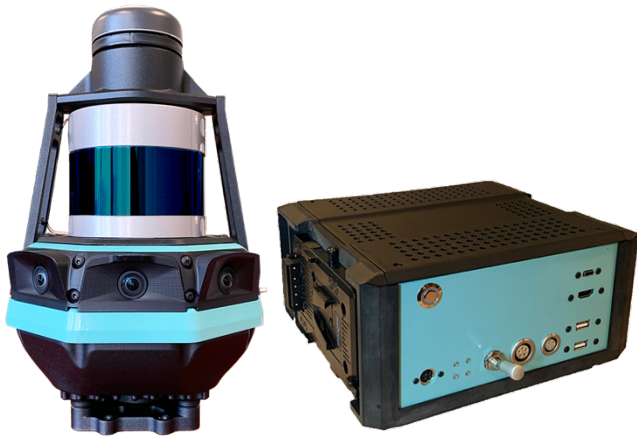


STENCIL PRO



POWERED BY KAARTA ENGINE



Pro-grade mobile laser scanner delivers impressive dimensional & visual fidelity

360°COLOR • RUGGED • GEO-ENABLED • HIGH DENSITY • VERSATILE

Kaarta Stencil® Pro is the innovative mobile mapping platform that goes anywhere – in just about any environment – giving you rapid, accurate and visually stunning reality capture. An all-in-one system to scan, process and view captured data in real time, Stencil Pro offers integrated GNSS, panoramic 4K imagery and colorized point clouds in an IP65-rated professional form factor. With robust surround-view perception in a wide range of light conditions, Stencil Pro is optimized for both indoor and outdoor performance. Featuring an impressive 32-line high-density, low-noise lidar with a range of 120m and a data rate of 600,000 points per second, Stencil Pro produces a highly accurate 3D model in minutes. New advancements are backed by proven Kaarta technology, quality, and accuracy.

An IP65-rating makes Stencil Pro a workhorse in infrastructure mapping, mining, forestry, earthworks, construction and other harsh environments. Stencil Pro's rugged and versatile design is adaptable to many environments, capturing data amidst poor weather, dusty work environments, and below-ground cavities.

The combination of high-resolution 3D perception and a broad vertical field of view enables Stencil Pro to accurately detect ground-level surfaces as well as overhead elements, mapping detail such as curbs, manholes, signs, and poles. The durable configuration makes Stencil Pro ideal for vehicle mounted applications, resulting in extremely fast surveys for large-scale projects.

An added benefit of Stencil Pro is its acquisition of high resolution 360° imagery with four 8-megapixel color cameras, enhancing an already comprehensive 3D model by creating a visual record of current project conditions, as-built environments, and corridor mapping projects. The integration of 3D and high-quality imagery data can improve or speed up the object identification process utilized by geospatial or machine-based learning applications and real-time change detection when compared to point cloud data alone.

Stencil Pro incorporates leading-edge components like a Velodyne Ultra Puck VLP-32C lidar, four >90° RGB cameras (full stitched panorama) and a 6 DoF IMU. Stencil Pro uses simultaneous mapping and localization in GNSS-denied environments, but also has an integrated Trimble GNSS receiver to achieve best-in-class, low-drift accuracy while mapping over longer ranges. GNSS data is collected, corrected via PPK or RTK, and then used to align and geo-register data, providing global accuracy and further enhancing the fidelity of large area scans and long, linear scan paths.

Stencil Pro's intuitive user interface makes data capture and processing simple. The user experience includes one-button scanning, real-time scan monitoring and streamlined post-processing options for maximizing data clarity and usability. Remote operation using the touchscreen monitor or the controller's start/stop scan button allows for mounting Stencil Pro on a multitude of transports. When hand-carrying, scan status can also be started and stopped with a push of a button on the device.

With Stencil Pro's high density, multi-sensor capture comes sizeable outputs. Stencil Pro was developed with transferability in mind. Multiple ports support large data transfers, including a high-speed ethernet adapter. Stencil Pro is also WiFi enabled for built-in connectivity and cloud readiness.

