MFORCE™ POWER DRIVE Plus MICROSTEPPING

FEATURES

- High Performance Microstepping Driver
- Advanced 2nd Generation Current Control for Exceptional Performance and Smoothness
- Single Supply: +12 to +75 VDC
- Low Cost
- Compact Package
- High Output Current up to 5 Amps RMS, 7 Amps Peak (Per Phase)
- 20 Microstep Resolutions up to 51,200 Steps Per Rev Including: Degrees, Metric, Arc Minutes
- Optically Isolated Logic Inputs will Accept +5 to +24 VDC Signals, Sourcing or Sinking
- Automatic Current Reduction
- Configurable:
  - Motor Run/Hold Current
  - Motor Direction vs. Direction Input
  - Microstep Resolution
  - Clock Type: Step and Direction, Quadrature, Step Up and Step Down
  - Programmable Digital Filtering for Clock and Direction Inputs
- Setup Parameters May Be Switched On-The-Fly
- Dual Mounting Configurations
- Interface via Pluggable Locking Wire Crimp Connectors
- Graphical User Interface (GUI) for Quick and Easy Parameter Setup

DESCRIPTION

The Microstepping MForce PowerDrive is a high performance, low cost microstepping driver that delivers unsurpassed smoothness and performance achieved through IMS's advanced 2nd generation current control. By applying innovative techniques to control current flow through the motor, resonance is significantly dampened over the entire speed range and audible noise is reduced.

Microstepping MForce PowerDrives accept a broad input voltage range from +12 to +75 VDC, delivering enhanced performance and speed. Oversized input capacitors are used to minimize power line surges, reducing problems that can occur with long runs and multiple drive systems. An extended operating range of –40° to +85°C provides long life, trouble free service in demanding environments.

The high, per phase output current of up to 5 Amps RMS, 7 Amps Peak, allows the extremely compact MForce PowerDrive to control a broad array of motors from size 23 to size 42.

The microstepping drive accepts up to 20 resolution settings from full to 256 microsteps per full step, including: degrees, metric and arc minutes. These settings may be changed on-the-fly or downloaded and stored in nonvolatile memory with the use of a simple GUI which is provided. This eliminates the need for external switches or resistors. Parameters are changed via an SPI port.

The versatile Microstepping MForce PowerDrive comes with dual mounting configurations to fit various system needs. All interface connections are accomplished using pluggable locking wire crimp connectors. Optional cables are available for ease of connecting and configuring the MForce, and are recommended with first order.

The Microstepping MForce PowerDrive is a compact, powerful and inexpensive solution that will reduce system cost, design and assembly time for a large range of applications.

CONFIGURING

The IMS SPI Motor Interface software is an easy to install and use GUI for configuring Microstepping MForce from a computer's USB port. GUI access is via the IMS SPI Motor Interface included on the CD shipped with the product, or from www.imshome.com.

The IMS SPI Motor Interface features:

- Easy installation.
- Automatic detection of MForce version and communication configuration.
- Will not set out-of-range values.
- Tool-tips display valid range setting for each option.
- Simple screen interfaces.

MForce PowerDrive – MICROSTEPPING

STANDARD SPECIFICATIONS

INPUT VOLTAGE (+V)	Range	+12 to +75 VDC	
OUTPUT CURRENT	RMS (Max)	5 Amps	
	Peak (Per Phase)	7 Amps	
ISOLATED INPUT	Step Clock, Direction and Enable		
	Voltage Range	+5 to +24 VDC Sourcing or Sinking	
MOTION	Digital Filter Range	50 nS to 12.9 µS (10 MHz to 38.8 kHz)	
	Clock Types	Step/Direction, Quadrature, Step Up/Step Down	
	Step Frequency	2 MHz Default (5 MHz Max)	
	Resolution	Number of Settings	20
		Steps Per Revolution	200, 400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 20000, 25000, 25600, 40000, 50000, 51200, 36000 (0.01 deg/µstep), 21600 (1 arc minute/µstep), 25400 (0.001mm/µstep)
THERMAL	Heat Sink Temperature	–40° to +85°C	

SETUP PARAMETERS

	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	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
DIR	Motor Direction Override	0/1	—	CW
HCDT	Hold Current Delay Time	0 or 2–65535	mSec	500
CLK TYPE	Clock Type	Step/Dir, Quadrature, Up/Down	—	Step/Dir
CLK IOF	Clock and Direction Filter	50 nS to 12.9 µS (10 MHz to 38.8 kHz)	nS (MHz)	200 nS (2.5 MHz)
USER ID	User ID	Customizable	1–3 characters	IMS
EN ACT	Enable Active	High/Low	—	High
WARN TEMP	Over Temperature Warning	0 to 125°C	°C	80°C

