

# MDrive® 34ac Hybrid Step • Torque • Speed



## Notes and Warnings

Installation, configuration and maintenance must be carried out by qualified technicians only. You must have detailed information to be able to carry out this work. This information can be found in the user manual.

- Motor overload protection and over temperature sensing is required.
- Unexpected dangers may be encountered when working with this product!
- Incorrect use may destroy this product and connected components!

The user manual is not included, but may be obtained from the Internet at: <http://www.imshome.com/downloads/manuals.html>.

## Required for Setup\*

- PC running Microsoft® Windows XP Service Pack 2 or greater.
- Hybrid Configurator GUI (available online).
- MD-CS200-000 or equivalent Lumberg Euro AC cable for AC line (required for UL recognition).
- RS-422/485 communications interface (recommended: MD-CC401-001 communication converter).

Depending on your MDrive connectors configuration, you may also need:

- I/O interface to 19-pin M23 circular connector (recommended: MD-CS100-000 or MD-CS101-000 prototype development cordset).

\* If you purchased your MDrive Hybrid with a QuickStart Kit, you have received all of the connecting cables needed for initial functional setup and system testing.

## Getting Started

All documentation, software and resources are available online at: [http://www.imshome.com/products/mdrive\\_motor\\_driver.html](http://www.imshome.com/products/mdrive_motor_driver.html).

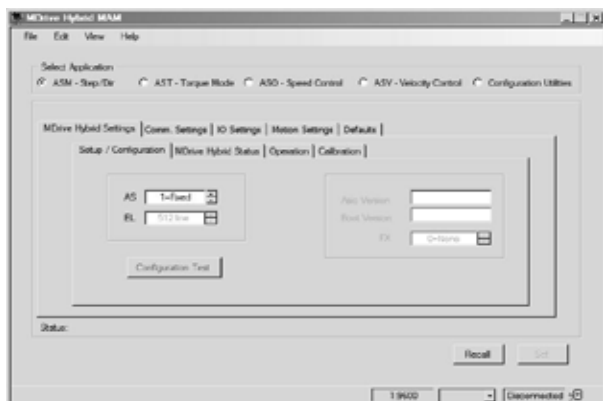
**Use of the manual is required to understand parameter settings.**

### Connecting Power and I/O

Your MDrive is configured with power and I/O on separate connectors. Please refer to the opposite side of this document for connecting details and available connectivity options including prototype development cables and mating connector recommendations.

### Connecting Communications — RS-422/485

1. Connect RS-422/485 communications converter to MDrive and PC.
2. Install the communication converter drivers onto PC (available online).
3. Install and open the Hybrid GUI.
4. Apply power to MDrive Hybrid.
5. Connect to the appropriate port.
6. Within the "Select Application" area, select the radio button for the desired mode of operation, step, torque, speed or velocity (shown below). Config-



ure parameters may be set as required by your application.

## General Specifications

### Electrical Specifications

Input Voltage Range (120 VAC MDrive)	95 to 132 VAC @ 50/60 Hz
Input Current (120 VAC MDrive)	4.2 Amps
Input Voltage Range (240 VAC MDrive)	95 to 264 VAC @ 50/60 Hz
Input Current (240 VAC MDrive)	2.1 Amps
Aux-Logic Input Voltage	+12 to +24 VDC
Aux-Logic Input Current	230 mA Max

### Environmental Specifications

Operating Temperature (non-condensing)	Heat Sink	-40°C to +75°C
	Motor	-40°C to +90°C
Sealing		IP65

### I/O Specifications

#### Motion, Direction and Enable

Voltage Range (Sinking or Sourcing)	+5 to +24 VDC
Current (+5V Max)	8.7 mA
Current (+24V Max)	14.6 mA

#### Attention Output

Collector-Emitter Voltage	60 VDC
Emitter-Collector Voltage	7 VDC
Output Current	5.5 - 42 mA

#### Analog Input

Range	0 to +5 V, 0 to +10 V, -10 to +10 V
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### Motion Specifications

Digital Filter Range	50 nS to 12.9 µS (10 MHz to 38.8 kHz)
Clock Types	Step/Direction, Up/Down, Quadrature
Step Frequency (Max)	5 MHz
Step Frequency Minimum Pulse Width	100 nS
Number of Microstep Resolution Settings	20

