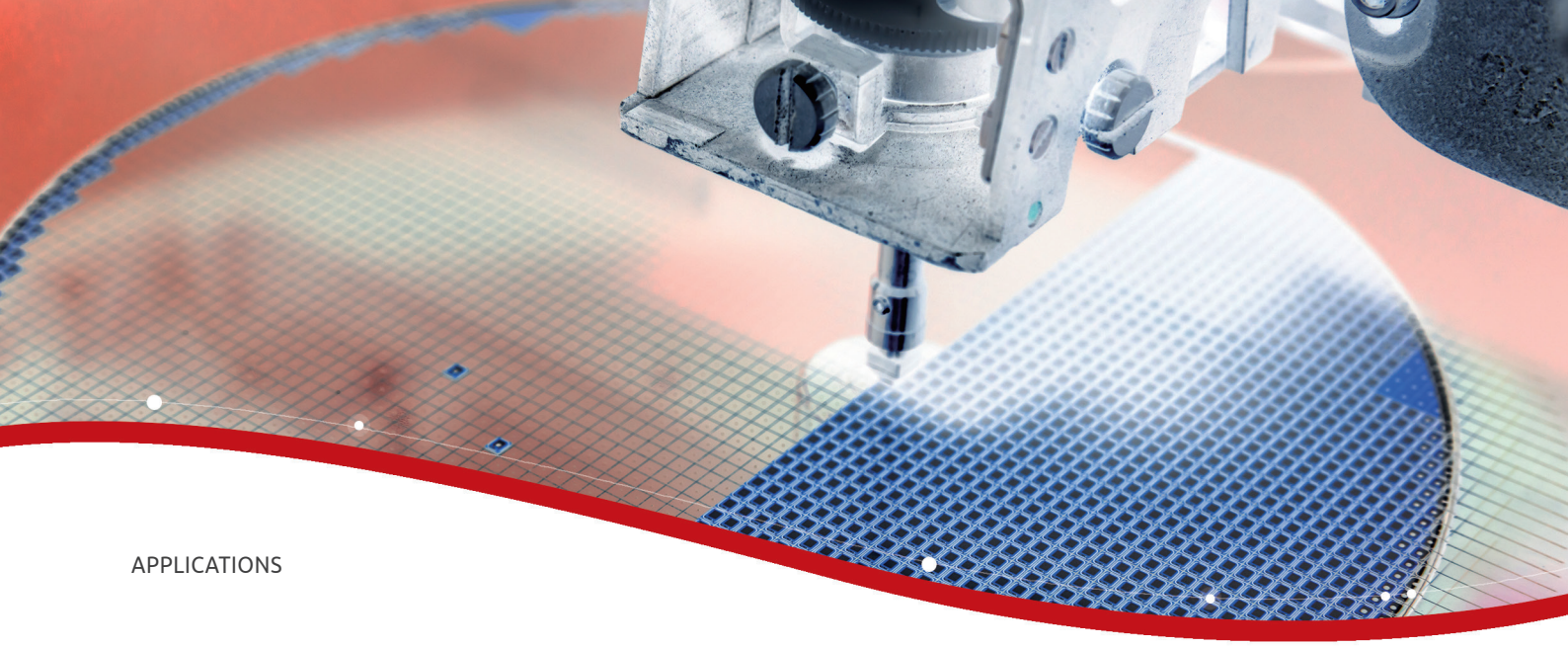


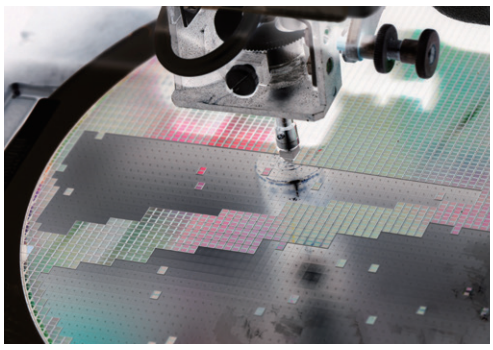
APPLICATIONS

ADLINK Introduces a High-Efficiency Die Sorting Solution to Overcome Packaging and Testing Bottlenecks

As global semiconductor supply continues to fall short of demand, wafer fabs have seen no shortage of orders while the back end IC packaging and testing plants have reached full capacity utilization. Chip probing (CP) is one of the important steps during the IC packaging and testing process. The goal of chip probing is to test the electrical properties of each die on the wafer, so that chips with poor performance can be vetted out before packaging.

Once CP is completed, the next process is "Sorting", which is responsible for performing quality inspections. Manufacturers are always looking for ways to significantly increase sorting efficiency, so that good dies can be more quickly sorted from faulty ones. For products that pass the sorting process, the manufacturer will have them further binned into levels to match the specifications needed in the production of various electronic components, while defective products can then be repaired.

