

OPTICS IN MOTION

Small OEM Fast Steering Mirror Controller
External Command Version
OIMC101B Rev B

August 13, 2021

Controller Description:

Optics In Motion LLC OEM controller is a compact version of our standard controller designed for OEM applications. The controller is powered by an external voltage source of $\pm 15V$ @ 1.5 amps.

The motor drive amplifier needs to be heat sunk to prevent overheating. This can be accomplished via a finned heat sink attached to the power amp, or with a thermal strap to dissipate the heat to the user's enclosure. The case of the power amplifier (OPA2544T) is connected to the negative power voltage input so it must be isolate by using heat sink pads and isolated washers. Verify that the case of the op-amp is isolated from ground before turning it on.

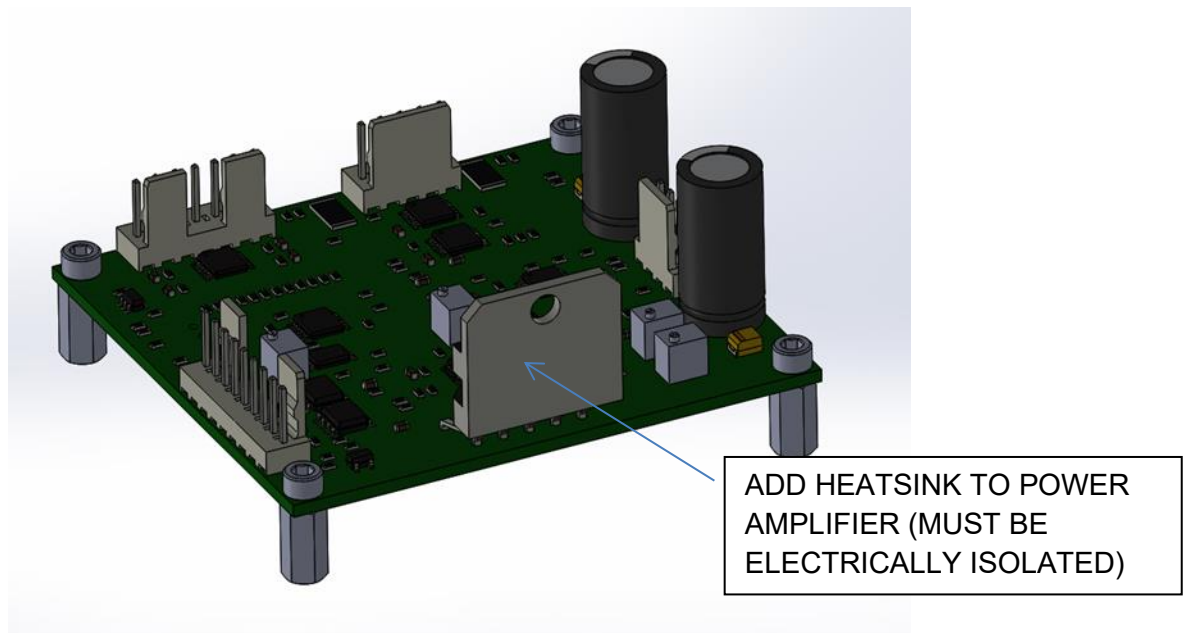
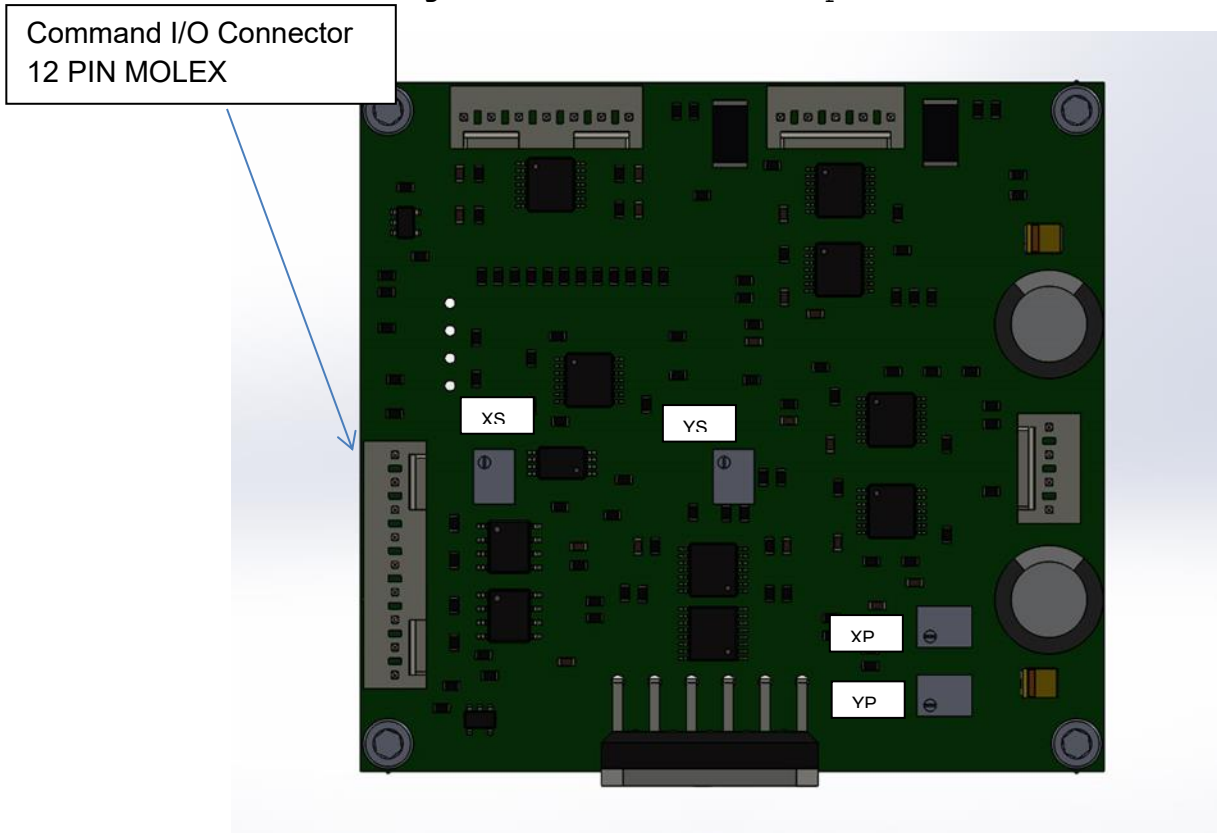


