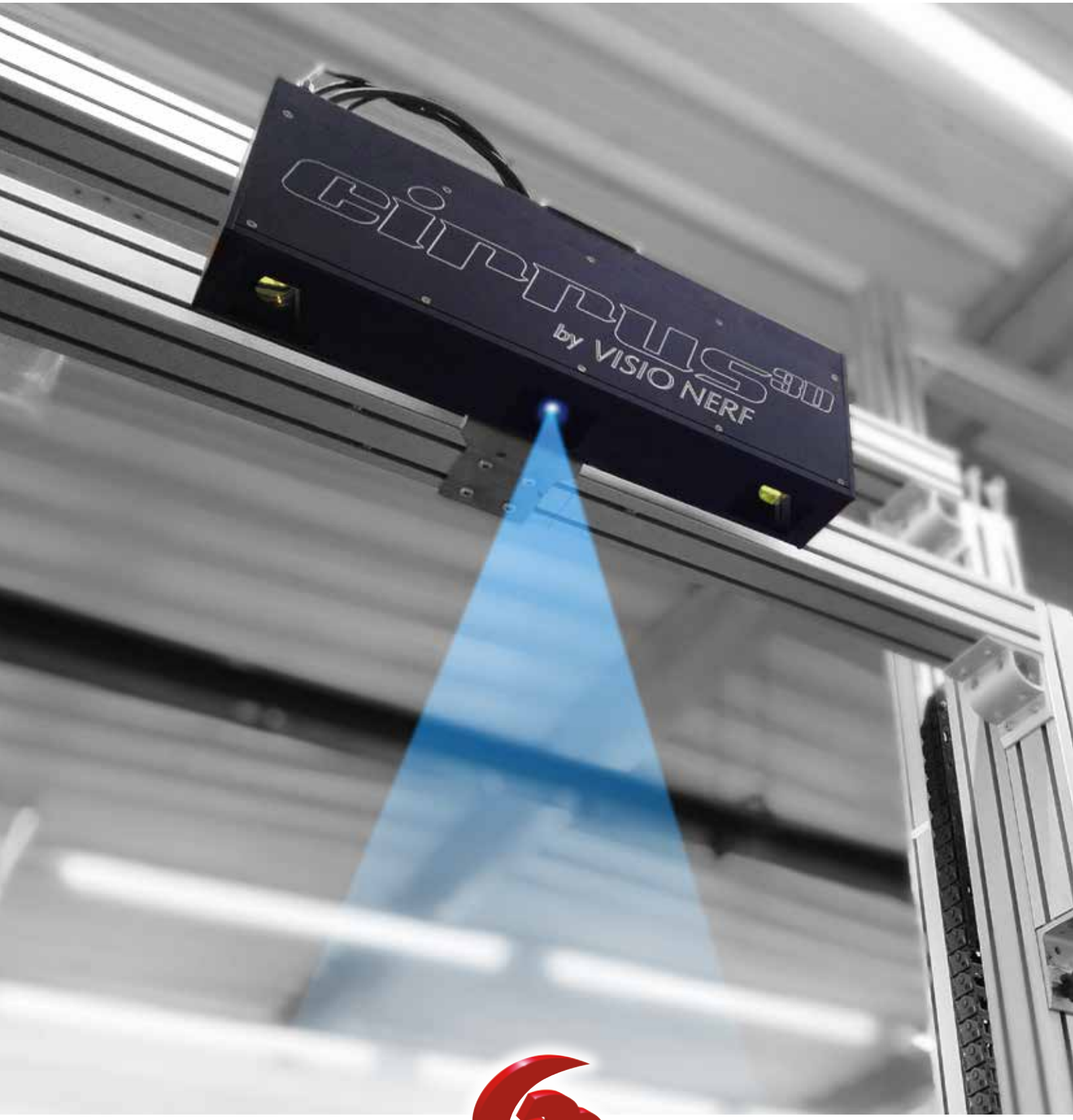


VISIO NERF

VISIO NERF

Experience and innovation...

2003
3D robot guidance for deburring large raw parts.

2006
3D robot guidance for bin-picking of crankshafts.

2009
Full range of software for analysis of 3D point clouds, with learning via the CAD file for parts.

eyesberg 3D by VISIO NERF

2012
3D robot guidance for bin-picking of links (Caterpillar).

2014
Launch of the cirrus 3D sensors range.

2015
3D robot guidance for windscreen installation with cirrus 3D.

2016
Renault starts using the cirrus 3D and eyesberg 3D for its production.

2017
Inspection of foundry parts.

2018
Launch of the cirrus 3D conveyor range.

cirrus 3D C by VISIO NERF

In just the right place

Over more than 15 years, VISIO NERF has implemented numerous 3D vision installations for quality control or robot guidance applications. Bolstered by this experience, VISIO NERF is proud to present its cirrus 3D range of 3D vision systems. cirrus 3D is a complete 3D vision system contained within a single, ready to use unit and features eyesberg 3D software. Whatever your project, 3D vision will improve effectiveness and performance compared with 2D vision.

