

Geospatial Modeling & Visualization

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Leica C10 Scan Station

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Introduction



The Leica C10 Scan Station scanner is a time-of-flight scanner with an effective operating range of +/- 1-200 m (up to 300 m with 90% reflectivity). It's motorized head allows scanning of a complete 360 degree by 270 degree area. Data is acquired at a rate of 50,000 points/second and can be stored on-board or on a wireless or wired laptop. The C10 has a number of features which make it particularly effective. For example it has automatic target acquisition capabilities that quickly allow survey control points to be integrated with the scan data. The Center has a number of targets for this purpose, which it has used both in large outdoor sites and within complex interiors. It has an on-board video camera which can be used for scan management/planning; the pictures of this camera are automatically aligned with the scans to texture the point clouds. Published specifications indicate that the accuracy of a single measurement is 6 mm in position and 4 mm in depth (at ranges up to 50 m). The system supports traverse and resection capabilities.

Data acquired by the systems is processed using various software including [Cyclone](#), [CloudWorx](#) (a series of plug-ins for CAD software), [PolyWorks](#), and [Rapidform](#).

The system has already been used in a number of projects and educational activities, some of which are described below.

Research Projects

The C10 scanner played a key role in the precise 3D mapping of the Greco-Roman structures at Karanis in the Fayum of Egypt as part of the [UCLA's Fayum Project](#). Closer to home, the unit has served as a key component in a long term effort to improve the extraction of urban infrastructure from point clouds. A local project is focusing on the extraction of architectural and contextual elements of complex urban structures. This research continues an ongoing collaboration with the [University's of Arkansas' Facilities Management](#) Department pursuing a cohesive "digital campus". Utilizing laser scanning in this collaboration began with the documentation of the [Heating and Cooling Plants](#) in the winter of 2010. This research continues with the current renovation of [Vol Walker Hall](#) and the attempts to create more accurate as-built plans. This scanning component is one element in the development of the next generation of tools to record and manage complex urban infrastructure. (As this is an ongoing project, this section is under construction.)

Educational projects

Along with the Z-F 5600i, the C10 was part of the CI-TRAIN NSF-Funded summer field training program at the [University of Arkansas](#) campus in summers 2010 and 2011, as well as the 2010 summer program at [Eleusis Greece](#), co-sponsored by the Center, the Cotsen Institute of Archaeology and the Initiative of Heritage Conservancy.

Detailed technical information on the C10 is provided on the Leica web site – at this [location](#) and Leica provides useful tutorials [here](#).

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