

## Using the CAIRN Optoscan with DAC Interface

**Document ID**  
T10256

**Created**  
11-Jul-2001

### Abstract

Cairn Research makes a monochromator called the Optoscan. This device features a rapidly variable center wavelength, as well as rapidly variable input and output slits. The latest version of the Optoscan can be controlled via a DAC card that requires one PCI slot in the computer. The DAC card uses three analog output channels to control the various features of the monochromator.

### Instructions

#### Requirements

To use the DAC Interface version of the Optoscan, you must be running Meta Imaging Series version 4.6.4 or later, as well as you must have a free PCI slot in your computer.

#### Installation Instructions

Please follow these instructions carefully to install the hardware and software.

- ♦ Do not install the PCI card yet!
- ♦ The Cairn comes with a DT331 PCI card and software for it on the Data Translation OmniCD. Install the DT software by clicking on "Install Products" when the CD launches. If the CD does not start automatically, then browse to the CD and double-click the LAUNCH program on the CD.
- ♦ After you click "Install Products", click on "Device Drivers". This will bring up another installation program. Click Next-> until you get to the "Select Components" screen. On this screen, choose the DT330 Series Software checkbox, this is towards the bottom of the list. Press Next-> until the installation completes. Then press "Finish".
- ♦ Now you are back at the "Install Products" screen. Click on "Quick Data ACQ". This will bring up another installation program. Press Next-> until the install completes. Then press "Finish".
- ♦ Exit the "Install Products" screen.
- ♦ Shutdown Windows and the computer.
- ♦ Install the DT331 PCI card.'
- ♦ Startup the computer. When Windows starts, it will bring up the Found New Hardware Wizard. When you get to the screen where it asks you to Locate Driver Files, clear all the checkboxes except for "Specify a location". Then press Next->.
- ♦ Press the Browse button and locate the driver file, which is called DT330.inf. This file is located in the \Products\Core\DT330 directory on the Data Translation OmniCD CD-ROM. Complete the driver installation.
- ♦ To verify that the board is installed, you can check the following: Use the System Control Panel, click on the Hardware tab, and click on the Device Manager button. There will be an entry in the device manager called "DT-Open Layers Data Acquisition Devices" and beneath that, "DT331". Exit the Device Manager.
- ♦ There will also be a new control panel called Open Layers Control Panel. If you click that you will

**Keywords:** cairn optoscan

**Issue Type:** Hardware

---

see the "DT331" in the board list. Exit the control panel.

### Configuring the Hardware Driver for Meta Imaging Series Applications

- ♦ Start up the Meta Imaging Series Administrator. Press the Configure Hardware button and then press Configure Devices. Press the Hardware Drivers button.
- ♦ Find "Cairn Optoscan" in the device list, and press Add->. You will be presented with a dialog that asks you whether you want to use the "Serial Port and Parallel Port" or the "DT 33X Series DAC Board" as the interface type. Choose the latter (the DAC board). At the bottom of the dialog the text will read "Monochromator controller: NOT USED". This means that you do not need the controller box when using the DAC board, as all the control signals are generated by the board, and the controller box is not necessary. Press the Configure button.
- ♦ The DT331 card name will appear at the top of the dialog.
- ♦ The Wavelength, Input Slit, and Exit Slit fields are for entering in pre-defined positions for up to 8 settings. These settings will be available as a logical "filter wheel". They serve as a shortcut for being able to switch between up to 8 settings of grouped wavelength, input, and exit slit settings. These shortcuts are also essential if you want to use Device Streaming to change not only the wavelength but also the slit values. If you are not using these settings, then no values need to be entered

### Optoscan Components

The Optoscan with DAC interface has 5 components. These components are:

- ♦ Optoscan Exit Slit Width - a continuous control that lets you set the physical opening width of the exit slit. This is typically used in the "intensity" field of the Illumination MetaDevice.
- ♦ Optoscan Input Slit Width - a continuous control that lets you set the physical opening width of the input slit. This is typically used in the "intensity" field of the Illumination MetaDevice.
- ♦ Optoscan Position - a "filter wheel" control that lets you switch between the logical settings defined in the hardware configuration dialog. This is typically used in the "wavelength" field of the Illumination MetaDevice.
- ♦ Optoscan Shutter - a "shutter" control that shutters the lamp on/off by closing or opening the input slit. This is typically used in the "illumination control" field of the Illumination MetaDevice.
- ♦ Optoscan Wavelength - a continuous control that lets you set the center wavelength by moving the galvanometer. This is typically used in the "wavelength" field of the Illumination MetaDevice.

### Creating MetaDevices

The primary MetaDevice is an Illumination MetaDevice which has the Optoscan Wavelength as the wavelength control, the OptoScan Input Slit Width as the intensity control, and the Optoscan Shutter as the illumination control. Name this MetaDevice as "Optoscan".

The next MetaDevice is an Illumination MetaDevice which just has the Optoscan Exit Slit Width as the wavelength control, with the other two controls empty. Name this MetaDevice as "Bandwidth". The last MetaDevice is an Illumination MetaDevice which has the Optoscan Position as the wavelength control, the intensity control is empty, and the Optoscan Shutter as the illumination control. Name this MetaDevice as "Optoscan FW".

### Using the MetaDevices in Meta Imaging Series Applications

Select the "Bandwidth" MetaDevice to set the bandwidth; this is going to be an approximation of the bandwidth as the actual bandwidth depends on the center wavelength and the input slit as well, but it can serve as an approximation. Select the "Optoscan" MetaDevice to control the center wavelength and relative intensity, and to shutter the device on and off. When Device Streaming, use the "Optoscan FW"

---

MetaDevice. This will let you switch between various positions while streaming, where each position is a setting of wavelength, input slit, and exit slit.