OASIS-blue Installation Guide

Rev. A

Warning!

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

Please take care not to overstress the high-density front-panel connectors.

Do not plug or unplug motors while the board is powered-up, as this may damage the controller.

Introduction

The OASIS-blue is a universal PCI card designed to control and drive directly, without additional power supplies or amplifiers, up to four stepper motors, of the two or four phase variety, suitable for micro-stepping. Typical motors have a 1A to 2A per phase current rating, and an impedance of 3 to 4 ohms per phase. The power supplied to the motors is typically, although not necessarily, provided by the PC 12V supply. It is possible to set the maximum phase current for each motor to anything from 0A to 1.5A as desired, but thought should be given to the load on the PC power supply 12V rail. It is normally possible, and indeed desirable, to set the motor drive current to a lower value than the stepper-motor rating, assuming this can be done without the motor stalling. The default factory settings are 0.6A per phase peak current, which works well with nearly all stages, focus motors and filter-wheels. Consideration should also be given to cooling of the OASIS-blue. If the board is typically used with several motors being driven continuously, it may be necessary to provide extra cooling in the form of a nearby auxiliary fan. Most PC's have one or have a space where one can be fitted. In addition the optional OASIS-B-IM card is available to fit in an adjacent PCI slot (where possible), and has a cooling fan provided for this purpose.

Once the driver for your particular operating system has been installed, it may be necessary to run the OASIS Configuration Wizard, '\Utils\OIConfigWiz.exe', in order to setup the OASIS-blue to match your hardware configuration. More advanced settings can be adjusted using the '\Utils\OIFlashCfg.exe' utility program. Having set the board up to suit your hardware, all the functionality may be tested using the '\Utils\OASIS.exe' application. This program is useful to test functionality and diagnose problems.

Please look in the \Docs folder of the OASIS Installation CD for further information such as connector pinouts or software examples, or look at our website (**www.objectiveimaging.com**) for the latest documentation and software updates.

Installation Requirements

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

- PC with a half-length PCI or PCI-X slot available

- Windows® XP, Windows® Vista® or Windows® 7 operating system

- CD-ROM drive

- One free (hard disk style), power connector, with 2A at 12V available

- Cross-head screwdriver

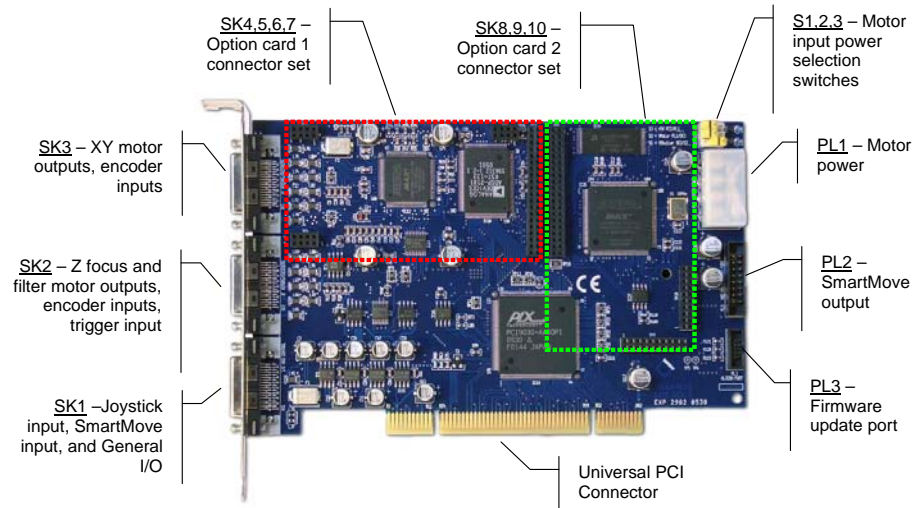- OASIS Installation CD

Installation Process

The OASIS-blue installation process consists of three steps:

1. **Hardware Installation**. In this step, you will physically place the OASIS-blue 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-blue card to match your particular system setup.

Once these steps are complete, the OASIS-blue 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-blue 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-blue.

Connector Identification

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

SK4,5,6,7 – Option card 1 connector set

SK8,9,10 – Option card 2 connector set

S1,2,3 – Motor input power selection switches

SK3 – XY motor outputs, encoder inputs

PL1 – Motor power

SK2 – Z focus and filter motor outputs, encoder inputs, trigger input

PL2 – SmartMove output

SK1 –Joystick input, SmartMove input, and General I/O

PL3 – Firmware update port

Universal PCI Connector

Hardware Installation Procedure

Preparing the PC case

1) Switch off the PC and unplug it from the mains to disable any standby power.

2) Remove the system unit cover or side panel.

3) Select a suitable PCI or PCI-X 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

8) If necessary, fit any daughter modules and their external connections.

9) Connect a spare power connector from the PC power supply to PL5 at the rear of the board. Preferably the OASIS-blue 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, in addition attached shutters may also use the +12V and +5V from this connector. There is an extension cable provided with the OASIS-blue in case the PC cable is too short.

