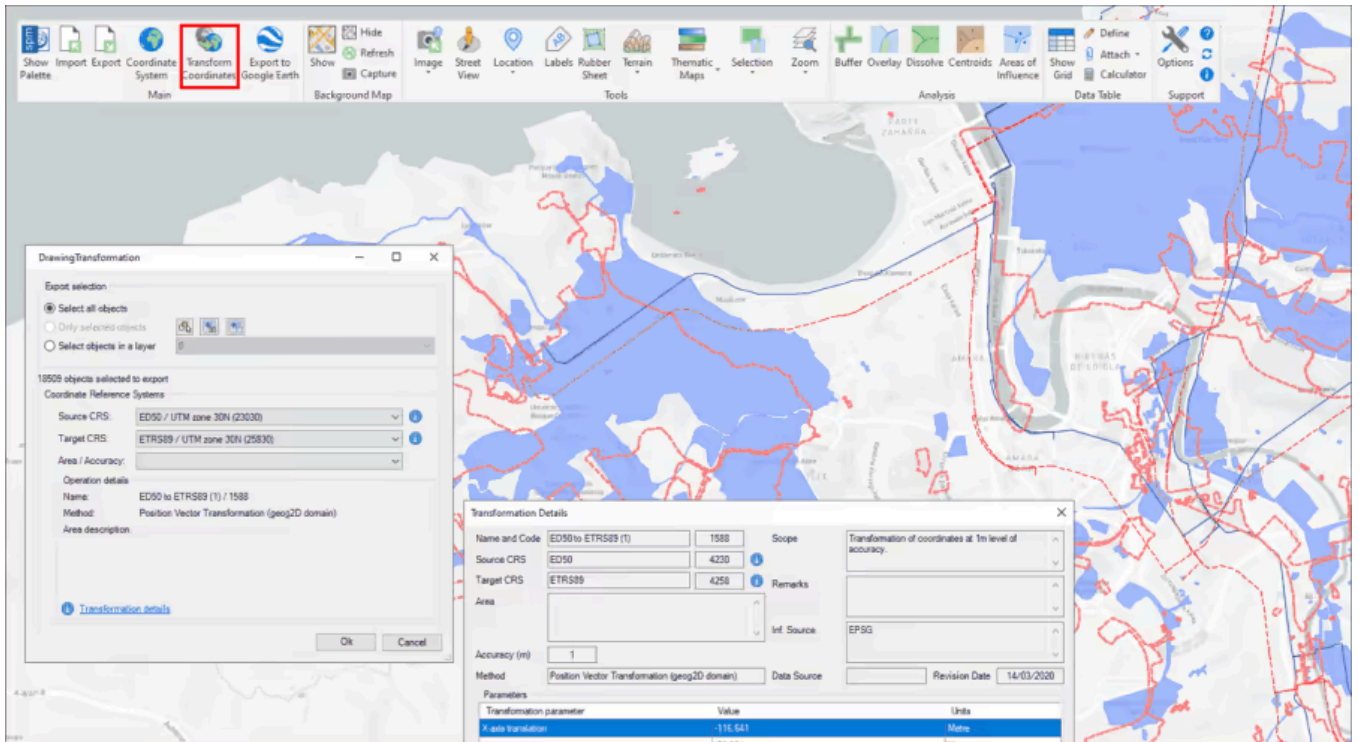
Transform the Coordinate System (CRS) of a whole drawing or a set of selected objects, which automatically creates a new drawing including geometrically regenerated objects from the current drawing according to the chosen transformation between two CRSs.

Transform the entities geometry by defining a Transformation of the drawing Coordinate System

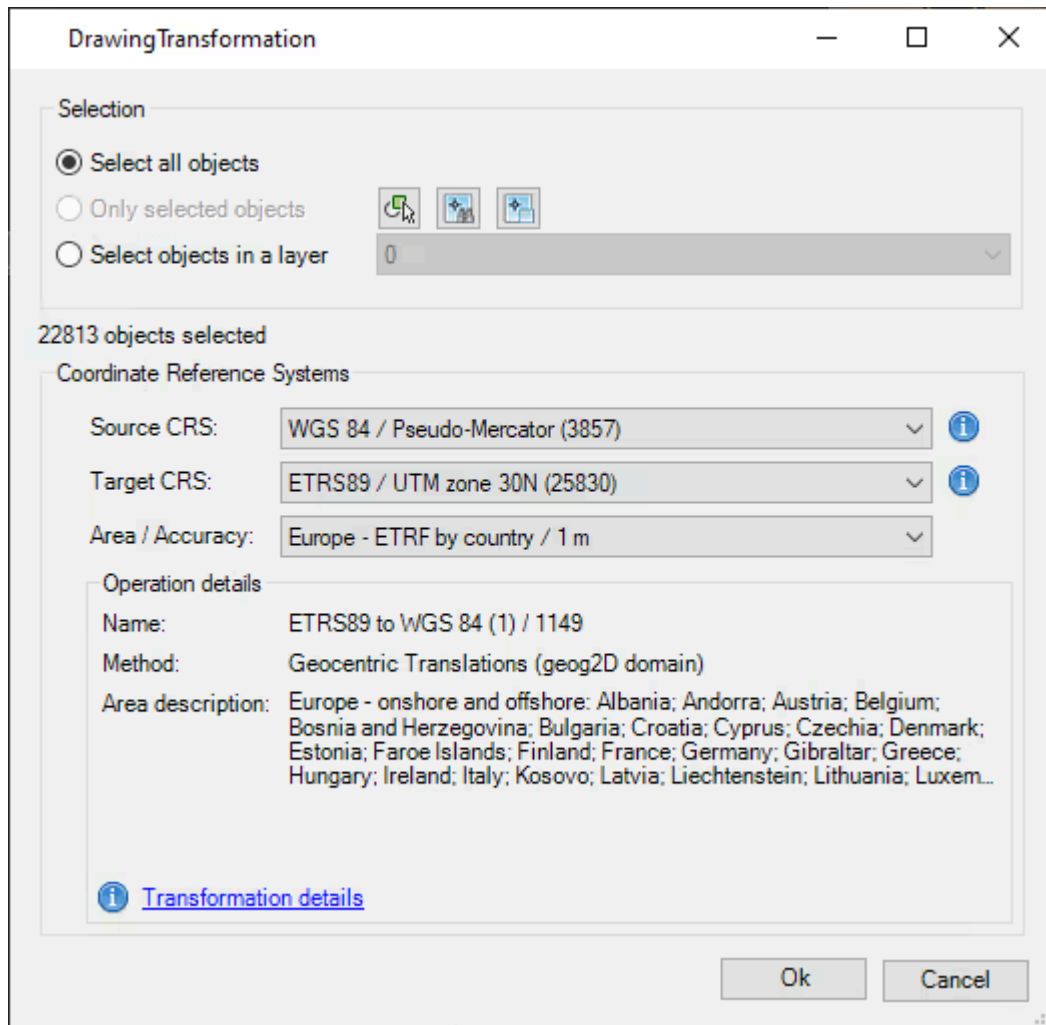
You can transform the Coordinate System (CRS) of a whole drawing or a set of selected entities by executing the 'SPMTRANSFORMCRS' command of Spatial Manager™ for ZWCAD, which automatically creates a new drawing including geometrically regenerated entities from the current drawing according to the chosen transformation between two CRSs. At the end of the transformation process, the newly generated drawing will also be automatically opened. This functionality has been designed to execute this transformation in a direct and highly automated way, regardless of whether other application functions can perform geometric transformation operations between Coordinate Systems of entities or Background Map images, if these are necessary in [Import](#) , [Export](#) , [Background Maps](#) , etc. processes.



'SPMTRANSFORMCRS' command in the Spatial Manager™ for ZWCAD ribbon



Transform drawing Coordinate System functionality (Original and transformed drawings overlapped in order to show the transformation)



Transform parameters window

- **Transformation selection** (review [selection control options](#)).
 - *Note: When choosing the option to transform all entities in the drawing, those entities that are in locked, off or frozen layers will also be included. If the entities are selected by any means before transforming and the option to transform the selected entities is chosen, they will be transformed even if they are in locked, off or frozen layers.*
- **Entities report.**
 - The application shows here the total number of the entities which will be transformed and any warnings prior to the transformation process, such as the total number of unsupported entities which will not be transformed or others.
- **Coordinate Reference Systems.**
 - **Source CRS** and **Target CRS** used in the transformation process. Read more about selecting CRSs in the [next article](#) .
 - If the drawing to be transformed already has a CRS assigned to it (by using SPMSETCRS or by any other automatic assignment method), this CRS will be selected by default, although you can select any other if for any reason this parameter is not appropriate.
 - Click on the [Information button](#) next to any of the drop-down lists in order to get more information about the selected CRS.

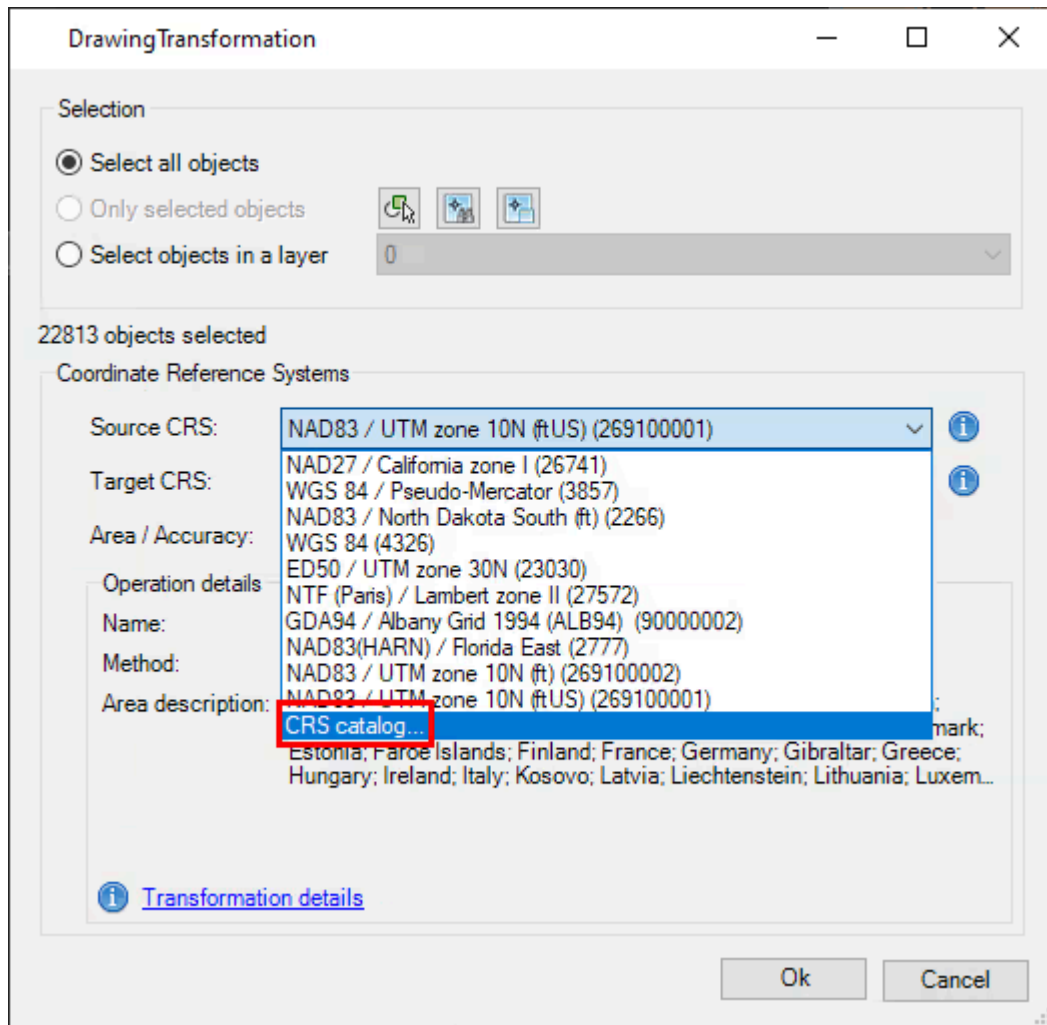
- **Area / Accuracy:** after selecting a pair of valid CRSs for the transformation, you need to choose the geographic Area to apply it to (the application will choose by default the most common Area for this transformation).
- **Operation details:** summary of the transformation operation to be processed. Click on [Transformation details](#) at the window bottom in order to get detailed information on this process.

Note: If a [Background Map](#) is shown in the source drawing, it will be hidden when the transformation process starts.

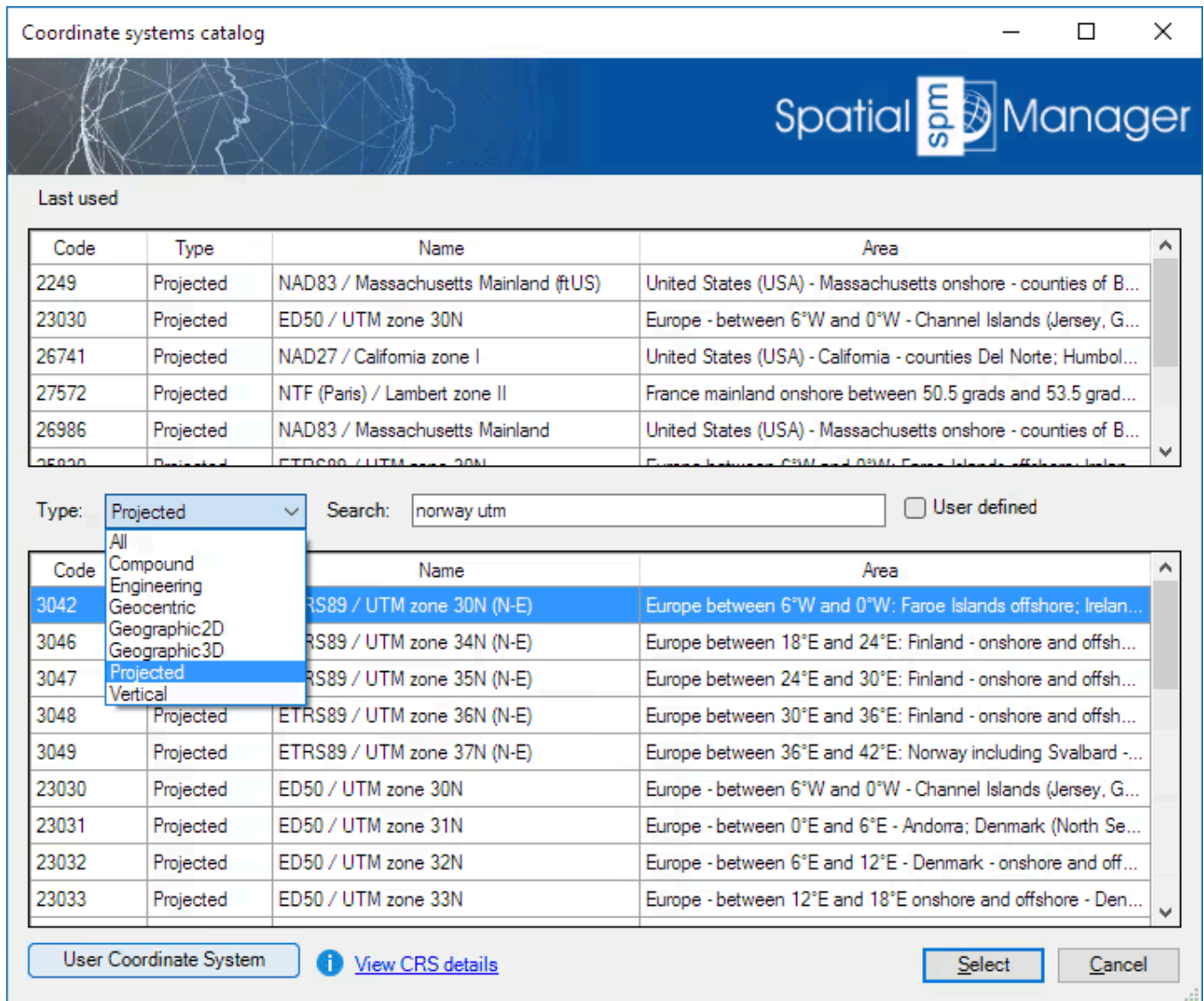
Select the Source and Target Coordinate Systems for a Transformation

You can choose the appropriate CRSs by clicking on "CRS catalog..." in the CRS dropdown list for the source or for the target data. In the CRS Catalog table you can:

- Filter the CRSs by type (Geocentric, Projected, etc.).
- Choose a CRS by clicking on its row in the table.
- Search CRSs by typing the search criteria in the "Search" box. You can type here as many words as you like separated by blanks. The application will find all the rows including all these words in any column of the table.
 - As you will see, the CRS dropdown lists will include more and more CRSs as they have been previously chosen in other Transformation operations, so you can choose your "last-used" CRSs directly from the dropdown list without having to access the CRS Catalog all the time. In addition, the CRS Catalog window also includes a list of the "last-used" CRSs (if any) in the upper zone.
 - [Coordinate Systems entities available in the current version](#) .



Select CRS drop-down



CRS Catalog of the application

- *Notes about transformation Grid files:*
 - *Some coordinate transformations (NTv2, etc.) require one or more Grid files in order to be processed. Some of the most commonly used Grid files worldwide are included in the application, but you can see that some others instruct you on where to download Grid file(s) not included with the application (usually a download URL).*
 - *On the other hand, even if the required Grid file(s) already exists (included as standard in the application, or previously downloaded by the user), the application allows the user to choose alternative Grid file(s) so that he can use more accurate or updated Grid transformations when more appropriate files are available. This custom choice for a Grid file is kept by default for a work session, but will not be memorized when exiting and re-entering the application.*

Coordinate Reference Systems

Source CRS: DHDN / 3-degree Gauss-Kruger zone 4 (E-N) (5678) ⓘ

Target CRS: ETRS89 / UTM zone 32N (25832) ⓘ

Area / Accuracy: Germany - onshore / 0.9 m

Operation details

Name: DHDN to ETRS89 (8) / 15948

Method: NTv2 (BETA2007.gsb)
[Select custom grid file](#)

Area description: Germany - onshore - states of Baden-Wurtemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein, Thuringen.

ⓘ [Transformation details](#)

Selecting alternative Grid files

Note: Read more about Coordinate Systems, Coordinate Systems Transformation and how to define and select User Coordinate Systems in the [Import](#) or [Export](#) articles.

DOCUMENTATION

Custom

This function allows you to define your own Coordinate Systems to suit your specific needs..

User Coordinate Systems

You can create new User Coordinate Systems based on any existing one. To do so, in the CRS Catalog select an existing base Coordinate System and click on the "User Coordinate System" button in order to modify the parameters of the chosen System according to your convenience. [Review the available Coordinate Systems and Transformation details and parameters](#) .

The screenshot shows the 'User Coordinate System' dialog box with the following configuration:

- Name: [USER] St. Lucia 1955 / British West Indies Grid - Zone AB
- Remarks: Projects parcels AB-2343
- Type: Projected
- Area: St Lucia - onshore.
- Base CRS: St. Lucia 1955
- Datum: St. Lucia 1955
- Coordinate system: Cartesian 2D CS. Axes: easting, northing (E,N). Orientations: east, north. UoM: m.
- Projection: British West Indies Grid

Transformation parameter	Value	Units
Latitude of natural origin	0	Degree
Longitude of natural origin	-62	Degree
Scale factor at natural origin	0.9995	Unity
False easting	400000	Metre
False northing	0	Metre

User Coordinate System setup'

Once a User Coordinate System is defined, it will be stored in the application configuration, and you will be able to select it in any drawing in the CRS Catalog by checking the "User defined" box, which will display a list of all the User Coordinate Systems you have defined.

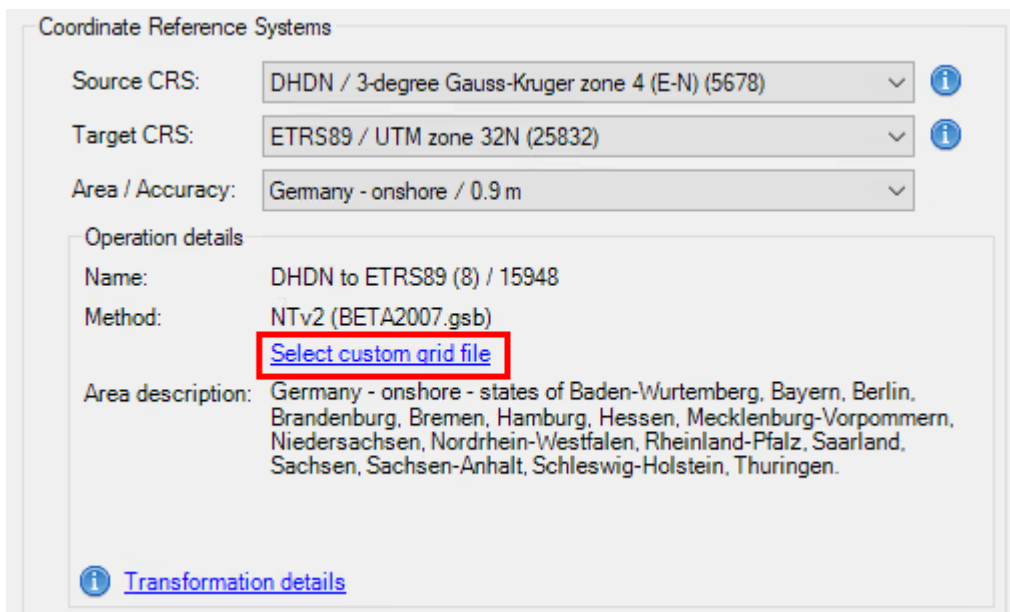
DOCUMENTATION

Grid files

The application allows loading custom grid files for NTV2 coordinate transformations..

Transformation using Grid files

- Some coordinate transformations (NTv2, etc.) require one or more Grid files in order to be processed. Some of the most commonly used Grid files worldwide are included in the application, but you can see that some others instruct you on where to download Grid file(s) not included with the application (usually a download URL).
- On the other hand, even if the required Grid file(s) already exist (included as standard in the application, or previously downloaded by the user), the application allows the user to choose alternative Grid file(s) so that he can use more accurate or updated Grid transformations when more appropriate files are available. This custom choice for a Grid file is kept by default for a work session, but will not be memorized when exiting and re-entering the application.



Selecting alternative Grid files'

DOCUMENTATION

LISP Programming

Calculate coordinate transformations of the objects in the import and export processes in ZWCAD.

Coordinate Systems (CRS)

Available on edition **Professional**

Transform the coordinates of a point: `(spm_cstransformpoint '(x y z) SourceCRS# TargetCRS# [Transformation#])`.

- `'(xyz)` : Point source coordinates.
- `SourceCRS#` : Source CRS code.
- `TargetCRS#` : Target CRS code.
- `Transformation#` : Transformation code (Optional).
- *Sample:* `(spm_cstransformpoint '(-2.5548 43.2148 0) 4326 23030 1133)`

Get the current drawing CRS Code: `(spm_csgetdrawingcrscode)`.

Get the current drawing CRS Name: `(spm_csgetdrawingcrsname)`.

Assign a CRS to the drawing: `(spm_cssetdrawingcrs CRS#)`.

- `CRS#` : CRS Code.
- *Sample:* `(spm_cssetdrawingcrs 23030)`

DOCUMENTATION

Drawing Tools

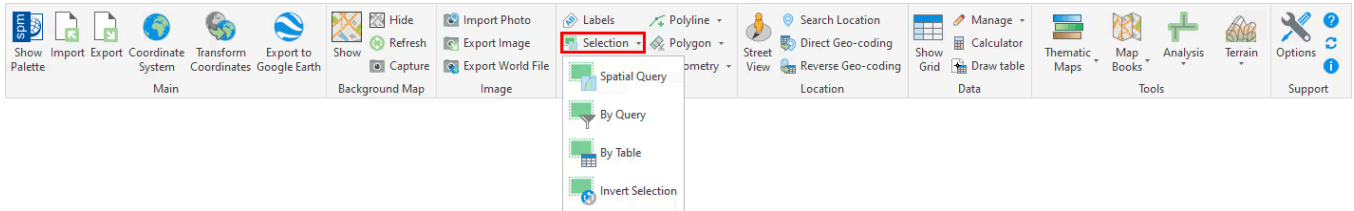
Drawing tools for ZWCAD make your life easier by allowing you to perform actions directly on the drawing.

Selection tools	168
Zoom tools	170

DOCUMENTATION

Selection tools

Spatial Manager™ for ZWCAD includes several commands for advanced selection tasks.

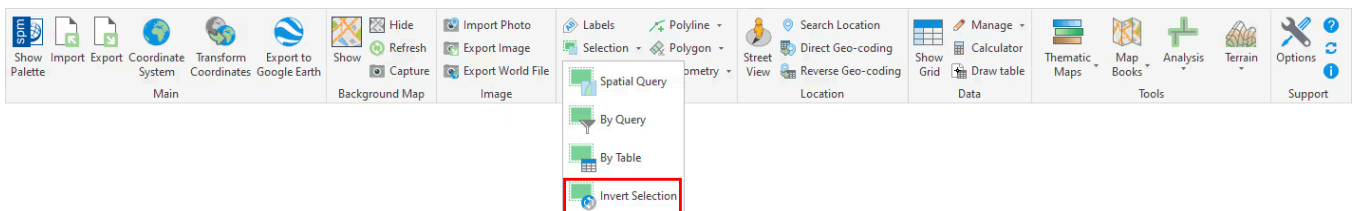


Advanced selection commands in the Spatial Manager™ for ZWCAD ribbon

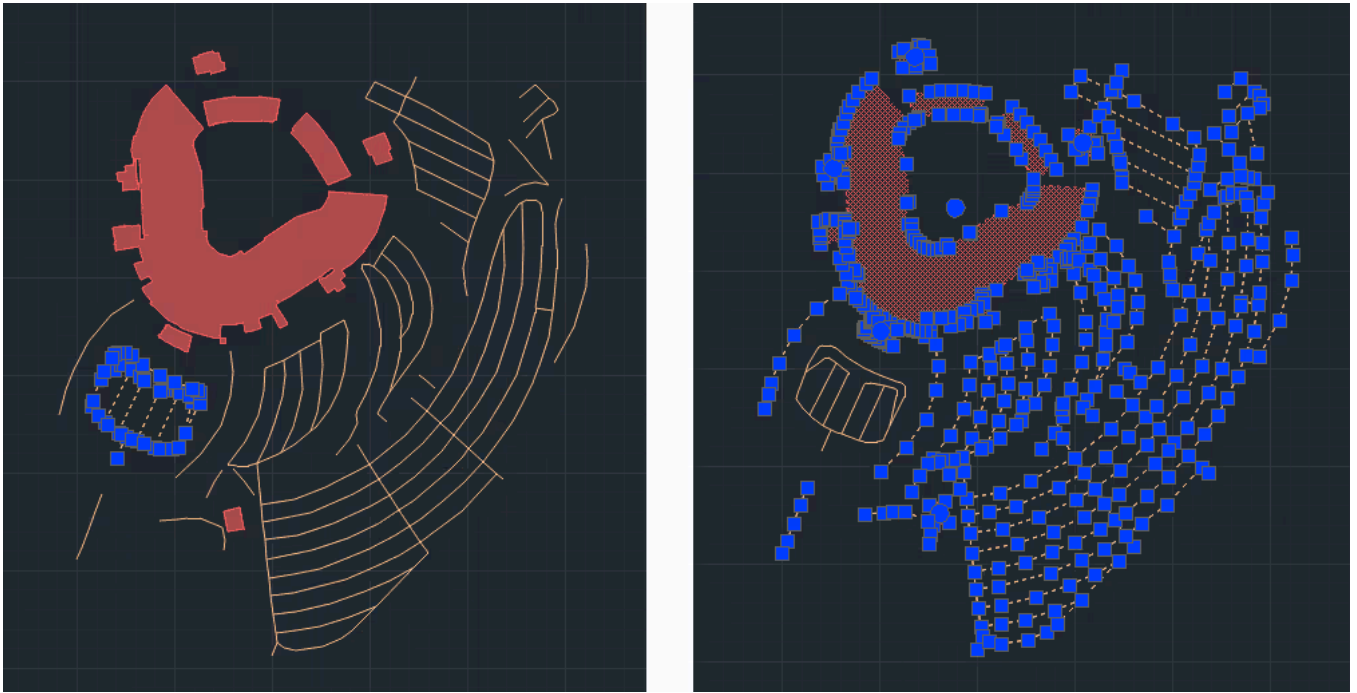
- [SPMSPATIALQUERY](#) allows you to select entities in the drawing according to the result of advanced simple or compound spatial queries.
- [SPMSELECTBYQUERY](#) allows you to select entities in the drawing according to the result of a simple or compound data query.
- [SPMSELECTBYTABLE](#) allows you to select all the entities that have been previously attached to a specific data table.
- [SPMSELECTINVERSE](#) allows you to invert the selection of entities in the drawing.
- [SPMZOOMTOSELECTION](#) zooms to the current selection extent so you can locate all the selected entities in an optimal size view, and [SPMZOOMTOSELECTIONLAYER](#) zooms to all the entities included in the layers corresponding to the selected entities.

Invert the selected entities

The Spatial Manager™ for ZWCAD **SPMSELECTINVERSE** command allows you to invert the selection of entities so that the selected entities are deselected and all other entities on active layers of the drawing are selected.



'SPMSELECTINVERSE' command in the Spatial Manager™ for ZWCAD ribbon



Invert the current selection

Notes:

- *Entities data:* You can learn more about tables and attached data in the [Data Structure Management](#) chapter.
- *Selection performance:* The selection of entities in ZWCAD may be slightly slower when the 'SpatialManager' palette is open, depending on the data of the entities.
- *Complex and mixed selections:* In addition to the use of the commands below, or in combination with them, you can make use of selecting entities in the [Data Grid](#) or by using any other selection method available in ZWCAD (Quick Select, etc.). Also note that, as most of the advanced application or ZWCAD selection commands allow you to apply the selection to the current selection, the number of possible combinations to select what you are interested in is almost unlimited.

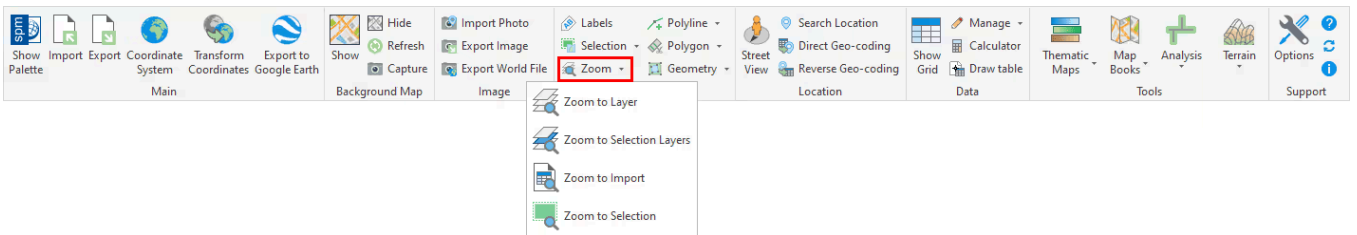
DOCUMENTATION

Zoom tools

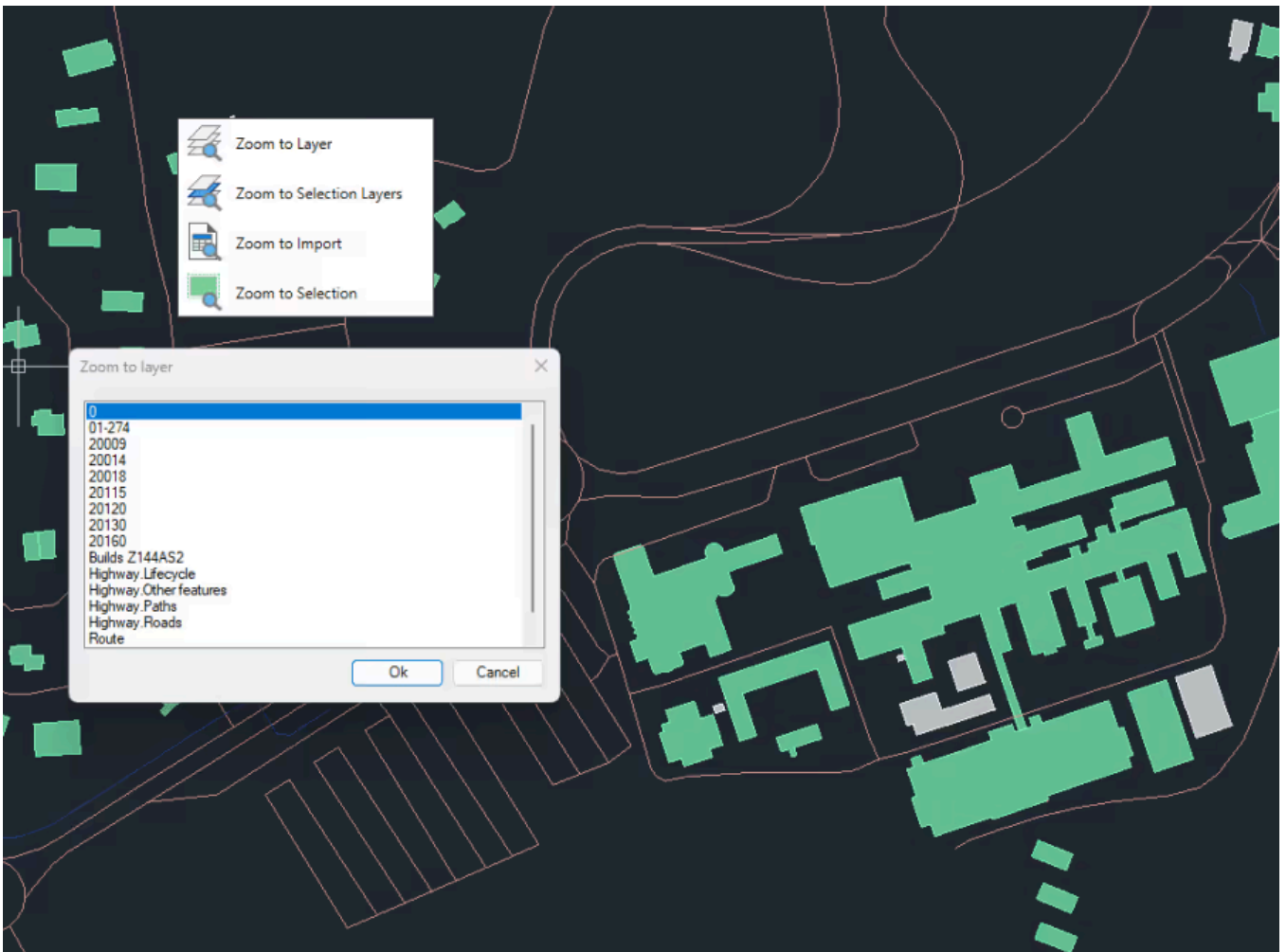
Zoom to the objects on the selected layers, to the objects on the layers of selected objects, to the objects resulting from the last import process or to the selected objects.

Visualization tools

Spatial Manager™ for ZWCAD includes several commands that allow you to process zooms on selections, imports, etc.



Advanced Zoom commands in the Spatial Manager™ for ZWCAD ribbon

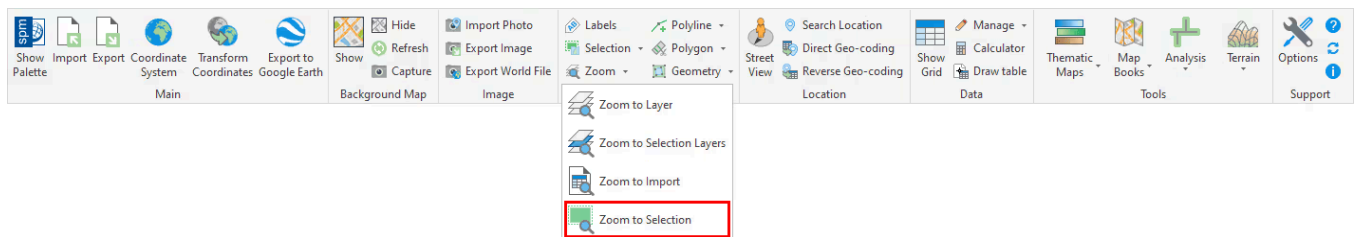


Zoom to Layers, Selected entities, Import set, etc.

- Zoom to Layer (SPMZOOMTOLAYER): Zoom to the entities on the selected layers (by default on the current layer).
- Zoom to Selection Layers ('SPMZOOMTOSELECTIONLAYER')
Zoom to the entities on the layers of selected entities.
- Zoom to Import ('SPMZOOMTOIMPORT')
Zoom to the entities resulting from the last import process.
- Zoom to Selection ('SPMZOOMTOSELECTION')
Zoom to the selected entities.

Locate on the screen the selected entities

The Spatial Manager™ for ZWCAD **SPMZOOMTOSELECTION** command zooms to the current selection extent so you can locate all the selected entities in an optimal size view.

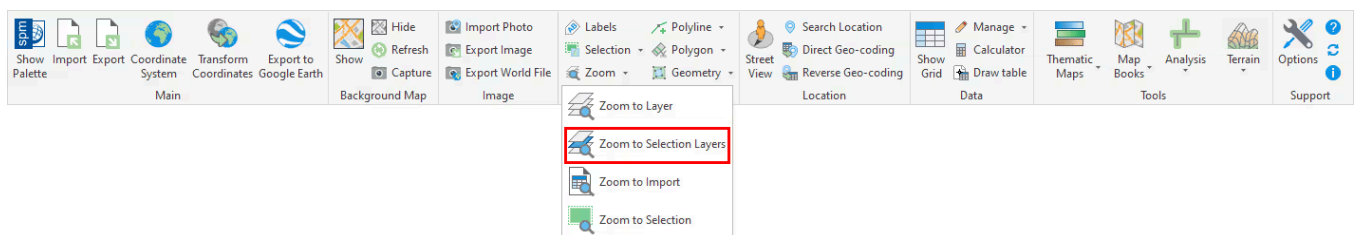


'SPMZOOMTOSELECTION' command in the Spatial Manager™ for ZWCAD ribbon

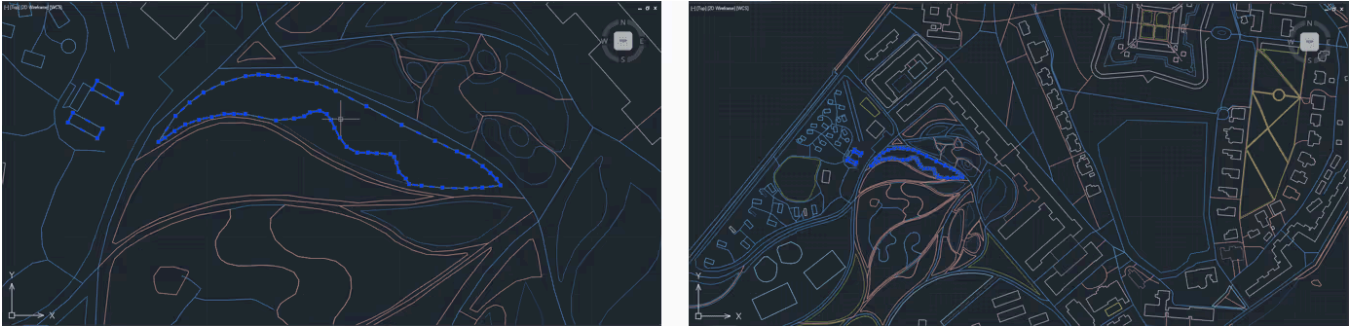


Zoom to the current selection extent

In addition, you can display on the screen all the entities included in the layers corresponding to the selected entities using the Spatial Manager™ for ZWCAD **SPMZOOMTOSELECTIONLAYER** command.



'SPMZOOMTOSELECTIONLAYER' command in the Spatial Manager™ for ZWCAD ribbon



Zoom to the current selection layers extent

Note: These functionalities can be very handy as complements to the previous selection commands, but also if they are used with other ZWCAD selection functions.

DOCUMENTATION

Image Tools

Available on edition

Professional

Spatial Manager™ for ZWCAD's image tools allow you to efficiently manage work with raster images.

Import raster	174
Export raster	175
World file	176

DOCUMENTATION

Import raster

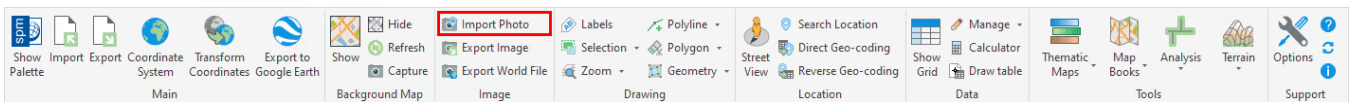
Available on edition

Professional

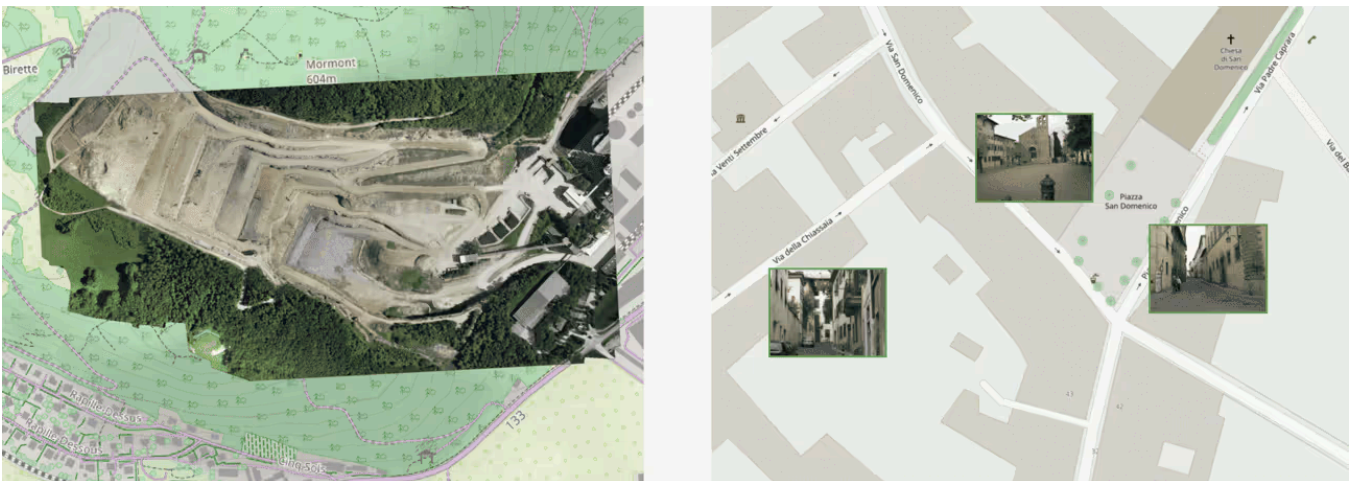
Import of georeferenced raster images into the drawing. Supports a variety of formats such as TIF, PNG, JPG, JPEG, TIFF, Cloud Optimized GeoTIFF, ... ([Data providers list](#)).

Import images or photos as raster files in my drawings

Although the general [Import functions](#) allow importing [raster files in addition to vector files](#), the command **SPMIMPORTPHOTO** in Spatial Manager™ for ZWCAD is more straightforward for importing geo-referenced raster images or photos into drawings.



Import photo command in the Spatial Manager™ for ZWCAD ribbon



Import raster images or photos in ZWCAD

DOCUMENTATION

Export raster

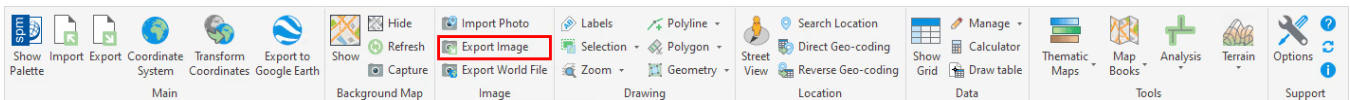
Available on edition

Professional

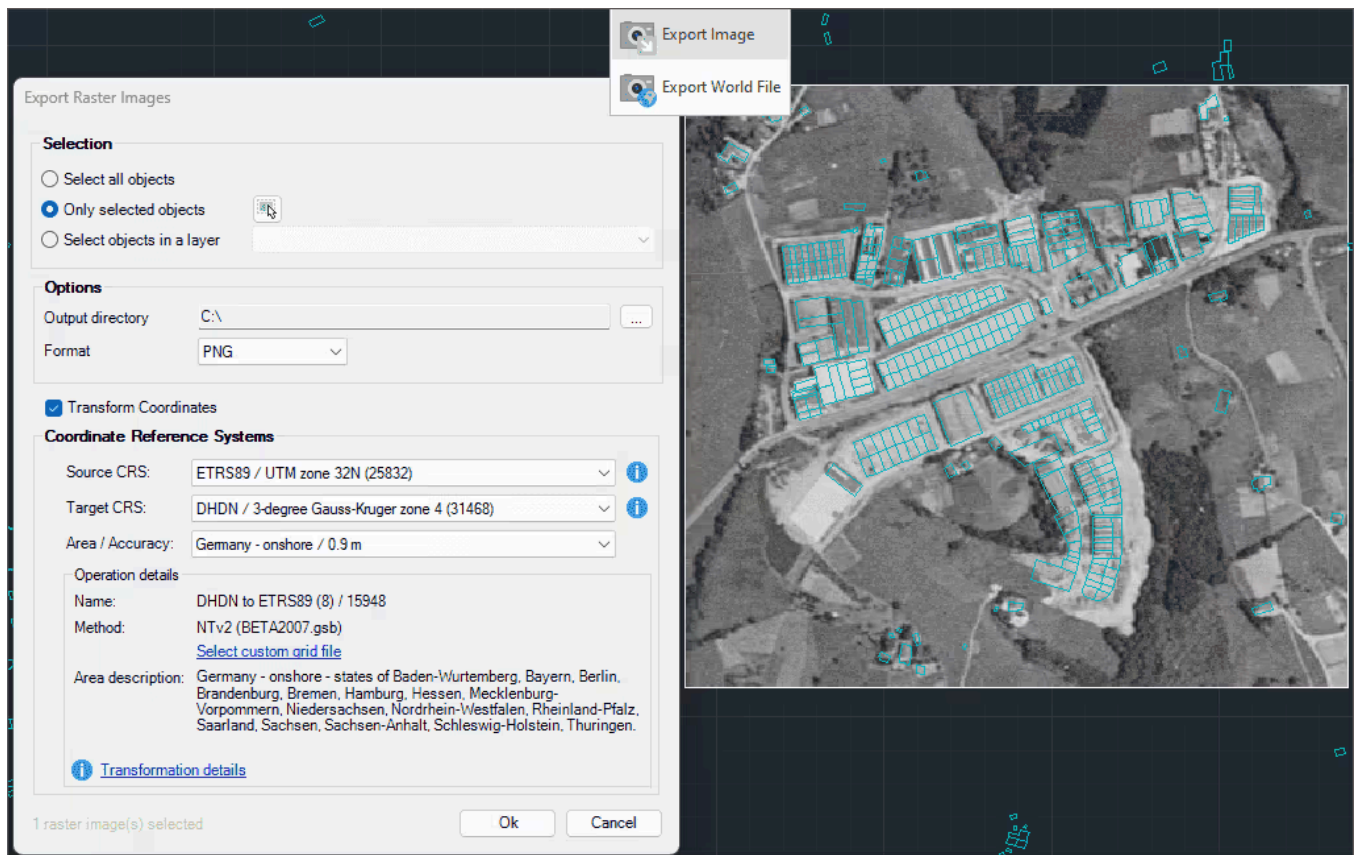
Export of georeferenced raster images from the drawing. Supports a wide variety of georeferenced formats such as TIF, PNG, JPG, ... ([Data providers list](#)).

Export geo-referenced images to external files

Although the general [Export functions](#) allow exporting [raster files in addition to vector files](#), the command **SPMEXPORTIMAGE** in Spatial Manager™ for ZWCAD is more straightforward for exporting geo-referenced images and, if needed, related geo-referencing additional files (Geo-reference and Coordinate System files).



