

OASIS-4i Installation Guide

Warning!

This board contains static sensitive components. Please take the necessary precautions when handling and installing the board, to prevent damage or malfunction.

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Introduction

Thank you for purchasing the OASIS-4i four axis stepper controller for the PCI bus! The OASIS-4i is an advanced, high-performance controller designed for the most demanding imaging and microscopy applications. The compact PCI form factor ensures a highly integrated solution for automation control.

This guide provides an overview of how to physically install the OASIS-4i card into your system, install the required driver software, and configure the controller for your particular setup.

Note that your OASIS-4i may have been provided as part of an integrated automation system. There may be aspects of your system configuration that are specialized for your application. In these situations, please contact your system vendor for details regarding your configuration before proceeding.

Installation Requirements

In order to install the OASIS-4i card into your system, you will need the following:

- PC with one three-quarter length PCI slot available
- Windows® XP, Windows® 2000, Windows® 95/98/Me, or Windows® NT4.0 operating system
- CD-ROM drive
- One free (hard disk style), power connector, with 2A at 12V available
- Cross-head screwdriver
- OASIS-4i Installation CD

Installation Process

The OASIS-4i installation process consists of three distinct steps:

1. **Hardware Installation.** In this step, you will physically place the OASIS-4i card inside your computer.
2. **Driver Installation.** After installing the hardware, you need to install the driver software so that Windows recognizes the card and application software can use it.
3. **Configuration.** You will need to configure the OASIS-4i card to match your particular system setup.

Once these steps are complete, the OASIS-4i card is generally ready for use. However, if you are using a 3rd party application, you may need to install additional software so that your application package can use the OASIS-4i controller to drive the motorized components of your system. Refer to your application / system documentation for further details on how to configure the application for use with OASIS-4i.

Connector Identification

Refer to the following diagram for information regarding the various connectors available on the OASIS-4i card.

