GEFASOFT Automatisierung und Software GmbH
Franz-Mayer-Straße 10
93053 Regensburg
Deutschland

Telefon: +49 (0) 9 41 7 88 30-0
Telefax: +49 (0) 9 41 7 88 30-66
eMail: info(at)gefasoft.com

IRISOR - Eclectic technologies

The Irisor is a fully automated system for optical inspection and classification. The delivery of the products is made in hordes, cassette leadframes with peferably identical outside measurements. However with the option to process different indexes or heights.

The assembly of the products on the carrier is divided into rows and columns and can vary from product to product. The machine inspects always from above in flow direction. 3D inspections and / or side inspections are realized through appropriate optical arrangements. Every productcarrier is equipped with a unique number (2D-code) for tracking and tracing.

By reading the DMX horde number also the position of hordes assembled from above or below is determined. Alternatively the hordenumber can be entered through the operational guidance. The inspectionprocess is fully automated. On each cycle, numerous optical inspections (vision-jobs) can be executed serial. Noticed errors are recorded with hordenumber, productnumber, postion, errorcode, image and inspectionparameter (e.g.: camera- / lightsettings). An option to save all pictures is available. The results can be reviewed by an operator using an optional post evaluation site, if necessary.

Concept

Partidentification

By reading the DMX horde number the position of hordes assembled from above or below is determinated. Alternatively the hordenumber can be entered through the operational guidance.

SECS/GEM

The system is connected to a superior system via SECS/GEM. Among control and montoring of the system, also productdata and results are shared with the "leading" system.

Modularity

The machine concept includes the option to string a maximum of 5 AOI stations together. With this concept serial executed inspection tasks can be parallelized for cycletime-reasons. Stacks or hordeloader / -unloader are available as seperate modules.

Base

The base frame of the machine is made up of a welded steel-construction -1- mounted on a massive granite baseplate -2-. The whole system is housed using steel-plate panels -3- or transparent plastics -4-.

This system is made for inspection concepts with sophisticated tasks related to large numbers. It enables both the part delivery and the actual image processing within a short time. Different inspection scenes (Lighting-, Lens-, Camerasituations) are repeatable very fast.
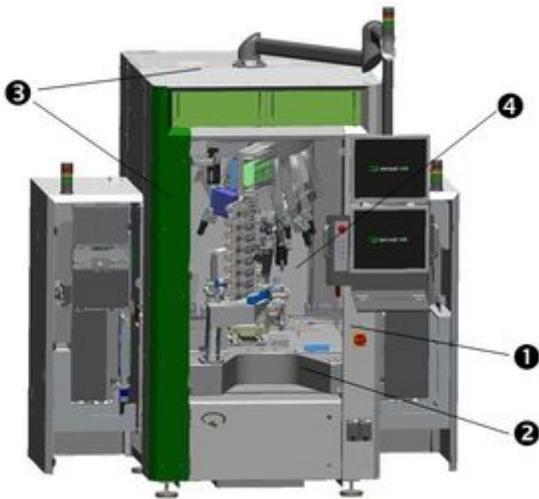
Magazin handler

The magazin- / hordelead is implemented through a seperated magazin-handling-system. The control of these modules is also realized through seperated control technology -1-. Capsuling of the feed technology is particularly necessary to meet the modular inspection concept.

The feeder can be loaded with several cassettes -2-. A seperation module selects the hordes from the cassettes into the transport system of the inspection module. Reverse operation of the part handler ensures the minimal operation using one loading- / unloading module. Sensor technology and image processing for part identification is integrated.
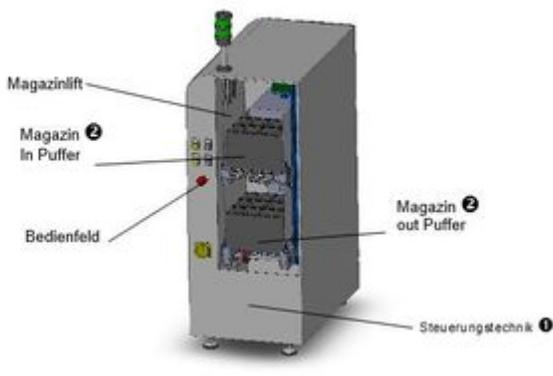

Inspection unit

The inspection unit can be equipped with a maximum of 10 camera- / 3D-Sensor units and different lenses, plus a maximum of 10 lights 8 variable light holders of various types. The image processing components can be combined fully automated and random for most different inspection situations. Associated drop-down menus are integrated in the operational guidance.

The cameras are arranged on a rotatable camerahead. Max. 10 cameras / 3D sensores with differing lenses can be positioned. The focus is positioned using a motorized Z-axis. The lights are arranged on a seperated Z-axis on another Z-gantry. A maximum of 16 light units can be positioned on 2 light holders. For each inspection, the height of the lighting can be adjusted motorized.

Through the variable concept a large number of different inspection methods can be realised:

Photometric Stereo / Shape-from-Shading
Depth from Focus
2D inspections with variable hights and different lightings
3D inspections with strip light or laser light sheet
Inspections wiht line scanners
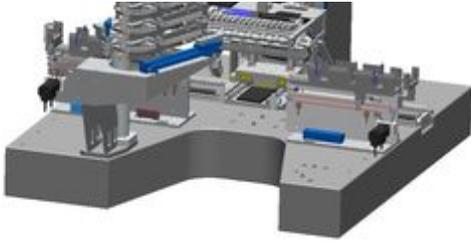
Control technology

The control technology is intetegrated in the machine. The control process is realized with a Beckhoff Soft-PLC. Visualization is made with an industrial computer system (19" / 4U) that also takes over image processing jobs and / or interface communication jobs (to superior systems). The stacks handlers have their own control technology and visualisation. All necessery customer guidance functions and -features like failure-display, process monitoring, manual control and mode selection are considered in the control concept.

Operation modes:

Automatic inspection:

The inspection tasks are fully automated. All parts are validated according to the results. The software architecture of the image processisng application includes an offline scoring for the inspected parts (confirmed / pass) through an external computer system. Both the results of the image processing inspections and the results of the confirmed / pass inspection are saved at the image processing system additionally. The maximum amount of stored data is bound to a threshold and is executed as a ringbuffer.

Teach mode:

Interactive operator guidance for configuration and parameterization of the image processing jobs.

Manual mode:

Used for manual control of all actuators (Drivings and Controll Elements)