

OPTICS IN MOTION

**Small OEM Fast Steering Mirror Controller
with DC/DC Converter & Beam Stabilizer Card
OIMC101E**

Rev NC, April 21, 2020

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 +24 volts @ 2 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.

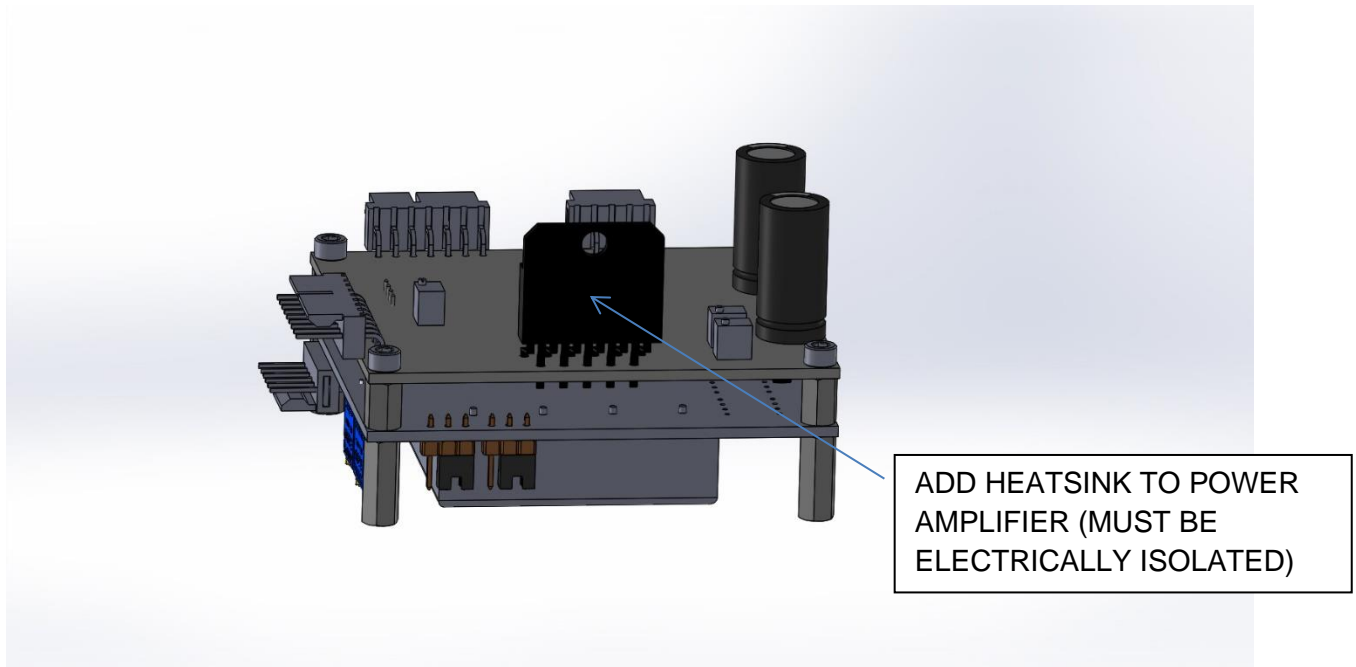


Figure 1: OEM controller Power Amp

Mirror commands are input to the controller through a Molex right angle 9 pin connector (DigiKey part number WM4307). 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).

