

# Quick Reference MDrive17Plus Microstepping



**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/mdrive17plus\\_mdm.html](http://www.imshome.com/mdrive17plus_mdm.html).

## Required for Setup\*

- PC running Microsoft® Windows XP Service Pack 2 or greater.
- IMS SPI Motor Interface (available online)
- +12 to +48 VDC unregulated linear or switching power supply. (Recommended: IMS IP404 or ISP200-4)
- 0 to 5 MHz clock signal for step clock, may be a controller high speed output or signal generator.
- SPST switch or controller I/O point to control axis direction.
- SPI communications interface (Recommended: IMS MD-CC300-001 or MD-CC303-001 Communication Converters)

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

- If using a 7-pin pluggable terminal IMS recommends 22 AWG shielded twisted pairs for logic wiring. Wire gauge for power connection varies with the distance from the MDrive and current. See MDrivePlus product manual.
- I/O, Power and Communications interface to 12-pin wire crimp connector. (Recommended: IMS PD12-1434-FL3 Prototype Development Cable)

\* 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

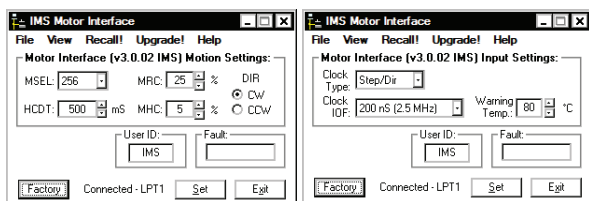
All documentation, software and resources are available online at: [http://www.imshome.com/mdrive17plus\\_mdm.html](http://www.imshome.com/mdrive17plus_mdm.html)

## Connecting Power and I/O

Your MDrivePlus is configured with power and I/O combined on a single connector. 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.



Motor Settings Screen

I/O Settings Screen

## Specifications

### Electrical Specifications

Input Voltage (+V) Range*	+12 to +48 VDC
Max Power Supply Current (Per MDrive17Plus)*	2 A

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

### Environmental Specifications

Operating Temperature (non-condensing)	Heat Sink	-40°C to +85°C
	Motor	-40°C to +100°C

### Isolated Input Specifications

#### Step Clock, Direction and Enable

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

### 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>

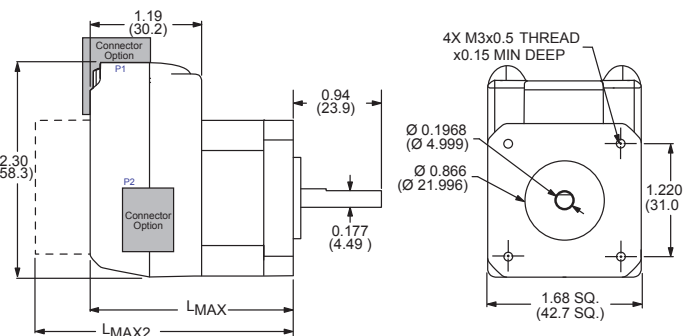
1=0.01 deg/µstep 2=1 arc minute/µstep 3=0.001 mm/µstep

## Setup Parameters

### Setup Parameters

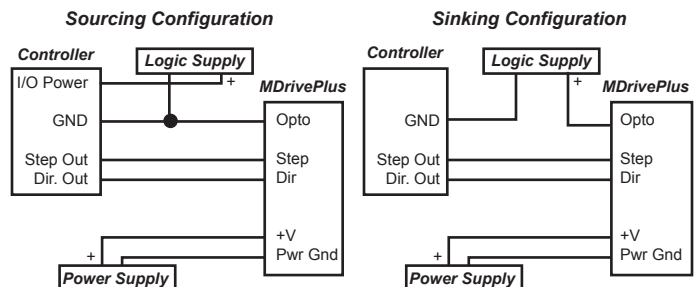
Name	Function	Range	Units	Default
MHC	Motor Hold Current	0 to 100	Percent	5
MRC	Motor Run Current	1 to 100	Percent	25
MSEL	Microstep Resolution	See Motion Specifications	µsteps/ Full Step	256
DIR	Motor Direction Override	0/1	—	CW
HCDT	Hold Current Delay Time	0 or 2 - 65535	mSec	500
CLK TYPE	Clock Type	See Motion Specifications	—	Step/ Direction
CLK IOF	Clock Input Filter	50 nS to 12.9 µS (10 MHz to 38.8 kHz)	nS (MHz)	200 nS (2.5MHz)
EN ACT	Enable Active High/Low	High/Low	—	High
USER ID	User ID	3 Characters Viewable ASCII	Viewable ASCII	IMS

## Mechanical Specifications

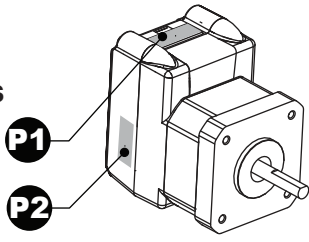


Motor Length	Dimensions in inches (mm)	
	LMAX1 (Single Shaft or Internal Encoder)	LMAX2 (Control Knob or External Encoder)
Single	2.20 (55.9)	2.79 (70.9)
Double	2.43 (61.7)	3.02 (76.7)
Triple	2.77 (70.4)	3.37 (85.6)

