



User Manual

UIM240XX Series Parallel Port Miniature Integrated Stepper Motor Controller



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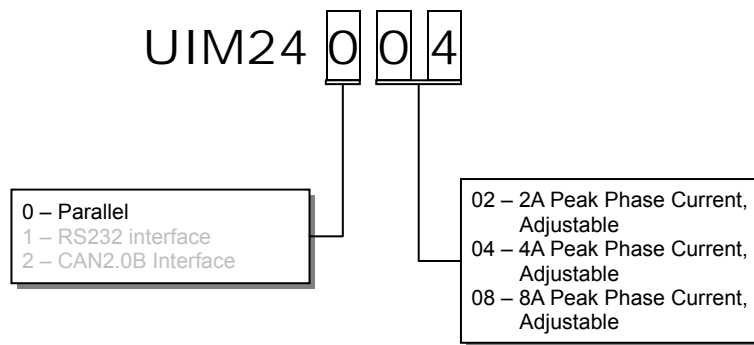
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[UIM240XX Order Information]

In order to serve you quicker and better, when order UIM240XX series controller, please provide the product number in following format.



Note: Options in gray is not applicable.

Examples:

UIM24002
UIM24004
UIM24008

UIM240XX Miniature Integrated Stepper Motor Controller

UIM24002/24004/24008 Parallel Port Control Miniature Integrated Stepper Motor Controller

Features

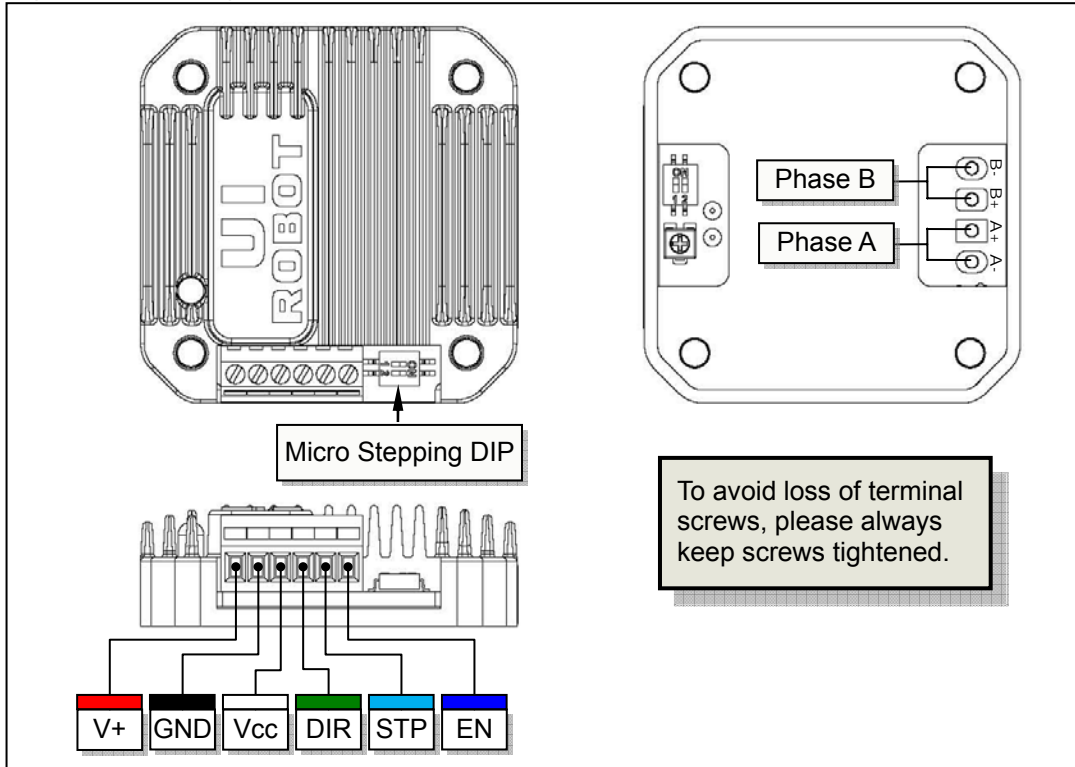
- Miniature size 42.3mm*42.3mm*13.5mm (L*W*H)
- Integrally designed to fit onto motors seamlessly, as well as work standalone
- Wide range input voltage 10-40VDC
- Max 2A / 4A / 8A adjustable output current
- 1 to 16th micro step resolution
- Automatic Current Reduction
- Dual full H-bridge with PWM constant current control
- Enable/shutdown input for power saving
- Optoisolated inputs with common anode
- Die-cast aluminum enclosure, improve heat radiation and durability

Description

UIM240xx Miniature Stepper Motor Controller is a series of miniature, high performance stepper motor controller. They can be mounted onto 42 / 57 / 86 / 110 series stepper motor seamlessly through corresponding flanges. The thickness of these controllers is less than 14 mm. UIM24002 is capable to provide 0-2A adjustable current. UIM 24004 is capable for 1.6-4A adjustable current output and UIM24008 is capable for 2A-8A adjustable current output. Their mixed-decay current control reduces the back-EMF effect under high motor speed and improves the performance. Except that UIM24002 takes 10-35VDC input, UIM240xx series controllers can work on 12 to 40VDC input. Enclosure is made of die-cast aluminum which provides a rugged durable protection and improves the heat dissipation.

