Active Alignment

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Introduction

A dedicated team of 170 people
At 7 locations world-wide, >50% have an engineering degree.

Design and Manufacturing in Eindhoven
Sales and Support offices in all other Adimec locations.

Perfect Fit into Customer Applications
Leading experts in application-specific camera design, in-depth sensor knowledge.

Application-Specific Cameras in Small Batches
Typical batches are between 50 and 500 cameras/year.

We are a medium-sized company that make image sensors suitable for demanding applications at leading equipment manufacturers.

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Different kinds of focus

- Photo- or videography,
  - Electronic Autofocus,
  - Manual focusing ring.
- *Working distance is unknown.*

Different kinds of focus

- Industrial applications,
  - Locking focusing ring,
  - Locking focus thread,
  - Active Alignment.
- *Known working distance,*
  - *Focus during assembly.*

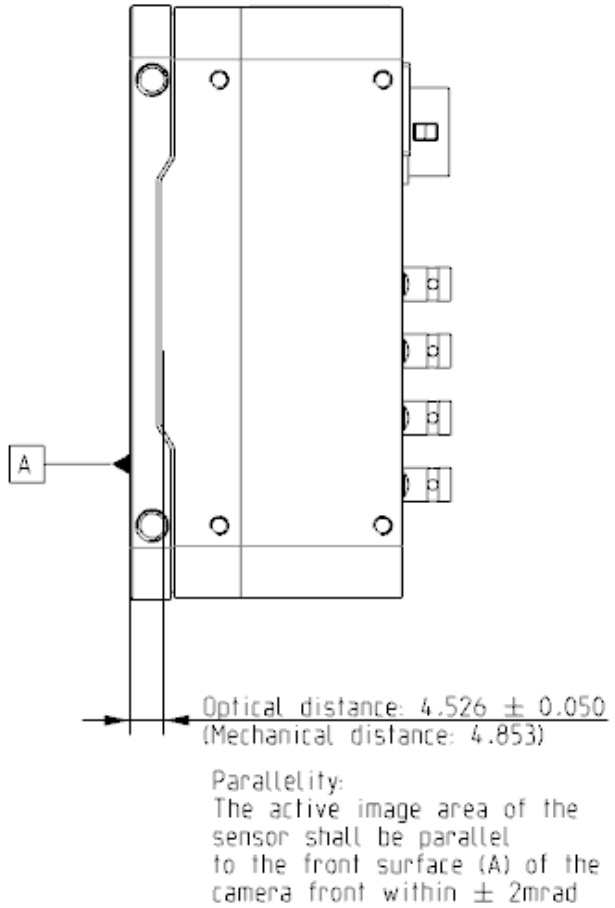
Focusing with active alignment

- Lens is fixed, sensor is focused.
- *Not usable for every application.*

- *Link to video:*
- *https://www.youtube.com/watch?v=fgqZXx1PQBQ*

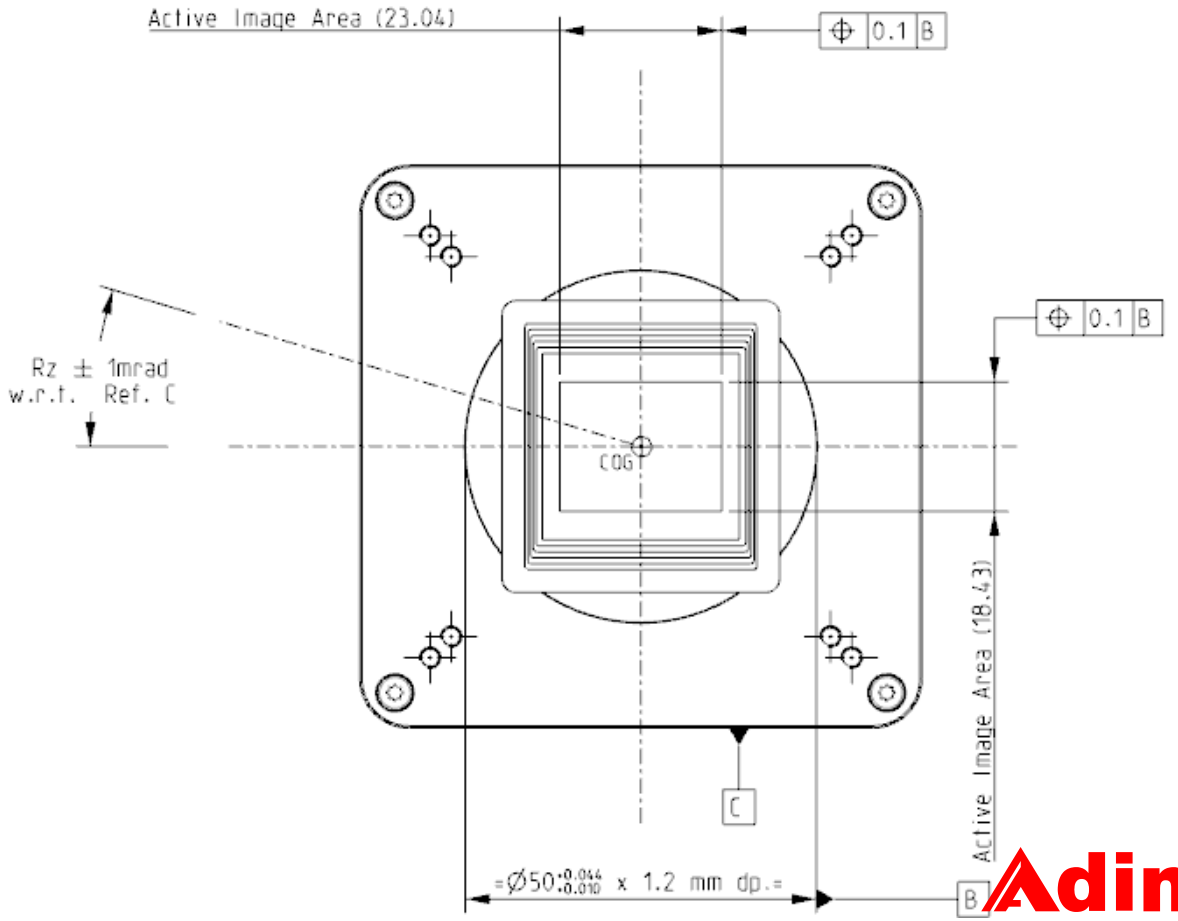
Why perform active alignment?

- First active alignment project in 2004.
- Sensor die positioning accuracy is low.
- Sensor is aligned accurately to reference.



Why perform active alignment?

- Active image area size of *centimetres*.
- Depth-of-focus of *micrometres*.



Why perform active alignment?

Example

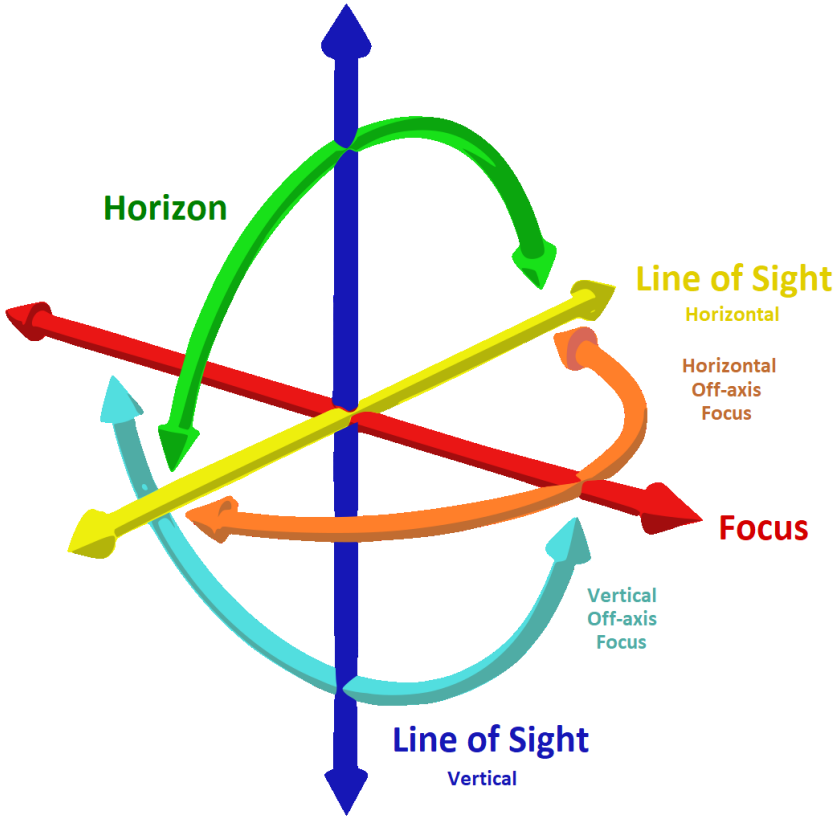
- Sensor parallelism for off-axis focus.
  - Inspection of flat surfaces.
  - Parallelism between sensor and DUT.

