OnPOZ
Precision Positioning

EZTag CE™

User Guide // Version 2.104

This revision reflects EZTag CE™
software release 2.104

April 2023

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CPAT Flex Inc.
4101, rue Molson, Suite 400
Montréal (Québec)
Canada H1Y 3L1

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Chapter 1

1   Introducing EZTag CE™
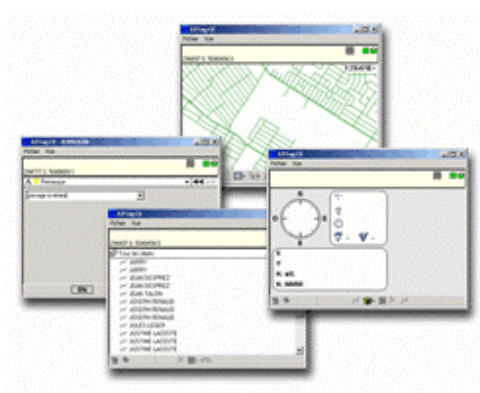
EZTag CE™ is powerful GNSS data collection software for Windows and Windows Mobile. You can use **EZTag CE™** to capture geographic and descriptive data with a dictionary tailored to the needs of your application. **EZTag CE™** currently collect GPS and GLONASS data (with a GLONASS compatible GNSS receiver)

You can also perform field updates of the data from your existing office databases. With **EZTag CE™** you can capture and update data with or without the use of a GNSS receiver. You can use a cartographic background of ESRI shapefiles, **BMP** and **ECW** with exceptional performance.

This guide describes how to use **EZTag CE™**. It is organized in five chapters. Each chapter contains many lessons to help you progressively discover most of the features of the software.

1.1   Overview

EZTag CE™ supports the OnPOZ **GPS**/**TAG** format for collecting data in the field. This format uses a relational model and is capable of capturing data intended for post-processing of GNSS observations.

Data captured in OnPOZ **GPS**/**TAG** format can easily be converted to ESRI Shapefile format for input into any GIS. The OnPOZ **GPS**/**TAG** format can also be linked to a third party relational database management system such as Oracle Lite

The OnPOZ **GPS**/**TAG** formats produces the following types of files in Real time and in Post processing modes:

Type of project	File extensions
Real time	GPS, TAG, POS
Post processing	GPS, TAG, POS, OBS, ORB

EZTag CE™ supports two formats to display background layers:

The **ESRI Shapefile** (**SHP**) format used in many GIS systems, to be used as background vector map layers;

The **ER Mapper ECW** format (**ECW**) used to display background image maps layers.

Although the **BMP** format is also supported, it is not recommended since this format uses a lot more memory and disk space than the **ECW** format.

1.2 Data Flow

The following figure illustrates the data flow of a typical data capture project with the **GPS**/**TAG** format.
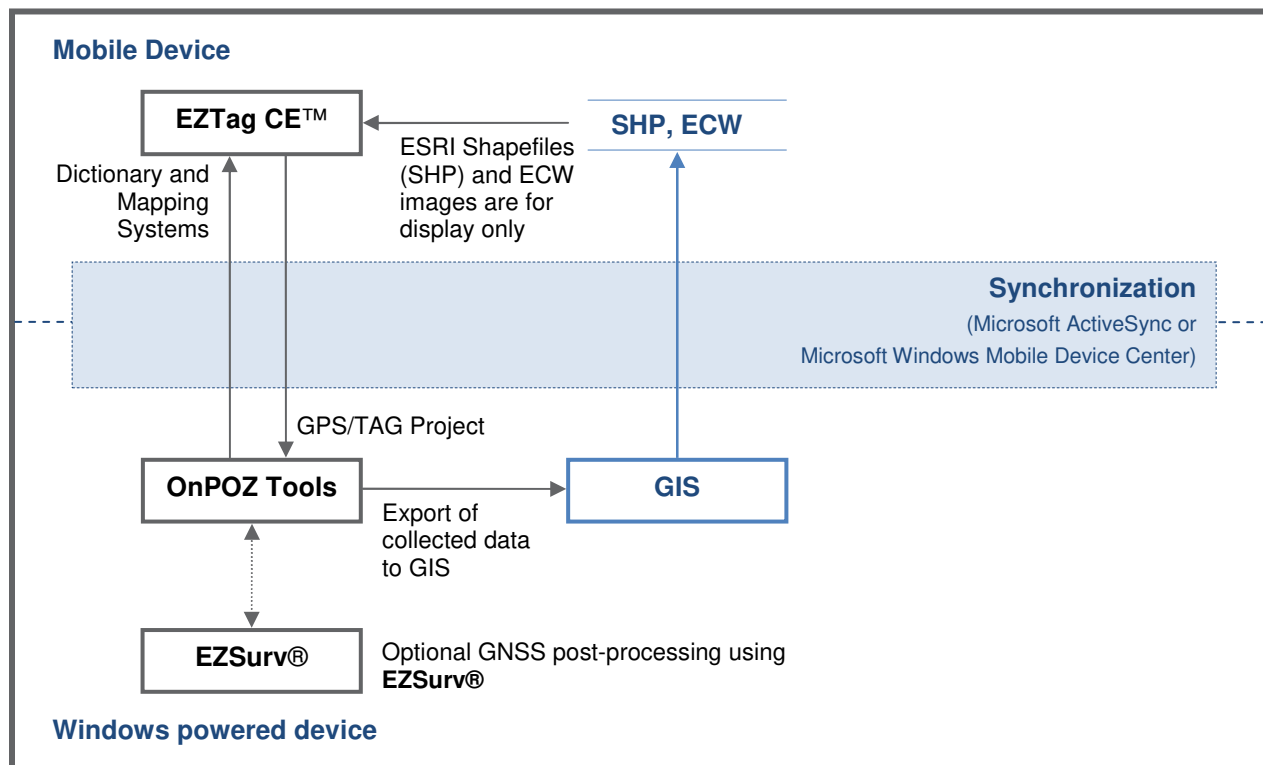
A data dictionary is first created on the Windows powered device using **Dictionary** in **OnPOZ Tools**;

If needed, a custom mapping systems may also be created on the Windows powered device using the **Mapping System Editor** in **OnPOZ Tools**;

The dictionary (and possibly the mapping system) is loaded onto the Mobile device using **Mobile File Manager** in **OnPOZ Tools**;

If needed, background ESRI Shapefile and **ECW** layers are created on the Windows powered device and then transferred to the Mobile device using **Mobile File Manager** in **OnPOZ Tools**;

If needed, a web map can be created and transferred to the Mobile device using **Mobile File Manager** in **OnPOZ Tools**;

Data is then captured with **EZTag CE™** using the OnPOZ **GPS**/**TAG** format;

Data is transferred back to the Windows powered device from the Mobile device using **Mobile File Manager** in **OnPOZ Tools**;

On the Windows powered device, the data can be optionally post-processed using **EZSurv®**;

Finally the data is exported to ESRI Shapefile, AutoCAD DXF, ASCII CSV and Google Earth KMZ for use in your GIS system using **Export Features** in **OnPOZ Tools**.

2   Getting Started with EZTag CE™

2.1   Start EZTag CE™ and Display Cartographic Data

This lesson will teach you how to start the **EZTag CE™** application, how to configure a projection system and how to display ESRI Shapefiles, **BMP** and **ECW** data in the **Plan View**. You will also learn how to take measurements and how to inspect the descriptive data of existing graphic features.

2.1.1   Starting the Application

To start **EZTag CE™** on Windows Mobile, select **EZTag CE** from the **Start** menu.
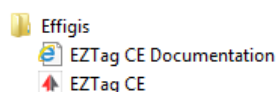
To start **EZTag CE™** on Windows, choose **EZTag CE** under the **Start > All Programs > OnPOZ** menu.
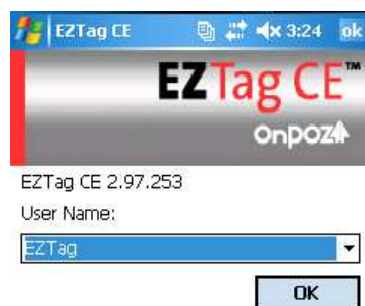
The **User Identification** window opens upon start-up.

Select the user **EZTag** and click on **OK**.

You can configure the user name list in **Preferences** (**File (**📁**) > Preferences > Users**). You can also choose to display the user identification (or not) when the application starts.

Project files are named according to the current user name.
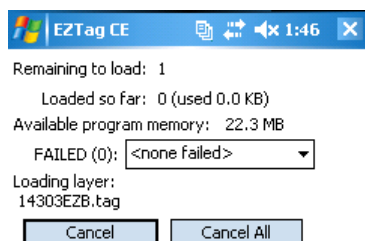
Any active layers from previous sessions are loaded. You have to wait until the **Loading Map Layers** closes to continue. You can press **Cancel** or **Cancel All** at any moment to stop loading layers.

2.1.2   Selecting a Mapping System and Measure Unit

The ESRI Shapefiles, **BMP** and **ECW** data files to display must all be in the same mapping system. You can use your favorite GIS tools to prepare the data files in the desired projection.

EZTag CE™ ships with a few predefined mapping systems.

In **OnPOZ Tools**, use the **Mapping System Editor** to create new mapping systems. See *EZSurv® User Guide* for more details.
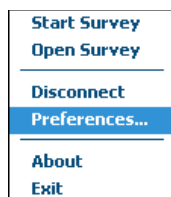
A mapping system must be selected prior to the display of ESRI Shapefiles, **BMP** or **ECW** data. The selected mapping system must match the projection of the data to display.

Select **Preferences...** under the **File ( )** menu to open the **Preferences** window.
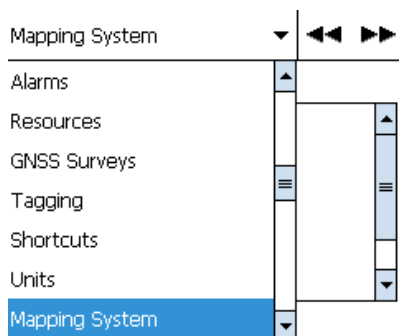
In the **Preferences** window select the **Mapping System** page.
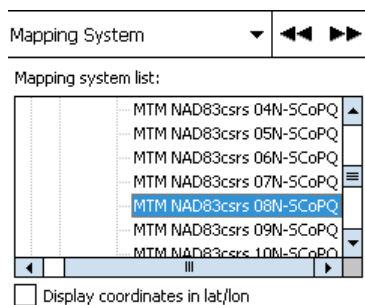
The **Mapping System** page is opened. Select an appropriate mapping system from the list.

Coordinates displayed in the status bar will be shown in latitude / longitude if **Display coordinates in lat/lon (WGS84)** is checked.
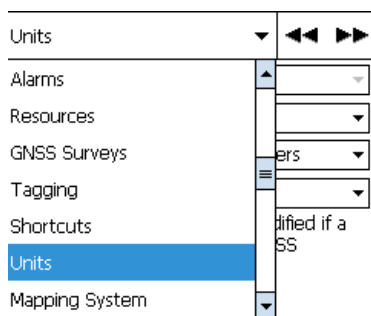
In the **Preferences** window select the **Units** page.
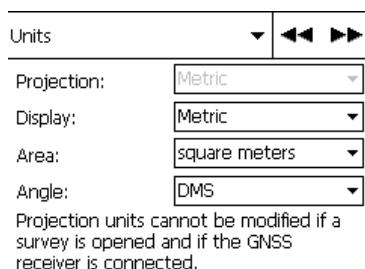
The **Units** page is opened.

The **Projection** unit controls the unit from background layer like shapefiles.

The **Display** unit controls all coordinates and distances presented to the user on the screen.

Adjust these values if necessary.

Click on (ok) to accept the change and to close the **Preferences** window.

2.1.3   Selecting a Layer
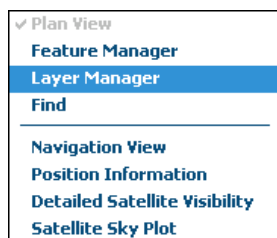
Select **Layer Manager** from the **View (⚙)** menu.
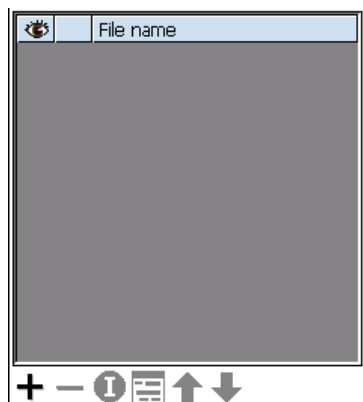
The **Layer Manager** is open.

Click on ✚ to add a new layer.

Select a layer to add
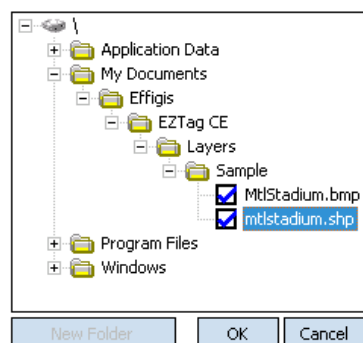
Check one or more layers to add.

Click on **OK**.
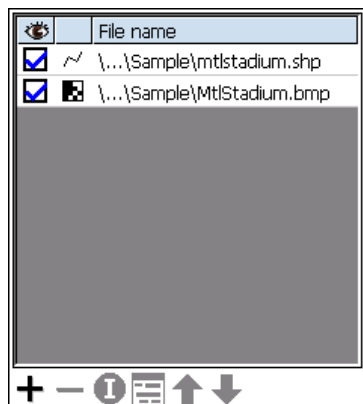
The layer(s) you just checked is(are) added.

By defaut, any added layer will be visible (👁).

The ∿ symbol indicates the file contains lines. Possible symbols are:

- ⬆ : Current project.
- ▲● : Feature
- ● : Shapefile – point
- ∿ : Shapefile – line
- ⌐ : Shapefile – polygon
- ▨ : Raster (BMP/ECW)
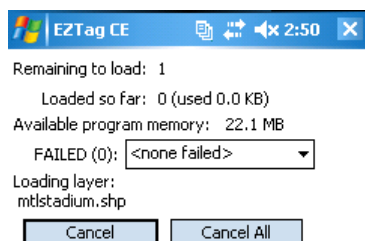
The **Loading Map Layers** is displayed while the new actives layers are loaded.

■ Creating files in ECW format

The ECW format technology allows you to compress high-resolution images so that they use a minimum amount of space on disk. To create images in ECW format you must download and install an ECW image compressor program.

2.1.4   Display in the Plan View

Select **Plan View** from the **View (👁)** menu to open the **Plan View**.

Click on the **Fit All** button to fit the data to the view.
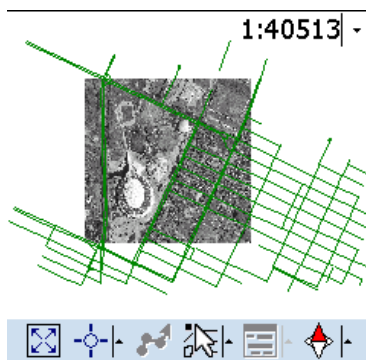
The visible layers of data are displayed.

NOTE: Polygon filling is not performed on polygons containing more than 20000 points. However the polygon boundaries are still displayed.

2.1.5   Layer list (Windows version only)
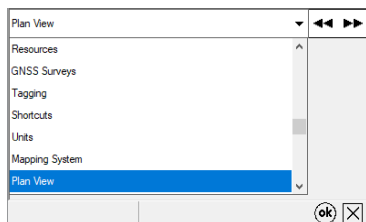
In the **Preferences** window select the **Plan View** page.
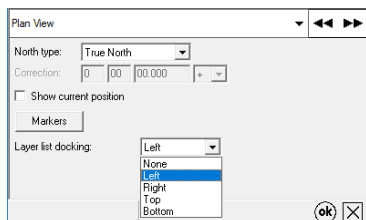
The **Plan View** page is opened.
In the **Layer list docking**, select **Left**.

Click on ⊛ to accept the change and to close the **Preferences** window.

The **Plan View** now displays the **Layer list** and it is docked on the left.

You can now show or hide any layer by checking or unchecking the box on the left of the layer name.
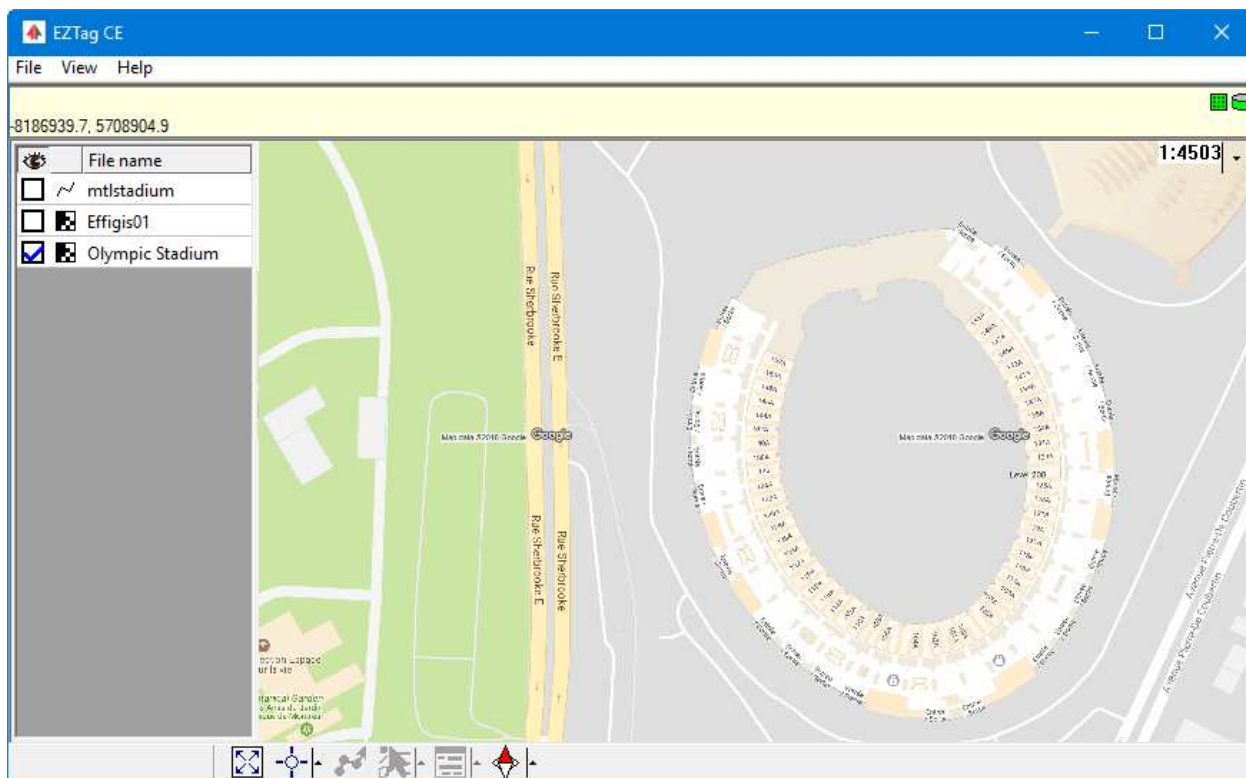
2.1.6   Zoom In

At any time, it is possible to enlarge the size of the features displayed in the **Plan View**.

Locate the **Current Tool** button. At the start of the application it shows the **Center to GNSS position** tool.
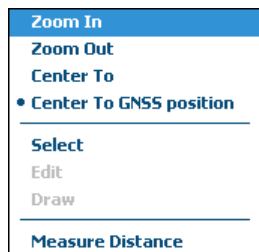
Click on the **Current Tool** button and select **Zoom In** from the list.
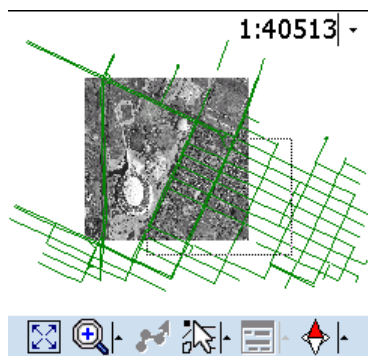
Click on a first point at the top left of the area to enlarge, then drag & drop to the bottom right point of the area to enlarge.

Alternative: Click on the point around which the data will be enlarged.

Alternative for Windows powered device only:

If you have a mouse with a scroll wheel, you can zoom in or out by pressing the **Ctrl** key on the keyboard while using the scroll wheel. It will zoom in or out from the center of the **Plan View**.
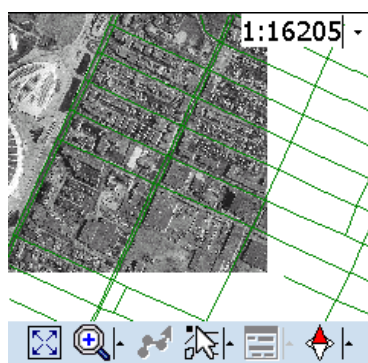
The **Plan View** now displays the enlarged data.

2.1.7   Zoom Out

At any time, it is possible to reduce the size of the features displayed in the **Plan View**.

