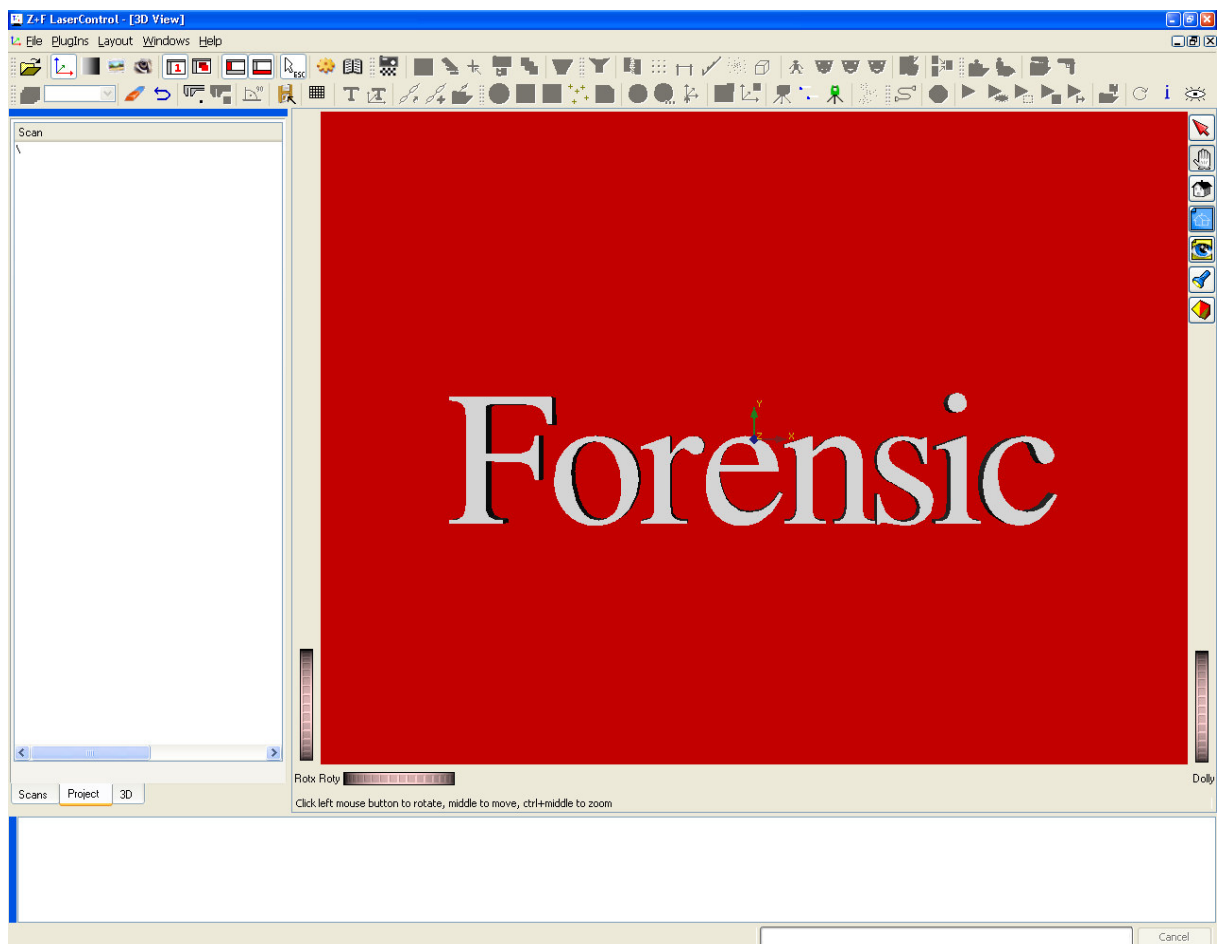


What is new in Z+F LaserControl 7.6

1. Forensic-Tools
 - a. Generation of bullet trajectories [Shot channel]
 - b. Positioning of virtual people
 - c. 3D-view from different points of view
2. Image rectification
3. Optimization of ColorMapping
 - a. White balance
 - b. Skyfilter
4. Optimized “Preprocessing” filter function
5. Improved Layer-Management
6. Registration with bundle adjustment as standard
7. Support of Gauss-Krueger-coordinates
8. Plugin “Kinematic” in Basic-license



1 Forensic-Tools

In the latest version of Z+F LaserControl you will find many new and interesting features especially for forensic applications. The special program is for fast on site post processing of the captured data. It is for example possible to reconstruct a bullet trajectory with only two mouse clicks after scanning. The information of the bullet trajectory direction is immediately available. Another helpful forensic tool is to place virtual people in the point cloud. With this tool the operator is able to place witnesses and check their testimony. Was it even possible to see the scene from his position???

a. Generation of bullet trajectories [Shot channel]

In the forensic tool it is possible to show and manipulate a bullet trajectory in 3D by clicking two points within the point cloud (possible in all available views -2DView, BubbleView and 3DView). The bullet trajectory can be shown as a 3D line or as a cone, additionally the operator can select a changeable scale to show the distance of the bullet trajectory.

These settings can be manipulated (Image 1-1):

- Position of bullet hole
- Position of the full penetration or end of a tube
- line width
- show a cone with a defined angle (transparent or closed)
- Distance of the bullet trajectory (in both directions)
- Spacing interval