Export image command in the Spatial Manager™ for ZWCAD ribbon



Export images from ZWCAD

DOCUMENTATION

World file

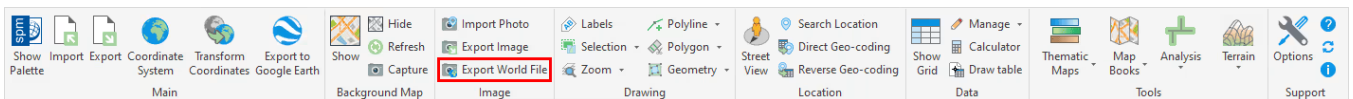
Available on edition

Professional

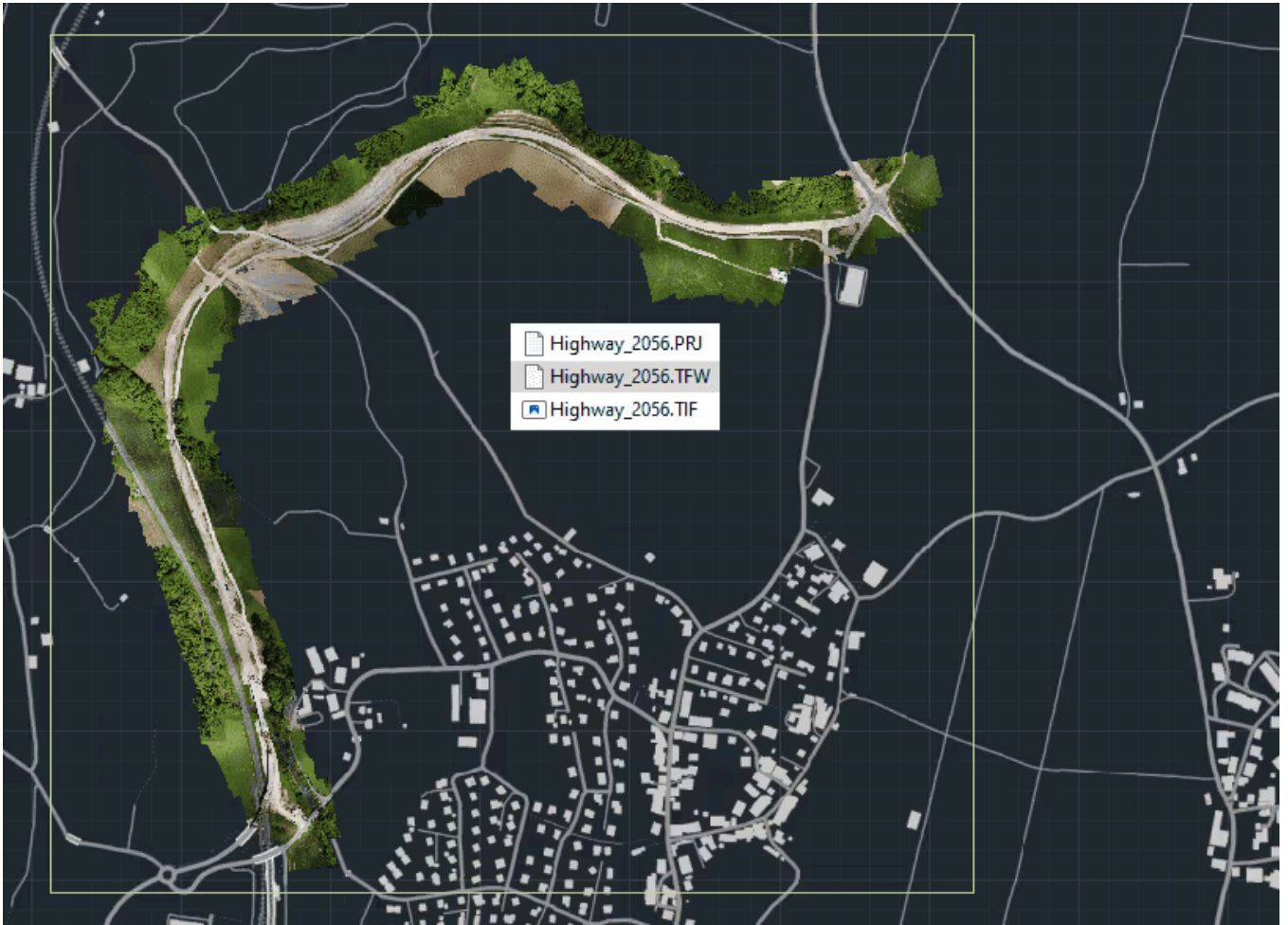
Export to external file the complete geo-reference information of any raster image contained in your drawing.

Export the additional geo-reference files of an image inserted in a drawing

Although when exporting images it is possible to include additional geo-reference files (World, PRJ, etc.) in the export process, it is also possible to export **only** these additional files when the image is already stored as a separate file. This operation can be carried out using the command **SPMWORLDFILE** of Spatial Manager™ for ZWCAD.



Export geo-reference files command in the Spatial Manager™ for ZWCAD ribbon



Export image geo-reference files from ZWCAD

DOCUMENTATION

Terrains

Available on edition**Professional**

Create Terrains and other related objects (3D Points, Contours, etc.) from 3D data or from Elevation services in ZWCAD.

Elevations	179
Contours	180
Advanced terrains	182

DOCUMENTATION

Elevations

Available on edition

Professional

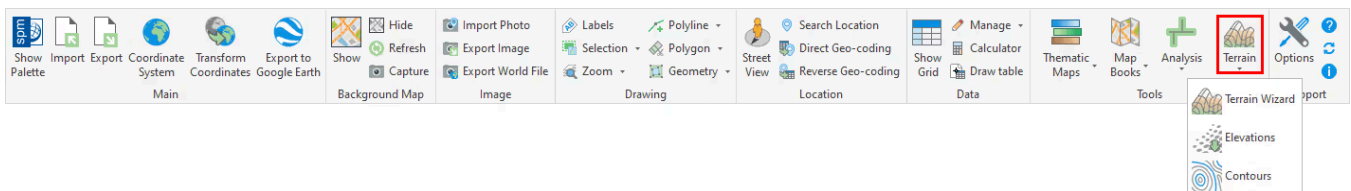
Use Points or Blocks selected in the drawing or built from Elevation service providers in any selected area. You can also use already generated terrain as source 3D geometry.

Get elevation 3D Points, create Contours or Terrain 3D models

Spatial Manager™ for ZWCAD includes the **SPMTERRAIN** command that allows you to create Terrains and other related entities. Three options are available when this command is executed:

- **1 Elevations**, which is a shortcut to get 3D Points on your drawing from Internet elevation providers in any Earth area ([Data sources](#)).
- **2 Contours**, which is a shortcut to create 2D or 3D Contours in your drawing from 3D Points, Block References or Terrains. You can review the [Contour options](#) .
- **3 Terrain Wizard**, which allows you to access the Terrain wizard in order to run one or more Terrain chained processes (obtain elevation 3D Points, and/or create Contours, and/or create Terrain 3D models, and/or project any Raster Image or [Background Map](#) to Terrains).

As you can see in the following image, these options are found on any application interface component ready to run separately.



'SPMTERRAIN' command (3 sub-commands) in the Spatial Manager™ for ZWCAD ribbon

DOCUMENTATION

Contours

Available on edition

Professional

Create minor and major Contours, label Contour altitudes, separate in different Layers and different color models. Optional attached Data Tables will include Contour elevation values and types.

Create Contours options

In Spatial Manager™ for ZWCAD you can create 2D or 3D Contour Polylines through the Terrain wizard (**SPMTERRAIN** option '3 Terrain Wizard' - Third button in the "Terrain" group) or directly through the Contours shortcut (**SPMTERRAIN** option '2 Contours' - Second button in the "Terrain" group). You will find the following available Contour options:

'Contour' options

- **Top group**
 - **Minor interval.** Contours interval (minor contours). In addition to using a fixed interval, you can define custom intervals for contour lines. This allows you to create contours at specific elevations that are important for your project, rather than being limited to regular intervals.
 - **Major every.** Every how many minor contours one is considered a major contour.
 - **Smoothing.** Contour Polylines smoothing level.
 - **Layer.** Layers for minor and major contours.
 - *Note: At the bottom of this section you will see the total number of Contour Polylines that will be created according to the chosen interval.*
- **Colours.** Colour models. You can choose one of the following options:
 - **None.** By layer. If it is necessary to create new layers according to the ones defined in the previous section, they will be assigned random colors that will be different for the minor and major Contour Polylines.
 - **By contour type.** You can choose the colours for major and minor Contour Polylines.
 - **By altitude.** The Contour Polylines will be created using an automatic colour ramp from which you can choose the colours for the lowest contour and the highest contour.
- **Labels.** Contour elevation labels.
 - **Label elevations.** Check it if you want labels.
 - **Label also minor contours.** The major contours will be labeled, but you must check this option if you also want to label the minor contours.
 - **Style, Justify, Height.** You can define the style, height and justification of the labels here. Although you can change it as you wish, by default the justification selected is "Middle center" so that the labels are centered with the contours.
 - If you select **Mask labels**, masks will be generated (Wipeout entities, grouped with the labels) and they will trim the contours in the labels' location in order to improve their readability.
 - **Insert a label each.** You can also specify the separation in drawing units between labels to be repeated along the Contour Polylines.
 - *Notes:*
 - *The number of decimal places for the numeric values in the labels will be consistent with the contour interval chosen above.*
 - *Label masks are available for ZWCAD 2020 SP2 Special Package (2020.05.15 - 56123) and upper versions.*
- **Elevation options**
 - **Create contours without elevation (2D).** Contour Polylines will be placed in their corresponding Z elevation (3D contours) unless you check this option to place them in the XY plane regardless of their elevations (2D contours).
 - **Append data table with elevation values.** When checking this option, the Contour Polylines will be [attached to a data Table](#) that will include the "Elevation" field. The table will also include another field ("Major") that will indicate if it is a minor or a major contour. You can specify the data table name below.

DOCUMENTATION

Advanced terrains

Available on edition

Professional

3D models generation using 3D Meshes or other CAD/BIM objects from the selected 3D objects

Automatic image projection and fitting of any Background Map (preset or user-configured) on one or more Terrains in their actual location.

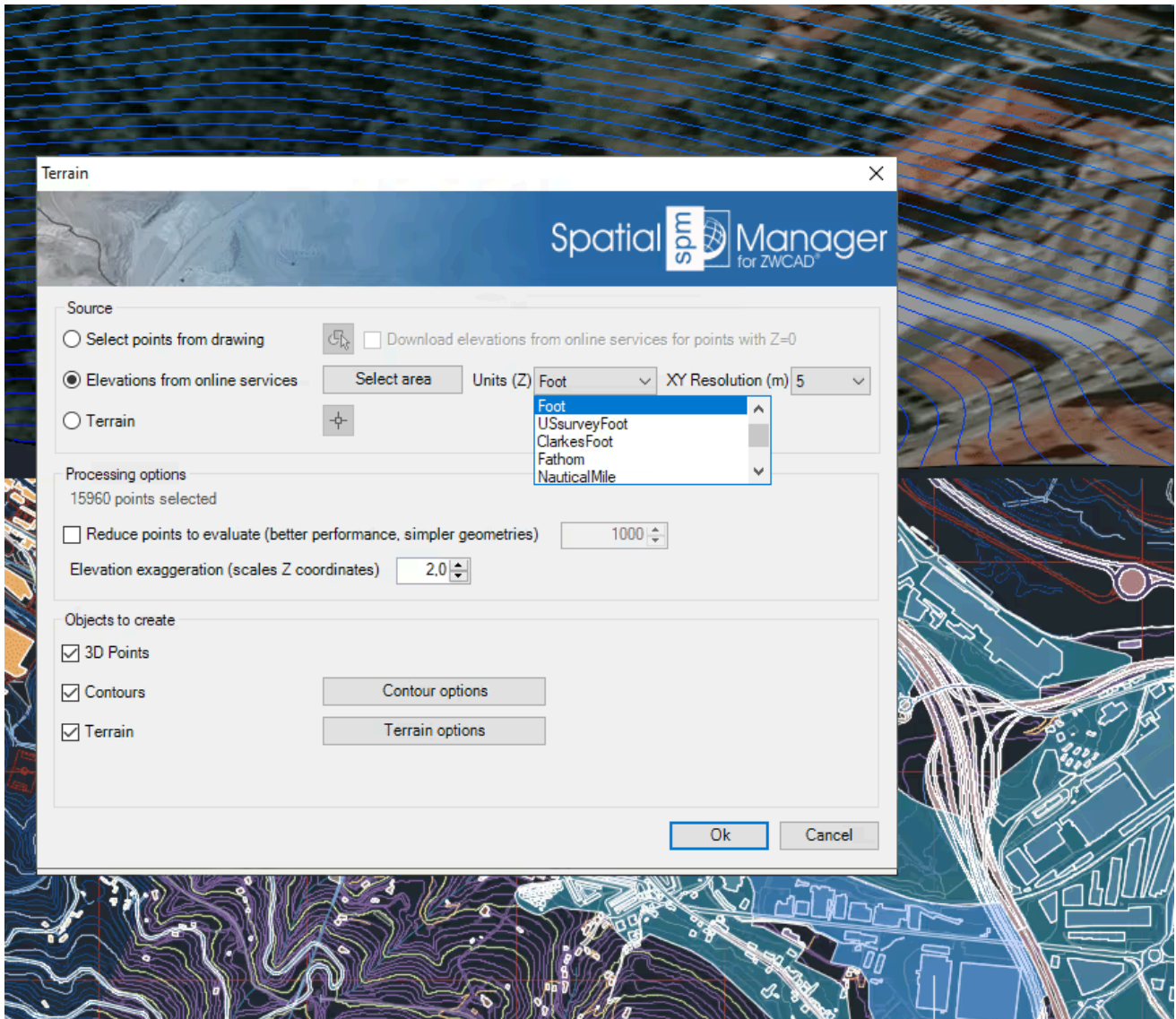
Sections in the Terrain wizard

The Spatial Manager™ for ZWCAD Terrain wizard (third button in the "Terrain" group) includes three sections (see the image below):

- **Source** - Starting data. Select one of the following options:
 - **Select points from drawing**. Allows you to select any number of Points or Block References in your drawing in order to create Contours (Polylines) for this point cloud, and/or create one Terrain 3D model for this point cloud, and apply (project and fit) a Raster Image or Background Map texture to this Terrain. If before executing the SPMTERRAIN command there are already selected Points in the drawing, this option will be adopted by default and the selection set will include all the already selected Points.
 - **Download elevations from online services for points with Z=0**. This option allows you to get the elevation values (Z-coordinates) for any selected entity with Z=0 from Internet elevation providers ([Data sources](#)). If all the selected entities have Z=0, a pop-up window will alert you about it and you will be able to activate this option from the warning itself. The drawing must be [georeferenced](#) before using this option.
 - **Elevations from online services**. Allows you to define a rectangular area in your drawing for any Earth location in order to create a 3D Points grid from Internet elevation providers in the selected area ([Data sources](#)), and/or create Contours (Polylines) for this point cloud, and/or create one Terrain 3D model for this point cloud, and apply (project and fit) a Raster Image or Background Map texture to this Terrain.
 - *Notes:*
 - *Select the elevation (Z) units. The options available in the drop-down menu will display all the units available in the [Coordinate Systems entities list](#).*
 - *You can also choose the grid resolution in meters. Available values are proposed and limited according to the resolution returned by the elevation service.*
 - *The drawing must be [georeferenced](#) before using this option.*
 - **Terrain**. Allows you to select one or more Terrain 3D models in your drawing in order to extract their 3D point geometries (vertices) and create a 3D points cloud, and/or create Contours

(Polylines) for this point cloud, and/or create one Terrain 3D model for this point cloud, and apply (project and fit) a Raster Image or Background Map texture to the selected or created Terrain(s).

- Processing options
 - **Reduce points to evaluate.**
 - If you selected 3D Points in the previous section (from the drawing or by creating a grid), here you can reduce the number of points used in the calculation of entities in the next section (3D Points and/or Contours and/or Terrain).
 - A reduction of points will improve the speed of entities generation but will result in entities with simpler geometry.
 - **Elevation exaggeration.**
 - This factor will multiply the resulting Z-coordinates of entities calculated in the next section (3D Points and/or Contours and/or Terrain).
 - The exaggeration does not affect the numerical values that may result from the calculation, such as the elevation labels or the values in the elevation table of the contour lines.
 - *Note: You will see at the top of this section the total number of entities currently selected.*
- Entities to create - Resulting entities. Depending on the option you have chosen in the first section, you will be able to select one or more of the entities to be created in the process.
 - **3D Points.**
 - **Contours.** See the [Contour options](#) .
 - **Terrain.** You can choose what ZWCAD 3D entity will be used to create the Terrain 3D model. The available options depend on each ZWCAD version.



'Terrain' wizard window

DOCUMENTATION

Map Books

Available on edition**Professional**

Create atlas-like layouts automatically within ZWCAD. Ideal for large areas, this feature helps you organize and print multi-page maps with consistent viewports, titles, and layouts.

Create	186
Sheets definition	189

DOCUMENTATION

Create

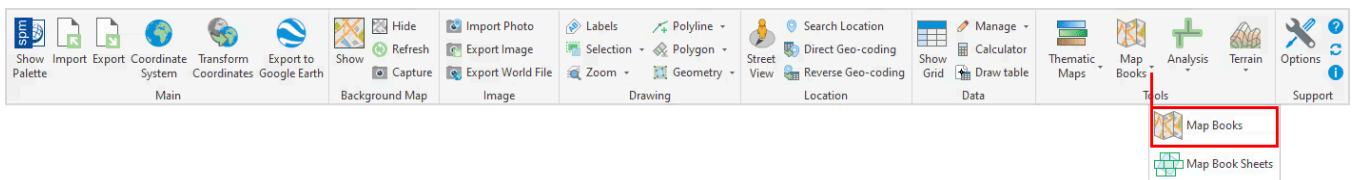
Available on edition

Professional

Create atlas-like layouts automatically within ZWCAD. Ideal for large areas, this feature helps you organize and print multi-page maps with consistent viewports, titles, and layouts.

The **SPMMAPBOOK** command in Spatial Manager™ for ZWCAD automates the generation of map book sheets based on the sheet definitions you've created. This command processes all defined sheets and creates individual layouts or drawings for each one.

Create a Map Book

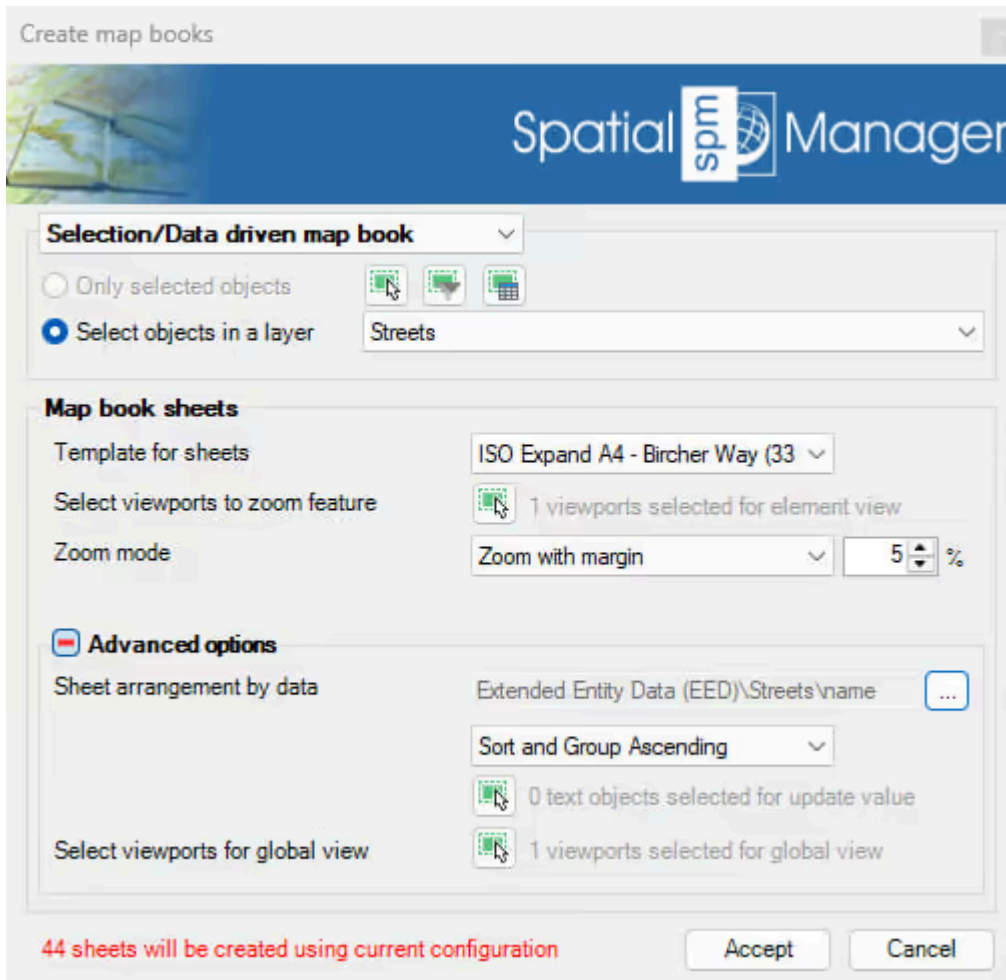


'SPMMAPBOOK' command in the Spatial Manager™ for ZWCAD ribbon

Map Book Options

- **In the first options group:**
 - **Selection/Data driven map book:** creates a sheet for each feature in a selected layer or by their data.
 - **Map book from sheets:** creates a map book based on previously defined sheets or [create new sheets](#) .
- **Map book sheets**
 - *Template for sheets:* select a layout or drawing template to be used for each sheet in the map book.
 - *Viewports to zoom feature:* automatically selects the largest viewport in the template to zoom to the feature extent, it can be selected manually as well.
 - *Zoom mode:*
 - *Zoom:* zooms to the feature extent.
 - *Zoom with margin:* zooms to the feature extent with a specified margin percentage.
 - *Zoom to best fitting predefined scale:* adjusts the view to the best fitting predefined scale.
 - *Center view in current scale:* centers the view, but does not change the scale.
 - **Advanced options**

- *Sheet arrangement by data*: allows to create a sheet grouping by the same attribute or property value. The value will be used for the layout name.
- *Sort and group*: sort ascending or descending and group the the selected data into the same sheet.
- *Text value*: the selected data can also be set as a custom text value in the layout, click and select the text object to be replaced in the template layout.
- *Viewport for global view*: select a viewport in the template layout to be used as a global view, which will not be zoomed to the feature extent, only centered on the feature with the existing viewport scale.



'SPMMAPBOOK' options

Map Book video

VIDEO AVAILABLE

[Watch video on YouTube](#)

Note: there is a limit of 256 layouts for ZWCAD drawings, if the selected options exceed this limit, the process can not be completed.

DOCUMENTATION

Sheets definition

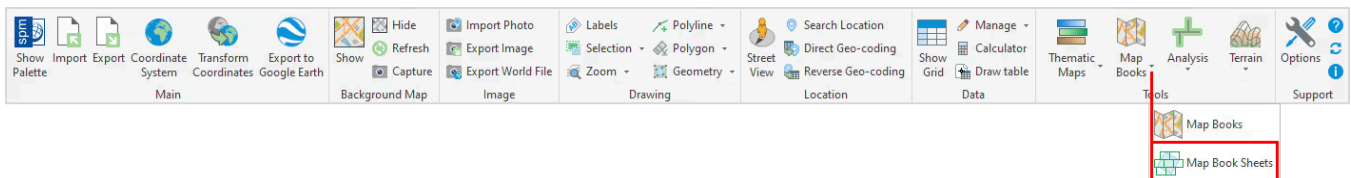
Available on edition

Professional

Create a grid over selected objects or a defined area in your drawing. This grid serves as the foundation for generating Map Books, organizing your project into consistent map sections..

Define Sheets for Map Books

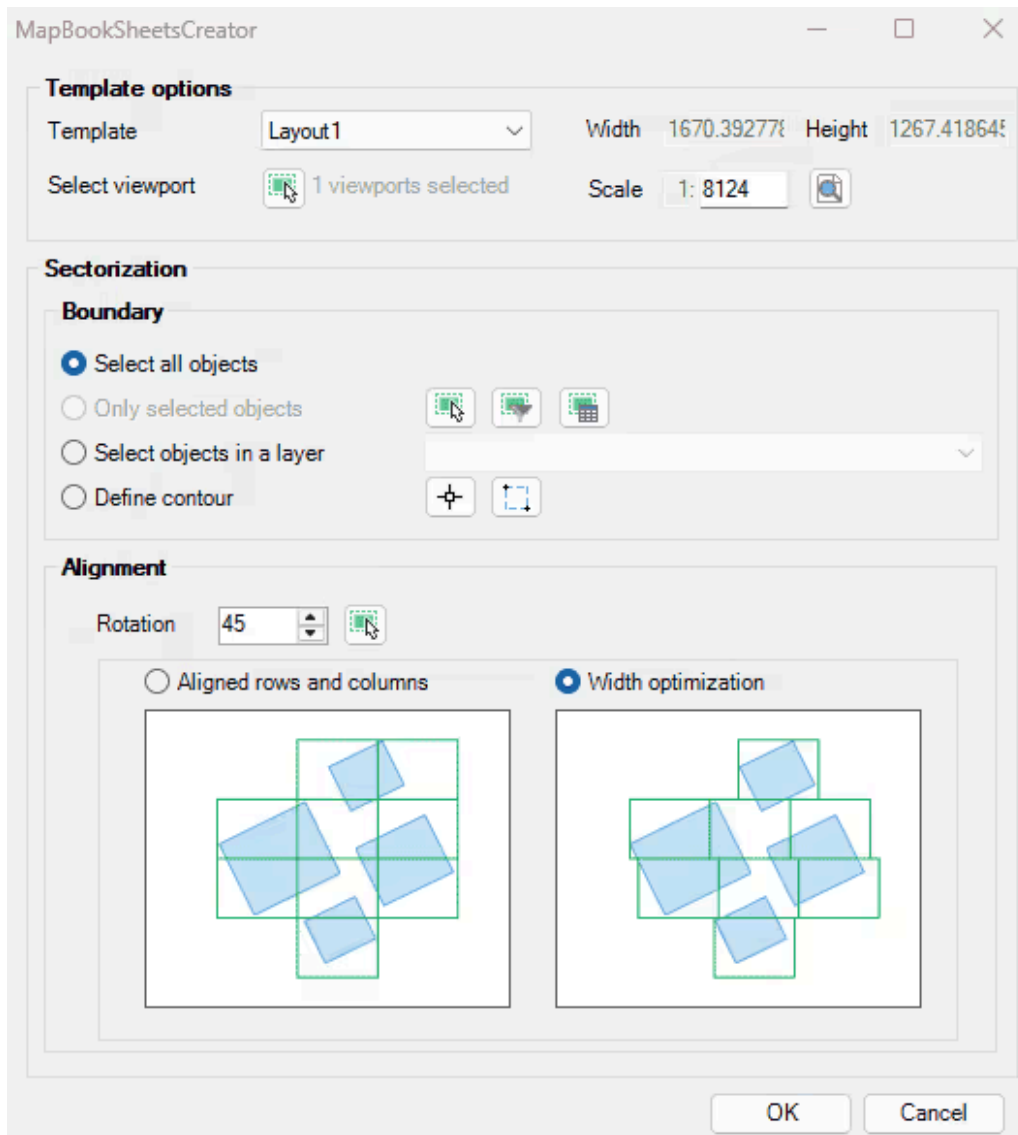
The **SPMMAPBOOKSHEETS** command in Spatial Manager™ for ZWCAD allows you to define the individual sheets that will make up your map book. This is the essential first step before [generating a map book](#), as it establishes the coverage, scale, and properties of each sheet.



'SPMMAPBOOKSHEETS' command in the Spatial Manager™ for ZWCAD ribbon

Map Book Sheets Options

- **Template options:**
 - **Template:** select a layout as template to be used for defining the sheets.
 - **Width/Height:** automatically set by the template and scale.
 - **Selected viewport:** select a viewport in the template layout to be used for the sheet, by default the largest one is selected.
 - **Scale:** define the scale for the sheet, by default the current viewport scale is used, but can be changed to a custom one.
- **Boundary:**
 - **Selection:** use the [selection control](#) tools.
 - **Define contour:** or define a create a contour for the map book area.
- **Alignment:**
 - **Rotation:** the sheets can be aligned to the boundary or set to a fixed rotation angle.
 - **Aligned rows and columns:** the sheets can be aligned to each other in rows and columns.
 - **Width optimization:** the sheets can be optimized for width to minimize empty space and number of resulting sheets.



'SPMMAPBOOKSHEETS' options

Map Book Sheets video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

Thematic Maps

Available on edition

Professional

Visualize objects coloring them depending on their field values in ZWCAD.

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DOCUMENTATION

Display

Available on edition

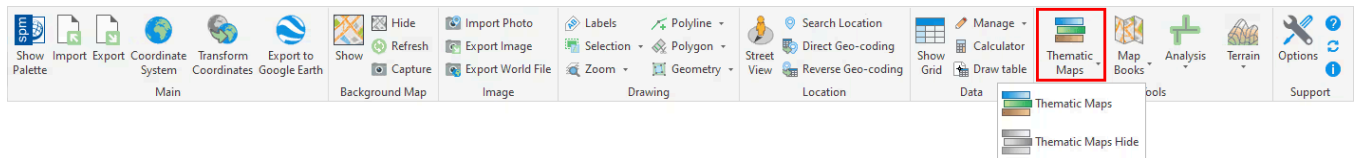
Professional

Visualize objects coloring them depending on their field values in ZWCAD.

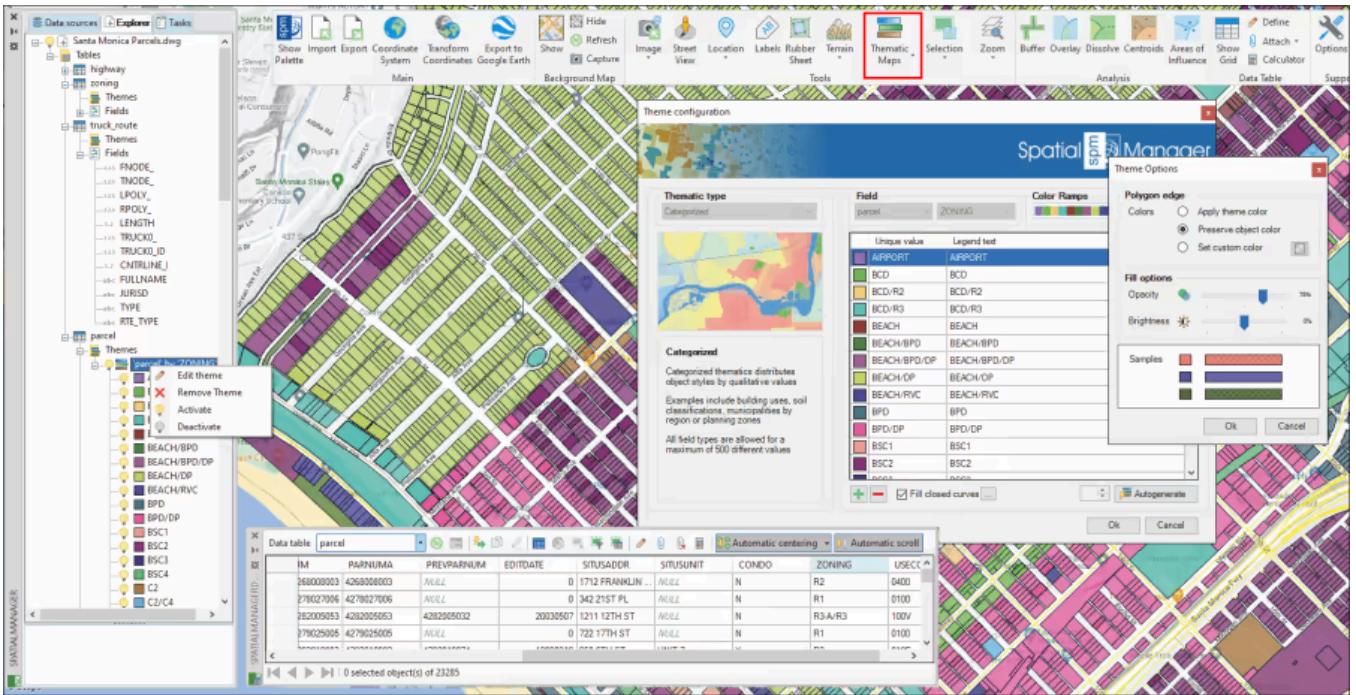
Graphically represent in the drawing the Data values attached to the entities

Spatial Manager™ for ZWCAD includes the Thematic Maps functionality, which allows you to temporarily change the entities' color in the drawing according to their associated alphanumeric data. You can define a new Thematic Map using the **SPMTHEMATICMAP** command, whose window includes the definition of all the necessary parameters and options, as you can read below.

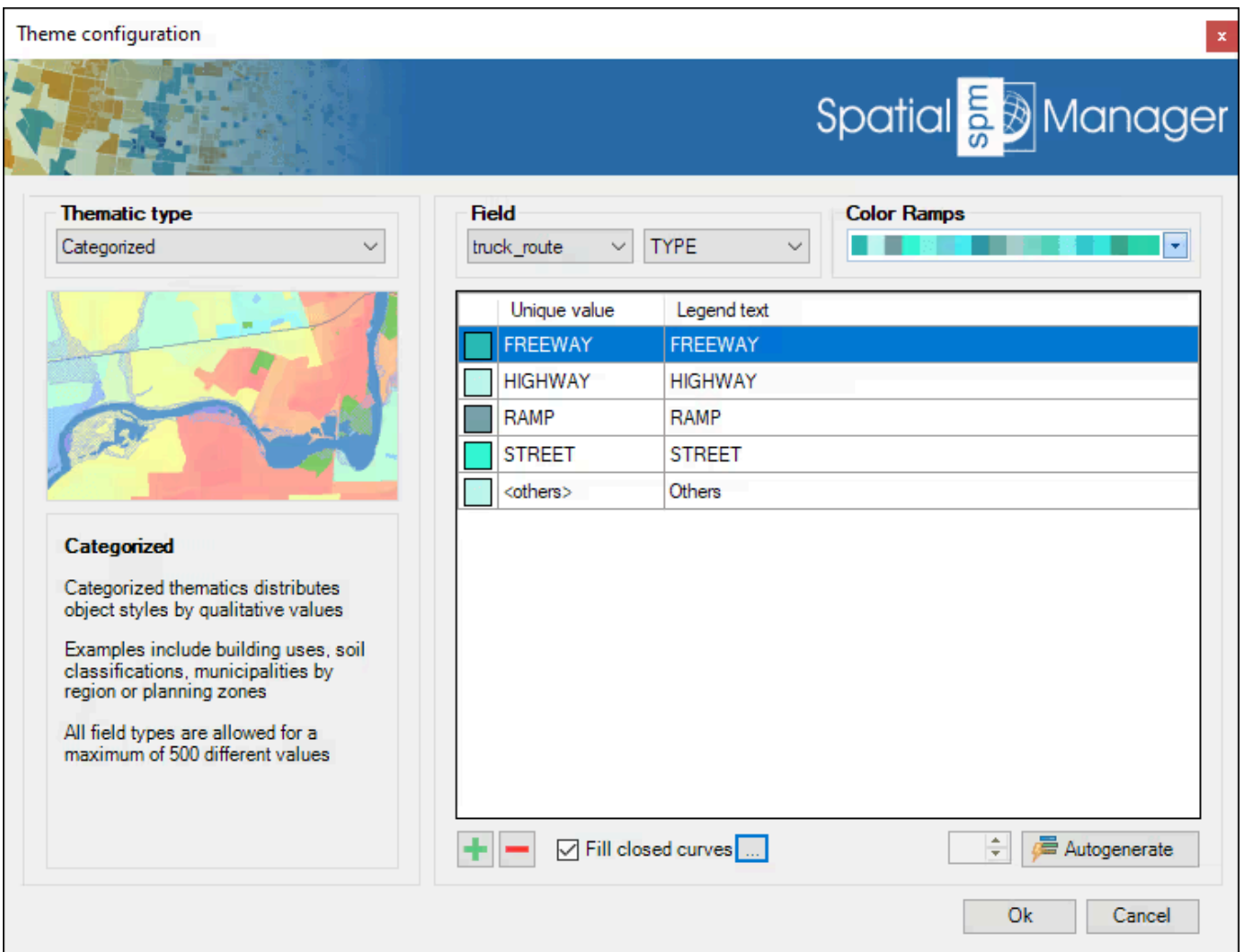
In a drawing you can define as many Thematic Maps as you wish and activate or deactivate (return the display of entities to their native color) the Maps or any of the Styles. In addition, you can edit the colors and names of the Styles, and the visual update of the entities is dynamic. If data values are modified while a Thematic Map is active, the colors will automatically change to reflect the new values of the affected entities.



'SPMTHEMATICMAP' and 'SPMTHEMATICMAPHIDE' commands in the Spatial Manager™ for ZWCAD ribbon



Thematic Maps in a drawing



Thematics configuration and parameters window

In the Thematic Map definition (and edition) window all the parameters and options of the Map are specified:

- **Thematic type**

- *Categorized*: Distributes entity Styles by qualitative values. Examples include building uses, soil classifications, municipalities by region, or planning zones. All field types are allowed for a maximum of 500 different values.
- *Graduated*: Distributes entity Styles considering value ranges. Examples include rivers by flow, buildings by height, or urban areas by population density. Numeric fields (including date/time) are allowed.
- *Graduated Gradient*: Distributes entity Styles considering value/color ranges, creating one or more gradients. Examples include altimetry representations or heat maps. Numeric fields (including date/time) are allowed.



Samples of Categorized, Graduated and Graduate Gradient Thematic Maps

- **Field**

- *Field in a Table* whose values will be represented by the Thematic Map.

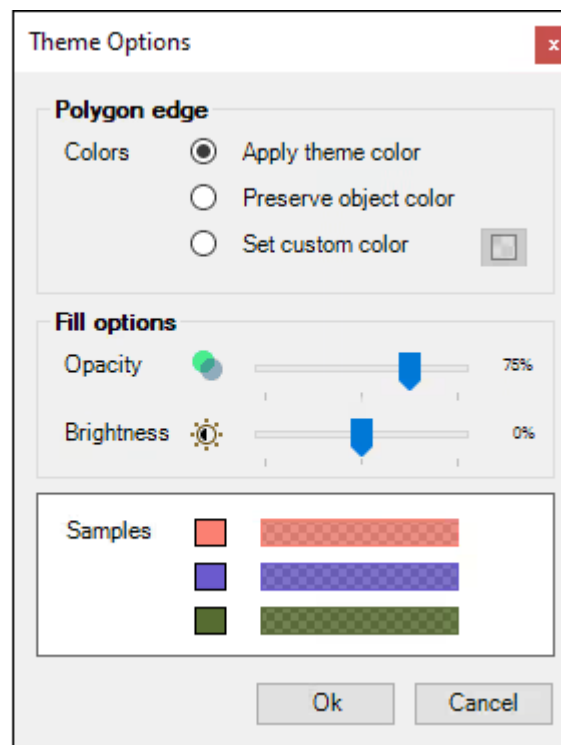
- **Color Ramps**

- Although you can manually define and edit the colors of each Style, the application includes a large number of predefined color ramps (single colors, gradients, etc.) that can be selected to assign these colors. Even after selecting a color ramp, the colors can be modified by the user for one or more Styles of the Thematic Map.

- **Styles table**

- Includes the color, value (unique or values range) and legend text for each Style in the Thematic Map. All these parameters can be customized.
- The buttons below this table allow you to manually add or remove Styles. The *Autogenerate* button will automatically create the Styles of the Thematic Map based on the values of the chosen field. In the case of graduated thematics, it is possible to define the number of "steps" in the range of the field values.
- In addition, it is possible to select whether to automatically fill the closed entities that are part of the Thematic. In this case, the following Theme Options are available:
 - **Polygon edge**
 - *Apply theme color*: The entity edges will be displayed in the color defined in the corresponding Style.
 - *Preserve entity color*: The entity edges will be displayed in their native drawing color regardless of the color defined in the Style that corresponds to them.

- *Set custom color*: A custom color can be selected for all entity edges regardless of the color defined in the Style that corresponds to them.
- **Fill options**
 - Here you can define the opacity and brightness levels for the resulting hatches.



Fill closed entities options

Note: Thematic Maps are only available in ZWCAD 2022 (64-bit) and later 64-bit versions.

DOCUMENTATION

Persistent

Available on edition

Professional

Once a thematic map is defined, you can apply the chosen styling persistently across your DWG drawing..

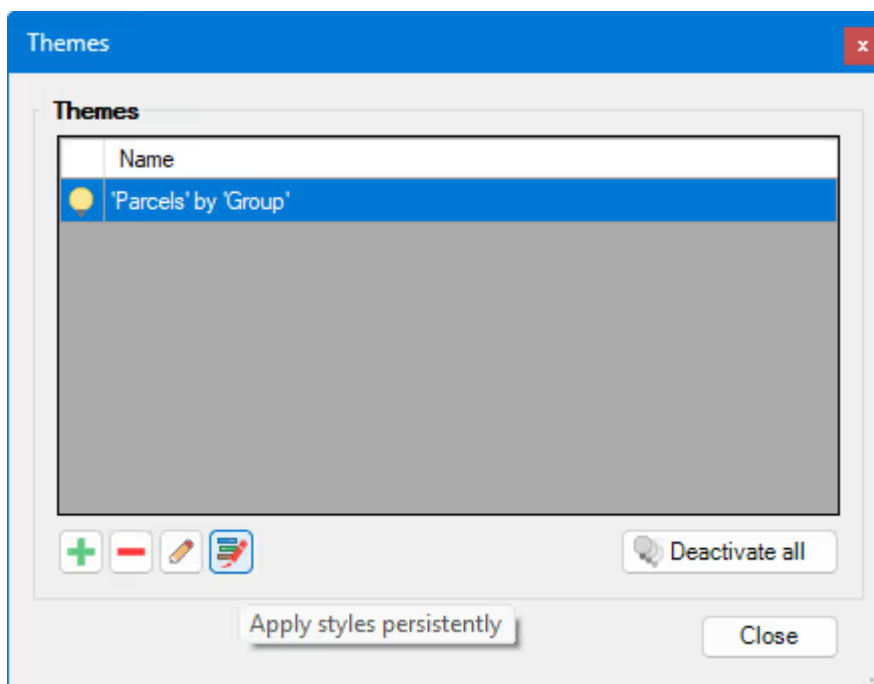
Persistent Thematic Maps

Thematic Maps can now be made **persistent**, which means the color changes are applied directly to the entities' properties rather than being only a temporary visual representation. When you make a Thematic Map persistent:

- The colors defined in the Thematic Map styles are permanently applied to the entities.
- The visual appearance of the entities is modified directly in the drawing.
- The thematic color representation becomes part of the entity properties and is preserved even after closing and reopening the drawing.

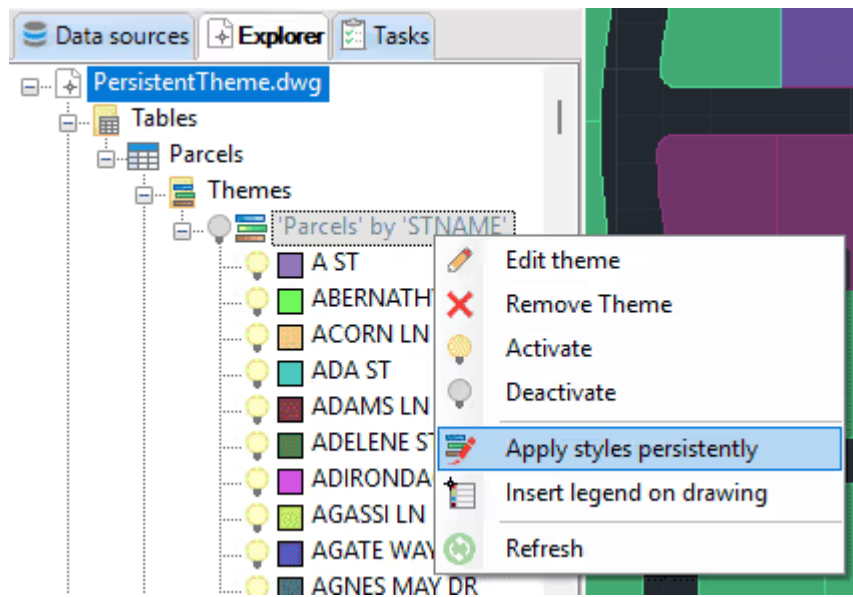
This feature is particularly useful when you want to maintain the thematic visualization as a permanent part of your drawing, or when you need to share the drawing with users who don't have Spatial Manager™ for ZWCAD installed.

Once a thematic map is created, you can make it persistent from the window that appears running the SPMTHEMATICMAP command by clicking the "Apply persistent theme" button:



Apply persistent theme button

Or also searching the thematic map in the **Explorer** , right-clicking on it, and selecting *Apply styles persistently* from the context menu:



Apply persistent from explorer

Review this video about this feature:

VIDEO AVAILABLE

[Watch video on YouTube](#)

Note: Thematic Maps are only available in ZWCAD 2022 (64-bit) and later 64-bit versions.

DOCUMENTATION

Manage

Available on edition

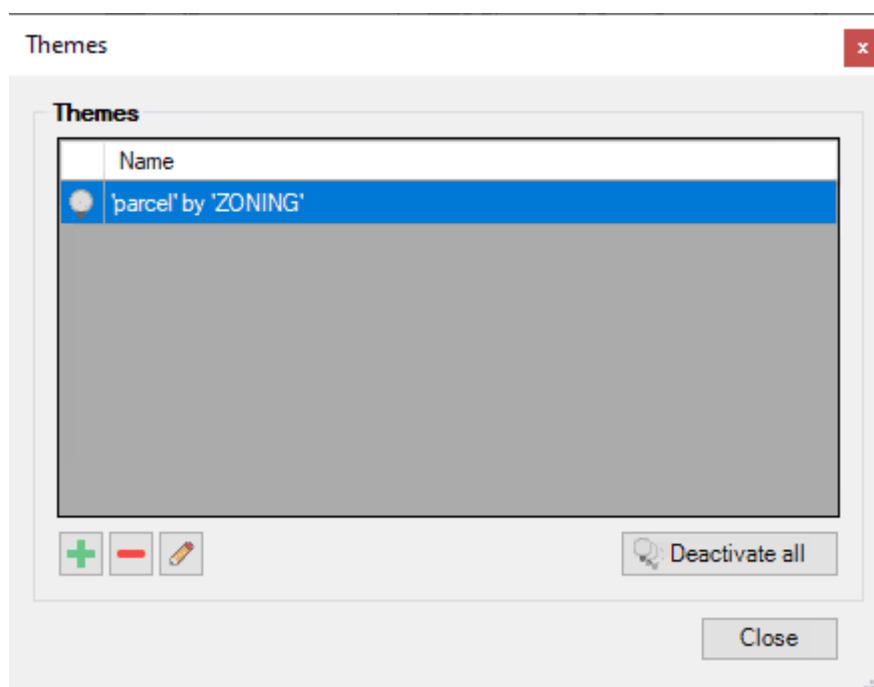
Professional

Visualize objects coloring them depending on their field values in ZWCAD.

Manage Thematic Maps in the drawing

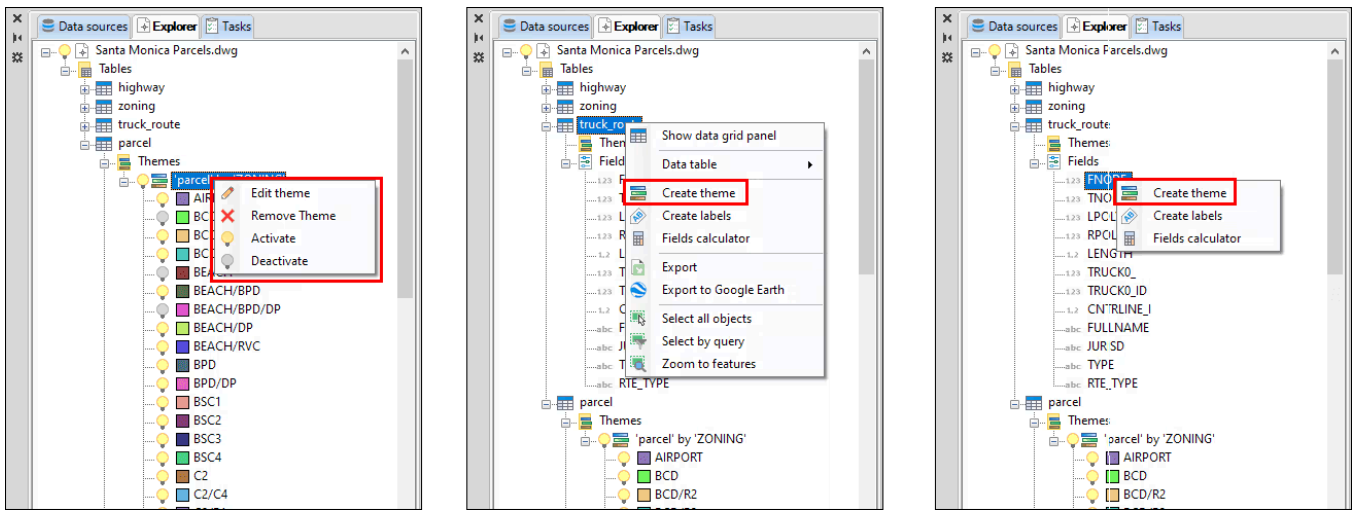
You will find two ways to manage Thematic Maps: from the direct commands or from the [application's Explorer](#) .

