

CASAO™

Adaptive optics command & control software

CASAO is a unique application that seamlessly combines wavefront measurement and correction features with extensive instrument diagnostics to provide users with an ergonomic adaptive optics PC workspace. Perfectly adapted to our HASO™ 32-eye and mirao™ 52-e, CASAO equally functions with a wide variety of wavefront sensors and active components including deformable mirrors, MEMS and SLMs, CASAO is the only software tool that you need to get the most out of your open or closed-loop system. CASAO is Windows XP and 7 (version B for x64) compatible.

Perfect loop control for imperfect wavefronts

Whether you're an established expert in adaptive optics or just getting started, you'll be up and running quickly thanks to CASAO's user-friendly, feature rich environment.

Once again our products lead the industry by providing newcomers to adaptive optics with a unique, hands-on tutorial mode that guides users step by step through measurement, correction and diagnostics. Experienced users can choose between standard and automatic modes that put the ensemble of CASAO's features at your disposal right away.

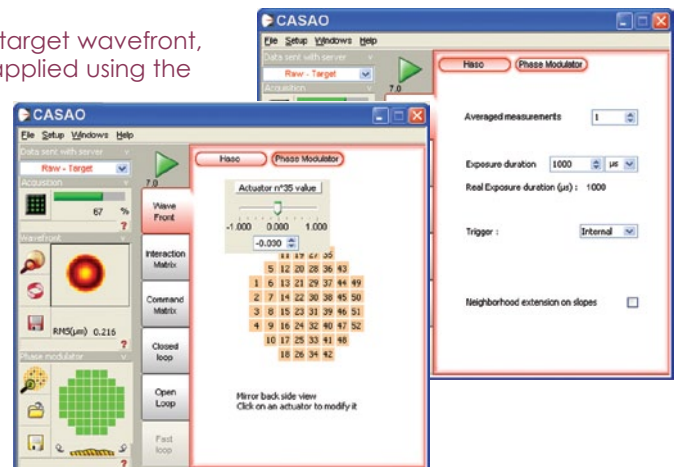
From sensor configuration on to acquisition and correction, a few clicks are all it takes to get underway. Key measurement and correction features include:

- Variable user modes
- Wavefront analyzer hardware control including integration time, trigger mode, averaging
- Wavefront measurement
- Target wavefront formation – set tilt, curve and high-frequency aberrations independently using actual measurements or theoretical values using Zernike polynomials
- Measure the functional influence matrix (also called interaction matrix)
- Calculate command matrix and modify filtering modes
- Open & closed-loop wavefront correction
- Add command – enables users to modify the target wavefront in real-time using Zernike polynomials to induce or correct for aberrations, either by manual intervention or over a network connection (localhost or Ethernet)
- Client-server interaction with HASOv3 software enables users to take advantage of HASOv3's advanced wavefront analysis features

Understanding your wavefront

CASAO's wavefront and instrument diagnostics enable you to better understand and use the information you acquire by providing detailed information on its nature. Key diagnostic features include:

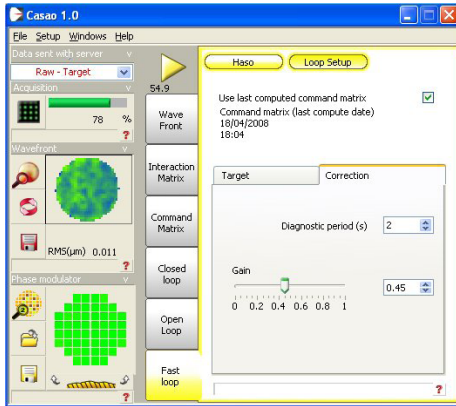
- Wavefront sensor diagnostics
 - Multiple views including raw measured wavefront, residual vs. target wavefront, and residual vs. target wavefront following the modifications applied using the "Add command" feature
 - HASOv3 interaction – used in client-server mode with HASOv3, you can perform advanced wavefront diagnostics including Zonal reconstruction, create Zernike or Legendre polynomials, view the spot diagram, and calculate the PSF, MTF, M² and Strehl ratio
- Active component diagnostics
 - Display mirror actuator states, applied voltages and 3D mirror form
 - Show individual actuator influence on the interaction matrix
 - Choose filtering modes by previewing mode changes and associated applied voltages to actuators
- Camera diagnostics
 - Display raw camera image



CASAO - FAST & CASAO SDK also available. See back.



CASAO - Fast *



CASAO – Fast is an optional addition to CASAO that is based on specially optimized, ultra-fast algorithms for local wavefront slope calculation and transferring those commands to the active component. For users that want to work at exceptionally high-speeds, CASAO – Fast enables you to measure your wavefront and command your wavefront shaping component faster than the wavefront sensor's CCD readout time in closed-loop configurations. Even more, users continue to have access to loop diagnostics but choosing the interval at which he or she wants to obtain information including residual wavefront, mirror state, actuator voltages, etc.

CASAO - SDK *

The CASAO SDK provides users with a simple programming interface that allows users in C, C++, Python or LabIV to incorporate CASAO's unique functionality into their own software applications. The SDK comes complete with a library of functions that enable you to:

- Acquire wavefront information with your HASO sensor
- Calculate the acquired wavefront's local slopes
- Command a phase modulator such as a deformable mirror or SLM
- Apply parameters to the adaptive optics loop (interaction matrix, command matrix)
- Control and open or closed adaptive optics loop in either normal or fast mode
- Perform advanced wavefront analyses (those in the standard version of HASOV3) including calculating the phase map, effective pupil, Zernike coefficients, removal of reference slopes, etc.