So do not hesitate!

For almost 30 years now, VISIO NERF has been designing and building image processing systems for use in quality control and (camera-led) robot guidance applications across a wide range of production scenarios.

With several thousand systems installed worldwide across all sectors of industry, VISIO NERF has built up unparalleled experience and is now regarded as a leading player in the field of industrial vision.

Thanks to innovative developments in the design of its sensors and software, VISIO NERF SA has become the "go-to" partner for customers with increasingly demanding requirements.

Beyond the limits of vision...

VISIO NERF has built its offer around easy to use and highly effective tools for the localization of parts and quality control in production-specific contexts.

Thanks to our various acquisition technologies, we can offer you robust solutions that reflect your needs while taking account of any constraints specific to the environment associated with your process, such as variations in the shade or color of parts, variations in lighting conditions inside factories, and variations in the size and shape of raw parts.

Our vision sensors are developed to be robust in industrial working conditions, including dusty atmospheres and fluids sprayed from surrounding machinery.

Contents

The new VISIO NERF 3D sensor helps simplify integration into your industrial process. cirrus^{3D} is specially designed for integration at the heart of your installation – without any specific development requirements.

Used as a fixed or mobile component, with eyesberg^{3D} image processing software (patented technology) available as an option, cirrus^{3D} makes it possible to implement vision/robotic applications of unrivaled effectiveness and very high quality.*

Intended for use in industry, these scanners are pretty impervious to their environment, to dust, and to variations in light conditions, ensuring your installations benefit from peerless reliability and robustness (IP 65).

Assembly, inspection, identification, localization of single or bulk parts: these are just some of the industrial applications where the cirrus^{3D} range can offer you a great return on your investment.

Autonomous "plug & play" sensor

Watertight industrial connectors (power supply and inputs/outputs, digital video output, Ethernet RJ45, USB)

Ultra-rapid scanning: minimum 0,2 seconds

Cooling to ensure a high protection rating

Integrated high-performance processor for calculating 3D points

High protection rating (IP 65)

Blue LED

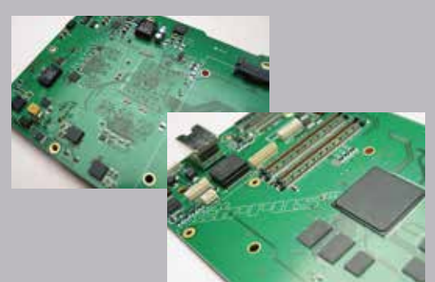
4 MP camera

Components "made in" VISIO NERF

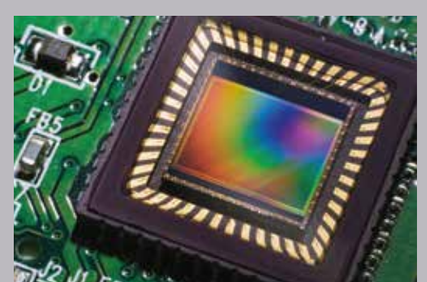
Watertight industrial connectors

Powerful projector linked to a blue LED

High-performance cooling



Integrated high-performance processor for calculating 3D points



CMOS sensor and lens specially designed for high resolution

VISIO NERF

* eyesberg^{3D}: smart localization thanks to CAD models

VISIO NERF

cirrus3D in a few words

- Range of high-quality scanners for industrial uses.
- Autonomous "plug & play" products calibrated in the factory (integrated calculator).
- High-resolution images.
- Ultra-rapid scanning: from 0,2 second for 1 million 3D points.
- Comparison of a point cloud with a CAD file (option).
- 3D vision system for robotic and non-robotic applications (bin-picking, localization, identification, inspection, etc.).
- Structured light (blue LED).
- Water-based cooling possible (option).

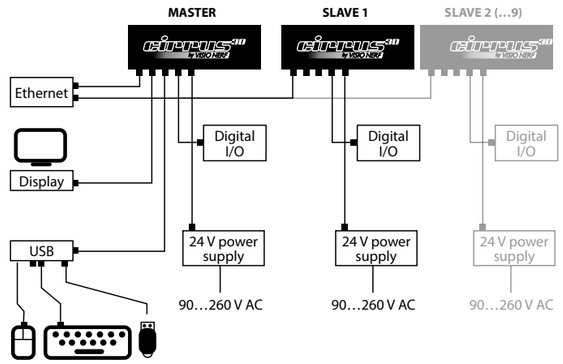
Benefits

- Fast return on profits.
- Good immunity to ambient light.
- Limited safety problematic (*laser replaced by LED, a proven technology*).
- Easy to integrate into both robotized and non-robotized industrial processes.
- Easy to implement communication protocols (TCP/IP).
- Easy to set parameters for the whole of the eyesberg3D 3D vision application (option).
- Direct screen/mouse interface for connection, parameter setting, and programming.