Available Microsteps Per Revolution									
200	400	800	1000	1600	2000	3200	5000	6400	10000
12800	20000	25000	25600	40000	50000	51200	36000 <sup>1</sup>	21600 <sup>2</sup>	25400 <sup>3</sup>

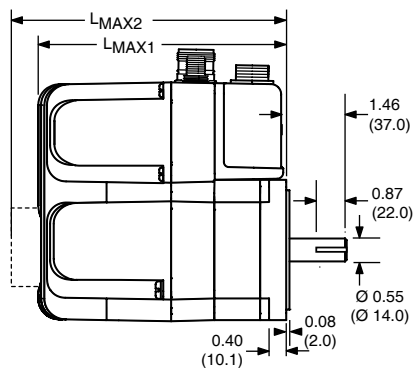
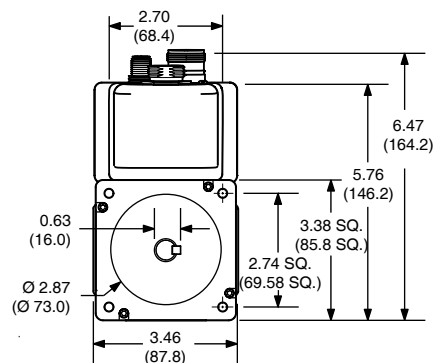
1=0.01 deg/µstep 2=1 arc minute/µstep 3=0.001 mm/µstep

## Setup Parameters

<b>Operating Mode (Select Application)</b>		Select: Step & Direction (ASM), Torque Control (AST), Speed Control (ASO) or Velocity (AST).
<b>Hybrid Settings</b>	<b>Setup/Configuration</b>	Turn Hybrid off or on in fixed or variable mode; set and confirm encoder line count.
	<b>Operation</b>	Set control bounds for motor torque and speed, lead, lag, and make-up of lost steps.
	<b>Hybrid Status</b>	Display status alerts of 8 pre-programmed fields, read-only.
	<b>Calibration</b>	To maintain synchronization, select options for motor's rotor-to-stator physical position.
<b>Analog Settings</b>		Set analog ranges, select input mode: 0-5V, 0-10V, -10 to +10V (not applicable for Step mode).
<b>Communication Settings</b>		Set baud rate; enable/disable parity mode and features; Check Sum integrity quality assurance
<b>I/O Settings</b>		Clock and filter settings; Attention Output with 11 pre-programmed fields to select among.
<b>Motion Settings</b>	<b>All operating modes</b>	Set various motion settings, which vary with the operating mode selected ex. Current, MSEL.
	<b>Speed control mode</b>	Additional settings: for setting acceleration, deceleration, velocity and flags.
<b>Defaults</b>		Restore system defaults or previously stored settings; view current communication settings.

## Mechanical Specifications

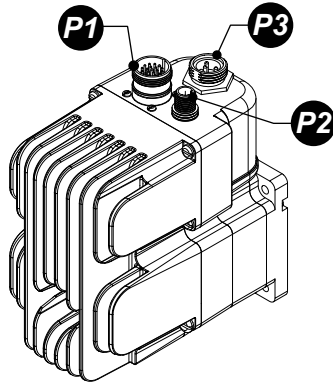
Dimensions in inches (mm)



Motor stack length	Lmax (1)	Lmax2 (2)
Single	6.1 (155.0)	7.1 (180.4)
Double	6.9 (174.3)	7.9 (199.7)
Triple	8.4 (214.3)	9.4 (239.7)

(1) Single shaft.  
(2) Control knob.

# MDrive 34ac Hybrid Step • Torque • Speed Connectivity Options

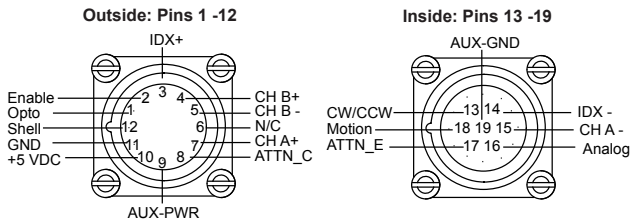


Connector Style                      Function

- P1** 19-pin M23 Circular (male)..... I/O
- P2** 5-Pin M12 Circular (female)..... Communications
- P3** 3-pin Euro AC (male)..... AC Power

## **P1** I/O

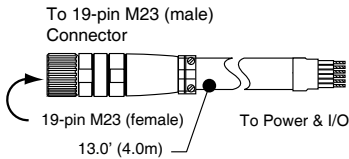
19-pin M23 circular connector (male)



### Prototype Development Cordset

p/n (straight connector): MD-CS100-000  
 p/n (right-angle connector): MD-CS101-000

Pre-wired mating connector interfaces to the 19-pin M23 circular connector, with flying leads other end, for quick test/development.



