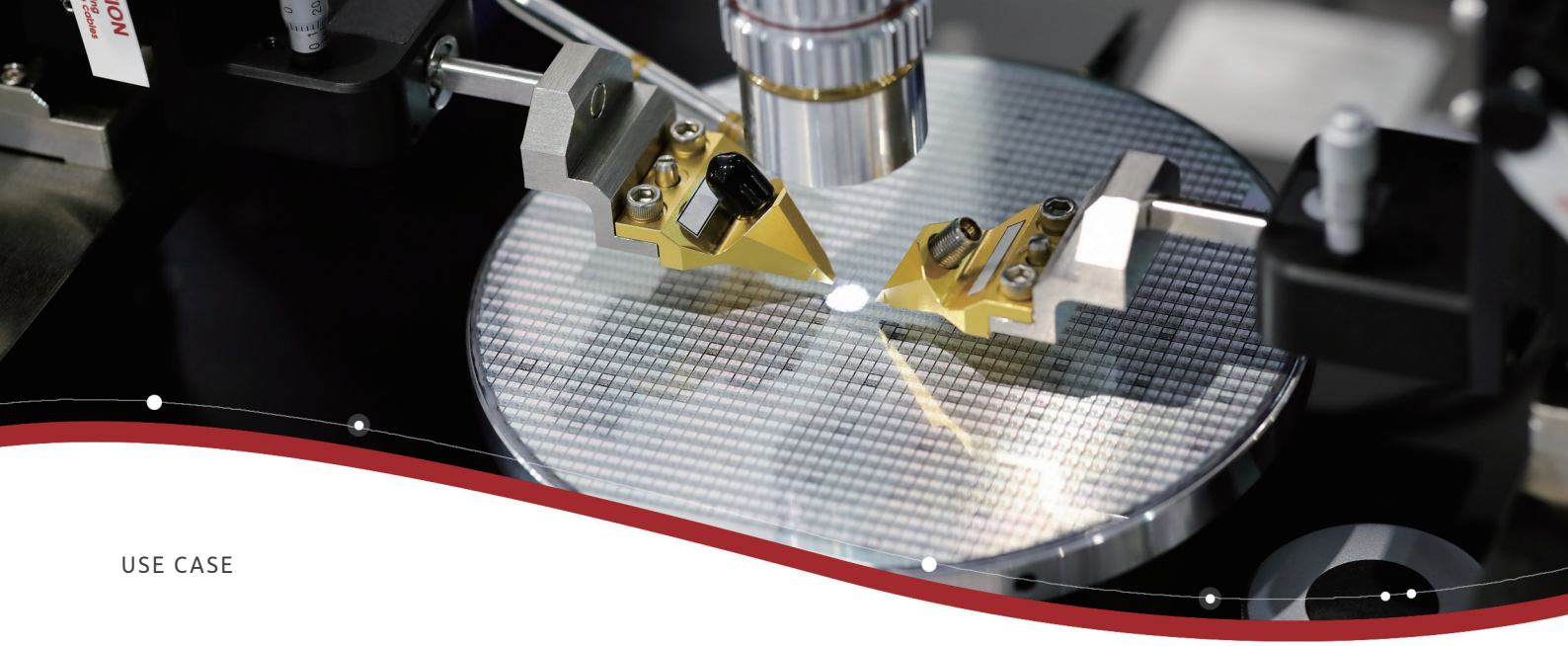
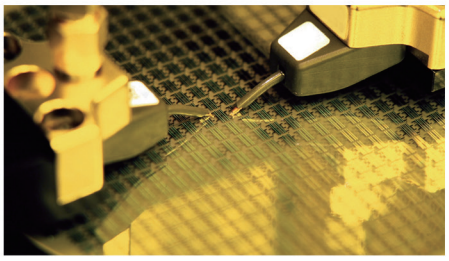


USE CASE

ADLINK's 2D Error Compensation Solution Improves the Precision and Accuracy of Wafer Inspection

Fierce competition in the global LED industry coupled with the rise of suppliers in mainland China supported by government subsidies has led to a significant increase in price competition. The allocation of emerging markets and technologies such as mini-LED and micro-LED has become the primary focus of LED manufacturers. In particular, mini-LEDs are predicted to have wide application in high-end products; key market player Apple is expected to introduce mini-LED displays in the next generation of the iPad Pro, which could have a watershed effect on the industry.