When you run the **SPMTHEMATICMAP** command, if the drawing has no Thematic Maps defined, the definition window will appear, as you can read in the previous article. But if the drawing already has one or more Thematic Maps defined, the following window will appear, from which you can add a new Thematic and delete or edit any Thematic already defined. From this window you can also deactivate all the Thematic Maps defined in the drawing, which is equivalent to running the command **SPMTHEMATICMAPHIDE**.



Thematic Maps management window

The second alternative, the application Explorer, is the most recommendable since not only will you find many other functions concerning the drawing, tables or fields, but you can also selectively activate or deactivate Styles of a Thematic, all through contextual menus (right-click) and the use of the Thematic or Styles "light bulbs":



Examples of contextual menus available in the application Explorer

Note: Thematic Maps are only available in ZWCAD 2022 (64-bit) and later 64-bit versions.

DOCUMENTATION

Legends

Available on edition

Professional

Insert a thematic map legend directly into the drawing, making it easier to interpret and communicate the meaning of the applied styles. The legend reflects the categories or value ranges used in the map presentation.

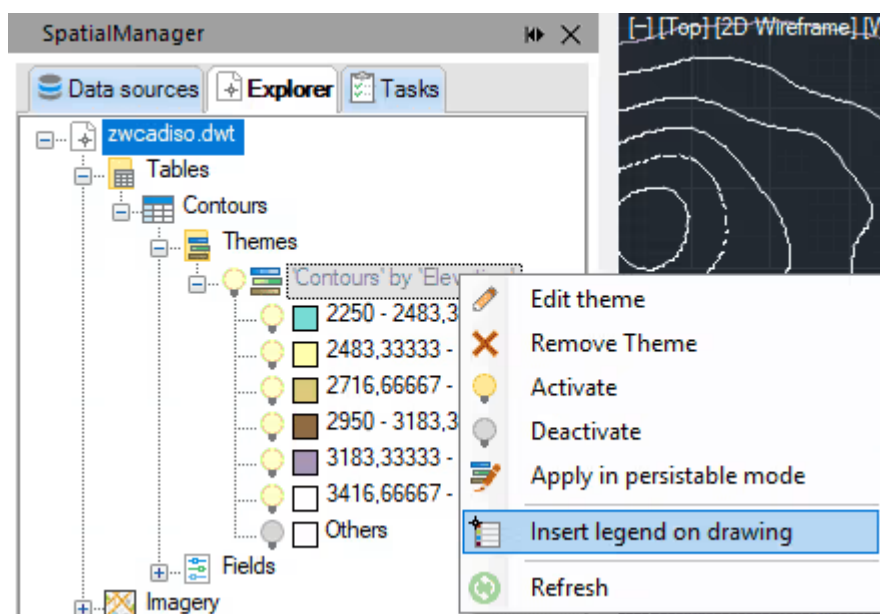
Thematic Map Legend

Once a thematic map is created, a legend can be inserted in the drawing from the [Explorer](#) context menu.

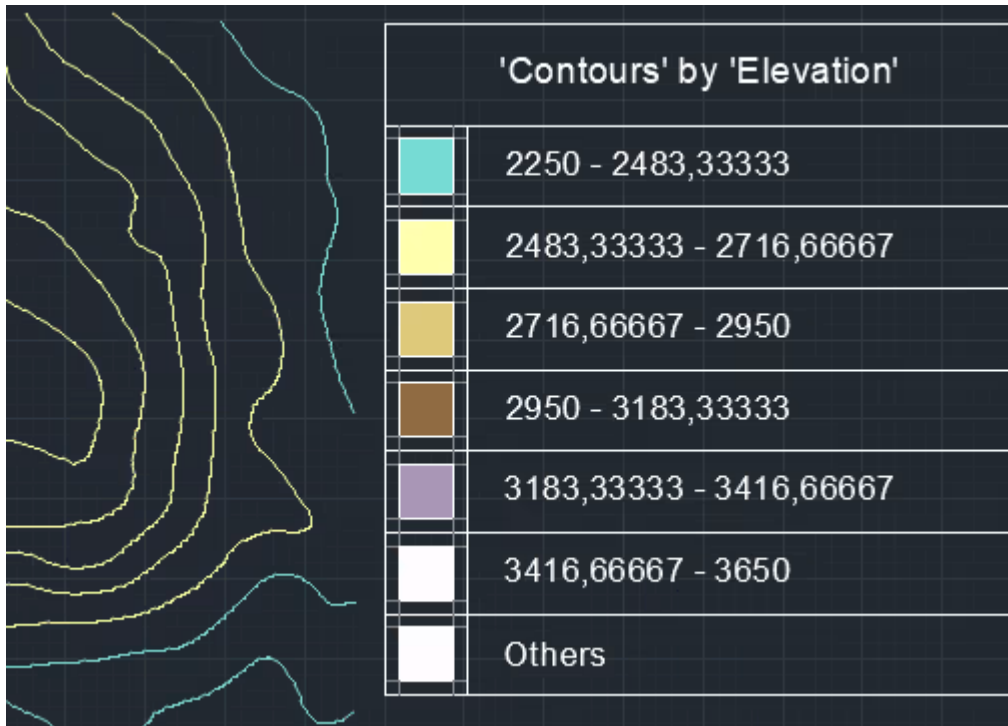
The legend will be inserted in the drawing as a ZWCAD table and will display the styles of the thematic map.

Follow the steps below to insert a legend:

1. If you have not still created a thematic map, [create one](#) with the SPMTHEMATICMAP command.
2. Select the thematic map in the [Explorer](#).
3. Right-click on the thematic map and select "Insert legend on drawing" from the context menu (see image below).
4. Click on the insertion point and scale the table for setting the legend size.
5. The legend will be inserted in the drawing as a ZWCAD table and will display the styles of the thematic map (see image below).



Create legend context menu



Legend inserted as a table

Review this video to see the full process:

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

Geometry Tools

Available on edition

Professional

A suite of geometry tools for ZWCAD designed to edit, transform, and optimize a wide range of vector elements, including polylines, polygons, and other geometries.

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DOCUMENTATION

Polyline Tools

Available on edition**Professional**

A powerful set of tools for editing and transforming polylines. Whether you need to compound new lines from others, convert between 2D and 3D polylines, reduce complexity using simplification, or create new linear geometries from points, these tools will help your workflow.

Aggregate Line	204
Convert Polyline Type	206
Curve to Polyline	208
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Segmentation	212

DOCUMENTATION

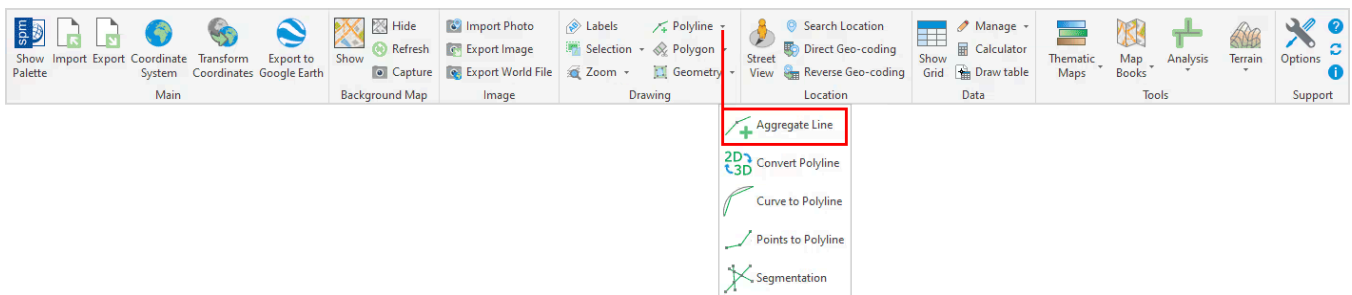
Aggregate Line

Available on edition

Professional

Generates a single polyline by combining multiple existing polylines. When the polylines are not connected, the application can automatically join them based on proximity. Additionally, this process allows grouping and aggregation of polylines according to a specific field value, offering a flexible way to organize and simplify complex line geometries..

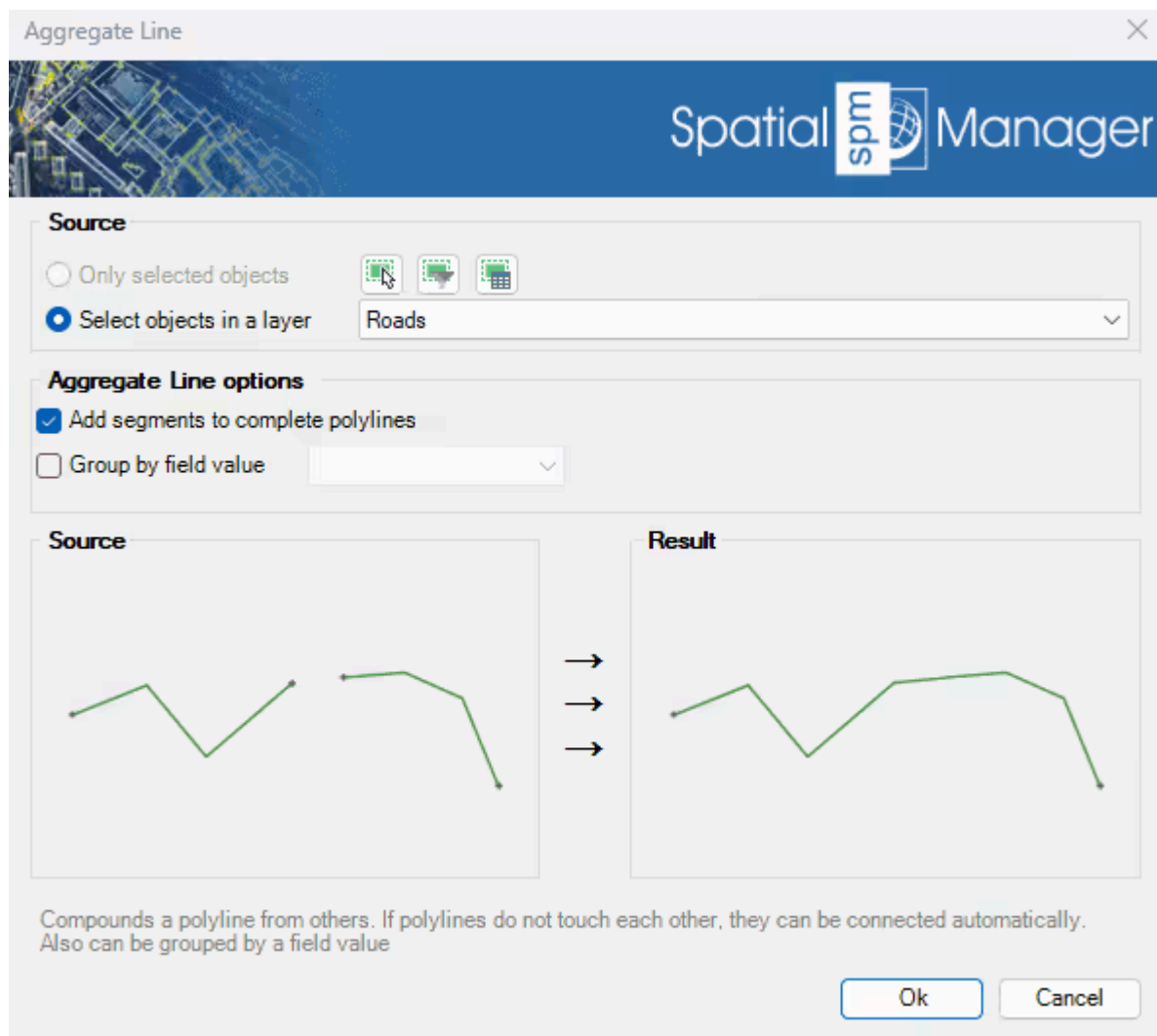
The **SPMAGGREGATELINE** command connects separate line segments or different polylines into continuous polylines.



'SPMAGGREGATELINE' command on ribbon

Aggregate Line Options

- **Source:** select the polylines to aggregate (review [selection control options](#)).
- **Aggregate Line options:**
 - *Add segments to complete polylines:* If polylines do not touch each other, they will be connected creating new segments. If unchecked, only polylines that touch each other will be connected.
 - *Group by field value:* If checked, the polylines will be grouped by the value of the selected field, creating polylines for the same value. If unchecked, all polylines will be joined into one polyline.



'SPMAGGREGATELINE' options

Aggregate Line video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

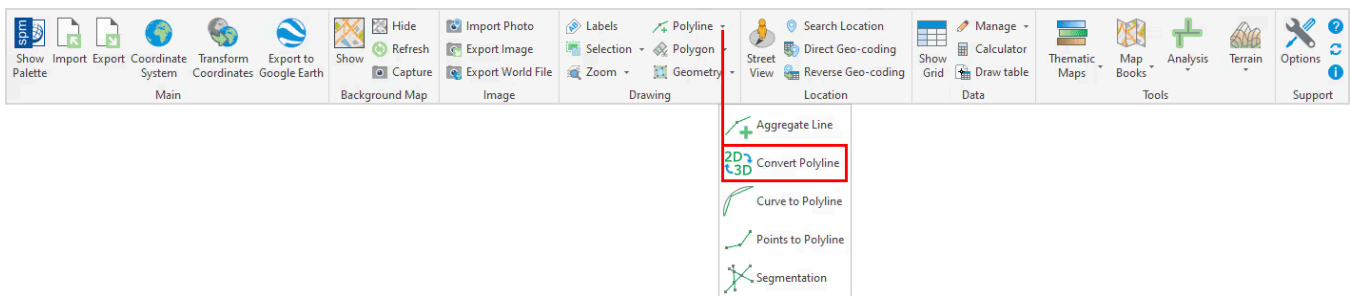
Convert Polyline Type

Available on edition

Professional

Easily converts polylines between 2D and 3D types within your drawing. The tool ensures precision and consistency during the conversion, preserving key properties of the original polylines whenever possible..

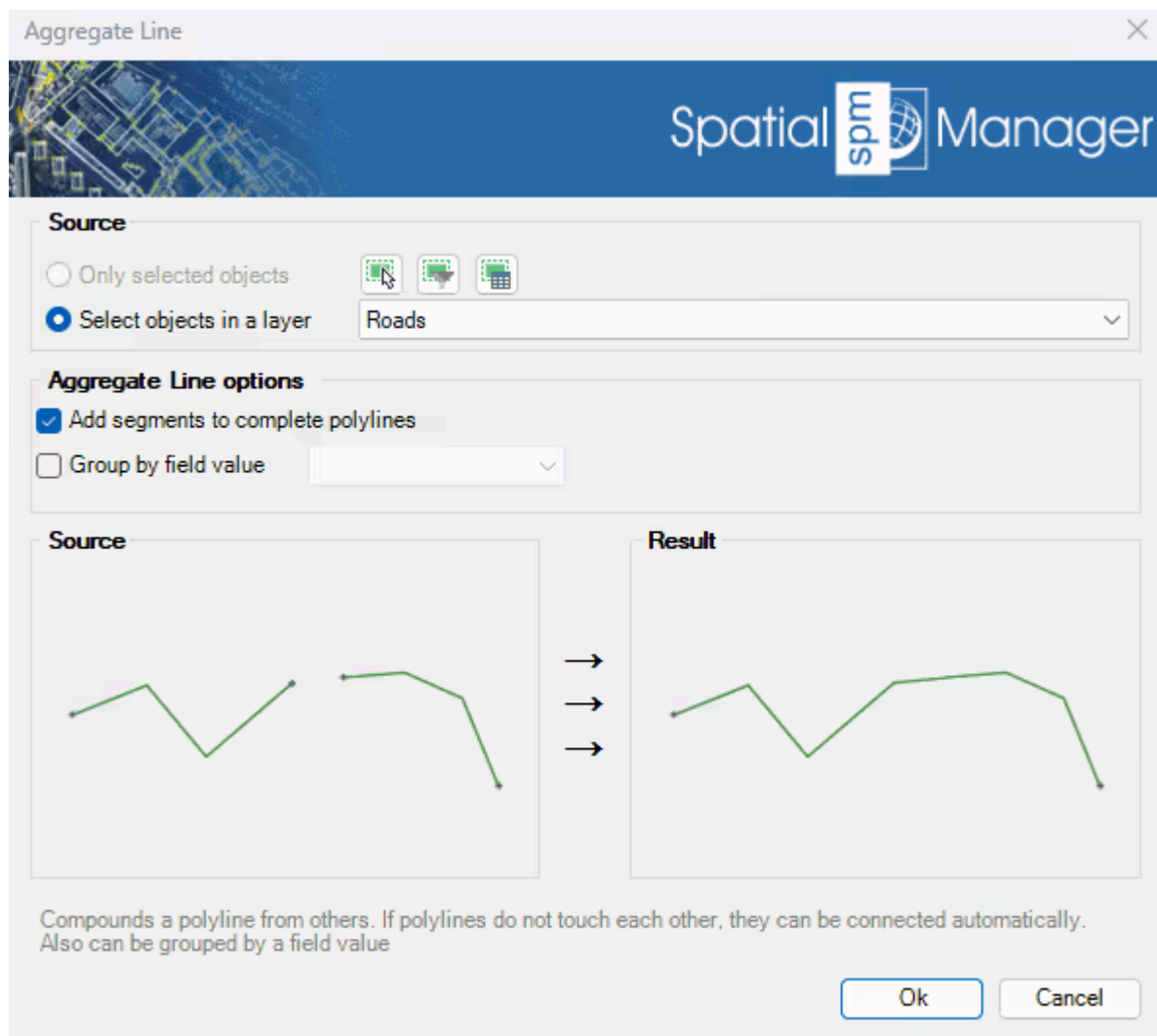
The **SPMCONVERTPOLYLINE** command converts polylines between different ZWCAD polyline types (lightweight polylines, heavy polylines, 2D polylines, 3D polylines, etc.).



'SPMCONVERTPOLYLINE' command on ribbon

Convert Polyline Options

- **Source:** select the polylines to convert (review [selection control options](#)).



'SPMCONVERTPOLYLINE' options

Convert Polyline video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

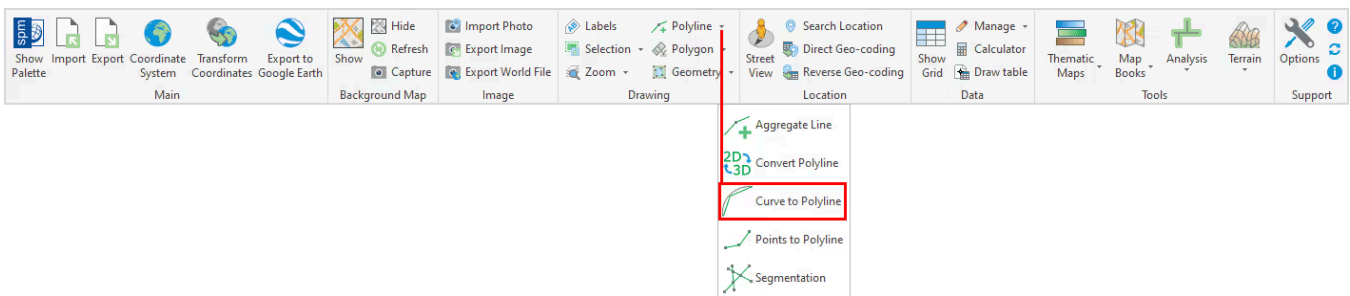
Curve to Polyline

Available on edition

Professional

Converts complex curve geometries—such as arcs, splines, and circles—into polyline objects. This transformation simplifies editing and enhances compatibility with CAD and GIS operations. It is especially useful when preparing data for export, analysis, or further modification within the drawing..

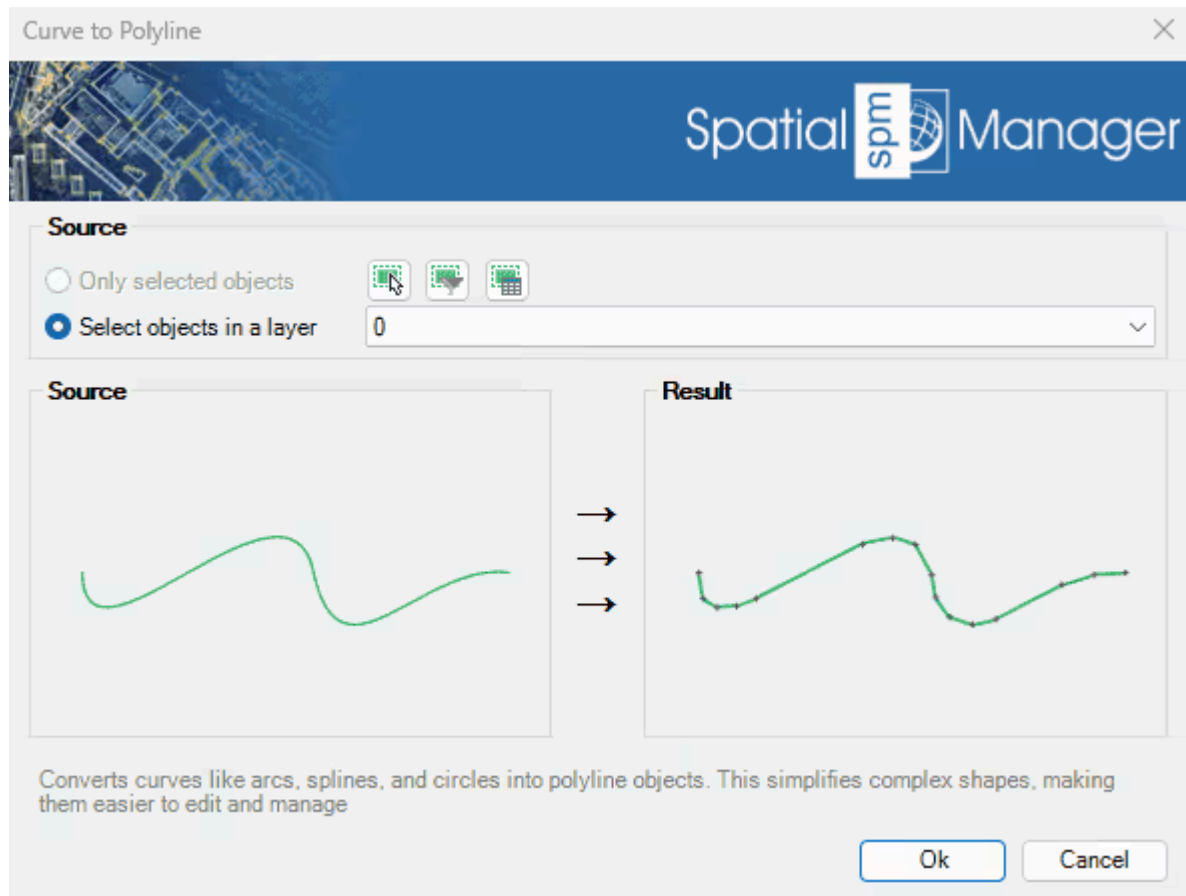
The **SPMCURVETOPOLYLINE** command converts curved entities (arcs, circles, ellipses, splines, polylines with arc segments) into polylines composed only of straight line segments.



'SPMCURVETOPOLYLINE' command on ribbon

Curve to Polyline Options

- **Source:** select the polylines to convert (review [selection control options](#)).



'SPMCURVETOPOLYLINE' options

Curve to Polyline video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

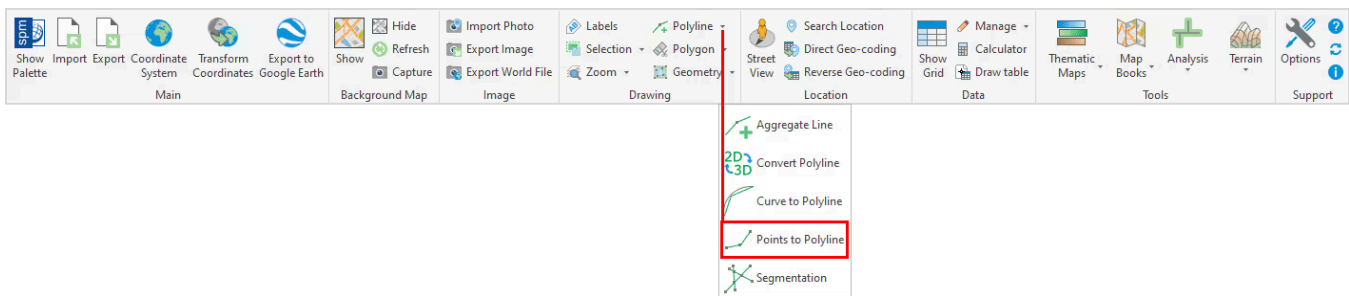
Points to Polyline

Available on edition

Professional

Transforms individual points into continuous polylines by connecting them in the order they appear or based on a selected attribute. This feature is ideal for generating linear features such as routes or boundaries from point data. Points can be grouped by a specific data field, allowing for the creation of multiple polylines from categorized point sets..

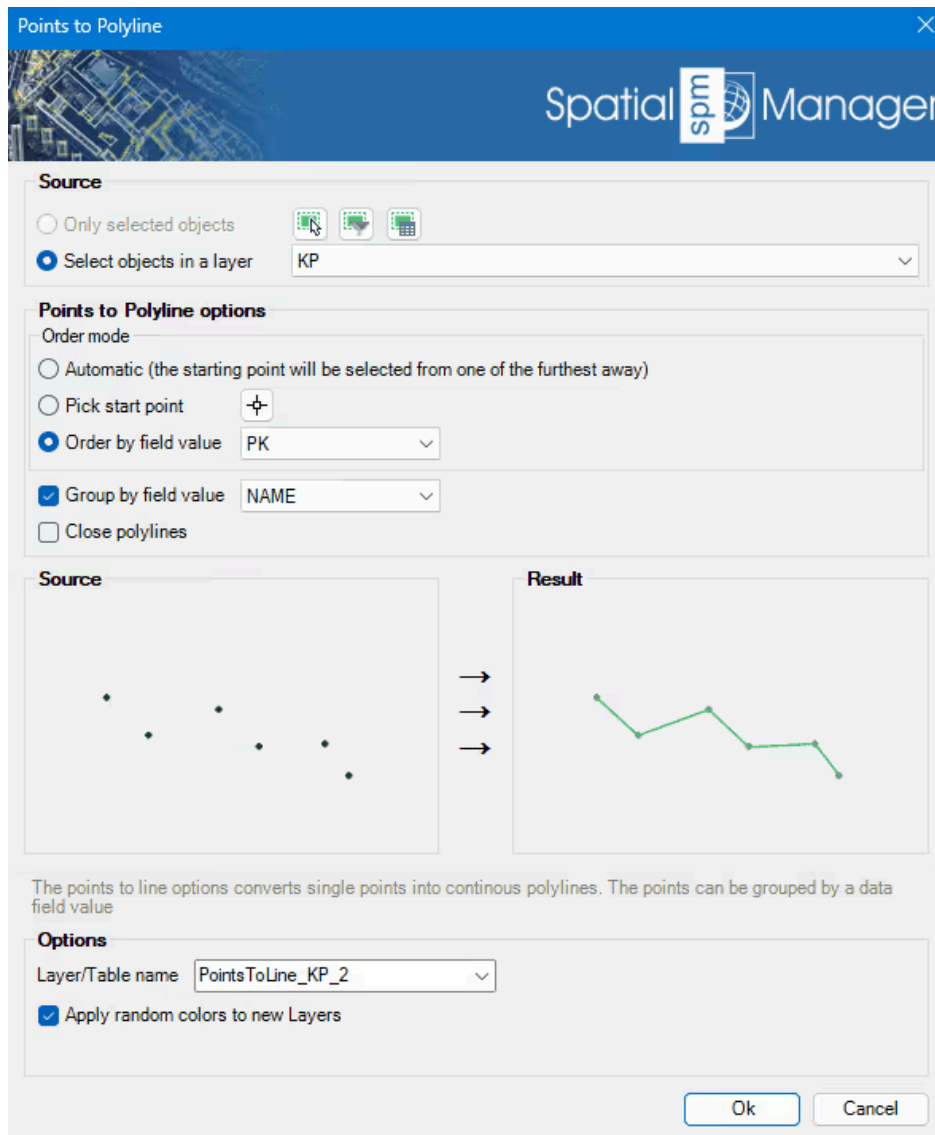
The **SPMPOINTSTOLINE** command creates polylines from a set of points.



'SPMPOINTSTOLINE' command on ribbon

Points to Polyline Options

- **Source:** select the points to convert (review [selection control options](#)).
- **Points to Polyline options**
 - *Order mode:*
 - *Automatic:* The polyline creation begins at the furthest point from all selected points. Each following point is selected as the nearest point from those remaining.
 - *Pick start point:* If the point arrangement makes the previous method unsuitable, you can manually select the start point on the drawing. Subsequent points are then selected as the nearest remaining point.
 - *Order by field value:* If the points have an associated field value, you can choose to create the polyline based on that value ascending order.
 - *Group by field value:* If the points have an associated field value, you can choose to create separate polylines for each unique field value.
 - *Close polyline:* If checked, the last point will be connected to the first point to close the polyline.
- **Options**
 - *Layer/Table name:* specify the layer where the created polylines will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.



'SPMPOINTSTOLINE' options

Points to Polyline video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

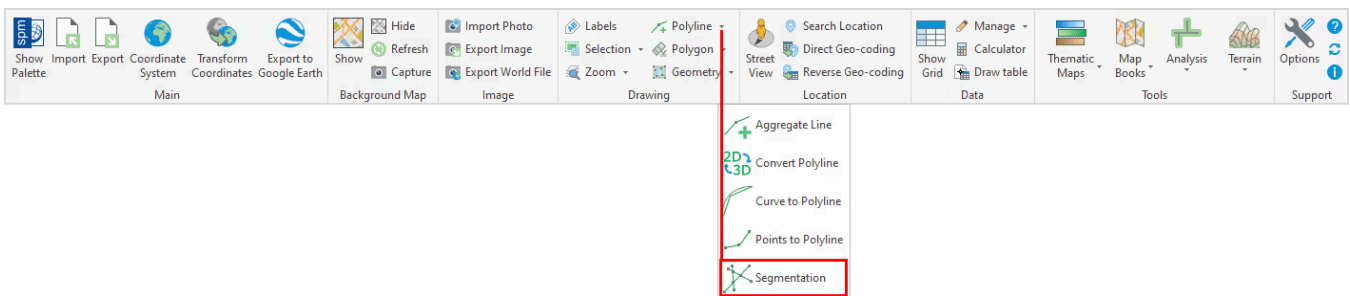
Segmentation

Available on edition

Professional

Identifies intersections and automatically splits complex linear geometries into simpler line segments. This process is useful for preparing data for topological analysis, editing, or export to systems that require simpler geometry structures..

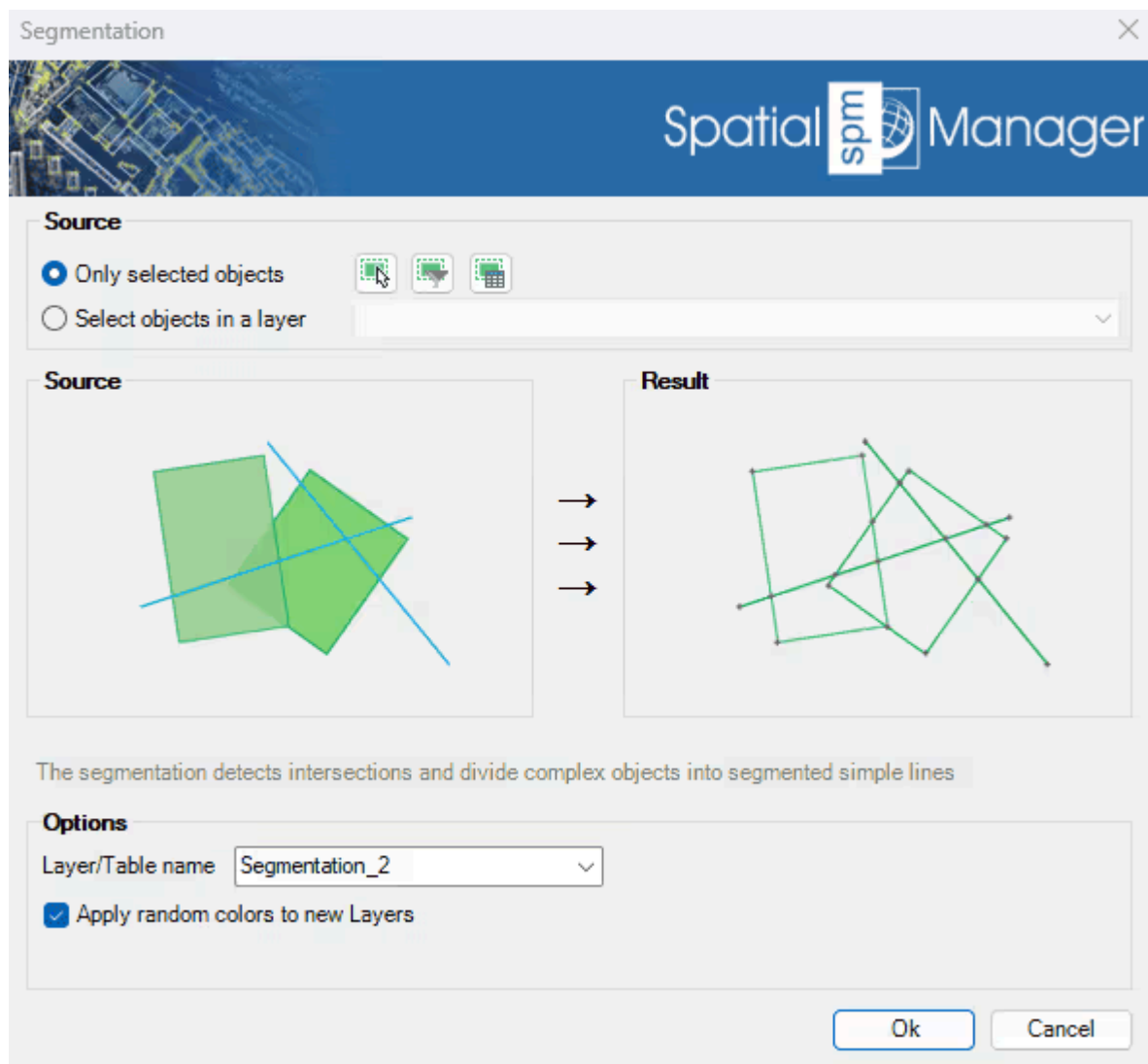
The **SPMSEGMENTATION** command splits polylines or polygons at all intersection points with other polylines in the selection, creating a network of non-overlapping segments.



'SPMSEGMENTATION' command on ribbon

Segmentation Options

- **Source:** select the entities to segmentize (review [selection control options](#)).
- **Options**
 - *Layer/Table name:* specify the layer where the created polylines will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.



'SPMSEGMENTATION' options

Segmentation video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

Polygon Tools

Available on edition**Professional**

A set of polygon tools designed to simplify and enhance your spatial editing tasks. Dividing polygons into smaller sections, generating polygons from point sets, merging adjacent polygons, or creating polygons from intersecting lines.

Divide Polygon	215
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DOCUMENTATION

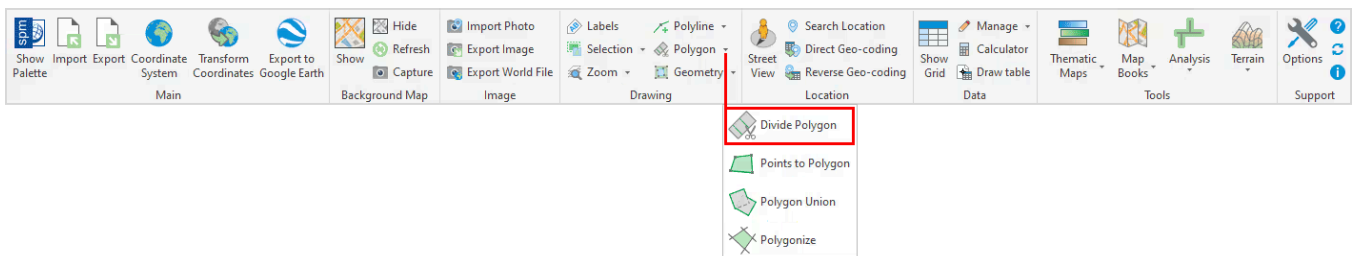
Divide Polygon

Available on edition

Professional

Splits polygons into smaller sections along lines parallel to a defined direction. This division can be based on a fixed number of parts, equal-area segments, equidistant stripes, or custom area percentages. The tool is ideal for land parceling, planning layouts, or preparing zoning maps, offering precision and flexibility in how the divisions are calculated and applied..

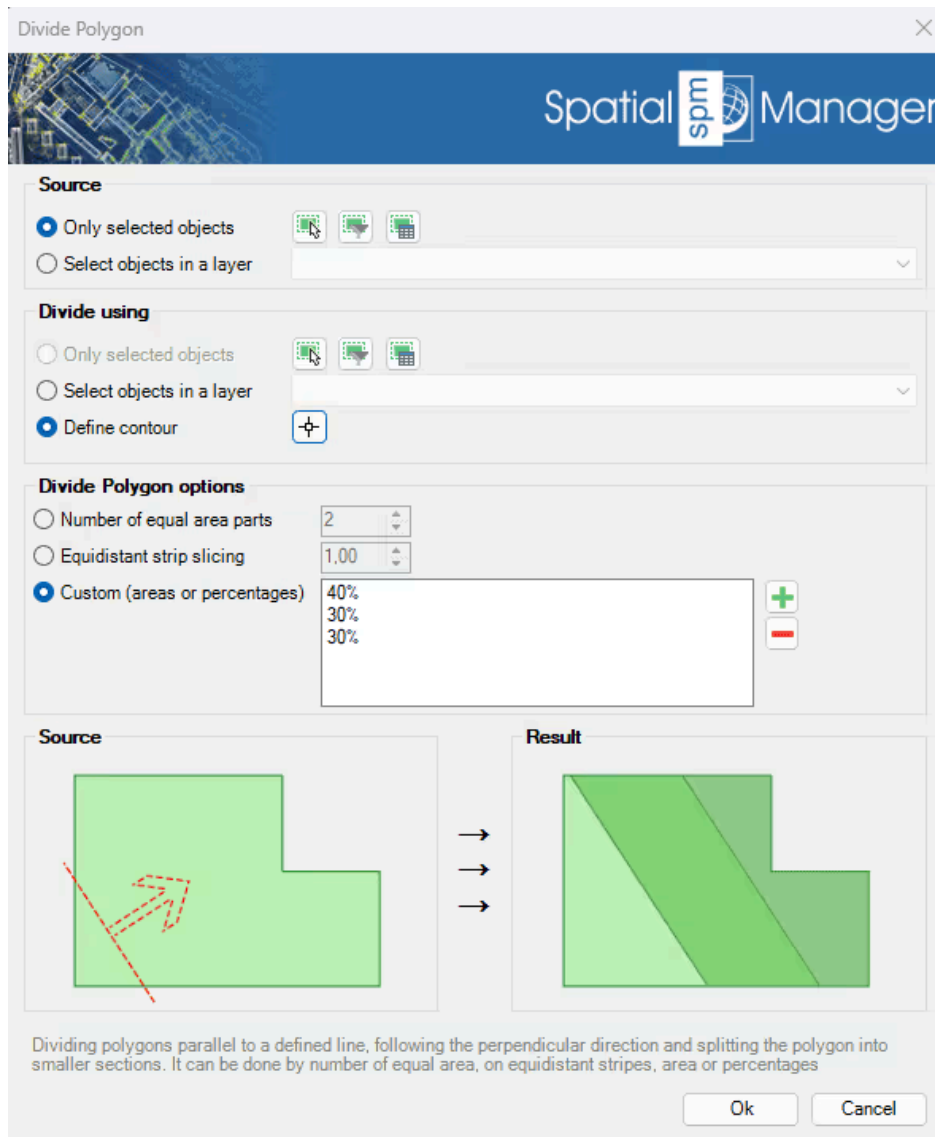
The **SPMDIVIDEPOLYGON** command provides powerful tools for subdividing polygon entities (closed polylines) into smaller parts using various division methods.



'SPMDIVIDEPOLYGON' command on ribbon

Divide Polygon Options

- **Source:** select the entities to divide (review [selection control options](#)).
- **Divide using:** select the line to divide by, or draw it manually. The line direction determines how the polygon will be divided.
- **Divide Polygon options**
 - *Number of equal area parts:* specify the number of equal area parts to divide the polygon into.
 - *Equidistant strip slicing:* specify the distance (in drawing units) between each slice to create equidistant strips.
 - *Custom (areas or percentages):* specify custom fixed areas and/or percentages for division.



'SPMDIVIDEPOLYGON' options

Divide Polygon video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

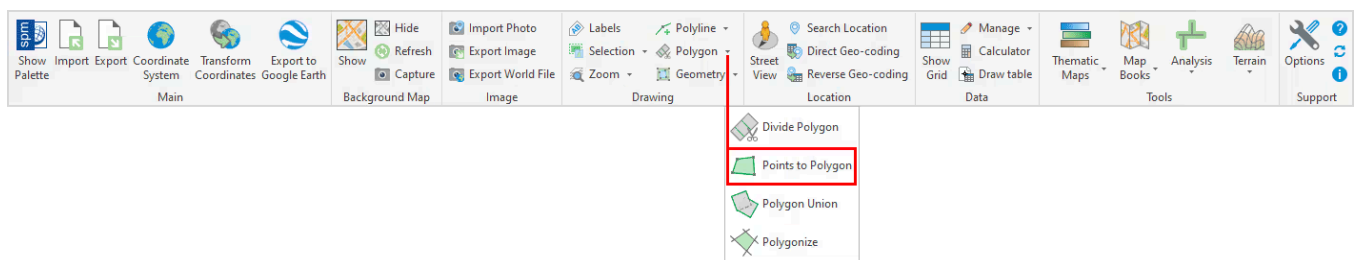
Points to Polygon

Available on edition

Professional

Creates closed polygon geometries by connecting individual points in sequence. This tool is particularly useful when reconstructing area features from boundary points, such as land plots or enclosures. Points can be grouped by a specified data field, enabling the generation of multiple polygons based on categorized point sets..

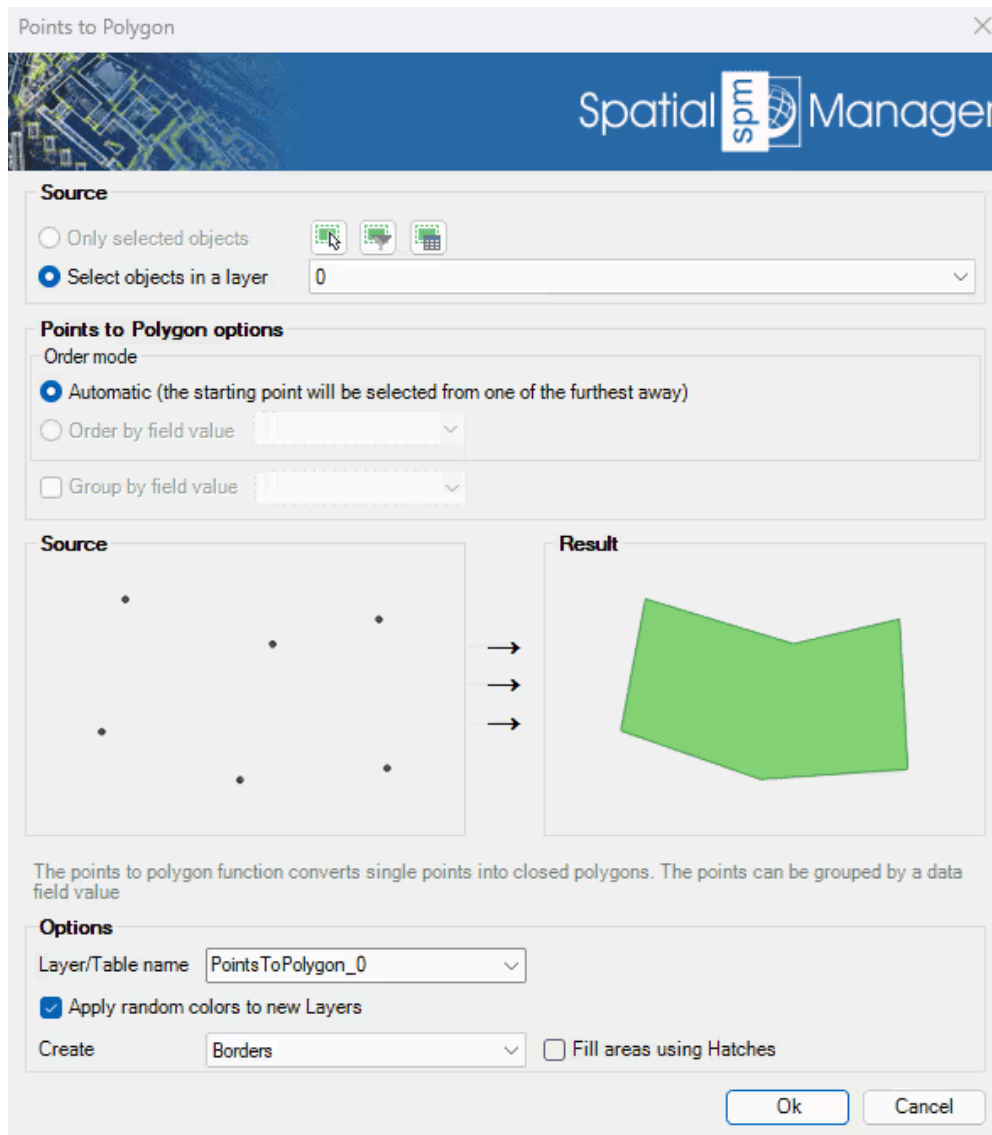
The **SPMPOINTSTOPOLYGON** command creates closed polygon entities from sets of points.



'SPMPOINTSTOPOLYGON' command on ribbon

Points to Polygon Options

- **Source:** select the points to convert (review [selection control options](#)).
- **Points to Polygon options**
 - *Order mode:*
 - *Automatic:* The polygon creation begins at the furthest point from all selected points. Each following point is selected as the nearest point from those remaining.
 - *Order by field value:* If the points have an associated field value, you can choose to create the polygon based on that value ascending order.
 - *Group by field value:* If the points have an associated field value, you can choose to create separate polygons for each unique field value.
- **Options**
 - *Layer/Table name:* specify the layer where the created polygons will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.
 - *Fill with hatches:* the resulting closed polylines can be filled with hatches.



'SPMPOINTSTOPOLYGON' options

Points to Polygon video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

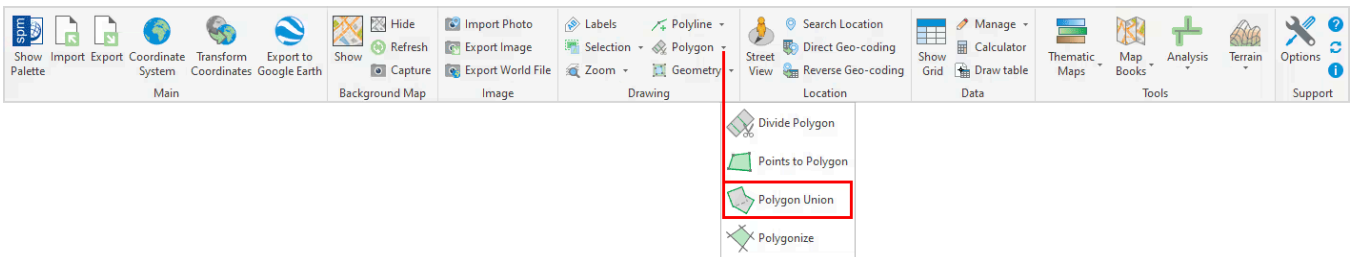
Polygon Union

Available on edition

Professional

Combines overlapping or adjacent polygons into a single, unified geometry. This tool simplifies complex datasets by removing internal boundaries and merging connected areas. It is essential for consolidating features such as land parcels, administrative zones, or habitat regions, ensuring cleaner and more efficient spatial data..

