

DESCRIPTION

The MMS740xxx-24-R2 is part of a family of fully integrated smart motor solutions for servo motor applications. This 40mm motor integrates a permanent magnet synchronous motor (PMSM) and driver module inside.

The MMS740xxx-24-R2 supports four commonly used motion control modes: profile position (PP), profile velocity (PV), profile torque (PT) and homing (HM). It also has six isolated I/Os for external signal input and output.

MotionLAB is an easy-to-use GUI software that allows users to flexibly optimize the design online via the USB or RS-485 control interface. The parameters are saved in the motor's non-volatile memory (NVM). The GUI and its user guide are available for download at www.EZmotion.co.

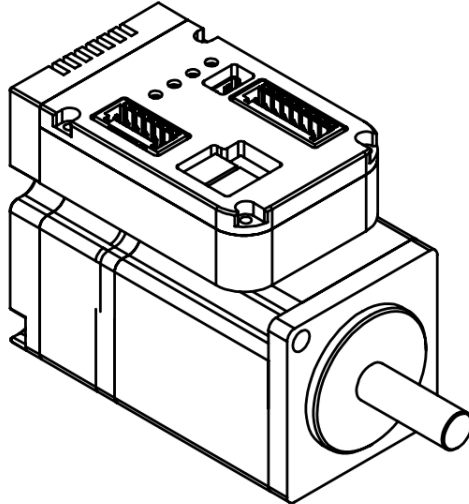
In addition to fully integrated smart motor solutions, the driver modules and accessories can be ordered separately for customization into different motor types.

FEATURES

- RS-485 Interface with Modbus Protocol and Step/Direction Control Interface
- 12V to 50V Input Voltage (V_{IN}) Range
- 50W to 100W Continuous Power Output (P_{OUT})
- 0.1° Position Resolution
- Four Control Modes: Profile Position (PP), Profile Velocity (PV), Profile Torque (PT), Homing (HM)
- Motor and Load Parameter Identification and Loop Parameter Auto-Tuning
- AccuFilter for Low Noise and Vibration.
- Advanced Motion Controller Enables Smooth Transition between Different Operational Modes
- Two Separate Notch Filters for Elastic Load Optimization
- Rich Protection Functions
- Six I/Os with Selectable Function and Polarity
- Driver Module Temperature Sensing

PRODUCT INFORMATION

Part Number	Flange Dimension (mm)	Power (W)	Nominal Voltage (V)	Control Mode	Control Interface
MMS740050-24-R2-1	40	50	24	PP, PV, PT, HM	Modbus, step/direction
MMS740100-24-R2-1	40	100	24	PP, PV, PT, HM	Modbus, step/direction



ACCESSORIES

There are two accessory packages available for order that are used for servo motor evaluation. The MMA02-3001 includes the MotionLAB communication kit and cable. The MMA03-4001 includes the connectors matching with the servo motor.

Part Number	Component	Description	Quantity
MMA02-3001	MotionLAB communication kit	USB to RS-485/I ² C/SPI converter tool	1
	USB cable	1.5m, USB Type-A to USB Type-B cable	1
	Dupont wires	Dupont wires, 3-pin	1
MMA03-4001	KF12EKD-2.5-6P-1G	2.5mm pitch, 6-position connector	1
	KF12EKD-2.5-8P-1G	2.5mm pitch, 8-position connector	1
	ZER-04V-S	1.5mm pitch, 4-position connector	2
	SZE-002T-P0.3	Socket contact tin 24-28 AWG crimp	8

PRODUCT SPECIFICATIONS

Parameter	Condition	Value		Units
		50W	100W	
Rated DC input voltage (V_{IN})		24		V
V_{IN} range		18 to 50		V
Continuous output power (P_{OUT})	0°C to 40°C	50	100	W
Nominal speed		3000		rpm
Continuous output torque	0°C to 40°C	0.16	0.32	Nm
Peak output torque	0°C to 40°C, <3.5s	0.48	0.96	Nm
Rotor inertia		29	36	g-cm ²
Pole pairs		4		
Position resolution		0.1		deg
Weight		396	513	g
Interfaces				
RS-485 baud rate	Configurable	9600 to 921600		bps
USB 2.0		Mini USB Type-B, Full speed		
Maximum digital output load current (I_{DO_MAX})		100		mA
Maximum digital output voltage (V_{DO_MAX})		36		V
Digital input logic high voltage (V_{DI})		18 to 28		V
DI1+, DI2+ pulse frequency		<500		kHz
DI1+, DI2+ minimum pulse width		1µs		µs
DI3+, DI4+ pulse frequency		<10		kHz
DI3+, DI4+ minimum pulse width		20		µs
Mechanical				
Direction of rotation	Viewed from the load side with a forward run command	CCW		
Axial force (f_A)		<120		N
Radial force (f_R)	Distance to the front surface = 20mm	<60		N