Multi-sensor application

We have envisaged the possibility of connecting several sensors with each other. In this kind of configuration, the actual intelligence is integrated into just one "master" sensor. Only one piece of software is required to control up to 9 "slave" sensors.

Configuration with 2 cirrus3D (master/slave)



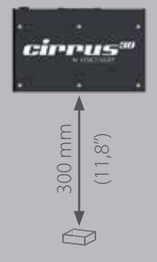
6 sensors - 6 working volumes

cirrus3D model	cirrus 150	cirrus 300	cirrus 600	cirrus 800	cirrus 1200	cirrus 1600
Vision volume in mm (L x W x H)	150 x 150 x 70 (5,9″ x 5,9″ x 2,8″)	300 x 300 x 150 (11,8″ x 11,8″ x 5,9″)	600 x 500 x 300 (23,6″ x 19,7″ x 11,8″)	800 x 600 x 500 (31,5″ x 23,6″ x 19,7″)	1200 x 1000 x 1000 (47,2″ x 39,4″ x 39,4″)	1600 x 1200 x 1200 (63″ x 47,2″ x 47,2″)
Minimum working distance in mm	300 (11,8″)	450 (17,8″)	950 (37,4″)	1250 (49,2″)	1900 (74,8″)	2500 (98,4″)
3D image resolution* in mm (Z)	0.1	0.2	0.45	0.9	1.5	1.8
Resolution of CMOS sensors	4 MP	4 MP	4 MP	4 MP	4 MP	4 MP
Sensor dimensions in mm (L x W x H)	312 x 100 x 210 (12,3″ x 3,9″ x 8,3″)	312 x 100 x 210 (12,3″ x 3,9″ x 8,3″)	412 x 100 x 210 (16,2″ x 3,9″ x 8,3″)	412 x 100 x 210 (16,2″ x 3,9″ x 8,3″)	612 x 100 x 210 (24,1″ x 3,9″ x 8,3″)	812 x 100 x 210 (32″ x 3,9″ x 8,3″)
Sensor weight (kg)	6	6	7	7	8	10

* For a single 3D point, furthest away from the sensor, without any averaging or interpolation.
Part localization is 10 times better than the resolution, but depends on deviations between the CAD file and the actual part.

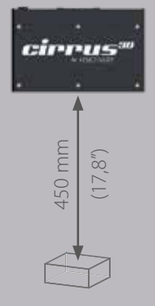
Standard features on all models			
Scanning speed	from 0,2 s	**Box material**	Anodized aluminum
Number of 3D points	Up to 4 million per scan	**Connectors**	Power supply and inputs/outputs, Display, Ethernet RJ45, USB
Information processing software (option)	eyesberg3D	**Power supply**	24 V DC 8 A max.
Calibration	Pre-calibrated in the factory	**Light source**	LED
Communications interface	Ethernet	**Operating temperature**	0°C…50°C
Digital inputs/outputs	24 V DC 4 inputs 3 outputs		

cirrus 150



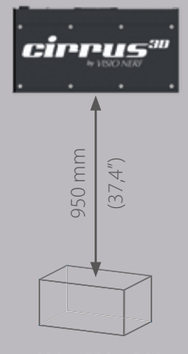
max. 150 x 150 x 70 mm
(5,9″ x 5,9″ x 2,8″)

cirrus 300



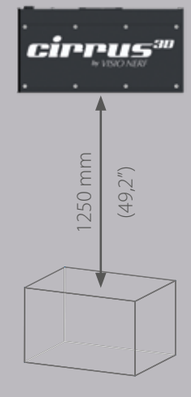
max. 300 x 300 x 150 mm
(11,8″ x 11,8″ x 5,9″)

cirrus 600



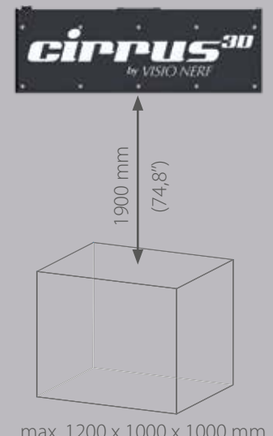
max. 600 x 500 x 300 mm
(23,6″ x 19,7″ x 11,8″)

cirrus 800



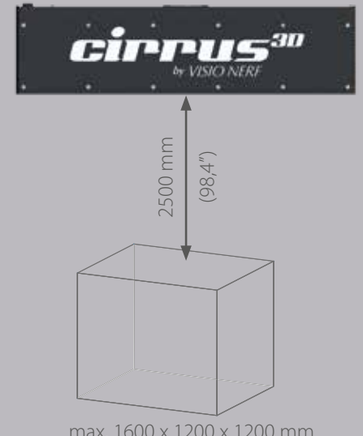
max. 800 x 600 x 500 mm
(31,5″ x 23,6″ x 19,7″)

cirrus 1200



max. 1200 x 1000 x 1000 mm
(47,2″ x 39,4″ x 39,4″)