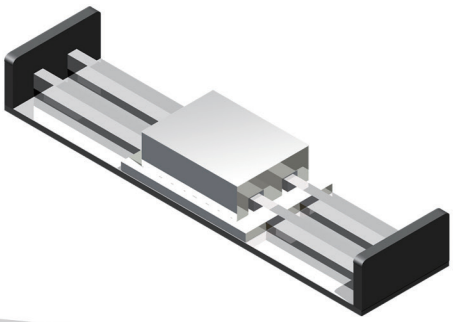
When it comes to manufacturing micro-LEDs and mini-LEDs, precision and accuracy are common problem. Compared with conventional LEDs, micro-LEDs and mini-LEDs require exceptional precision and accuracy; however, most existing equipment is unable to achieve the required standards. To solve this problem, ADLINK has introduced a 2D error compensation solution that can adjust existing equipment to achieve the precision and accuracy required for modern LED manufacturing.

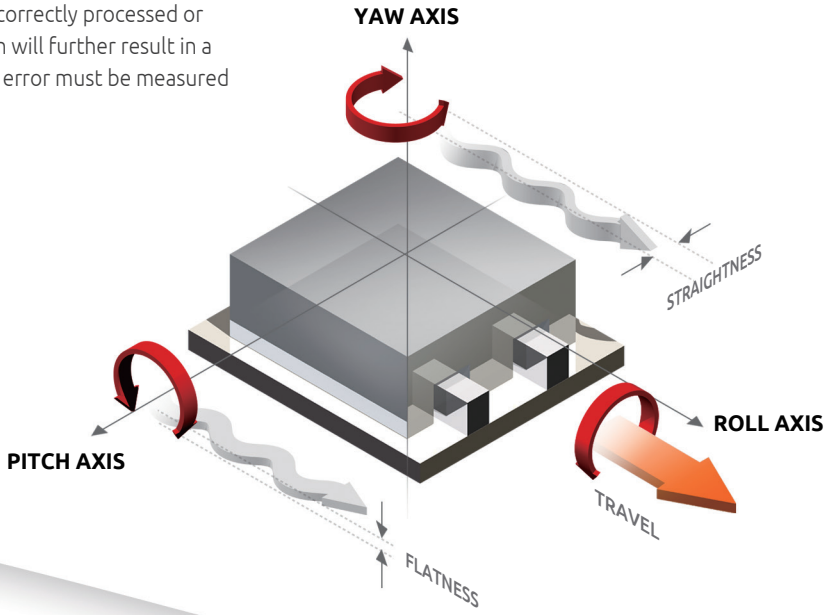


2D Error Compensation Solution Improves Precision and Accuracy

Transmission components play a key role in the manufacturing process. If transmission components used in the semiconductor industry are not sufficiently accurate, robot arms or other devices on the guide rail may move slightly, creating a discrepancy during production, which ultimately results in a deviation in the final assembly and processing position. For example, during practical application of X-Y sliding tables, "snaking" motions often observed during macro movement are usually due to poor alignment, which can be caused by any combination of errors in assembly, screw accuracy, and correction methods.

Only one axis of an X-Y sliding table can move freely. An incorrectly processed or poorly assembled guide rail will cause an angle error, which will further result in a spacing error during the assembly of a machine. The angle error must be measured and compensated for in order to correct it.





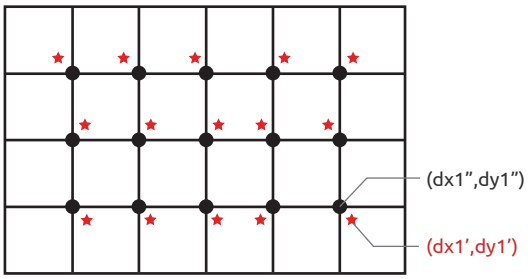
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2D Error Compensation Solution Enhances High-Precision Wafer Inspection

High-precision wafer inspection requires exceptional accuracy, and existing hardware is not sufficiently accurate due to the limited space between components. ADLINK's 2D error compensation solution can achieve the required accuracy by making small adjustments during the wafer inspection process.

