

Analog Controller



User's Manual

*Analog Fast Steering Mirror Controller
Model OIMC100*



*February 3, 2023
Revision B*

Product Warranty

Optics-In-Motion LLC warrants this product to be free from defects in material and workmanship for a period of 1 year from the date of shipment. If the product is found to be defective during the warranty period, the product will either be repaired or replaced at Optics-In-Motion's option.

This warranty does not apply to defects resulting from modifications or misuse of any product or part.

Optics-In-Motion LLC shall not be held liable for any indirect, special, or consequential damages caused by the use of the product.

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Mirror Controller:

The mirror controller electronics are housed in a remote enclosure connected to the FSM via a 6 foot cable. Mirror commands are input to the controller through a 25 socket D sub-miniature connector. The commands are differential signals representing the x and y mirror positions, scaled to the +/- 10 volt range. For example, the X- command can be grounded and the X+ command can go from +10volts to -10volts. The input impedance of the command signals is 10K ohms. Monitor signals are provided for the actual mirror positions, error signals (feedback error between commanded position and actual position). The PID gain of the controller may be set from the controller front panel potentiometers (See fig. 1)

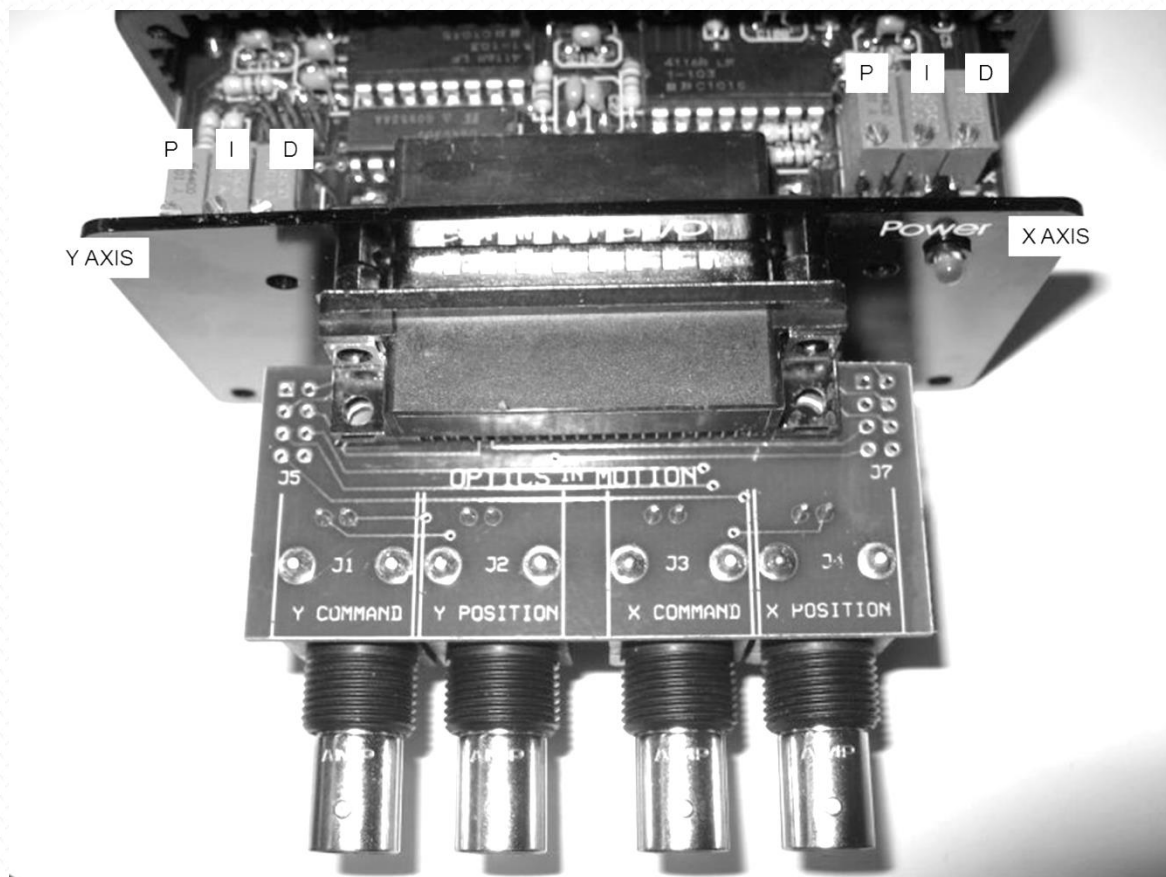


Figure 1: Adjustable PID

The mirror bandwidth and step response are factory tuned, the data sheets included with the unit show the current settings. The user can optimize the tuning for their specific application by changing these settings. The PID adjustment potentiometers are located inside the controller, to access these pots the front 4 cover screws must be removed. The photo in figure 1 shows the front panel slid forward to allow access to the proportional (P), integral (I), and derivative (D) gain potentiometers (CCW to increase gain on these pots).

The controller card is attached to another card via a ribbon cable which is hidden inside the controller box. The mirror can be driven while this card is pulled forward, allowing the user to optimize the PID values for a given step requirement while monitoring the position and error signals on a scope. Also shown in the figure is our 25 pin D to BNC adapter that can be used for non OEM operation.

Mirror Power Supply:

The controller is powered by an external +24 volt @ 3.75 amp power supply. The external power supply is an air cooled tabletop supply which plug directly into a 110 or 220 volt wall socket.