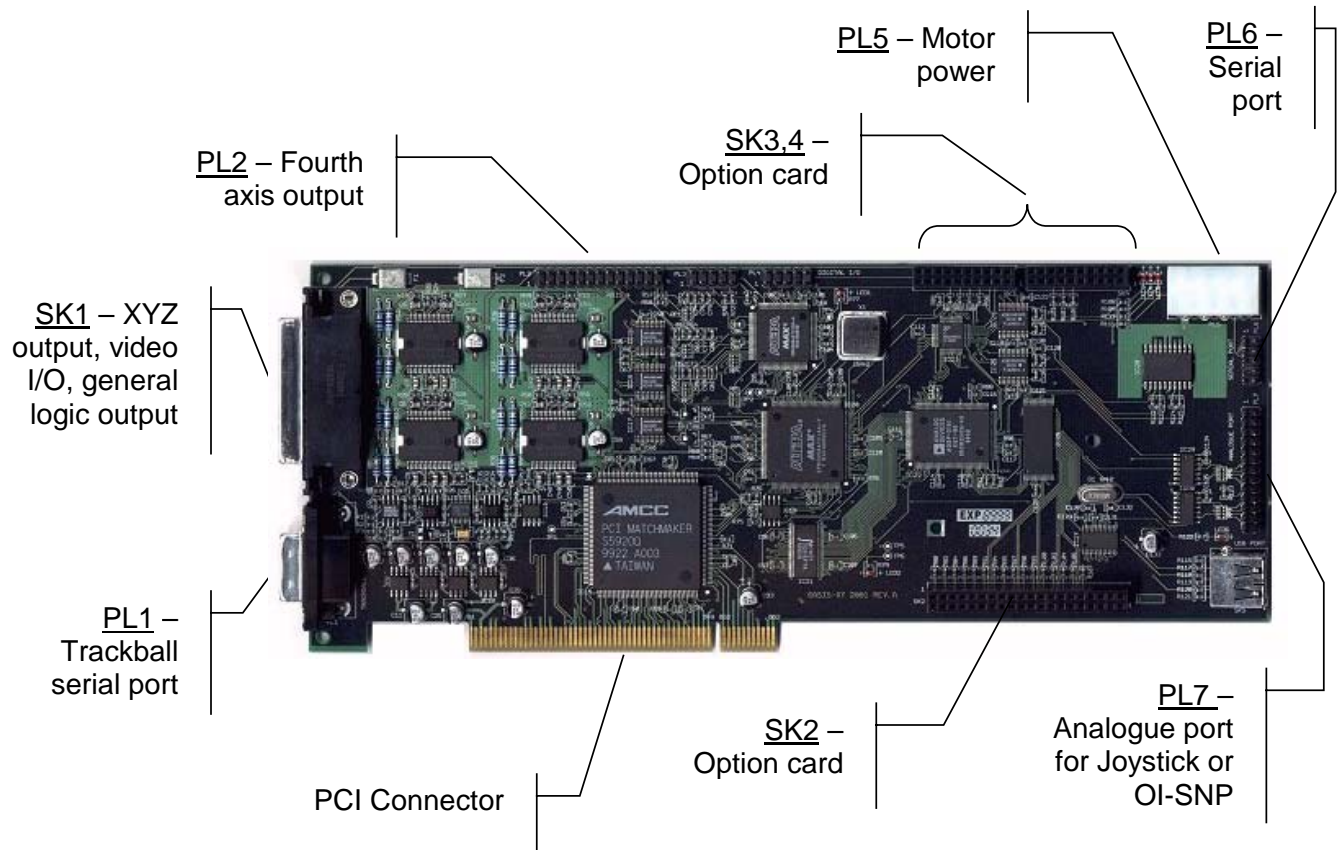


Figure 1. OASIS-4i Connectors

Hardware Installation Procedure

Preparing the PC case

- 1) Switch off the PC and unplug from the mains to disable any standby power.
- 2) Remove the system unit cover or side panel.
- 3) Select a suitable PCI slot with no obstructions (preferably one with adequate air-flow from the auxiliary fan), and remove blanking panel as necessary.

Fitting the card

- 4) Ground yourself to an antistatic mat or other grounded source to discharge static electricity before handling the board.
- 5) Pick up the board (still in its anti-static sleeve), by grasping the metal edge bracket with one hand, and remove the sleeve.
- 6) Taking care to hold the edges of the board, avoiding contact with the electronic components, position it over the PCI slot and locate the tip of the metal bracket in the slot of the PC chassis, before pushing the board firmly but gently home with a slight rocking action.
- 7) Secure the bracket with a retaining screw.

Connecting power and options

- 8a) If intending to use the 4th axis, you will need to fit an adapter plate to another spare slot and the interconnecting cable to PL2 the 4th axis output. Be careful to attach pin 1 of the ribbon cable (with the red stripe), to pin 1 of PL2, which is marked on the board (towards metal bracket).
- 8b) If fitting a joystick or OI-SNP (Leica SmartMove interface), you will need to fit an adapter plate to another spare slot and the interconnection cable to PL7, the Analogue Port. Be careful to attach pin 1 of the ribbon cable (with the red stripe), to pin 1 of PL7, which is marked on the board (towards the power connector).
- 8c) If intending to use the OASIS-XA1 5th axis module, please refer to the OASIS-XA1 documentation for connection details.
- 8d) If intending to use the OASIS-DC1 module, please refer to the OASIS-DC1 documentation for connection details.
- 9) Connect a spare power connector from the PC power supply to PL5 at the rear of the board. Preferably the OASIS-4i should be the only device drawing power from this lead. The on board motor drive components get their power via the +12V from this connector.

Making external connections

- 10) Replace PC system cover or side panel.
- 11) If using a Kensington Expert Mouse 5.0 trackball or other serial control device, connect it to PL1, the 9-pin trackball serial port below the 44-way main connector.
- 12) Connect the appropriate cable from SK1, the 44-way XYZ and video in/out connector, to your desired XY stage, focus adapter(Z) and video source as required. Notice that this 44 way connector is keyed to prevent insertion of an incorrect cable.
- 13) You are now ready to switch on the PC and proceed with the

driver installation for your operating system.

Warning: Do not connect or disconnect motor cables while the PC is powered on. The OASIS-4i card may be applying power to the motors, in which case a connection or disconnection could damage the OASIS-4i card.

Driver Installation Procedure for Windows 2000/XP

- 1) Switch on PC and boot into Window.
- 2) The 'Add New Hardware Wizard' should appear.
- 3) Select 'Search for best driver for your device' and press next.
- 4) Insert OASIS-4i installation CD into your CD-Rom drive and select 'Specify a Location' with 'D:' as the source for the driver. (Where D: is the CD-Rom drive letter).
- 5) Windows should find 'OASIS-4i : 4-axis PCI Stage Controller'. Press next.
- 6) After drivers and dll's have been copied to the relevant directories, press 'Finish'.
- 7) Re-boot the PC before operation of the board and/or installation of the SDK or other software.
- 8) A 'WinDriver Virtual Device' may be found after a re-boot. If so, a suitable driver is included in the 'Drivers' folder of the OASIS-4i installation CD.

Driver Installation Procedure for Windows 98/Me

- 1) Switch on PC and boot into Window.
- 2) The 'Add New Hardware Wizard' should appear.
- 3) Select 'Search for best driver for your device' and press next.
- 4) Insert OASIS-4i installation CD into your CD-Rom drive and select 'Specify a Location' with 'D:' as the source for the driver. (Where D: is the CD-Rom drive letter).

