

X·PAD

Z O O M 3 D



User's guide





User's guide

November 2015

© 2015 LSE S.r.l. – All rights reserved



WARNING

In writing this manual every care has been taken to offer the most updated, correct and clear information possible; however unwanted errors are always possible and information can be subject to change. LSE S.r.l. cannot assume any liability resulting from the use of this manual and the same is true for every person or company involved in the creation, production or distribution of this manual. This manual is protected by copyright. Reproduction of this manual, even partial, in the absence of written authorization by LSE S.r.l. is prohibited by law.

Trademarks

Google is a registered trademark of Google Inc.

Google Maps is a registered trademark of Google Inc.

Android is a registered trademark of Google Inc.

Bluetooth is a registered trademark of Bluetooth SIG, Inc.

AutoCAD is a registered trademark of AutoDesk Inc.

All other trademarks are trademarks of their respective owners.

Index

WARNING	4
Trademarks.....	4
Index	5
Introduction	10
X•PAD 3D modules	10
Installing and first run	11
Installing and first start	11
License activation	11
General description of the system	13
Main menu	13
Information on current version.....	14
Link to Zoom3D	14
WiFi	14
USB	14
Leveling of the Zoom3D	14
Changing the WiFi channel.....	14
WiFi connection recovery.....	14
Description of the windows function	14
Simple dialog windows.....	15
Measure windows	15
Camera operation	16
Moving the pointing direction.....	16
Moving the pointing direction with the Joystick.....	17
Moving the pointing direction with side buttons.....	17
Moving the pointing direction with the remote control.....	17
Changing the zoom of the camera	17
Changing the brightness of the camera	17
Operation of the graphic window	17
Visualization filters	18
Measures performing and target type choice.....	18
Target height	19
Activating the laser spot.....	19
Continuous measures.....	20

Remote control	20
Working with targets and Robotic module	20
Research left and right	21
Research on Panorama	21
Following target	21
Automatic research of the lost target	22
Autozoom and Autozoom on Measure	22
Research from graphic window.....	22
Measure of the target with offset	22
Zoom3D direction control	23
Calculator and results recording	24
Jobs managing.....	26
Organization of the jobs in Sites.....	26
Job management on Cloud servers	26
New job	26
Opening an existing job	26
Jobs manager	26
Copy a job.....	26
Delete a job	27
Share a job.....	27
Job sheets	27
Current job sheet	27
To create a new job sheet	27
Duplicate a job sheet.....	27
Delete a job sheet	27
Photos managing.....	28
Data importing.....	29
Import drawings from AutoCAD DXF.....	29
Import points from (ASCII) text file	29
Data exporting and sharing	30
Exporting the job sheets on AutoCAD DXF.....	30
Exportation of the measured points coordinates on (ASCII) text file.....	31
Settings	32
Units of measure and precision.....	32
Visualization filters	32
Tolerances	32

WiFi	32
Language	32
Relocation and reference points	33
Reference points	33
Adding a reference point.....	33
Delete a reference point	33
Calculation of the current position from reference points	33
Calculation of the current position from points of the job sheet	34
Reference axis	34
Calculate elevation of the current position from reference point	35
Measure.....	36
Reference elevation and reference axis.....	36
Smart Drawing.....	36
Measure of single points	36
Lines measuring.....	36
Measuring other elements.....	37
Measuring vertical elements.....	37
Measuring a point and saving the photo	38
Delete objects	38
Editing utilities.....	38
Inserting a point on a line.....	38
Calculation of intersections.....	38
Calculation of a new parallel line	38
Calculation of points along a line	39
Measuring edges	39
Rectangles recognition	40
Frontal visualization referring to a line	40
Visualization of data and results	40
Calculation of distances.....	42
By SmartDrawing (points)	42
By SmartDrawing (lines).....	42
By selection of the point	42
Angle calculation	42
Calculation di area e perimeter	42
Other tools	43
Setting of the reference elevation	43
Measuring a reference point.....	43

Relocation	43
Generic photo	43
Rotation of the drawing	43
To create a new job sheet	44
Select a new job sheet	44
Management of the job sheets	44
Measuring a surface and calculation of the volume	45
Measure points of the surface	45
Measure breaklines	45
Volume calculation	45
Visualization filters	45
Automatic scan	47
Lines scan	47
Reference elevation	47
Horizontal scan	47
Vertical scan with two reference points	47
Vertical scan with automatic calculation of the plane	47
Scan according to an sloped direction	48
Operations you can perform during the scan	48
Utilities at the end of the scan	48
Automatic scan of a surface	48
Reference height	49
Automatic scan of a plane	49
Automatic scan of a generic surface	50
Operations you can perform during the scan	50
Stakeout of points and lines	51
Stakeout of points	51
Next point to stakeout	51
Stakeout of points with offset	52
Stakeout of lines	52
Stakeout tools	53
Projection on surfaces	54
Measuring of reference plane	54
Measuring of the reference points by alignment	54
Select subject to project	54
Alignment	54

Moving drawing	54
Rotate drawing on rotation point	55
Rotate drawing on a line	55
Projection	55
Insides measuring utilities.....	56
Plumb point.....	56
Level	56
Parallel line.....	56
Marking of heights	57
Distance & Offset	57
Generic measuring utilities	59
Check flat surfaces	59
Horizontal plane.....	59
Vertical plane	59
Generic plane by 3 points.....	59
Checkup and measuring of distances.....	60
Horizontal distances.....	60
Vertical distances	60
Distances from a line.....	61
Distance from arc and circle.....	61
Area & Perimeter	62
Objects height	62

Introduction

Thank you for buying **X•PAD 3D**!

This guide will allow you to have all necessary information to use your **X•PAD 3D** quickly and properly in all situations.

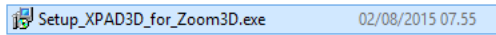
X•PAD 3D modules

X•PAD 3D functions are organized in two configurations covering the different user's needs.

Configuration	Description
Standard	Main configuration including all functions for measuring and stakeout of insides.
Robotic	Robotic configuration extends the Standard configuration introducing the possibility to recognize, follow and measure a target that can be also positioned on a pole.

Installing and first run

To proceed installing the software on your device it's necessary having the following file:



Installing and first start

Run the installing file and follow all steps until completing installation. When the installation finished, on your desktop two links will be created:



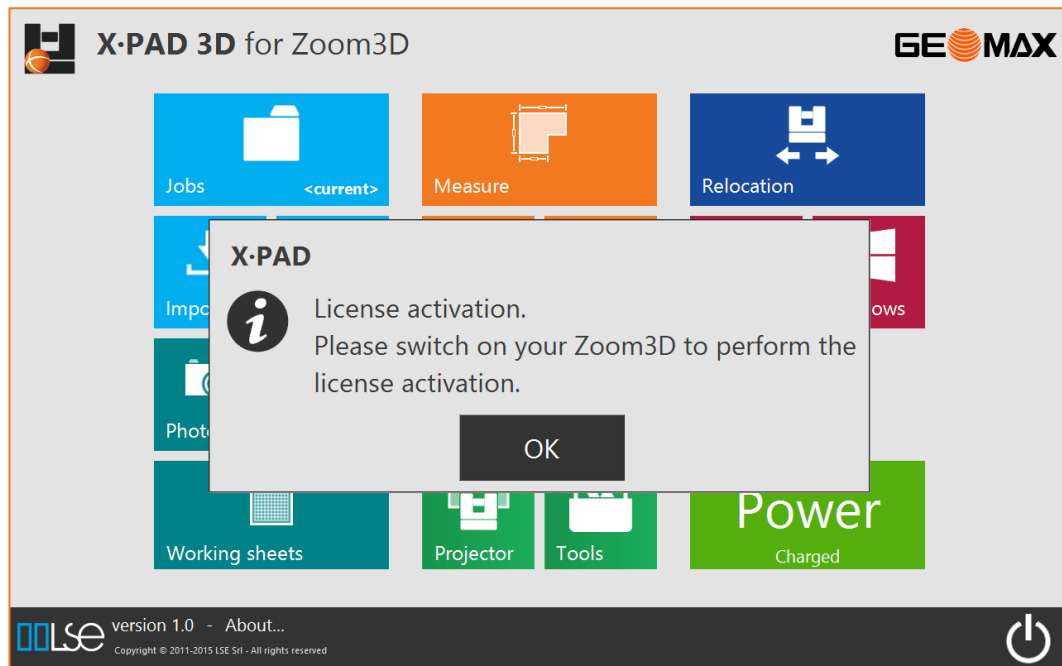
Link to use to run **X•PAD 3D**. Click on this icon to run the software.



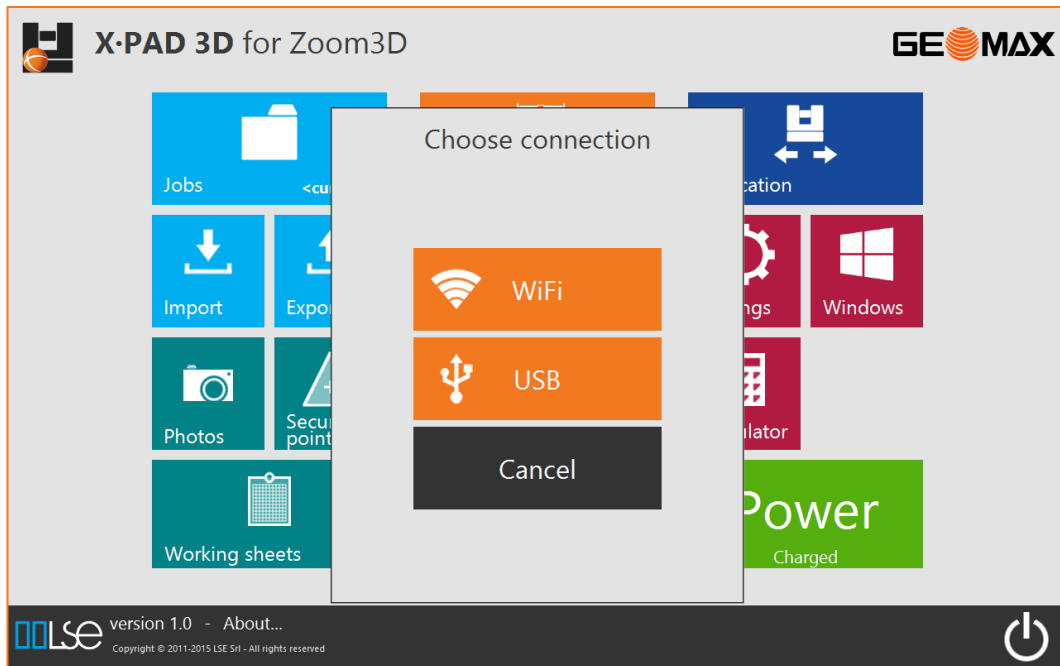
Link to use to open the folder in which are saved the **X•PAD 3D** jobs.

