# TUTORIAL DATA MANAGEMENT







# DATA MANAGEMENT

### DESCRIPTION

- Data management
- Data visualization

# GOAL

 Learn how to use X-PAD FUSION main interface and project manager

How to view and analyze the imported data







# **Project manager**

∨ 💸 Surveys	م
V 🗱 Surveys	
😂 Main survey	<b>†  _</b>
😂 FRAZIONAMENTO ALINA	; =
Surfaces	: €
V L Drawings	: €
Main drawing	₹ 🖆
FRAZIONAMENTO ALINA	₹ =
🖂 Sections groups	ŧ =
Æxternal documents	₹ 🖆
Hight sessions	•
Ground photos sessions	•
Point clouds (Registered)	₹ 🖆
Point clouds (Not registered)	₹ 🖆
Raster maps	₹ 🗐
Orthophotos	₹ 🗐
✓ < Projection planes	
< <b>≿</b> None	
Clipping planes	•
Clipping boxes	•
Plot boxes	•
A Views	
🔁 🗈 🖻 🗖 🗘 🕫 🔁	
E Project Manager	
😂 Layers	
Survey codes	
T Filters	
Report	
1 Export	

53

- Essential tool to organize the data
- All your data can stay together and you can manage their visibility with one click
- It is possible to assign a color to each subproject
- It is possible to save and manage also Projection planes, Clipping planes, Plot boxes, Views





### **Project manager**

Project Manager	<
	Q
v 🔅 Surveys	ŧ ∎ ≜
😂 Main survey	ŧ =
😂 FRAZIONAMENTO ALINA	ŧ =
Surfaces	‡ ≞
V L Drawings	ŧ =
Main drawing	<b>† ≞</b>
FRAZIONAMENTO ALINA	: €
🖂 Sections groups	; ≡
Ø External documents	₹ =
Hight sessions	÷
Ground photos sessions	•
Point clouds (Registered)	₹ =
Point clouds (Not registered)	₹ =
Raster maps	₹ =
Orthophotos	: €
V I Projection planes	
< <b>☆</b> None	
Clipping planes	•
Clipping boxes	•
Plot boxes	•
📩 Views	<b>•</b>
🕒 🗈 🖬 🖵 🧔 🤕	
Project Manager	
⊑⁄ Layers	
Survey codes	
<b>T</b> Filters	
Report	
1 Export	
🛞 Building Information Model	
8	

GE

ΜΔΧ

By clicking with the right mouse button on one of the entities from the Project Manager It is possible to open a drop-down menu and use further functionalities

✓ v Surveys	_ <b>≡</b> 1	v % surveys	
😂 Main survey	₹ =	🖨 Main survey	. 1
🔀 FRAZIONAME	INTC ······	🗱 FRAZIONAMENTO ALINA	
Surfaces	Edit	Surfaces	
V Drawings	🌻 Invisible	✓ I Drawings	
Main drawing	New	Main drawing	
	NT Rename		
Sections groups	Duplicate	Sections groups	
@ External document	s Delete	External documents Invisible	
Flight sessions	Utilities	💥 Flight sessions 🕒 New	
Ground photos ses	sion 📑 Topographic point's table	Ground photos sess III Rename	
e Point clouds (Regis	stere 🚺 Measurements's table	Point clouds (Regis Duplicate	
Point clouds (Not r	egist 🖬 Calculate survey	Point clouds (Not re Delete	
Raster maps	Settings	Raster maps Utilities	
Orthophotos	Zoom fit	Orthophotos Settings	
✓ < Projection plane	s	V 🗢 Projection plane 💽 Zoom fit	
⊲ <b>x</b> None		< <b>t</b> x None	
Clipping planes	•	Clipping planes	
Clipping boxes	•	Clipping boxes	
			-
		: 🕀 🗈 🖻 🗊 🖵 🞺 🗗	×.





