

OptoSpin operation via external control – supplementary notes (Including external operation in NIS Elements)

The OptoSpin filter wheel can be stepped to each position via external TTL signals in imaging software packages with an appropriate data interface via the DIG I/O 25-way D-connector on the OptoSpin power supply. Up to two filter wheels can be operated in this manner, from a single dual channel power supply.

This document provides a brief summary of hardware connections and operation via this external mode for a variety of different TTL input devices. Please refer to the technical document **OptoSpinManualJan2019** for more detailed information.

1. OptoSpin external control with supplied Cairn National Instruments data interface

Hardware Connections

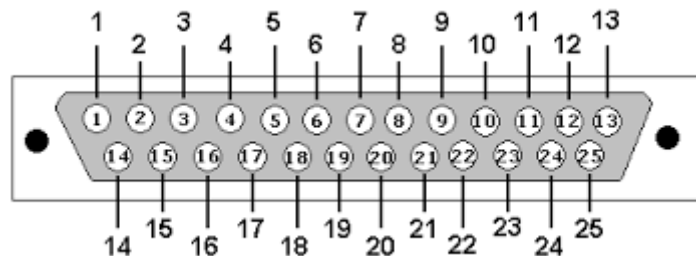
Connect the 'AUX' 25-way D-connector on the National Instruments USB-6501 or USB-6001 Data Interface to the 'DIG I/O' connector on the rear of the OptoSpin power supply via the ribbon cable provided.

Hardware control

Filter positions 1 to 6 are encoded by bit values ranging from 001 to 110 respectively. When the "Step Command" input goes high, any wheel that is not currently in the specified position will step to it. A bit value of 000 (where logic 0 is the default state of any unconnected input) is interpreted as "stay at current filter position".

The supplied data interface is typically connected as follows:

25-way D-connector pin	NI connection	Wheel number	Encoded bit
1	P2.0	1	0
14	P2.1	1	1
2	P2.2	1	2
15	P2.3	2	0
3	P2.4	2	1
16	P2.5	2	2
17	P2.7	Both	Step Command



Corresponding wheel positions (Bits)

Filter 1: 001

Filter 2: 010

Filter 3: 011

Filter 4: 100

Filter 5: 101

Filter 6: 110

2. OptoSpin external control in NIS Elements with supplied Cairn National Instruments data interface

When supplied specifically for NIS Elements, the National Instruments USB-6501 (or USB-6001) is connected slightly differently, although the connections and principles of the bit operation and step command are the same.

For Elements, the supplied data interface is connected as follows:

25-way D-connector pin	NI connection	Wheel number	Encoded bit
1	P2.0	1	0
14	P2.1	1	1
2	P2.2	1	2
15	P2.4	2	0
3	P2.5	2	1
16	P2.6	2	2
17	P2.3	Both	Step Command

Cairn OptoSpin Connection

Connection

☐ USB
☒ DIG I/O (TTL via NIDAQ)

NIDAQ Settings

Card

USB-6501 - Dev1

☒ TTL Line
☐ Analog Line

Control

☐ One Wheel (ROTOR1)

4 lines are required

☒ Two Wheels (ROTOR1+ROTOR2)

7 lines are required

DIG IO Pin/Line

1

Dev1/port2/line0

14

Dev1/port2/line1

2

Dev1/port2/line2

17

Dev1/port2/line3

15

Dev1/port2/line4

3

Dev1/port2/line5

16

Dev1/port2/line6

☐ Enable Triggering:

/Dev1/PFI0

OK

Cancel

Please note – the Triggering function is not enabled when using the NI USB 6501 / 6001 data interfaces, so leave this box unchecked.

3. OptoSpin external control by an alternative DIG I/O device

Upon request, the OptoSpin can be supplied with the 25-way D-connector cable terminated with BNC cables, or bare ends to use with screw terminals on an auxiliary device, such as an Arduino microcontroller.

In this instance, the following connections are labelled on the 25-way cable:

25-way D-connector wire	Label	Wheel number	Encoded bit / signal
1	Bit 0	1	0
14	Bit 1	1	1
2	Bit 2	1	2
15	Bit 0 (2)	2	0
3	Bit 1 (2)	2	1
16	Bit 2 (2)	2	2
17	GO	Both	Step Command
24	HIGH	Either	Ready to Step again
25	GROUND	n/a	Ground line

Please contact us if you have any questions or need further assistance during setup or operation
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