- Zoom In
- **Zoom Out**
- **Center To**
- **Center To GNSS position**

- **Select**
- Edit
- Draw

- **Measure Distance**
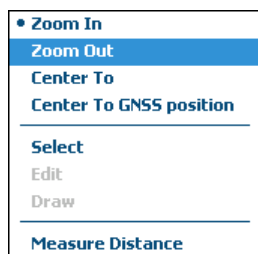
Click on the **Current Tool** button and select the **Zoom Out** tool from the list.

Click on the point around which to zoom out the displayed data.

Alternative for Windows powered device only:

If you have a mouse with a scroll wheel, you can zoom in or out by pressing the **Ctrl** key on the keyboard while using the scroll wheel. It will zoom in or out from the center of the **Plan View**.
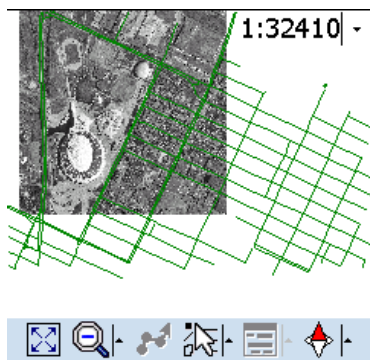
The **Plan View** now displays the zoomed out data.

2.1.8   Changing the Display Scale
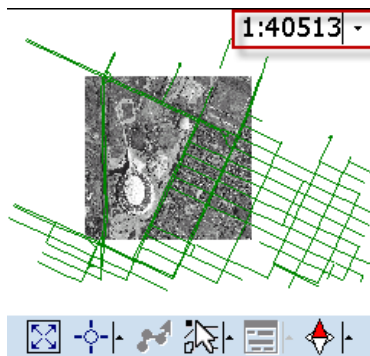
The **Zoom In** and **Zoom Out** tools modify the display scale in the **Plan View**. The scale is always shown at the top right corner of the **Plan View**.
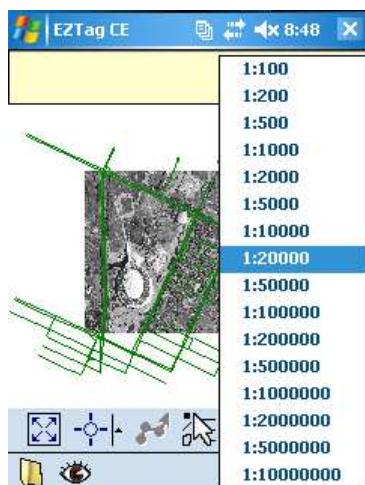
To modify the scale without using the **Zoom In** or **Zoom Out** tools, click on the arrow to the right of the scale indicator and choose a scale value from the list.

You can configure the list of available scales in the **Preferences** (select **File** (📁) **> Preferences…** then choose the **Scale** page)

The **Plan View** is redrawn at the selected scale.

2.1.9 Inspecting the Cursor Coordinates

At anytime you can inspect the coordinates of the cursor location in the **Plan View**.
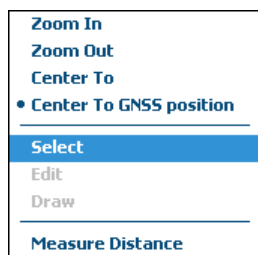
Click on the **Current Tool** button and choose the **Select** tool from the list.

Click in the **Plan View** to inspect the coordinates.

The coordinates are displayed in the status bar, at the top of the screen.

Under Windows Mobile, the status bar is displayed only on demand. Use the following icon to show the status bar:

Coordinates displayed in the status bar will be shown in latitude / longitude if **Display coordinates in lat/lon (WGS84)** is checked in the **Preferences… | Mapping System** page.

2.1.10   View the Descriptive Data
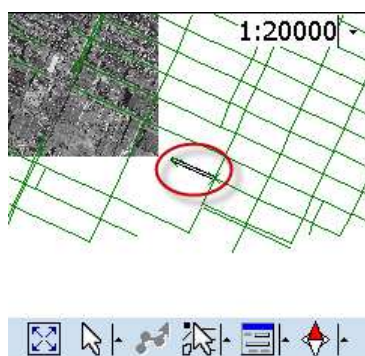
Choose the **Select** tool then click on a line to select it.

The selection is highlighted with a double line ending with an arrow.

When selecting a line or a polygon, statistics on the feature is displayed in the **Plan View**.

> 168.7 m (...)

To view the coordinates, click on the line.

> 301705.8, 5046048.2 (...)

To go back to statistics, click the line again.
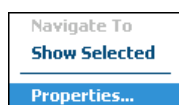
Click on the ▤⊦ button to open the menu of the selected feature. Choose **Properties...** to open the **Descriptive Data Editor** for the selected feature.

The **Descriptive Data Editor** is opened.

Please note that everything is read-only. The layer for the current survey is the only layer that support edition.

Click on ☒ to close the window without modifying the descriptive data.

2.1.11   Center To

Zoom In
Zoom Out
Center To
Center To GNSS position
• **Select**
Edit
Draw
Measure Distance
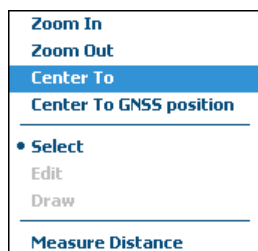
Click on the **Current Tool** button and choose the **Center To** tool from the list.

Alternative for Windows powered device only:

If you have a mouse with a scroll wheel, you can pan up and down using the scroll wheel. You can pan left and right by pressing the **Shift** key on the keyboard while using the scroll wheel. You can pan up and down by using the scroll wheel.

1:20000 ·
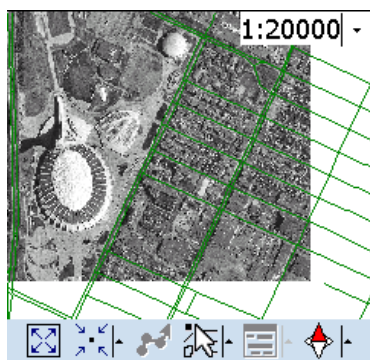
Click at the location where you want the **Plan View** to be centered.

The **Plan View** is now centered on this new location.

2.1.12   Center To GNSS Position

Automatic centering of the **Plan View** ensures the current position of the observer, as computed by the GNSS receiver, stays in the center of the view.

Zoom In
Zoom Out
• **Center To**
Center To GNSS position
Select
Edit
Draw
Measure Distance
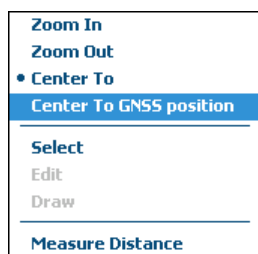
Click on the **Current Tool** button and choose the **Center To GNSS Position** tool from the list.

1:107625 ⏷
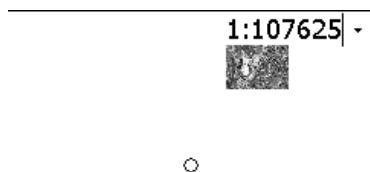
The **Plan View** is now centered on the GNSS location. Each displacement of the observer will translate to a displacement of the content of the **Plan View** so that the center of the view will match the current position of the observer.

○

The current position indicator is displayed as a circle in the **Plan View**, located at the most recent position received from the GNSS receiver.

2.1.13   Display Labels

👁	File name
☑ ∿	\...\Sample\mtlstadium.shp
☑ ▓	\...\Sample\MtlStadium.bmp

➕ ➖ ❶ 🗒 ⬆ ⬇
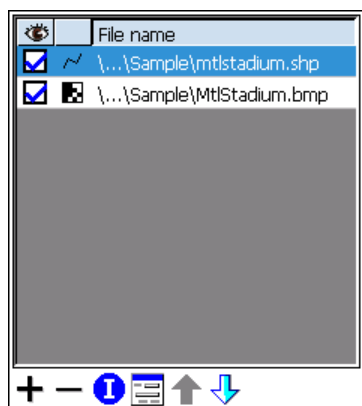
Go back to the **Layer Manager**.

Click on a line **SHP** file to select this layer in the list.

Shapefile Layer Properties   ok ✕

Min scale: Always ⏷ ➤

┌Label─────────────
☐ Show   NOM ⏷
When scale <   Always ⏷

┌Line─────────────
Width: 1 ⏷ Color: ⬛ ⏷
Style: ⦿ Solid ◯ Dashed

┌Default───────────
| Save | Reload |

Click on the **Properties** button to display the **Shapefile Layer Properties** for this layer.

➕ ➖ ❶ 🗒 ⬆ ⬇

Check the **Show** checkbox and then select the field name from the list on the right.

Choose **When scale < 1:2000**.

Click on ⬜ and select a new color.

Click on the **ok** button to close this window then click on **ok** again to accept and to close the **Layer Manager**.

The **Plan View** is now configured to display street names at scales lower than 1:2000.

Choose the scale **1:1000** in the **Plan View** to see the labels.

Use the **Center To** tool to view the street names at different locations on the map.

2.1.14   Filter Based on Scale
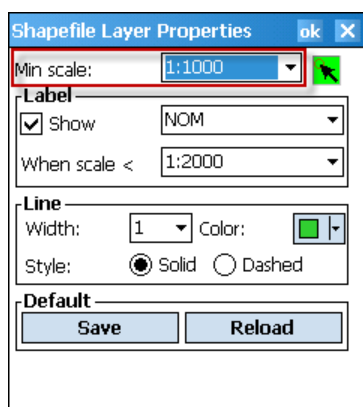
Go back to the **Layer Manager**.

Click on line **SHP** file to select this layer in the list.

Click on the **Properties** button to display the **Shapefile Layer Properties** for this layer.
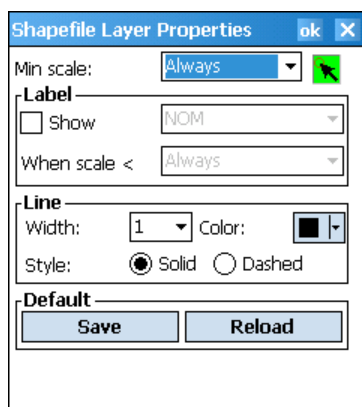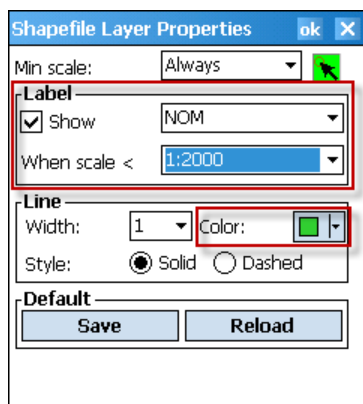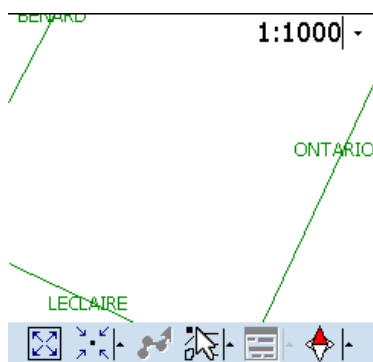
In the **Min scale** section, choose the **1:10000** scale.
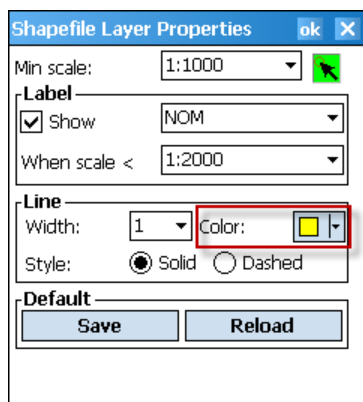
You can also change the color for this layer.

Click on [ ] and select the yellow color.

Click on the **ok** button to close this window then click on **ok** again to accept and to close the **Layer Manager**.

The **Plan View** is now configured to display this Shapefiles data in yellow at scales lower than 1:10000.
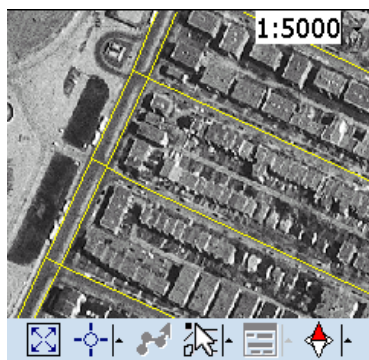
Change the display scale in the **Plan View** to a scale lower than 1:10000 to view the results.
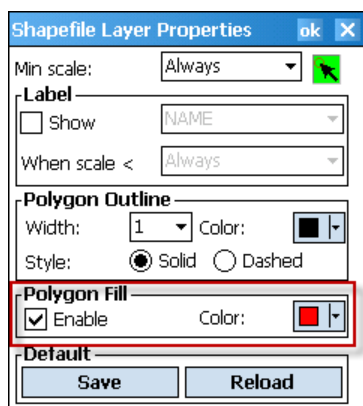
For a polygon **SHP**, a **Polygon Fill** section is added containing a checkbox and color picker is added to the **Shapefile Layer Properties**.

Polygon filling is not performed on polygons containing more than 20000 points. However the polygon boundaries are still displayed.

2.1.15   Measuring Distances
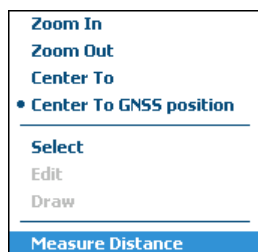
Click on the **Current Tool** button and choose the **Measure Distance** tool from the list.
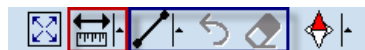
The three buttons on the right are adjusted to reflect the new mode.
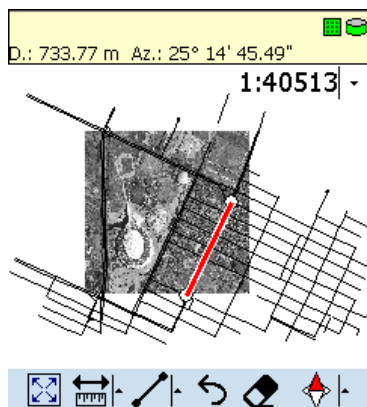
Click two points in the **Plan View** to measure the distance between these two points. If there is an object in the area you click, it will snap on it. If there is more than one object, it will display a list and you can choose.

The distance (**D.**) and heading (**Az.**) are displayed in status bar.

You can also measure a polyline by clicking on the third button and selecting **Polyline**:
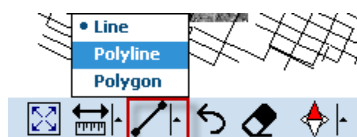
Click three or more points in the **Plan View** to measure distance on a polyline.

The distance of the last segment (**D.**) and the total distance (**T.D.**) are displayed in the status bar.

Use ↩ to remove the last segment.

Use ◇ to clear and start over.

You can also measure a polygon by clicking on the third button and selecting **Polygon**.

Click three or more points in the **Plan View** to measure distance on a polygon. Since a polygon is a closed figure, a closing segment (in blue, while the rest is in red) is added between the last point and the first point.

The perimeter (**Pe.**) and area (**Ar.**) are displayed in the status bar.

Using a long click, you can do a **Zoom In**, a **Zoom Out** or a **Center To** while remaining in the **Measure Distance** mode.

2.1.16   Viewing the State of the Resources

301081.9, 5046652.5

1:5000
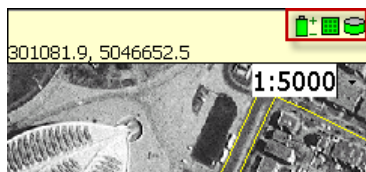
The upper right corner of the status bar displays the resource indicators.

The battery indicator displays the percentage of internal battery charge left on the computer.

On some Windows powered device the battery indicator is not available.

On Windows Mobile the battery indicator is not available when the computer is docked to a cradle that is on charge.

The memory indicator displays the percentage of memory available to **EZTag CE™**.

The disk space indicator displays the percentage of disk space left on the disk containing the data folder, as configured with **File ( ) > Preferences > Folder > Survey Folder**.

Resources		◀◀ ▶▶
	Low	Critical
Battery:	17	16	%
Storage:	5120	3072	Kb
Memory:	5120	3072	Kb
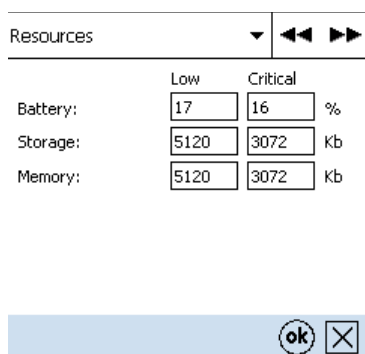
The **File ( ) > Preferences > Resources** menu allows you to configure alarms on the battery level, the disk level and the memory level. The graphics resource indicators change to yellow (low level) or red (critical level) under alarm condition.

	Normal	Low	Critical
Battery			
Disk			
Memory			

Click on an indicator to toggle between graphic display and digital display (in percentage) for this indicator.

Graphic

Digital

88 70 77

2.1.17   Exiting EZTag CE™

Start Survey
Open Survey
Disconnect
Preferences...
About
Exit
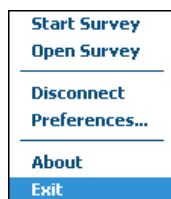
To exit **EZTag CE™**, choose **Exit** from the **File ( )** menu.

2.2 Capture Features Graphically in the Plan View

This lesson will teach you how to start a project and how to capture features graphically in the **Plan View**. The following figure illustrates the key elements covered in this lesson.

2.2.1 Selecting a Dictionary

Start Survey
Open Survey
Disconnect
Preferences...
About
Exit
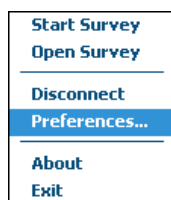
Before proceeding with data collection, you must first select a dictionary.

Choose **Preferences...** under the **File ( )** menu.
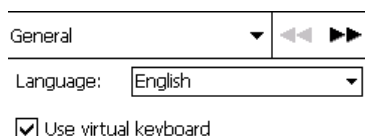
The **Preferences** window is open.

The preferences window contains many pages.
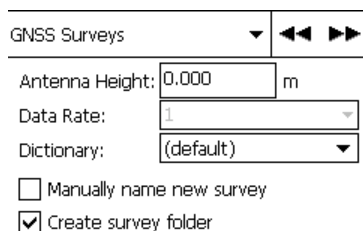
To jump directly to a page, click ▾ then choose a page from the list.

To move from one page to another use ◄◄ and ►► buttons.
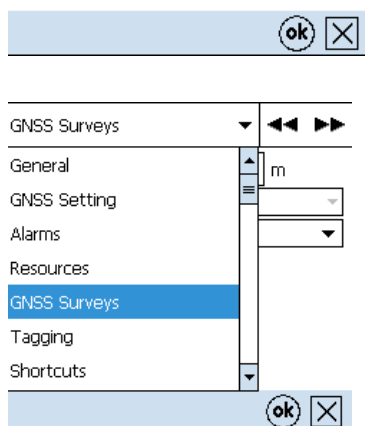
Click on the button ▾ at the top of the page to list the available preference pages.

Choose **GNSS Surveys** from the list.

The **GNSS Surveys** page is open.

The **Dictionary** field contains the list of available dictionaries. Choose **(default)** from this list.

When **Manually name new survey** is checked, a dialog is displayed after asking to Start Survey.

When **Create survey folder** is checked, all survey files are created in a subfolder named after the survey name.

Click the (ok) button to confirm your choice.

2.2.2   Starting the Data Collection
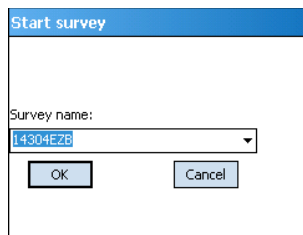
To start a new project, choose **Start Survey** from the **File ( )** menu.
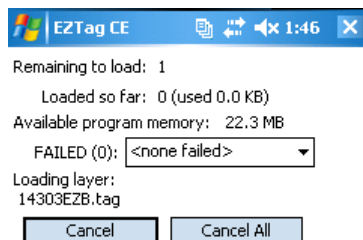
When **Manually name new survey** is checked in the **File ( ) > Preferences > GNSS Survey**, a dialog is displayed after asking to Start Survey.

This creates a new survey. The **Loading Map Layers** is displayed while preparing the survey.

The available features from the dictionary can be accessed from the **current feature** button.

The **current feature** button lists all the features that are available for data capture.

The **GNSS capture** button is found to the right of the **current feature** button. Use of this button is discussed later in this manual.

The **GNSS capture** button allows capturing a feature using a GNSS receiver.

2.2.3   Capturing a Point Graphically in the Plan View
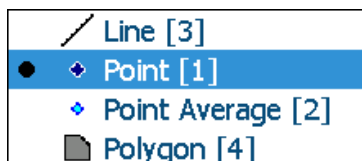
To prepare for capturing a point, choose **Point** from the **current feature** button.

Note that the **(default)** dictionary contains four features: **Line**, **Point**, **Point Average** and **Polygon**.

The icon of the **current feature** button changes to the icon of the selected feature. In this case it is the icon of the **Point** feature.

