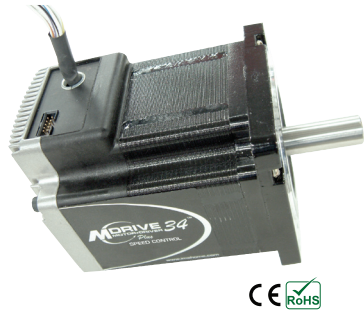


Quick Reference

MDrive34Plus Speed Control with 12" Flying Leads



**IMS™ INTELLIGENT MOTION
SYSTEMS, INC.**

by Schneider Electric



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 manuals.

- Unexpected dangers may be encountered when working with this product!
- Incorrect use may destroy this product and connected components!

The user manuals are not included. You can obtain them from the Internet at: http://www.imshome.com/mdrive34plus_mdo.html.

Required for Setup*

- PC running Microsoft® Windows XP Service Pack 2 or greater.
- IMS SPI Motor Interface (available online)
- +12 to +75 VDC unregulated linear or switching power supply. (Recommended: IMS IP806 or ISP300-7)
- 10 kΩ Potentiometer for velocity control (or appropriate current source if using current mode)
- Two (2) SPST switches or controller I/O points to control axis direction and the on/off state of the internal clock generator.
- SPI communications interface (Recommended: IMS MD-CC300-001 Communication Converters)

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

- Breakout board and cabling to interface power and I/O to the 12" Flying Leads.

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

Getting Started

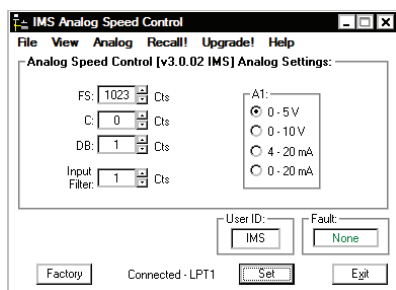
All documentation, software and resources are available online at: http://www.imshome.com/mdrive34plus_mdo.html

Connecting Power and I/O

Your MDrivePlus is configured with power and I/O signals on 12" flying leads. Please refer to the opposite side of this document for connecting details and available IMS connectivity options including Prototype Development Cables and Mating Connector Kits.

Connecting Communications

1. Connect IMS USB to SPI communications converter to MDrivePlus and PC.
2. Install the communication converter drivers onto PC (available online).
3. Install and open SPI Motor Interface.
4. Apply power to MDrivePlus.
5. Parameters may be adjusted via two screens, the Motor Settings screen or the I/O settings screen (shown below), accessible via the View menu.



Specifications

Electrical Specifications

Input Voltage (+V) Range*	+12 to +75 VDC
Max Power Supply Current (Per MDrive34Plus)*	4 A

*Actual Power Supply Current will depend on Voltage and Load.

Environmental Specifications

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

I/O Specifications

Analog Inputs

A/D Resolution	10 Bit
Range (Voltage Mode)	0 to +5VDC, 0 to +10 VDC
Range (Current Mode)	0 to 20 mA, 4 to 20 mA
Range (PWM)	15 to 20 kHz

Stop/Start and Direction

Range	TTL
Logic Threshold (Logic 0)	< 0.8 VDC
Logic Threshold (Logic 1)	> 2.2 VDC
Internal Pull-Up Resistance	20 kΩ
Protection	Transient

Step/Direction Outputs

Type	Open Drain
Drain-Source Voltage	+100 VDC
Continuous Drain Current	100 mA
Output Pulse Width (Step Clock)	100 ns to 12.8 μs (550 ns Default)

Communications Specifications

Protocol	SPI
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Motion Specifications

Velocity

Oscillator Frequency (Max.)	5 MHz
Resolution	0.5961 Steps/Second

Acceleration/Deceleration

Range	1.5 x 10 ⁹ Steps/Second ²
Resolution	90.9 Steps/Second ²

Number of Microstep Resolution Settings	20
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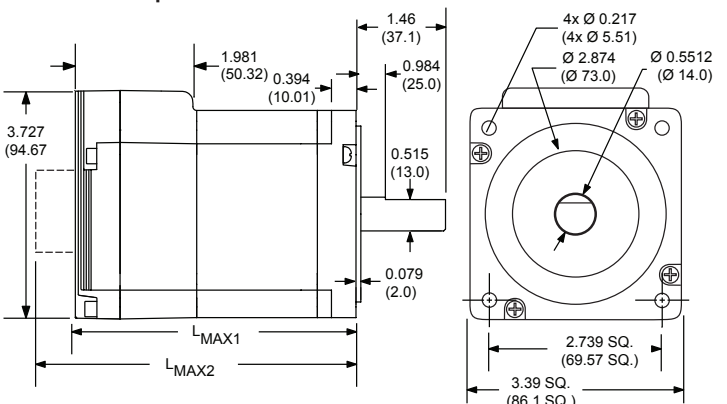
Available Microsteps Per Revolution									
200	400	800	1000	1600	2000	3200	5000	6400	10000
12800	20000	25000	25600	40000	50000	51200	36000 ¹	21600 ²	25400 ³

