SCORPION VISION SOFTWARE®

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Scorpion Vision Software® version 9 Product Overview

Scorpion Vision Software® is an independent and open software tool for industrial vision. It is the first configurable 3D framework for machine vision.

The system gives the user the choice of a small form factor of an embedded PC, a Sony SmartCam or the power of an Industrial PC multicore PC.

The system is founded on top of a standard Windows XP/Vista/7 PC platform. It is cost effective benefitting from the processing power of the multicore CPU low cost - high quality firewire/usb/GigE cameras and the possibility of connecting multiple cameras to one PC.

Scorpion Vision Software® is a family of products:

Scorpion Lite - for simple tasks replacing sensors

Scorpion Basic - a complete vision system, typically used for robot vision, colour processing and assembly verification.

Scorpion Premium - for 3D systems, high precision gauging, robot vision and label inspection

Scorpion Vision Server™ - running multiple camera systems on quad core server

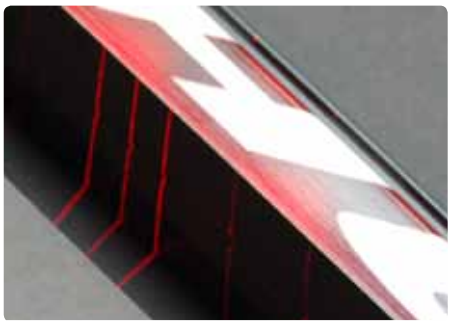
Scorpion Maintenance - for maintaining and testing profiles on a separate computer

Scorpion Image Logger - automatic image capture, database access and image saving

Scorpion SmartCam and SmartCam3D - configurable machine vision in a small form factor

Scorpion Stinger and Scorpion 3D Stinger™ - families of machine vision components and products providing building blocks for OEM and system integrators.

Scorpion solves tasks within robot vision, label inspection, assembly verification, color identification and gauging without any programming.



3D support is available as options to all Scorpion versions. The basic 3D option contains 40 tools with everything you need for stereo vision.

Scorpion Lite

Scorpion Lite is designed to solve simple tasks. With its low price and ease of use, a production engineer can measure dimensions and diameters, count and check presence of objects and color inspection and verification.
In many cases Scorpion Lite and a low cost USB, GigE or FireWire camera will replace hardware sensors due to the greater flexibility and higher performance of a vision system. Scorpion Lite is installed on a standard Windows PC and can coexist with other applications on the PC. It can also be installed on an embedded PC.
Scorpion Lite is a complete vision system for one SVGA camera. Multiple cameras can be connected adding camera licenses.

Scorpion Basic and Basic 3D

Scorpion Basic is a Scorpion Lite with one SXGA camera license and Toolbox extended with Geometry and Reference Tools. With the Geometry tools new points and lines can be constructed and measured from detected details. Reference tools handle rotation and gauging in engineering units.
Basic is a very powerful vision system. This version competes very well with vision sensors typically if there is a need to handle many product variants and variations.
Scorpion Basic 3D is a two camera system with all the basic 3D tools included.

Scorpion Premium and Premium 3D

Scorpion Premium's Toolbox contains all the Advanced Tools including a large range of sophisticated multiple polygon ROI tools, 5th order camera calibration to eliminate lens distortion and the very powerful LineFinder, capable of finding a multitude of lines.
High resolution and high quality cameras can be used.
This version targets Label Inspection, Robot Vision, Inspection of Printed Circuits and high precision 2D gauging including laser measurements.
Scorpion Premium 3D is a three camera system with all the basic 3D tools included.

Scorpion Vision Server™

The Scorpion Vision Server™ can run tens of vision sensor tasks or more than four demanding machine vision applications on one Industrial Vision Server. Important features are: multiple Scorpion applications connected to a specific CPU core and remote debugging of the active system.

Scorpion Maintenance

Scorpion Maintenance is used to develop, test and modify Scorpion Vision Systems on a separate PC using images stored on disk.