Locate the **Current Tool** button. At the start of the program it is shown as, indicating that the **Center To GNSS Position** tool is active.
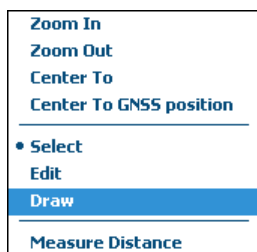
Click on the **Current Tool** button and choose the **Draw** tool from the list. The icon of the **Draw** tool is now shown in the **Current Tool** button:

The **Draw** tool allows capturing graphically a feature of the **current feature** in the **Plan View**.
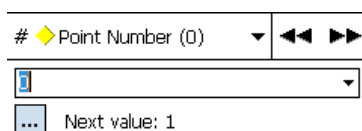
With the **Draw** tool active, click somewhere in the **Plan View** to draw a feature. In this case it is a **Point** feature.

This opens the **Descriptive Data Editor**.

Click on (ok) to accept the values and to close the window.
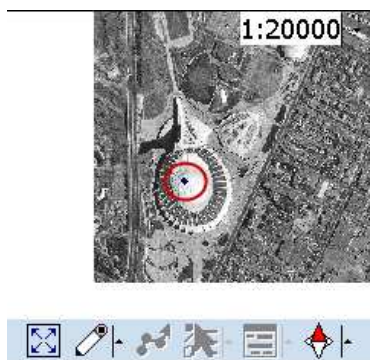
The captured point is now shown in the **Plan View**.

2.2.4   Saving the Data Collection
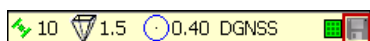
Changes made to a project are automatically saved regularly.

The icon is displayed in the status bar while a save operation is being performed. The save operation will generate backup files (bak1) in the same folder as the project. If the current project closes properly, these backup files will be removed. However if the project does not close properly, these files may be used to help recover the project.

2.2.5   Stopping the Data Collection
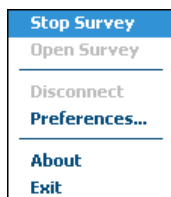
To terminate the data collection and close the current project, choose **Stop Survey** from the **File ( )** menu.
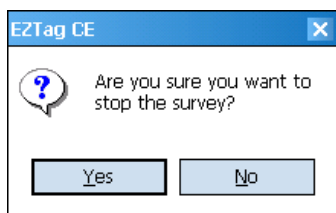
A confirmation to close the project is asked.

Answer **No** to resume without closing the project, or **Yes** to close the project.
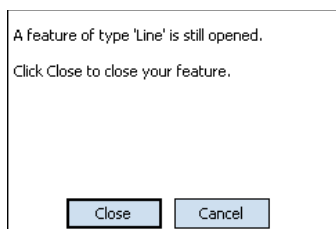
When you close a project that contains unclosed lines or polygons, the following dialog is displayed.

Click on **Cancel** button to resume the application without quitting. The **Close** button allows you to close the opened feature and close the project now.
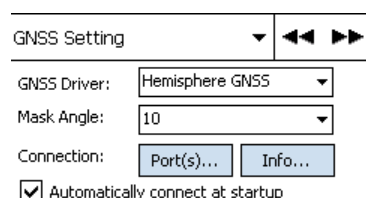
3   Using the GNSS Receiver

3.1   Configuring the GNSS Receiver
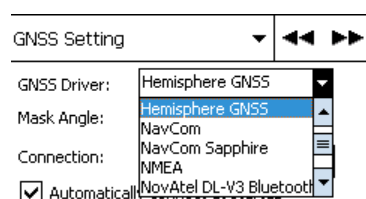
This lesson you will teach you how to select and configure a GNSS connection. You must setup the GNSS receiver so that the data received will be properly interpreted and used by the application.

3.1.1   Configuring the GNSS Parameters

Select **Preferences...** under the **File (**🗋**)** menu to open the **Preferences** window.

Select the **GNSS Setting** page.
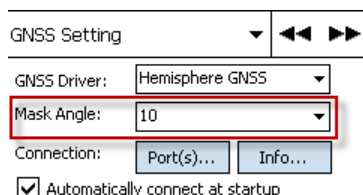
Use the **GNSS Driver** field to choose the type of receiver. The receiver may be connected for recording data for post-processing or for recording position data only, through the **NMEA** standard format.

See **More about the GNSS Receiver** on how to use a receiver in **NMEA** mode.

All the GNSS drivers except **NMEA** are supported for GNSS post-processing.
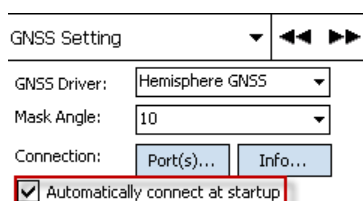
The **Mask Angle** (not used under **NMEA** mode) allows you to specify the angle under which the visible satellites must be ignored when computing the position of the observer.

Check the **Automatically connect at startup** option to force the automatic search of a receiver at application' startup.
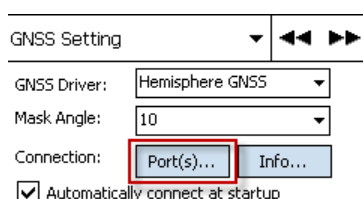
If the **Automatically connect at startup** option is not checked, you can connect the GNSS receiver using the **Connect** option under the **File ( )** menu.

When the **Automatically connect at startup** option is checked, the receiver will always connect, provided that it is available. You must uncheck this option if you wish to disconnect the receiver.

3.1.2   Selecting the Serial Ports

The serial port selection window allows selecting the serial ports used by the system to automatically search for a GNSS receiver.

In the **GNSS Setting** page, click on the **Port(s)...** button.
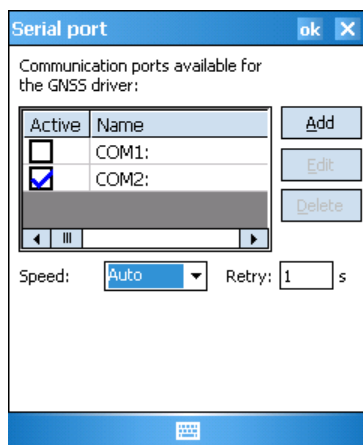
The **Serial port** window opens, and gives a list of the available serial ports.

Check the serial ports to use during the automatic search. The GNSS receiver search system will attempt to connect to each of the ports.

On most devices, no serial ports are checked by default.

IMPORTANT: You must select only serial port on which a GNSS receiver can be connected. Activating a port used by another device will at best slow the search and at worst causes **EZTag CE™** to freeze.
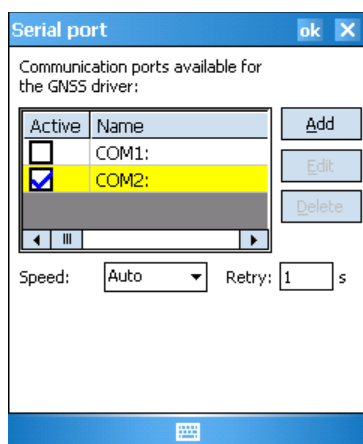
When a port is currently used by **EZTag CE™**, it is highlighted to distinguish it from the others. You cannot uncheck it when it is being used.

3.1.3   Displaying Information about the Connection
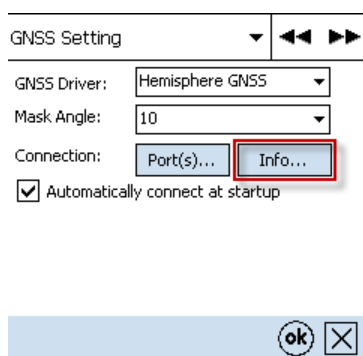
In the **GNSS Setting** page, click on the **Info...** button.
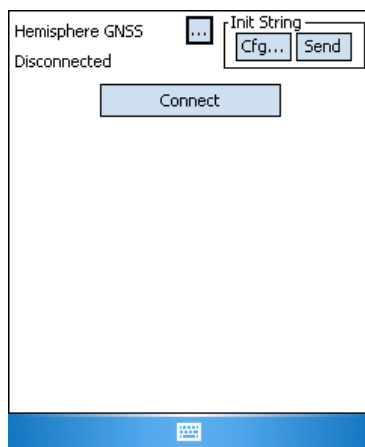
The **GNSS Receiver Info** window opens. This window displays the type of the active receiver and the status of the connection (**Hemisphere GNSS** and **Disconnected** in this example).

The `Cfg...` and `Send` buttons allow configuring and sending an initialization string to the receiver.

In manual mode the **Connect** button allows to test the connection. You must still establish a manual connection with the **Connect** option of the **File ( )** menu.

The button displays the **GNSS receiver details**.
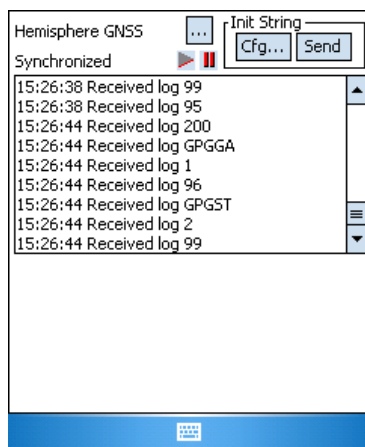
During the connection process, the access port and the speed are displayed at each attempt.

Once the connection is established, the GNSS receiver transmits data blocks to the application. A message is added to the list upon receiving each of the blocks. The message includes the time and the log number. With a receiver in NMEA mode, the actual NMEA data is also displayed.

Click on the ▌▌ button to pause the display of messages. Click on the ▶ button to resume the display of messages.

3.1.4   Configuring the GNSS Alarms

Open the **Alarms** page in the **Preferences** window.

This page allows you to configure the alarms used to warn the operator when the GNSS data will not have the desired quality.

By default the software emits a sound during an alarm. Click on the speaker icon to configure otherwise.

The alarm on the number of satellites warns the user if the number of available satellites falls below a specified threshold. This alarm is always active to ensure that a minimum of 4 satellites is available during a project. To increase the minimum, enter a value in the **Num. Satellites <** field.

When enabled, checking the **Loss of Lock** box activates the GNSS loss of lock alarm on the specified number of satellites.

Loss of Lock is enabled only when **EZField™** is running.

GNSS signal is severely obstructed in forest environment. This is why **the loss of lock alarm should not be used under forest canopy.** This alarm is specially designed for centimeter accuracy job performed in open environment.

Check the **DGNSS** box to activate the DGNSS alarm. This alarm warns when GNSS positions are not corrected in real-time with DGNSS corrections (RTK or SBAS).

Check the **PDOP** or **HDOP** box to activate the DOP alarm. This alarm warns if the DOP is higher than the specified value.

When **PDOP** is selected, the status bar will display the **PDOP indicator**:
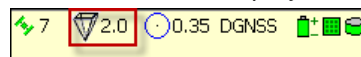
When **HDOP** is selected, the status bar will display the **HDOP indicator**:
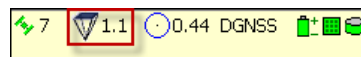
The following table gives an idea of DOP precision:

Value	Precision
1	Ideal
1-2	Excellent
2-5	Good
5-10	Moderate
10-20	Fair
>20	Poor

Check the **Accuracy** box to activate the **accuracy** alarm. This alarm warns if the current standard deviation is higher than the specified value.

Use the **Accuracy** combo to select the type of horizontal accuracy level to use as alarm.

- **1 Sig. Hor. (39%):** One time horizontal (2D) variance.
- **2 Sig. Hor. (86%):** Two times horizontal (2D) variance.
- **3 Sig. Hor. (99%):** Three times horizontal (2D) variance.

Under alarm conditions, data are recorded in the GNSS position file (extension .POS) only if the **Filter GNSS POS data with alarm** box is not checked.

Check the **Critical Alarm** box to activate an alarm that warns when one or more of the following conditions are met:

- The GNSS receiver is connected but a valid GNSS position cannot be computed.

- Loss of communication between the handheld computer and the GNSS receiver.

- The levels of resources (battery, disk and memory) have reached a very low level.

3.1.5   Configuring keyboard shortcuts

If you mobile device has a keyboard, you can configure keyboard shortcuts for some common operations.

Open the **Shortcuts** page in the **Preferences** window.

In the upper section, you have the keyboard shortcuts for the current dictionary.

In the lower section, you can configure keyboard shortcuts for some tagging and plan view operations.

En empty entry means there is no shortcut set.

3.2   Using the GNSS in the Plan View

This lesson will teach you how to interpret the GNSS indicators and how to use some features of the **Plan View** that are available only under a GNSS connection.

3.2.1   Using the GNSS Indicators

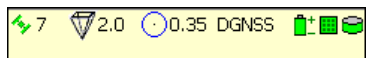On Windows Mobile, the 🛈 button displays or hides the status bar.

The GNSS indicators are displayed at the top left of the status bar. See **Appendix A** for more details about each GNSS indicators.
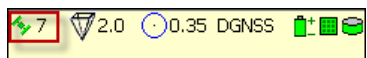
The **connection/number of satellites indicator** displays the state of the GNSS receiver connection, and the number of satellites used by the receiver to computer the position of the observer.

If a receiver is connected and operating well, the indicator shows a small green satellite, followed by the number of satellites used to compute the position of the observer. If there is a problem or if the system is searching for a GNSS receiver, the display of the connection/number of satellites indicator will vary.
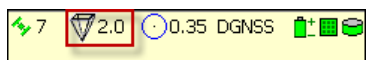
The **PDOP indicator** displays the current value of the PDOP. This value helps in checking the quality of the geometry of GNSS constellations that are currently recorded by the GNSS receiver.

PDOP indicator is shown only when **Preferences > Alarms** is set to **PDOP**.
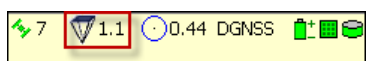
The **HDOP indicator** displays the current value of the HDOP. This value helps in checking the quality of the geometry of GNSS constellations that are currently recorded by the GNSS receiver.

HDOP indicator is shown only when **Preferences > Alarms** is set to **HDOP**.

The **GNSS precision** indicator gives an estimate of the precision of the current GNSS position. For a real time project this indicator is always a circle followed by an estimated (2D or 3D) precision in meters. For a survey for post-processing, you can click on the indicator to view the anticipated precision that GNSS post-processing will yield.
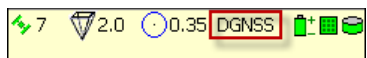
The **GNSS solution type** indicator displays the status of the solution as computed by the GNSS receiver (GNSS, DGNSS, or SBAS).

3.2.2   Displaying the Coordinates of the Observer's Position

Select **Preferences...** under the **File ( )** menu to open the **Preferences** window.

Select the **Plan View** page.

Check the **Show current position** box to activate the display of the coordinates of the current position in the **Plan View**.

Click on (ok) to accept the changes.

When the **Show current position** option is active, the **Plan View** displays the coordinates of the GNSS position below the current position indicator.

If you want coordinates shown in latitude / longitude instead, select **Preferences...** under the **File ( )** menu to open the **Preferences** window.

Select the **Mapping System** page.

Check **Display coordinates in lat/lon**.

Lat: 45°32'30.814" Lon: -73°33'52.601"

The **Plan View** now displays the coordinates of the GNSS position in latitude / longitude.

3.2.3   Using the Dynamic Plan View

In the **Plan View** toolbar, click on the **Dynamic Plan View** button.

• Plan View - North
Plan View - Dynamic

Select the **Plan View - Dynamic** option.

The button in the toolbar will change to indicate the new state.

When this option is active, the orientation of the **Plan View** is automatically updated so that the top of the view matches the direction of displacement of the observer.

The north is a function of the type of north configured in the **Plan View** page of the **Preferences** window.

A direction indicator is displayed at the top right of the **Plan View** (just below the scale).

If the observer is moving, then the red triangle always points to the north, and the content of the **Plan View** is refreshed automatically so that the top of the map matches the direction of the observer.

If the observer is not moving (or if the incoming GNSS data is not valid), a red X is overlaid on top of the indicator.

3.3   Using the GNSS Views

This lesson will teach you how to use the GNSS views to view information about the current GNSS position and to view the list of visible satellites.

3.3.1   Viewing the Navigation Compass

Choose **Navigation View** from the **View (👁)** menu.
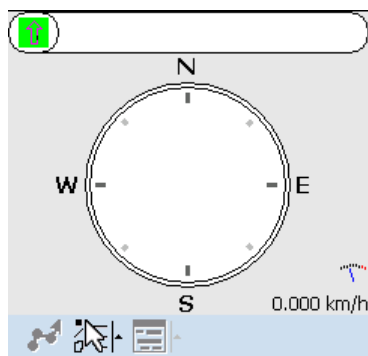
The **Navigation View** displays a compass. The top of the compass indicates the direction of your displacement. The angle of displacement relative to the north is indicated inside the compass, near the top

3.3.2   Navigating to a point

The compass can also be used to assist your navigation to a destination. Before you activate the navigation, you must first select a destination point. Select a point feature in the **Plan View**.

Click on the third button of the **Plan View** toolbar to activate the navigation.

While navigation is active, you see several information overlayed in the **Plan View**:

- Top left: distance to point.
- Top right: compass with current direction.
- A line between your current position and the selected point, with distance and heading.
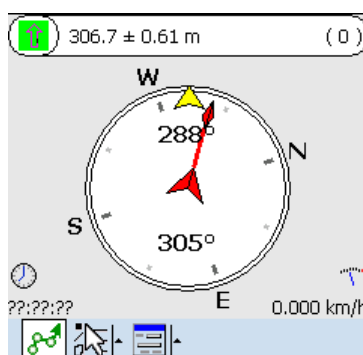
Choose **Navigation View** from the **View ( )** menu.

The top of the compass indicates the direction of your displacement. The arrow inside the compass indicates the direction to follow in order to get to the selected destination. For instance, if the arrow points to the right, then you need to turn right.
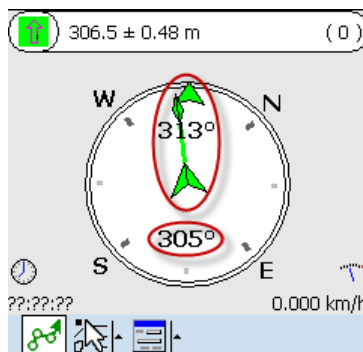
The arrow points towards the top when your displacement is in direct line with the destination.

The angle at the bottom of the compass indicates the angle relative to the north.
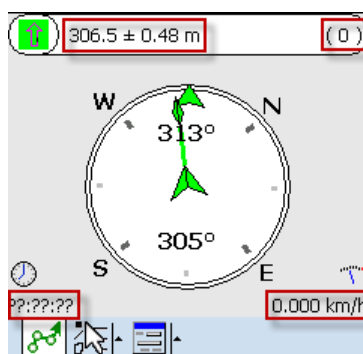
Information is displayed in the four corners of the window:

At the top left: distance to the destination.

At the top right: label of the point used as the navigation destination.

At the bottom left: estimated time left to get to the destination.

At the bottom right: speed of displacement.
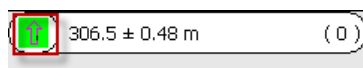
You can click in the circle at the top left to obtain a list of choices.

Select **DOP** instead of **Distance**.
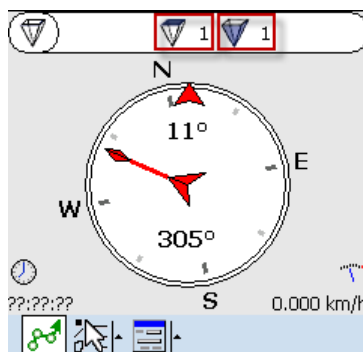
It now displays the **HDOP** and **VDOP** are displayed to assist in judging the geometry of the satellite constellation.
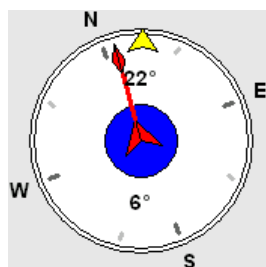
When approaching the destination, the center turns blue. A sound is played indicating that the destination is about to be reached.
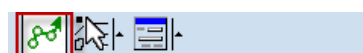
To stop the navigation, you simply click on the button again, either in the **Plan View** or the **Navigation** View.

or

3.3.3   Viewing the GNSS Position Information

Choose **Position Information** from the **View (👁)** menu.
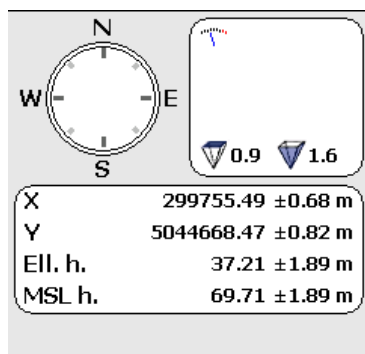
The **Position Information** window is displayed. This view contains the current position, indicators about the precision of the position, and DOP precision indicators.
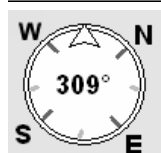
The **direction indicator** shows the approximate direction of displacement of the observer.
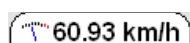
The **speed indicator** shows the instantaneous speed of displacement of the observer, since the last measurement.
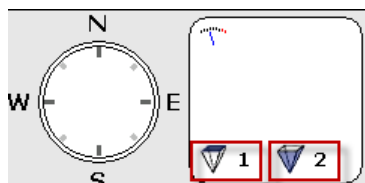
The **HDOP** and **VDOP** values are displayed to assist in judging the geometry of the satellite constellation.

The **X** and **Y** coordinates and the **height** of the current position are displayed in the current mapping system. The height is displayed in two forms:

Ell. h. shows the ellipsoidal height.