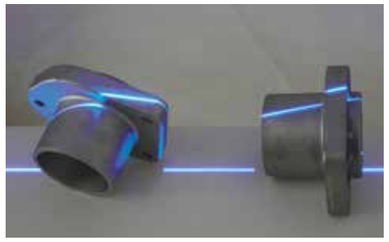
cirrus 1600



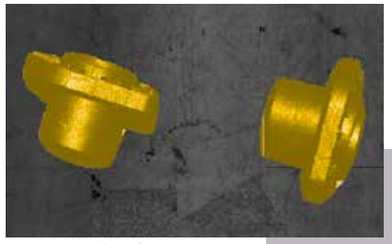
max. 1600 x 1200 x 1200 mm
(63″ x 47,2″ x 47,2″)

cirrus 3D C by VISIO NERF conveyor

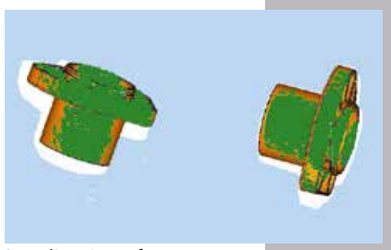
Tracking a part on a conveyor



Actual scene



3D point cloud



Localization of parts

Benefits

> Fast

> Easy calibration of system in just a few minutes

> Precision: up to 0,5 mm (0,02")

> Field of view of up to 1600 mm (63")

> Compatibility with all major robot brands

> Flexibility of system

> Economical instrument: all in one

> Matte and shiny parts; raw parts

Sensor inputs

Connection: power supply/screen/Ethernet

Parameter setting: intuitive and easy to use interface for setting acquisition parameters.

Visualization of 3D point cloud.

Calibration in just a few minutes.

24 V incremental encoder input. Encoder resolution higher than the resolution for capturing 3D lines.

Encoder resolution is determined automatically during the calibration phase. And calibration makes it possible to measure and compensate for the exact position of the cirrus in relation to the conveyor; so the position of the cirrus at the time of installation is not critical.

Automatic detection of parts on the conveyor.

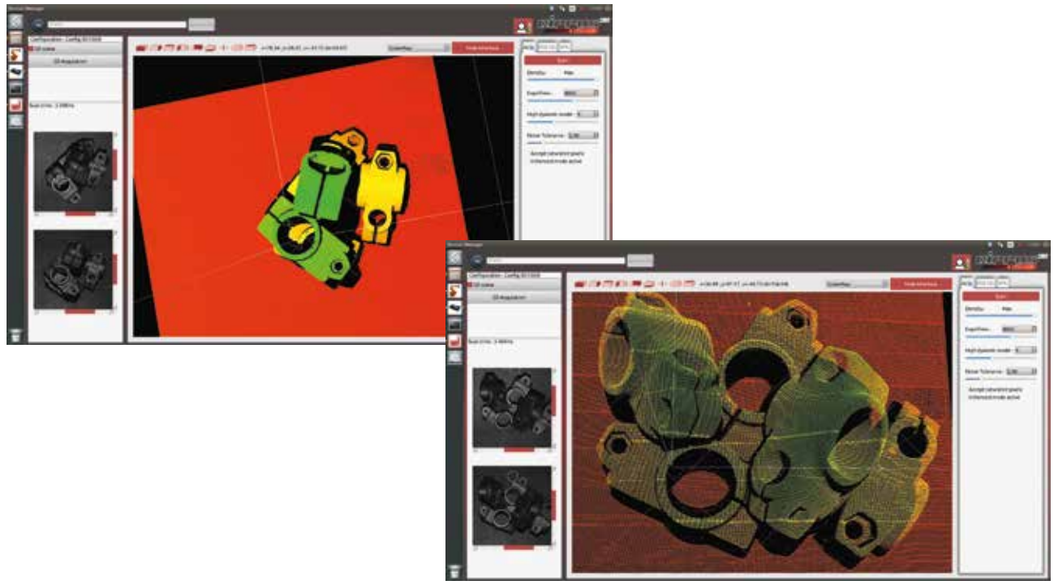
Synchronization signal sent to the robot via a 24 V output, followed by coordinates of the part via TCP/IP. The 24 V signal simulates the detection cell for parts traditionally used by robots for tracking applications.