RECOMMENDED OPERATING CONDITIONS

Input voltage (V_{IN}) 18V to 50V
 Max pulse frequency..... 500kHz
 RS-485_A/RS-485_B voltage ±15V
 RS-485 common-mode voltage -7V to +12V
 Operating temperature..... 0°C to 70°C
 Storage temperature..... -20°C to +85°C

HARDWARE CONNECTIONS

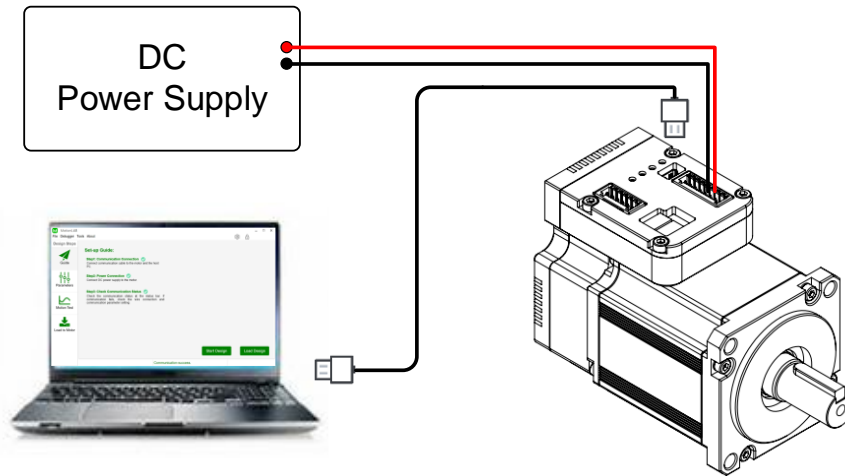


Figure 1: Connect the Servo Motor to the MotionLAB GUI

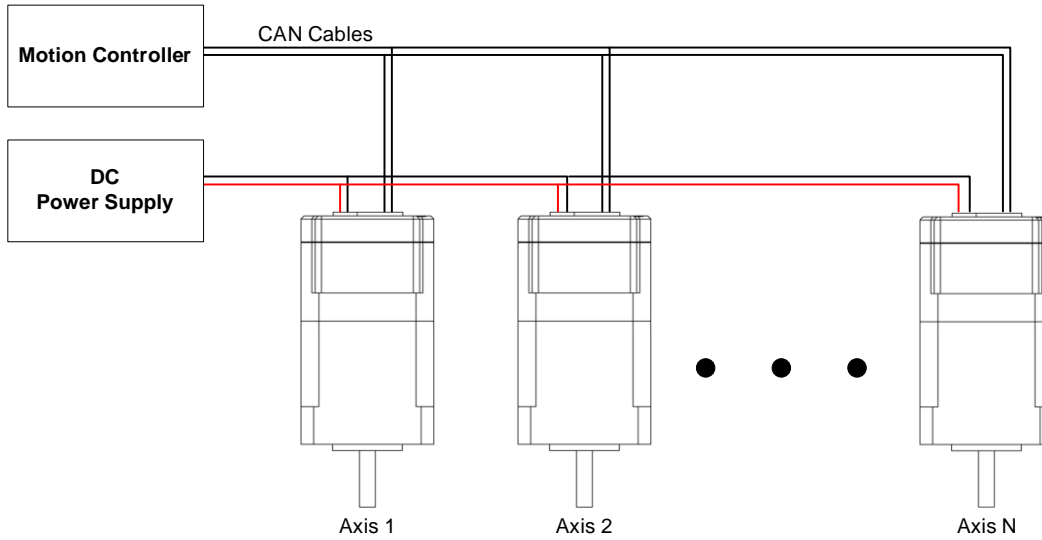
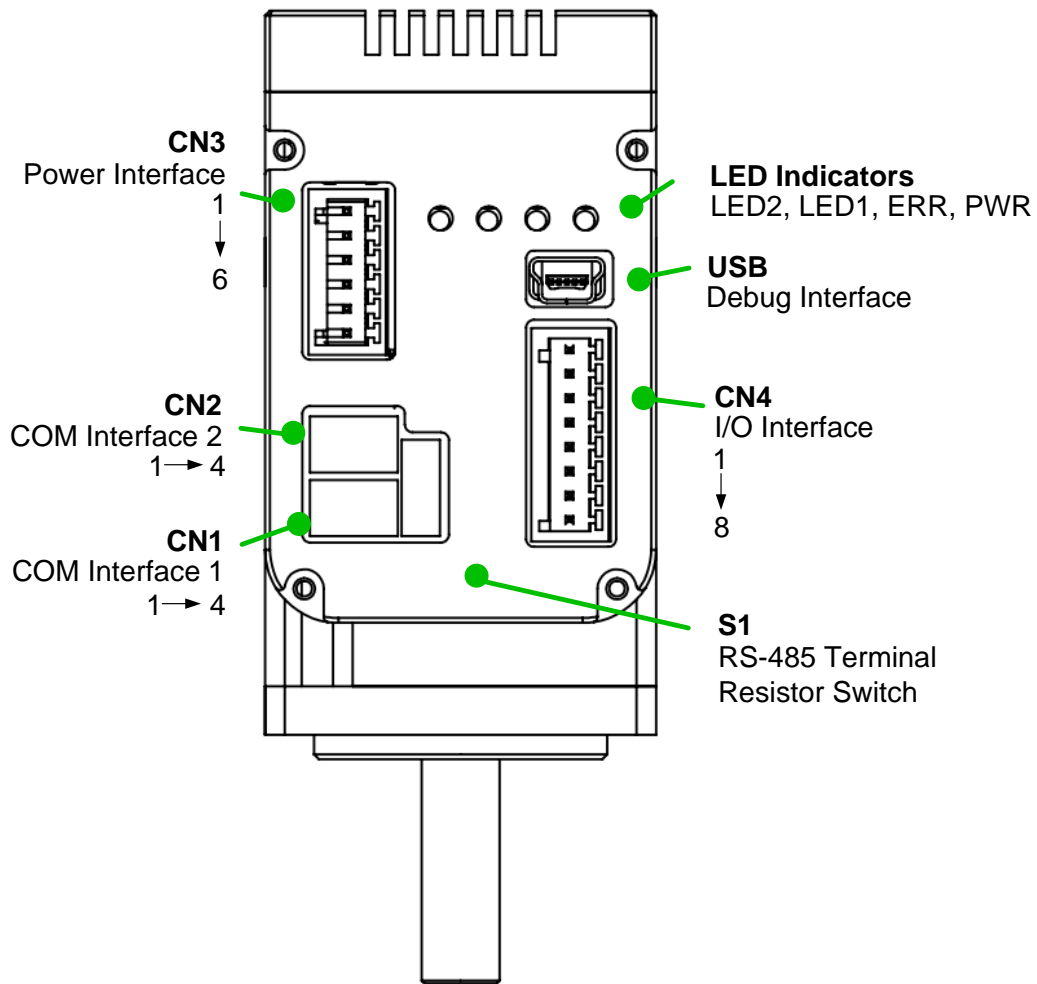


Figure 2: Multi-Axis Application Connection

PIN CONFIGURATION



MMS740xxx-24-R2 Pin Definitions

COM Interface (CN1, CN2)

Pin Number	Designation	Pin Description
1	SHIELD	Shield
2	RS485_B	RS-485 node B
3	GND	Ground
4	RS485_A	RS-485 node A

Power Interface (CN3)

Pin Number	Designation	Pin Description
1	VIN	Input power supply
2	VIN	Input power supply
3	GND	Power ground
4	GND	Power ground
5	R-	Shunt resistor return node
6	PE	Earth ground

I/O Interface (CN4)

Pin Number	Designation	Pin Description
1	DI1+	Input I/O 1, default DIR
2	DI2+	Input I/O 2, default PUL
3	DI3+	Input I/O 3, default ENA
4	DI4+	Input I/O 4
5	COMI	Common input return
6	DO1+	Output I/O 1, default ALM
7	DO2+	Output I/O 2, default PEND
8	COMO	Common output return

Figure 3 shows the I/O interface internal circuit. The digital input signals have a common input terminal, and the digital output signals have a common output terminal.