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

Setup Parameters

MDrivePlus Speed Control Setup Parameters				
Name	Function	Range	Units	Default
ACCL	Acceleration	91 to 1.5 X 10 ⁹	steps/sec ²	1,000,000
C	Joystick Center	0 to 1022	counts	0
DB	Deadband	0 to 255	counts	1
DECL	Deceleration	91 to 1.5 X 10 ⁹	steps/sec ²	1,000,000
DIR	Motor Direction Override	Clockwise/Counterclockwise	—	CW
FAULT	Fault/Checksum Error	Error Code	—	None
FS	Full Scale	1 to 1023 (205 to 1023 – 4 to 20 mA mode)	counts	1023
HCDT	Hold Current Delay Time	HCDT + MSDT <= 65535	milliseconds	500
IF	Analog Input Filter	1 to 1000	counts	1
IMODE	Analog Input Mode	0 to +5 VDC, 0 to +10 VDC, 4 to 20 mA, 0 to 20 mA, 15 to 25kHz PWM	—	0 to +5 VDC
MHC	Motor Hold Current	0 to 100	percent	5
MRC	Motor Run Current	1 to 100	percent	25
MSDT	Motor Settling Delay Time	MSDT + HCDT <= 65535	milliseconds	0
MSEL	Microstep Resolution	1, 2, 4, 5, 8, 10, 16, 25, 32, 50, 64, 100, 108, 125, 127, 128, 180, 200, 250, 256	μsteps per full step	256
STEPW	Output Step Width	Square Wave, 100 ns to 12.8 μs	ns - μs	550 ns
SSD	Stop/Start Debounce	0 to 255	milliseconds	0
VI	Initial Velocity	0 to < VM	steps/sec	1000
VM	Maximum Velocity	VI to 5,000,000	steps/sec	768000
TEMP	Warning Temperature	0 to 85	°C	80
USER ID	User ID	1 to 3 Characters	Viewable ASCII	IMS

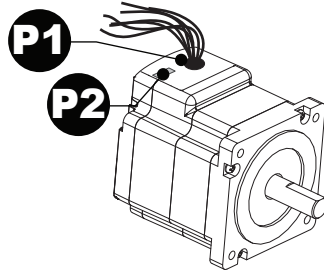
Mechanical Specifications



Motor Length	Dimensions in inches (mm)	
	LMAX1 (Single Shaft & Internal Encoder)	LMAX2 (Control Knob)
Single	3.81 (96.77)	4.52 (114.81)
Double	4.60 (116.84)	5.31 (134.87)
Triple	6.17 (156.72)	6.88 (174.75)

All documentation, software, program examples and resources are available online at: http://www.imshome.com/mdrive34plus_mdo.html

MDrive34Plus Speed Control Connectivity Options



Connector Style	Function
P1 Flying Leads.....	I/O, Power & Encoder
P2 10-pin IDC.....	Communications

P1 I/O & Power

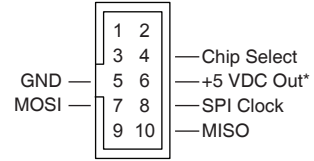
Flying Leads

Base Model	
Wire Color	Function
Violet	Stop/Start
White/Brown	Speeds A1/A2 Select/PWM
White	Opto Reference
White/Orange	Step Clock Output
White/Blue	Direction Output
Blue	CW/CCW Direction
Green	Speed Control 1
White/Green	Speed Control 2
Yellow	+5 VDC Output
Gray	Logic Ground
Black	Ground
Red	+V

Optional Internal Optical Encoder		
Wire Color	Single-End	Differential
Yellow/Black	GND	GND
Yellow/Violet	IDX	IDX+
Yellow/Blue	CH A	CH A+
Yellow/Red	+5 VDC	+5 VDC
Yellow/Brown	CH B	CH B+
Yellow/Gray	—	IDX -
Yellow/Green	—	CH A-
Yellow/Orange	—	CH B-

P2 Communications

10-pin IDC

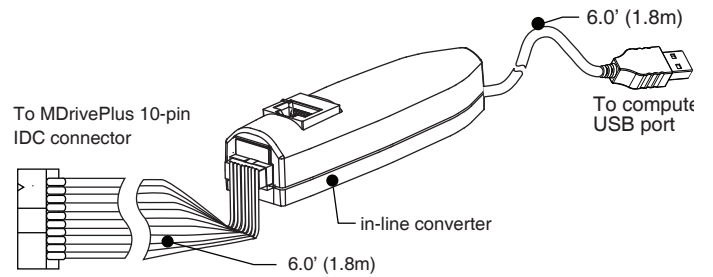


pins not labeled are no connect.

*used to power the MD-CC300-001 only.

Communications Converter p/n: MD-CC300-001

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



Mating Connector Kit p/n: CK-01

Use to make your own cables, kit contains 5 mating connector shells for making interface cables.

IDC Parts Shell: SAMTEC TCSD-05-01-N
 Ribbon Cable: AMP 1-57051-9