**GE** 

- Layers are organized in an AutoCAD style
- Automatic link «entity type» -> «layer»







# ACADEMY

# **Survey codes**



GE

- Allows to create survey code list (importable and exportable to X-PAD Field)
- Allows to create survey drawing lines between points
- Drawing attributes and layers linked to codes
- Symbols linked to codes





#### **Filters manager**

•

Filt	ers		<							
T	Surv	eys								
<u>ئ</u>	<eve< th=""><th colspan="9"><everything></everything></th></eve<>	<everything></everything>								
$\sim$	E	Entities								
	~	Points								
		Points	•							
		GNSS Bases	•							
		GNSS Points	•							
		TPS Stations	•							
		TPS Points	•							
		Other points	•							
		Reference point	•							
	$\sim$	Measurements								
		Measurements	•							
		Measurements GNSS	•							
		Measurements TPS	•							
		Measurements PicPoint	•							
		Traverses	•							
		Survey drawing	•							
		Parcels	•							
~	P	oint labels								
		Pointname	1							
		Point elevation	1							
		Point code	<u> </u>							
٤	Proj	ect Manager								
g	Laye	rs								
2	Surv	ev codes								
	Filte	are								
-										
Report										
Ţ	Expo	ort								
*	Build	ling Information Model								
<u> </u>										
	and the second distance									

53

MAX

- Allow to make the entities visible/invisible
  - In this way you can display/hide entities despite of their layer visibility

T	Surveys	Ŧ
***	Surveys	
	Surfaces	
~	Drawings	
	Sections groups	
	Flights/Photos sessions	





#### **Reports manager**

Report	<
Volume Calculation	10/08/2021
68 Kbytes	15:36:26
Topographic Points	10/08/2021
68 Kbytes	15:36:26
Measurements GNSS	10/08/2021
59 Kbytes	15:36:00
Measurements TPS	10/08/2021
62 Kbytes	15:35:45
≓ Ē ≜↓- ⊠	
Project Manager	
∃ Layers	
Survey codes	
Filters	
Report	
Export	
Building Information Model	

6E

List of all reports generated in the current project

	Open	
1	Open file path	
Ē	Delete	
	Sort	۲
$\square$	Opens the selected file with the corresponding application.	





#### **Export manager**

Export	<
Document245	10/08/2021
ws 58 Kbytes	15:38:20
Document245	10/08/2021
30 Kbytes	15:38:04
Document245	10/08/2021
12 Kbytes	15:37:54
Project Manager	
Eayers	
Survey codes	
Filters	
Report	
£ Export	
Building Information Model	

• List of all exported files for the current project

	Open	
<b>E</b>	Open file path	
Ē	Delete	
	Sort	۲
$\square$	Opens the selected file with the corresponding application.	





# **Data visualization**

Х 🗅 🖯	111   1	<b>=</b>  り												Docum	ient245
File Ho		liew	Draw	Edit	Survey		Surfaces	Design 3D	Imagir	ng X-sections	Cadast	ral	Cloud	Output	t P
10	2	Ξ	🟦 Worki	ing mode		-¢	A ~	ø		li	ð	÷.	7	-	16
New survey	Survey	Survey codes	D Point	name ~	Pc nts	Point	4	Photos manager ~	Ref.points manager	Measurements ~	Link meas. & points	TPS	Traverse	GNSS	<b>%</b> <sup>M</sup> α
Survey Doint name							Po	oints	-				Mea	suremen	ts
Export			Z Poir	nt elevation		<	Graphic vi	ew							

- Working mode changes the visualization of the drawing and points in CAD view
- Is the best way to work while drawing or making operations on the points, the point labels are automatically scaled





# **Data visualization CAD**



- CAD view represents how the drawing will be plotted or exported in CAD
- Symbol and text size depends on the scale selected



• And on the size defined in the Survey settings

GE







# Data visualization





Mouse navigation

GΕ

MAX

Previous view, zoom windows,2D/3D

- The buttons located on top-right of the graphic view are used to Zoom and Rotate the view
- Selecting the 2D/3D button is possible to switch between a 2D visualization and a 3D visualization
- After the 3D view is selected, use the central button of the mouse or the
   3D cube to rotate easily the view





#### Web Map



- Web Map visualizates the points over a Web Map (Google Map, Bing, etc...) or a defined Web Map Service
- Points must have a valid WGS84 position or a function to locate the project on Web Maps is available