cirrus^{3D} conveyor	cirrus^{3D} conveyor 500	cirrus^{3D} conveyor 1000	cirrus^{3D} conveyor 1500
Field of view in mm (ft)	Conveyor width 550 (21,6") Max. part height 300 (11,8")	Conveyor width 1050 (41,3") Max. part height 400 (15,7")	Conveyor width1500 (59") Max. part height 500 (19,7")
Working distance in mm (ft)	800 (31,5") / above parts 1100 (43,3") max to the conveyor	1500 (59") / above parts 1900 (74,7") max to the conveyor	2200 (86,5") / above parts 2700 (106,2") max to the conveyor
Scanning speed	Max. 3000 lines of 2048 3D points max./second*		
Resolution	0.5 mm (0,02")	1 mm (0,04")	1 mm (0,04")
Lighting	LASER class 2M or 3R		
IP	65		
Sensor dimensions in mm (ft) (L x W x H)	412 x 100 x 210 (16,2" x 3,9" x 8,3")	612 x 100 x 210 (24,1" x 3,9" x 8,3")	812 x 100 x 210 (31,9" x 3,9" x 8,3")
Sensor weight (kg)	7	8	10
Robot compatibility	All major brands		

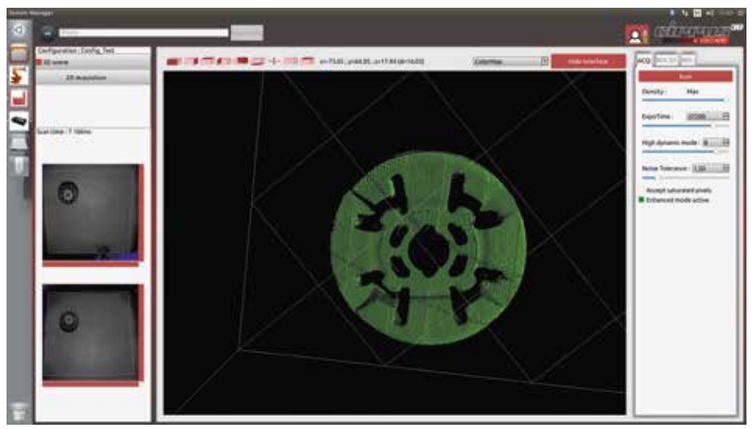
* Typical speed 200 profiles of 2000 3D points/seconde for the full scan height
Other model available on request – customization possible

SENSOR MANAGER

A simple and intuitive interface for setting parameters for high-quality point clouds.



Highly dynamic sensor for digitalizing work scenes involving matte or shiny parts or those consisting of multiple materials.



3D point cloud

Actual part

Precise and good-quality 3D points, whatever the height of the parts in terms of the field of view and their orientation.

Top of bin

Actual image

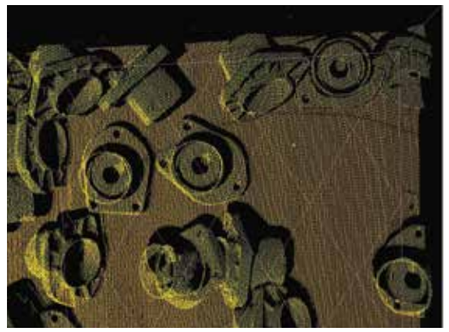
3D point cloud

Enlarged image of 3D point cloud

Bottom of bin

Actual image

3D point cloud



Enlarged image of 3D point cloud

3D vision system designed to process any geometric part shape without any special programming.

Visio Nerf offers you a range of **eyesberg^{3D}** solutions based on proven and robust technology.