Terminal Description

Figure 0-1: Wiring Terminal



Description of Screw Terminals

Terminal No. / Color	Description		Input			
			MIN	NOM	MAX	UNIT
1 / Red	V+	Supply voltage	UIM24004-8	12	40	VDC
			UIM24002	10	35	
2 / Black	GND	Supply voltage ground		0		VDC
3 / White	Vcc	Opto-coupler common anode		5 ⁽¹⁾		VDC
4 / Green	DIR	Direction input ⁽²⁾		GND	Vcc	VDC
5 / Cyan	STEP	Stepping pulse input ⁽³⁾		GND	Vcc	VDC
6 / Blue	EN	Enable the controller ⁽⁴⁾		GND	Vcc	VDC

Note:

- (1) Please refer to “optically isolated input interface” section for details.
- (2) Input is considered high level if this terminal is not connected.
- (3) Low-level pulse duration should > 8μs. Maximum pulse frequency is 50 KHz.
- (4) An active low-level input shuts down power supply to the motor. High-level input or left open makes the controller fully working. When awoken from shutdown mode, wait 1 millisecond before sending pulse.

Motor Wiring Pads (at the bottom of the controller)

Pad A + / A- : Connect to the stepper motor phase A

Pad B + / B- : Connect to the stepper motor phase B

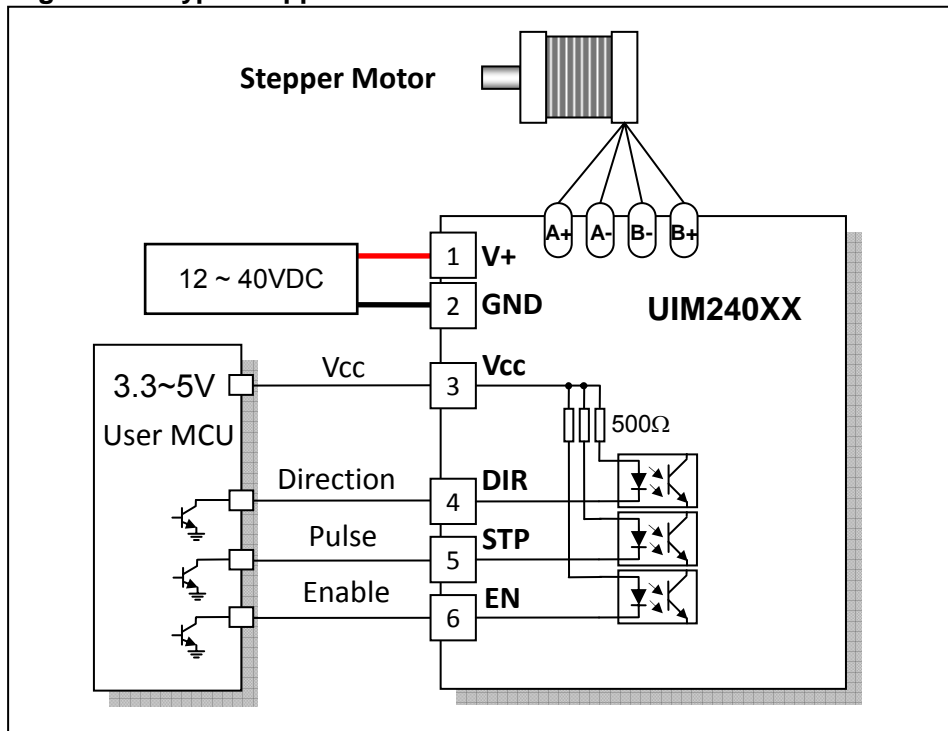
Note: To avoid damaging, make sure the phase winds are connected correctly. Resistance between leads of different phases is usually > 100KΩ. Resistance between leads of the same phase is usually < 100Ω.

UIM240XX Miniature Integrated Stepper Motor Controller

Typical Application

UIM240xx controller's wiring is very straightforward as shown in following Figure. Terminal 6 (EN) can be left open if offline is not needed.

