

[Volume XXXVIII-5/W12](#)

Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXVIII-5/W12, 191-196, 2011
www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XXXVIII-5-W12/191/2011/
doi: 10.5194/isprsarchives-XXXVIII-5-W12-191-2011
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A LOW BUDGET MOBILE LASER SCANNING SOLUTION USING ON BOARD SENSORS AND FIELD BUS SYSTEMS OF TODAY'S CONSUMER AUTOMOBILES

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Keywords: Mapping, Surveying, Laser Scanning, Point Cloud, TLS, Mobile, Dynamic, Cost

Abstract. Mobile laser scanning systems (MLS) offer a great potential for acquiring detailed point cloud data of urban and suburban surroundings with minimum effort. In this paper a new solution for MLSs is presented, requiring solely a combination of a profile laser scanning device and systems that are included in today's serialized end consumer vehicles. While today's mobile laser scan systems require different and expensive additional hardware that needs to be mounted onto the vehicle, the devices included within vehicle electronics offer good alternatives without additional costs. The actual scan consists of a continuous profile scan together with information gathered from on-board sensor modules. In a post-processing step, the sensor data is used to reconstruct the car's trajectory for the period of the scan and, based on this information, the track of the scan device for every measured laser pixel. Synchronization of pixel data and vehicle movement is realized via a timestamp signal which is transmitted to the car's field bus system and the scan device. To generate the final point cloud scenario, the trajectory is interpolated for every single scan point and used to convert its local position within the profile into the global coordinate system (Fig.1, Left).

[Conference Paper](#) (PDF, 522 KB)

Citation: Vock, D. M. M. and Jungmichel, M.: A LOW BUDGET MOBILE LASER SCANNING SOLUTION USING ON BOARD SENSORS AND FIELD BUS SYSTEMS OF TODAY'S CONSUMER AUTOMOBILES, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXVIII-5/W12, 191-196, doi:10.5194/isprsarchives-XXXVIII-5-W12-191-2011, 2011.

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