

OASIS Driver for Scope-Pro

The OASIS Driver for Media Cybernetics Scope-Pro enables the use of Objective Imaging's OASIS-4i Four Axis Motion Controller and OASIS-AF AutoFocus Module from directly within Scope-Pro.

The driver is the file "SOasis32.DLL", which should be in the Image-Pro root directory. The installation program does this automatically for you.

The OASIS-4i product is a 4-axis motion controller that fits internally into the PC using a single PCI slot. Using micro-stepping control, the OASIS-4i controller provides for precise and accurate positioning of motorized stage and focus mechanisms.

An optional OASIS-AF module may be fitted directly onto the OASIS-4i controller in order to provide automatic focus operation using a standard video signal (e.g. from an analogue output of a video camera).

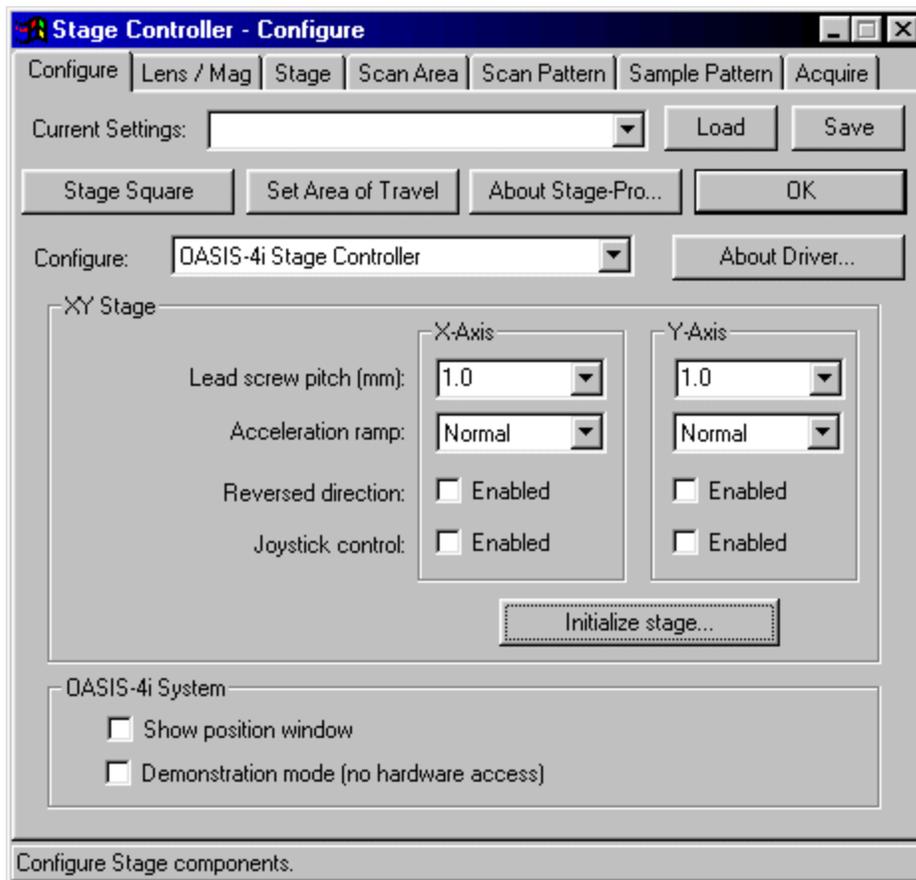
In order to use the OASIS driver for Scope-Pro, you must first ensure the OASIS-4i hardware has been properly installed into the system. For more information regarding the installation and configuration of the OASIS-4i and OASIS-AF modules, please consult the *OASIS Automation System Manual*.

Configuration

The Stage-Pro Configure tab is used to configure both the XY Stage and Z Focus settings of the OASIS-4i controller. These settings affect the calibration of movement for each axis, the overall acceleration and speed used, and the configuration of other options.

Configuring the Stage Controller

Within the Stage-Pro Configure tab is a drop-down list box labeled "Configure:". This selection is used to specify either the Stage or Focus controller configuration. To configure the stage, ensure that the selection set to "OASIS-4i Stage Controller" as shown in the figure below:



The OASIS-4i Stage Controller configuration settings are:

Lead screw pitch (mm): This is used to specify the thread pitch of the lead screws used to drive the X and Y axes of the motorized stage. Typically, both X and Y are set to identical values, such as 1.0 mm, 2.0 mm or 4.0 mm. Check your stage manufacturer's documentation for information about your particular stage's settings.