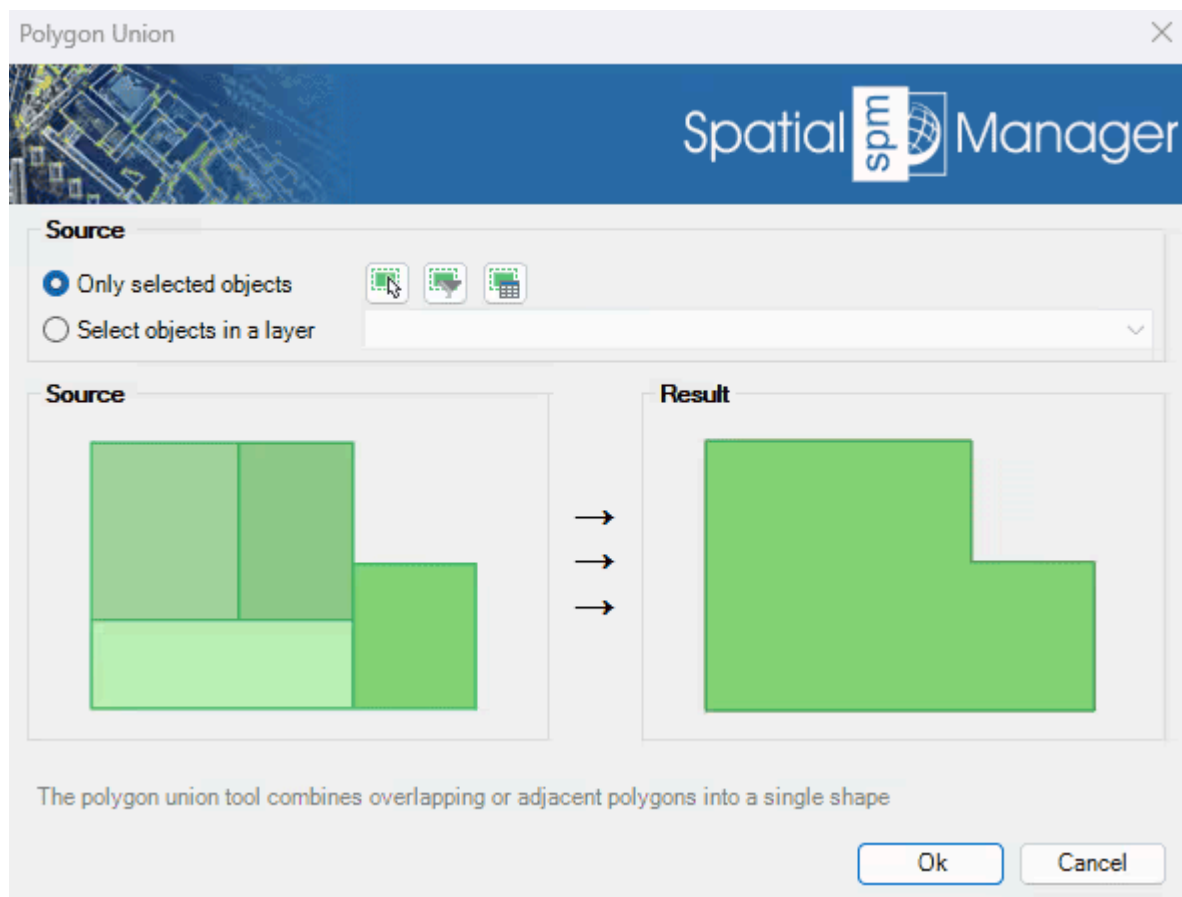
The **SPMPOLYGONUNION** command merges overlapping or adjacent polygon entities into unified polygons, eliminating internal boundaries.



'SPMUNION' command on ribbon

Polygon Union Options

- **Source:** select the points to convert (review [selection control options](#)).



'SPMUNION' options

Polygon Union video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

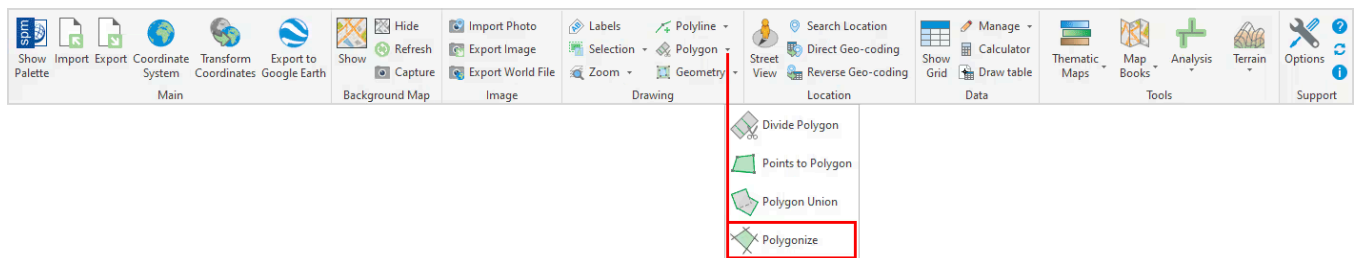
Polygonize

Available on edition

Professional

Automatically detects intersections between line geometries and generates polygons from the resulting closed shapes. This tool is ideal for transforming networks of lines—such as cadastral boundaries or urban layouts—into usable polygon features..

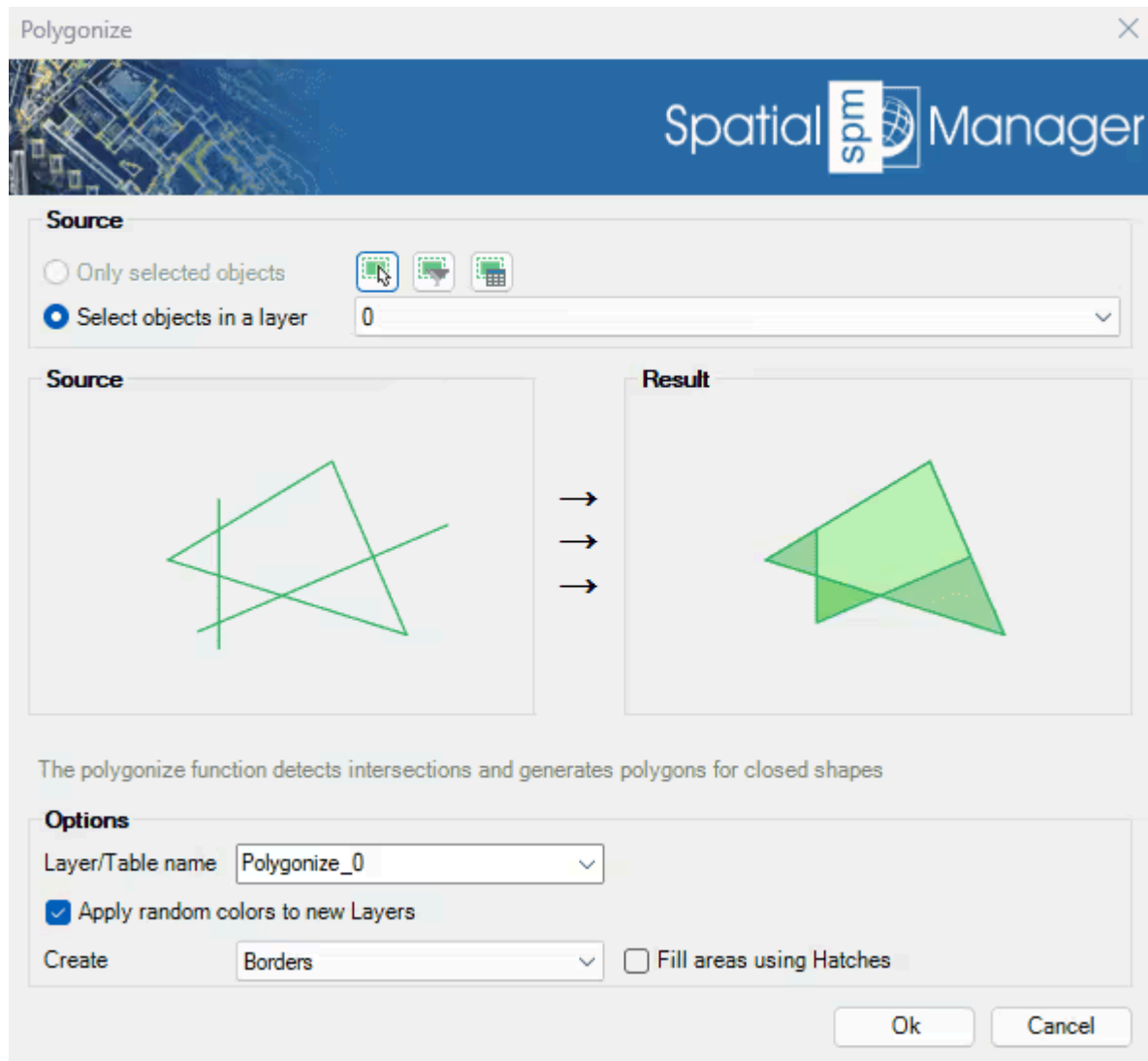
The **SPMPOLYGONIZE** command converts closed polylines into polygon entities, or creates polygons from collections of polylines that form closed boundaries.



'SPMPOLYGONIZE' command on ribbon

Polygon Union Options

- **Source:** select the points to convert (review [selection control options](#)).
- **Options**
 - *Layer/Table name:* specify the layer where the created polygons will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.
 - *Fill with hatches:* the resulting closed polylines can be filled with hatches.



'SPMPOLYGONIZE' options

Polygonize video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

Geometry Editing

Available on edition**Professional**

A wide range of functions to edit, reshape, and analyze spatial geometries. From aligning datasets using Rubber Sheet, cutting or trimming features with Break and Trim, to generating new geometries such as Convex Hull, Envelope, or Triangulation. Additional capabilities like Simplify reduce complexity in shapes or Vertex extraction are available.

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Triangulation	237
Vertex extraction	239

DOCUMENTATION

Rubber sheet

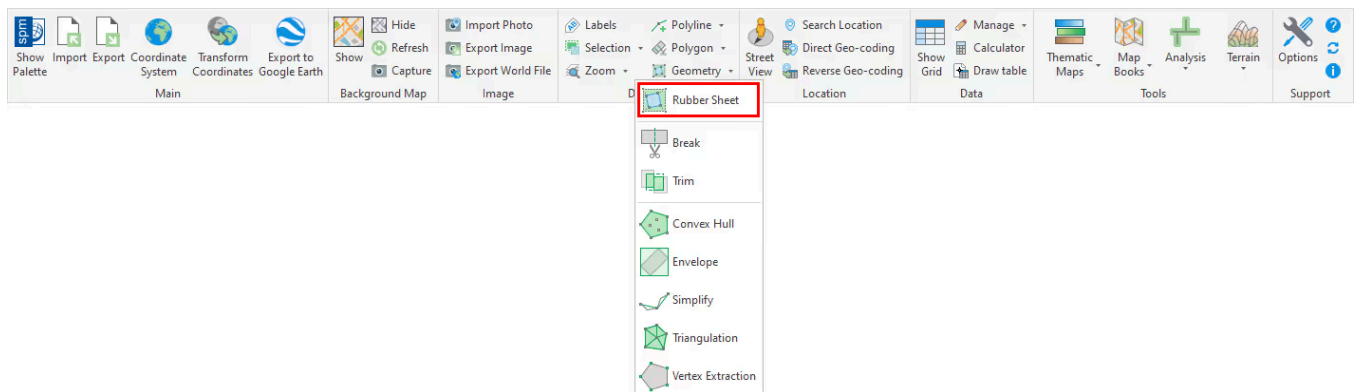
Available on edition

Professional

Geographically align two or more graphic datasets by defining control points that match known coordinates between them. This process adjusts the geometry of one dataset to fit another, correcting positional inaccuracies and improving spatial consistency across different data sources. It is especially useful when integrating legacy drawings, scanned maps, or misaligned layers into a unified coordinate framework..

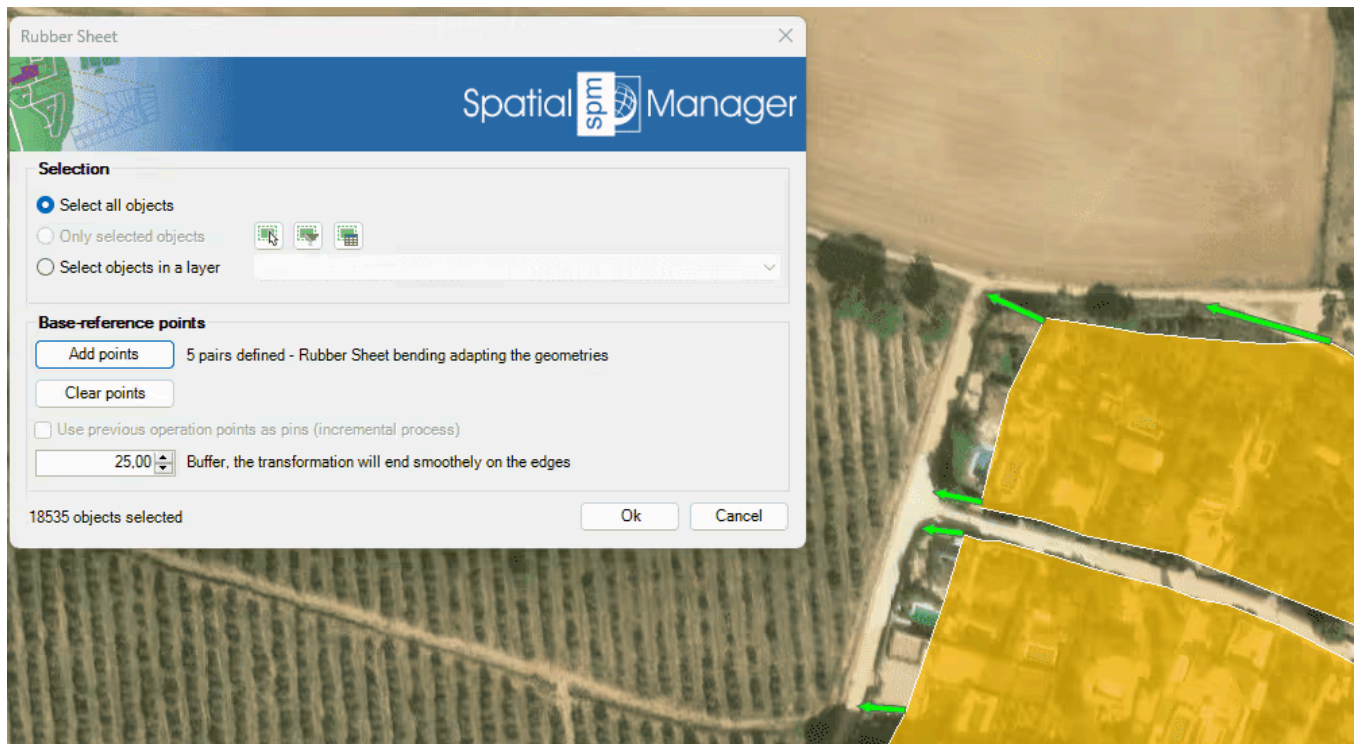
Transform entities in order to geographically align them based on reference points

You can use the **SPMRUBBERSHEET** command of Spatial Manager™ for ZWCAD to elastically deform (Rubber sheet) a set of selected entities by defining a set of source points and the equivalent set of target points.



Rubber Sheet command in the Spatial Manager™ for ZWCAD ribbon

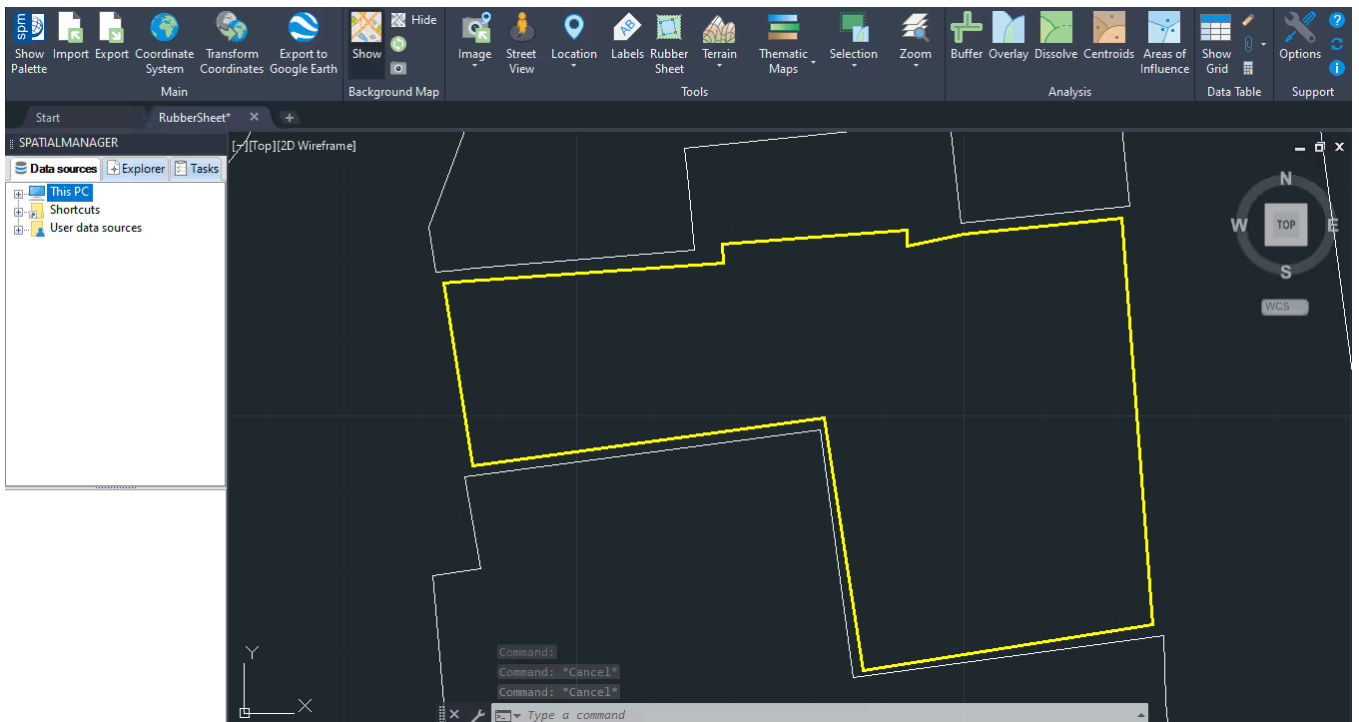
For example, you can use this command when stretching a new subdivision map into a preexisting parcel map.



Rubber Sheet command window

In the window of this command you can:

- **Select the entities to deform** (review [selection control options](#)).
- **Base-reference points.**
 - *Add points:* You can add as many pairs of source/target points as you want (at least one pair) to define the desired transformation. The transformation method will vary depending on the number of base-reference points used.
 - 1 pair of points: Translation, a simple offset according to the pair of points.
 - 2 pairs of points: Translation, uniform scaling and rotation over the two pairs of points.
 - 3 pairs of points: Affine transformation for matching.
 - 4 or more pairs of points: Rubber Sheet bending, adapting the geometries (recommended).
 - *Clear points:* Eliminates any previously defined pair of points.
 - *Use previous operation points as pins:* Allows keeping previously defined points anchored in a transformation, which allows reaching the required result through several transformations incrementally.
- **Buffer.**
 - You can define a buffer width so that the calculations of the sides of the entities are better adjusted and without loss of precision or addition of superfluous vertices.



Rubber Sheet transformation sample

*Note: For **raster images**, only up to two pairs of points can be used, so the transformation will be limited to translation, uniform scaling and rotation. Undesired results may occur if more base points are selected.*

DOCUMENTATION

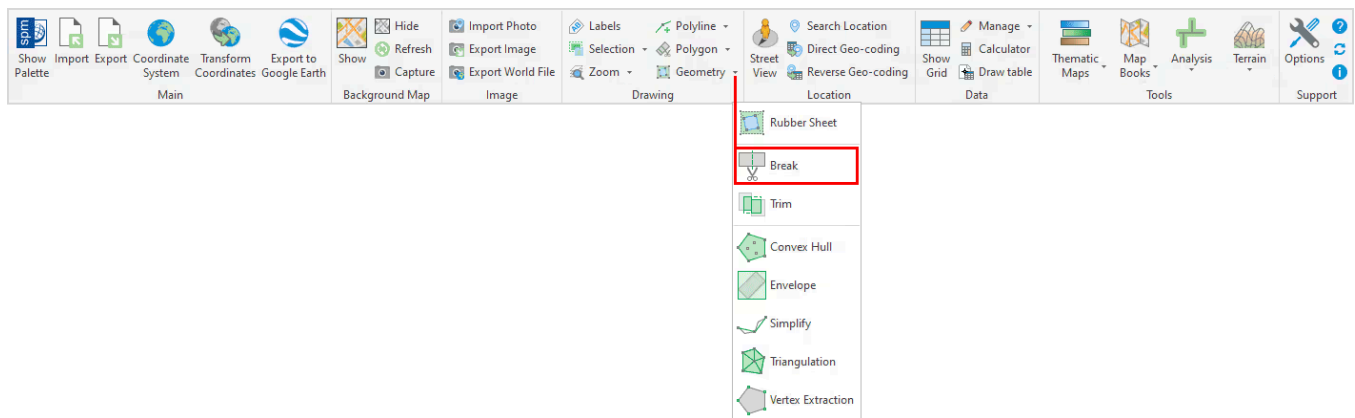
Break

Available on edition

Professional

Splits geometries that intersect a specified line, effectively breaking them at the points of intersection. This tool is useful for editing or preparing data for downstream processes that require segmented features, such as network analysis or land subdivision..

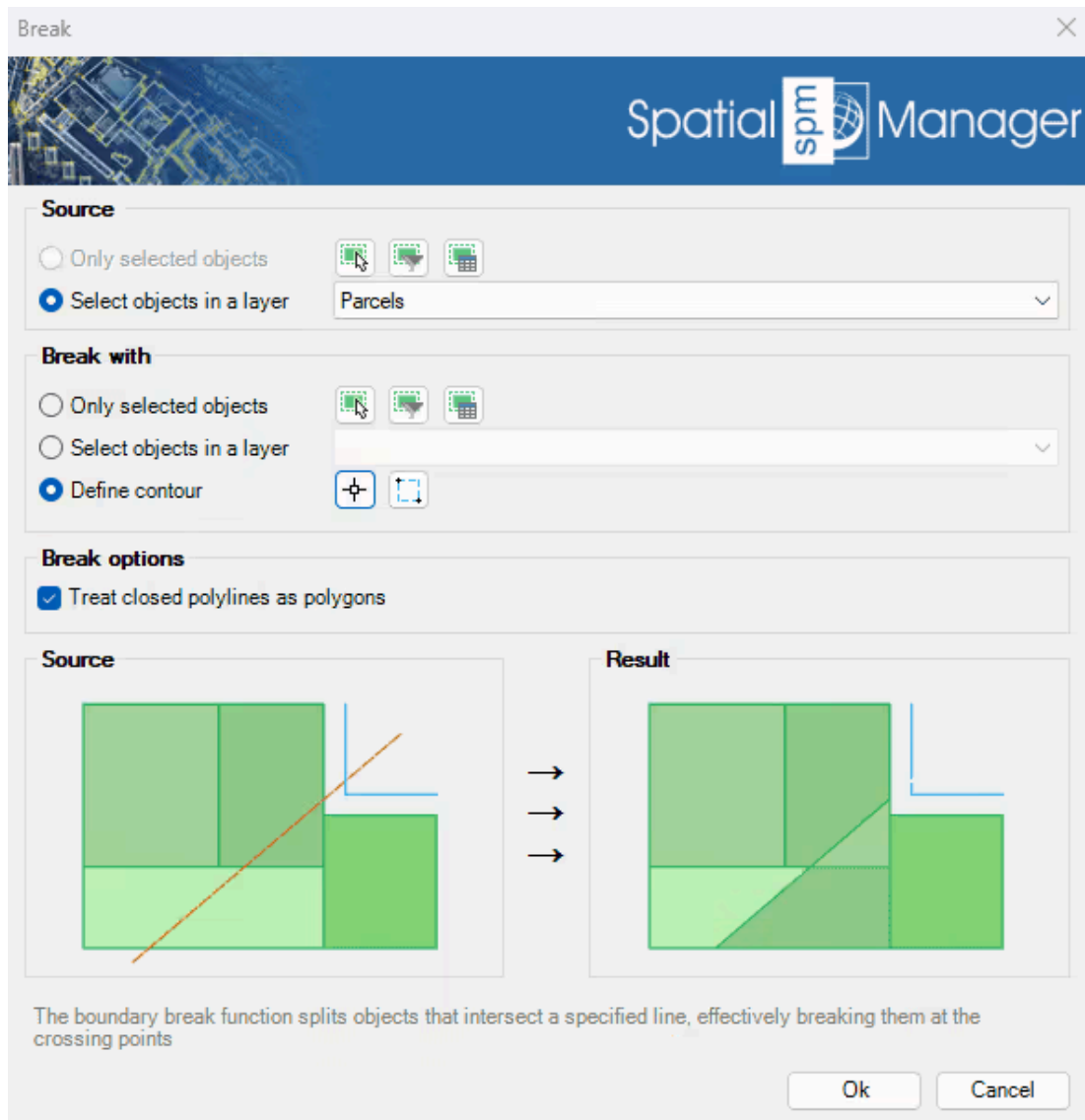
The **SPMBREAK** command splits entities at their intersection points with boundary entities, creating separate entities from each segment.



'SPMBREAK' command on ribbon

Break Options

- **Source:** select the entities to divide (review [selection control options](#)).
- **Break with:** select the line to break by, or draw it manually.
- **Break options**
 - *Treat closed polylines as polygons:* if checked, closed polylines will be treated as polygons for breaking purposes, resulting in new closed polylines. If not checked, the result will be opened polylines.



'SPMBREAK' options

Break video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

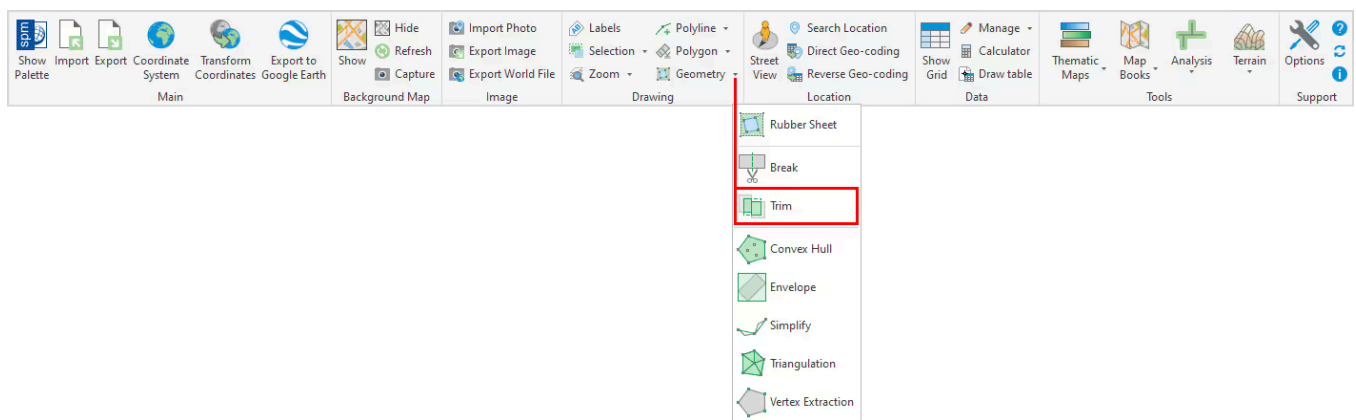
Trim

Available on edition

Professional

Enables the use of a closed boundary as a trimming edge to cut intersecting geometries. Users can choose whether to retain the elements inside or outside the boundary, making it a powerful tool for refining drawings, isolating areas of interest, or cleaning up spatial data..

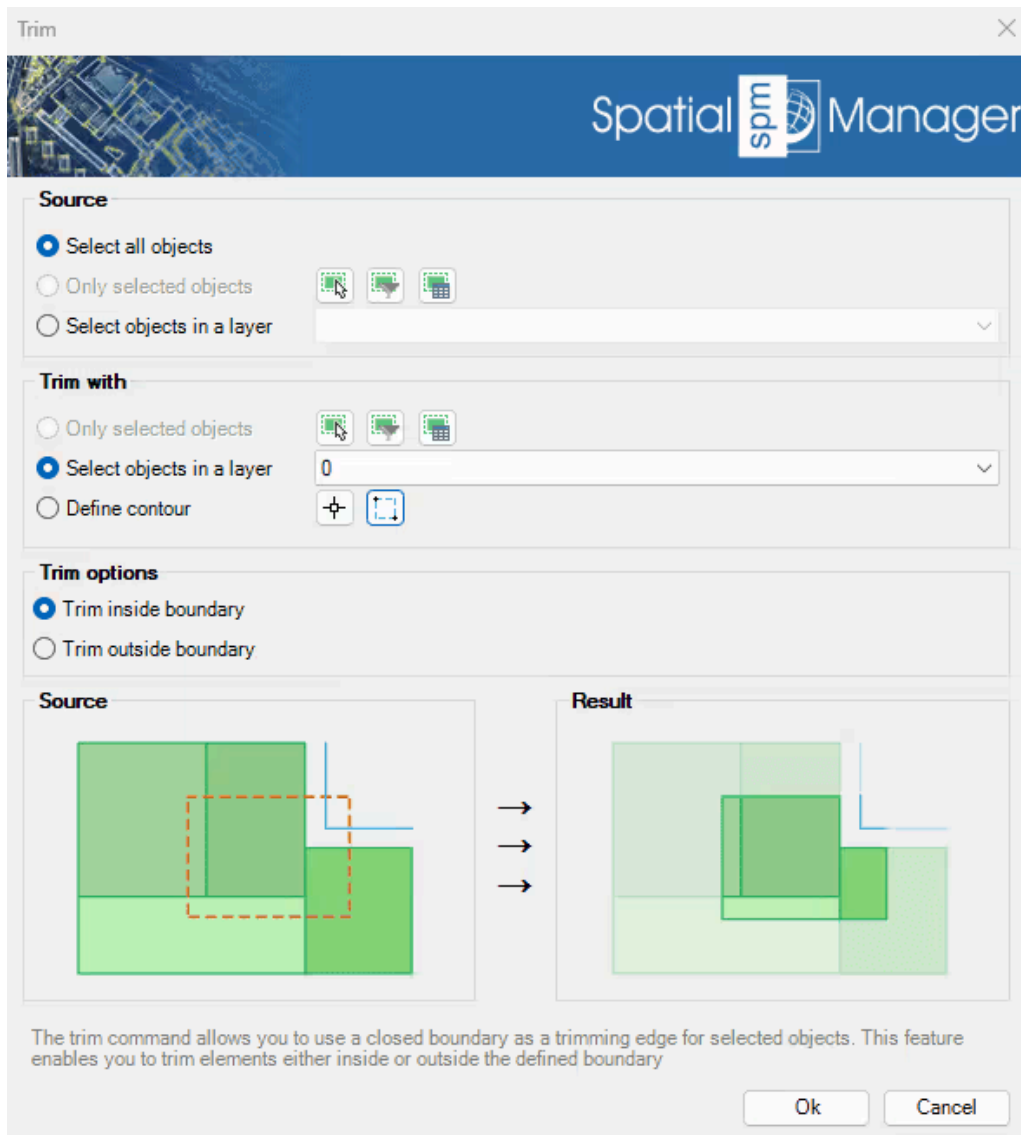
The **SPMTRIM** command removes portions of entities that fall outside (or inside) boundary polygons, keeping only the desired parts.



'SPMTRIM' command on ribbon

Trim Options

- **Source:** select the entities to divide (review [selection control options](#)).
- **Trim with:** select the line to trim by, or draw it manually. The trimming lines should form closed polygons to define the areas to keep or remove.
- **Trim options**
 - *Trim inside boundary:* only the parts of the entities inside the boundary will be kept.
 - *Trim outside boundary:* only the parts of the entities outside the boundary will be kept.



'SPMTRIM' options

Trim video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

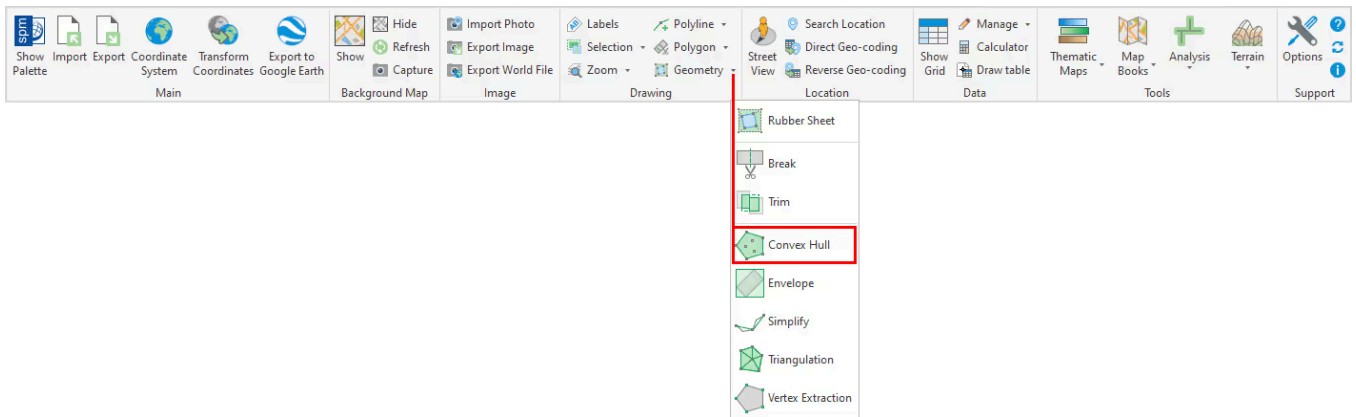
Convex hull

Available on edition

Professional

Generates the smallest convex polygon that completely encloses a selected set of geometries. This operation is useful for creating bounding areas, simplifying complex datasets, and performing spatial analysis. The resulting shape forms the minimal convex envelope around the input features, ensuring optimal coverage with minimal boundary length..

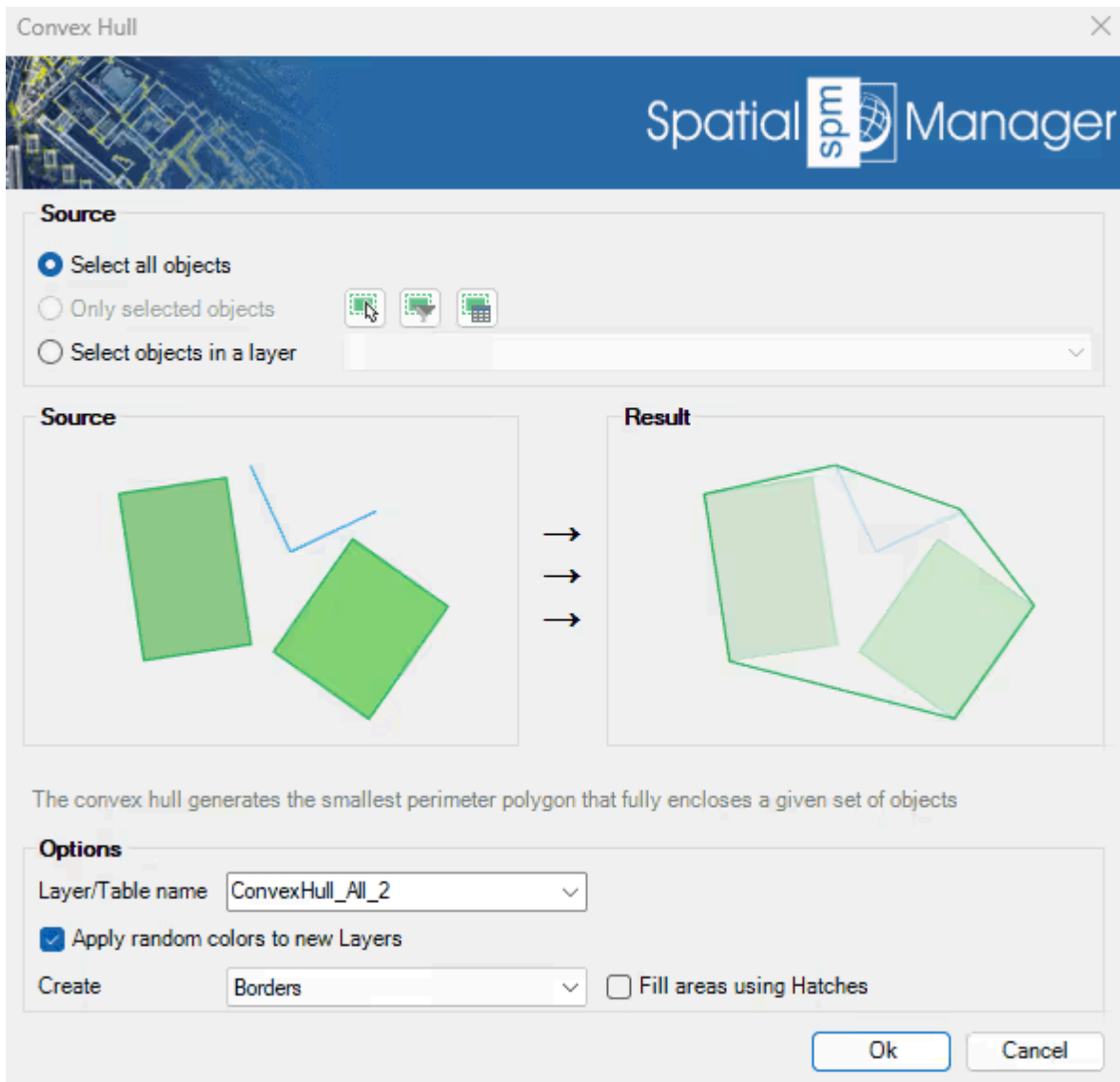
The **SPMCONVEXHULL** command creates the convex hull (convex envelope) of selected entities - the smallest convex polygon that contains all selected features.



'SPMCONVEXHULL' command on ribbon

Convex Hull Options

- **Source:** select the entities to create the convex hull around (review [selection control options](#)).
- **Options**
 - *Layer/Table name:* specify the layer where the created polygons will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.
 - *Fill with hatches:* the resulting closed polylines can be filled with hatches.



'SPMCONVEXHULL' options

Convex Hull video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

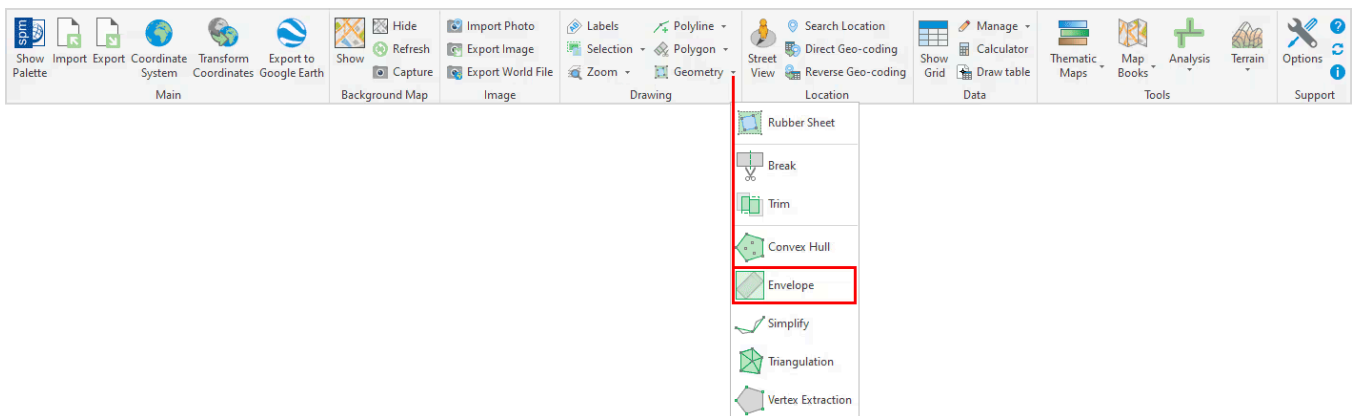
Envelope

Available on edition

Professional

Creates an envelope or bounding box for selected geometries. This refers to the smallest rectangular area that fully contains each object. It is commonly used to generalize shapes, define extents, or prepare spatial data for indexing, visualization, or spatial queries. The result is a simplified and standardized representation of the original geometry's outer limits..

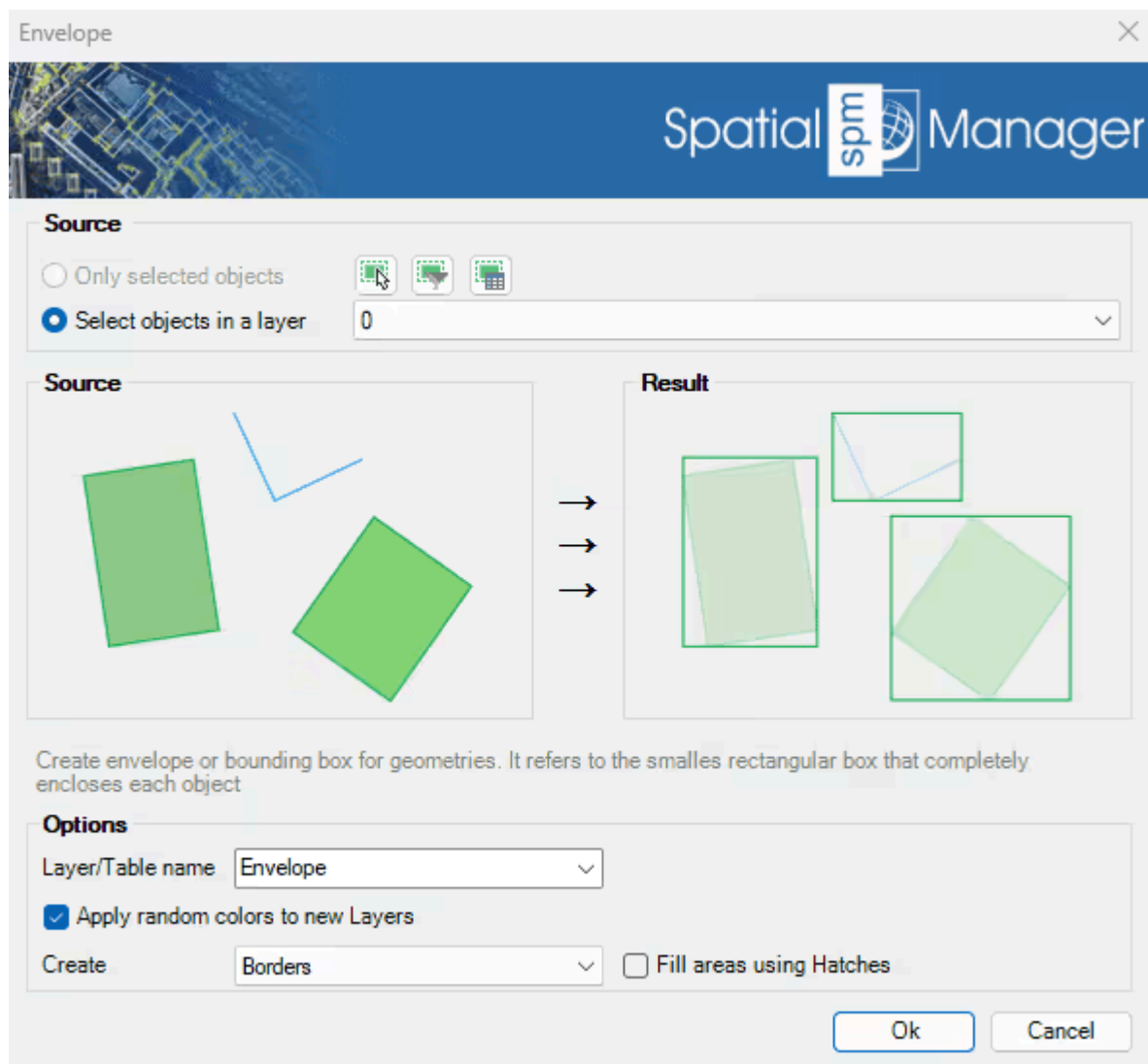
The **SPMENVELOPE** command creates rectangular polygon entities representing the minimum bounding rectangle (envelope) of selected entities.



'SPMENVELOPE' command on ribbon

Envelope Options

- **Source:** select the entities to create the envelope around (review [selection control options](#)).
- **Options**
 - *Layer/Table name:* specify the layer where the created polygons will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.
 - *Fill with hatches:* the resulting closed polylines can be filled with hatches.



'SPMENVELOPE' options

Envelope video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

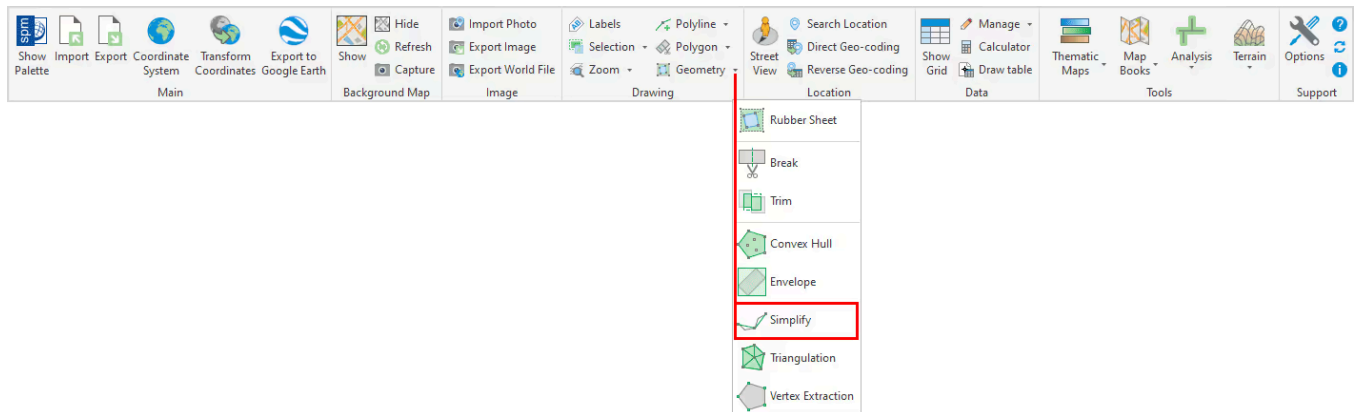
Simplify

Available on edition

Professional

Reduces the number of vertices (nodes) to simplify polylines or polygons, optimizing geometry complexity while maintaining overall shape integrity. This function is useful for improving performance and visualization of spatial data by decreasing detail where appropriate. When working with adjacent polygons, caution is advised as simplification may create unintended intersections or holes. The tolerance parameter controls the maximum allowed deviation between the simplified geometry and the original..