Scorpion Image Logger

The Scorpion Image Logger provides exciting product traceability for manufacturers. Scorpion Image Logger can capture and store images of every manufactured product in real time. It can capture images from multiple cameras connected to one PC.

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Scorpion 2D SmartCam

In close cooperation with Sony, we have integrated the Scorpion Vision Software® into their SmartCam family.

A full version of Scorpion running on top of the Windows XPe operating system, processes the images inside the camera. The combination of high resolution images and Scorpion's world class gauging tools is ideal for high precision measurements and 2D robot vision applications.

Scorpion SmartCam3D™

A fully integrated machine vision solution, consisting of a Sony SmartCamera and Scorpion Vision Software® with the latest 3D Vision algorithms.

This package is designed for robot guidance and other vision applications where objects require to be located in 3D.

3D is important where an object's height in space needs to be measured. Particularly valuable in robot guidance, this application offers not just 3D capability but also most robust machine vision tools. Using these latest algorithms, the application is more tolerant of difficult and challenging objects.

Now Scorpion Vision Software® comes with MonoPose3D™, enabling 3D vision using a single camera. This is ideal for robot vision – a single camera which can be attached to the robot with a single flex ethernet cable.

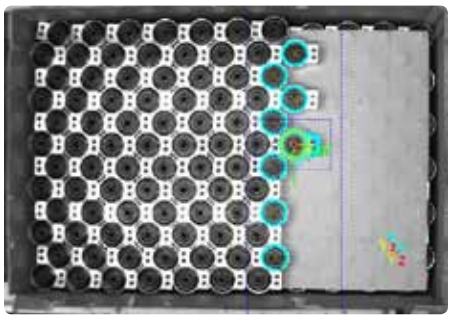
Scorpion SmartCam3D: Sony SmartCam running Scorpion Vision Software® - 3D vision with a single camera

Application Areas

Scorpion Vision Software provides powerful image processing for 2D and 3D applications without the need for programming skills. Applications are developed in a powerful and expedious graphical user interface which can be customised to show various amounts of information and controls to the operator such as datainput, .net and html based instruction screens and .net and activeX based add-ins.
More than 100 different image analysis tools are available with user selectable outputs. This allows for rapid development from the simplest to the most complex image analysis tasks.
The user interface also has built-in statistics and logging capabilities making it ideal for process control and integrating with manufacturing database systems.

Scorpion Robot Vision

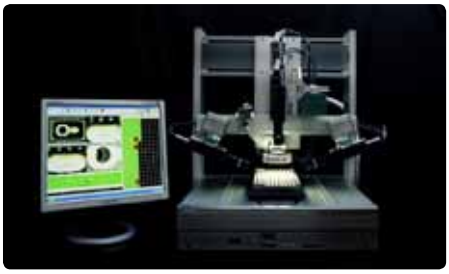
Flexible automation means robots, automation and vision working together. This reduces cost and increases the flexibility and possibility to produce several product variants in one production line at the same time - 24 hours a day - with profits.
The vision system's ability to locate and identify objects are critical elements in making these systems.



A box of valves. Scorpion sends the valve positions to the robot.

Scorpion Robot Inspection

Sony desktop robot's winning combination of superior performance and compact size, combined with Sony Firewire cameras and Scorpion Vision Software® are redefining the meaning of optical inspection systems.
Advanced inspection systems are put into operation in the matter of days using only standard components.



Sony desktop robot, firewire cameras and Scorpion Vision Software working together.

Robot inspection used for quality control in the Pharmaceutical industry

Scorpion Barcode

Scorpion Barcode is a camera based automatic barcode reader application supporting multiple readers on one PC. Scorpion Barcode is a Scorpion Lite with an integrated Euresys EasyBarCode™ reader software module.

Scorpion Barcode

Scorpion MatrixCode

Scorpion MatrixCode is a camera based automatic 2D MatrixCode reader application supporting multiple readers on one PC. Scorpion MatrixCode is a Scorpion Lite with an integrated Euresys EasyMatrixCode™ reader software module.

