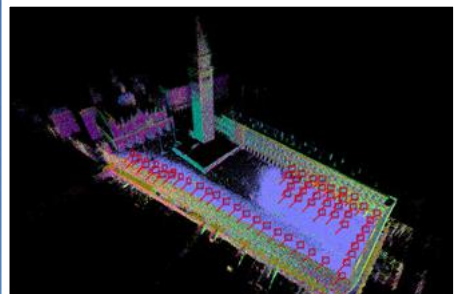
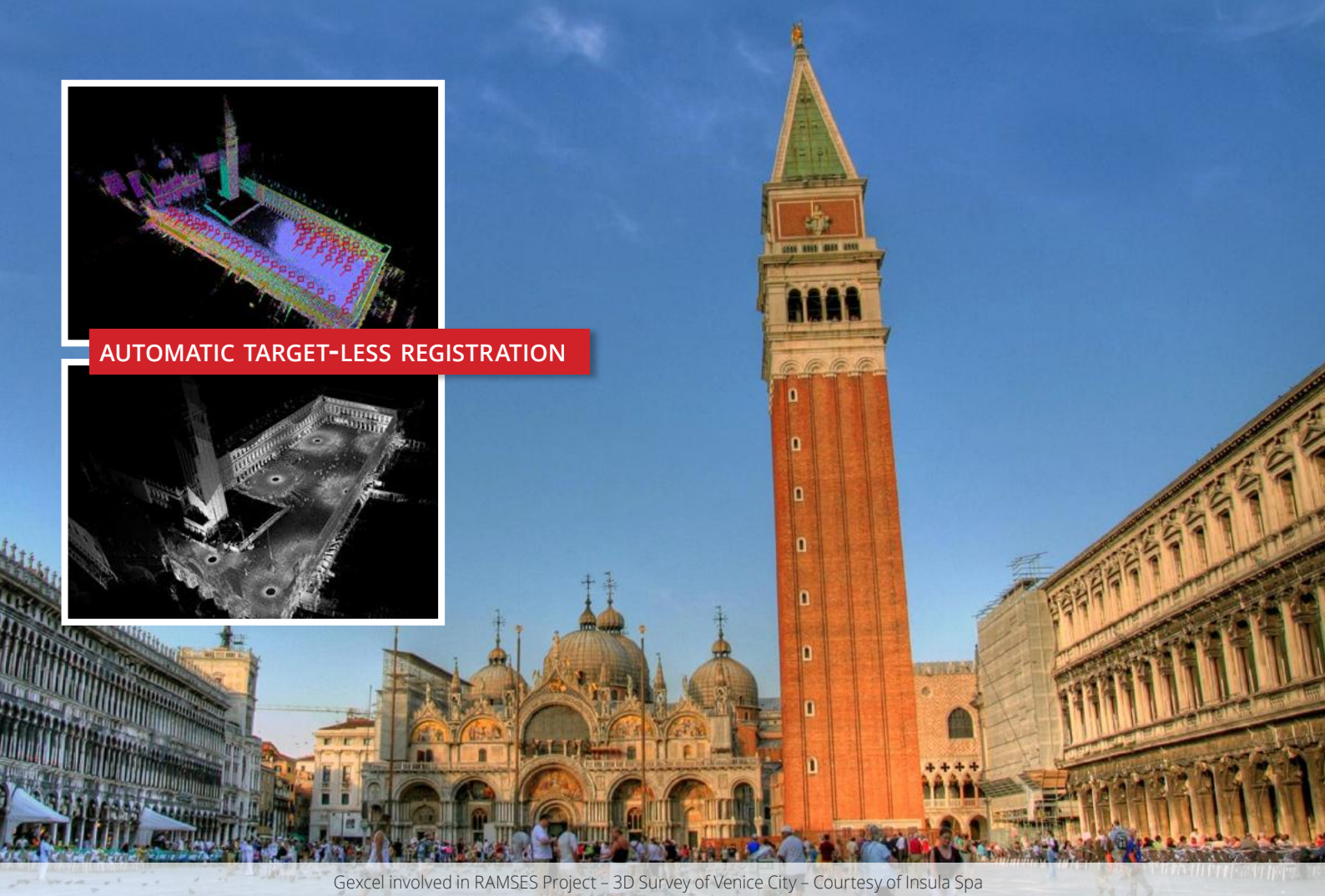
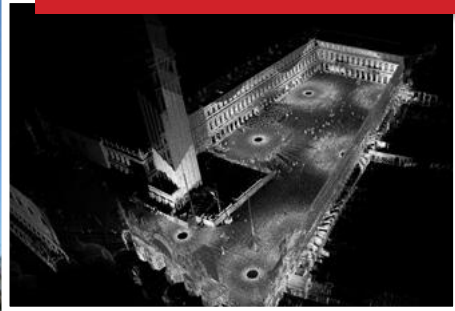


# SMART Point Clouds

The best for your LiDAR data and 3D imaging!



