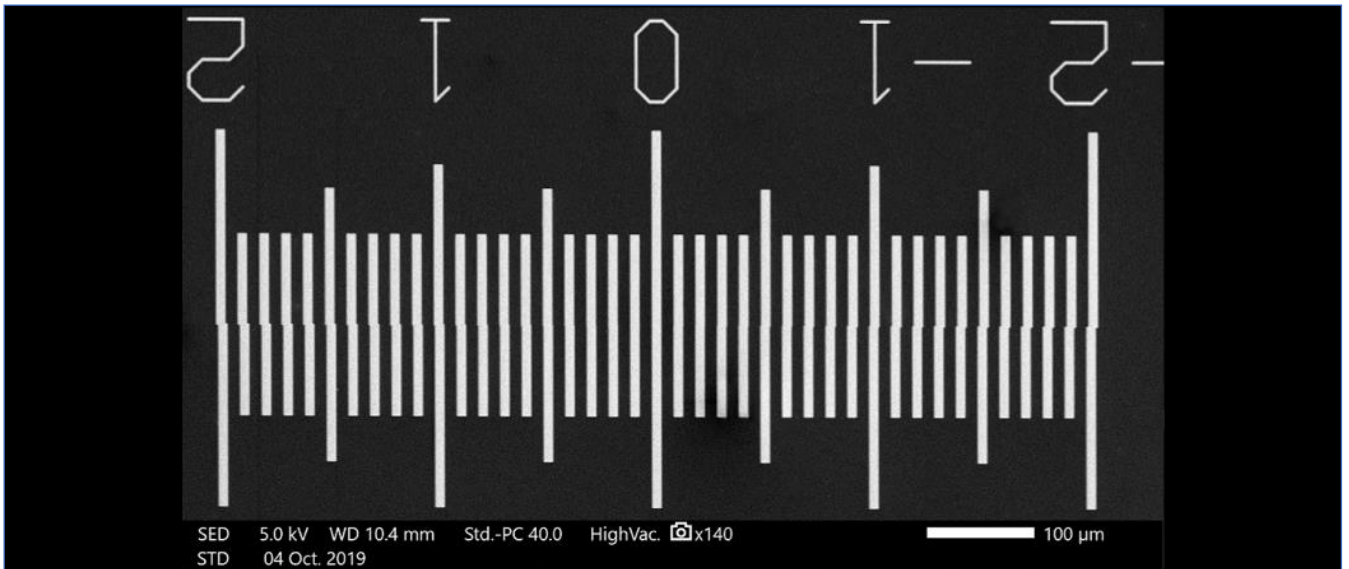


APPLICATION NOTE

Front Side Alignment



SEM measurement of Vernier scale in one direction. Alignment error $\ll 100\text{nm}$.

Description

The PicoMaster system supports Front Side Alignment (FSA) by means of a 5.2MP monochrome camera, a 560nm illumination source and automatic marker recognition through machine vision software (MVS) built into the compact optical module.

Each pixel on the camera sensor measures an area of $1\mu\text{m}$. The MVS interpolates the measured data approx. 10 times resulting in a measuring resolution of approx. 100nm. The final alignment error depends not only on the measured resolution, but also on the quality of the marker, the temperature stability and system calibration.

Requirements and results

Alignment errors smaller than 250nm can be achieved. However, some requirements apply.

- Proper calibration of the system.
- Temperature stability of both the system and substrate.
- Quality markers with a minimum size of $50\mu\text{m}$
- Markers to be written on the PicoMaster system as first step before any other layer is written.

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