VIVA Designed by Experts-Developed for End-Users

Robot Vision — V

Inspection — I

Gauging — V

Identification — A

Versatile
Intelligence for
Vision
Automation

Vision Automation Suite
Application Packages for
Machine Vision
All Modules – One Platform

ISRA
VISION perceptron

VIVA – Versatile Intelligence for Vision Automation

**"Bright" Vision Applications –
with VIVA created by the operator in a blink.**

VIVA is not only synonymous with versatile vision intelligence for your automation, but also with such responses as:

"VIVA! The integration of my vision application was incredibly easy and ready in a blink".

VIVA is built upon 20 years of experience with thousands of vision applications, designed by our experts in a way that you don't have to be an expert to get your vision application done.

The application packages for 2D and 3D Robot Guidance, for Quality Inspection, Gauging and Part Identification only need to be configured and customized to your application with a flexible integrated sequencer – and are ready to run.

VIVA Vision Application Packages for

- **Robot Vision**
- **Inspection**
- **Gauging**
- **Identification**

VIVA translates into

- ✔ Configurable applications
- ✔ Integrated sequencer
- ✔ Universal 3D calibration
- ✔ Concise graphics
- ✔ Combination of all packages possible
- ✔ Unique easy-to-use GUI
- ✔ Open interfaces
- ✔ Unlimited flexibility with unprecedented user-friendlyness

Already have experience with machine vision software packages?
VIVA will surprise you!
VIVA is not the tool box of algorithms and procedures in which you have to be an expert to create your first simple applications.
VIVA is the application – you just have to configure it.

No experience with machine vision software packages so far?
VIVA will inspire you!
Our application know-how is available to you at the click of a mouse.

Robot Vision

Machine Vision for robot guidance is the automation of automation technology. Speed, flexibility, and a high degree of positioning accuracy – all increase efficiency and reduce costs for tasks involving handling and processing. The experience of hundreds of applications in 2D and 3D robot guidance in various industries have poured into the design of the robot vision VIVA application package, allowing you to implement your application quickly.

VIVA offers

- **2D Robot Guidance**
  Fast, precise position recognition of any components in any rotation in the plane. Use in applications where the distance between the camera(s) and component remains constant, such as gripping components from a conveyor belt.
- **2 1/2D Robot Guidance**
  Scalable, robust and easy to implement solution for recognizing any rotated objects in various planes or at various distances to the camera position, such as depaletizing of parts.
- **3D Robot Guidance**
  Component-saving and space-saving method for 3D robot guidance with only one camera. Using only one image and three measurement features, all six degrees of freedom (position and orientation) of a 3D object are calculated

Gauging

In gauging, image processing can perform what the naked eye cannot: determine measurements in physical units in a matter of milliseconds at the highest degree of accuracy and repeatability. VIVA works always calibrated, manages various reference coordinate systems, supports temperature compensation and is configured quickly to new measurement features. The inspection of the dimensional accuracy of components in 2D and 3D with one or more cameras, cameras or sensors – including the statistical preparation of the measurement results – can also be integrated with other VIVA packages such as robot vision and quality inspection.

VIVA offers

- Camera-based 2D measurement technology
- Camera-based 3D measurement technology
- 3D form matching based measurement technology

for all typical measurement features:

- Holes and drillings
- Surfaces
- Radii
- Angles
- Slotted holes
- Edges
- Diameters
- and much more.

Vision Applications Created By Yourself

Designed by Experts – Developed for End-Users

Inspection

Inspection and quality control are the classic tasks for machine vision in production. VIVA ensures that no defective or incorrect components arrive at the next manufacturing stage or the end customer.

Quality control places the highest demands on the flexibility of a system: from simple to complex, from one camera to a number of cameras, from black and white to color, and with a myriad of different inspection tasks.

With simple, concise sequences, you can put together inspection tasks in an inspection program for every job.

The advantage: the results gained can be reviewed directly and can be used for subsequent steps and further calculations.