License activation

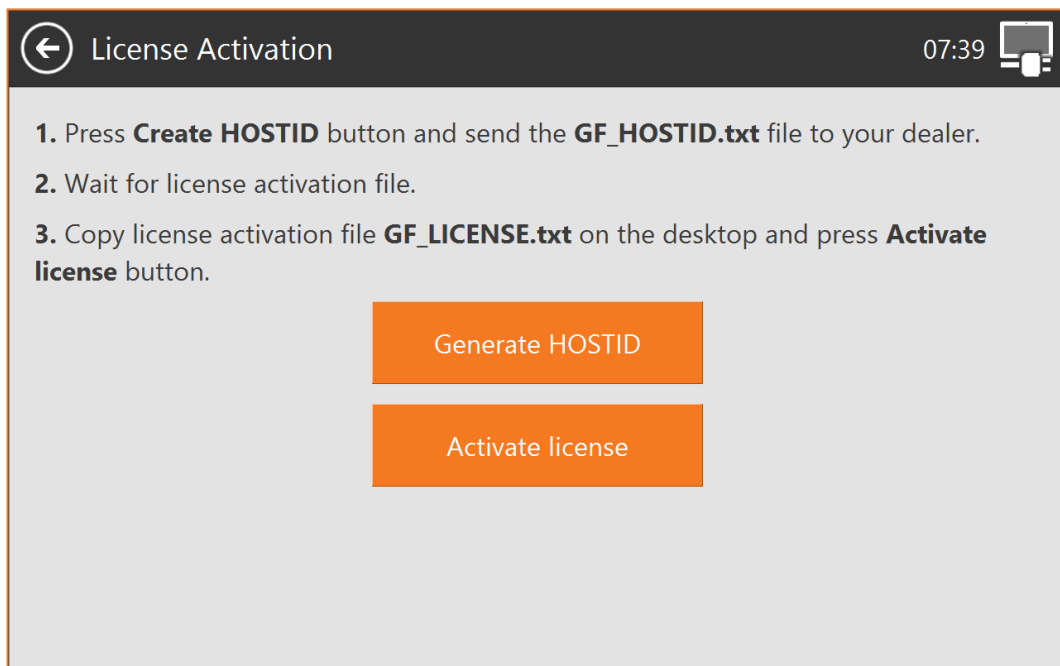
At first run it's necessary proceeding with the **X•PAD 3D** license activation. It appears the following window:



Turn on your **Zoom3D** device and press **OK** to proceed.



Select the option corresponding to the type of link to use to connect the software to your **Zoom3D**. In case of using the WiFi connection be sure that this type of connection is enabled on your computer; in case of using the USB connection be sure of having installed the corresponding drivers.



Press **Generate HOSTID** to create the **GF_HOSTID.txt** file on your desktop. The file must be sent to your GeoMax dealer with the serial number of your **Zoom3D** and the license information you possess (software serial number and software identification number). Wait for the file **GF_LICENSE.txt** that must be copied on the system's desktop.

Press **Activate license** to proceed with the activation; if the activation is successful it appears a window resuming the license data and that allows to start using **X•PAD 3D**.

General description of the system

When running **X•PAD 3D** it appears a window similar to the following:



To start using **X•PAD 3D** it's necessary to create a new job or to continue using an existing job.


Main menu



Main commands of **X•PAD 3D** are organized in boxes allowing to access to all functions of the software. To quit the software press the button on bottom right.

Information on current version



To have information according the current version you are using press the button  on top left in the main window.

Press the button **License** to view the information about the current active license.

To change license, for example to activate a new configuration, press the button **Change**; it will appear the same window that has allowed the first activation.

Link to Zoom3D

The link to **Zoom3D** can be established through a WiFi connection or through a USB connection.

WiFi

To allow WiFi connection it's necessary to activate this type of connection on your computer; the first WiFi connection can request waiting for several seconds. The WiFi connection works properly under 50 meters distance; we recommend always maintaining your computer turned toward your **Zoom3D** to facilitate connection.

USB

Use the USB cable to connect your **Zoom3D** to your PC. For a correct use it's necessary installing the corresponding drivers.

Leveling of the Zoom3D

At turn on of the **Zoom3D** it's automatically started the leveling procedure; before using **X•PAD 3D** wait for the end of procedure; the leveling procedure can be automatically activated also during the system's use.

Changing the WiFi channel

If using the WiFi is difficult in particular environment or places, it can be a solution to change the communication channel. To change channel it's necessary to connect **Zoom3D** by USB cable.



Select item **Zoom3D WiFi Analyzer**. The button allows to check the channel occupation by all WiFi devices. Chose a free and "distant" by others channel;
Disconnect the USB cable and try again the WiFi communication.

WiFi connection recovery

If WiFi connection should interrupt, **X•PAD 3D** shows a warning window that allows to di recover connection.

Description of the windows function

During the use of **X•PAD 3D** they can appear two types of windows: simple dialog windows allowing to execute setups or to edit data, and measuring windows. Measuring windows are all those windows where it happens an interaction with **Zoom3D** and that allow to perform measures.

Simple dialog windows

Simple dialog windows are characterized by an upper bar similar to this one:



To close the window press the button on top left. On top right is reported the current time and the PC battery level. Click on the battery level icon to have further information.

Measure windows

In the measure windows the upper bar contains several information about the **Zoom3D**.



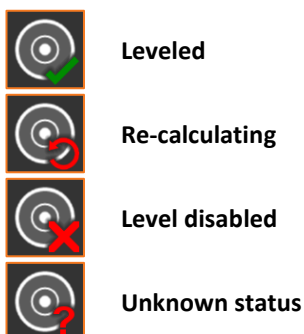
In the right side there are the following icons:

- **Current time**
- **PC battery level**
- **Zoom3D battery level:** click on the icon to have further information about the battery level.
- **Zoom3D current status:** the possible status are:



Click on the icon to have further information about the **Zoom3D** status.

- **Zoom3D level status:** the icon indicates if the **Zoom3D** is automatically leveled or if the level is disabled. Clicking on the icon it's possible to activate or deactivate the automatic level.



Measure windows contain also a panel on the right side; the content of the panel changes in some parts basing on the type of measure you set.

If the measure with laser-spot is activated the panel is similar to the following:

Activates the camera visualization; the central button allows to activate the double view: camera and graphic
Zoom in the camera or the graphic view

Increase the camera brightness

Activates continue measuring

Zoom3D control window

Setup window



Activates the graphic visualization

Zoom out the camera or the graphic view

Decrease the camera brightness

Start/Stop measure

Current target type and target type choice

Utilities

If the measure with target is activated the panel is similar to the following:

Activates the camera visualization; the central button allows to activate the double view: camera and graphic

Zoom in the camera or the graphic view

Increase the camera brightness

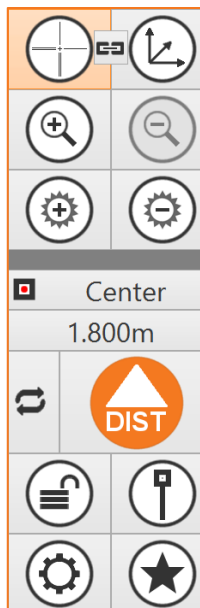
Measure position on target: left, center, right

Target height

Activates continue measuring

Target locking status and Zoom3D control window

Setup window



Activates the graphic visualization

Zoom out the camera or the graphic view

Decrease the camera brightness

Strat/Stop measure

Current target type and target type choice

Utilities

Camera operation



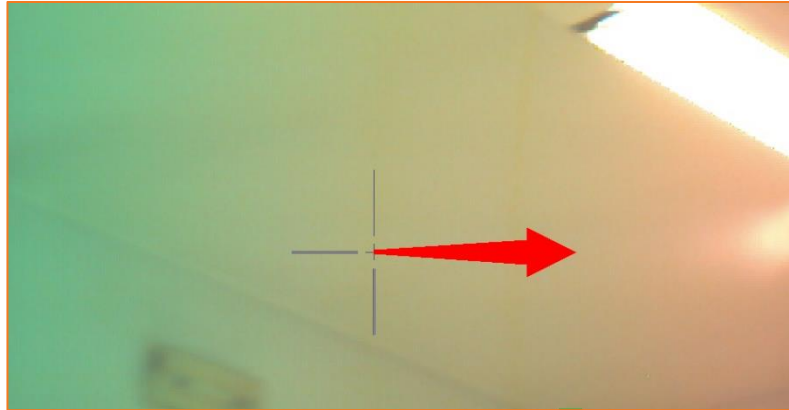
The camera is a main element of the **Zoom3D** because it's the only way to check the collimation point and consequently the point that will be measured.

Moving the pointing direction

To move the pointing direction click on screen in correspondence of the desired position; the **Zoom3D** will move to aim the indicated point.

Moving the pointing direction with the Joystick

To move quickly the pointing direction on positions that are outside of the screen it's possible to use the joystick; keep pressed for a second on the target of the camera: a blue spot will appear; from now on it's possible to drag the view toward every direction. To drag the view keep pressed your finger or the pen on the screen and move it. The **Zoom3D** will follow the indicated direction. To stop the movement uplifts your finger or the pen from the screen.



Moving the pointing direction with side buttons

It's possible to change the pointing direction using the four buttons located on the external sides of the view; a short hit on the button corresponds to a micro movement; a long hit starts movement toward selected direction. The greater is the time of the pressure and the higher is the rotation speed.