MSL h. shows the height relative to the mean sea level

Precision indicators about the position allow to evaluate the precision with which the current coordinates are computed by the GNSS receiver.

3.3.4 Viewing the Satellites Table

Select **Detailed Satellite Visibility** from the **View ( )** menu.

The satellite visibility window shows four columns: the **Satellite Number**, the **Angle of elevation**, the **Azimuth** and the **SNR** (Signal-to-Noise Ratio).

SNR is a measure of the ratio of the amplitude of the recovered GNSS carrier signal to the noise. The higher the value, the best it is.

The color of a satellite indicates the status:

Gray: the satellite is inactive, unusable or not visible.

Red: the satellite is below the mask angle or is not used to compute the solution.

Yellow: the satellite is a less than 5° above the mask angle and is used to compute the solution.

Green: the satellite is above the mask angle and is used to compute the solution.

The geometric shape indicates the constellation for the satellite:

Circle: a **GPS** satellite.

Square: a **GLONASS** satellite.

Ellipse: a **SBAS** satellite.

Note: Galileo and BeiDou satellites are not displayed.

Click on the header of a column to sort the list according to the values of that column. The column used for sorting is displayed in gray.

When you first click on a column header, the sort is ascending. In the example on the left, satellites number are sorted on ascending order.

Click again on the header of the column already having the sort and it will sort in descending order.

When there are more satellites than can be shown, you will see a button to go to the previous or next page.

In the example, clicking on the button at the bottom right will display the next page of satellites.

You now see the remaining satellites.

Clicking on the button at the top right will go back to the previous page of satellites.

3.3.5   View the Satellites Sky Plot

Choose **Satellite Sky Plot** from the **View (👁)** menu.
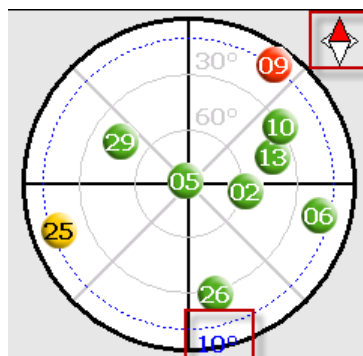
The **Satellite Sky Plot** shows a graphical plot of the position of the visible GNSS satellites in the sky.

A dotted blue line shows the mask angle. The mask angle value is shown in blue as well.

A compass displays the current heading.
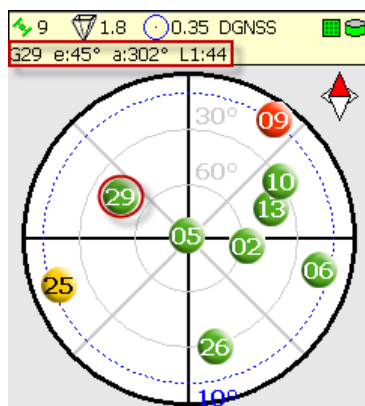
After clicking on a satellite, it will display satellite information on the second line of the status bar.

- **Satellite number**: First letter indicates the constellation:
    - **G**: **GPS**
    - **R**: **GLONASS**
    - **S: SBAS**
- **e:** Elevation in degree.
- **a:** Azimuth in degree.
- **L1:** Signal-to-Noise Ratio for L1 (if available)
- **L2:** Signal-to-Noise Ratio for L2 (if available)

3.4   Capturing Points with the GNSS

This lesson will teach you the basic techniques for capturing data with a GNSS receiver. Before starting this lesson, make sure that your GNSS receiver is connected and is not running under alarm conditions.

3.4.1   Preparing for GNSS Capture

Select **Preferences...** under the **File (📖)** menu to open the **Preferences** window.

Select the **GNSS Surveys** page.

Select **(default)** in **Dictionary**.

To start a new survey, choose **Start Survey** from the **File (📖)** menu.

A new survey is created, and the features from the current dictionary are available in the **current feature** button.

To the right of the **current feature** button is the **GNSS capture** button, which will be used to start the capture of features with the GNSS.

3.4.2   Capturing a Single Point
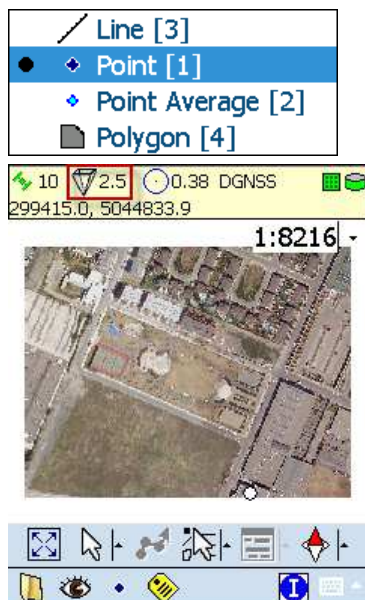
Choose **Point** from the **current feature** button. The icon of the c**urrent feature** button changes to that of the selected feature; in this case it is the **Point**.

Make sure that the number of satellites and **PDOP** (or **HDOP**) indicators are not under alarm conditions in the **Plan View**.

Click on the **GNSS capture** button to start the capture of a GNSS point.
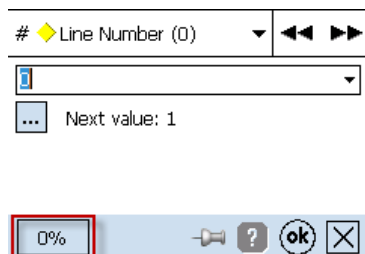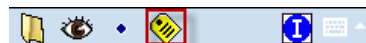
The **Descriptive Data Editor** is displayed, and the **GNSS capture progress** indicator shows 0% initially.
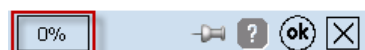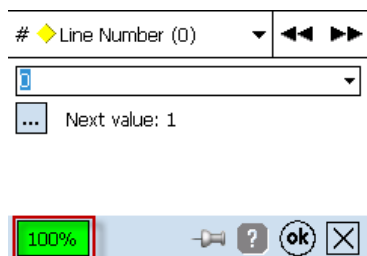
If there is no alarm condition, the **GNSS capture progress** indicator will quickly rise to 100%.

To redo the GNSS capture (because you were not at the right place), click on the **GNSS capture progress** indicator. The indicator go back to 0% after the confirmation.

Click on (ok) to accept the point.

The captured point is displayed in the **Plan View**.

3.4.3   Capturing a Point Average
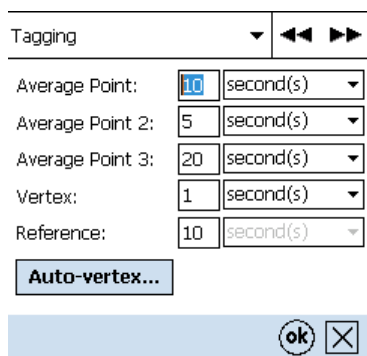
Select **Preferences...** under the **File ( )** menu to open the **Preferences** window.

In the **Tagging** page, configure the **Average Point** parameter to **10 second(s)**.

During the capture of features of type **Point Average**, the GNSS position will be computed as the mean of 10 GNSS positions.
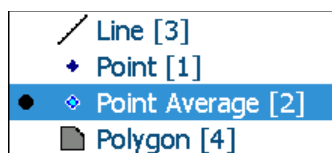
Choose **Point Average** from the **current feature** button.

Make sure that the number of satellites and **PDOP** (or **HDOP**) indicators are not under alarm condition in the **Plan View**.

Click on the **GNSS capture** button to start the capture of a GNSS average point.
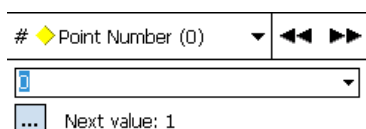
The **Descriptive Data Editor** is displayed and the GNSS capture progress indicator initially shows 0%, then increments by 10% at every second, up to 100%.

A movement of the antenna during the recording of an average point (or an average vertex in a line or polygon) has a negative impact on the precision of the resulting GNSS position.

Progress of the average is interrupted under alarm conditions.
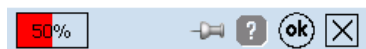
When the indicator reaches 100%, click on ⓞⓚ to accept the average point.
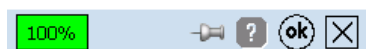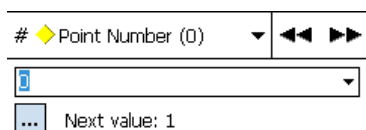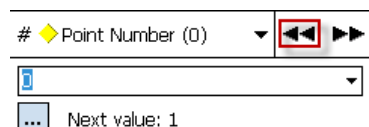
The captured average point is displayed in the **Plan View**.
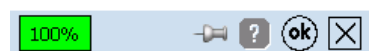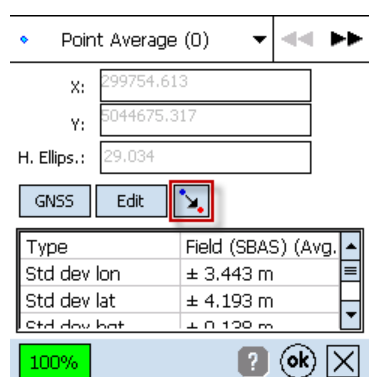
3.4.4 Offsetting a point using one reference point

IMPORTANT: The **Plan View** does not display the offsetted positions for one point offset. Use **Export Features** to apply the offset when exporting the data.
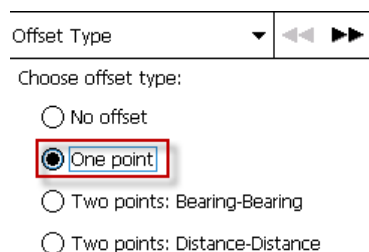
During data collection of a single point or an average point, open the combo at the top of the page and select the first node or click on ◄◄.
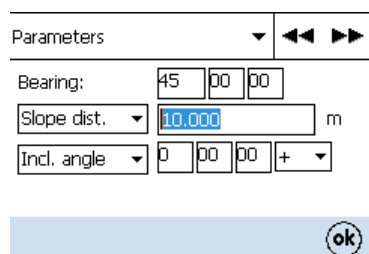
Wait until the GNSS capture is completed and then press the 🔾 button.

Select the kind of offset you want to apply.

Click on the **One point** radio button.

The **Parameters** page is displayed automatically.

Parameters may be entered automatically using a range finder. You need to be in the **Parameters** page when taking a measurement with the range finder. See *Appendix C* for range finder configuration.

You may switch between parameter types by selecting one of the combo on the left.

Enter the following parameters for offsetting the point:
Bearing: **45°**

Slope distance: **10.000**.

Press ►► to see the **Result** page.

You can see the calculated position.

Press (ok) to close and save parameters.

3.4.5   Offsetting a point using two reference points – 2 distance

Select **Preferences...** under the **File ( )** menu to open the **Preferences** window.

In the **Tagging** page, configure the **Reference** parameter to **10 second(s)**.

Start an offset as shown above but select **Two points: Distance-Distance** instead.

The **Parameters for A** page is displayed. Enter the parameters for reference point A and then press the left **GNSS** button in the toolbar.

Parameters may be entered automatically using a range finder. You need to be in any of the **Parameters** pages when when taking a measurement with the range finder. See *Appendix C* for range finder configuration.

Wait until the GNSS capture is completed.

You can display the position of the reference while it is being collected by selecting the **Reference A** page.

Now move to the position of the reference point B.

Select the **Parameters for B** page, enter parameters for reference point B and then press the right **GNSS** button in the toolbar.

Select the **Result** page to see the calculated position.

Wait until the GNSS capture is completed.

Press (ok) to close and save parameters.
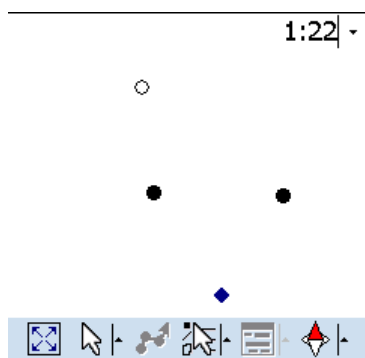
Save the tag and go to the **Plan View**. The two references are displayed in the **Plan View** with the ● symbol.

Please choose the position of Reference A and B carefully. For better precision, they should be widely spread. Example:

Recommended   Not recommanded

References cannot be selected nor edited directly in the **Plan View** or the **Feature Manager**. They are editable only through offset parameters.

3.4.6   Offsetting a point using two reference points – 2 bearings

Start an offset as shown above but select **Two points: Bearing-Bearing** instead.

The **Parameters for A** page is displayed.

Basically, from here on, the procedure is identical to the **Two points: Distance-Distance**.

Parameters may be entered automatically using a range finder. You need to be in any of the **Parameters** pages when when taking a measurement with the range finder. See *Appendix C* for range finder configuration.

3.5   Capturing Lines with the GNSS

This lesson will teach you how to capture lines with a GNSS receiver. All the techniques in the lesson also apply to the capture of polygons. Before starting this lesson, make sure that your GNSS receiver is connected and is not running under alarm conditions.

3.5.1   Starting the GNSS Capture of a Line

Start a new survey, using the default dictionary.

Choose **Line** from the **current feature** button. The icon of the **current feature** button will now be this one:
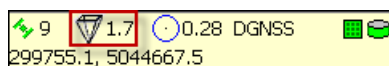
Make sure that the number of satellites and **PDOP** (or **HDOP**) indicators are not under alarm conditions in the **Plan View**.

Click on the **GNSS capture** button to start the capture of a GNSS line.
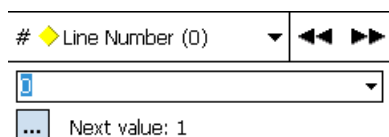
The **Descriptive Data Editor** is displayed and the GNSS capture progress indicator initially shows **0%**, then eventually **100%** when the GNSS capture of the first vertex is completed. Click on (ok) to accept the first vertex of the line.
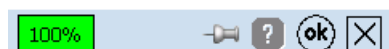
The **Line** is now opened and contains the first vertex for the line. Since the line starts as continuous, other points in the line are added every second.

The two buttons on the right of the **GNSS capture** button are now active:

: The **open feature** button opens a menu that allows to control the steps for capturing a line (or polygon).

: The **GNSS vertex capture** button allows capturing vertices that will be added to the opened line (or polygon).

3.5.2   Adding Vertices to an Open Line
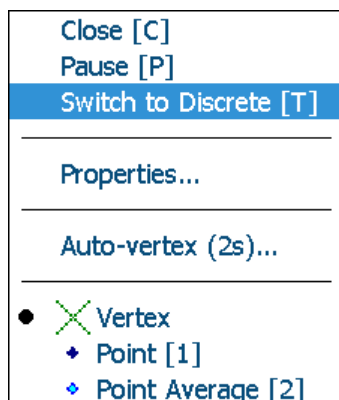
Before adding a vertex manually, we will switch the line to discrete.

Click the **open feature** button and select **Switch to Discrete** in the menu.

Move a few meters away, then click on the **GNSS vertex capture** button to add another vertex to the line.
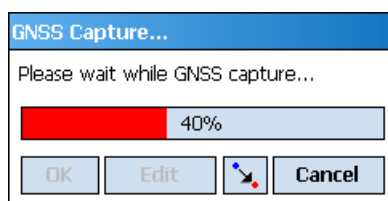
The **GNSS capture** is displayed and the progress indicator initially shows **0%**, then eventually **100%** when the GNSS capture of the new vertex is completed. It will close automatically unless the offset button is pressed. You can close it manually with the **OK** button.
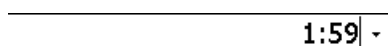
Note the new segment that appears between your starting position and your current position.

Repeat this operation to add one or more additional vertices to the line.

3.5.3 Capturing a Point Feature while a Line is Open

EZTag CE™ allows capturing features of point type during the capture of features of line or polygon type. It is thus possible to capture a line, for instance along a street, and to capture points, for instance poles, all along the line. At this point in the lesson, we already have an open line, and we will proceed to the capture of a point, and then resume the capture of vertices in the line.
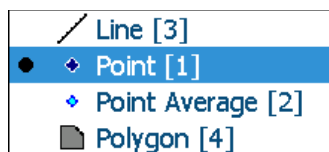
Choose **Point** from the **current feature** button. The icon of the **current feature** button changes to that of the selected feature; in this case it is the **Point**.

1:59
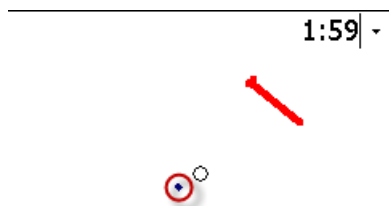
Make sure that the number of satellites and **PDOP** (or **HDOP**) indicators are not under alarm conditions in the **Plan View**.

Click on the **GNSS capture** button to start the capture of the GNSS point.

The capture of the point is done as explained in the previous lesson. Note that a point is added in the **Plan View**.

1:59

Click on the **GNSS vertex capture** button to add another vertex to the line.

You can add more vertices by using the **GNSS vertex capture** button and you can continue to capture single points outside the line using the **GNSS capture** button.

3.5.4 Terminate the GNSS Capture of a Line

Close [C]
Pause [P]
Switch to Discrete [T]

Properties...

Auto-vertex (2s)...

● ✕ Vertex
  ✦ Point [1]
  ✧ Point Average [2]
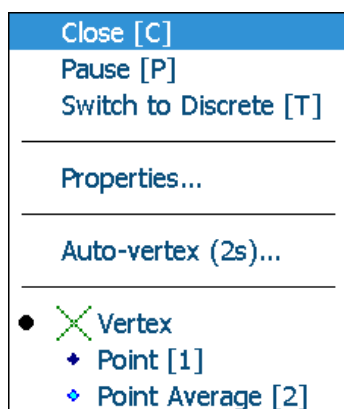
Click on the **open feature** button to open the menu for the open feature.

Choose **Close** to terminate the capture of the line.

It is recommended to close the line as soon as it is finished. You are not allowed to close a line if it does not have at least 2 vertices. For a polygon, the minimum is 3 vertices.

1:70 ▾

The capture of the line is now finished.
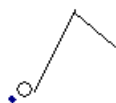
Since there are no more open features, the **open feature** button and the **GNSS vertex capture** button are no longer available.

3.5.5 Reopen a Line to Resume the GNSS Capture

A line can be reopened if you need to add more vertices with the GNSS. This is useful for instance when you need to close the application and resume the survey later.

1:70 ▾

In the **Plan View**, use the **Select** tool to select the line to reopen.
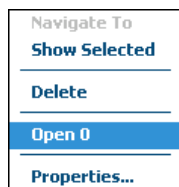
Click on the **properties** button to open the menu for the selected line.

Choose **Open** to reopen this line.

Navigate To
Show Selected
Delete
Open 0
Properties...

1:70 ▾ The line is reopened, and ready for adding new GNSS vertices, as explained previously.

3.5.6 Pause then Resume the Capture of a Line

It is useful to capture points while capturing a line (or a polygon). This can be done with the **Close** and **Open** functions described previously, or with the use of the **Pause** and **Resume** functions.
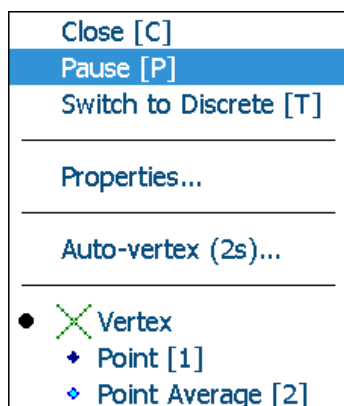
Click on the **open feature** button to open the menu for the open feature.

Choose **Pause** to pause the line.

Select a Point feature and collect one or more points, as previously explained.
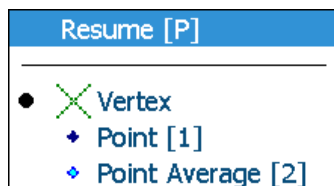
Click on the **open feature** button to open the menu for the open feature.

Choose **Resume** to resume the GNSS capture of this feature.

When choosing **Resume**, the opened feature will automatically be paused, while the feature selected with **Resume** will be reopened. There can only be one opened feature at any time.

3.5.7 Switch between continuous and discrete line (or polygon)

A continuous line (or polygon) is a line (or polygon) containing auto-vertices generated at a configurable interval (of time or distance).

A discrete line (or polygon) is a line (or polygon) containing only the vertex you added
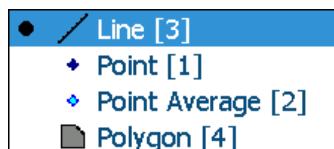
Start a new survey using the default dictionary. Start the capture of a **Line** feature.

