DATA COLLECTION

GIS

TOPO

ACCURACY

ARPENTGIS-EXPERT
ARPENTGIS-ANDROID

USERGUIDE

ArpentGIS

D3E ELECTRONIQUE

Version 6.4 - Revision A - July 2018

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ArpentGIS-Android is an application running on Android 4.x devices.

ArpentGIS-Expert is a software running on Windows environment : Seven (32&64 bits) last Services Packs installed, Eight et Ten with last Services Packs installed

The screenshots in this manual are for information only; they are likely to evolve according to the specific needs of each user.

This manual is not exhaustive, but provides the main information needed to collect data with a GNSS receiver with ArpentGIS-Expert software and ArpentGIS-Android application.

Documentation conventions :

To be read 0.0.1

This part to describe an important information. It is required to read this specific technical point before processing or continuing.

Advice 0.0.1

This part to describe a recommendation of the author. Indications are strongly recommended.

Detail 0.0.1

❶, ❷, ❸, ❹... *This part to describe a detailed step by step procedure.*

Note 0.0.1

This part to describe a specific technical information, not required but highly recommended.

One doubt ? 0.0.1

Coordinates of your local reseller for more information.

Tip 0.0.1

This part to describe a tip to help the user.

This document includes :

- A description of the main features of the ArpentGIS-Android application
- A description of the main features of the ArpentGIS-Expert software

CONTENTS

PARTIE

I

Software Installation

DANS CETTE PARTIE

IN THIS CHAPTER

CHAPTER 1

ArpentGIS-Expert software installation

ArpentGIS-Expert software is the desktop application to check-in data collected with *ArpentGIS-Android* field software. This tool is also designed to easily edit maps and make transfer and format conversion ease and flexible.

1.1 Minimum System Requirements

Windows Laptop running Seven (7), Eight (8) or Ten (10) operating system with a 1 GHz core processor or above, 512 Mo memory, 1 Go free storage space. SVGA (800x600) screen resolution minimum.

1.2 Installation of *ArpentGIS-Expert* single license or evaluation license

1.2.1 Installation of Microsoft Framework .NET 4.5.2 (optional)

ArpentGIS-Expert software is build with ***.NET*** language. To be fully functional it is necessary to install .NET Framework 4.5.2 on the laptop. Some computer may already have this component installed ; for others it is necessary to install this component manually.
When trying to install *ArpentGIS-Expert* software, an information message appears the installation of the component is required. If the computer has a valid Internet connection download of the Framework component is automatic. If the computer does not have a valid Internet connection, user will have to download the component manually. Use this adress to download it from another computer : www.d3egps.com/arpentgis/DotNet452.exe

Note 1.2.1

Administrator rights are required to install this component.

To be read 1.2.1

Do not install the component if there is no information message. It means it is already installed.

1.2.2 Installation from an Internet link

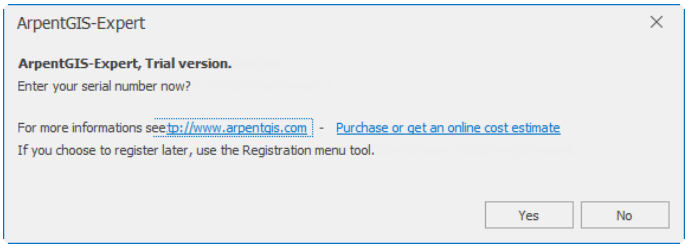
Note 1.2.2

Administrator rights are required to install the software.

- Download the ***ArpentGIS-Expert*** software a the following address : www.d3egps.com/arpentgis/ArpentGIS-Expert.exe
- Start ***ArpentGIS-Expert.exe*** EXE file and follow the screen instructions.

1.2.3 Registration

When starting *ArpentGIS-Expert*the first time a registration window will be prompted to help the customer registering his software.



- If the user owns an installation code click on Yes and enter the installation code.

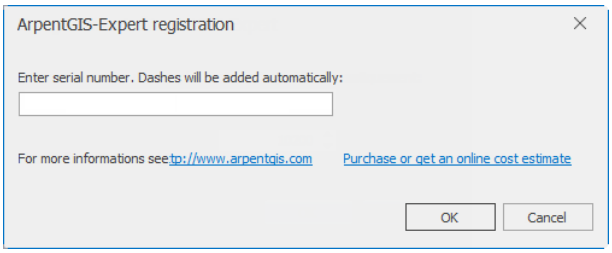


Figure 1.1: ArpentGIS-Expert Installation code

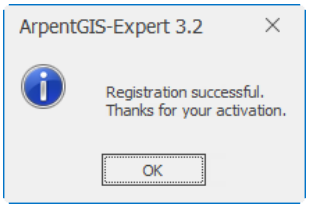


Figure 1.2: ArpentGIS-Expert successfully registered

Note 1.2.3

- *If the customer does not have a valid installation code click on Cancel. The software will start in evaluation mode (export and printing option disabled)*
- *If the customer wants to order an installation code click on "Buy or ask for a quotation". The user is automatically "redirected" on D3E Electronique GPS-Boutique website (http://www.gps-boutique.com) in order to get a quotation.*

1.3 Installation of *ArpentGIS-Expert* with a floating license

To be read 1.3.1

Administrator rights are required to install the license manage (laptop or server).

1.3.1 Server Installation : ArpentGIS.LicenceManager

To use *ArpentGIS-Expert* software with a floating license it is required to install a license manager on a Windows Server. This server will manage the existing license or allow the customer to enter a new license code.

- Download the ***ArpentGIS-Expert-LicenceManager*** software at the following address : www.d3egps.com/arpentgis/ArpentGIS-Expert-LicenceManager.exe
- Start the ***ArpentGIS-Expert-LicenceManager.exe*** EXE file and follow the screen instructions.

Note 1.3.1

- *To install the application on a server it is required to install Microsoft .NET Framework 4.5.2 component. Thus the installation described above will only be available for Windows Server.*
- *The ArpentGIS-Expert Licence Manager software is compatible with Seven, Eight, Ten and Windows Server 2003/2008 operating systems (last service packs installed)*

1.3.2 Licenses manages

1.3.2.1 Start licenses manager

On the Server where the license manager had been installed click on "Start/Program/ArpentGIS" and click on "ArpentGIS.LicenceManager"

To be read 1.3.2

It is required to launched (and leave start) the license manager before starting ArpentGIS-Expert software on the computer connected to the server.

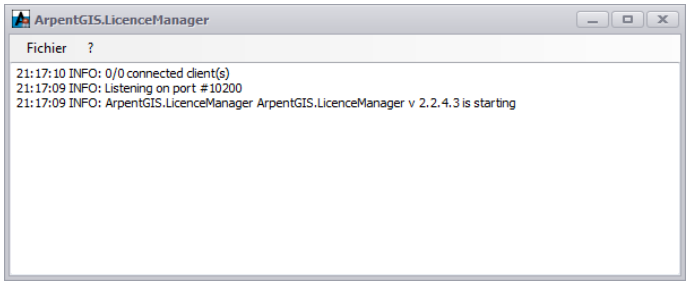


Figure 1.3: Start the license manager

1.3.2.2 Add a license file

- Click on ***File***
- Select ***Configuration...***
- Enter the license code and the port. The default port is ***10200***

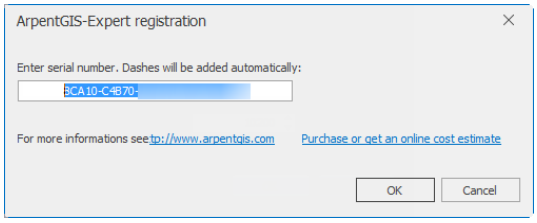


Figure 1.4: Add a multi-license code to the license manager

- Click on OK to valid the license code

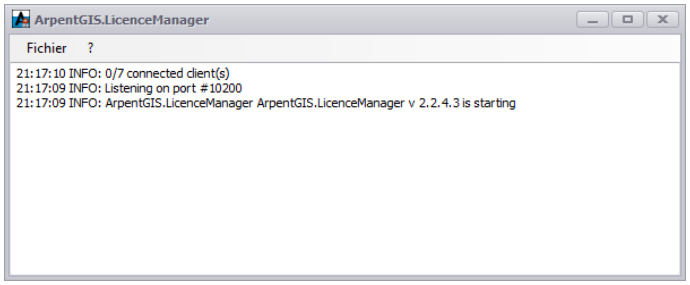


Figure 1.5: Start the license manager

To be read 1.3.3

Leave the license manager started to allow connections from the client computers running ArpentGIS-Expert software.

1.3.2.3 Server connection example

Once the license manager launches on the server and the *ArpentGIS-Expert* software started the license manager with prompt the IP addresses connected to the server and the and the number of licenses remaining available.

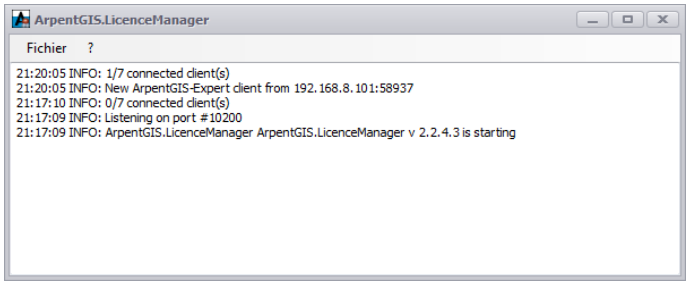


Figure 1.6: Floating licenses used

1.3.3 Setting on the client computer

1.3.3.1 Installation of *ArpentGIS-Expert* software on the client computer

To install the software follow the procedure described section 1.2 on page 3.

To be read 1.3.4

Do not follow the section "Registration" 1.2.3 on page 3

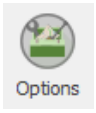
After installation, to set the *ArpentGIS-Expert*software with a floating license follow the procedure below :

- Click on 

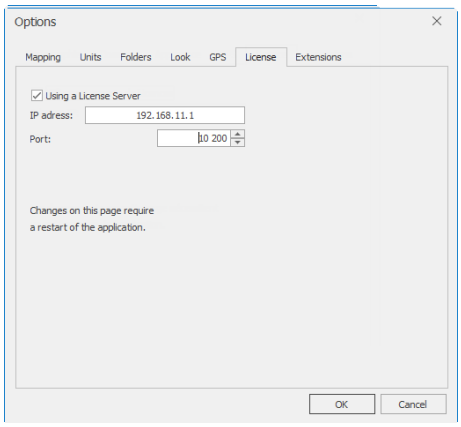
on the desktop

(or)
- Click on "Start/Program/ArpentGIS" and click on "ArpentGIS-Expert"

- In *ArpentGIS-Expert* software select 

tab and click on 

button
- In ***License*** tab check the option concerning the license manager and define the IP address and the port of the server to be used with *ArpentGIS-Expert Licence Manager* software



As shown in the settings it is necessary to restart *ArpentGIS-Expert* software to validate the communication settings with the server.

Note 1.3.2

*The IP address has to be set as followed < **XXX.XXX.XXX.XXX** >*

To be read 1.3.5

After restart of ArpentGIS-Expert software with a floating license, the software will not ask to enter a license code (figure 1.1 on page 4) that indicates that the software is still in evaluation mode. If this message is prompted it means that the floating license mode is not activated properly..
Return to the license settings of ArpentGIS-Expert software and check the connection to the server.

One doubt ? 1.3.1

In cas of problem, please contact you IT manager or send an email to D3E Electronique.

1.4 Start an updates of the software

1.4.1 Starting the software

After installation, use one of the following options to start *ArpentGIS-Expert* software :

- Click on 

on the desktop

(or)
- Click on "Start/Programs/ArpentGIS Expert" and click on "ArpentGIS-Expert"

1.4.2 Updates

Updates of the software will be available on www.arpentgis.com.

IN THIS CHAPTER

CHAPTER 2

Install and activate ArpentGIS-Android software

To be read 2.0.1

*The mobile device is already delivered pre-installed (with an **.apk** file) file on the terminal GPS (ou appareil mobile ou PDA). Use the following procedure to install the software via the Play Store and benefit of regular software updates (some features, however, depend on the level of license used).*

The ArpentGIS solution is a GNSS mapping solution to collect data in the field and update GIS (Geographic Information Systems) data.
To fully use the features of *ArpentGIS-Android* software it is recommended to use a mobile device running Android 4.4 or above and if necessary connect it to a compatible external GNSS receiver ***NMEA*** or ***Mock*** mode.

2.1 Minimum System Requirements

***ArpentGIS-Android* software :**

Mobile device running Android 4.4 or above (smartphone or tablet) with a minimum screen resolution 340 x 480 pixels.
The terminal Android must run Google Mobile Services (***GMS***)

The following device are recommended for the use of the ArpentGIS solution :

- Android device : Trimble TDC100, Samsung Galaxy Tab Active, Samsung Galaxy S Series (S4, S5, S6, S7, S8, S9), Sony Xperia Z3 Compact, Caterpillar (S40, S50)
- External GNSS receivers : Trimble R Series (R1, R2) (***Mock*** mode or ***NMEA***), Trimble Pro 6 Series (6T, 6H) (***NMEA*** mode), and any receiver providing NMEA sentences especially : $GGA, $GSA, $GSV and $GST.

Note 2.1.1

This list is non-exhaustive and may change depending on Android system updates. It can also be complemented by other mobile devices (smartphones and tablets) and latest receivers series.

One doubt ? 2.1.1

Contact our technical service to check the compatibility of a specific terminal Android.

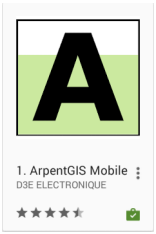
2.2 Reinstall the software or install an update

2.2.1 Installation of *ArpentGIS-Android* software from the *Play Store*

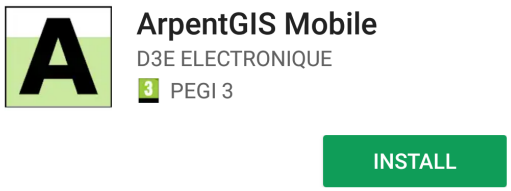
To be read 2.2.1

After receiving the terminal Android and before installing the software from the Play Store please uninstall the software from the settings of the terminal Android.

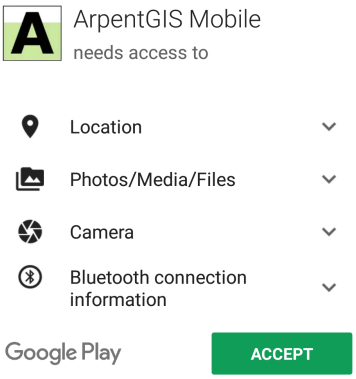
- Start the terminal Android
- Click on  to access applications center
- In the search field of the *Play Store* enter ***ArpentGIS***. Wait until the end of search and check if *ArpentGIS-Android* is listed in available applications.



- Click on ***ArpentGIS***
- Click on INSTALL to install *ArpentGIS-Android* software on the terminal Android



- Accept the terms of use of the application by clicking on ACCEPT



- Continue the download and installation of the application *ArpentGIS-Android*

2.3 Software registration by entering an activation code

Note 2.3.1

This step is only to be performed for the initial activation of the ArpentGIS-Android software or after updating the device operating system and restoring its default settings (factory reset).
Applying an update does not require re-entering the activation code.

- Start the terminal Android
- Click on  and select ***ArpentGIS***. The ***ArpentGIS*** software splashscreen appears
- Wait fews seconds till the launch of the application

It is possible to use the *ArpentGIS-Android* software for a limited period in case the user does not register it. The software will start in demo mode.

To register permanently the software, please contact D3E Electronique to get a valid activation code if this code was not delivered with the order.

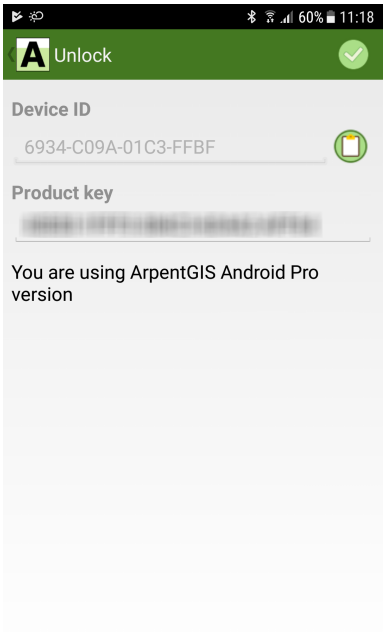
- Click on  and click on  Pas d'image pour AA-ConfigurationButton.png ?
- Click on  and check the ***Device ID***
- Enter in the field ***Product key*** the code delivered with the order
- Click on 

To be read 2.3.1

Once registration is done it is not necessary to register again. Only after a factory reset of the mobile device.

One doubt ? 2.3.1

In case of problem please contact our technical support +33 8.92.68.10.57(0.34€/min & international additional fees) from monday to friday, from 8am to 5pm.



IN THIS CHAPTER

CHAPTER 3

ArpentGIS-Expert user interface

ArpentGIS-Expert software is the desktop application to check-in data collected with *ArpentGIS-Android* field software. This tool makes it easy to edit plans and export data coming from a GNSS receiver.

3.1 General presentation

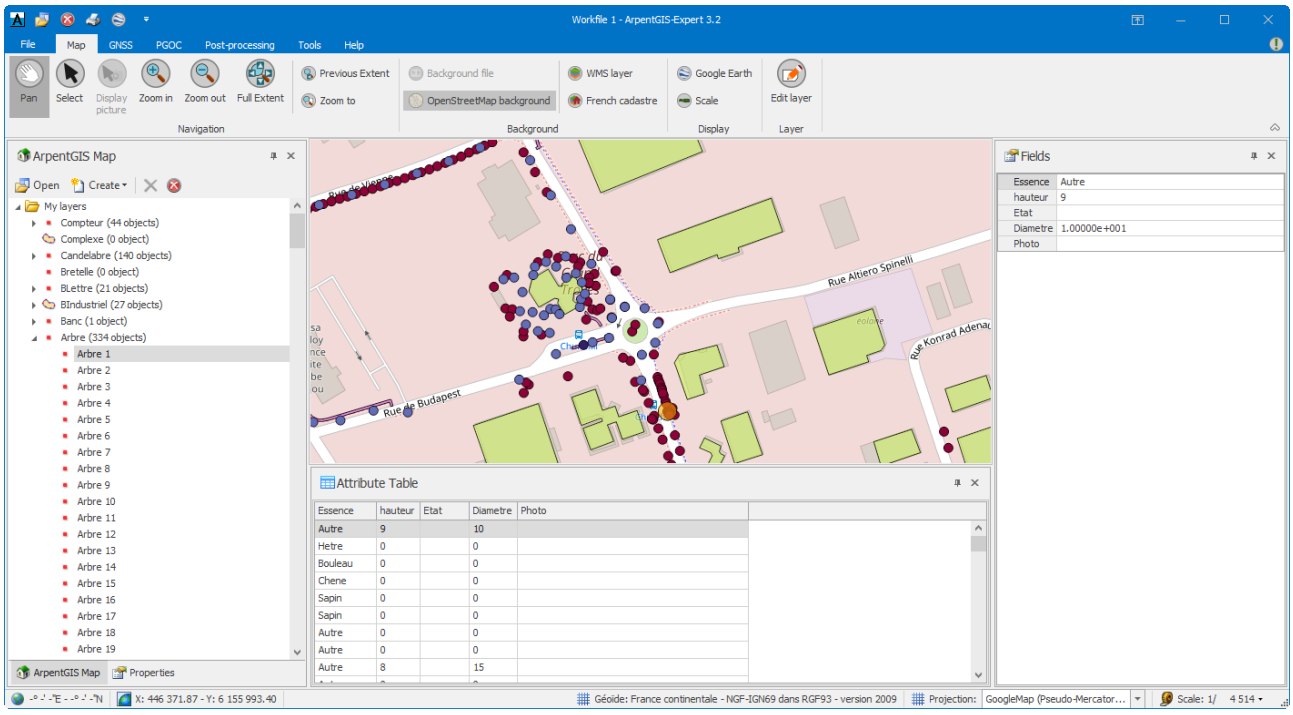


Figure 3.1: Main screen of ArpentGIS-Expert software

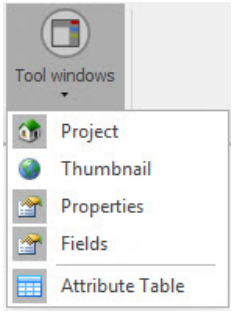
List of the main features of *ArpentGIS-Expert* software :

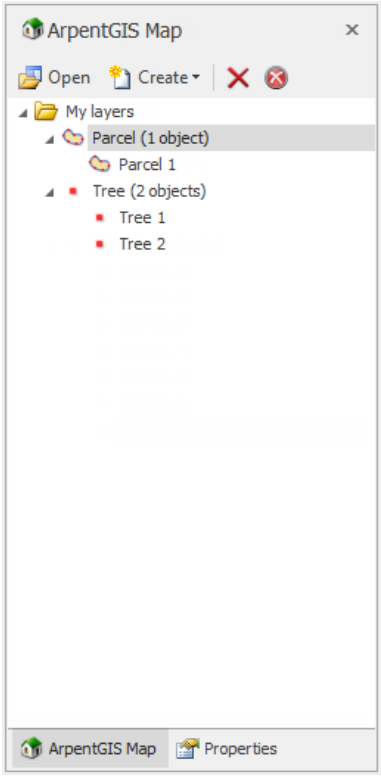
- Display maps and data collected in the field with *ArpentGIS-Android* software
- Read and write AGI files
- Import Shapefile (SHP), MIF/MID, DXF, DWG, Mapsource and text files
- Raster background (TIFF, JPEG, ECW, MrSID)
- Data dictionary editor *ArpentGIS-Android*
- Display and edition of layers, choice of color, labels, delete features, attributes updates

- Direct export for *ArpentGIS-Expert* software to Google Earth application
- Export to Shapefile (SHP), DXF, CartoExploreur, ASCII, MIF/MID, Raster file with world file
- Print maps
- Symbology management, Digitize feature
- Analysis of features quality collected in the field with a GNSS receiver
- Tracks analysis (collected with *ArpentGIS-Trajet* software)

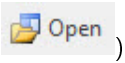
3.2 Panels

The main interface of *ArpentGIS-Expert* consists of 4 panels. These panels allow the user to manage data layers (***workspace***), manage the properties of the layer (***Properties***), display and modify attributes values of a feature (***Grid*** and ***Attributes***) and get a general view of the map (***Thumbnail***). Those panels are dockable within the interface of *ArpentGIS-Expert* software. The user can modulate the interface of the software at his convenience. Those panels are accessible from the menu ***Tools/Panels***.

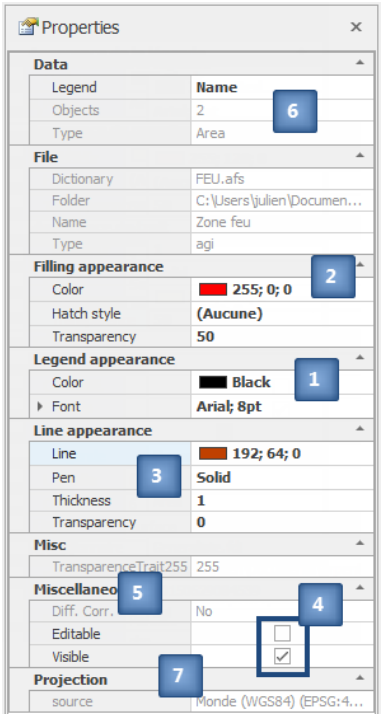




3.2.1 Workspace panel

- The button ***Open*** allows to add a new layer to the current workspace (

). This layer can be :
  - ArpentGIS (*.agi)
  - Shapefile (*. shp)
  - AutoCad (*.dxf, *.dwg)
  - CartoExplorer (*.trk/*.wpt)
  - MapInfo (*.mif/*.mid)
  - Image Tiff (*.tif) - with world file (*.tfw)
  - Image ECW (*.ecw) no world file needed
  - Image MrSid (*.sid) - with world file (*.sdw)
  - Image Jpeg (*.jpg) - with world file (*.jgw)
  - Text flle (*.csv)
-  button to remove the selected layer from the current workspace
-  button to remove all files from the current workspace



3.2.2 Properties panel - for a layer

Use the ***Properties*** panel to manage the symbology of the layers used in the workspace.

Detail 3.2.1

1. *The appearance of the label displayed for the features (color and font)*
2. *The filling of the layer for an area layer*
3. *The appearance of the line for a surface or linear layer (color, thickness, transparency)*
4. *The visibility and edition status of the layer in the workspace*
5. *If the layer had been post-processed : the box "**Corr. diff.**" is checked*
6. *The settings of the layer : geometry (point, line, area) and number of features per layer*
7. *The settings of the file associated with the layer : the file format, the data dictionary used (AGI file), the projection...*

3.2.3 Properties panel - for a feature

Coordinates	
Precision	0.1 m
X/longitude	774 826.59
Y/latitude	6 799 691.46
Z (HAE)	165.473 m
Z (MSL)	120.059 m
Déport	
Miscellaneous	
Diff. Corr.	Yes
Layer	mesure
Nb vertices	1

Figure 3.2: Point feature

Coordinates	
Precision	0.01 m
Dimension	
Longueur (WGS84)	10.13 m
Miscellaneous	
Diff. Corr.	Yes
Layer	Ligne
Nb vertices	9

Figure 3.3: Line feature

Coordinates	
Precision	0.575 m
Dimension	
Périmètre (WGS84)	48.96 m
Surface (WGS84)	54.23 m²
Miscellaneous	
Diff. Corr.	No
Layer	ZONE_BRUL
Nb vertices	55

Figure 3.4: Area feature

For point features the panel will show:

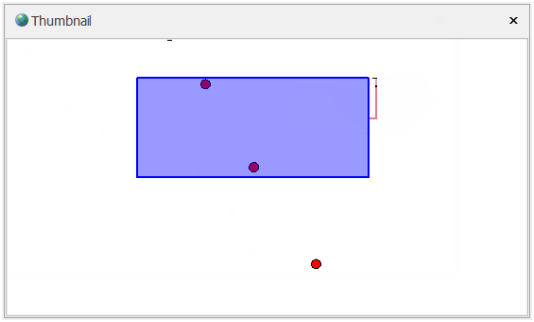
- Estimated accuracy
- E/N Coordinates
- Z coordinate (MSL)
- Z coordinate (HAE), height above ellipsoid WGS84
- Post-processing status (Only for *ArpentGIS-Mobile* software)
- Name of the layer
- Number of positions for the selected feature

For line or area features, the panel will show :

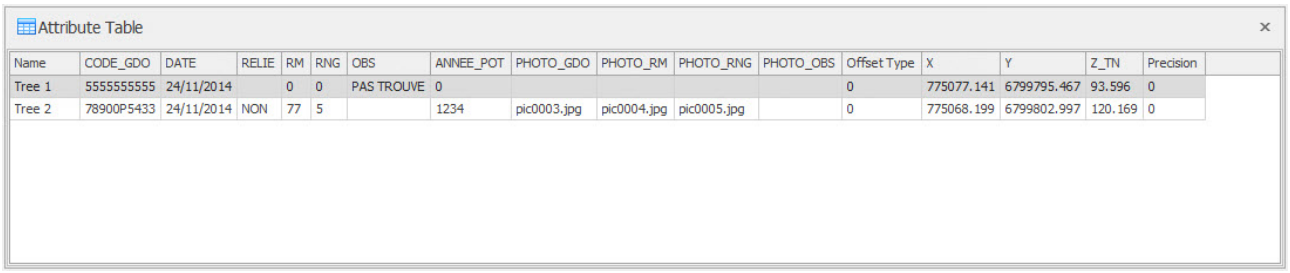
- Estimated accuracy
- Length for a line feature ; or perimeter and area value for area feature
- Post-processing status (only for *ArpentGIS-Mobile* software)
- Name of the layer
- Number of positions for the selected feature

3.2.4 Thumbnail panel

The ***thumnail*** panel to locate the active area of the ArpentGIS workspace within the full extents of the workscape.
It also allows the user to quickly zoom in on a part of the map.



3.2.5 Grid panel



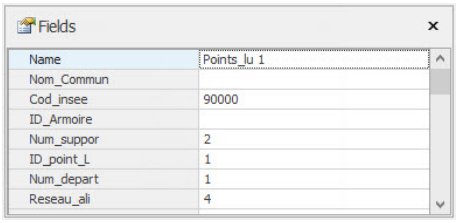
Name	CODE_GDO	DATE	RELIE	RM	RNG	OBS	ANNEE_POT	PHOTO_GDO	PHOTO_RM	PHOTO_RNG	PHOTO_OBS	Offset Type	X	Y	Z_TN	Precision
Tree 1	5555555555	24/11/2014		0	0	PAS TROUVE	0					0	775077.141	6799795.467	93.596	0
Tree 2	78900P5433	24/11/2014	NON	77	5		1234	pic0003.jpg	pic0004.jpg	pic0005.jpg		0	775068.199	6799802.997	120.169	0

Use the grid to visualize all the values of attributes of features within the selected layer. Each column can be sorted in ascending or descending order by clicking on one of the headers.

Note 3.2.1

This panel does not allow the modification of the attributes of the features of a layer. Those changes are made from the ***Attributes*** *panel as long as the layer is set to* ***Editable****.*

3.2.6 Attributes panel



Name	Points_lu 1
Nom_Commun	
Cod_insee	90000
ID_Armoire	
Num_suppor	2
ID_point_L	1
Num_depart	1
Reseau_ali	4

This panel allows to modify the attributes any feature as long as a layer has been defined as editable in the workspace. To activate a layer from edition click on  in the Map tab. Fill or modify the attributes of the feature in the panel.

To validate the edition and save the changes click on  .

3.3 Toolbars

The main interface of *ArpentGIS-Expert* software consists of three toolbars. These toolbars allow the user to manage display options, ArpentGIS workspaces, choose a coordinate system, or grant access to the navigation features of the software. These toolbars are accessible at the top of the software interface.

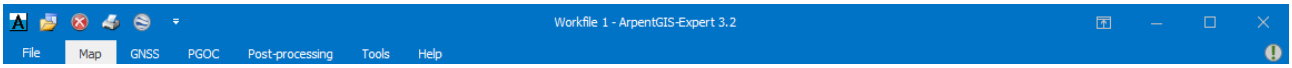
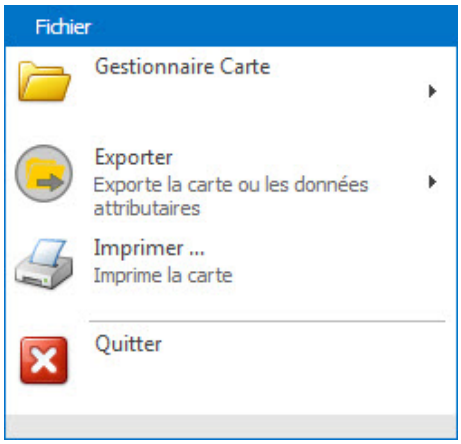


Figure 3.5: ArpentGIS-Expert toolbar

3.3.1 "ArpentGIS" toolbar



This toolbar, accessible by clicking on File tab, allows the user to manage the ArpentGIS workspace (save, open, print). It also manages the export of open layers in the current workspace to different formats: SHP, MIF / MID, DXF, AGI...

Detail 3.3.1

1. Gestionnaire Carte — *Manage workspaces :*
   - Nouvelle carte — Crée une nouvelle carte ArpentGIS
   - Enregistrer la carte — Enregistre la carte ArpentGIS
   - Enregistrer la carte ArpentGIS sous ...
   - Ouvrir une carte ... — Ouvre une carte ArpentGIS
   - Fermer la carte — Ferme la carte ArpentGIS
2. Export — Export Map view or attribute table — *Exporter toutes les couches prÃ©sentes dans l'interface dans un format SIG/DAO ou ASCII spÃ©cifique*
3. *Print the current workscpace* — Print... — Print Map View
4. *Exit the software* — Quitter

3.3.2 "Quick access" toolbar

This toolbar provides quick access to the main features of the software. Initially composed of 4 buttons (described below) it can be modified at the convenience of the user (adding buttons, removing buttons, moving the toolbar ...)

Detail 3.3.2

1. *Open an existing workspace*
2. *Save changes to the current workspace*
3. *Print the current workspace*
4. *Return to previous zoom in the "**Map**" view*
5. *To add a button to the toolbar, right-click on the button and select "**Add to Quick Access Toolbar**"*
6. *Right-click on the button and select "**Remove from Quick Access Toolbar**"*
7. *Right click in the toolbar and select "**Show Quick Access Toolbar below the Ribbon**". The toolbar is moved under the toolbar "**Manage**"*

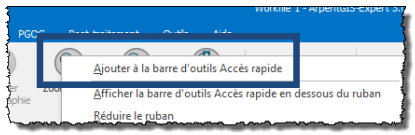


Figure 3.6: Add a tool

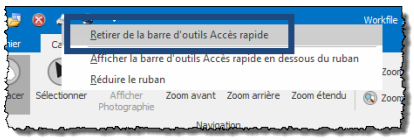


Figure 3.7: Delete a tool

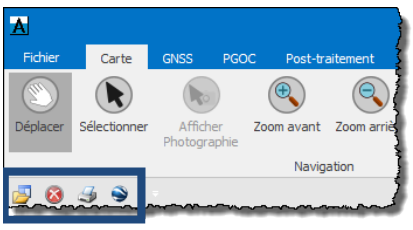


Figure 3.8: Move the quick access toolbar

3.3.3 "Manage" toolbar

The ***Manage*** toolbar is the main toolbar of *ArpentGIS-Expert* software and allow the user to navigate within the ***map*** view, access to the measurement functions or launch the various software wizards (post-processing, Data dictionary editor, File Transfer, Registration of the software, Options...)

Detail 3.3.3

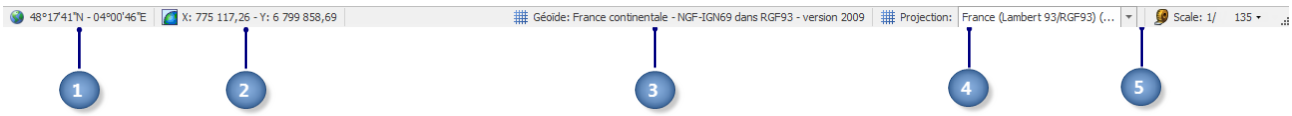
1. File — *Access to management options and data export functions*
2. Map — *Access to the navigation functions in the **Map** view : zooms, selection, navigation, direct export to Google Earth, backgournd layers...*
3. GNSS — *Access to file transfer wizard, post-processing wizard, data dictionary editor, quality analysis, attach pictures to features*
4. PGOC — *Access to specific options for french energy service ENEDIS. Need to activate the extension **PGOC** in the software options*
5. Post-processing — *Access to post-processing options with Trimble GPS Pathfinder Office software. Need to activate **Post-processing** tab inthe software options*
6. Tools — *Access to measurement tools, thematic analysis, registration wizard, software display options and panel options*
7. Help — *Online help of the software*

Note 3.3.1

By double clicking on this toolbar the user can make it constantly visible, or on the contrary, always hidden.

3.3.4 "Status" toolbar

The statusbar at the bottom of the software, allows the user to select a projection among the predefined list in order to check the coordinates of the mouse tip in the ***Map*** view.



Detail 3.3.4

1. *Latitude/Longitude WGS84 (DMS) coordinates*
2. *Projected coordinates*
3. *Geoid model used for altimetry data*
4. *Projection and Current Coordinate System (EPSG Code Classification)*
5. *Scale (customizable)*

Note 3.3.2

The ArpentGIS-Expert software proceeds by conversion on the fly so that when the user changes the coordinate system the features are automatically projected to the new selected coordinate system.
Reprojection of Raster layers is impossible.

ArpentGIS-Expert is compatible with the following coordinate systems (non-exhaustive list) :

- Zones Lambert (I, II, II etendu, III, IV) (French grid used GR3DF97A)
- Zones Lambert Carto (I, II, III, IV)
- Conformal Conic projections RGF93 (CC42 to CC50)
- Lambert 93
- Lat/Lon WGS84
- Lat/Lon RGF93
- Zones UTM (Northt and South)
- Projection GoogleMap

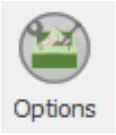
Note 3.3.3

*To change the default coordinate system, **see section 3.4.1***

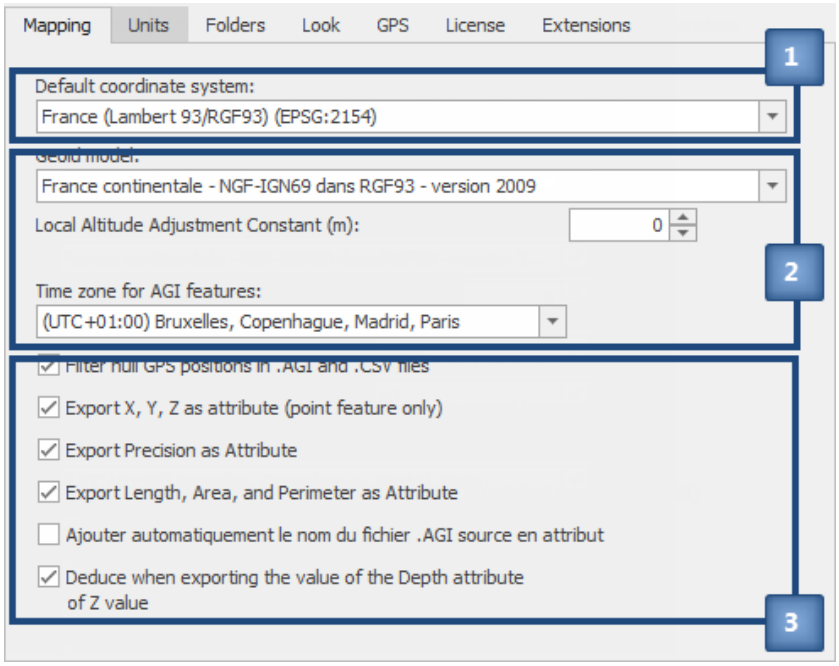
3.4 Manage options and folder in *ArpentGIS-Expert*

3.4.1 Mapping options

Use *ArpentGIS-Expert* software options to define general settings of the application : default coordinate system, units, look, external device connection...

- To access mapping options click on ***Tools*** tab of ***Manage*** toolbar and click on 

- Click on ***Mapping*** tab



Detail 3.4.1

❶ *Default coordinate system*

❷ *Choice units :*
- *Choice of Geoid Model used in ArpentGIS-Expert software and if needed the Z-constant to use*
- *Choice of distance/area units*
- *Choice of the time zone to convert from UTC to local time (Check for summer time and winter time difference)*

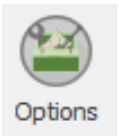
❸ *Manage data filters and default attributes :*
- *Filter null GPS positions in .AGI and .CSV files (enabled by default to remove GPS positions)*
- *Include X, Y and Z coordinates for point objects when exporting data to GIS or CAD format (not enabled by default)*
- *Include accuracy, length, area, and/or perimeter as attributes when exporting data to GIS or CAD format (not enabled by default)*
- *Automatically add the name of the source .AGI file as an attribute (not enabled by default: adds a column to the attribute list containing the original AGI file name)*
- *Deduce the value of the "Profondeur" attribute from the Z-value*

Note 3.4.1

*When using an underground locator device or when manually entering depth values, by checking this option, when exporting data to GIS or CAD format, the depth value will be deducted automatically from the Z-value of the feature (Z_TN). **The output Z-value will be in this case the Z-network but not the Z-GNSS value**.*

3.4.2 Folder options

Before transfering a file between the mobile device and the computer or export/import data from *ArpentGIS-Expert* software it is necessary to specify the transfer, import and export folders.

- To access options of the folders, Click on ***Tools*** tab in ***Manage*** toolbar and click on 

- Click on ***Folders*** tab

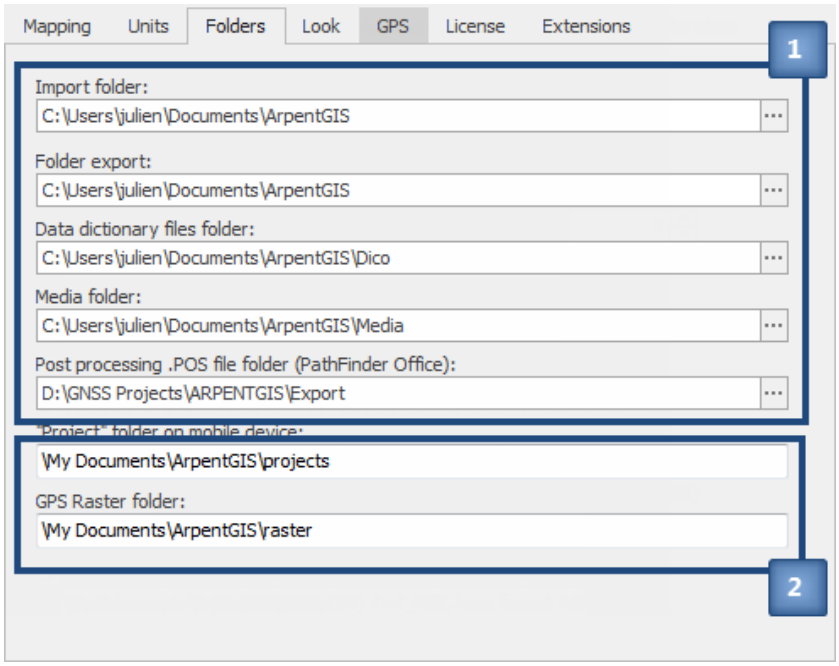


Figure 3.9: Sous Windows 7/8/10

Detail 3.4.2

❶ *Computer folders. For **import**, **export**, **data dictionary** and **media** folders, keep the default folder "**C:\Users\<Session name>\Documents\ArpentGIS**" for Windows Vista/7/8/10.*
❷ *Options for **ArpentGIS-Mobile** only*

To be read 3.4.1

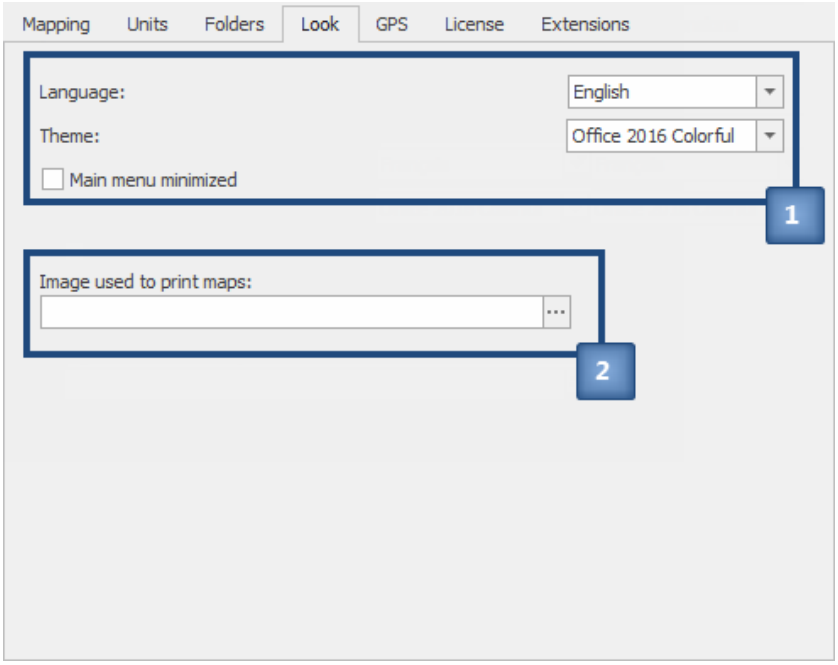
SD Card field may change from one mobile device to another depending on Windows Mobile Operating System version.