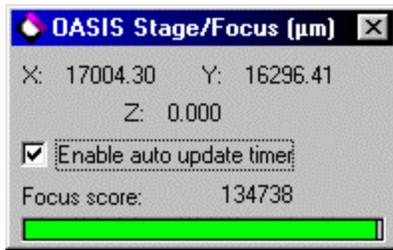
Acceleration ramp: This setting specifies the rate at which the axes of the stage are accelerated and decelerated during a move. These may be set to Slow, Normal, or Fast. The Slow setting gives a slowest acceleration and overall speed, whereas the Fast setting uses the maximum acceleration and overall speed. Note that for some stages, too high of speeds and/or acceleration may cause stalling.

Reversed direction: This setting specifies the actual direction of stage movement corresponding to given moves in the positive or negative direction. If selected, the apparent direction of travel will be reversed for that specific axis.

Joystick control: This setting enables the use of a hardware joystick, if it has been fitted to the OASIS-4i controller.

Initialize Stage: This button causes the OASIS-4i controller to automatically seek the stage's hard limit switches. This initializes the stage to a known maximum range of travel, and sets software limits to be just inside the hard limit switches. The stage should be initialized whenever there is a question about the position accuracy of the stage (for instance, if the stage motors have been manually turned).

Show position window: This selection enables the display of the OASIS Position window:



This window displays the current X, Y, and Z positions, in microns relative to the current origin.

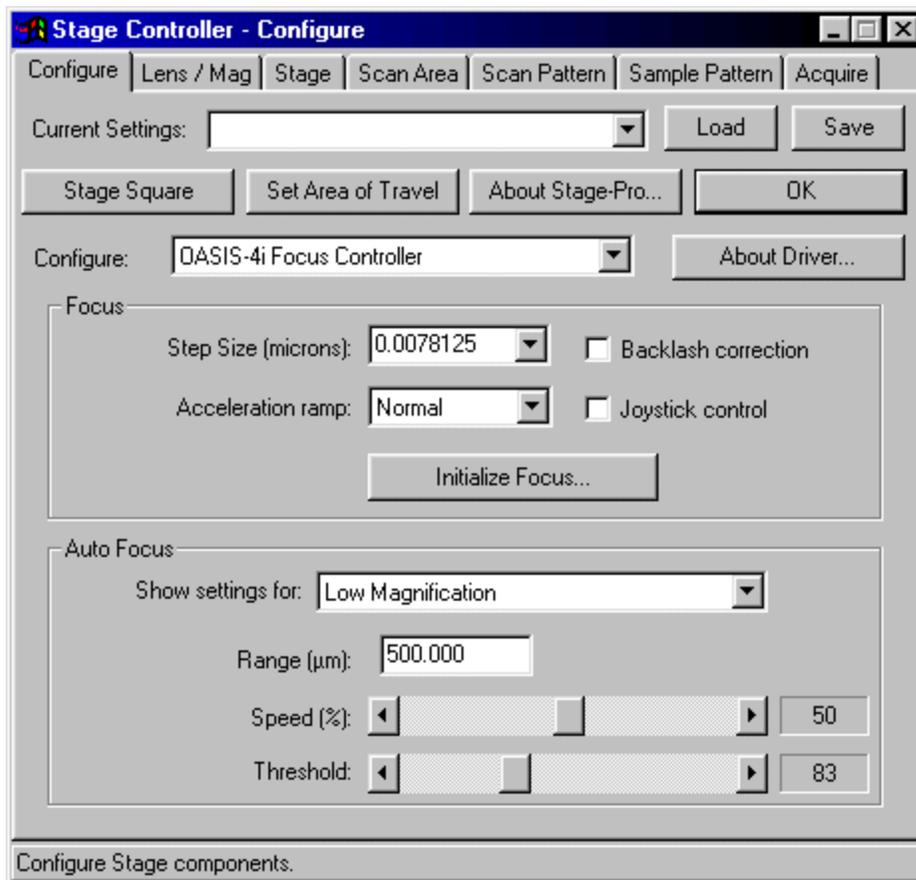
If the OASIS-4i is fitted with an OASIS-AF automatic focus module, the current focus score is also displayed. A horizontal bar graphically displays the focus score. When the focus score is near the current maximum value, the bar turns green. If the focus score is not near the maximum, the bar is blue. To reset the maximum value, click in the bar.

The "Enable auto update timer" option enables the automatic timer that continuously display of the position and focus score values.

Demonstration mode (no hardware access): This selection enables the demonstration mode of the OASIS driver. This allows for simulated operation of the hardware, without any direct communication. This is helpful in demonstration situations when no OASIS hardware may be available or installed.