Figure 0-2: Typical Application

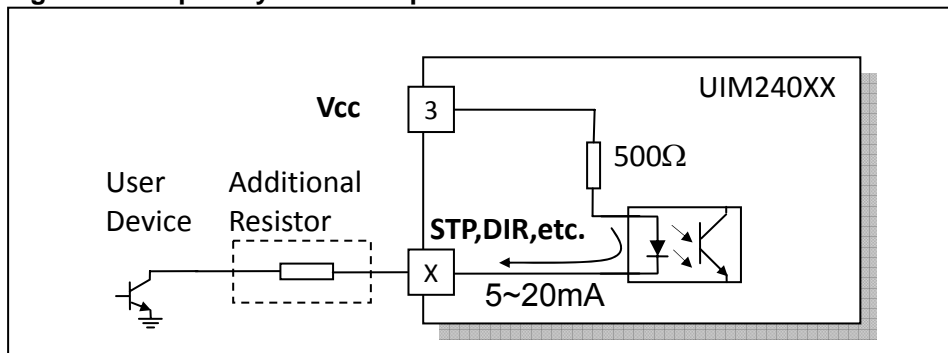


Optically Isolated Input Interface

UIM240xx controllers' logic control inputs are all optically isolated. All opto-couplers share one common anode (Vcc) as shown in above schematic diagram. Typically, Vcc is 5V. However, 3.3V or voltages higher than 5V are also acceptable, so long as the current through the opto-coupler's emitter is between 5~20mA.

Should a voltage higher than 5V be applied to Vcc, an additional resistor is needed for every terminal to ensure that the current through each emitter does not exceed 20mA.

Figure 0-3: Optically Isolated Input Interface



Characteristics

Absolute Maximum Ratings ^(†)

Supply Voltage.....	10V to 40V
Ambient temperature under bias.....	-20°C to +85°C
Storage temperature.....	-50°C to +150°C

†NOTICE: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics (Ambient Temperature 25°C)

Supply Power Voltage	12V ~ 40VDC (UIM24002 is 10V ~ 35VDC)
Motor Output Current	Max 2A/4A/8A per phase (Adjustable through on-board trimmer)
Driving Mode	PWM constant current
Stepping Resolution	Full-step, half-step, quarter-step, and sixteenth-step
Insulation Resistance	>100MΩ
Dielectric Strength	0.5KV in one minute

Communication (Ambient Temperature 25°C)

Parallel Communication	3-wire interface: Pulse, Direction, Shutdown
Micro Step Resolution	1,2,4,16 set through on-board DIP switch

Environment Requirements

Cooling	Free Air	
Working Environment	Environment	Avoid dust, oil mist and corrosive gases
	Temperature	-20 °C ~+ 85 °C
	Humidity	<80%RH, no condensation, no frosting
	Vibration	3G Max
Storage Temperature	-40 °C ~+ 150 °C	

Size and Weight

Size	42.3mm x 42.3mm x 13.5mm (L*W*H)
Wight	0.1 kg

UIM240XX Miniature Integrated Stepper Motor Controller

Functional Description

Supply Voltage

UIM240xx controllers accept a wide range input voltage from 12 to 40VDC. (UIM24002 accepts 10~35VDC) In general, higher supply voltage improves motor performance under high speed situation, but also increases the power loss and temperature raise.

Automatic Current Reduction

UIM240XX controller is featured of Auto Current Reduction. If this function is enabled, when the motor stops running, the phase current will be cut to 30% of the set value. As soon as the motor goes back to working, the current will go back to the set value. This function is enabled by turn the DIP1 (figure 0-4) to the ON position.

Adjust Output Current

UIM24002/04/08 are capable of providing maximum 2A / 4A / 8A per phase output current respectively. In specific application, the peak output current needs to be adjusted to meet the rated motor current. A trimmer (potentiometer) is provided to serve this purpose at the bottom of the controller, as shown in the following figure. Measuring the mapped voltage (V_a) when tuning the trimmer provides a easy way to set the output current.