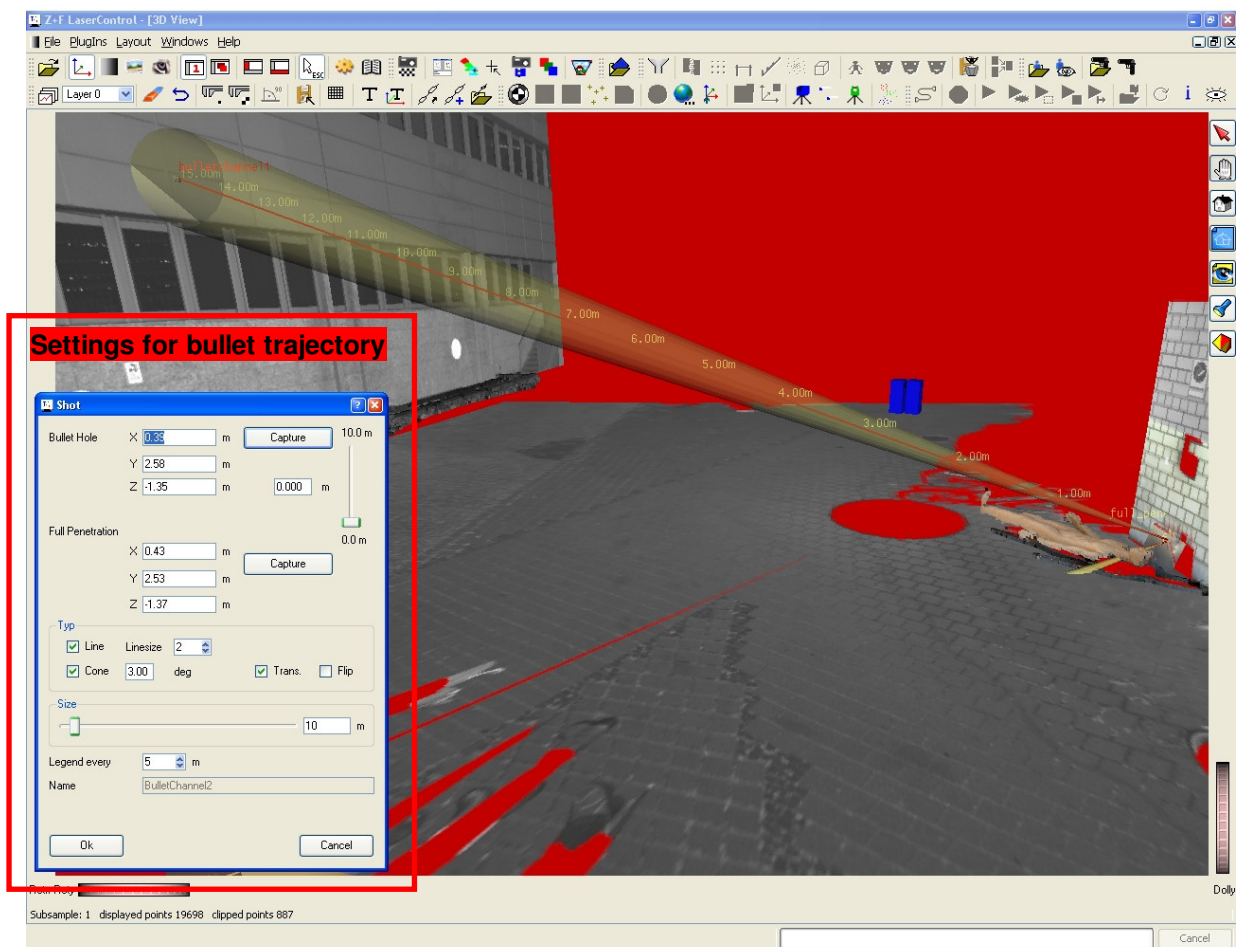


Image1-1 Bullet trajectory definition

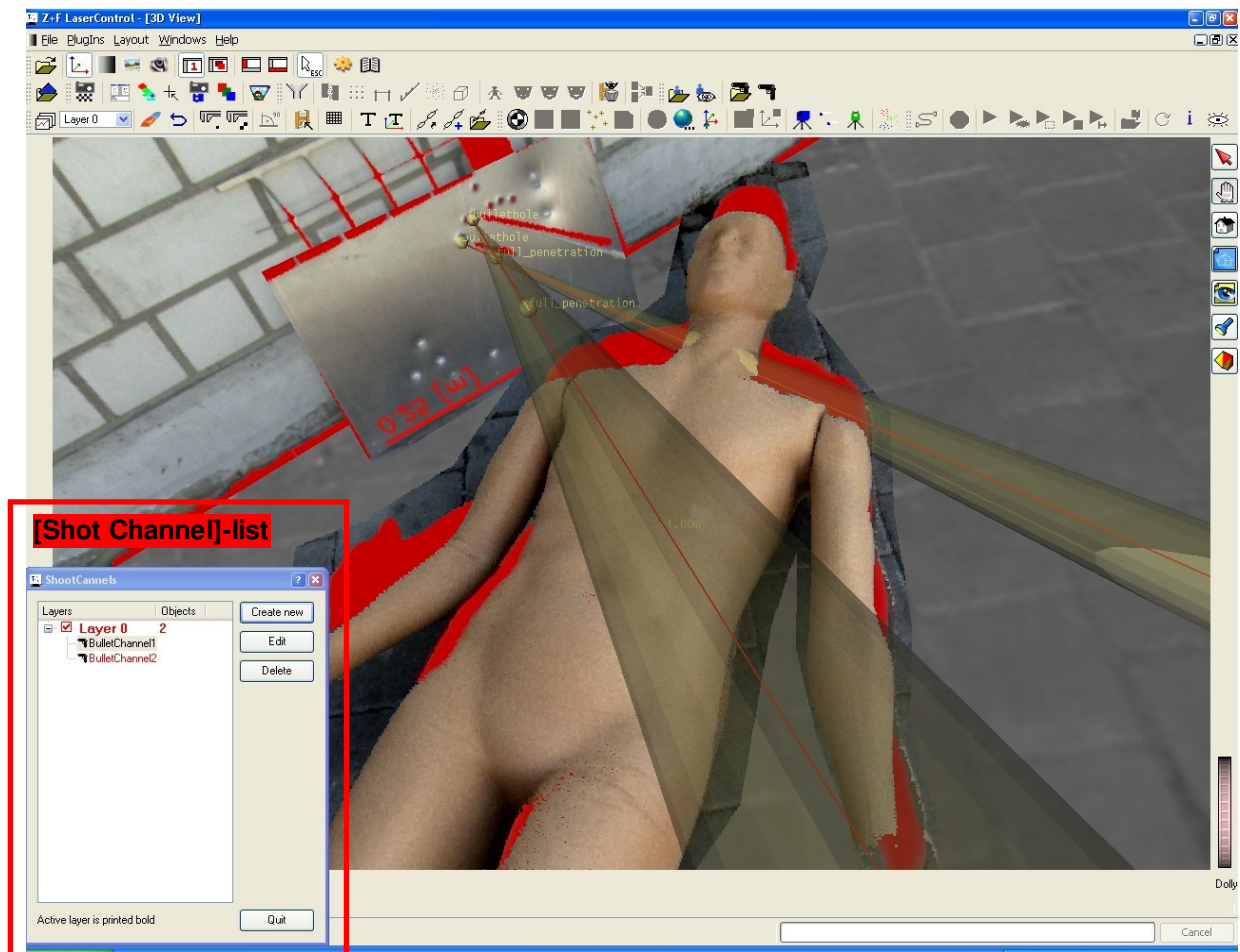


Image 1-2 Bullet trajectory in 3D and [Shot Channel]-List

Every bullet trajectory will be stored in a layer structure for fast and easy management (Image 1-2). Every defined bullet trajectory is stored in an active layer and can either be selected in the bullet trajectory list or directly in the layer management every time. The trajectory can be exported to a DXF-file and imported to a CAD system afterwards.

The export function (Image 1-3) is available through **File | Export...**:

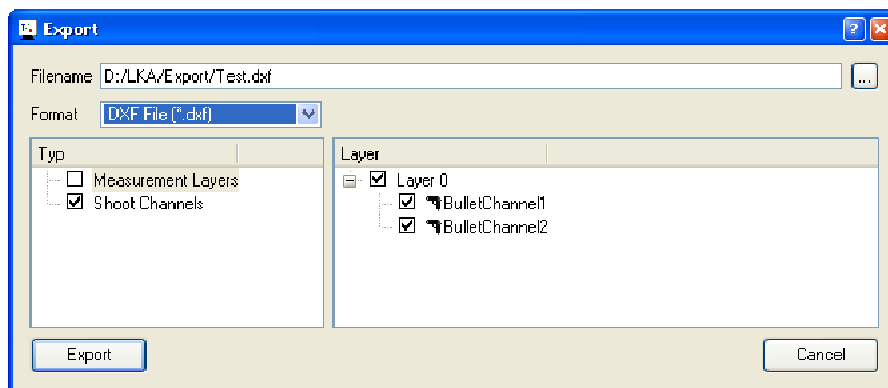


Image 1-3 Export of 2D Object to DXF

b. Positioning of virtual people

To reconstruct the scene virtually, it is often necessary to position a person at the scene. In all available views (2DView, BubbleView, 3DView) it is possible to position and define a virtual person into the scene. Through setting of the eye height, for example of a witness, the virtual position will be placed into the 3D room. The operator can give the person a name and a separate colour to get a clear scene.