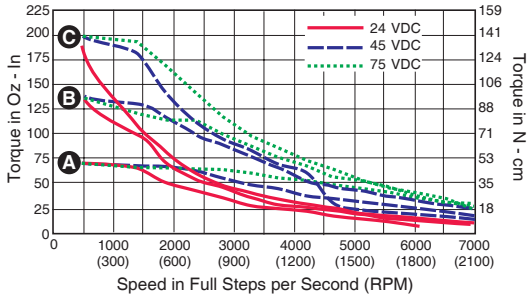
All parameters are set using the supplied IMS SPI Motor Interface GUI and may be changed on-the-fly.
An optional Parameter Setup Cable is recommended with first orders.

MOTOR RECOMMENDATIONS

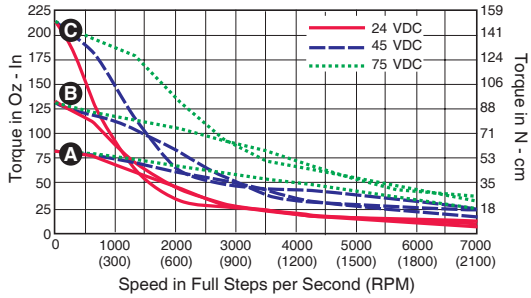
IMS PART NUMBERS	**Size 23** (2.4 Amps)	**Size 23** (3.0 Amps)	**Size 23** (6.0 Amps)	**Size 34** (6.4 Amps)
SINGLE LENGTH	M-2218-2.4	M-2218-3.0	M-2218-6.0	M-3424-6.3
DOUBLE LENGTH	M-2222-2.4	M-2222-3.0	M-2222-6.0	M-3431-6.3
TRIPLE LENGTH	M-2231-2.4	M-2231-3.0	M-2231-6.0	M-3447-6.3

