

C3-2350-CL

High Speed 3D Measurement

- High resolution and high speed CMOS camera
- Integrated 3D-profile algorithms:
up to 23500 Profiles/s with 58 Million 3D points
- Standard CameraLink™ interface, GenICam compliant
- Flexible trigger interfaces: RS422 resolver interface, opto coupled trigger inputs and CameraLink™ trigger
- Multiple Sensor AOIs

C3-2350-CL unmatched performance and flexibility for 3D imaging

The C3-2350-CL is a revolution for three dimensional shape measurement. It offers unique key benefits for OEMs and Vision Integrators while making 3D imaging as easy as 2D vision.

Measurement Principle

The C3 sensor acquires height profiles and height images by means of laser sheet-of-light (triangulation) technique: a laser line is projected on the object, the resulting sensor image is evaluated by the C3 camera core and converted into a single height profile. By scanning the laser line over the object a complete height image of the object can be acquired.

Fastest 3D-Sensor on market

By using the C3-Technology of high speed parallel hardware processors the complete 3D data calculation is done inside the camera. This enables the C3-2350-CL to acquire up to 23500 profiles per second. For a maximum of flexibility, three profile algorithms are included in the C3 core: TRSH, MAX and COG. Furthermore, the choice of the profile algorithm does not influence the profile speed. This means that the profile data are always output at the same maximum speed.

Multiple Sensor-AOIs and Multiple-Featureoutput

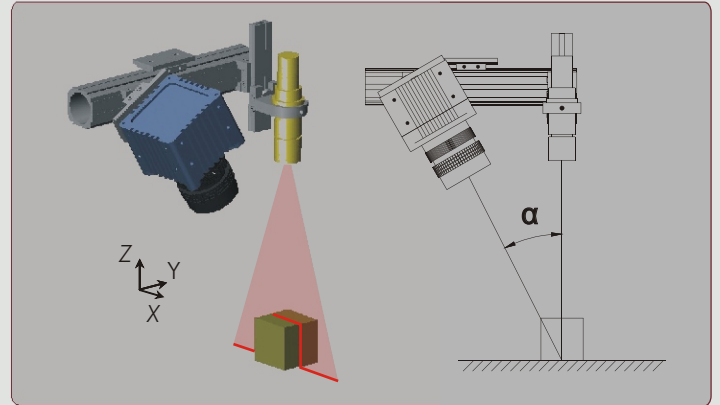
The C3 sensor is capable of delivering position data as well as additional features (e.g. intensity, line width) without sacrificing profile speed. Furthermore up to eight sensor AOIs can be defined for dividing the sensor in separate subwindows.

High quality profile data

All C3 sensors are equipped with a full frame snap shutter for capturing sharp, undistorted image and profile data even for fast moving objects

Flexible Trigger Interface

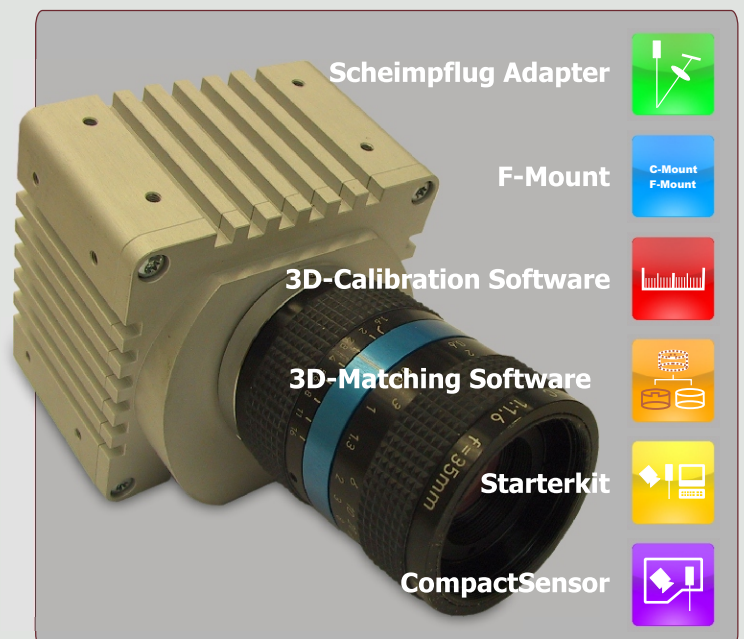
The C3 camera contains a configurable trigger interface based on opto-coupled I/O lines and a RS422 shaft encoder with tick counter and direction evaluation. Using this advanced trigger options assures precise profile triggering even at changes of movement velocity.



