Kaarta Stencil® 2-16 is a low cost, flexible mobile mapping platform for rapid mobile scanning; a computer small enough to fit in your hand but powerful enough to process and view any of the data it captures. Stencil's integrated 3D mapping and real-time position estimation allows capabilities not possible with fixed-base scanning systems.

At the heart of Stencil is Kaarta Engine, Kaarta's patent-pending advanced 3D mapping and localization algorithms. Kaarta Engine's proprietary approach surpasses the drift error of alternative SLAM systems by an order of magnitude.

Stencil accurately maps exterior and large interior spaces quickly and easily with a range of up to 100 meters with a lidar accuracy of ±30mm. Data rate is 300,000 points per second up to 10Hz.

Stencil records GNSS data for use in loop closure to georegister or geolocate datasets, correcting for drift and further enhancing the fidelity of data collection. Kaarta provides an optional GNSS receiver and bracket kit or Stencil integrates with most NMEA 0183 GNSS systems.

Stencil's user interface and on-screen keyboard accessed on the included tablet makes real time operation easy, organized, and intuitive; giving users better control over scanning operations.

Confidence Metrics provide immediate feedback on the quality of scan matching by signaling whether new scan data is registered properly in the existing map, signaling the likelihood of errors and allowing the user to increase the level of confidence by adjusting data collection techniques, or adjusting parameters. Automated Floor Leveling/Sectioning algorithms identify floor structures and levels for better scans and reduced post-processing time. Floor Planner levels, rotates, and generates 2D images of "slices" from a point cloud.

The combination of small size and customizable capture hardware creates a system that is easily adaptable. Stencil base configuration is an aluminum enclosure with machined plates for lidar mounting and adapters as well as mounting points to attach to monopods, ATVs, UAVs, drones, etc. Feature Tracker, a high frame-rate imaging device, enhances operation in open, unstructured environments. Stencil 2-16 includes a Velodyne VLP-16 and accepts Velodyne VLP-32 and HDL-32 with an adapter ring.

Stencil is a turnkey system that contains everything needed to capture and process the captured data. No internet connection, additional computers, software licenses, or subscription needed. Stencil serves as a stand-alone scanning solution but can also be used to complement or augment other scanners.

Stencil's ease of use, breadth of applications, and streamlined workflow make it the perfect choice for infrastructure inspectors, surveyors, engineers, architects, facilities planners, security personnel, or anyone who needs an easy way to document the 3D world quickly and dependably.
SAMPLE OUTPUT

Stanford University Quad scanned in 15 minutes

Three passes through an intersection correctly registered in post processing using GNSS in loop closure

Scan of heavily wooded area. Topography can be seen by cropping to terrain.

Stencil captured fine details such as overhead wires at this light rail station. The scan’s 72,000,000 points of data were captured in the 20 minute interim time between trains.

GANSS data with dropouts

Stencil 2 trajectory

Corrected trajectory

GANSS in loop closure: GNSS data showing dropouts over the course of the data collection (left), trajectory data from Stencil 2 with some drift (center), and corrected trajectory in yellow overlaid on the original GNSS data (right).