Wire Colors	Function
Violet	OPTO
Red	ENABLE
Gray	IDX +
Red/Blue	CH B+
Green	CH B-
Blue	N/C
Gray/Pink	CH A+
White/Green	ATTN OUT C
White/Yellow	AUX-PWR
White/Gray	+5V
Black	GND
Green/Yellow	Shell
Yellow/Brown	DIR
Brown/Green	IDX-
White	CH A-
Yellow	ANALOG
Pink	ATTN OUT E
Gray/Brown	MOTION
Brown	AUX-GND

### Mating Connector Recommendations

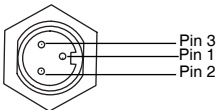
MD-CS100-000 recommended with: 19-pin M23 connector.

For comparable connector only vendors shop:

- Lumberg
- Phoenix
- Turck
- RDE Connectors

## **P3** AC Power

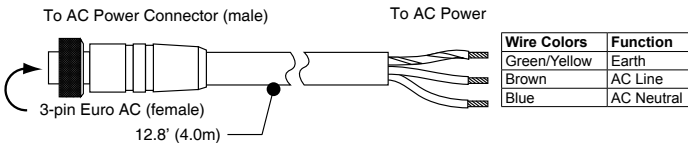
3-pin Euro AC connector (male)



### Prototype Development Cordset

p/n (straight connector): MD-CS200-000  
 p/n (right-angle connector): MD-CS201-000

Pre-wired mating connector interfaces to the 3-pin circular EuroAC connector, with flying leads other end, for quick test/development.



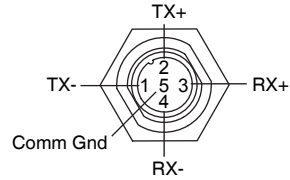
### Mating Connector Recommendations

The following field-solderable mating connector is recommended for use with the MDrive Hybrid 34ac.

Lumberg: RKC 30/11

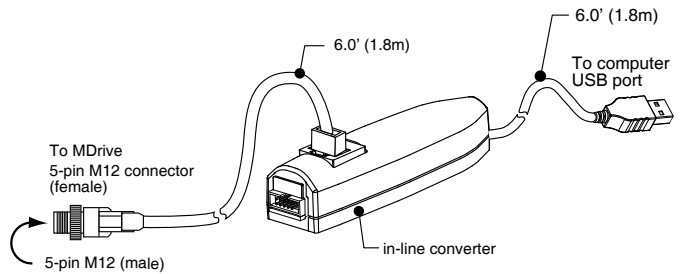
## **P2** Communications — RS-422/485

5-pin M12 circular connector (female)



### Communications Converter p/n: MD-CC401-001

Electrically isolated in-line USB to RS-422/485 converter pre-wired with mating connector to conveniently program and set configuration parameters.



### Mating Connector Recommendations

MD-CC401-001 recommended with: 5-pin M12 connector.

For comparable connector only vendors shop:

- Lumberg
- Phoenix
- Turck
- RDE Connectors

## UL Conditions of Acceptability

When used in end-product equipment, the following are among the considerations to be made:

The temperature tests were conducted with the device's face mounted to an aluminum heat sink. For devices with the frame designation 34, the dimensions for the heat sink were 10" x 10" x 1/4". The shaft was also provided with aluminum wheels, approximately 4" in diameter and 1/4" thick.

These devices are intended for installation in a Pollution Degree 2 (controlled) environment. Suitability of the spacings shall be considered in end-use application.

The enclosure of this device is intended as the final end-use enclosure.

This device does not provide motor overload protection.

This device has not been subjected to the short circuit test. This test shall be considered in the end-product investigation.

The following MDrive AC products are excluded from UL Recognition:



MDrive AC models with a rear motor shaft extension, i.e. Control Knob versions