VIVA offers

- Presence checks
- Completeness checks
- Assembly inspections
- Position and orientation recognition
- Component type checks
- Surface inspection

Identification

Reliable identification of components is one of the core tasks in the automation of manufacturing processes. Using clear-text inscription, codes or component features themselves, it is ensured that the right components are located in the right position in the manufacturing flow and, therefore, complications in other process stages are avoided.

An exact pre-positioning of the parts for inspection is not necessary, as object recognition and position correction are a standard feature of VIVA.

An additional special feature: codes or symbols distorted or skewed through the geometry of the optical set-up are rectified automatically and recognized accurately.

VIVA offers

- Identification of components using features
- Recognition and allocation of various part types
- Verification of product IDs
- Verification of component numbers or labels
- Decoding of Data Matrix Code in all methods of application
- Recognition and verification of clear-text inscriptions
- Decoding of barcodes in all methods of application
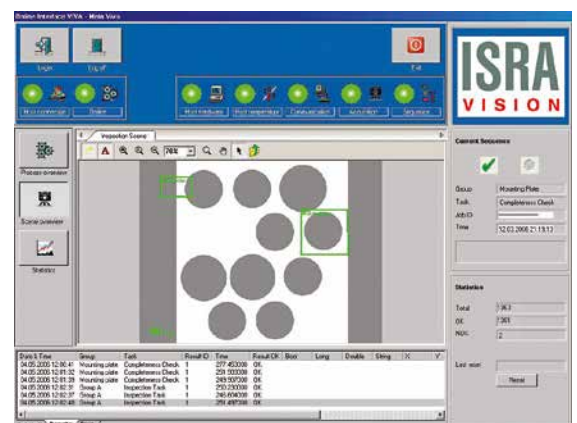
Simply Simpler With VIVA

Designed by Experts – Developed for End-Users

VIVA Highlights at a Glance

3D Total Modeling

All modules and tools in the VIVA application packages are always calibrated. The system always holds the complete 3D model of the application and camera geometry. Even for tasks from the fields of identification and inspection, which are classic 2D tasks, the 3D modeling solves several challenges. In this way, for example, distorted images can be rectified, meaning that the application of the tools works in a robust and reliable way. Optical distortions and angles of inclination between the camera and an observed surface are also compensated for.

3D Tool Referencer

The 3D Tool Referencer function enables the tracking of the search areas of image processing tools by determining the 3D object position in the image. VIVA is the first system where it is possible to determine the position and orientation of an object in all 6 degrees of freedom and, based on this information, to track the search areas of the inspection tools on the object in any camera or even in a camera network.

Total Statistics

VIVA Total Statistics offers total flexibility for the assessment of all results generated by VIVA. For every tool, every inspection task and, in general, every data element, it is possible to store the results, positions and values generated in the SQL database that is linked with VIVA. Therefore, you can choose which values are written to the database. The degree of detail and the amount of values to be retained within the scope of the current application can be chosen freely, and can be changed or configured at any time. VIVA offers its own integrated statistical assessments; however, external tools can also access the SQL database.

Flex-IO

VIVA offers the greatest of flexibility for setting up any communication interface, but remains simple. Aside from a selection of standard communication modules, each piece of interface hardware can be programmed freely. All the commonly-used interfaces are supported, such as Digital IO, Interbus, DeviceNet, Profibus, RS232/422 and TCP/IP-based communication. The common robot interfaces are also supported.

