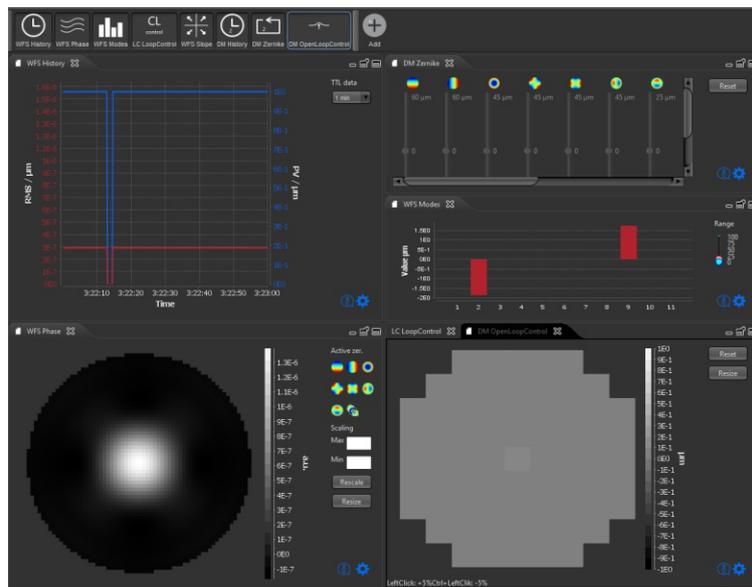


ALPAO Core Engine (ACE) is the perfect choice to control adaptive optics systems. Using ACE, you are able to develop quickly and efficiently your own adaptive optics instruments.



Key features

EASE OF USE

User friendly interface customizable to your needs

FLEXIBILITY

Object-oriented modular architecture

HIGH PERFORMANCE

Close the AO loop at up to 100Hz with a pure delay around 1.5ms
Access to all data in real time

EASE OF USE

The **ACE** user friendly graphical interface allows fine tuning and closing the loop in one click. **ACE** is also easy to learn with its convenient built-in documentation, which includes realistic examples.

With **ACE**, you can easily optimize your AO system to your needs. Automated experiments and advanced control set-ups are easy to develop. It is also possible to use **ACE** without wavefront sensors and to correct aberrations with iterative algorithms.