MOTOR PERFORMANCE — Speed-Torque

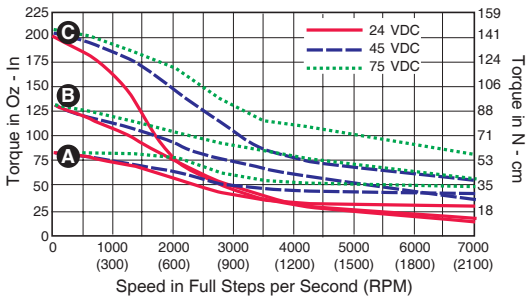
NEMA 23 — 2.4 Amps RMS



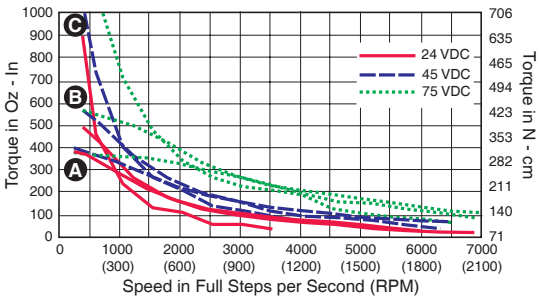
NEMA 23 — 3.0 Amps RMS

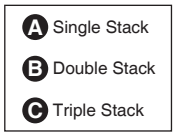


NEMA 23 — 6.0 Amps RMS



NEMA 34 — 6.3 Amps RMS





PIN ASSIGNMENTS

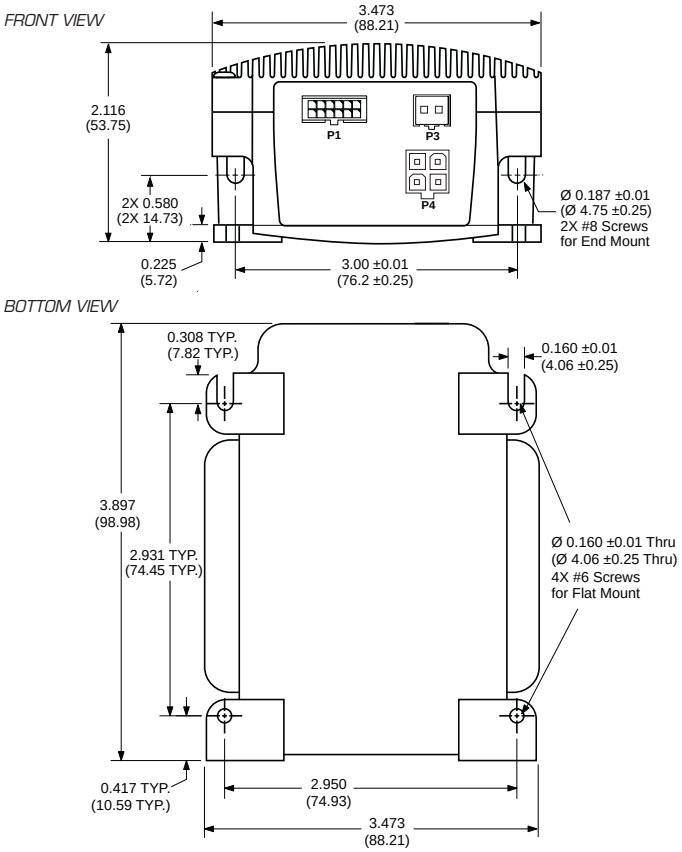
P1: I/O & COMM CONNECTOR	
Pluggable Locking Wire Crimp	**Function**
Pin 1	No Connect
Pin 2	No Connect
Pin 3	Optocoupler Reference
Pin 4	Step Clock Input
Pin 5	Enable Input
Pin 6	CW/CCW Direction Input
Pin 7	+5 VDC Output
Pin 8	SPI Clock
Pin 9	Communications Ground
Pin 10	SPI Master Out – Slave In
Pin 11	SPI Chip Select
Pin 12	SPI Master In – Slave Out

P3: POWER CONNECTOR	
Pluggable Locking Wire Crimp	**Function**
Pin 1	+V (+12 to +75 VDC)
Pin 2	Power/Aux Ground

P4: MOTOR CONNECTOR	
Pluggable Locking Wire Crimp	**Function**
Pin 1	Phase A
Pin 2	Phase /A
Pin 3	Phase B
Pin 4	Phase /B

MECHANICAL SPECIFICATIONS

Dimensions in Inches (mm)



OPTIONS

Motors and Encoders

IMS offers a wide range of motors, encoders and accessories recommended for interface with the Microstepping MForce PowerDrive. For complete specifications on these products, please visit the IMS web site at www.imshome.com.

Power Supplies

IMS recommends the following power supplies for operating the MForce PowerDrive: IP804, IP806, ISP300-7. For complete specifications, go to www.imshome.com

ACCESSORIES

Parameter Setup Cable and Adapter

The optional 12.0' (3.6m) parameter setup cable and adapter, MD-CC300-000 and MD-ADP-1723C, facilitate communications interface from the Microstepping MForce PowerDrive's 12-pin P1 connector to a PC's USB port with pluggable mating connectors. Recommended with first order.

Prototype Development Cables

To speed prototyping, 10.0' (3.0m) development cables are available with pluggable locking wire crimp mates to:

I/O & Comm: 12-Pin Connector PD12-1434-FL3
Power: 2-pin Connector PD02-3400-FL3
Motor Interface: 4-pin Connector PD04-MF34-FL3

Accessories details at: www.imshome.com/cables_cordsets.html

ORDER INFORMATION

INTELLIGENT MOTION SYSTEMS, INC.

www.imshome.com

Excellence in Motion™

370 N. Main St., P.O. Box 457
Marlborough, CT 06447 U.S.A.
Phone: 860/295-6102
Fax: 860/295-6107
E-mail: info@imshome.com

TECHNICAL SUPPORT (U.S.A.)
Phone: 860/295-6102
Fax: 860/295-6107
E-mail: etech@imshome.com

IMS ASIA PACIFIC OFFICE
30 Raffles Pl., 23-00 Caltex House
Singapore 048622
Phone: +65/6233/6846
Fax: +65/6233/5044
E-mail: wllee@imshome.com

IMS EUROPEAN SALES MGT.
4 Quai Des Etroits
69005 Lyon, France
Phone: +33/4 7256 5113
Fax: +33/4 7838 1537
E-mail: bmartinez@imshome.com

IMS UK Ltd.
25 Barnes Wallis Road
Segensworth East
Fareham, Hampshire PO15 5TT
Phone: +44/0 1489-889825
Fax: +44/0 1489-889857
E-mail: mcheckley@imshome.com

U.S.A. SALES OFFICES

Eastern Region
Phone: 973/661-1270
Fax: 973/661-1275
E-mail: jroake@imshome.com

Central Region
Phone: 260/402-6016
Fax: 419/858-0375
E-mail: dwaksman@imshome.com

Western Region
Phone: 602/578-7201
E-mail: dweisenberger@imshome.com

DISTRIBUTED BY:

REV052307

IMS Product Disclaimer and most recent product information at www.imshome.com.