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Imaging Total Stations – Modular and Integrated Concepts

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Initialized in 2009, the Institute for Spatial Information and Surveying Technology i3mainz, Mainz University of Applied Sciences, forces research towards modular concepts for imaging total stations. On the one hand, this research is driven by the successful setup of high precision imaging motor theodolites in the near past, on the other hand it is pushed by the actual introduction of integrated imaging total stations to the positioning market by the manufacturers Topcon and Trimble.
Modular concepts for imaging total stations are manufacturer independent to a large extent and consist of a particular combination of accessory hardware, software and algorithmic procedures. The hardware part consists mainly of an interchangeable eyepiece adapter offering opportunities for digital imaging and motorized focus control. An easy assembly and disassembly in the field is possible allowing the user to switch between the classical and the imaging use of a robotic total station. The software part primarily has to ensure hardware control, but several level of algorithmic support might be added and have to be distinguished. Algorithmic procedures allow to reach several levels of calibration concerning the geometry of the external digital camera and the total station. We deliver insight in our recent developments and quality characteristics.
Both the modular and the integrated approach seem to have its individual strengths and weaknesses. Therefore we expect that both approaches might point at different target applications. Our aim is a better understanding of appropriate applications for robotic imaging total stations. First results are presented.

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