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Machine Vision in 3D: Precise Point Clouds without Artifacts ShapeDrive G4 3D Sensor Impresses with Integrated Point Cloud Calculation

The latest machine vision release from wenglor sensoric group has it all: The next generation of ShapeDrive 3D sensors is now available worldwide – and stronger than ever before. The two product series from the ShapeDrive G4 family for small and large measuring volumes MLAS and MLBS generate high-resolution point clouds in the shortest possible time with almost no noise or artifacts. Among other things, this is made possible by the integrated MPSoC technology (multiprocessor system-on-a-chip), which ensures powerful performance values fourfold. The integrated Ethernet interface with up to 10 Gbit/s also enables fast transmission speeds.

The 3D sensors of the new ShapeDrive G4 product family meet the highest demands on the quality and availability of 3D point clouds. The combination of high-quality hardware and sophisticated algorithms ensures an excellent measuring rate and display performance. Stable and repeatable measured values are guaranteed even under fluctuating ambient conditions thanks to the built-in temperature management. The G4 sensors can be integrated via an SDK or a GigE Vision interface. The built-in web server also makes configuration easier. Calibration on delivery and regular updates ensure that the sensors provide consistent results for years to come and stay up-to-date at all times. Two out of nine sensor models come with 5 MP resolution and three others with 12 MP resolution. All models cover small measuring volumes of just 60 × 40 × 40 mm – for example, for inspecting the smallest electronic components such as circuit boards – up to large volumes of 1,300 × 1,000 × 1,000 mm, e.g. for bin picking applications from large containers.

ShapeDrive G4: New Chip Technology Enables Four Times More Performance

All of these advantages are made possible by sophisticated multiprocessor system-on-a-chip technology (MPSoC). ShapeDrive G4 combines four performance features on a single chip. Two Dual Core Arm® processors with up to 1.3 GHz act as a unit to enable extremely smooth command processing, control and communication. As a real-time processing unit with 192k System Logic Cells, the Field Programmable Gate Array (FPGA) enables fast calculation of the 3D point clouds in less than 250 milliseconds. The large (4 GB) and fast (19.2 Gbit/s) memory manages the huge amounts of data in a very short time. Generated data volumes are transmitted via Gigabit Ethernet interface with fast transmission speeds of up to 10 Gbit/s.

Bin Picking, Depalletizing, Measurement Technology: Application Variety in 3D

More and more companies are relying on 3D measurement technology with results in micrometer accuracy. Logistics companies in particular have long been aware of the advantages of this innovative technology: For fully automated gripping and moving of chaotically arranged objects, so-called bin picking, for loading and unloading Euro pallets (depalletizing) or for robot-assisted filling and emptying of pallet cages or multiple Euroboxes: 3D sensor technology makes handling movements by robots, which can be reproduced millions of times over, even safer, more reliable and faster. In bin picking applications in particular, users benefit from the symmetrical design of the built-in camera and illumination –

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which significantly reduces shadowing effects in containers. However, the micrometer-precise resolution of the sensors is also used for the visual quality inspection of metal components in the automotive industry.

Structured Light: How 3D Sensors Work

Structured light is an illumination technology where the light creates a known pattern such as grids or bars. The depth and surface information of the objects can be detected by the way in which the patterns are deformed. Highly accurate resolutions of less than 10 micrometers can be achieved with the measurement method based on triangulation and structured light. This enables the smallest structures that are practically invisible to the human eye to be identified. The pattern sequence of structured light is recorded by the camera. The result of the calculation is a 3D point cloud – i.e. the set of points providing a three-dimensional description of the object surface. Information on the intensity and quality of the point can also be obtained.

The Highlights at a Glance

- 9 model variants in two MLAS and MLBS series
- Camera resolutions of 5 or 12 MP
- MPSoC including FPGA for integrated 3D point cloud calculation for the highest measuring rates up to 4 Hz (250 ms)
- Active temperature management for stable measured values
- SDK and GigE Vision interface up to 1/10 Gbit/s
- 4 digital I/Os
- Standard M12 connections
- Durable housing with IP67 protection

Approximately 4,751 characters

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Captions

Nine models, two product series, one innovation: ShapeDrive G4 3D sensors stand for excellent 3D point clouds with virtually no noise or artifacts.

About the wenglor sensoric group

The wenglor sensoric group develops innovative sensors, safety systems and machine vision products with intelligent interfaces and software for industry all over the world. Founded in 1983, wenglor is one of the world's key high-tech providers of automation technology. The solutions from the wenglor sensoric group enable the trends of Industry 4.0 as well as Internet of Things, 3D technologies and robotics. In doing so, they conserve resources and increase the quality and safety of the manufactured products. The second-generation owner-managed family business is represented worldwide with 26 subsidiaries in 46 countries.

In addition to the company headquarters in Tettang, the group of companies with over 1,000 employees also develops and produces its multi-patented products in Munich, Sibiu (Romania), Perth (Scotland) and La Chevrolière (France).