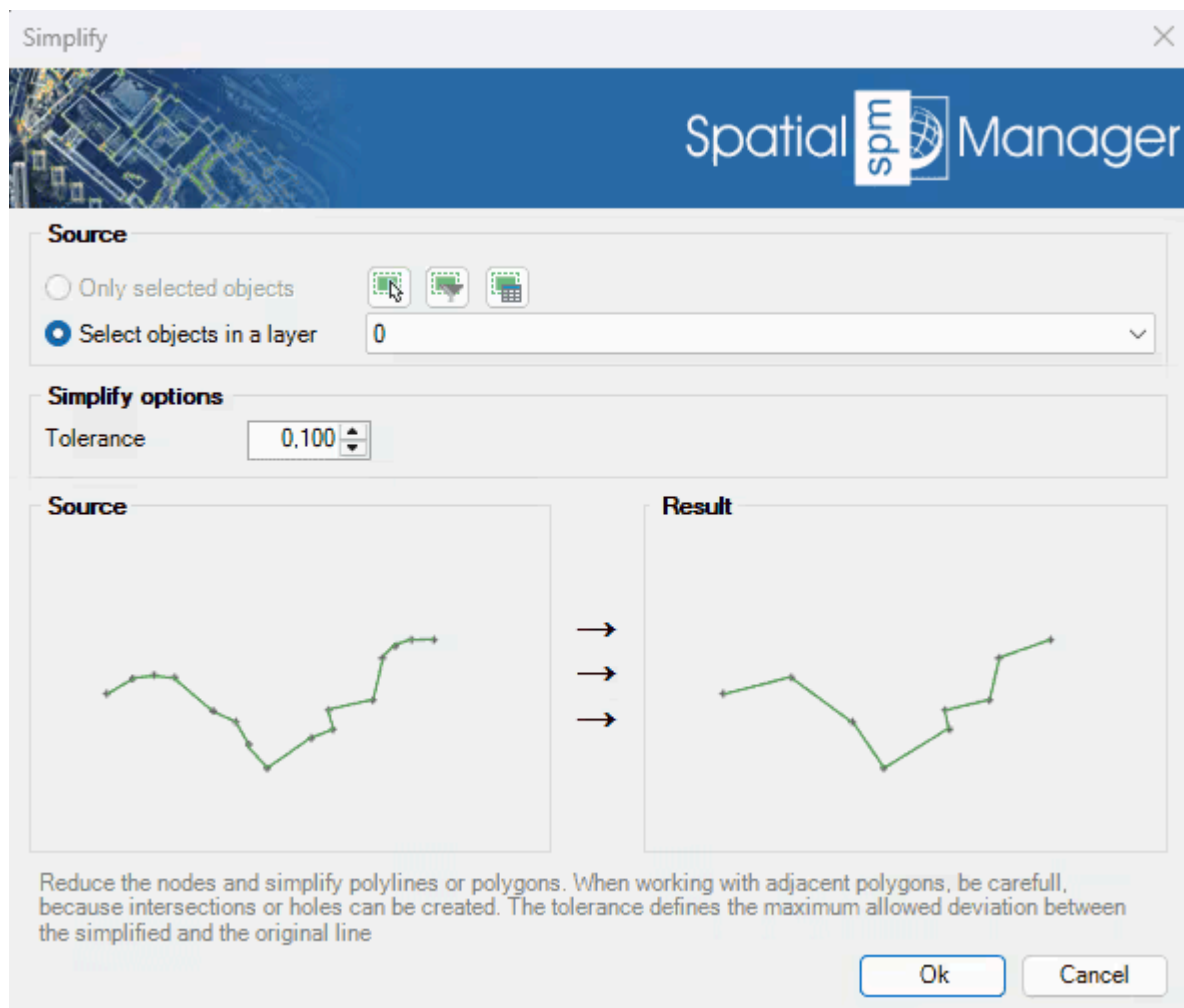
The **SPMSIMPLIFY** command reduces the complexity of polyline geometries by removing unnecessary vertices while preserving the overall shape.



'SPMSIMPLIFY' command on ribbon

Simplify Options

- **Source:** select the entities to create the envelope around (review [selection control options](#)).
- **Tolerance:** defines the maximum permitted deviation between the simplified geometry and the original.



'SPMSIMPLIFY' options

Simplify video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

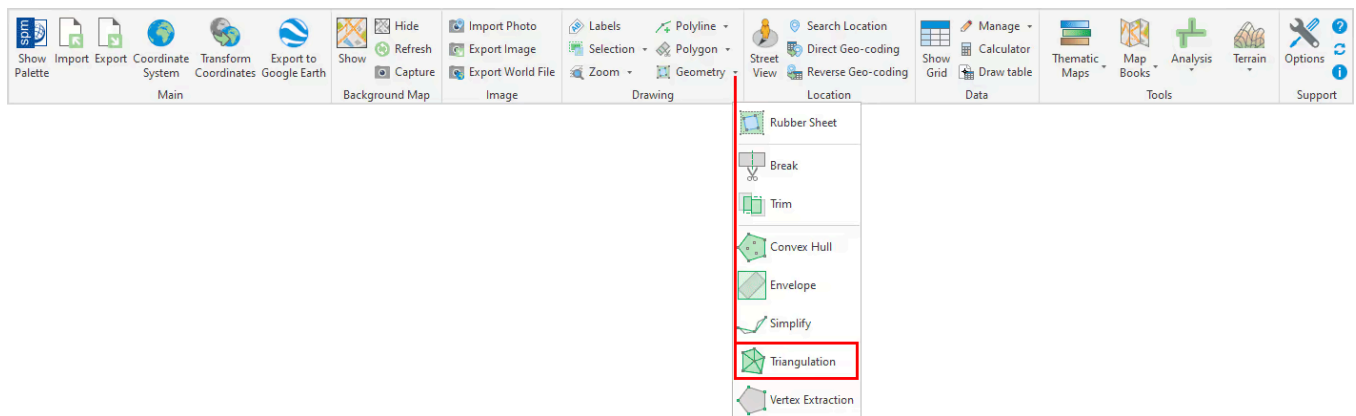
Triangulation

Available on edition

Professional

The Triangulation from Points tool generates a mesh of interconnected triangles by connecting a given set of points. This process creates a network of triangles that can be used for surface modeling, terrain analysis, and interpolation of spatial data. The resulting triangular mesh provides a foundation for advanced GIS and CAD operations, ensuring accurate representation of complex spatial structures..

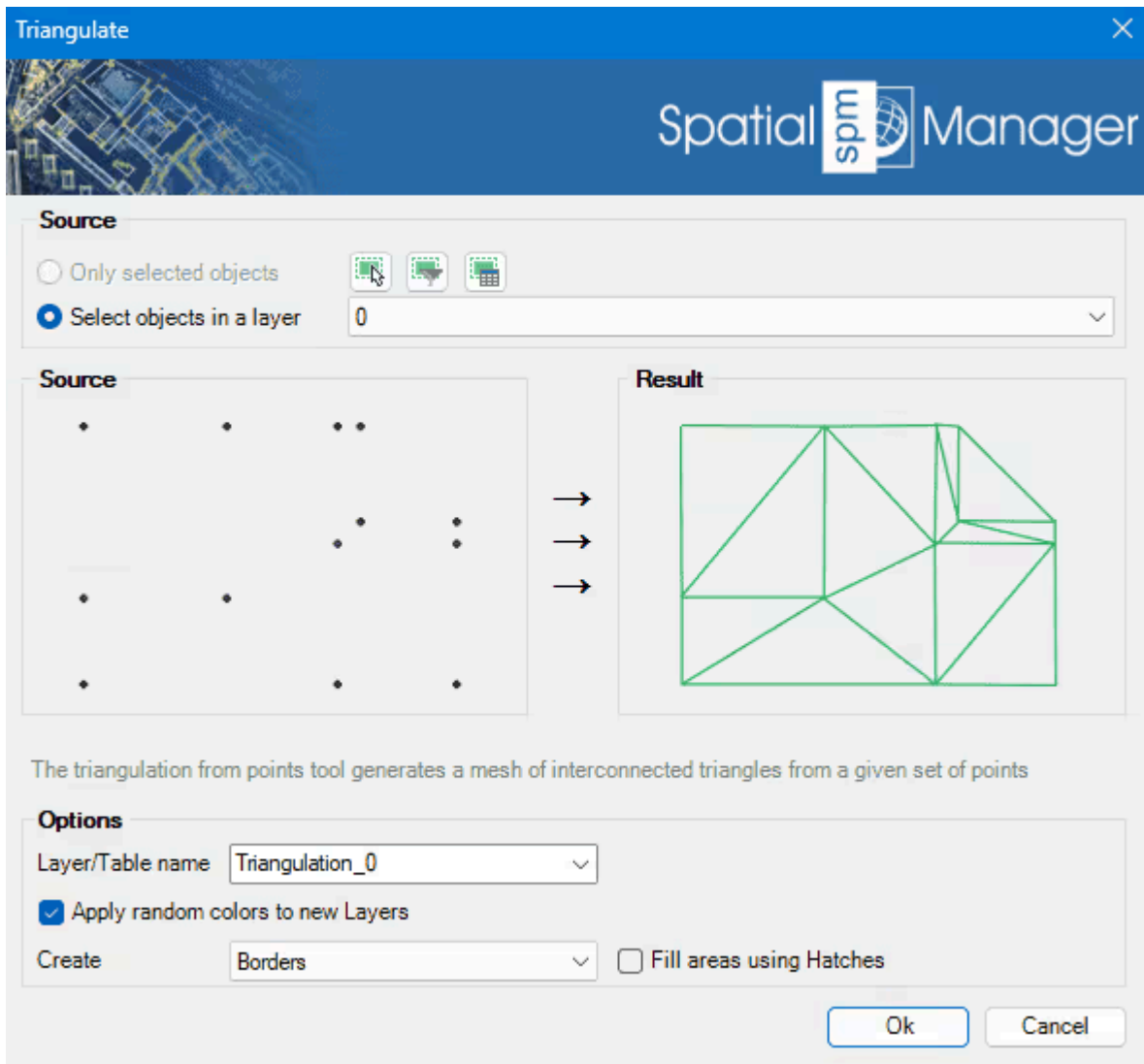
The **SPMTRIANGULATION** command creates a triangulated irregular network (TIN) from the vertices of selected entities or from point entities.



'SPMTRIANGULATION' command on ribbon

Triangulation Options

- **Source:** select the entities to create triangulation from their vertices (review [selection control options](#)).
- **Options**
 - *Layer/Table name:* specify the layer where the created polygons will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.
 - *Fill with hatches:* the resulting closed polylines can be filled with hatches.



'SPMTRIANGULATION' options

Triangulation video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

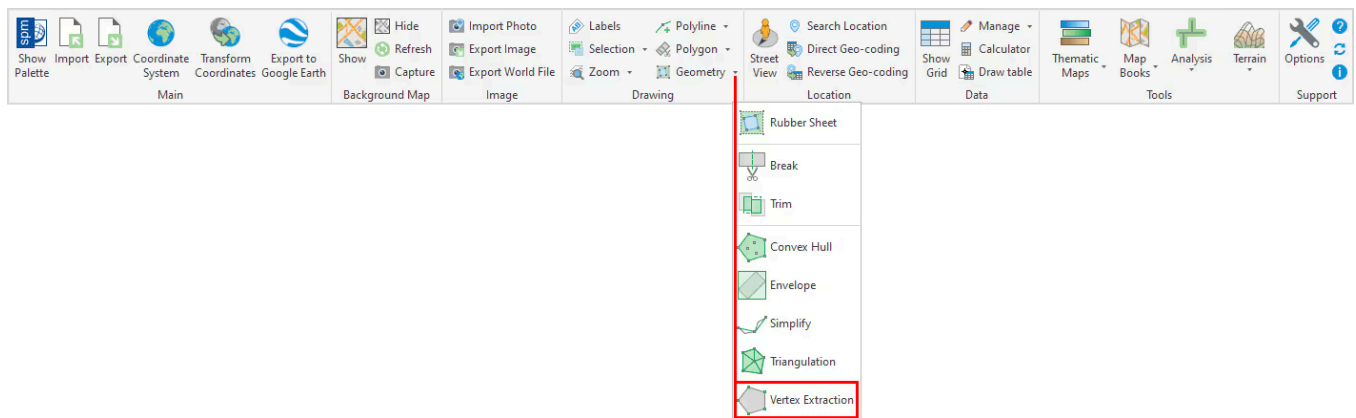
Vertex extraction

Available on edition

Professional

The Vertex Extraction tool generates individual point features from the vertices of existing geometries. This function is useful for analyzing, editing, or exporting key coordinate points that define lines, polylines, or polygons..

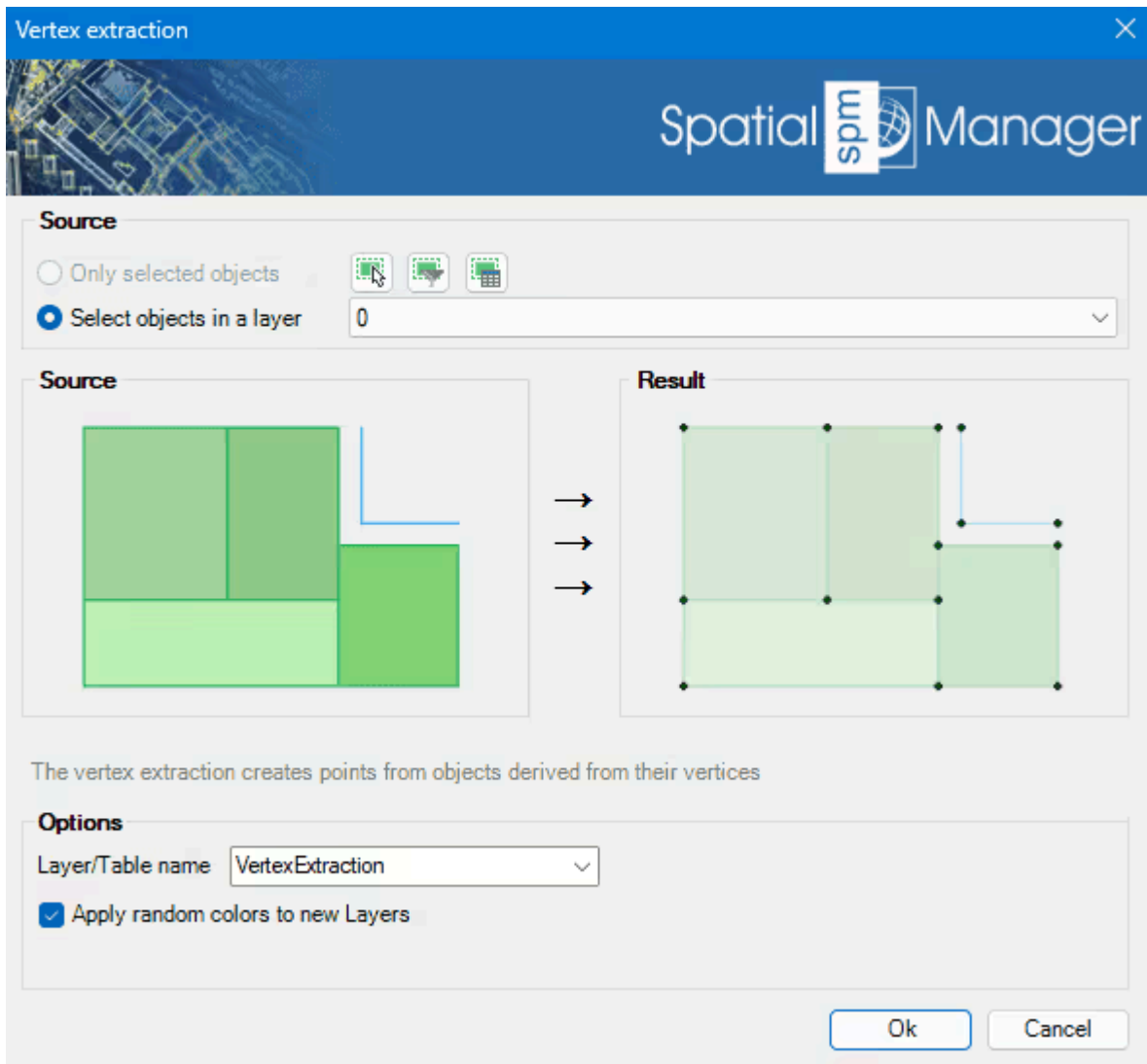
The **SPMVERTEX** command extracts vertices from polylines or polygons and creates point entities at each vertex location.



'SPMVERTEX' command on ribbon

Vertex extraction options

- **Source:** select the entities to extract their vertices from (review [selection control options](#)).
- **Options**
 - *Layer/Table name:* specify the layer where the created polygons will be placed and the table name for attached data.
 - *Apply random colors to new layers:* if checked, the created layers will be assigned random colors.



'SPMVERTEX' options

Vertex extraction video

VIDEO AVAILABLE

[Watch video on YouTube](#)

DOCUMENTATION

Data Sources

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DOCUMENTATION

Providers

Data Providers

Spatial Manager™ for ZWCAD accesses spatial data for importing and/or exporting using their own data Providers. The application can access different data formats and storage systems depending on the spatial data Providers installed.

Available data Providers

The available standard data Providers for Spatial Manager™ for ZWCAD at this time are the following:

Spatial files

- Esri Shape file (.SHP)
- Google Earth file (.KML .KMZ)
- OpenStreetMap file (.OSM .OSC .PBF) ⁽¹⁾
- LiDAR file (.LAS .LAZ)
- GPS exchange format file (.GPX)
- Esri ASCII Grid file (.ASC .ASCII)
- ASCII text file (.ASC .CSV .NEZ .TXT .XYZ .UPT)
- SQLite file (.DB .SQLITE)
- GeoPackage file (.GPKG)
- GML file (.GML .GZ)
- GeoJSON file (.GEOJSON .JSON)
- GeoJSON file ⁽²⁾ ⁽⁵⁾
- Autodesk SDF file (.SDF) ⁽³⁾
- MicroStation v.7 file (.DGN) ⁽²⁾
- ZWCAD DXF file (.DXF) ⁽²⁾
- Esri ArcInfo export file (ASCII) (.E00) ⁽¹⁾ ⁽²⁾
- MapInfo file (.TAB) ⁽²⁾
- MapInfo interchange format file (.MIF) ⁽²⁾
- LandXML file (.XML) ⁽¹⁾

Spatial raster files

- Raster image file (.TIF .PNG .JPG .JPEG .TIFF) ⁽⁶⁾
- Variable resolution Raster image file (Cloud Optimized GeoTIFF/COG TIFF) ^{(1) (4) (6)}
 - Georeference sources (GeoTIFF, World files, Google Earth .GEPRINT, GPS EXIF, etc.)

Spatial data servers and Geo-databases

- Esri Geodatabase File (.GDB) ⁽¹⁾
- PostGIS database
- Microsoft SQL Server Spatial database
- MySQL database ^{(1) (3)}

Image map servers

- WMS/OGC API Maps Web Map Services ⁽⁴⁾
- WMTS/OGC API Tiles Web Map Tile Services ⁽⁴⁾
- XYZ/TMS Tile Map Services ⁽⁴⁾

Other spatial data sources

- Open Database Connectivity ODBC ⁽¹⁾
- WFS/OGC API Features data store ⁽¹⁾
- WFS data store (OGR) ^{(1) (2) (5)}
- WFS data store (FDO) ^{(1) (3) (5)}

⁽¹⁾ Read-only

⁽²⁾ OGR data source

⁽³⁾ FDO provider

⁽⁴⁾ [Background Maps technology](#)

⁽⁵⁾ DEPRECATED - Whenever possible use the native data provider. In addition, OGR for WFS data stores will not be found in the data Provider list under some circumstances (certain ZWCAD Map versions and others).

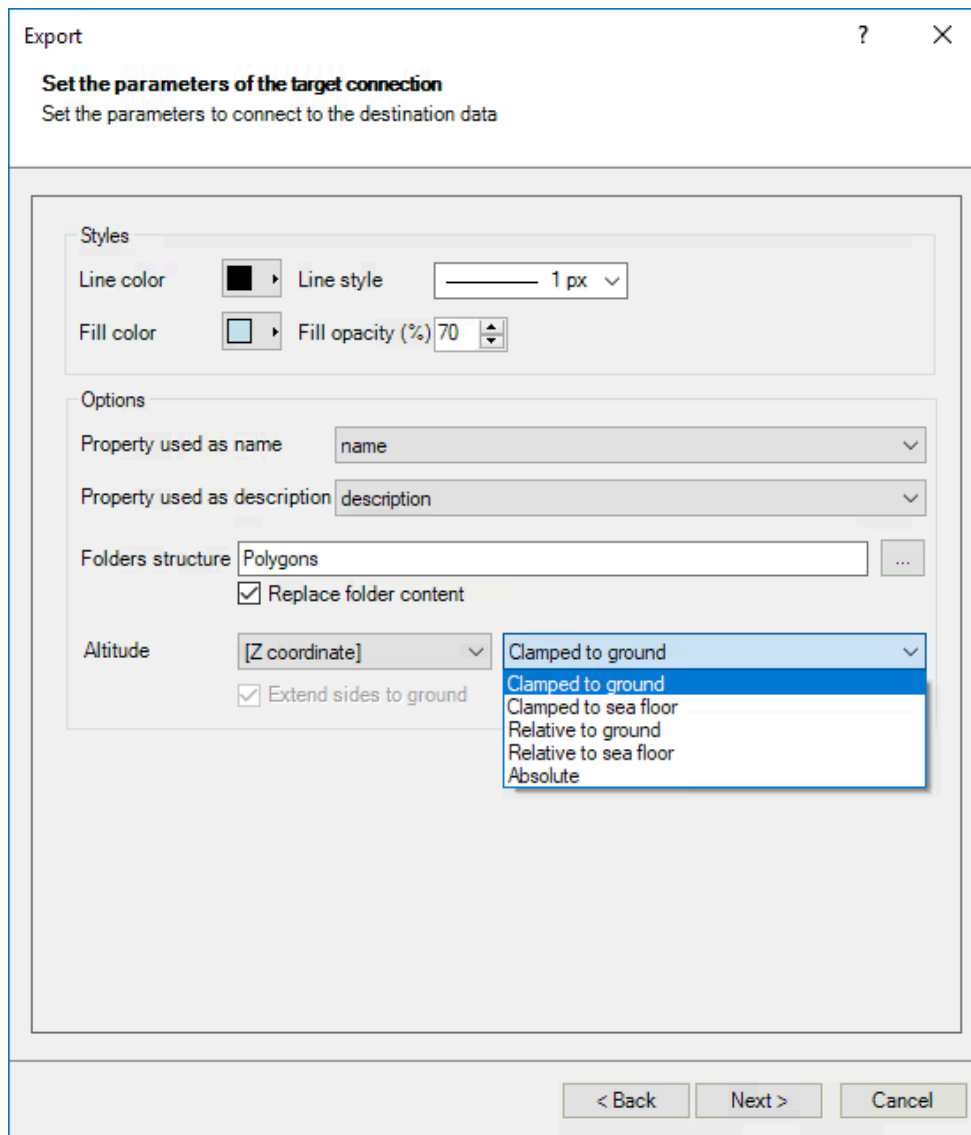
⁽⁶⁾ Professional Edition only

Note: certain data Providers are only valid for some Editions of the application.

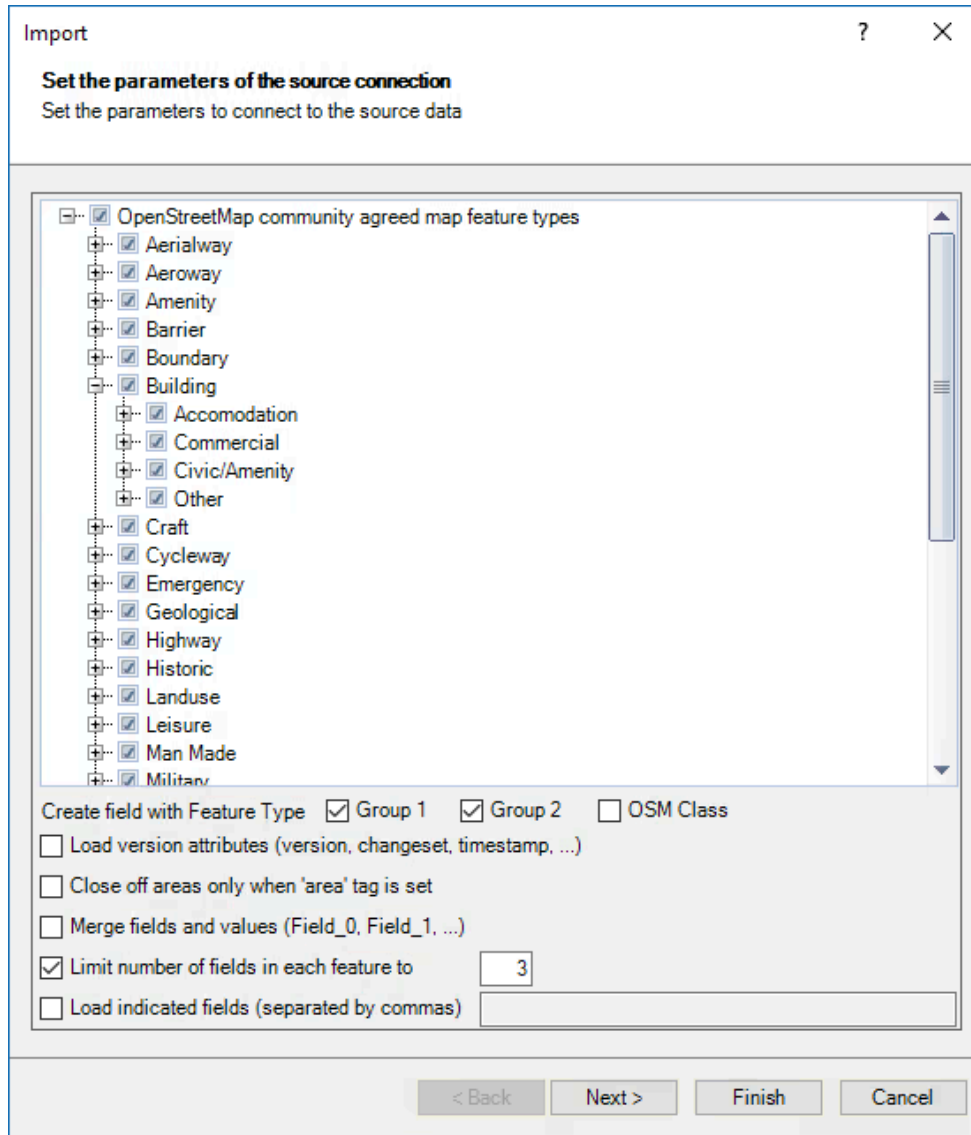
Parameters of the data Providers

The parameters of the data Providers in Spatial Manager™ for ZWCAD are the settings that the application needs to connect when reading (importing) or writing (exporting) spatial tables or files by using a given data Provider. Certain data Providers need the reading parameters and the writing parameters, and these settings can be different. Some other data Providers will only need the reading or the writing parameters but not both of them. You will see a parameters window every time the application needs them when running a given import or export process.

Sample 1: KML/KMZ Google Earth file writing parameters window



KML/KMZ Google Earth file writing parameters window

Sample 2: OSM/PBF OpenStreetMap file reading parameters window

OSM/PBF OpenStreetMap file reading parameters window

Sample 3: Open Database Connectivity ODBC (creating a User Data Source) parameters window

Create user data source

Set the connection properties
Set the properties for connecting to the selected provider

Select method for connecting ODBC data source

User Data Source Name (DSN)
 Connection String (advanced)

Options

DSN name: GeoLoc

User: [] Password: []

Connect

Table: GeoLoc

Geometry type: Point Any type (WKB)

Longitude/X field: Long

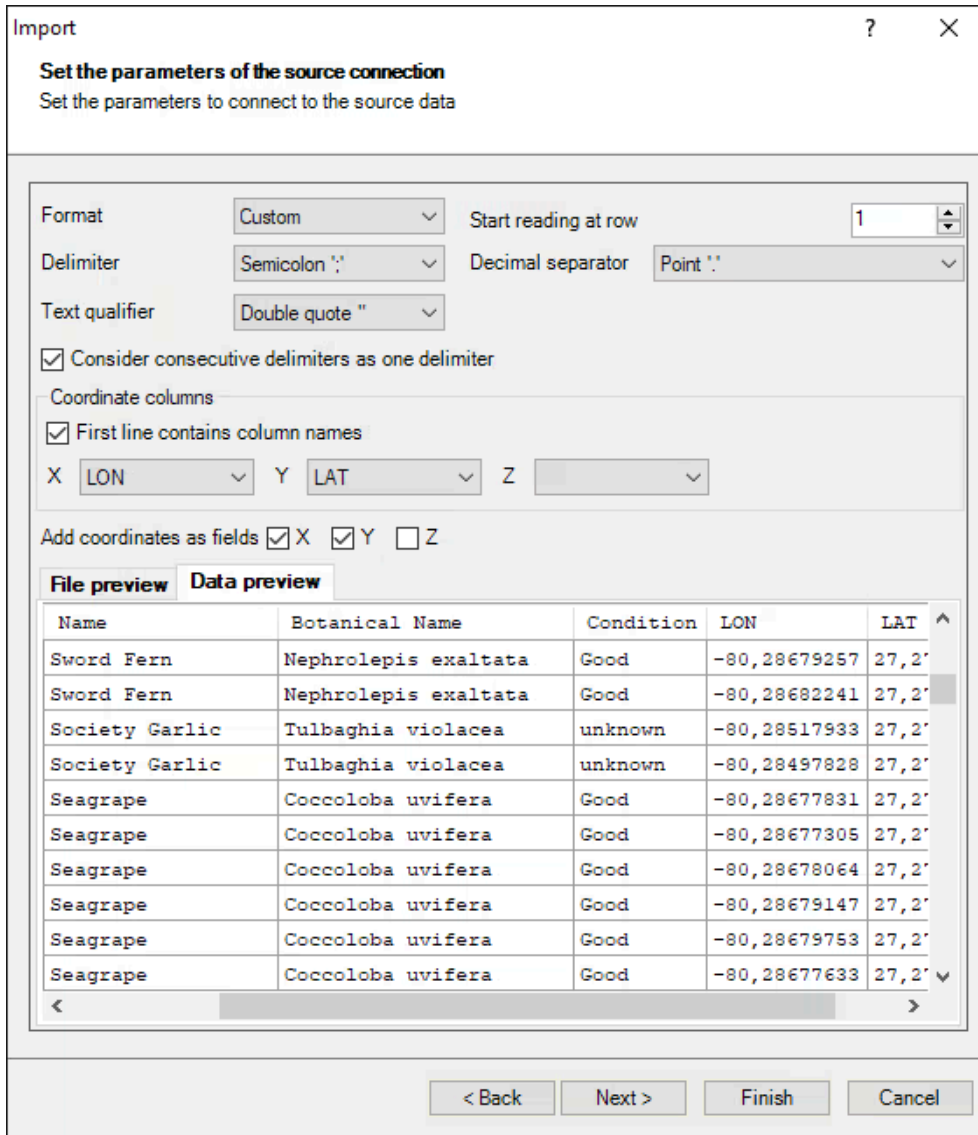
Latitude/Y field: Lat

Note: Features with nu

< Back Next > Cancel

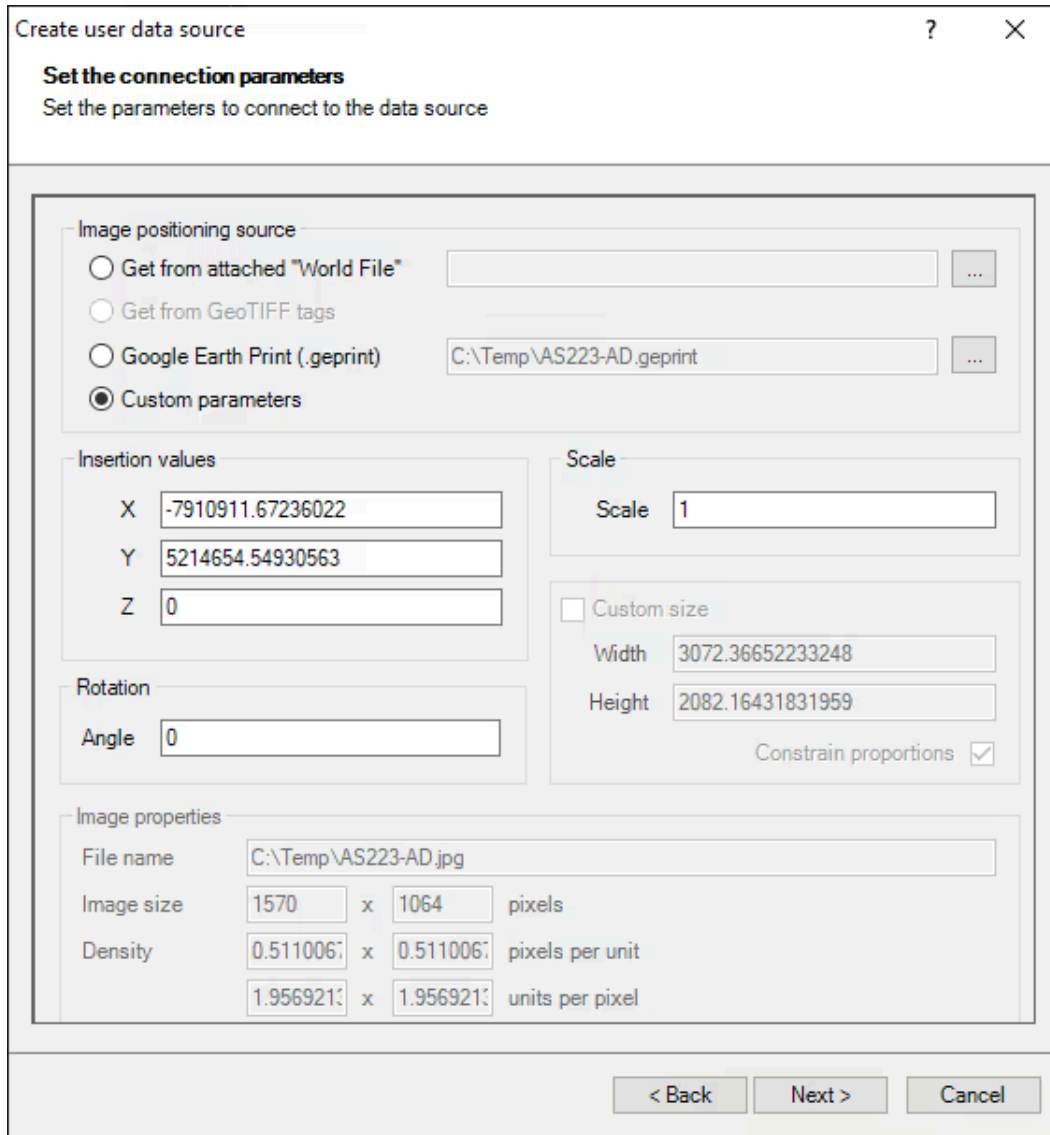
Open Database Connectivity ODBC parameters window

Sample 4: ASCII file (custom settings) reading (import process) parameters window



ASCII file reading (import process) parameters window

Sample 5: Raster image file reading Provider parameters window



Single image Raster Provider parameters window

Sample 6: LiDAR file reading parameters window

The screenshot shows a dialog box titled "Create user data source" with a question mark and a close button in the top right corner. Below the title bar, the text "Set the connection parameters" is followed by the instruction "Set the parameters to connect to the data source".

The main area of the dialog is divided into two columns of checkboxes:

- Classifications to load:**
 - 3 Low Vegetation (352,376 points)
 - 5 High Vegetation (180,267 points)
 - 7 Noise (56,753 points)
 - 10 Rail (187,629 points)
- Fields:**
 - Classification
 - Color
 - Edge of Flight Line
 - GPS Time
 - Intensity
 - Number of Returns (given pulse)
 - Point Source ID
 - Return number
 - Scan Angle
 - Scan Direction Flag
 - User Data

Below these columns is a section labeled "Percentage to load" with a spin box set to "26.0" and the text "Estimated points to load: 202,026".

At the bottom of the dialog are three buttons: "< Back", "Next >" (which is highlighted with a blue dashed border), and "Cancel".

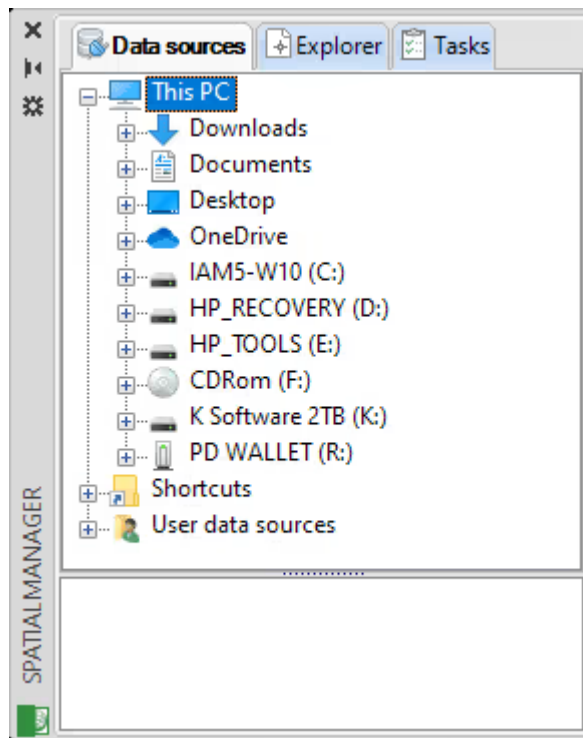
LiDAR file reading parameters window

DOCUMENTATION

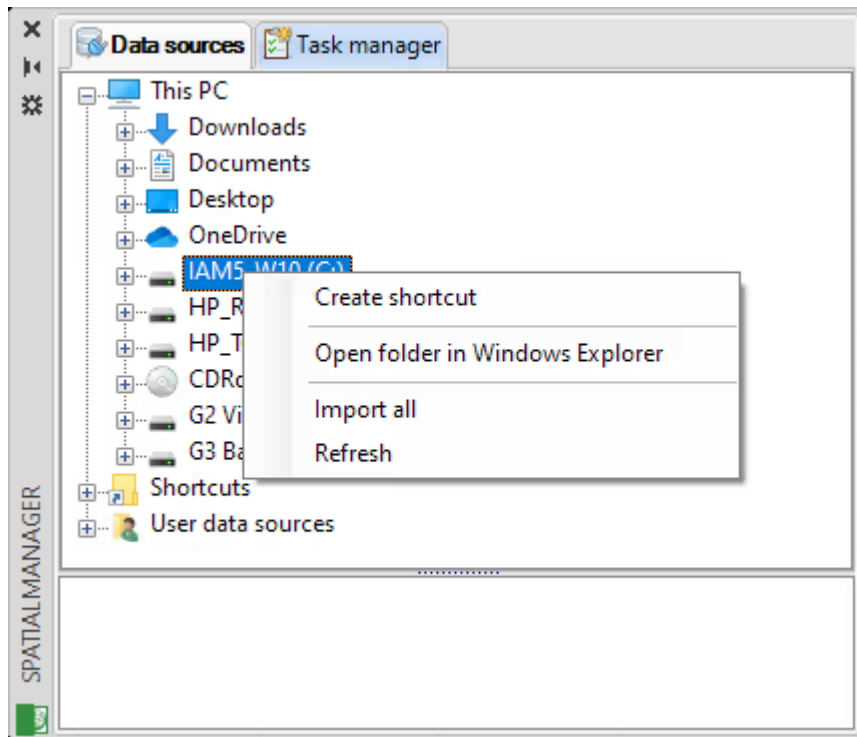
Shortcuts

Access to disk drives, local folders, local network paths, etc.

You can access local locations (such as hard drives, removable disks, local network drives, etc.) through the "This PC" branch in the 'SpatialManager' palette of Spatial Manager™ for ZWCAD. Here you will also find access to common folders, such as Downloads, Documents, OneDrive, etc. The contextual (right-click) options in this area will allow you to create shortcuts (see next paragraph) and run many other disk- and folder-related functions.



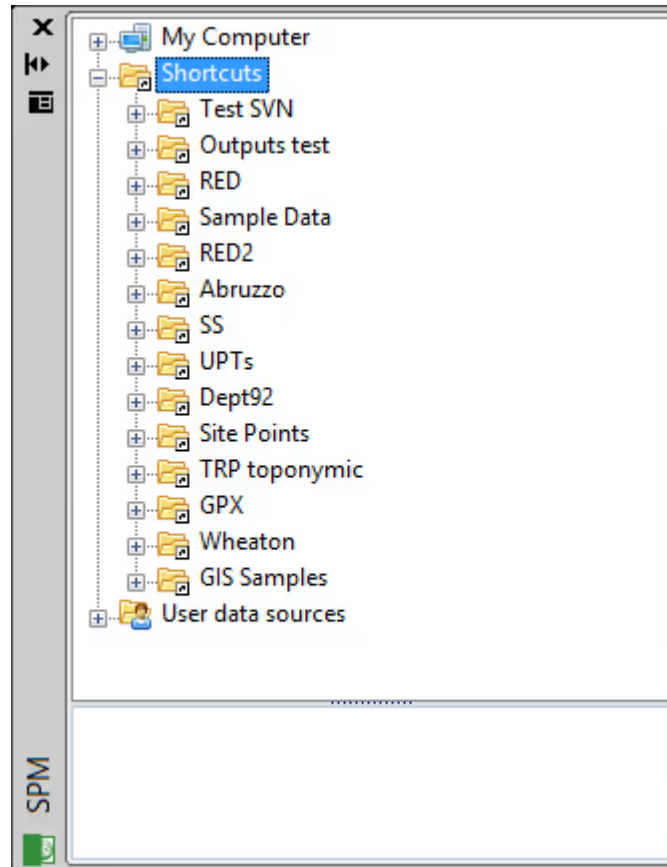
Spatial Manager Folders-Disks



Spatial Manager Folders-Disks contextual options

Shortcuts

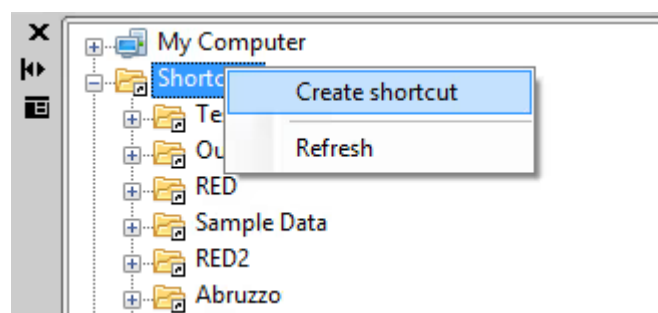
The shortcuts in Spatial Manager™ for ZWCAD are the way you can reference any folder on a physical or network drive, or the drive itself, and they allow you quick access to its path. You can access the shortcuts through the 'SpatialManager' palette.



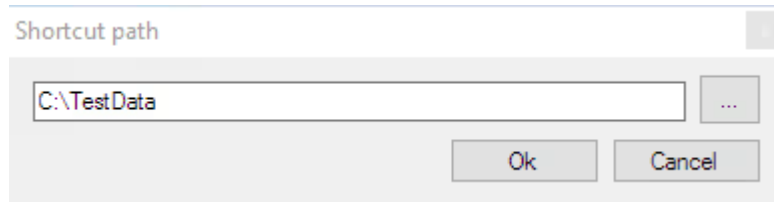
Spatial Manager Shortcuts

Create a new Shortcut

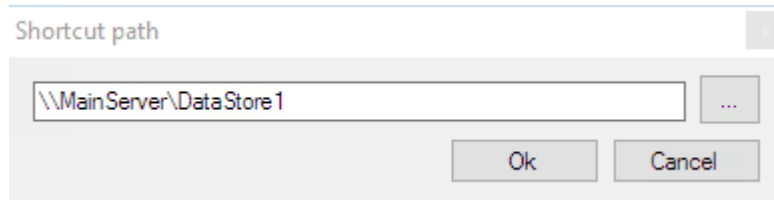
You can create new shortcuts in Spatial Manager™ for ZWCAD using the right-click menu over the "Shortcuts" paragraph in the 'SpatialManager' palette, typing a path (local or network) or choosing a folder or drive. You can also create a new shortcut using the right-click menu over any folder or drive item that you see in the 'SpatialManager' palette, to reference the path of this folder or drive.



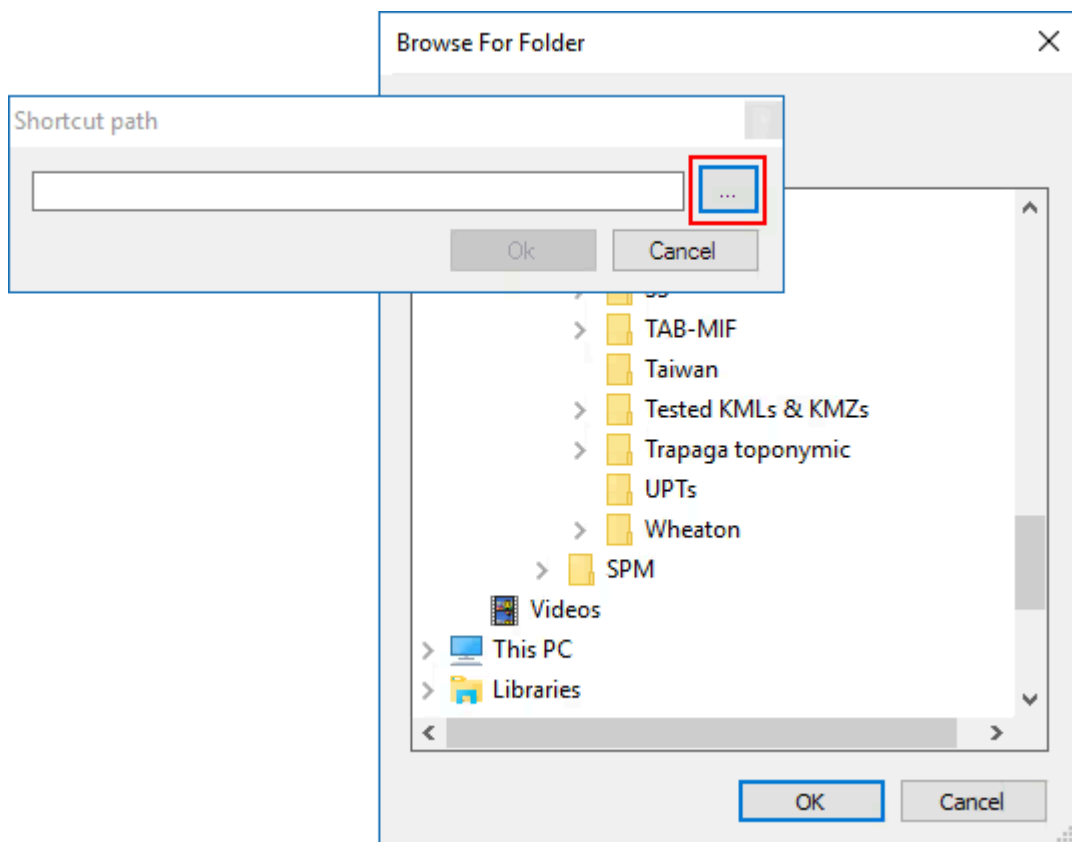
Create a new Shortcut



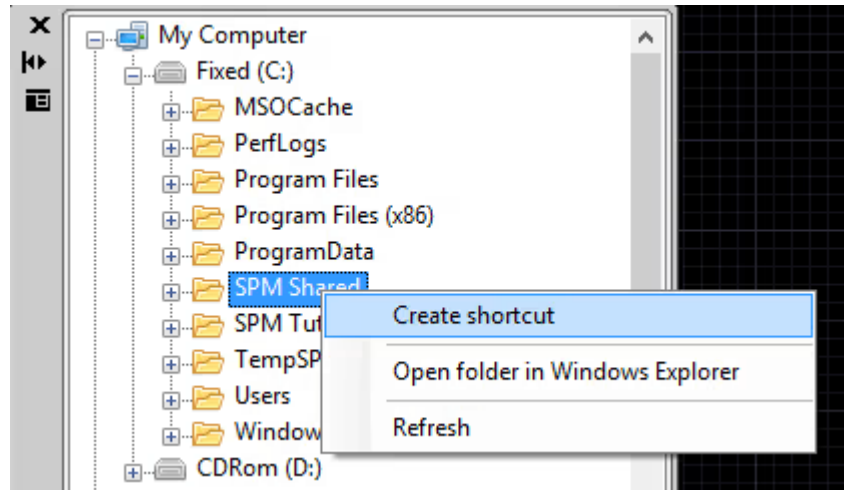
Create a new Shortcut - Type a local Shortcut



Create a new Shortcut - Type a network Shortcut



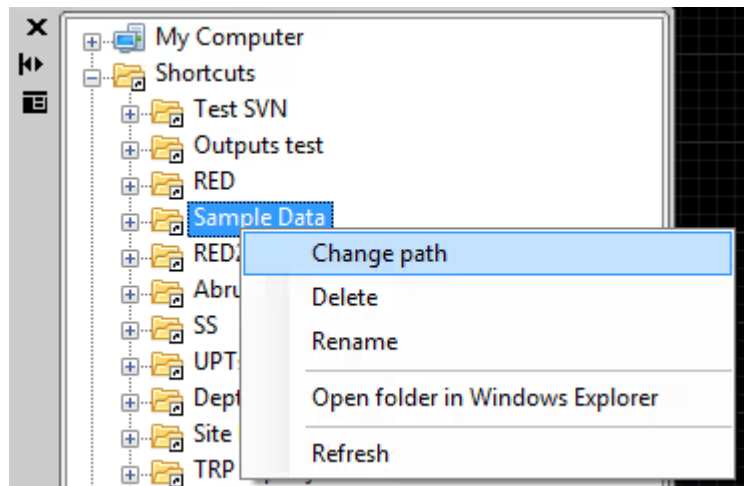
Create a new Shortcut - Browse for folder



Create a new Shortcut from a folder

Edit a Shortcut

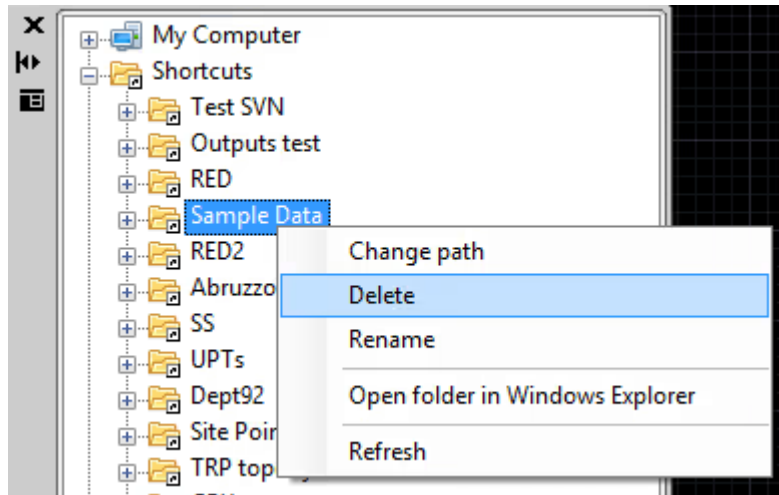
You can edit a shortcut in Spatial Manager™ for ZWCAD using the right-click menu over the item in the 'SpatialManager' palette to change the path of the folder or drive referenced.



