

AI for Imaging Applications

System for Part Handling Powered by an Artificial Intelligence-Based Computational Unit and Data Flow Based Software

A new, complete solution for imaging applications includes a module for flexible part feeding, an AI-based computational unit equipped with camera and fixed focal lens, a robot arm with gripper, a conveyor based refilling system, and a complete guarding and safety system.

In today's industry one of the main features sought after is simplicity. Every day, vision engineers are faced with many different tasks and challenges, but the beauty of a bright idea, an exceptional moment of genius, a simple trick which solves everything – that is what everyone is looking for.

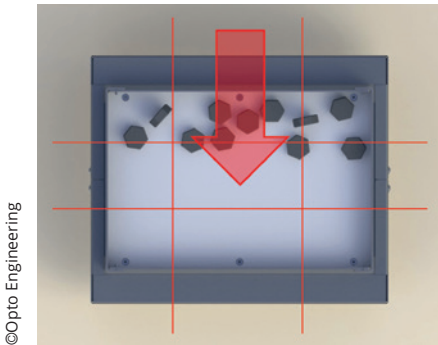
Simple Works Better

At imaging component manufacturer Opto Engineering, the motto is: simple works better. One can work on a simple and efficient solution from many sides. Choosing the right hardware is, of course, critical – and that is where your trusted supplier of components comes into play. But it is with software that things usually come to a halt. Many software products on the market are either too com-

plex or too simple, and they do not provide the optimal combination of capabilities and ease of use needed to move things forward smoothly and save precious time. That is the spirit behind an innovative solution developed by BaseClass Automation from Hungary that recently released Shake Picker, an innovative system for part handling powered by two special products from Opto Engineering: Penso, an artificial intelligence-based computational unit for imaging application, and FabImage, a data-flow based software designed for machine vision engineers.

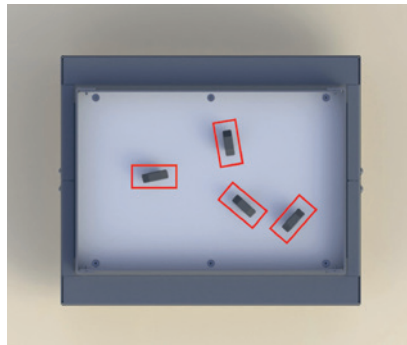
Flexible Part Feeding

The Shake Picker system is a vibrating, shaking solution for flexible part feeding. The parts laying on its flat, backlit surface can be



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Directional shake program – uniformity of parts distribution



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Custom shake program – verticalization of parts

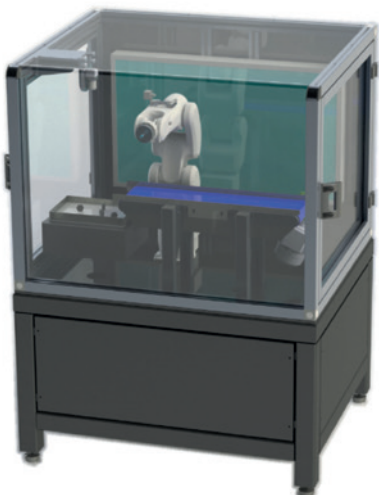


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Penso

moved and distributed as needed by its 4D shake engine, with an adjustable frequency in the 0.5 to 100 Hz range and customizable wave shape. Using either one of the 32 shaking pattern program banks – or a custom program – parts distribution can be controlled precisely. According to the actual parts distribution, directional shake programs can be executed to redistribute parts equally. In addition, the system integrates a digital I/O based program selection. The module offers several advantages:

- it is suitable for parts that cannot be handled by bowl feeders;
- fine tuning is carried out via software rather than mechanically and can thus be done remotely;
- there is no part jamming;
- part changeover does not require hardware changes.



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The Base Class Shake Picker – System version

AI-Based Computational Unit

Of course, to exploit its entire potential, the module must be governed by a vision system. That is where the collaboration with Opto Engineering comes into play. The manufacturer helped Base Class to finalize the



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Fab Image

first version of the system called Shake Picker – System version which was successfully presented at the Vision show in Stuttgart in 2018.

Shake Picker – System version is a complete solution which in its complete setup includes the Shake Picker module, Opto Engineering Penso, an AI-based computational unit equipped with camera and fixed focal lens, a robot arm with gripper (for example from NACHI, OTC-Daihen, Fanuc, ABB, or others), a conveyor-based refilling system, and a complete guarding and safety system.

Penso is an artificial intelligence-based computational unit for imaging applications. It self-learns the expected features of an object by simply looking at a small series of samples, regardless of the possible pres-

ence of defective product among them. The information related to defective parts can be sent to the robot arm via TCP/IP protocol. The robot arm can then move or discard the respective part.

New Projects with Data Flow-Based Software

Recently, Opto Engineering cooperated with Base Class again providing components for new projects with Shake Picker. This time, instead of using Penso, the robot was controlled using a vision application developed with Opto Engineering FabImage Studio Professional. Fab Image is a data flow-based software designed for machine vision engineers. Its graphical design allows for fast software prototyping, while the easy “export to code” function provides developers with the freedom needed for the most advanced applications. Its architecture is highly flexible, ensuring that users can easily adapt the product to the way they work and to specific requirements of any project – as it was the case with the Shake Picker – System version.

The right choice of components, the support provided by the vendor to integrate them and the innovative ideas of the integrator are a sure recipe for success. ■

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