SPECIFICATION SHEET

DepthScan Camera Specifications

Configurable 3D structured light scanner for dimensional inspection and 3D machine vision - including metrology, robotic guidance, pick-and-place, and perception-driven path planning for painting, sanding, and welding. Three camera models, working distances from 250 mm to 5 m, verified accuracy per VDI/VDE 2634 Part 2.

4M	400ms	100fps	28um
3D POINTS / SCAN	FULL-RES CAPTURE	HIGH-SPEED MAX	SD @ 500mm WD

3D SCANNING PERFORMANCE

PARAMETER	FULL RESOLUTION MODE	HIGH SPEED MODE
Scan method	Binary structured light	Proprietary high speed structured light patterns
Capture images / scan	73	5
Capture time	400 ms	33 ms (30 fps)
Max frame rate	2.5 Hz	30 fps full ROI / 100+ fps reduced
Point cloud output	4M color 3D points (1824 × 2280)	1M color 3D points (full ROI)
GPU requirement	NVIDIA GPU (CUDA)	NVIDIA GPU (CUDA)
Availability	All models	Fixed Focus (10-15 fps), HSFF (30+ fps, standard), Auto Focus (with HS upgrade)

Camera row readout can be reduced to proportionally increase frame rate up to 100+ fps in high speed mode.

VERIFIED ACCURACY

VDI/VDE 2634 Part 2

Acceptance test results for **DepthScan Fixed Focus** at 500 mm working distance. Full Resolution Mode. Traceable reference artifacts.

Certificate: VDI-20260223-0001 | **Temperature:** 20 C | **Humidity:** 30 %RH | **Mode:** Full Resolution

PARAMETER	DESCRIPTION	VERIFIED VALUE	RUNS
P_F	Probing form error (sphere)	0.1514 mm	5
P_S	Probing size error (sphere)	0.0317 mm	5
SD	Sphere-spacing distance error	0.0283 mm	5
F	Flatness measurement error	0.2535 mm	6

NOISE FLOOR

RMS sigma on certified flat at 500 mm WD: **30 to 33 um** (range across 6 runs). This is the underlying measurement noise separated from sphere probing form error.

REFERENCE ARTIFACTS

Ball Bar
MWs 6 in Invar-440C
SN 1213235001
Certified CTC: 156.37002 mm
Uncertainty: 2.8 um
Traceable per F-096b

Granite Flat
12 x 18 x 3 in Grade A-2
Per GGG-P-463c
Certified flatness: 0.0030 mm
Uncertainty: 0.003 mm
Autocollimator verified

SCOPE AND EXTENSION

Accuracy envelope varies with working distance and camera model. The published values above are for Fixed Focus at 500 mm WD. Additional VDI/VDE 2634 Part 2 certificates are generated per camera unit and per working distance on request. Extended working distance characterization across Fixed Focus, High Speed Fixed Focus, and Auto Focus models is in progress.

— FIELD OF VIEW & SPATIAL RESOLUTION

FOV Across Working Distances

FOV Model

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Width (mm) = 0.813 × WD (mm) + 4.5
Height (mm) = 0.517 × WD (mm) − 0.3
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Sensor Geometry

Point cloud resolution: 1824 × 2280 pixels (W × H)

Baseline (camera to projector): 120 mm

WD (MM)	FOV W (MM)	FOV H (MM)	XY RES X (UM)	XY RES Y (UM)
250	208	129	114	57
300	248	155	136	68
400	330	206	181	90
500	411	258	225	113
600	493	311	270	136
700	573	361	314	158
800	655	413	359	181
1000	818	517	448	227
1500	1224	775	671	340
2000	1631	1034	894	454
2500	2037	1292	1117	567
3000	2444	1551	1339	680
3500	2850	1809	1562	794
4000	3257	2068	1785	907
4500	3663	2326	2008	1020
5000	4070	2585	2231	1134

XY Resolution = FOV dimension / pixel count in that axis. 3D accuracy at 500 mm WD is verified per VDI/VDE 2634 Part 2 (see Verified Accuracy section).

CAMERA MODELS

Three Configurations

	FIXED FOCUS	HIGH SPEED FF	AUTO FOCUS
Focus	Factory calibrated, locked to specified WD	Factory calibrated, locked to specified WD	Motorized - multiple factory-calibrated WDs on device
Full-res mode	4M color 3D points	4M color 3D points	4M color 3D points
High-speed mode	Available (10-15 fps, not optimized)	1M color at 30+ fps (optimized)	Available (HS upgrade)
WD change	Factory recalibration	Factory recalibration	Customer WDs calibrated at order
Best for	Fixed geometry, known WD	Inline, conveyor, moving parts	Variable parts, robot-mounted, multi-distance

CALIBRATION

Method
Proprietary multi-pose calibration using checkerboard targets and robotics. Fully automatic factory calibration.

Verification
Against traceable artifacts - certified granite flat and certified ball bar. Per VDI/VDE 2634 Part 2.

Included with Purchase
Fixed Focus / HSFF: 1 working distance calibration. Auto Focus: 2 working distance calibrations.

Additional Services
Additional WD calibrations available as a service (setup + machine time). Recalibration service for Fixed Focus models requiring WD changes.

MULTI-CAMERA OPERATION

- Managed by the Ajile 3D software suite - extensible to any number of cameras
- Per-device configuration via serial number
- Hardware and software triggering (application-dependent synchronization)
- Coordinated capture with synchronized timing across cameras
- Each camera independently configurable (exposure, patterns, ROI)

SOFTWARE & SDK

Ajile Software Suite

COMPONENT	SPECIFICATION
Standard application	Ajile 3D Vision Studio - 3D capture, measurement, and visualization
Inspection software	Ajile Inspect: automated recipe-based inspection with Setup and Operator modes
SDK languages	Python and C++
Operating systems	Windows and Linux
Measurement toolkit	Ajile measurement toolkit included
PolyWorks integration	Full bidirectional - native DepthScan plugin + PolyWorks full control
PolyWorks versions	All versions
Documentation	Comprehensive SDK documentation with examples
Customization	Software customization available

OUTPUT FORMATS

.ajpcd
Ajile native point cloud (preserves full metadata)

.pcd
PCL generic point cloud format

.txt
ASCII XYZ, configurable delimiter, optional color / normals

.pif
PolyWorks Parametric Image Format

.ply
Point cloud or triangulated mesh (binary or ASCII)

.stl
Triangulated mesh output (binary or ASCII)

CAD Import
.stp, .step, .stl (via OpenCascade)

PARTNERSHIP & INTEGRATION

DepthScan is designed for integration into existing metrology workflows. PolyWorks users retain their measurement engine; PLC/MES/QMS integration is supported through configurable digital I/O and database upload. Custom ProcessFlow nodes and measurement routines are available as professional services.