



Release 3.0

Release Notes SCANTRA PRO & LT

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Document-Version:
01.09.2021

SCANTRA 3.0.1.225

Table of Content

1	NEW FEATURES.....	3
1.1	UPDATED INTERFACE.....	3
1.2	MULTI-THREADING.....	3
1.3	SUPPORT OF POINTCAB ORIGINS.....	3
1.4	SEPARATION OF GEOMETRY AND INPUT AND OUTPUT INFORMATION.....	3
1.5	SPHERE DETECTION.....	4
1.6	POINT MATCHING.....	4
1.7	SELECTION LOGIC.....	5
1.8	FILTER FUNCTION IN THE DATA BROWSERS.....	5
2	IMPROVEMENTS.....	5
2.1	IMPROVED SPEED OF PROJECT OPERATIONS.....	5
2.2	MATCHMAKER.....	5
2.3	DEFINITION OF REFERENCE STATIONS AND GLOBAL POINT IDENTITIES.....	6
2.4	CUSTOMISABLE ARROW COLOURS.....	6
2.5	ALTERNATIVE INI-PARSER.....	6
2.6	PATHFINDER.....	6
2.7	SELECTION OF RELATIONS.....	6
2.8	PTX IMPORT AND UPDATE.....	6
3	BUGFIXES.....	6
3.1	INVALID FLOATING-POINT OPERATION.....	6
3.2	DUPLICATES OF STATION RELATIONS.....	6

1 New Features

1.1 Updated Interface

The first visual difference of the latest release to SCANTRA 2 is the all-new interface. This should make life a lot easier for new users since the new GUI guides you through the required processes within scanning projects. Experienced users of SCANTRA 2 should adapt quickly to SCANTRA 3 since the user concept remained the same.



1.2 Multi-Threading

The most anticipated feature of SCANTRA 3 is its novel multi-threading capability. Hence, it is now possible to run e.g., plane detection, plane or point matching as well as a block adjustment in parallel which drastically increases the productivity. Our new *Process Manager* allows you to define which tasks should be automatically carried out in dependence to the outcome of other processes.

1.3 Support of PointCab Origins

PointCab started off this year with a bang by introducing their major release called PointCab Origins earlier this year. Hence, we're delighted to be the first ones to support their all-new SDK that allows seamless communication between the two solutions. Customers who continue to work with PointCab 3 can still use the existing SDK.

1.4 Separation of geometry and input and output information

Until now, the result of a block adjustment depicted the true orientation and location of adjusted scans while the underlying network geometry is coloured deploying output information (*a posteriori*) such as e.g., residuals or partial redundancies. When processing data that describes multi-level buildings the result graph is often confusing since all scans and relations are seen from birds-eye view. From SCANTRA 3.0 on the input and output information of a block adjustment are separated from the network geometry. This allows to e.g. arrange different levels side by side, as shown in the figure below, while illustrating potential tensions between them that would otherwise be hard to spot.

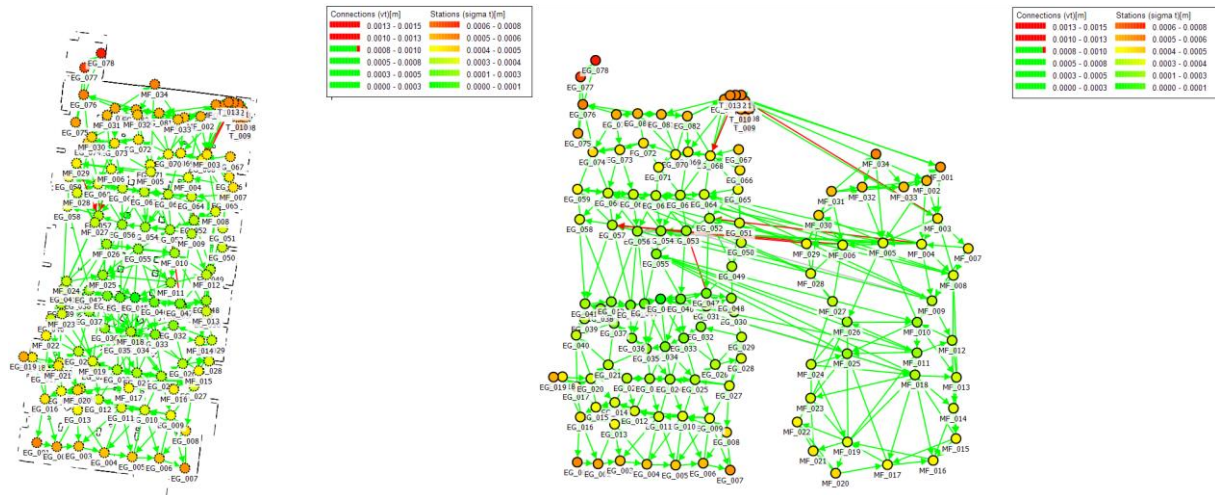


Figure 1: True geometry and output information (left) and different levels side by side coloured by output information