3.4.3 Software look

Use *ArpentGIS-Expert* software options to define the appearence of the software : display a toolbar, logo picture for print options...

- To access appearence look, click on ***Tools*** tab in ***Manage*** tab and click on 

- Click on ***Look*** tab

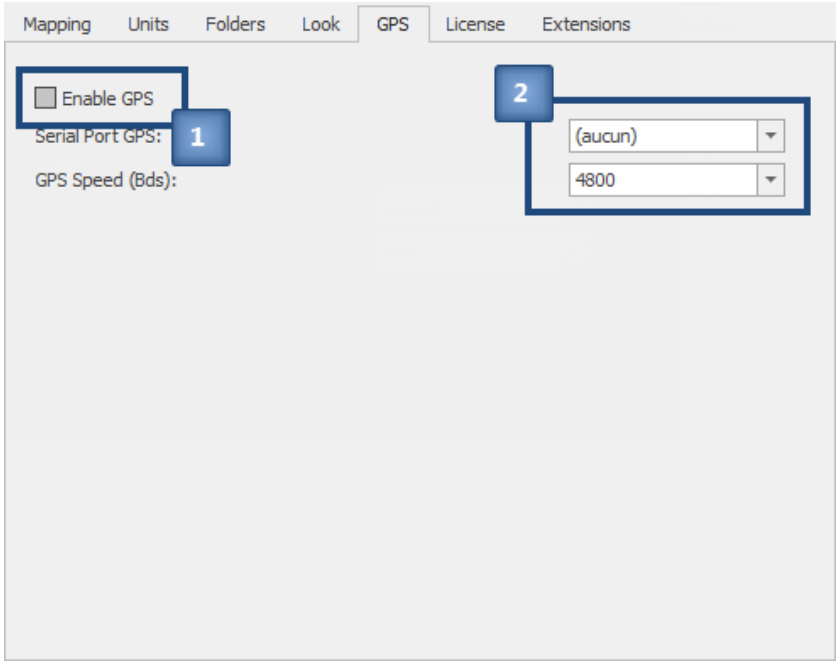


Detail 3.4.3

❶ *Choice of the language for the software and the appearance of the interface (color and display of the main toolbar in collapsed or extended mode)*
❷ *Path to Logo picture in print window*

3.4.4 Options GPS

Use *ArpentGIS-Expert* software to connect to GNSS receiver using National Marine Electronics Association (NMEA) mode. Use this option to get a valid/fix GNSS position in the ***Map*** view of *ArpentGIS-Expert* software and define targets to reach. This use is particularly recommended for users wishing to find features in the field. In this case, *ArpentGIS-Expert* software must be installed on a windows tablet and used in the field with a Bluetooth connection to a GNSS receiver or a serial RS232 connection.



Detail 3.4.4

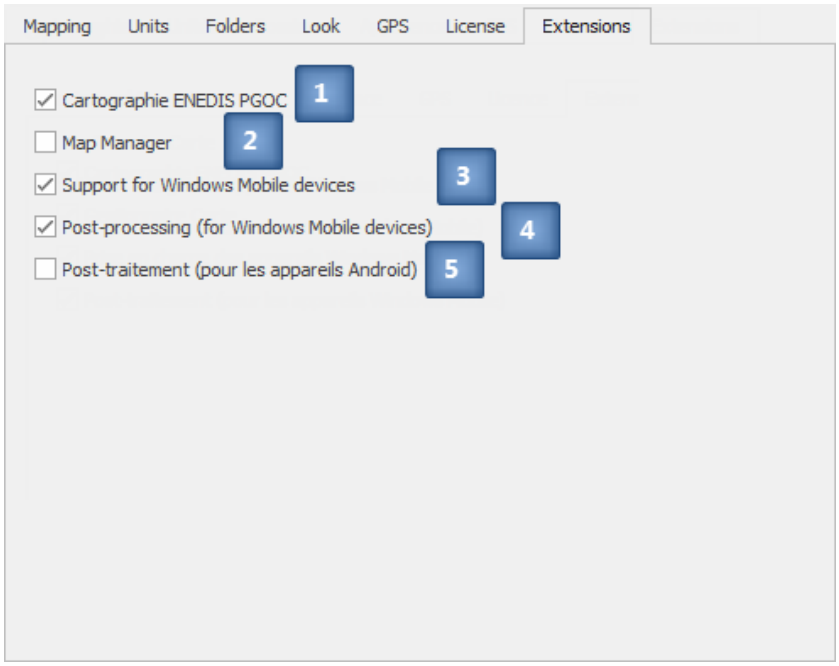
1. *GPS Activation*
2. *Select the communication pour and the baud rate*

One doubt ? 3.4.1

Settings may change from one receiver to another. Check GPS device documentation to choose the correct setting for ArpentGIS-Expert.

3.4.5 Manege Extensions

Use extensions to add additional options to the interface of *ArpentGIS-Expert* software



Detail 3.4.5

1. Activate drawing options for PGOC ENEDIS users (France only)
2. Activate workspace management to create, save or close the current workspace
3. Activate connection option to a Windows Mobile device
4. Activate post-processing option for GPS Pathfinder Office software. Disabled if 3 extension is disabled.

To be read 3.4.2

Needs to install and activate GPS Pathfinder Office software (available as an option).

5. Activate post-processing option for Spectra Precision Survey Office software

To be read 3.4.3

Needs to install and activate Spectra Precision Survey Office software (available as an option).

PARTIE

II

GPS Data collection : Preparing the mission

DANS CETTE PARTIE

IN THIS CHAPTER

CHAPTER 4

Data dictionary editor

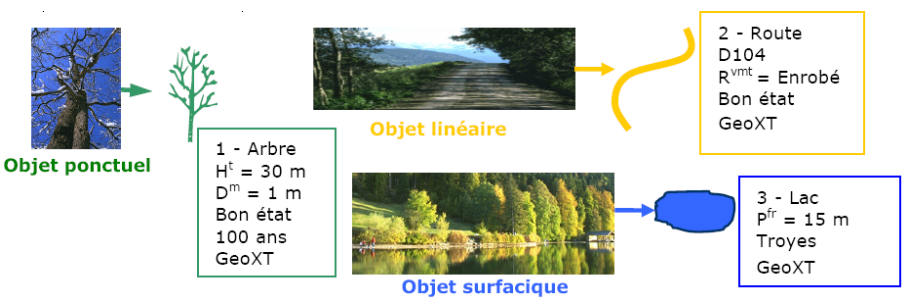
Ideally, a GPS data collection should begin with a field inspection of the sites to be collected. Use this method to identify the features that will be surveyed in the field as well as their attributes, in order to optimize the quality of data collection. If several people participate in the project, all the information will be centralized and this will ensure that the definition of the objects lists is global for all users.

A ***data dictionary*** contains the inventory of the features to be collected with the GNSS receiver and their attributes. The features can be : Point feature, Detection point feature, Line feature or Area feature. Each feature can be displayed with a specific symbol.

Features type...	Attributes type ...attributes	
	Text	Text (up to 100 characters)
	Digit	Digit (Decimal numeric value or integer with Min and Max values)
	Picture	Link to an external file : picture..
	Scrollable list	List (with option to add a code that will automatically replace the attribute data entered)
	Date	Date (Automatic calendar)
	Time	Time (Automatic Time)

To be read 4.0.1

The name of the features and the attributes are limited to 10 characters.



4.1 Start the data dictionary editor

To create a data dictionary file in *ArpentGIS-Expert* software, select the ***GNSS*** tab and use the tool ***Data dictionary editor***

A file with .afs extension will be created on the computer and it will be necessary to transfer it to a mobile device running *ArpentGIS-Android*.

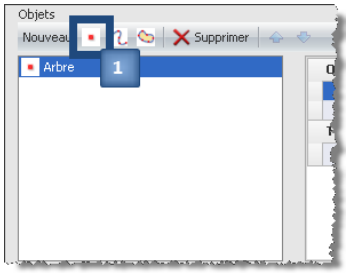
Note 4.1.1

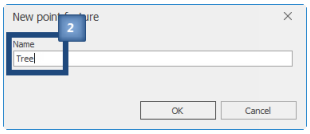
This data dictionary is not linked to a specific project and can be used for several projects. Several data dictionaries can be copied to the save mobile device.

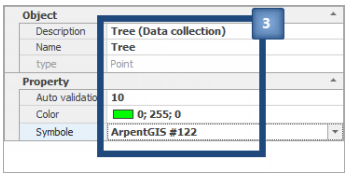
In the data dictionary editor it is possible to edit point feature, underground locator point feature, line or area feature (see section 4.2).

4.2 Create features

4.2.1 Create point feature







Detail 4.2.1

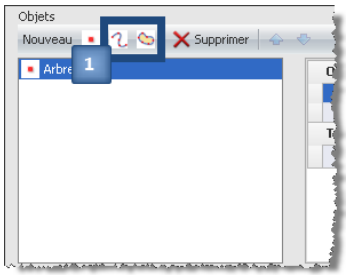
❶ *Click on*  *and enter the name for the feature (❷)*
❸ *Enter addtional information for the feature*
- *Description : not mandatory*
- *Name : mandatory, correspond to the name displayed in the ArpentGIS-Android software. Limited to 10 characters*
- *Color: corresponds to the color displayed for the layer in ArpentGIS-Android software*
- *Auto validation : not mandatory, corresponds to the automatic end of the GPS logging to validate the feature. When the number of positions is reach inArpentGIS-Android software the feature is automatically stopped and stored in the AGI file*
- *Size : radius (in m) of the circle displayed in ArpentGIS-Android software*

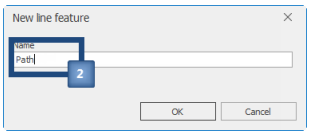
Note 4.2.1

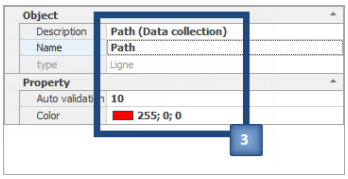
There is no limitation for the number of features; the only limit is the "ease of use" in the mobile device (if the list is too long the choice of the feature may be tedious due to the size of the screen)

See section 4.3 on the next page to create the attributes of the object.

4.2.2 Creating a line or area feature







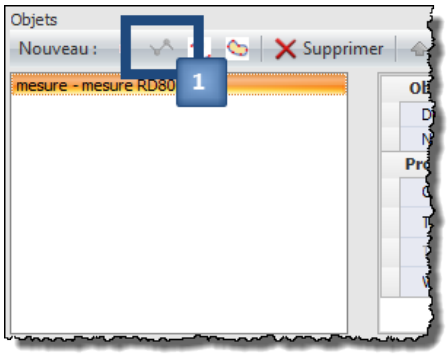
Detail 4.2.2

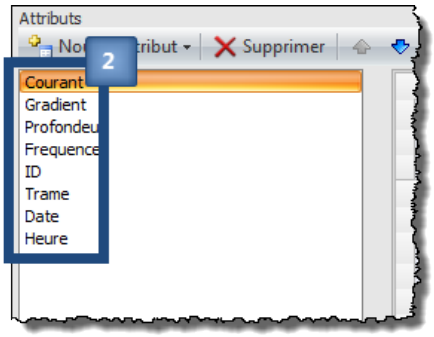
❶ *After clicking on*  *for a line feature or on*  *for an area feature, enter the name for the feature (❷)*
❸ *Additional information for the feature*
- *Description : not mandatory*

- *Name : mandatory, correponds to the name displayed in ArpentGIS-Android software. Limited to 10 characters*
- *Color: corresponds to the color displayed for the layer in ArpentGIS-Android software*
- *Auto validation : When the "vertex" mode is used to collect a line or area feature, this value corresponds to the automatic end of the GPS logging to validate the vertex.*

See section 4.3 to create the attributes of the object.

4.2.3 Create an underground locator point feature



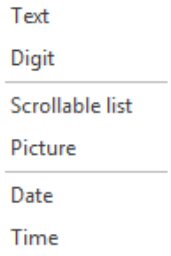


Detail 4.2.3

1. *Click on . Check the automatic generation of the feature "**mesure**"*
2. *Check that attributes for the feature had been automatically created*

4.3 Attributes definition for a feature (point, line or area)

For each feature, user can add attributes. To do this, select one of the feature and click on New field .



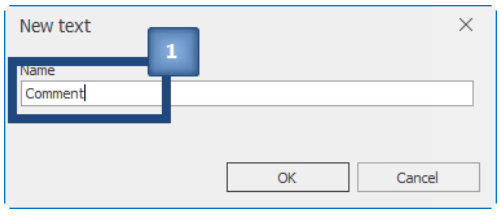
The user can assign as many attributes as he wants to an object, from the list :
For more information, see table on page 27.

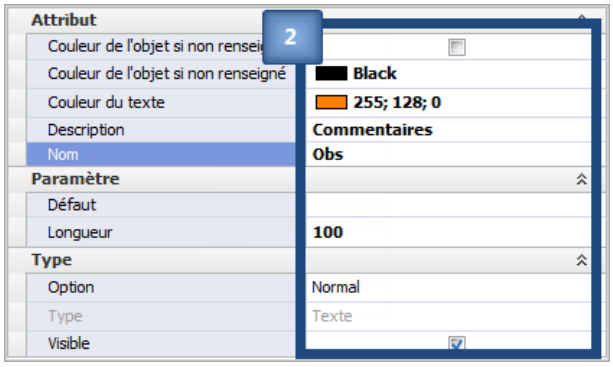
Note 4.3.1

There is no limitation for the number of features; the only limit is the "ease of use" in the terminal GPS (ou appareil mobile ou PDA) software (if the list is too long the choice of the feature may be tedious due to the size of the screen).

4.3.1 Text attribute

Select ***Text*** and enter the name of the attribute.





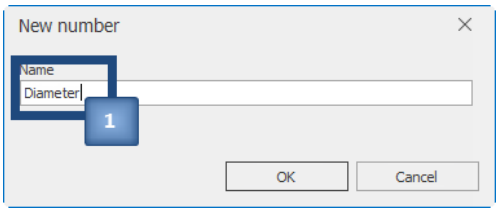
Detail 4.3.1

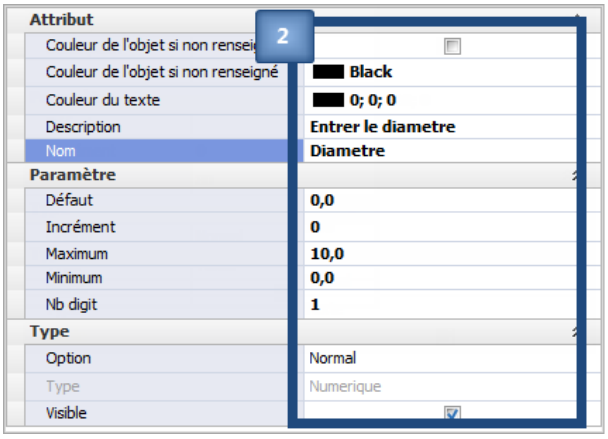
1. *Attribute name. Example : Obs, comment...*
2. *Enter additional information for the attribute*
   - *(not mandatory) Feature color if not specified : option activating the change of color of the object if the attribute is not filled*
   - *(not mandatory) Feature color if not specified : color of the object if the option is used*

- *(not mandatory) Color of the text : color displayed for the attribute in the attribute form in ArpentGIS-Android*
- *Description : not mandatory*
- *(mandatory) Name : name of the field displayed in ArpentGIS-Android software. Limited to 10 characters*
- *Default : automatic value for ArpentGIS-Android software for the attribute*
- *Length : number of characters for the field*
- *(not mandatory) Option : "Normal" (not mandatory), "Required" (mandatory) or "Forbidden" (not editable).* *See section 4.5.2 on page 34*
- *Visible : if checked, field visible in the attribute window of ArpentGIS-Android software*

4.3.2 Digit attribute

Select ***Digit*** and enter the name of the attribute.



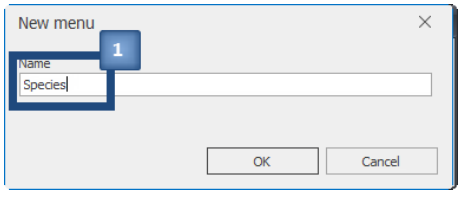


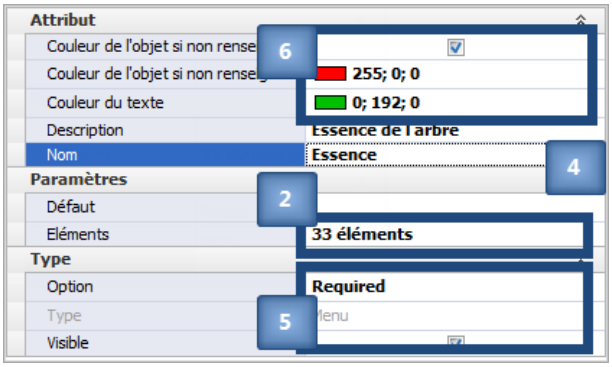
Detail 4.3.2

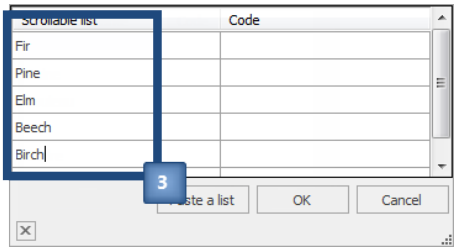
1. *Attribute name. Example : Height, Number, Id...*
2. *Enter additional information for the attribute*
   - *(not mandatory) Feature color if not specified : option activating the change of color of the object if the attribute is not filled*
   - *(not mandatory) Feature color if not specified : color of the object if the option is used*
   - *(not mandatory) Color of the text : color displayed for the attribute in the attribute form in ArpentGIS-Android*
   - *Description : not mandatory*
   - *(mandatory) Name : name of the field displayed in ArpentGIS-Android software. Limited to 10 characters*
   - *Default : automatic value for ArpentGIS-Android software for the attribute*
   - *Increment : the value of the attribute will be automatically increased by this value if it is greater than zero*
   - *Maximum : max value for the attribute*
   - *Minimum : min value for the attribute*
   - *Nb digit : number of decimal values*
   - *(Not mandatory) Option : "Normal" (not mandatory), "Required" (mandatory) ou "Forbidden" (Not editable).* *See section 4.5.2 on page 34*
   - *Visible : if checked, field visible in the attribute window of ArpentGIS-Android software*

4.3.3 Menu attribute

Select ***Scrollable list*** and enter the name of the attribute.







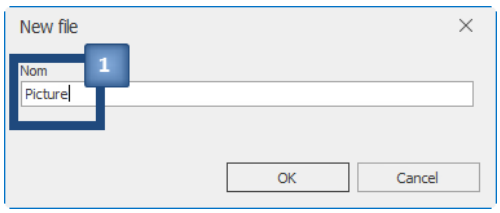
Detail 4.3.3

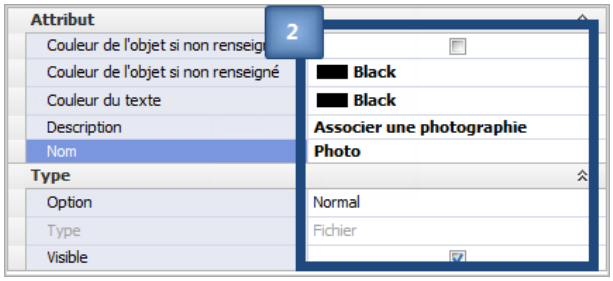
1. *Attribute name. Example : status, type, species...*
2. *Click on* ***0 element*** *afin d'ajouter les valeurs de l'attribut.*
3. *Enter values (limited to 20 characters). Example for an attribute "Specie" : fir, oak, pine, elm, ash, beech, birch... If needed enter code values.*

   If necessary, click on Paste a list *to paste a value list copied from MS Excel or a text editor for example.*
4. *(not mandatory) Default : default value for ArpentGIS-Android software for the attribute if one of the values of the list is selected*
5. *Enter additional informations for the field*
   - *(not mandatory) Option : "Normal" (not mandatory), "Required" (mandatory) ou "Forbidden" (Not editable).* *See section 4.5.2 on page 34*
   - *Visible : if checked, field visible in the attribute window of ArpentGIS-Android software*
6. *Define feature color and field color*
   - *(not mandatory) Feature color if not specified : option activating the change of color of the object if the attribute is not filled*
   - *(not mandatory) Feature color if not specified : color of the object if the option is used*
   - *(not mandatory) Color of the text : color displayed for the attribute in the attribute form in ArpentGIS-Android software*

4.3.4 Picture attribute

Select ***Picture*** and enter the name of the attribute.



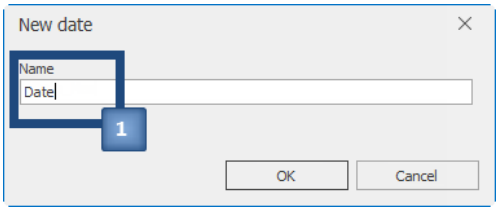


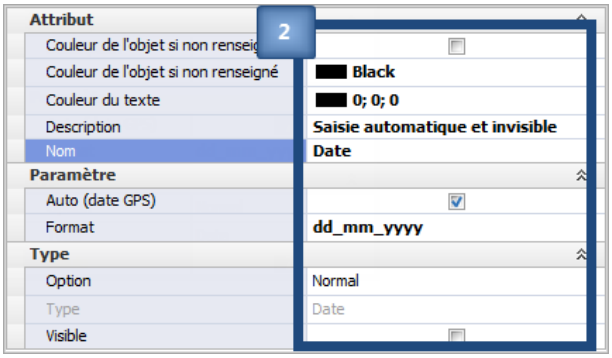
Detail 4.3.4

1. *Attribute name. Example : Picture, photo, image...*
2. *Enter additional information for the attribute*
   - *(not mandatory) Feature color if not specified : option activating the change of color of the object if the attribute is not filled*
   - *(not mandatory) Feature color if not specified : color of the object if the option is used*
   - *(not mandatory) Color of the text : color displayed for the attribute in the attribute form in ArpentGIS-Android*
   - *Description : not mandatory*
   - *mandatory) Name : name of the field displayed in ArpentGIS-Android software. Limited to 10 characters*
   - *(Optional) Option : "Normal" (not mandatory), "Required" (mandatory) or "Forbidden" (Not editable).* *See section 4.5.2 on page 34*
   - *Visible : if checked, field visible in the attribute window of ArpentGIS-Android software*

4.3.5 Date attribute

Select ***Date*** and enter the name of the attribute.



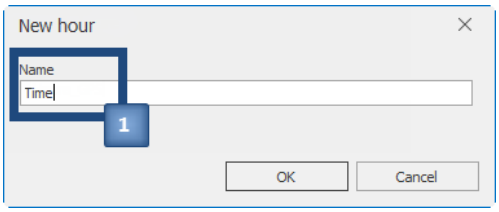


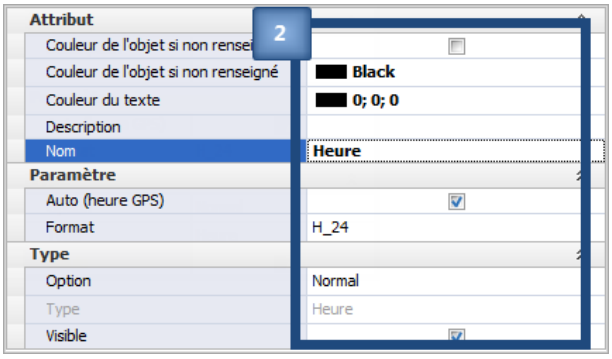
Detail 4.3.5

1. *Attribute name. Example : Date, Date_mea, Date_GPS...*
2. *Enter additional information for the attribute*
   - *(not mandatory) Feature color if not specified : option activating the change of color of the object if the attribute is not filled*
   - *(not mandatory) Feature color if not specified : color of the object if the option is used*
   - *(not mandatory) Color of the text : color displayed for the attribute in the attribute form in ArpentGIS-Android*
   - *Description : not mandatory*
   - *(mandatory) Name : name of the field displayed in ArpentGIS-Android software. Limited to 10 characters*
   - *Auto (GPS date) : checked, will be filled automatically with the current GPS date otherwise with the date of the mobile device*
   - *Format : depends on the GIS software used for data processing. Default, "**dd_mm_yyyy**"*
   - *(Not mandatory) Option : "Normal" (not mandatory), "Required" (mandatory) or "Forbidden" (not editable).* *See section 4.5.2 on page 34*
   - *Visible : if checked, field visible in the attribute window of ArpentGIS-Android software*

4.3.6 Time attribute

Select ***Time*** and enter the name of the attribute.





Detail 4.3.6

1. *Attribute name. Example : Time, Time_mea, Time_GPS...*
2. *Enter additional information for the attribute*
   - *(not mandatory) Feature color if not specified : option activating the change of color of the object if the attribute is not filled*
   - *(not mandatory) Feature color if not specified : color of the object if the option is used*
   - *(not mandatory) Color of the text : color displayed for the attribute in the attribute form in ArpentGIS-Android*
   - *Description : not mandatory*
   - *(mandatory) Name : name of the field displayed in ArpentGIS-Android software. Limited to 10 characters*
   - *Auto (GPS time) : checked, will be filled automatically with the current GPS time otherwise with the time of the mobile device*
   - *Format : depends on the GIS software used for data processing. Default, "**H_24**"*
   - *(not mandatory) Option : "Normal" (not mandatory), "Required" (mandatory) or "Forbidden" (note editable).* *See section 4.5.2 on page 34*
   - *Visible : if checked, field visible in the attribute window of ArpentGIS-Android software*

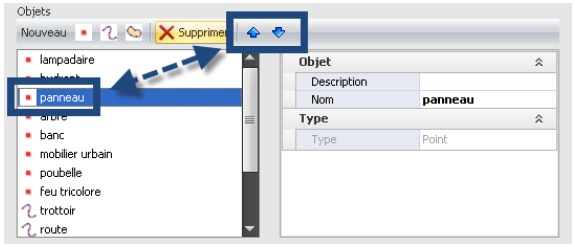
Advice 4.3.1

Create the attributes of all features with the above fields options.

4.4 Additional tools : settings for features

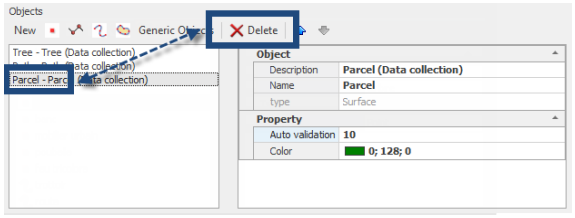
4.4.1 Sort features in the data dictionary file

In order to set the order of the fetaures in the data dictionary (and therefore the order of appearance in *ArpentGIS-Android* software), use the buttons and from the data dictionary toolbar.
The defined order can for example correspond to the number of features to be collected in the field. In this case, it will be necessary to put the features likely to be logged most often, to the top of the list.



4.4.2 Delete a feature

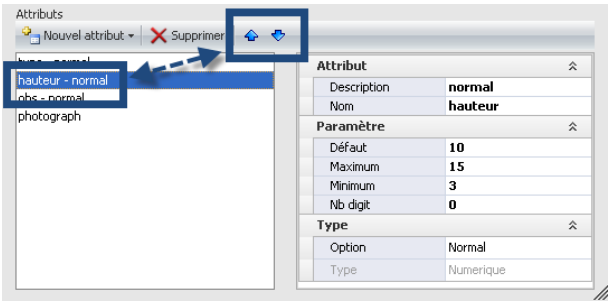
To delete a feature in the data dictionary, simply select it and click on Delete



4.5 Additional tools : settings attributes of a feature

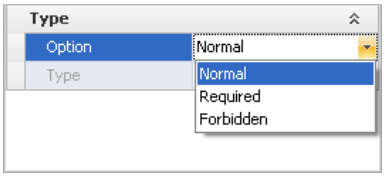
4.5.1 Attributs order in the data dictionary editor

To reorder the features in the data dictionary (and the way the feature will appear in *ArpentGIS-Android* software), use the buttons and in the data dictionary editor toolbar.
One of the possible order could be the mandatory status of the field. In this case the ***Required*** attributes will be on top of the list.



4.5.2 Options settings

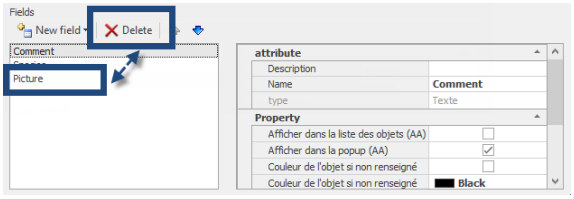
For all attributes options will be available for the user. Those options will be used to determine whether an attribute will be mandatory in *ArpentGIS-Android* software.



Attributes actions	
The entry...	**...for**
Normal	the field may stay empty
Required	set the field to mandatory *ArpentGIS-Android*.
Forbidden	set the field to visible to the user but not editable.

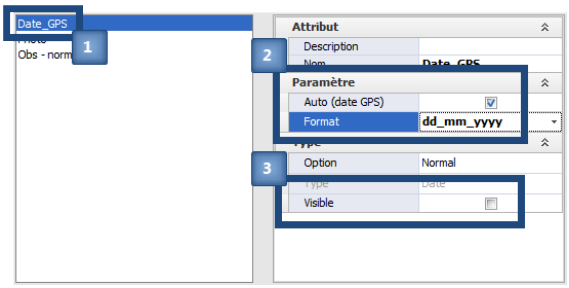
4.5.3 Delete an attribute

To delete an attribute from a feature in the data dictionary, simply select it and click on Delete



4.5.4 Set an attribute to invisible

In specific cases it is interested to set fields as not visible in the data dictionary file for a better use in a GIS or CAD software. Those attributes are not necesseraly required in the field but at the office and can be set to not visible in the data dictionary file and won't appear during data collection in *ArpentGIS-Android* software.
These attributes will, however, be generated when exporting data to *ArpentGIS-Expert*.



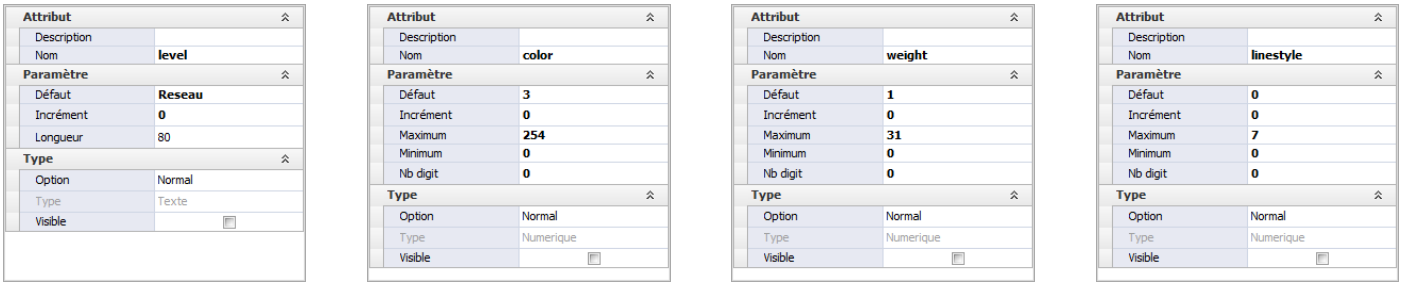
Detail 4.5.1

1. *Select the attribute*
2. *Enter logging default values*
3. *Set the visible option of the field for ArpentGIS-Android software*

4.5.4.1 Special information/fields for MicroStation software users

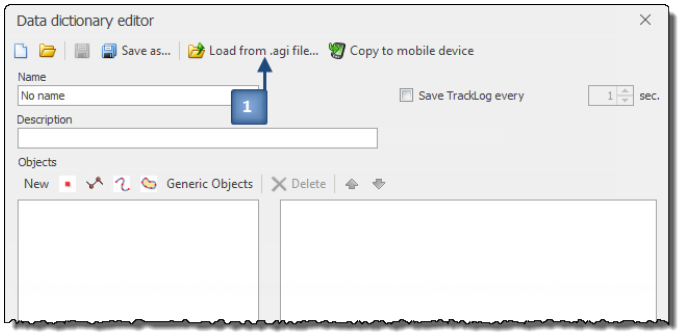
For DGN MicroStation file for line or area features, *ArpentGIS-Expert* software will use the optional following fields to generate the corresponding information in the DGN file :

- **level** : define the level in which data will be exported. ***Text*** field with default value corresponding to the level used in MicroStation software
- **color** : line color. ***Digit*** field from "0" to "254"
- **weight** : thickness of the line. ***Digit*** field from "0" to "31"
- **linestyle** : linestyle. ***Digit*** field from "0" to "7"



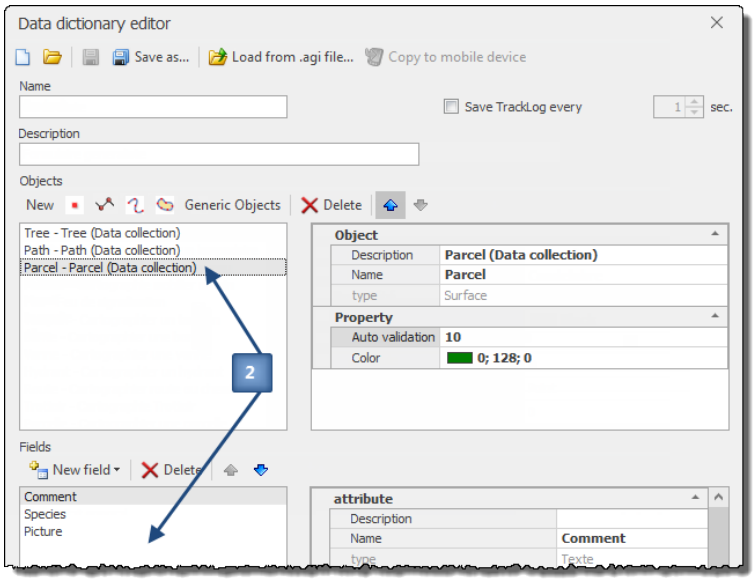
4.6 Additional tool : extract a data dictionary automatically from an AGI file

If the user wants to create a data dictionary from an existing data structure used in a GIS/CAD software it is possible to generate an ***afs*** file directly from the structure of an existing ***agi*** file.
To import the file it is first necessary to create an ***agi*** file from an existing GIS/CAD file. To export data use the options available in *ArpentGIS-Expert* software and then use the import option of data dictionary editor wizard.



Detail 4.6.1

❶ *Click on* Load from .agi file... *to select the* ***agi*** *file to import*



Detail 4.6.2

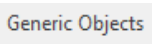
❷ *Check the contents of the file by importing the file structure* ***agi****. Features and attributes will be automatically created.*

To be read 4.6.1

Importing the structure of an AGI file automates the creation of fields in the data dictionary file. This tool does not allow the automatic creation of drop-down list for text fields and does not set the fields automatically. For each field the user will have to edit the definition and the settings in *see sections 4.3 to 4.4 on pages 29–33*.

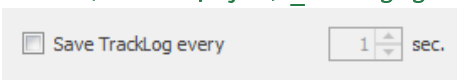
4.7 Save the data dictionaryOption

4.7.1 Add generic objetcs

Use *ArpentGIS-Android* software and the data dictionary editor to add three generic features to collect none defined features in the field. Those feature (point, line or area) can be added to the data dictionary file by clicking on 

4.7.2 Add a GPS Tracklog

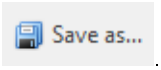
Use *ArpentGIS-Android* software to logged GPS tracklog when the software is started. If this option is checked and an interval defined, a special file will be created : ***<Name of project>_tracklog.agi*** and added to the available list of projects.

To activate a tracklog click on 

and define a time interval (in seconds).
The ***AGI*** file corresponding to the GPS tracklog can be transferred to the computer as a regular data file by using the transfer option of *ArpentGIS-Expert* software (see chapter 14 on page 111).

4.7.3 Log and store on a computer

To save the data dictionary file on the hard drive on the computer, click on 

or 

.

Note 4.7.1

By default the data dictionarty file will be saved to ***C:\Documents and Settings\<Windows session>\Documents\ArpentGIS\Dico*** *(or a custom folder). Use this folder to transfer the file to the mobile device.*

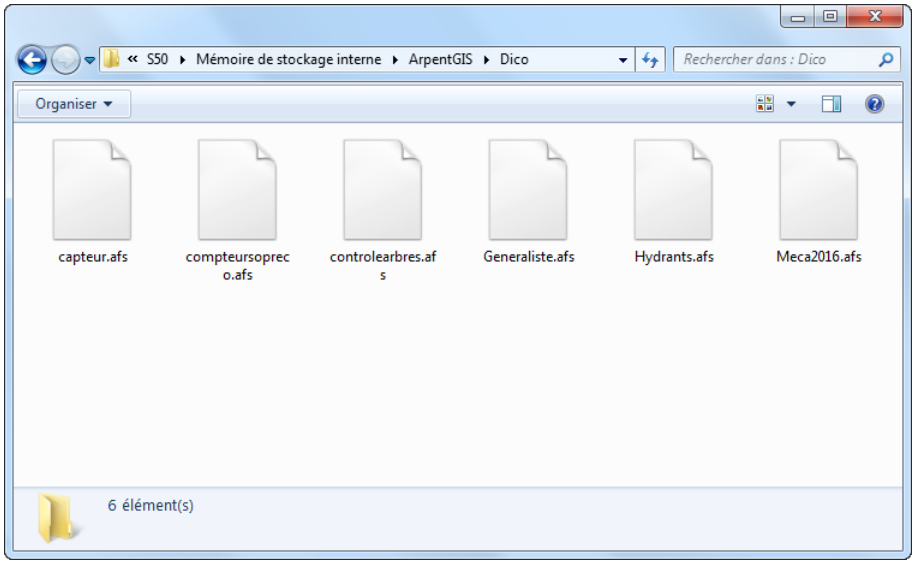
4.8 Transfer data dictionary file in the mobile device

Data dictionary file is an ***.afs*** file. To use this file with *ArpentGIS-Android* software it is necessary to transfer it to a mobile device.

- Ensure that the terminal Android is connected to the laptop in Windows Explorer
- To transfer the file, browse the main memory of terminal Android
  - Select the ***ArpentGIS*** folder
  - Copy the ***.afs*** file to the ***Dico*** subfolder

Note 4.8.1

In rare cases, for ***ArpentGIS*** *folder to be displayed in Windows Explorer it is necessary to restart the terminal Android.*

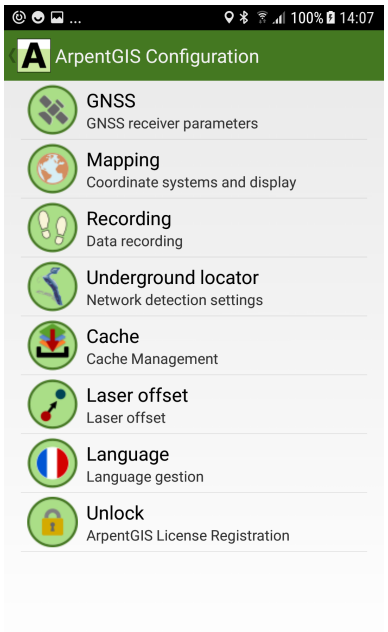

« S50 ▸ Mémoire de stockage interne ▸ ArpentGIS ▸ Dico
Rechercher dans : Dico
Organiser
capteur.afs
compteursoprecco.afs
controlearbres.afs
Generaliste.afs
Hydrants.afs
Meca2016.afs
6 élément(s)

IN THIS CHAPTER

CHAPTER 5

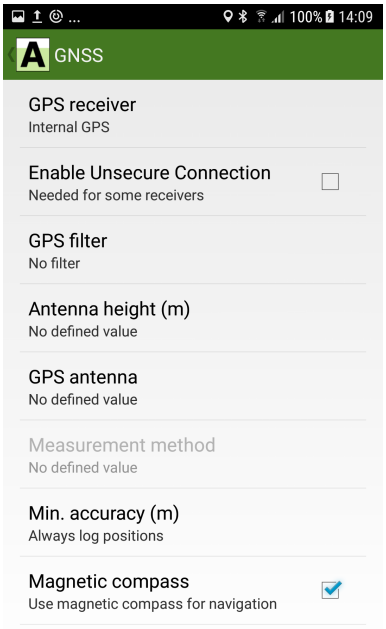
ArpentGIS-Android configuration

The user can modifiy the configuration of his software any time during data collection. To check or modifiy the current configuration, *ArpentGIS-Android* software has its own configuration menu. To access this menu, in *ArpentGIS-Android* software click on  and click on  Pas d'image pour AA-ConfigurationButton.png ?.
This menu allows the user to unlock the software and allows access to the configuration tabs : ***GNSS***, ***Mapping***, ***Recording***, ***Underground locator***, ***Cache***, ***Laser offset*** et ***Language***



5.1 GNSS Tab

- ***GNSS receiver*** : Choose the receiver to use
  - Internal receiver
  - Bluetooth device connected to terminal Android and providing NMEA sentences
  - Bluetooth device connected to terminal Android and providing sentences for ***Mock*** mode



Note 5.1.1

*Activation the **Mock** mode may depend from one device to another. Check with the manufacturer if it is required to activate this mode in the terminal Android.*

Tip 5.1.1

For information, in NMEA mode, the sentences used by ArpentGIS-Android software are $GGA, $GSA, $RMC and $GST.

