IMAGING WORKBENCH

Software for Multichannel Dynamic Fluorescence Image Acquisition and Analysis

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Imaging Workbench Application Note 8

Pin Connections for Device Control and DIO-3

Imaging Workbench 5 can control several devices using a parallel output port of the computer, as shown in Table 1. A convenient method of making connections to these devices is provided by the DIO-3 Cable Interface, that includes a “break-out box” and a 25-wire cable. The cable brings all lines of the parallel output port to the two DB-25 connectors on the box. Certain lines are also brought to BNC connectors.

Name	Purpose
Sutter Instruments Lambda DG-x and 10-x series	Control the Lambda DG-4, the filter wheel and shutter of the Lambda 10-x, and the wheel of the Lambda 10. The shutter of the Lambda 10 is controlled by the Shutter control line of the DIO-3.
Trigger In	Allows synchronization of continuous or episodic recording by Imaging Workbench with other data acquisition or stimulation hardware and software. An example application is simultaneous synchronized episodic recording made with Imaging Workbench and the Digidata 1200 or 13xx series from Axon Instruments under control of the pCLAMP or AxoScope software. Used if IW is the slave and the other system is the master when using hardware triggering. See Imaging Application Note 5 in the Imaging Workbench Users Guide.
Trigger Out	Similar purpose as for Trigger In described above, but used if IW is to act as master and the other system as slave when using hardware triggering. See Imaging Application Note 5 in the Imaging Workbench Users Guide.
Shutter	Control the shutter on the Lambda 10 and other shutter units.
Auxiliary	Other functionality, e.g. as a digital output bit that can be controlled when running IW.

Table 1: Devices controlled by Imaging Workbench 5 via the DIO-3 and a parallel output port.

Installation

Connect the 25-pin cable supplied with the DIO-3 Cable Interface to any parallel port on the back of the computer. Connect the other end of this cable to the DIO-3. Connect the DIO-3 output lines you need to the appropriate devices as described below.

Connecting to the Sutter Instrument Lambda DG-xx and 10-x Wavelength Switchers

Use the DB-25 cable supplied with the wavelength switcher. Plug one end into the DB-25 connector labeled TO LAMBDA SERIES on the DIO-3. Plug the other end into the wavelength switcher or controller.

Configuring Imaging Workbench 5

Once all the connections are established, identify the parallel port (e.g. LPT1) you are using for the DIO-3. Enter this information in the *Configure* | *Choose Wavelength Controllers* | *Control Port* field. For further help, contact INDEC BioSystems (see the Imaging Workbench Users Guide or the Web site *www.imagingworkbench.com*).

Wiring Connections

The 25-wire cable connects each pin of the PC parallel port to the corresponding pin on both the input DB-25 connector of the DIO-3, labeled “Computer Parallel Port”, and the output DB-25 connector, labeled “Sutter Instruments Lambda Series”. Pin 1 of the PC parallel port is connected via the DIO-3 to Pin #1 on both the input and output DB-25 connectors, similarly for Pin #2, and so on. In addition, several lines are also brought to BNC connectors, as shown in Table 2.

DIO-3 DB-25 Pin #	DIO-3 BNC #	BNC Label
1	BNC #1 Center	Integrate
18	BNC #1 Shield	
13	BNC #2 Center	Trigger In
19	BNC #2 Shield	
14	BNC #3 Center	Shutter
20	BNC #3 Shield	
17	BNC #4 Center	Trigger Out
21	BNC #4 Shield	
16	BNC #5 Center	Auxiliary
22	BNC #5 Shield	

Table 2: Connections between the DB-25 connectors and the BNC connectors on the DIO-3 breakout box.

Digital Outputs from Imaging Workbench 5

Pin #16 (Auxiliary) is used for the Digital Output bit defined in the *Acquire* | *Edit Protocol* | *Mode/Rate* tab.

Controlling other Wavelength Control Devices

Imaging Workbench 5 can control a number of other wavelength switching and shutter devices using the Shutter and Auxiliary control lines available on the DIO-3. Contact INDEC BioSystems Technical Support for more information.