Making external connections

10) Replace PC system cover or side panel.

11) Connect a joystick or other compatible control device to SK1 (marked I/O on front panel) as required.

12) Connect the XY stage cable to SK3 (marked X/Y on front panel), and the Focus and Filterwheel cable to SK2 (marked Z/F on front panel) as required.
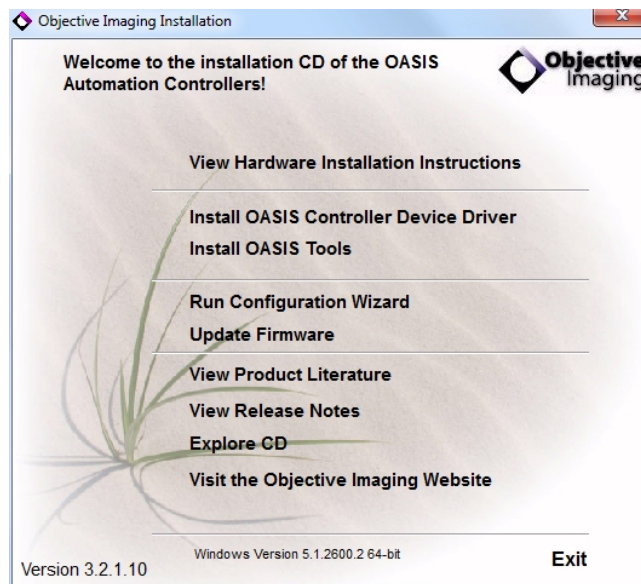
NOTE: **All three front-panel connectors are identical and are not keyed, so take care to fit the cables correctly. If you do not, the OASIS-blue will sense that they are fitted incorrectly and disable functionality for those connectors.**

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-blue card may be applying power to the motors, in which case a connection or disconnection could damage the OASIS-blue card.

Driver Installation

1) Switch on PC and boot into Windows.

2) If the 'Add New Hardware Wizard' appears, choose Cancel.

3) Insert the OASIS Installation CD or navigate to the folder where you downloaded and unzipped the installation download.

4) Run the '**Setup.exe**' from the installation disk or from the root folder of the software download.

5) Click on the '**Install OASIS Controller Device Driver**' option. A message will indicate the drivers were installed and registered correctly.

6) Click on the '**Install OASIS Tools**' option to install the Configuration Wizard, the Flash Configuration program and the OASIS Application utility. These utilities will be useful in configuring the OASIS-blue controller for your particular hardware situation.

Configuring the OASIS-blue to match different hardware

Insert the OASIS Installation CD and wait for the menu screen to auto-load. Select ' Run Configuration Wizard' and follow the on-screen instructions. Some parts of the process take a few seconds, so please be patient after pressing the 'next' button, otherwise you may skip past an important dialog. The 'Auto-detect XY' section will move the stage to it's limit switches, so make sure this will not cause any damage to lenses etc. before going ahead. By selecting an XY stage type, you tell the wizard the size of the stage. This fact is used to calculate the lead-screw pitch (how far an axis moves for one turn of the motor). If the stage type is incorrectly specified, or is not present in the list, it is not serious, but the lead-screw pitch may be calculated incorrectly. In this case it is necessary to manually enter the correct lead-screw pitch to ensure correct software calibration. Please consult the information provided by the stage manufacturer. The stage limit switch polarity and orientation will be automatically noted and programmed into the OASIS-blue Flash memory, so that it is not necessary to repeat this process unless the stage type is subsequently changed. The preferred direction of travel for each axis can be set using the wizard, to suit the hardware configuration. The defaults generally suit a microscope with the camera oriented in such a way that the view on the monitor is the same as the view through the eyepieces, and with a motorised focus adapter mounted on the left hand side. The 'Axis pitch' setting in the focus dialog should be set to the distance Z is raised or lowered for one turn of the motor. This is usually one turn of the microscope fine focus knob, which is usually calibrated in microns (typically 100 microns per revolution).

Updating the OASIS-blue DSP code

The DSP firmware on the OASIS-blue is stored in flash memory which can be updated as necessary. The Installation CD contains the current DSP version in the \Utils folder (OASIS-blue_DSP_V1.00.bnm or similar). In order to perform a flash update it is necessary to run the Flash Configuration Utility 'OIFlashCfg.exe', also found in the \Utils folder. At the top of the screen is an Icon labelled 'DSP', press this and a file selection dialog appears. Select the appropriate file and if it appears to be valid the flash memory will be updated. Note: Please make sure no other applications (such as the Configuration Wizard etc.) are running whilst using the Flash Configuration Utility, or corruption of the flash memory may occur. All recent versions of the Installation CD will not allow the Flash Configuration Utility to run whilst another application is active.

Federal Communications Commission

NOTE: This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications to this product not expressly approved by the party responsible for the compliance, could void the user's authority to operate the equipment.