To be read 5.1.1

The information displayed on the screen may differ depending on the connection method used :

- ***NMEA** mode : the number of satellites comes from the sentence $GSA*
- ***NMEA** mode : the PDOP comes from the sentence $GSA*
- ***NMEA** mode : the accuracy comes from the sentence $GST*
- ***Mock** mode or **Internal receiver** : accuracy come with the Google API*
- *Coordinates come with Google API Google (**Mock** mode or **Internal GPS**), except for the **NMEA** mode only.*

- ***Trimble R2 receiver in NMEA*** : Manage specific Bluetooth connections, unencrypted. This feature is especially useful for ***NMEA*** connection to a Trimble R2 receiver.
- ***GPS filter*** : Manage the status of corrections received by the receiver. This option is especially useful for connections to centimeter accuracy receivers in order to collect only accurate date.(***RTK float***ou ***RTK fixed***).
  - ***No filter*** : all data are recorded, regardless of their correction status
  - ***GNSS only*** : only ***non corrected*** positions are logged
  - ***DGNSS only*** : only ***corrected*** code positions (submeter accuracy) are logged
  - ***Fix RTK only*** : only ***corrected*** carrier positions are logged
  - ***Float RTK only*** : only ***corrected*** carrier positions are logged
- ***Antenna height (m)*** : set the height of the pole or holding method (devices "hold in the hand") of the GPS antenna.

To be read 5.1.2

This value is important when logging accurate height data. It must be as accurate as possible. For high accuracy devices, the antenna height must correspond to the mounting point (top of the pole holder, backpack holder ...)

- ***GPS antenna*** : set the type of external GPS/GNSS antenna used.
- ***Measurement method*** : setting the measurement method used for the selected external antenna. This method of measurement depends on the receiver and the mounting method of the device, on a pole, on a backpack and may also depend on the use of an additional external antenna.
  The value (in meters) the software will automatically add to the measurement is variable according to the chosen method and is displayed next to the method.
- ***Min. accuracy (m)*** : Minimum accuracy above which data will not be saved.

Fournisseur	Antenne
Trimble	R1 Internal antenna
Trimble	R2 Internal antenna
Trimble	R10 Internal antenna
Trimble	Tempest external antenna
Trimble	Tornado external antenna
GeoMax	Zenith35 Internal antenna
Spectra Precision	SP60 Internal antenna
Spectra Precision	SP80 Internal antenna
Satlab	SLC Internal antenna
Satlab	AT external antenna

Table 5.1: List of compatible GPS/GNSS antenna

Antenna	Measurement method	Value added by *ArpentGIS-Android* application
R1 Internal antenna	Bottom of receiver	0.07800
R1 Internal antenna	Center of the support thread	0.008
R2 Internal antenna	Bottom of antenna mount	0.11200
R10 Internal antenna	Bottom of antenna mount	0.14910
R10 Internal antenna	Bottom of quick release	0.19910
R10 Internal antenna	Lever of R10 extension	0.34910
R10 Internal antenna	Bottom of V10	0.24691
R10 Internal antenna	Lever of V10 extension	0.54610
Tempest external antenna	Bottom of antenna mount	0.10860
Tornado external antenna	Bottom of antenna mount	0.07240
Tornado external antenna	Upper case bottom	0.03189
Zenith35 Internal antenna	Bottom of antenna mount	0.1250
SP60 Internal antenna	Bottom of antenna mount	0.000
SP80 Internal antenna	Bottom of antenna mount	0.0846
SLC Internal antenna	Bottom of receiver	0.000
AT External antenna	Bottom of antenna mount	0.0493

Table 5.2: Methods of measurement of external GPS/GNSS antenna supported in ArpentGIS-Android application

Note 5.1.2

Value in meter. Without prior notice, all positions will be recorded regardless of the accuracy indicated in ArpentGIS-Android software.

- ***Magnetic compass*** : when browsing/searching for an object in *ArpentGIS-Android*, the software will use the heading provided by the mobile device compass rather than the heading provided by the GPS/GNSS receiver used.

5.2 Mapping tab

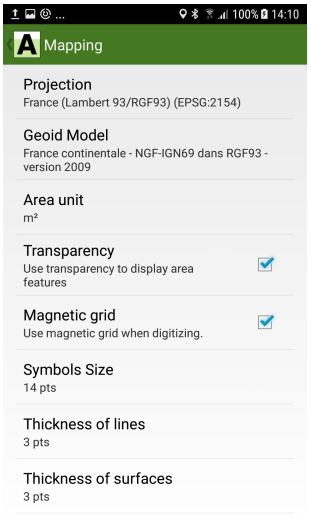
- ***Projection*** : select the coordinate system amon the following : Lat/long WGS84, Lambert I, Lambert I Carto, Lambert II, Lambert II etendu, Lambert III, Lambert III Carto, Lambert IV, Lambert IV carto, Lambert 93, Conique Conforme (42->50), UTM...

To be read 5.2.1

*For projection of NTF system, ArpentGIS-Android software does not use the IGN precise grid **GR3DF97A**.*

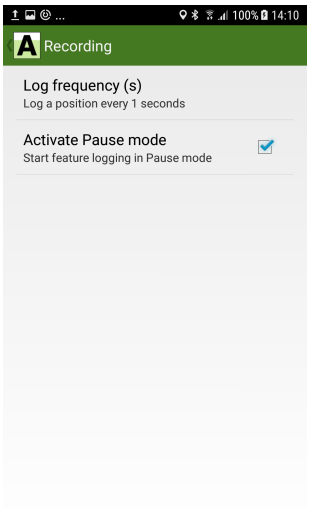
The list of all supported projections is provided in Annex A on page 159 section A.2 on page 160

- ***Geoid model*** : choice of the geoid model to be used for altimetric ***MSL*** data, amongst : RAF09, RAC09...
The list of all geoid models is provided in Annex A on page 159 section A.1 on page 159
- ***Area unit*** : ***m2*** or ***ha***
- ***Transparency*** : display area features with a transparency factor in the ***Map*** view
- ***Magnetic grid*** : use of a magnetic snapping grid when digitizing feature in the ***Map*** view
- ***Symbols Size*** : symbol size used for point features. Default: ***16 pts***
- ***Line thickness*** : thickness for line features. Default: ***3 pts***
- ***Thickness of area*** : thickness for area features. Defautl: ***3 pts***



5.3 Recording tab

- ***Log frequency. (in s)*** : manage the logging frequency of GNSS measurements. By default a position is logged every second
- ***Activate Pause mode***: When recording a line or area feature, logging will only start when the user clicks on ***Play*** button



5.4 Underground locator tab (Pro version only)

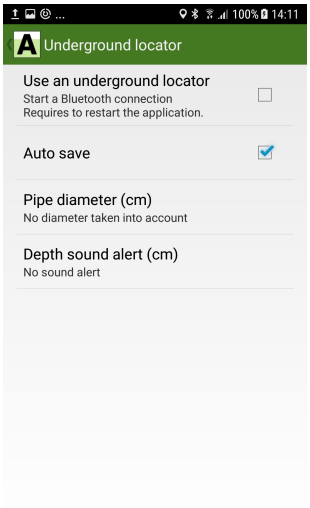
To be read 5.4.1

This tab only applies to users wishing to pair an underground locator to ArpentGIS-Android software. If not the user does not need to change the information on this tab.

- ***Use an underground locator*** : Select the locator. *ArpentGIS-Android* software is compatible with the following locators :
  - RD8000
  - RD8100
  - RDMRX

To be read 5.4.2

The detector used must have been previously paired to the terminal Android with a Bluetooth connection. After connection, ArpentGIS-Android software will automatically transfer data from the locator to the software.



- ***Auto save*** : The detection measurements are automatically saved in *ArpentGIS-Android* software and it keeps focus on the ***Map*** view. The GIS attributes can be edited by clicking on the list of objects.
- ***Pipe diameter (cm)*** : Enter the diameter value of the pipe detected by the underground locator.

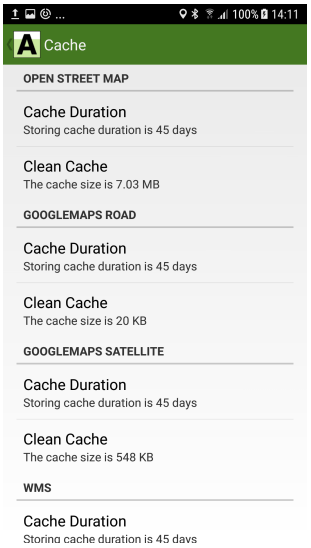
Note 5.4.1

When entering a value of diameter the value of the depth taken into account will be ***depth-(diameter/2)***.

- ***Depth sound alert (cm)*** : Value (in cm) that allows the user to have an alert if the depth measurement detected is less than the entered value.

5.5 Cache tab

- ***Open Street Map*** :
  - Cache duration (days) : Max cache duration. Default: ***45 days***
  - Clean Cache : delete existing cache on the terminal Android
- ***GoogleMaps Road*** :
  - Cache duration (days) : Max cache duration. Default: ***45 days***
  - Clean Cache : delete existing cache on the terminal Android
- ***GoogleMaps Satellite*** :
  - Cache duration (days) : Max cache duration. Default: ***45 days***
  - Clean Cache : delete existing cache on the terminal Android
- ***WMS (WMS and Cadastre)*** :
  - Cache duration (days) : Max cache duration. Default: ***45 days***
  - Clean Cache : delete existing cache on the terminal Android



5.6 Offset tab

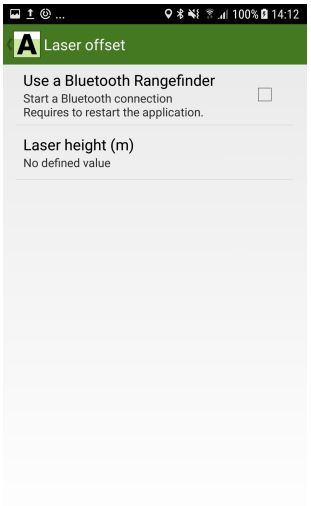
- ***Use a Bluetooth Rangefinder*** : collect offset data with a Bluetooth connected laser rangefinder. Depending on the laser rangefinder used, the distance measurements (horizontal and vertical) and bearing will be transferred automatically to the *ArpentGIS-Android* software

Note 5.6.1

The supported rangefinder are :

- *Trupulse® 360B (Laser Technlogy Inc) : Bearing and horizontal/vertical distances*
- *Trupulse® 200 (Laser Technlogy Inc) : Horizontal/vertical distances*
- *Trupulse® 200X (Laser Technlogy Inc) : Horizontal/vertical distances*

- ***Laser height (m)*** : mounted height of the laser rangefinder for offset tilt values. Positive value in meters.



5.7 Language tab

Choice of the language among :

Figure 5.1: French

Figure 5.2: English

Figure 5.3: Spanish

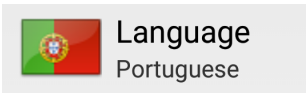


Figure 5.4: Portuguese

PARTIE

III

GPS Data collection : In the field data collection

DANS CETTE PARTIE

IN THIS CHAPTER

CHAPTER 6

Bluetooth connection to a Trimble R1 GNSS receiver

6.1 Bluetooth discovery of the GNSS receiver

- Start the Trimble R1 receiver by clicking on . Wait a few moments for the receiver to start.

6.2 Starting the Bluetooth Manager on the Android device

- Start the terminal Android
- Click on and select ***Settings***

Note 6.2.1

The icon used to launch the applications panel may differ from one device to another.

- Check Bluetooth activation on the terminal Android

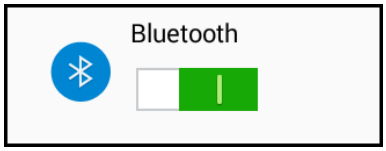


Figure 6.1: Bluetooth enabled

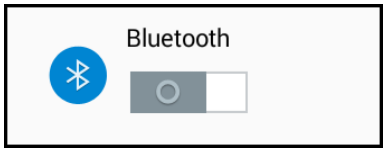


Figure 6.2: Bluetooth disabled

6.3 Pairing between an external receiver and the Android device

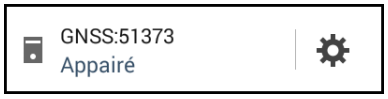
In the Bluetooth settings of the terminal Android, once Bluetooth is enabled, to pair an external GNSS receiver, proceed as follows:

- Click on ***Analyse*** or ***Find devices*** to start discovery of Bluetooth devices available nearby (see section 7.1 on the next page to enable Bluetooth on the external device)
- Select the name of the device corresponding to the external GNSS receiver to be paired to terminal Android. The pairing mode is launched.

- After a few moments the external GNSS receiver is paired with the terminal Android

Note 6.3.1

The pairing process with a Trimble R1 does not require code.



IN THIS CHAPTER

CHAPTER 7

Bluetooth connection to a Trimble R2 GNSS receiver

7.1 Bluetooth discovery of the GNSS receiver

- Start the Trimble R2 receiver by clicking on  . Wait a few moments for the receiver to start. The R2 receiver is automatically enabled for Bluetooth discovery.

7.2 Starting the Bluetooth Manager on the Android device

- Start the terminal Android
- Click on  and select ***Settings***

Note 7.2.1

The  icon used to launch the applications panel may differ from one device to another.

- Check Bluetooth activation on the terminal Android

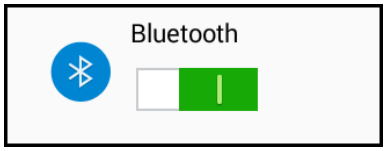


Figure 7.1: Bluetooth enabled

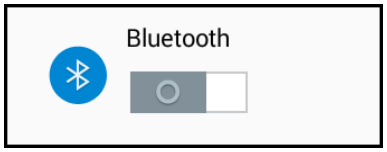


Figure 7.2: Bluetooth disabled

7.3 Pairing between an external receiver and the Android device

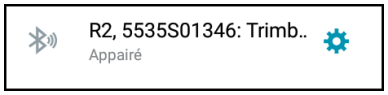
In the Bluetooth settings of the terminal Android, once Bluetooth is enabled, to pair an external GNSS receiver, proceed as follows:

- Click on ***Analyse*** or ***Find devices*** to start discovery of Bluetooth devices available nearby (see section 7.1 on the preceding page to enable Bluetooth on the external device)
- Select the name of the device corresponding to the external GNSS receiver to be paired to terminal Android. The pairing mode is launched.

- After a few moments the external GNSS receiver is paired with the terminal Android

Note 7.3.1

The pairing process with a Trimble R2 does not require code.



IN THIS CHAPTER

CHAPTER 8

Configure an external GNSS receiver

In order to receive data from an external Trimble device (Trimble R1 or R2 GNSS receiver) it is necessary to configure the receiver connection in the terminal Android and to configure real-time access for the desired use and accuracy level.

Note 8.0.1

This step assumes that the user has (or created) a Google (Gmail) account to download and installing application on the terminal Android.

To be read 8.0.1

Creating a Google account will not be described in this document.

To be read 8.0.2

This part assumes that a Trimble R1 or R2 device has been paired with the terminal Android.

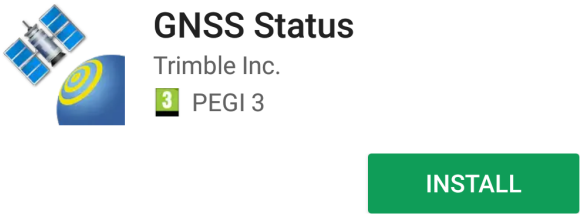
8.1 Installing applications *Trimble GNSS Status* and *Trimble GNSS Direct* from the *Play Store*

- Start the terminal Android
- Click on  in order to access Google's applications market

8.1.1 Installing *Trimble GNSS Status* application

- In the *Play Store* search box enter ***GNSS Status***. Wait till the end of the search and check that the *Trimble GNSS Status* application is displayed in available applications.

- Click on ***GNSS Status***
- Click on INSTALL to install the *Trimble GNSS Status* application on the terminal Android

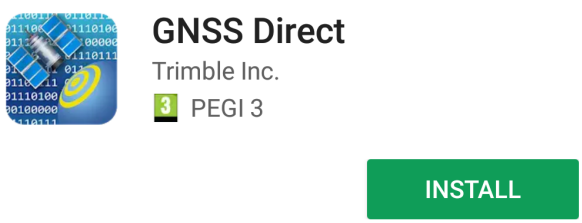


- Continue the download and installation of the application *Trimble GNSS Status*

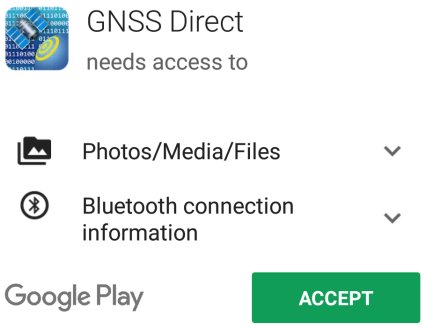
8.1.2 Installing *Trimble GNSS Direct* application

- In the *Play Store* search box enter ***GNSS Direct***. Wait till the end of the search and check that the *Trimble GNSS Direct* application is displayed in available applications.

- Click on ***GNSS Direct***
- Click on INSTALL to install the *Trimble GNSS Direct* application on the terminal Android



- Accept the terms of use of the application by clicking on ACCEPT



- Continue the download and installation of the application *Trimble GNSS Direct*

8.2 Setting up the application *Trimble GNSS Status*

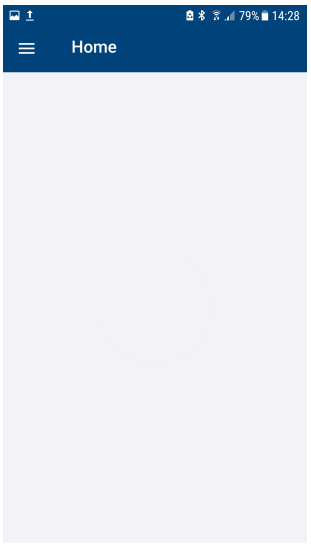
8.2.1 Application startup *Trimble GNSS Status*

- Start the terminal Android
- Click on  and select ***GNSS Status***

Note 8.2.1

The start icon  *of applications may differ from one device to another.*

- Wait a few moments till the application starts



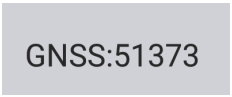
8.2.2 Connect to a Trimble R1 or R2 receiver

8.2.2.1 First connection setting

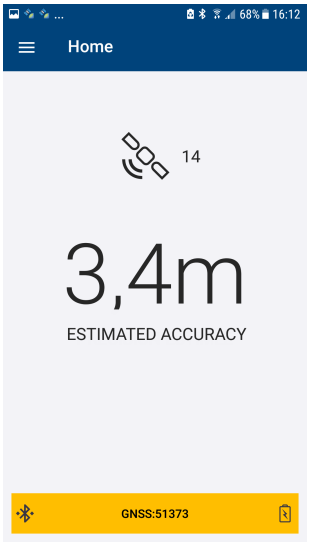
- Click on 

to select the GNSS connection mode (Internal GPS oof the terminal Android or Bluetooth external device)
- Select ***Bluetooth***
- Select the receiver to connect to terminal Android application
- Click on 

to connect the receiver



- *Trimble GNSS Status* returns to the main menu after the receiver had been connected



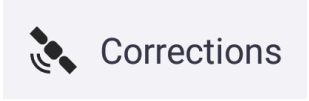
8.2.2.2 Further connections

Start the *Trimble GNSS Status* application. If the GNSS receiver is turned on the application automatically connects to the last connected receiver.

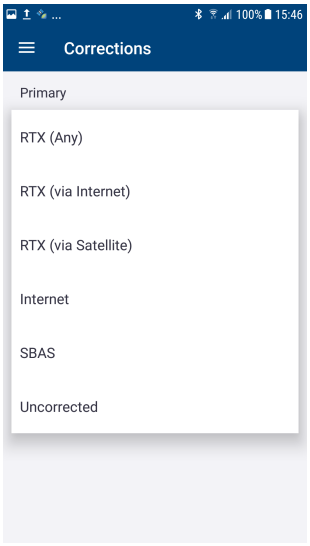
8.2.3 Setting up a source of realtime correction

8.2.3.1 Activation of a real time correction source

- Click on  and select ***Corrections***

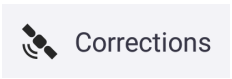
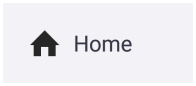


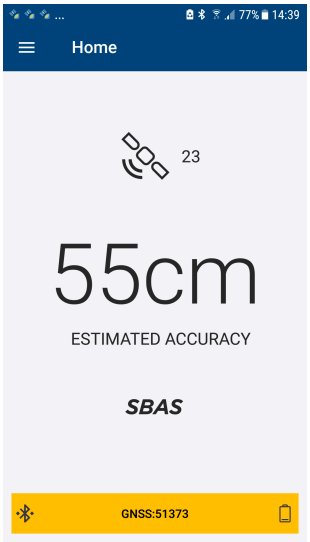
- Select from the list the correction source to be used with the Trimble GNSS device.



- Click on  to validate the configuration

8.2.3.2 Example of using the SBAS real time source

- In the menu  select the source ***SBAS***
- Click on  and select  to return to the main window of *Trimble GNSS Status* application
- After a few moments a correction status indicator will be visible by the user



- Check the accuracy displayed on the screen of *Trimble GNSS Status* application

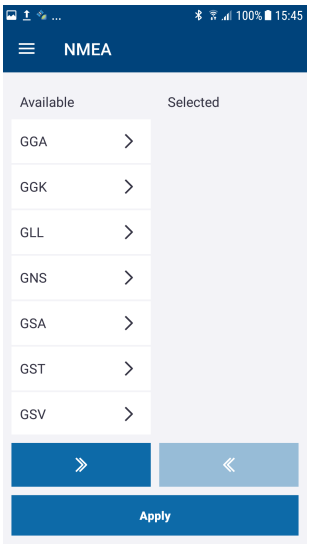
To be read 8.2.1

*After activation of a real time correction source, the acquired positions by Trimble GNSS Status are automatically transmitted to the application ArpentGIS-Android in the NMEA protocol or through fictional positioning integrated by the Android operating system (known as mode **MOCK**)*

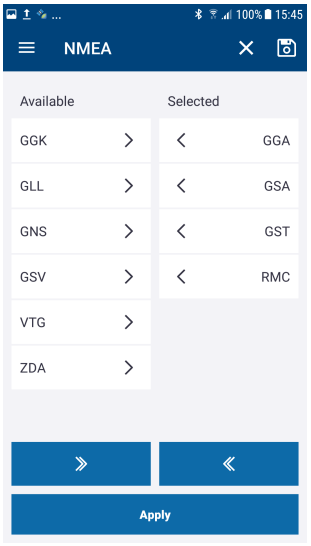
8.3 Setting the NMEA output from the application *Trimble GNSS Status*

In order to transmit data from the external receiver to the *ArpentGIS-Android* application it is necessary to set the receiver to broadcast its positioning data in NMEA format.

- Click on  and select ***NMEA Settings***

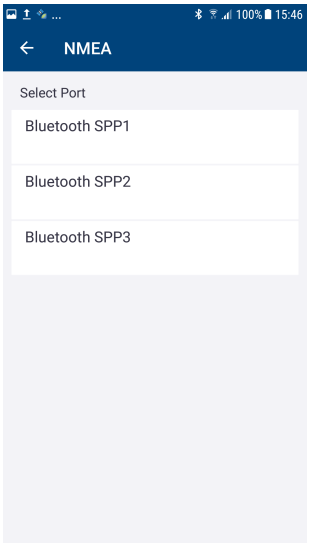


- Select the sentences ***$GGA***, ***$GSA***, ***$RMC*** and ***$GST*** from the ***Available*** column to the ***Selected*** column



- Click on  to save the configuration
- Click on 

to apply settings for one of the output COM ports of the receiver. Select ***Bluetooth SPP1*** COM Port



- A notification will be prompted and the settings applied within the *Trimble GNSS Status* application 

. The configuration is automatically saved.

IN THIS CHAPTER

CHAPTER 9

Activation of the Mock Positions mode for connection to an external GNSS receiver in ArpentGIS-Android

To be read 9.0.1

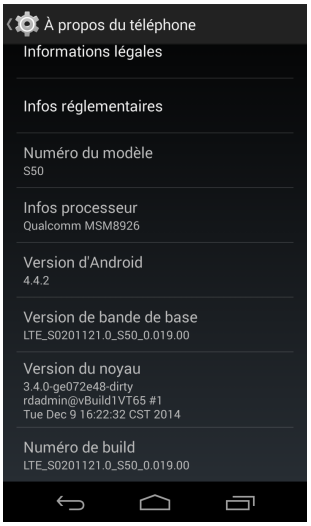
*This chapter is intended for users of Trimble R1 and Trimble R2 receivers wishing to work in real-time correction and transfer data to ArpentGIS-Android software using the **MOCK** mode.*

Note 9.0.1

If ArpentGIS-Android software is used with the internal receiver of the terminal Android it is not necessary to follow the procedure above.

9.1 Enabling developer mode in the terminal Android (Android versions prior to version 6.0 only)

- Start the terminal Android
- Click on  and select ***Settings***
- (Opt) On some devices, click on the ***General*** tab
- Select ***About the device*** or ***About phone***

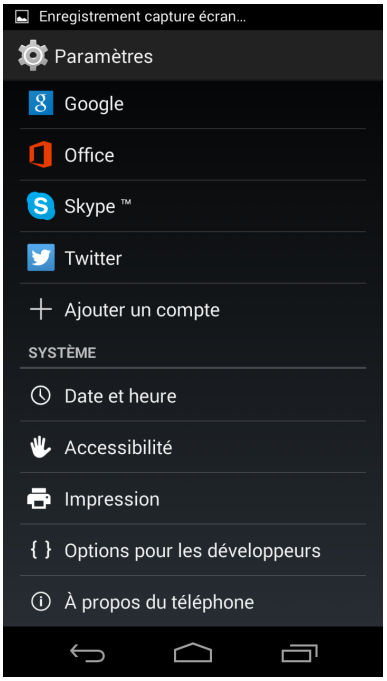


- Search in the menu ***Software info*** or ***Build number***

Note 9.1.1

The choice depends on the terminal Android used.

- Type 7 times on the menu ***Software info*** or ***Build number***. A notification appears and proposes the switchover of the terminal Android to developer mode
- Return to menu and ***Settings***. Check that the ***Developer options*** menu is now available in the list.



9.2 Activation of the Mock Positions mode on the terminal Android

- Start the terminal Android
- Click on and select ***Setting***

(Opt) • On some devices, click on the ***General*** tab

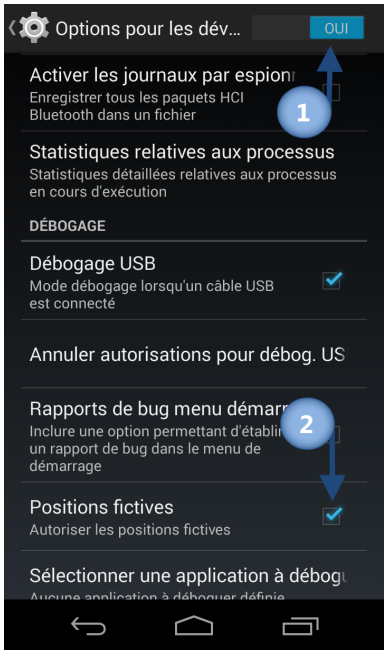
- Select ***Developer options***
- Depending on the device, select :
  - ✱ Mock location

(Or) ✱ Autor. mock location

(Or) ✱ ... any equivalent

Note 9.2.1

The choice depends on the terminal Android used.



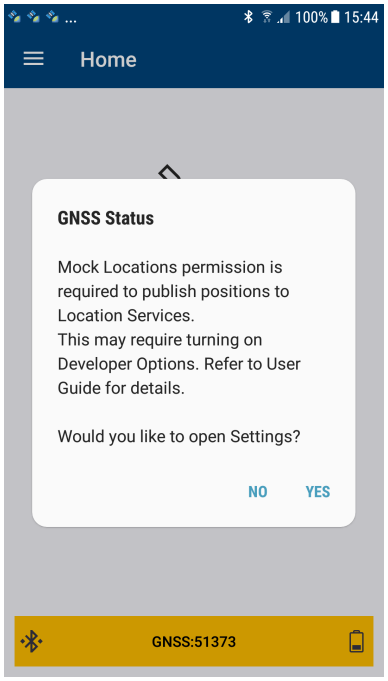
Detail 9.2.1

1. *Activatation of developer options*
2. *Activation of Mock location*

- Retrun to the main menu of the terminal Android

9.3 Enabling developer mode in the terminal Android (Android versions greater than 6.0 only)

The user must define an application that will transfer mock locations to a thrid party application to use (*ArpentGIS-Android*). The activation request is automatically performed from the software that will broadcast mock locations. For instance, if *Trimble GNSS Status* is launched but no application broadcasting mock location is defined, the following message will appear.



By validating the choice, the user activates the broadcast of the mock location through the application that has been selected.

Note 9.3.1

*In this case, activation of developer options is possible but not required (**See section 9.1 on page 61** if user wants to activate this option).*

IN THIS CHAPTER

CHAPTER 10

Data collection : project management and feature creation

10.1 Start the software *ArpentGIS-Android*

10.1.1 Start *ArpentGIS-Android* software

Start the terminal Android and launch the *ArpentGIS* software. To launch the software, use one of the following methods:

- Click on  and select ***ArpentGIS***

(or)

- Click on  on one of the panels of the terminal Android software

10.1.2 User interface

ArpentGIS-Android software is designed to collect GNSS data in the field and to log GIS data associated to attributes. It runs under Android 4.X operating system or higher.
Wait few seconds till the splash screen disappear and the ***main menu*** is display.

Use...	...the option...	...for
	Center	pan (or cancel pan) the current GNSS position is set to the center of the map
	Objects	access the list of features in the current project
	Log	log new features in the current project
	Option/Configuration	configure the GNSS receiver and the GIS options of the terminal Android

Table 10.1: ArpentGIS-Android user interface an its 4 main options

10.2 Check the GNSS receiver connection

Before collecting data in the field it is important to wait a few moments to fully initialize the GPS receiver.
By default a new preconfigured terminal Android is set to use its internal receiver.
After launching the *ArpentGIS-Android* software the GNSS connection is usually automatic (Notification DGNSS 9 sat. in the statusbar of *ArpentGIS-Android* software).

However, in rare cases, the connection to the receiver must be verified due to a change in the settings of the communication port between the receiver and the terminal Android. To configure the communication port see chapter 5 on page 39.
When the receiver uses a minimum of 4 satellites the user can start logging data.

Figure 10.1: GNSS not connected or two few satellites

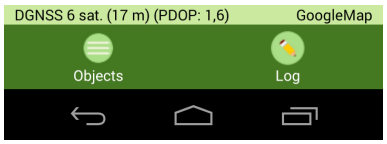


Figure 10.2: GNSS connected

DGNSS 25 sat. (40 cm) (PDOP: 1) GoogleMap

10.3 GNSS Statusbar

The statusbar is always visible, but the icons displayed depend on the current status of the *ArpentGIS-Android* software, the current logging mode or the status and type of GNSS receiver.

To be read 10.3.1

*Real-time accuracy will be displayed if the user works with the internal receiver of the terminal Android or an external receiver using **Mock** mode. If the user is in **NMEA** mode the number of satellites will be displayed.*

GNSS 12 sat. (8 m) (PDOP: 1,5)

Figure 10.3: Internal receiver

GNSS 15 sat. (6 m)

Figure 10.4: External receiver Mock mode

DGNSS 25 sat. (40 cm) (PDOP: 1)

Figure 10.5: External receiver NMEA

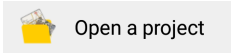
10.4 Open an existing project

10.4.1 Structure

Projects are stored in the folder ***\Internal Memory\ArpentGIS\Projects*** of the terminal Android.
For information, folder used by ArpentGIS software are the following :

- Data dictionary files : ***\Documents\ArpentGIS\Dico***
- Projects (ArpentGIS AGI files) : ***\Documents\ArpentGIS\Projets***
- Pictures : ***\Documents\ArpentGIS\Projets\<Name of the project>***

10.4.2 Open a project

- Click on 
- Click on 
- Click on 

- Select the ***Project*** (ArpentGIS AGI file) to open. The project is automatically opened in *ArpentGIS-Android* software

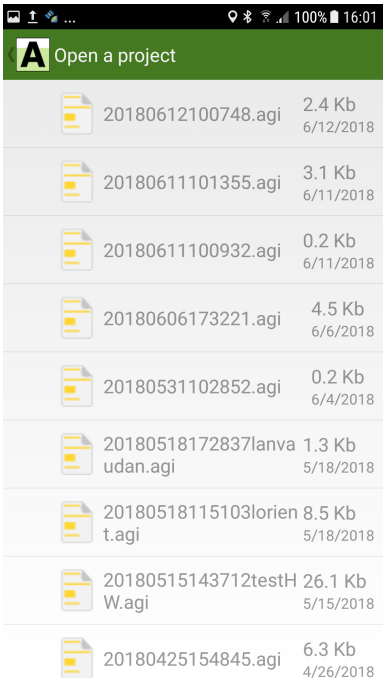


Figure 10.6: Open an existing project

10.5 Create new project

The user enters a project name (spaces and accents are allowed, but not special characters such as "\", "/", ".", ":", "," or "~"). When the cursor is flashing in the field ***Name*** virtual keyboard is automatically displayed.

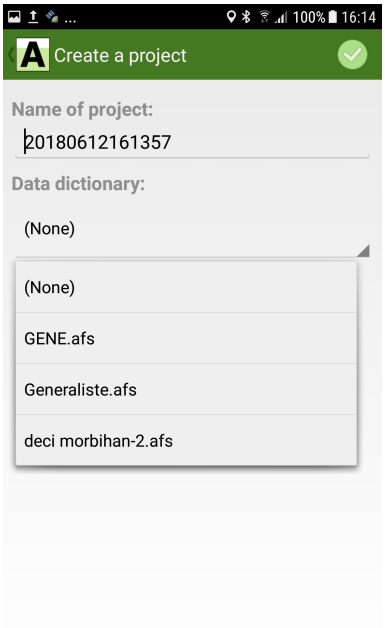
Data dictionary files can be accessed by clicking on button. Data dictionary files use ***.afs*** extension and are stored in the folder ***\Documents\ArpentGIS\Dico***.

Note 10.5.1

Several data dictionary models are available. They can be modified by the user or completed with the data dictionary editor of the ArpentGIS-Expert software.

- Click on
- Click on
- Click on Create a project
  - ∗ Verify that the field ***Name*** is not empty (By default the field is filled with an automatic name based on the GNSS current date of the receiver (Sample ***AAAAMMJJHHMMSS***)
  - ∗ If the field is empty and the user validate by clicking on button a warning message will be prompted
  - ∗ If no data dictionary is selected the "basic" features, point, line and area will be available
- Click on to select a data dictionary
- Click on to create the project

(or) • Click on Create a project to return to the ***map*** view of *ArpentGIS-Android* software



Note 10.5.2

A project does not have a limit considering the number of features. However it may detend on the memory of the mobile device used in the field. In order to avoid lose of data it is recommended to regularly transfer data to a computer - and create a backup copy if necessary - and clean the memory of the device. terminal Android...

10.6 Create new features with *ArpentGIS-Android*

10.6.1 Create a new GNSS point feature

- In the ***Main*** view, click on 

- Select the new feature in the list and fill the attributes form for this feature

Figure 10.7: Select an object type

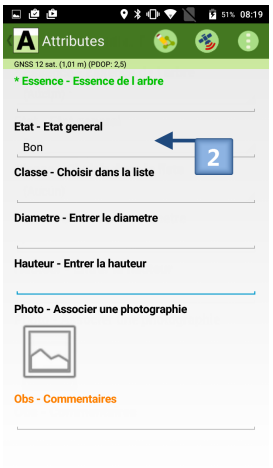


Figure 10.8: Fill the attributes form

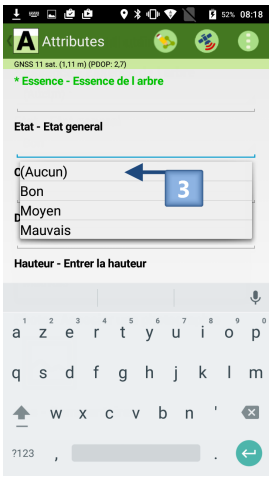


Figure 10.9: Select a value for a dropdown list attribute

Detail 10.6.1

❶ *Select the feature type (Point feature with the symbol)*
❷ *Fill the attributes list of the feature*
❸ *For a "**scrollable list**" attribute a predefinde list will pop up, for a "**text**" attribute or a "**numeric**" attribute the user can directly enter the value.*

Note 10.6.1

*The attributes marked with the symbol ***** are mandatory and cannot be left blank.*

To be read 10.6.1

Check in the banner the accuracy of the current GNSS position before continuing with the logging of the feature.
GNSS 12 sat. (1,01 m) (PDOP: 2,5)

- Click on  to create the feature with valid GNSS positions
- A beep indicates the increment of the number of GNSS positions recorded for the new featture as well as an incremented indicator in the main banner 

)

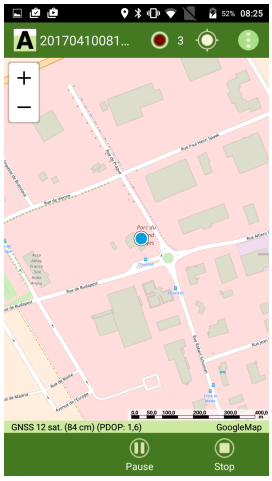


Figure 10.10: Log positions in progress

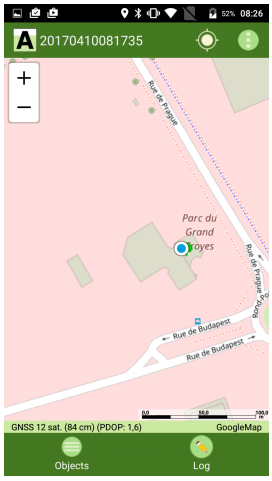


Figure 10.11: Save a feature

Detail 10.6.2

- Click on Pause to pause the logging of GNSS positions

(or) • Click on Play to resume logging GNSS positions for the collected feature

(or) • Click on Stop to stop logging GNSS positions and save the collected feature to the project

Tip 10.6.1

After validation, an notification sound indicates to the user that the point feature has been saved.

10.6.2 Digitize a new point feature

- In the ***Main*** view, click on Log
- Select the new feature in the list and fill the attributes form for this feature

Figure 10.12: Select an object type

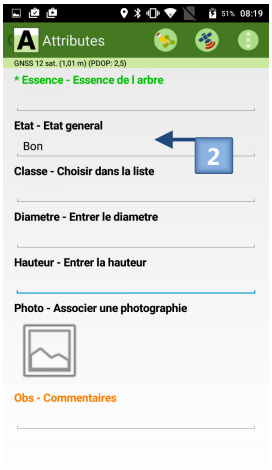


Figure 10.13: Fill the attributes form

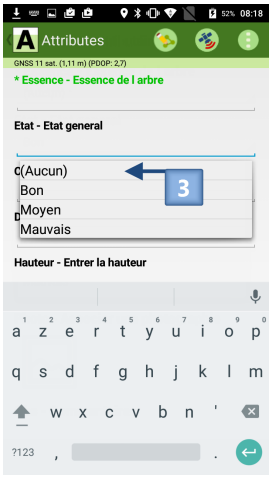


Figure 10.14: Select a value for a dropdown list attribute

- Click on to digitize manually the feature on the screen. The symbol indicates the location of the feature on the map view of *ArpentGIS-Android*

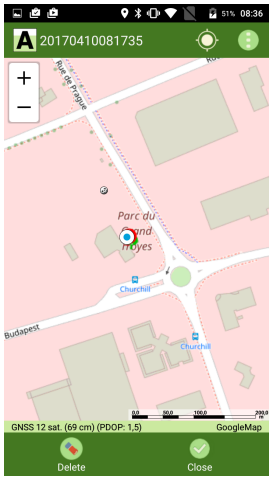


Figure 10.15: Digitize a point location

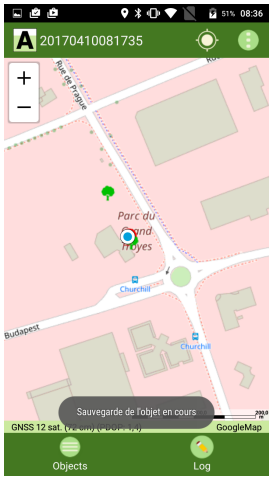


Figure 10.16: Save a feature

Detail 10.6.3

- Click on Delete to clear the location defined for the point and define a new one by clicking on the map again ArpentGIS-Android

(or)

- Click on Validate to validate the position of the object and save it in the project

To be read 10.6.2

A point feature digitized will have a null Z-value.

10.6.3 Create a new line/area GNSS feature

- In the *Main* view, click on Log
- Select the new feature in the list and fill the attributes form for this feature

Figure 10.17: Create a feature

Figure 10.18: Fill the attributes form

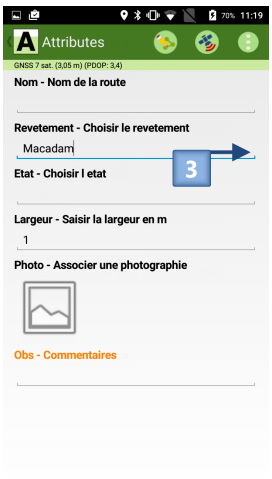


Figure 10.19: Select a value for a dropdown list attribute

Detail 10.6.4

❶ *Select the feature type (Line feature with the symbol*  *or Area feature with the symbol*  *)*
❷ *Fill the attributes list of the feature*
❸ *For a "**scrollable list**" attribute a predefinde list will pop up, for a "**text**" attribute or a "**numeric**" attribute the user can directly enter the value.*

Note 10.6.2

*The attributes marked with the symbol * are mandatory and cannot be left blank.*

To be read 10.6.3

Check in the banner the accuracy of the current GNSS position before continuing with the logging of the feature.
GNSS 12 sat. (1,01 m) (PDOP: 2,5)

- Click on  to create the feature with valid GNSS positions
- A beep indicates the increment of the number of GNSS positions recorded for the new featture as well as an incremented indicator in the main banner )

Note 10.6.3

The user has to start moving.