Moving the pointing direction with the remote control

It's possible to use the buttons on the remote control to change the pointing direction of the **Zoom3D**.

Changing the zoom of the camera



The two buttons allow to change the level of zoom of the camera.

Changing the brightness of the camera



The two buttons allow to change the brightness of the images of the camera.

Operation of the graphic window



The graphic window shows the position of all measured elements of the current job file. The graphic window is operable from a toolbar in the upper part.



The toolbar disappear automatically after some seconds if the graphic window is not used; to show again the toolbar click on the screen.



Zoom in the current view. The view can be zoomed in also with the corresponding button on right panel.



Zoom out the current view. The view can be zoomed out also with the corresponding button on right panel.



Allows to define the visualization window indicating the opposite angles.



Visualization of all elements of the drawing.



Activates the modes of movement of the view. The view can be moved by the dragging of two fingers on the screen.



Go to 2D visualization.



Go to 3D visualization.

Visualization filters




The command allows to enter in to the general settings of **X•PAD 3D**; Select **Setup** to enter in to the camera data visualization settings and in to the graphic window.

The box is divided in two sections, one for the camera and one for the graphic view; for each section it's possible to set the data to be shown in the corresponding view.

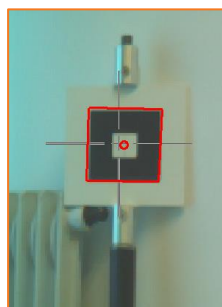
Measures performing and target type choice

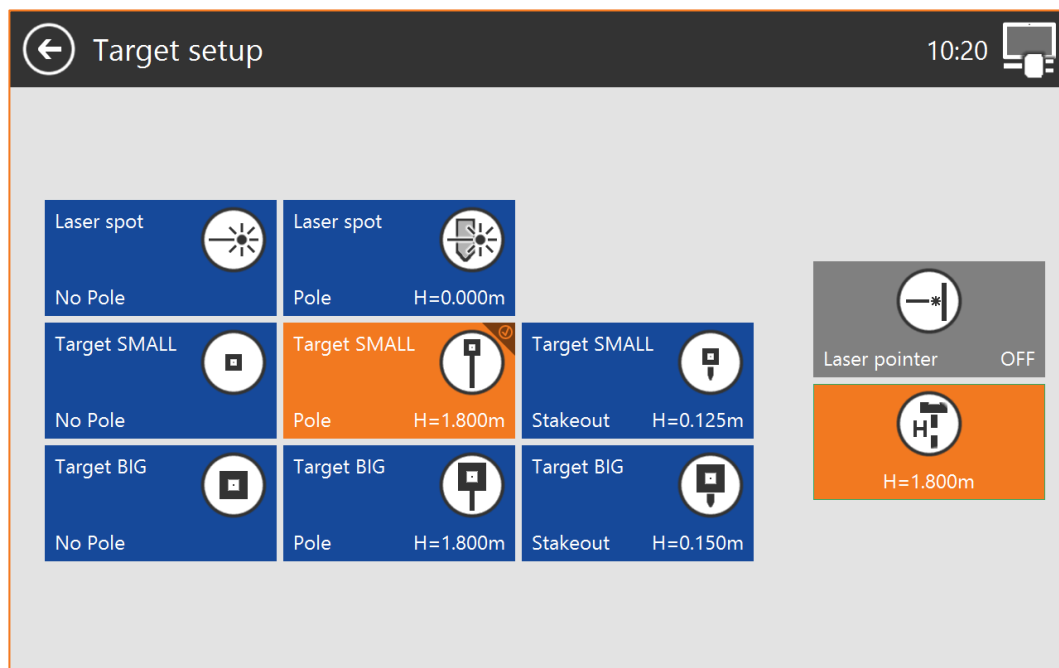


To perform measures press the button . The measure is performed basing on the type of target selected. The button located just below the button **Measure** shows the current type of target and allows to choose the type of target.

X•PAD 3D allows to perform measures in two modes:

1. **Laser spot:** the measure is performed on the collimation point shown on the camera.
2. **Target:** the target is automatically recognized by the images sent by the camera. When the measure is started the center of the target is calculated, the camera is moved on the Center and at last the measure is performed.





Measure with laser spot; the measured point corresponds exactly to the point indicated by the laser.



Measure with laser spot on vertical support. Set the height of the support with the button **Target height**. The calculated point corresponds to the point at the bottom end of the support.



Measure on small target. The measured point corresponds to the center of the target.



Measure with small target on vertical pole. Set the height of the pole with the button **Target height**. The calculated point corresponds to the point at the bottom end of the pole.



Measure with small target upside down. The target can be used with the tip pointing down and has a fixed height from the ground.



Measure on big target. The measured point corresponds to the center of the target.



Measure with big target on vertical pole. Set the height of the pole with the button **Target height**. The calculated point corresponds to the point at the bottom end of the pole.



Measure with big target upside down. The target can be used with the tip pointing down and has a fixed height from the ground.

Target height



Target height: For targets **Laser spot with pole**, **Target small on pole** and **Target big on pole** it's necessary setting the height from the ground of the support; the height is referred to the distance between the center of the target and the bottom end of the pole.

Activating the laser spot



Laser pointer: by this button it's possible to activate and deactivate the laser pointer. The laser pointer allows to check the measure direction on the surface to be measured.

Continuous measures



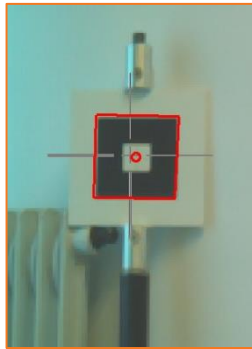
Measure continuous: by this button it's possible to activate and deactivate the continuous measure of the target. To stop the continuous measure press **STOP** button. The continuous measure is available only in some commands.

Remote control

It's possible to start the measure from the remote control pressing the red button.

Working with targets and Robotic module

Robotic module enables **X•PAD 3D** to recognize, follow and measure targets. The target is automatically recognized by analyzing images coming from the camera. When the target is recognized it's shown on the image with a red rectangle.



To recognize target it's necessary that this one has a sufficient dimension in the camera view; for this reason it's necessary to change the level of zoom of the camera basing on the distance. To this purpose it's also available an option that automatically adapts the level of zoom.

To maintain target locked it's necessary that this one is always visible in the camera field of view; if the target moves too quick and goes out of the camera field of view you can operate like this:

1. Starting the manual research of the target right or left
2. Specifying your position in the **Panorama**
3. Specifying your position on graphic window
4. Activating an automatic research of the target; one available option is the research toward the last movement direction; when the target is lost, **X•PAD 3D** starts automatically a research in the same direction of the last movement of the target.
5. Using the joystick to manually rotate the **Zoom3D** toward your position.

In the side control panel a button indicates the locking and following status of the target:

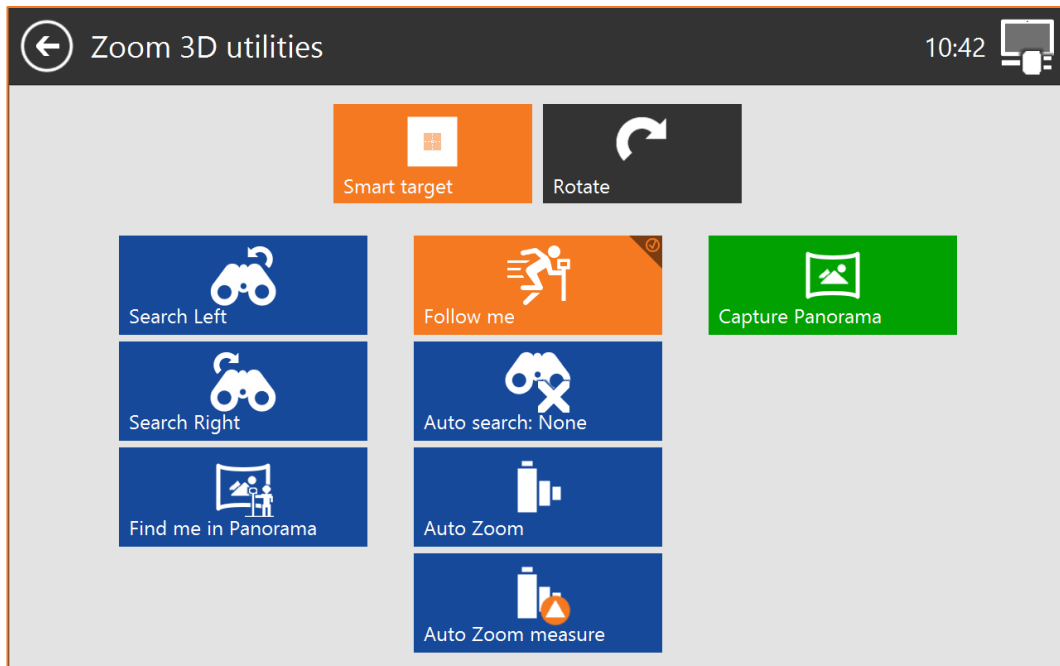


Locked: target has been recognized and is followed by **Zoom3D**.



Unlocked: target is not followed by **Zoom3D**.

Clicking on button you enter in to the window allowing to fully control the **Zoom3D**.



Research left and right



Research left: the rotation of the **Zoom3D** on left is started searching the target; if the target is found the rotation is stopped.



Research right: the rotation of the **Zoom3D** on right is started searching the target; if the target is found the rotation is stopped.

To stop research press the button **Stop**.

Research on Panorama

Panorama is a new mode of Research of the target. After positioning the **Zoom3D** it's necessary to proceed capturing the panorama all around.



Panorama capture: Starts procedure allows to capture panorama. Press **Start** to start procedure. At the end the panorama is saved and can be used to research the target.



Find me in panorama: after capturing panorama it's possible to use this function to indicate to the **Zoom3D** where you are in this moment. Scan the panorama till you find the current position and press the button **I'm here**. **Zoom3D** will automatically rotate toward the current position.

Following target



Follow me: when this function is active **Zoom3D** recognize target and is also able to follow it. When the target moves the **Zoom3D** will rotate too maintaining the target in the center of the view.