Edit a Shortcut

Other functions for the Shortcuts

In Spatial Manager™ for ZWCAD you can delete or rename the shortcut. You can also refresh the folder or drive content, and you can open Windows Explorer for the folder or drive referenced by the shortcut. All these functions are available using the right-click menu over the shortcut item in the 'SpatialManager' palette.



Other Shortcuts functions

DOCUMENTATION

User data sources

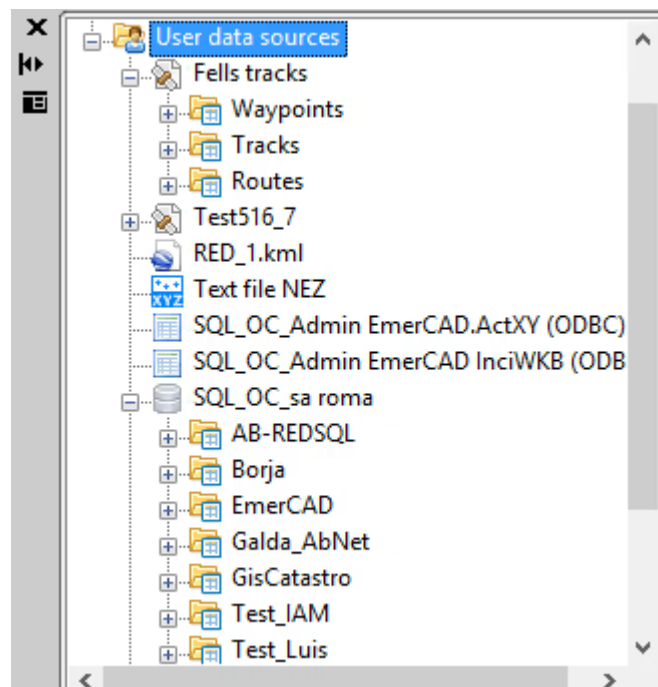
User Data Sources (UDSs)

Available on editions **Standard** **Professional**

The UDSs in Spatial Manager™ for ZWCAD are the way you can connect with spatial database servers or data stores, and also the way you can define the path to a particular spatial data file and its parameters. You can access the UDSs through the 'SpatialManager' palette.

Usually, the access to the data tables in the servers is tedious. Depending on the type of server, you need to enter many connection parameters that are not easy to remember, such as the server name, the user, the password, the connection port, the name of the database, etc. Spatial Manager™ for ZWCAD introduces the concept of "User Data Source" (UDS), which allows you to store, inside your user settings, all the access parameters for the servers that you regularly connect to, by defining all the parameters once.

Files: If you frequently access a file that requires some connection parameters to import it into a drawing, you may be interested in creating a UDS for this file access, which will also include the connection parameters you choose at the time of defining the new UDS.

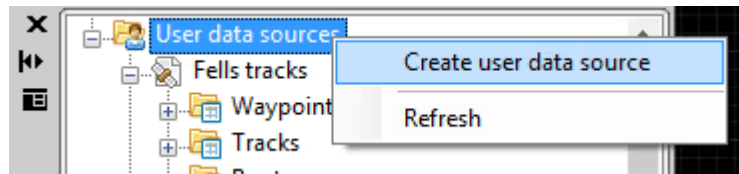


Spatial Manager User Data Sources (UDS)

Create a new User Data Source (UDS)

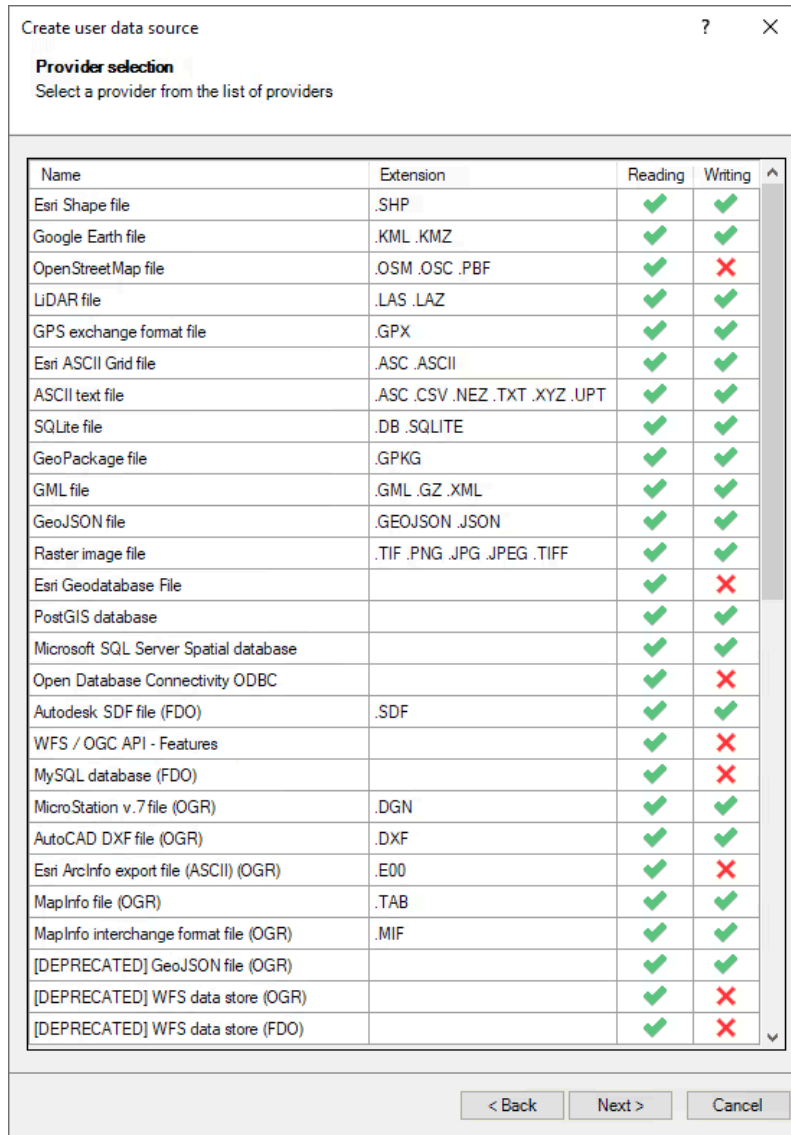
Available on editions **Standard** **Professional**

You can create new UDSs in Spatial Manager™ for ZWCAD using the right-click menu over the “User data sources” paragraph in the ‘SpatialManager’ palette to start the “Create user data source” wizard.

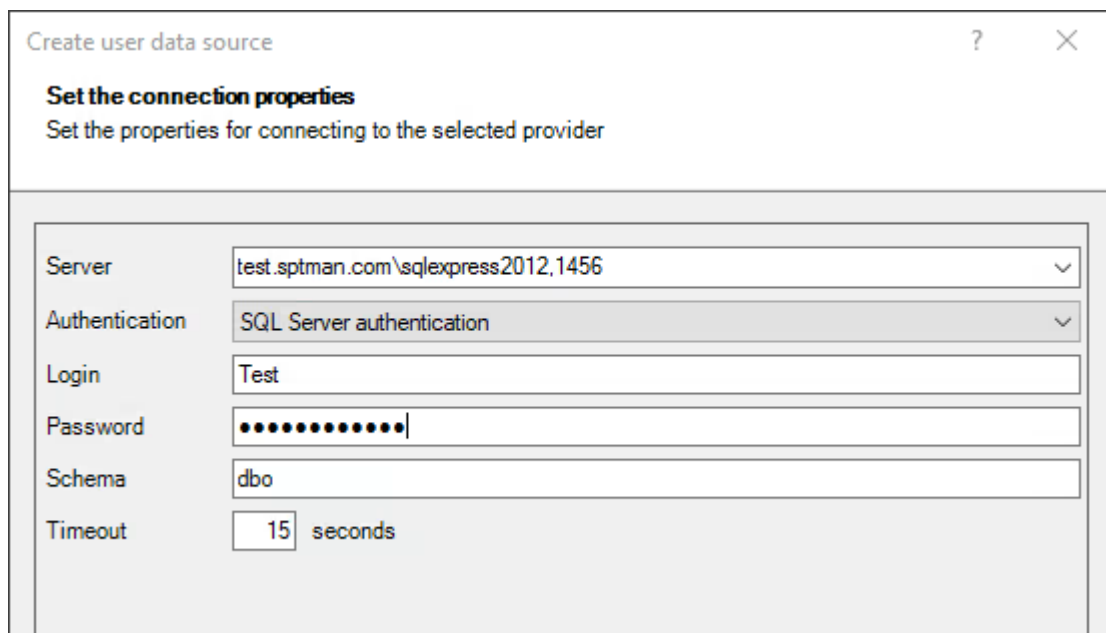


Create a User Data Source

When you create a new UDS to connect with a particular spatial database server, you need to select the appropriate data provider for this server, the connection parameters for the server, and the name of the UDS. When you create a UDS to access a particular spatial data file, you also need to select the appropriate data provider for this file, the file itself, the file parameters, and the name of the UDS. All this data is saved in your application configuration until you decide to delete or modify it.



Select a Spatial Manager Data Provider



Define the Connection Parameters

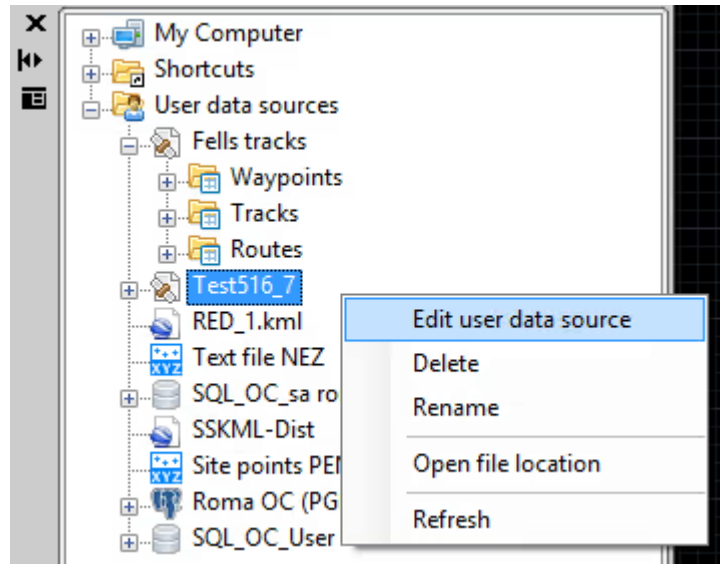


Assign a Name to the new User Data Source

Edit a User Data Source (UDS)

Available on editions **Standard** **Professional**

You can edit a UDS in Spatial Manager™ for ZWCAD using the right-click menu over the UDS item in the 'SpatialManager' palette to start the "Create user data source" wizard and proceed as described in "Create a new User Data Source (UDS)." The only difference is that the parameters you entered when you created the UDS are still there to be edited.

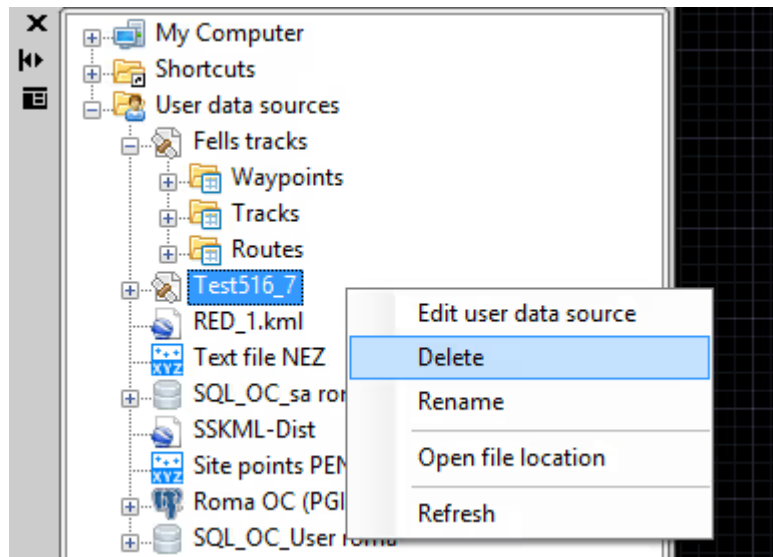


Edit a User Data Source

Other functions for the User Data Sources (UDSs)

Available on editions **Standard** **Professional**

In Spatial Manager™ for ZWCAD you can delete and rename the UDS. You can also refresh the UDS content and, if the UDS is connected to a file, you can open Windows Explorer for the folder of the file location. All these functions are available using the right-click menu over the UDS item in the 'SpatialManager' palette.

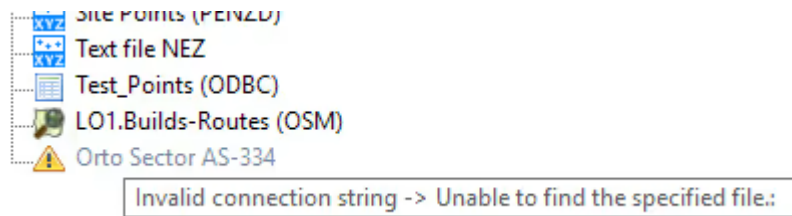


Other User Data Source functions

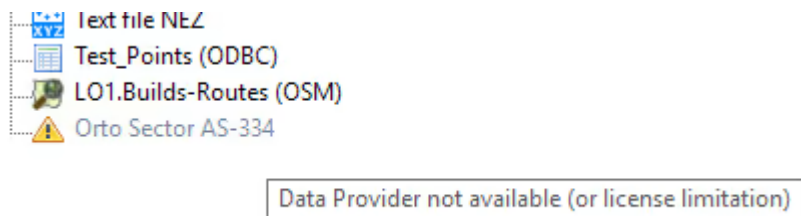
Warnings in the list of User Data Sources (UDSs)

Available on editions **Standard** **Professional**

When problems occur with any UDS, such as deleted sources, incompatible UDSs, etc., warning messages may appear in the 'Spatial Manager™ for ZWCAD' "Data sources" panel that alert you about the problem caused by the corresponding inaccessible UDS.



Missing USD warning



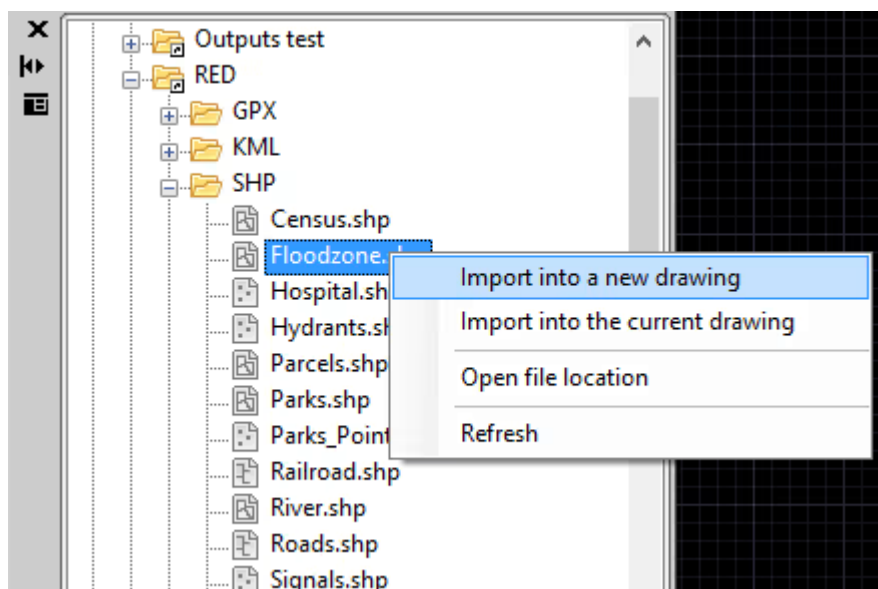
USD Data Provider not available

DOCUMENTATION

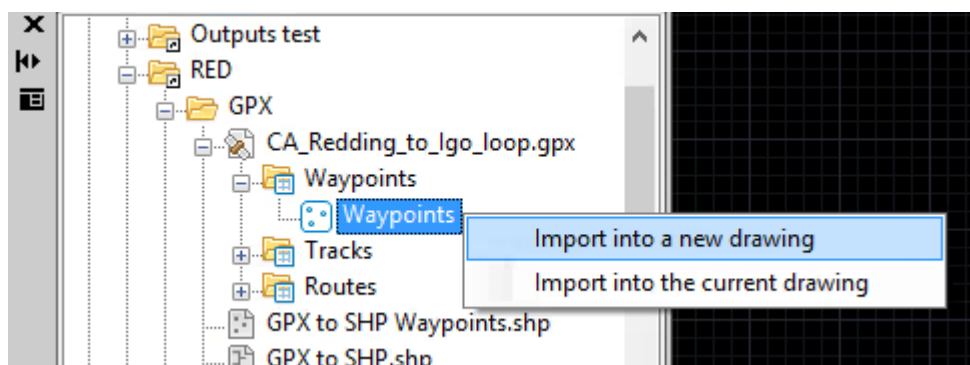
Spatial files

Access to a data table inside a spatial file

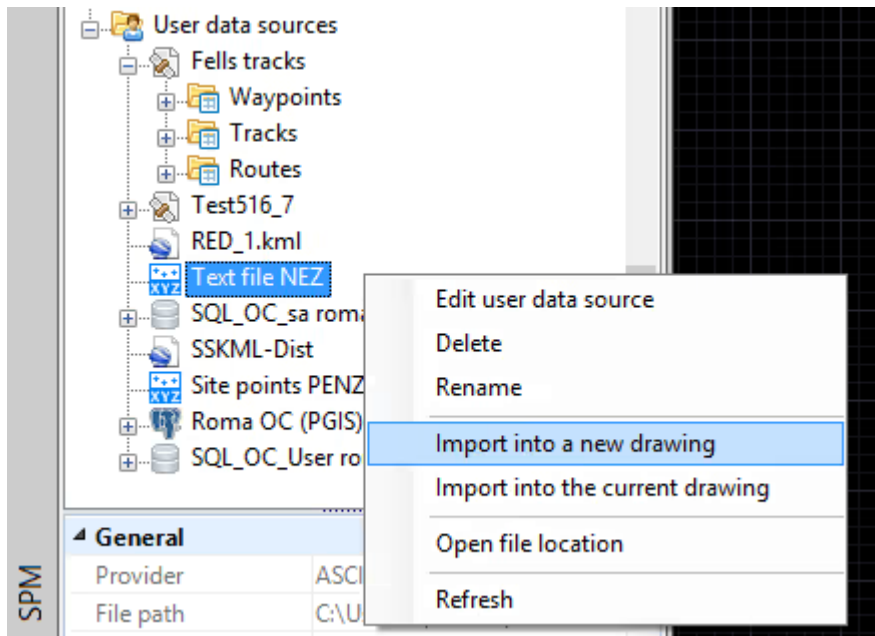
In Spatial Manager™ for ZWCAD you can access a data table from a spatial file using the right-click menu over the file item itself, over a table from the file, or over any UDS (“Standard” and “Professional” editions only) that refers to the file, in the ‘SpatialManager’ palette, to import its content into a new or the current ZWCAD drawing. You can also double-click the file item itself, a table from the file, or any UDS (“Standard” and “Professional” editions only) that refers to the file, in the ‘SpatialManager’ palette, to access and import its content into a new or the current ZWCAD drawing (this behaviour may be configured through the “Spatial Manager” tab in the “Options” window of ZWCAD or by running the SPMOPTIONS command).



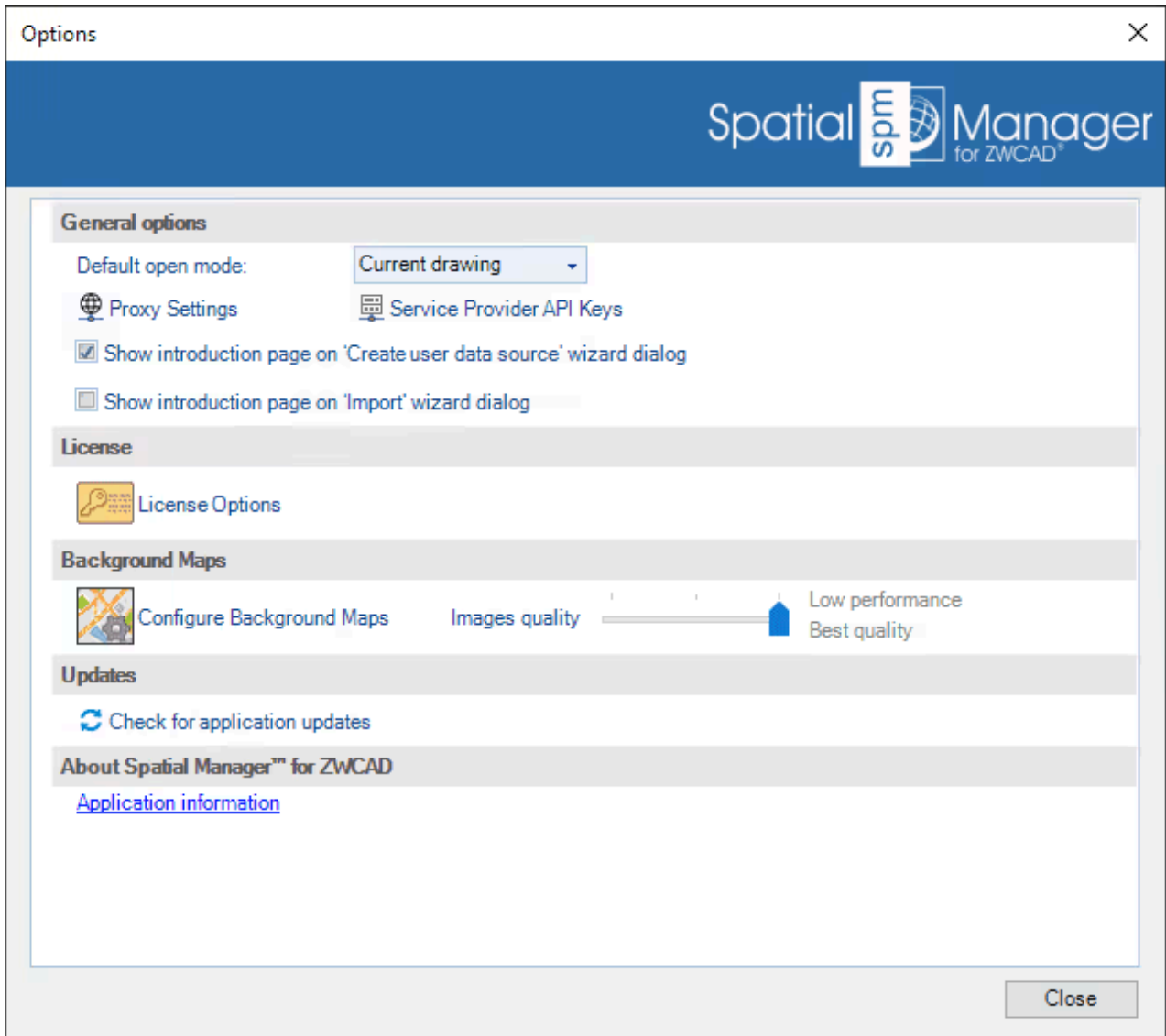
Import a file into Spatial Manager™ for ZWCAD



Import a table in a file into Spatial Manager™ for ZWCAD



Import a table from a User Data Source (UDS) into Spatial Manager™ for ZWCAD

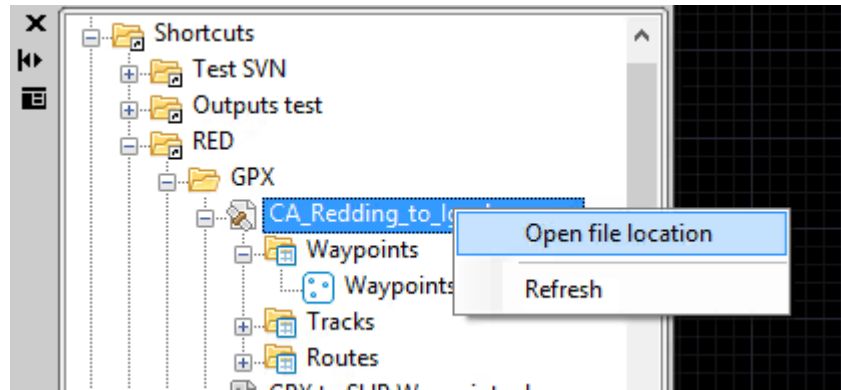


Configure the double-click option

To perform the import process of the data table, see: [Import](#) .

Open directly the folder containing a file

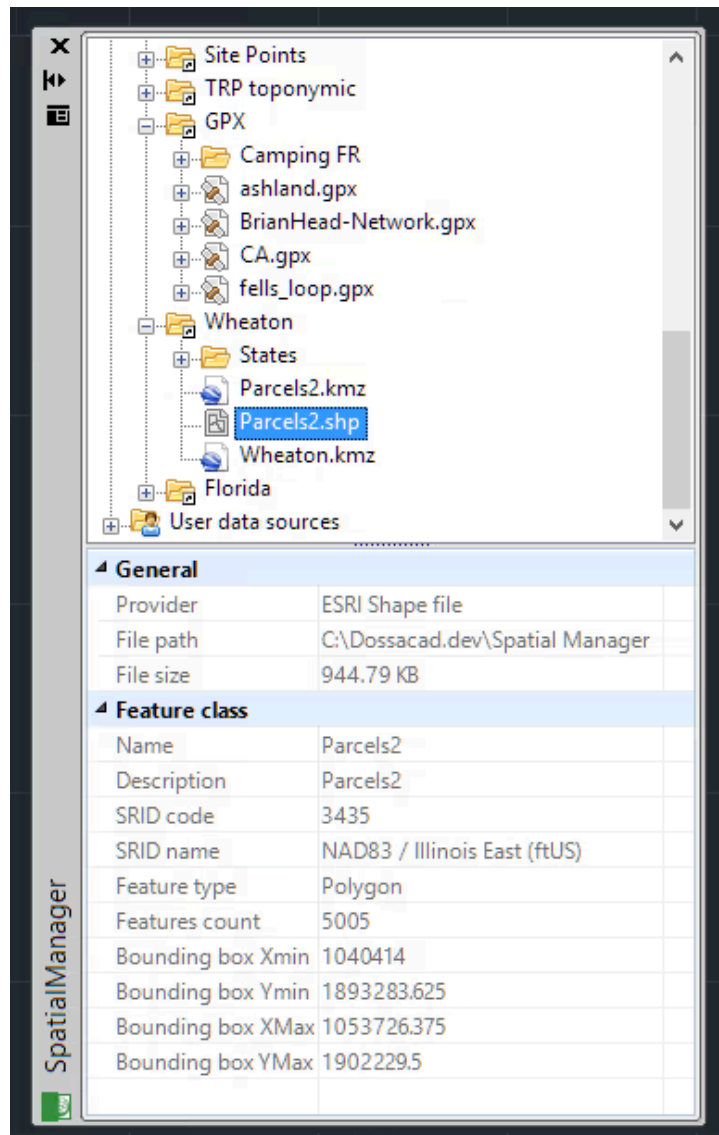
To open a file location in Spatial Manager™ for ZWCAD, use the right-click menu over the file item in the 'SpatialManager' palette.



Open the file location in Windows Explorer

Recognize each different type of file and its properties

To recognize each different type of file, you will see the different icons used for each data provider in the "Data sources" area of the 'SpatialManager' palette in Spatial Manager™ for ZWCAD. In addition, when you select any file, you will see its properties in the "Properties" area of the 'SpatialManager' palette.



Different types of files in the application palette

DOCUMENTATION

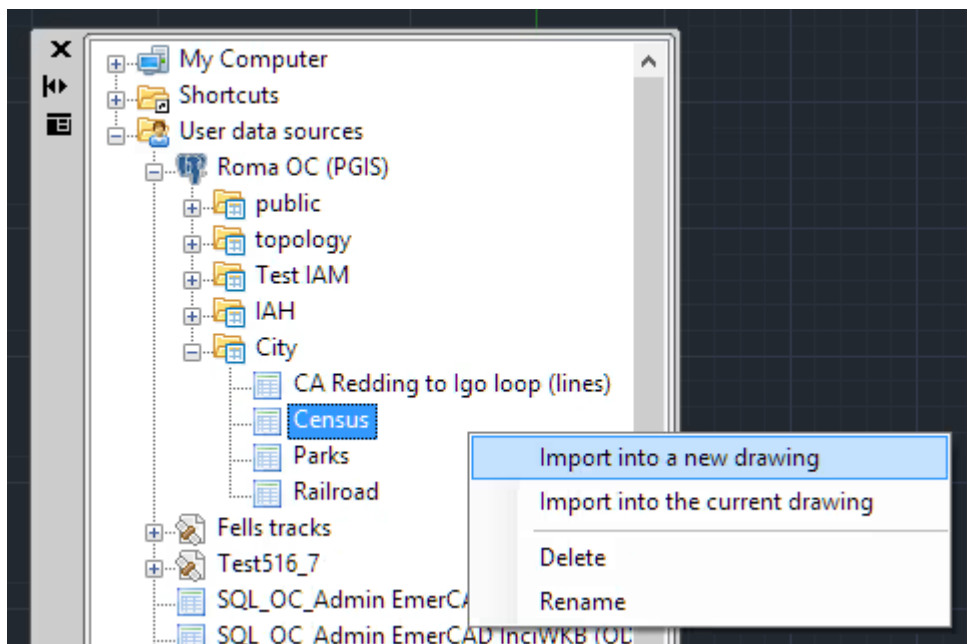
Databases

Access a data table from a spatial database or data store

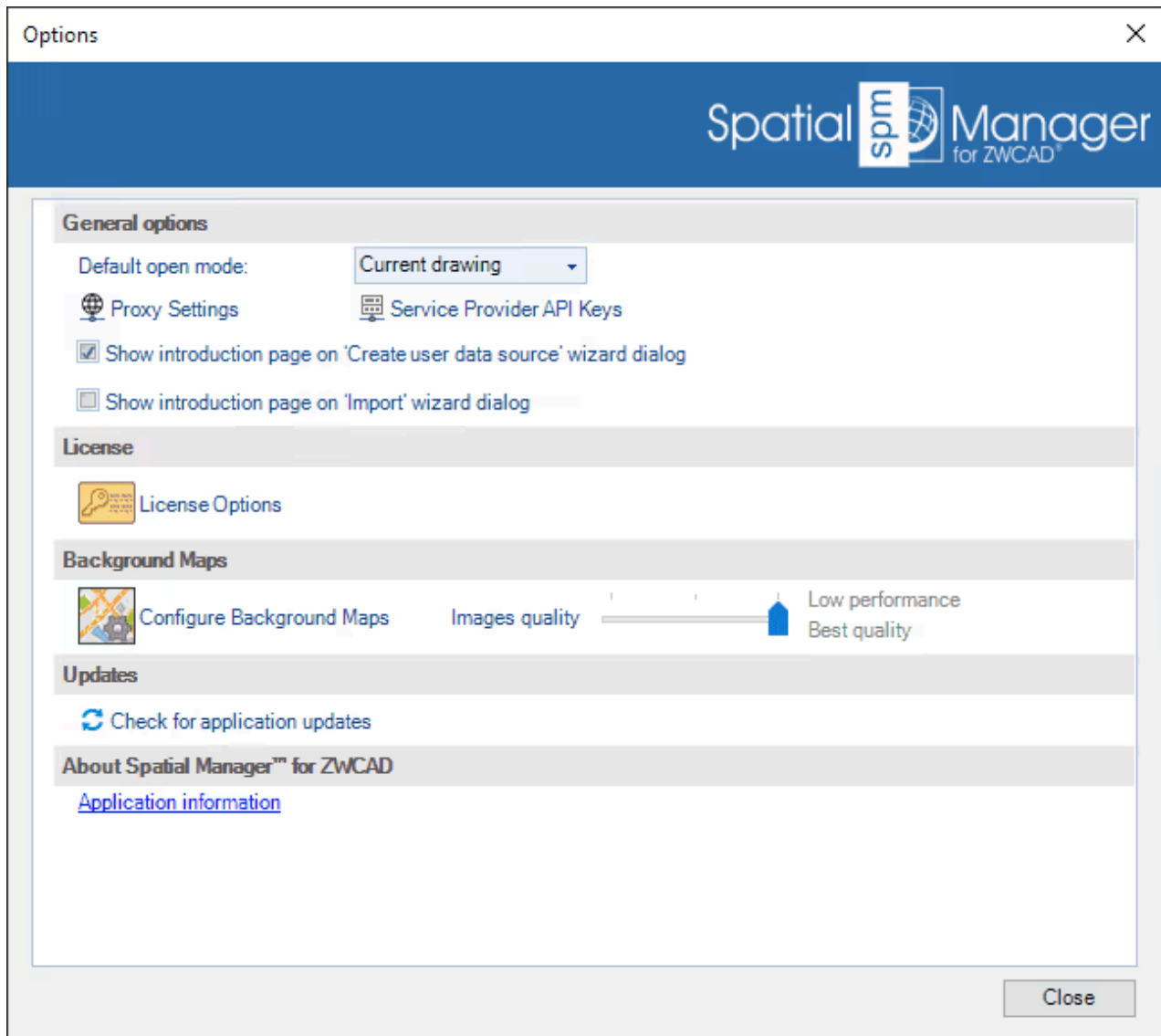
Available on editions **Standard** **Professional**

To access spatial databases or data stores in Spatial Manager™ for ZWCAD, you first need to have defined a User Data Source (UDS). A UDS is a saved connection configuration that stores all the parameters needed to connect to a specific database or data store, so you don't have to enter them each time. To learn more about UDSs, see: [Data sources page](#) .

You can access a data table from a spatial database or data store using the right-click menu over the table item itself inside a container of the UDS (usually a schema) in the 'SpatialManager' palette, to import its content into a new or the current ZWCAD drawing. You can also double-click the table item itself in the 'SpatialManager' palette to access and import its content into a new or the current ZWCAD drawing (this behaviour may be configured through the tab "Spatial Manager" in the "Options" window of ZWCAD or by running the SPMOPTIONS command).



Import a table from a spatial database into Spatial Manager™ for ZWCAD



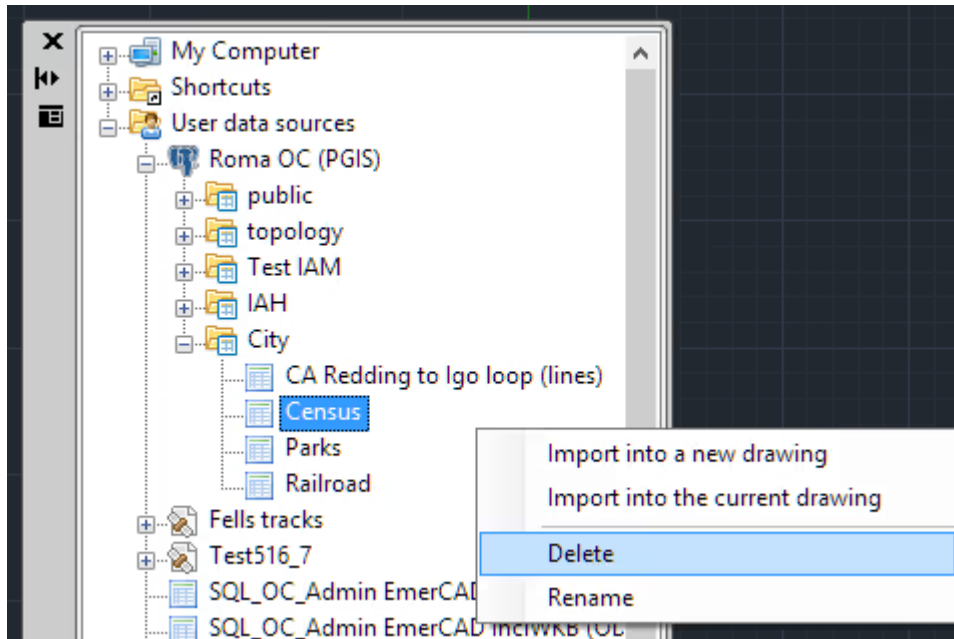
Configure the double-click option

To perform the import process of the data table, see: [Import](#) .

Other functions for the tables

Available on edition **Professional**

You can delete or rename the tables in Spatial Manager™ for ZWCAD using the right-click menu over the table item itself. This is valid for tables in spatial databases but not for tables in data stores.

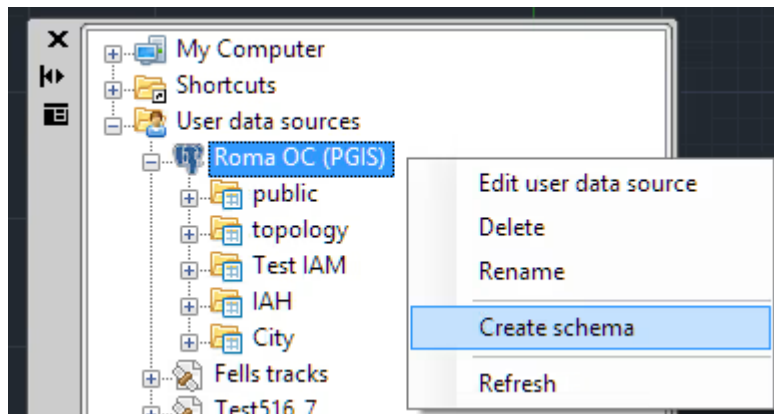


Delete or rename a table in a spatial database

Create a schema in a spatial database

Available on edition **Professional**

You can create a schema in a spatial database in Spatial Manager™ for ZWCAD using the right-click menu over the UDS. When creating, you can assign a name to the new schema.



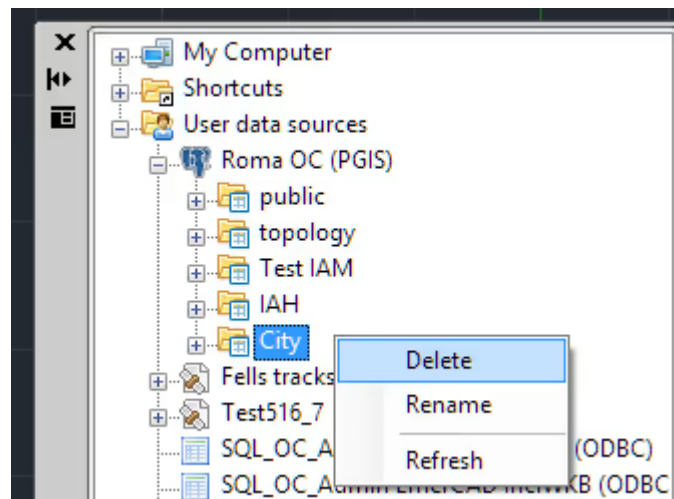
Create a schema in a spatial database

Other functions for the schemas

Available on edition **Professional**

You can delete or rename the schemas and refresh the schema contents in Spatial Manager™ for ZWCAD using the right-click menu over the schema item itself. **Be careful** when you delete a schema

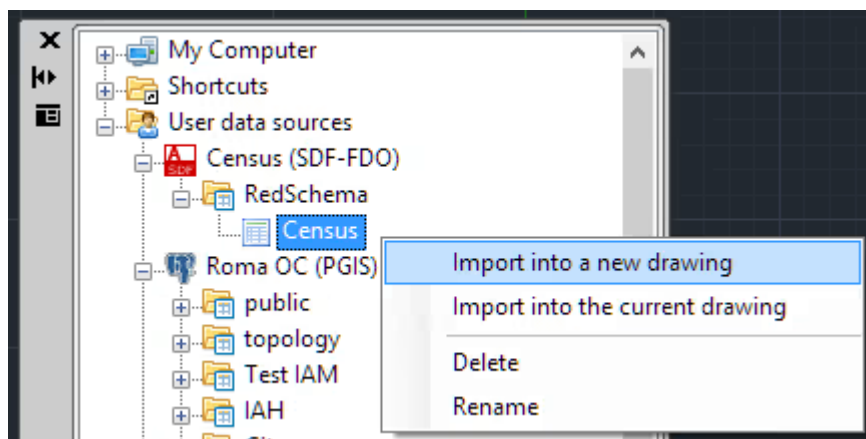
because all the tables that it contains will also be deleted. This is valid for schemas in spatial databases but not for schemas in data stores.



Delete or rename a schema in a spatial database

Other kinds of data sources using schemas or tables

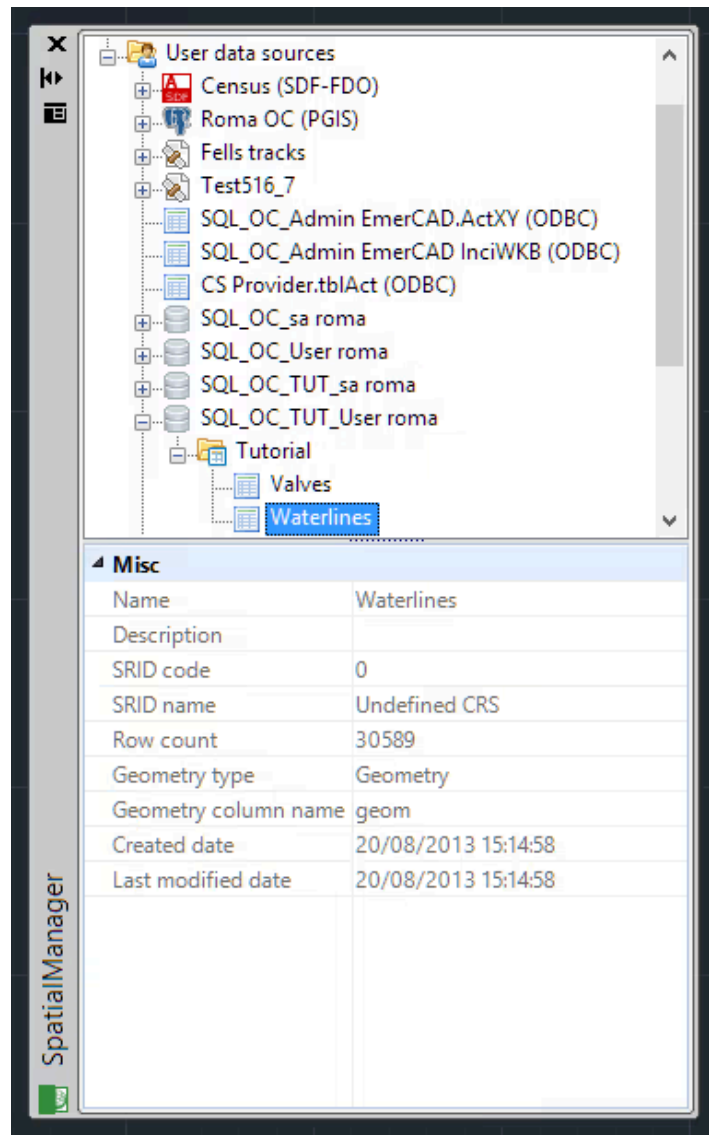
You can find some providers using schemas or tables in Spatial Manager™ for ZWCAD, besides spatial databases or data stores, such as some types of files like SQLite and more, or special connections such as ODBC ("Standard" and "Professional" editions only) and more. Everything said here for schemas and tables is valid for these types of data sources.



Import a table from a User Data Source (UDS) into Spatial Manager™ for ZWCAD

See the properties of schemas or tables

You can see the properties of schemas or tables in the 'Properties' area of the 'SpatialManager' palette in Spatial Manager™ for ZWCAD when you select any of those items in the 'Data sources' area of this palette.



Properties of schemas and tables in the application palette

DOCUMENTATION

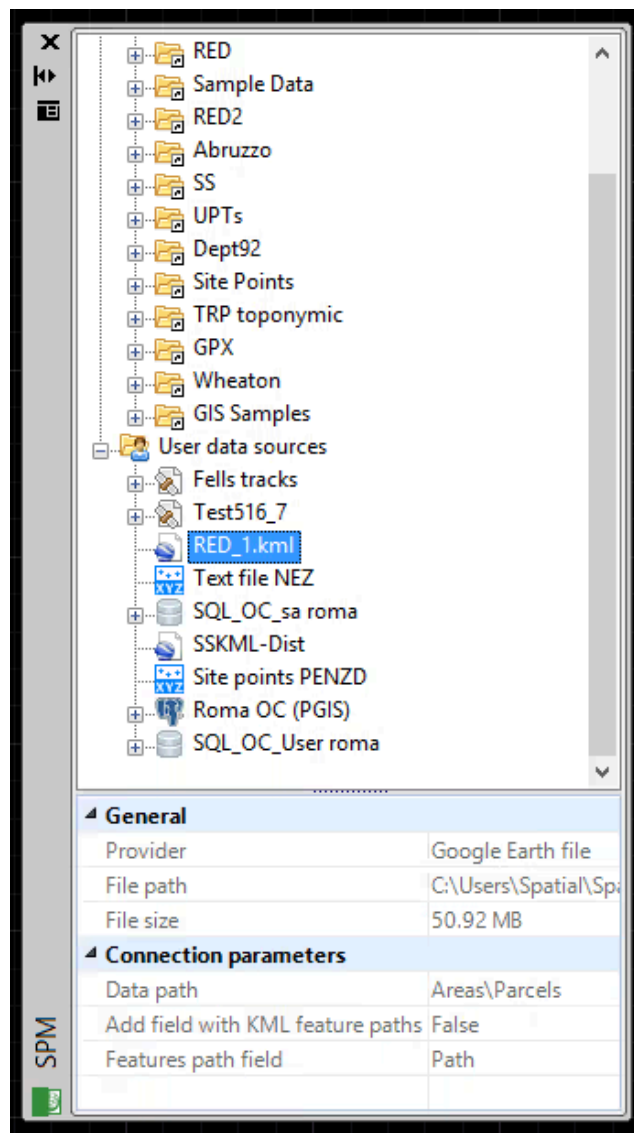
Advanced

Sort the Shortcuts or User Data Sources (UDS)

To sort any Shortcut or UDS ("Standard" and "Professional" editions only) item in the 'SpatialManager' palette of Spatial Manager™ for ZWCAD, you must drag and drop up or down the item itself.