This starts a continuous line.
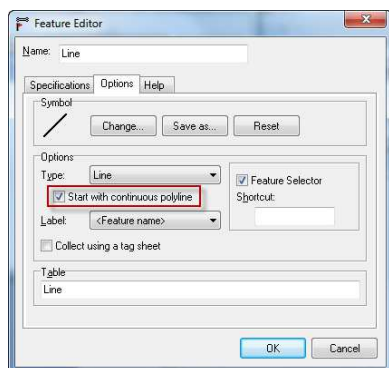
NOTE: In the **Dictionary Editor**, you can configure the dictionary so that it starts as a continuous line (or polygon). To do so, check the **Start with continuous polyline** box under the **Options** tab for a theme of type **Line** or **Polygon**.
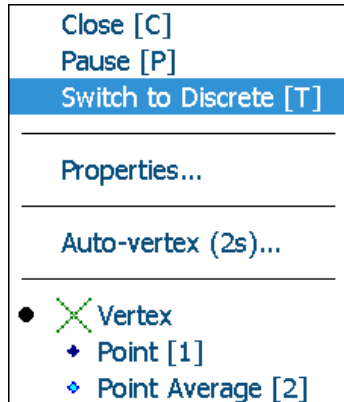
To switch from continuous to discrete:
Click on the **open feature** button and choose **Switch to Discrete**.
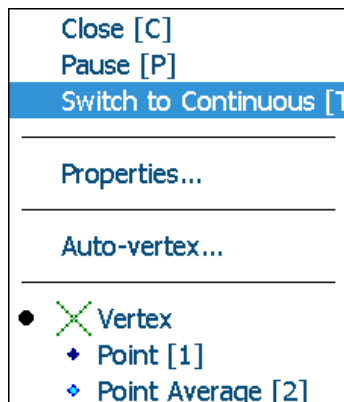
To switch from discrete to continuous:
Click on the **open feature** button and choose **Switch to Continuous**.
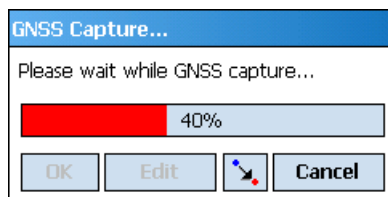
Switching between the two mode always generate a vertex.

You switch between continuous and discrete at any time during the capture of a line or a polygon.

The GNSS capture opens for the capture of that vertex. It will close automatically when finished.

Continue your collect.
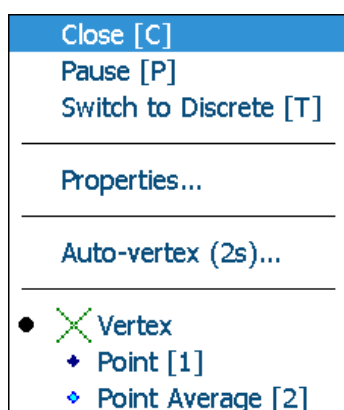
Click on the **open feature** button to bring up the open feature menu.

Choose **Close** to terminate the capture of the line.

3.5.8   Configuring auto-vertices

When a line or a polygon is in continuous mode, it will generate auto-vertices at a configurable interval.
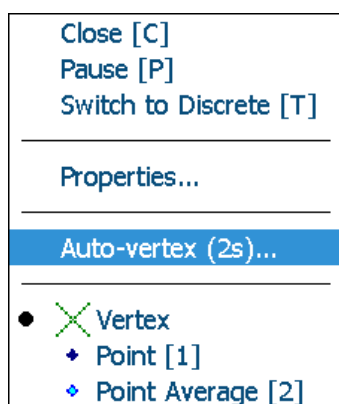
Click on the **open feature** button to bring up the open feature menu.

Choose the **Auto-vertex...** menu.
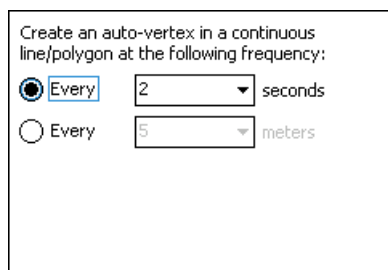
The **Auto-vertex** window is displayed.

The first radio generates an auto-vertex at a fixed interval in seconds.
The second radio generated an auto-vertex at a fixed distance.

It is also configurable from the **File ( ) > Preferences > Tagging > Auto-Vertex** option.

In the above example, an auto-vertex is generated every 2 seconds.

The current setting for auto-vertex is display in the menu as well.

3.6   Viewing and Exporting the Collected Data

This lesson will teach you how to view and export the data that you collected on the field.

3.6.1   Export the Survey Features and GNSS Trace

You can export features as well as the GNSS trace to ESRI Shapefile, AutoCAD DXF files, ASCII CSV files or Google Earth KMZ.
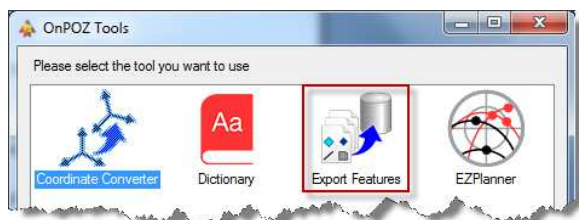
Start **OnPOZ Tools**.

Double-click on the **Export Features** item.
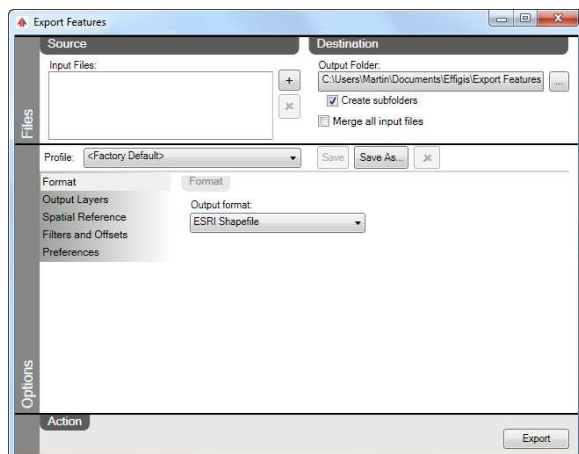
This opens the **Export Features** application.

See *EZSurv® User Guide* for more information about **Export Features**.

4   Data Collection

4.1   Editing a Dictionary

This lesson will teach you how to use the **Dictionary Editor** to create new features.

4.1.1   Creating a Dictionary
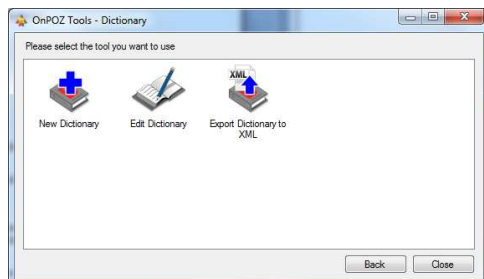
Start **OnPOZ Tools**.

Double-click on **Dictionary**.

To create a new dictionary, double click the **New Dictionary** item.

To edit an existing dictionary double-click the **Edit Dictionary** item.
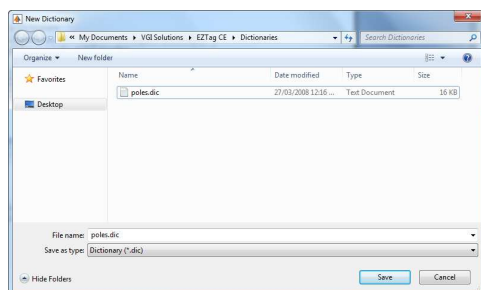
Choose the folder in which the new dictionary will be created, then enter a name in the **File Name** field.

Click on **Save** to accept. The new dictionary will be created and ready for adding new features.

4.1.2   Creating a New Feature
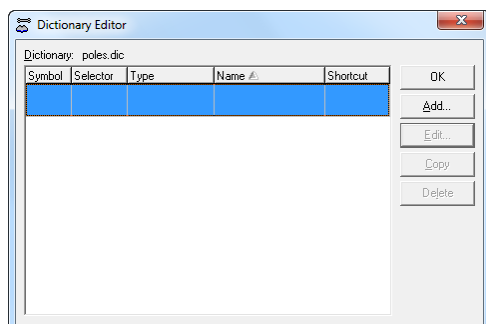
After creating a new dictionary (or after opening an existing dictionary), the **Dictionary Editor** is opened.

Click on the **Add...** button to add a new **Feature**.
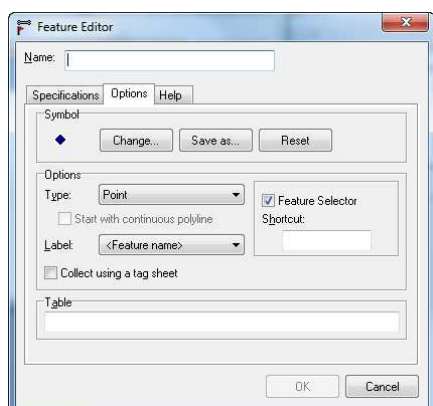
The **Feature Editor** is opened. Click on the **Options** tab.

You can select from the **Label** field the label that will be displayed for this feature in **EZTag CE™**.

To prevent features of this feature to be created directly in **EZTag CE™**, you can uncheck the **Feature Selector** box.

Choose the type of geometry to associate to this feature from the **Type** list.

Click on the **Change...** button to associate a symbol to this feature. The symbol identifies this feature in the user interface of **EZTag CE™**.

Click on the **Collect using a tag sheet** to do your collect all attributes in a grid within a single page instead of editing one attribute per page.
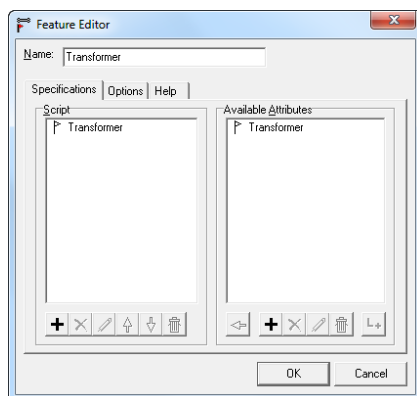
Click on the **Specifications** tab.

Enter the name of the feature in the **Name** field.

Click on the **✚** button in the **Available Attributes** section to start adding attributes to this feature.

4.1.3   Adding Attributes to a Feature

The **Attribute Editor** is opened. Enter the name of the new attribute in the **Attribute** field.

Select the type of attribute from the **Type** list (*Numeric, Alphanumeric, Date, etc.*), and then enter the parameters that are specific to this attribute.

Click on the **OK** button to accept.
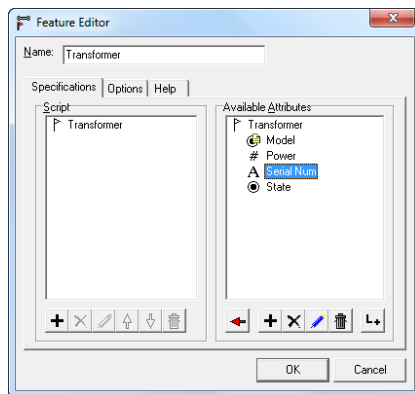
The new attribute is added to the feature.

Click on the ✚ button to add another attribute, and then repeat the above operation to define the properties of this attribute.

The 🖊 button edits the properties of the selected attribute.
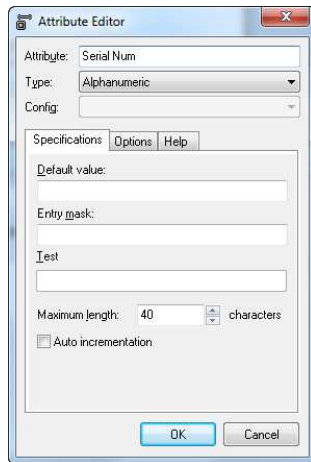
The ✖ button deletes the selected attribute.

Repeat for each of the desired attributes.
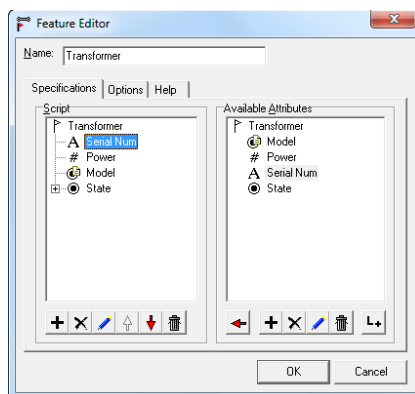
You must now build a script scenario for this feature. The script supports pages that will be displayed conditionally to answers provided on attributes of type **Single Choice**.

To do so use the mouse to select the attributes in the **Available Attributes** column, then drag and drop the selected attributes at the desired location into the **Script** column.

4.1.4   Saving the Changes
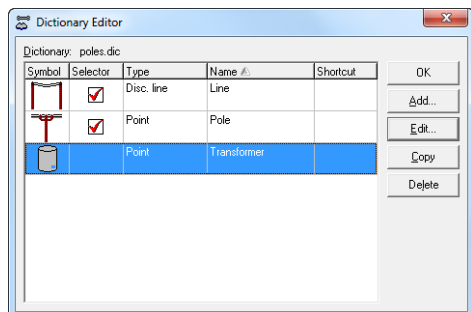
Use the **Add...** button in the **Dictionary Editor** to add other features.

Once the features have been added, click on the **OK** button to save the changes.
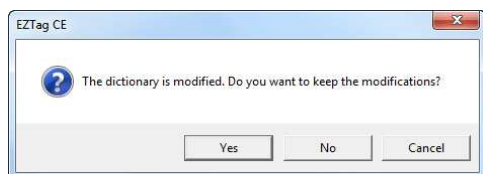
A confirmation is asked.

Click on the **Yes** button to accept and save the changes.

The dictionary is now ready for use in **EZTag CE™**.

4.2   Capturing Descriptive Data

This lesson will teach you the basic concepts related to the entry of descriptive data.

IMPORTANT: The sample dictionary is available in the **Knowledge Base** in **Field Applications > EZTag CE > Sample Dictionary**. You will need to put it manually in **My Documents\Effigis\EZTag CE\Dictionaries** to make it works.

4.2.1   Choosing a Dictionary
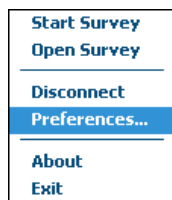
Choose **Preferences...** from the **File ( )** menu.
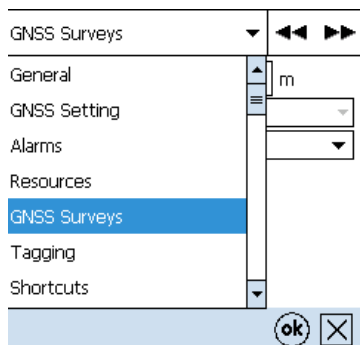
Click on the ▼ button at the top of the page to list the available preference pages.

Choose **GNSS Surveys** from the list.

The **GNSS Surveys** page is open.

The **Dictionary** field lists the available dictionaries. Select **poles** from the list.

Click on the (ok) button to accept this choice.

Select **Start Survey** from the **File ( )** menu to start a new survey.

4.2.2   Entering Descriptive Data

To prepare for the capture of a line, choose **Line** from the **current feature** button.

Click the **GNSS capture** button to start the capture of features with the GNSS.

The **Descriptive Data Editor** is displayed, and you can start to enter the descriptive values for this feature.

4.2.3   Basic Operations in the Descriptive Data Editor

Select the **Pole** feature and click the **GNSS capture** button. This opens the **Descriptive Data Editor**.

Click on the ▼ button at the top of the page to list the content of the data capture scenario.

You can also use the following methods to navigate in the scenario:

Use ◄◄ and ►► to move from an attribute to its predecessor or successor.

Use the ►► button to move to the next attribute that is still required.

The first symbol in the scenario shows the type of attribute, and the second symbol shows its current state.

- The 🟢 symbol indicates that the attribute has been answered.
- The 🔶 symbol indicates that an attribute has not been answered but is not required.
- The 🟥 symbol indicates that an answer is required for this attribute, and must be entered.

Choose **Comments** from the list to open the page for this attribute.

Enter **Pole19** in the edit control.

Auto increment on alphanumeric attribute increments the suffix (the rightmost numbers or letters of the same case).

Example: Pole19 becomes Pole20 and PoleAZ becomes PoleBA.

Click on the **Default** button (⌗) and choose **Set this value as default**.

The **Default** button changes to 📌.

This will set the value of the current field as the new default value for the capture of other tags of this feature.

If the attribute has an auto increment, it will be applied to the new default.
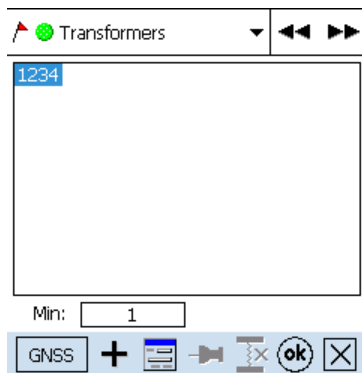
Once all the required attributes are entered the (ok) button is displayed. Click on this button to end the data capture for this feature.

4.3   Advanced Concepts

All Dictionary functions are under **OnPOZ Tools** in the **Dictionary** section.

This lesson will teach you advanced concepts about the dictionary and the capture of descriptive data.

4.3.1   Conditional Branch
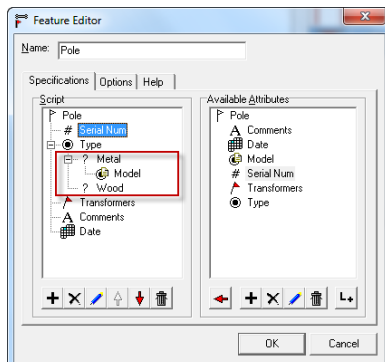
Before starting this step, open the **poles** dictionary and edit the **Pole** feature to view the scenario. The Script section contains a single choice attribute named **Type**. Two answers are possible: **Metal** and **Wood**. If the answer is **Metal**, the **Model** attribute is available. If the answer is **Wood**, the **Model** attribute is not available.
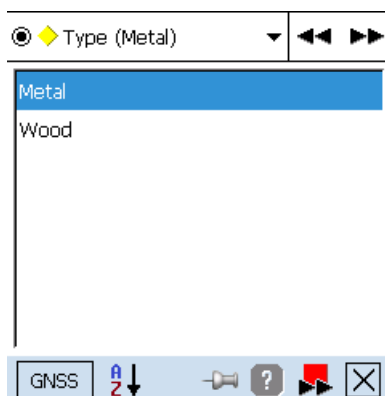
In **EZTag CE™**, create a new **Pole** and go to the **Type** attribute.

Note that **Metal** is selected for this attribute.
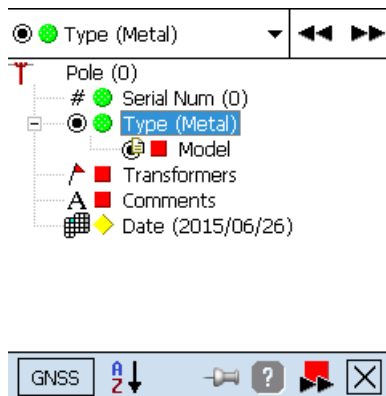
Click on the ▾ button at the top of the page to list the scenario, and note that the **Model** attribute is available under **Type**.
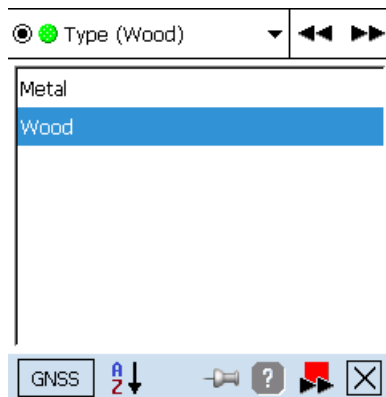
Click at the top of the page to close the scenario and select **Wood** as the choice for this attribute.

Single choice items can be sorted using this button:
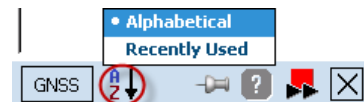
You select the new sort with a popup menu.
The look of the button indicates the active sort:

- ⬛ : Alphabetical sort
- ⬛ : Most recently used sort
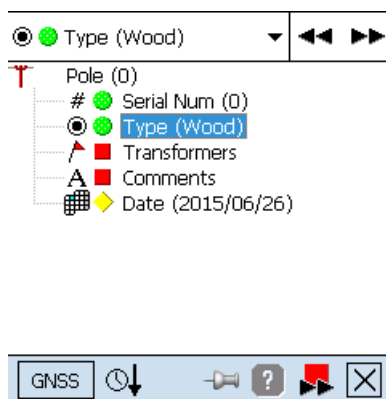
Click again on the ▾ button at the top of the page to list the scenario, and note that the **Model** attribute seen earlier is no longer available.

As defined in the scenario, **Model** is only available if **Metal** is selected in the **Type** attribute.

4.3.2   Display GNSS meta-data

Create a new **Pole** feature. The **Descriptive Data Editor** is opened on the edition page for the first attribute.

Click on the ◄◄ button to go to the position page for this feature.

You can click on the ▾ button at the top of the page to list the scenario, and select the first node. The first item in the scenario always leads to the location page.

You have the position in the upper section and the GNSS meta-data in a table at the bottom.

4.3.3   Required Attributes

Before starting this step, open the **poles** dictionary and edit the **Pole** feature. Edit the **Comments** attribute. Click on the **Options** tab. Note that the **Required** checkbox in the **Options** tab is checked, which indicate that this attribute is required.
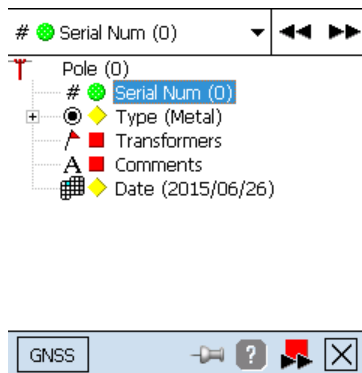
In **EZTag CE™**, create a new **Pole**.

Click on the ▼ button at the top of the page to list the scenario and note that the **Comments** attribute is preceded by the ■ symbol, which indicates that the attribute is still required.