Stencil Pro is a turnkey system advancing next generation mobile surveying.

STENCIL PRO SPECIFICATIONS

OUTPUT	.ply, .las
MODES	Baseline mapping GNSS scan alignment
IMU	Internal MEMS-based IMU Six DoF: X, Y, Z, Roll, Pitch, Yaw
PROCESSOR	Intel NUC i7 Octa Core
PORTS	1 HDMI 2 USB-A 1 USB-C
STORAGE	1TB SSD
DISPLAY	Portable HDMI touchscreen monitor
OS	Ubuntu Linux OS
LIDAR	Velodyne Ultra Puck VLP-32C lidar 1m [min] - 200m [max] range 360° horizontal FOV 40° (-25° to +15°) vertical FOV Class 1 Eye-safe per IEC 60825-1:2014
GNSS	Integrated Trimble BD-990 receiver, AV28 antenna Synchronized with map data for global registration 336 tracking channels Supports other GNSS antennas, RTK w/NTRIP or PPK
CAMERAS	1 High-frame rate B/W Camera for visual odometry (4 MP) 4 Panoramic high-resolution 4K color cameras (8 MP), each camera with >90° HFOV and 55° VFOV provide full stitched 360° panorama (maximum resolution of panorama is 10K+)
ACCURACY	30mm (lidar)
SPEED	600,000 points/sec [data acquisition] 10 Hz [scanning speed]
WEIGHT	Scanner: 3.4kg (7.5lbs) Controller: 3kg (6.7lbs) 2 x 98Wh battery: 0.7kg (1.6lbs)
OPERATING TEMPERATURE	-10°C min- 45°C max [scanner]
HUMIDITY	<96% [scanner]
SPRAY/DUST/WATER	IP65 [scanner]
POWER	Input 100-240 VAC
BATTERY LIFE	3 hours of scanning, hot swappable
PLATFORMS	Hand carry, roadway vehicle, ROV, robot, ATV, rail
INCLUDED ACCESSORIES	Wireless keyboard and mouse AC power adaptor Extendable monopod Umbilical cables Portable HDMI monitor and cables 2 V-Mount batteries with charger (USA only) Control pack carry bag Rugged backpack [2] carrying case Tactical bag for all accessories U mount clips
OPTIONAL ACCESSORIES	Vehicle Mounting Kit
WARRANTY	1 year
MODEL NUMBERS	KRT-STN-PR-32-000: Stencil Pro + Base Accessory Kit KRT-STN-HW-01-010: 1 yr extended hardware warranty KRT-STN-HW-02-010: 2 yr extended hardware warranty

KAARTA ENGINE



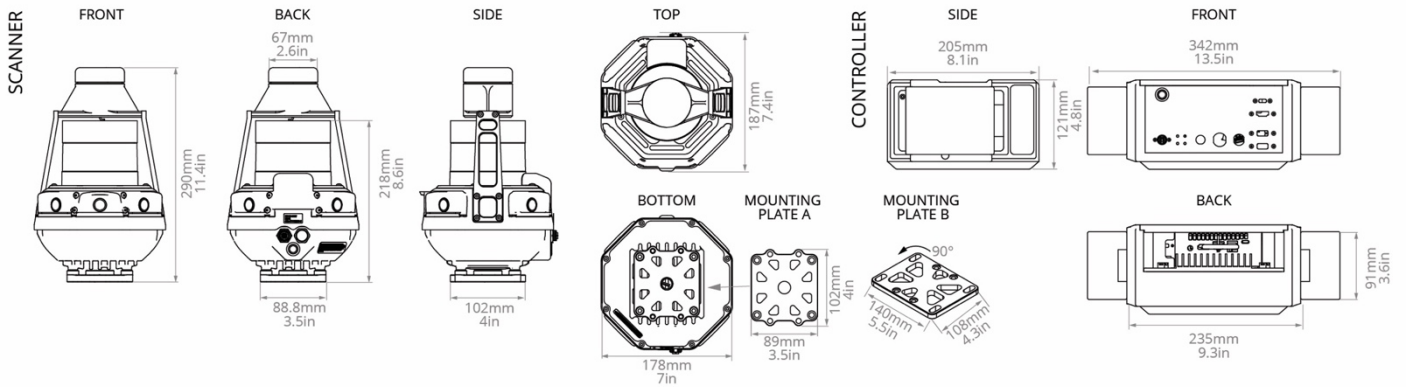
- Patent-pending real-time registered point cloud generation
- Multi-sensor input (lidar, IMU, feature tracker, camera, GNSS)
- Continuously self-correcting minimal drift techniques
- Implicit loop closure
- Fast, explicit loop closure at point of scan