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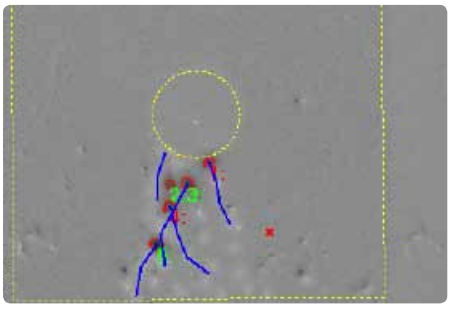
Fish Egg Sorter

Scorpion Vision is used in the fish farming Industry. One application is a salmon and trout egg sorter. The eggs must be properly sorted to ensure that over 98% will finally develop into large healthy fish. To accomplish this, eggs are sorted at the rate of up to 125,000 eggs per hour or nominal inspection rate of 40 eggs/second.

Measuring the intensity of pixels within a circular region determines whether eggs are dead or damaged. Should four dark areas assumed to be eyes be present, the egg likely contains twins as seen above.

Aqua - Fish Pellets counting

In this area Scorpion is used in systems for fish pellets counting and tracking. This to ensure the fish are fed correctly.



Fish pellets counting and tracking

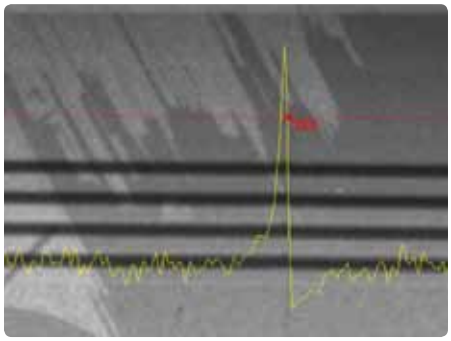
Scorpion Capture

Scorpion Capture can display and capture images from Windows cameras.

Included are: standard usb, firewire and gigE area and linescan cameras are supported, image viewer with zoom and manual measurement, image history list for manual inspection and storing of selected images to disk and automatic image logging.

Solar Cell Wafer Inspection

Scorpion Vision Software is used for quality control of wafers with low noise, high sensitivity, high repeatability and high resolution.

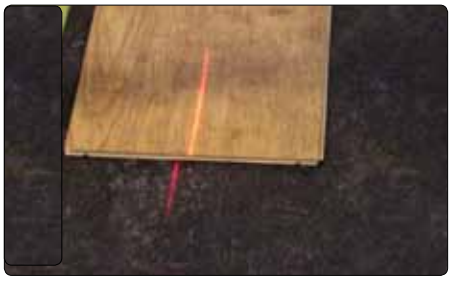


Screen image showing typical sawmark changes across a solar cell wafer.

Laser Length Measurement

The Scorpion Laser Length Measurement system is a general purpose length measurement system.

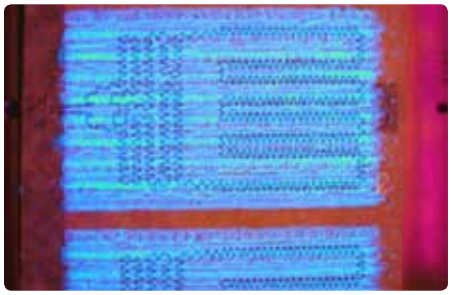
Here it is used for in-line measurements of lamella lengths. The system assumes that the other end of the object has a fixed position and direction during the measurement.



In-line measurements of lamella lengths

Colour Identification

The system picks the best colour match from a set of reference images and calculates the color coverage of the inspected item. The SurfaceAnalyzer is a unique tool performing color, texture and shape classification of multiple objects.



Glue detected with colour identification.

Image Logger

Use Scorpion Image Logger to digitize, tag and store video data from multiple video sources in real-time.

Scorpion is capable of acquiring digital images from a broad range of commercial video cameras, optionally tagging the images with real-time data from external data sources such as GPS receivers and OPC devices, before storage to JPG or BMP disk files.
Successful applications have been created using Scorpion with GPS receivers for tagging real world data to images or documenting lack of defects prior to shipments in automotive traceability environments.