Select the **Comments** attribute.
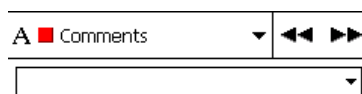
The scenario still shows the ■ symbol for a required attribute.

Click on the ►► button to go to the next attribute.
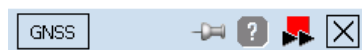
A required alphanumeric attribute loses its required status as soon as it has been visited, even if its value is not changed. The rules vary from one type of attribute to another.
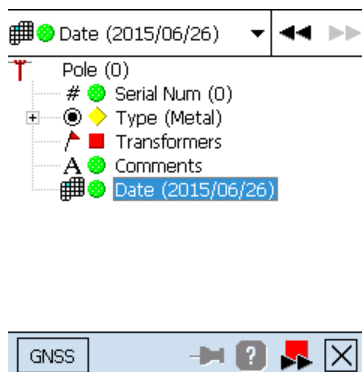
Click on the ▼ button at the top of the page to list the scenario and note that the **Comments** attribute is now preceded by the ● symbol, which indicates that the attribute is answered.

As long as there are any attribute with the ■ symbol in the scenario, you will see the ►► button. When all required are answered, the (ok) button will take its place.

The ►► button will jump directly to the next required attribute still unanswered.

4.3.4   Children
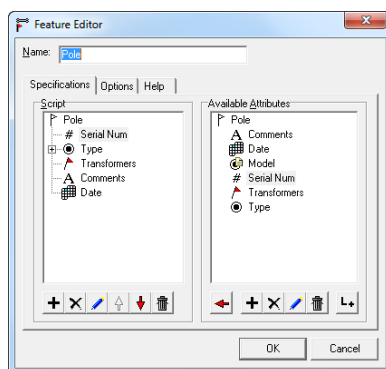
Before starting this step, open the **poles** dictionary and edit the **Pole** feature.

Select the **Transformers** attributes and click on the ✎ button.
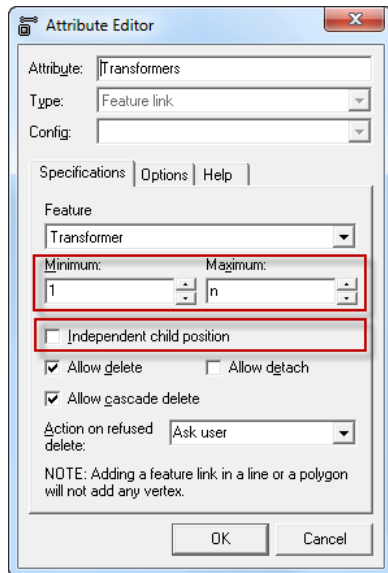
The **Minimum** and **Maximum** fields indicate the cardinality of the relationship. In this example the **Poles** attribute of the **Line** feature will have a minimum of 1 and no maximum.

When a **Minimum** is set, the attribute will be required until the minimum has been reached.

The **Independent child position** checkbox defines whether a child has a position that is independent of that of the parent or not.

The **Allow delete** and **Allow detach** checkboxes define whether the delete and detach buttons will be displayed when editing the attribute.

The **Allow cascade delete** checkbox defines whether deleting the linked feature will cause the deletion of its own children.
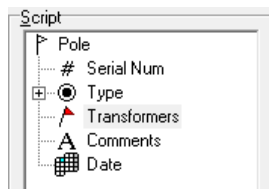
When a child does not have an independent position, it is placed at the same position as the parent.
The child is then shown with the ⚑ symbol in the scenario.
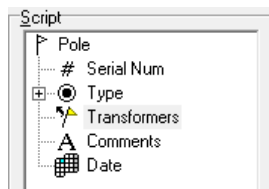
When a child has an independent position,

☑ Independent child position

It will exist separately from the parent. The child feature will have its own position that can be the same or different from the parent.
The child is then shown with the 🎌 symbol in the scenario.
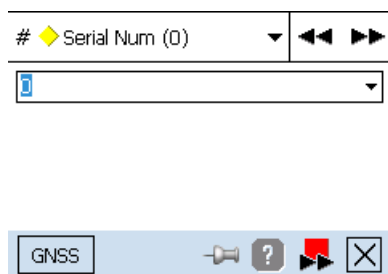
In **EZTag CE™**, create a new **Pole** feature.

Select the **Transformers** attribute.

Click on the **+** button in the tool bar to add a new child of type **Transformer**.

Enter the primary value **10001212** to identify the child, and then click on the ▶▶ button to move to the next attribute (**Power**).

Click on the ▼ button at the top of the page to list the scenario and note that the **Transformer** child feature is under the **Transformers** attribute.

Click the ▶▶ button.
Select **1000** as Model.

Click the ▶▶ button again.

Click on the (ok) button to save the child.
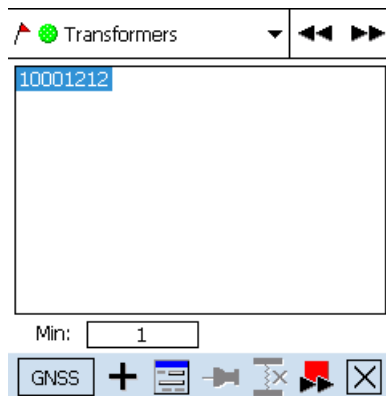
The editor goes back in the **Transformers** attribute of the parent **Pole** feature.

A child with a minimum cardinality will remain in the required state (■) until the minimum number of children has been added. Notice that the minimum number is shown at the bottom of the page.

Select the child *10001212* and note that the following buttons are available:

+ Add more children

Edit the descriptive data of the selected child

✕ Delete the selected child
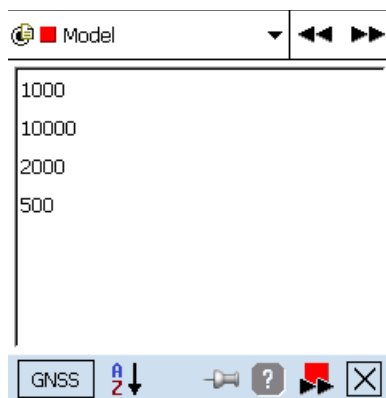
Click the ▶▶ button.
Select **1000** as Model.
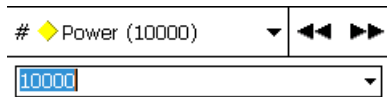
Click the ▶▶ button again.
Click on the (ok) button to close the **Pole** feature.

4.3.5   Trends
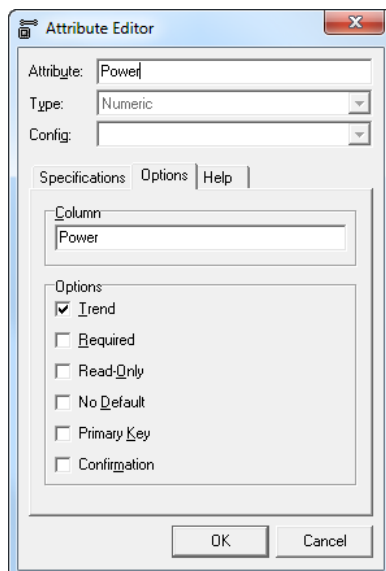
Before starting this step, open the **poles** dictionary and edit the **Transformers** feature. Edit the **Power** attribute. Click on the **Options** tab. Note that the **Trend** checkbox in the **Options** tab is checked. This indicates that this attribute will follow a trend.
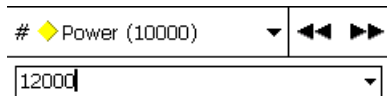
In **EZTag CE™**, create a new **Pole** feature.

Add a **Transformer** in the attribute **Transformers**. Enter the primary key then select the **Power** attribute.

The default value is *10000*.
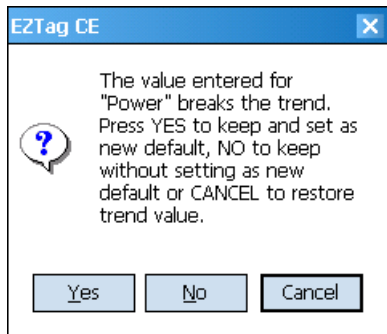
Enter another value for **Power**, *12000* for instance, and click on ►► to move to the next attribute.

The following message is displayed to warn that the trend has been broken:

Click on **Yes** to accept the value *12000*. This value becomes the new default. If the value *12000* is kept the next time, then no message will be displayed.

Click on **No** to accept the value *12000* for this time around only. The default value will remain 10000 and a value different than *10000* will display this message again the next time.

Clicking on **Cancel** will restore the field to the value *10000*.

NOTE: The message will not be displayed when the **Default** button is in the state. This has the same effect as answering **Yes** to the message.

4.3.6   Primary Key
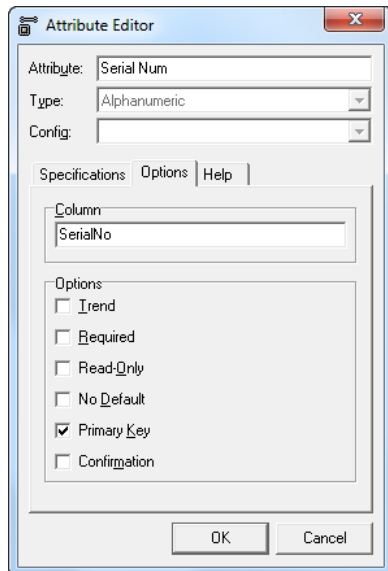
Before starting this step, open the **poles** dictionary.

Edit the **Transformer** feature.

Edit the **Serial Num** attribute.

Click on the **Options** tab.

The **Primary Key** checkbox is checked. This indicates that this attribute is a primary key. This option is only available for **numeric** and **alphanumeric** attributes.
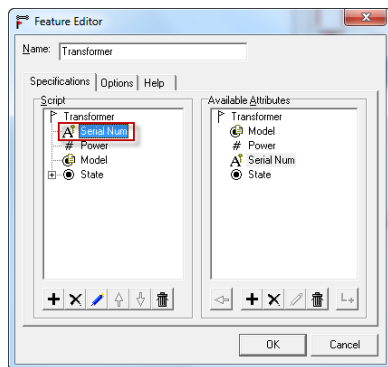
Only one primary key is allowed in a feature. The primary key is automatically placed at the start of the scenario and cannot be moved.

When an attribute is changed to a primary key, the symbol is added to its regular symbol. Since the type of the **Serial Number** attribute is alphanumeric, the symbol will be (a combination of both symbols).
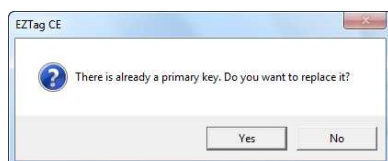
When entering a second primary key, the following confirmation is asked.

If confirmed, the attribute is changed to a primary key. The previous primary key loses it primary key status and is moved to second position in the scenario.

In **EZTag CE™**, create a new **Pole** feature. Go to the **Transformers** attribute and add a child.

Note that it is mandatory to answer the primary key attribute. The scenario is disabled so that you <u>cannot</u> click on the ▼ button at the top of the page.
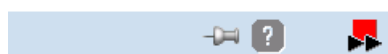
Enter a new value for this primary key then click on the ►► button.
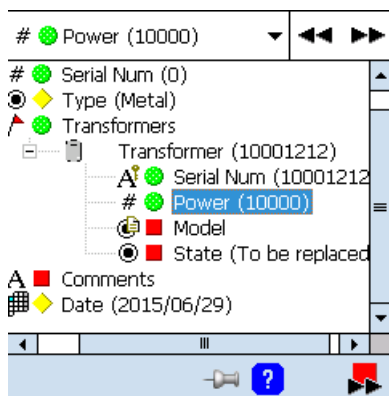
Normally, the primary key did not exist previously (unless you have entered an existing value at the previous step).

If the key existed, a confirmation is required. If you answer **Yes**, the feature with this key is read. Attributes are answered since the feature already exists.

Since it is a new primary key, a new **Transformer** feature is created.

Resume the edition of the new feature and note that the required attributes in the scenario for the **Transformer** feature.

4.3.7   Input Mask

The **Descriptive Data Editor** allows you to define an input mask for an attribute of alphanumeric type. Such a mask validates that the data entered follows rules that are specific to the application. Before starting this step, open the **Dictionary Editor** and create a new dictionary named **test.dic**.
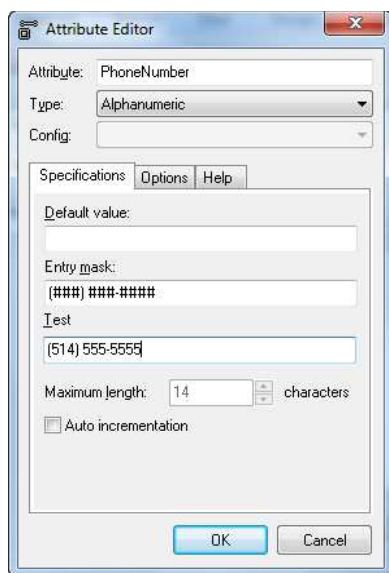
This example shows how to create an input mask for a telephone number.

1. In the **Dictionary Editor**, add a new feature, and then add an attribute of type **Alphanumeric** named **PhoneNumber**.

2. Under the **Options** tab, check the **No Default** checkbox.

3. Under the **Specifications** tab, enter (###) ###-#### in the **Entry mask** field. See the **Input Mask appendix** for details about the syntax used to define an input mask.

Use the **Test** field to test the input mask.
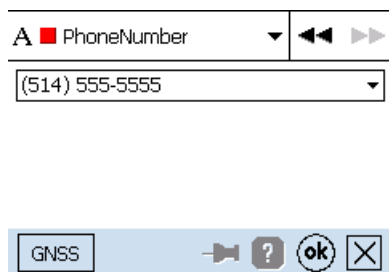
In **EZTag CE™**, start a new survey with the **test.dic** dictionary created with the above instructions. Create a new feature.

Go to the **PhoneNumber** attribute. Possible values for this attribute are limited to those defined by the input mask. In this case it must be a valid telephone number.

4.3.8   Help about a Feature
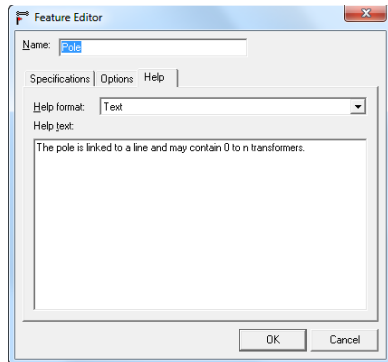
Before starting this step, open the **poles** dictionary.
Edit the **Pole** feature.
Click on the **Help** tab to display the help for the **Pole** feature.

Three help formats are available:
Text: Use to enter a short help text.
Html: Must contain a short text formatted as a HTML page.
Html file: Must be the name of an external file that contains the HTML code.
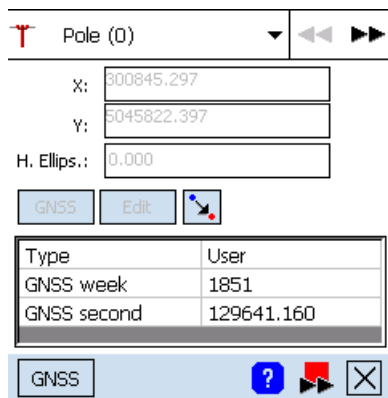
In **EZTag CE™**, create a new **Pole** feature.

Click on the ◄◄ button to go to the position page for this feature.

Click on the 🛈 button in the toolbar.
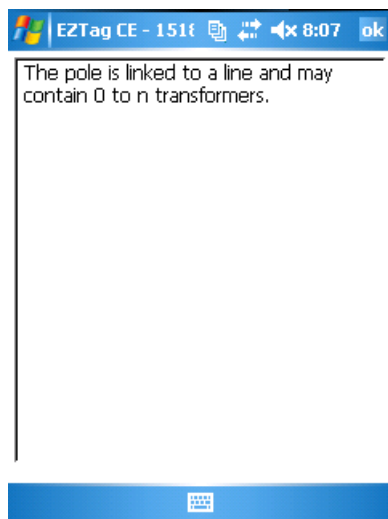
A help dialog is displayed.

Click on the **ok** button to close the help dialog.

4.3.9   Help about an Attribute
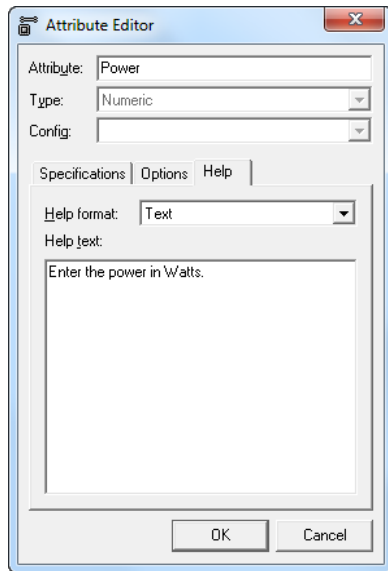
Before starting this step, open the **poles** dictionary.

Edit the **Pole** feature.

Select the **Power** attribute.

Click on the **Help** tab to display the help for this attribute.

Three help formats are available:

Text: Use to enter a short help text.

Html: Must contain a short text formatted as a HTML page.

Html file: Must be the name of an external file that contains the HTML code.
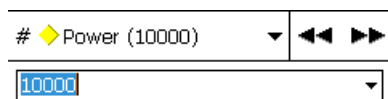
In **EZTag CE™**, create a new **Pole** feature.

Add a **Transformer** in the attribute **Transformers**. Enter the primary key then select the **Power** attribute.
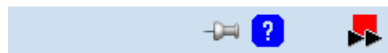
Click on the ❓ button in the toolbar.
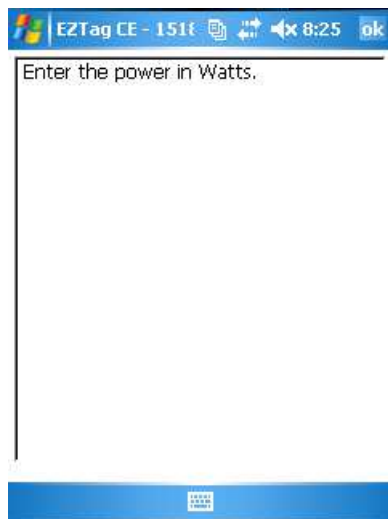
A help dialog is displayed.

Click on the ok button to close the help dialog.

4.3.10   Confirmation
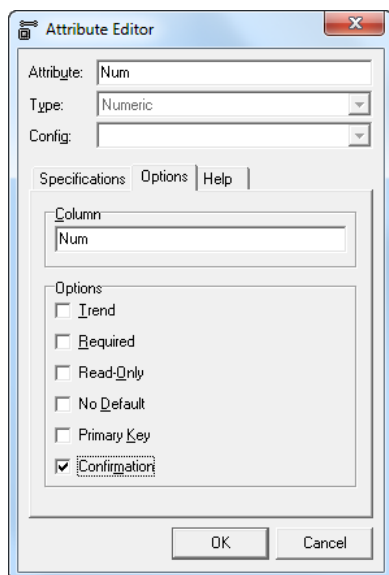
Before starting this step, create a new dictionary, add a new feature and add a new attribute. Click on the **Options** tab. Check the **Confirmation** checkbox.
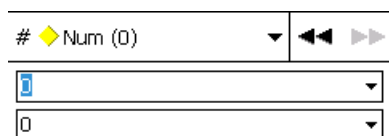
Start a new project with your dictionary. Create your new feature and select the **Num** attribute.

The confirmation takes the form of an attribute that requires to be entered twice and with identical values to continue.
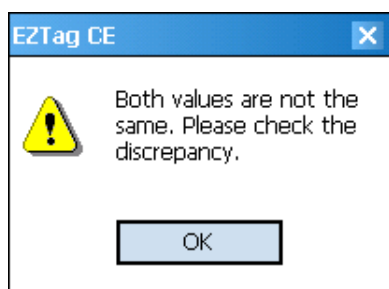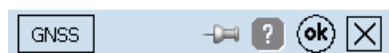
When trying to switch attribute or save the tag with a different value in both fields, it will display an error message.

4.3.11   Picture
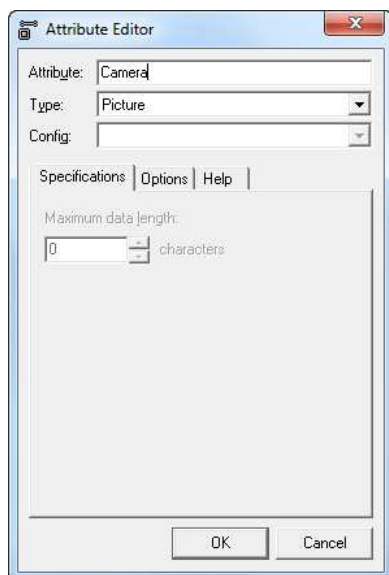
Before starting this step, create a new dictionary, add a new feature and add a new attribute of **Picture** type and fill the **Attribute** name.

Start a new project with your dictionary. Create your new feature and select the **Camera** attribute.

The camera button ( ) is enabled only for Windows Mobile 6 device and for Windows 10 device coming with an internal camera.