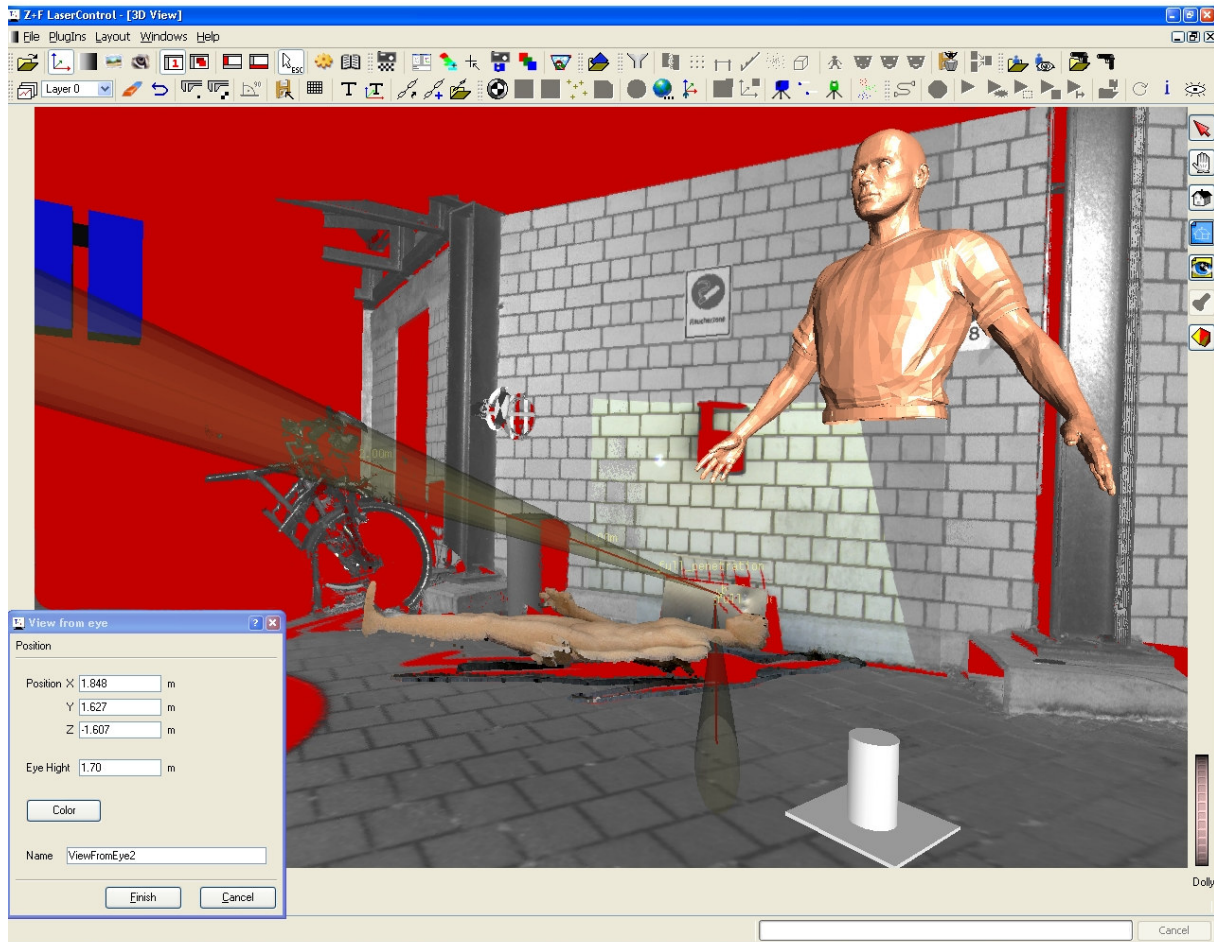


Image 1-4 Virtual people in 3D

All objects will be stored in a layer structure for a fast and easy management. Every defined virtual person is stored in an active layer and can either be selected in the [View from Eye]-list or directly in the layer management every time.

c. 3D-view from different points of view

After the definition of a virtual person (see section 1b) it is possible to have a view from the virtual person in the 3D room. The navigation in 3D will not be available, so you can only rotate around the eye position.

Example:

2 placed virtual persons in 2D – Witness1 and Witness2 (Image 1-5)