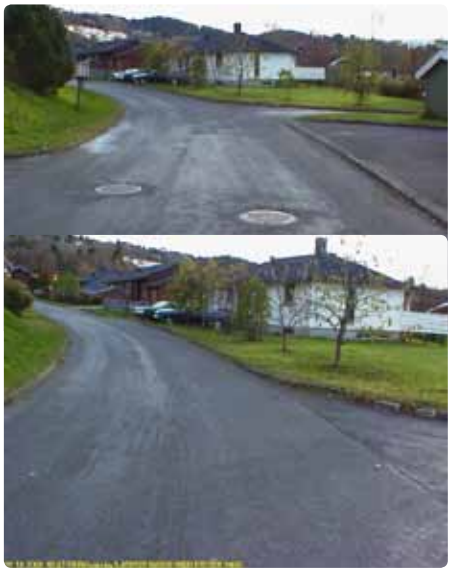


Image logger system collecting data for a national road information base. A camera positioned on the roof of a car captures an image every 20 meter. The GPS coordinates are saved with the image.

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3D Machine Vision

Application areas for 3D machine vision are 3D robot vision, volume measurement, automotive part measurement and 3D object location and identification.

3DMaMA locates seven parts located in 1 second in an occluded scene

Scorpion 3D Stinger™

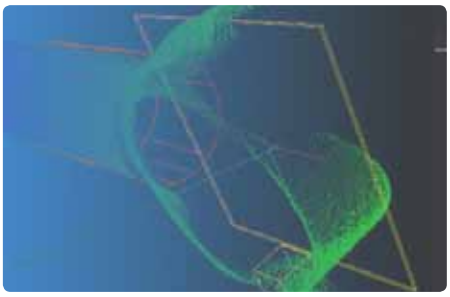
Scorpion 3D Stinger™ is a family of machine vision components and products. They provide building blocks for OEM and system integrators.
Scorpion 3D Stinger is ised in 3D Robot Vision, 3D Laser Triangulation and other advanced machine vision solutions.

Scorpion 3D Stinger Camera for 3D Stereo Vision applications - locates moving objects in 3D in real-time.

Scorpion 3D Stinger used in the production of cross country skis.

3D Modeller

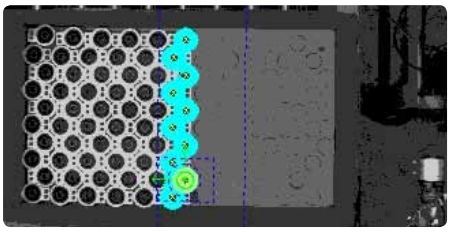
High precision 3D modelling using structured light makes 3D measurement, 3D robot vision, random bin picking and 3D assembly verification feasible for everyone.

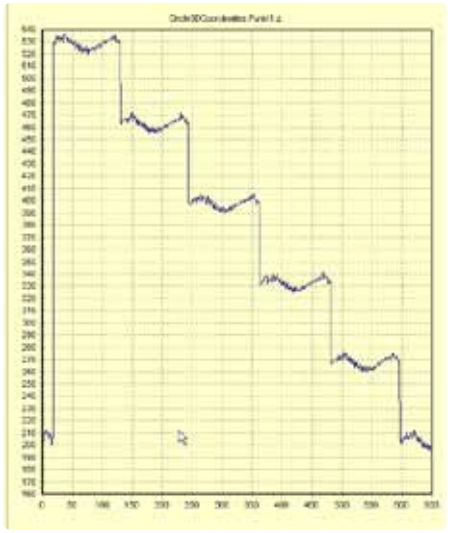


Measurement on an automotive V-stay with the Scorpion 3D Modeller

3D Robot Vision based on Stereo Vision

A typical industrial task is to pick objects from a box with a robot. Scorpion 3D Robot Vision using stereo vision technology is ideal to solve these tasks..