Automatic research of the lost target

When target is lost it's possible activating an automatic research:



None: automatic research is not started. The target must be searched manually using a position function.



Last direction: Zoom3D is rotated toward the same direction of the target before its loss. Rotation goes for some time; if the target is not found the rotation stops.

Autozoom and Autozoom on Measure



Autozoom: when this option is active the target dimensions are continuously analyzed; when dimension is too big or too small the level di zoom is automatically adapted to ensure always the right dimension of the target.

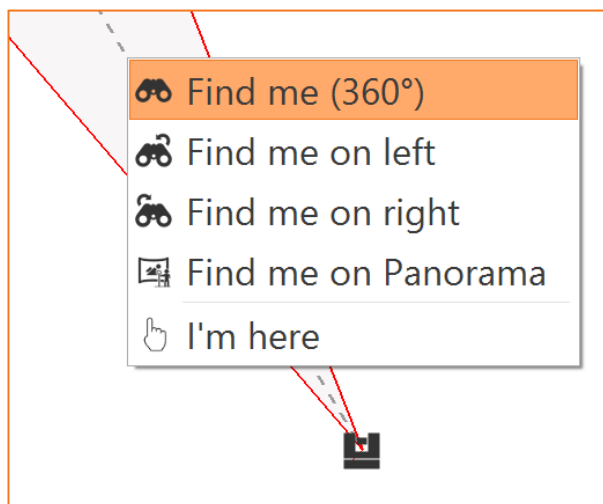


Autozoom on Measure: when this option is active, the measure is performed after the target is zoomed at the maximum possible level; this way the calculation of the center of the target is performed with the best precision. At the end of the measure, the zoom is set on previous level.

Research from graphic window

It's possible to activate some of the previous functions directly from the graphic window without opening the **Zoom3D** control window.

The position of the **Zoom3D** is shown with the corresponding target direction; click on the dashed line to view the local menu:











From the local menu it's possible to start research of the target in the modes still explained; moreover it's available the function **I'm here**. This function allows to indicate directly on the graphic view your position; the **Zoom3D** will rotate toward the indicated position.

Measure of the target with offset

When the **Target small** or **Target big** is selected, it's possible to specify the measure position:



Top Left: it's measured the point finding on the corner top left of the target.




-  **Top Center:** it's measured the point finding on the center of the top edge of the target.
-  **Top Right:** it's measured the point finding on the corner top right of the target.
-  **Center Left:** it's measured the point finding on the external left edge of the target.
-  **Center:** it's measured the center of the target.
-  **Center Right:** it's measured the point finding on the external right edge of the target.
-  **Bottom Left:** it's measured the point finding on the corner bottom left of the target.
-  **Bottom Center:** it's measured the point finding on the center of the bottom edge of the target.
-  **Bottom Right:** it's measured the point finding on the corner bottom right of the target.

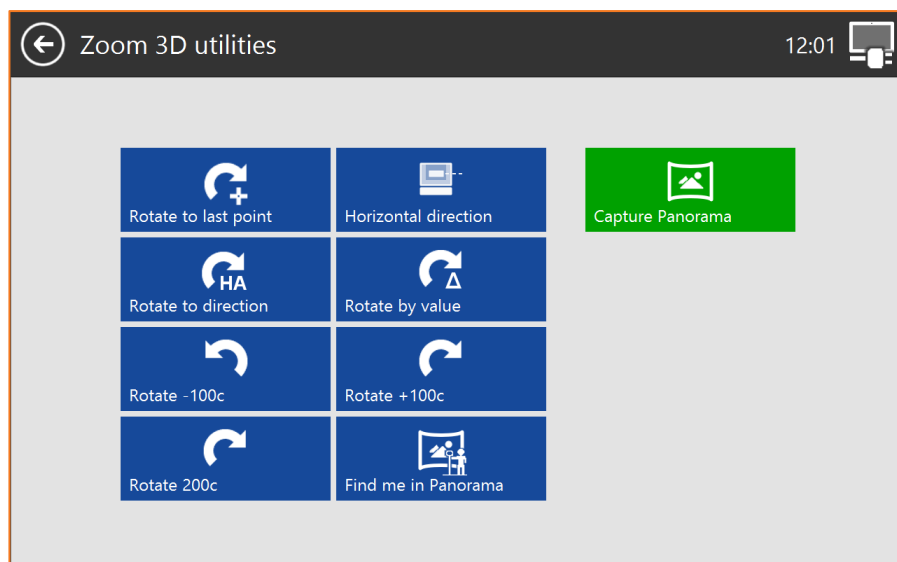
The direction to be considered to understand what is on the right and on the left is the one from target toward the **Zoom3D**.

With the offset on target options it's possible to measure easily elements that otherwise would be hardly measurable such as corners, angles, etc.

Zoom3D direction control

To access to the control window of the **Zoom3D** direction use the button located on the side control panel:

-  Type of target is laser spot
-   Type of target is target; Press the button **Target**.





Rotates on last measured point



Rotates on the preset absolute angle



Rotates Left 90°



Rotates 180°



Bring **Zoom3D** in horizontal direction



Rotates **Zoom3D** to an angular value



Rotates Right 90°



Find me in panorama: after capturing panorama it's possible to use this function to indicate to the Zoom3D where you are in this moment. Scan the panorama till you find the current position and press the button **I'm here**. **Zoom3D** will automatically rotate toward the current position.




Panorama capture: Starts procedure allows to capture panorama. Press **Start** to start procedure. At the end the panorama is saved and can be used to research the target.

Calculator and results recording

Calculator function allows performing every type of calculation, but most of all to use in calculations the values obtained during measuring operations with the **Zoom3D**. In the measure windows it's possible to find an object similar to the following:



The object reports a list of values calculated. Clicking on button  it appears the calculator. This window reports the calculated values and allows to use them in calculations.

Calculate values can be saved for a next use. Press the button **Save** to record current result. It's visualized the window to manage the saved results; the window shows all results that have been saved;

to save the new result assign a description and press . They are available the following commands:



Add a new result



Edit result of the current line



Delete current line



Copy the current result on calculator to be used in other calculations

Jobs managing




To work with **X•PAD 3D** it's necessary to create a job or to open an existing job. The jobs are organized in Sites; it's possible to create new sites and to manage existing ones; every new job is created in current site. Every site can contain different jobs.

Organization of the jobs in Sites

In the upper part of the window it's visualized the current site. To access the sites manager press



. It's visualized the list of sites and the number of jobs present in every site. When a site is

selected you'll go back at the window listing the jobs present in the site. Press  to create a new site.


Job management on Cloud servers

It's possible to open jobs saved on Cloud as Google Drive, DropBox, OneDrive. Press the button



and select the Cloud service on which the jobs are saved. They will be listed the present jobs; it's possible to open the selected job and continue working.

New job

Press  to create a new job. Assign a name at the job. The job is saved on the current site or on the one of the selected cloud service.

Opening an existing job

Select the job to open among the present ones in the list; the list is referred to the current site.

Jobs manager



Jobs manager allows to perform different operations on jobs present in the system.

Copy a job


The command allows to make a complete copy of the selected job.

1. Select a job from the list

2. Press  to copy the job


Delete a job

The command allows to delete completely all data of the selected job.

1. Select a job from the list
2. Press  and assign a name to the copy of the job

Share a job

The command allows to share the selected job; it's possible to send the job by e-mail or save it on a Cloud server as Google Drive, Microsoft SkyDrive, DropBox.

1. Select a job from the list
2. Press 
3. Select the sharing mode; it's possible to attach the job to an e-mail message or it's possible to copy it on a Cloud service.

Job sheets




Inside a job it's possible to organize the measure sessions, the imported data, the scans performed, and in general all data, in job sheets. Every sheet can contain points, drawings, surfaces, etc. It's possible to create new job sheets, select the current job sheet or delete the unnecessary job sheets.


The content of the job sheets is visualized in sequence in the corresponding box of the main window of the software.

Current job sheet


Among all the present job sheets only one is the current job sheet; the current job sheet is the sheet that will be used in the command **Measure** and in other commands; it's possible to change the current job sheet in every moment.

1. Click on  to make current the corresponding sheet.


To create a new job sheet

1. Press  to create a new job sheet
2. Assign a name to the job sheet
3. The job sheet is the current one

Duplicate a job sheet

1. Press  to create a copy of the selected job sheet
2. It's automatically created a copy of the job sheet

Delete a job sheet

1. Press  to delete the selected job sheet
2. The current job sheet can't be deleted

Photos managing



X•PAD 3D allows to create a photos archive for every job; photos can be shot together with the measure of a point or can be shot freely by the camera of **Zoom3D**. Photos are visualized in sequence in the corresponding box of the main window of the software.

Data importing



Importing procedures allow to load points and drawings from files in different extensions. Files to import can be present on the controller folders or on Cloud server.

It's visualized the list of files of the selected extension present in the current folder. Press the button



to select the folder in which it's present the file to import. The button



allows to select the file to import from a cloud server service correctly installed and available in the system.

Import drawings from AutoCAD DXF

There are proposed some importing options about points:

Drawing points	Activates import of drawing points (POINT) as points.
Convert blocks in points	Activates import of blocks references (INSERT) as points.
Insert points on main positions	Activates the automatic creation of points on geometrical objects vertexes of the drawing.

Press **Import** to start importation. The content of the DXF file is saved in a new job sheet that will have the same name of the DXF file.

Import points from (ASCII) text file

It's possible to set the importation rules of the text file:

1. During selection procedure of the file it's possible to specify the type of file; in the list are visualized the importing/exporting schemes present in the system; Select the correct scheme for the file if available.
2. After having selected the file to import the content is visualized in a preview window.
3. Press **Next**. If an importing scheme has been selected you'll proceed directly to file importing without having to define other parameters.
4. Select the type of format: **Fixed** or **Delimited**; Select **Fixed** if data are saved in the file with fixed width (by columns); Select **Delimited** if data are separated by a character; in case of **Delimited** format specify the character that has been used to separate the content of the fields.
5. It's possible to specify the number of heading lines present in the file; the heading lines won't be imported.
6. Press **Next**
7. In this step it's possible to set which fields must be imported and their order inside the file. If the **Fixed** format has been set, it's possible also to define the number of characters of every block (column). The table visualizes in real time how data to import will be selected.
8. Press **Next**
9. Settings made can be saved in an importation scheme to which you can assign a name. The next importations/exportations can be performed using the scheme still set without having to set every time the correct parameters.
10. Press **Next** to start importation. The imported points are saved in a new job sheet that will have the same name of the text file.