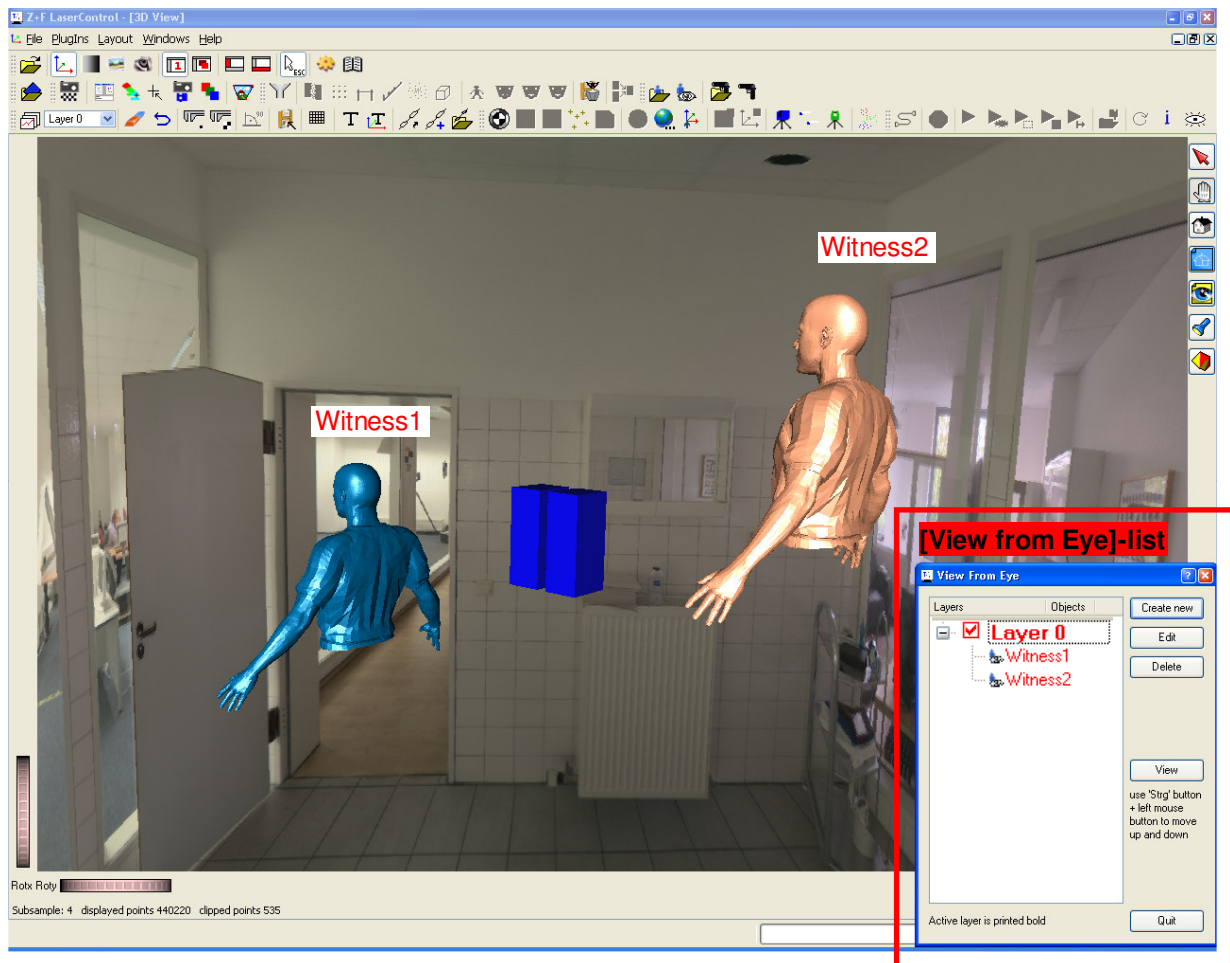


Image 1-5 Witness1 and Witness2 placed in 3D

The virtual person, whose view is supposed to be placed in the point cloud, needs to be selected from the [View from Eye]-list. By pushing the button [View], the rotation centre of the eye position of the selected person will be located and it will be only possible to rotate around this fixed point afterwards.

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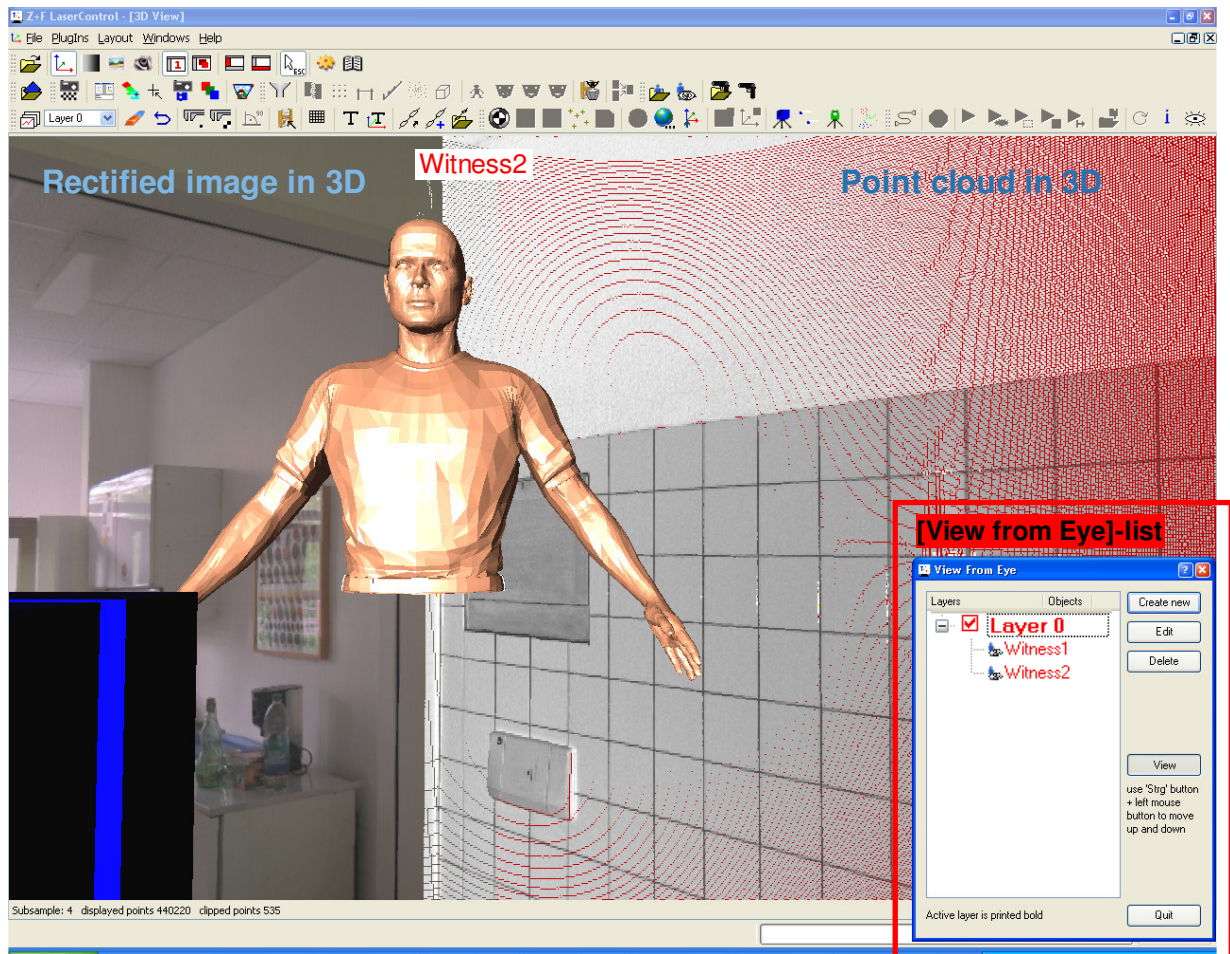


Image 1-6 View in 3D from view of Witness1 to Witness2, Wall displayed as 3D point cloud and wall displayed as rectified image

From now on it is only possible to have a view around the eye position of witness1, all other navigation possibilities (place the rotation centre, zoom) are disabled. The view can be changed from the left hand to the right hand by pushing the left mouse button and moving the mouse. Moving up and down is possible by additional pushing of the "Strg"-button. Before doing this all necessary data need (point cloud or rectified image) to be loaded into 3D. By pushing the [View]-button again the 3D navigation will switch back to ordinary method