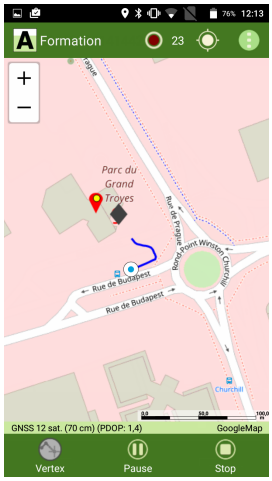


Figure 10.20: Log positions in progress

Figure 10.21: Save a feature

Detail 10.6.5

- *Click on*  *to suspend GNSS positions logging*

Note 10.6.4

User has to stop moving.

(or)
- *Click on*  *to resume GNSS positions logging for the current feature*

Note 10.6.5

User have to start moving.

(or)
- *Click on*  *to stop logging GNSS positions and save the current feature to the project*

Tip 10.6.2

After validation, an sound indicates to the user that the line or area feature has been saved.

10.6.4 Digitize a new line/area feature

- In the ***Main*** view, click on 

- Select the new feature in the list and fill the attributes form for this feature

Figure 10.22: Create a feature

Figure 10.23: Fill the attributes form

Figure 10.24: Select a value for a dropdown list attribute

Detail 10.6.6

1. *Select the feature type (Line feature with the symbol*  *or Area feature with the symbol*  *)*
2. *Fill the attributes list of the feature*
3. *For a "**scrollable list**" attribute a predefinde list will pop up, for a "**text**" attribute or a "**numeric**" attribute the user can directly enter the value.*

Note 10.6.6

*The attributes marked with the symbol * are mandatory and cannot be left blank.*

- Click on  to digitize manually the feature on the screen. Click successively on the screen to digitize the different vertices of the line or the area feature. The symbol  indicates the location of a vertex on the map view of *ArpentGIS-Android* application.

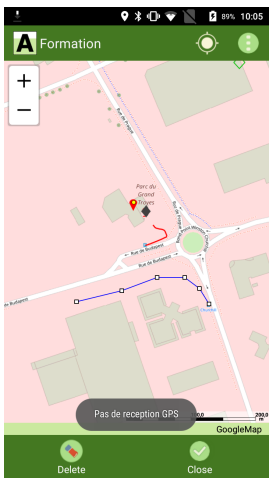


Figure 10.25: Log vertices of the feature

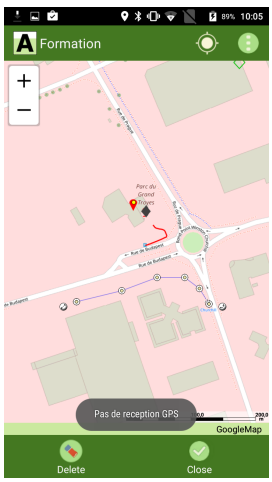


Figure 10.26: Stop digitizing and save the feature

Detail 10.6.7

- Click on Delete to delete already created vertices (all vertices will be deleted) on the map view ArpentGIS-Android

(or) • Click on Close validate the creation of the new feature

Note 10.6.7

To finish the construction of the object it is also possible to make a long click on the screen of the terminal Android

To be read 10.6.4

A line (or area) feature digitized will have vertices with null Z-value.

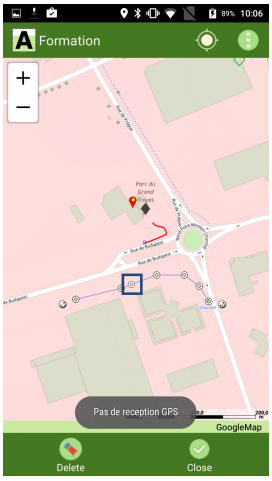


Figure 10.27: Add a vertex

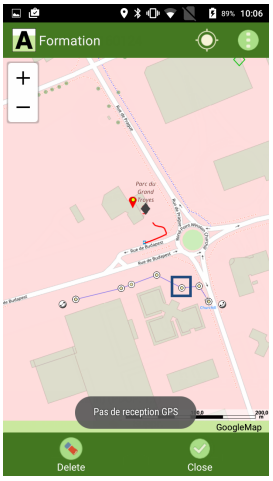


Figure 10.28: Move a vertex

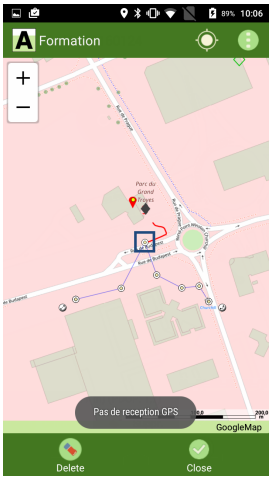


Figure 10.29: Snap a vertex to an existing node

Detail 10.6.8

- To add a new vertex (between two existing vertices) click on the feature in the map view ArpentGIS-Android

(or) • To move a vertex, hold the click on the feature and move the vertex to the desired position on the map ArpentGIS-Android

(or) • To move a vertex on an existing feature (snap according to the definition of the magnetic grid (see chapter 5 on page 39)), hold the click on the feature and move the vertex to a feature in the map view ArpentGIS-Android

Note 10.6.8

A sound beep indicates to the user whether the snap was made when moving the vertex on an existing object on the map.

Detail 10.6.9

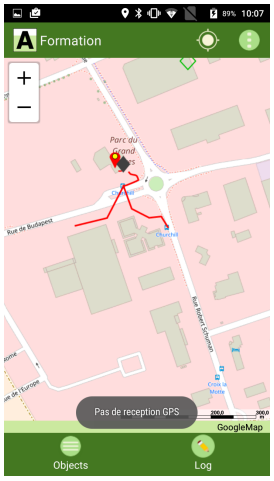
- Click on Validate to validate the creation of the feature and save it to the project

10.6.5 Associate a picture to a feature

- In the *Main* view, click on Log
- Select the new feature in the list
- Fill the attributes form (see section 10.6.1 on page 68)

Detail 10.6.10

❶ For the picture attribute click on the corresponding attribute name
❷ (option) Select a picture from the existing library or take a new photo. Use the option "**Delete**" to remove a previous selected picture.



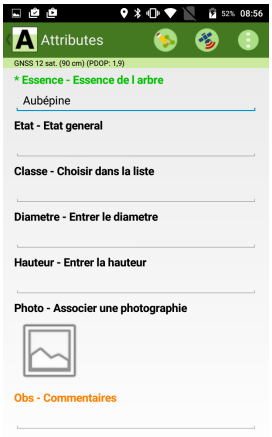


Figure 10.30: Select the picture attribute

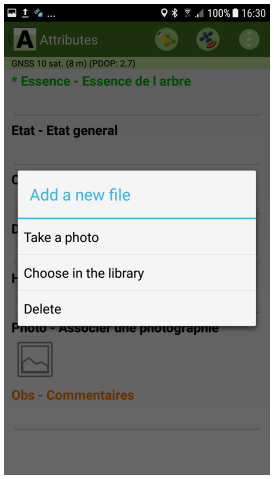


Figure 10.31: Select the option to associate the picture to the feature

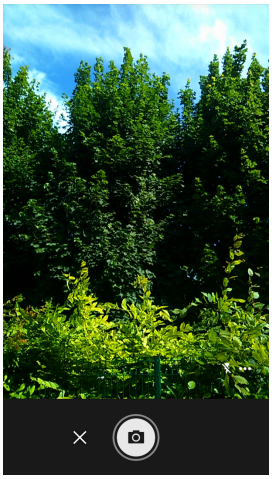


Figure 10.32: Take the picture

❸ *In the camera application click on*  *to take the picture*

To be read 10.6.5

The picture icon may differ depending on the terminal Android used.

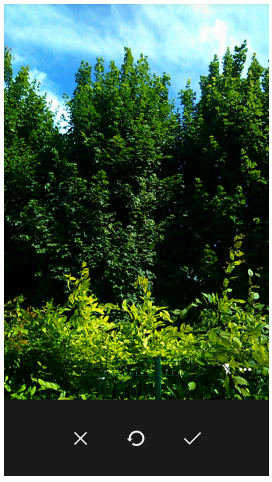


Figure 10.33: Validate the picture

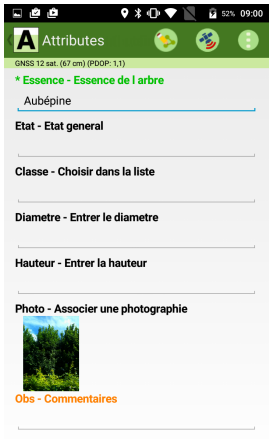


Figure 10.34: Thumbnail of the picture

Detail 10.6.11

4 Click on  to save the picture and assign it to the feature being collected
5 A thumbnail displays a preview of the image associated with the feature

To be read 10.6.6

The picture validation button may differ from one terminal Android to another.

One doubt ? 10.6.1

Camera button may differ from one device to another. For more information, contact our technical support (0892.68.10.57 (0.34€/min) France).

- Finish the construction of the feature. See sections 10.6.1 to 10.6.3 on pages 68–70

10.7 Manage the "Map view" of *ArpentGIS-Android* software

This is the main menu of the *ArpentGIS-Android* software. A statusbar keeps displaying the status of data received from the GNSS receiver. In case a project is opened, the list of objects saved in the project is displayed in the center of the screen as a list.

10.7.1 How to use the map tools ?

Collecting data on a terminal Android does not require the use of zoom functions (in or out). These functions are available using the pinch functions used for other Android applications. The option ***Pinch*** to zoom out. The option ***Unpinch*** to zoom in.

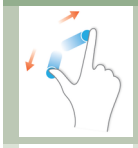
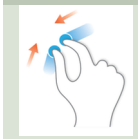
Button...	...for
	Zoom in
	Zoom out
	Pan on the current GNSS position

Table 10.2: How to zoom in the map view ?

10.7.2 Main menu

Use the  menu, top right of the screen, to choose which background to display (Raster image, Shapefile or WMS flow) or access to the software configuration *ArpentGIS-Android*.

Button...	...for
	Projects
	Create a project
	Open a project
	Close un project
	File manager
	Background menu
	Display Open Street Map background
	Display Google Maps routes background
	Display Google Maps satellite background
	Display a WMS background
	Display a cadaster (WMS) background (France only)
	Display a WMS/Cadaster background stored in cache
	Select a background stored on the terminal Android, Vector or Raster
	Delete current background
	Tools
	Enter coordinates of a target
	Measure a distance
	Export coordinates of features to a CSV file
	Export coordinates and attributes of features to a CSV file
	Export features to a Shapefile
	Userguide of the application
	Configuration

Table 10.3: Main features of ArpentGIS-Android application

10.7.3 Features list

A complete list of the features collected in a project is available by clicking on 

.

Pour chaque objet, les informations suivantes sont affichÃ©es :

- The feature type (the layer to which the object belongs)
- Name of the feature
- The horizontal coordinates of the feature in the current coordinate system
- The Z-value of the feature (MSL or HAE depending on the system selected in the configuration menu)

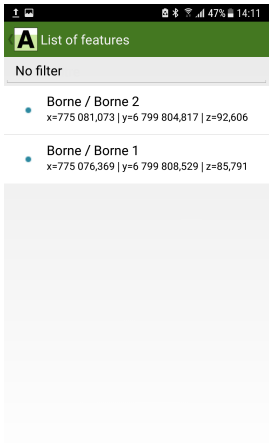


Figure 10.35: List of features

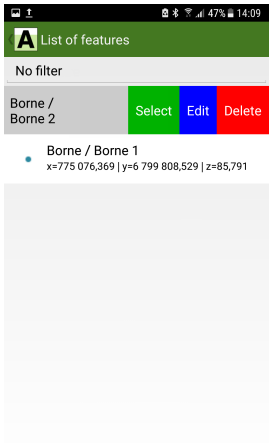


Figure 10.36: Editing mode enabled

Button/Action...	...for
	Access edit options
Select	Select a feature and display it on the map view
Edit	Edit an existing feature in the current project
Delete	Delete a feature from the list

Table 10.4: How to edit a feature ?

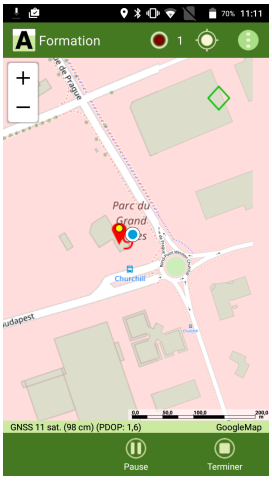
To be read 10.7.1

User cannot recover a deleted file. There is no validation message.

When attempting to edit a feature, use will have the following choices :

- For a point feature :
  - View the attribute form of an existing feature in the project
  - Edit the attributes of an existing feature
  - Update the existing coordinates of an existing feature
- For a line or area feature :
  - View the attribute form of an existing feature in the project
  - Edit the attributes of an existing feature
  - Extend an existing feature (with a GNSS receiver or by digitalization)

10.7.4 Map features



When a project file is opened, all the features are displayed in the main view, with the possibility to display a vector background (Shapefile), raster (TIF) and WMS Server connection (OpenStreetMap, Google Maps routes and Google Maps satellite)
The scale appears on the screen, bottom right.
When an object is being logged, the positions logged are displayed in blue on the screen.

When logging GNSS positions the Stop button and Pause button are displayed at the bottom of the screen. The shortcuts allow the user to close an object or to suspend the logging of GNSS positions. When the Stop button is used, the new feature is added to the list of collected features in the project.

When the Pause button is used, logging GNSS data is suspended and the Play button is available.

10.7.5 Labels

Whenever the user selects an object on the ***Map*** view of *ArpentGIS-Android* software, a popup window will appear on the screen. This popup window contains attributes values of the selected feature as well as its coordinates (X, Y and Z). It is therefore easy to identify the selected feature or to select another feature.
The attributes entered by the user will be automatically shown on the *ArpentGIS-Android* software as well as attributes auto-generated:

- For a point feature :

Button...	...for
Stop	stop logging
Pause	pause logging
Play	resume logging

Table 10.5: What can be done when logging a feature ?

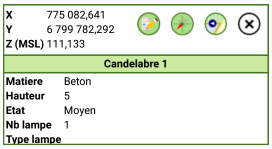


Figure 10.37: Label for point features

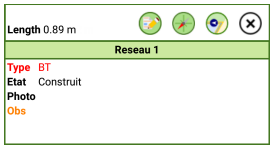


Figure 10.38: Label for line features

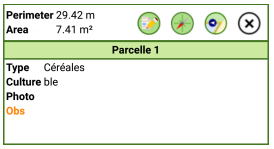


Figure 10.39: Label for area features

  - X, Y and Z (HAE) if no geoid had been selected in the configuration menu (See chapter 5 on page 39)
  - X, Y and Z (MSL) if a geoid had been selected in the configuration menu (See chapter 5 on page 39)
- For a line feature :
  - The length
- For an area feature :
  - The length of the feature
  - The area of the feature

Note 10.7.1

*Unit will be set to the one selected in the configuration menu (**See chapter 5 on page 39**)*

10.7.6 Edit attributes of a feature from the Map view

- Select a feature on the *Map* view
- Double-click on this feature
- The attributes form of the feature appears on the screen. Modify the attributes of the feature
- Click on ✓ to validate the changes.

10.7.7 Edit the attributes of a feature from the menu "Objects"

- In the *Map* view of *ArpentGIS-Android* software click on Objects
- Select a feature from the available list
- Slide on the left
- Click on Edit
- The attributes form of the feature appears on the screen. Modify the attributes of the feature
- Click on ✓ to validate the changes.

10.7.8 Delete a feature

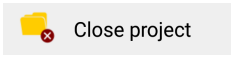
- In the *Map* view of *ArpentGIS-Android* software click on Objects
- Select a feature from the available list
- Slide on the left
- Click on Delete
- Click on A List of features to return to the *Map* view

To be read 10.7.2

After deletion it is not possible to retrieve a feature.

10.8 Close a project

Once the data collection is complete and before closing the *ArpentGIS-Android* software close the current project :

- Click on 
- Click on 
- Click on 

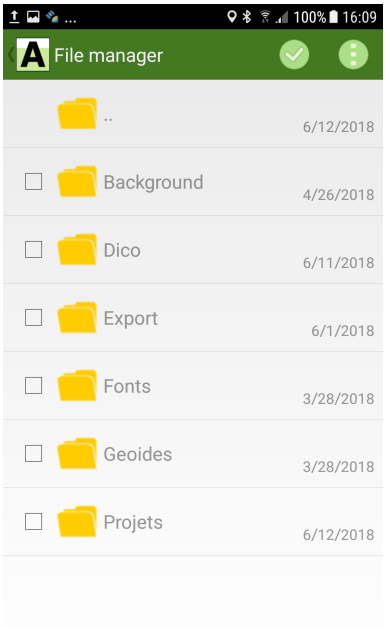
10.9 Share a project

To be read 10.9.1

This section may require an Internet connection and an email account on the terminal Android.

Once the data collection is complete and after closing the current project, to share it to a mobile device, computer or collaborator use the following procedure :

- Click on 
- Click on 
- Click on 



- Use the folders of the terminal Android to navigate to the folder containing the files

Note 10.9.1

The default folder containing the projects is ***Projets****.*

- Select the file to share

Note 10.9.2

A project of ArpentGIS-Android software use the extension ***agi****.*

- Click on 

- Click on 
- In the "Pop-up" window select the sharing method to use and follow the intruction on the screen of the terminal Android
  - To use ***Bluetooth*** sharing select the device to share with (mobile device or laptop)
  - For sharing via messaging, select the appropriate provider and follow the instructions on the screen
  - For sharing via a cloud service (***Dropbox*** or ***Drive***) select the transfer folder

Note 10.9.3

If needed use this method to share multiple files.

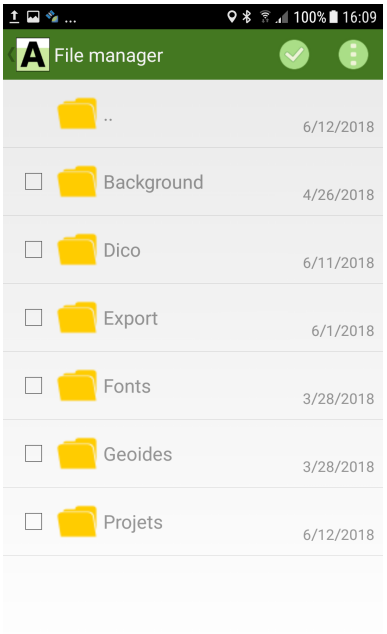
Tip 10.9.1

*This method allows you to share all types of files, data dictionary (**.afs**), background files (**.shp** or **.tif**)*

10.10 Delete a project

To delete a file from the terminal Android, follow this procedure :

- Click on 
- Click on 
- Click on 



- Use the folders of the terminal Android to navigate to the folder containing the files

Note 10.10.1

*The default folder containing the projects is **Projets**.*

- Select the file to be shared

Note 10.10.2

*An ArpentGIS-Android software projects is a **agi** file.*

- Click on 
- Click on  . Confirm the deletion message. The file is deleted from the terminal Android

To be read 10.10.1

After deletion it is not possible to retrieve the file.

Note 10.10.3

This method allows multiple selection of files.

Tip 10.10.1

*Use this option to delete various type of files, data dictionary files (**.afs**), background files (**.shp** or **.tif**)*

IN THIS CHAPTER

CHAPTER 11

Advanced features: vertices, offsets and export

11.1 "Vertex"

Use this function to increase the accuracy of the vertices of linear or area features by averaging a set of GNSS positions for a particular point (or vertex) of the line (or of the area) feature.
This function is enable when logging the feature.

- Click on 

button
- Move to the vertex location of the feature
- Click on 

button in order to start logging the vertex
- Wait around ten seconds and click on 

button to store the vertex.

Note 11.1.1

A beep indicates the increment of the number of GNSS positions recorded for the new vertex of the object as well as an incremented indicator in the main banner 

)

To be read 11.1.1

Repeat the previous steps to create as many vertices as needed.

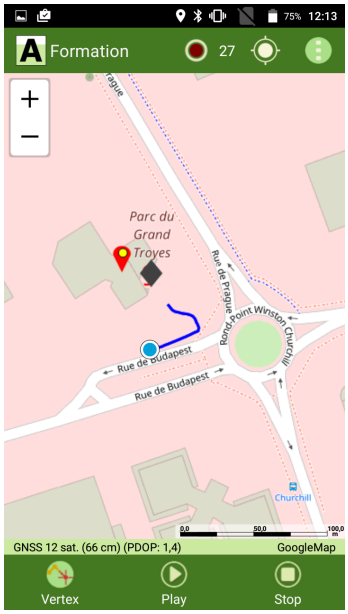


Figure 11.1: Start the new vertex

Figure 11.2: Stop the vertex

Note 11.1.2

If an auto-validation had been defined in data dictionary editor, the vertex is automatically validated after "n" positions.

Note 11.1.3

To switch back to the stream logging option, click on Play.

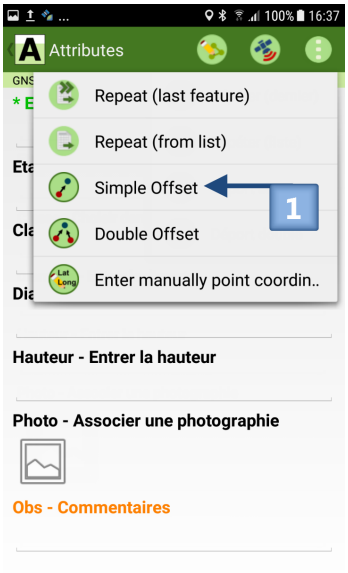
to stop logging positions and save the feature to the project click on Stop

11.2 Offset tool

11.2.1 Bearing and distance offset (point features only)

This feature allows the user to collect a point remotely without having to physically go to that point. The user can collect a large amount of data from a single location. The aiming and distance measurements can be read from a laser rangefinder associated to an electronic compass.

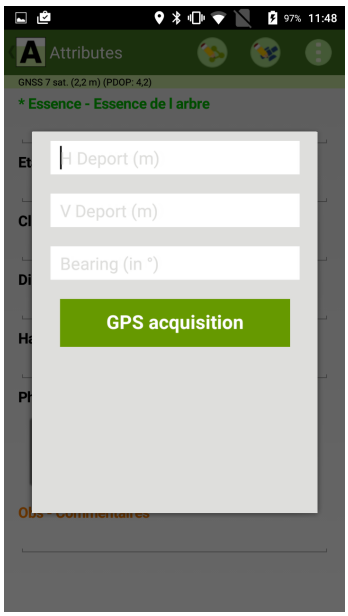
- Start the *ArpentGIS-Android* software
- Click on Create a project button to create a new project,or click on Open a project to open an existing project.
- Select a point feature
- Click on
- In the attributes form click on
- Select option

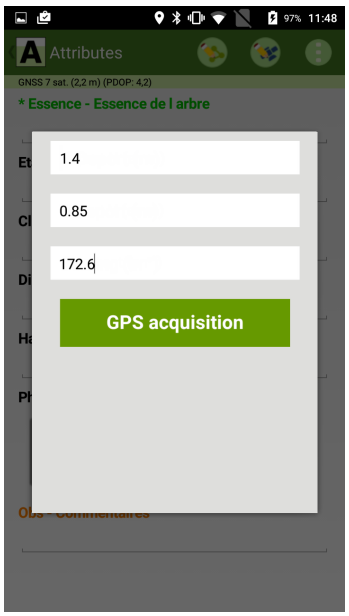


Detail 11.2.1

Enabling the offset option

- In the offset form, enter the horizontal and vertical distances, as well as the bearing value separating the current GNSS position of the device and the point to be collected.
  - distance unit is set to meter (m)
  - bearing unit is set to degree (deg)

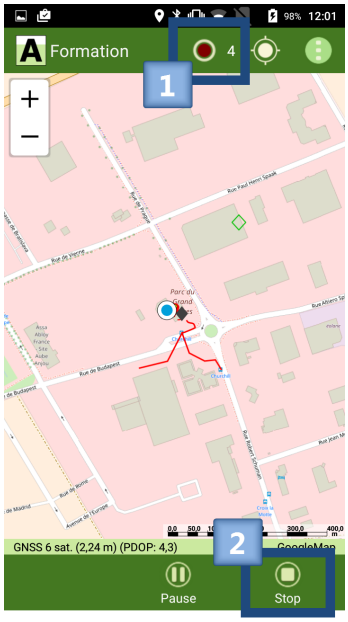




To be read 11.2.1

Check in the GNSS strip the availability of a valid GNSS position and the accuracy of the current location before continuing to create the feature. GNSS 12 sat. (1,01 m) (PDOP: 2,5)

- Click on **GPS acquisition** to start logging the GNSS reference position



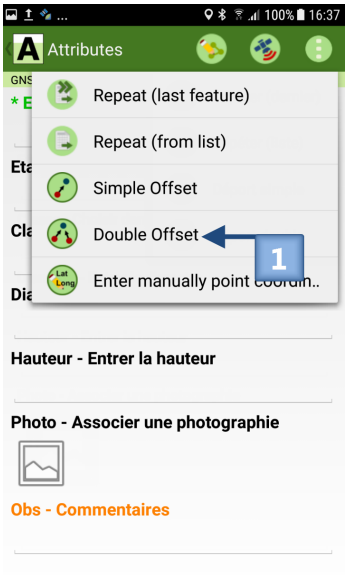
Detail 11.2.2

1. *Log reference position*
2. *Stop collecting reference position*
3. *Visualization of the deported feature*

11.2.2 Double distances offset (point features only)

This feature allows the user to collect a point remotely without having to physically go to that point. The user can collect a large amount of data from a single location. The aiming and distance measurements can be read from a laser rangefinder associated to an electronic compass.

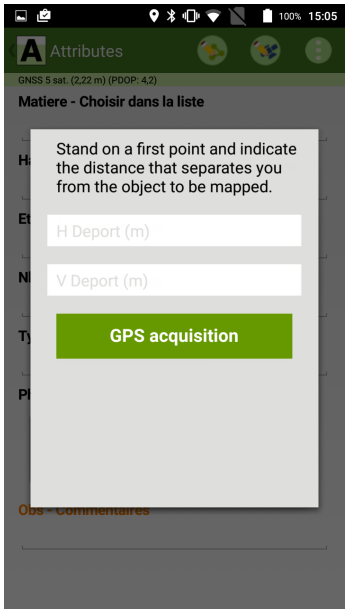
- Start the *ArpentGIS-Android* software
- Click on Create a project button to create a new project,or click on Open a project to open an existing project.
- Select a point feature
- Click on
- In the attributes form click on
- Select option

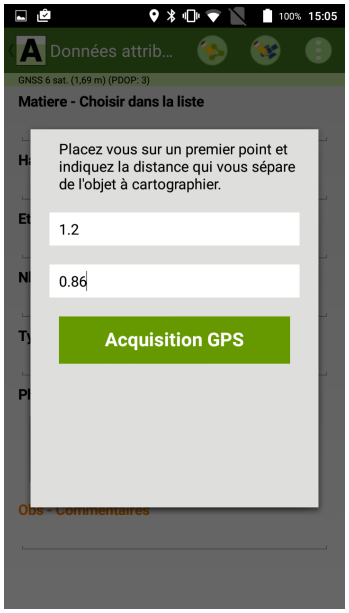


Detail 11.2.3

❶ *Activation of the double offset option*

- Move to a suitable location for logging the first reference position
- In the offset form, enter the horizontal and vertical distances separating the current GNSS position of the device and the point to be collected
  - ∗ distance unit is set to meter (m)

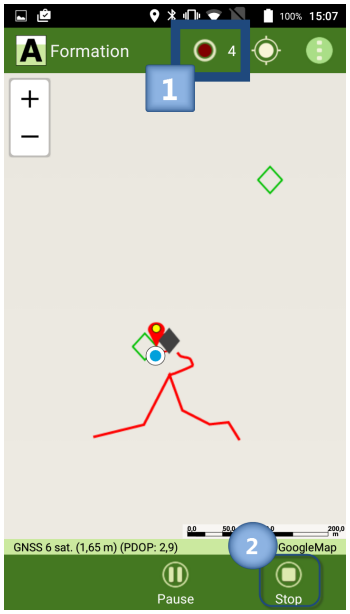




To be read 11.2.2

Check in the GNSS strip the availability of a valid GNSS position and the accuracy of the current location before continuing to create the feature. GNSS 12 sat. (1,01 m) (PDOP: 2,5)

- Click on **GPS acquisition** to start logging the first GNSS reference position

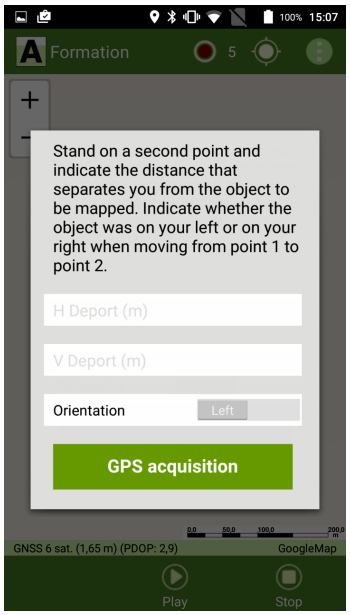


Detail 11.2.4

❶ *Log reference position*

❷ *Stop collecting reference position*

- Move to a suitable location for logging the second reference position
- In the offset form, enter the horizontal and vertical distances separating the current GNSS position of the device and the point to be collected
  - ∗ distance unit is set to meter (m)
  - ∗ the orientation of the offset corresponding to the direction followed by the user between point 1 and point 2



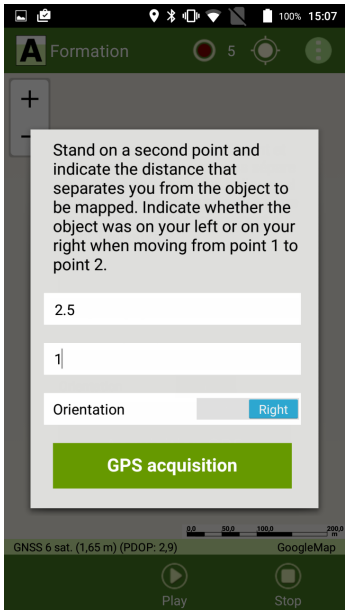


Figure 11.3: Enter offset values. Case where the feature is on the right from the line 1 to 2

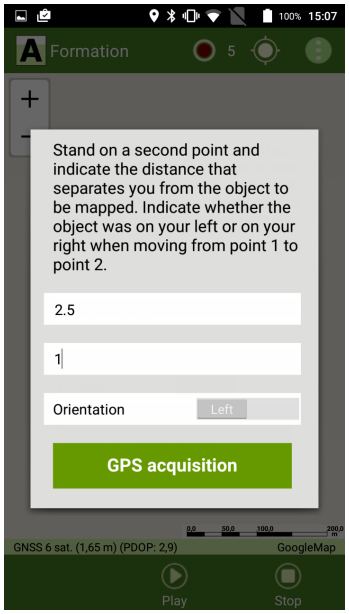


Figure 11.4: Enter offset values. Case where the feature is on the left from the line 1 to 2

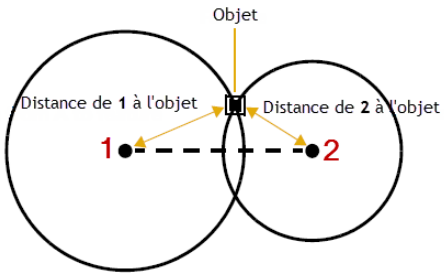
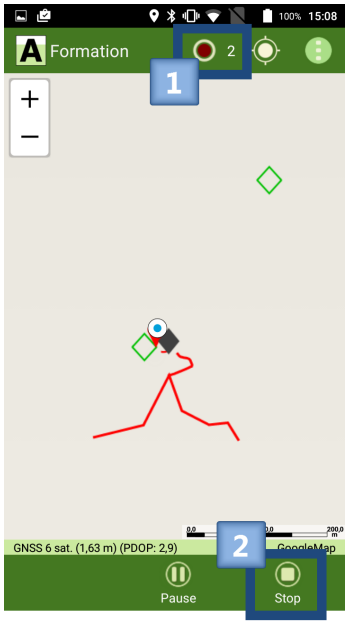
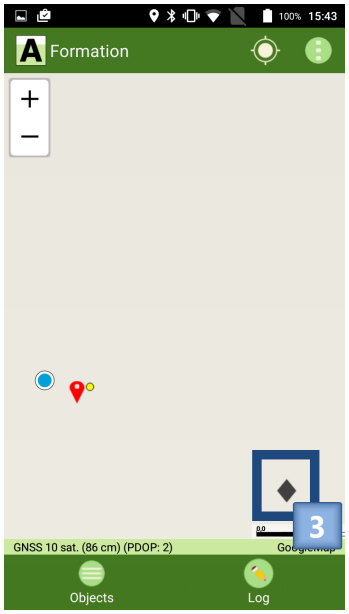


Figure 11.5: Note concerning the orientation to be given according to reference positions 1 and 2

- Click on **GPS acquisition** to start logging the second GNSS reference position





Detail 11.2.5

1. *Log reference position*
2. *Stop collecting reference position*
3. *Visualization of the deported feature*

11.2.3 Automatic tarnsfer of offset values from a laser range finder

Follow the same procedure described section 11.2.1 on page 84. When entering offset values (distances and bearing), use the laser rangefinder and aim the point to be measured.

If the user successfully configured a Bluetooth connection to a laser rangefinder in the ***Configuration*** menu of *ArpentGIS-Android* software, transfer of the measurements of the laser rangefinder will be automatic and the values will appear in the offset form of the software.

Note 11.2.1

*If the transfer is not automatic, **see section 5.6 on page 44** to enable the Bluetooth connection to the rangefinder.*

To be read 11.2.3

Activating this feature requires to restart the application

Continue the procedure describe section 11.2.1 on page 84 in order to complete the creation of the offset feature.

To be read 11.2.4

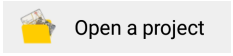
In the case of use of a laser rangefinder equipped with an digital compass, in order to get accurate values it is necessary to regularly calibrate the compass. With the calibration, disturbing elements (metal, cars, buildings...) would not affect the values calculated from the digital compass.

One doubt ? 11.2.1

The calibration of the laser rangefinder is not described in this userguide. Additional information can be obtained from D3E Electronique technical support.

11.3 Export option

To export features collected in a project directly to a GIS format, follow the procedure below:

- Click on 
- Click on 
- Click on 

- Select the ***Project*** (ArpentGIS AGI file) to open. The project is automatically opened in *ArpentGIS-Android* software

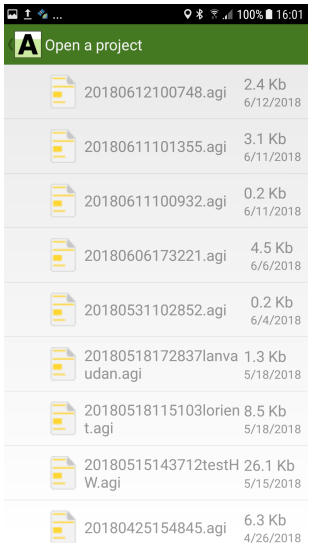


Figure 11.6: Open an existing project

11.3.1 Export to CSV file

11.3.1.1 CSV export without attributes

- Click on 
- Click on 
- Click on 

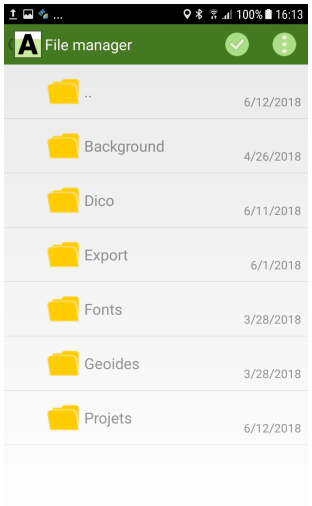


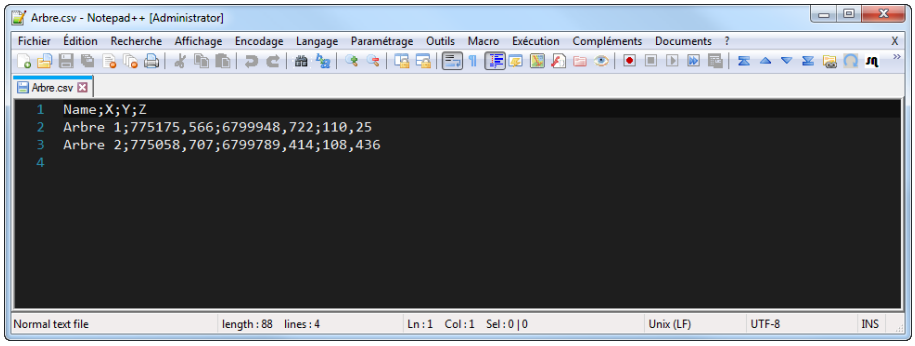
Figure 11.7: Select an export folder

- Select the folder that will contain the exported files
- Click on 

Note 11.3.1

If a subfolder has to be created in the device memory, it is necessary to first create this folder in a specific files application (available on the Play Store). ArpentGIS-Android does not allow the creation of subfolders, only the selection of an existing folder.

- Connect the terminal Android to a PC to transfer files or share the file to a collaborator (see section 10.9 on page 79) directly from the field.



Note 11.3.2

The following fields are exported :

- *Name*
- *X*
- *Y*
- *Z*

11.3.1.2 CSV export with attributes

- Click on 
- Click on 
- Click on 

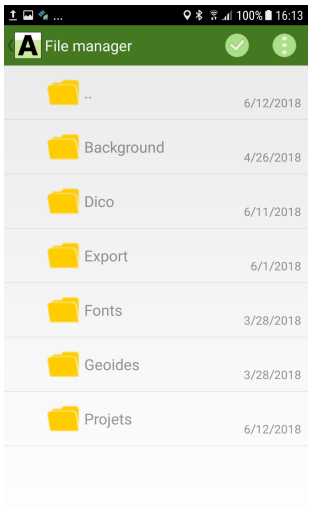


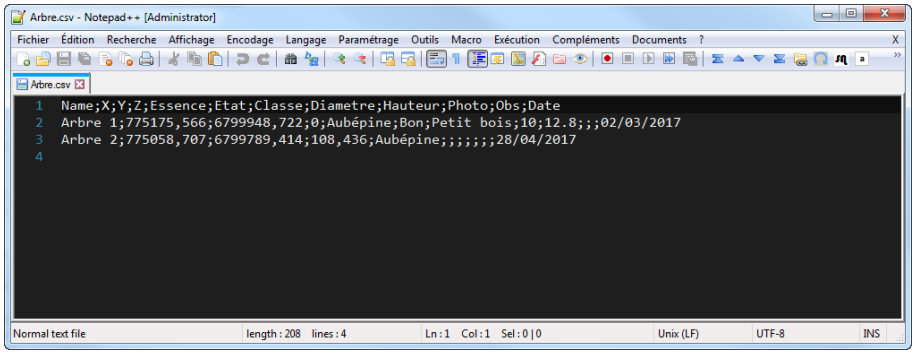
Figure 11.8: Select an export folder

- Select the folder that will contain the exported files
- Click on 

Note 11.3.3

If a subfolder has to be created in the device memory, it is necessary to first create this folder in a specific files application (available on the Play Store). ArpentGIS-Android does not allow the creation of subfolders, only the selection of an existing folder.

- Connect the terminal Android to a PC to transfer files or share the file to a collaborator (see section 10.9 on page 79) directly from the field.



Note 11.3.4

The following information are exported :

- *Name*
- *X*
- *Y*
- *Z*
- *[Attributes]*

To be read 11.3.1

*The number of columns added by the **[Attributes]** option may change from one layer to another.*

11.3.1.3 Shapefile (SHP) export

- Click on 
- Click on 
- Click on 

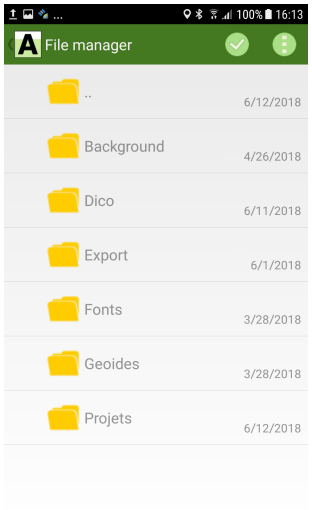


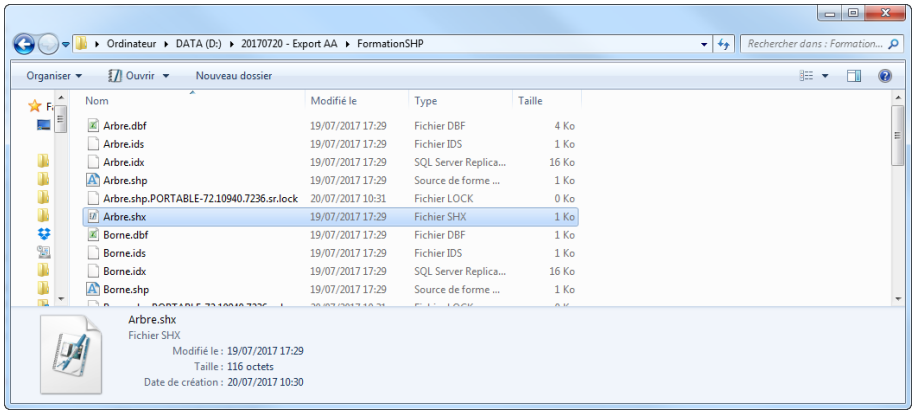
Figure 11.9: Select an export folder

- Select the folder that will contain the exported files
- Click on 

Note 11.3.5

If a subfolder has to be created in the device memory, it is necessary to first create this folder in a specific files application (available on the Play Store). ArpentGIS-Android does not allow the creation of subfolders, only the selection of an existing folder.