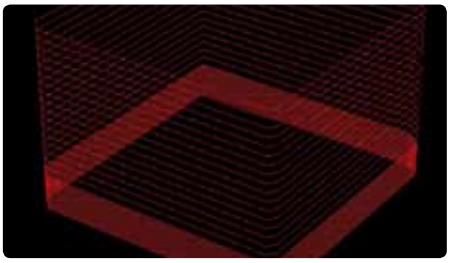




The objects captured with the two cameras and a graph showing the six layers in the box.

3D Scanner

The 3D scanner creates accurate 3D product models. The 3D scanner uses multiple laser triangulation profiles working in a common 3D coordinate system with the highest accuracy. A scan is fast and creates models with a resolution down to 0.01 mm.



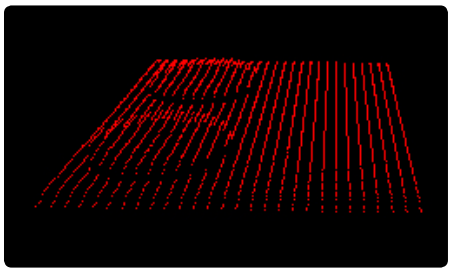
3D scan of wafer block

Conveyor Inspection

Scorpion Vision Software's excellent 3D modelling capability is being put to use in the volume production of food. It is ideal for bakery lines where products come out of the oven and move very quickly into packaging. In many cases the products are decorated or as for pizzas: topping is added before packing.

The problem with current manufacturing processes is that the product cannot easily be individually inspected so if it is deformed in any way (or just too big to fit in the packaging) it has to be rejected. If it is rejected after topping has been added this adds to the wastage. Having a system that checks each product as it leaves the oven and rejects it automatically solves this problem.

The system ensures the product has the right shape and size and isn't for example burned or under cooked.



Shape verification in food production

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Training & Support

Support policy

The primary source of support is www.scorpionvision.com and it's FAQ. On the Scorpion CD there is numerous Scorpion profiles demonstrating and explaning how to use Scorpion.

Read Scorpion Vision's blog, scorpionvision.wordpress.com, to be updated on the latest cases and solutions.

All users can register for download privileges to get access to the electronic Scorpion CD located on the Web. The latest official version of Scorpion will always be available together with the latest documentation and the latest course material.

Our Scorpion Newsletter is sent to registered users and provides important information about the software: new releases, new features, case studies, events and more.

For details on the use of Scorpion, we recommend our online help system; scorpion.tordivel.no/help.

The extensive FAQ, Frequently Asked Questions, are available on-line and as part of the integrated html-help file. Questions are handled in hours and can be submitted using the web support form or by sending an e-mail directly to support@tordivel.no.

When Scorpion users have potential vision tasks, we can help. Submit a description of what you want to do and maybe some images to vision@tordivel.no. We will then take a look, give you some advice and maybe provide a skeleton solution profile using Scorpion. With Scorpion installed, this profile can be run on your own computer. 30 days free e-mail and phone support are included in the Premium and Server versions of Scorpion.

Links

www.scorpionvision.com
scorpionvision.wordpress.com
tordivelblog.wordpress.com
scorpion.tordivel.no/help

We want to provide our Scorpion Vision Software users the best available support 365 days a year. To facilitate a seamless start of using Scorpion Vision Software and to provide efficient support to all users, several options of training, support, upgrades and special kits, are available.

Scorpion Vision Software Training

Our training courses are designed to make the participants capable of building their own vision systems. All training material is found on the Scorpion CD. The courses are frequently arranged by Scorpion distributors and System Integrators. On request they can be arranged on-site adapted to the customer's requirements.
Every year, one and two days workshops on important application areas, like robot vision and label inspection, is conducted with a practical and hands on focus.

Scorpion Starter Kits

We offer a number of different Scorpion Starter Kits. These are bundles of either Scorpion Basic or Premium, cameras, lenses, cables and a two days Scorpion Introduction Course. The starter kits are specialized for different vision tasks, like industrial vision, robot vision and 3D vision. The Starter Kit contents are described in our price list.

One starter kit is available per customer or factory.