Data exporting and sharing



Exporting procedures allow to export points, drawings and other information on files in different extensions to be used in other applications.

Exporting procedures allow to specify the name of the file to export and the exportation folder; press



the button to change the name of the file and to select the exportation folder. The button



allows to di select, as exportation folder, a cloud server service correctly installed and available in the system.

After having specified the name of the file and the exportation folder, it's possible to specify the job sheet to export; the content of the job sheets must be exported in separate manner.

At last it's possible to activate the option **Share** to send the file attached to an e-mail message.

Exporting the job sheets on AutoCAD DXF

There are available different exporting options:

DXF version	AutoCAD DXF format
Drawing export	Allows to export all elements of the job sheet (lines, circles, arcs, ...)
Surfaces export	Allows to export also surfaces present in the job sheet.
3D exportation	It's exported a DXF file containing all elements of the job sheet with the 3D coordinates (file with suffix _3D).
2D exportation	It's exported a DXF file containing all elements of the job sheet with the only XY coordinates (file with suffix _2D).
Front exportation	It's created a DXF file containing main front that have been automatically identified (files with suffix _front). X•PAD 3D analyzes the content of the job sheet and identifies the main planes that have been measured; on every plane the other near elements are projected and this way the relative front is generated.

About the exportation of the points there are available instead the following options:

Export points	Allows to export the points present in the job sheet.
Export as block	The points are exported as AutoCAD blocks with attributes.
Export photo	The points having a photo associated are exported with the link to the file of their photo; this way, in AutoCAD, clicking on the link present near the point it's possible to open the photo.

Press **Export** to start exportation. If the option **Share** has been activated, it will be asked the sharing mode.

Exportation of the measured points coordinates on (ASCII) text file

It's possible to set the rules to export on text file:

1. During the procedures of selection of the exportation file it's possible to specify the type of file; in the list are visualized the importation/exportation schemes present in the system; select the correct scheme for the file if available.
2. After defining the name of the file to export and the exportation folder press **Next**. If an exportation scheme has been selected you will proceed directly to exportation of the without having to define other parameters.
3. Select the type of format: **Fixed** or **Delimited**; Select **Fixed** if data are exported with fixed width (by columns); Select **Delimited** if data are separated by a character; in case of **Delimited** format specify the character to be used to separate the content of the fields.
4. It's possible to add a heading line with the name of the type of data exported.
5. Press **Next**
6. In this step it's possible to set which fields must be exported and their order inside the file. If the **Fixed** format has been set, it's possible also to define the number of characters of every block (column). The table visualizes in real time how data to export will be selected.
7. Press **Next**
8. Settings made can be saved in an exportation scheme to which you can assign a name. The next importations/exportations can be performed using the scheme still set without having to set every time the correct parameters.
9. Press **Next** to start exportation.

Settings



The software is subject to several parameters and options that are fully customizable by the operator.

Units of measure and precision

The page allows to set the units of measure and the precisions to use for every kind of data.

Visualization filters

The page is divided in two sections, one for the camera and one for the graphic view; for every section it's possible to set the data to keep visible in the corresponding view.

Tolerances

The page allows to set the tolerance to use in calculation of the relocation and in the stakeout procedures.

Relocation: if the calculation of the relocation gives an error higher than the tolerance, a warning is visualized.

Stakeout: when the stakeout distance is lower than the preset tolerance, **X•PAD 3D** announces that the point has been reached.

WiFi

If using the WiFi is difficult in particular environment or places, it can be a solution to change the communication channel.

The button **WiFi Analyzer** allows to check the channels occupation by all WiFi devices. Select a free and the most "far" from others channel possible.

Disconnect the USB cable and try again the WiFi communication.

Language

X•PAD 3D can be used in different languages. Select the desired language from the list. To use **X•PAD 3D** with a new language it's necessary to close the software and re-start it.

Relocation and reference points

The relocation of **Zoom3D** is a necessary operation to allow continuing the operations with **Zoom3D** inside the same site and with the same reference system. The relocation is necessary in the following situations:

Measure – Continue measures in a new position

After starting the measuring job, it is necessary moving the **Zoom3D** to measure some invisible points by the actual position. Locate **Zoom3D** in a new position and start the **Relocation** procedure.

Measure – New session

The measuring job hasn't been completed in a single session and it's necessary to acquire new measures. Locate **Zoom3D** and start the **Relocate** procedure.

Stakeout



It has been loaded a job sheet with points and/or a stakeout drawing. To define the position of **Zoom3D** referring to the job sheet it's necessary to perform the **Relocation** procedure.

Reference points




The relocation procedure can be performed basing on reference points correctly recorded or basing on points present on a job sheet. Reference points are specific points, unmovable present in the site that are opportunely measured and photographed to be used simply and quickly in relocation procedures. Reference points are visualized in sequence in the corresponding box of the main window of the software.

Adding a reference point

1. Press the button  to create a new reference point.
2. Assign a name to the point
3. Measure the reference point with precision 
4. For the reference point it's shooted also the photo allowing a rapid and sharp selection of the point when **Re-positioning**.

The reference point can be inserted also in the command **Measure**.

Delete a reference point



1. Select the reference point from the list and Press the button .

Calculation of the current position from reference points



If you have at least two reference points it's possible to calculate the position and the orientation of the **Zoom3D** through the direct measure of the same points. We recommend however, for a better precision of the calculation, to use at least three reference points.

1. Select the operation **Reference points**



2. Select the first reference point from the list 
3. Measure the reference point with precision
4. Select the second reference point from the list 
5. Measure the reference point with precision
6. It's possible to proceed the procedure and measure further reference points. The more the measured points, the more is the calculation precision.
7. A window visualizes the precisions obtained both about distances and both about the elevations.

Calculation of the current position from points of the job sheet



If you have no reference points, it's possible to calculate the position and the orientation of **Zoom3D** through the measure of at least two points present in the job sheet; the points to measure have to be measured with precision in the site. So you can relate the position of **Zoom3D** in the site with data present in the job sheet.

This situation is typical when you import data on a job sheet and you must perform a stakeout of these points; in this case it's possible to measure at least two points present both in the job sheet and both in the site to proceed then with stakeout procedure. We recommend in this case also for a better precision of the calculation, to use at least three reference points.



1. Select the operation **Points of the job sheet**
2. Select first reference point from graphic window 
3. Measure the reference point with precision
4. Select the second reference point from graphic window 
5. Measure the reference point with precision
6. It's possible to proceed the procedure and measure further reference points. The more the measured points, the more is the calculation precision.
7. A window visualizes the precisions obtained both about distances and both about the heights.

Reference axis



Position and orientation of **Zoom3D** are determined by measuring two points stating the direction of X axis (abscissa). First point measured will assume coordinates **(0,0,0)** instead the second point measured will assume coordinates **(distance from first point, 0, 0)**.

The position of **Zoom3D** and the position of all next measured points will be calculated basing on this reference system.

1. Measure the point **Origin** of the reference system 
2. Measure the point defining the **Direction** of the reference system 

Calculate elevation of the current position from reference point



It's possible to assign to a point to measure a reference elevation; the elevation of all next points measured will be calculated referring to the elevation of the reference point.

1. Measure the point representing the reference elevation
2. Assign the elevation value.



Measure



The command **Measure** allows to perform simple and complex surveys both of insides both of outsides; however it presents several functions making it suitable also as a drawing CAD system. About this is a command that can be used also without the connection to the **Zoom3D**.


Reference elevation and reference axis

When it's used a new job sheet it's possible to measure a point that will be used as reference elevation: measure the point and then assign the corresponding elevation. All next measured points will have their elevation referred to the reference elevation.

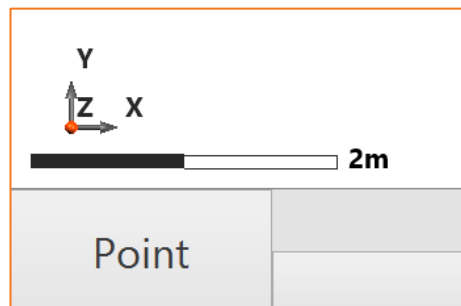
First two points measured determine the reference axis of the job sheet; it's important so to measure two points that will be represented on the abscissa axis in the drawing.

Smart Drawing

SmartDrawing is a group of drawing functions allowing to create complete surveys of every kind. The functions present allow not only to create lines between points but also complete polylines, rectangles, circles, arcs; there are also commands to create solid objects as parallelepipeds, cylinders, flat surfaces and stairs.

SmartDrawing commands are based on points: the points can be measured directly with  or selected directly on screen. For example it's possible to create a line between an existing point and a new point to measure.


To access the **SmartDrawing** functions select the button located bottom left.



The **SmartDrawing** commands can be stopped with the button **Cancel**.

Measure of single points

1. Select the **Point** mode from the **SmartDrawing** window.

2. Measure points with .

Lines measuring

1. Select the **Line** mode from the **SmartDrawing** window.

2. Measure the points of the line with  or select existing points from the graphic window.

When it's created a line it's possible to perform some operations:

Delete	Delete the line just inserted.
Insert	Allows to insert a new point between first and second point of the line.
Frontal view	Rotates the view keeping the camera in front of the line and providing so an elevation.

When at least three points have been measured it's added automatically a temporary line closing the shape; to close the shape, select the temporary closing line and press **Close**.

It's possible to create a new line also in the following manner:

1. Select the starting point of the line
2. Press the button **Line**
3. Measure the next point of the line with  or select it from the graphic window.