- Connect the terminal Android to a PC to transfer files or share the file to a collaborator (see section 10.9 on page 79) directly from the field.



Note 11.3.6

The following files will be created for each layer of a project:

- ***.dbf***
- ***.ids***
- ***.idx***
- ***.shp***
- ***.shx***

To be read 11.3.2

The generated files are 2D Shapefile only.

Note 11.3.7

The following information are exported:

- *Name*
- *[Attributes]*

To be read 11.3.3

*The number of columns added by the **[Attributes]** option may change from one layer to another.*

IN THIS CHAPTER

CHAPTER 12

Background files

ArpentGIS-Android allows you to use raster and vector backgrounds as well as data flows from the Internet : Data ***Open Street Map***, ***Google Maps route***, ***Google Maps satellite***, ***WMS French Cadastre*** or ***WMS Server***.

12.1 Manage a preconfigured Internet data flow

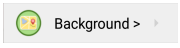
Note 12.1.1

This option assumes that an Internet connection is available on the terminal Android.

By default the *ArpentGIS-Android* application uses an Internet background in case the user has on his terminal Android a valid Internet connection. The following backgrounds are available for terminal Android :

- ***Open Street Map***, ***Google Maps route***, ***Google Maps satellite***

To use background files :

- Click on 
- Click on 

- Select one of the following background

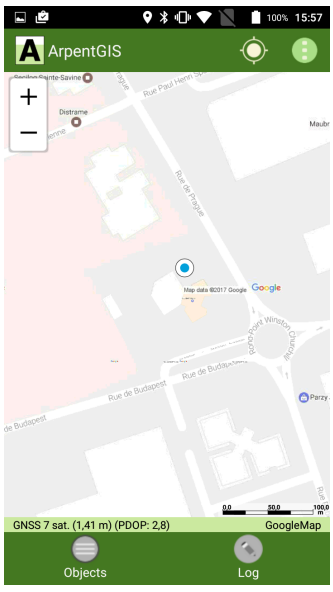


Figure 12.1: Google Maps Routes

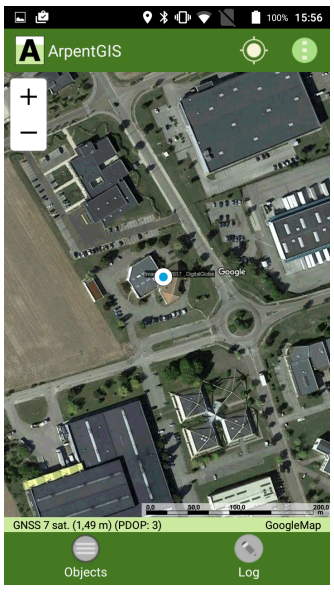


Figure 12.2: Google Maps satellite

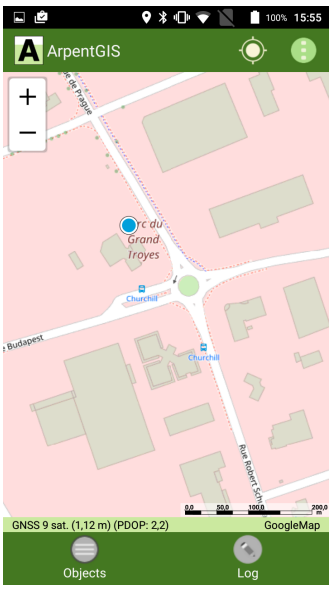


Figure 12.3: Open Street Map

To be read 12.1.1

Extra fees may appear depending on the Data subscription used. Inquire your Internet provider for more information.

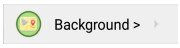
12.2 Manage cadastral Internet WMS Server

Note 12.2.1

This option assumes that an Internet connection is available on the terminal Android.

To be read 12.2.1

*Cadastre flow can only be displayed with the coordinate system **RGF93** and the projection **Lambert 93**.*

- Click on 
- Click on 

- Click on 

- Enter the name of the city or the unique ID (INSEE Code) of the city

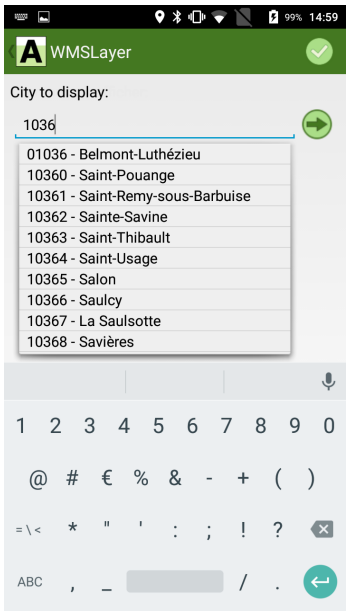


Figure 12.4: Select the city with the ID code

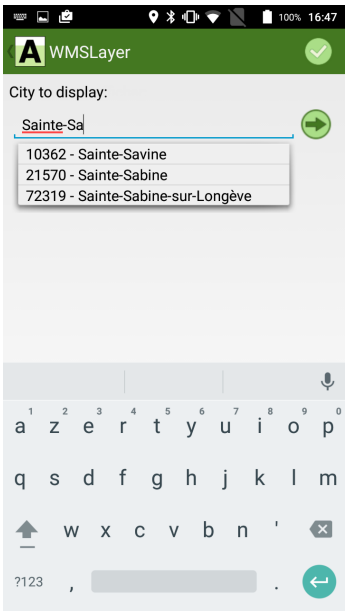


Figure 12.5: Select the city with the name

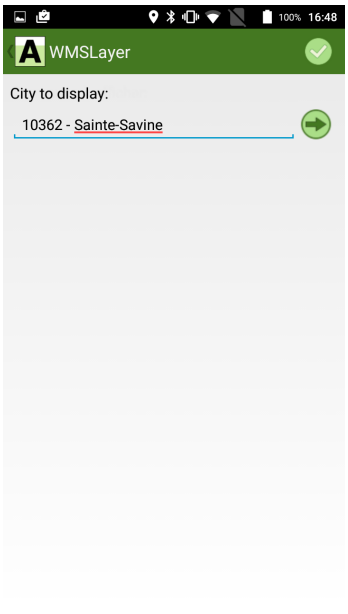
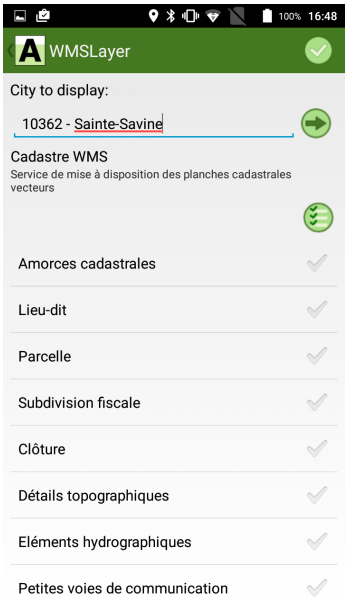


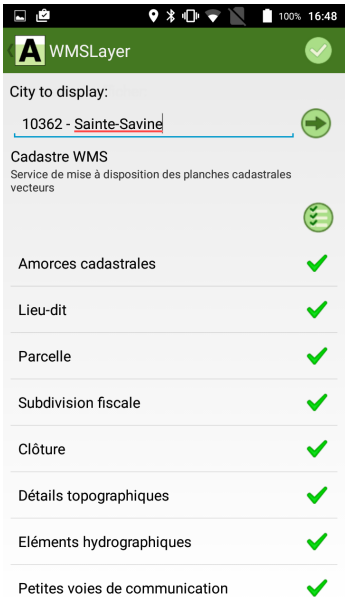
Figure 12.6: Valid city selection

- Click on  to list the layers to display in the ***Map*** view

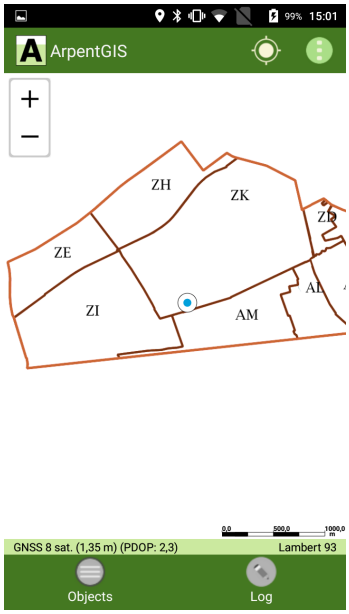


- Select the layers to display

(or)
- Click on  to select all layers



- Click on  to validate the selection and display the cadastral layers in the *Map* view



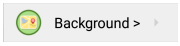
12.3 WMS background connection

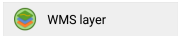
Note 12.3.1

This option assumes that an Internet connection is available on the terminal Android.

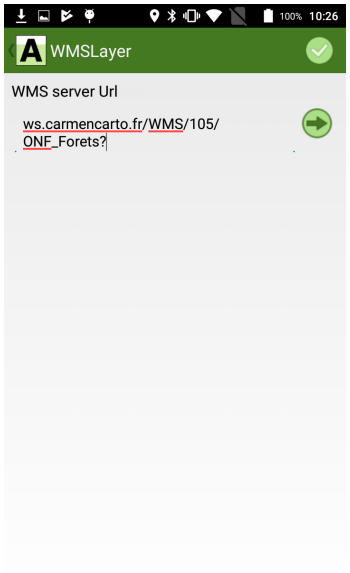
To be read 12.3.1

Check if the coordinate system in which the flow is provided is consistent with the coordinate system defined in ArpentGIS-Android software.

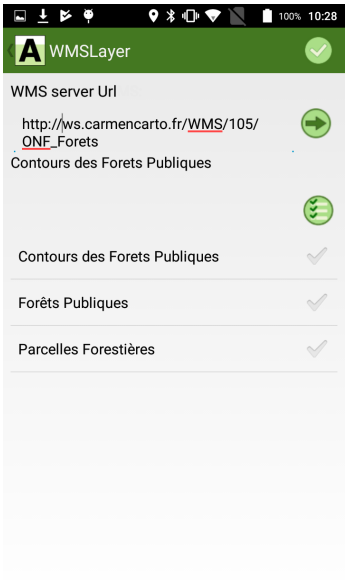
- Click on 
- Click on 

- Click on 

- Enter the WMS address

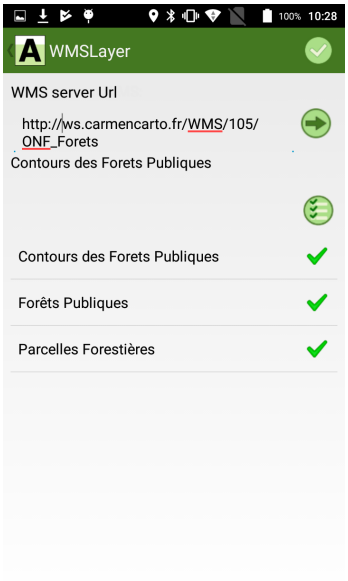


- Click on  to list the layers to display in the ***Map*** view

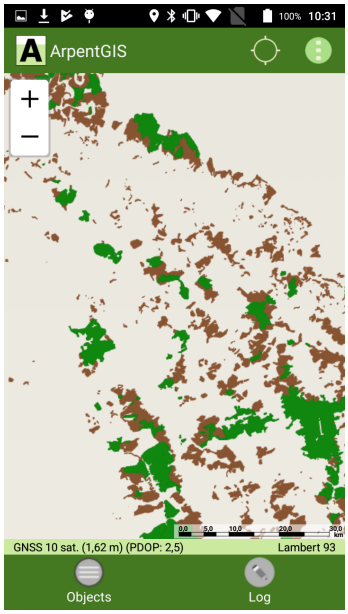


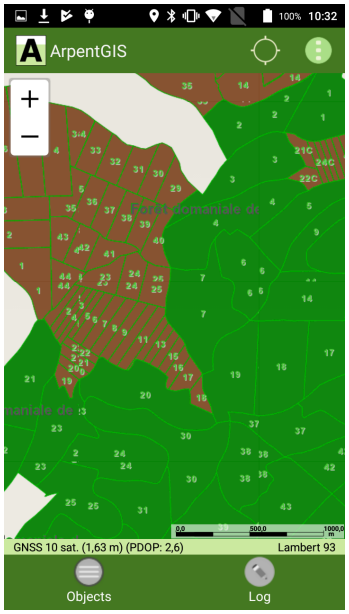
- Select the layers to display

(or) - Click on  to select all layers



- Click on  to validate the selection and display the layers of the flow in the ***Map*** view





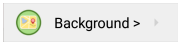
12.4 Display a WMS or cadastral WMS stored in cache

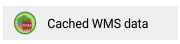
Note 12.4.1

This option assumes that an Internet connection is available on the terminal Android.

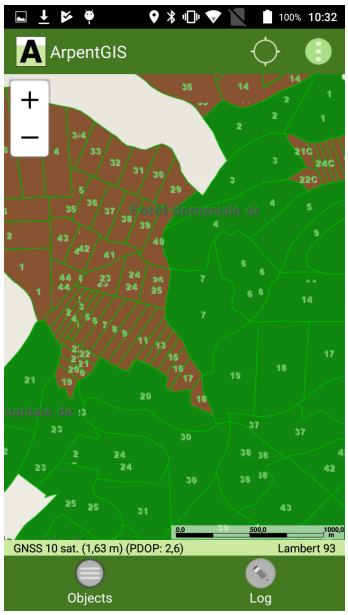
To be read 12.4.1

Check if the coordinate system in which the flow is provided is consistent with the coordinate system defined in ArpentGIS-Android software.

- Click on 
- Click on 

- Click on 

- Check that the WMS connection is valid and the tiles displayed in the map view



To be read 12.4.2

Some information or data might not be displayed especially at certain scales depending on the data stored in cache.

12.5 Vector background files

Extension of vector file	Name and description of the format
shp	Shapefile
agi	*ArpentGIS-Android* or *ArpentGIS-Expert* project file

Table 12.1: List of compatible vector formats

To be read 12.5.1

Before displaying vector backgrounds in ArpentGIS-Android software, check that the coordinate system used by the software fits to the coordinate system of the Shapefile.

To use a vector background follow this procedure :

- Create a folder in the main memory of terminal Android
- Copy in this directory all the files to display in the field

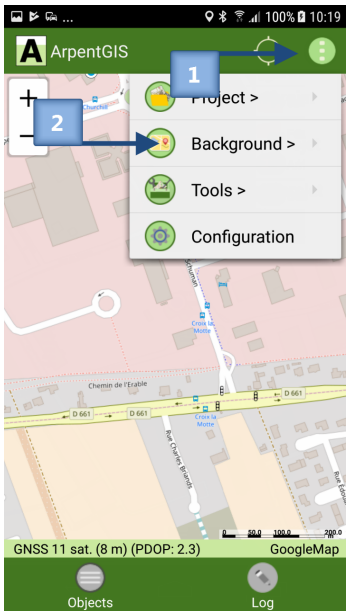


Figure 12.7: Select a "Vector background"

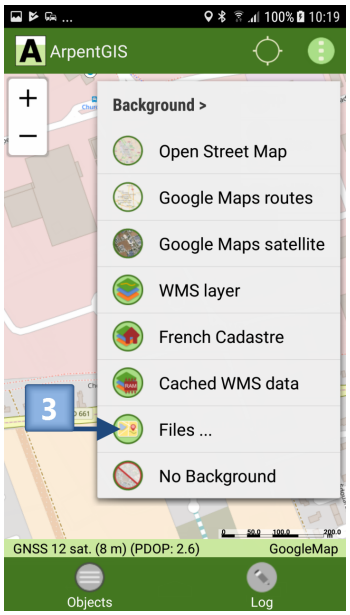


Figure 12.8: Access to the list of files

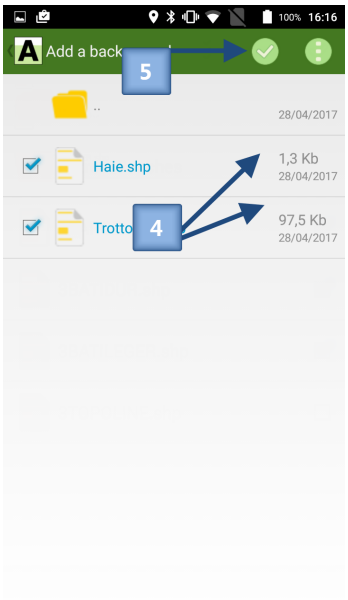


Figure 12.9: Select background files to use

Detail 12.5.1

1. *Select the main menu*
2. *Select* Background >
3. *Select* Files ...
4. *Browse the tree of the terminal Android and check the box of the different files to add.*

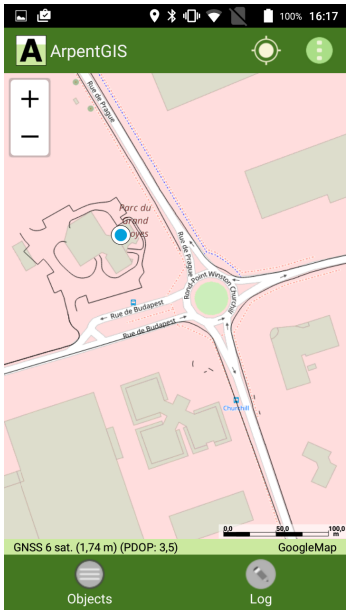
Tip 12.5.1

ArpentGIS-Android is able to open background files contain in different folders. If the user already displayed backgrounds and wants to add new ones, the background files already displayed remain visible once the new ones are added.
To remove loaded background files *see section 12.6.3 on page 103*

Use the option to select all the files in the current folder.

Use the option to deselect all the files in the current folder.

5. *Click on to validate the selection and return to the* ***Map*** *view..*



12.6 Manage Raster background

12.6.1 Structure of a Raster image

Raster images can be displayed as backgrounds in *ArpentGIS-Android*. The compatible formats are listed below along with the format of their associated world files :

Extension of Raster file	Extension of world file	Extension of global world file
tif	tfw	wld

Table 12.2: List of compatible Raster formats

12.6.2 Display in *ArpentGIS-Android*

To be read 12.6.1

Before displaying Raster backgrounds in ArpentGIS-Android, check that the coordinate system used by the software matches the coordinate system used by the image (or images) to be displayed.

To use a Raster background, follow this procedure:

- Create a folder in the main memory of terminal Android
- Copy in this folder all the Raster files to be displayed in the field

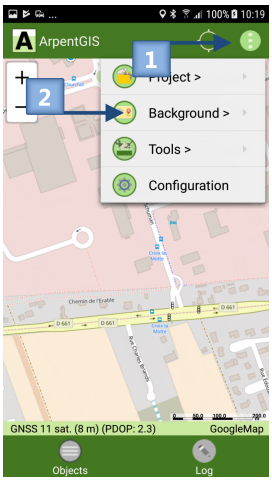


Figure 12.10: Select "Raster background"

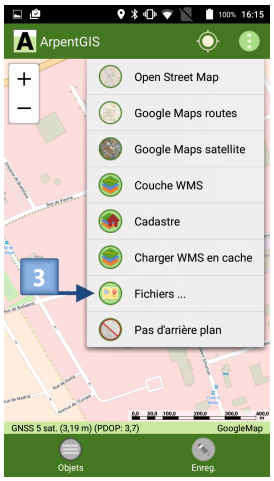


Figure 12.11: Access to the list of files

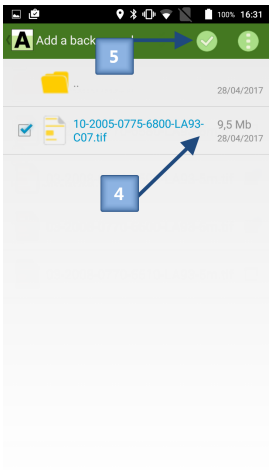


Figure 12.12: Select background files to use

Detail 12.6.1

1. Select the main menu
2. Select Background >
3. Select Files ...
4. Browse the tree of the terminal Android and check the box of the different files to add.

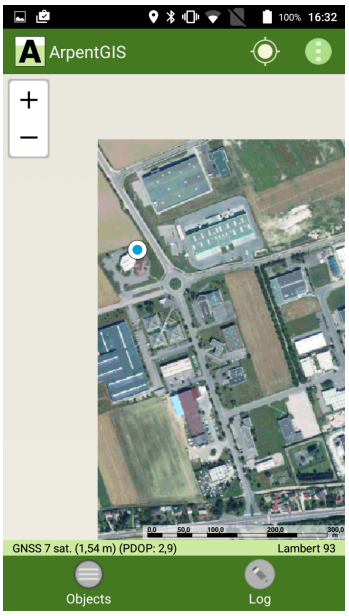
Tip 12.6.1

ArpentGIS-Android is able to open background files contain in different folders. If the user already displayed backgrounds and wants to add new ones, the background files already displayed remain visible once the new ones are added.
To remove loaded background files **see section 12.6.3**

Use the option to select all the files in the current folder.

Use the option to deselect all the files in the current folder.

5. Click on to validate the selection and return to the **Map** view...



12.6.3 Remove background file for the map view *ArpentGIS-Android*

- Click on
- Click on Background >
- Click on No Background. All the backgrounds loaded into the terminal Android will be disabled automatically.

IN THIS CHAPTER

CHAPTER 13

Navigation

The user defines a target with its coordinates in a dialog box. The target can also be defined in the *Map* view after selecting a feature.

13.1 Manually enter target coordinates (without saving coordinates to a project)

This method allows the user to navigate to a point for which they manually enter the coordinates, but these are not stored in a file and cannot be reused. If the user wishes to navigate again to a point whose coordinates he has previously entered, he will have to enter values again.

- Start *ArpentGIS-Android* software
- Click on button and on button
- Click on . It is then possible to manually enter the coordinates of a target to be reached. (Figure 13.1)

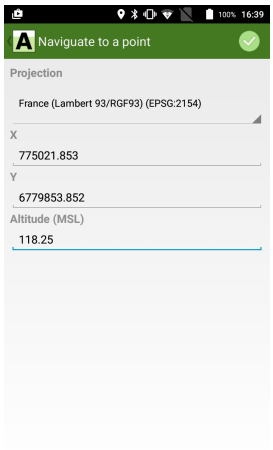


Figure 13.1: Enter manually navigation coordinates of the target

To be read 13.1.1

*The coordinates of the target must be entered using the coordinate system currently used in the application (see chapter 5 on page 39 and **Projection**).*

Note 13.1.1

It is possible to enter the coordinates of a target using the following coordinate systems ***Annex A on page 159, section A.2 on page 160****).*
The entry of coordinates is possible any time in ***Latitude/Longitude (WGS84)****.*

- Click on button in the view (**figure 13.1 on the preceding page**) to access to navigation form.
- To reach the target follow the red arrow and bring the distance and delta coordinates as close as possible to ***zero***.

13.2 Select a target from the map to navigate in compass mode

- Stat the *ArpentGIS-Android* software
- Click on Create a project button to create a new project and create a set of points in the project, or click on Open a project button to open an existing project containing the points to which the user wants to reach.
- Select a point on the ***Map*** view. The label popup window is displayed and allows to navigate in compass mode to the feature
- Click on

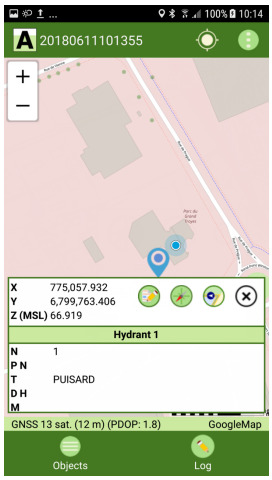


Figure 13.2: Select the target

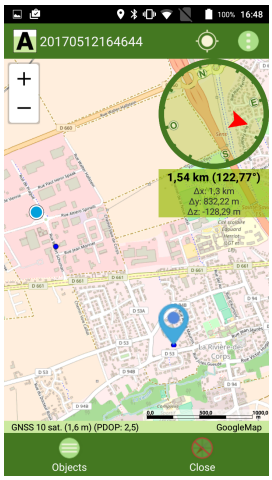


Figure 13.3: Navigation

The application displays a navigation window to indicate the direction to reach the target. This window displays a large direction arrow (behaving like a compass), as well as the remaining distance and deviations in X, Y and Z.

13.3 Select a target from the map view to navigate in step by step mode

- Stat the *ArpentGIS-Android* software

- Click on Create a project button to create a new project and create a set of points in the project, or click on Open a project button to open an existing project containing the points to which the user wants to reach.
- Select a point on the *Map* view. The label popup window is displayed and allows to navigate in step by step mode to the feature
- Click on

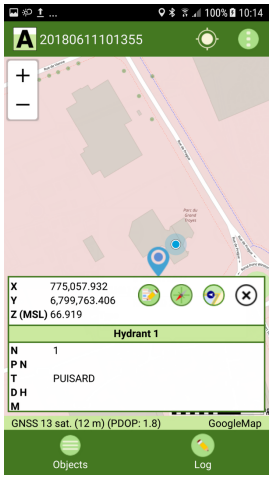


Figure 13.4: Select the target

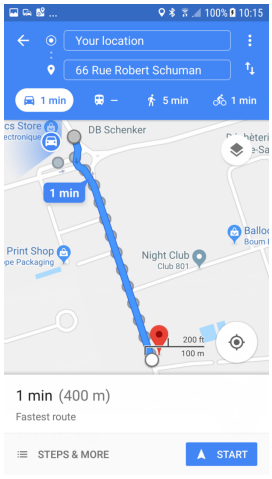


Figure 13.5: Navigation

The terminal Android software automatically toggles to *Google Maps* application and the route is automatically calculated.

13.4 Finish the navigation

To be read 13.4.1

This step assumes that a target has been defined in ArpentGIS-Android software (see sections 13.1 to 13.2 on pages 105–106).

- Click on Close button

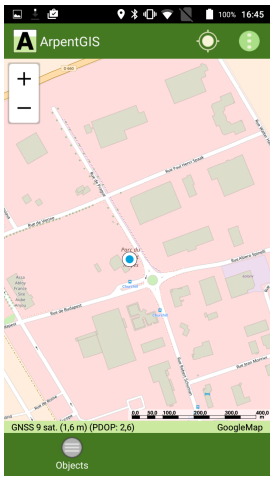


Figure 13.6: End of navigation

PARTIE

IV

Campagne GPS : Analyse et exportation

DANS CETTE PARTIE

IN THIS CHAPTER

Transfer from the PC to the mobile device

CHAPTER 14

File transfer between a computer and an Android handheld

To be read 14.0.1

Make sure the terminal Android is well connected to the PC and display in Windows Explorer.

14.1 Transfer from the PC to the mobile device

- Start Windows Explorer and browse the removable devices to find the terminal Android

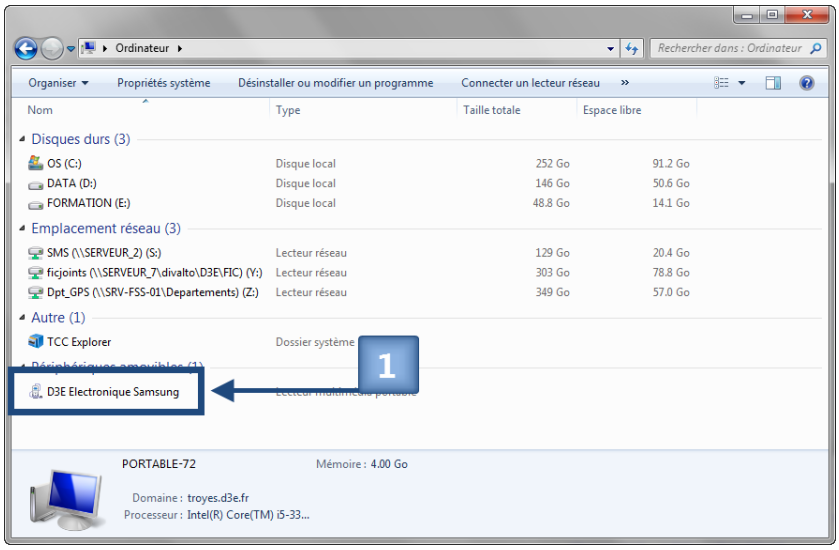
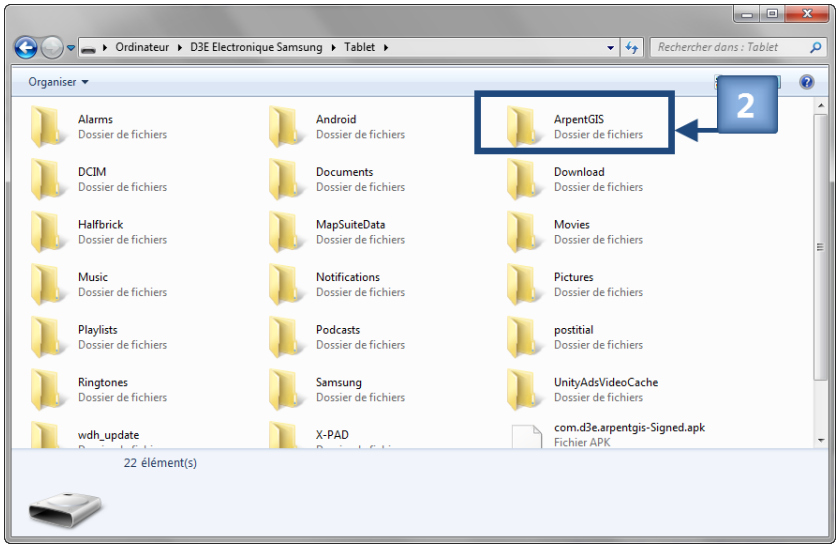


Figure 14.1: AccÃ¨s au terminal Android

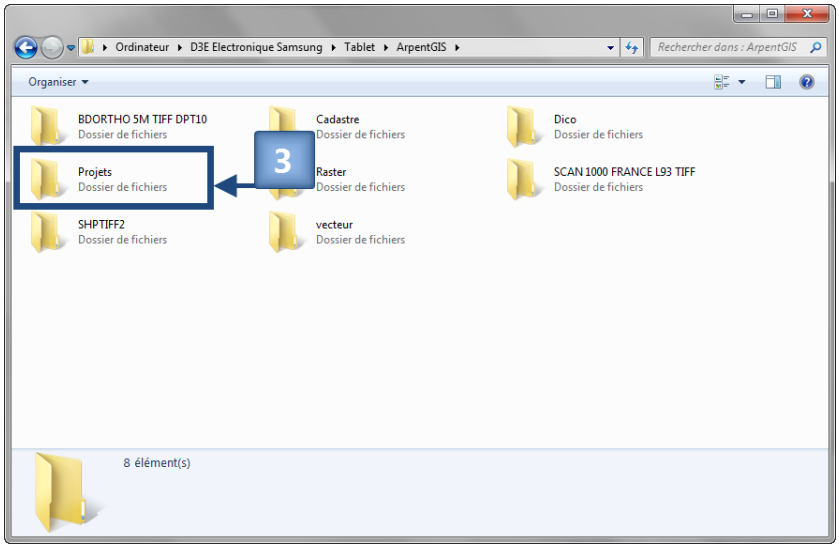
Detail 14.1.1

❶ *Access to the mobile device folder*



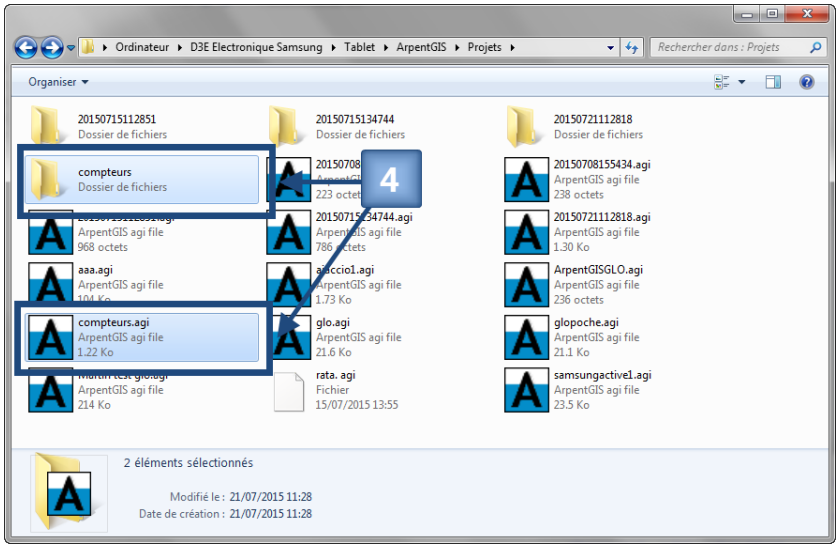
Detail 14.1.2

❷ *Select the folder **ArpentGIS***



Detail 14.1.3

❸ *Navigate to the folder containing the projects of ArpentGIS-Android software*



Detail 14.1.4

❹ *Select the AGI file and the folder (if available) corresponding to the AGI file name. This folder contains the pictures associated with the features collected with ArpentGIS-Android software*

Paste the selected data on the computer and use the ArpentGIS-Expert software options to analyse or export data.

IN THIS CHAPTER

CHAPTER 15

Import/Add data in ArpentGIS-Expert software

15.1 Manage a workspace

ArpentGIS-Expert starts on a new workspace where users can display and manage layers and data. The workspace is composed of different panels described section 3.2 on page 14 and toolbars.

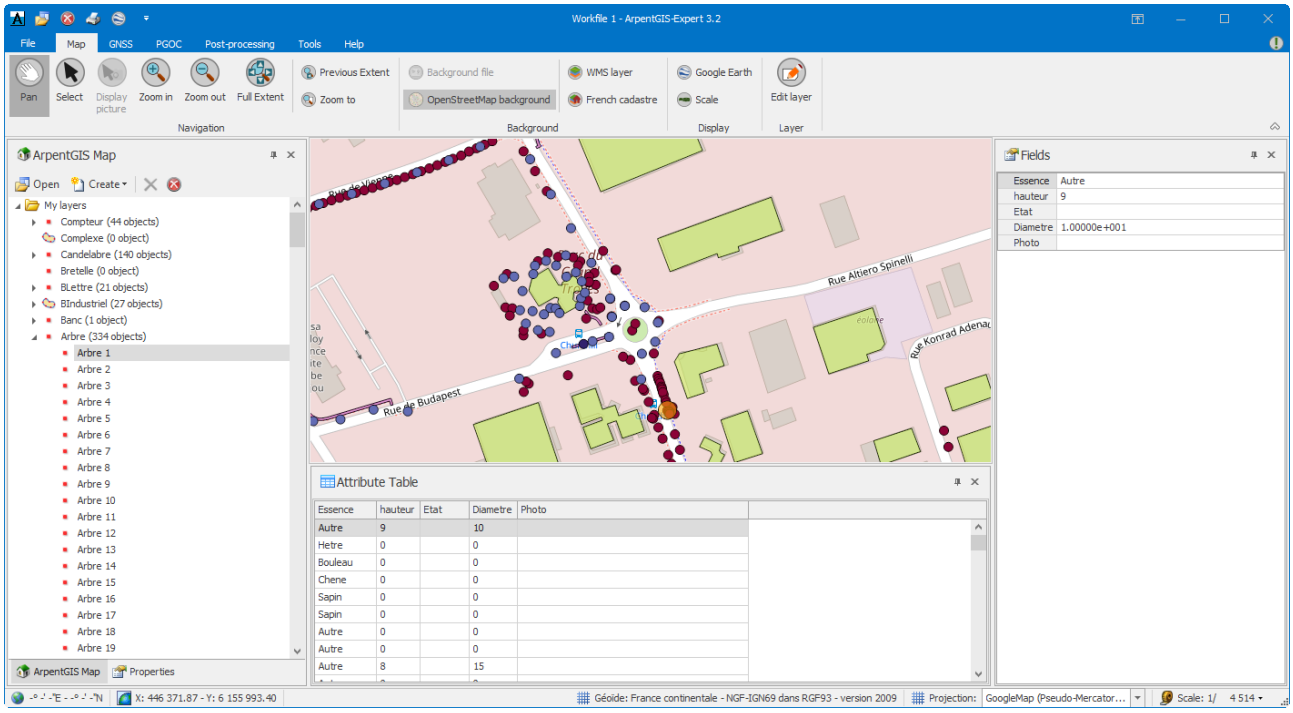
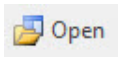


Figure 15.1: ArpentGIS-Expert workspace

15.1.1 Add data to a workspace

To add data file to a workspace click on 

in the panel ***Project*** and select the files. Data can be from different formats and different coordinate systems.
After selecting the coordinate system, the software will display data in the workspace.

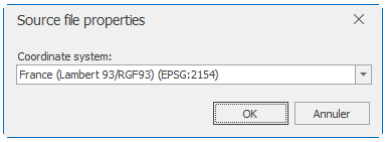


Figure 15.2: Choose the coordinate system

With *ArpentGIS-Expert* software user can manage and display the following file formats :

- ArpentGIS (*.agi)
- Shapefile (* .shp)
- AutoCad (*.dxf, *.dwg)
- CartoExplorer (*.trk/*.wpt)
- MapInfo (*.mif/*.mid)
- GoogleEarth (*.kml)
- Image Tiff (*.tif) - world file *.tfw
- Image ECW (*.ecw) no world file needed
- Image MrSid (*.sid) - world file *.sdw
- Image Jpeg (*.jpg) - world file *.jgw

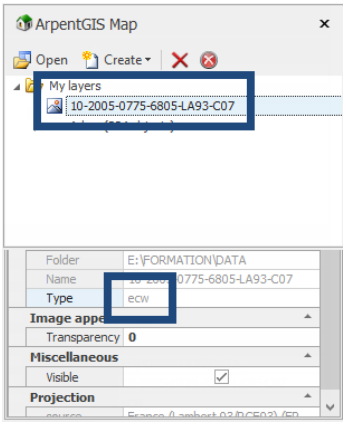


Figure 15.3: Open a background Raster ECW file

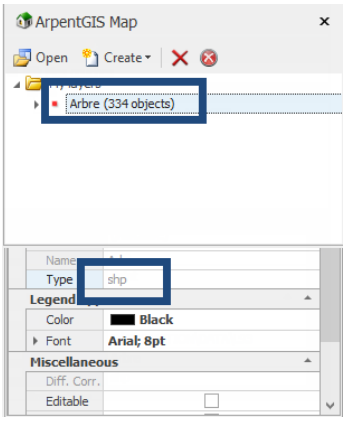


Figure 15.4: Open a Shapefile

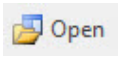
With the opened file user can :

- export the file to a ***AGI*** file (proprietary format of *ArpentGIS-Expert* software) or to a GIS/CAD format (see section 18.1 on page 143)
- used to create a symbol analysis from a selected attribute (see section 16.4 on page 126)
- display/export the features to Google Earth (see section 18.6.2 on page 155)

Tip 15.1.1

To add data file to ArpentGIS-Expert workspace use the "drag & drog" option from Windows Explorer.

15.1.2 Add a CSV file to the current workspace

To add data file to a workspace click on 

in the panel ***workspace*** and select the CSV file.

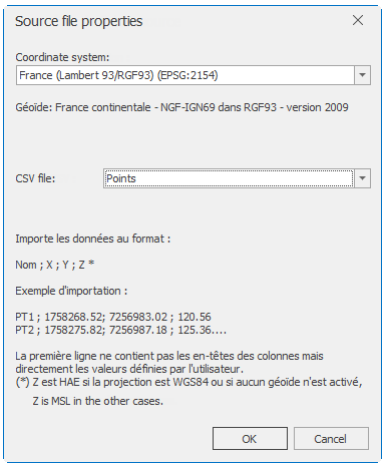


Figure 15.5: Import a points file

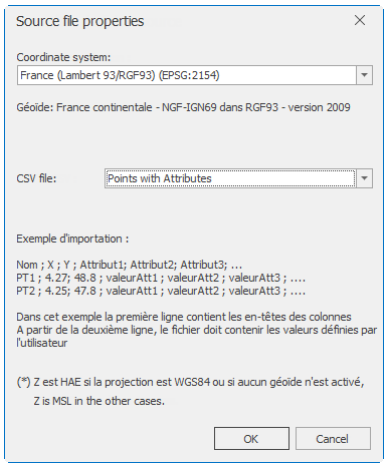


Figure 15.6: Import a points file with attributes

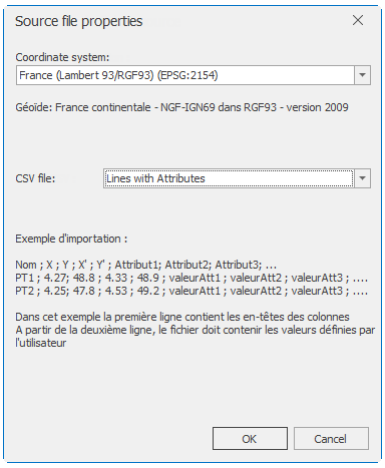


Figure 15.7: Import a points file with attributes

Select the coordinate system and check the format of the CSV file. The file must be one of the following :

- Name (or description) of the point ; X; Y

To be read 15.1.1

No headers on the first line.

(or)
- Name (or description) of the point ; X; Y ; Z

To be read 15.1.2

No headers on the first line.

(or)
- Name (or description) of the point ; X; Y ; Attributes

To be read 15.1.3

The first line of the file must contains the headers of the column.
*The header of the first column must be named "**NAME**".*

(or)
- Name (or description) of the line ; X; Y ; X; Y; Attributes

To be read 15.1.4

The first line of the file must contains the headers of the column.
*The header of the first column must be named "**NAME**".*

Note 15.1.1

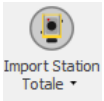
The separator symbol is "Semi-column".
In case of use of Z-values, those must be MSL values if not HAE values would be used.