**AUTOMATIC TARGET-LESS REGISTRATION**



Gexcel involved in RAMSES Project – 3D Survey of Venice City – Courtesy of Insula Spa



# Software

Powerful. Easy. Advanced.



## JRC 3D Reconstructor®

**THE WORLDWIDE WELL KNOWN SOFTWARE FOR LIDAR DATA PROCESSING!**

With the unique and powerful tools for point clouds registration and geo-referencing:

- **LineUp®**
- **LineUp® Pro** for automatic target-less registration
- **LineUp® Notes** free APP for iPad

### FULL (Educational offer available)

The leading and worldwide well known top level Gexcel software to easily integrate multi-platform and multi-resolution 3D models and manage large cartographic coordinates (UTM, ...), Lidar data, Hi-Res RGB images, GNSS topographic 3D points and 3D mesh models.

### CONSTRUCTION

Designed for construction, infrastructures and civil engineering surveying projects. The perfect answer to the needs of surveyors working in civil engineering.

- Cross sections, front buildings, orthographic views extraction
- Displacement/verticality maps, areas and volumes evaluation
- Easy transfer the results to CAD for easy deliverables production

### MINING/TUNNELLING

The outstanding solution for mines and tunnels surveying projects using Lidar sensors and UAVs.

- Contour lines, crests&toes, cut&fill volumes, profiles, plan views
- DTM generation and editing with an easy workflow
- UAV GeoTIFF mapping

### HERITAGE/ARCHITECTURAL

The worldwide outstanding software for cultural heritage and architectural projects.

Designed to easily create 3D colored models using Hi-Res RGB images acquired both from the cameras mounted on the laser and from independent external cameras.

- Create mesh models from point clouds or import meshes from third parties software
- Calibrate and map full resolution RGB images on mesh models
- Extract Hi-Res orthophotos for a perfect colored representation

### FORENSIC

The success history of JRC 3D Reconstructor® in forensic field is now improved by a new dedicated software package.

- LineUp® Pro (for automatic target-less alignment)
- Inspection tool to point out the geometric differences of the crime scenes in time
- Easy 3D measuring tools and mapping Hi-Res RGB images on mesh models

## PointR<sup>3</sup>

The perfect software to merge point clouds from any Lidar source (mobile, terrestrial laser scanner, UAV, airborne) without limit on the file dimensions.

- Easily manage no limits point clouds, in different formats
- Generate HD measurable depth images (*Solid Images*) and easily extract 3D drawings using the *gexcel CAD plug-in*
- Extract orthophotos, videos and CAD drawings

## PixR<sup>3</sup> and PixR<sup>3</sup> AIR

Extract the 3D from images!  
An easy and affordable software to get colored 3D point clouds from images.

- Automatic data processing and camera calibration
- Unlimited number of images
- Colored 3D point clouds and meshes generation
- Full integration with JRC 3D Reconstructor®

**PixR<sup>3</sup> AIR** is specifically designed for UAVs dataset.

## Scan to Vector Suites

**BIM&PLANT Suite.** The speed and accuracy of the automatic target-less scans registration combined with structures, walls, windows, pipes, conduits and round ducting automatic extraction in one single platform along with Revit integration.

**INDUSTRIAL PLANTS Suite.** The speed and accuracy of the automatic target-less scans registration combined with structure/cylinder extraction along with PDMS, CADWorx (and a host of other platforms) integration.

# Data Processing Workflow

Complete. User friendly. Customized.



**FARO**



**RIEGL**

**STONEX**



**TOPCON**

**ZF**  
Zoller Fröhlich

## JRC 3D Reconstructor® Registration Tools



### LineUp®

- Point clouds importing and filtering
- Automatic target detection
- Geo-referencing
- Scans alignment per groups
- Cloud to cloud best fitting alignment
- Bundle adjustment

### LineUp® Pro

- Automatic target-less registration
- Interactive validation process
- Automation and user control balancing

## DATA PROCESSING

### JRC 3D Reconstructor®

- Managing and merging of different data
- Data filtering and editing
- 3D meshing and Hi-Res texturing
- DTM creation
- Hi-Res images calibration (also spherical)

## No Limits Point Clouds Manager



### PointR3

- Import of JRC 3D Reconstructor® projects, Lidar data and 3D meshes
- Handling and visualization of massive point cloud models

## DELIVERABLES

- Elevations, plans, cross sections (\*.dxf polylines)
- Models comparison for planarity, verticality and change detections maps
- Texturized 3D meshes (several formats available)
- True orthophotos ready for CAD
- Mining/Tunnelling tools (cut&fill volumes, crests&toes, tunnel cross sections, etc.)
- Unwrapping of cylindrical and spherical surfaces

## DELIVERABLES

- HD elevations and plans as *Solid Images* (high resolution depth image measurable in 3D)
- *Solid Images* exportable in JRC 3D Reconstructor® (or third-party software) as a point cloud
- Large change detection maps
- Fly-through videos of large models