Measuring other elements

In addition to points and lines it's possible to measure other kind of elements:

Circle (Center and radius)	Measure the center of the circle and a point on perimeter.
Circle (3 points)	Measure three points on perimeter of the circle.
Arch (3 points)	Measure three points on perimeter of the arch.
Square (2 points)	Measure two opposite points of the square
Square (Center and radius)	Measure the center of the square and the middle point of a side.
Rectangle (base and height)	Measure the two points representing the base of the rectangle and every point on the opposite side.
Rectangle (Center and height)	Measure the center of the rectangle, the middle point of a side and a point for the height calculation.
Face (4 points)	Measure 4 points defining a shape of 4 vertexes; After the first shape it's possible proceeding and indicating two new vertexes; it will be built a second shape as continuation of the first one.
Parallelepiped	Measure two points defining the base of the parallelepiped, a point defining depth on the base and at last a point defining the height.
Cylinder	Measure three points on the base of the cylinder and a point defining the height.
Stairs	Measure two points on the base of the first step, two points on the height of the first step and then proceed with points defining the height of the next steps.

Measuring vertical elements

Commands **Circle with Center and Radius**, **Square** and **Rectangle** create shapes on the horizontal plane; if the measured shapes are on a vertical plane it's possible to activate the operation **Vertical plane** before measuring the objects.

1. Select the operation **Vertical plane** on **SmartDrawing**.

To return to standard mode, select the operation **Horizontal plane** on **SmartDrawing**.

Measuring a point and saving the photo

It's possible to measure a point and at the same time acquire a photo identifying the measured point.

1. Select the operation **Take photo** on **SmartDrawing**.



2. Measure the point
3. Photos can be visualized and managed by command **Photo** of the main menu.

Delete objects

1. Select the element to delete from the graphic window
2. Press the button **Delete**.

When it's deleted an element as a line, this determine the deletion also of the points linked to the object if these are not common to other objects.

Editing utilities

For the lines there are available some commands allowing to create new points and new lines starting by the existing objects.

Inserting a point on a line

1. Select a line from the graphic window
2. Press the button **Insert**
3. Measure the new point with  or select an existing point.

Calculation of intersections

This command calculates the point of intersection between two lines.

1. Select a line from the graphic window
2. Press the button **Tools**
3. Select the item **Intersection**
4. Select the line to intersect
5. It's calculated the point of intersection between the two lines
6. Press **Accept** to save the point

Calculation of a new parallel line

This command creates a new parallel line to the selected line.

1. Select a line from the graphic window
2. Press the button **Tools**
3. Select the item **Offset**
4. Specify the direction and the offset value
5. It's visualized the calculated parallel line

6. Press **Accept** to save the line

Calculation of points along a line

This command allows to calculate a point along a reference line and at a distance to it.

1. Select a line from the graphic window
2. Press the button **Tools**
3. Select the item **Distance & Offset**


Starting point	The point to insert can be calculated by the starting point or by the ending point of the reference line.
Direction	The point can be inserted along the line or on its left or right.
Distance	Distance to which inserting the new point; the distance is referred to the starting or ending point of the line.
Angle	If it has been chosen the operation insert Right/Left it's possible to specify the angle of insertion of the point referring to the reference line. An angle of 90° indicates that the point is inserted perpendicularly to the line.
Offset	If it has been chosen the operation insert Right/Left it's possible to specify the distance at which to insert the point referring to the reference line.

4. It's visualized the point calculated
5. Press **Accept** to save the point

Measuring edges

Measuring rooms it's fundamental the measure of the edges between the walls, the edges between walls and ceiling and of edges between walls and pavement; the sharp collimation of these points with the room can be difficult due to uniformity of the color of the walls or not favorable light conditions. To solve this problem it has been introduced the possibility to determine automatically these elements through the recognition of the surrounding plans defining the point to measure.

This option is obviously available when it has been set the laser spot as measuring mode. To set the

automatic measuring of the edges press the button located just over the button .



Direct measure: it's measured the point collimated by the camera.



Top line: it's determined and measured the intersection point between the wall and the ceiling



Bottom line: it's determined and measured the intersection point between the wall and the pavement



Top corner: it's determined and measured the upper edge resulting by the intersection of two walls and the ceiling.



Vertical line: it's determined and measured the intersection point between two walls.



Bottom corner: it's determined and measured the lower edge resulting by the intersection of two walls and the pavement.

After having selected the edge measuring mode, collimate in rough manner the edge to measure and



press **DIST**; **X•PAD 3D** will perform some measures to determine the position of the desired point and will perform the measure.

The operation **Cancel mode after measure** allows to return to the standard measure mode after completing the edge measure.

Rectangles recognition

When the view of the camera is active, **X•PAD 3D** tries to locate rectangular elements among the framed objects; every rectangular object identified it's visualized with a blue dashed frame. It's possible to select one or more rectangles directly by the view of the camera and proceed directly at the measure



with **DIST**.

X•PAD 3D measures automatically the 4 vertexes of the rectangle and builds a closed polyline.

To activate and deactivate the automatic recognition of rectangles use the command **Rectangles recognition** on **SmartDrawing**.

Frontal visualization referring to a line

1. Select a line
2. Press the button **Front view**; The view is rotated keeping the camera in front of the line and providing so an elevation.

Visualization of data and results

When you select an element in the graphic view, are visualized several numeric information representing it.























Information is different basing on the type of object. With the function calculator it's possible to save the values or to use them in calculations combining them to other values.



Line - Horizontal length



Line – Sloped length (3D)

	Line – Height
	Line – Slope
	Angle 3D
	Complementary angle 3D
	Complementary angle
	Angle
	Area on horizontal plane
	Sloped area (3D)
	Parallelepiped – depth
	Parallelepiped – Height
	Solid – Volume
	Parallelepiped – Base
	Circle diameter
	Perimeter of the circle
	Radius of the circle
	Area of the circle
	Cylinder – Height
	Cylinder – Volume
X Y Z	Coordinates of the point
	Perimeter on horizontal plane
	Perimeter 3D

Calculation of distances

The calculation of distances is one of the main functions of the Measure command. It's possible to measure distances in different ways.

By SmartDrawing (points)

1. Select the command **Distance** on **SmartDrawing**
2. Select the points between which to measure the distance; after the first two points the calculated values are visualized; it's possible to proceed and indicate further points. The calculated distances represent the sum of the distances of the single pieces.




By SmartDrawing (lines)

1. Select the command **Distance** on **SmartDrawing**
2. Select the first line: they are visualized the calculated values; it's possible to proceed and indicate further lines. The calculated distances represent the sum of the distances of the single lines.

By selection of the point

1. Select a point
2. Press the button **Dist**
3. Select another point or select a line; they are visualized the distance between the two points or between the point and the line values
4. The distance value It's visualized in the graphic window; it's possible to select it and to press the button **Save** to save the label in the drawing.

Angle calculation

1. Select the command **Angle** by the window **SmartDrawing**.
2. Measure the center of the angle to measure with  or select an existing point from the graphic window.
3. Measure the first direction of the angle to measure with  or select an existing point from the graphic window.
4. Measure the second direction of the angle to measure with  or select an existing point from the graphic window.
5. The calculated angles values are visualized.
6. To save the angle as a label press the button **Save**.

Calculation di area e perimeter

1. Select the command **Area/Volume** by the window **SmartDrawing**.
2. Measure points defining the area to measure; it's possible also to select points and lines still existing in the graphic window.
3. Press the button **Volume** to insert a height that will be used for the calculation of the volume
4. To save the area as a label press the button **Save**.

Other tools



d

There are available several utility commands allowing to perform some operations directly in the measuring window without requesting to return in the main window.

Setting of the reference elevation



It's possible to assign a reference elevation to a point to be measured; the elevation of all next points measured will be calculated referring to the elevation of the reference point.

1. Measure the point representing la reference elevation
2. Assign the elevation value.



Measuring a reference point



The command allows to measure a new reference point to use in the Relocation procedure of the **Zoom3D**.

1. Measure the reference point with precision
2. With the reference point it's shooted also the photo allowing to select quickly and sharply the point within Relocation procedure.



Relocation



Relocation of the **Zoom3D** it's a necessary operation to allow continuing to operate with **Zoom3D** inside the same site and with the same reference system. Please refer to chapter **Relocation and Reference points**.

Generic photo



The command allows to shoot a photo at high resolution. It's possible managing photos by the command **Photo** of the main menu.

Rotation of the drawing



The command allows to rotate the drawing at a certain angle. In this way it's possible to visualize the drawing in the better way referring to the surveyed site.

Toward Right 90°

The whole drawing is rotated of 90° toward Right.

Toward Left 90°

The whole drawing is rotated of 90° toward Left.

By 2 points or line

Select two points or a line; it's calculated an angle of rotation that brings the 2 points or the line to be in horizontal direction.

To create a new job sheet



The command allows to create directly a new job sheet without entering to the job sheets window by the main menu. Give a name to the new job sheet.

Select a new job sheet



The command allows to select and visualize in the graphic window another job sheet among the present ones. Select the desired job sheet from the list.

Management of the job sheets



The command allows to access to management of the job sheets.

Measuring a surface and calculation of the volume



The command **Surface points (manual)** allows to measure points manually; every point measured updates the triangles 3D model.

1


1. Select on which job sheet to save new points that will be measured.

Current sheet	Saves points in the current job sheet.
New	Saves points on a new job sheet.
Select	Select the job sheet where you want to save points.


2. If the job sheet still contains a surface it's possible to continue saving points on that surface or to create a new surface; if the job sheet still contains more than one surface it will be created a new surface.

Measure points of the surface



1. Press  to measure points composing the surface. For every point saved the 3D surface is re-calculated.
2. In the lower part of the window it's visualized the area on the horizontal plane and the sloped area.

Measure breaklines

1. Press the bottom left button and Select **New breakline**
2. Press  to measure points composing the breakline.
3. Press again bottom left button to start a new breakline or to measure single points.

Volume calculation

Basing on the current surface it's possible to calculate volume. Calculable volumes are:

Automatic	It's calculated automatically the cut and fill volume considering the perimeter of the surface as reference.
Volume by height	It's calculated automatically the cut and fill volume referring to a horizontal plane at the indicated height.
Volume by point	It's calculated automatically the cut and fill volume to a horizontal plane at the height of the indicated point.