#### **Points table**

**GE** 

Γ	File	Home	Vi	iew	Draw	Edit	Survey	S	urfaces	Design 3D	Imagir	ng X-sections	Gadast	ral	Cloud	Output	t	P Search		
	6	÷	<b>}</b>	ίΞ	H Work	king mode	•	6	▲ ~	o		1	P	8 Io	7	7	16	<b></b>		•=
	New surv	vey Su	urvey	Survey codes	D Poin	t name ¥	Points ~	Foint ~	4	Photos manager ∀	Ref.points manager	Measurements ~	Link meas. & points	TPS	Traverse	GNSS	%	Move GNSS base	GNSS Post Processing	Level data manager
	Survey								P	pints					Mea	suremen	its			

- *Points table* allows to view all the points in a survey
- Double click on a point to review more information

♦ Po	Points [FRAZIONAMENTO ALINA]														
	Туре	•	Name	Code	E	Ν	Z	Description		Щy					
1	Ŧ	$\checkmark$	100		0.284m	4.038m	0.386m		~		<b></b>				
2	Ŧ	$\checkmark$	200		-9.338m	-9.061m	-0.630m		~						
3	Ŧ	$\checkmark$	300		-13.107m	-68.626m	-11.496m		~						
4	Ţ	$\checkmark$	400		7.357m	-131.228m	-21.082m		~						
5	Ŧ	$\checkmark$	PF06/0860/B067		202.489m	261.373m	13.134m		$\checkmark$						
6	Ŧ	$\checkmark$	401		202.485m	261.375m	13.125m		~						
7	Ŧ	$\checkmark$	AUX_1		250.739m	-164.576m	-32.990m		~						
8	Ŧ	$\checkmark$	AUX_2		249.292m	-163.487m	-33.207m		~		-				
ЕМ	< Ro	ow 83 of	102 🕨 🗎	0 / 1	▼ Q 👯 ĝ↓	9 🗉 ē					t ENZ -				



#### **Measure table**

GE

File	Home	View	Draw	Edit	Survey	S	urfaces	Design 3D	) Imagir	ng X-sections	Cadast	ral	Cloud	Output	오 Search		
10	2	:=	H Work	king mode		-∲-	▲ ~			1	ð	8 To	7	📆 12	, 🚍	-	
New surv	vey Survey	Survey codes	D Poin	it name ⊻	Points ~	Point ~	4	Photos manager ∀	Ref.points manager	Measurements ~	Link meas. & points	TPS	Traverse	GNSS	Move GNSS base	GNSS Post Processing	Level data manager
Survey						Points					Measurements						

- Measure table allows to manage all types of measures
- Measures are divided by type
- Double click on a measure to review more information

🗳 Fraziona			Туре	Use	Date/Time	Base name	Base Height	Name	Code	Latitude	Longitude	Height	Rover Height	Description	Ŷ	
GNSS							4 0 0 0	100			5 0000150 07001					-
<b>977</b>	(66)	1	T	H+V	20/07/2016 08:04:11	6977	1.980m	100		N 44°24'12.20	E 9°22'52.2763"	229.692m	2.200m			
A TPS	(/	2	Ŧ	H+V	20/07/2016 08:05:06	6977	1.980m	200		N 44°24'11.77	E 9°22'51.8417"	228.647m	2.200m			
<b>9</b> 6977	(15)	3	Ŧ	H+V	20/07/2016 08:07:26	6977	1.980m	300		N 44°24'09.84	E 9°22'51.6739"	217.775m	2.200m			
<b>9</b> 800	(16)	4	Ŧ	H+V	20/07/2016 08:09:58	6977	1.980m	400		N 44°24'07.82	E 9°22'52.5962"	208.195m	2.200m			
<b>@</b> 600	(5)	5	Ŧ	H+V	20/07/2016 08:34:13	6977	1.980m	PF06/0860/B067		N 44°24'20.53	E 9°23'01.4145"	242.411m	2.200m			
1: Traverse	(0)	6	Ŧ	H+V	20/07/2016 08:34:21	6977	1.980m	401		N 44°24'20.53	E 9°23'01.4144"	242.402m	2.200m			
Distance	(2)	7	Ŧ	H+V	20/07/2016 09:20:11	6977	1.980m	AUX_1		N 44°24'06.74	E 9°23'03.5943"	196.287m	2.200m			
http://www.align.off	(0)	8	Ŧ	H+V	20/07/2016 09:21:01	6977	1.980m	AUX_2		N 44°24'06.77	E 9°23'03.5289"	196.070m	2.200m			
'=' Level data	(0)			H+\/	20/07/2016 00:23:20	6077	1 0.9.0 m	102		N //*2//06 71	E 0°23'03 /0/1"	106 10/m	2 200m			
B Note	(19)	: M	4	Row 1	of 66 🕨 N	0/1		Colors by B	ase 🗖 Colors	hy Code					Geodetic con	rdinates
				110001		● ⊵ ш		+ = colors by by		by code					ocoucie coor	
																83