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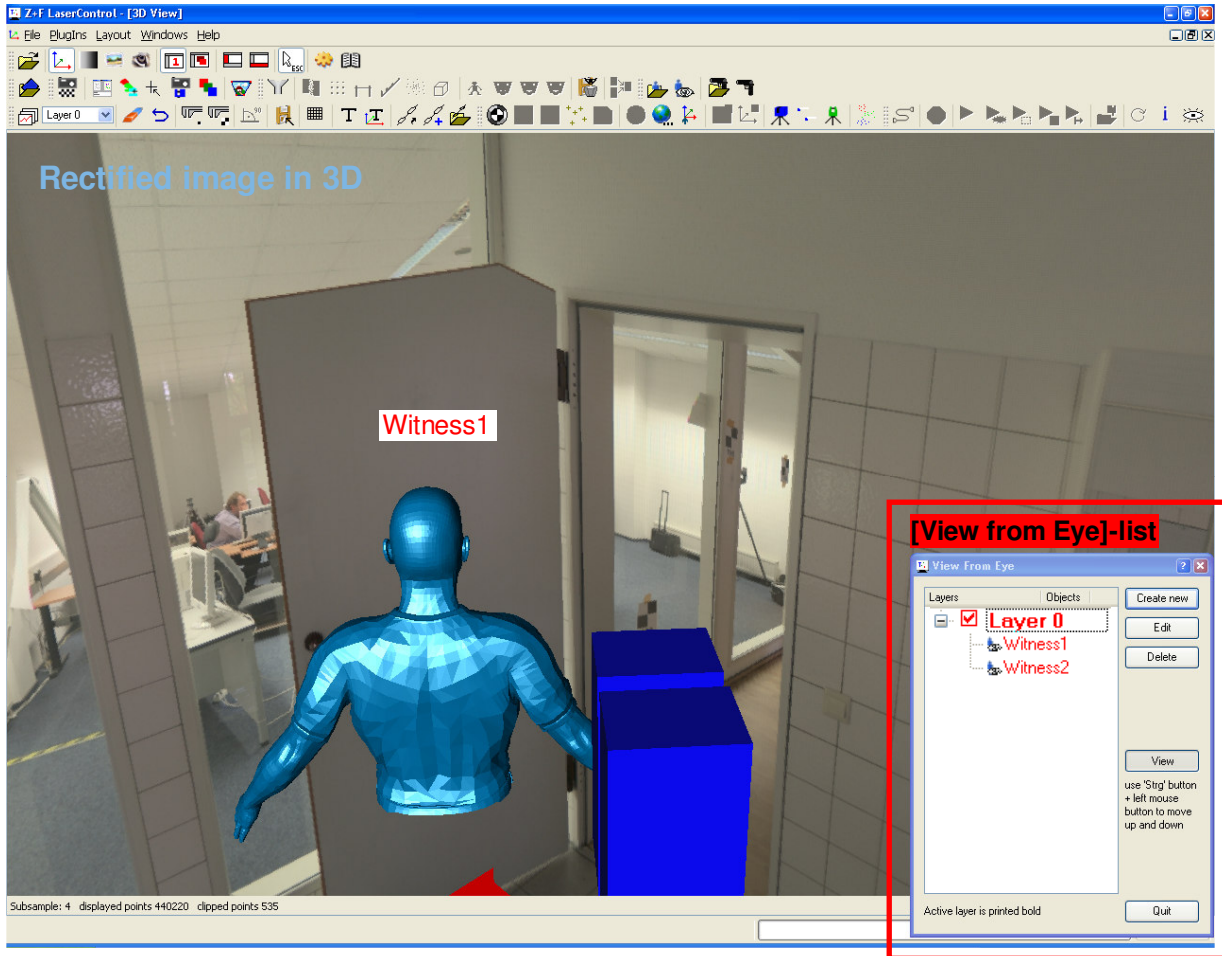


Image 1-7 View from Witness2-to Witness1 and 2 walls as rectified image in 3D

2 Image rectification

LaserControl 7.6 can generate rectified images out of the intensity values (Image 2-1) or registered pictures (Image 2-2). The data will be rectified and projected onto a plane, which was defined in advanced. The result is a JPG- and a VMRL2-file, thus the image is also available in 3D (Image 2-3).



Image 2-1 Rectified image generated from intensity values



Image 2-2 Rectified image generated from pictures

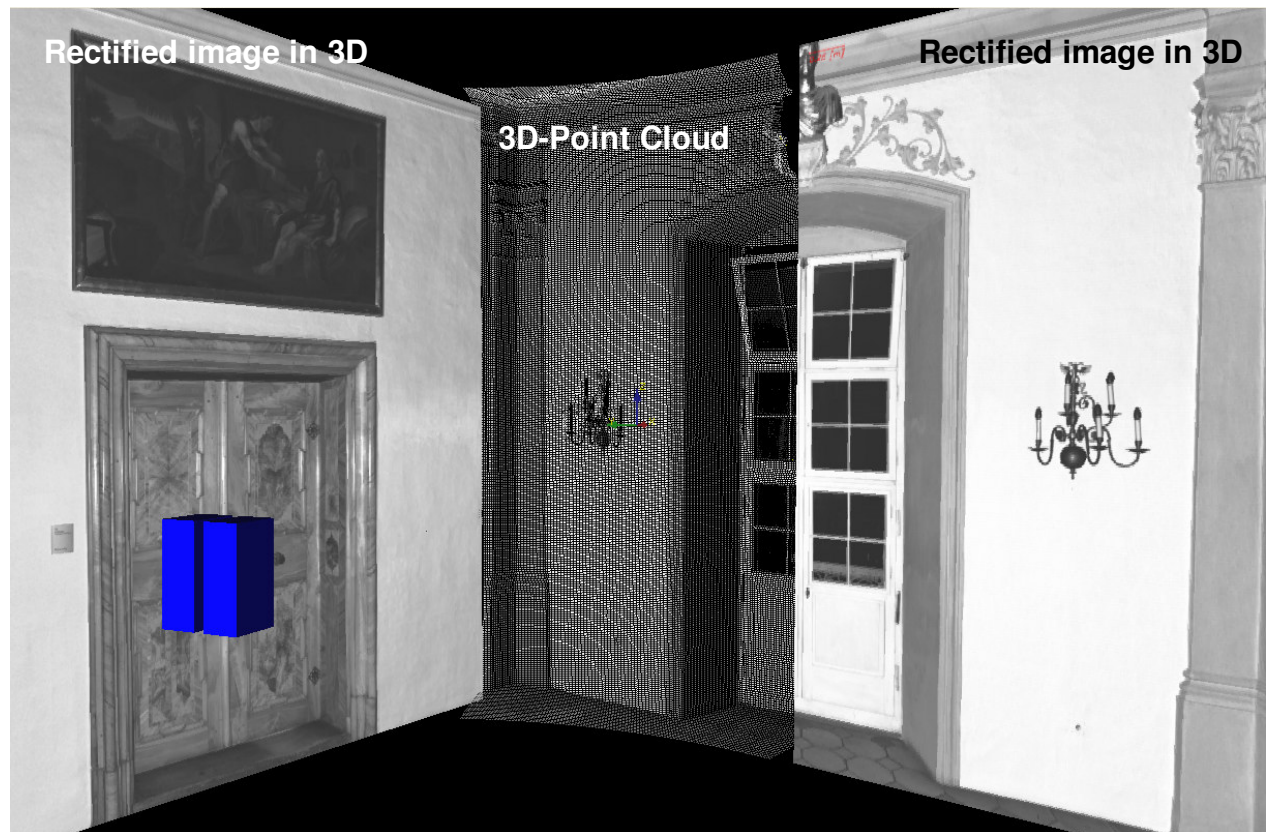


Image 2-3 Rectified image as VRML in 3D

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To generate a rectified image it is necessary to define a plane for the projection. This will be done by the 3D construct function [PlugIns – 3D Construct]. The definition of the points for the calculation of the plane can be done in 3D (selection of 3 points) or in 2D View by selecting the region. After calculating of the plane parameters a clearly name must be given to the plane. The object “plane” will be stored in a layer and can always be selected for other functions (OrthoPhoto, Cut...), too.