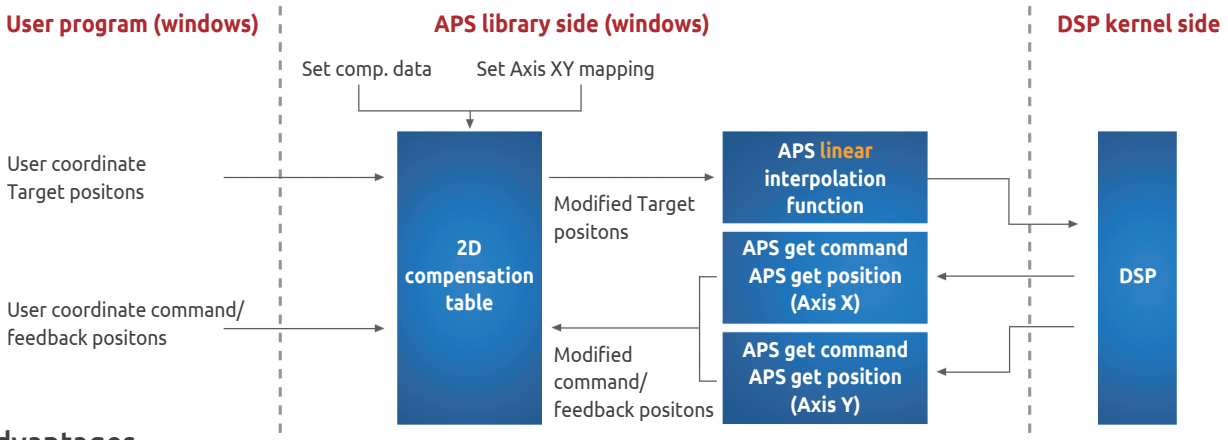
ADLINK's 2D error compensation solution can compensate for X and Y position values according to measurement and calculation results. This is done by establishing the corresponding coordinates to compensate for the X and Y position values and then providing controller-related set values, including spacing distance and compensation starting position.



(Δdx1,.Δdy1)=(dx1",dy1")-(dx1',dy1')
(Δdx1,.Δdy1) Compensation value
(dx1",dy1") Accurate position (dx1',dy1') Actual position

2D Error Compensation Architecture

After activating the controller's error compensation function, the output position command is superimposed on the discrepancy to correct the measurement error.



Advantages

With over 20 years in motion control, ADLINK provides complete hardware and software solutions that streamline implementation. Due to their reliability, durability, and accuracy, ADLINK products have been adopted in several industries, including industrial automation, smart medical, military and aerospace, transportation, and IoT.

ADLINK's verified 2D error compensation solution provides the following benefits:

- ***Improves precision and accuracy:*** Improving the precision and accuracy of existing small-scale edge devices allows them to be utilized in the manufacturing process.
- ***Reduces overall cost:*** Utilizing existing hardware saves expenses that would normally be used to replace outdated equipment with new modules.
- ***Increases output value:*** Improving accuracy naturally increases output value, resulting in rapid expansion and growth.

The 2D error compensation solution utilizes the following ADLINK products: • ***AMP-204C/208C*** • ***APS Function Library***

The AMP-204C and -208C are high-performance, high-accuracy centralized motion controllers with comprehensive application functions and are used in semiconductor, display, and traditional manufacturing. These controllers support the ADLINK APS function library, reducing implementation time and speeding up the launch process.

For the near future of the LED industry, mini-LED and micro-LED products will continue to be miniaturized. Therefore, improving precision and accuracy during the production process is a key priority for manufacturers. ADLINK's 2D error compensation solution specifically addresses this problem by allowing manufacturers to reduce equipment replacement costs, increase production yields, overcome technical problems, and become more competitive.

Learn more about ADLINK's motion control solutions: ***https://www.adlinktech.com/tw/Motion_Control***

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