Networking

VIVA supports various types of networking for shared resource use, remote visualization, as well as database connection and local monitoring and data management.
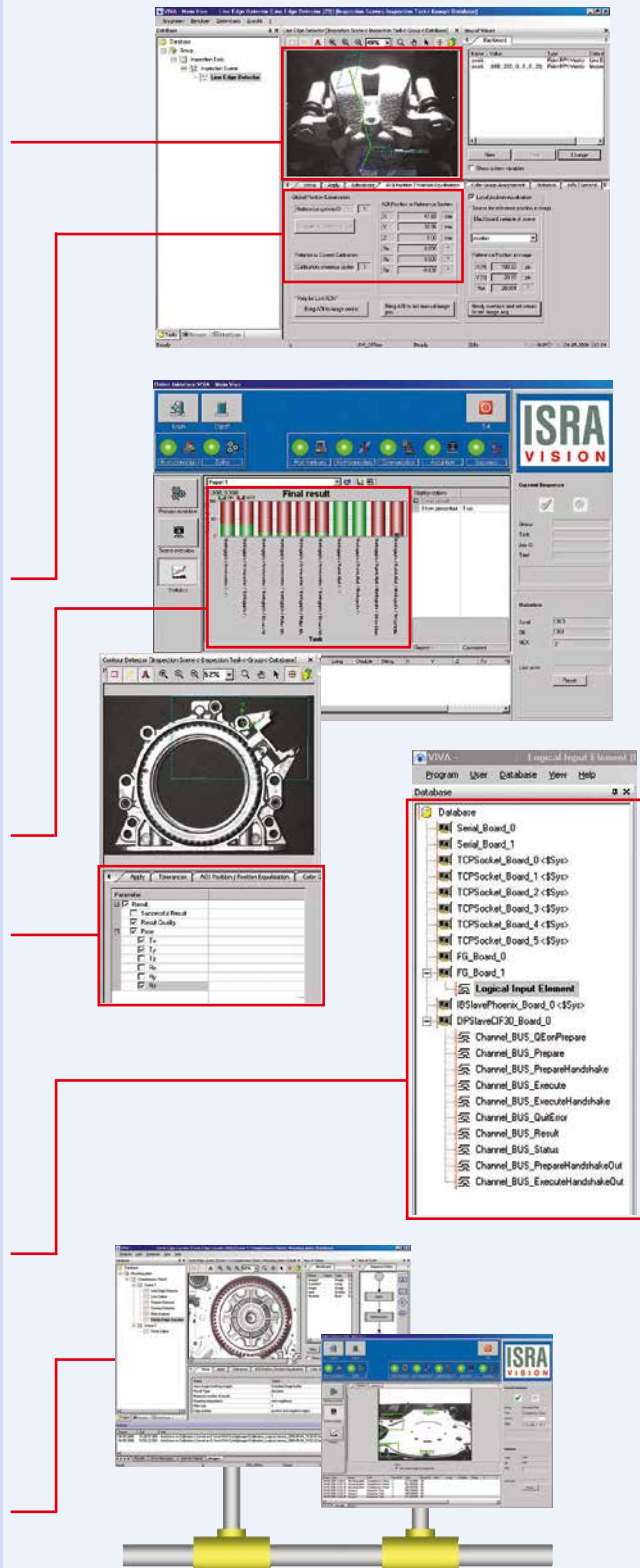
VIVA – Versatile Intelligence for Vision Automation

Clearly Structured User-Interfaces

Every Vision System has two user-interfaces: one for online mode in which the system works automatically and one for the configuration mode in which the system is configured or optimized for the application. The requirements for these two interfaces are different in many respects. VIVA accommodates these differences and offers an online interface and a configuration interface with clearly separated functionalities. The interfaces can be available on either one computer or separate computers. In particular for remote visualization and remote maintenance, it is advantageous to be able to divide the tasks between computers. Process information can be visualized at a remote overall control console for the line or centrally at a control center. Even from completely different locations, for example, at service headquarters for various national or international locations, permanent or temporary connections are possible.

The separation of the interfaces offers:

- structured, simple access to the many possibilities to optimally configure VIVA for the current application during the setup process
- the ability to show only the information relevant for the current VIVA application in a simple manner during running production.