Figure 1: OEM controller Power Amp

Mirror commands are input to the controller through a Molex right angle 12 pin connector (DigiKey part number WM4310). 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 +10 volts to -10 volts. 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 controller can be run in open loop mode. This mode bypasses the controller PID functions and drives the motor directly. Position feedback signals are still valid. Input +5v on pin 10 referenced to ground (pin 3) to switch to open loop mode.

Figure 2: Controller Input Connector



On board Potentiometers:

XS - X scale, used to set scale factor in the x scan direction

YS - Y scale, used to set scale factor in the y scan direction

XP - X proportional gain, increase or decrease X 'P' gain

YP - Y proportional gain, increase or decrease Y 'P' gain

Table 1: Command I/O Connector Wiring Table

12-Pin Molex Right Angle Connector

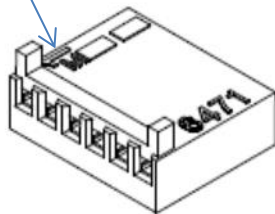
Pin Number	Signal Name	I/O Type	Description
1	Y+ COMMAND	Input	Y mirror command. High side of differential command input. Range +/-10 Volts.
2	Y- COMMAND	Input	Y mirror command. Low side of differential command input. Range +/-10 Volts.
3	GND	Output	Ground Reference
4	Y POSITION	Output	Y mirror angular position readout from local position sensor. (referenced to ground)
5	Y ERROR	Output	Y summing junction error voltage output, difference between commanded and actual position. (referenced to ground)
6	X POSITION	Output	X mirror angular position readout from local position sensor. (referenced to ground)
7	X+ COMMAND	Input	X mirror command. High side of differential command input. Range +/-10 Volts.
8	X- COMMAND	Input	X mirror command. Low side of differential command input. Range +/-10 Volts.
9	X ERROR	Output	X summing junction error voltage output, difference between commanded and actual position. (referenced to ground)
10	OPEN LOOP SW	Input	TTL level switch to put the controller in external control mode (leave unconnected or 0V for OFF, +5V = ON)
11	X OPEN LOOP COMMAND	Input	Drive the controller in open loop mode, analog input range +/-10 volts, input impedance = 10K ohms
12	Y OPEN LOOP COMMAND	Input	Drive the controller in open loop mode, analog input range +/-10 volts, input impedance = 10K ohms