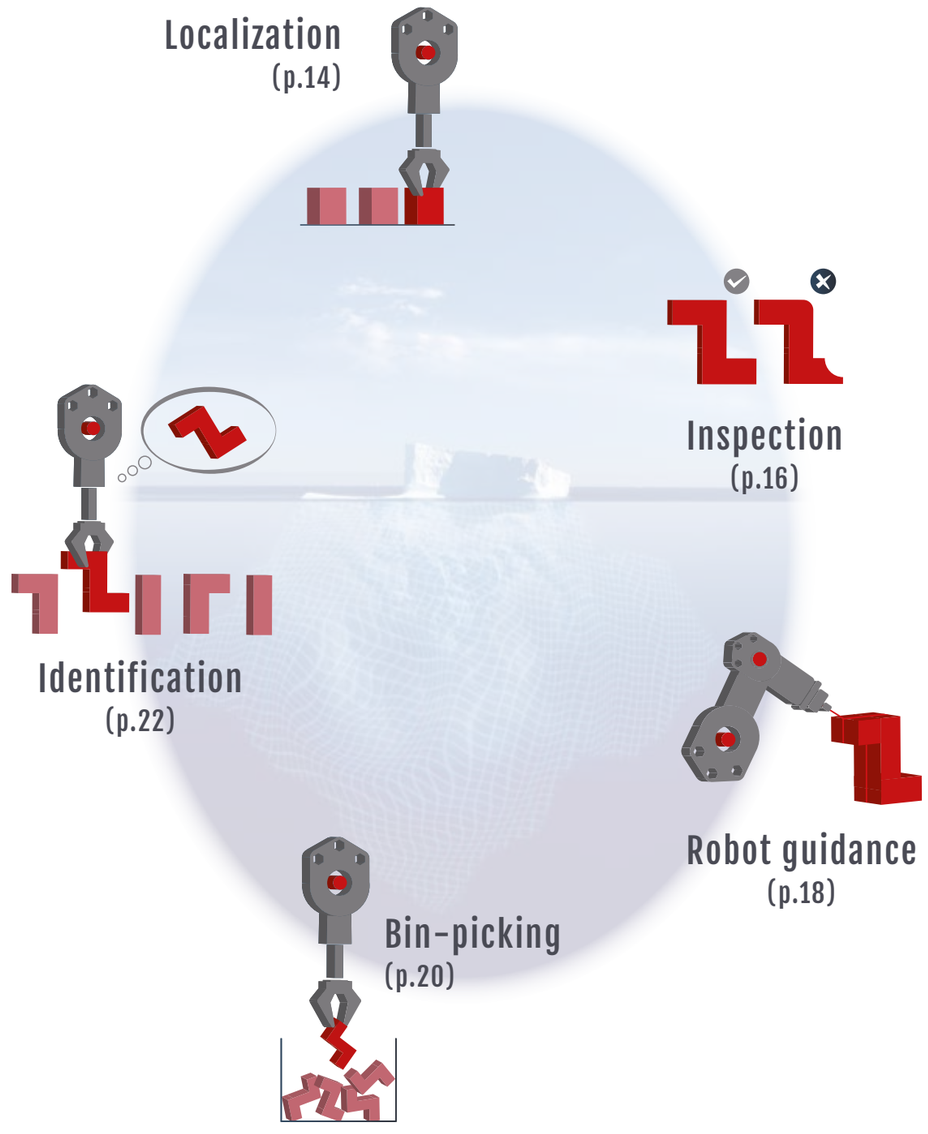
The underlying principle involves establishing a link, in real time, between a 3D point cloud acquired by the 3D sensor and the CAD model for the part concerned. A small portion of the part, rather like the visible section of an iceberg, is enough for the software to identify and localize the part within the work scene.

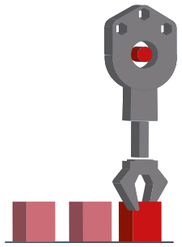
We offer our customers a generic and open program, which users simply need to complete by importing the CAD file for the part.

Different modules can be combined together on the same cirrus^{3D} sensor (e.g. identification/guidance, identification/inspection) with a view to dealing with the complex problems associated with standard tools.

Numerous sectors of industry (aviation, automotive, railways, etc.) have been looking into and waiting for these kinds of solutions for several years now as they can deal with quality control (eyesberg^{3D} inspection) and increase productivity.

5 main applications





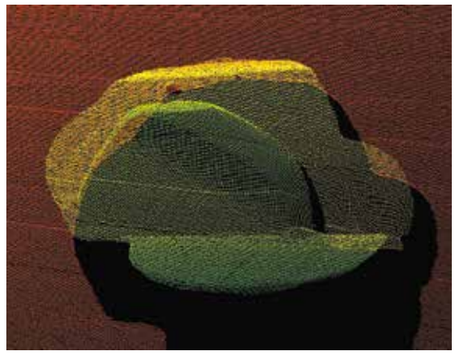
Localization

For cost-effective automation of the loading of a production line.

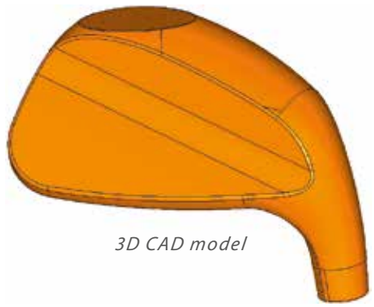
From the real to the virtual

The actual work scene is digitalized in the form of a 3D point cloud.