- 5) Windows 98 should find 'OASIS-4i : 4-axis PCI Stage Controller'. Press next.
- 6) After drivers and dll's have been copied to the relevant directories, press 'Finish'.
- 7) Re-boot the PC before operation of the board and/or installation of the SDK or other software.

Driver Installation Procedure for Windows NT

- 1) Boot into Windows.
- 2) Run the program called 'Oasis4i_Setup.exe', which is located in the root directory of the CD. This will install, register and start the driver.
- 3) It will be necessary to re-boot before using the board or installing the SDK or other software.

Configuring the OASIS-4i controller

The OASIS-4i controller is designed to work with a wide range of different types of automation hardware. For instance, there are a number of manufacturers of XY motorized stages for microscopes, and each manufacturer uses different styles of connectors, wirings for limit switch logic, and other features specific to their make and model of stage.

In order to drive these different types of hardware, the OASIS-4i controller must be configured accordingly. Most of these configuration settings are stored in the onboard flash memory of the OASIS-4i card, permitting the correct startup conditions when the card is powered up and initialised.

OASIS Configuration Wizard

The easiest way to configure the card is to run the OASIS Configuration Wizard (Figure 2). The wizard provides step-by-step instructions for defining the settings most appropriate for your particular system.



Figure 2. OASIS Configuration Wizard.

The wizard includes a listing of the various makes and models of XY stage, focus drives, and filter wheels, and can setup the card based on known default values for the particular device. The wizard can also auto-detect the settings of your particular systems—such as limit switch polarity, axis and limit directions, and encoder settings (if fitted)—by performing various movements to test and measure your system's characteristics.

OASIS Flash Memory Configuration Utility

Individual flash memory settings may be modified using the OASIS Flash Memory Configuration Utility (Figure 3).

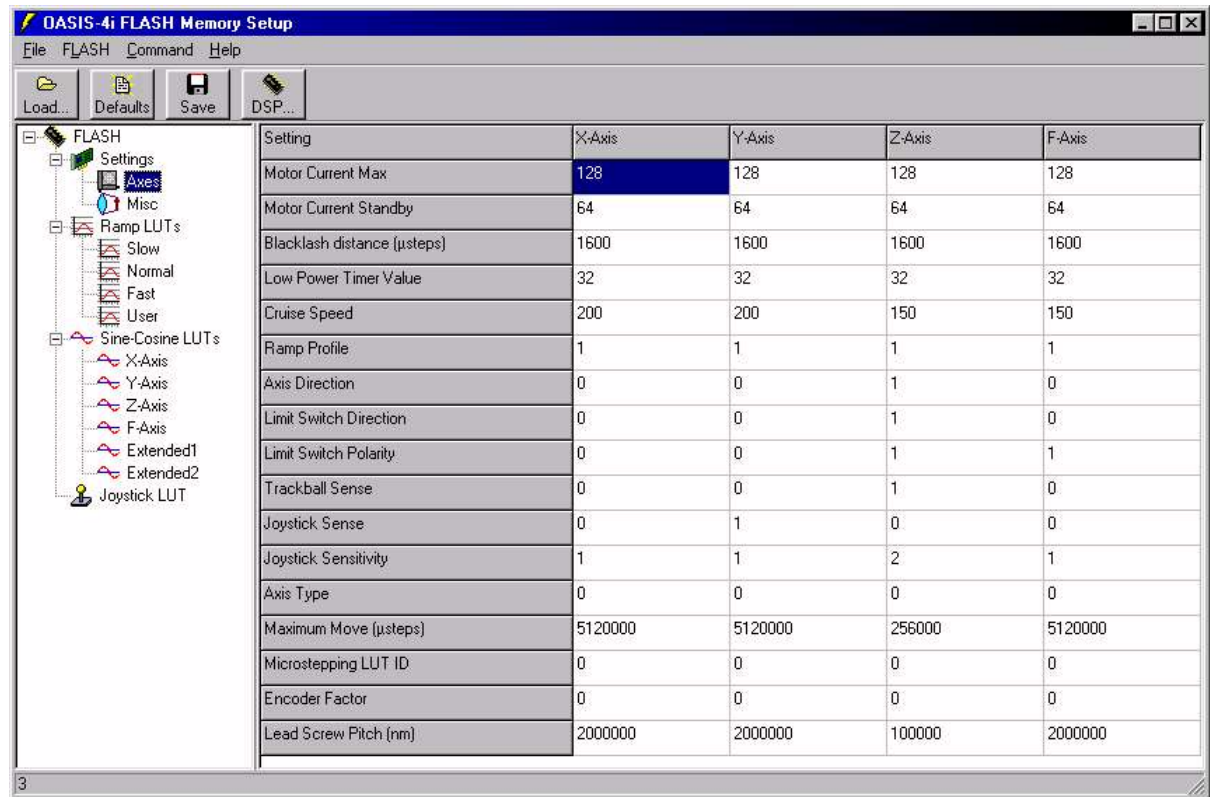


Figure 3. OASIS Flash Memory Configuration Utility.