The Online Interface
- with graphical status displays and comprehensive statistics

The VIVA online interface visualizes the current system status using graphical displays. In addition to the measurement, inspection and control results, an overview image of the component being inspected or current camera images can be shown. This way, you can receive all important information at a glance:

- Status lights symbolize the inspection areas, status and the state of the system
- Graphical overview images or current camera images visualize the status of the measurement, inspection or control through colored markings directly in the image
- Icons for OK and Not OK show the overall result
- Additional information is displayed via text output
- Measurement and inspection results are displayed in a freely configurable statistical assessment and indicate the current quality level of your production at a glance

The Configuration Interface
- A finished application with just a few clicks of the mouse

The configuration interface serves the initial creation of the application and also later optimization of parameters and configuration settings. VIVA differentiates between

- Hardware data
  (cameras, lighting, communication channels)
- Configuration data (parameters and settings)

VIVA Graphical Interactive Navigation facilitates the simple configuration of the application with just a few clicks of the mouse. You can move around in the flat data hierarchy by clicking on the function windows in the system images or camera images. If you prefer not to navigate in the data tree, it can be removed from the interface and the configuration can be done entirely graphically. Symbols and graphical elements in the data tree signalize the status of every element in corresponding colors:

- Online/Offline,
- Correct/Incorrect,
- Initialized.
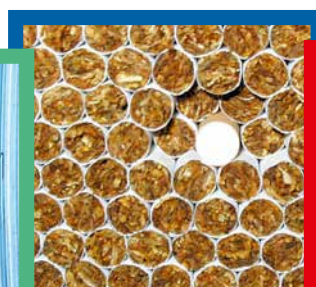
The Basic Components of the VIVA Application Packages

VIVA makes all the functionalities available that are necessary for classic machine vision tasks.

- 2D/3D calibration
- Image preprocessing
- Recognition of features using
  - Edge detectors
  - Feature detectors
  - Contour detectors
  - Surface detectors
- Quality assessments
- Decoding tools
- 2D/3D coordinate transformations
- Processing of intermediate results
  - Boolean
  - Numerical
  - Distance
  - Point
  - Straight line
  - Tolerance filter
- Color group administration
- Formula editor

The areas of interest for all image-based tools are managed by VIVA with respect to their position on the object. The advantage: even objects that are displaced or rotated can be identified and inspected.

## The Basic Strategy of the VIVA Application Packages

All VIVA tools can exchange data using the Black Board and can be set against each other or against other additionally entered values.

All program processes can be individually and freely defined. You are supported in this task by graphical process programming in the sequence editor, so that it is not necessary to have programming knowledge or learn a cryptic language.

Very simple program structures are the result. The individual programs remain small and simple, even when complex overall processes are created.

VIVA allows you to change every process stage, influence camera image acquisitions, integrate IO and process communication in the process, read and write results and variables, as well as to process results or variables with a formula editor.

Through data exchange and the individual design of process programming, even execution parameters and behaviors can be configured dynamically in the course of automatic operation.

The More You See...
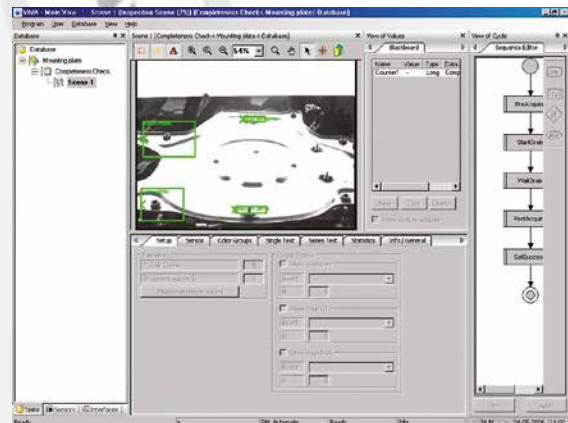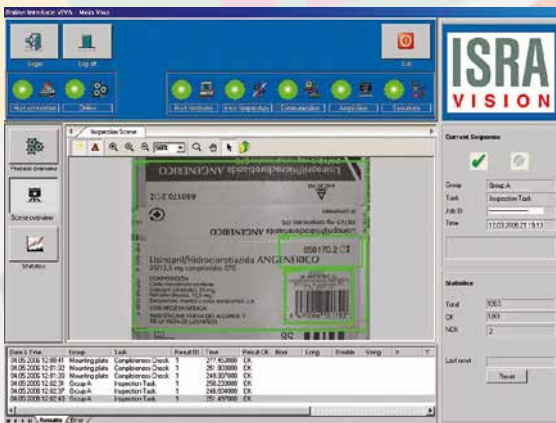
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VIVA Management Tools

Hierarchical Operation Control HOC

Program sequence creation in a hierarchical structure.
Advantage: The individual programs remain small and simple,
even when complex overall processes are programmed.

