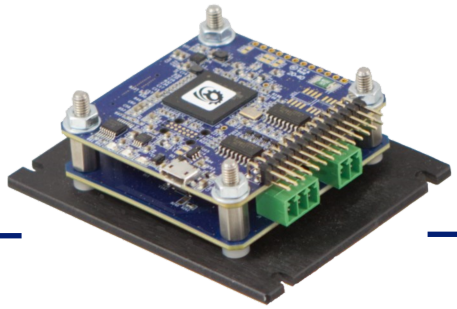
OMA-21



The OMA-21 is a small formfactor servo amplifier and controller capable of Sensorless, Hall sensors, Incremental or Absolute Encoders (SSI or BiSS). Ideal for managing motors of 140W or less in a tightly controlled feedback loop for superior performance. The OMA-21 communication is through USB 2.0 and offers more than 170 motion commands for a variety of application requirements. The OMA operates from a single power supply of 15 to 50 VDC and is internally monitored for overcurrent and overvoltage. Overtravel limit and home inputs are included as well as up to 8 general purpose I/O. The small size outline matches the NEMA23 frame motor dimensions for flexible mounting options.

FEATURES

- Highly integrated, high performance combined motion controller and BLDC servo amplifier
- Small formfactor (PCB size: 2.22” x 2.22” x 0.83”)(with heatsink: 2.6” x 3.27” x 1.1”)
- Up to 5A motor current, 8A Peak (140W typical*)
- Control loop update rate FOC configurable up to 100kHz.
- Control loop update rate for motion planning configurable from 1024 - 8192Hz.
- Rotor position feedback using incremental encoder or hall sensor.
- Eight opto-isolated +3.3 to +24VDC general purpose input/output including Home and Limit.
- Home and Limit low or high true state selectable by command input.
- Two differential quadrature incremental encoder inputs, up to 16,000,000 counts/s
- Alternative BiSS absolute encoder support for up to 50-bits on one incremental encoder.
- +5VDC 500mA supply pins to power encoders.
- Support for dual-loop position maintenance for load position control.
- Cascaded PID loops provide options for torque or velocity command mode
- OMS ASCII communication interface on virtual COM port over USB.
- Over 170 commands to configure and control the OMA-21.
- Position range ±562,949,953,421,311
- Velocity 0 to ±4,194,176 counts/s with a resolution of 1 count/s.
- Acceleration 1 to 8,000,000,000 counts/s^2 with a resolution of 1 count/s^2.
- All configuration parameters by command input are archivable to power-up defaults.
- Single supply: +15 to +50VDC
- LED state signaling of the device.

OMS MOTION, Inc.