The flash configuration utility provides a means to adjust the following settings for each axis:

- Maximum motor current
- Standby motor current
- Backlash correction distance
- Standby power timer interval
- Power-on cruise speed
- Power-on ramp profile
- Axis direction (clockwise or counter clockwise)
- Limit switch direction
- Limit switch polarity
- Trackball sense (direction)
- Joystick sense (direction)
- Joystick sensitivity
- Axis Type
- Maximum acceptable move command distance
- Microstepping setup
- Encoder setup
- Calibration leadscrew pitch

Also, advanced settings such as autofocus settings, acceleration ramp tables, motor drive tables, and joystick deflection tables are defined in the OASIS-4i flash memory.

What Next?

Once the OASIS-4i card has been installed and configured, the next step depends on your situation.

If you are the user of a 3rd party imaging application, you would next need to perform any further installation required to support the OASIS-4i card within your application. Please refer to your imaging application's documentation for further instructions.

If you are a developer of applications that will use the OASIS-4i controller, you should next install the OASIS-4i SDK from the OASIS CD. This will copy the full OASIS software utilities, libraries and include files, and support documentation to your development system. Please refer to the OASIS-4i SDK DLL manual for further details regarding integration of the OASIS-4i into your system software.

If You Need Help

As mentioned in the Introduction, if your OASIS-4i controller was provided as part of an integrated solution, your first contact should be to your system vendor. They will be most familiar with your overall system and any specialized configuration details.

To contact Objective Imaging directly, please visit www.objectiveimaging.com for contact details for your area.

Troubleshooting Guide

<i>Problem</i>	<i>Possible Causes</i>	<i>Solution</i>
OASIS-4i card not detected by Windows; Plug-and-Play does not find OASIS-4i card	<ul style="list-style-type: none">• Card not fully seated into PCI slot• Conflict with another card on PCI bus	<p>Ensure card is fully seated into PCI slot along entire length</p> <p>Move OASIS-4i card to another free PCI slot</p>

<i>Problem</i>	<i>Possible Causes</i>	<i>Solution</i>
OASIS-4i card is listed as an unknown PCI device in Windows Device Manager	<ul style="list-style-type: none"> • OASIS-4i driver not installed 	Perform driver installation procedure
My 3 rd party application software cannot recognize OASIS-4i card	<ul style="list-style-type: none"> • OASIS-4i driver not installed • Application's support library for OASIS-4i card not installed 	<p>Perform driver installation procedure</p> <p>Run application's motorized controller installation procedure; refer to the application documentation for further details</p>
My 3 rd party application recognizes the OASIS-4i card, but the motors are not working	<ul style="list-style-type: none"> • Motor power not connected • Motor cable connectors disengaged or faulty • OASIS-4i is not properly configured for the type of automation hardware fitted • Axis positions are outside the limits of travel 	<p>Ensure OASIS-4i motor power connector (PL5) is fitted with a power supply plug</p> <p>Ensure motors are connected fully fitted at OASIS-4i connector SK1 and at motor end of cables</p> <p>Run OASIS configuration wizard to setup the card for your system</p> <p>Run OASIS configuration wizard or 3rd party application options to initialize the axis coordinate system</p>
The system is stalling when making movements	<ul style="list-style-type: none"> • Insufficient power to motor drives • Insufficient power to motor drives 	<p>Adjust maximum motor current using the OASIS Flash Memory Configuration utility</p> <p>Use parallel motor windings to increase current in motor phases</p>

<i>Problem</i>	<i>Possible Causes</i>	<i>Solution</i>
	<ul style="list-style-type: none"> • Insufficient power to motor drives • The drive leadscrew is damaged 	<p>Increase motor drive voltage using external 24V power supply</p> <p>Contact automation mechanics manufacturer for service details</p>
The XY stage does not halt when a physical limit is reached	<ul style="list-style-type: none"> • Limit switch direction is incorrect for stage type 	Run OASIS configuration wizard to auto-detect limit switch direction and polarity
An axis is not moving the correct distance when attempting to step a known amount	<ul style="list-style-type: none"> • Axis calibration incorrect • The axis is stalling • Encoder, if fitted, is configured incorrectly 	<p>Set axis pitch or step size using OASIS or 3rd party application software</p> <p>See troubleshooting section for stalling during movement</p> <p>Run OASIS configuration wizard for encoders or define encoder settings using OASIS Flash Memory Configuration utility</p>
The Joystick is not working	<ul style="list-style-type: none"> • Internal cable connection error 	Verify internal connection from joystick cable connector plate to PL7 on back end of OASIS-4i card; ensure red stripe on ribbon cable is aligned to Pin 1 on connector PL7