1.5 Sphere detection

Spheres are still useful in many situations e.g., in tunnelling where the degrees of freedom along the longitudinal axis are poorly determined. Hence, we introduced an automatic sphere detection algorithm. The difference to other detection algorithms is, that every single sphere's centre receives individual stochastic values which serve as weights within a block adjustment. Up to three different sphere diameters can be pre-defined. If a sphere has not been automatically detected, then its coarse location can now be manually set in the Matchmaker.

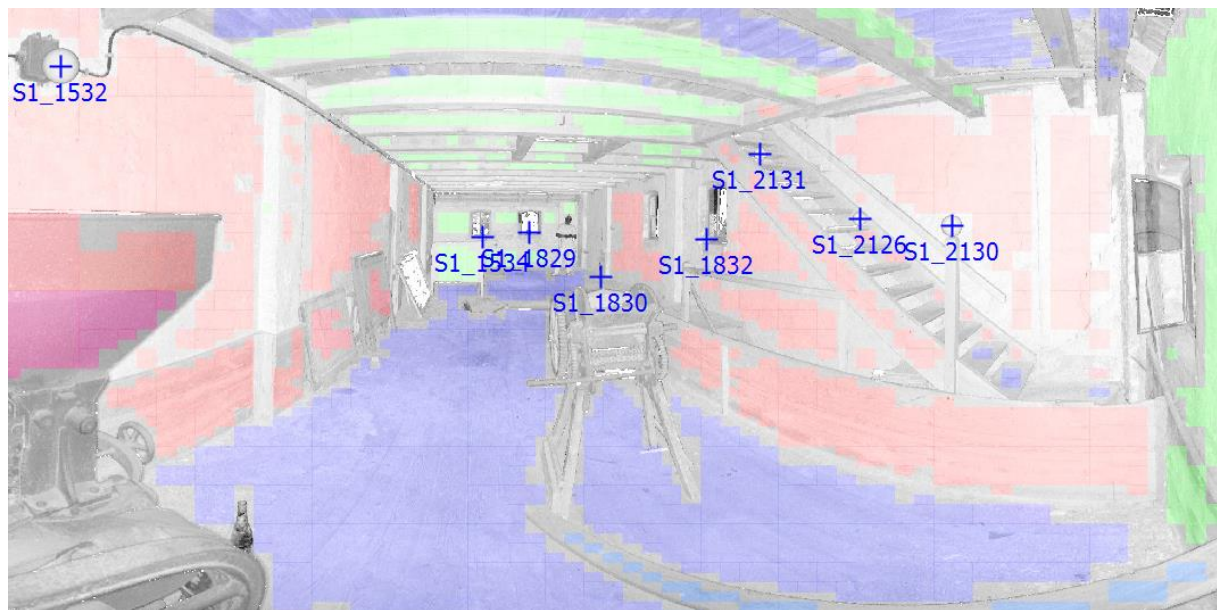


Figure 2: Detected spheres and planes within a scan (scan courtesy of Zell Aufmaß, Germany)

1.6 Point matching

Introducing multi-threading also opened up the opportunity to parallelise point matching. Apart from being much faster the robustness against false matches has also been improved. Two new algorithms were developed. One for pairwise matching between two scans based on at least three corresponding points and a datum-dependent one that also finds singles or tuples among registered scans.

1.7 Selection logic

In SCANTRA 2 stations had to be explicitly selected in the project tree which may have been time consuming in cases where only subsets of groups were of interest. Hence, a new selection logic was implemented. If stations or relations are selected in the graphics window, then the chosen operation will only be carried out for the selected elements (unless objects are switched off in the project tree). If no objects are selected in the graphics, then operations will apply to all active groups or stations in the project tree.

1.8 Filter function in the data browsers

Finding specific information in large datasets can be quite laborious. Hence, we have introduced new filter functions to our browsers that allows users to define and save tailored queries. For instance, find all active relations whose translational quality is lower than 1 mm.

2 Improvements

2.1 Improved speed of project operations

Numerous operations were enhanced in terms of speed and memory efficiency such as the block adjustment, create relations, project import and opening projects. A project with 4065 stations, 22 groups, 9128 relations and 1071 point identities requires only 4 seconds to open on a Dell XPS 15 (Quad Core 2.8 GHz; 16 GB RAM).