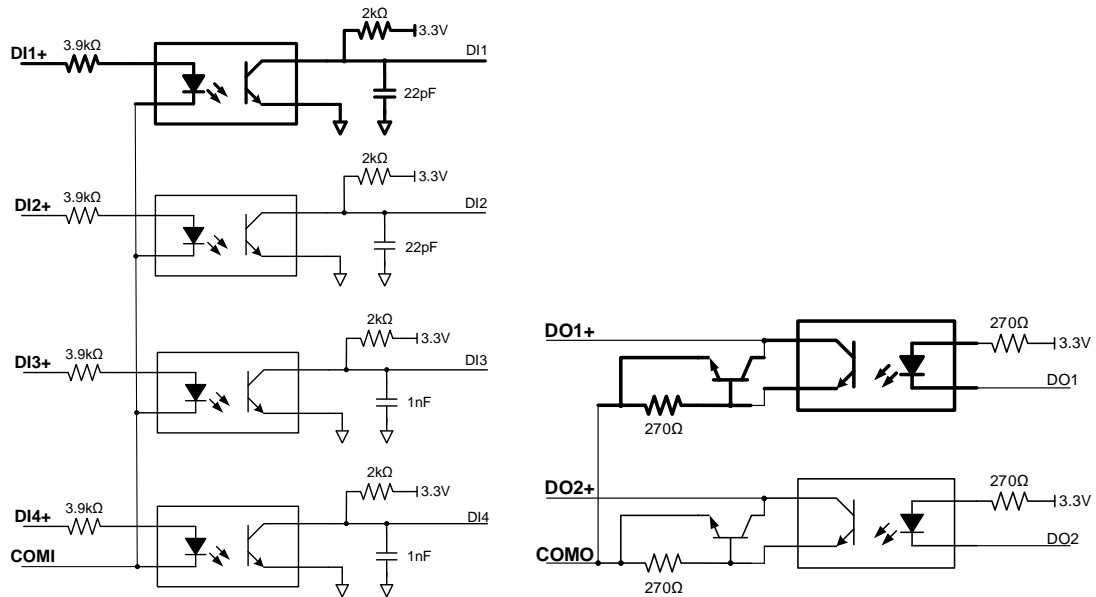


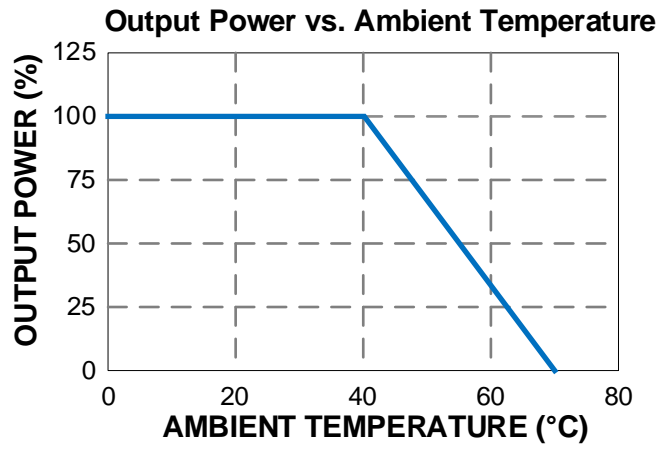
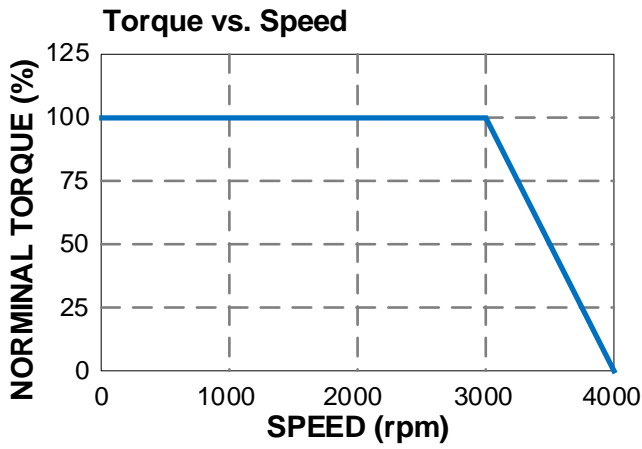
Figure 1: I/O Interface Internal Circuit