• The function *Colors by Station* or *Colors by Code* allows to display the observations with a different color depending on the station or depending on the point code









# **Property windows, Autolist**

Properties	푸
Entity	<b>^</b>
Туре	Measurement GNSS
General	^
Layer	MISURE-GPS
Color	128, 128, 128
Color mode	By Layer
Linetype	Continuous
Linetype mode	By Layer
Linetype scale	1.000
Line weight	0.5
Line weight mode	By Layer
Survey	FRAZIONAMENTO ALINA
Measurement data	^
Base name	6977
Base Height	1.980m
Name	PF02/0040/F173
Code	
Description	
Measurement values	~
Latitude	N 44°24'02.6512"
Longitude	E 9°22'40.9307"
Height	281.094m
Rover Height	2.200m
Quality	~
Solution	RTK Fixed
HRMS	0.016m
VRMS	0.046m
Epochs	3
Antenna tilt	0.0°
DOP	^
HDOP	0.800
VDOP	1.700
GDOP	0.000 -

6E

ΜΔΧ

- Property window is used to visualizate the properties of selected items
- Depending on the object selected, different information are displayed

1 🖌 🔛	±! A										
TOPOPOINT											
Layer	PUNTI										
Color	RGB: 0.0.0 (By										
Linetype	(ByLayer)										
Lineweight	1.0 (ByLayer)										
Survey	FRAZIONAME										
Name	PF02/0040/F173										
Code											
Description											
E	-250.798m										
N	-290.809m										
Z	51.817m										
Туре	GNSS survey p										

 Propertyies of an element are also displayed when moving the mouse pointer over the element





### How copy data between surveys

- Data is subdivided in project and subprojects
- Using the New Survey is possible to create a new survey database



• With copy and paste function, any set of point can be copied from a survey to another survey







# How copy data between surveys

• The tools in the Project Manager allows different operations:

• Create, Rename and Duplicate a subproject

• Import a subproject from a different project

 Import defined entities (topographic points, measures, surfaces, drawing, etc..) from another project or from current project







# **Info functions**

Distance			4
	Points		
From	То		
PF02/0040/F173	AUX_1		
400	700		
600	600A		
600	600A		
Dist	ances report		
Distance 2D		0.029m	ŀ
Distance 3D		0.031m	
ΔE		0.022m	
ΔΝ		0.019m	
ΔZ		-0.011m	
Azimuth		55.1839g	
Slope		-38.58%	
600			
E		96.462m	
Ν		-58.813m	Ŀ
Options			
		Yes 🔍	
Distance 3D			
Distance 3D Store annotation		Yes •	
Distance 3D Store annotation Progressive distance		Yes  No	
Distance 3D Store annotation Progressive distance Distance		Yes No Close	

6E

File	Home	View	Draw	/ Edit	Surve	зу	Surfaces	Design	3D	Imaging	X-sec	ons	Cadastral	Cloud	Outpu	it P	Search
B		0			<b>M</b>	TXT		KO> XML	<u>II</u>	IFC		+ xyz	尸	₩ <b>₩</b>	<b>₩₩</b>		È
Project	Scanne	er TPS	Digital level	Controller	X-PAD Survey	Text	DWG/DXF	LandXML	Survey data	BIM model	Scanner data	ID point	Annotation	Distance	Distance object	Area	Angle
Settings Transfer					Import file							Info					

- *INFO functions* are used to quickly get information from a survey
- Selecting *Store annotation*, the measure is also saved graphically