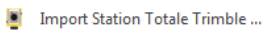
With the opened file user can :

- export the file to a ***AGI*** file (proprietary format of *ArpentGIS-Expert* software) or to a GIS/CAD format (see section 18.1 on page 143)
- used to create a symbol analysis from a selected attribute (see section 16.4 on page 126)
- display/export the features to Google Earth (see section 18.6.2 on page 155)

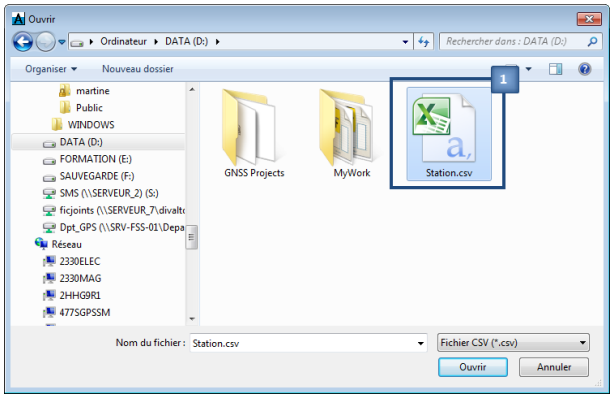
15.2 Import data from a total station

15.2.1 Import data collected with a Trimble M3 total station in *ArpentGIS-Expert* software in the case of a CSV export on a USB stick from the station

- Click on the ***Tools*** tab in the manage toolbar and select the tool 

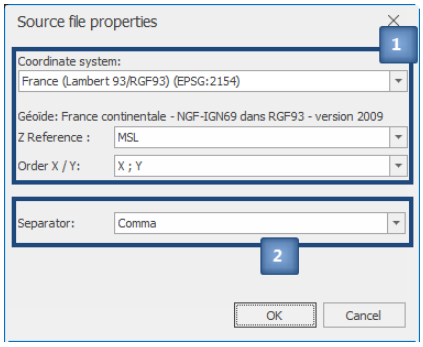
and 

to add the total station file to the workspace of *ArpentGIS-Expert* software



Detail 15.2.1

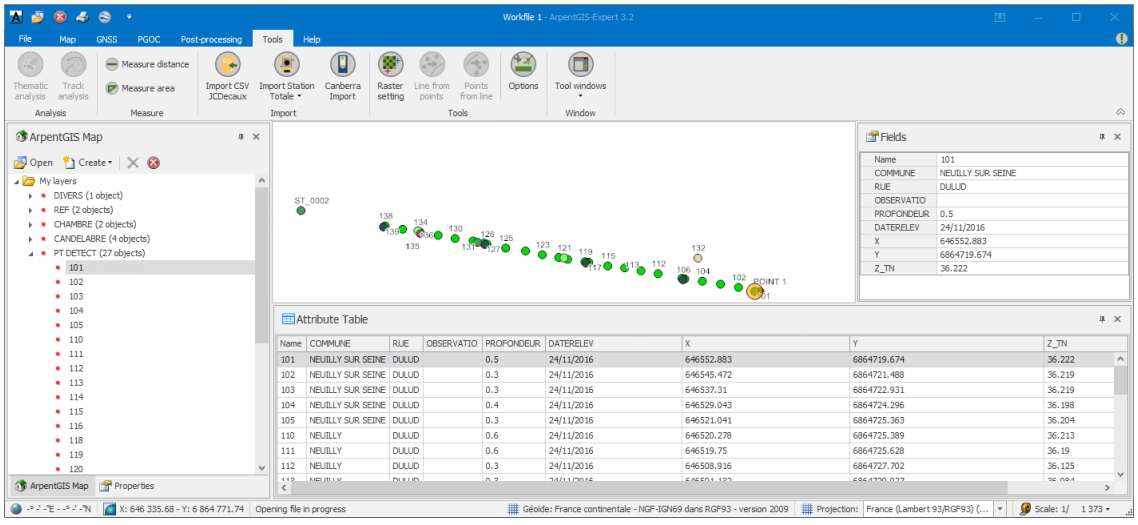
❶ *Select a total station file*



Detail 15.2.2

❶ *Select the coordinate system used for the CSV file, the altitude reference frame (HAE or MSL) and the sorting order of the coordinates*
❷ *Select the field separator used in the file*

Wait till the end of the import process and check the display of the layers in the map view of ArpentGIS-Expert software



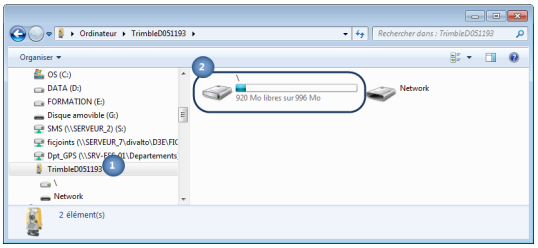
With the imported file user can :

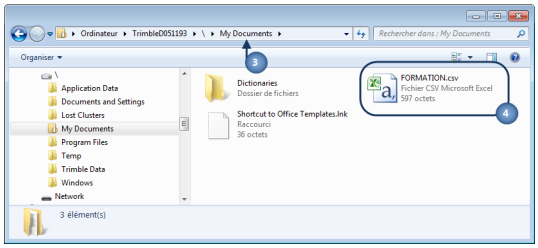
- export the file to a ***AGI*** file (proprietary format of *ArpentGIS-Expert* software) or to a GIS/CAD format (see section 18.1 on page 143)
- used to create a symbol analysis from a selected attribute (see section 16.4 on page 126)
- display/export the features to Google Earth (see section 18.6.2 on page 155)

15.2.2 Integration of data collected with a Trimble M3 total station in *ArpentGIS-Expert* software in the case of a CSV export copy to the main memory of the station

To be read 15.2.1

Ensure that the total station is connected to the PC and recognized by the PC with Windows Device Center. For more information, see page ??.





Detail 15.2.3

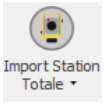
1. *Select the total station in the list of available devices*
2. *Select internal storage of the device*
3. *Browse to the folder containing the CSV file generated from the station*
4. *Select the CSV file corresponding to the job in the station and copy the file to the computer*

Follow the procedure section 15.2.1 on page 117 to integrate the CSV file to the *ArpentGIS-Expert* software.

With the imported file user can :

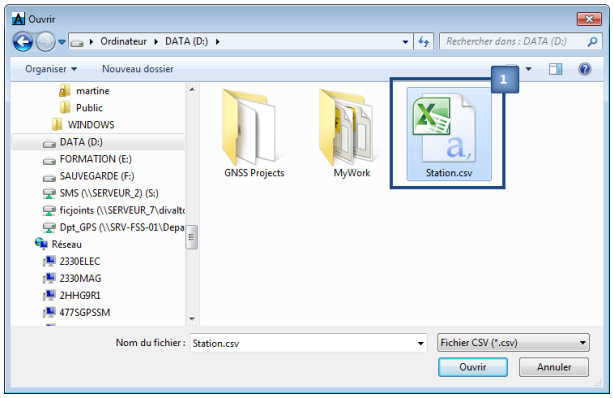
- export the file to a ***AGI*** file (proprietary format of *ArpentGIS-Expert* software) or to a GIS/CAD format (see section 18.1 on page 143)
- used to create a symbol analysis from a selected attribute (see section 16.4 on page 126)
- display/export the features to Google Earth (see section 18.6.2 on page 155

15.2.3 Import data collected with a Geomax Zoom 80/90 total station in *ArpentGIS-Expert* software in the case of a CSV export on a USB stick from the station

- Click on the ***Tools*** tab in the manage toolbar and select the tool 

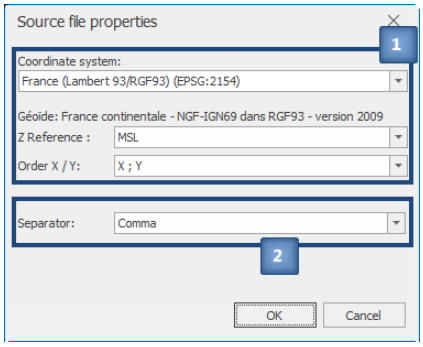
and 

to add the total station file to the workspace of *ArpentGIS-Expert* software



Detail 15.2.4

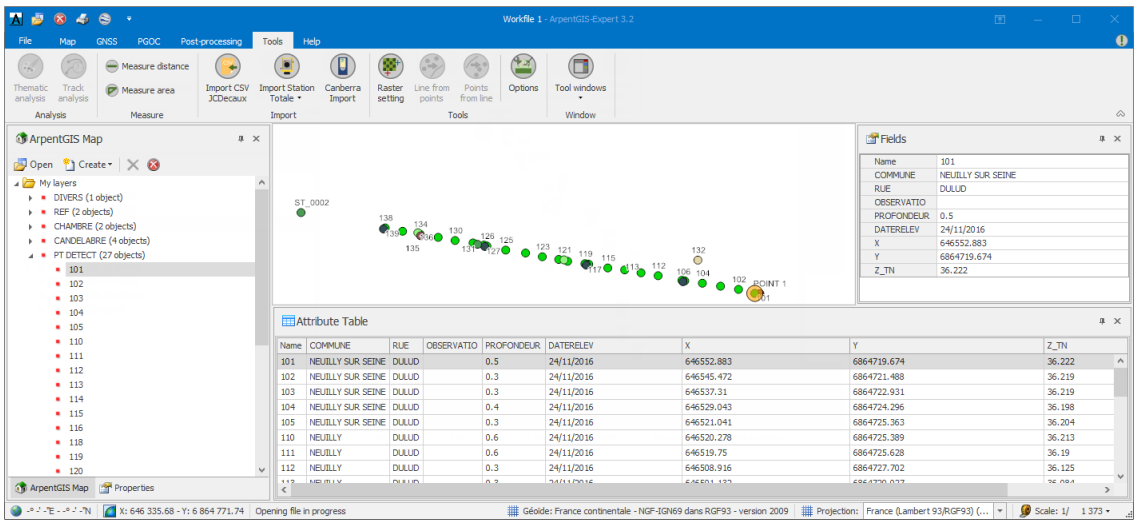
❶ *Select a total station file*



Detail 15.2.5

❶ *Select the coordinate system used for the CSV file, the altitude reference frame (HAE or MSL) and the sorting order of the coordinates*
❷ *Select the field separator used in the file*

Wait till the end of the import process and check the display of the layers in the map view of ArpentGIS-Expert software



With the imported file user can :

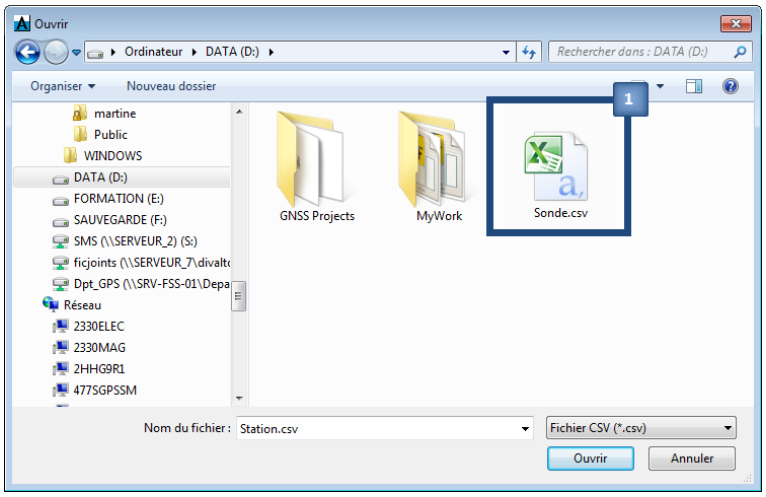
- export the file to a ***AGI*** file (proprietary format of *ArpentGIS-Expert* software) or to a GIS/CAD format (see section 18.1 on page 143)
- used to create a symbol analysis from a selected attribute (see section 16.4 on page 126)
- display/export the features to Google Earth (see section 18.6.2 on page 155)

15.3 Import data from an external sensor to a workspace

15.3.1 Import data collected with a Colibri probe®

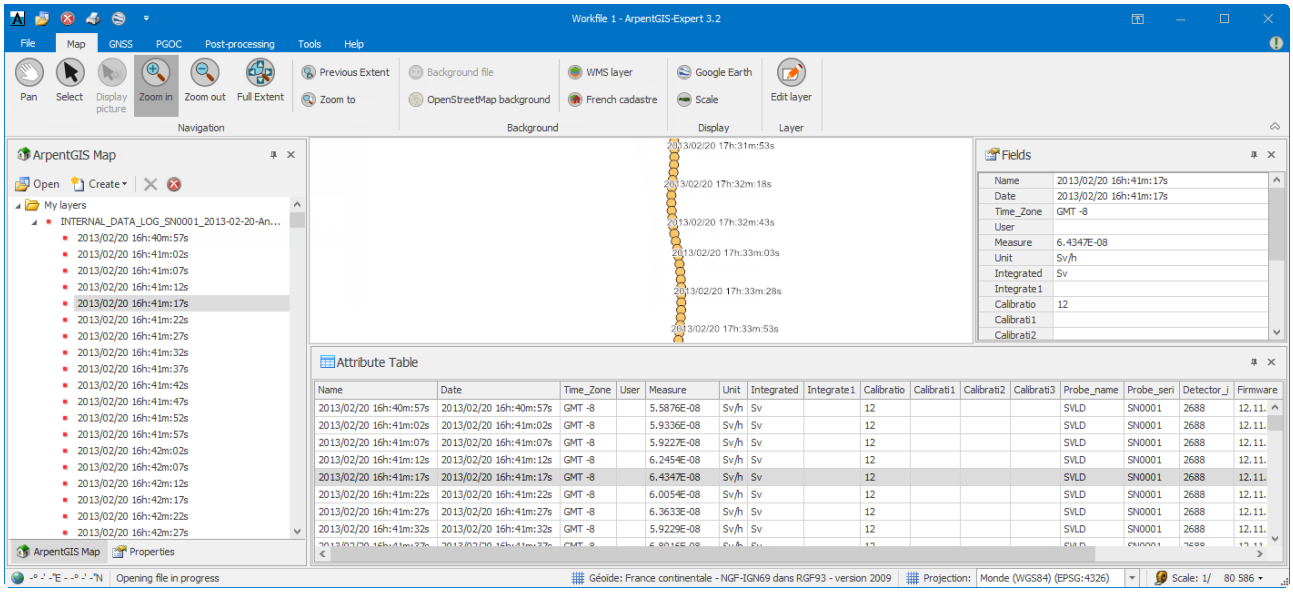
- Click on the ***Tools*** tab in the Manage toolbar and select the tool 

to add a total station file to the workspace of *ArpentGIS-Expert* software



Detail 15.3.1

❶ *Select a file containing data collected with a Colibri® probe. Wait till the end of the import process and check the display of the layer in the map view of ArpentGIS-Expert software*



With the opened probe file user can :

- export the file to a ***AGI*** file (proprietary format of *ArpentGIS-Expert* software) or to a GIS/CAD format (see section 18.1 on page 143)
- used to create a symbol analysis from a selected attribute (see section 16.4 on page 126)
- display/export the features to Google Earth (see section 18.6.2 on page 155)

IN THIS CHAPTER

CHAPTER 16

Manage data and files in ArpentGIS-Expert software

16.1 Manage a layer in the workspace

In the workspace, a geographic dataset is set as a layer. Each layer has specific properties (***Properties*** panel) to identify the data source (file type), display optins, label value ...

Properties	For	For the area
Font	manage the font, size and color of the label displayed for the layer	Police: BankGothic Lt ...
Cor. Diff.	check the post-processing status	Corr. diff.: Oui
Editable	manage layer editing in the workspace	Editable: ☐
Visible	manage the display of the layer in the workspace	Visible: ☑
Legend	display a label on the features in the layer associate to a field of the layer	Légende: REVETEMENT
Objects	display the number of objects for the layer	Objets: 55
Data/Type	display the data type for the layer	Type: Ligne
Dictionary	display the data dictionary used in the field	Dictionnaire: Leve_topo_DZ.fdi
Folder	display the folder containing the source of the layer	Dossier: C:\Documents ...
Name	display the name of the layer	Nom: Trottoir
File/Type	view the format of the layer source file	Type: shp
Source	display the projection defined for the layer	Source: LambertIIe

Table 16.1: Common properties

Properties	For	For the area
Color	manage the display color of the layer. **All features in the layer will be displayed the same way**	Couleur: 19; 233; ...
Symbol	manage the symbol of the layer. **All features in the layer will be displayed the same way**	Symbole: Défaut

Table 16.2: Properties for point features only

Properties	For	For the area
Thickness	manage the line thickness of the line	Epaisseur 1
Pen	manage the type of representation for the line	Stylo Dot
Line	manage the line color for the layer.**All objects in the layer will be displayed the same way**	Trait 255; 0...
Transparency	manage the transparency of the layer	Transparence 2

Table 16.3: Properties for line features only

Propertie	For	For the area
Hatching	manage the representation of the layer, hatching, fill ...	Hachure LargeGrid
Filling	manage the display color of the layer. **All features in the layer will be displayed the same way**	Remplissag 255; ...
Transparency	manage the transparency of the layer	Transparen 0

Table 16.4: Properties for area features only

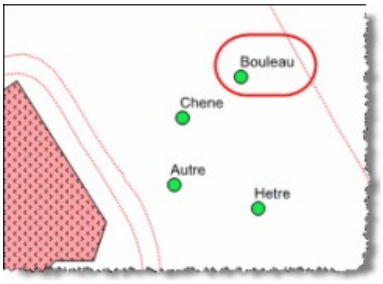


Figure 16.1: Display a label

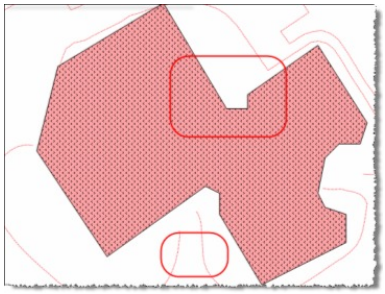


Figure 16.2: Manage the display of layers (hatches and dotted lines ...)

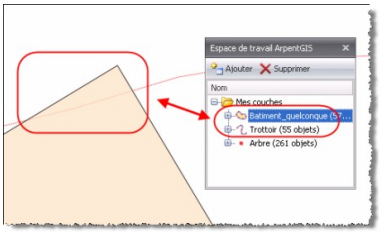


Figure 16.3: Transparency

The edits made on one of the properties described above are automatically apply in the map view.

16.2 Navigate in the map view

Use the menu Map from the *Manage* toolbar of *ArpentGIS-Expert* software to view objects recorded by GPS and to select features, to view attributes, to zoom or to measure distances between objects. These graphical tools can be found in the toolbox of *ArpentGIS-Expert* software, accessible via the following menu :

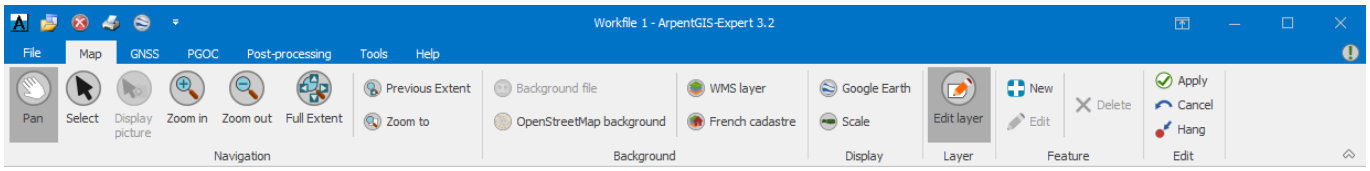


Figure 16.4: ArpentGIS-Expert Navigation tool

Tool	For
	Pan the map
	Select a feature on the map view
	Display a picture associated to a feature
	Zoom in on the map view
	Zoom out on the map view
	Return to previous zoom
	Zoom to full extents of the layers
	Zoom to the extents of a selected layer
	Display a background worldwide layer (decametric accuracy)
	Display OpenStreetMap background WMS layer
	Display a background WMS layer
	Display a cadastral background WMS layer (France only). Choose the layers to display
	Export automatically data to Google Earth
	Start edition for the select layer
	Create a new feature
	Move, resize the selected feature
	Delete nodes in the selected layer
	Delete the selected feature
	Apply edits for the selected feature
	Cancel edits
	When creating a feature, snap nodes of the new feature on existing features nodes

Table 16.5: Select the right tool to navigate in the map view

16.3 Order data layers

Use "drag & drop" option in the workspace to change the order of the different layers with the mouse (icon). The layer at the top of the list corresponds to the top layer in the "Map" view

- Figure 16.5, the layer "Puit" will be placed under the layer "Repere"

To place a data layer below a specific layer, use the "drag & drop" option shown by the icon

- Figure 16.6, the layer "Puit" will be placed under the layer "Pts_Part" and at the end of the list.

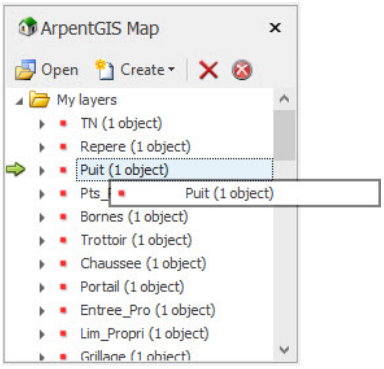


Figure 16.5: Display order management

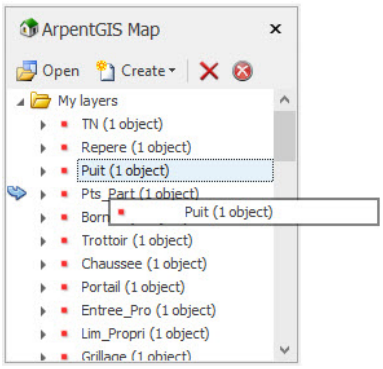


Figure 16.6: Placing a layer under another

16.4 Thematic analysis

Part of the job of a cartographer is to analyze geographic data. This analysis mainly consists of being able to identify easily the features of a layer that share a specific property or to analyze the spatial classification of features.
ArpentGIS-Expert software has a thematic analysis function to identify, according to a specific attribute, and for specific thresholds, the features of a layer.

Note 16.4.1

- *The thematic analysis window is a dockable window (movable in the interface of ArpentGIS-Expert software)*
- *Only one thematic analysis is available at a time*
- *The latest thematic analysis can be reused by clicking on* Last
- *The analysis can be reset by clicking on* Reinit

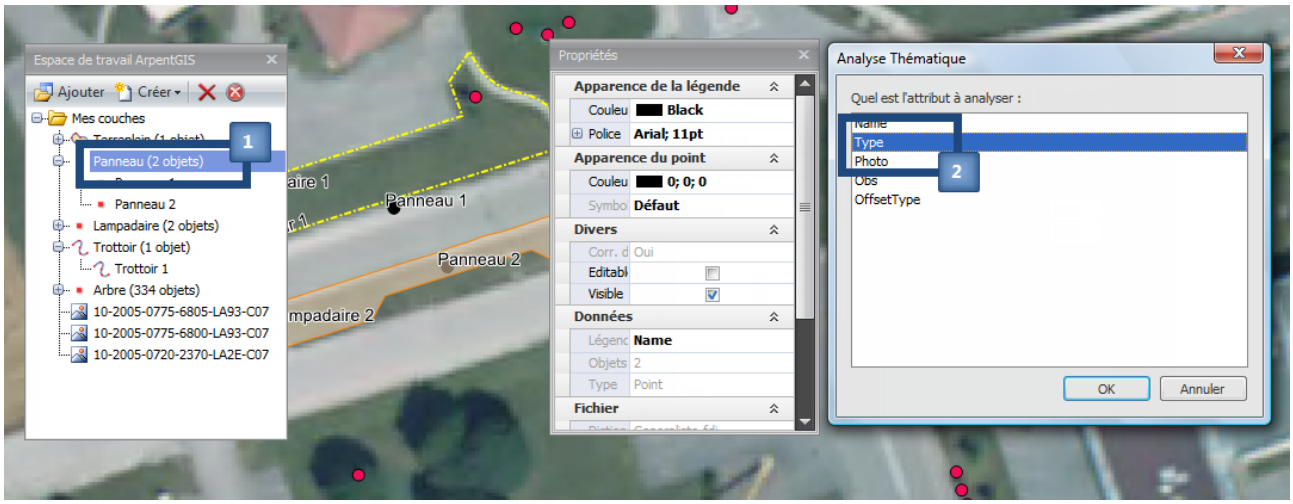


Figure 16.7: Choose the attribute to use for the thematic analysis

Detail 16.4.1

1. *In the* Tools *tab, select the layer and click on* 
2. *Choose the attribute on which the analysis will be achieved*

- Click on OK to start analysis. The thematic analysis window is opened and displays the thresholds or values defined for the analysis (up to 20). Choose the symbology for the different values.

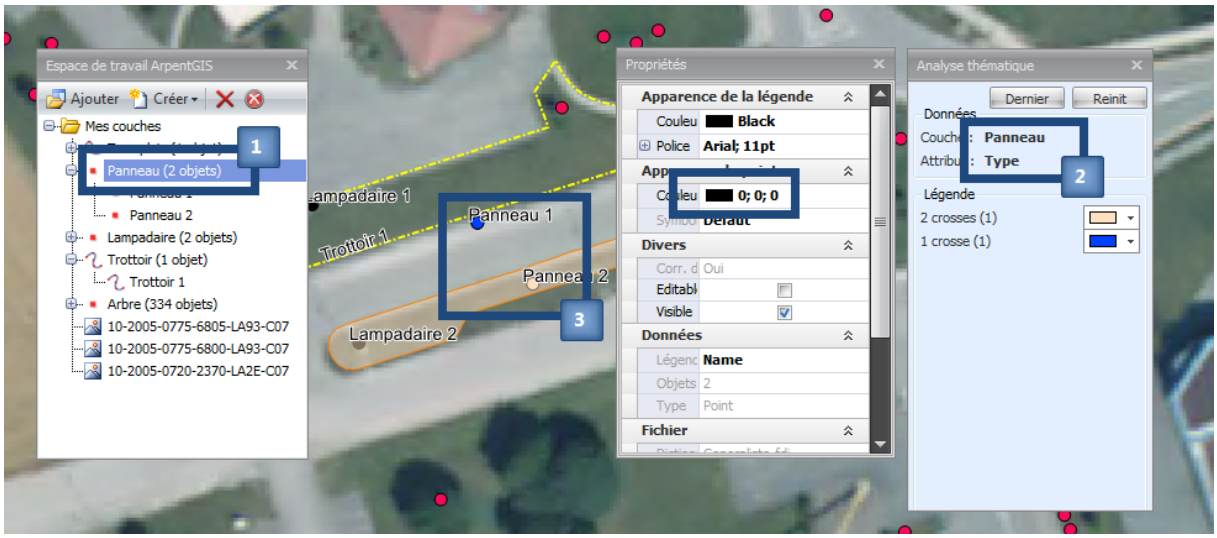


Figure 16.8: Defining symbology for the thematic analysis

Detail 16.4.2

1. *Choose the layer*
2. *Settings of the thematic analysis*
3. *Display the analysis on the map view*

- To cancel the thematic analysis, click back on 

Note 16.4.2

When exporting data to Google Earth, the colors associated with the layers are preserved, including any thematic analysis.

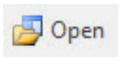
Tip 16.4.1

This analysis can be used, for example, to highlight the measurements made with an RD4000 or RD8000 locator or to highlight a survey performed with a luxmeter device.

16.5 Manage backgrounds

16.5.1 Display worldwide background layer

ArpentGIS-Expert software is provided with a worldwide background layer to be easily used to display GPS data.
Use this tool to print a detail map especially if the user does not have his own backgrounds (orthophotography, scans ...). Use this option to highlight RD4000 or RD8000 locator measurements.

- Click on 

in the ***Workspace*** panel to add a layer
- Click on  to add the background layer
- If necessary, click on  to zoom out to view the background layer.

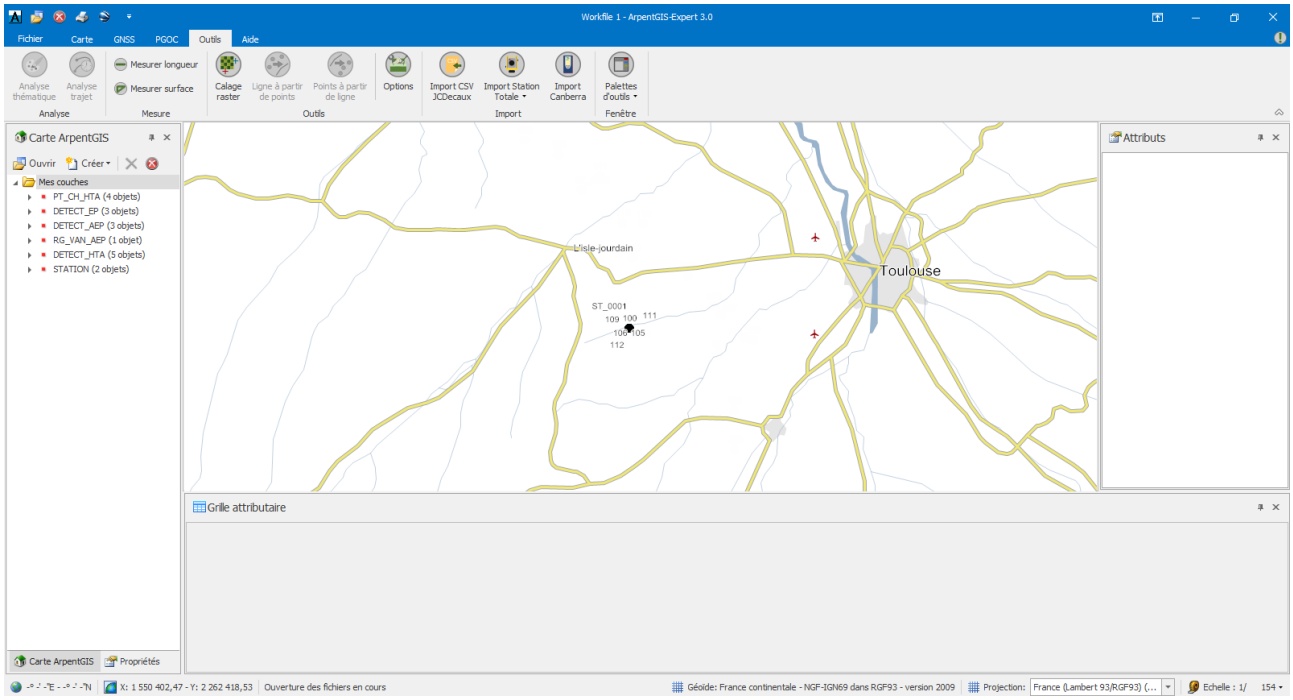


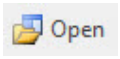
Figure 16.9: Display worldwide background

16.5.2 Display OpenStreetMap layer

Note 16.5.1

This section requires the use of an Internet connection on the computer.

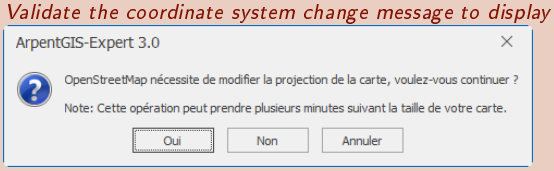
The worldwide background layer described above is a low detail background, but adequate for some large scale applications. For finer applications that require more details for background, *ArpentGIS-Expert* software can use OpenStreetMap background layer.
Use this tool to print a detail map especially if the user does not have his own backgrounds (orthophotography, scans ...). Use this option to highlight RD4000 or RD8000 locator measurements.

- Click on 

in the ***Workspace*** panel and add a layer
- Click on  to add the background layer

To be read 16.5.1

*To display the OpenStreetMap background layer it is necessary that the map view projection is set to (**Google Map**). Validate the coordinate system change message to display the background layer.*



- *Click on* 

to add the layer with the projection change
- *Click on* 

to cancel the projection change. Loading of layer is cancelled
- *Click on* 

to cancel loading. Loading of the layer stops

- If necessary click on  to zoom out to view the background layer.

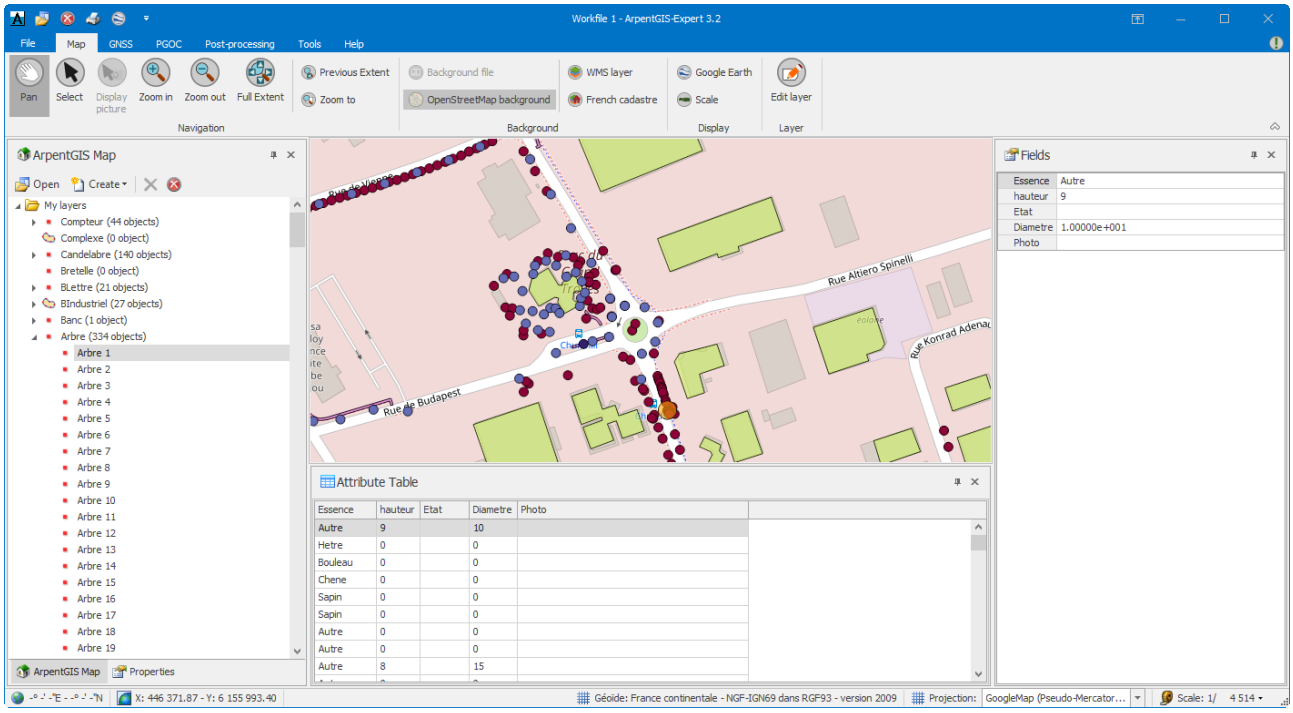
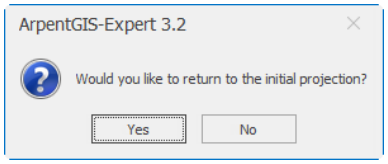


Figure 16.10: OpenStreetMap background

- To remove the OpenStreeMap background layer, click back on  . Validate the message to toggle the map back into the coordinate system used before displaying the OpenStreetMap background layer

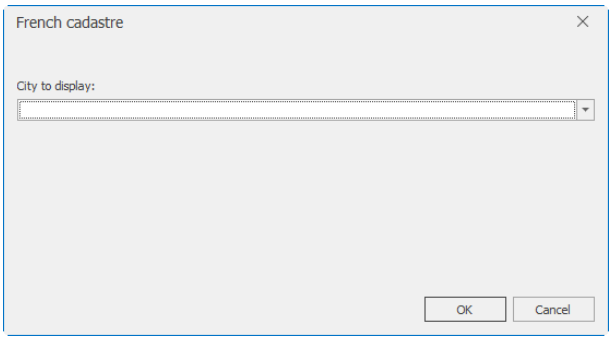


16.5.3 Manage cadastral WMS connections

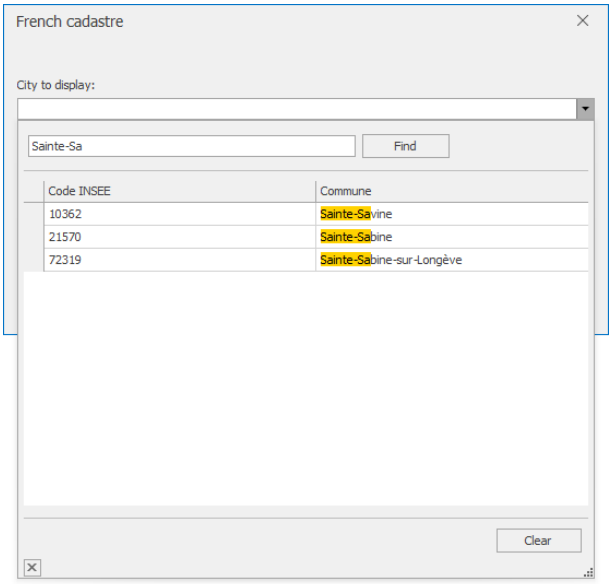
Note 16.5.2

This section requires the use of an Internet connection on the computer.

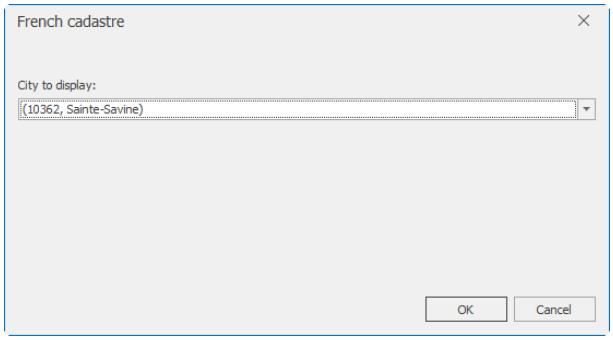
- Click on Open in the ***Workspace*** panel to add a layer
- Select the projection ***Lambert 93*** Projection: France (Lambert 93/RGF93) (...
- Click on to prompt the display wizard



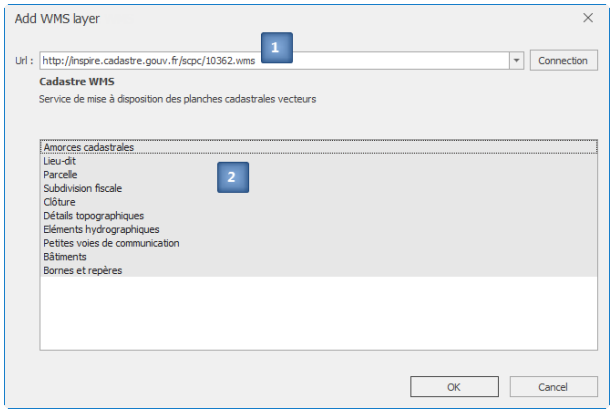
- Enter the ***INSEE Code*** or the ***City Name*** in the text box. Intuitive search makes it easy to find suitable cities name for ongoing research



- Select the city to display and click on OK



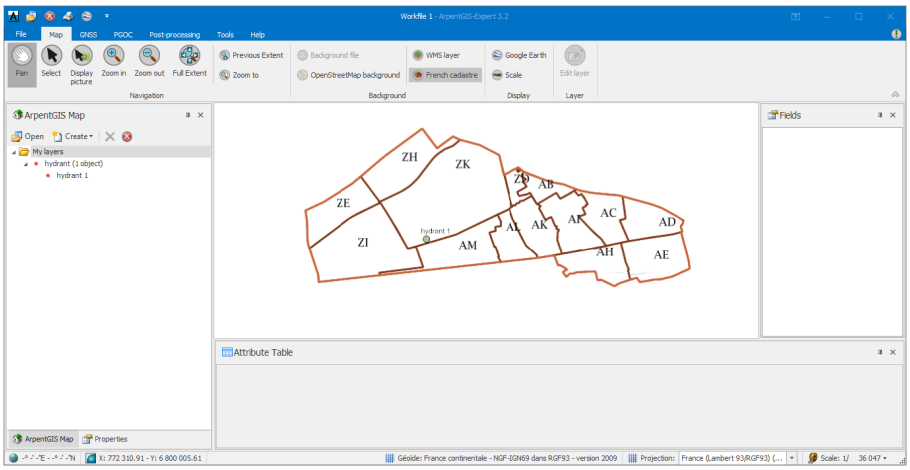
- Select the layers to display in *ArpentGIS-Expert* software



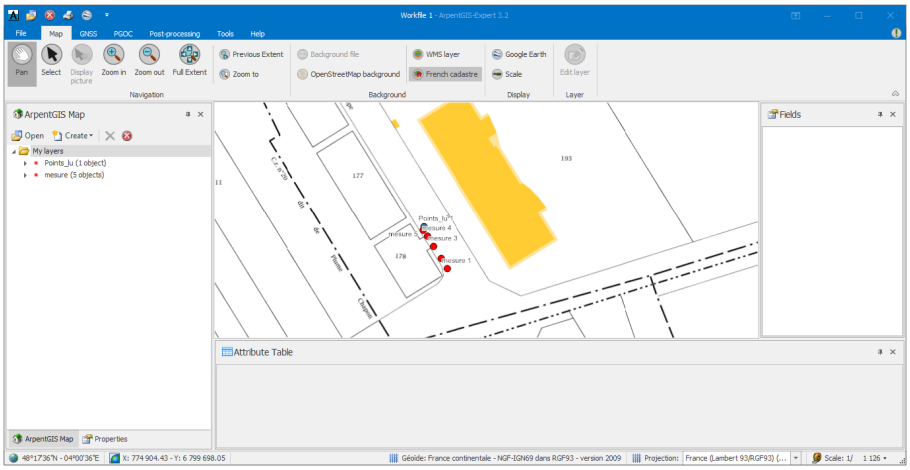
Detail 16.5.1

1. *Check the url WMS cadastral Server*
2. *Selecting layers to display in the **Map** view*

- Click on OK and check that the content of the WMS url is displayed in the ***Map*** view



- Click on  to zoom to the extents of the displayed data



16.5.4 Manage WMS Server

Note 16.5.3

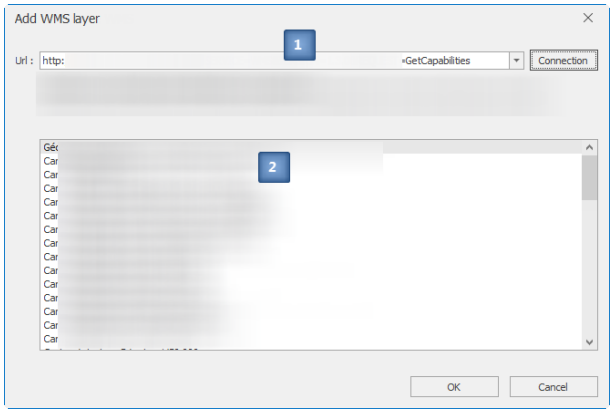
This section requires the use of an Internet connection on the computer.