LED Indicators

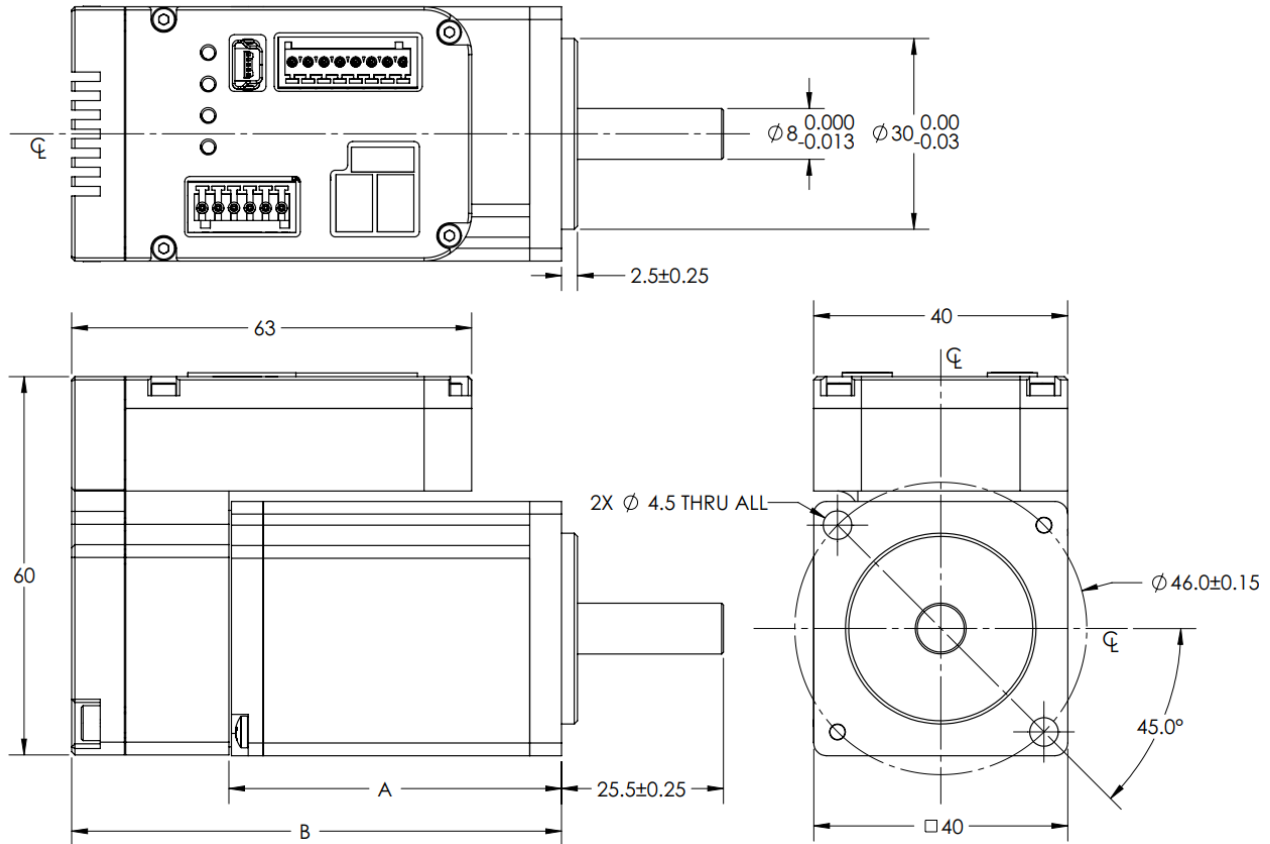
Pin Number	Designation	Pin Description
1	COM1	Communication status 1
2	COM2	Communication status 2
3	ERR	Error indicator
4	PWR	Power indicator

TYPICAL PERFORMANCE CHARACTERISTICS

$V_{IN} = 24V$, unless otherwise noted.



MECHANICAL DRAWING



UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN MM
 TOLERANCES:
 ANGULAR (MACH) = ± 0.1°
 ANGULAR (BEND) = ± 0.5°
 XX = ± 1
 XX.X = ± 0.2
 XX.XX = ± 0.05

Part Number	A (mm)	B (mm)
MMS740050-24-R2-1	51	74.3
MMS740100-24-R2-1	65	88.3

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	8/25/2023	Initial Release	-

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