## DELIVERABLES for CAD

### Gexcel CAD plug-in

- Read *Solid Images* in CAD
- Digitize *Solid Images* in 3D

# TECHNICAL NOTES

	CONSTRUCTION	MINING TUNNELLING	HERITAGE ARCHITECTURAL	FORENSIC	FULL
Import LiDAR point clouds, UAV, total station in open formats (.txt, .las, .e57, .ptx, .pts, .asc, .ply)	•	•	•	•	•
Import scans from 3D scanner manufacturers (.fls, .zfc, .rxp, .3dd, .x3s, .x3m, .clr, .cl3, .dp, .ixf, .imp)	•	•	•	•	•
Import meshes and CAD models (.dxf, .ifc, .stl, .wrl, .3ds, .ply, obj, .dae)	•	•	•	•	•
Raw scans colorization (FARO and TOPCON supported)	•	•	•	•	•
Import RIEGL RiSCAN PRO and Z+F LaserControl projects (thermal camera included)	•	•	•	•	•
Export point clouds (.txt, .LAS, .E57, .ptx, .pts, .asc, .ply, .ptc, .ixf)	•	•	•	•	•
Export 3D mesh models (.dxf, .stl, .wrl, .3ds, .ply, obj, .dae)	•	•	•	•	•
<i>Gexcel ReCap Plug-in</i> - Export ReCap 360™ formats (.rcp, .rcs) and import in ReCap 360™: JRC 3D Reconstructor projects (.recprj) and raw data (.rup, .rgp)	•	•	•	•	•
Point clouds filtering (noise reduction, edge detection, normals, vegetation removal, smart scan simplification, clustering with sampling and density homogenization)	•	•	•	•	•
<i>LineUp®</i> - Scans geo-referencing, Scans registration with automatic extraction of surveying target centers (circular). Scans alignment per groups. Cloud to cloud best fitting alignment. Bundle adjustment with constrains	•	•	•	•	•
<i>LineUp® PRO</i> - Automatic target-less registration	Add-on	Add-on	Add-on	•	•
Meshing 1_Scans-based uniform/multi-resolution meshes (for building large models)	•	•	•	•	•
Meshing 2_Mesh from user defined view (ideal for building façades)	•	•	•	•	•
Meshing 3_Topographic mesh (for DSM, excavations, open pit mines)		•			•
Meshing 4_3D mesh (for convex/concave surfaces, tunnels, tanks, statues)	•	•	•	•	•
Mesh editor and mesh simplification	•	•	•	•	•
Clever points clustering with Virtual Scan tools (perspective, ortho, spherical, cylindrical)	•	•	•	•	•
Point color editor (color with altitude, range, inclination)	•	•	•	•	•
Scans multi-color layer manager (for colors enhance or restoration simulation)	•		•	•	•
3D models comparisons (change detection, as built/as designed verification)	•	•	•	•	•
Surface analysis (planarity and verticality/horizontality maps creation)	•	•	•	•	•
Camera calibration tool with chessboard for internal (intrinsic) camera parameters			•	•	•
Scan based camera calibration tool for perspective, spherical and thermal images			•	•	•
Texture meshes with high resolution images			•	•	•
Import and projection of GeoTIFF images from UAV or aerial images (.tfw)		•	•	•	•
Multiple cross sections computation and isolines generation (direct export in .dxf)	•	•	•	•	•
Unfold cylindrical and spherical surfaces	•	•	•	•	•
Orthophotos extraction from point clouds and meshes	•	•	•	•	•
Orthophotos extraction from high resolution textured meshes			•	•	•
Linear distances, area computation and link to CAD	•	•	•	•	•
Volume calculation	•	•	•	•	•
Cut&Fill volume calculation		•			•
Ridges&Valleys extraction		•			•
Mesh border edges detection	•	•	•	•	•
Video creation from a camera path or user defined trajectories	•	•	•	•	•
Easy trajectories definition to evaluate vehicles collisions or shoots directions				•	•
View points definition for security and forensic applications				•	•
Cross sections and cylindrical surfaces unfolding respect to the tunnel axis		•			•

## SYSTEM REQUIREMENTS *suggested*

**OS:** Windows (XP SP2, Vista, 7, 8, 10) | **VERSION:** 64bit (32bit also available) | **CPU:** multi-core processor (8 Cores at least) | **RAM:** 16 GB  
**GRAPHICS CARD:** NVIDIA GeForce GTX 2GB ram (for large use of points) or NVIDIA Quadro (for large use of mesh and texture)

## MARKETING NOTES

**LANGUAGES:** Chinese, English, Italian, Japanese, Spanish | **LICENSING:** USB dongle | **EDUCATIONAL OFFER:** available for JRC 3D Reconstructor® Full  
**TRIAL VERSION:** 30-day evaluation. All functions available (saving locked). Downloadable on [www.gexcel.it/en/download](http://www.gexcel.it/en/download)

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