Free demo software

Demo software can be downloaded from our web site www.scorpionvision.com. A demo license is valid for 30 days. The demo licence is a full version of Scorpion with the following limitations: Automatic Mode is limited to 30 minutes and the application must be terminated and restarted after 4 hours of operation.

System License

A system license include one, two or unlimited camera connections with a specified resolution depending on the type of product purchased. A system license is linked to the computer using the network MAC address or to the serial number of a device.

Runtime License

This is a system license for a system that is built into a product. The price is calculated based on volume, features and function.

Version Upgrade

A version upgrade after purchase is available at 25% of the current list price.

Product Upgrade

The upgrade price is the actual price difference between the two products when ordering added 10%. Prod. no. 10-099.

Tool Upgrade

All Scorpion licences except Scorpion Image Logger can be upgraded with a tool upgrade. Prod. no. 10-091, 10-094.

Camera Upgrade – Camera Connections and Resolution Upgrades

Additional camera licenses and resolution upgrades can be added to the System License with limitations. More information about product capabilities is found in the Scorpion Tools document.
Prod. no. 10-090 and 10-092 (XGA), 10-070 (UXGA), 10-071 (16M), 10-072 (25M).

Scorpion SDK Addon

Scorpion SDK (Software Development Kit) Addon is required to develop Scorpion Vision Apps and Tool Components.

Maintenance Contract

A Scorpion Vision Software Maintenance Contract includes one year with free version upgrades, free e-mail support including access to the Scorpion Vision software support web. Product no. 10-098.

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Technical Data

Supported operating systems

- Windows 2000 SP1 to SP4
- Windows XP - recommended including SP2
- Windows XPe supported for OEM customers
- Windows 7

Minimum requirements

- CPU PIII 400 MHz
- 128 MB RAM
- 10 GB Hard disk
- VGA screen resolution

Minimum recommended configuration

- P4 2.0 GHz
- 512 MB RAM
- 40 GB Hard disk or better
- XGA – 1024 x 764 resolution

High performance configuration

- Intel i7 CPU
- 4.0 GB RAM
- Raid-1 mirrored 160 GB Hard disk or better
- SXGA - 1280 x 1024 resolution

Communication

- TDV Command Protocol
  - RS-232, TCP/IP
- Profibus, DeviceNet
- OPC - vendor independent
- RS-232, TCP/IP, RS-485
- Advantech Adam IO-modules and PCI cards
- Socket Server and Clients
- Extendable by using Scorpion Polygon Python script and .net and activeX components

Data export

- Number
- TCP/IP
- RS-232
- HTTP
- File - CSV-format, Custom formats
- Generic ODBC database access to MySQL, Oracle and MS SQL Server
- Scripting: Any file format, Direct access to MS Word, MS Access and MS Excel using COM

General

- Maximum Number of Cameras: 48
- Maximum number of inspections per sec.: 200, depending on camera resolution and PC capabilities
- Number of systems per PC: unlimited
- Communication links: unlimited

Camera and Image Source interfaces

- USB 1.0 and 2.0 using DirectX 8.1 or higher
- Unibrain Firewire Cameras
- Pixellink Firewire Cameras
- Prosilica GigE using Prosilica SDK
- Allied Vision Technologies firewire cameras using AVT uniAPI
- Basler Area Scan Camera using Pylon 2.1, 2.2
- Basler Line Scan Cameras using Pylon 2.1, 2.2
- PtGrey Firewire Camera using PtGrey SDK
- Sony SmartCameras
- Sony Firewire and GigE Cameras
- All cameralink linescan through generic interface to Matrox Solios MIL 9.0
  - Includes Basler Sprint and Goodrich NIR Camera
- Generic support for all Network Cameras from Sony, Axis and more
- Files - jpg and bmp 8 bit bw and 24 bit color formats
- Generic support for all IIDC 1.30 compliant cameras
- General support for all Windows Imaging Devices
- Imaging Source 1394a and 1394b firewire cameras
- Shared Memory Interface
- Check Scorpion Online Help, Camera Support

Language support

English, German and Norwegian

More information: http://scorpion.tordivel.no/help

For more information:

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