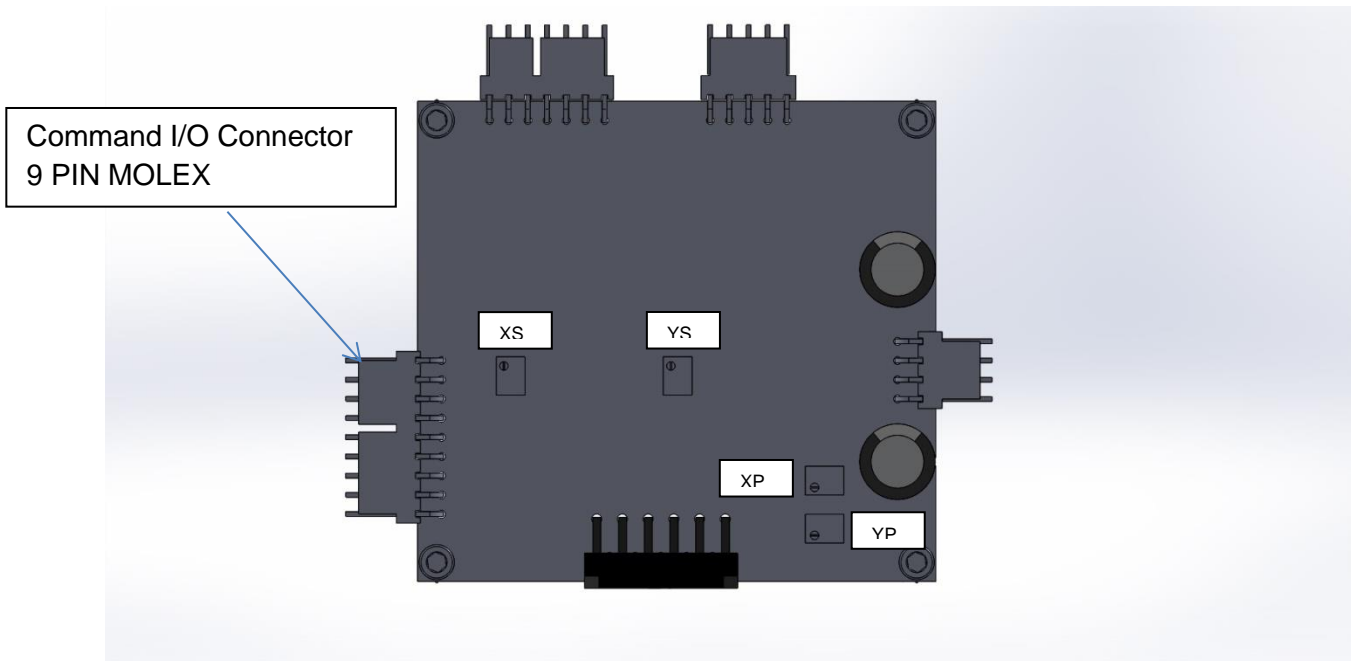


Figure 2: Controller Input Connector

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

9-Pin Molex Right Angle Connector

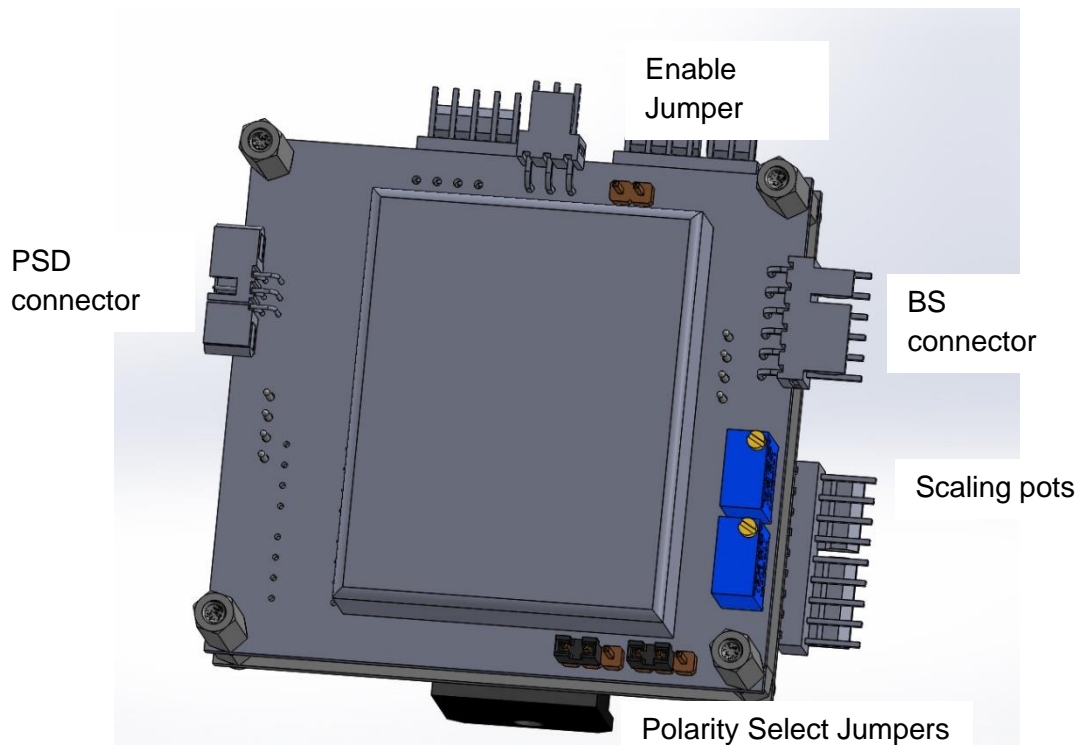
Pin Number	Signal Name	I/O Type	Description
1	Y+ COMMAND	Input	Y mirror command. High side of differential command input. Range +/-10 Volts.
2	Y- COMMAND	Input	Y mirror command. Low side of differential command input. Range +/-10 Volts.
3	GND	Output	Ground Reference
4	Y POSITION	Output	Y mirror angular 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)

Beam Stabilizer Card (lower card)

Optics In Motion offers the following choice of detectors:

- 1) PSD 4x4 mm (OIMPSD4)
- 2) PSD 9x9 mm (OIMPSD9)
- 3) QUAD Cell 5 x 5 mm (OIMQUAD5)
- 4) QUAD Cell 10 x 10 mm (OIMQUAD10)
- 5) InGaAs QUAD Cell 3 x 3 mm (OIMIRQUAD3)

The position sensing detectors plug into the small Harwin connector on the lower card. (Digikey PN 952-1285-5-ND)