Graphical Operation Control Programming GOCP

Creation of programs using graphical symbols. Every program
sequence is managed internally as an XML data file and can be
exported and imported as such.
Advantage: Can be edited freely while at the same time using
international standards.

System Resources Management

The VIVA System Resources Management clearly differentiates
between configuration data created and managed as a solution
for an application, and the system resources.
Advantage: High degree of clarity, and completed applications
can be copied simply to other systems.

Hierachical Variable Management HVM

All process results, for example of image processing operations,
measurements, and object position determination, can be
saved as variables. Therefore, various measurement tasks can
exchange information.
Advantage: Through the technology of limited visibility, use is
very simple even with high numbers of system-wide variables.
Only the information and variables relevant for the processing
context are visible.

Multi Authority User Management

VIVA has a complete User Management with up to 5 different
levels of authorization. Any number of users with various author-
izations can be registered. A part of the Multi Authority User
Management is the parameterization of the visibility and config-
urability of dialogs and data elements.
Advantage: the complexity of the configuration of an application
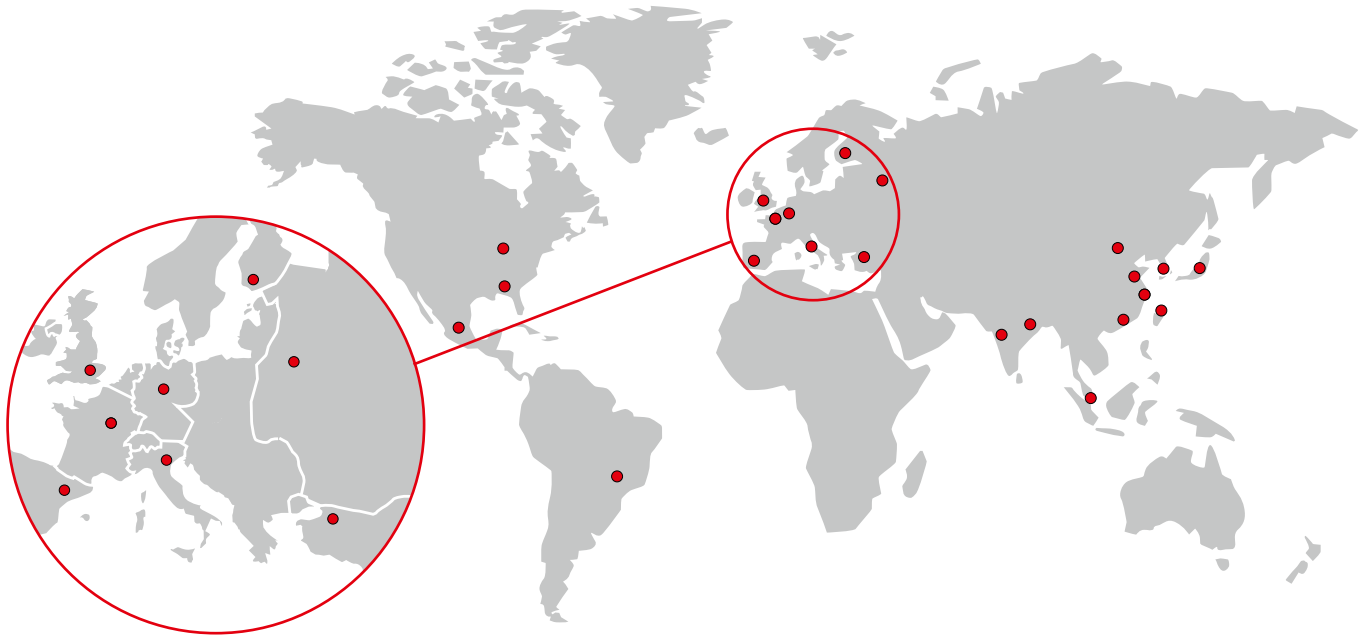is adjusted to the various access levels.