## Minimum Required Connections



# MDrive17Plus Microstepping Connectivity Options

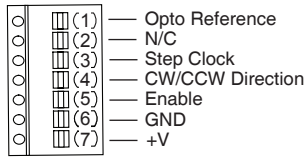


Connector Style	Function
<b>P1</b> Pluggable Terminal.....	I/O and Power
Flying Leads.....	I/O and Power
12-pin Wire Crimp.....	I/O, Power and Communications
<b>P2</b> 10-pin IDC.....	Communications

## **P1** I/O & Power

Pluggable terminal or flying leads

### Pluggable Terminal



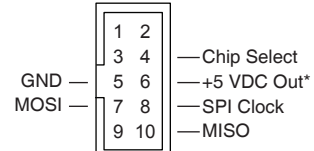
User Supplied Recommended  
Wire: 22 AWG Stranded

### Flying Lead Colors

Wire Color	Function
White	Opto Reference
Orange	Step Clock
Blue	Direction
Enable	Brown
Black	Ground
Red	+V

## **P2** Communications

10-pin IDC

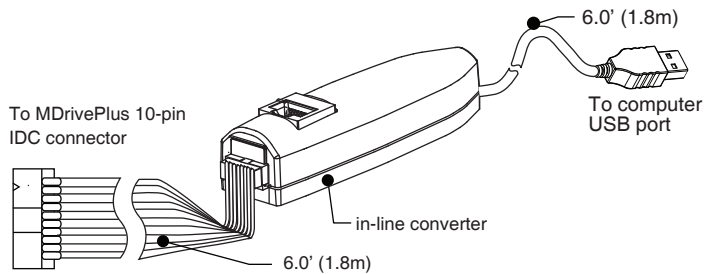


pins not labeled are no connect.

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

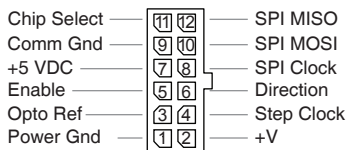
### Communications Converter p/n: MD-CC300-001

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



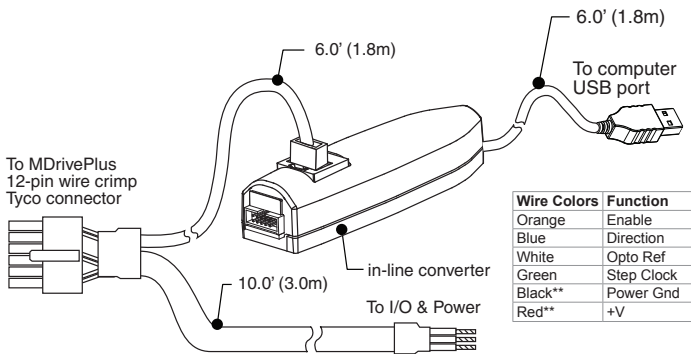
## **P1** I/O, Power and Communications

12-pin wire crimp



### Communications Converter p/n: MD-CC303-001

Electrically isolated in-line USB to SPI converter pre-wired with mating connector to conveniently program and set configuration parameters. A secondary cable from the mating connector provides interface to power and I/O.



Wire Colors	Function
Orange	Enable
Blue	Direction
White	Opto Ref
Green	Step Clock
Black**	Power Gnd
Red**	+V

### Mating Connector Kit p/n: CK-01

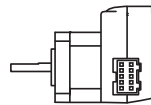
Use to make your own cables, kit contains 5 mating connector shells for making interface cables.

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

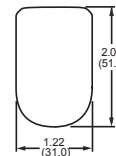
## Encoder Options

Three (3) different encoder styles are available, detailed below.

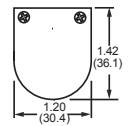
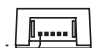
### Internal Differential Magnetic



### External Differential Optical

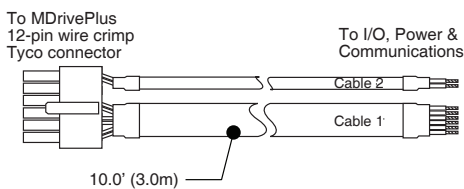


### External Single-End Optical



### Prototype Development Cable p/n: PD12-1434-FL3

Speed test and development with pre-wired mating connector.



Wire Colors	Function
Gray/White	Chip Select
White/Gray	SPI MOSI
White/Brown	+5 VDC
Brown/White	SPI MISO
White/Green	SPI Clock
Green/White	Comm Gnd
White/Orange	Enable
Orange/White	Direction
White/Blue	Opto Ref
Blue/White	Step Clock
Black	Power Gnd
Red	+V
Uninsulated	Drain Wire

## Optional Encoder Cables

p/n: ED-CABLE-JST10  
10.0' (3.0 m)

wire color: signal  
Orange/White: CH B-  
White/Orange: CH B+  
White/Blue: IDX+  
Blue/White: IDX-  
White/Green: CH A+  
Green/White: CH A-  
White/Brown: Ground  
Brown/White: N/C

p/n: ED-CABLE-6  
6.0' (1.8 m)

wire color: signal  
Orange/White: +5 VDC In  
White/Orange: Ground  
White/Blue: CH A-  
Blue/White: CH A+  
White/Green: CH B-  
Green/White: CH B+  
White/Brown: IDX-  
Brown/White: IDX+

p/n: ES-CABLE-2  
12" (30.4 cm)

wire color: signal  
(Pin 1) Brown: Ground  
Violet: IDX  
Blue: CH A  
Orange: +5 VDC In  
Yellow: CH B

### Mating Connector Kit p/n: CK-03

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

Tyco Parts Shell: 1-794617-2  
Pins: 794610-1