Bottom of the controller showing the beam stabilizer card

Table 2: Beam Stabilizer Card Connector Wiring Table

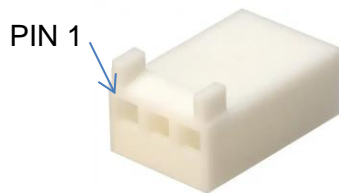
6-Pin Molex Right Angle Connector

Pin Number	Signal Name	I/O Type	Description
1	X PSD OUT	Output	Monitors the X position output from the external PSD
2	Y PSD OUT	Input	Monitors the Y position output from the external PSD
3	GND	Output	Ground Reference
4	NC		
5	INT/EXT SW	Input	TTL level input to switch the controller from external to internal feedback (+5V = EXT, 0V = INT)
6	PSD SUM	Output	Monitors laser power on PSD

Table 3: Power Input Connector Wiring Table

Connector - Molex, Right Angle, 3 pin (DigiKeyWM4301)

Pin Number	Signal Name	I/O Type	Description
1	+24 VDC	Input	Minimum current 2 amps
2	GND	Input	Supply Return
3	EARTH GND	Input	Earth Ground, may be tied to GND



Mating Molex Connector Digikey
PN (WM2001-ND)

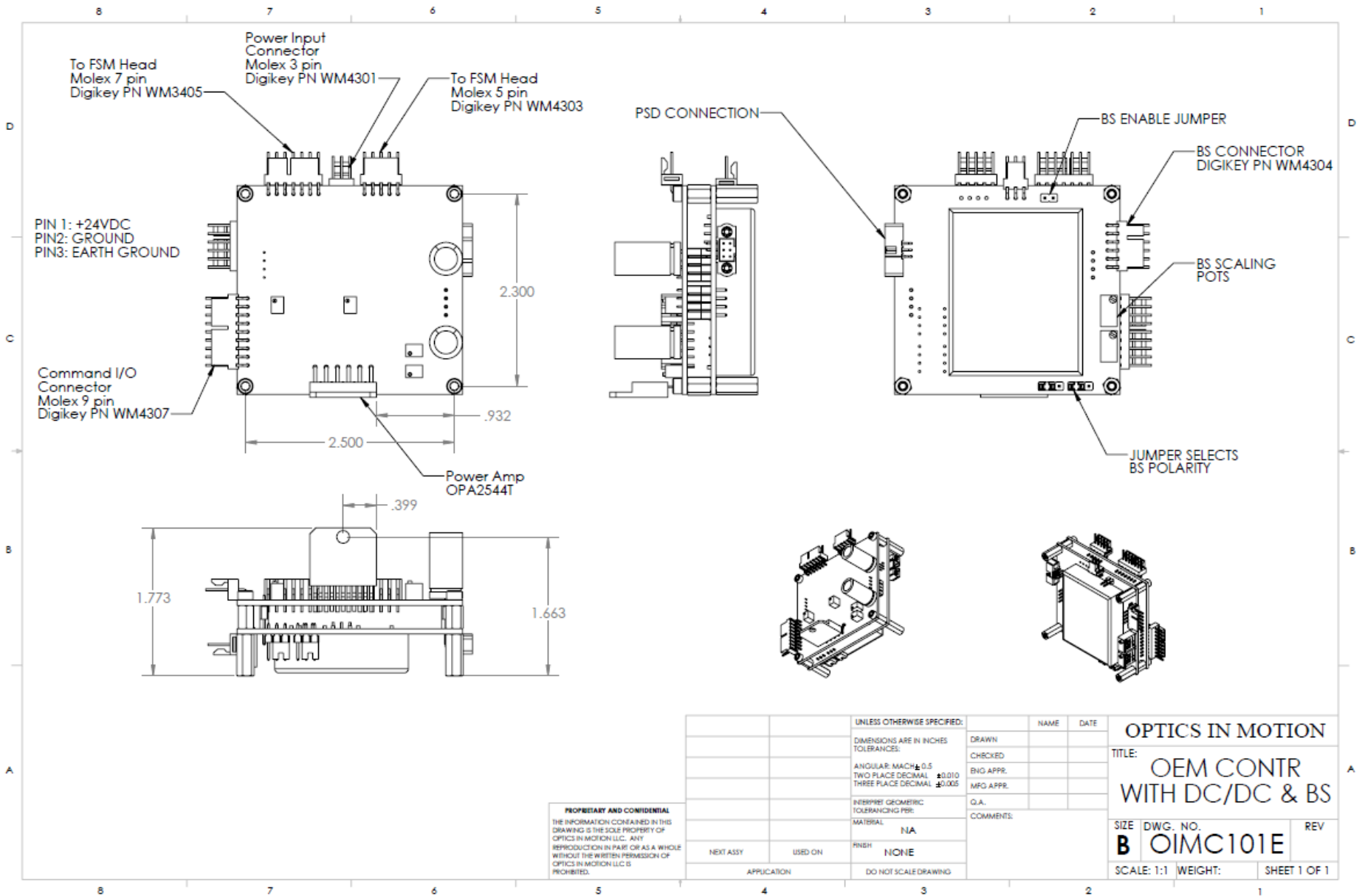


Figure 3: Small OEM Controller with DC/DC Converter & Beam Stabilizer ICD