Recognize each different type of spatial data and its properties

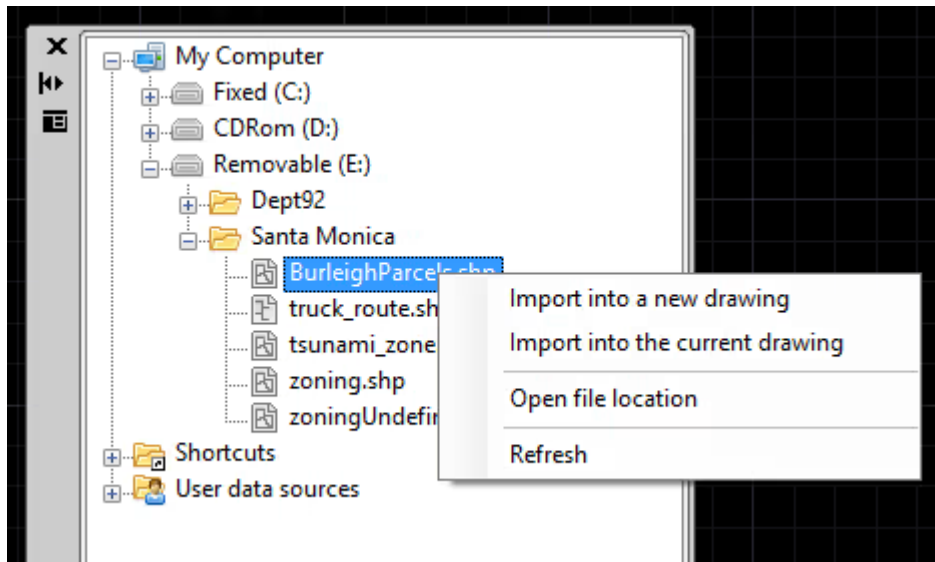
To recognize each different type of spatial data, you will see the different icons used for each data provider in the 'Data sources' area of the 'SpatialManager' palette in Spatial Manager™ for ZWCAD. In addition, when you select any data source, you will see its properties in the 'Properties' area of the 'SpatialManager' palette.



Different types of spatial data

Other ways to access spatial data

You can access spatial data files directly through the 'My computer' node in the 'Data sources' area of the 'SpatialManager' palette in Spatial Manager™ for ZWCAD. However, to access spatial databases or spatial stores, you should always use UDSs ("Standard" and "Professional" editions only).



Another way to access spatial data files

DOCUMENTATION

Spatial Analysis

Available on edition

Professional

Perform spatial analysis operations in ZWCAD over the objects in the drawing generating new objects from such analysis.

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DOCUMENTATION

Introduction

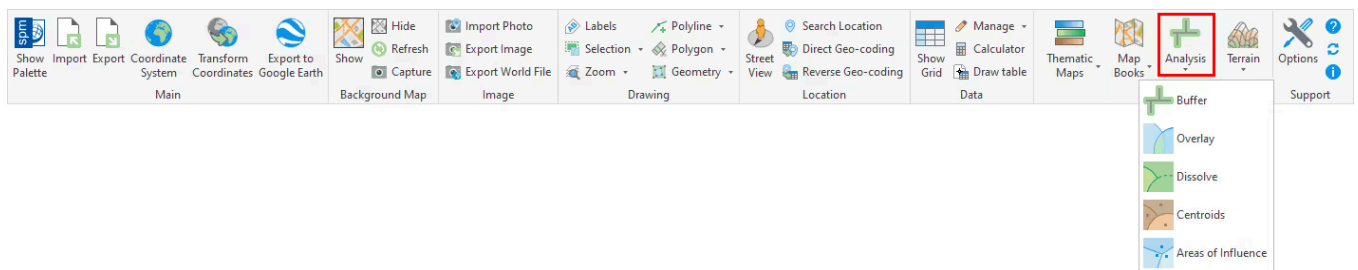
Available on edition

Professional

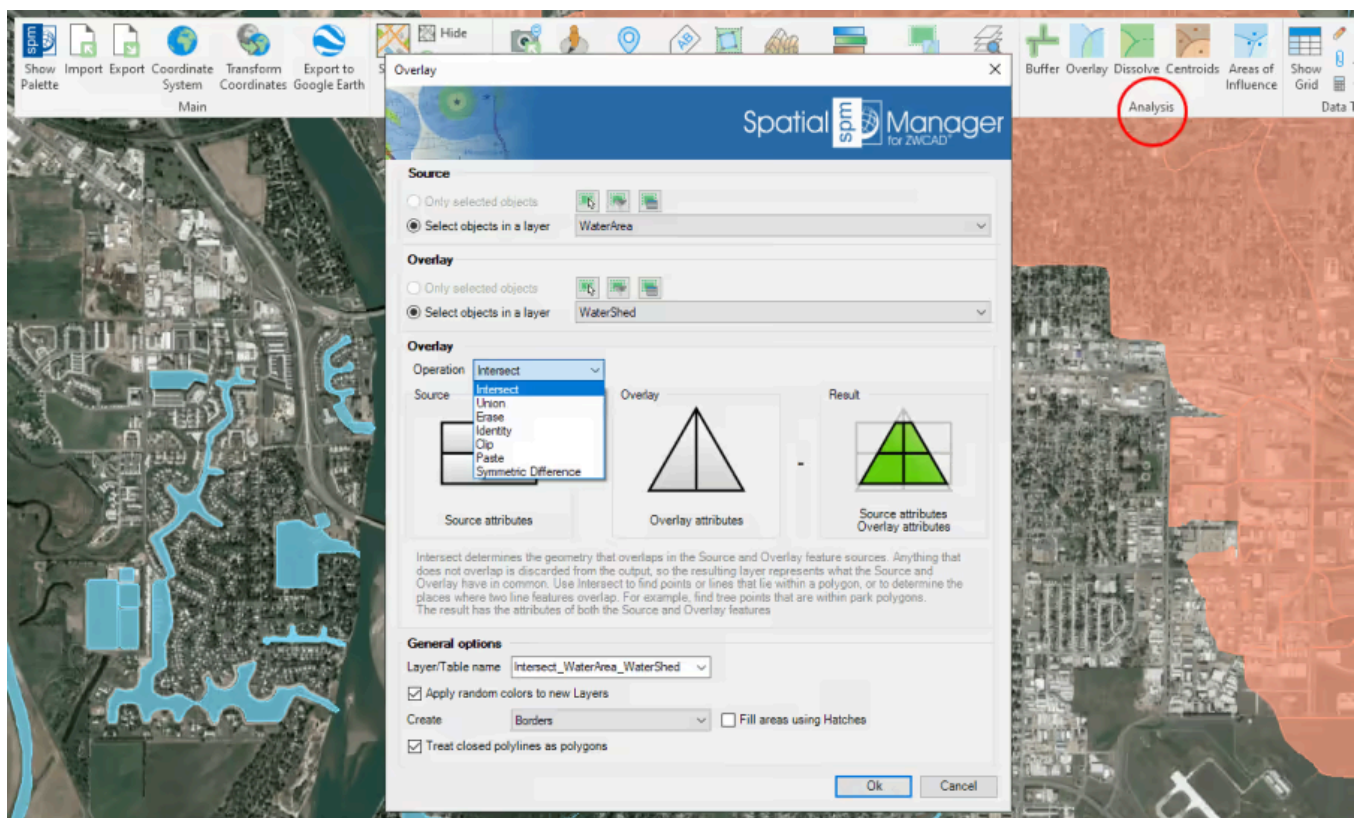
Perform spatial analysis operations in ZWCAD over the objects in the drawing generating new objects from such analysis.

GIS Analysis tools

Spatial Manager™ for ZWCAD includes a set of advanced tools designed for geometric and spatial analysis of geographic entities and their geometric relationships, resulting in new entities generated from the resolution of such analysis.



GIS Analysis commands in the ZWCAD ribbon



Performing GIS Analysis in the drawing

Some of the analysis tools allow entity selections. Review [selection control options](#) .

DOCUMENTATION

Spatial query

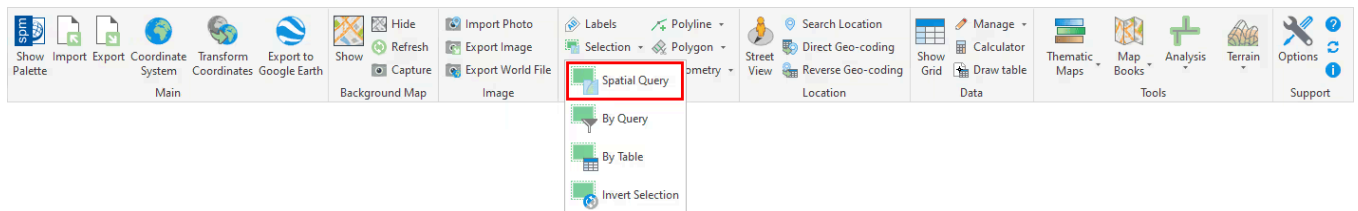
Available on edition

Professional

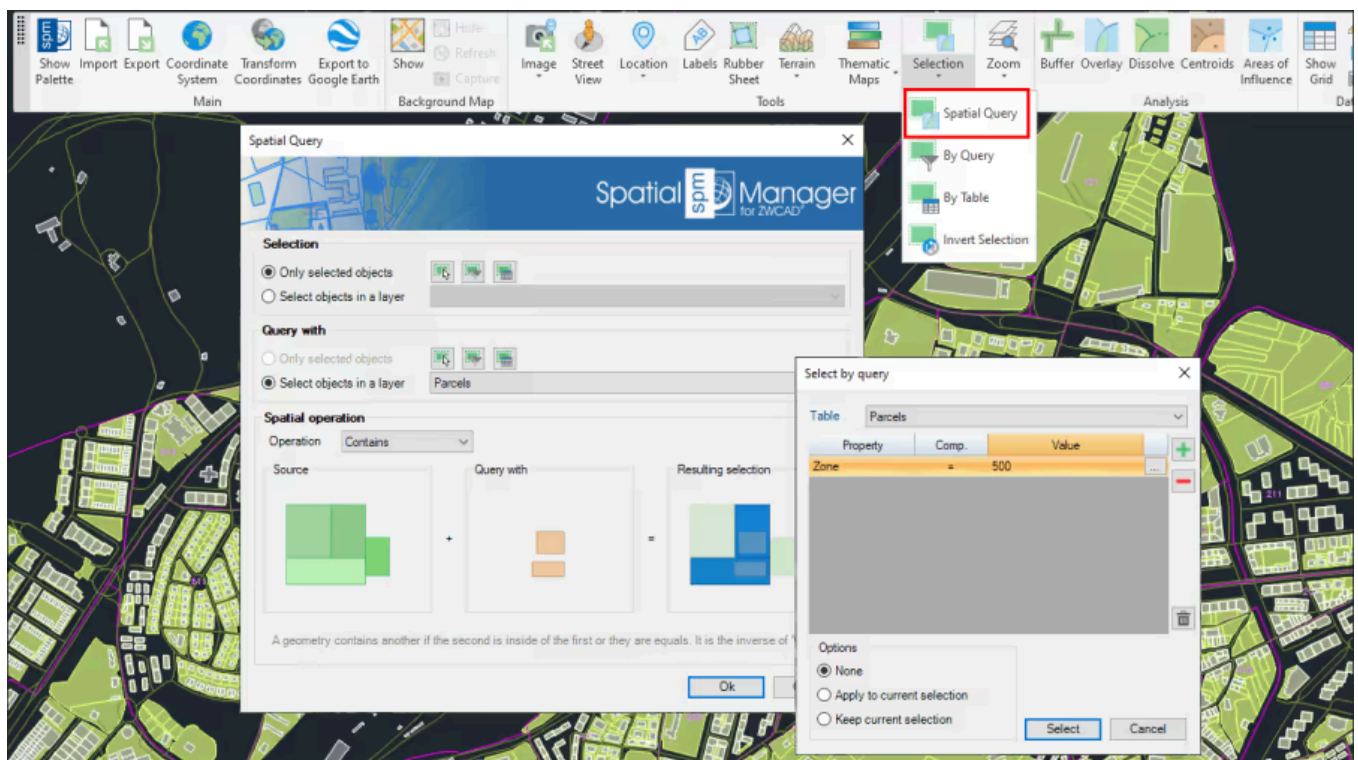
Select objects in the drawing according to the result of advanced simple or compound spatial queries by the following geometric operations..

Select entities based on their geometric relationship

The command **SPMSPATIALQUERY** in Spatial Manager™ for ZWCAD allows you to select entities in the drawing according to the result of advanced simple or compound spatial queries.

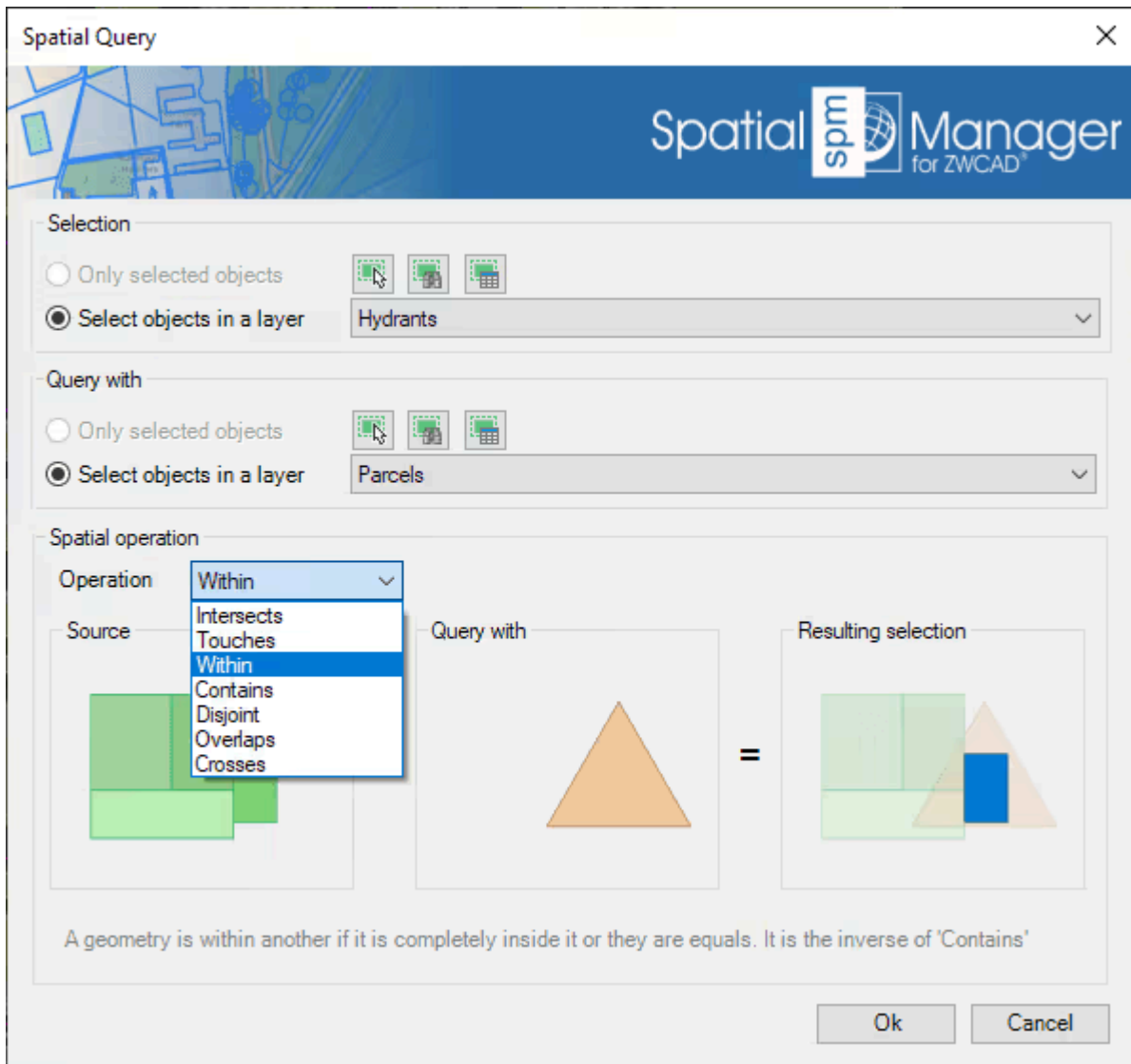


'SPMSPATIALQUERY' command in the Spatial Manager™ for ZWCAD ribbon



Advanced selection by processing Spatial Queries

Advanced selection by processing Spatial Queries.



Spatial Query parameters window

This function allows you to select entities in the drawing by performing geometric operations between two groups of entities: "Selection" (Group 1) and "Query with" (Group 2). For example, according to the chosen parameters in this image, all the hydrants (points) that are located within a parcel (polygons) would be selected.

- **Parameters and options**

- **Entities selection (Group 1 and Group 2)** (review [selection control options](#)).
- **Spatial operation**
 - **Intersects:** A geometry intersects another one if they have at least a point in common. It is the opposite of 'Disjoint'. For example, combined with [Buffers](#) , entities that are located at a certain distance from other entities, which will normally be points or linear entities (such as buildings located at a certain distance from road or street axes, etc.).
 - **Touches:** A geometry touches another one if they have common points only at their boundaries, without intersection, and none of them contains or is equal to the other. For

example, buildings touching another building within a block of contiguous buildings (the drawing must be very precise because no intersections should occur).

- **Within:** A geometry is within another one if it is completely inside or they are equal. It is the inverse of 'Contains'. For example, to select points representing pharmacies within a neighborhood, polygons representing hospitals within a municipality, or buildings within a parcel, etc.
- **Contains:** A geometry contains another one if the second one is completely inside the first one or they are equal. It is the inverse of 'Within'. For example, to select all the parcels in a municipality that contain one or more buildings.
- **Disjoint:** A geometry is disjoint from another one if they do not have any points in common (that is, "out of": It does not intersect and does not touch). It is the opposite of 'Intersects'.
- **Overlaps:** A geometry overlaps another one if they have areas in common, but neither is fully inside the other and they are not equal. For example, polygons that intersect but none of them are completely inside each other, i.e., "they cross". A practical case could be the selection of buildings in one municipality that are located partially within the boundary of the municipality and partially within the boundary of another adjacent municipality.
- **Crosses:** A geometry (linear entity) crosses another one if it has at the same time parts inside and outside the second one. For example, to select road sections that are partially located within the boundaries of two or more municipalities.

Note: You can use the command [SPMZOOMTOSELECTION](#) to quickly zoom to the selection extent.

DOCUMENTATION

Buffer

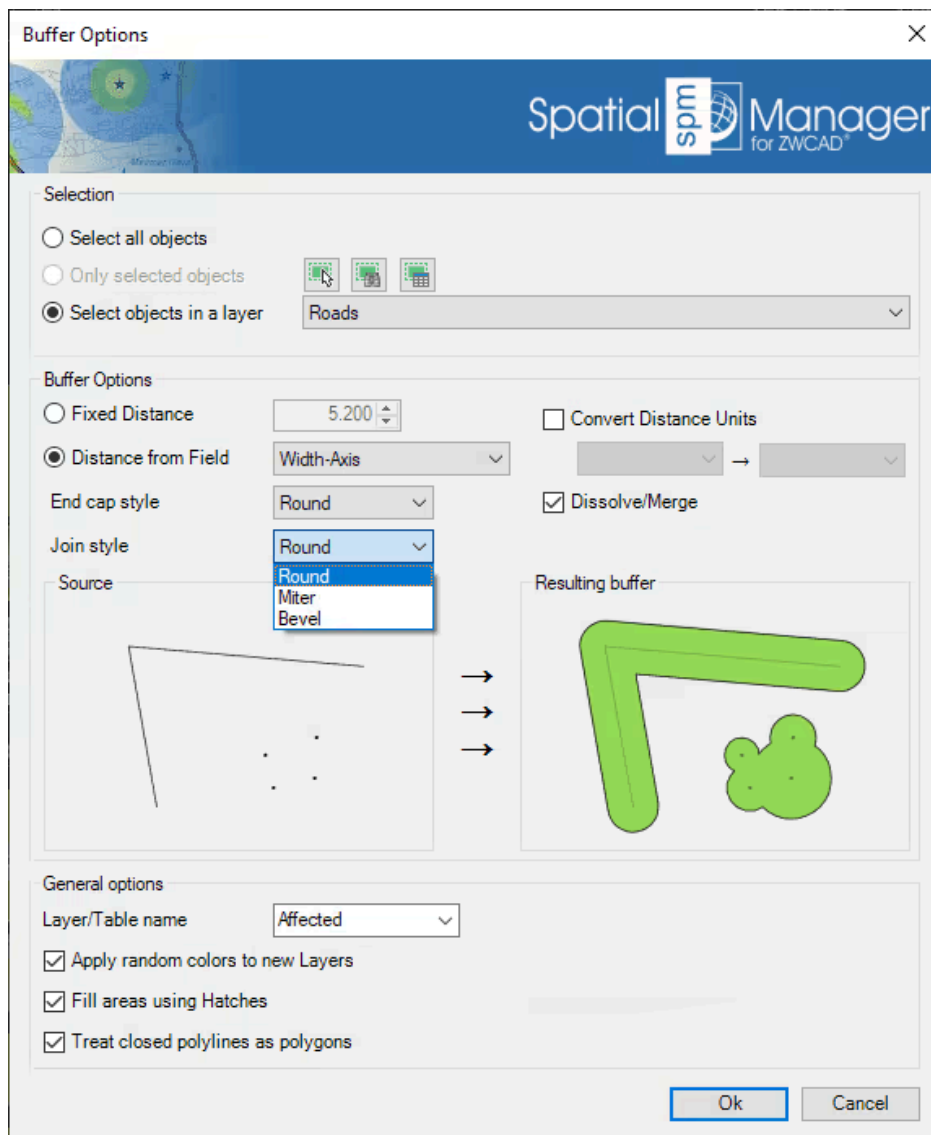
Available on edition

Professional

Generate Buffered polygons around point, linear or polygonal objects.

Buffer

A buffer is a zone around a geographic feature, defined by a specific distance. The command **SPMBUFFER** in Spatial Manager™ for ZWCAD allows you to generate buffered polygons around point entities, linear entities, or polygon boundaries. Buffer distance can be constant or taken from the value of a table field for each entity. It is possible to merge the generated entities in their common areas, and different styles of joins and endings can be chosen.



Buffer parameters window

- *Entities selection:* Review the section [selection control](#) .
- *Buffer options:* You can select the buffer distance (fixed value or field-based value), the distance units (read below), the join and end cap styles, and whether you want to dissolve/merge the generated buffered polygons.
 - About units conversion: If a coordinate system with a defined unit of measurement is assigned to the drawing, the user can select another unit from the drop-down list to define the entered buffer distance, and the application will perform the conversion between it and the unit defined by the coordinate system. If the drawing does not have a coordinate system assigned to it, or the coordinate system does not have defined units, the user can select from the drop-down lists the unit in which the entered buffer distance is defined and the drawing units. The application will perform the conversion between the two.
- *Table/Layer name:* This setting defines the target Layer and data table name for the buffers. You can select an existing Layer in the drawing, or you can write the name to create a new Layer. Buffer entities will adopt the same data as the entities that generate them, unless the "Dissolve/Merge" option has been checked, in which case this would not make sense and the combined buffer entities are not attached to any data table.
 - *Apply random colors to new Layers.*
 - *Fill areas using Hatches.*
- *Treat closed polylines as polygons:* When checked (default value), all closed polylines in the drawing will be considered as polygons and not as linear entities. Most of the time, closed polylines represent polygonal elements.

DOCUMENTATION

Overlay

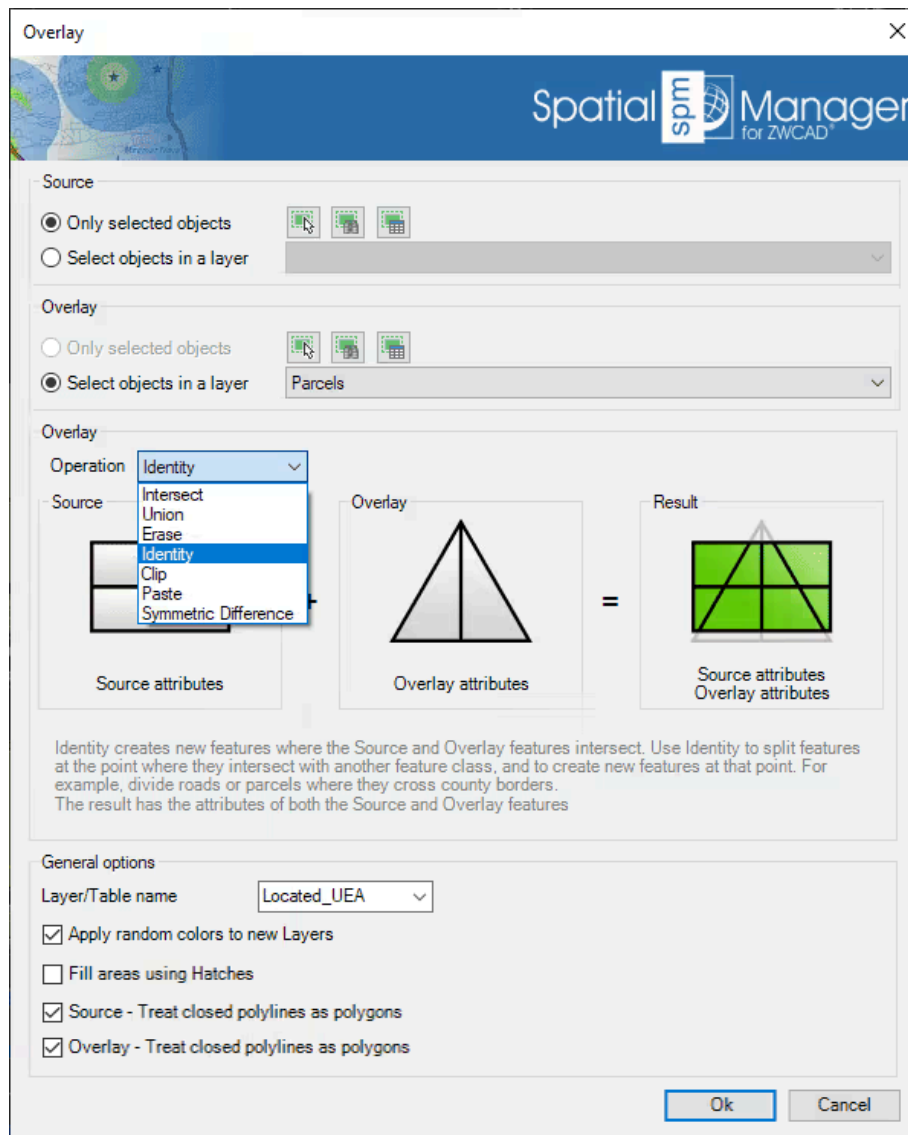
Available on edition

Professional

Allows you to create new objects based on geometric and data operations between two existing object groups. These operations are: **Intersect**, **Union**, **Erase**, **Identity**, **Clip**, **Paste** and **Symmetric Difference**.

Overlay

The command **SPMOVERLAY** in Spatial Manager™ for ZWCAD allows you to create new entities based on geometric and data operations between two existing entity groups.



Overlay parameters window

This function allows you to generate new entities in the drawing by performing geometric operations between two groups of existing entities: "Source" (Group 1) and "Overlay" (Group 2).

- *Entities selection:* For Group 1 and Group 2, review the [selection control](#) .
- *Overlay parameters and options:*
 - *Operation:*
 - *Intersect.*
 - *Union.*
 - *Erase.*
 - *Identity.*
 - *Clip.*
 - *Paste.*
 - *Symmetric Difference.*
 - *General options:*
 - *Table/Layer name:* Defines the target Layer and data table name for the newly created entities.
 - *Apply random colors to new Layers.*
 - *Fill areas using Hatches.*
 - *Treat closed polylines as polygons (Both Source and Overlay sets):* When checked (default value), all closed polylines in the drawing will be considered polygons and not linear entities.

DOCUMENTATION

Dissolve

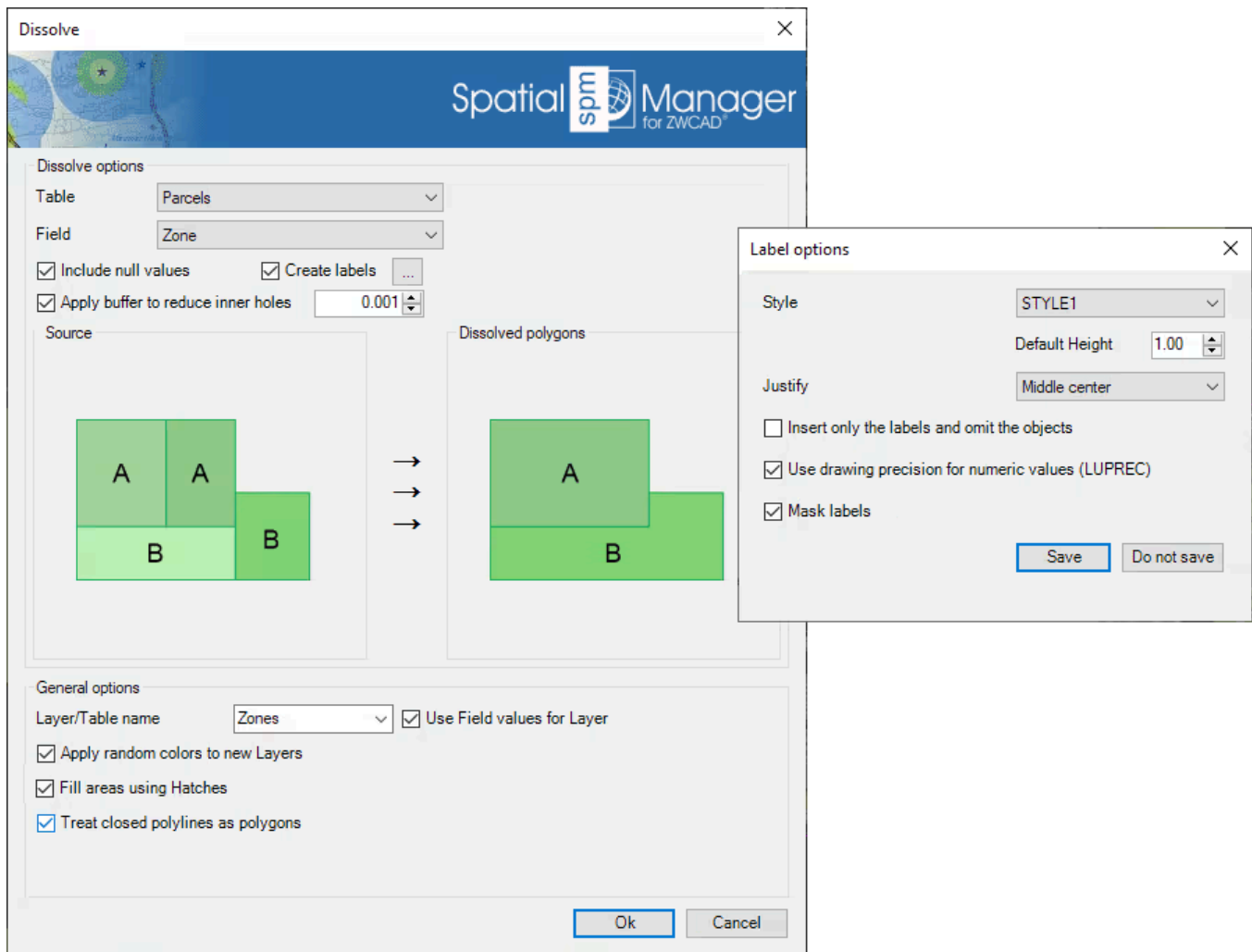
Available on edition

Professional

Generate new Polygons based on the grouping of other adjacent polygons with some common data.

Dissolve

Dissolve is a spatial operation that merges adjacent polygons sharing common attribute values into single, larger features. The command **SPMDISSOLVE** in Spatial Manager™ for ZWCAD allows you to generate new polygons based on the grouping of other adjacent polygons with some common data.



Dissolve parameters window

- *Dissolve options*: You can select the common table/field data for dissolving the polygons (even including null data).
- *Label options*: Define the style, height, and justification of the label text entities.
- *Table/Layer name*: Defines the target Layer and data table name for the new dissolved polygons.

- *Use field values for Layer.*
- *Apply random colors to new Layers.*
- *Fill areas using Hatches.*
- *Treat closed polylines as polygons:* When checked (default value), all closed polylines will be considered polygons.

Note: Since this operation can only be performed on polygonal entities, the application will alert the user either if there are non-polygonal entities attached to the selected table (warning) or if there are not enough polygons to process it (cancellation).

DOCUMENTATION

Centroids

Available on edition

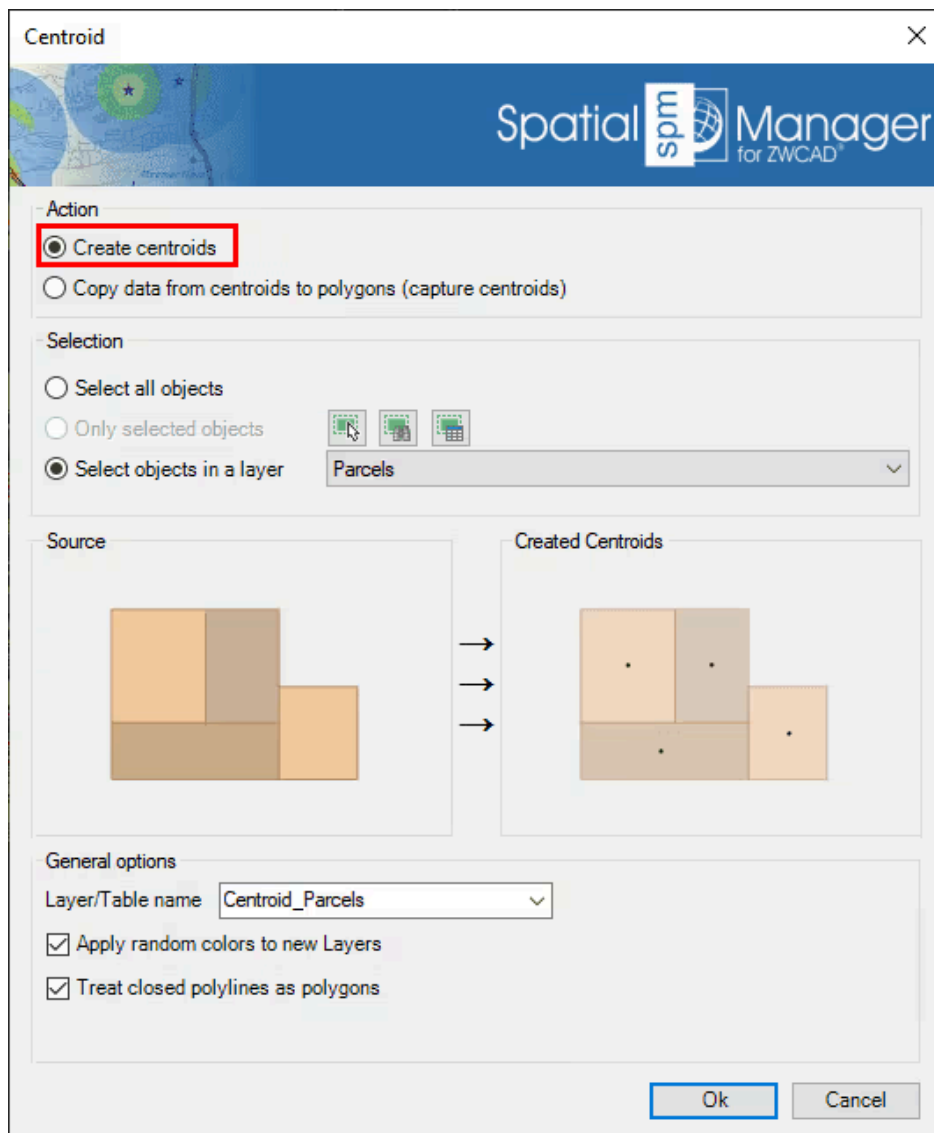
Professional

Allows you to generate polygon Centroids (Point objects) by adopting the polygons data, or add Centroids data to the polygons that contain them.

Centroids

The command **SPMCENTROID** in Spatial Manager™ for ZWCAD includes two functionalities:

1. Generate centroids (point entities) for the selected polygons. The polygon data, if any, will also be attached to the centroid entities.
2. Capture the selected centroid data to add it to a copy of the selected polygons that contain them.



Centroid parameters window

- *Entities selection:* Review [selection control](#) .
- *Table/Layer name:* Defines the target Layer and data table name for the centroids.
 - *Apply random colors to new Layers.*
- *Treat closed polylines as polygons:* When checked (default value), all closed polylines are considered polygons.

Copy data from centroids to polygons (capture centroids)

The screenshot shows the 'Centroid' dialog box with the following settings:

- Action:** Copy data from centroids to polygons (capture centroids)
- Centroids:** Only selected objects
- Polygons:** Select objects in a layer (Layer: Parcels)
- Capture centroids options:** Create also polygons without centroid found
- General options:**
 - Layer/Table name: Centroid_QueryParcelsCentroids
 - Apply random colors to new Layers
 - Fill areas using Hatches
 - Treat closed polylines as polygons

Centroid parameters window

- *Centroids selection:* Any point entity.
- *Polygons selection:* Any polygonal entity.
- *Capture centroids options:*
 - *Create also polygons without centroid found.*
- *Table/Layer name:* Defines the target Layer and data table name for the created polygons.
 - *Apply random colors to new Layers.*
- *Create:* Duplicate polygon entity type, borders, or polygons.

- *Fill areas using Hatches.*
- *Treat closed polylines as polygons:* When checked (default value), all closed polylines in the drawing will be considered polygons.

DOCUMENTATION

Areas of Influence

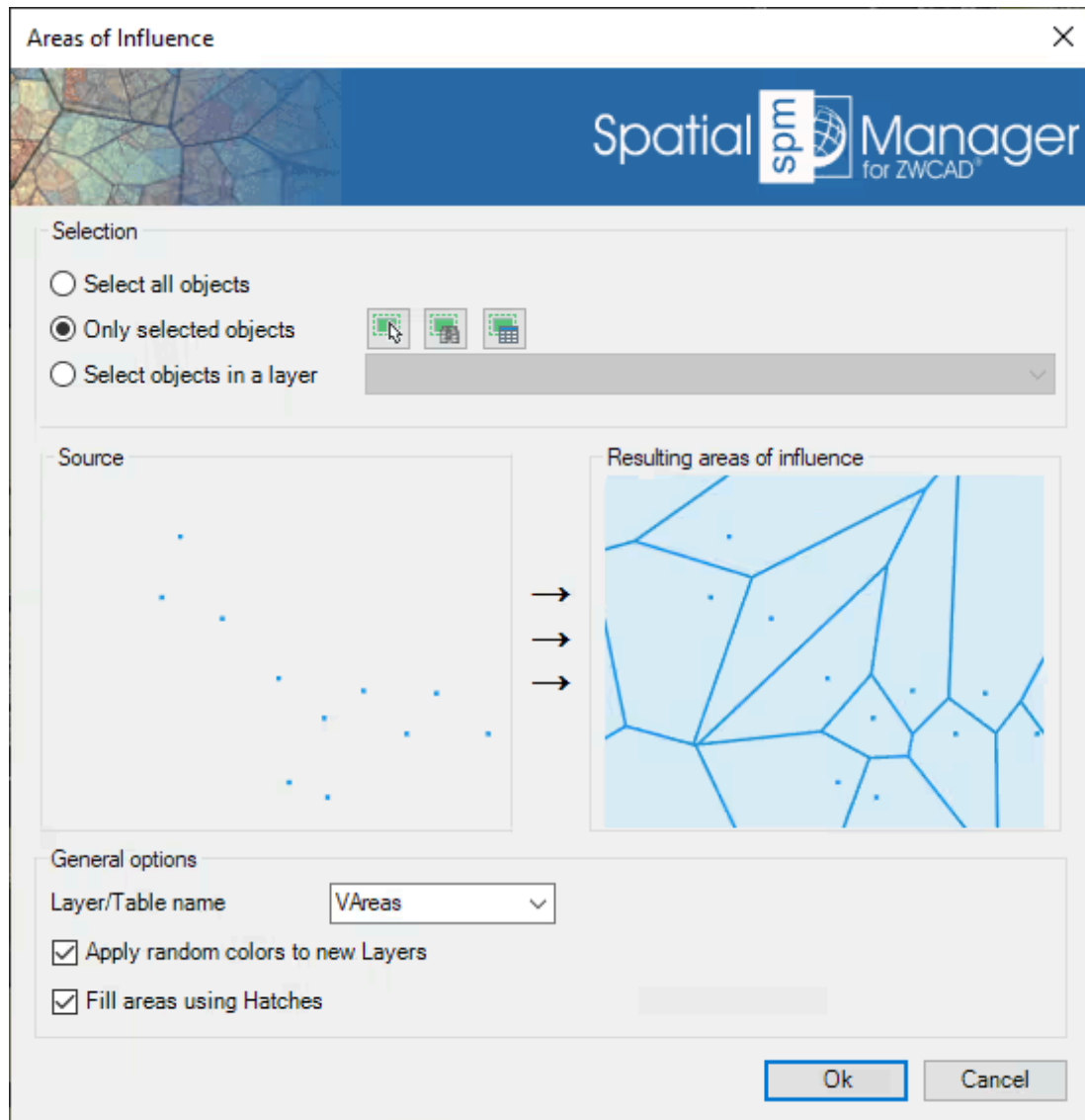
Available on edition

Professional

Creates polygons defined by the sets of points closest to each point of a selection in the drawing (Voronoi diagrams).

Areas of Influence

The command **SPMINFLUENCEAREAS** in Spatial Manager™ for ZWCAD allows you to generate polygons defined by the set of points closest to each point of a selection of points in the drawing (Voronoi diagram). Each polygon generated will adopt the same data (if any) as the corresponding point.



Areas of Influence parameters window

- *Entities selection:* Review the [selection control](#) .
- *Table/Layer name:* Defines the target Layer and data table name for the new polygons.
 - *Apply random colors to new Layers.*
 - *Fill areas using Hatches.*

DOCUMENTATION

Location Tools

Available on edition**Professional**

Location and geo-coding tools in ZWCAD help to add reference elements and enhanced data to existing objects.

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Direct geocoding

Available on edition

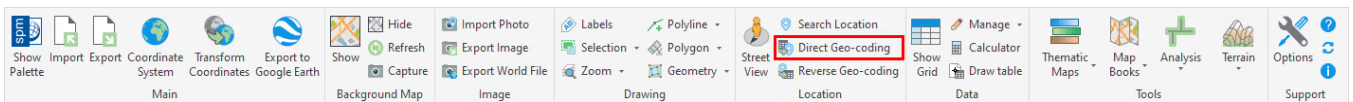
Professional

Insertion of points in the drawing from postal addresses

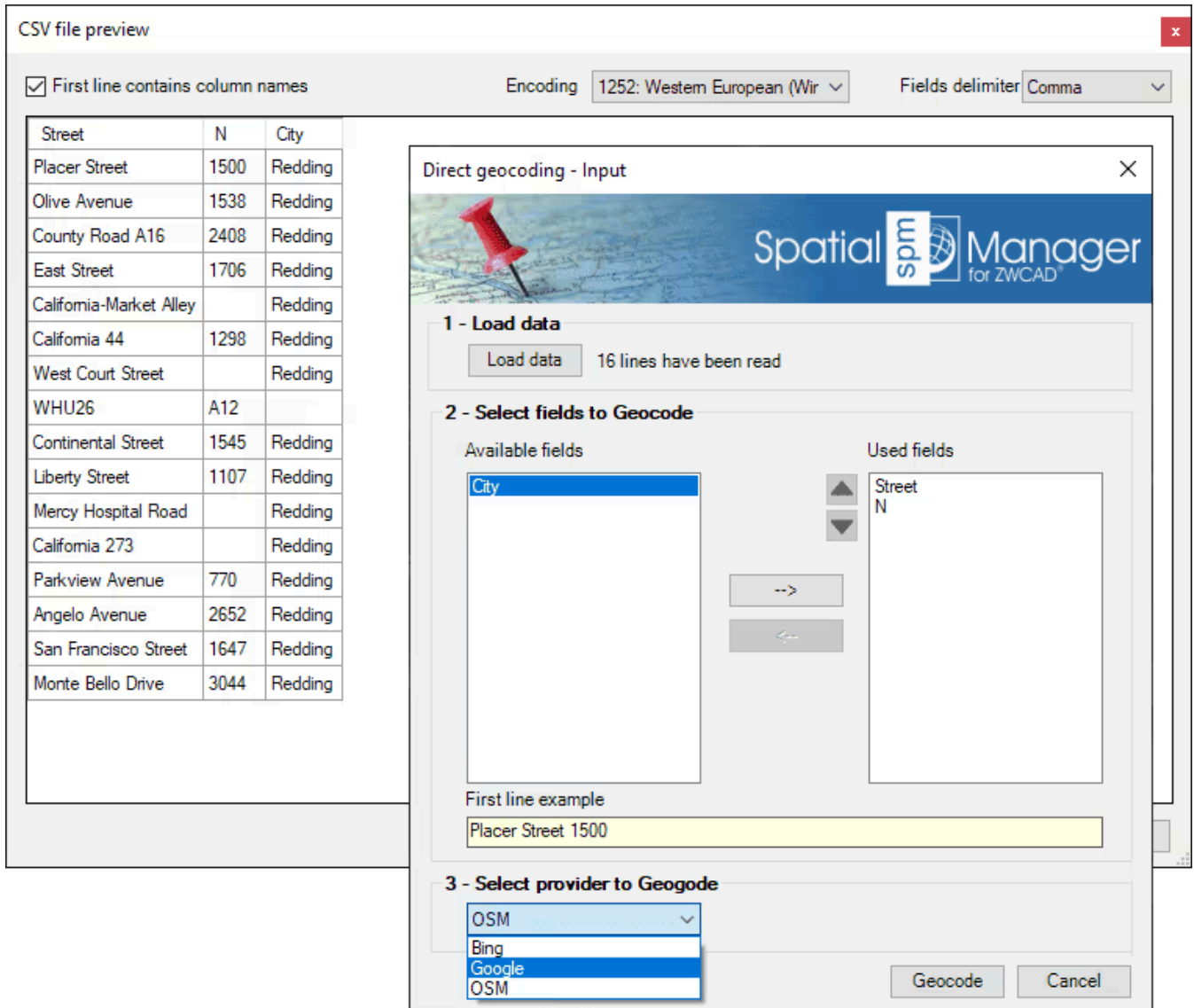
Load texts from CSV files and seek for their coordinates. Resulting points includes attached data.

Insert drawing Points from a geographic data table

Geocoding is the process of converting postal addresses into geographic coordinates (latitude and longitude). Spatial Manager™ for ZWCAD includes the **SPMGEOCODING_DIRECT** command that allows you to compose addresses from a geographic data file (CSV, TXT, etc.) and geocode these addresses through a Geocode provider (Google, Bing, OpenStreetMap). Once you load the geographic file, you can preview the resulting table, configure some file parameters (such as the fields delimiter, etc.), select (add or remove) and sort the appropriate fields, and select the provider to geocode from the list.



