

SPECIFICATIONS

3xDAC Card

The 3xDAC card is designed for controlling galvano-controlled servo mirrors or XYZ piezo-controlled devices utilized in fluorescence microscopy: when using the mirrors, their XY positions (that is the position of the excitation beam on the sample) and the z-position of the microscope objective are recorded along with the fluorescence data acquired; when using a piezo-controlled stage, its position is recorded during the data acquisition.

The card is designed for the ISS confocal microscopes systems although it can be utilized to assemble a custom system. The 3xDAC card works in synchronization with the 4-CH correlator card (utilized for FFS measurements), the FastFLIM and TCSPC cards (utilized for FLIM and FFS measurements).

Scan Mode and Alignment Mode

The board features two modes of operation: *scan mode* and *alignment mode*.

In scan mode, the three servo mirrors have pre-programmed movement sequences which are executed automatically. The starting point of the sequences within the movement range of the servo mirrors is controlled by a separate offset control. The offset control can only be updated when the sequence restarts. Scan mode is used for XY-, XZ, and YZ image scans.

In alignment mode, the control of the three servo mirrors is completely under user control. This mode is used to set the “zero” of the servo mirrors and park the beam in the center or other locations of the image after acquisition.

Applications of the 3xDAC card using VistaVision software

When the 3xDAC card is used with the ISS Vista software, a series of experimental setup are feasible:

- control of galvano-controlled XY mirrors for the acquisition of confocal images
- control of galvano-controlled XY mirrors for scanning FCS
- control of galvano-controlled XY mirrors and piezo controlled objective or stage in Z for particle tracking
- the acquisition of Fluorescence Fluctuations Spectroscopy data (in conjunction with the correlator card)
- full control of the XYZ piezo-controlled stage

BOARD SPECIFICATIONS

Feature	Description
Bus	32-bit PCI bus
Software driver	Windows 10 OS
Digital-to-Analog Converters	16 bit
External CLK	Frequency: 5 MHz to 22 MHz (10MHz nominal)
	Signal type: sine wave or TTL
	Signal amplitude: 100 mV _{pp} to 10 V _{pp}
	Signal impedance 50 Ohm
CLK Output	Qty. 2, 20 MHz (buffered TTL with 50 Ohm driver)
Pixel CLK	TTL with 50 Ohm driver
Line CLK	
Frame CLK	
Position DAC	X, Y and Z
	Resolution: 16-bit
	Output voltage range : ± 12 V
	Output impedance : 50 Ohm
	Output current: 25 mA
	Slew rate: 1.9 V/ μ s
	Low pass filter: 10 KHz
Gain DAC	Channels: 3
	Resolution: 8 bit
	Effective voltage range: 160 mV
Null-Offset	Channels: 3
	Effective Voltage Range: 160 mV
	Resolution: 8-bit
Operation temperature range (°C)	10-60
Power	110/240 V
Dimensions (cm)	42.5 (W) x 36 (D) x 10 (H)

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