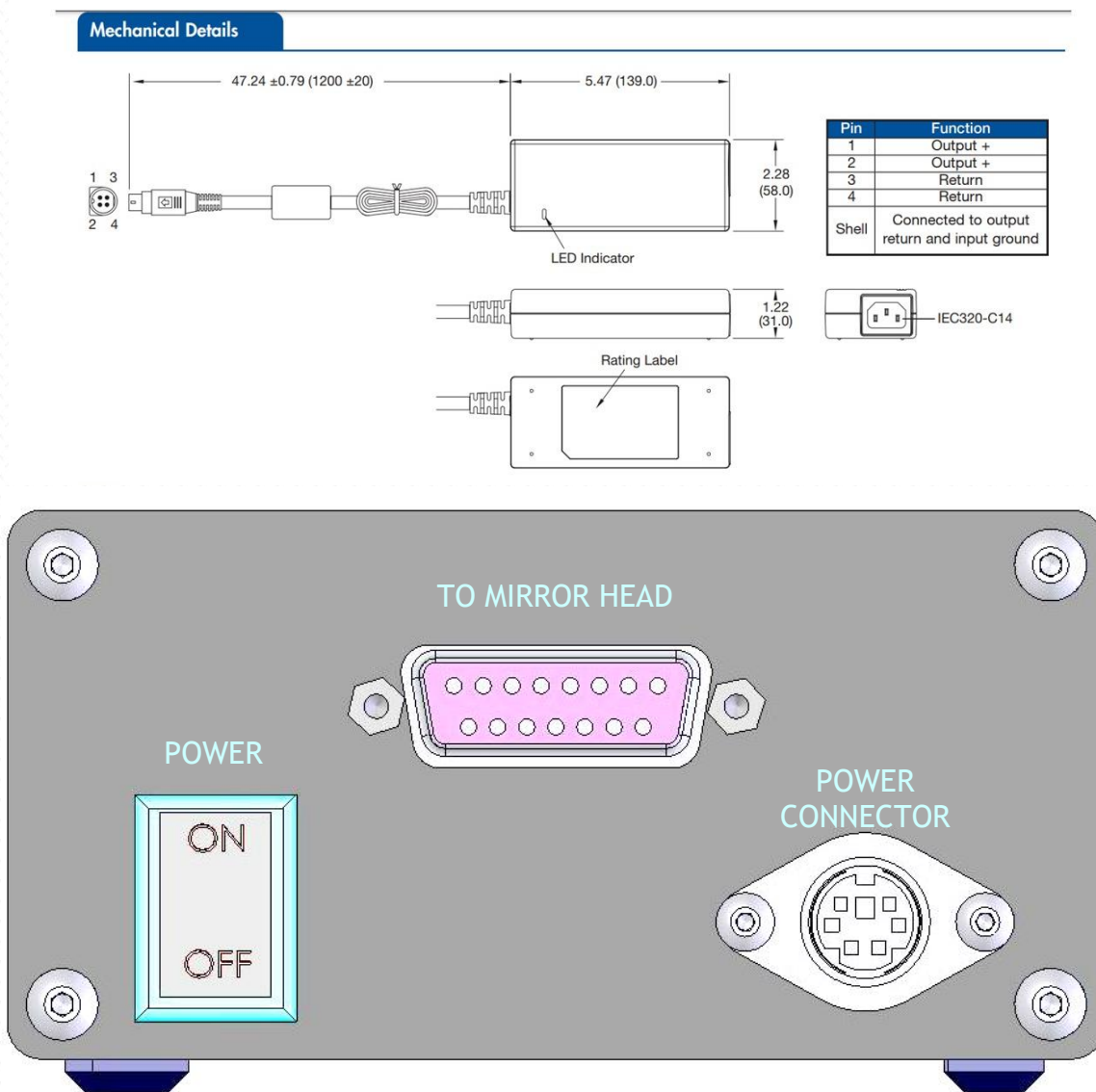


Figure 2: Controller Rear View

Command Connector Wiring Table

25-Socket Sub-miniature D Connector

Pin Number	Signal Name	I/O Type	Description
1	X ERROR	Output	X summing junction error voltage output, difference between commanded and actual position. (referenced to ground)
2	INT/EXT SWITCH	Input	Normally low TTL input. High level switches the position feedback input from local to external. (used with input pins 10,11 and 17, 5)
3	X- COMMAND	Input	X mirror position command. Low side of differential command input. Range +/-10 Volts.
4	X+ COMMAND	Input	X mirror position command. High side of differential command input. Range +/-10 Volts.
5	X- EXTERNAL	Input	X external mirror position. Low side of differential position input (from external quad or similar position sensor)
6	GND	Output	Ground Reference
7	-15 VOLTS	Output	-15 VDC for external loads of less than 100ma.
8	No Connection		
9	Y DISABLE	N/A	Ground this pin to disable Y axis of FSM
10	Y+ EXTERNAL	Input	Y external mirror position. High side of differential position input (from external quad or similar position sensor)
11	Y- EXTERNAL	Input	Y external mirror position. Low side of differential position input (from external quad or similar position sensor)
12	Y- COMMAND	Input	Y mirror position command. Low side of differential command input. Range +/-10 Volts.
13	Y+ COMMAND	Input	Y mirror position command. High side of differential command input. Range +/-10 Volts.
14	X POSITION	Output	X mirror angular position readout from local position sensor. (referenced to ground)
15	+5 VOLTS	Output	5 VDC for external loads of less than 100ma.
16	GND	Output	Ground Reference
17	X+ EXTERNAL	Input	X external mirror position Low side of differential position input (from external quad or similar position sensor)
18	X DISABLE	N/A	Ground this pin to disable the X axis of FSM
19	+15 VOLTS	Output	+15 VDC for external loads of less than 100ma.
20	GND	Output	Ground Reference
21	SUM SIGNAL	Output	PSD sum signal level (nom 7.5v)
22	GND	Output	Ground Reference
23	Y POSITION	Output	Y mirror angular position readout from local position sensor. (referenced to ground)
24	Y ERROR	Output	Y summing junction error voltage output, difference between commanded and actual position. (referenced to ground)
25	No Connection		