2.2 Matchmaker

The Matchmaker has been combined with “link stations manually” which allows not only to view and define new relations but also to manually interfere with registrations of interest. We have also integrated a feature that immediately illustrates all planes that were used for the computation of registration parameters. In addition, digitised local points can be associated to global points in the graphics. Furthermore, the Matchmaker can now be operated solely by the keyboard: the left image can be changed by using the “gaming keys” W, A, S and D while the arrow keys manipulate the right one. Using the space key creates a new or deletes an existing relation.

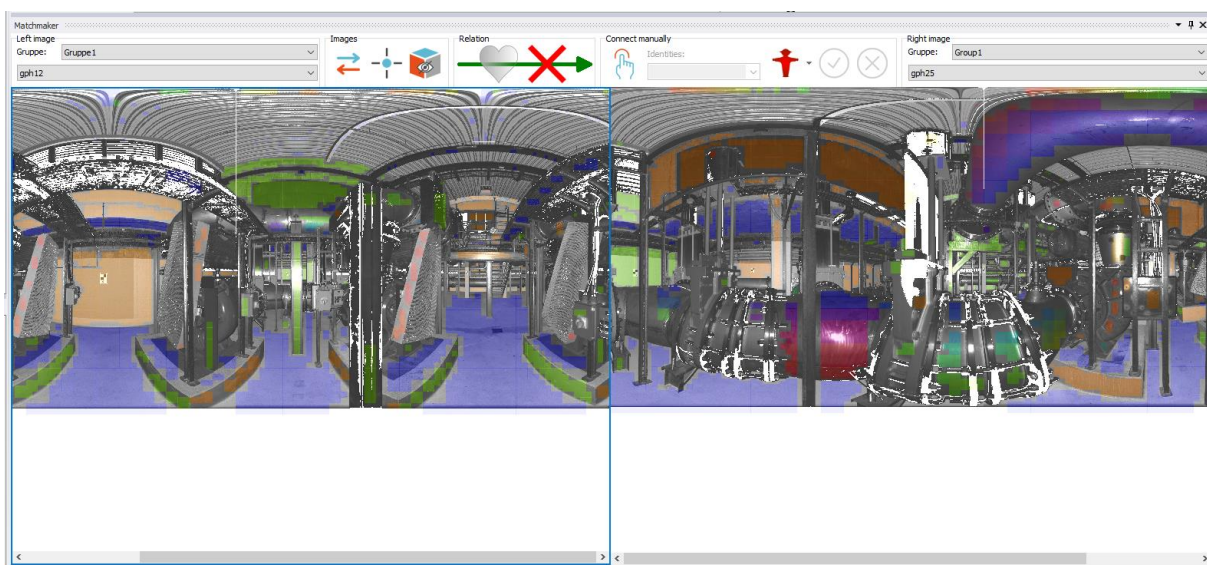


Figure 3: The extended Matchmaker

2.3 Definition of reference stations and global point identities

Reference stations can now be defined in three ways: based on the drop down menu under the block adjustment tab (comparable to SCANTRA 2), by setting a station in the project tree or the graphics. Point identities to global points can be set in the Matchmaker or in a single image.

2.4 Customisable arrow colours

Approximately 9% of all men and 1% of all women suffer from red-green sight loss. Hence, the colours of *a priori* information (input of a block adjustment) are now customisable.

2.5 Alternative ini-Parser

In SCANTRA 2 we still have used the standard windows ini-parser which is used to organise settings of programmes. Unfortunately, this function drastically slows the more settings it has to handle. Thus, we have implemented an alternative ini-parser that ensures much higher performance.

2.6 Pathfinder

The pathfinder in SCANTRA 2 is an automatic function that calculates pre-orientations based on ring closures in the relations topology. This function can now also be started by the user using the corresponding button, if required.

2.7 Selection of relations

Relations that surround a station can now selected by fencing the corresponding station.

2.8 PTX Import and update

To our surprise many users still rely on ASCII format such as PTX. Hence, we have revived and updated this ancient interface. Users can now import and update PTX-files after registration.

3 Bugfixes

3.1 Invalid floating-point operation

If a project contained very large contradictions, this error message appeared because a data type of the graphic had overflowed. In other words, the line thickness became too large. This problem has been fixed.

3.2 Duplicates of station relations

In some cases, duplicate relation arrows occurred which lead to reverse registrations between stations. This issue has been fixed.