Table 2: Power Input Connector Wiring Table

Connector - Molex, Right Angle, 4 pin (DigiKeyWM4302)

Pin Number	Signal Name	I/O Type	Description
1	-15 VDC	Input	Negative Supply min 1.5 amps
2	GND	Input	Positive and Negative Supply Return
3	+15 VDC	Input	Positive Supply min 1.5 amps
4	EARTH GND	Input	Earth Ground, may be tied to GND

PIN 1



Mating Molex Connector Digikey
PN (WM2614-ND)

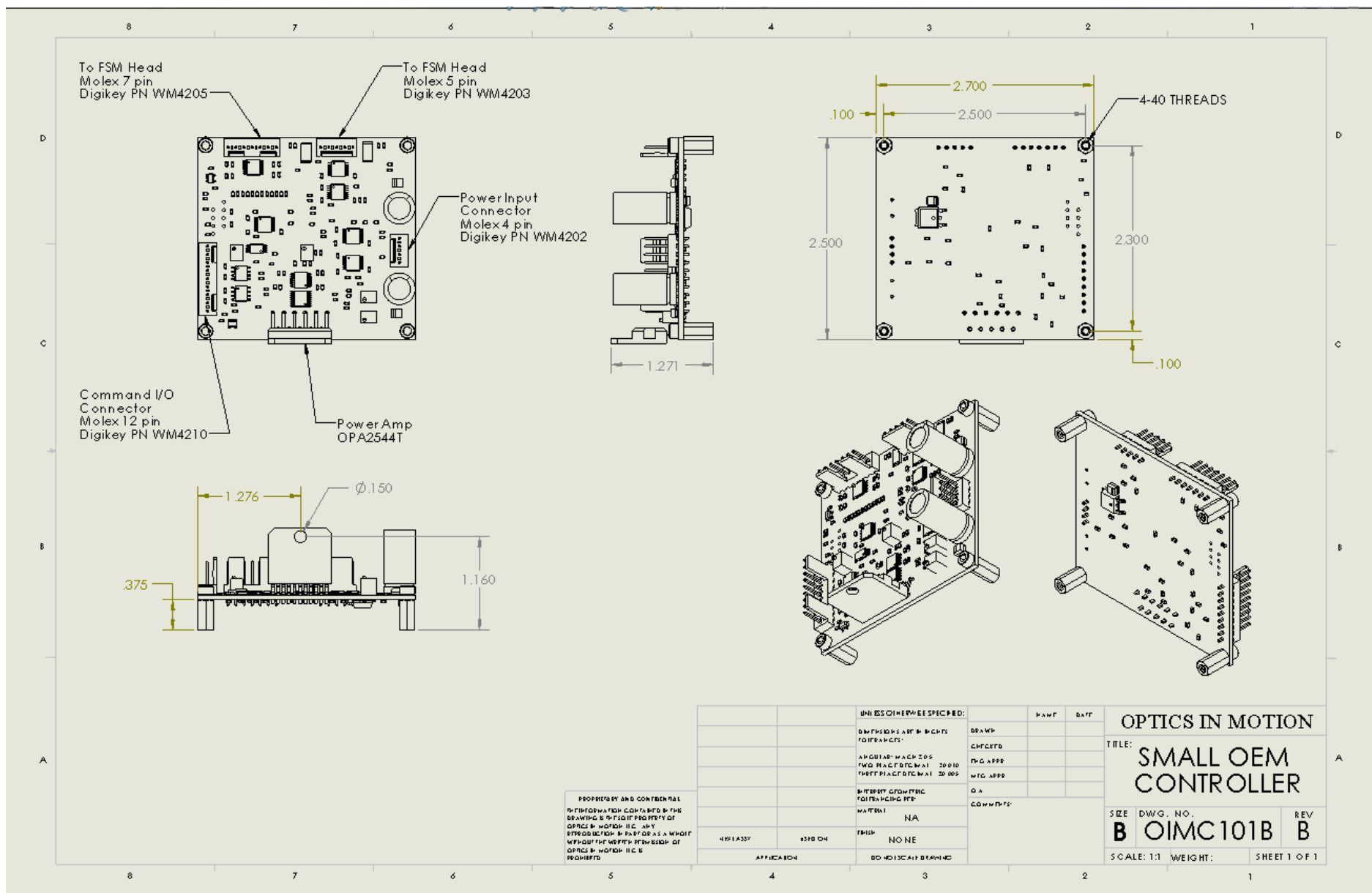


Figure 3: Small OEM Controller ICD