Easy Integration in Machine Vision Systems

The C3 concept is based on Gigabit-Ethernet interface and complies to GigE standard. Through the GenICam protocol the integration effort is minimised. We support our customer with an API and a standalone tool for configuring the camera. Once the camera is configured it boots up using the predefined configuration without any camera specific programming. Furthermore, the camera FPGA allows the storage of up to 4 different firmware versions, which can be field updated at any time.

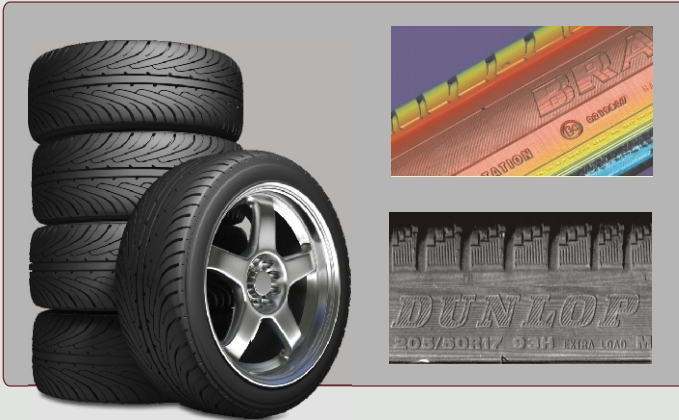
Available Options



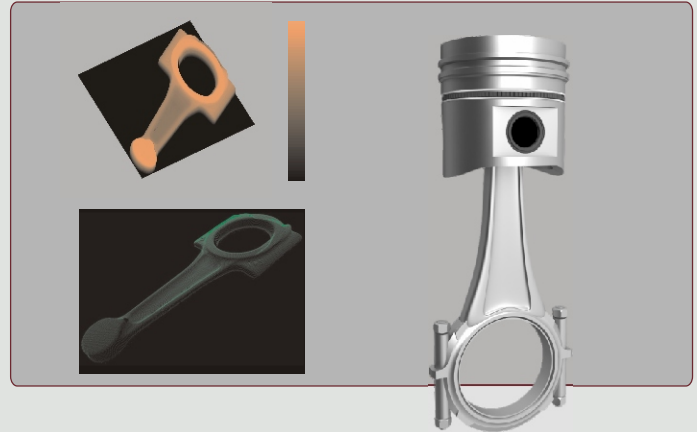
3D - Imaging solution for numerous applications

The C3-2350-CL provides a powerful solution to a broad field of industrial 3D- applications