It's visualized a window with the results of the calculation.

Visualization filters

Visualization filters allow to set some visualization parameters of data.

Wireframe mode	3D surface it's visualized only by sides connecting triangles.
Surface mode	3D surface it's visualized with a colored shade. The color changes basing on elevation.
Show/Hide points	Allows to show/hide points from the visualization.
Show/Hide breaklines	Allows to show/hide breaklines from the visualization.

Automatic scan

Commands for automatic scanning can measure automatically profiles (horizontal, vertical or inclined) or complete surfaces defining the measured distances among points.

Lines scan



The command **Lines scan** allows to perform the automatic measure, by preset distance intervals, of a defined plane; the plane can be horizontal, vertical or inclined. The scan can be complete (360°) or partial. The procedure is able to determine automatically the direction changes of the surfaces and measure vertexes (edges). It's possible at last to change the scan interval during measuring.

Reference elevation

Before starting with the scan it's possible to measure a point becoming the reference elevation:

1. Measure the point representing the reference elevation
2. Assign the corresponding elevation



The elevation of all next points measured will be calculated referring to the elevation of the reference point.

Horizontal scan

1. Select the item **Horizontal scan**
2. Measure the starting point of the scan
3. Select the scan direction: **Right**, **Left** or **From...To**; the operation **From...To** allows to measure the point where to stop the scan; in this case consider that the scan will be clockwise.
4. Set the scan distance between points
5. Press **Start** to start the scanning.




Vertical scan with two reference points

1. Select the item **Vertical scan (2 points)**
2. Measure the starting point of the scan
3. Measure the opposite point; the two points allow to determine the vertical profile to measure.
4. Select the scan direction: **Up**, **Down** or **From...To**; the operation **From...To** will perform the scan between the two points that have determined the scan profile.
5. Set the scan distance between points
6. Press **Start** to start the scan.





Vertical scan with automatic calculation of the plane

1. Select the item **Vertical scan (auto)**

2. Measure the starting point of the scan 
3. **X•PAD 3D** performs a set of measures to determine automatically the vertical plane perpendicular to the starting point.
4. Select the scan direction: **Up**, **Down** or **From...To**; the operation **From...To** will perform the scan between the two points that have determined the scan profile.
5. Set the scan distance between points
6. Press **Start** to start the scan.

Scan according to an sloped direction

1. Select the item **Sloped scan**
2. Measure the starting point of the scan 
3. Measure the ending point of the scan 
4. Set the scan distance between points
5. Press **Start** to start the scan.

Operations you can perform during the scan



During the automatic scan it's possible that one or more points can't be determined; After several attempts **X•PAD 3D** automatically passes to next point. However it's possible to press button **Skip** to skip directly to measure of the next point.

During the scan it's possible to perform the following operations available by **Pause** menu:

- | | |
|------------------------|---|
| Change distance | It's possible to edit the scan distance between points. |
| Stop here | The scan is stopped without being completed. |
| Continue scan | The scan continues normally. |
| Abort scan | The scan is stopped and is not saved. |

Utilities at the end of the scan

When the automatic scan is completed it's possible to use the following functions present in menu **Tools**.

- | | |
|--------------------------------|---|
| Add vertex | Select the line in which to insert the new vertex. Measure the new vertex to insert  . Press  to return to previous menu. |
| Delete vertex | Select the point to delete and press Delete . |
| Reduce aligned vertexes | This function delete automatically points that are aligned each other and that give therefore no further information. This way the measured profile contains only fundamental vertexes. |

Automatic scan of a surface



The command **Automatic scan** of a surface is able to measure automatically a grid of points at a defined distance. Two scan modes are available:



Plane: the surface to scan is measured basing on the defined distance interval; for every point measured it's visualized the distance from the reference plane. Also the color of the points and of the next surface is determined by the distance of every point from the plane.



Surface: the zone to scan is measured basing on the defined distance interval; if the surface is not regular the same distance between points is not guaranteed. The color of the points and of the next surface is determined by the distance referring to the **Zoom3D**.

Reference height



Before starting the scan it's possible to measure a point becoming the reference elevation:

1. Measure the point representing the reference elevation
2. Assign the corresponding elevation



The elevation of all next measured points will be referred to reference elevation.

Automatic scan of a plane

1. Select perimeter of the scan zone; perimeter can be rectangular or it can be an irregular polygon.
2. If perimeter is rectangular measure three of the four vertexes of the rectangle representing the scan zone with the button .
3. If the perimeter is a polygon measure all vertexes defining the shape with the button . Press **Close** to complete the polygon and proceed.
4. Set the scan distance; the scan distance is the distance between points that will be measured; the scan distance is considered on the calculated plane by points that have defined the perimeter of the zone.
5. Press **Start** to start the automatic scan. During the scan, bottom right, it's visualized the distance of every point by the calculated scan plane. The color of the measured points is assigned basing on the distance from the reference plane.
6. At the end of the scan it's possible to obtain the triangle surface generated and to accept the result. Press the button **Surface**:

3D plane Creates a triangles 3D surface by the points of the scan.

Delete surface Delete the current surface.

7. Press **Accept** to save results of the scan.

Only points Save only points.

Only surface Save only the surface.



Points & Surface Save points and surface.

8. Select where to save results of the scan.

Current sheet Save results of the scan in the current job sheet.

- New** Save results of the scan on a new job sheet.
- Select** Select the job sheet where to save results of the scan.

Automatic scan of a generic surface

1. Select perimeter of the scan zone; the perimeter can be rectangular or it can be an irregular polygon.
2. If perimeter is rectangular measure three of the four vertexes of the rectangle representing the scan zone with the button .
3. If the perimeter is a polygon measure all vertexes defining the shape with the button . Press **Close** to complete the polygon and proceed.
4. Set the scan distance; the scan distance is the distance between points that will be measured; the scan distance it's calculated as an average of the distances of points defining the scan zone by **Zoom3D**.
5. Press **Start** to start the automatic scan. During the scan, bottom right, it's visualized the distance of every point by **Zoom3D**. The color of the measured points is assigned basing on the distance from **Zoom3D**.
6. At the end of the scan it's possible to obtain the triangle surface generated and to accept the result. Press the button **Surface**:

- 3D plane** Creates a triangles 3D surface by the points of the scan considering an average plane as reference for triangulation.
- 3D Surface** Creates a 3D surface following in the best way possible the shape defined by the scan points.
- Delete surface** Delete the current surface.

7. Press **Accept** per save results of the scan.

- Only points** Save only points.
- Only surface** Save only the surface.
- Points & Surface** Save points and surface.

8. Select where to save results of the scan.

- Current sheet** Save results of the scan in the current job sheet.
- New** Save results of the scan on a new job sheet.
- Select** Select the job sheet where to save results of the scan.

Operations you can perform during the scan

During the scan it's possible to perform the following operations available by **Pause** menu:

- Change distance** It's possible to edit the scan distance between points.
- Stop here** The scan is stopped without being completed.
- Continue scan** The scan continues normally.
- Abort scan** The scan is stopped and is not saved.




Stakeout of points and lines

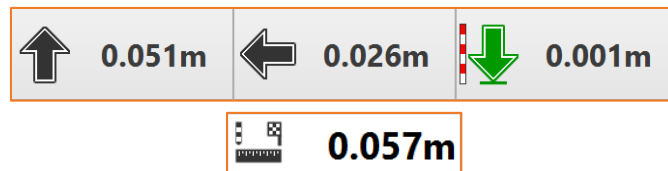



Stakeout procedures allow to provide information to the user, in graphic and numeric format, to reach a point, an element or, more in general, a known position. They are available many options and operative modes. Before proceeding with stakeout it's necessary to define the position of **Zoom3D** to guarantee correct correspondence between surveyed positions and stakeout positions.

1. Since points and drawing to stakeout are organized in job sheets, it's necessary to select the job sheet containing the points and the drawing to stakeout.
2. It's visualized the graphic window containing the points and the drawing saved in the selected job sheet.


Stakeout of points

1. Select the point to stakeout from the graphic window.
2. Press  **Start**.
3. If the type of target is **Spot**, **Zoom3D** will rotate automatically toward the point to stakeout.
4. Press  to start the measure; it's possible also to use the continuous measure .
5. In the lower part of the window are visualized the information related to movement to reach the stakeout point and the distance. It's possible to use the view of the camera, the graphic view or both.



6. Press **Accept** to confirm the stakeout of the point; it's proposed again the graphic view to allow selection of the next point to stakeout. The point staked is marked with symbol .

Next point to stakeout

It's possible to select the next point to stakeout. Press the button  and then first button of the window **Stakeout tools**. Options are:

Next point	it's selected as point to stakeout the next point, referring to current point, among the ones present in the job sheet not yet staked.
Previous point	it's selected as point to stakeout the previous point, referring to current point, among the ones present in the job sheet not yet staked.
Nearest point	it's selected as point to stakeout the nearest point, referring to current point, among the ones present in the job sheet not yet staked.
Manual selection	no point is selected but it's proposed again the graphic view to select manually

next point to stake.

Stakeout of points with offset

1. Select the point to stakeout from the graphic window.
2. It's possible to set a stakeout distance from point; in this way it will be possible to stake every position at the preset distance from the reference point; Press the button .
3. Set the offset distance; Press **Measure** to measure the offset distance; measure the point that will be used to calculate the offset distance . The offset distance will be the same as the distance between the reference point and the point just measured.
4. Press **Start**.
5. Press to start the measure; it's possible also to use the continues measure .
6. In the lower part of the window are visualized several information: information specifying if you must go away or closer to reference point to reach the preset offset distance, the height difference.



7. Press **Accept** to complete stakeout with offset from the reference point selected.


Stakeout of lines

1. Select the line to stakeout from the graphic window.
2. It's possible to set an offset distance; this way it's possible to stake a parallel line to the reference line; Press the button .
3. Set the offset distance; Press **Measure** to measure the offset distance; measure the point that will be used to calculate the offset distance . The offset distance will be the same as the distance between the reference line and the point just measured. It's possible to apply the offset distance on the Left or on the Right of the reference line.
4. Press **Start**.
5. Press to start the measure; it's possible also to use the continuous measure .
6. In the lower part of the window are visualized different information: the distance from the line to stakeout, the height difference, the position referring to the line and the distance referring to first point of the line.



