

## Affordable Laser Scanning

DotProduct develops high performance, easy-to-use solutions for capturing 3D data. The patent-pending technology makes it easy for anyone to obtain accurate 3D-models and measurements in-the-field. The device works very much like a hand-held video camera.

The company developed a new technology from scratch that enables tablets to capture and process all the data from depth-cameras in realtime.

The technology is designed for mobile professionals who need high-quality spatial data instantly. The device provides engineering-grade 3D data in seconds. The Phi.3D 2.0 software turns an NVIDIA SHIELD Android tablet into a fully mobile 3D-capture and -processing solution that delivers results before a worker leaves the worksite.

Phi.3D 2.0 Next Generation Mobile 3D Imaging Software allows users to capture and register 3D spatial data using only the processing power of a tablet, without a personal computer or cloud service. Users can define the coordinate system on the tablet, register multiple datasets in the field, pull measurements on the fly, and integrate automatically with AprilTags in Phi.3D 2.0. The technology also is a realtime indoor positioning system because the device pose is computed 30 times a second with superior precision. The technology can also recognize places that have been visited before.

The mobile system eliminates the need for a laptop and cables because 3D special data can be captured directly on a tablet.

The scanner allows for safe, one-handed operation, and allows users to get into hard-to-reach, occluded areas that may be inaccessible with other technologies.

Results are provided instantly in real time, so users have no surprises. They leave the jobsite knowing they've collected the right data they need for projects. DotProduct's Phi.3D technology provides users with real-time data quality feedback as the data is being acquired. Users can instantly review point cloud data sets right on the tablet.

The device allows users to geo-reference and take measurements in the field. They are able to set the coordinate system on the tablet in seconds, and measure vertical, horizontal, and point-to-point distances directly from the data on the jobsite. Survey targets or automatic AprilTags recognition may be utilized on high precision jobs for even more accurate results.

The system allows users to append multiple data sets together automatically. The Append to Scan function will add new data to previously captured 3D spatial data. New data can be captured and appended on-the-fly without the need for additional targets or control. With Phi.3D 2.0, the Append to Add function can be used to connect distinct data sets into the same coordinate system on the fly.

The device allows data export to industry formats. Phi.3D captured data can be used with desktop point cloud software, with no need to change current workflow. Data can be exported in PTS, PTX, PLY, PTG or the native DP format for efficient storage and rapid data export. Binary files integrate directly with AVEVA LFM, Autodesk ReCap, Trimble RealWorks, CloudCompare, ClearEdge3D, Veesus Arena4D, and PanoMap.

The data quality of the DPI-8 imager depends on range, temperature, ambient lighting conditions, reflectivity of the area of interest, operator skill and other factors. System accuracy is improved by using survey targets. System performance is degraded by long collection times, accumulation of frame-to-frame drift and lack of scene fitness induced by geometry and texture limitations. The working range of the DPI-8 is from 0.6 m to 3.7 m (2 ft – 12 ft).

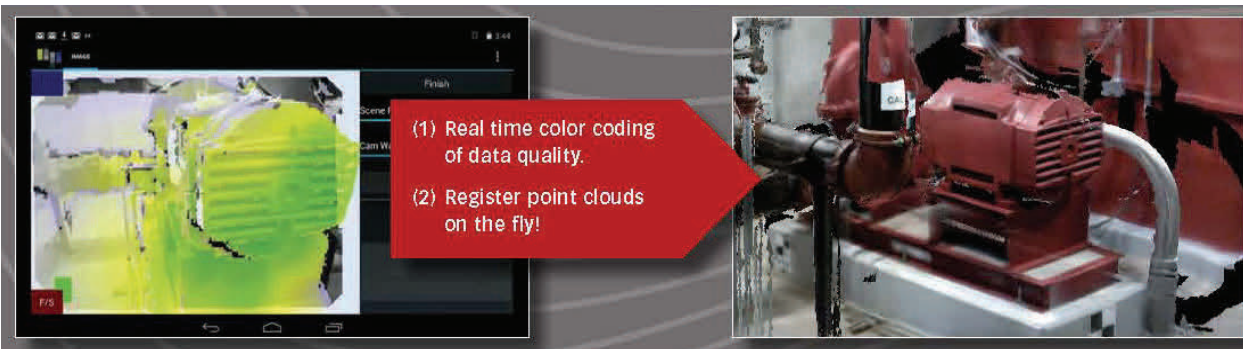
To eliminate the need to share USB-sticks or hard drives, the company developed a scene compression technology that is optimized for wireless transfer. Compression ratios up to 50x are achieved, compared to standard formats like PTS or PTX with the technology.

**Phi-3D 2.0 Technology**

- Real-time, markerless camera tracking
- Full 6-dof, mm-accurate indoor positioning
- Instant colored 3D model creation
- Real-time occlusion maps
- Re-localization and place-recognition
- All processing on tablet-no laptop needed
- 3rd party access through an API (coming soon)
- Cloud-optimized 3D-scan compression

**DPI-8 System**

Screen size: 8inch  
 Device size: 23x27x8 cm.  
 Interfaces: USB, WiFi, 3G  
 Capacity: 16 GB or 32 GB  
 Export formats: PTS, PTX, PLY, PTG, Cyclone, E57 (soon)  
 Sensor range: 60 cm to 5 m (2-15 ft.); 1 to 6 ft (SR version)  
 Op. Temperature: 5 to 33 degrees C (41-91 F)  
 Horizontal FOV: 57.5 degrees  
 Point density: ≤ 1.7mm at 1m distance; ≤ 3.4 mm at 2 m distance  
 Power supply: Using tablet battery



**The DotProduct DPI-8 Handheld 3D Imager Kit contains:**

1	8" Android Tablet computer with at least 16GB of storage (DotProduct reserves the right to provide greater than 16GB depending on availability)
1	License of DotProduct Phi.3D 2.0 software, preloaded and licensed to that tablet computer and PrimeSense Carmine 1.082 camera. One year of support and upgrades is included.
1	PrimeSense Carmine 1.082 red, green, blue and depth sensor.
1	8" tablet bracket with handle attachment
3	USB to micro USB connectors for connecting camera to tablet
1	Carrying case
1	Tablet charger

**DPI-8 Product Specifications - General**

Imager type	Compact, near infrared structured light and RGB 3D depth imaging system
User Interface	Android operating system
Data Storage	Onboard 16 GB or 32 GB flash drive
Data Transfer	USB 2.0/3.0, microUSB connector.

**DPI-8 Product Specifications - Physical**

Mass	< 1kg (2.2 lbs.)
Dimensions	23 cm x 27 cm x 8 cm (9 in x 10.5 in. x 3 in.)
Temperature	Tested operating range: 15 °C to 32 °C (60 °F to 85 °F)
Lighting	Not operational in direct sunlight
Humidity	Non-condensing

**Test Facility Results** (measured distance in final post-processed model)

Range	Typical Accuracy	Minimum Accuracy
< 1 m (3.3 ft)	99.8%	99.6%
1 m to 2 m (6.6 ft.)	99.5%	99.2%
2 m to 3.3 m (11 ft.)	99.0%	98.6%
> 3.3 m (11 ft.)	Not Specified	Not Specified