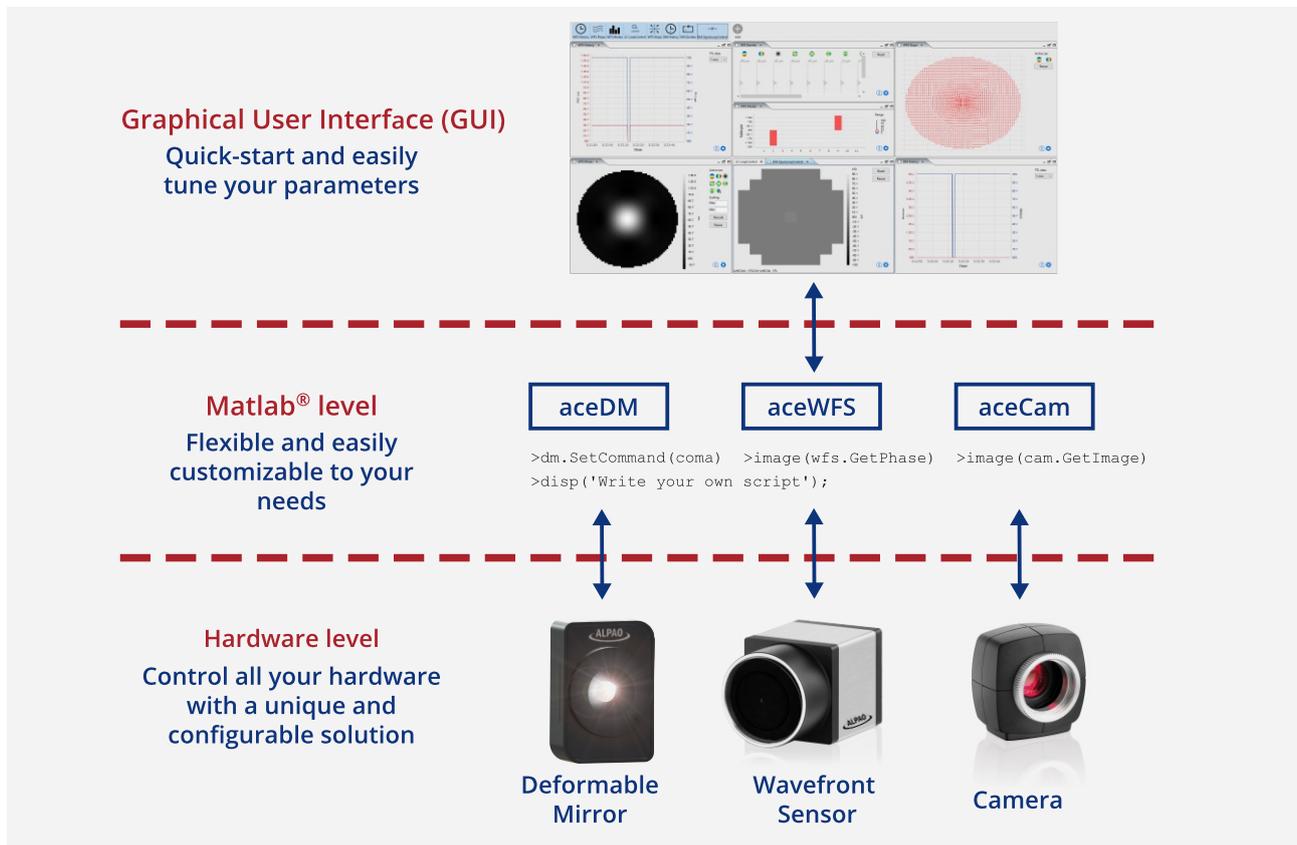
PERFORMANCES

Depending on your hardware configuration, it is possible with **ACE** to close the AO loop at up to 100Hz.

You are able to process your data in real-time and export the results, including displays and values, to a wide choice of file formats. ASCII, .xls, .tif, .jpg are among the many file options.

FLEXIBLE AND ERGONOMIC ARCHITECTURE

ACE is a powerful software architecture for adaptive optics. It is an object-oriented toolbox for MATLAB® that allows access to all your optoelectronic devices using built-in functions. Flexibility is the key to adapt to your application. With **ACE**, you are certain that the system is tailored to your need.



MORE INFORMATION

Download our tutorials!
Try it now for free!

- ▶ www.alpao.com
- ▶ contact@alpao.fr
- ▶ +33 476 890 965

For the most demanding applications, ALPAO can provide you with the state-of-the-art **ALPAO Core Engine *fast* (ACE *fast*)**. *ACE fast* is a CPU linux based Real Time Computer (RTC) running up to 5kHz with a pure delay lower than 150 μ s.