- Click on Open in the ***Workspace*** panel to add a layer
- Select the projection associated with the WMS Server Projection: France (Lambert 93/RGF93) (...

Note 16.5.4

This projection can change from one WMS Server to another. ArpentGIS-Expert software does not allow reprojection on the fly of Raster files.

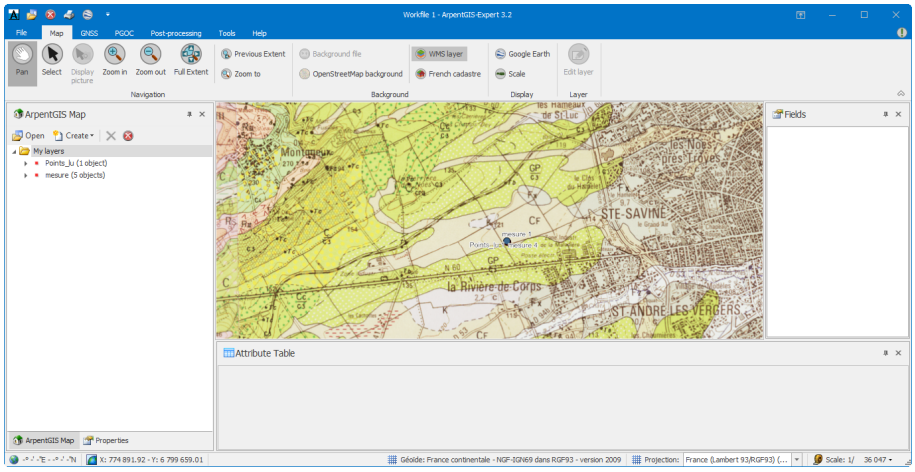
- Click on to start the display wizard
- Select the layers to display in *ArpentGIS-Expert* software



Detail 16.5.2

❶ *Check the url WMS Server*
❷ *Selecting layers to display in the* ***Map*** *view*

- Click on OK and check that the WMS Service is displayed in the ***Map*** view



16.6 Preview and printing

The option ***Preview*** is accessible through the menu File. Click on Print... Print Map View to start the printing wizard.

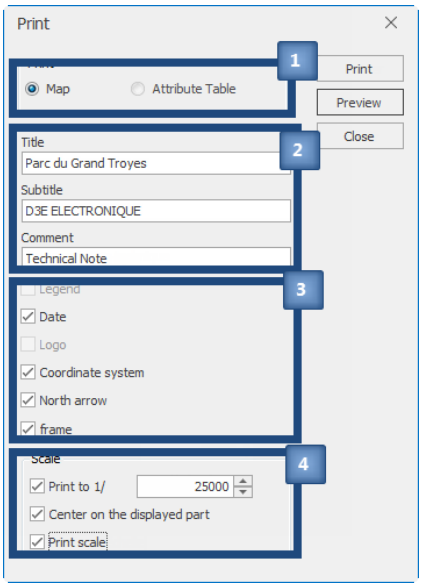


Figure 16.11: Printing settings

Detail 16.6.1

1. *Printing type (Map or attributes)*
2. *Choose the title of the document, the subtitle (optional), a comment (optional)*
3. *Display the date, legend, logo, projection system and North arrow*
3. *Choose the printing scale and settings*

- Click on "Preview" to access the preview window

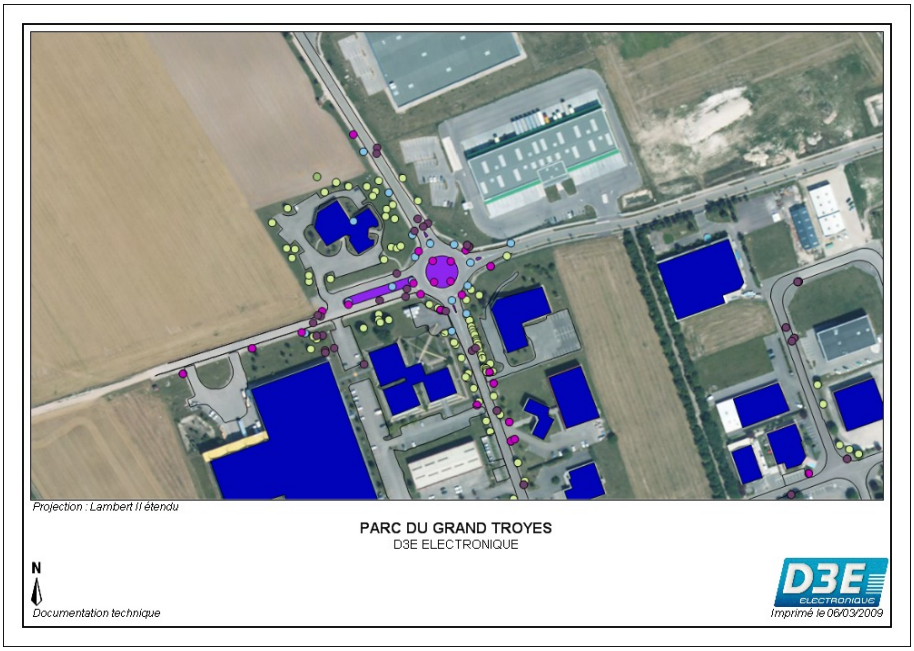


Figure 16.12: Preview before printing

- Click on ***Print*** or on  to print the document
- The printing will contain :
  - the scale
  - the title of the document
  - the subtitle
  - the comment
  - the date
  - the legend

IN THIS CHAPTER

CHAPTER 17

Create layers and features in ArpentGIS-Expert software

Use *ArpentGIS-Expert* software to create layers and digitize data. These layers can be Point, Line or Area features and will have a text attribute ***Comment***.
This function will be particularly useful when digitizing on specific backgrounds (vector or Raster) and for which the user does not want a very high survey accuracy.

17.1 Create layers

To access the new layer creation option, start the *ArpentGIS-Expert* software by choosing one of the following options :

- Click on ***Start/Programs/ArpentGIS/ArpentGIS-Expert***

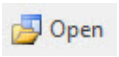
(or)
- Double click on the icon 

on the Windows Desktop.

To be read 17.1.1

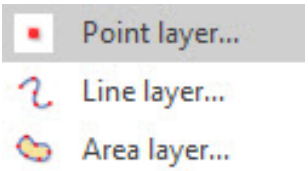
*In order to use the layer creation option it is necessary that a layer had been opened in the **Map** view of ArpentGIS-Expert software.*

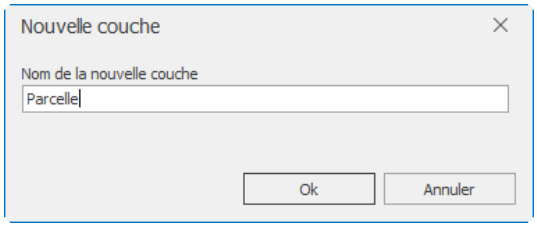
To create a new layer follow this procedure :

- Add a new background layer by clicking on 

- Click on 

and choose the geometry of the layer (Point, Line or Area)





- Enter a name for the new layer
- Click on ***OK***
- Click on  to start an edit session
- Check in the ***Workspace*** panel the layer had been created and is set to editable : symbol  .

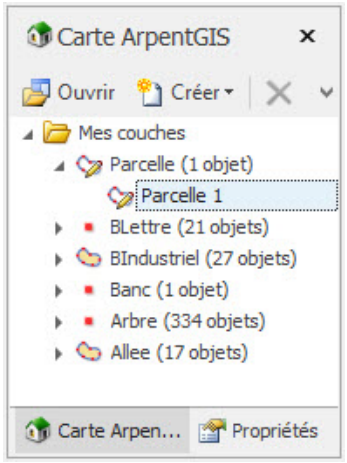


Figure 17.1: The created layer is editable...

- In the ***Map*** tab of the main toolbar *ArpentGIS-Expert*, in the ***Feature*** group click on New
- in the ***Map*** view of *ArpentGIS-Expert* software click, with the mouse, as much as needed on the screen :
  - One click for a point feature
  - At least two times for a line feature
  - At least three times for an area feature
- Double clik, with the mouse, to end the construction of the feature

Figure 17.2: Create an area feature

- In the ***Map*** tab of the main toolbar *ArpentGIS-Expert*, in the group ***Edit*** click on Apply to validate the feature creation
- Check that the object is selected: the object is highlighted in the ***Map*** view
- In the ***Properties*** panel, for the selected feature, if necessary enter a value for the attribute ***Name***. See figure 17.3 on the next page
- Repeat these edit steps to create other objects if needed.
- Click on to end the edit and creation session

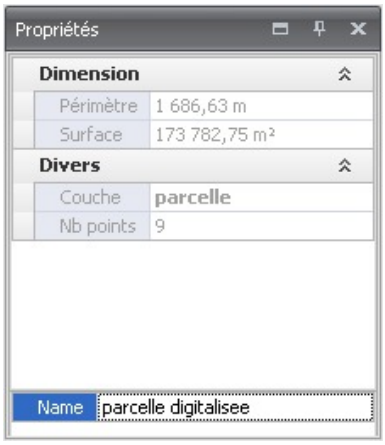


Figure 17.3: Enter attributes for the selected feature

17.2 Geometric edits of line and area features

To be read 17.2.1

Geometric edit of objects is only possible on Shapefiles.

- Click on Open in the ***workspace*** panel to add a new layer
- Use the tool to select the object to edit
- Click on Edit to display the vertices of the object
- Use the mouse, click on one of the vertices and move it
- Click on Apply to save the edits
- Click on to end the edit session. Repeat the method described above to modify other objects. Click on to save the edits

Figure 17.4: Move a node

Detail 17.2.1

The new vertex is displayed with the icon

- To create a new vertex, click on one of the parts, the vertex will be created at the position of the click

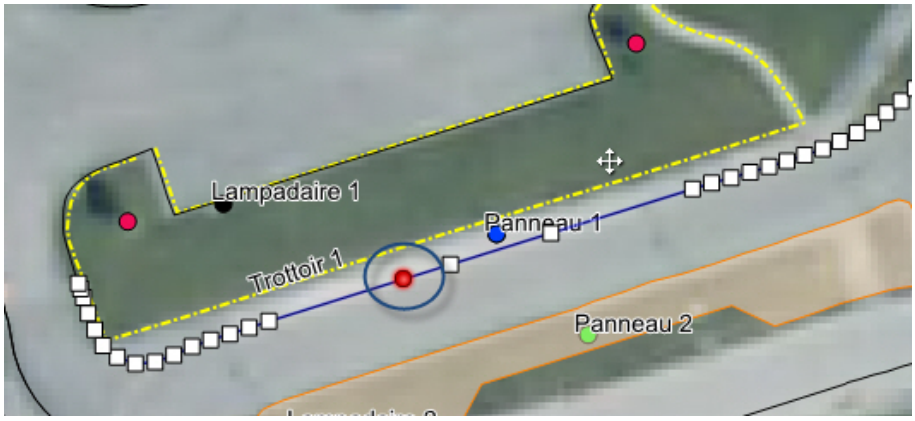


Figure 17.5: Create a new vertex

Detail 17.2.2

The new vertex is displayed with the icon

17.3 Geometric edits of point features

- Click on Open in the ***Workspace*** panel to add a new layer
- Click on to start an edit session
- Use the tool o select the feature to edit
- se the mouse to move the object to its new location
- Click on Apply to save the edits
- Click on to end the edit session. Repeat the method described above to modify other objects. Click on to save the edits

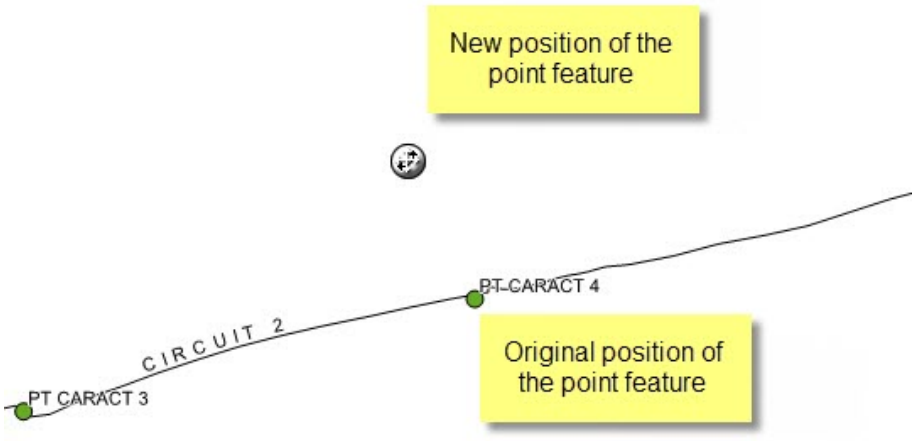


Figure 17.6: Move a point feature

Tip 17.3.1

Few comments on the digitization and edit options :

- *In the **Map** tab, in the workspace **Edit** Click on* Annuler *to cancel the creation of the object or edits made to the object*
- *For any object created in the **Map** view, if a layer is editable and an object is selected, click on* Delete *to delete the object from the layer.*

To be read 17.3.1

The layer created with ArpentGIS-Expert software is not automatically saved. To save changes to this layer, click on Fichier*, select the menu* Export Export Map view or attribute table *and select a file format appropriate for a GIS software or export data to an AGI file in order to use it back in ArpentGIS-Expert software or ArpentGIS-Android software.*

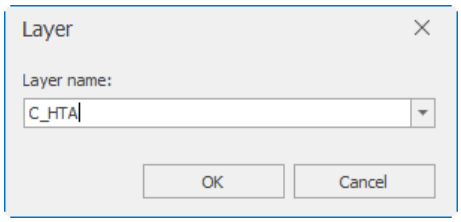
17.4 Create lines from points

To access the option of creating lines from point features, start the *ArpentGIS-Expert* software by choosing one of the following options :

- Click on ***Start/Programs/ArpentGIS/ArpentGIS-Expert***

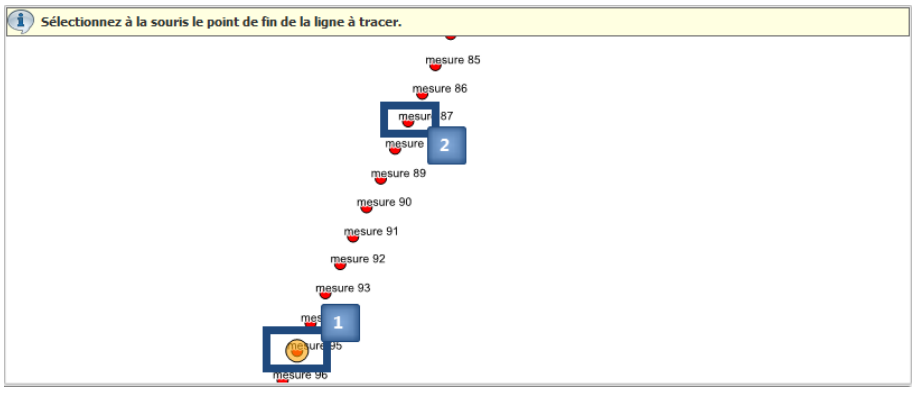
(or)

- Click on the icon ArpentGIS Expert on the Windows Desktop.
- Click on Open in the ***Workspace*** panel to add a new data layer or an AGI file
- Select a point feature layer
- Click on Tools in the ***Manage*** toolbar of *ArpentGIS-Expert* software ; select the tool
- As displayed on top of the ***Map*** view, select the start poin, of the line and the end point of the line
- Enter or select a layer name (line feature) that will store the line created by the tool



Note 17.4.1

If necessary, the thumbnail can be used to zoom in on the area of the selected line for which a start or end point should be selected.



Detail 17.4.1

1. *Select the start point of the line*
2. *Select the end point of the line*

- The line connecting the points included between the start point and the end point is automatically displayed in the ***Map*** view. In the case of a new layer, the layer it automatically added to the tableof contents and the workspace

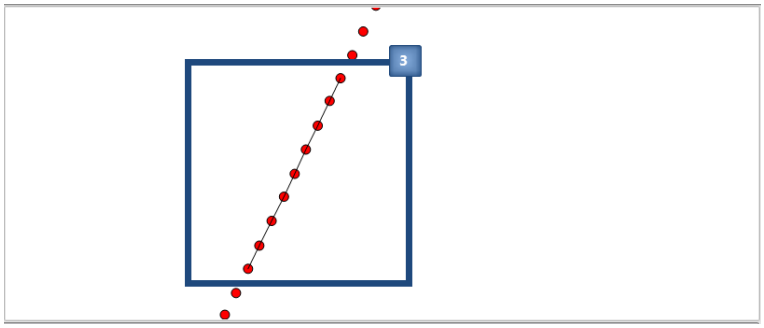


Figure 17.7: Line successfully created in the Map view

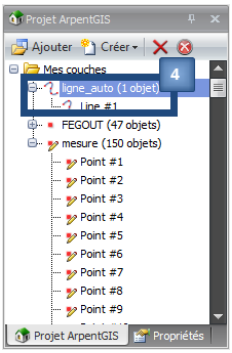


Figure 17.8: Display the line feature in the workspace

- Repeat the method described above to create as many lines as necessary
- The project, including previously created lines, can be exported in a GIS/CAD or text format (see section 18.1 on page 143)

Note 17.4.2

This tool is particularly recommended when recreating lines constituting a network (water, electricity, gas ...). when collecting data in the field with an underground locator.

Tip 17.4.1

*Before exporting data it is possible to edit the name of the lines created by this tool by starting an editing session on the layer in ArpentGIS-Expert software and by editing the value of the attribute "**Name**" in the "**Attributes**" panel.*

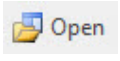
17.5 Create point features from a line feature

To access the option of creating points from a line feature, start the *ArpentGIS-Expert* by choosing one of the following options :

- Click on ***Start/Programs/ArpentGIS/ArpentGIS-Expert***

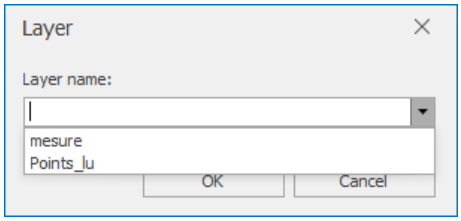
(or)
- Click on the icon 

on the Windows Desktop.

- Click on 

in the ***Workspace*** panel to add a layer or an AGI file
- Select a line feature layer
- Select a line feature within the feature layer previously selected
- Click on 

In the ***Manage*** toolbar of *ArpentGIS-Expert* software ; Then select the tool 
- Enter or select a layer name (point feature layer) that will store the created points



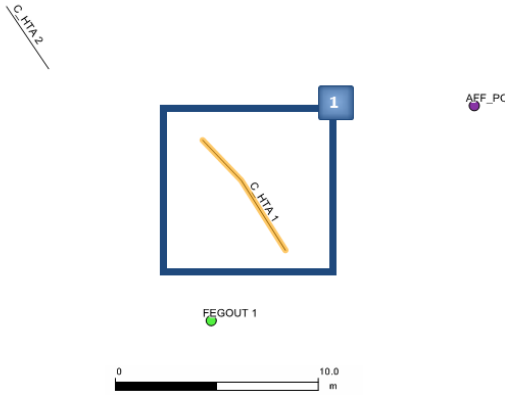


Figure 17.9: Select a line in the Map view

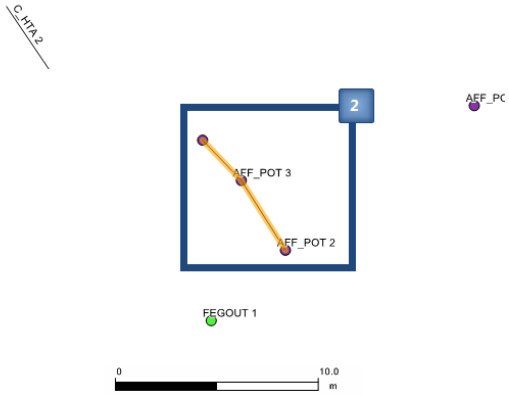


Figure 17.10: Points displayed in the Map view

Detail 17.5.1

1. *Select the line on which the point features will be created*
2. *Check that the point features have been created*

- Point features are automatically added to the ***Map*** view. In the case of a new layer, the layer it automatically added to the tableof contents and the workspace
- Repeat the method described above to create as many points as necessary
- The project, including previously created points, can be exported in a GIS/CAD or text format(see section 18.1 on page 143)

Note 17.5.1

This tool is particularly recommended when recreating the points constituting a network (water, electricity, gas ...).

Tip 17.5.1

*Before exporting data it is possible to edit the name of the point features created by the tool by starting an editing session on the layer in ArpentGIS-Expert software and by editing the value of the attribute "**Name**" in the "**Attributes**" panel.*

IN THIS CHAPTER

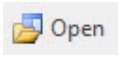
CHAPTER 18

Export data

18.1 Export data to a GIS/CAD or text editor software

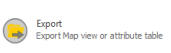
18.1.1 General features

A project (***AGI*** file) from *ArpentGIS-Android* software is a proprietary format (none lisible in a GIS/CAD software). In order to view the files in a GIS/CAD software it is necessary to use export option of *ArpentGIS-Expert* software to generate compatible files.

- Click on 

in the ***workspace*** panel to add a file to the current workspace in *ArpentGIS-Expert* software
- Select a coordinate system in the ***Map*** view (

). This will be used as the current export coordinate system
- Click on 

and select the menu 

. The different export formats are described in the table 18.1

Tool	For
	Export the AGI file to another AGI file (used when geometric edits have been made on the source file)
	Export the AGI file as SHP files (one per layer). An export folder will be requested from the user
	Export the AGI file as MIF / MID files (one per layer). An export folder will be requested from the user
	Export the AGI file to a configurable text file to be used as a spreadsheet (MS Excel, Calc ....)
	Export as a template-based DGN file and cell library for integration into Microstation
	Export as a model-based DGN file and cell library for Microstation integration with accuracy analysis for a locator detection / depth measurements
	Export the AGI file as a DXF file associated to a predefined template file (without blocks attributes)
	Export the AGI file as a DXF file associated to a predefined template file (with blocks attributes)
	Export the AGI file as a KML file that can be opened in Google Earth
	Export to a script for integration in Microstation
	Export the AGI file as a georeferenced Raster file (JPG or PNG format)
	Export the AGI file as CartoExplorer files (one per layer). An export folder will be requested from the user
	Export the AGI file as a specific CSV file (a single CSV file for all layers)
	Export the AGI file as files compatible with the Hub software. An export folder will be requested from the user

Table 18.1: Select the right tool to export a file

Note 18.1.1

Use appropriate GIS, CAD or text editor software to view exported data.

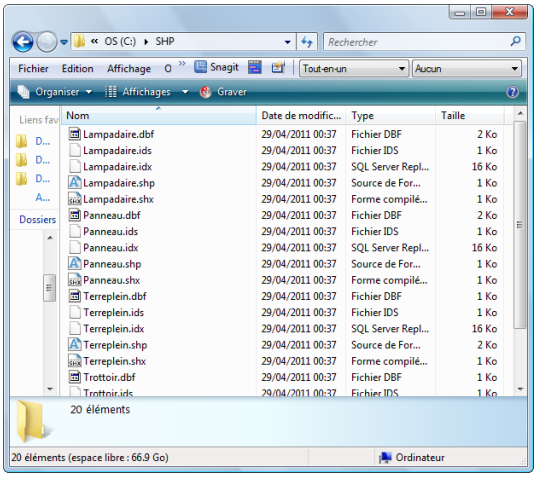


Figure 18.1: Export folder for Shape format

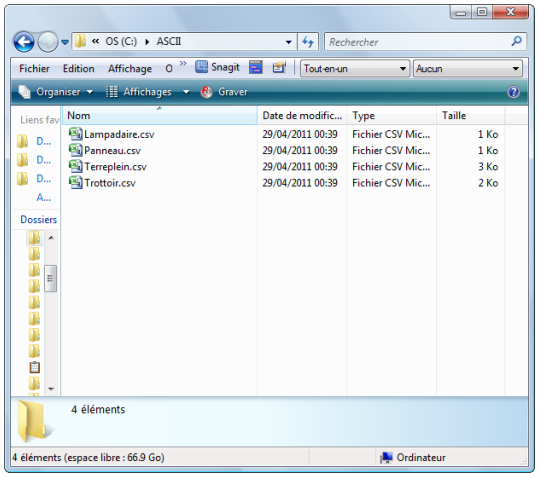
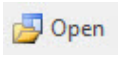


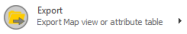
Figure 18.2: Export folder for ASCII format

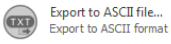
18.2 Export to ASCII format

- Click on 

in the ***workspace*** panel to add an AGI fileo the current workspace in *ArpentGIS-Expert* software
- Select a coordinate system in the ***Map*** viewie (

). This will be used as the current export coordinate system
- Click on 

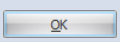
and select the menu 

- Select the option 

Detail 18.2.1

❶ *Select the separator between fields (tab, comma or semicolon)*
❷ *Enter the extension of the output file (3 letters only : "**txt**", "**csv**", "**asc**"...)*
❸ *Select the field that will be exported. These fields correspond to information automatically logged in the file and do not correspond to the attributes entered in the field by the user.*
❹ *Select options to use to export data*
- *Add field attributes*

(a/o) • *Create a file for each layer*
(a/o) • *Add the name of the layer*
(a/o) • *Add headers containing the name of the fields*

Click on 

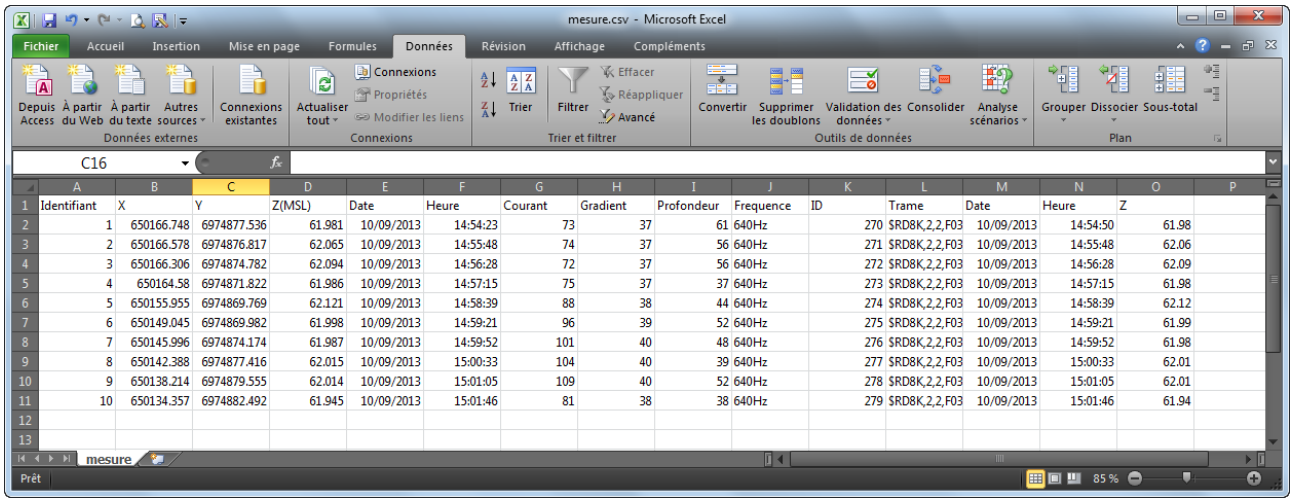
to start export.

Tip 18.2.1

The setting of the export process (fields and options) is automatically saved once the first export is done.

In the Export Wizard, select the folder that will contain the exported files.

Check in Windows Explorer that the files had been successfully created. If necessary, open one of the files in MS Excel or a text editor to control the contents.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Identifiant	X	Y	Z(MSL)	Date	Heure	Courant	Gradient	Profondeur	Frequence	ID	Trame	Date	Heure	Z	
2	1	650166.748	6974877.536	61.981	10/09/2013	14:54:23	73	37	61	640Hz	270	$RD8K,2,2,F03	10/09/2013	14:54:50	61.98	
3	2	650166.578	6974876.817	62.065	10/09/2013	14:55:48	74	37	56	640Hz	271	$RD8K,2,2,F03	10/09/2013	14:55:48	62.06	
4	3	650166.306	6974874.782	62.094	10/09/2013	14:56:28	72	37	56	640Hz	272	$RD8K,2,2,F03	10/09/2013	14:56:28	62.09	
5	4	650164.58	6974871.822	61.986	10/09/2013	14:57:15	75	37	37	640Hz	273	$RD8K,2,2,F03	10/09/2013	14:57:15	61.98	
6	5	650155.955	6974869.769	62.121	10/09/2013	14:58:39	88	38	44	640Hz	274	$RD8K,2,2,F03	10/09/2013	14:58:39	62.12	
7	6	650149.045	6974869.982	61.998	10/09/2013	14:59:21	96	39	52	640Hz	275	$RD8K,2,2,F03	10/09/2013	14:59:21	61.99	
8	7	650145.996	6974874.174	61.987	10/09/2013	14:59:52	101	40	48	640Hz	276	$RD8K,2,2,F03	10/09/2013	14:59:52	61.98	
9	8	650142.388	6974877.416	62.015	10/09/2013	15:00:33	104	40	39	640Hz	277	$RD8K,2,2,F03	10/09/2013	15:00:33	62.01	
10	9	650138.214	6974879.555	62.014	10/09/2013	15:01:05	109	40	52	640Hz	278	$RD8K,2,2,F03	10/09/2013	15:01:05	62.01	
11	10	650134.357	6974882.492	61.945	10/09/2013	15:01:46	81	38	38	640Hz	279	$RD8K,2,2,F03	10/09/2013	15:01:46	61.94	
12																
13																

Figure 18.3: Text file generate with ArpentGIS-Expert

18.3 Export to DGN format

18.3.1 Prerequisite for exporting data to DGN format

For the DGN via MicroStation export to use the cell library selected during the export (section 18.3.2), it is required that the names of the features used in *ArpentGIS-Android* are the same (from the data dictionary) as the one used in the library of cells.
For line and area features, *ArpentGIS-Expert* will use the optional attributes :

- **level** : define the level in which features will be created
- **color** : color of the line
- **weight** : thickness of the line
- **linestyle** : style of the line

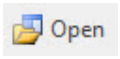
Note 18.3.1

For a complete use of feature specifications it is necessary that the above attributes are included in the data dictionary as visible attributes or not.

Advice 18.3.1

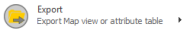
*It is strongly recommended to use non-visible attributes (**sections 4.5.4 to 4.5.4.1 on page 34**).*

18.3.2 Export DGN format wizard

- Click on 

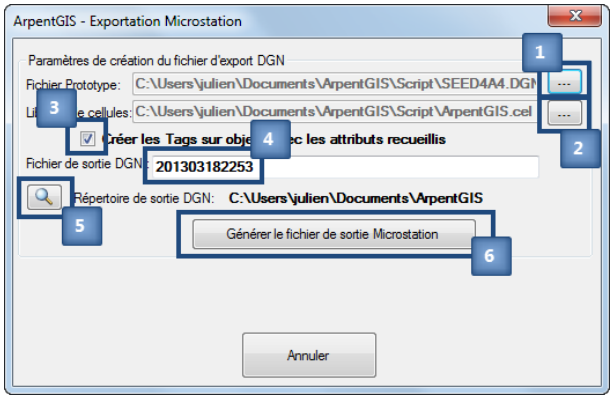
in the ***workspace*** panel to add an AGI fileo the current workspace in *ArpentGIS-Expert* software
- Select a coordinate system in the ***Map*** view (

). This will be used as the current export coordinate system
- Click on 

and select the menu 

- Select the option 

- Select the option 

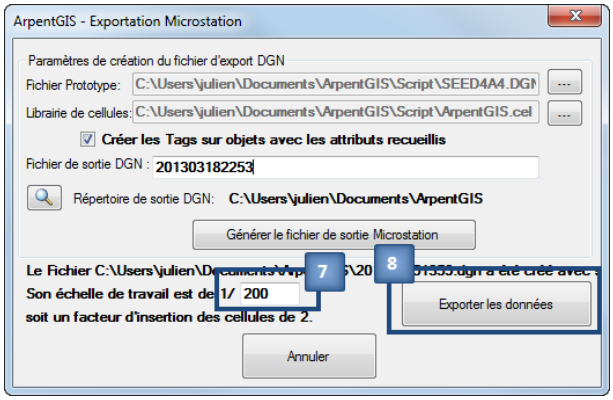


Detail 18.3.1

❶ *Select the prototype of the document. Prototypes templates are available when installing the software. It is also possible to use custom prototypes files*
❷ *Select the cell file (".**cel**" file) that contains symbols to used in the generated "**DGN**" file*
❸ *Use the attributes used in the field as labels in the "**DGN**" file*
❹ *Define a name for the "**DGN**" file*
❺ *Select the folder that will contain the "**DGN**" file*
❻ *Start creating the "**DGN**" file. A "**DGN**" file is generate from the prototype file selected in ❶ and the cell library selected in ❷ but do not generate features in the file*

To be read 18.3.1

*The **MicroStation** software is launched. It is necessary that **MicroStation** software is installed on the computer. In case the software is not installed an error message will be prompted.*



Detail 18.3.2

7 *Validate or change the working scale for the document*
8 *Start creating features in the file "**DGN**"*

- Check the creation of the file in "***MicroStation***" software

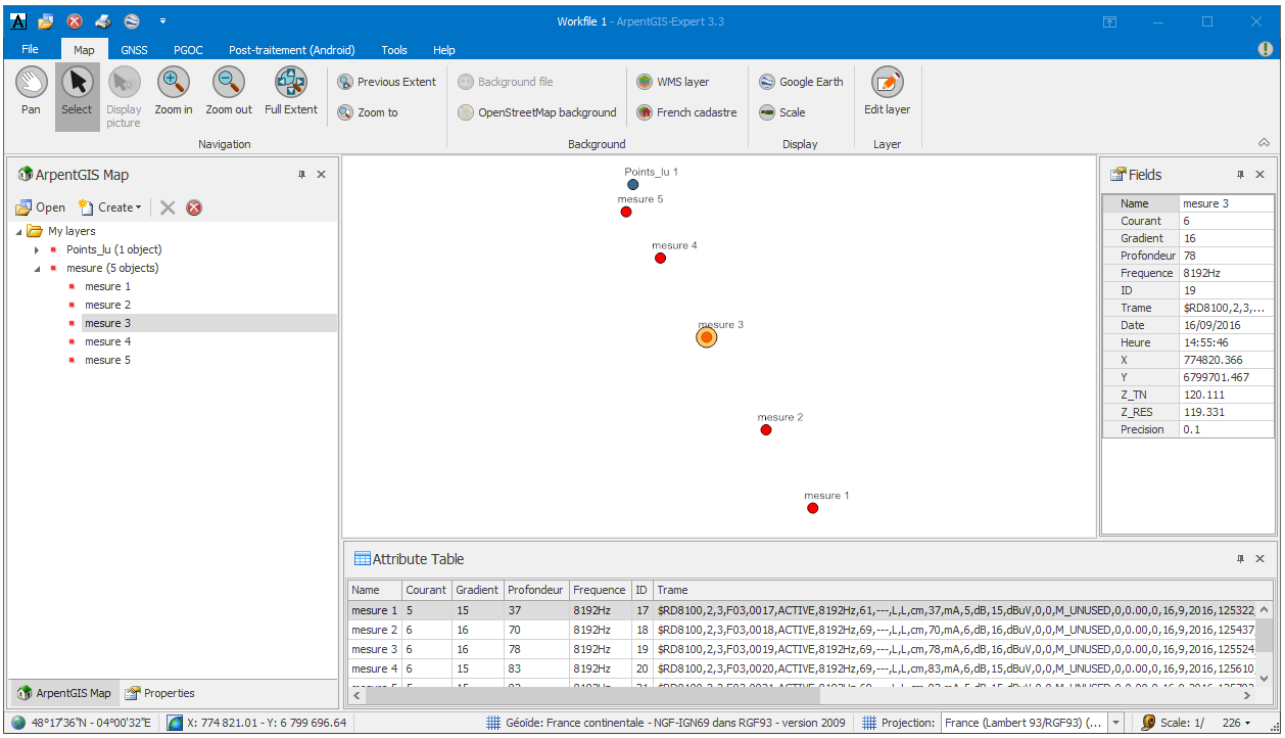


Figure 18.4: Sample AGI file to export to MicroStation

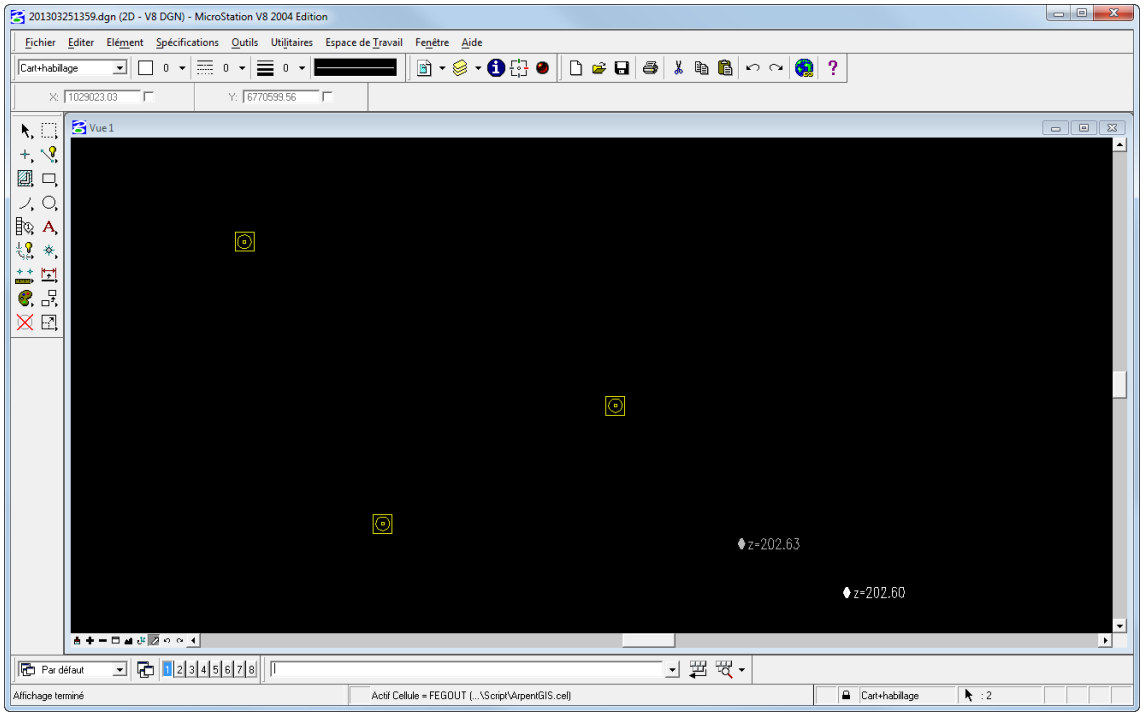
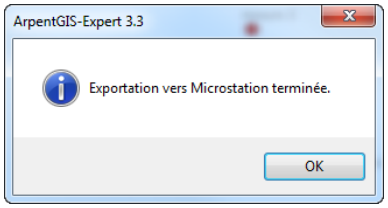
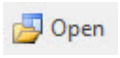


Figure 18.5: Same example of DGN file generated by the export from ArpentGIS-Expert and opened in MicroStation

- Validate the export message in *ArpentGIS-Expert* software

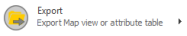


18.3.3 DGN export wizard with accuracy analysis of depth measurements/underground locator)

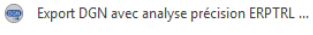
- Click on 

in the ***workspace*** panel to add an AGI fileo the current workspace in *ArpentGIS-Expert* software
- Select a coordinate system in the ***Map*** view (

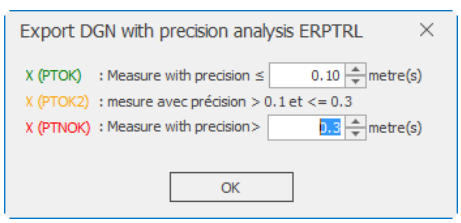
). It will be used as export coordinate system
- Click on 

and select the menu 

- Select the option 

- Select the option 

and enter the acuuracy thresholds that will identify the detection measures that do not meet the defined criteria



Continue exporting by following the described method section 18.3.2 on page 146. Check the output of the export in MicroStation software. Check the information related to the features in the layer ***ERPTRL*** or in the ***mesure*** layer. Those layers

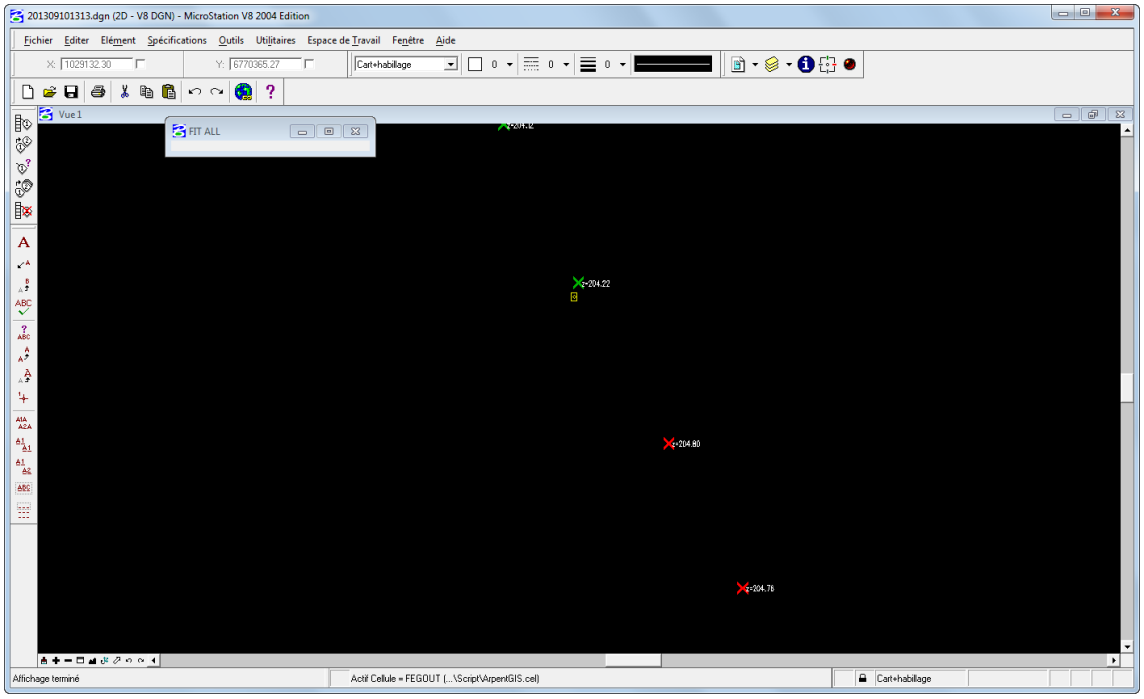
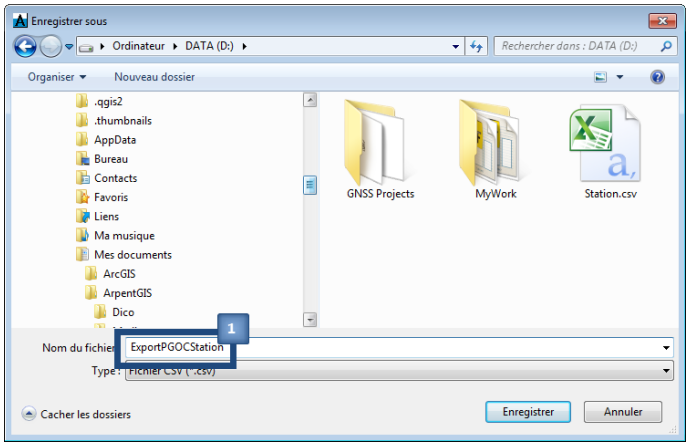


Figure 18.6: Example of an AGI file to export to MicroStation software with accuracy thresholds

18.4 PGOC export (French CSV format)

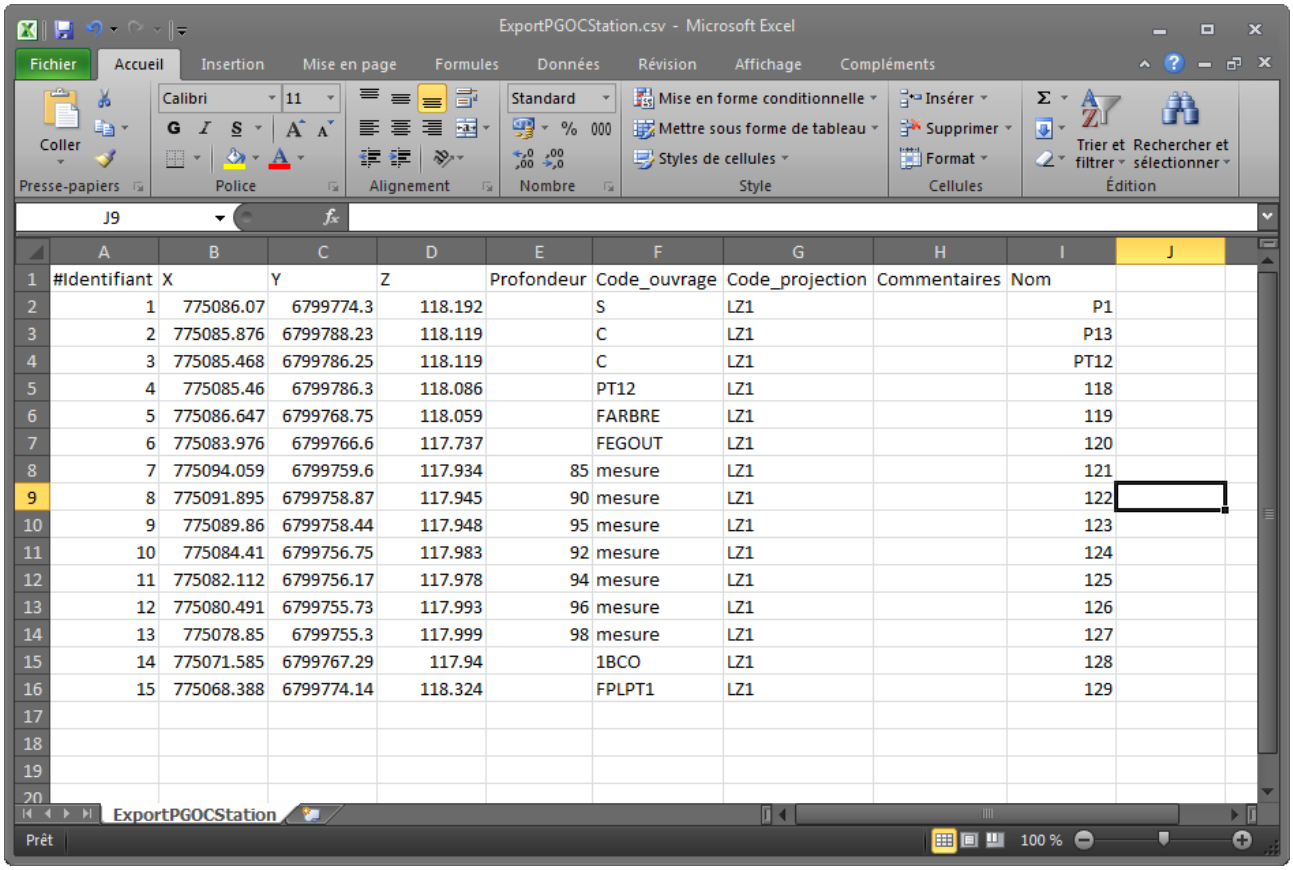
- Select a coordinate system in the ***Map*** view (Projection: Monde (WGS84) (EPSG:4326)). This will be used as the current export coordinate system
- Click on Fichier and select the menu Export Export Map view or attribute table
- Select the option Other GIS format Export all layers to other GIS format
- Select the option Export CSV PGOC ...