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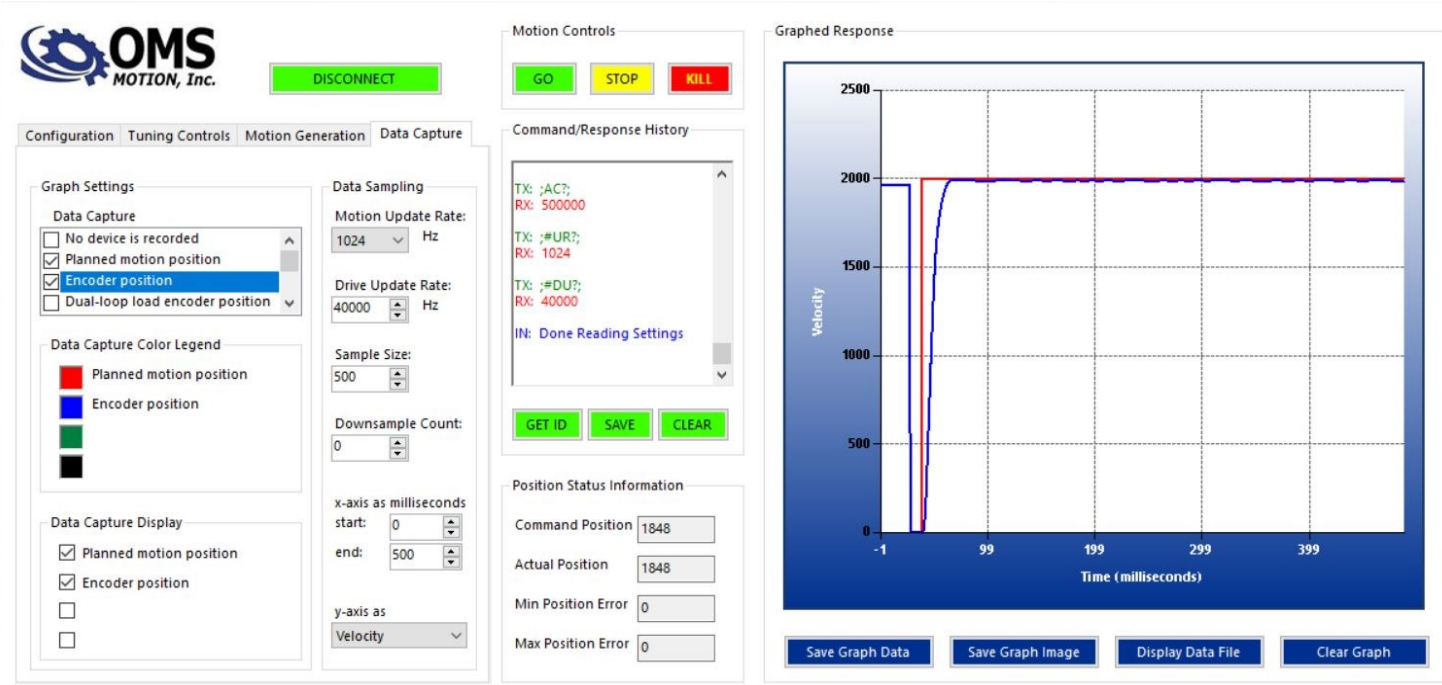
Electrical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Supply Voltage	15		50	VDC	Current depends on load
Motor Output Current	0		6	A	8-Amp Peak
Logic Output	0	12	30	mA	Vopto value defines current
Logic Input	1		4	mA	Vopto value dependent
Opto Voltage (Vopto)	3.3		24	VDC	
Incremental Encoder	0		4	MHz	Counts per second
BiSS/SSI Data resolution		32	50	Bits	Data bits are programmable
BiSS/SSI Communications	125k		6M	Hz	Optional CRC

Environmental Specifications

- Operating Temperature…….. 0.0 to +50º C (heatsink & ventilation recommended)
- Storage Temperature…….. - 20º to +85º C
- Weight……. 88g (including supplied heatsink)
- Humidity…….. 20 to 95% Φ, non-condensing
- Dimension Outline……. 2.22” x 2.22” x 0.83” (including mating connectors)
  (with heatsink: 2.6” x 3.27” x 1.1”)

Tuning Software Included



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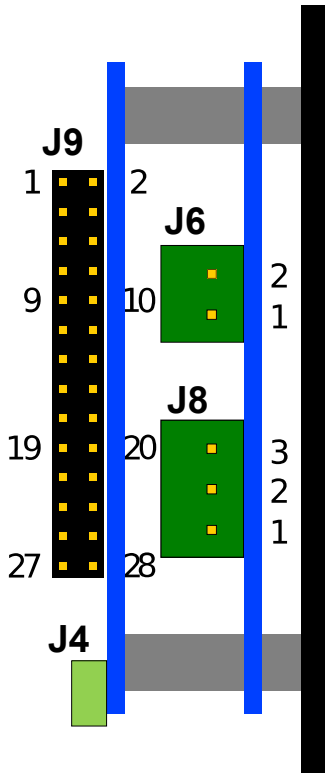
CONNECTOR DEFINITIONS