Actual raw part



Point cloud



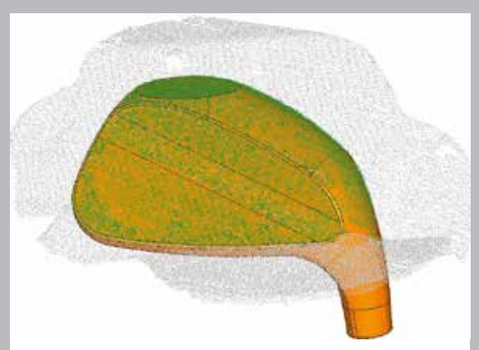
3D CAD model

From the virtual to the real

The actual work scene is digitalized in the form of a 3D point cloud.

The comparison between the 3D point cloud and the DAC model (in yellow on the figure) allows localizing the part (in green on the figure) in the middle of the acquired point on the raw part (in grey on the figure).

If needed, the collision management module can be verifies that the gripper can pick the part which the robot receives the coordinate in real time.



Examples of applications

Inspection

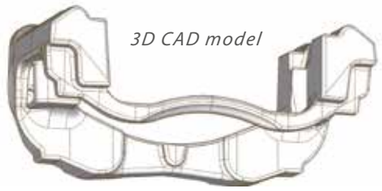
For cost-effective online inspection of conformity of your production parts.

From the real to the virtual

The actual work scene is digitalized in the form of a 3D point cloud.

Actual part

Point cloud



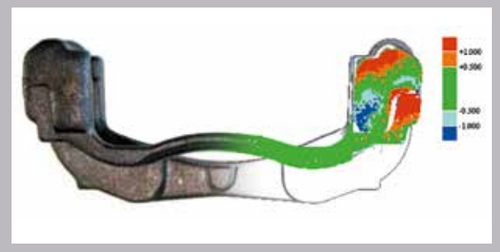
3D CAD model

From the virtual to the real

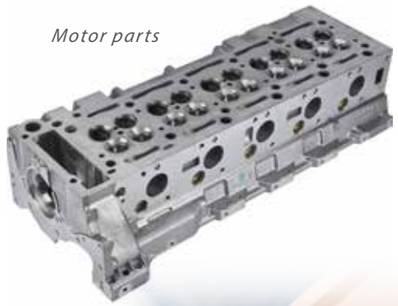
The analysis of the dimensions of the part permits a thorough inspection of the surface.

The comparison of the point cloud with the CAD model makes it possible to analyze the surface of the part and check one or more conformity criteria: insufficient material, excess material, dimensions, evenness, etc.

The production line receives information in real time regarding the conformity of the part in order to ensure optimal quality.

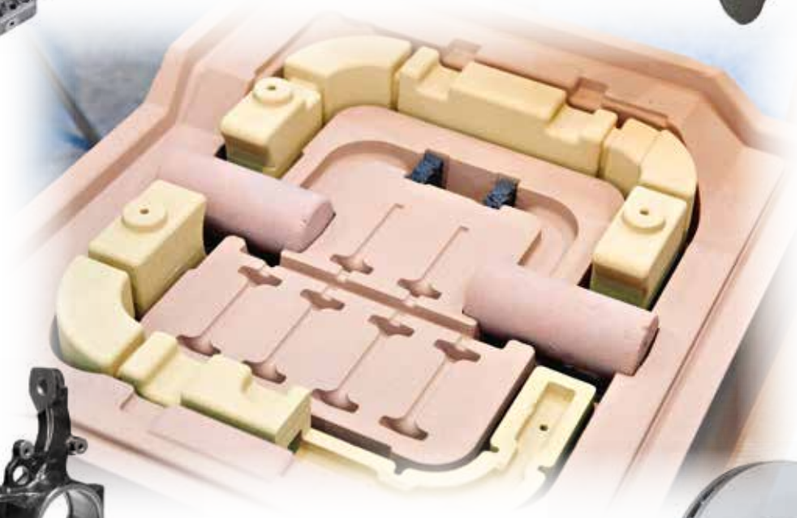


Examples of applications



Motor parts

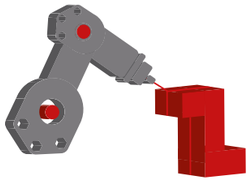
Crankshaft



Transmission parts

Brake parts

Sand core

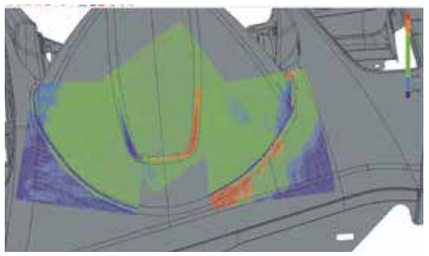


Robot guidance

For cost-effective automation of the finishing or machining of mechanical parts.

From the real to the virtual

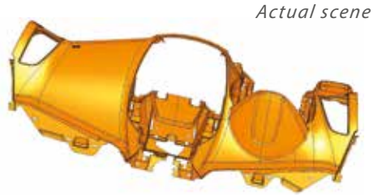
The actual work scene is digitalized in the form of a 3D point cloud.