Multi Access and Change Journal

VIVA keeps a journal of every time the configuration data is
accessed. In this journal, the date, time and registered user, as
well as old and new data set are listed.
Advantage: every change made to the system can be tracked
retrospectively.
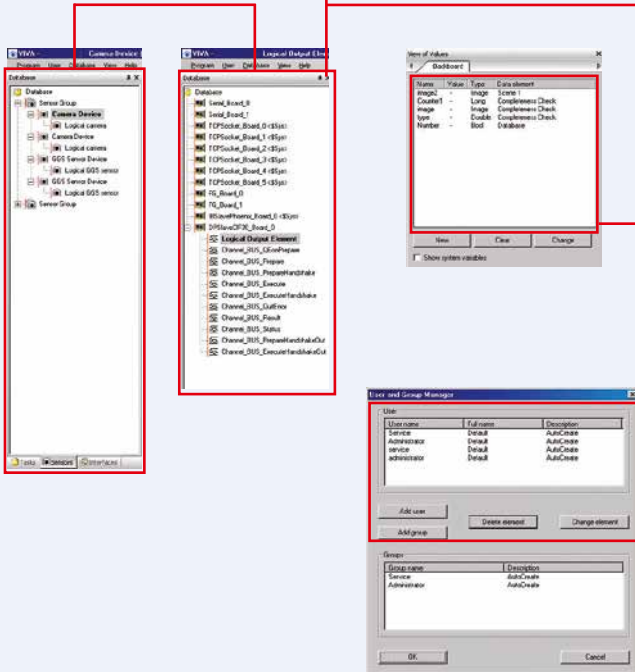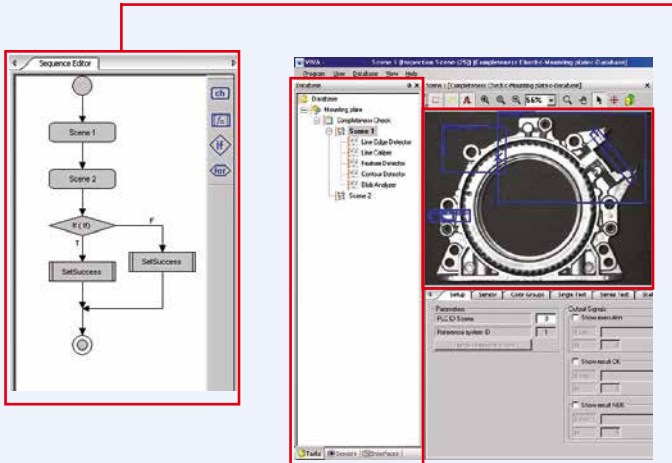
Innovation for Robot Automation

Automation at its best

ISRA VISION has been a leading supplier of high-performance quality inspection, robot guidance and production logistics systems for more than 30 years.

Our systems are used around the world in many different industries and applications. Our mission is to offer a comprehensive portfolio of standard solutions, covering all requirements along the process chain.

ISRA's experience and technological competence in the field of industrial image processing has been proven by thousands of successfully installed systems worldwide.

Benefits at a glance

Customers opt for ISRA's solutions for the following reasons:

- Our development activities are consistently aligned with our customers' requirements.
- We are continuously expanding our knowledge and expertise in all core areas of industrial image processing.
- Our customer relationships do not end with the delivery of new products. The Customer Support and Service Center provides comprehensive support for the use of your systems and helps you to increase your productivity – be it via our telephone hotline, remote service, on-site service, or our maintenance services.
- More than 900 employees at our sites in Europe, North and South America, and Asia are committed to your success.

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