Before the function [Image rectification] is available, it is necessary to select the region of interest in the 2D-View by using the rectangle selection mode (Image 2-4). As soon the [Image rectification]-assistant is started and the corresponding plane is selected, an additional section will be marked in green around the red selection. The red selection has been equalized and calculated to a “real” rectangle.

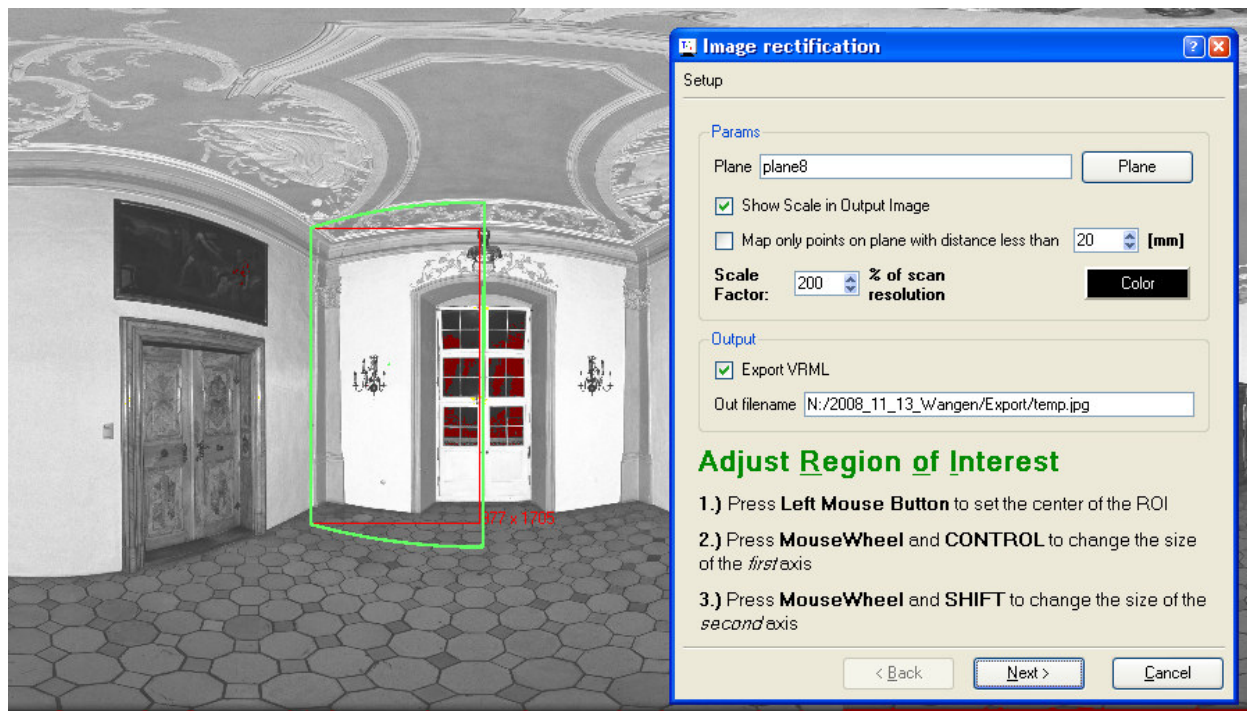


Image 2-4 Generation of rectified images

The position, size and orientation of the green selection can be manipulated by using the mouse- and arrow buttons.

Additional settings can be selected:

- Points which are far away from the plane will be marked in a color- distance too plane and color can be selected by the operator
- Scale factor to increase the resolution of the Image
- Additional storage of a VMRL-file
- Directory and name of result-file
- Show scale in rectified image

3 Optimization of the Color Mapping

a. White balance

The white balance is used to adjust the raw data of the M-Cam to the color temperature of the exposure area. In combination with the firmware version 7.3.2 (and up) of the Z+F IMAGER® 5006(i) now the M-Cam takes two more pictures of a white balance grey card. These additional pictures can be used in Z+F LaserControl 7.6 to remove any appearing color casts from the raw-data.

When a project with images of the environment and the grey card, taken by the M-Cam, is loaded into Z+F LaserControl 7.6, the white balance function is available in the [Properties]-window (Image 3-1) and can be manipulated (see image underneath) . Both grey card pictures are activated by default. The calculated corrections will be shown online in the preview images (left hand – raw-data, without color-correction / right hand – with color correction). In case that the shown result is not good enough, the grey images can be deactivated or the corresponding color-channels can be adjusted manually [Whitebalance – Manually].