Next generation of active alignment

- Alignment of sensor directly to the lens,
  - Remove the tolerance chain lens – mount – camera.

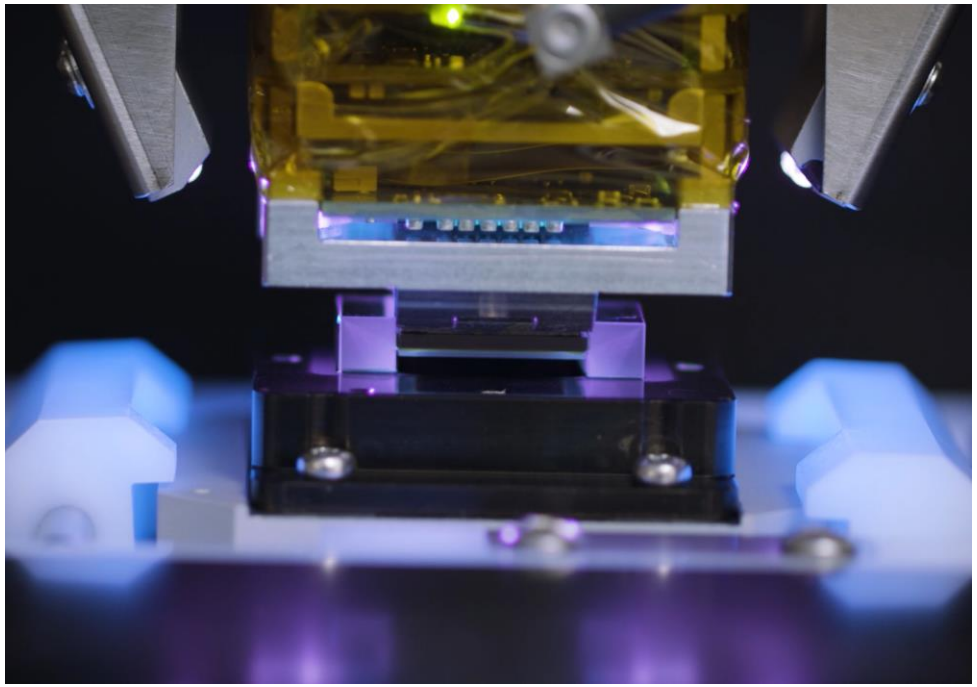
Advantages of active alignment

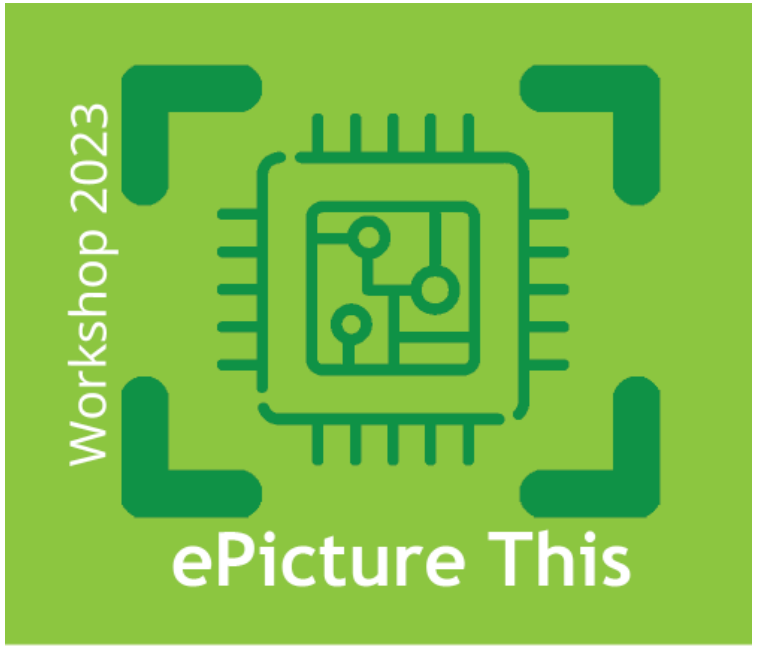
- Alignment in six degrees of freedom.
  - Sensor tilt for off-axis focus,
  - Line of Sight alignment,
  - Horizon alignment.
- Accuracy in micrometers.
- No moving parts,
  - Improved ruggedness.



Challenges with active alignment

- Sensor glued in focus.
- No refocusing possible,
  - Predefined focus position,
  - Athermalised design.





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THANK YOU

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Excellence in Imaging