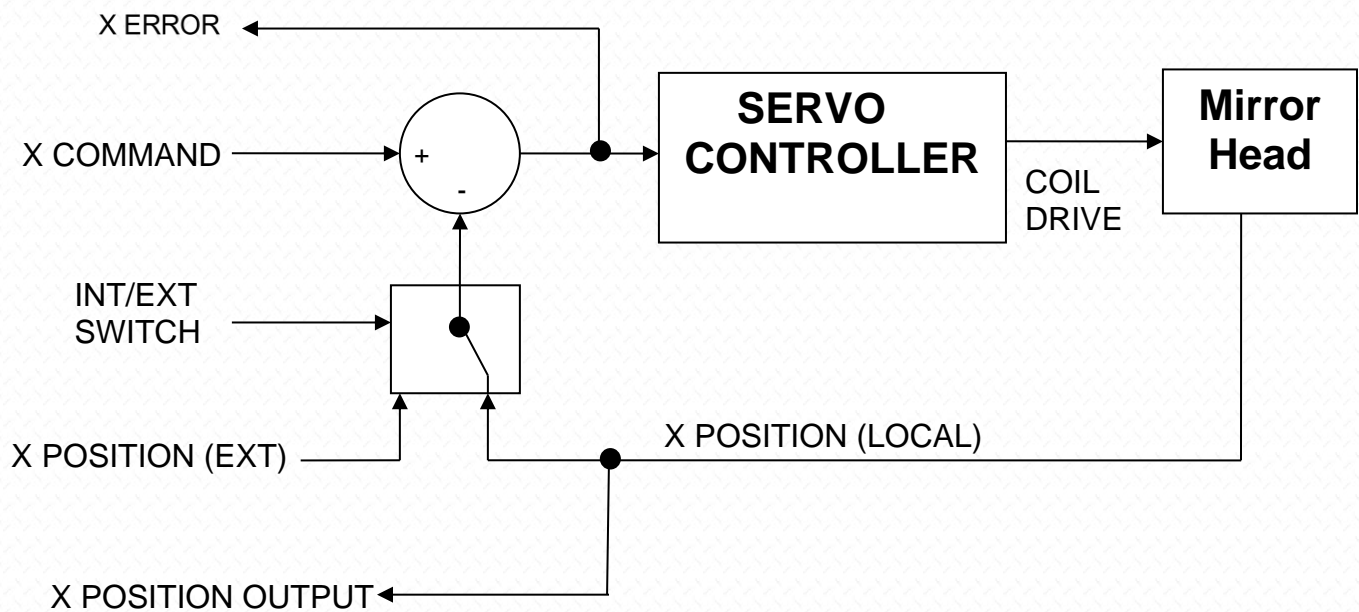
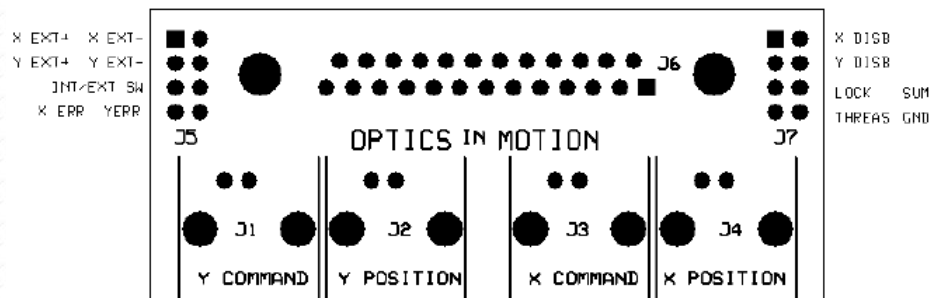


Figure 3: Block diagram for X-axis control



J5 PINOUT

1. X+ External input
2. X- External input
3. Y+ External input
4. Y- External input
5. INT/EXT SWITCH } Jumper to activate external switch
6. +5V
7. X Error output
8. Y Error output

J7 PINOUT

1. Ground } Jumper to disable X axis
2. X Disable
3. Ground } Jumper to disable Y axis
4. Y Disable
5. LOCK output
6. SUM output
7. Threshold output
8. Ground

Figure 4: BNC to 25 PIN D Adapter PINOUT