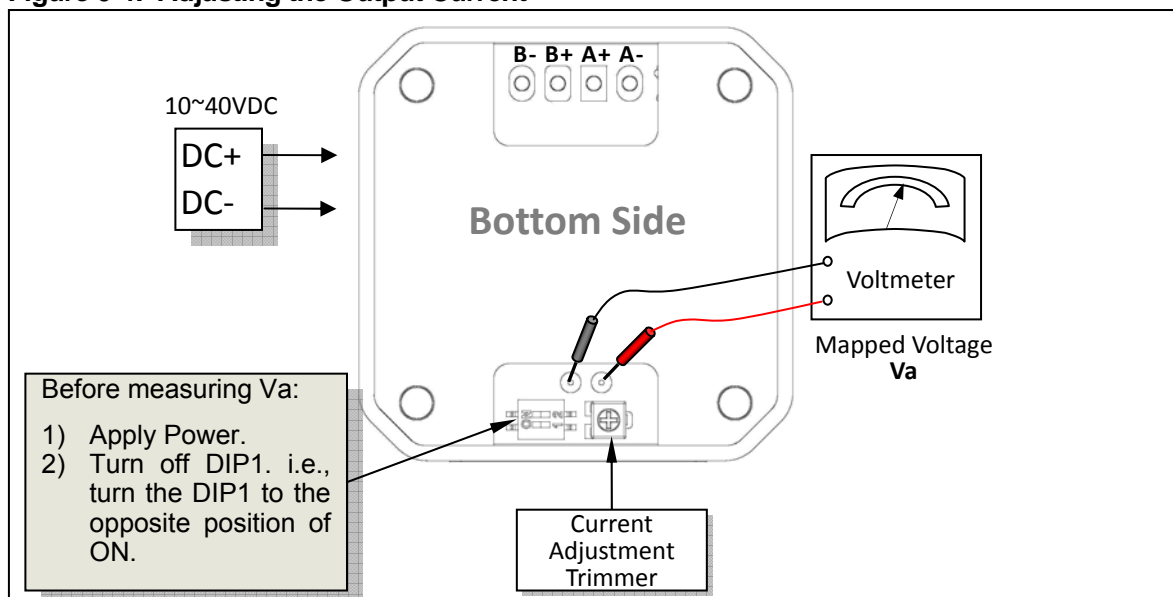
For UIM24002, a mapped voltage " V_a " of 0 - 2V proportionally represents 0 ~ 2A.

For UIM24004, a mapped voltage " V_a " of 0 - 4V proportionally represents 0 ~ 4A.

For UIM24008, a mapped voltage " V_a " of 0 - 4V proportionally represents 0 ~ 8A.

Note: (1) The controller needs to be powered before mapped voltage " V_a " can be measured. (Motor is not required to be connected at this time.) (2) DIP1 needs to be turned off. (3) After adjustment, user can choose to turn on the DIP1 to enable the automatic current reduction.

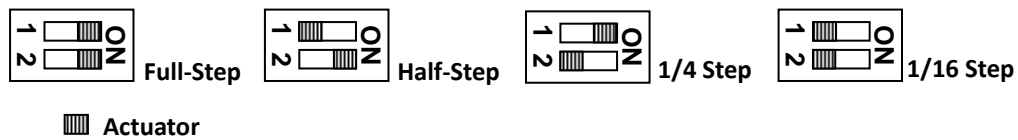
Figure 0-4: Adjusting the Output Current



Micro Step Resolution

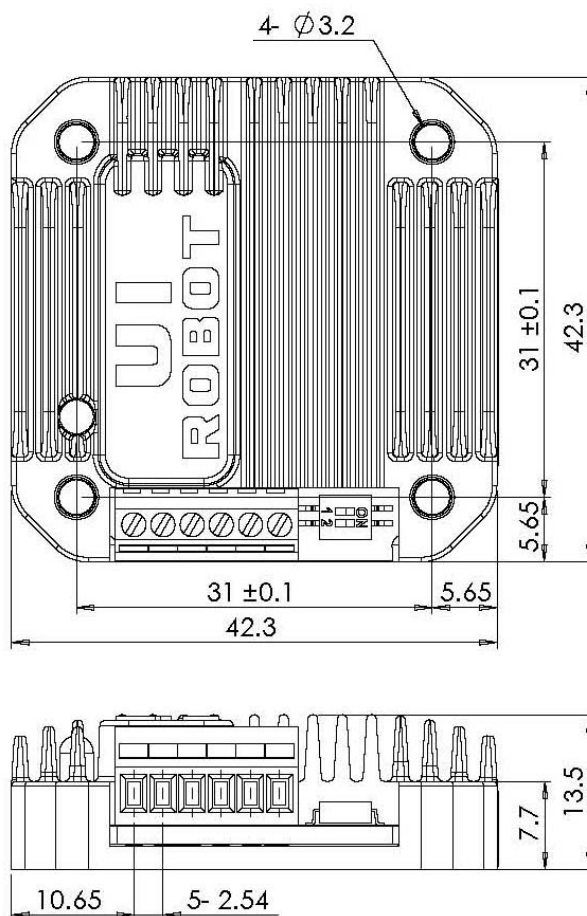
The micro step resolution is set by the DIP switch as shown in following figure.

UIM240xx controller can provide complete micro-stepping control at full-step, half-step, quarter-step, and sixteenth-step resolutions.



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Appendix A Dimensions



Unit: mm

Appendix B Installation