Point cloud

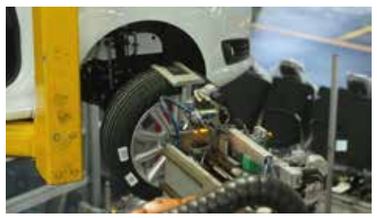
Actual scene

CAD model of the part



For cost-effective automation of assembly lines.

Windscreen installation



Wheel fitting

From the virtual to the real

The analysis of the virtual work scene makes it possible to optimize the process.

Linking the point cloud with the CAD model of the part makes it possible to compensate, to a large degree, for positioning problems or local problems involving shape.

The machining cell receives trajectory corrections to ensure the tool tracks the outline of the part as closely as possible.

Examples of applications

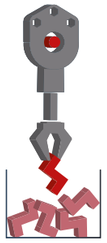
Interior vehicle parts

Vehicle windscreen

Bodywork parts

Structural vehicle parts

Vehicle wheels



Bin-picking

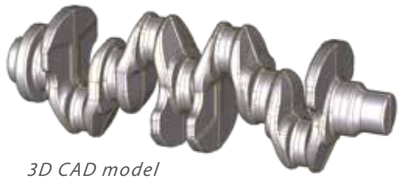
For cost-effective automation of the loading of a production line with bulk parts arranged (more or less) in some kind of order.

From the real to the virtual

The actual work scene is digitalized in the form of a 3D point cloud.

Point cloud

Actual scene



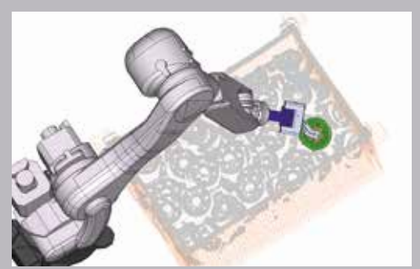
3D CAD model

From the virtual to the real

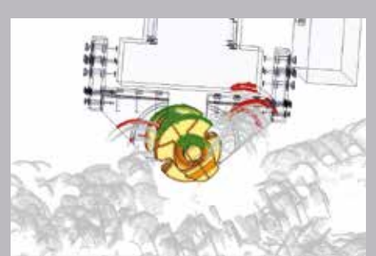
The analysis of the virtual work scene makes it possible to find the best part to pick.

The comparison of the point cloud with the CAD model makes it possible to chose the best part to pick and ensure the gripper will grasp it without any collisions.

The robot receives information in real time about the position of the part to be picked. The container will therefore be completely emptied.



Management of path planning



Management of collisions

Management of overlaps

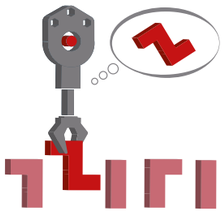
Examples of applications

Forged parts

Mechanical parts

Safety parts

Electromechanical subassemblies



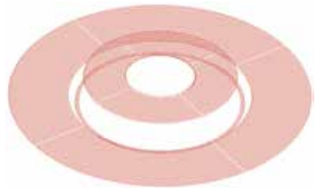
Identification

For cost-effective automation of processing of parts in a heterogeneous flow.

From the real to the virtual

The actual work scene is digitalized in the form of a 3D point cloud.

Actual part



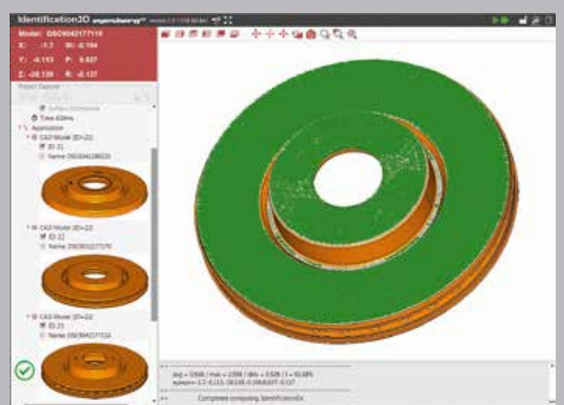
Point cloud

3D CAD model

From the virtual to the real

The analysis of the work scene makes it possible to identify the current part.

The comparison of the point cloud with CAD models from the eyesberg[3D] database makes it possible to identify and localize the current part within the process flow.



The automated element receives information in real time regarding the identifier and position of the part, which it can then process as required.

Examples of applications

Painting

Foundry

Stamping

Our systems are compatible with

ABB · COMAU · DENSO robotics · ESTUN AUTOMATION

FANUC ROBOTICS · HIWIN · Kawasaki · KUKA

MITSUBISHI ELECTRIC · SEPRO GROUP · SIASUN 新松 · STÄUBLI

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