Configuring the Focus Controller

To configure the focus, ensure that the selection set to "OASIS-4i Focus Controller" as shown in the figure below:



The OASIS-4i Stage Controller configuration settings are:

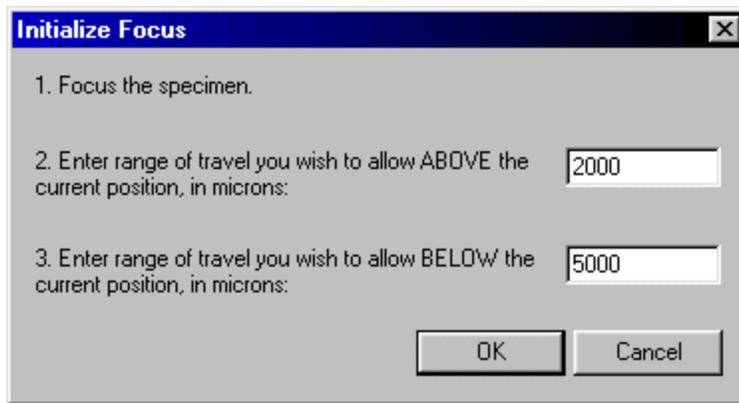
Step Size (microns): This is used to specify the size of each microstep on the fine focus mechanism. For most microscopes, this setting should be set to 0.0078125, which corresponds to the OASIS-4i's 12,800 microsteps per 100-micron revolution of the fine focus control.

Acceleration ramp: This setting specifies the rate at which the axes of the stage are accelerated and decelerated during a move. These may be set to Slow, Normal, or Fast. The Slow setting gives a slowest acceleration and overall speed, whereas the Fast setting uses the maximum acceleration and overall speed. Note that for some stages, too high of speeds and/or acceleration may cause stalling.

Backlash correction: This setting enables the OASIS-4i's internal backlash correction for Z-axis movement. Backlash correction can improve reproducibility of movements by ensure a given position is always from the same direction of travel.

Joystick control: This setting enables the use of a hardware joystick, if it has been fitted to the OASIS-4i controller.

Initialize Focus... This button allows you to specify the allowable range of travel of the Z (focus) axis. You will be shown this dialog:



where you enter the maximum distances of travel allowed above and below the Z-axis origin (i.e., a position value of 0). These values are specified in microns and are useful in helping prevent accidental collisions between the stage and other optical components such as objectives and the condenser.

AutoFocus Configuration

If the system has been fitted with an OASIS-AF module, then you will also see options for setting the automatic focus operations in the OASIS-4i Focus Controller configuration. These options are:

Show settings for: Stage-Pro automatically selects between Low, Medium, and High magnification settings for autofocus operations, based on the currently selected lens. Use this option to select which of the situations you are currently configuring.

Range (μm): This setting specifies the range of travel over which the focus is to be sampled. The OASIS system will move the focus over this range while sampling the focus score in order to determine the optimal focus position.

Speed: This setting defines the rate at which the focus is moved during the automatic focus operation, from 0% (the slowest) to 100% (the fastest). Though faster rates of speed mean that the focus operation takes less time, due to the fixed video rate faster speeds also result in fewer focus score samples for a given range.

Threshold: This setting defines the threshold value used in the calculation of the focus score. Higher threshold values generally lead to lower focus scores, and this has the effect of reducing the effect of noise in the video signal. If the OASIS Position Window is displayed, then you can see how the threshold affects the focus score using the Focus score readout.

Using the OASIS System with Image-Pro and Scope-Pro

Once you have installed the driver, you may proceed to use all the native facilities in Scope-Pro, either through the Scope-Pro and Stage-Pro dialogs, or through Auto-Pro macro functions.

Refer to your *Scope-Pro User Guide for Windows* that was included with your Scope-Pro product for further information.

Special Considerations

Unlike many stage/focus controllers, the OASIS-4i does not use a RS-232 serial communications protocol. Due to its internal design, the OASIS-4i instead takes advantage of the high-speed PCI interface for communication directly with the controller hardware. This provides significantly better performance than is possible with controllers that use the RS-232 interface.

Because a serial port is not needed for the OASIS-4i controller, you may ignore most of the information in the *Scope-Pro User Guide* that refer to Serial Port configuration and setup.

Also, the Auto-Pro/Stage-Pro macro functions **IpStageXYRead**, **IpStageXYWrite**, **IpStageZRead**, **IpStageZWrite**, which provide for reading and writing strings to the controller's serial port, have no effect on the OASIS-4i controller.