OASIS-4i to Ludl XYZ and Heidenhain Encoder Interface (OI-2024) Rev. A User Guide

Introduction

This unit is designed to provide an easy connection route between the OASIS-4i PCI stage controller card and Ludl BioPrecision stages and focus adapters. In addition the unit provides buffering and interpolation for Ludl rotary encoders and Heidenhain (or similar) linear encoders.

Connector Description

Referring to the picture above, the top three 15 way male D-type connectors are for X, Y and Z encoders which work on the complementary TTL or RS422 format, such as Heidenhain and Renishaw linear types. The pinout is designed to be directly compatible with Heidenhain encoders, however please note, that due to a PCB error, the male connectors are wired like a female 15 way D-type. This means that pin 1 has the signal intended for pin 8, pin 2 for pin 7 etc.
Please use the short adapter cables with a revision A unit (which can be determined by looking at the first letter of the serial number), to fix this problem. The pin-out information for these connectors (when using the adapter cable) is as follows :-

Pin no.	Signal
1	encoder A+
2, 10	0V
3	encoder B+
4, 12	+5V
9	encoder A-
11	encoder B-

The lower three female 15 way D-type connectors are for direct connection to Ludl X, Y and Z axes. They each provide power and signal connection for Ludl rotary encoders (TTL).
The pin-out information for these connectors is as follows :-

Pin no.	Signal
1	encoder channel A
2	encoder channel B
3,4	0V
7	+5V
8	Limit -
9	Limit +
10	Motor phase 1 out
12	Motor phase 1 in
13	Motor phase 2 out
15	Motor phase 2 in

The two BNC connectors on the right of the unit provide a means of inputting standard video to the OASIS-4i, for video processing or autofocusing, and a buffered video output signal.

Configuring the Unit

On the underside of the unit there are 8 DIP-switches which allow the selection of either rotary (via the motor connector), or linear (via the separate encoder connector) encoder type, for each axis, and

also whether or not the encoder signals should be used directly or interpolated by a factor of 4, before being fed to the OASIS-4i.
The switches, reading from left to right, have the following functions:-

Switch	OFF	ON
1	X Encoder Direct	X Encoder with 4x Interpolation
2	Y Encoder Direct	Y Encoder with 4x Interpolation
3	Z Encoder Direct	Z Encoder with 4x Interpolation
4	Test use only	
1	X Encoder Linear (RS422)	X Encoder Rotary (TTL)
2	Y Encoder Linear (RS422)	Y Encoder Rotary (TTL)
3	Z Encoder Linear (RS422)	Z Encoder Rotary (TTL)
4	Test use only	

Note:
If the two test switches (both labelled 4) are left in the ON position, then the green LED of the opposite side of the box from the connectors will be permanently on whilst the unit is powered up.

When interpolation is enabled on an axis, then both edges of both encoder phases A and B are used to update the counters. This is normally necessary to achieve the resolution as stated on the encoder.

General Notes

The captive cable to the OASIS-4i board has been kept purposely short to minimize the noise induced on the encoder inputs from the switching motor currents. It is not recommended that this cable be extended.

Objective Imaging Ltd.
The Bury, Newmarket Road
Stow cum Quy
Cambridge CB5 9AQ
Great Britain
+44 (0)1223 813777
www.objectiveimaging.com