Vision and Motion Integration, Enabling Rapid Response to Feedback



As semiconductor manufacturing continues to evolve, die sizes have become increasingly smaller while the number of units that need to be tested has conversely grown exponentially. Further increasing sorting speed will be no easy task for manufactures looking to optimize their IC packing and testing operating efficiency. The main reason is that speed and accuracy are frequently opposing goals where meeting one means sacrificing the other.

To solve this problem, ADLINK developed an IC sorting solution that integrates both image acquisition cards and motion control cards. This solution allows end users to easily achieve capabilities like multiaxial integration and rapid feedback response through a single coding process, striking the optimal balance between speed and accuracy.

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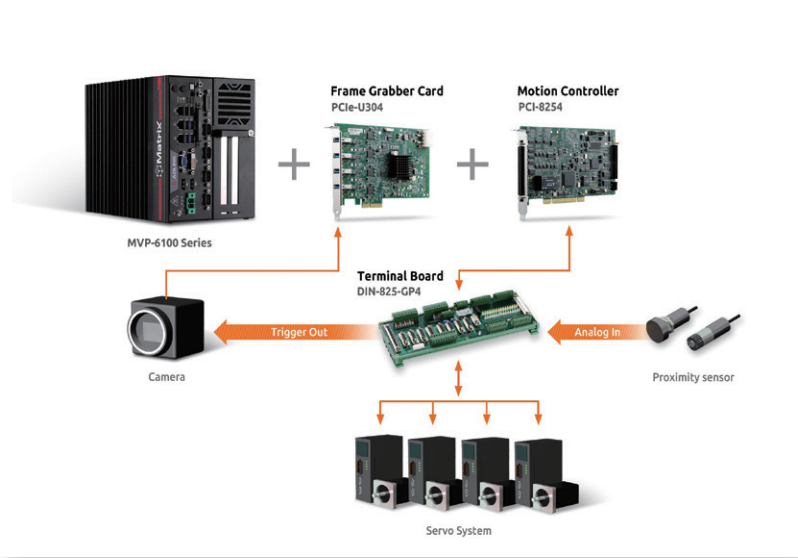
ADLINK's Advantages

There are a number of pain points in the semiconductor industry when handling the sorting process, the first being the complexity of simultaneous multiaxial control. Robot arms function by first picking up a die through suction on one side, rotating to a different location, then unloading the die onto a different tray. This process involves six to eight movement axes, meaning that the sorting machine has to integrate into many different work zones. Under a traditional PLC-based control system, this presents a challenging programming task.

Second is the fact that PLC-based infrastructures usually do not support video input. Manufacturers wishing to achieve fast and accurate positioning will have to purchase a separate video system and arduously integrate it into the system, greatly ramping up development costs. As the number of dies that need to be tested keeps growing, manufactures have been forced to enhance the speed of motion control systems to keep up with production efficiency.

ADLINK has long been a provider of high-quality image capture cards and motion control cards that function under a unified PC-based interface, thus ensuring the exceptional compatibility and usability of these components. ADLINK made use of their established strength to build a die sorting solution system that effectively overcomes the above mentioned pain points.

This sorting system solution integrates machine vision and motion control into a unified ready-to-use infrastructure that allows end users to easily perform additional customization. The simplified coding process can be quickly completed to create a single program in charge of both visual input and simultaneous multiaxial motion control. Not only does this help with reducing development costs, but having the steps of visual location, suction loading, arm rotation, and unloading done as a continuous motion can contribute towards further raising packaging and testing efficiency.



ADLINK's Sorting Solution

More importantly, as the industry moves towards the age of the Internet of things (IoT), factories are also starting to rely on more types of ports for greater connectivity. International interface standards like USB and Ethernet jacks are being used to connect to sub-systems for machine vision, temperature sensing, and pressure detection. In terms of connectivity, ADLINK's PC-based sorting system solution undoubtedly has much greater flexibility and compatibility than PLC-based industrial controllers, allowing customers to easily use various interfaces to meet the operational needs of various types of precision equipment.

ADLINK's sorting solution includes three other major critical functions that make it the optimal choice for end users to help them solve the pain points of the sorting process. First, the solution can quickly adjust itself based on real-time feedback of the detected die surface (e.g., unevenness of the surface) to reduce sorting time by 20% to 30%.

Second, the solution has an "instant trigger" function that combines machine vision and multiaxial precision positioning compensation to swiftly sort out dies of different levels at a precision of up to 30nm and place them into corresponding trays. Third, the solution supports automated sorting processes that can be quickly adapted to different pre- and post-processing needs. For example, the system can be made to transfer an object in the "NG die" tray to the repair station or send an object from the "Level 1 qualified die" tray to the corresponding testing machine to verify that the die truly meets Level 1 specifications.

For the past 25 years, ADLINK has been pushing the boundaries on new solutions for the semiconductor industry as more clients have come to rely on ADLINK technologies, making ADLINK the best equipment partner for major semiconductor players in the Greater China region. Benefiting from ADLINK's comprehensive machine vision and motion control integrated sorting technology, semiconductor manufacturers will be able to meet the rigorous challenges of faster, more accurate, and more productive solutions and meet the ever-changing needs of the market.

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