7. Press **Accept** to complete stakeout of the selected line.

Stakeout tools

Press the button  to access the window **Stakeout tools**. The window allows to:




Next point	Set the strategy for automatic selection of the next point to stake.
Re-positioning	Relocate and define orientation of Zoom3D . See chapter Relocation .
Shoot photo	Take a photo of the current position. Shot photos can be managed by the command Photo in main menu.
Change job sheet	Select another job sheet. They will be visualized data of the selected job sheet.

Projection on surfaces




The command **Projector** allows to position on a reference surface a rectangular grid of points, a set of generic points previously imported or a generic drawing. First operation to perform is measuring 3 points allowing to determine the plane on which it will be projected the grid, the points or the drawing; then it's possible to measure further reference points that can be used to position correctly the elements to project. Positioning of the grid, points or drawing can be made moving and rotating as you like the elements on the reference plane. When positioning is completed it's possible to select every point to project so that **Zoom3D** determines automatically the correct position.

Measuring of reference plane

1. Measure first point of the reference plane 
2. Measure second point of the reference plane 
3. Measure third point of the reference plane 

Select three not-aligned points defining in the best way possible the projection plane.

Measuring of the reference points by alignment

1. Measure reference points for alignment 
2. Reference points are connected with lines
3. When all reference points for the alignment are measured, Press **Accept**.

Select subject to project


Select if you desire to project a regular grid or a drawing previously set on a job sheet. If you choose the operation **Regular grid** it's possible to select the type of grid and the distance between points; if you choose the operation **Job sheet** it's possible to select the job sheet to project from the list.

Alignment


1. The grid or the job sheet are visualized in the graphic window.
2. Select a point of the grid or of the job sheet: the distances from the first reference line and from the first reference point are visualized; it's possible to select another reference line or another reference point.

Moving drawing




1. After selecting a point press the button **Move**.
2. Use the four buttons to move drawing in the corresponding direction; values of distance from reference elements are updated.

3. Press the button **Move** and select the operation **Move on point** to move the whole drawing on the reference point that must be selected.
4. Press the button **Move** and select the operation **Move the value** to move the whole drawing by a desired quantity.
5. When movement is completed Press the button  to return to previous step.





Rotate drawing on rotation point

1. After having selected a point press the button **Rotate**.
2. Press the two buttons **Rotate on Left** and **Rotate on Right** to rotate the whole drawing
3. Press the button **Rotate** to rotate the whole drawing clockwise or counterclockwise of 90°
4. When the rotation is completed press the button  to return to previous step.

Rotate drawing on a line

1. Select a line of the drawing
2. Press the button  to rotate the whole drawing in order to make the selected line perfectly vertical.
3. Press the button  to rotate the whole drawing in order to make the selected line perfectly horizontal.
4. Press the button  to rotate the whole drawing so that the selected line is parallel to a reference line to select.

Projection

1. Press **Accept** to accept the alignment and proceed with projection of the points on the reference surface
2. Select the point to stakeout; the point can be selected also using the four buttons with direction arrows or pressing the corresponding buttons on the remote control.
3. Press . **Zoom3D** automatically position itself on desired position.
4. The measured point is marked with symbol .
5. It's possible to use a projection plane different from the one defined at the beginning: before pressing  position approximately the target on the plane on which you want to perform the projection of the selected point; this way the point selected will be projected perpendicularly to first reference plane up to meet the preset measure plane. With this solution it's possible not only staking points on the main plane but also staking the same points on an opposite plane, parallel or not to the main plane.
6. Press  to stop projection procedure.

Insides measuring utilities





The set of utilities below is particularly useful in insides surveys with **Zoom3D**.

Plumb point




The command **Plumb point** allows to determine, for the measured point, the corresponding plumb point (toward the top or toward the bottom).

1. Measure the point of which you want determine the corresponding plumb point 
2. Measure approximately the position on which should be the plumb projection 
3. **X•PAD 3D** will determine automatically the exact position. If position is found the laser spot lamps.

Level





The command **Level** allows to bring a reference height on every other surface.

1. Measure the point representing the reference height 
2. Measure approximately the surface on which you want to bring the reference height 
3. **X•PAD 3D** will determine automatically the exact position. If position is found the laser spot lamps.


Parallel line



The command **Parallel line** allows to determine parallel lines to a reference line on every surface.

1. Measure first point of the reference line 
2. Measure second point of the reference line 
3. Now it's necessary to set the distance at which to create the parallel line. The distance can be:

- a. Calculated by the measure of the distance between two points to measure; select the item **Measure (2 points)** and then measure two points; the distance between the two points will be used for calculation of the parallel line.
- b. Determined by the distance of a reference point to measure referring to the reference line; select the item **Measure by line** and then measure a point; the distance between the measured point and the reference line will be used for calculation of the parallel line.
- c. Inserted manually: select the item **Insert offset**. Type the offset distance to use for calculation of the parallel line

4. Measure approximately the position on which you should find the parallel line .
5. **X•PAD 3D** will determine automatically the exact position. If position is found the laser spot lamps.





Offset: Press this button to modify the distance to use for calculation of the parallel line.

Marking of heights



The command **Marking of heights** allows to determine the position at different heights starting by a reference height.

1. Indicate the absolute height corresponding to reference point
2. Measure the point representing the reference height 
3. Indicate the Absolute height you want to stake
4. Measure approximately the vertical surface on which you want determine the position of the absolute height 
5. **X•PAD 3D** will determine automatically the exact position If position is found the laser spot lamps.



New height: Press this button to insert a new absolute height to stake.

Distance & Offset



The command **Distance & Offset** allows to determine new positions and distances related to a starting point on vertical surfaces. Having a starting point it's possible to set a relative distance horizontally and a relative distance vertically and **Zoom3D** will position itself exactly on requested point.

1. Measure the starting point 
2. Insert desired movements vertically and horizontally





3. On the camera picture are visualized the buttons representing the four main directions. Click on corresponding button to determine the position along the chosen direction.
4. **X•PAD 3D** will determine automatically the exact position. If position is found the laser spot lamps.

Generic measuring utilities





The set of utilities below are generic utilities that can be used in many different situations both in survey and stakeout of insides both outside.

Check flat surfaces






The command allows to check if a reference surface is uniform or presents higher or lower areas. It's possible to select among three different types of surface: **Horizontal**, **Vertical** or **Generic by 3 points**.





Horizontal plane

1. Measure a point on horizontal reference plane 
2. Measure points to check on reference plane ; for every point measured it's visualized the distance between the measured pointed and reference plane.

Vertical plane

1. Measure the first point defining the vertical plane 
2. Measure the second point defining vertical plane 
3. Measure points to check on the reference plane ; for every point measured it's visualized the distance between the measured point and the reference plane.

Generic plane by 3 points

1. Measure the first point defining the reference plane 
2. Measure the second point defining the reference plane 
3. Measure the third point defining the reference plane 
4. Measure points to check on the reference plane ; for every point measured it's visualized the distance between the measured point and the reference plane.

It's possible to activate the continuous measuring that allows to change the measuring direction while **Zoom3D** measures.

In the camera view are visualized the measured points in **Red** if they are below the reference plane; in **Blue** if they are over the reference plane.



To delete visualization of all measured points press the button **Delete points**.

Checkup and measuring of distances



The command allows to perform measures of distances between two points or between a point and a reference element as a line, a circle or an arch; measuring of distances can be made also with the command **Measure** but in this case it's available a specific command and thoroughly dedicated to this purpose.

Horizontal distances

1. Measure first point 
2. Measure second point 

In the lower part of the window they are visualized measured values:



Horizontal distance



3D Distance



Height difference



Slope

It's possible to select between two measuring modes:





Single: it's calculated the distance between the first point and the point just measured



Multiple: it's calculated the progressive distance between the first point and all the points measured after.

It's possible to activate continuous measuring allowing to change measuring direction while **Zoom3D** measures.

Vertical distances

1. Measure first point 
2. Measure second point 

In the lower part of the window are visualized measured values:



Distance on vertical plane between the two points

It's possible to select between two measuring modes:






Single: it's calculated the distance between the first point and the point just measured



Multiple: it's calculated the progressive distance between the first point and all the points measured after.

It's possible to activate continuous measuring allowing to change measuring direction while **Zoom3D** measures.

Distances from a line

1. Measure the starting point of the line 
2. Measure the ending point of the line 
3. Measure the point of which you want to know the distance referring to the line 

In the lower part of the window are visualized measured values:



Distance from the starting point of the line



Distance from the final point of the line







Distance from the line



Height difference from the line

It's possible to activate continuous measuring allowing to change measuring direction while **Zoom3D** measures.

Distance from arc and circle

1. Measure first point of the arc/circle 
2. Measure second point of the arc/circle 
3. Measure third point of the arc/circle 
4. Measure the point of which you want to know the distance referring to the arc/circle 

In the lower part of the window are visualized measured values:



Distance from first point of the arc/circle



Distance from third point of the arc/circle



Distance of the point from the arc/circle



Height difference between the point and the arc/circle.

It's possible to activate continuous measuring allowing to change measuring direction while **Zoom3D** measures.

Area & Perimeter



The command allows to calculate the area and the perimeter of a sequence of points; The measure of area and perimeter can be made also with the command **Measure** but in this case it's available a specific command and thoroughly dedicated to this purpose.

1. Measure points that delimit the surface to measure



After having measured the third point in the lower part of the window the results are visualized:



2D Area



3D Area



2D Perimeter



3D Perimeter




Stop: Press this button to stop measuring of the surface and to start the measure of a new surface

Objects height



The command allows to calculate the height of elements that can't be measured directly as trees power lines.

1. Measure the reference point that is at the same horizontal distance of the point you want measure directly 
2. Aim the point you want measure indirectly; the height difference referring to the reference point it's visualized in real time as result in the lower part of the window



X·PAD



GeoMax AG
www.geomax-positioning.com
e-mail: sales@geomax-positioning.com

Developed by:



© 2015 LSE S.r.l. - All rights reserved