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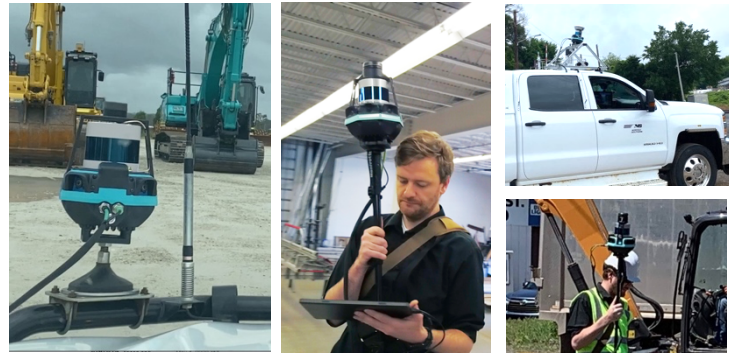
DIMENSIONS



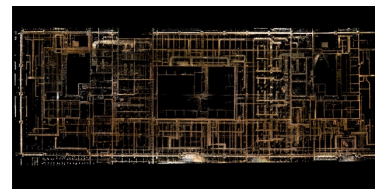
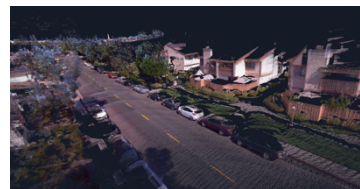
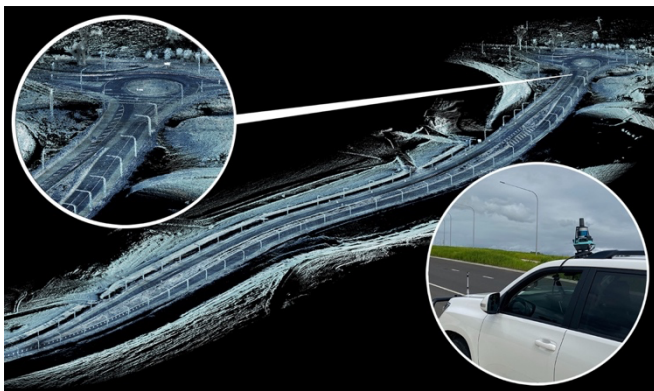
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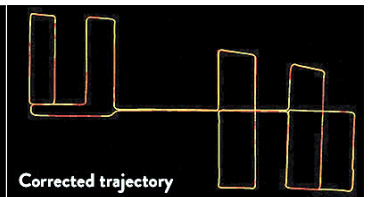
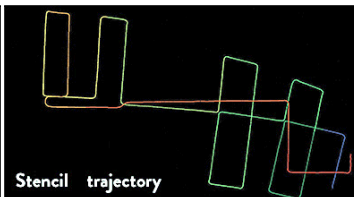
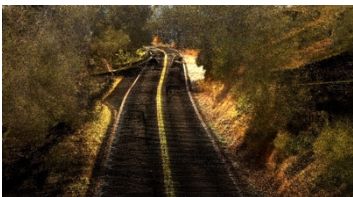
PLATFORM & APPLICATION VERSATILITY



SAMPLE OUTPUT



GNSS INTEGRATION



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



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