Key features

SPEED

Up to 5kHz

LOW LATENCY AND JITTER

Pure delay
as low as 150 μ s

FLEXIBILITY

Modification of the code
running on the control node

ACE fast UNIQUE ARCHITECTURE

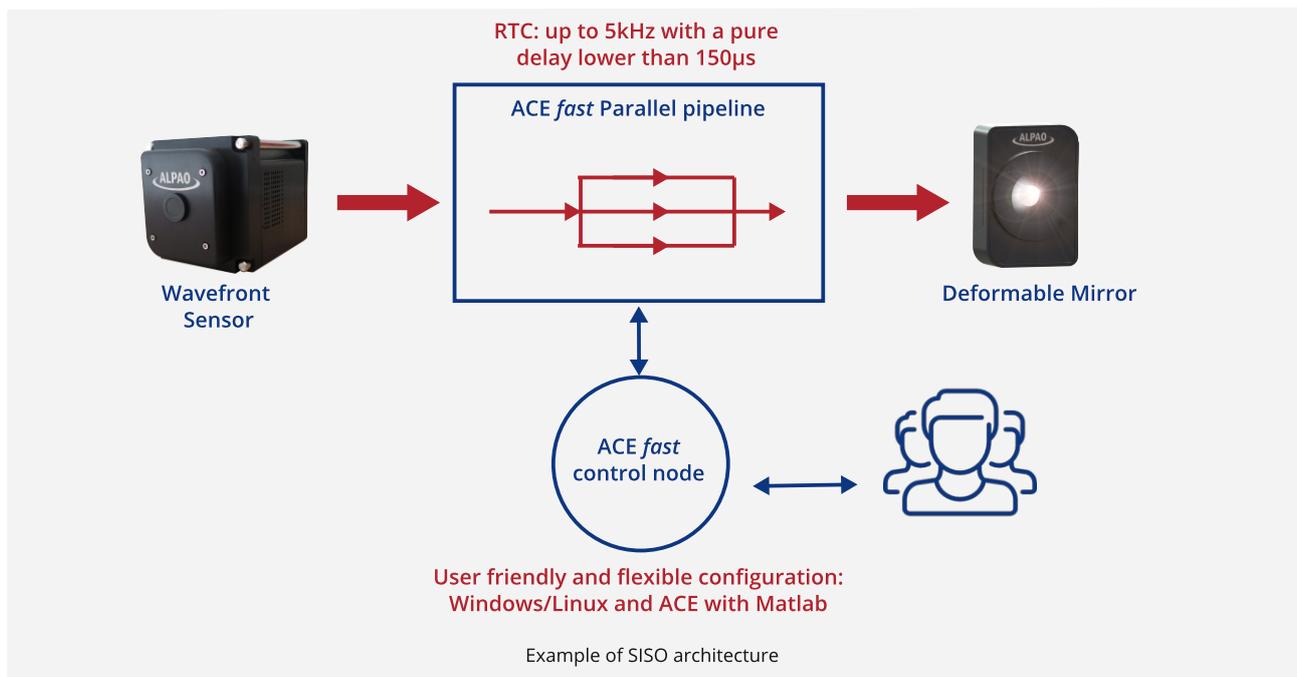
ACE fast can be easily customized to fit your application. It allows for example different kind of architectures such as SISO (Single Input Single Output), SIMO (Single Input Multiple Output) or MIMO (Multi Input Multi Output). Large capacity storage device can also be added as an option to save all telemetry from your experiment.

The **ACE fast** pipeline is specially optimized for high speed AO loop. To obtain such performances, it is hardware dependent and closed source.

The **ACE fast** control node is based on the **ACE** toolbox, already powering more than 100 adaptive optics systems worldwide. The **ACE** layer is based on the standard Matlab® environment, which allows high flexibility.

The following functionalities are provided in **ACE**:

- Step-by-step operation of the **ACE fast** pipeline: Interactive manipulation of the input/output data from each processing stage.
- Non-intrusive monitoring of all data streams (such as raw images, centroids (slopes), reconstructed wavefront map and Zernike, and decomposition deformable mirror command vector...).
- Configuration of each worker process such as integration time, CCD gain, CCD readout mode, CCD dark and flat images for gain/offset compensation, threshold level, target centroids (reference slopes), partial command matrix, integrator gain, and deformable mirror offsets.
- Script-based generation of all calibration data such as reference centroids, influence matrix, dark and flat images.



ACE fast is provided with the specific hardware already plugged in the bay (1000 x 600 x 1160mm³, ~150kg, up to 4kW via a standard rocket), which includes:

- The supervisor for the control node (19" x 1U x 400mm).
- The Linux multi CPU server for the fast pipeline (19" x 2U x ~900mm).

MORE INFORMATION

▶ www.alpao.com

▶ contact@alpao.fr

▶ +33 476 890 965

Linux and MathWorks are registered trademarks.

ALPAO reserves right to change this document at any time without notice and disclaims liability for editorial pictorial or typographical errors.