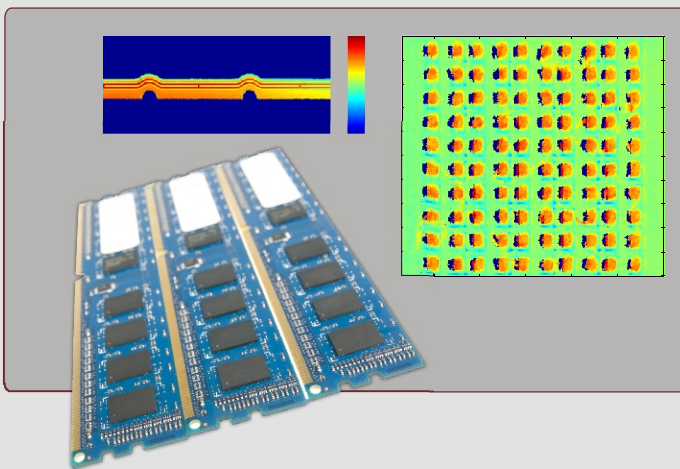
Inspection of tyres and rubber gaskets



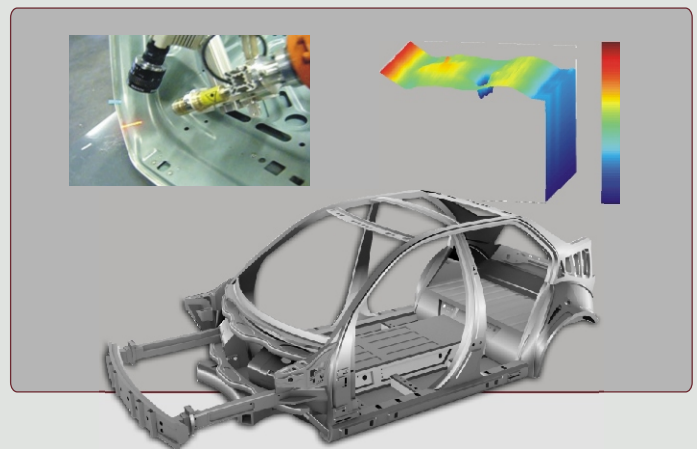
Inspection of connection rods



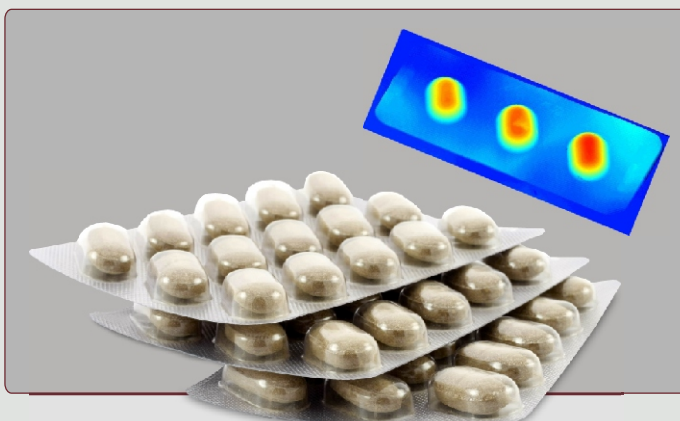
Inspection of Printed Circuit Boards (PCB)



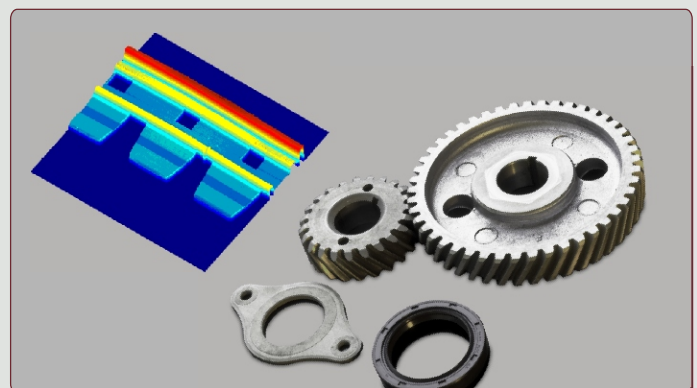
Inspection of glue beads



3D Inspection of Packaging

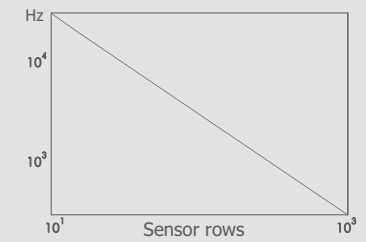


Inspection of Sintered Components



C3-2350-CL

Sensor Specifications			
Pixels	2352 (H) x 1728 (V)		
Pixel size	7µm x 7µm		
Digitization	10Bit		
Shutter	Rolling shutter		
Sensitivity	17000 LSB/(µJ cm ²) @ 610nm		
Sensor algorithm	Image, Profile-MAX, Profile-TRSH, Profile-COG		
Length of profile in 3D-mode	2352 pixels		
Typical profile speed depending on number of sensor rows	Sensor rows	Profile speed (Hz) with 2352 pixels	
	1728 216 108 27 14	190 1550 3100 12400 23850	
Height resolution can be increased by using Profile-TRSH (1/2 pixel) or Profile-COG (1/16 pixel) without loss of speed			
Max. frame rate for image mode over CameraLink™ (full frame)	20 fps with 40 Mhz CameraLink™ - clock (2 tap mode) 30 fps with 60 Mhz CameraLink™ - clock (2 tap mode)		
Max. Number of Sensor-AOIs	8		
Interface Specifications			
Digital I/O's and external synchronisation signals (MDR14 connector)	2 opto-coupled inputs, 2 opto-coupled outputs, Inputs can be configured as image and profile trigger, RS422 Resolver interface with signals A,/A,B,/B, tick divider and direction evaluation		
Video output	CameraLink™		
Power Requirements			
Power supply	7 - 24V		
Power consumption	< 3,5W		
Mechanical Specifications			
Lens mount	C-Mount / F-Mount		
Size	72mm x 72mm x 57,4mm (C-Mount) / 86,4mm (F-Mount)		
Mass (without optics)	330g (C-Mount) / 400g (F-Mount)		
Housing mount	4 x M3 on each side		
Environmental Specifications			
Operating temperature	0°C to +50°C (non condensing)		
Storage temperature	-30°C to +70°C (non condensing)		
General			
PC requirements	CameraLink™		
Operating systems	Windows 98, WIN NT, 2000, , XP, Vista, Linux (on request)		
Software environment	Configuration tool C3-Explorer, C3Lib-API with source code (C++), Compatible with standard image processing libraries, e.g. CVB, NI-IMAQ, HALCON, MIL, EMC, SAPERA, IFC, LABVIEW, MATLAB, etc.		



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