PIN	J6
1	15-50 VDC
2	GND

PIN	J8
1	Phase W
2	Phase V
3	Phase U

PIN	J9	PIN	J9
1	Enc1 PhA+ / BiSS D+	2	Enc1 PhA- / BiSS D-
3	Enc1 PhB+	4	Enc1 PhB-
5	Enc1 Ind+ / BiSS Dclk+	6	Enc1 Ind- / BiSS Dclk-
7	+5V	8	GND
9	Vopto2	10	*GNDopto2*
11	GPIO2 / pLim	12	GPIO3 / nLim
13	GPIO1 / Dir In	14	GPIO4 / Hm
15	GPIO0 / Step In	16	GPIO7 / Hall C
17	GPIO6 / Hall B	18	GPIO5 / Hall A
19	Vopto1	20	GNDopto1
21	+5V	22	GND
23	Enc0 PhA+	24	Enc0 PhA-
25	Enc0 PhB+	26	Enc0 PhB-
27	Enc0 Ind+	28	Enc0 Ind-



- USB 2.0 interface is located at **J4**.
- Encoder I/Os and motor phases are referenced to the supply power GND. GPIOs are split into the two opto-isolated groups Vopto1 and Vopto2.

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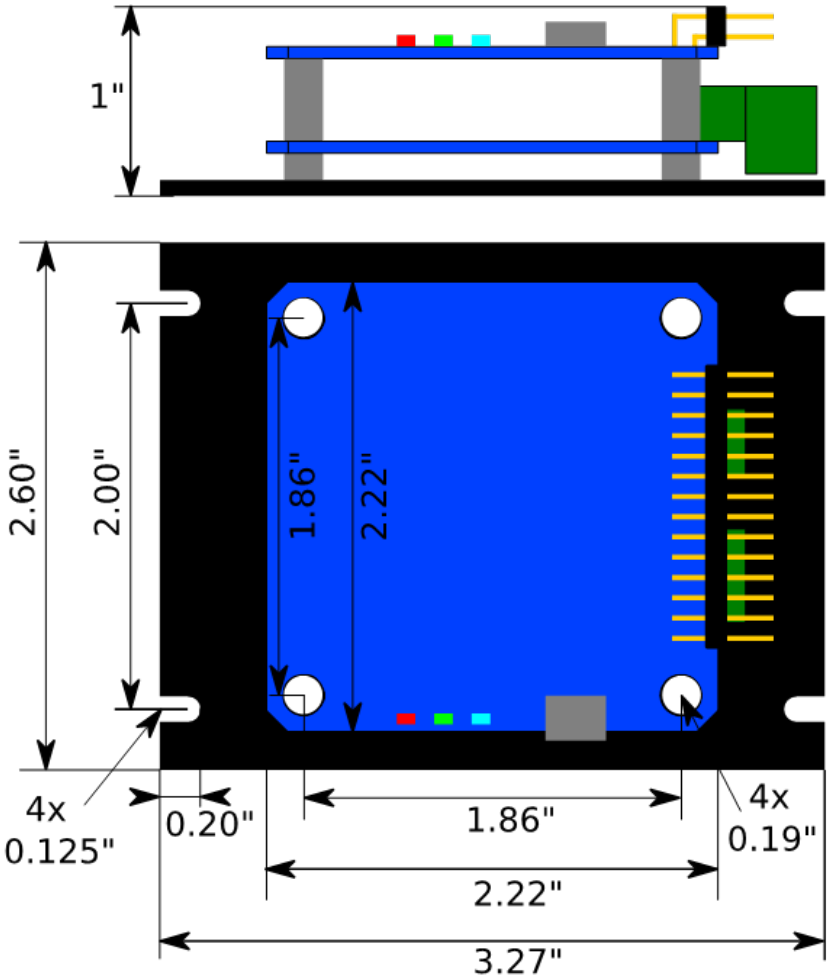
Dimensions



ORDERING INFORMATION	
Model	**Description**
OMA-21	Servo Amplifier & Control, 140W

* = Typical values may vary

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