Click the button to take a picture.
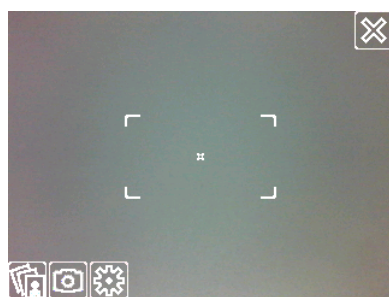
The **camera view** is displayed. The view look and capability may vary from one device to another.

Take your picture by pressing the camera button on the Windows Mobile device. Repeat this step if the picture is not satisfactory.

On some device, it closes automatically after taking a picture. On others, you need to click the **OK** button to close it.
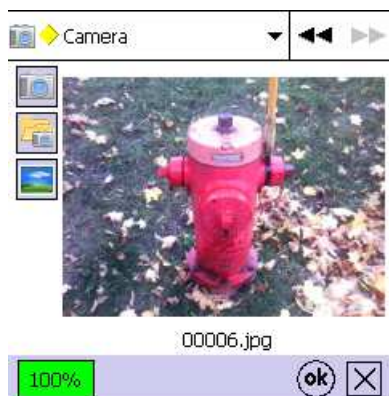
Your picture is displayed.
The picture name is displayed under it.

If you want to use a picture previously taken instead of taking a new one, click on the 🖼 button.

The **picture selector** is displayed. The **picture selector** always opens in the project **Pictures** subfolder.

The **picture selector** is not available on all devices. When it is not available, it will display a standard **Open** dialog

Click on a picture to select it.

You can change folder and select picture from any folder you want. Any picture chosen from another folder will be copied in the **Pictures** subfolder since they are now part of your project.

Press the 🖼 button to display the viewer.

The application use the viewer associated with JPEG file on the device.

The viewer look and capability may vary from one device to another.

Click **OK** to close the viewer.

4.4   Tag Sheet

The **Descriptive Data Editor** supports a new mode of edition by using a **Tag Sheet**. A **Tag Sheet** will display all attribute names and their value in a single page in the form of a grid instead of editing one attribute per page.

A **Tag Sheet** does not support parent-child relations so it cannot be used on every kind of feature.

4.4.1   Configuring a Tag Sheet

Edit or create a feature in the **Dictionary Editor**.

The **Feature Editor** is opened.

Click on the **Options** tab.

Click on the **Collect using a tag sheet** to do your collect all attributes in a grid within a single page instead of editing one attribute per page.
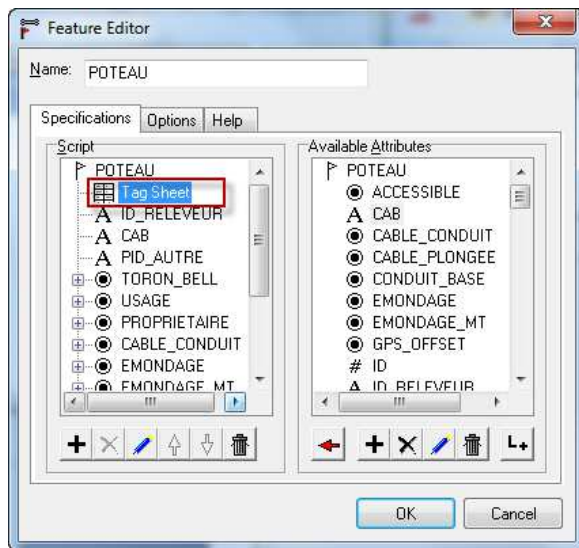
Click on **Specifications** tab.

A new **Tag Sheet** atttibute is added at the top of the script.

Click **OK** to save the Feature.

Click **OK** to save the dictionary.

4.4.2   Collecting using a Tag Sheet
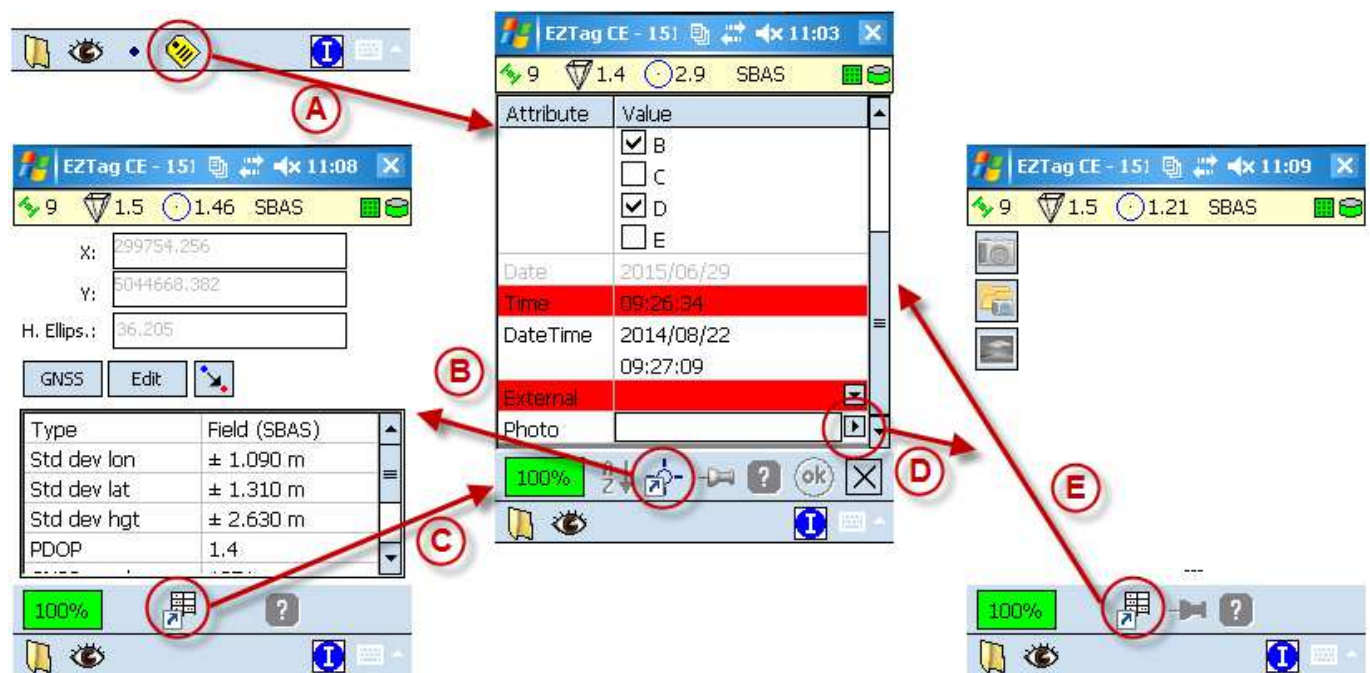
When you use the **Descriptive Data Editor** with **Tag Sheet**, the navigation bar is hidden. Some buttons on the toolbar takes over the navigation part.

- A. The **Descriptive Data Editor** always starts with the **Tag Sheet** page.
- B. Using the 🔹 button, the user can go to the **Position** page.
- C. In the **Position** page, the user can go back to the **Tag Sheet** page using the 🔹 button.

D. The **Tag Sheet** page does not support editing all attribute types or flags. So, entering editing mode on some attributes will go to a classic attribute page.

E. In the classic attribute page, the user can go back to the **Tag Sheet** page using the ⊡ button.

The ⓞⓚ ⊠ buttons are only available in the **Tag Sheet** page so you need to be in the **Tag Sheet** page to save or cancel your tag.

4.4.3   Edition within a Tag Sheet

The **Tag Sheet** page displays two columns:
- **Attribute**: Attribute name. The whole column cannot be edited.
- **Value**: The current answer for that attribute.

If the text of a whole line is gray, it is read-only and therefore cannot be edited. In the example, the **Date** attribute is read-only.

If the line has a red background, the value is:
- Unanswered primary key,
- Unanswered required (**Time** attribute in the example),
- Unanswered no default (**External** attribute in the example),
- Out of range or blank numeric value,
- Incomplete mask value.

As long as there is a line with red background, the ⓞⓚ button is disabled.

Edition is done in two steps:
1. Select the cell you want to edit. A rectangle appears in the cell.
2. Selecting again the cell will enter the edition mode.

Enter the value you desired and then select any other cell in the grid to exit the edition mode.

The new value is applied.
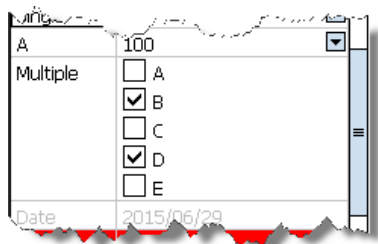
Editing a **Multiple choices** is different. It does not require a selection before edition. You can simply check or uncheck the checkbox directly.

Sometimes, edition must be done in a classic attribute page.

In that case, the cell is marked with a right arrow button (▶).

It is also a two steps edition:

1. Select the cell you want to edit. A rectangle appears in the cell.
2. Selecting again the cell will go to a classic attribute page.

Do your edition in the classic attribute page.

Click on 🔲 to go back to the **Tag Sheet** page.
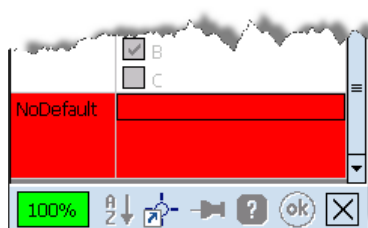
When an attribute of **Date**, **Time**, **Date/Time** or **Multiple Choices** has the **No Default** flag set in the **Attribute Editor**, it will not display any value at first.

First, you must make the control appears :

1. Select the cell you want to edit. A rectangle appears in the cell.
2. Selecting again the cell fill the value and make edition possible.
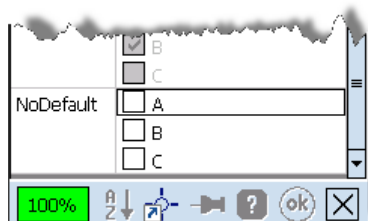
Then, you can edit the value normally.

5   Editing

5.1   Graphic Editing in the Plan View

This lesson will teach you how to move a point or a vertex directly in the **Plan View**.

5.1.1   Move a Point

Before starting this step, capture a point feature in the **Plan View**.
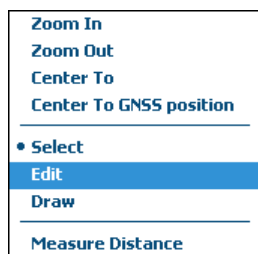
Click on the **Current Tool** button and choose the **Edit** tool from the list.

The icon of the **Edit** tool is now shown in the **Current Tool** button:
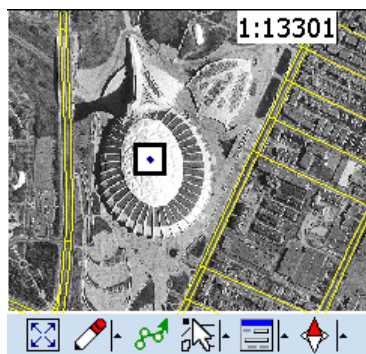
Click on the point to move in the **Plan View**. The point is highlighted with a square around the symbol of the feature.
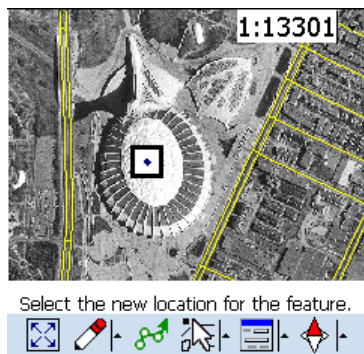
Drag the point to its new position, by holding the left mouse button down (or by keeping the pen in contact with the touch screen).
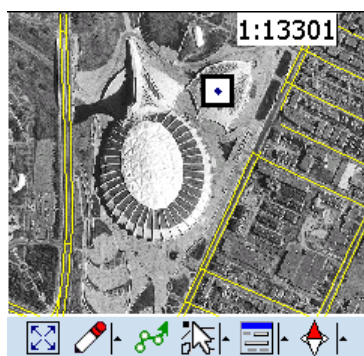
Release the mouse button (or lift the pen) to stop moving the point.

5.1.2 Delete a feature
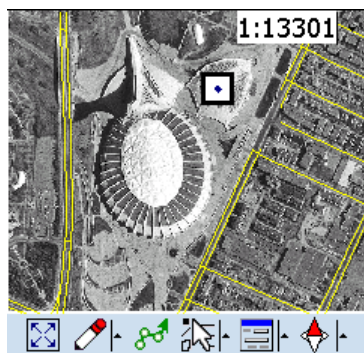
With the **Edit** tool active, select a feature, open the contextual menu (right-click on the mouse, or long click on the touch screen).
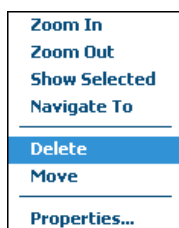
Choose **Delete** to delete the selected feature.
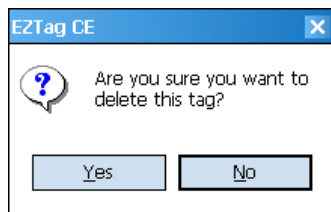
Answer **Yes** to confirm that you want to delete the feature.
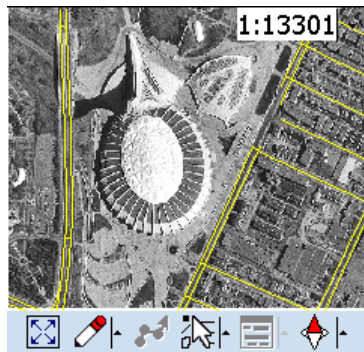
Note that the feature has been deleted.

5.1.3   Edit or delete a vertex within a Line

Before starting this step, collect a line feature in the **Plan View**.
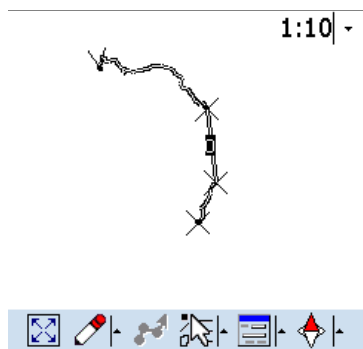
With the **Edit** tool, click on the line to edit in the **Plan View**. The line is highlighted with a double line (══) and a series of ✖ representing vertices.
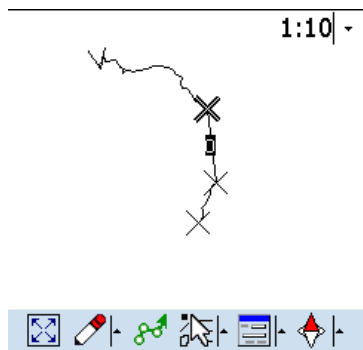
Click on the vertex to edit or delete in the line.

The vertex is shown as ✖.
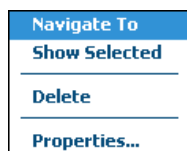
Click the following button:

To delete the vertex, click on **Delete**. Vertex is removed.

To edit the position, click on **Properties…** menu to open the **Descriptive Data Editor**.
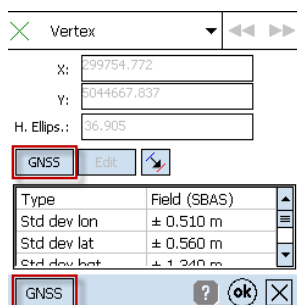
Click on one of the **GNSS** button to capture a new GNSS position.

Click **Yes** to restart the GNSS recording.
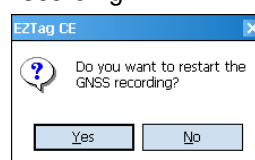
Wait until the GNSS button reached 100% and click ⓞⓚ.
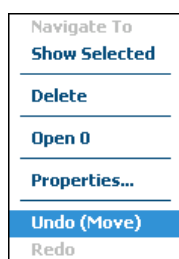
If you are not satisfied with the new position (or the delete), you can use **Undo** from the menu. To reach the menu, click the following button:
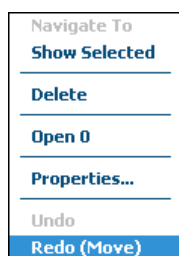
It you changed your mind again after an **Undo**, you can always use **Redo** available in the same menu after un undo has been done.

5.2   Editing in the Feature Manager

This lesson will teach you how to select, delete and restore any feature in the **Feature Manager**.

5.2.1   Using the Feature Manager

Before starting this step, capture some points, lines and polygons in the **Plan View**.

Choose **Feature Manager** from the **View (👁)** menu.

This opens the **Feature Manager** window.
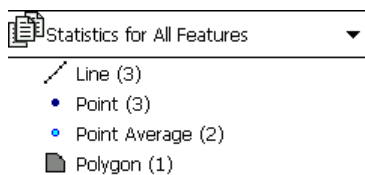
This displays the **Statistics for All Features** as filter.

This is a statistic page indicating the number of tags collected so far per feature types.
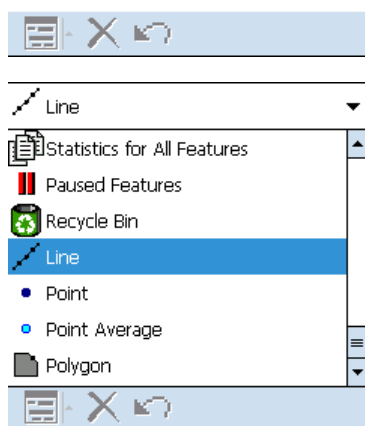
Click on the ▼ button at the top of the page to list the available feature filters.

Choose the feature you wish from the list.
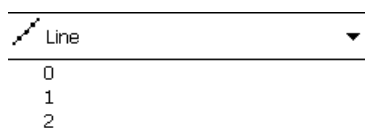
The features you wished are listed.

5.2.2   Select and Edit Descriptive Data
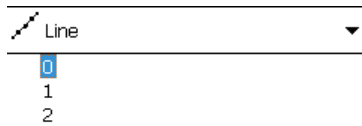
Return to the **Line** feature page in the **Feature Manager**.

Click one of the feature in the **Feature Manager**.

Click on the leftmost button of the toolbar.

Choose the **Properties...** menu to open the **Descriptive Data Editor**.

This does the same as viewing the descriptive data from the **Properties...** menu in the **Plan View**.
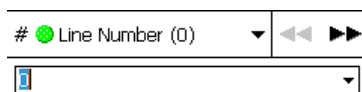
Click on ⊠ to close the window without saving changes to the descriptive data.
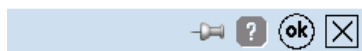
5.2.3   Deleting and restoring a feature
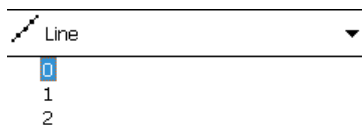
Return to the **Line** feature page in the **Feature Manager**.

Select a feature and then click on the middle button of the toolbar to delete it.

Answer **Yes** to the confirmation requested.
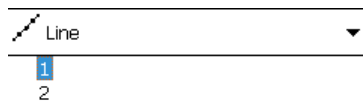
The deleted feature is no longer displayed in the list of features for the **Line** feature.
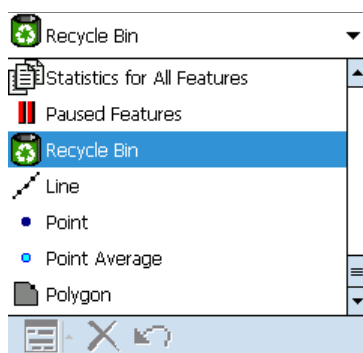
Click on the ▼ button at the top of the page to list the available feature filters.

Choose the **Recycle Bin** filter from the list.
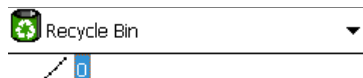
The **Recycle Bin** page is displayed. It gives a list of all the deleted features.

To restore a feature, select it then click on the rightmost button in the toolbar.
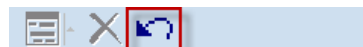
6 Appendix A: More about the GNSS Receiver

6.1 Using a Receiver in NMEA Mode

To be useable with the application in NMEA mode, your GNSS receiver must generate a subset of NMEA 0183 protocol messages. It must also be configured to transmit data at regular intervals.

The application uses the information from the following NMEA messages:

- GPALM
- GPGGA (or GPGLL)
- GPGSA (or GPGSV)
- GPGST
- GPRMB
- GPRMC
- GPGTG
- GPZTG

If the optional NMEA message is not present, some functionalities of the application may not be active. It will not work at all if the required NMEA messages are not present.

IMPORTANT: You must configure a receiver in NMEA mode so that it transmits the messages used by the application on a continuous basis, and at regular intervals. You can use a software application provided with the receiver to configure the GNSS receiver, or you can use a GNSS initialization strings to request specific messages from the receiver.

6.2 Connection Indicator
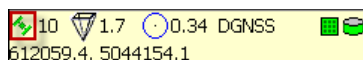
The **connection indicator** is the first item of the status bar.

Nothing displayed

EZTag CE™ is configured for manual connection, and no search for the GNSS receiver is currently underway.