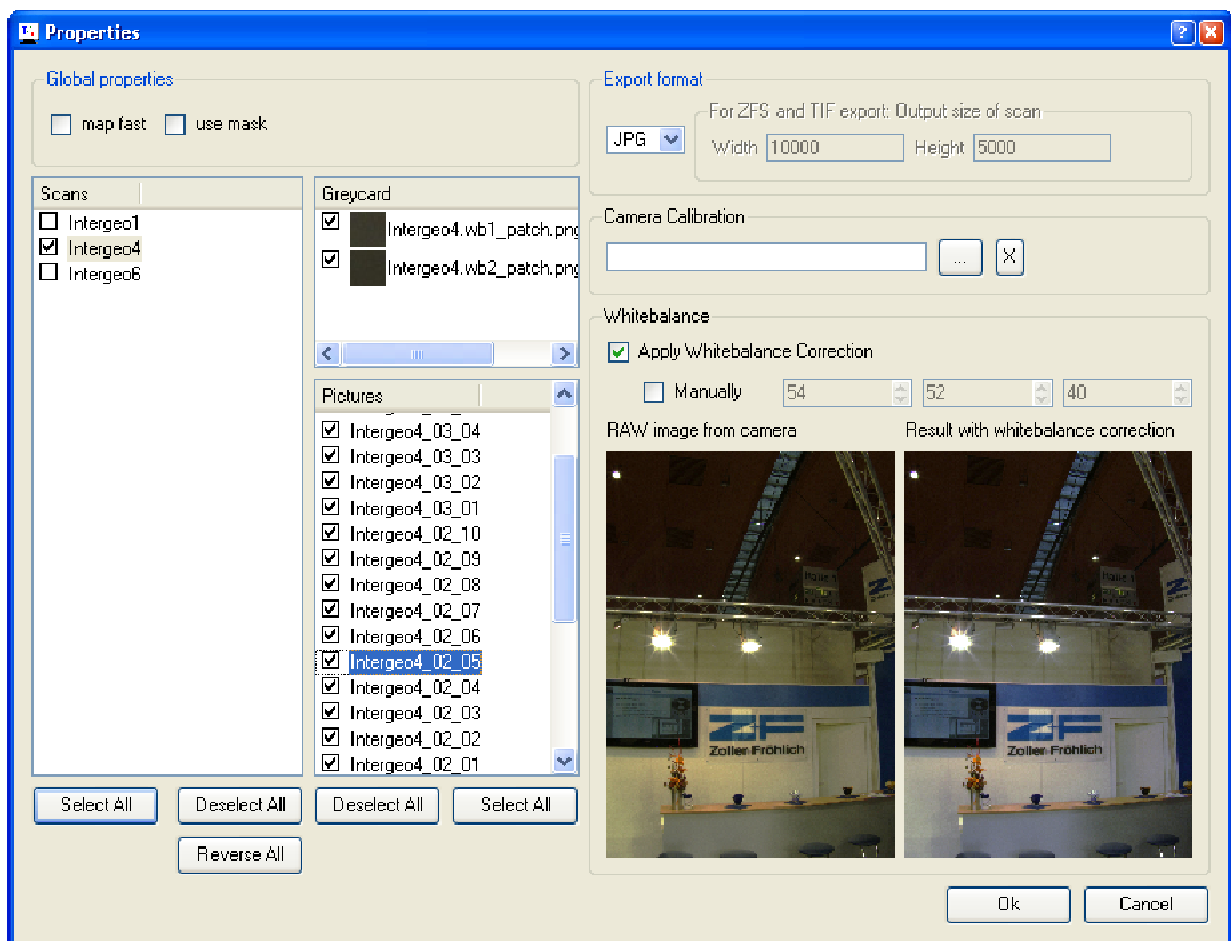


Image 3-1 Properties-Dialog for white balance

When the color-mapping process starts, the corrections will be calculated and projected onto the scan. Thus the raw data remains in its originality.

b. Skyfilter

In Z+F LaserControl 7.6 the color-mapping process has been optimized, so that a colored representation of the sky, in 2D-View and Bubble View, is now shown more homogeneously (Image 3-2 and 3-3).



Image 3-2 Previous representation of the sky



Image 3-3 Representation of the sky with skyfilter

Z+F LaserControl 7.6

Default the filter is always activated. Under **File - Options - Plugin.Color** (Image 3-4) the option can also be disabled [Sky Filter]:

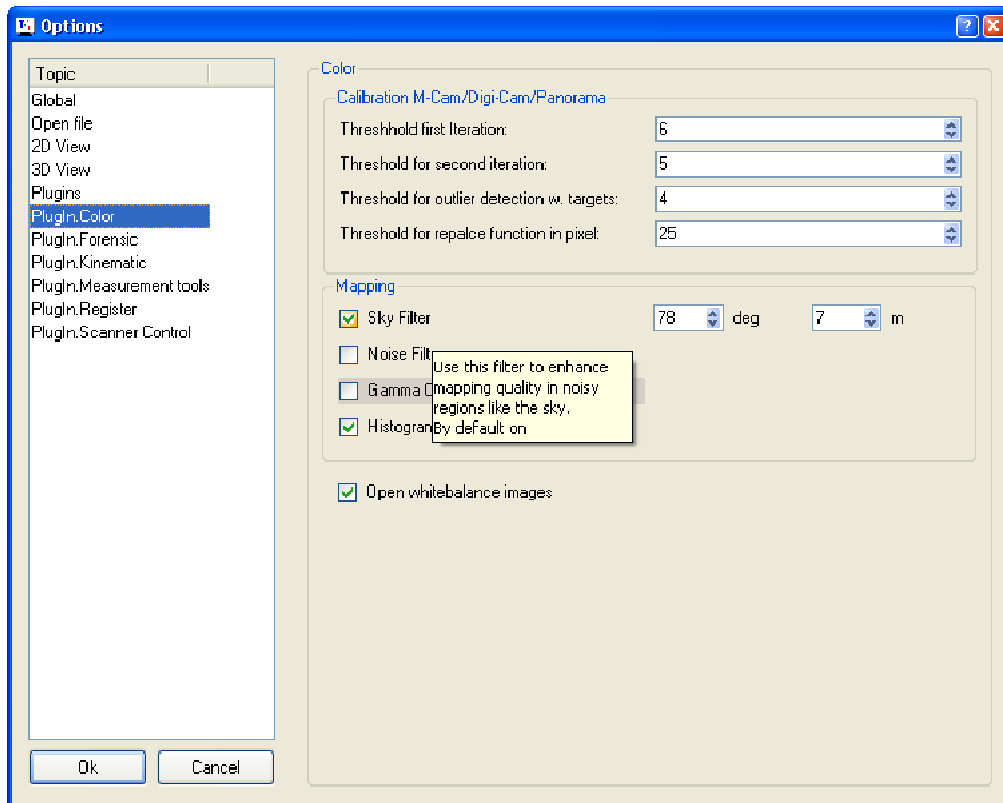


Image 3-4 Options-window for skyfilter

4 Optimized “Preprocessing” filter function

In the preprocessing function (Image 4-1) it is now possible to deactivate scans before doing the filter process. In the past all scans in the project were filtered automatically. Now filtering of only a part of the project-scans is possible.

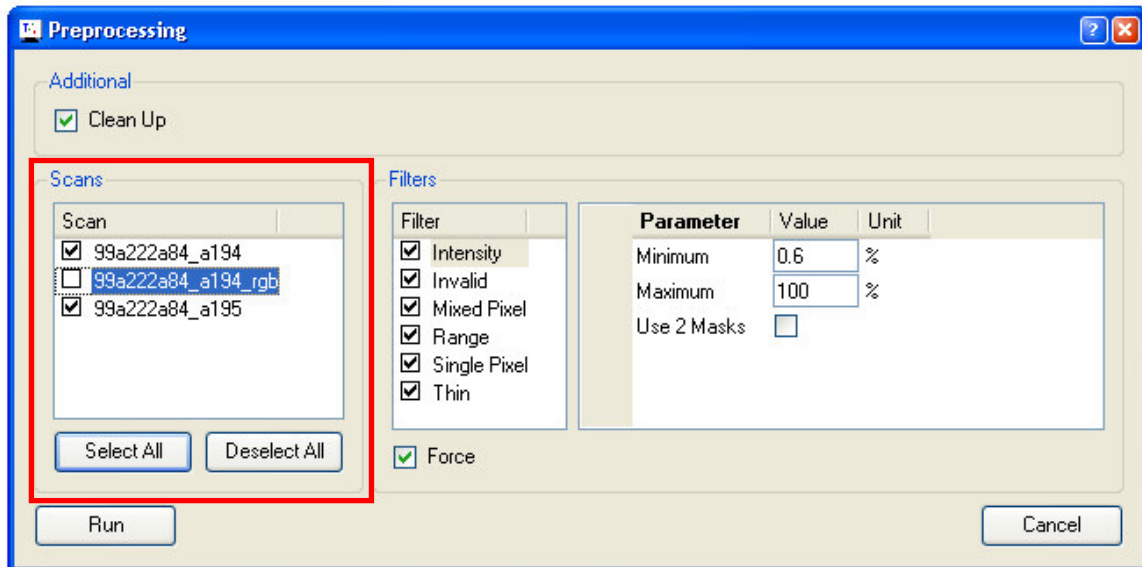


Image 4-1 Preprocessing-window

5 Improved Layer-Management

In the previous Z+F LaserControl version the Layer-Manager was already introduced. Now this function has been adjusted to the different work flows. For example, it is possible to activate a layer in the measurement-management, to add the objects (plane, shot channel, view from eye, measurement chain) to the corresponding layers (Image 5-1).