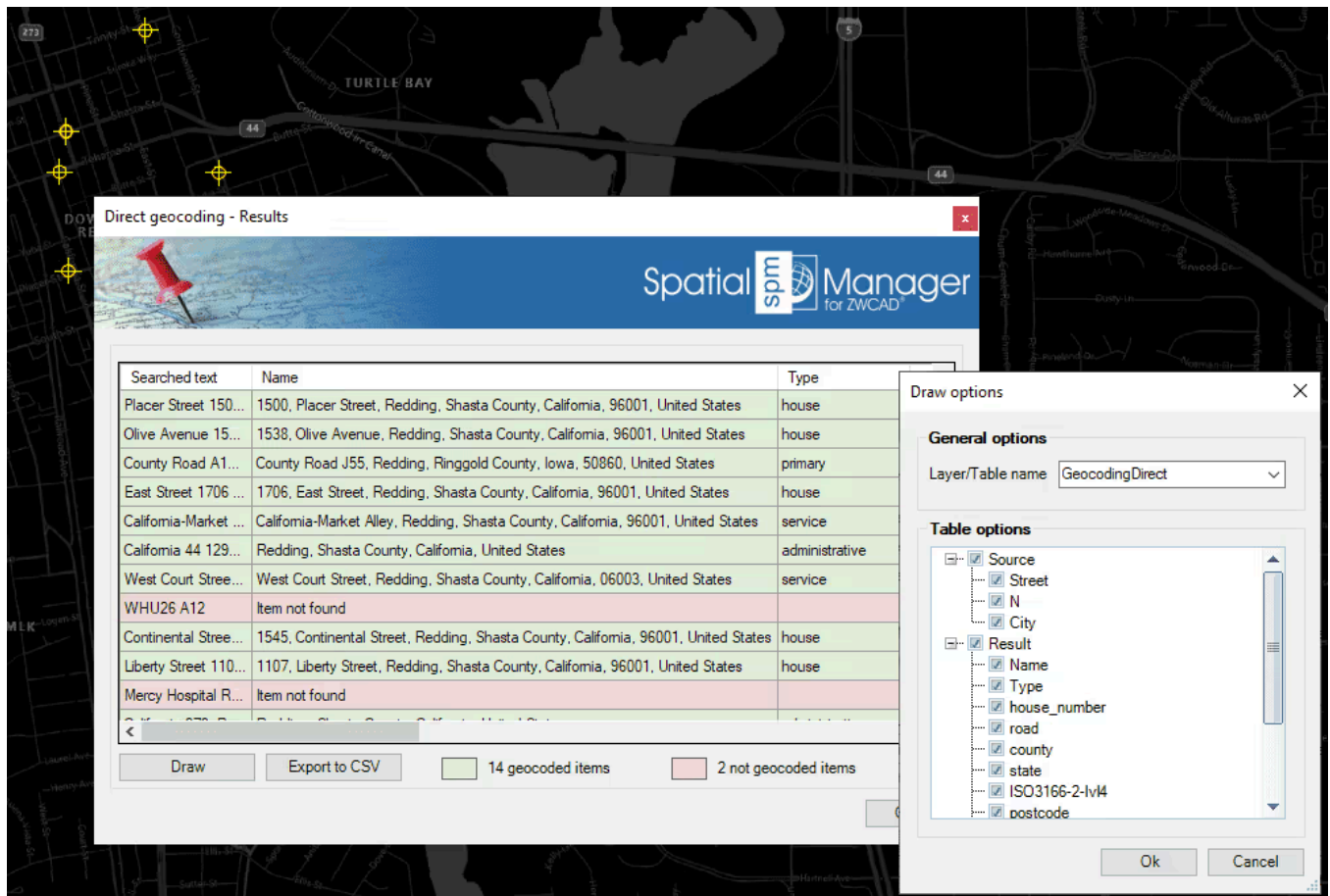
'SPMGEOCODING_DIRECT' command in the Spatial Manager™ for ZWCAD ribbon



Direct geocoding file preview and geocoding parameters

Once the direct geocoding process is finished, you will get a results table including all the fields returned by the chosen geocoding service. Those addresses that could not be geocoded (perhaps due to insufficient or inconclusive data) are shown in a different color. From the results of the table, you can:

- **Draw the geocoded Points:** Enter the name of the Layer and attached Table name for the created points, and select the fields that will be included in this table from the source and result data.
- **Export the table to a CSV file:** Select the exporting to CSV parameters (delimiter, separator, etc.). You can also opt to omit in the exported CSV the addresses that have not been geocoded.



Direct geocoding results and draw parameters

- **Notes:**

- Certain geocoding providers (such as Google or Bing) may require special terms of use for the users of this service. You can configure any special setting for such providers through the [Service Provider API Keys in the application Options \('SPMOPTIONS'\)](#).
- If you select a large number of addresses to geocode, the application will warn you that this operation may involve high data consumption depending on the geocoding provider chosen.
- If the drawing is not empty when 'SPMGEOCODING_DIRECT' is executed, it is necessary that the drawing has been assigned a Coordinate Reference System (CRS), learn [how to georeference a drawing](#).
- If the drawing is empty and has no coordinate system assigned to it, when **SPMGEOCODING_DIRECT** is executed Spatial Manager™ for ZWCAD will assign the CRS Code:3857 (WGS84 / Pseudo-Mercator) to the drawing. This CRS is valid for any Earth area, but may be inaccurate for measurements in some areas.

DOCUMENTATION

Reverse geocoding

Available on edition

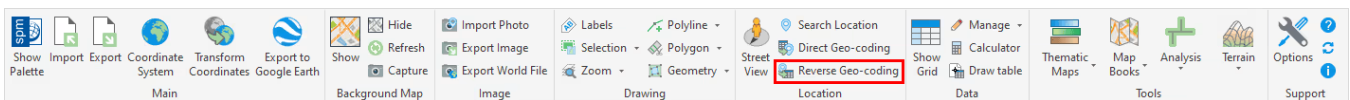
Professional

Obtain postal addresses from objects in the drawing

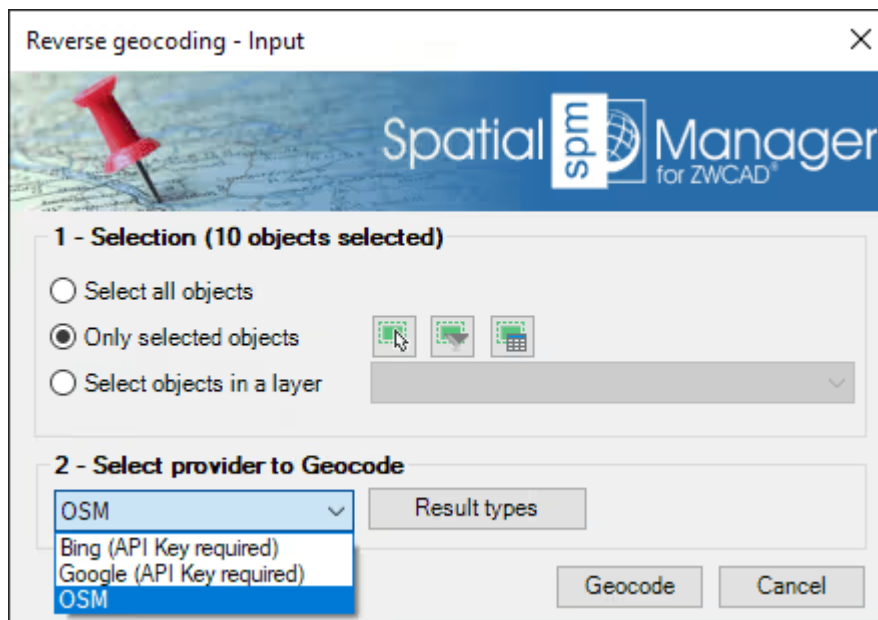
Get data like street, municipality, postal code, etc. and add it to existing objects.

Get the postal addresses of entities in the drawing

Spatial Manager™ for ZWCAD includes the **SPMGEOCODING_REVERSE** command that allows you to obtain the postal addresses of the selected entities through a Geocode provider (Google, Bing, OpenStreetMap). All that you need is to select the entities in your drawing to be geocoded, choose the provider to geocode from the list, and, optionally, choose the result types (which depend on the results returned by each provider).



'SPMGEOCODING_REVERSE' command in the Spatial Manager™ for ZWCAD ribbon

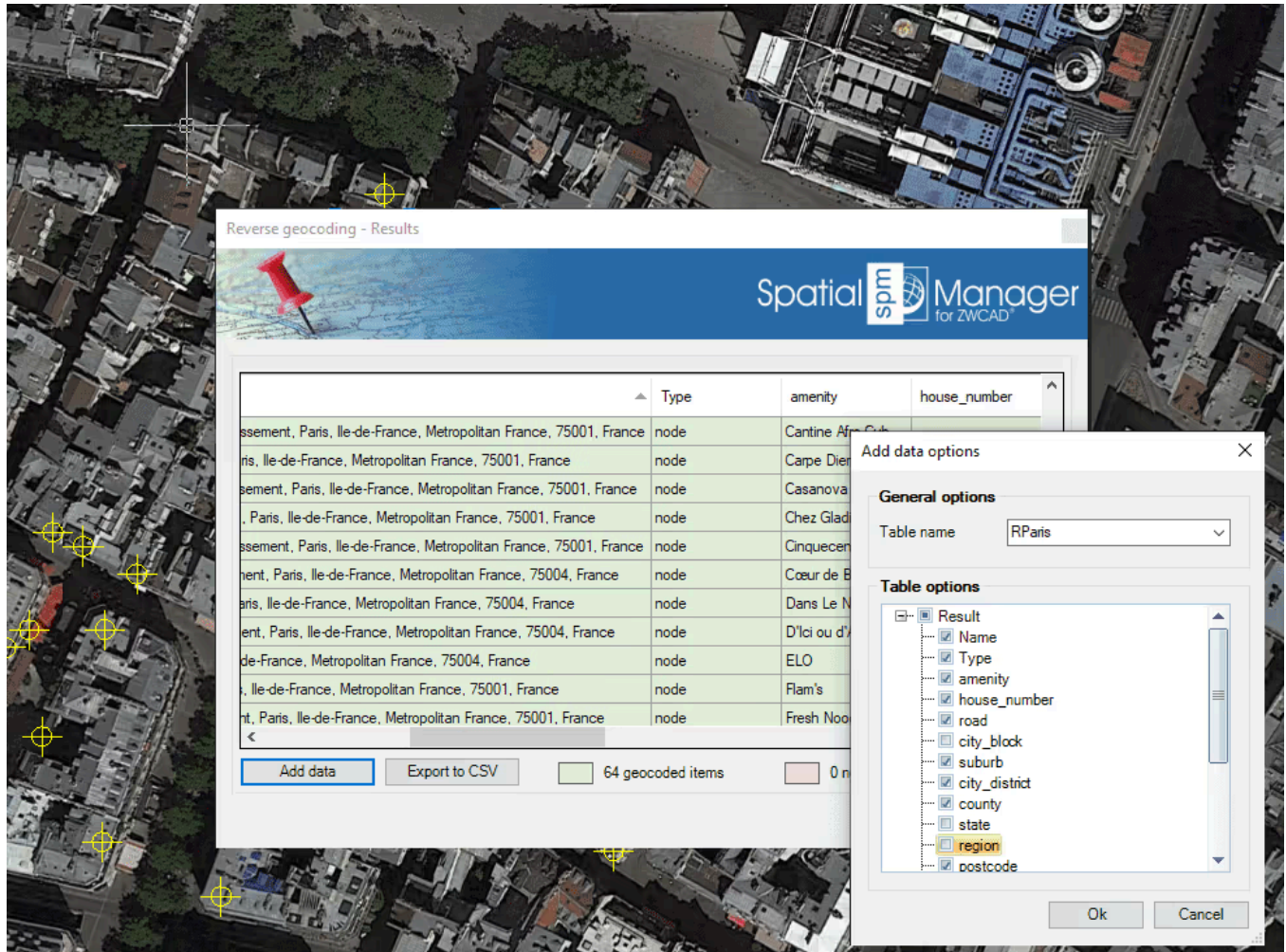


Reverse geocoding entities selection and geocoding parameters

- **Selection options** (review [selection control options](#)).

Once the reverse geocoding process is finished, you will get a results table including all the fields returned by the chosen geocoding service. Those addresses that could not be geocoded (may be due to insufficient or inconclusive data) are shown in a different color. From the results of the table, you can:

- *Add data*: Enter the name of the attached table for the geocoded entities, and select the fields that will be included in this table from the result data. The selected table can be a new table or, if all geocoded entities are already attached to the same existing table, this table can be chosen, which is a good way to add the geocoding data to other existing entity data.
- *Export the table to a CSV file*: Select the exporting to CSV parameters (delimiter, separator, etc.). You can also opt to omit in the exported CSV the addresses that have not been geocoded.



Reverse geocoding results and data parameters

- *Notes*:
 - *Certain geocoding providers (such as Google or Bing) may require special terms of use for the users of this service. You can configure any special setting for such providers through the "Service Provider API Keys" in the application Options ("SPMOPTIONS").*
 - *If you select a large number of entities to geocode, the application will warn you that this operation may involve high data consumption depending on the geocoding provider chosen.*
 - *If you select non-point entities to geocode (such as polygons, polylines, etc.) the results may be inaccurate depending on the shapes of these entities. For example, for polygonal entities (such as parcels, zones, etc.) the centroid of the entities will be chosen to calculate their postal address, which may be inaccurate if the shape of these polygons causes the centroid to be outside the polygon or away from the appropriate postal address.*

- *If the drawing is not empty when 'SPMGEOCODING_REVERSE' is executed, it is necessary that the drawing has been assigned a Coordinate Reference System (CRS), learn [how to georeference a drawing](#) .*
- *If the drawing is empty and has no coordinate system assigned to it, when **SPMGEOCODING_REVERSE** is executed Spatial Manager™ for ZWCAD will assign the CRS Code:3857 (WGS84 / Pseudo-Mercator) to the drawing. This CRS is valid for any Earth area, but may be inaccurate for measurements in some areas.*

DOCUMENTATION

Search locations

Available on edition

Professional

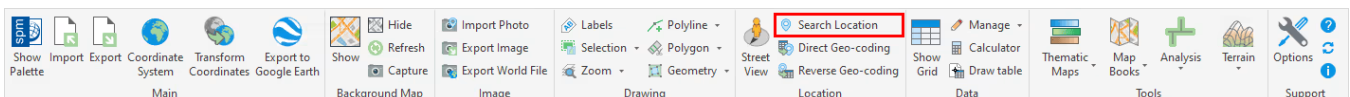
Spatial Manager™ for ZWCAD include functions to geo-locate in your drawing postal addresses, streets, neighborhoods or other geographical objects.

Search for locations of geographical entities in my drawing

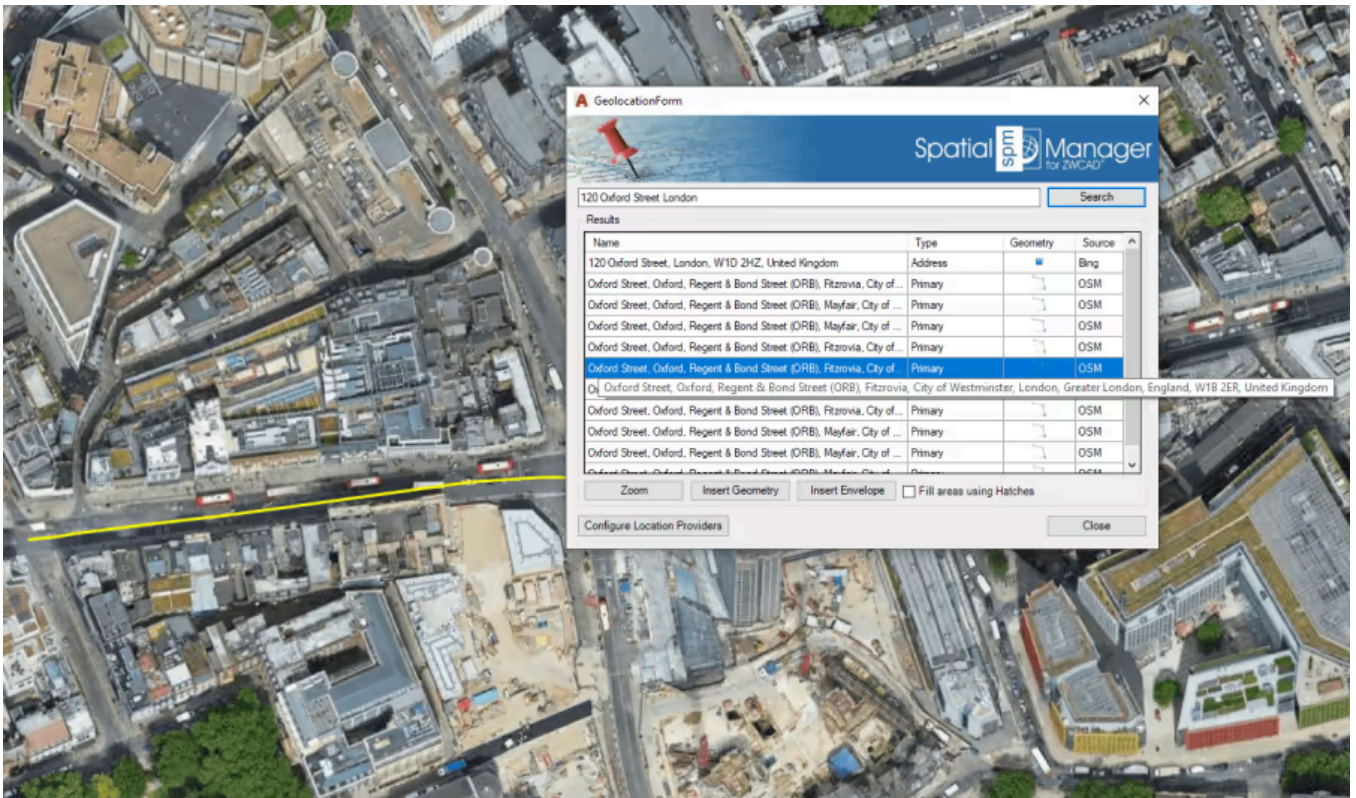
Spatial Manager™ for ZWCAD includes the **SPMSEARCHLOCATION** command that allows you to search for locations through Internet location services based on your search text. Once you enter the search text (the more precise, the more accurate the location) and click "Search" (or press Enter), the results returned by these services (if found, one or more results) will be shown in the search window and include the following information:.

- **Name:** Full location name. Although you can resize the window if you want, if the full text does not fit, scroll over and a tooltip will be shown.
- **Type:** Location type. According to the classification provided by the localization service.
- **Geometry:** Geometry type. Point, Line-string, Polygon, Multi-Polygon, etc. The icon represents in a simplified way the geometry type, but you can scroll over it and a tooltip including the geometry type text will be shown.
- **Source:** Location service source. The name of the Internet location service that returned the result.
 - *Note: Certain location service providers (such as Google) may require special terms of use for the users of this service. You can configure any special setting for such providers through the button "Configure Location Providers" or the [Service Provider API Keys](#) in the application Options ("SPMOPTIONS"). If this is not done, the results corresponding to these providers will not appear in the results table as they will not be available for query.*

You can sort the result rows according to the "Name", "Type" or "Source" columns (direct or inverse order) by clicking on the column title.



'SPMSEARCHLOCATION' command in the Spatial Manager™ for ZWCAD ribbon



'Search Location' window

- **Notes:**
 - If the drawing is not empty when 'SPMSEARCHLOCATION' is executed, it is necessary that the drawing has been assigned a Coordinate Reference System (CRS), learn [how to georeference a drawing](#) ..
 - If the drawing is empty and has no coordinate system assigned to it, when **SPMSEARCHLOCATION** is executed Spatial Manager™ for ZWCAD will assign the CRS Code:3857 (WGS84 / Pseudo-Mercator) to the drawing. This CRS is valid for any Earth area, but may be inaccurate for measurements in some areas..

Use the results shown in the 'Search Location' window

The Spatial Manager™ for ZWCAD 'Search Location' window allows you to select any shown result in order to:

- **Zoom to the location.** By using the "Zoom" button or by double-clicking on the chosen result.
- **Insert the Geometry in your drawing**, and zoom to the Geometry. Points, Polylines, Polygons, etc., depending on the geometry type.
- **Insert the geometry Envelope**, and zoom to the Envelope. Internet location services usually also return a rectangular envelope of the geographic entity found. This option allows you to insert this rectangle in your drawing.

You can choose "Fill areas using Hatches" in order to add a Hatch when inserting polygonal geometries or rectangular envelopes. The inserted entities (and their optional hatches) will be drawn in the current Layer of the drawing.

Note that the 'Search Location' window remains open until you close it so that you can repeat the actions with the results you want. In fact, you can navigate through the drawing, edit the drawing, etc., while the window is still on screen..

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Trial

Trial version of Spatial Manager™ for ZWCAD

The trial version of Spatial Manager™ for ZWCAD is a limited version which allows you to try out the application for up to 15 days. When this period ends, or if you want to use the unlimited version, you need to purchase a commercial license of Spatial Manager™ for ZWCAD.

Every time you start a process using the trial version of Spatial Manager™ for ZWCAD, you will see a window showing the days left in the trial period and the buttons to [purchase](#) a commercial license of Spatial Manager™ for ZWCAD or to [activate](#) a license.



Spatial Manager™ for ZWCAD trial version window

When the trial period has ended, you will see a similar window, but you can no longer “Continue” using the “Trial version”, and you need to activate a commercial license in order to keep working.

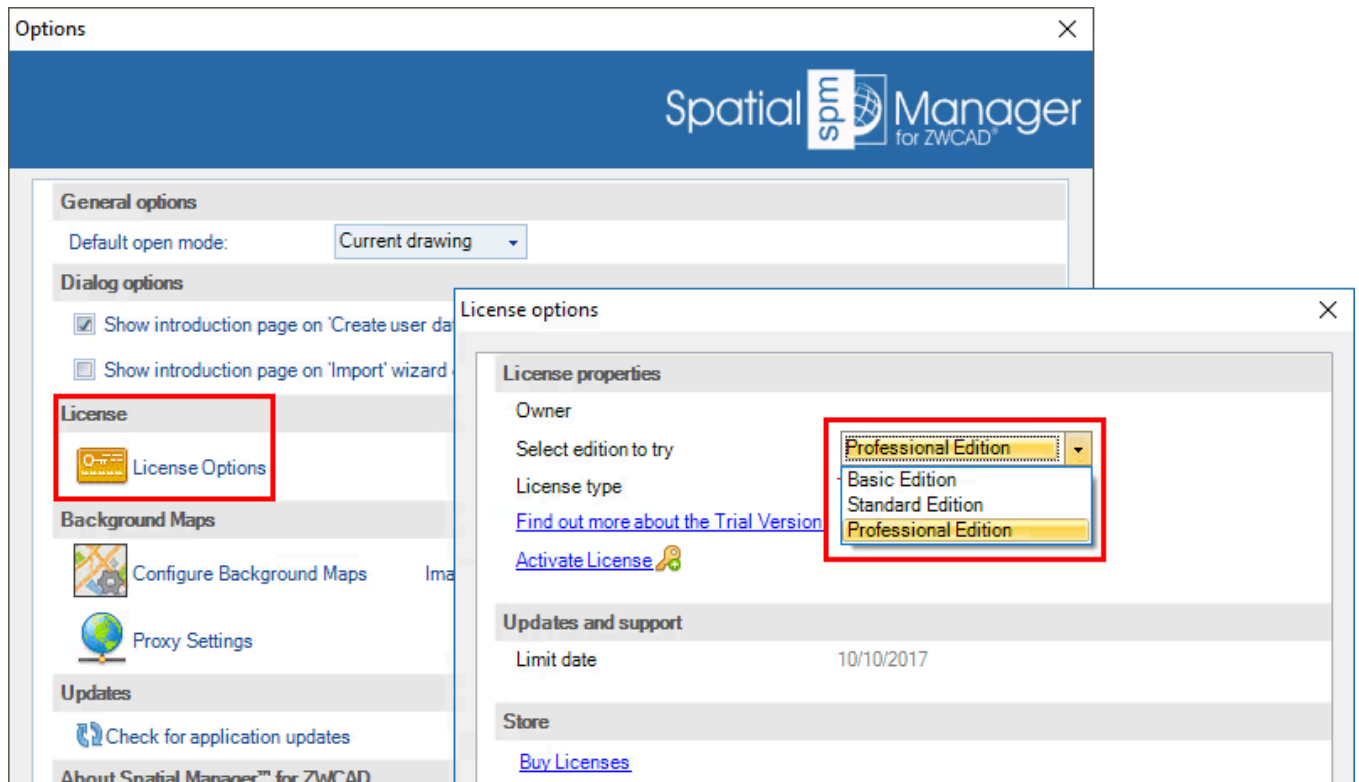
During the testing period, you will find the following **limitations**:

- A maximum number of Entities will be imported (from each incoming table) or exported (from the drawing, when testing the “Professional” Edition). The quantity will be 75% of the total number of Entities to be processed.
 - The number of Entities processed if you select the option “Import only Features in the current view” when importing is also conditioned by this limitation.
- A “DEMO” watermark will be added (if you are testing the “Standard” or “Professional” editions):
 - When showing any ‘Background Map’.

- When importing geo-referenced raster images. Thus, a new image will be saved on disk even if the imported image is not transformed. The user will be prompted for the location to save the newly generated image.
 - If you 'Import-all' the images in a folder, the "Working path" will be used to save the new images.
- A maximum number of terrain contours will be created (when testing the "Professional" Edition). The quantity will be 75% of the total calculated contours.
 - In addition, if contour elevations are labeled, a portion of the labels (25%) will be shown as "DEMO".
- When transforming the drawing Coordinate System, a maximum number of Entities will be transformed (when testing the "Professional" Edition). The quantity will be 75% of the total number of Entities to be transformed.
- The following functions are limited to 5 uses per session only:
 - Elastic deformation (Rubber Sheet) (SPMRUBBERSHEET) (if you are testing the "Professional" edition).
 - Labeling entities (SPMLABEL).
 - GIS Analysis tools (SPMBUFFER, SPMOVERLAY, SMPDISSOLVE, SPMCENTROID and SPMINFLUENCEAREAS) (if you are testing the "Professional" edition).
 - Street View palette (SPMSTREETVIEW) (if you are testing the "Professional" edition).
 - Search for Locations (SPMSEARCHLOCATION) (if you are testing the "Professional" edition).
 - Direct and Reverse Geo-coding (SPMGEOCODING_DIRECT and SPMGEOCODING_REVERSE) (if you are testing the "Professional" edition). In addition, these two functions will only return a maximum of 5 results each time they are executed.
 - Image tools (SPMIMPORTPHOTO, SPMEXPORTIMAGE, SPMWORLDFILE) (if you are testing the "Professional" edition).
 - Fields Calculator (SPMDATACALCULATOR) (if you are testing the "Professional" edition).
- The following functions are limited to 10 uses per session only:
 - API functions (if you are testing the "Professional" edition).
- When running some commands or processes, a warning window may appear about a specific limitation of the "Trial version".

Note: If you think you need an unlimited version for testing, please feel free to contact us (support@spatialmanager.com).

While using the trial version, and whenever you want, you can select the application Edition you would like to try through the application Options (SPMOPTIONS).



Spatial Manager™ for ZWCAD select trial edition

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Purchase

Purchase commercial licenses of the application.

You can purchase commercial licenses of Spatial Manager™ for ZWCAD through the product prices page in the: [Spatial Manager™ for ZWCAD prices page](#)

Once you click on the “Buy now” button you will be able to select the options of the license to purchase on the next page. Please read carefully the “Frequently Asked Questions” section at the bottom of this page in order to answer any questions about license types, features, updates/support periods, etc.:

- **License type:** Standalone or Network/Floating.
- **Initial Updates/Support period:** 1 or 3 years (see possibilities of extending this period below).
- **Quantity.**

Once you have purchased and installed a commercial license of Spatial Manager™ for ZWCAD, you need to [activate it](#) .

Please feel free to consult us with any questions or issues you may have with the purchasing, installation, activation, deactivation or transfer processes (support@spatialmanager.com).

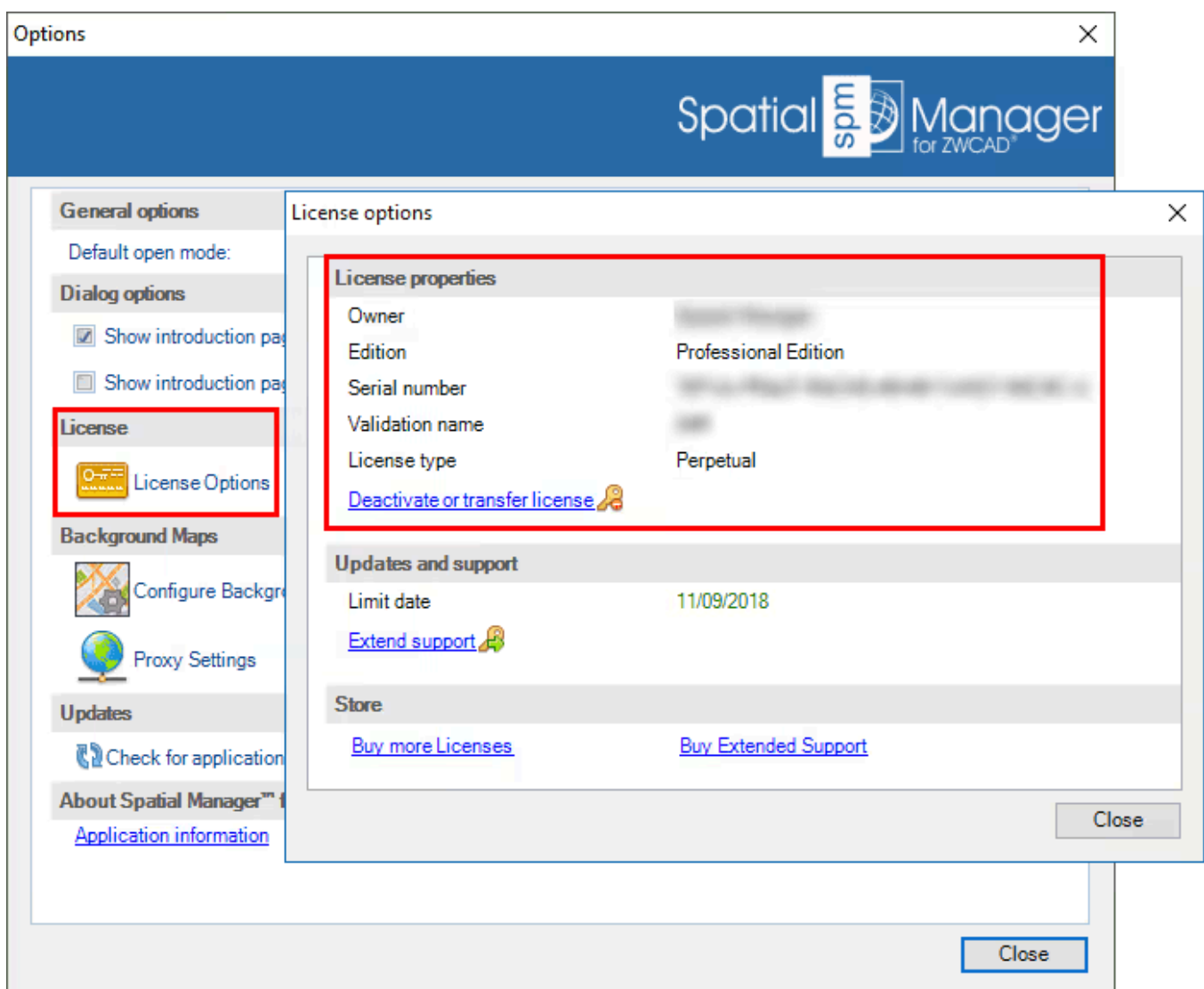
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Activate

Activate commercial licenses of the application

CAUTION: You must run the application as administrator to perform any task related to activation, deactivation or transfer of licenses.

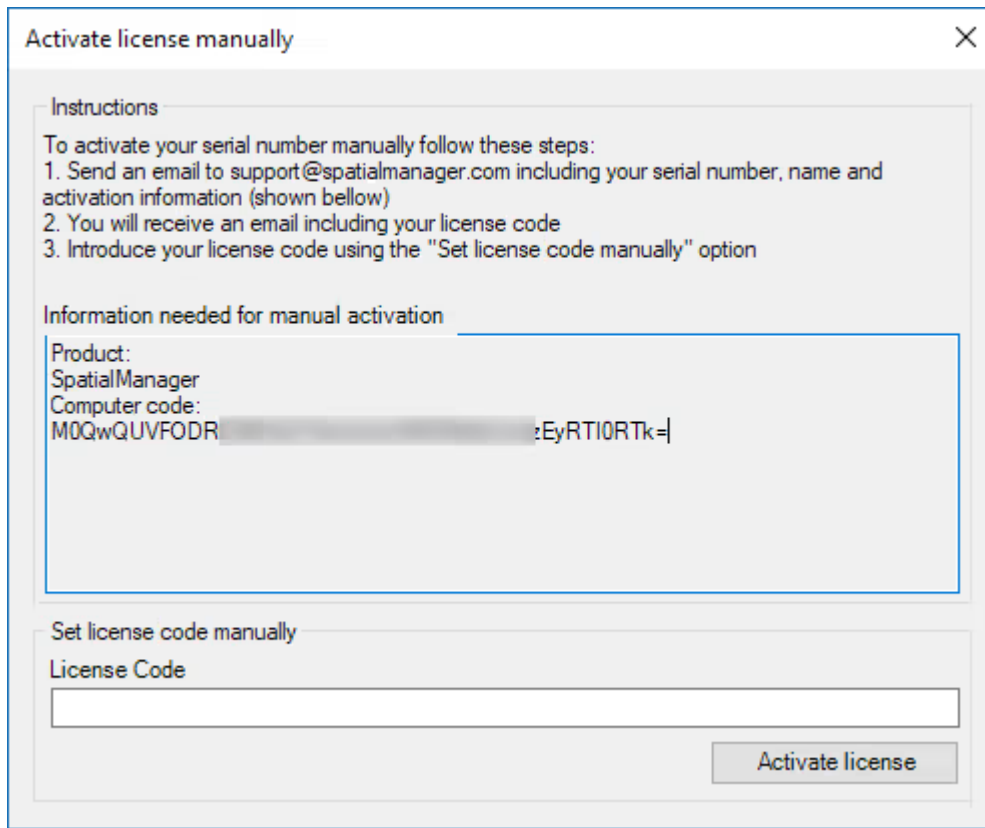
When you purchase one or more licenses of Spatial Manager™ for ZWCAD, you will receive by email your serial number(s) to activate your commercial license(s). After installing the application (if needed), you can activate your license by entering the serial number using the "Activate license" function, which can be found in the "License" section of the application Options (SPMOPTIONS).



Spatial Manager™ for ZWCAD Activate licenses window

As stated in the first paragraph of this page, please note that you can also activate your license directly from the "Trial version" window, even if the "Trial version" has expired.

Under some circumstances (no Internet connection, License Server stopped, etc.), it may not be possible to complete successfully the automatic activation of a license. If this happens, you will get a warning window including the "Computer code" and the steps needed to activate it manually.



Spatial Manager™ for ZWCAD - Instructions for manually activate the licenses

Notes about licenses activation:

- *Which network ports are used for activating/deactivating licenses?* License server communication is over standard HTTP/HTTPS protocol, so ports 80 and 443 are used.
- *Is the network license service installed by the user?* The application uses a cloud license server hosted by us, so there is no need to install anything more on the local network whether you use standalone or network (floating) licenses.

Please feel free to consult us with any questions or issues you may have with the purchasing, installation, activation, deactivation or transfer processes (support@spatialmanager.com).

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Upgrade

If you already own a license of Spatial Manager™ for ZWCAD, you have several options to upgrade or expand your license to meet your needs.

Upgrade Edition

If you currently have a Basic or Standard edition, you can upgrade to Professional edition to access advanced features. The upgrade process is simple and the cost is calculated based on your current license.

Benefits of Upgrading:

- Access to advanced features

To upgrade your edition:

1. Go to [license info page](#)
 2. Enter your activation key
 3. Select the "Upgrade Edition" option
 4. Follow the checkout process
 5. Restart the application and the license will be updated
-

Add License Seats

If you need additional users to work with the application, you can purchase additional license seats. This is particularly useful for teams that are growing or need to expand their usage.

Benefits of Additional Seats:

- Cost-effective for teams
- Centralized license management

To add seats to your license:

1. Go to [license info page](#)
 2. Enter your activation key
 3. Select the "Add Seats" option
 4. Choose the number of additional seats needed
 5. Complete the purchase process
 6. Restart the application and the license will be updated
-

Upgrade Support and Updates Period

All commercial licenses include a Updates/Support period (1 or 3 years initial period).

Benefits of active Support:

- Software updates and new features
- Technical support
- Access to latest versions
- Bug fixes and patches

To extend your Updates/Support period:

1. Go to [license info page](#)
2. Enter your activation key
3. Select the "Extend Support" option
4. Choose the support period (1 or 3 years) or a custom end date
5. Complete the purchase process
6. Restart the application and the license will be updated

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Support

Support period for the application.

You have a free-of-charge support period when you buy Spatial Manager™ for ZWCAD (1 year from the license purchase date). The support of the application (Updates and Support) includes your right to download, install and run any update released within the support period, as well as to enjoy the use of the answer center via email (support@spatialmanager.com) over the same period.

You can extend the support period for Spatial Manager™ for ZWCAD by purchasing an extension through the product support prices page in the: ([Spatial Manager™ for ZWCAD prices page](#))

Notes:

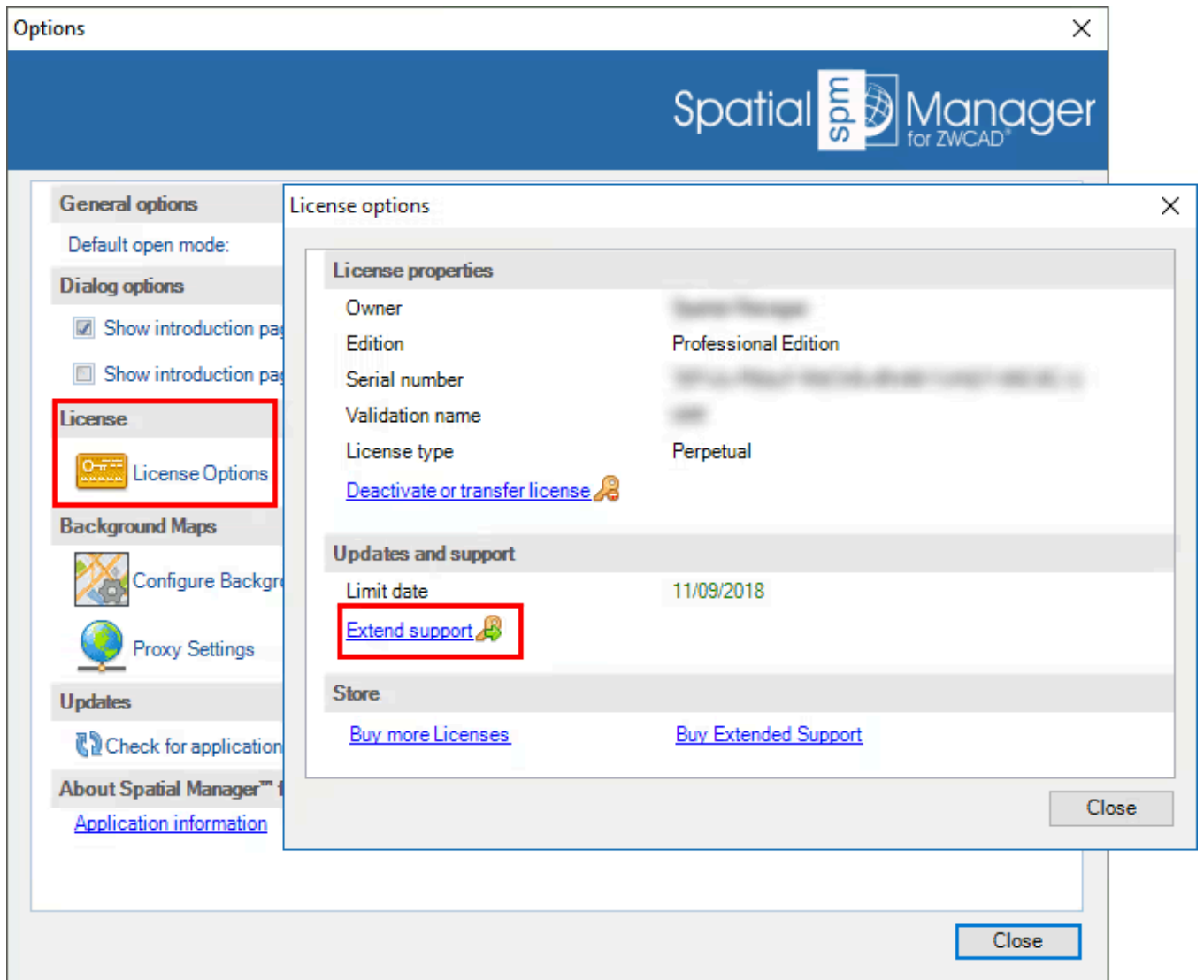
- *When you access here from the application, you will only see the support products applicable to the installed Edition (Basic, Standard or Professional).*
- *The free support period was 30 days for all the licenses bought before 6/10/2016.*

As you will see when you process the purchase of any extension, you will be able to enter your license number or activation key so that the process will automate the license extension. If you want to extend the Updates/Support periods of several licenses, or even change or homogenize these periods for all of them, you can click on [If you have more than one key, click here](#) and then enter the numbers or activation keys for all licenses.

Activate support extension for the application.

CAUTION: *You must run the application as administrator to perform any task related to activation, deactivation or transfer of licenses.*

When you purchase one or more support products for Spatial Manager™ for ZWCAD, you will receive a confirmation by email in order to extend the support period for the application. After purchasing the support extension, the new support period will be automatically activated the next time you run the application.



Spatial Manager™ for ZWCAD Activate support window

Please feel free to consult us with any questions or issues you may have with the purchasing, installation, activation, deactivation or transfer processes (support@spatialmanager.com).

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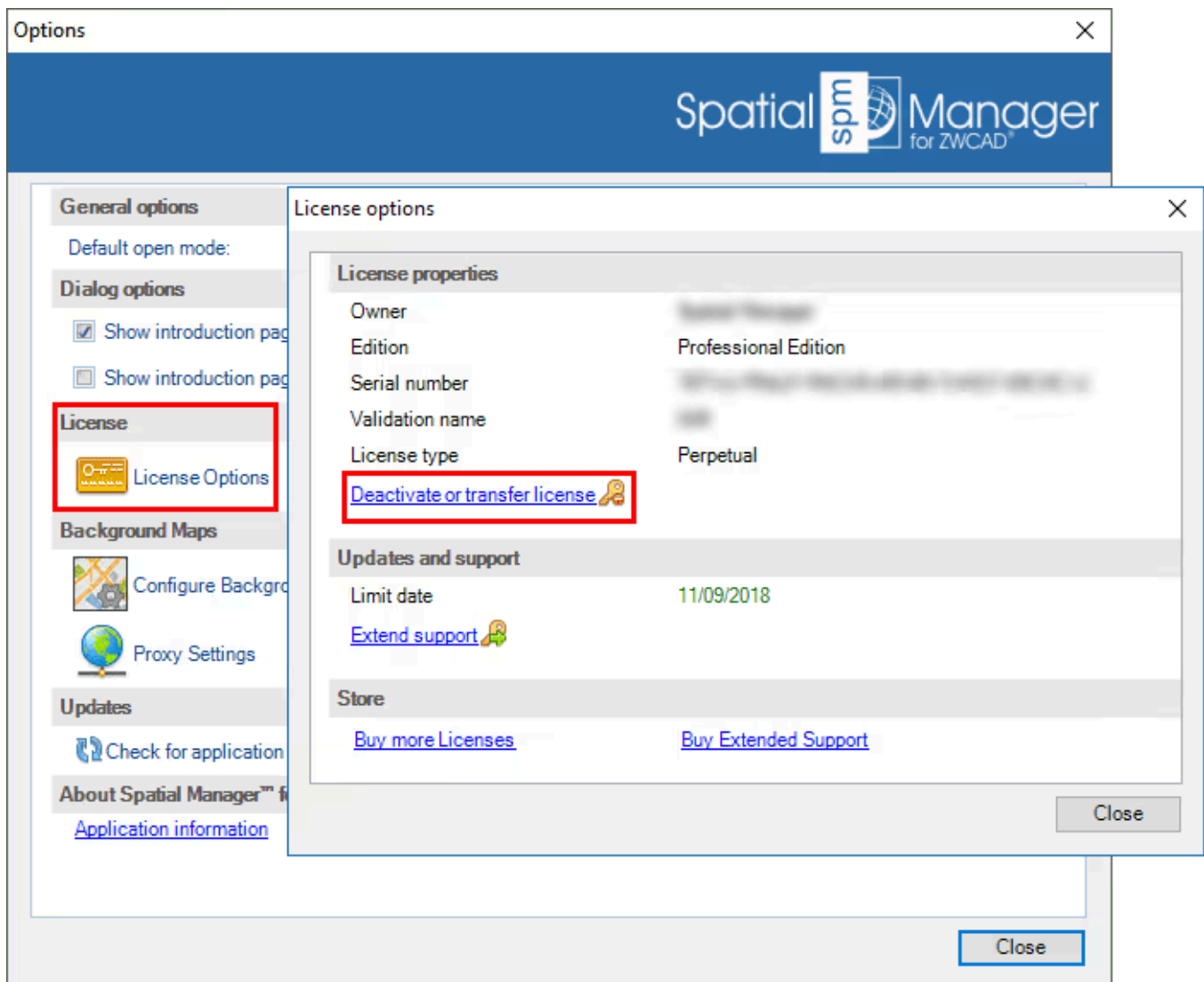
Deactivate

Deactivate or transfer a license.

CAUTION: You must run the application as administrator to perform any task related to activation, deactivation or transfer of licenses.

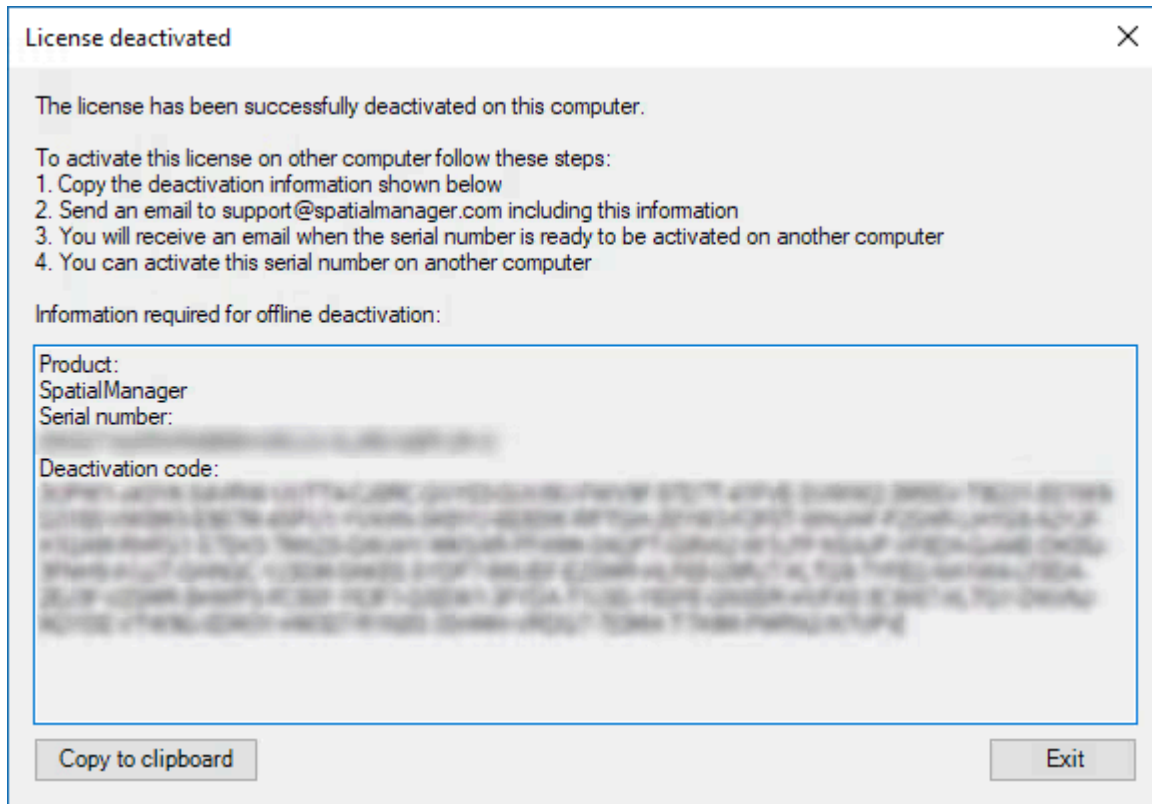
You can deactivate or transfer a license of Spatial Manager™ for ZWCAD by using the “Deactivate or transfer license” function, which can be found in the “License” section of the [application options](#) .

When you deactivate a license of Spatial Manager™ for ZWCAD on a computer, you can reactivate it on this computer or on another computer by entering the last serial number of the license; this number is shown when the deactivation process ends.



Spatial Manager™ for ZWCAD Deactivate licenses window

Under some uncommon circumstances (no Internet connection, License Server stopped, etc.), it may not be possible to complete successfully the automatic deactivation of a license. If this happens, the license will be deactivated on your computer and you will get a warning window including the “Deactivation code” and the steps needed to re-activate it manually.



Spatial Manager™ for ZWCAD - License deactivated

Please feel free to consult us with any questions or issues you may have with the purchasing, installation, activation, deactivation or transfer processes (support@spatialmanager.com).