Detail 18.4.1

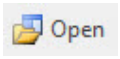
❶ *Select the name of the CSV file to export*

- Check the creation of the CSV file in Windows Explorer
- If necessary, open the CSV file in a spreadsheet to check the contents



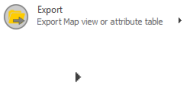
	A	B	C	D	E	F	G	H	I	J
1	#Identifiant	X	Y	Z	Profondeur	Code_ouvrage	Code_projection	Commentaires	Nom	
2	1	775086.07	6799774.3	118.192		S	LZ1		P1	
3	2	775085.876	6799788.23	118.119		C	LZ1		P13	
4	3	775085.468	6799786.25	118.119		C	LZ1		PT12	
5	4	775085.46	6799786.3	118.086		PT12	LZ1		118	
6	5	775086.647	6799768.75	118.059		FARBRE	LZ1		119	
7	6	775083.976	6799766.6	117.737		FEGOUT	LZ1		120	
8	7	775094.059	6799759.6	117.934	85	mesure	LZ1		121	
9	8	775091.895	6799758.87	117.945	90	mesure	LZ1		122	
10	9	775089.86	6799758.44	117.948	95	mesure	LZ1		123	
11	10	775084.41	6799756.75	117.983	92	mesure	LZ1		124	
12	11	775082.112	6799756.17	117.978	94	mesure	LZ1		125	
13	12	775080.491	6799755.73	117.993	96	mesure	LZ1		126	
14	13	775078.85	6799755.3	117.999	98	mesure	LZ1		127	
15	14	775071.585	6799767.29	117.94		1BCO	LZ1		128	
16	15	775068.388	6799774.14	118.324		FPLPT1	LZ1		129	
17										
18										
19										
20										

18.5 Export to DXF format

- Click on 

in the ***workspace*** panel to add an AGI fileo the current workspace in *ArpentGIS-Expert* software
- Select a coordinate system in the ***Map*** viewie (

). This will be used as the current export coordinate system
- Click on 

and select the menu 

- Select the option

18.5.1 Export with a Template file

18.5.1.1 Introduction

Use a template file (***AutoCAD 2010/LT2010 DXF*** file) to represent as blocks and layers the information contained in the data file collected with *ArpentGIS-Android* software. With blocks user can assign symbols to each object of a layer in the ***AGI*** file.
The "AutoCAD" object will be a block with specific symbol, coordinates and attributes. This object will be placed, if necessary, on a defined layer.

Placing blocks requires the use of a prototype file called ***Template*** which defines the representation of the block, the display, the management and the placement of the attributes as well as the position of the blocks on the layers.

18.5.1.2 Structure of a template file

To optimize the use of Template files for AutoCad in *ArpentGIS-Expert* software it is necessary that blocks defined in the Template file have the same definition name and the same attributes (all attributes or only some of them) that the features defined in the data dictionary file (***.fdi*** file, see chapter 4 on page 27) used in the field to create data.
Check the template file structure before proceeding to any data export.

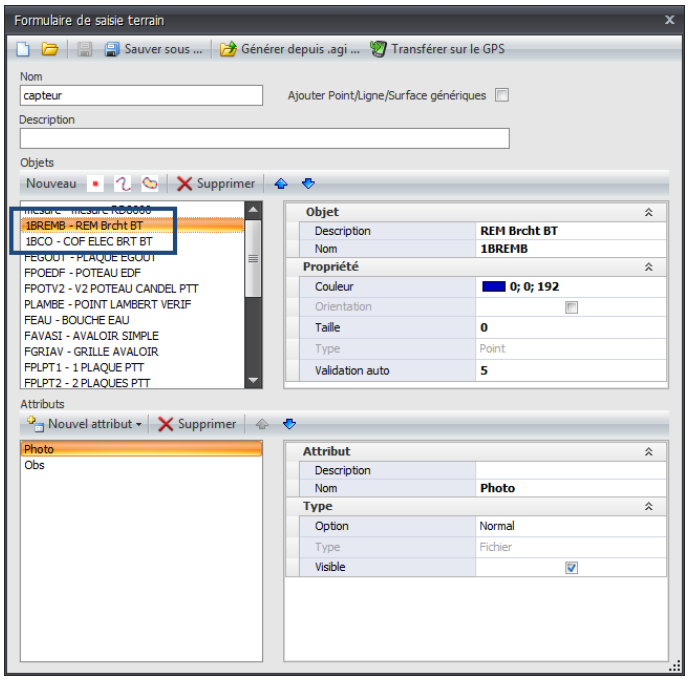


Figure 18.7: Example of the schema of a data dictionary - Objects

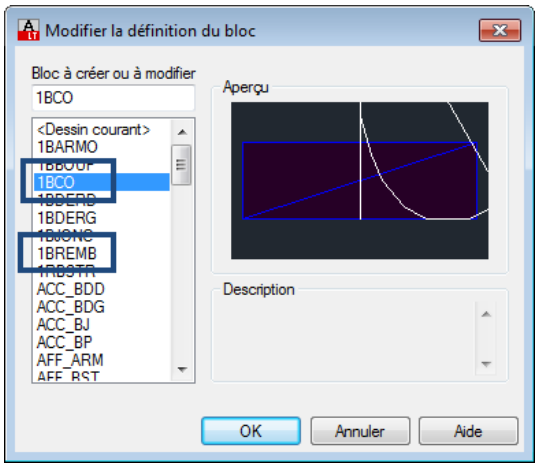


Figure 18.8: Example of the schema of the block manager in Autocad software

- For point features in the data dictionary :
  - objects have to be defined as blocks in the ***Template*** file
  - layers with the name of the objects layer can additionally be defined in the ***Template*** file. The objects will be set in the corresponding layer unless the user has set the placement of the features in another layer. If no layer with the object's name exists in the DXF file, when exporting data from *ArpentGIS-Expert* software, the layer will be automatically created and the objects will be set on this layer
  - attibutes of features will be integrated as ***XDATA*** information. To integrate and display attributes in an AutoCAD drawing, it is necessary that these attributes exist as block attributes
  - a feature defined in the ***FDI*** file but not defined in the ***Template*** file will be set as a point feature in AutoCad software not a block. This feature won't have attributes

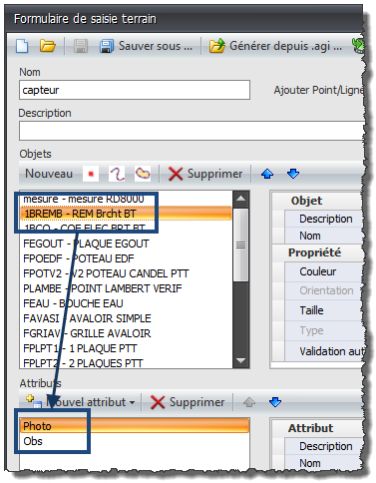


Figure 18.9: Example of the schema of a data dictionary - Attributes

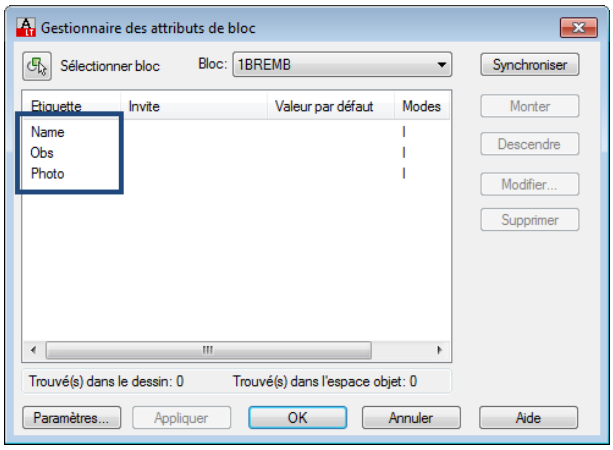


Figure 18.10: Example of the schema of the block attributes in Autocad

- For line or area features :
  - layers with object names can be defined in the ***Template*** file. The features will be set in the corresponding layer. If no layer with the object's name exists in the DXF file, when exporting data from *ArpentGIS-Expert* software, the layer will be automatically created and the objects will be set on this layer
  - attibutes of features will be integrated as ***XDATA*** information

To be read 18.5.1

XDATA *informations are extra data associated with a feature. An AutoCAD command, available in the Express Tools can be used to display those informations. Express tools are extra features provided by AutoCAD, but they are not necessarily available. It is possible to install tools postpone to the installation of AutoCad. In case Express tools are available, a specific ribbon tab is available and the command to use to display XData information is* ***List Xdata****.*
These tools are not accessible in an AutoCAD LT release.

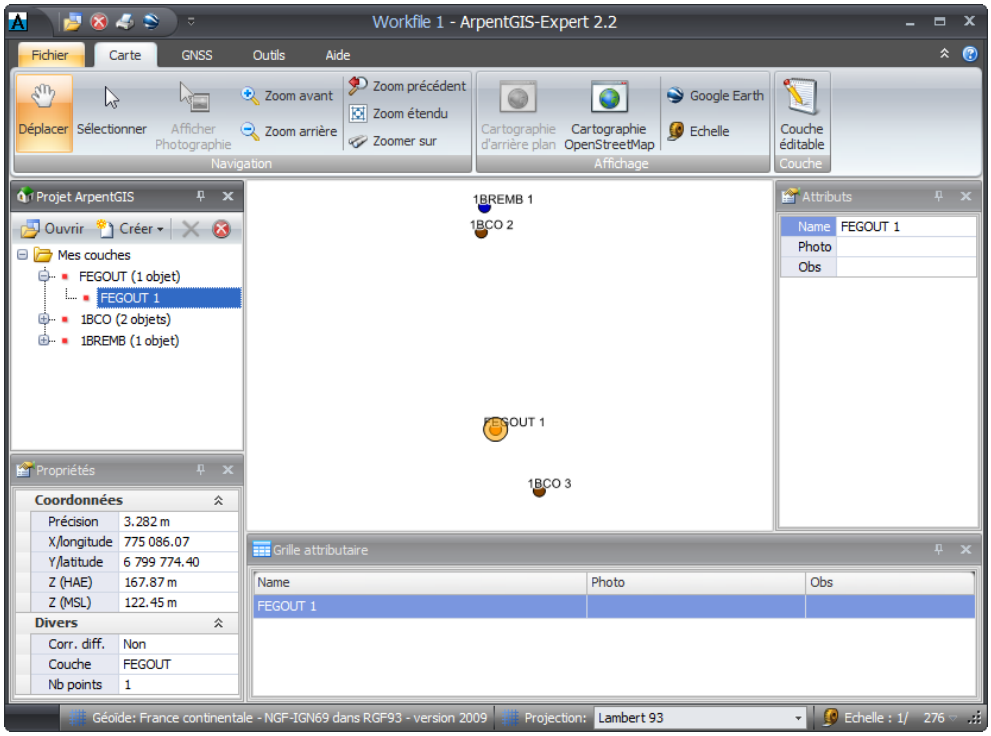


Figure 18.11: Example of an AGI file

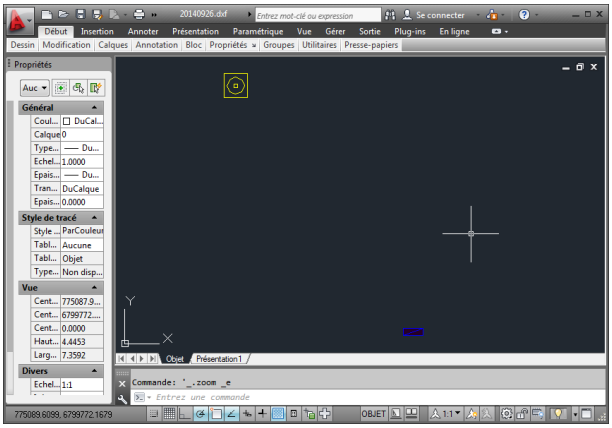


Figure 18.12: Sample rendering with an appropriate template without attributes displayed

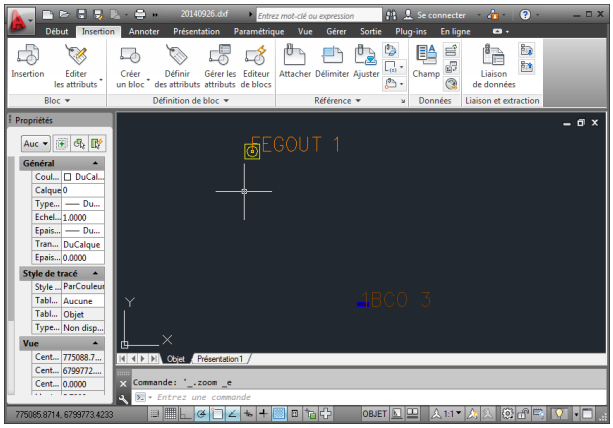
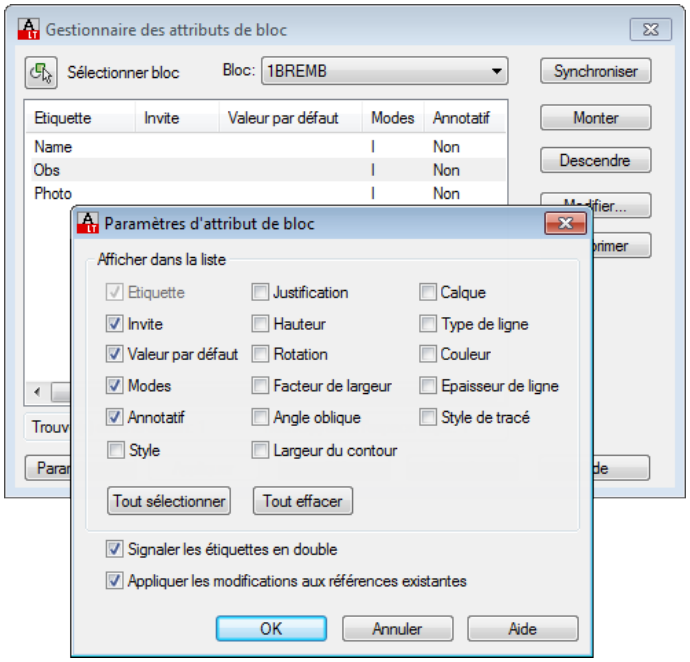


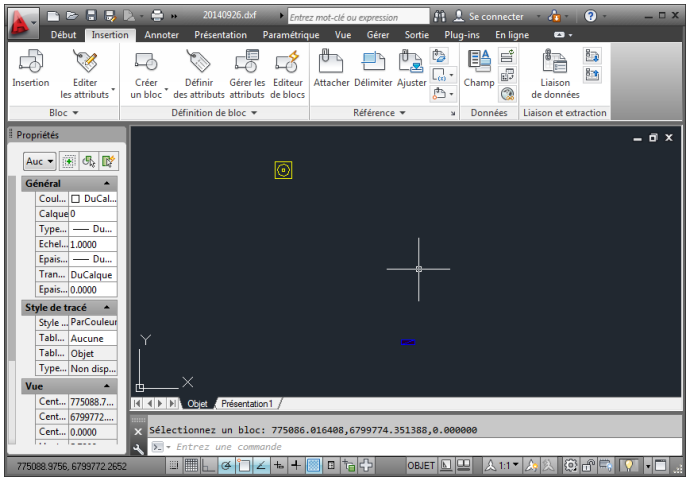
Figure 18.13: Sample rendering with an appropriate template with attributes displayed

In the case shown figure 18.13 the attribute ***Name*** is the only one that is being displayed. This option is set directly in the parameters of the corresponding block. It is possible to quickly display all the attributes or change the display options at any time in the ***Manage attributes*** editor of AutoCAD software.



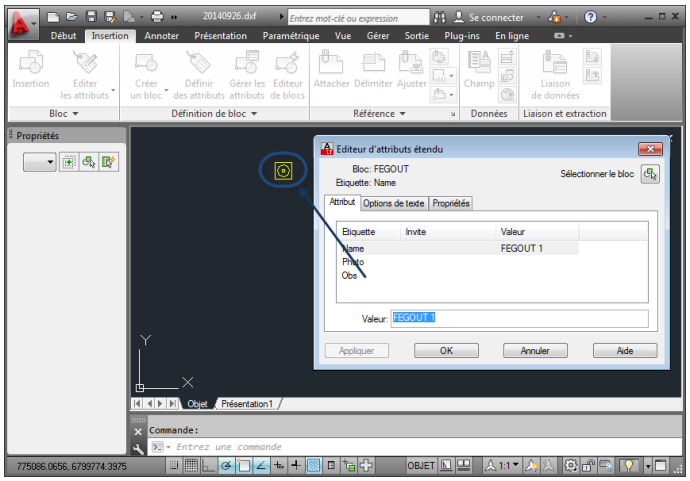
18.5.1.3 Export with a Template file, without attributes

- Select the option Export to DXF format...
- Select the ***Template*** file that will contain the symbols and attributes that will be used for the ***DXF*** file
- Enter a name and storage location for the ***DXF*** file



18.5.1.4 Export with a Template file, with attributes

- Select the option DXF XDATA export
- Select the ***Template*** file the information to be used in the ***DXF*** file
- Define a name and a folder for the ***DXF*** file

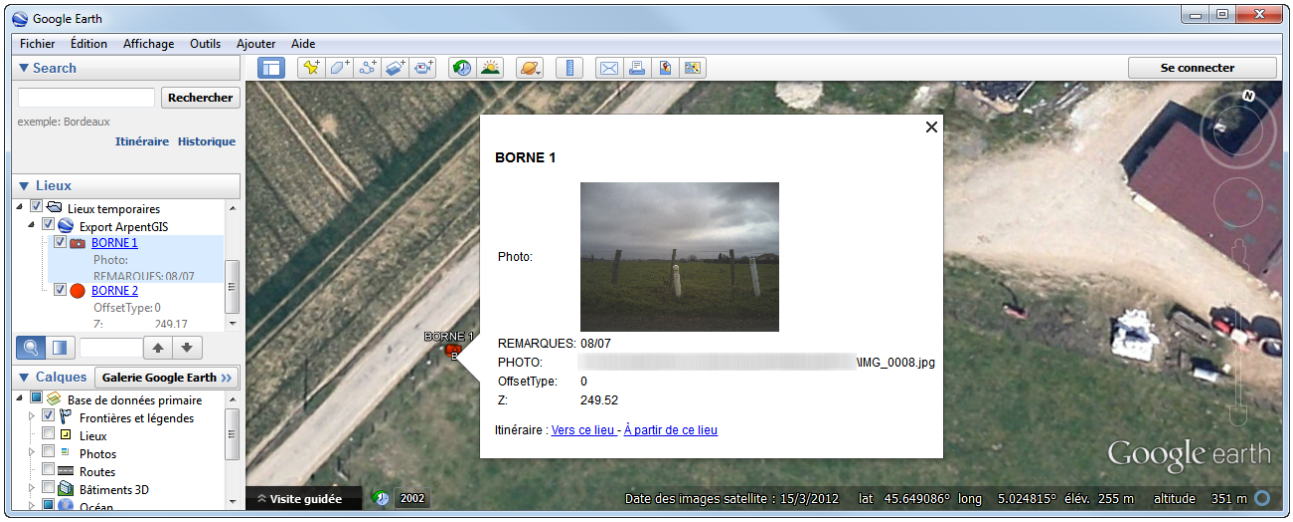


18.6 Export to GoogleEarth

18.6.1 Create a KML file

- Click on Open in the ***workspace*** panel to add an AGI fileo the current workspace in *ArpentGIS-Expert* software
- Click on Fichier and select the menu Export Export Map view or attribute table
- Click on Other GIS format Export all layers to other GIS format
- Select the option Export to Google Earth... . Enter the file name and select the folder that will contain the generated KML file.

Transfer the file by email to a co-worker who uses GoogleEarth. He will be able to view the data directly in GoogleEath software.

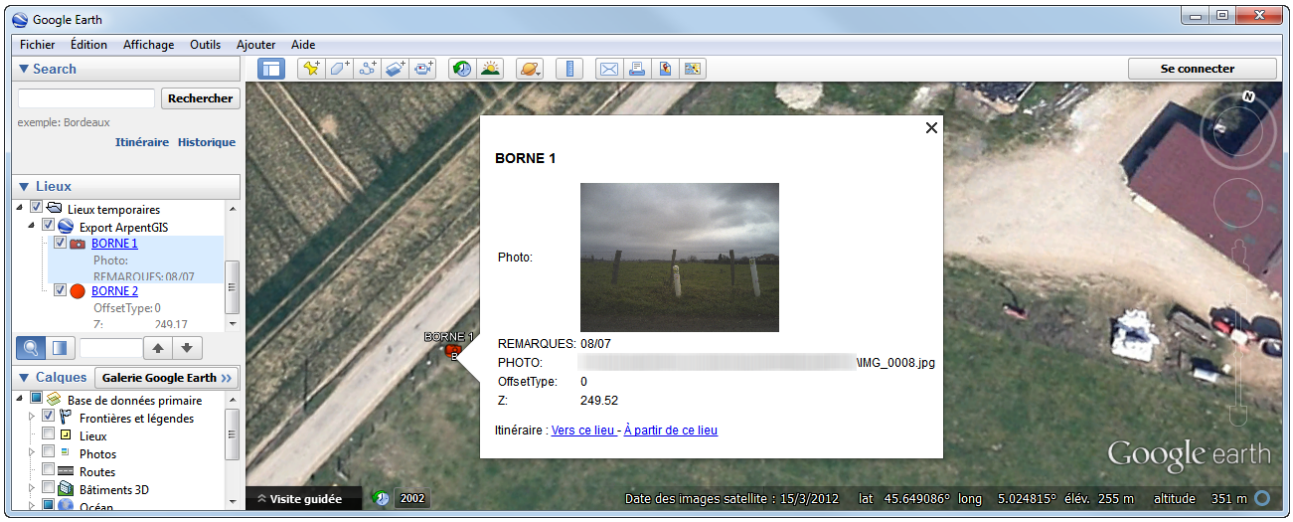


18.6.2 Direct export to GoogleEarth

To be read 18.6.1

This export requires GoogleEarth to be installed on the user station.

- Click on Open button in the ***workspace*** panel to add an AGI file to the current workspace of *ArpentGIS-Expert* software
- Click on Map
- Click on Google Earth. The export is automatic to GoogleEarth.



PARTIE

V

Annexes

DANS CETTE PARTIE

IN THIS CHAPTER

List of géoïd models
List of coordinate systems and projections available in *ArpentGIS-Android*

APPENDIX A

Manage coordinate systems in ArpentGIS-Expert and ArpentGIS-Android

A.1 List of géoïd models

Name (Country/Geographic area)	Iteration	Date of commissioning
France continentale	NGF-IGN69 dans RGF93	version 2009
Corse	NGF-IGN78 dans RGF93	version 2009
Geoide geometrique pour la Martinique	EGM96 + points GPS niveles	
Geoide geometrique pour la Martinique	EGM2008 + points GPS niveles	
Geoide geometrique pour la Guyane	EGM96 + points GPS niveles	
Geoide geometrique pour la Guadeloupe : Grande-Terre et Basse-Terre	EGM96 + points GPS niveles	
Geoide geometrique pour Grande-Terre & Basse-Terre	EGM2008 + points GPS niveles	
Geoide geometrique pour La Desirade	EGM96 + points GPS niveles	
Geoide geometrique pour La Desirade	EGM2008 + points GPS niveles	
Geoide geometrique pour Les Saintes	EGM96 + points GPS niveles	
Geoide geometrique pour Les Saintes	EGM2008 + points GPS niveles	
Geoide geometrique pour Marie-Galante	EGM96 + points GPS niveles	
Geoide geometrique pour Marie-Galante	EGM2008 + points GPS niveles	
Geoide geometrique pour Saint-Barthelemy	EGM96 + points GPS niveles	
Geoide geometrique pour Saint-Barthelemy	EGM2008 + points GPS niveles	
Geoide geometrique pour Saint-Martin	EGM96 + points GPS niveles	
Geoide geometrique pour Saint-Martin	EGM2008 + points GPS niveles	
Mayotte	SHOM 1953 dans RGM04	
Polynesie	BORA_SAU 2001 dans RGPF	
Polynesie	HUAHINE_SAU 2001 dans RGPF	
Polynesie	MAIAO 2001 dans RGPF	
Polynesie	MAUPITI_SAU 2001 dans RGPF	
Polynesie	RAIATEA_SAU 2001 dans RGPF	
Polynesie	TAHAA_SAU 2001 dans RGPF	
Polynesie	TUPAI 2001 dans RGPF	
Polynesie	HIVA OA dans RGPF	
Polynesie	NUKU HIVA ALTI dans RGPF	
Polynesie	IGN TAHITI 1966 dans RGPF	
IGN89 dans RGR92		
Geoide geometrique Saint Pierre et Miquelon	EGM96 + Points GPS niveles	
Cameroun	DMA Global (10x10) dans WGS84	Version 02 Avril 2015
Cameroun	EGM08 dans WGS84	Version 02 Avril 2015
Congo / Gabon / Guinee equatoriale	DMA Global (10x10) dans WGS84	Version 29 Janvier 2016
Congo / Gabon / Guinee equatoriale	EGM08 dans WGS84	Version 29 Janvier 2016
Portugal	PT08	
Senegal	EGM96 dans WGS84	Version 9 Avril 2012
Irlande	OSGM15	
Monde(Global World Wide)	EGM96	
Valeur MSL definies dans l'AGI		

Table A.1: List of available Geoid models in ArpentGIS-Expert software and ArpentGIS-Android application

A.2 List of coordinate systems and projections available in *ArpentGIS-Android*

Coordinate system	EPSG
Antilles Françaises (RRAF 1991/UTM zone 20N)	EPSG:4559
Belgique (Lambert 72/Belgium 2005)	EPSG:31370
Canada (NAD83/MTM zone 7)	EPSG:32187
Canada (NAD83/MTM zone 8)	EPSG:32188
Espagne (UTM 28N/ETRS89)	EPSG:25828
Espagne (UTM 29N/ETRS89)	EPSG:25829
Espagne (UTM 30N/ETRS89)	EPSG:25830
Espagne (UTM 31N/ETRS89)	EPSG:25831
Espagne (UTM 28N/ED50)	EPSG:23028
Espagne (UTM 29N/ED50)	EPSG:23029
Espagne (UTM 30N/ED50)	EPSG:23030
Espagne (UTM 31N/ED50)	EPSG:23031
France (RGF93)	EPSG:4171
France (Lambert I Nord/NTF)	EPSG:27561
France (Lambert II Centre/NTF)	EPSG:27562
France (Lambert III Sud/NTF)	EPSG:27563
France (Lambert IV Corse/NTF)	EPSG:27564
France (Lambert I Carto/NTF)	EPSG:27571
France (Lambert II Carto/NTF)	EPSG:27572
France (Lambert III Carto/NTF)	EPSG:27573
France (Lambert IV Carto/NTF)	EPSG:27574
France (Lambert 93/RGF93)	EPSG:2154
France (Lambert CC42/RGF93)	EPSG:3942
France (Lambert CC43/RGF93)	EPSG:3943
France (Lambert CC44/RGF93)	EPSG:3944
France (Lambert CC45/RGF93)	EPSG:3945
France (Lambert CC46/RGF93)	EPSG:3946
France (Lambert CC47/RGF93)	EPSG:3947
France (Lambert CC48/RGF93)	EPSG:3948
France (Lambert CC49/RGF93)	EPSG:3949
France (Lambert CC50/RGF93)	EPSG:3950
GoogleMap (Pseudo-Mercator/WGS84)	EPSG:3857
Guadeloupe (UTM 20N/WGS84)	EPSG:32620
Guadeloupe (UTM 20N/Sainte-Anne)	EPSG:2970
Guyane (UTM 22N/RGFG95)	EPSG:2972
Hongrie (GCS S42 Hungary)	EPSG:37257
Irlande (Irish National Grid/TM65)	EPSG:29900
Irlande (Irish National Grid/OSNI 1952)	EPSG:29901
Irlande (Irish Grid/TM65)	EPSG:29902
Irlande (Irish Grid/TM75)	EPSG:29903
Irlande (Irish Transverse Mercator/IRENET95)	EPSG:2157
Maroc (Merchich/Zone I)	EPSG:26191
Maroc (Merchich/Zone II)	EPSG:26192
Maroc (Merchich/Zone III)	EPSG:26194
Maroc (Merchich/Zone IV)	EPSG:26195
Martinique (UTM 20N/WGS84)	EPSG:32620
Martinique (UTM 20N/Fort Desaix)	EPSG:2973
Mayotte (UTM 38S/RGM04)	EPSG:4471
Nouvelle-Caledonie (Lambert Nouvelle-Caledonie/RGNC91-93)	EPSG:3163
Portugal (ETRS89/Portugal TM06)	EPSG:3763
Portugal (Datum 73/Modified Portuguese Grid)	EPSG:27493
Portugal (Lisboa Hayford Gauss IGeoE)	EPSG:102164
Reunion (UTM 40S/RGR92)	EPSG:2975
Saint-Pierre et Miquelon (UTM 21N/RGSPM06)	EPSG:4467
Monde (WGS84)	EPSG:4326
Monde (UTM 1N/WGS84)	EPSG:32601
Monde (UTM 2N/WGS84)	EPSG:32602
Monde (UTM 3N/WGS84)	EPSG:32603
Monde (UTM 4N/WGS84)	EPSG:32604
Monde (UTM 5N/WGS84)	EPSG:32605
Monde (UTM 6N/WGS84)	EPSG:32606
Monde (UTM 7N/WGS84)	EPSG:32607
Monde (UTM 8N/WGS84)	EPSG:32608
Monde (UTM 9N/WGS84)	EPSG:32609
Monde (UTM 10N/WGS84)	EPSG:32610
Monde (UTM 11N/WGS84)	EPSG:32611
Monde (UTM 12N/WGS84)	EPSG:32612
Monde (UTM 13N/WGS84)	EPSG:32613
Monde (UTM 14N/WGS84)	EPSG:32614
Monde (UTM 15N/WGS84)	EPSG:32615
Monde (UTM 16N/WGS84)	EPSG:32616

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Coordinate system	EPSG
Monde (UTM 17N/WGS84)	EPSG:32617
Monde (UTM 18N/WGS84)	EPSG:32618
Monde (UTM 19N/WGS84)	EPSG:32619
Monde (UTM 20N/WGS84)	EPSG:32620
Monde (UTM 21N/WGS84)	EPSG:32621
Monde (UTM 22N/WGS84)	EPSG:32622
Monde (UTM 23N/WGS84)	EPSG:32623
Monde (UTM 24N/WGS84)	EPSG:32624
Monde (UTM 25N/WGS84)	EPSG:32625
Monde (UTM 26N/WGS84)	EPSG:32626
Monde (UTM 27N/WGS84)	EPSG:32627
Monde (UTM 28N/WGS84)	EPSG:32628
Monde (UTM 29N/WGS84)	EPSG:32629
Monde (UTM 30N/WGS84)	EPSG:32630
Monde (UTM 31N/WGS84)	EPSG:32631
Monde (UTM 32N/WGS84)	EPSG:32632
Monde (UTM 33N/WGS84)	EPSG:32633
Monde (UTM 34N/WGS84)	EPSG:32634
Monde (UTM 35N/WGS84)	EPSG:32635
Monde (UTM 36N/WGS84)	EPSG:32636
Monde (UTM 37N/WGS84)	EPSG:32637
Monde (UTM 38N/WGS84)	EPSG:32638
Monde (UTM 39N/WGS84)	EPSG:32639
Monde (UTM 40N/WGS84)	EPSG:32640
Monde (UTM 41N/WGS84)	EPSG:32641
Monde (UTM 42N/WGS84)	EPSG:32642
Monde (UTM 43N/WGS84)	EPSG:32643
Monde (UTM 44N/WGS84)	EPSG:32644
Monde (UTM 45N/WGS84)	EPSG:32645
Monde (UTM 46N/WGS84)	EPSG:32646
Monde (UTM 47N/WGS84)	EPSG:32647
Monde (UTM 48N/WGS84)	EPSG:32648
Monde (UTM 49N/WGS84)	EPSG:32649
Monde (UTM 50N/WGS84)	EPSG:32650
Monde (UTM 51N/WGS84)	EPSG:32651
Monde (UTM 52N/WGS84)	EPSG:32652
Monde (UTM 53N/WGS84)	EPSG:32653
Monde (UTM 54N/WGS84)	EPSG:32654
Monde (UTM 55N/WGS84)	EPSG:32655
Monde (UTM 56N/WGS84)	EPSG:32656
Monde (UTM 57N/WGS84)	EPSG:32657
Monde (UTM 58N/WGS84)	EPSG:32658
Monde (UTM 59N/WGS84)	EPSG:32659
Monde (UTM 60N/WGS84)	EPSG:32660
Monde (UTM 1S/WGS84)	EPSG:32701
Monde (UTM 2S/WGS84)	EPSG:32702
Monde (UTM 3S/WGS84)	EPSG:32703
Monde (UTM 4S/WGS84)	EPSG:32704
Monde (UTM 5S/WGS84)	EPSG:32705
Monde (UTM 6S/WGS84)	EPSG:32706
Monde (UTM 7S/WGS84)	EPSG:32707
Monde (UTM 8S/WGS84)	EPSG:32708
Monde (UTM 9S/WGS84)	EPSG:32709
Monde (UTM 10S/WGS84)	EPSG:32710
Monde (UTM 11S/WGS84)	EPSG:32711
Monde (UTM 12S/WGS84)	EPSG:32712
Monde (UTM 13S/WGS84)	EPSG:32713
Monde (UTM 14S/WGS84)	EPSG:32714
Monde (UTM 15S/WGS84)	EPSG:32715
Monde (UTM 16S/WGS84)	EPSG:32716
Monde (UTM 17S/WGS84)	EPSG:32717
Monde (UTM 18S/WGS84)	EPSG:32718
Monde (UTM 19S/WGS84)	EPSG:32719
Monde (UTM 20S/WGS84)	EPSG:32720
Monde (UTM 21S/WGS84)	EPSG:32721
Monde (UTM 22S/WGS84)	EPSG:32722
Monde (UTM 23S/WGS84)	EPSG:32723
Monde (UTM 24S/WGS84)	EPSG:32724
Monde (UTM 25S/WGS84)	EPSG:32725
Monde (UTM 26S/WGS84)	EPSG:32726
Monde (UTM 27S/WGS84)	EPSG:32727
Monde (UTM 28S/WGS84)	EPSG:32728
Monde (UTM 29S/WGS84)	EPSG:32729
Monde (UTM 30S/WGS84)	EPSG:32730
Monde (UTM 31S/WGS84)	EPSG:32731
Monde (UTM 32S/WGS84)	EPSG:32732

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Coordinate system	EPSG
Monde (UTM 33S/WGS84)	EPSG:32733
Monde (UTM 34S/WGS84)	EPSG:32734
Monde (UTM 35S/WGS84)	EPSG:32735
Monde (UTM 36S/WGS84)	EPSG:32736
Monde (UTM 37S/WGS84)	EPSG:32737
Monde (UTM 38S/WGS84)	EPSG:32738
Monde (UTM 39S/WGS84)	EPSG:32739
Monde (UTM 40S/WGS84)	EPSG:32740
Monde (UTM 41S/WGS84)	EPSG:32741
Monde (UTM 42S/WGS84)	EPSG:32742
Monde (UTM 43S/WGS84)	EPSG:32743
Monde (UTM 44S/WGS84)	EPSG:32744
Monde (UTM 45S/WGS84)	EPSG:32745
Monde (UTM 46S/WGS84)	EPSG:32746
Monde (UTM 47S/WGS84)	EPSG:32747
Monde (UTM 48S/WGS84)	EPSG:32748
Monde (UTM 49S/WGS84)	EPSG:32749
Monde (UTM 50S/WGS84)	EPSG:32750
Monde (UTM 51S/WGS84)	EPSG:32751
Monde (UTM 52S/WGS84)	EPSG:32752
Monde (UTM 53S/WGS84)	EPSG:32753
Monde (UTM 54S/WGS84)	EPSG:32754
Monde (UTM 55S/WGS84)	EPSG:32755
Monde (UTM 56S/WGS84)	EPSG:32756
Monde (UTM 57S/WGS84)	EPSG:32757
Monde (UTM 58S/WGS84)	EPSG:32758
Monde (UTM 59S/WGS84)	EPSG:32759
Monde (UTM 60S/WGS84)	EPSG:32760

Table A.2: List of compatible coordinate system

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SIGNS

NMEA National Marine Electronics Association.