Alternating between 🖱️ and ⚡	**EZTag CE™** is searching for a connection to a GNSS receiver.
🖱️	**EZTag CE™** is connected to a GNSS receiver.
Alternating between ✦ and ⚡	**EZTag CE™** is connected to a GNSS receiver and is waiting for the receiver to be ready for use.
✦	**EZTag CE™** is connected to a GNSS receiver, and the data received is valid and useable.
Alternating between ✦ and ⚡	**EZTag CE™** is connected to a GNSS receiver, but the number of visible satellites is less than the minimum number specified in the number of satellites alarm.
Alternating between ✗ and ⚡	**EZTag CE™** has lost the connection to the GNSS receiver and is trying to get it back.
🛑	**EZTag CE™** has failed to connect to a GNSS receiver and the program has given up trying to connect.

6.3   PDOP/HDOP Indicator
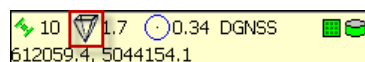
✦ 10 ▽ 1.7 ◯0.34 DGNSS ▦ 🖴 612059.4, 5044154.1	The **PDOP**/**HDOP indicator** is the second item of the status bar.
Nothing displayed	**EZTag CE™** is configured for manual connection, and no search for the GNSS receiver is currently under way. or **EZTag CE™** has found a receiver, but the receiver does not yet transmit useable data.
▽ or ▽	**EZTag CE™** is connected to a GNSS receiver, and the received data are valid and useable.
Alternating between ▽ and ▼	**EZTag CE™** is connected to a GNSS receiver, but the PDOP value is higher than the maximum specified on the PDOP alarm.
Alternating between ▽ and ▼	**EZTag CE™** is connected to a GNSS receiver, but the HDOP value is higher than the maximum specified on the HDOP alarm.
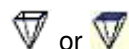
6.4   GNSS Precision and GNSS Solution Type Indicators

6.4.1   Indicators in real-time mode

The display of the precision and solution type indicators in real-time mode is always available, as long as the GNSS receiver is connected and operating.
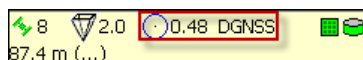
The **GNSS precision** indicator shows an estimate of the position accuracy.

The **GNSS solution type** indicator shows the status of the real-time GNSS solution:

- **NONE**: no GNSS position is computed
- **GNSS**: the GNSS position is computed normally
- **DGNSS**: the GNSS position is calculated with DGNSS differential corrections.
- **SBAS**: the GNSS position is calculated with SBAS precision augmentation.
- **FIXED**: A fixed RTK position
- **FLOAT**: A float RTK position.
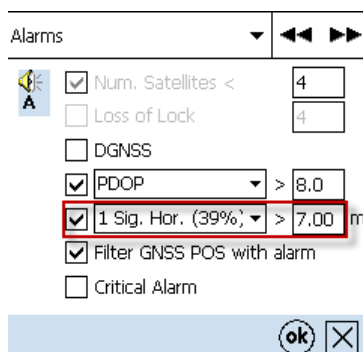
The precision is estimated according to the accuracy choice in **File ( ) > Preferences > Alarms**. To choose the type of accuracy, check the box on the left of the accuracy choice then select from the list:

- **1 Sig. Hor. (39%):** One time horizontal (2D) variance.
- **2 Sig. Hor. (86%):** Two times horizontal (2D) variance.
- **3 Sig. Hor. (99%):** Three times horizontal (2D) variance.

If you do not need an alarm on the GNSS precision indicator, uncheck the box on the left of the accuracy.

6.4.2   Indicators in post-processing mode

The display of the precision and solution type indicators in post-processing mode is available only when a GNSS project is opened for post-processing (any GNSS driver except NMEA).

Real time:
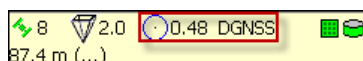
Click on the **GNSS precision** indicator or the **GNSS solution type** indicator to toggle between the real-time display mode and the post-processing display mode.
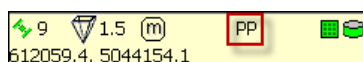
The **GNSS solution type** indicator always shows PP in post-processing mode.
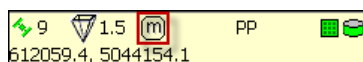
The **GNSS precision** indicator in post-processing mode shows an estimate of the anticipated precision after GNSS post-processing:

- ⟨?⟩: The precision is unknown. Let time pass to view the estimated precision.
- ⟨5⟩: The precision after post-processing will be in the order of 5 meters.
- ⟨3⟩: The precision after post-processing will be in the order of 3 meters.
- ⟨m⟩: The precision after post-processing will be in the order of 1 meter.
- ⟨LOL⟩: This indicates a GNSS loss of lock. Precision cannot be estimated. Let time pass to view the estimated precision.

7 Appendix B: Input Mask

The **Dictionary Editor** allows associating an input mask to an alphanumeric attribute. Such a mask allows validating that the data is entered according to rules that are specific to the application. This appendix describes the language used to define an input mask for an alphanumeric attribute.

7.1 Simple Element

7.1.1 Basic rules

The mask can include any *literal*. A *literal* is any character, punctuation sign, digit, or letter that can be entered at the keyboard.

The following *command characters* have a special meaning:

Stands for a digit: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0

c Stands for a letter of the roman alphabet: a, b, c … z, A, B, C … Z

e Stands for an extended letter. This includes any letter from the roman alphabet, as well as any letter with an accent, regardless of the nationality.

* Stands for any literal.

To use a command character as a literal, you must precede it with the '\' character

- Example: "c" stands for any letter of the Roman alphabet. «\c» means the literal 'c'.

To use the literal '\', write « \\ ».

A character in the input text will match each literal or command (unless specified otherwise).

7.1.2 UNICODE Characters

To specify a UNICODE literal character as a single element, use the form \uXXXX where XXXX is the UNICODE code specified as an integer hexadecimal value. The value of XXXX must be between 0000 and FFFF inclusively. The four « X » must be present. For instance, to write FF, you must absolutely use the form \u00FF.

Example: \u0040\u0041\u00ff would accept a UNICODE character 0x40, followed by UNICODE character 0x41, and UNICODE character 0xff.

7.2   Complex Element

7.2.1   Set

A set is a collection of literals and commands assembled to modify the type of literal that is accepted at a specific point in the mask. A set has the form of a collection between '[' and ']'.

Any character entered between '[' and ']' is used as a literal, except for '-', the set delimiters ('[' and ']'), '\ ', '~', '<', '>', '{' and '}'. See the corresponding sections to learn how to use these characters in a set.

To use the '[' and ']' literals inside a set, it must be preceded by '\'.
Example: [\[\]] specifies a set that accepts the characters '[' and ']'.

To use a command character as a command in a set, it must be preceded by '\'
Example: [+\#] specifies a set that accepts a number and the '+' character.

To use the literal '\', write « \\ ».

To use a sequence of literals without specifying each of them, use the notation 'first-last'. The '-' means that all literals between 'first' and 'last' inclusively are accepted.
Example: [1-5a-x] specifies a set that accepts a digit between 1 and 5 inclusively, or a letter between 'a' and 'x' inclusively.

To use a sequence of UNICODE literals, use the following form: [\uXXXX-\uYYYY] where XXXX and YYYY are UNICODE codes that follow the rules described previously. The value of XXXX must be less than the value of YYYY.
Example: [\u0234-\u9871]

To use a UNICODE literal, use the form \uXXXX.

To use the literal '-' in a set, it must be preceded by '\'.
Example: [+\-\#] specifies a set that accepts a digit, and the characters '+' and '-'.

7.3   Modifiers

7.3.1   Counter

A counter specifies the minimum and maximum number of times that a literal or a command is repeated (or repeatable). It has the form {min, max} and is placed immediately after a literal, a command, or a set.
Example: #{1,5} specifies a sequence of 1 to 5 digits.

When only one number is specified, then the maximum number is the same as the minimum number.
Example: #{3} specifies a sequence of exactly 3 digits. This is the same as #{3,3}.

However, if only the number 0 is specified, then the maximum number is 1.
Example: #{0} specifies zero or one digit. This is the same as #{0,1}.

The smallest possible minimum number is 0. The smallest possible maximum number is 1. The maximum number cannot be smaller than the minimum.

The character 'n' is used as an infinite maximum number. The minimum number cannot be 'n' (infinite). If the minimum number and the comma are specified, then the maximum number is assumed to be infinite.
Example: {1,} is the same as {1,n}.

If only the comma and the maximum number are specified, then the minimum number is assumed to be 1.
Example: {, 5} is the same as {1, 5}

A counter cannot be included inside a set.

To use the literals '{' and '}' as literals or as elements of a set, they must be preceded by the '\' character.

Sample usage of counters:
c{1,4} specifies a mask that accepts 1 to 4 letters of the roman alphabet (a, abcd).
[c#]{2} specifies a mask that accepts 2 characters that must be 'c' or '#' (ex: #c, ##).
[\c\#]{3,5} specifies a mask that accepts 3 to 5 characters that can be a letter of the roman alphabet or a digit (ex: ABC, A1B2C).
\{###\} specifies a mask that accepts 3 digits between "{ }" (ex: {123}, {514}).

7.3.2   Negation

A negation means "not" and is represented by ~. Examples:
~c means that the input character cannot be a letter of the roman alphabet.
"[\~#\~c]" means that the input character cannot be a character of the Roman alphabet, nor a digit. Writing « ~[\#\c] » would yield the same result.

The negation character is placed before a command or before a set to specify that the input character can be anything that is not a member of the set.

The negation cannot be applied to the '*' command.

A negation should be thought of as a set of characters to be subtracted from the set of allowed characters at a given position.

Examples of valid negations:
[\~#\~c] specifies any character that is not a letter of the Roman alphabet and that is not a digit.
[\e\~c] specifies any letter with an accent (excluding letters without accents).

To use the literal '~' in a mask (as a literal, or as an element of a set), it must be preceded by the '~' character, giving "~~".

7.4   Result Modifiers

The modifiers are used to modify the content of the text entered by the user. They have no effect on the mask and on the validation of the text entered by the user.

Modifier	Effect
<	Changes all the following characters to uppercase.
>	Changes all the following characters to lowercase.
<>	Deactivates the modifiers from that point on.

Example: <e specifies an uppercase letter with or without accent.

A result modifier must be placed between two elements. It cannot be placed within an element.

To use a result modifier as a literal or as an element of a set, it must preceded by the '\' character.
Example: "\<" specifies the literal '<'.

7.5   Examples

To express…	Use…
A phone number	(#{3}) #{3}-#{4} or (###) ###-####
An address of the type "222e Rosemont Street" or "1234 St-Jean blvd 12"	#{1,5}c{0} [\e\# \-.]{1,}
Anything except a digit	~#
Anything except a digit or a character from the roman alphabet	~[\c\#] or [\~c\~#]
A date in the form YYYY/MM/JJ	[12][90]##/[01]#/[0123]#
A password made of a mix of letters and digits, and containing between 6 and 12 characters	[\c\#]{6,12}
The name of a person where the first letter is uppercase, and the others are lowercase	<e>e{1,n}
A floating point number (example −1.32e5)	[+\-]{0}#.#{1,}[eE][+\-]{0}#.{1,}
An email address	[\e\#_.]{1,}@[\e\#_.]{1,}
An email address with unusual characters	*{1,}@*{1,}

8   Appendix C: Configuring Range Finder

8.1   Range Finder Supported

This version of **EZTag CE™** supports only the TruPulse 360 and 360B.

8.2   Configure COM Port

To use the range finder on Windows Mobile or on a Windows powered device, you must connect it to a serial port (TruPulse 360). When using a Bluetooth connection (TruPulse 360B), power up the range finder and start the Bluetooth manager on your Windows Mobile or Windows powered device. Then, configure a new Bluetooth connection for using the device.

Please refer to the range finder User's Guide for details.

8.2.1   Configure COM port for EZTag CE™

To configure and to test the communication between **EZTag CE™** and the range finder, use the **Range Finder** shortcut provided. This should be done once only.
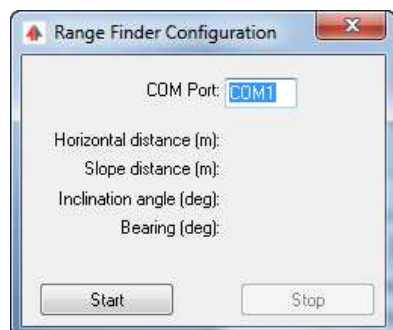
On a Windows powered device, select **Start > All Programs > OnPOZ > Range Finder Configuration**.

On a Windows Mobile, select **Start > Programs > Range Finder**.

Check if the **COM Port** displayed corresponds is the one expected and change it if necessary. Power up the range finder. Press **Start**. Take a measure with the range finder. Measured values are displayed on the form if the system is connected properly. If not, press **Stop**. Check if your range finder is connected properly. Adjust the **COM port** if necessary and try again.

Once the procedure has succeeded, quit the program. It is ready for **EZTag CE™**.

8.3   Using in EZTag CE™

The range finder is available when collecting a point with an offset. As an example, start a new project in **EZTag CE™**, create a new point, select a one point offset and go to the **Parameters** page (see 3.4.4 - *Offsetting a point using one point reference* for details). Power up the range finder and take a measure with it. The measured values will be automatically transferred to the offset parameters' fields.

Before:

After:

8.4   Configure Magnetic North

The range finder can either send bearing values relative to true north or magnetic north. Unfortunately, **EZTag CE™** has no way to detect what setting is used by the range finder so you must adjust the setting manually in **EZTag CE™** in order for the bearing values to be read properly. Please refer to the range finder User's Guide for details how to display and modify declination value.

On the range finder	What to do in **EZTag CE™**
If magnetic declination is zero, the range finder will send bearing values relative to magnetic north.	Go to **Plan View** page in **Preferences**, set **North type** to **Magnetic** and set the magnetic **Correction** for your area. Example:

	Plan View ▼ ◄◄ ►► North type: Magnetic ▼ Correction: 15 30 00.000 + ▼
If magnetic declination is set with the correct value for your area, the range finder will send bearing values relative to true north.	Go to **Plan View** page in **Preferences**, set **North type** to **True North**. Example: Plan View ▼ ◄◄ ►► North type: True North ▼ Correction: 0 00 00.000 + ▼

8.4.1   Get Magnetic Declination

If you do not know the magnetic declination in your area, you can use an online Magnetic declination calculator.

National Centers for Environmental Information (USA)	https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml
Natural Resources Canada (Canada)	https://geomag.nrcan.gc.ca/calc/mdcal-en.php

All these online tools provide values around the globe even if they are optimized for their local area.

The **Declination** returned by these web sites is given in East/West value. When entering in **EZTag CE™** or **Export Features**, set any East value as positive and any West value as negative.
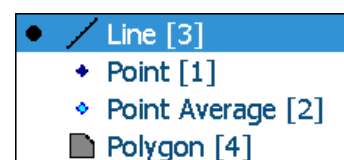
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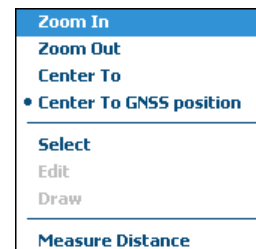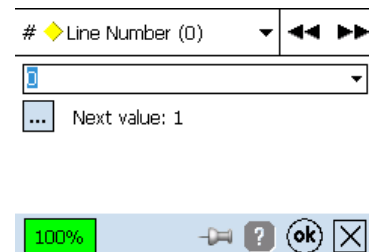|		
Current Feature	The current feature is one feature selected from the project Dictionary. The **GNSS capture** button or the **Draw** tool will start the capture of the current feature.	
Current Feature Button	The **current feature** button shows the feature that will be used to capture features with the **Draw** tool or with the **GNSS capture** button. The button always displays the icon associated with the current feature.	
Current Tool	The list of current tool opens when clicking on the **Current Tool** button. It shows the list of tools used to interact with the **Plan View** or with graphic features in the **Plan View**.	
Current Tool Button	The **current tool** button shows which tool is currently active for interacting with the **Plan View**.	
Descriptive Data Editor	The **Descriptive Data Editor** allows viewing and editing the descriptive data associated with a graphic feature. The editor opens automatically when starting the capture of a feature. The editor can also be accessed from the **Properties...** menu of a feature.	
Dynamic Plan View Button	The **Dynamic Plan View** options button sets the orientation of the **Plan View**.	

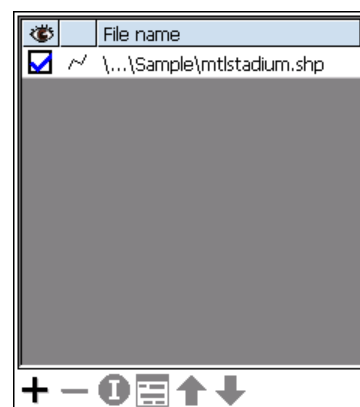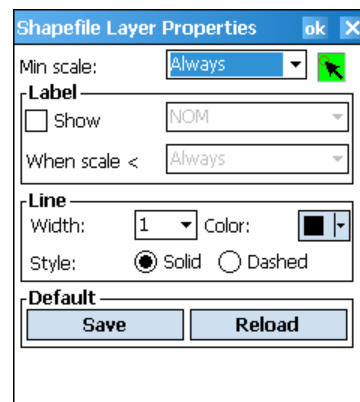|		
Feature	A feature is an object you can collect. It has attributes, a position and an icon associated with it. A dictionary is used to define a feature.	
GNSS Capture Button	The **GNSS capture** button starts the capture of a new feature with GNSS position.	
GNSS Vertex Capture Button	The **GNSS vertex capture** button will add a new vertex with GNSS position to an opened line or polygon.	
Layer Manager	The **Layer Manager** allows selecting the set of Feature, ESRI Shapefiles, BMP Files and ECW Files data to display in the **Plan View**. It allows configuring other parameters, including the display order, the display scale for each level, as well as the symbology to use to display each layer. You can access it from the **View ( )** menu.	
Layer Properties	The **Layer Properties** editor specifies how to display this layer in the **Plan View**. It is available from the **Layer Manager**.	
Open Feature Button	The **open feature** button allows opening the menu that contains the options for an open line or polygon, and the options to pause or continue a line or a polygon.	

Plan View

The **Plan View** is the **EZTag CE™** window that displays graphics, such as ESRI Shapefiles, BMP and ECW layers, as well as the TAG features.
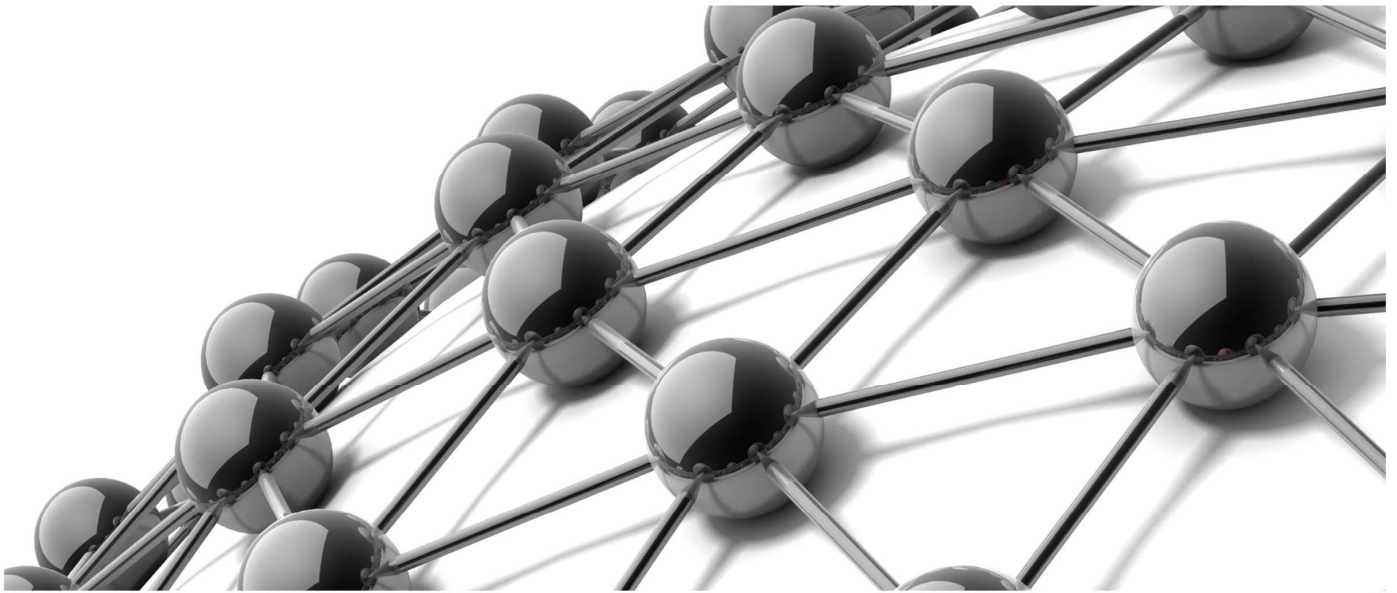
You can access it from the **View ( )** menu.
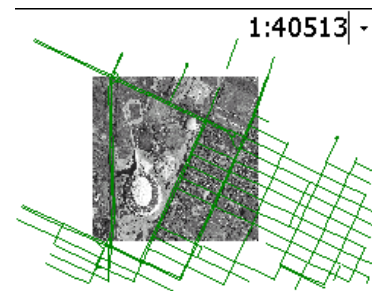
Preferences Window

The **Preferences** window configures the options for the application. You can access this window from the **Preferences...** item under the **File ( )** menu.

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