Top: Results merging pictures and point cloud
Bottom: Results of another bridge with picture + point cloud

Trimble MX2 Portable Mobile Mapping System on a Boat

AllTerra Deutschland GmbH is the Trimble Center of Competence for Northern and Eastern Germany, and represents Trimble´s Geospatial, Marine and GIS divisions in the region using their mobile mapping solutions as well as all sorts of Geospatial products for several years on various projects all around Germany.

One of the latest products that have revolutionized the mobile mapping data collection has been the Trimble MX2 due to its portability and versatility being able to be deployed on all sizes of on- and off-road vehicles, quad bikes and boats.

One of our customers was interested in checking the results and accuracy of such a system from a boat in order to analyze the bridge clearance areas for river transportation.

BY FERNANDO CALVO

Trimble MX2 system. View from the rear with dual head scanners

We performed this 5 Km long pilot project close to Halle (Germany) on the Saale river. We used the Trimble MX2 with a dual head side laser scanner option and a Ladybug camera for 360° panorama pictures. This system additionally contains a surveying grade differential GNSS receiver and and IMU so the scans and images are continuosly georeferenced.

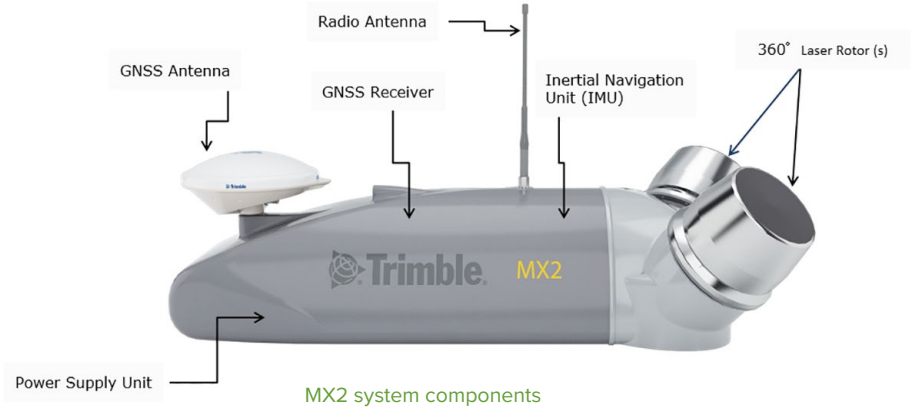
Both side scanners collect 36.000 points/second and rotate 20 times/second. The Ladybug panorama camera composed by 6 individual cameras (5 horizontal and 1 to the top) creates a 30 Mpx panorama picture each 5 m. We chose a boat "walking" speed of 6 Km/h which gave us scan sections each 5cm.

In order to check the accuracy both global and local we previously marked and measured with a Trimble R10 High-End GNSS receiver some points in some bridge foundations so we were able to compare later from the point cloud getting impressing accuracies of around 5 cm globally positioning and 2 cm relatively.

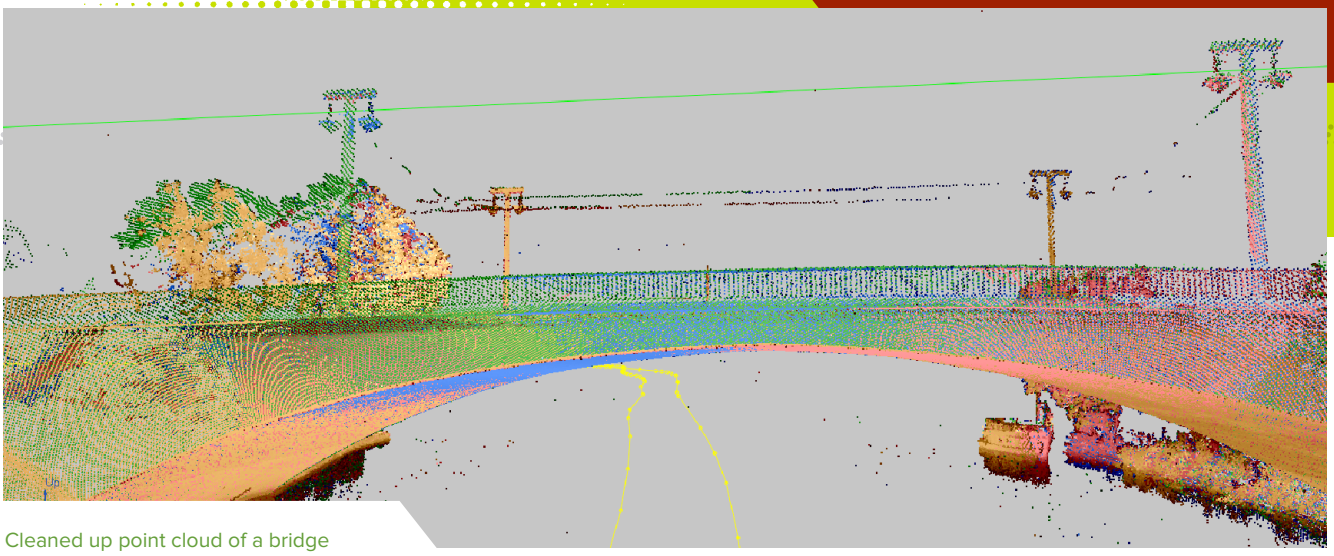
The postprocessing of the data was done with Trimble PosPac and Trimble Trident calculating the trajectories and point clouds out of all collected data. We additionally used the Ladybug software together with Trident to create the 360° panorama pictures and also individual ones containing their orientation which is extremely important for many applications.

We also wanted to check the potential and accuracy of adding an echo-sounder to the whole combination and this can be done via Quinsy software, however

View of the bridge from the boat



MX2 system components



Cleaned up point cloud of a bridge

we didn´t use the depth data for our results as this was not the goal of the project but to determine the clearance areas under the brigdes.

The results can then be exported from Trident to different point cloud formats such as LAS, but also manually created points, lines and areas to Shapefiles or DXF.

As conclusion we can strongly recommend this solution for such kind of projects where the accuracy around 2 cm is required. The work and data flow are extremely optimized and seamless and the deliverables very open and flexible.

For more information, contact AllTerra Deutschland GmbH | Trimble Kompetenz-zentrum; An der Feldmark 1631515 Wunstorf Germany • Telefon: +49 (0) 50 31 - 51 78 0 • Web: www.allterra-dno.de

Fernando Calvo was born in Madrid, 1976. He studied Survey Engineering at the Polytechnical University in Madrid and since 1997 held several positions in Spain and Germany as Land Surveyor, Software and Business Development, Technical, Project and Channel Manager at different companies such us Trimble, Esri-Eptisa, SunPower, and some more and was responsible for several European countries. Currently he is leading the Scanning, BIM and GIS sectors in Northern Germany at AllTerra Deutschland GmbH and is based in Hamburg (Germany). calvo@allterra-dno.de

View from the rear of whole mounting system

View of the whole system mounting