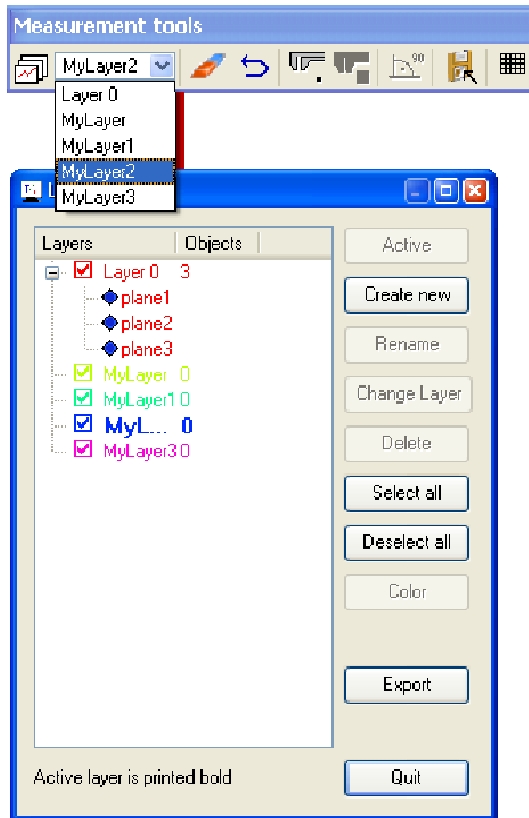


Image 5-1 Layer-structure

It is also possible to add objects to a layer later [Change Layer] - (Image 5-2):

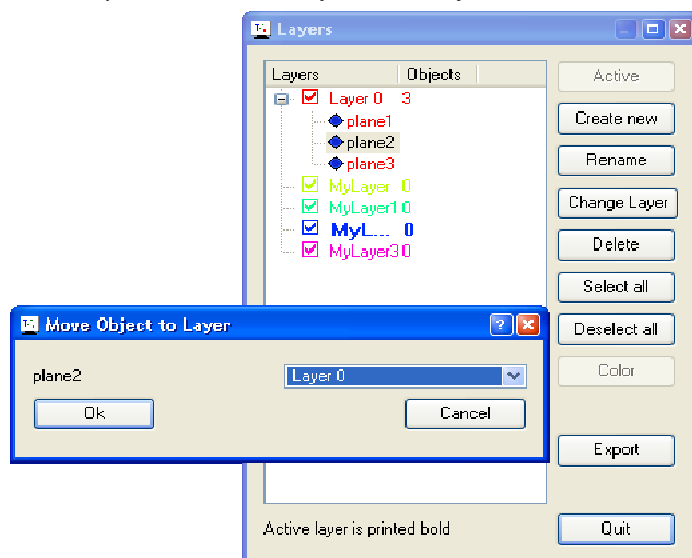


Image 5-2 Add objects to a layer afterwards

6 DXF-Export of 2D objects

Constructed measurement chains and bullet trajectories can be exported with Z+F LaserControl to DXF-files. Thus the generated objects are available for CAD software. This function can be selected by going to- Export... (Image 6-1):

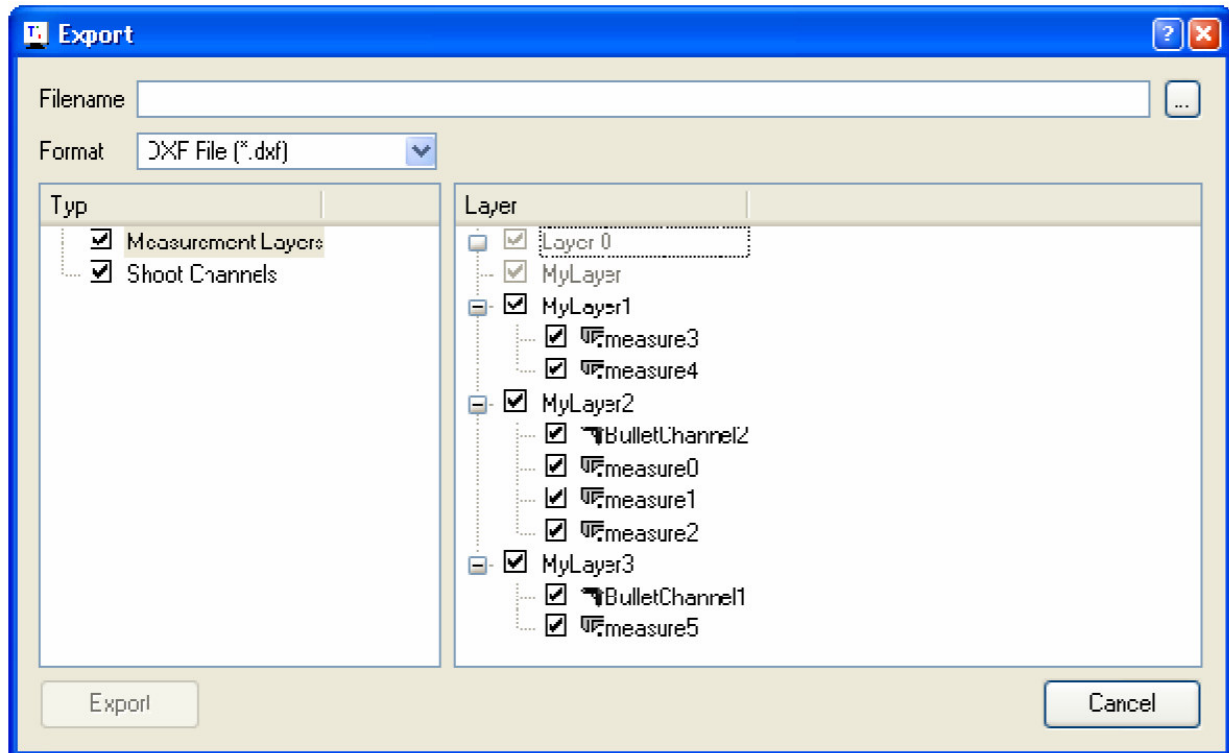


Image 6-1 Export of 2D objects

7 Registration with bundle adjustment as standard

From Z+F LaserControl 7.6 on the bundle adjustment is a standard tool and part of the register license. That means, with the purchase of a register license the customer will get the bundle adjustment tool, too. The bundle adjustment is a spatial equalization, which determines the transformation parameters simultaneously.

8 Support of Gauss-Krueger-coordinates

Z+F LaserControl 7.6 supports the possibility to do the geo-referencing with Gauss-Krueger coordinates. Thus the representation of the point cloud in 3D room is now possible without any difficulties.

9 PlugIn “Kinematic“ in Basic-license

From now on the “Kinematic“-PlugIn is a part of the basic-license

System requirements (minimum)

- Windows XP (32 Bit), Windows Vista (32 Bit)
- Single core 1600 MHz
- nVidia/ATI/Intel 512 MB RAM
- 2.0 GB RAM

System requirements (recommended)

- Windows XP (32 Bit), Windows Vista (32 Bit)
- Intel® Core™ 2 Duo Processor 2 x 2666 MHz or higher
- nVidia 1 GB RAM
- 4 GB RAM



If you work with Windows Vista, don't install Z+F LaserControl in the standard folder (C:/Programme), because this cannot connect with the system-file caused by a write protection

Contact

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